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FCC RADIO TEST REPORT

Applicant's company	**TP-Link Technologies Co., Ltd.**
Applicant Address	Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Nanshan, Shenzhen, 518057 China
FCC ID	**TE7C3150V2**
Manufacturer's company	**TP-Link Technologies Co., Ltd.**
Manufacturer Address	Building 24 (floors 1,3,4,5) and 28 (floors1-4) Central Science and Technology Park, Nanshan, Shenzhen, 518057 China

Product Name	AC3150 Wireless MU-MIMO Gigabit Router
Brand Name	TP-Link
Model No.	Archer C3150
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5150 ~ 5250 MHz / 5725 ~ 5850 MHz
Received Date	Nov. 02, 2016
Final Test Date	Feb. 06, 2017
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 v01r03, 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

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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR5O1803-03AB	Rev. 01	Initial issue of report	Feb. 15, 2017

1. VERIFICATION OF COMPLIANCE

Product Name	:	AC3150 Wireless MU-MIMO Gigabit Router
Brand Name	:	TP-Link
Model No.	:	Archer C3150
Applicant	:	TP-Link Technologies Co., Ltd.
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. 02, 2016 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.

Cliff Chang
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	15.207	AC Power Line Conducted Emissions	Complies
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
4.5	15.407(a)	Power Spectral Density	Complies
4.6	15.407(b)	Radiated Emissions	Complies
4.7	15.407(b)	Band Edge Emissions	Complies
4.8	15.407(g)	Frequency Stability	Complies
4.9	15.203	Antenna Requirements	Complies

3. GENERAL INFORMATION

3.1. Product Details

Items	Description
Product Type	WLAN (4TX, 4RX)
Radio Type	Intentional Transceiver
Power Type	From power adapter
Modulation	IEEE 802.11a: OFDM IEEE 802.11n/ac: see the below table
Data Modulation	IEEE 802.11a/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) IEEE 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM, 1024QAM)
Data Rate (Mbps)	IEEE 802.11a: OFDM (6/9/12/18/24/36/48/54) IEEE 802.11n/ac: see the below table
Frequency Range	5150 ~ 5250 MHz / 5725 ~ 5850 MHz
Channel Number	9 for 20MHz bandwidth ; 4 for 40MHz bandwidth 2 for 80MHz bandwidth
Channel Bandwidth (99%)	Band 1: <For Beamforming Mode> IEEE 802.11ac MCS0/Nss1 (VHT20): 17.97 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 36.61 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.25 MHz Band 4: <For Non-Beamforming Mode> IEEE 802.11a: 17.02 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 18.58 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.92 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.83 MHz <For Beamforming Mode> EEE 802.11ac MCS0/Nss1 (VHT20): 18.06 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 36.90 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 76.41 MHz

Maximum Conducted Output Power	Band 1: **<For Beamforming Mode>** IEEE 802.11ac MCS0/Nss1 (VHT20): 26.89 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 26.92 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 22.17 dBm Band 4: **<For Non-Beamforming Mode>** IEEE 802.11a: 29.92 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 29.90 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 29.81 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 25.42 dBm **<For Beamforming Mode>** IEEE 802.11ac MCS0/Nss1 (VHT20): 26.94 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 26.97 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 25.42 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 for 802.11ac in 5GHz.	☐ Without beamforming
Operate Condition	☒ Indoor	☐ Outdoor

Antenna and Bandwidth

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

IEEE 11n/ac Spec.

Protocol	Number of Transmit Chains (NTX)	Data Rate / MCS
802.11n (HT20)	4	MCS 0-31
802.11n (HT40)	4	MCS 0-31
802.11ac (VHT20)	4	MCS0-11/Nss1-4
802.11ac (VHT40)	4	MCS0-11/Nss1-4
802.11ac (VHT80)	4	MCS0-11/Nss1-4
Note 1: IEEE Std. 802.11n modulation consists of HT20 and HT40 (HT: High Throughput). Then EUT supports HT20 and HT40. Note 2: IEEE Std. 802.11ac modulation consists of VHT20, VHT40, VHT80 and VHT160 (VHT: Very High Throughput). Then EUT supports VHT20, VHT40 and VHT80. Note 3: Modulation modes consist of below configuration: HT20/HT40: IEEE 802.11n, VHT20/VHT40/VHT80: IEEE 802.11ac		

3.2. Accessories

Power	Brand	Model	Rating	Remark
Adapter	Huntkey	HKA06012050-7G	Input: 100-240V~1.5A, 50/60Hz Output: 12.0V, 5.0A	Cable (Non-shielded, 1.3m)
Other				
Power cable*1: Non-shielded, 1.5m				

3.3. Table for Filed Antenna

Ant.	Brand	Model No.	Product Number	Antenna Type	Connector	Gain (dBi)	
						2.4GHz	5GHz
1	TP-LINK	T3060-NU000 1.0	3101500587	Dipole Antenna	RF-SMA-F	2	3
2	TP-LINK	T3060-NU000 1.0	3101500587	Dipole Antenna	RF-SMA-F	2	3
3	TP-LINK	T3060-NU000 1.0	3101500587	Dipole Antenna	RF-SMA-F	2	3
4	TP-LINK	T3060-NU000 1.0	3101500587	Dipole Antenna	RF-SMA-F	2	3

Note: The EUT has four antennas.

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

3.4. Table for Carrier Frequencies

There are three bandwidth systems.

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

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

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

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

3.5. Table for Test Modes

Preliminary tests were performed in different data rate to find the worst radiated emission. The data rate shown in the table below is the worst-case rate with respect to the specific test item. The following table is a list of the test modes shown in this test report.

Test Items	Mode		Data Rate	Channel	Chain
AC Power Conducted Emission	Normal Link		-	-	-
Max. Conducted Output Power Power Spectral Density 26dB Spectrum Bandwidth & 99% Occupied Bandwidth Measurement 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	38/46/151/159	1+2+3+4
	11ac VHT80	Band 4	MCS0/Nss1	42/155	1+2+3+4
	<For Beamforming Mode>				
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2+3+4
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2+3+4
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2+3+4
6dB Spectrum Bandwidth Measurement	<For Non-Beamforming Mode>				
	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 1&4	MCS0/Nss1	149/157/165	1+2+3+4
	11ac VHT40	Band 1&4	MCS0/Nss1	151/159	1+2+3+4
	11ac VHT80	Band 1&4	MCS0/Nss1	155	1+2+3+4
Radiated Emission Below 1GHz	Normal Link		-	-	-

Radiated Emission Above 1GHz 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 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2+3+4
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2+3+4
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2+3+4
Frequency Stability	20 MHz	Band 1&4	-	40/157	1
	40 MHz	Band 1&4	-	38/151	1
	80 MHz	Band 1&4	-	42/155	1

Note: 1.VHT20/VHT40 covers HT20/HT40, due to same modulation. The power setting for 802.11n HT20 and HT40 are the same or lower than 802.11ac VHT20 and VHT40.

2.All the specification of test configurations and test modes were based on customer's request.

The following test modes were performed for all tests:

For Conducted Emission test:

Mode 1. EUT with Adapter

For Radiated Emission test<Below 1GHz>:

Mode 1. EUT in Z axis with Adapter

Mode 2. EUT in Y axis with Adapter

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

For Radiated Emission test<Above 1GHz>:

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

Mode 1. EUT in Z axis

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 FA5O1803-03) 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 Designation No.**	**IC File No.**	**VCCI Reg. No**
03CH01-CB	SAC	Hsin Chu	TW0006	IC 4086D	-
CO01-CB	Conduction	Hsin Chu	TW0006	IC 4086D	-
TH01-CB	OVEN Room	Hsin Chu	-	-	-

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

3.7. Table for Class II Change

This product is an extension of original one reported under Sporton project number: FR5O1803AB

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

Modifications	Performance Checking
1. Updating Chip model to BCM4366 C0 (MU-MIMO) from BCM4366 B1 (SU-MIMO).	Radiated Emissions 1GHz~10th Harmonic Band Edge Emissions
2. Modifying product function closed Repeater Mode. 3. Adding an adapter (level 6) Model No.: HKA06012050-7G.	AC Power Line Conducted Emissions Radiated Emissions 9kHz~1GHz
4. Updating Flash Memory to 32M from 16M.	Radiated Emissions 9kHz~1GHz
5. 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 ""15.407 (b)(4)(ii) of New Rules (ET Docket No. 13–49; FCC 16–24)". 6. Adding Beamforming function of 5GHz Band 1/4.	Max. Conducted Output Power Power Spectral Density 26dB Spectrum Bandwidth & 99% Occupied Bandwidth Measurement 6dB Spectrum Bandwidth Measurement Radiated Emission Above 1GHz Band Edge Emission Frequency Stability
7. Modifying brand name to TP-Link from TP-LINK. 8. Changing FCC ID to TE7C3150V2 from TE7C3150.	Do not effect the test results.

Note: Item 1 Item 1 will be based on original output power to re-test; after evaluating only verify 11a Channel 48: 5240 MHz.

3.8. Table for Supporting Units

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

Support Unit	Brand	Model	FCC ID
Notebook*2	DELL	E4300	DoC
Notebook*2	Apple	Mac Book	DoC
Flash Disk2.0	Silicon Power	I-Series	DoC
Flash Disk3.0	Silicon Power	B06	DoC

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

<For Non-Beamforming Mode>

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E4300	DoC

<For Beamforming Mode>

Support Unit	Brand	Model	FCC ID
Notebook*2	DELL	E4300	DoC
RX Device	TP-LINK	Archer C3150	TE7C3150

For Test Site No: CO01-CB

Support Unit	Brand	Model	FCC ID
Notebook *4	DELL	E6430	DoC
Flash Disk	Silicon	I-Series	DoC
Flash Disk3.0	Transcend	639205 7755	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 2.0.2.7		
Mode	Test Frequency (MHz)		
	NCB: 20MHz		
	5745 MHz	5785 MHz	5825 MHz
802.11a	91	91	92
802.11ac MCS0/Nss1 VHT20	92	93	93
Mode	NCB: 40MHz		
802.11ac MCS0/Nss1 VHT40	5755 MHz	5795 MHz	
	91	92	
Mode	NCB: 80MHz		
802.11ac MCS0/Nss1 VHT80	5775 MHz		
	74		

<For Beamforming Mode>

Test Software Version	Mtool 2.0.2.7					
Mode	Test Frequency (MHz)					
	NCB: 20MHz					
	5180 MHz	5200 MHz	5240 MHz	5745 MHz	5785 MHz	5825 MHz
802.11ac MCS0/Nss1 VHT20	76	83	83	84	85	85
Mode	NCB: 40MHz					
802.11ac MCS0/Nss1 VHT40	5190 MHz		5230 MHz		5755 MHz	5795 MHz
	60		83		84	85
Mode	NCB: 80MHz					
802.11ac MCS0/Nss1 VHT80	5210 MHz				5775 MHz	
	63				74	

3.10. EUT Operation during Test

For CTX Mode:

non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

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 transmit and receive packet by Telnet and transmit duty cycle no less 98%.

For Normal Link:

During the test, the EUT operation to normal function.

3.11. Duty Cycle

<For Non Beamforming Mode>

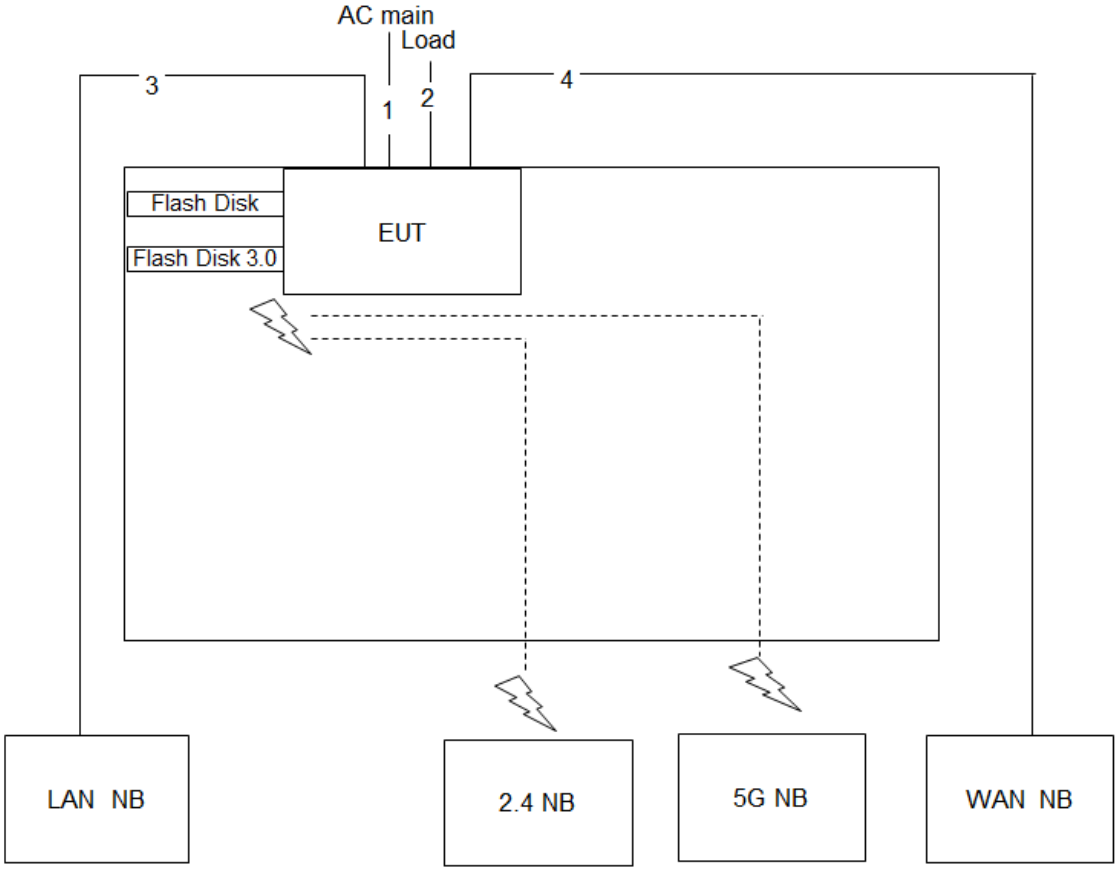
Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11a	2.061	2.097	98.28%	0.08	0.01
802.11ac MCS0/Nss1 VHT20	1.927	1.968	97.92%	0.09	0.52
802.11ac MCS0/Nss1 VHT40	0.960	0.984	97.56%	0.11	1.04
802.11ac MCS0/Nss1 VHT80	0.460	0.489	94.07%	0.27	2.17

<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	3.800	3.880	97.94%	0.09	0.26
802.11ac MCS0/Nss1 VHT40	3.620	3.750	96.53%	0.15	0.28
802.11ac MCS0/Nss1 VHT80	5.048	5.190	97.26%	0.12	0.20

3.12. Test Configurations

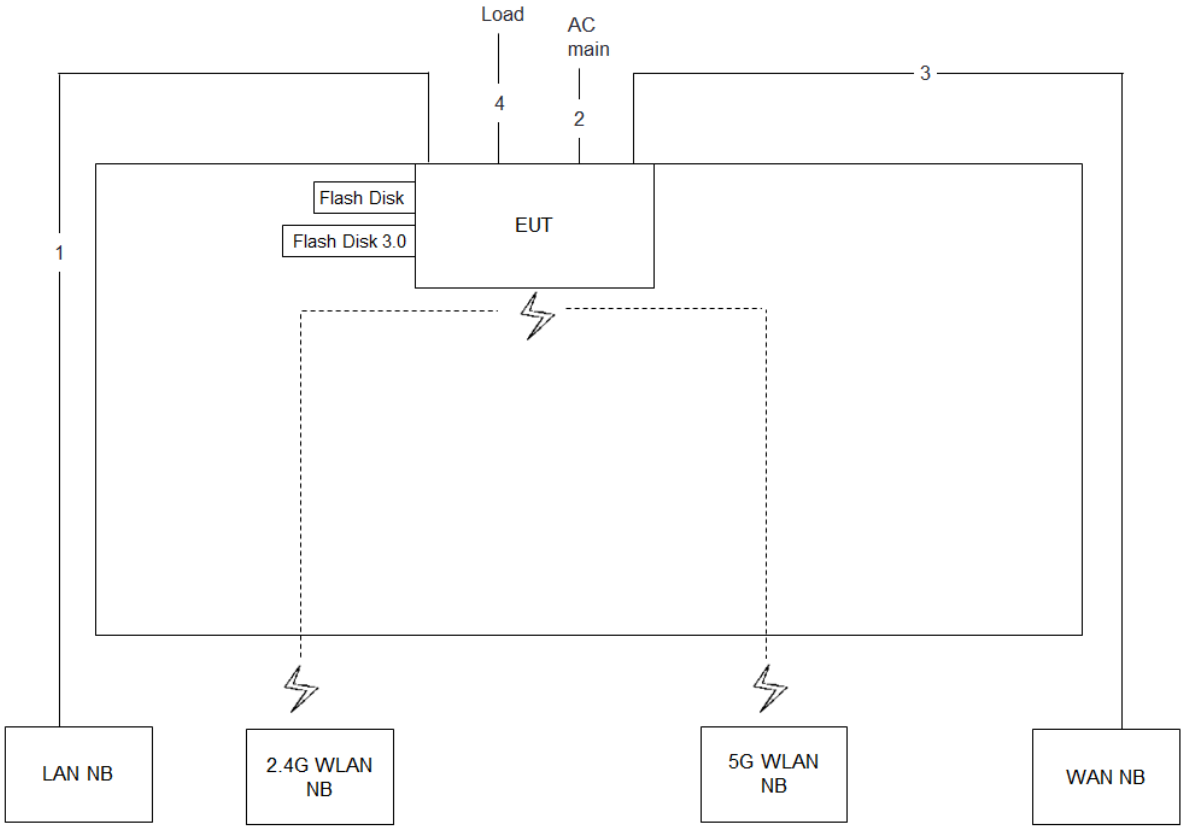
3.12.1. AC Power Line Conduction Emissions Test Configuration



Item	Connection	Shielded	Length
1	Power cable	No	2.8m
2	RJ-45 cable*3	No	1.5m
3	RJ-45 cable	No	10m
4	RJ-45 cable	No	10m

3.12.2. Radiation Emissions Test Configuration

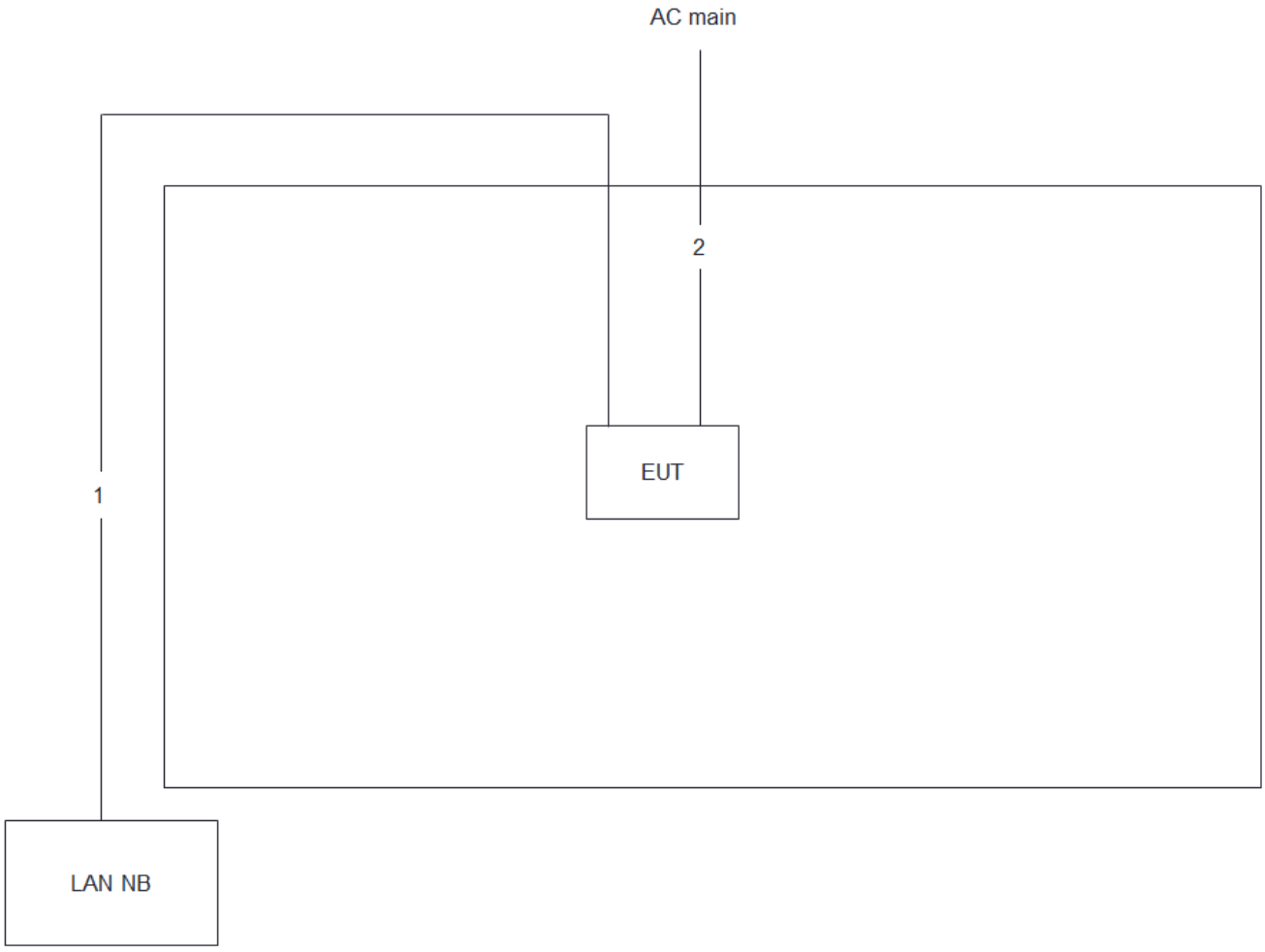
Test Configuration: 30MHz ~1GHz



Item	Connection	Shielded	Length
1	RJ-45 cable	No	10m
2	Power cable	No	2.8m
3	RJ-45 cable	No	10m
4	RJ-45 cable*3	No	1.5m

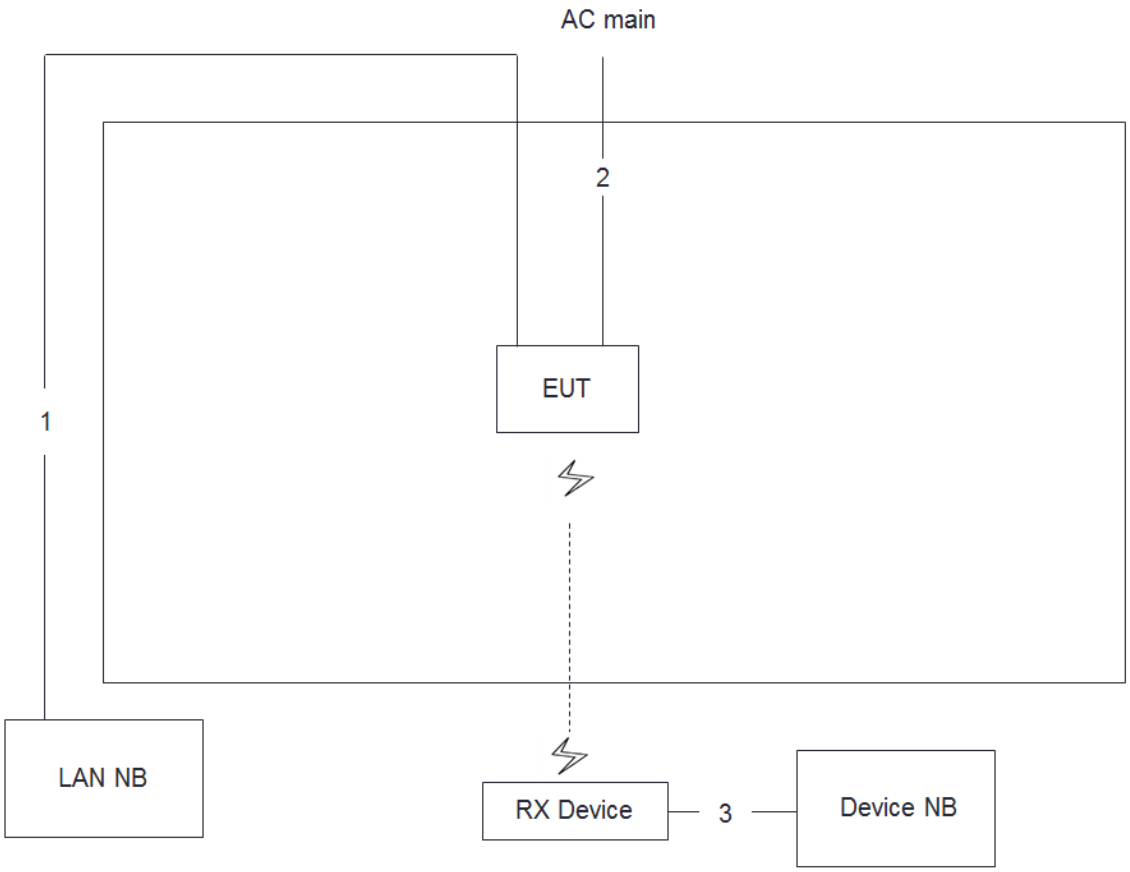
Test Configuration: above 1GHz

<For Non Beamforming Mode>



Item	Connection	Shielded	Length
1	RJ-45 cable	No	10m
2	Power cable	No	2.8m

<For Beamforming Mode>



Item	Connection	Shielded	Length
1	RJ-45 cable	No	10m
2	Power cable	No	2.8m
3	RJ-45 cable	No	1.5m

4. TEST RESULT

4.1. AC Power Line Conducted Emissions Measurement

4.1.1. Limit

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

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

4.1.2. Measuring Instruments and Setting

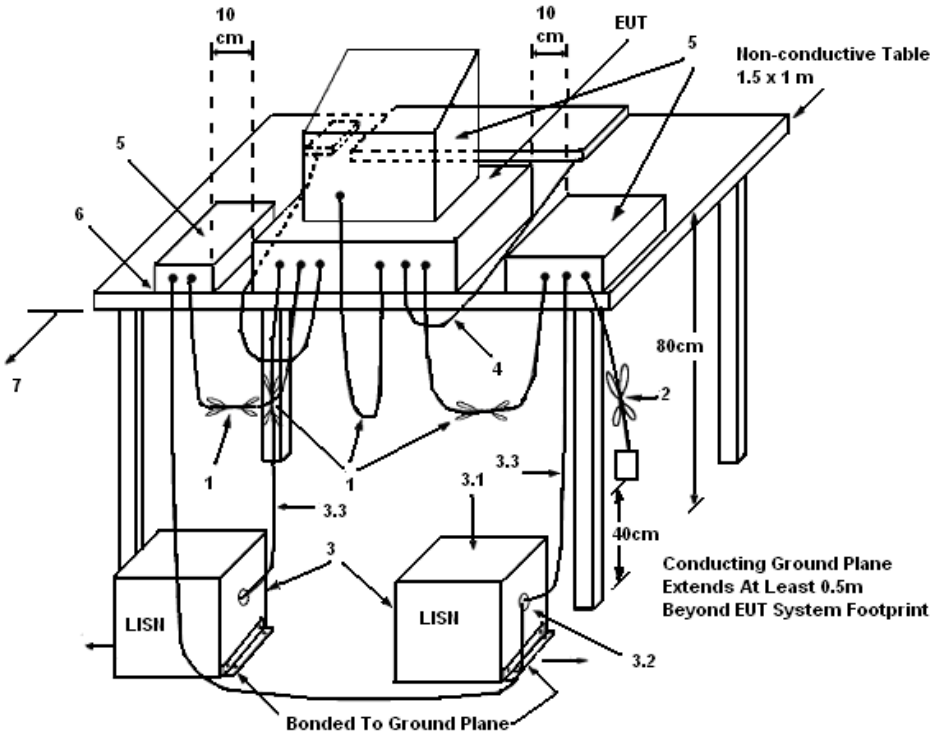
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

4.1.3. Test Procedures

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

4.1.4. Test Setup Layout



LEGEND:

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

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

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

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

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

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

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

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

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

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

4.1.5. Test Deviation

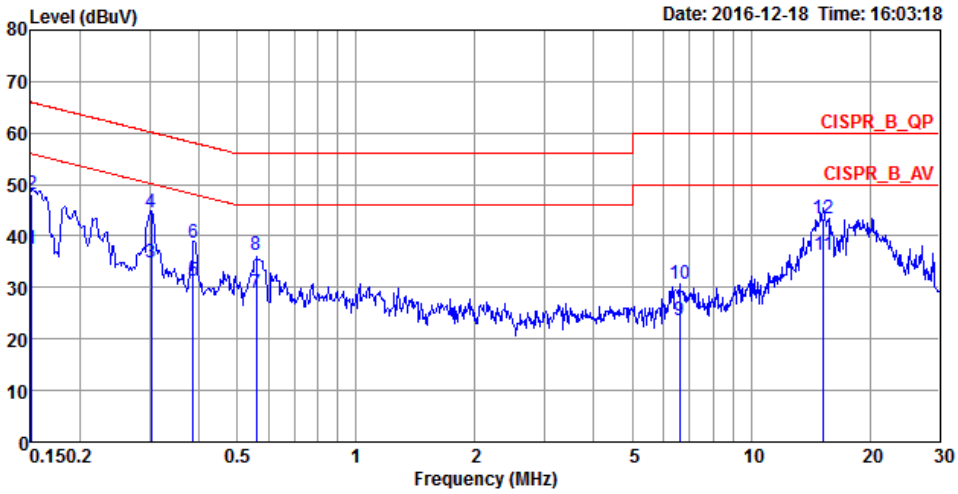
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

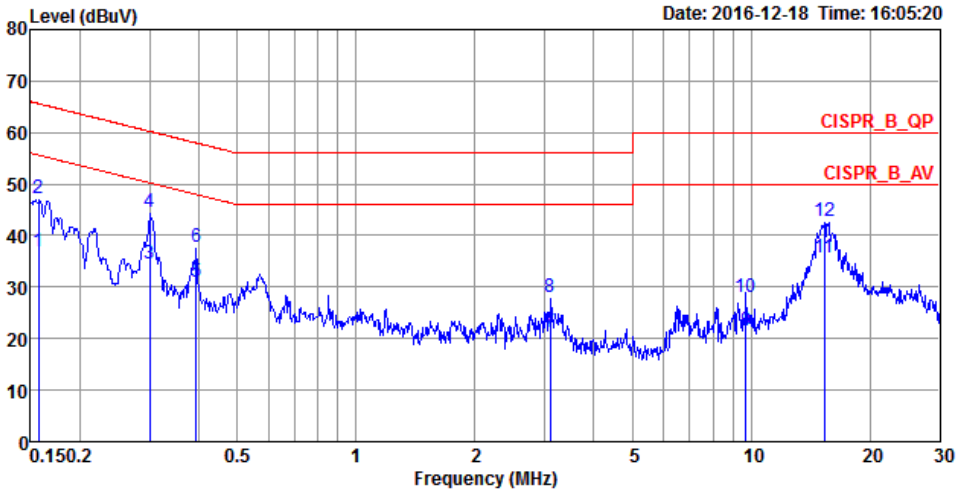
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	22°C	Humidity	55%
Test Engineer	Gavin Peng	Phase	Line
Configuration	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1508	37.53	-18.43	55.96	27.35	10.02	0.16	LINE	Average
2	0.1508	48.21	-17.75	65.96	38.03	10.02	0.16	LINE	QP
3	0.3035	34.81	-15.34	50.15	24.81	9.92	0.08	LINE	Average
4	0.3035	44.54	-15.61	60.15	34.54	9.92	0.08	LINE	QP
5	0.3872	31.41	-16.71	48.12	21.47	9.92	0.02	LINE	Average
6	0.3872	38.80	-19.32	58.12	28.86	9.92	0.02	LINE	QP
7	0.5581	28.82	-17.18	46.00	18.62	9.93	0.27	LINE	Average
8	0.5581	36.35	-19.65	56.00	26.15	9.93	0.27	LINE	QP
9	6.5921	23.63	-26.37	50.00	13.45	10.06	0.12	LINE	Average
10	6.5921	30.76	-29.24	60.00	20.58	10.06	0.12	LINE	QP
11	15.2261	36.44	-13.56	50.00	25.99	10.23	0.22	LINE	Average
12	15.2261	43.33	-16.67	60.00	32.88	10.23	0.22	LINE	QP

Temperature	22°C	Humidity	55%
Test Engineer	Gavin Peng	Phase	Neutral
Configuration	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1573	36.76	-18.84	55.60	26.57	10.02	0.17	NEUTRAL	Average
2	0.1573	47.15	-18.45	65.60	36.96	10.02	0.17	NEUTRAL	QP
3	0.3003	34.50	-15.74	50.24	24.49	9.92	0.09	NEUTRAL	Average
4	0.3003	44.54	-15.70	60.24	34.53	9.92	0.09	NEUTRAL	QP
5	0.3934	30.85	-17.14	47.99	20.92	9.92	0.01	NEUTRAL	Average
6	0.3934	37.91	-20.08	57.99	27.98	9.92	0.01	NEUTRAL	QP
7	3.1066	21.17	-24.83	46.00	11.11	9.98	0.08	NEUTRAL	Average
8	3.1066	28.18	-27.82	56.00	18.12	9.98	0.08	NEUTRAL	QP
9	9.7051	21.41	-28.59	50.00	11.12	10.14	0.15	NEUTRAL	Average
10	9.7051	27.94	-32.06	60.00	17.65	10.14	0.15	NEUTRAL	QP
11	15.3070	35.65	-14.35	50.00	25.20	10.23	0.22	NEUTRAL	Average
12	15.3070	42.71	-17.29	60.00	32.26	10.23	0.22	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	Serway Li		

<For Non-Beamforming Mode>

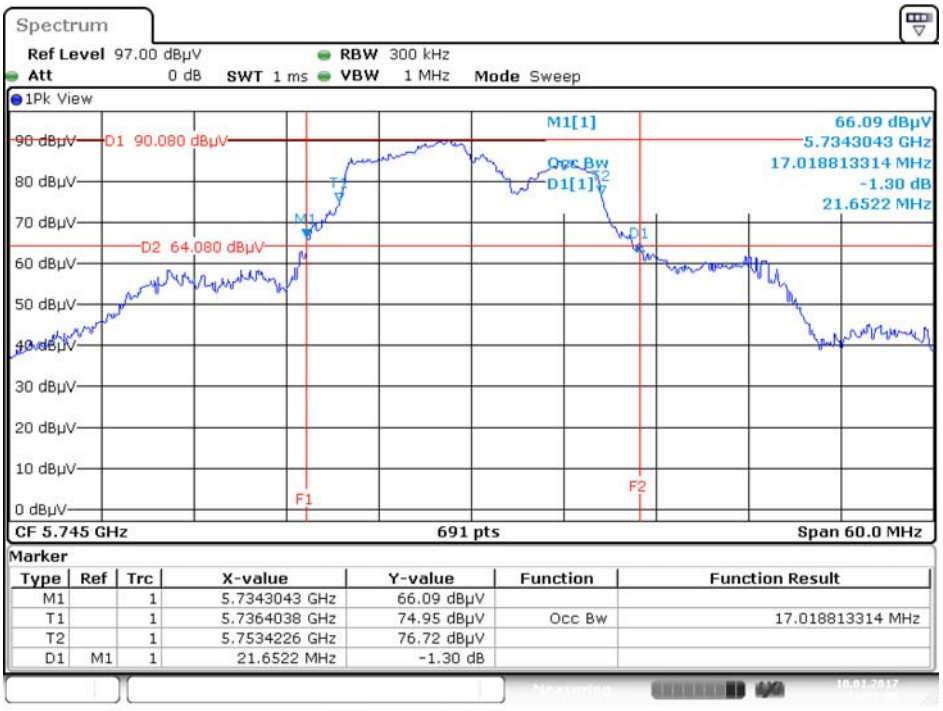
Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5745 MHz	21.65	17.02
	5785 MHz	21.48	17.02
	5825 MHz	21.48	17.02
802.11ac MCS0/Nss1 VHT20	5745 MHz	33.83	18.32
	5785 MHz	37.39	18.58
	5825 MHz	32.26	18.23
802.11ac MCS0/Nss1 VHT40	5755 MHz	73.62	37.92
	5795 MHz	76.38	37.77
802.11ac MCS0/Nss1 VHT80	5775 MHz	82.03	75.83

<For Beamforming Mode>

Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11ac MCS0/Nss1 VHT20	5180 MHz	20.61	17.97
	5200 MHz	21.22	17.89
	5240 MHz	20.87	17.97
	5745 MHz	21.39	18.06
	5785 MHz	21.74	18.06
	5825 MHz	21.65	18.06
802.11ac MCS0/Nss1 VHT40	5190 MHz	40.73	36.61
	5230 MHz	40.58	36.61
	5755 MHz	40.87	36.76
	5795 MHz	41.01	36.90
802.11ac MCS0/Nss1 VHT80	5210 MHz	80.87	75.25
	5775 MHz	81.74	76.41

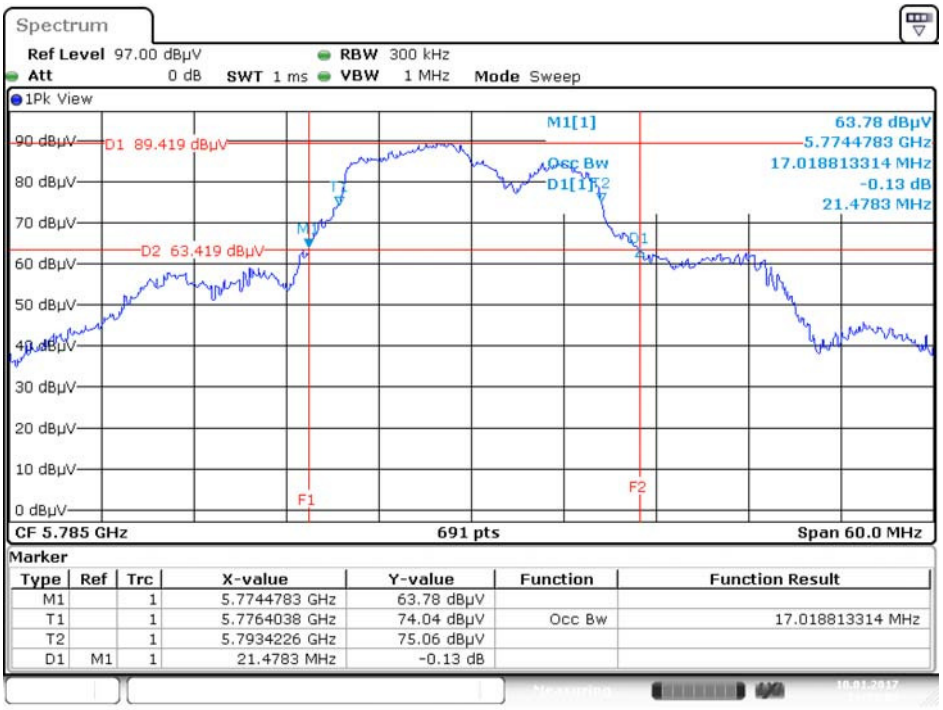
<For Non-Beamforming Mode>

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



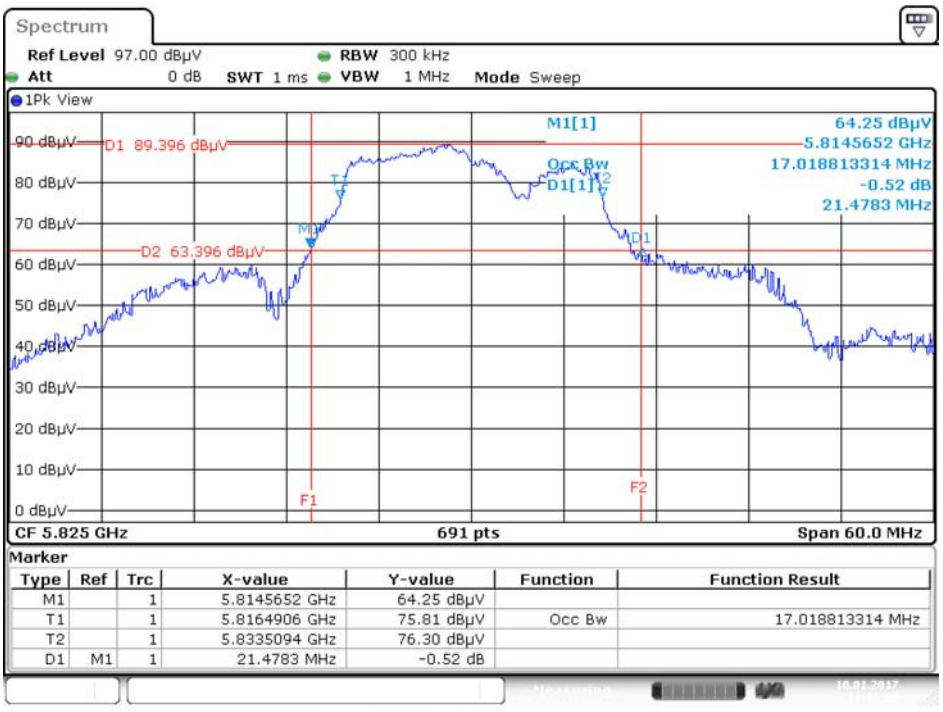
Date: 10.JAN.2017 19:31:06

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



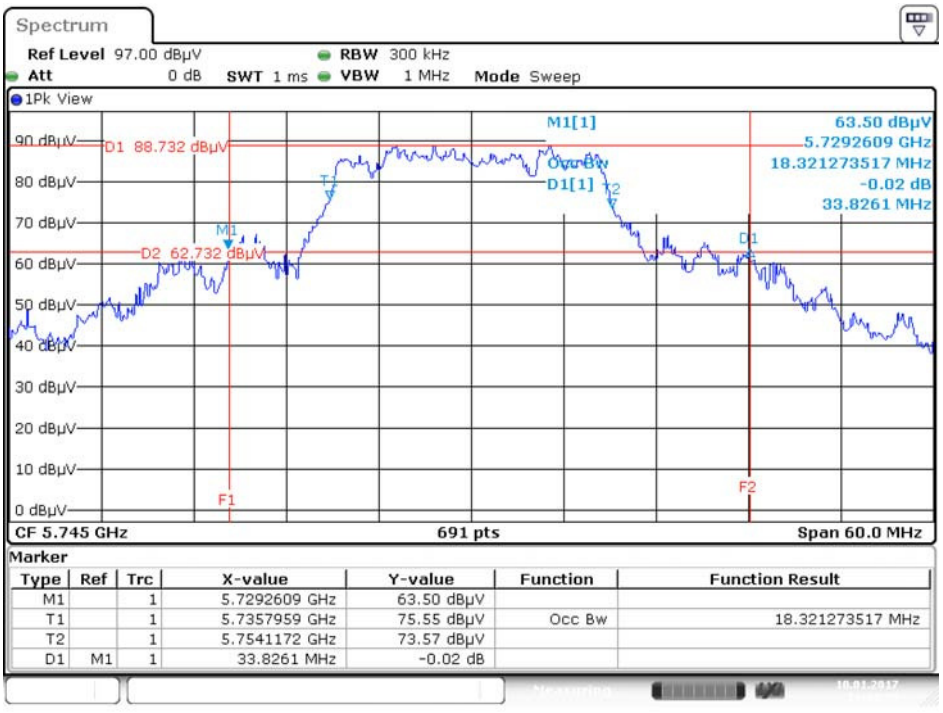
Date: 10.JAN.2017 19:35:04

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



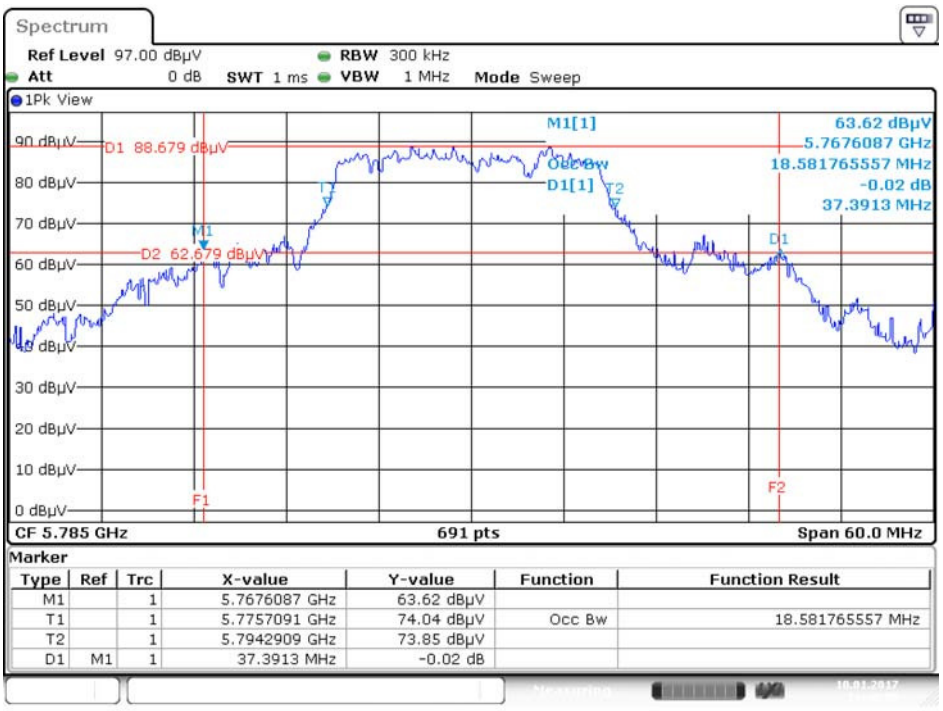
Date: 10.JAN.2017 19:37:00

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



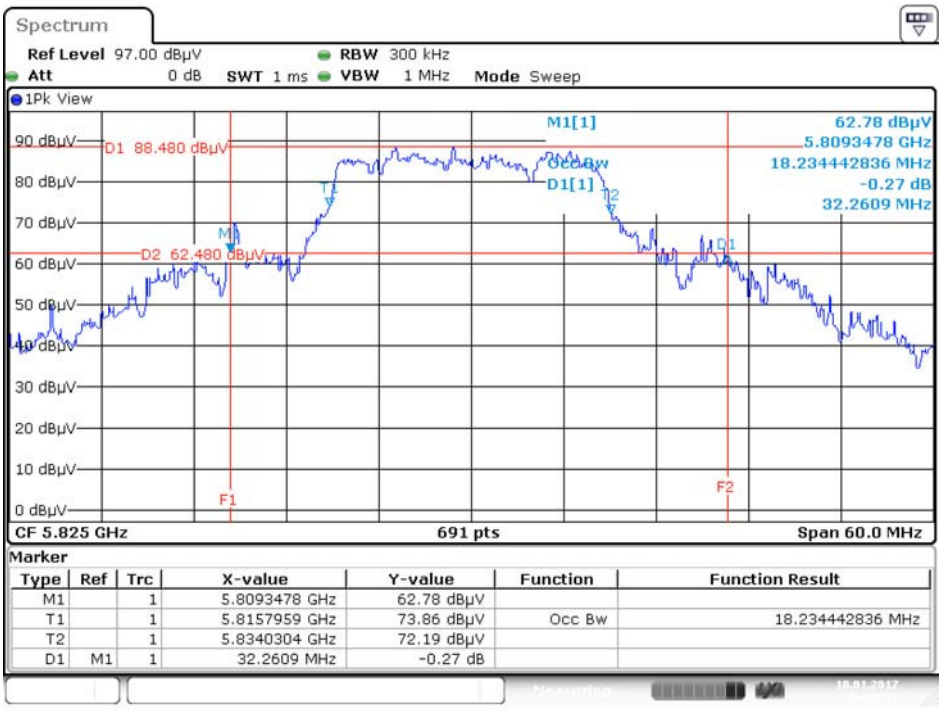
Date: 10.JAN.2017 19:43:53

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



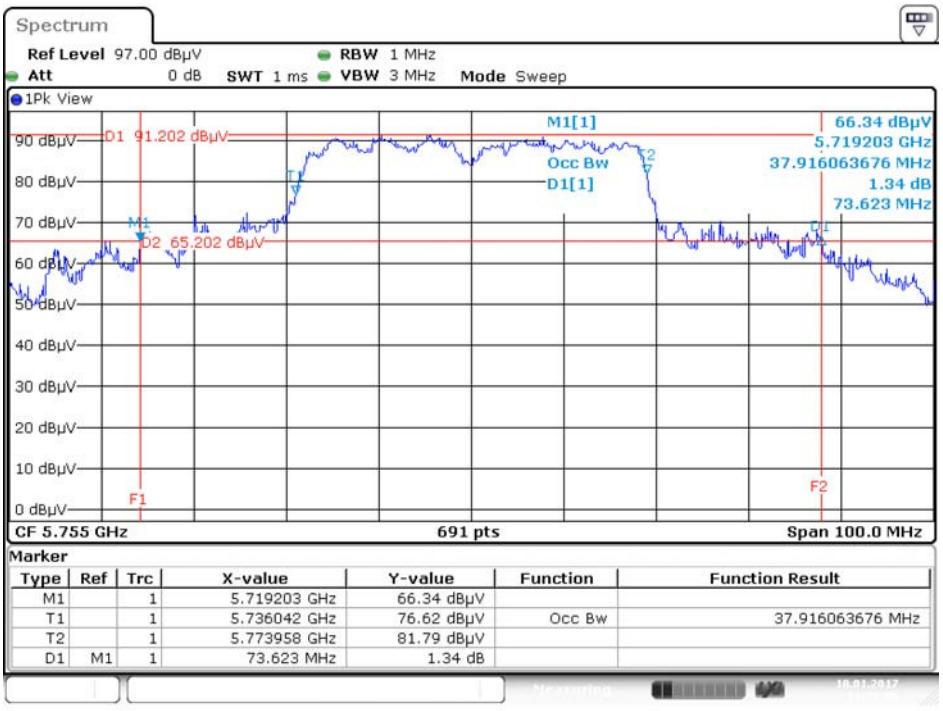
Date: 10.JAN.2017 19:45:50

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



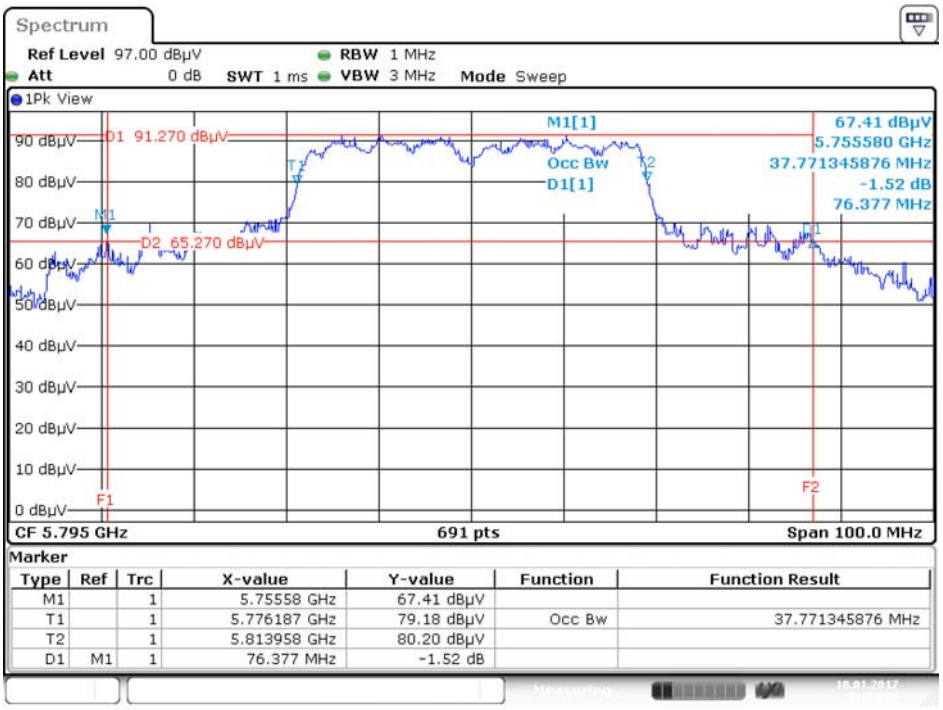
Date: 10.JAN.2017 19:47:18

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



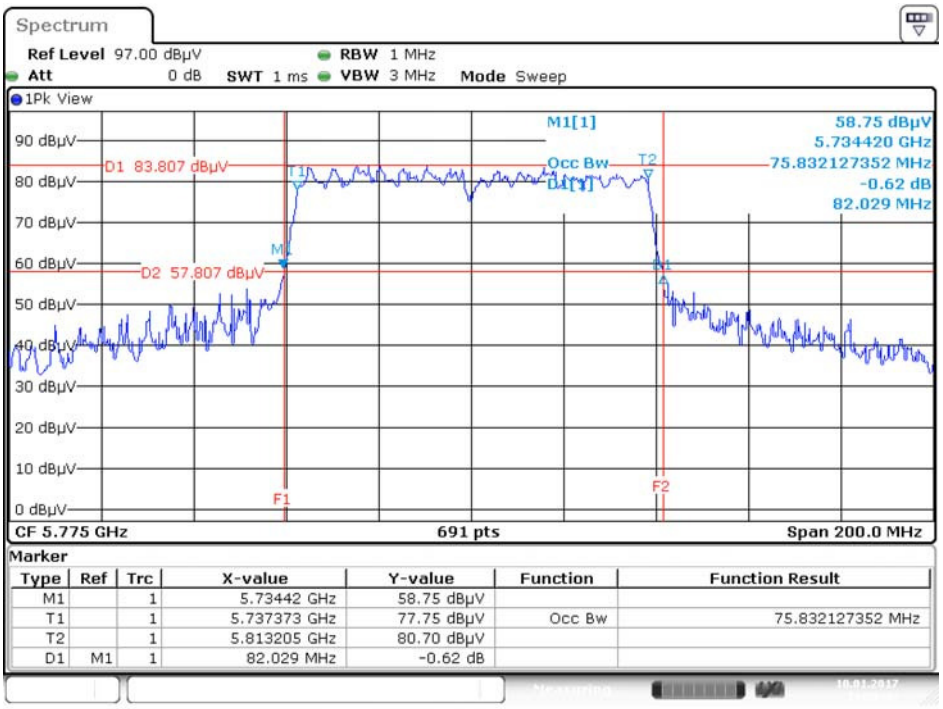
Date: 10.JAN.2017 19:51:56

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



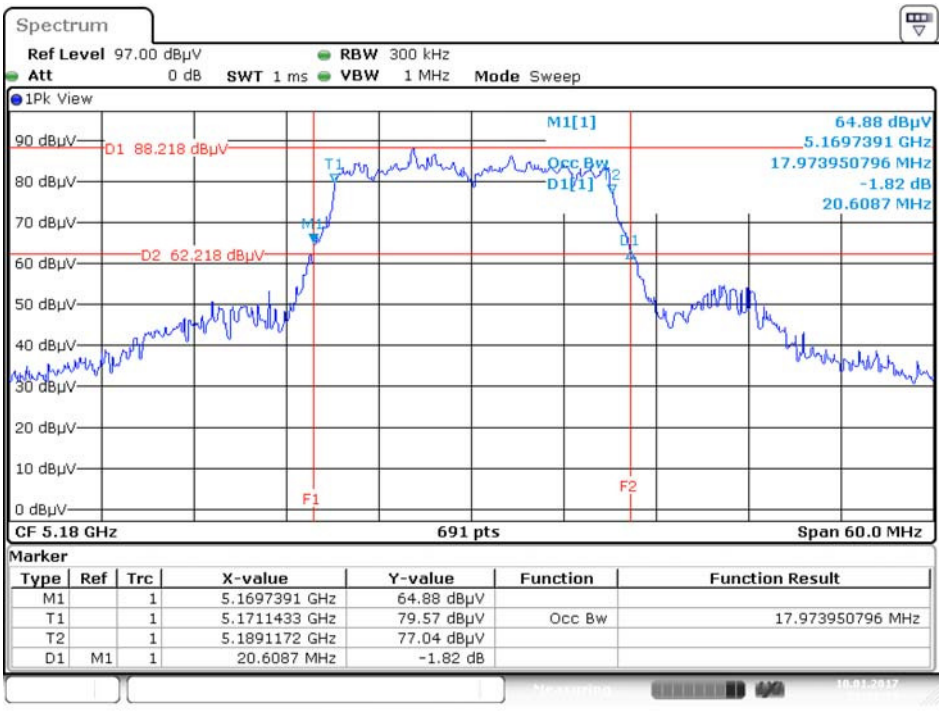
Date: 10.JAN.2017 19:53:57

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



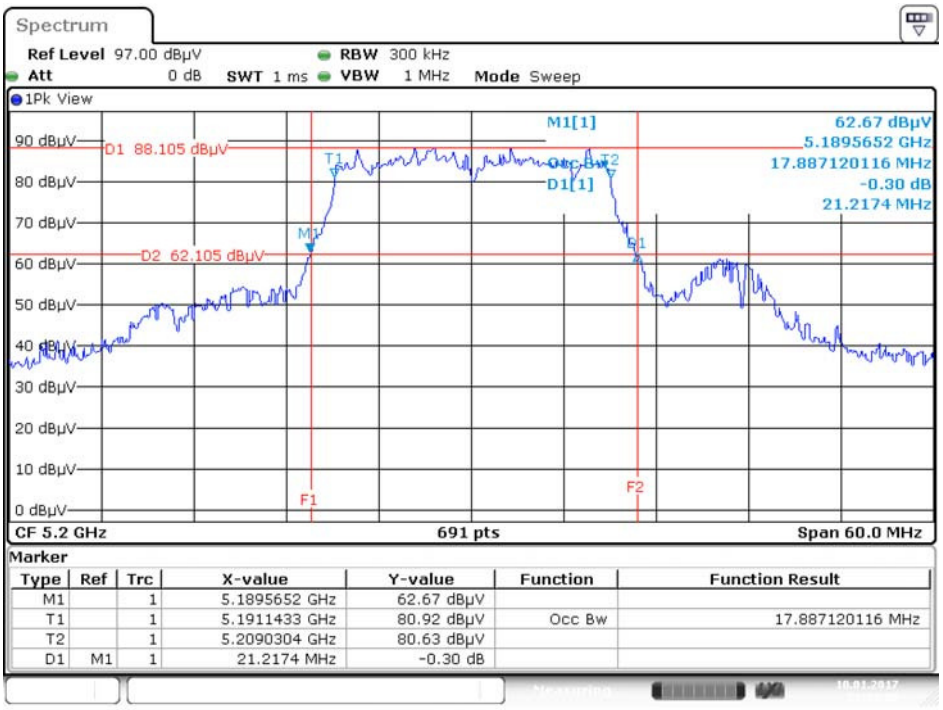
<For Beamforming Mode>

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



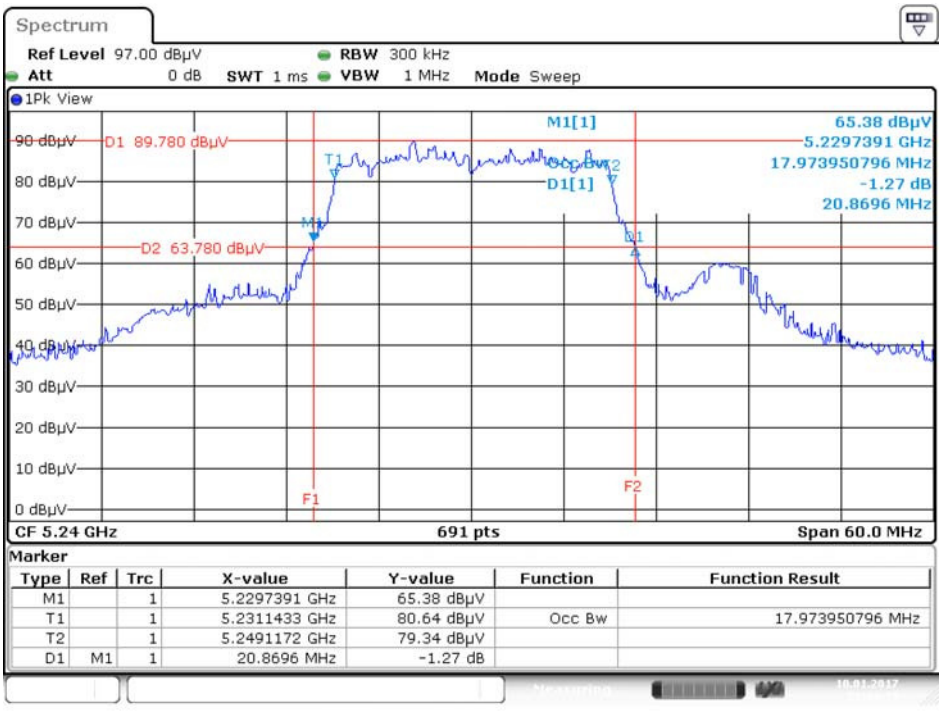
Date: 10.JAN.2017 21:01:33

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



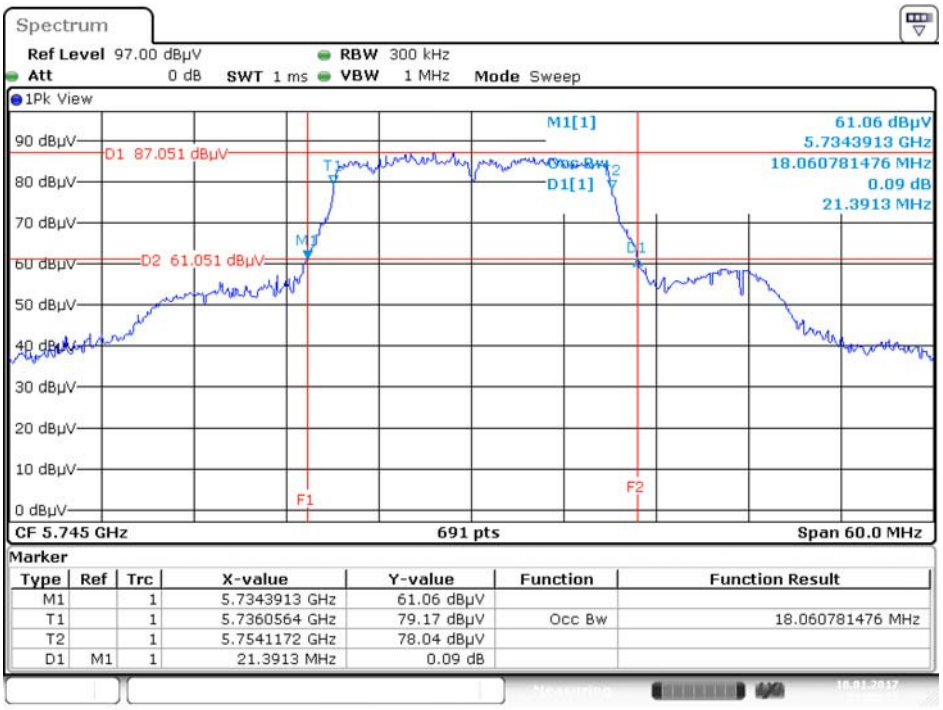
Date: 10.JAN.2017 21:03:08

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



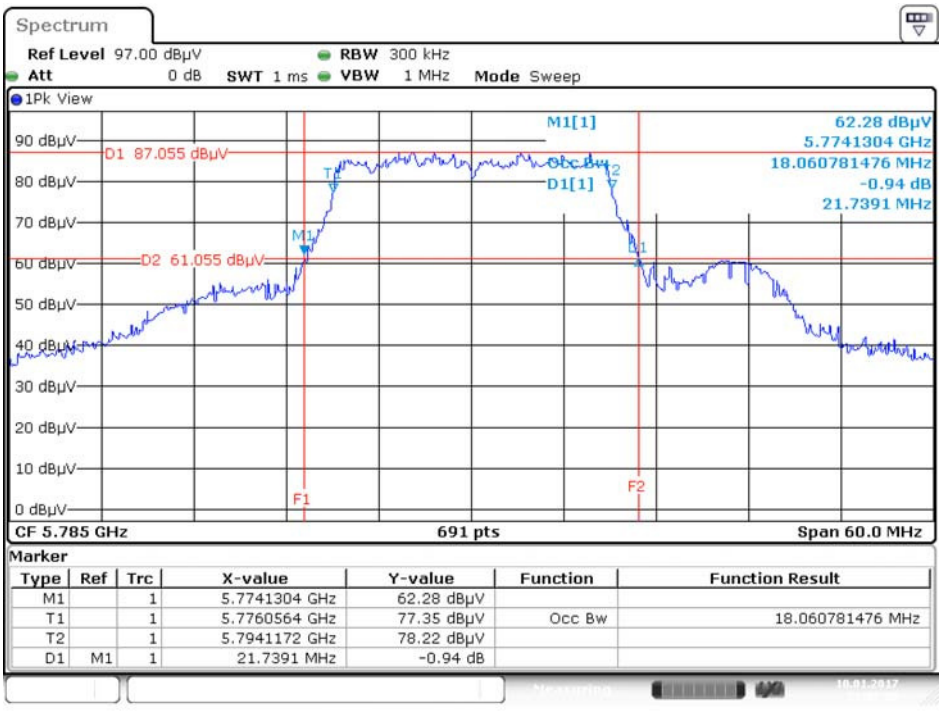
Date: 10.JAN.2017 21:04:13

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



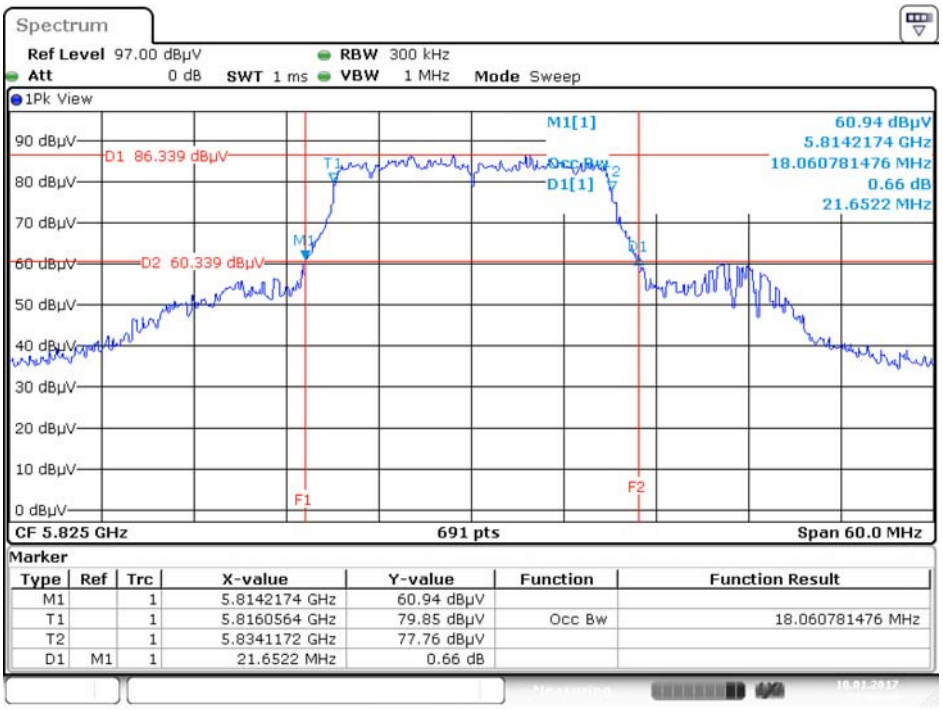
Date: 10.JAN.2017 21:05:21

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



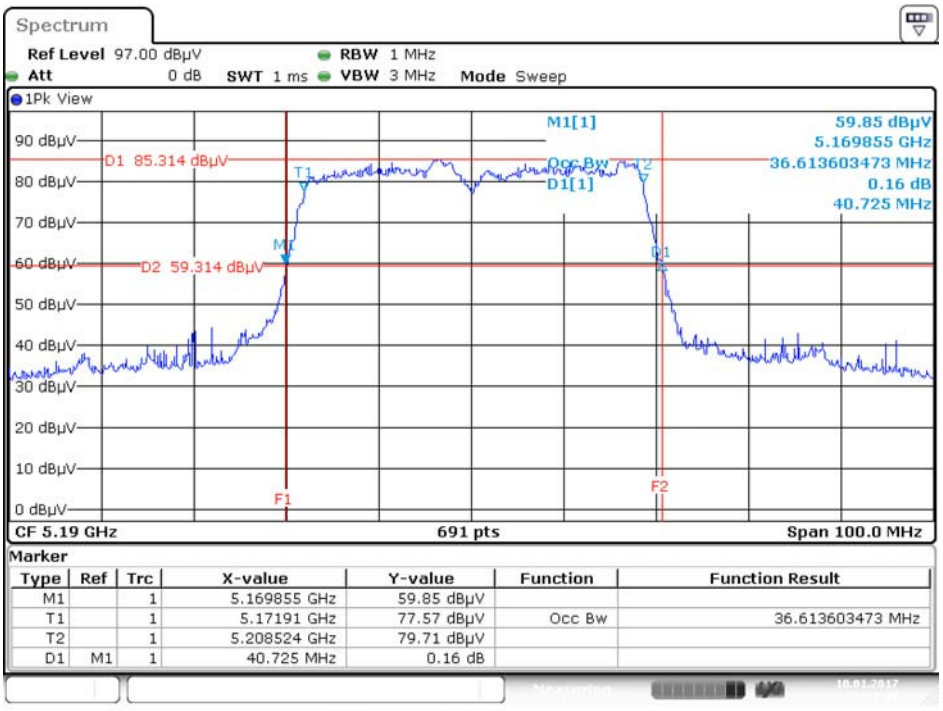
Date: 10.JAN.2017 21:07:20

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



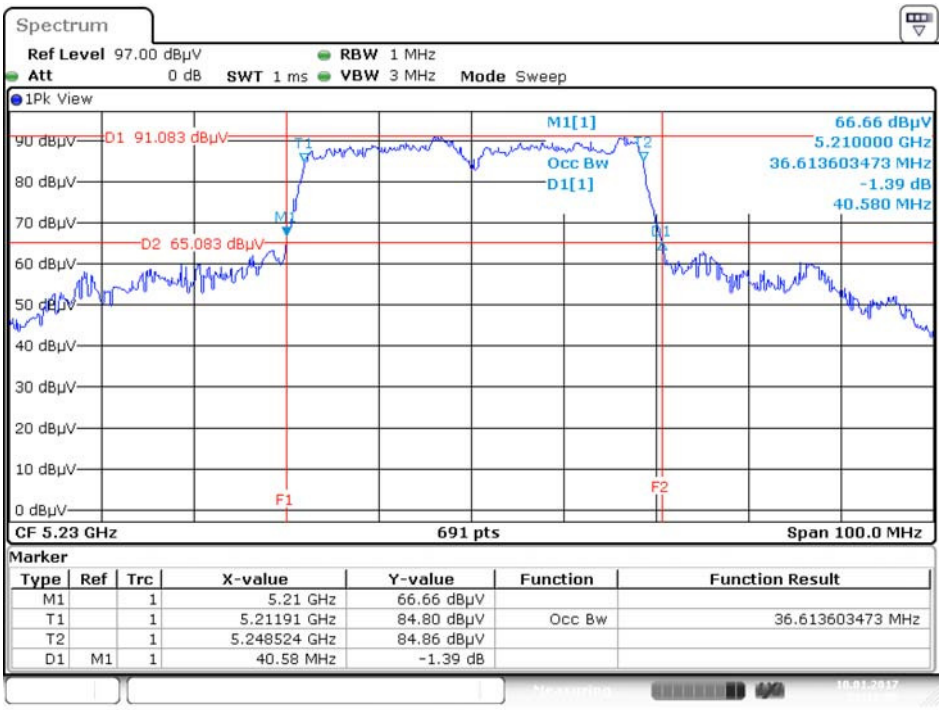
Date: 10.JAN.2017 21:09:25

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



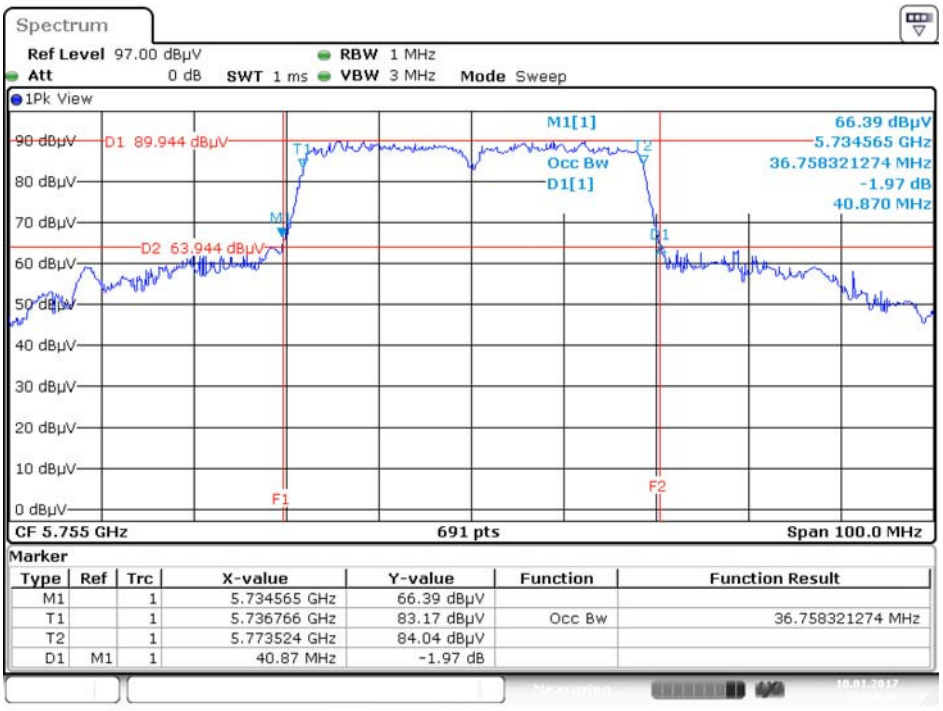
Date: 10.JAN.2017 21:11:16

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



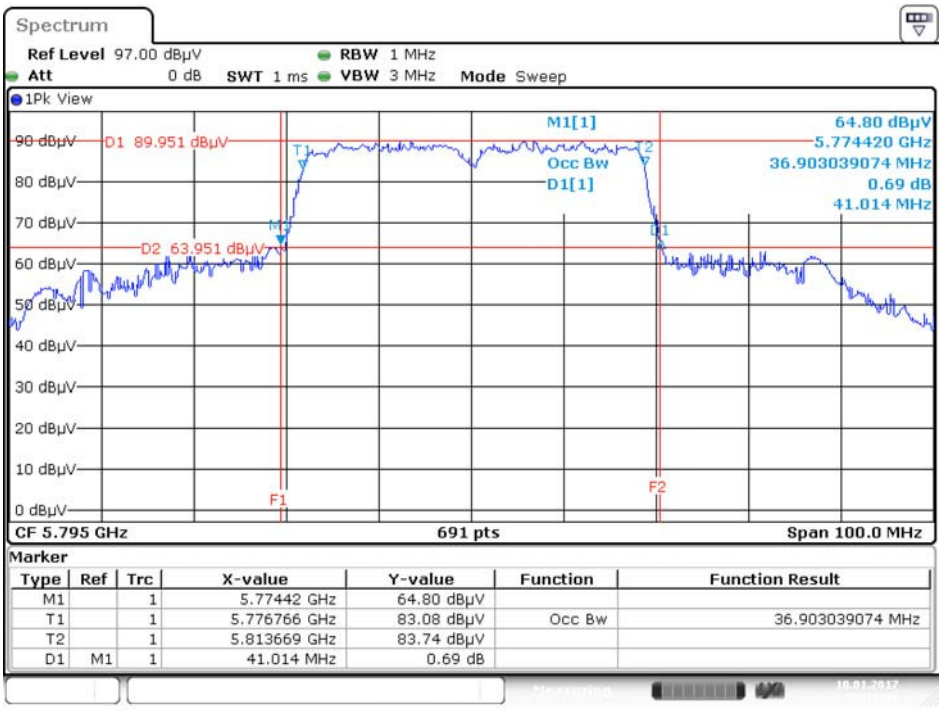
Date: 10.JAN.2017 21:12:58

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



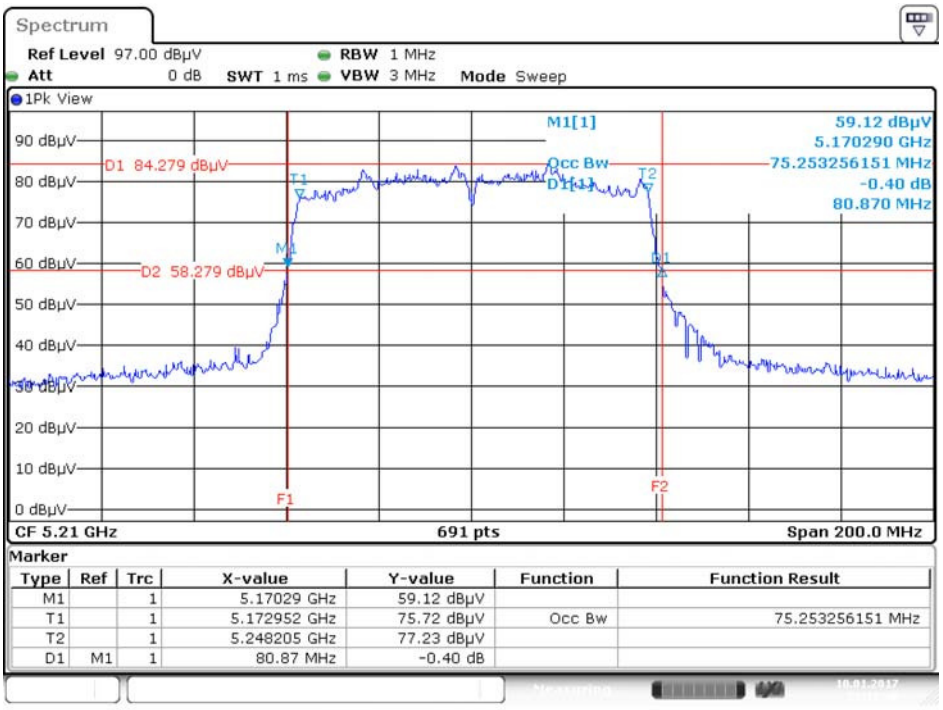
Date: 10.JAN.2017 21:14:41

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



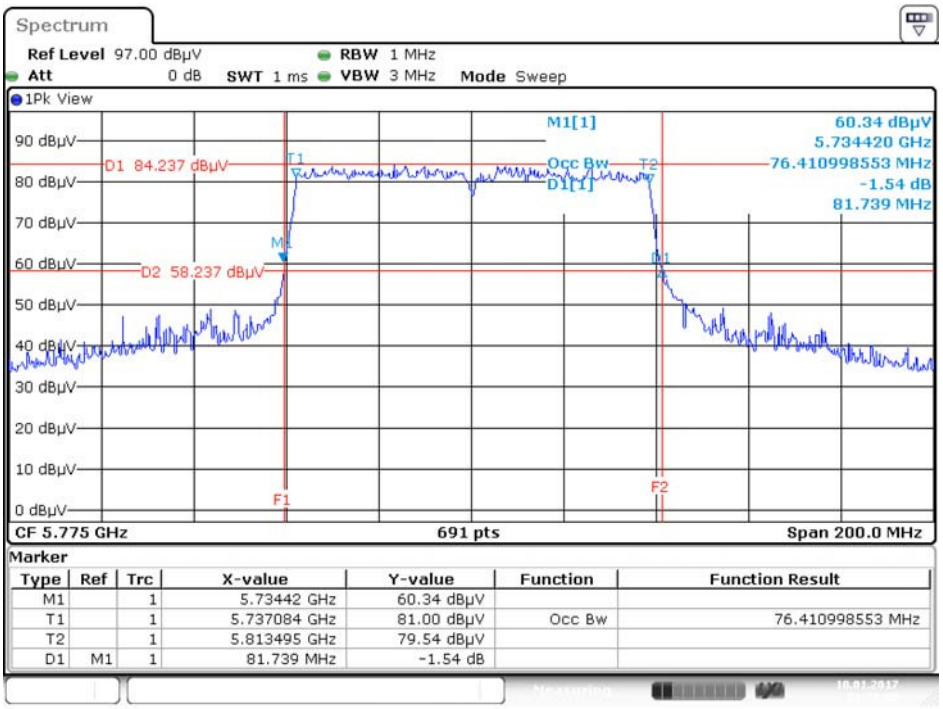
Date: 10.JAN.2017 21:16:41

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



Date: 10.JAN.2017 21:18:40

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



Date: 10.JAN.2017 21:21:09

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 v01r03 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	Serway Li		

<For Non-Beamforming Mode>

Mode	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11a	5745 MHz	15.71	500	Complies
	5785 MHz	14.43	500	Complies
	5825 MHz	14.49	500	Complies
802.11ac MCS0/Nss1 VHT20	5745 MHz	16.52	500	Complies
	5785 MHz	16.93	500	Complies
	5825 MHz	16.29	500	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	33.04	500	Complies
	5795 MHz	33.28	500	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	75.94	500	Complies

<For Beamforming Mode>

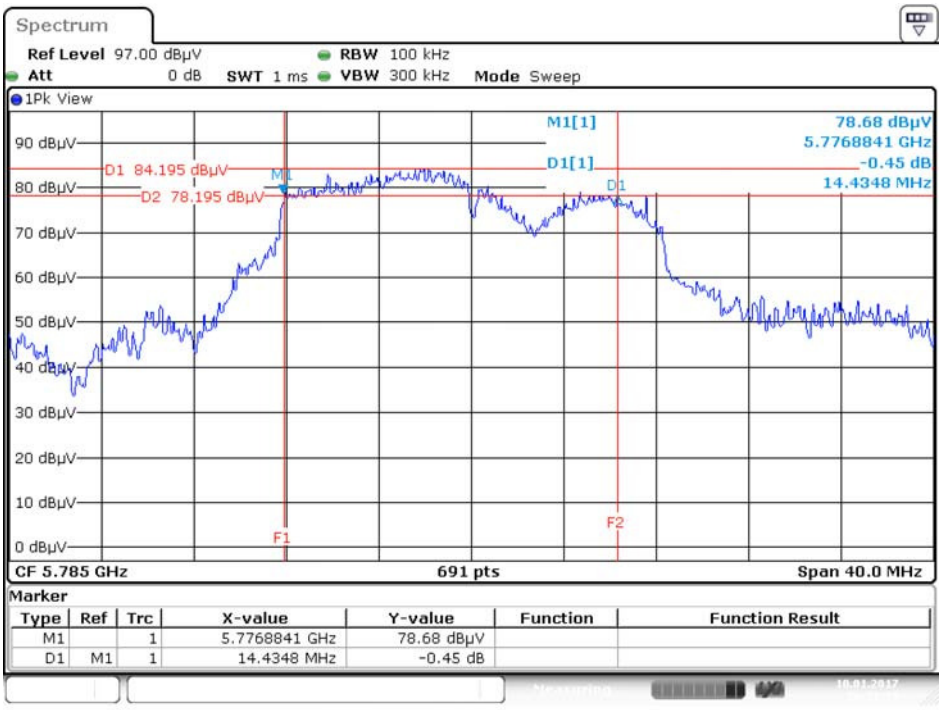
Mode	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11ac MCS0/Nss1 VHT20	5745 MHz	16.35	500	Complies
	5785 MHz	16.93	500	Complies
	5825 MHz	16.35	500	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	35.94	500	Complies
	5795 MHz	35.71	500	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	75.94	500	Complies

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

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

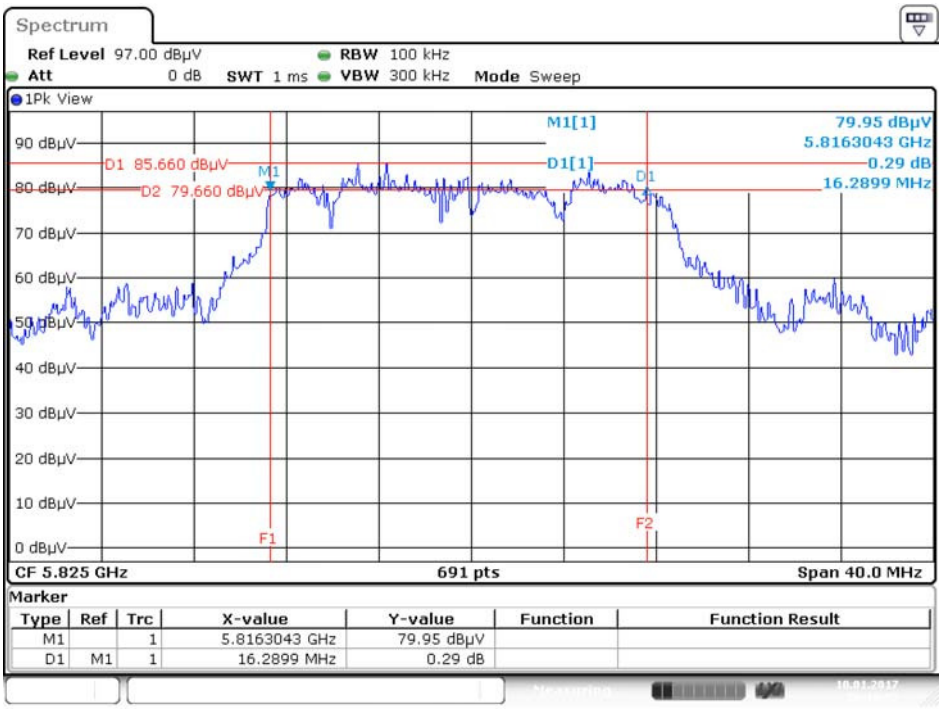
<For Non-Beamforming Mode>

6 dB Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5785 MHz



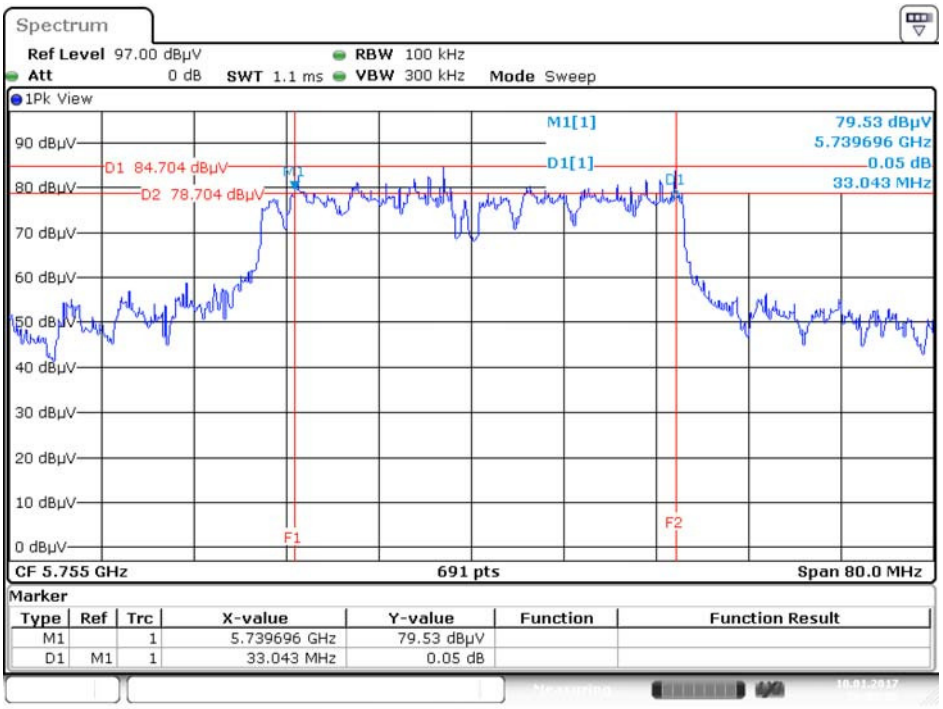
Date: 10.JAN.2017 20:21:39

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



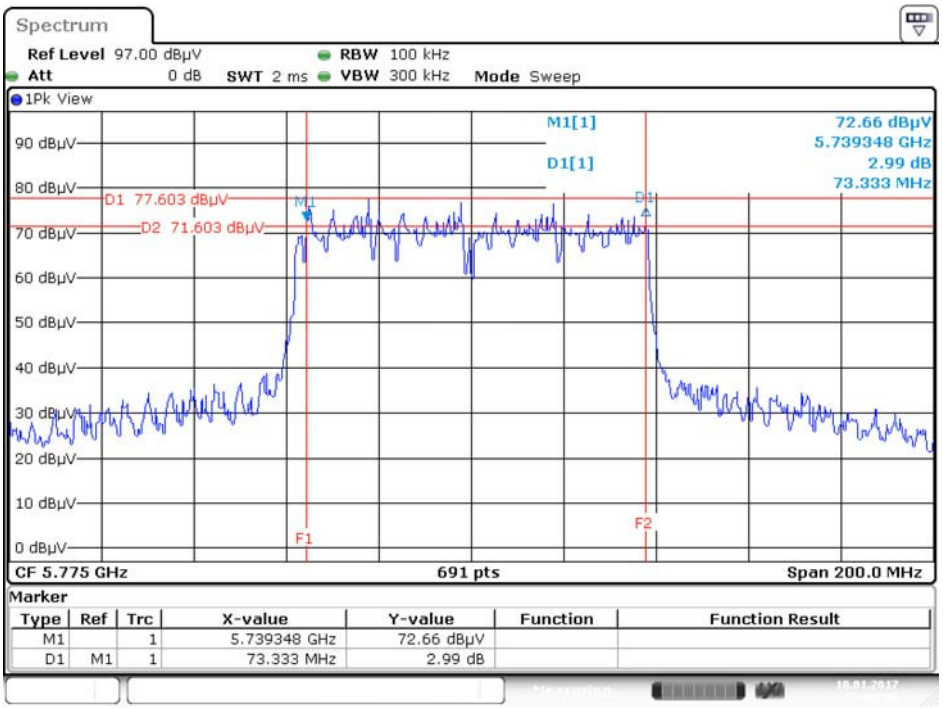
Date: 10.JAN.2017 20:14:52

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



Date: 10.JAN.2017 20:05:26

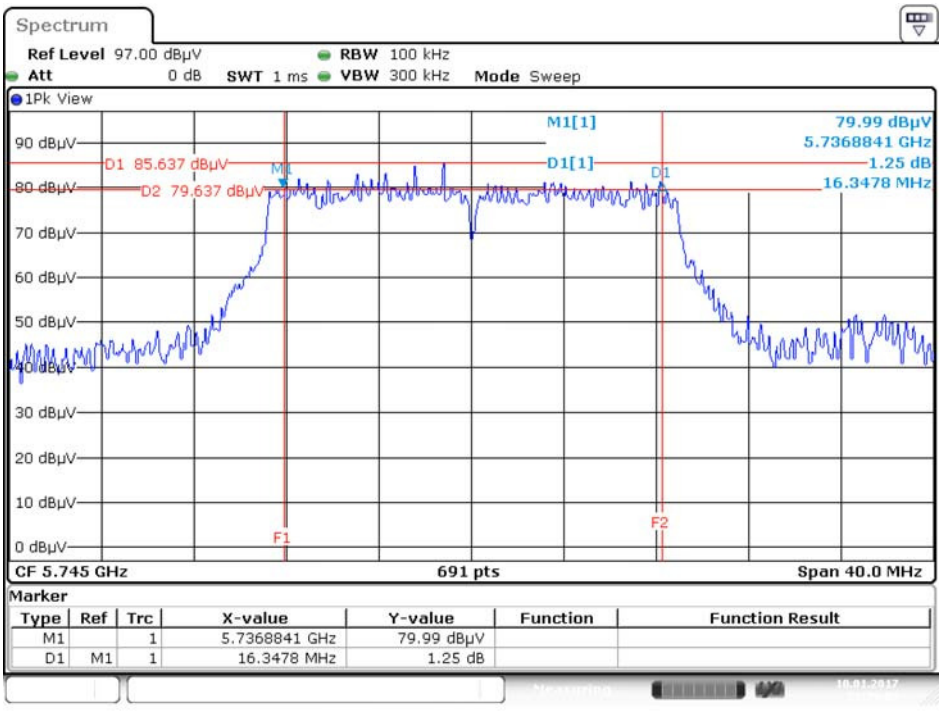
6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5775 MHz



Date: 10.JAN.2017 20:02:07

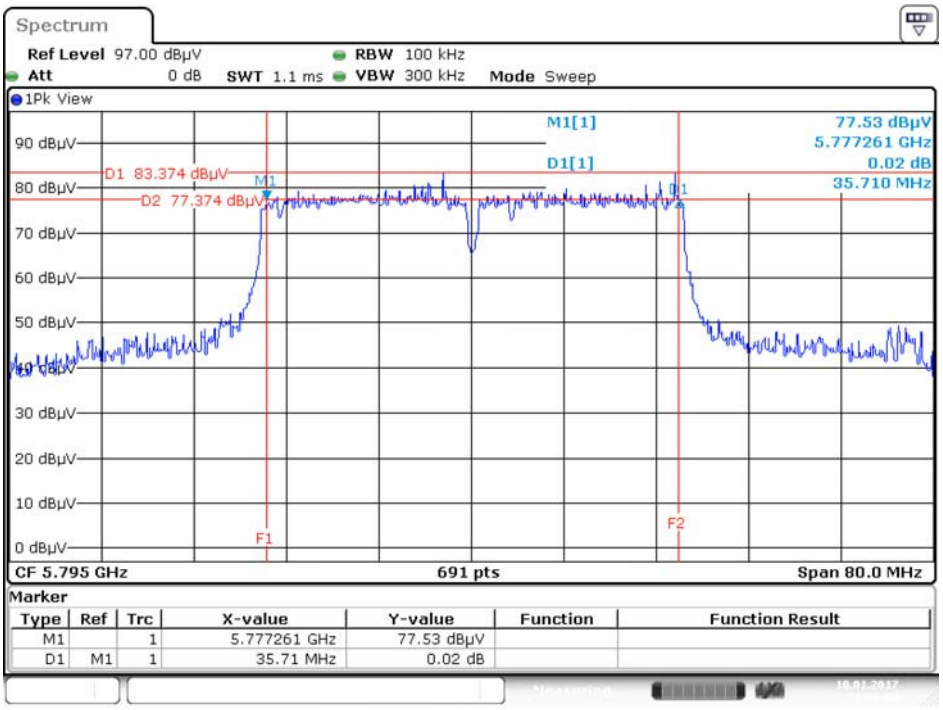
<For Beamforming Mode>

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



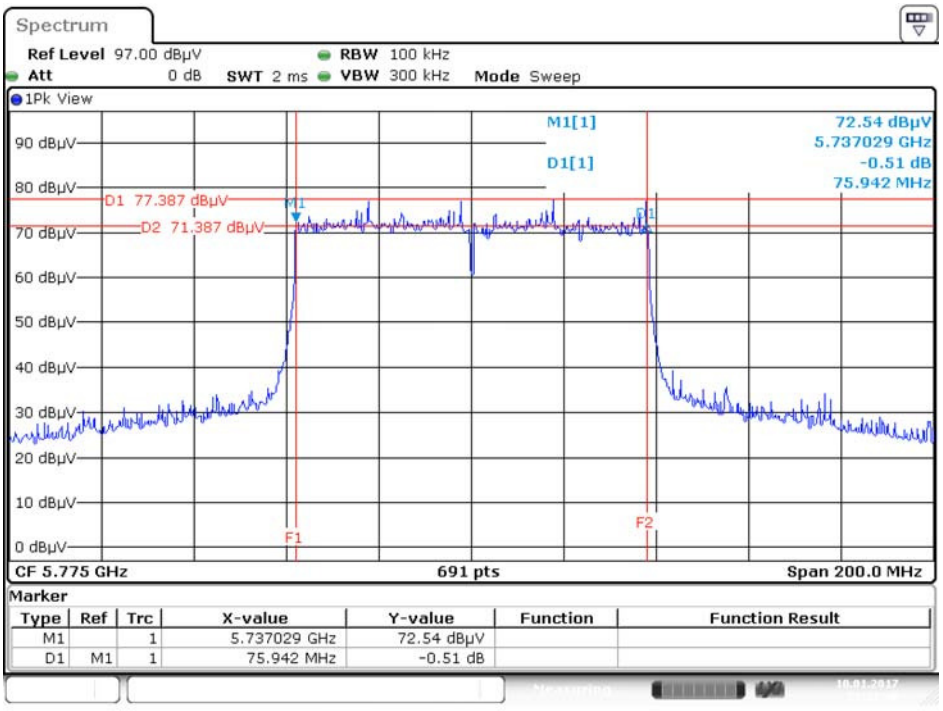
Date: 10.JAN.2017 21:29:03

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



Date: 10.JAN.2017 21:26:30

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



4.4. Maximum Conducted Output Power Measurement

4.4.1. Limit

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

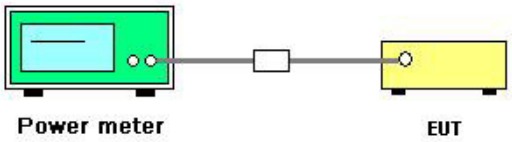
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

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 v01r03 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (E) Maximum conducted output power =>3. Measurement using a Power Meter (PM) =>b) Method PM-G (Measurement using a gated RF average power meter).
3. Multiple antenna systems was performed in accordance with KDB662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. When measuring maximum conducted output power with multiple antenna systems, add every result of the values by mathematic formula.

4.4.4. Test Setup Layout



4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.4.7. Test Result of Maximum Conducted Output Power

Temperature	25°C	Humidity	45%
Test Engineer	Serway Li	Test Date	Jan. 10, 2017

<For Non-Beamforming Mode>

Mode	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
802.11a	5745 MHz	23.08	24.50	23.55	23.65	29.75	30.00	Complies
	5785 MHz	23.49	24.30	23.58	23.54	29.76	30.00	Complies
	5825 MHz	23.67	24.57	23.91	23.37	29.92	30.00	Complies
802.11ac MCS0/Nss1 VHT20	5745 MHz	23.47	24.51	23.67	23.79	29.90	30.00	Complies
	5785 MHz	23.74	24.64	23.57	23.43	29.89	30.00	Complies
	5825 MHz	23.44	24.41	23.75	23.46	29.80	30.00	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	23.38	24.41	23.58	23.69	29.80	30.00	Complies
	5795 MHz	23.41	24.67	23.55	23.39	29.81	30.00	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	19.31	19.34	18.72	20.13	25.42	30.00	Complies

<For Beamforming Mode>

Mode	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
802.11ac MCS0/Nss1 VHT20	5180 MHz	18.44	19.51	18.49	20.01	25.19	26.98	Complies
	5200 MHz	20.28	21.23	20.41	21.37	26.87	26.98	Complies
	5240 MHz	20.16	21.27	20.31	21.58	26.89	26.98	Complies
	5745 MHz	20.08	21.64	20.56	20.83	26.84	26.98	Complies
	5785 MHz	20.15	21.68	20.84	20.87	26.94	26.98	Complies
	5825 MHz	19.98	21.59	20.91	20.62	26.83	26.98	Complies
802.11ac MCS0/Nss1 VHT40	5190 MHz	14.69	15.68	14.45	15.73	21.20	26.98	Complies
	5230 MHz	20.35	21.37	20.25	21.49	26.92	26.98	Complies
	5755 MHz	20.25	21.52	20.68	20.67	26.83	26.98	Complies
	5795 MHz	20.34	21.66	20.88	20.81	26.97	26.98	Complies
802.11ac MCS0/Nss1 VHT80	5210 MHz	15.38	16.28	16.08	16.74	22.17	26.98	Complies
	5775 MHz	19.31	19.34	18.72	20.13	25.42	26.98	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.02dBi>6dBi, so limit=30-(9.02-6)=26.98 dBm.

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
	☐	Client devices	11 dBm/MHz
☒	5.725~5.85 GHz		30 dBm/500kHz

4.5.2. Measuring Instruments and Setting

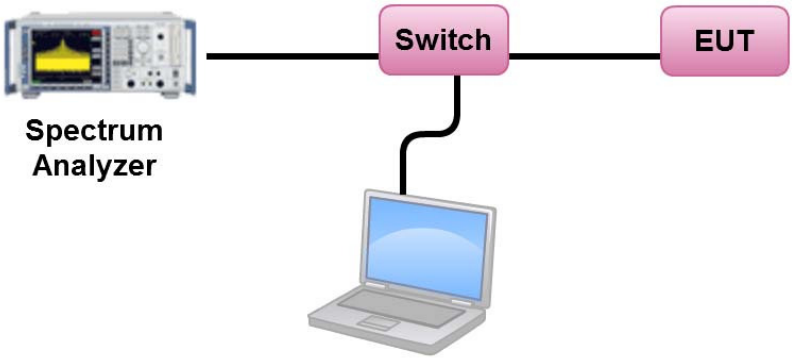
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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 v01r03 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (F) Maximum Power Spectral Density (PSD).
3. Multiple antenna systems was performed in accordance KDB662911 D01 v02r01 in-Band Power Spectral Density (PSD) Measurements and sum the spectra across the outputs.
4. For 5.725~5.85 GHz, the measured result of PSD level must add 10log(500kHz/RBW) and the final result should ≤ 30 dBm.

4.5.4. Test Setup Layout



4.5.5. Test Deviation

There is no deviation with the original standard.

4.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.5.7. Test Result of Power Spectral Density

Temperature	25°C	Humidity	45%
Test Engineer	Serway Li		

<For Non-Beamforming Mode>

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	16.52	-3.01	13.51	26.98	Complies
157	5785 MHz	16.56	-3.01	13.55	26.98	Complies
165	5825 MHz	16.71	-3.01	13.70	26.98	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.02dBi>6dBi, so limit=30-(9.02-6)=26.98 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	16.62	-3.01	13.61	26.98	Complies
157	5785 MHz	16.69	-3.01	13.68	26.98	Complies
165	5825 MHz	16.68	-3.01	13.67	26.98	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.02dBi>6dBi, so limit=30-(9.02-6)=26.98 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	13.61	-3.01	10.60	26.98	Complies
159	5795 MHz	13.71	-3.01	10.70	26.98	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$ =9.02dBi>6dBi, so limit=30-(9.02-6)=26.98 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	6.14	-3.01	3.13	26.98	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$ =9.02dBi>6dBi, so limit=30-(9.02-6)=26.98 dBm/500kHz.

<For Beamforming Mode>

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	11.93	13.98	Complies
40	5200 MHz	13.65	13.98	Complies
48	5240 MHz	13.69	13.98	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.02dBi>6dBi, so limit=17-(9.02-6)=13.98 dBm/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	13.62	-3.01	10.61	26.98	Complies
157	5785 MHz	13.73	-3.01	10.72	26.98	Complies
165	5825 MHz	13.63	-3.01	10.62	26.98	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.02, so limit=30-(9.02-6)=26.98 dBm/500kHz.

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	5.09	13.98	Complies
46	5230 MHz	10.75	13.98	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.02dBi>6dBi, so limit=17-(9.02-6)=13.98 dBm/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	10.69	-3.01	7.68	26.98	Complies
159	5795 MHz	10.83	-3.01	7.82	26.98	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.02, so limit=30-(9.02-6)=26.98 dBm/500kHz.

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
42	5210 MHz	3.01	13.98	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.02dBi>6dBi, so limit=17-(9.02-6)=13.98 dBm/MHz.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
155	5775 MHz	6.24	-3.01	3.23	26.98	Complies

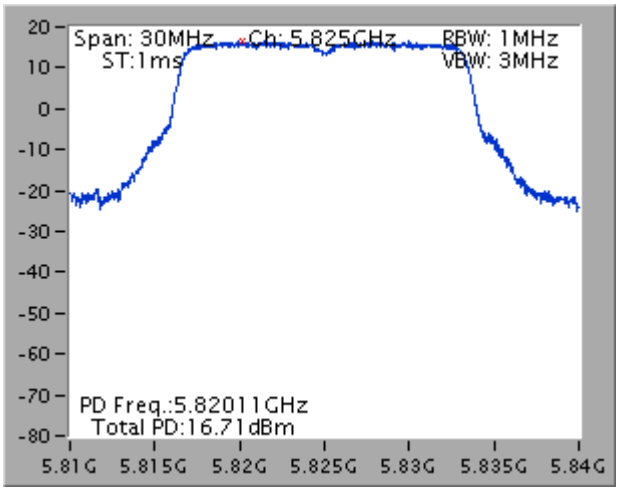
Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.02, so limit=30-(9.02-6)=26.98 dBm/500kHz.

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

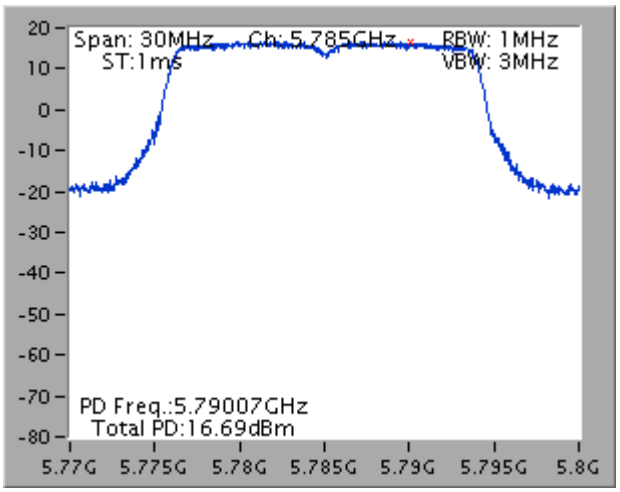
For plots, only the channel with worse result was shown.

<For Non-Beamforming Mode>

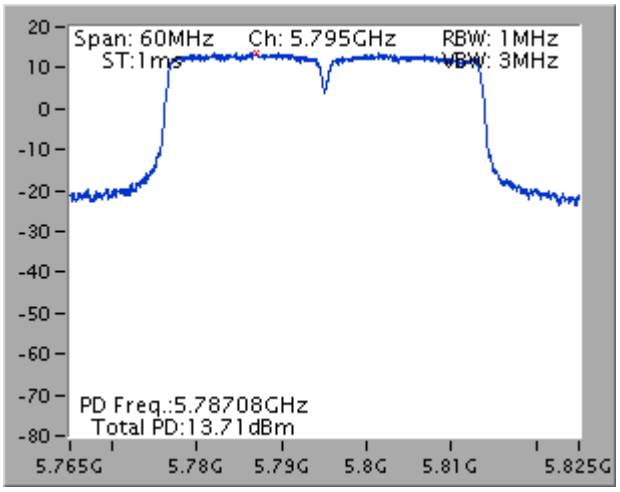
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5825 MHz



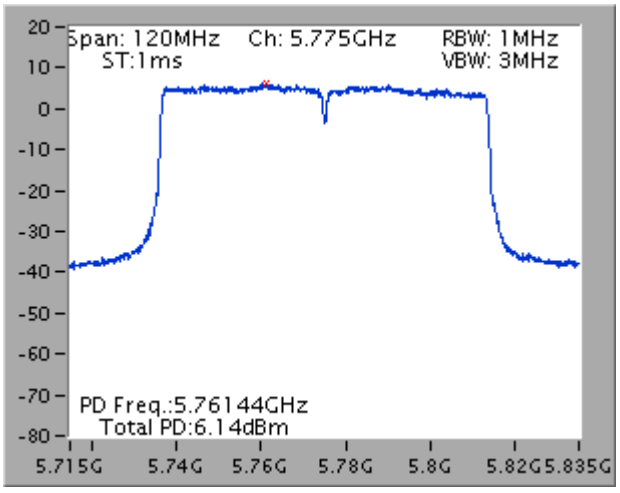
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5785 MHz



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

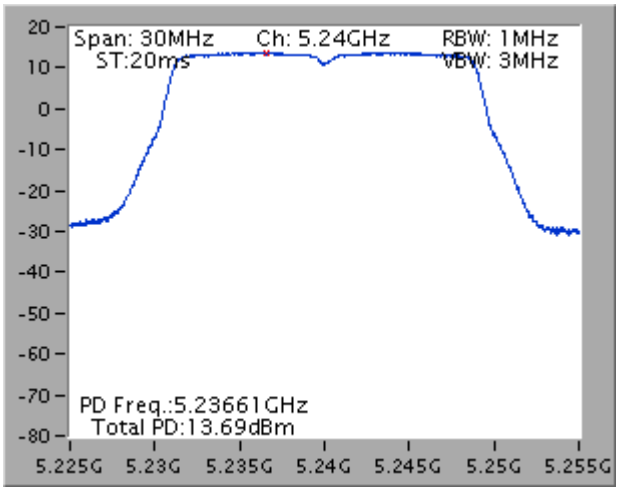


Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5775 MHz

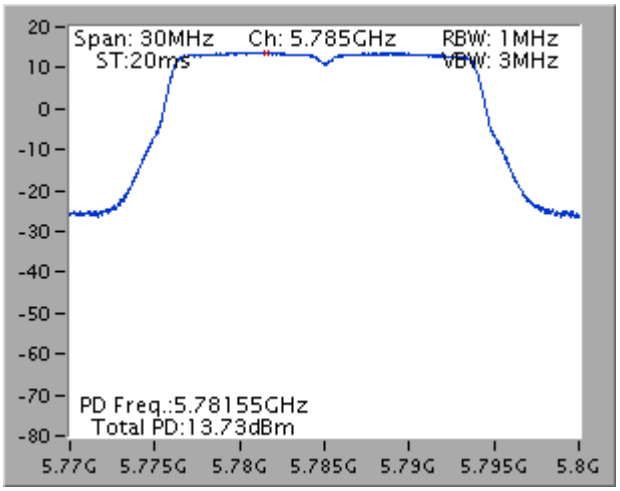


<For Beamforming Mode>

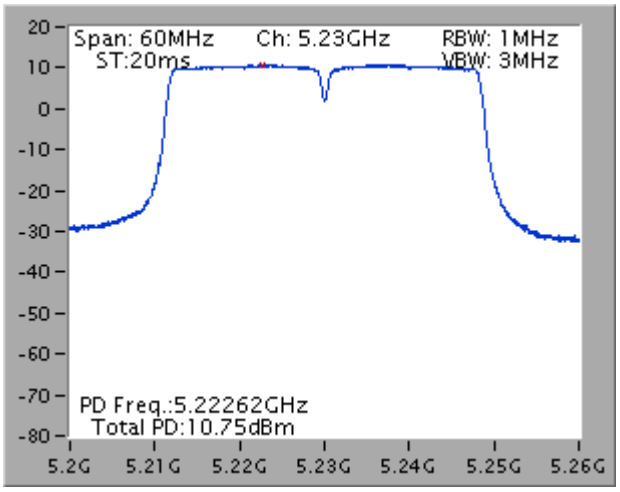
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5240 MHz



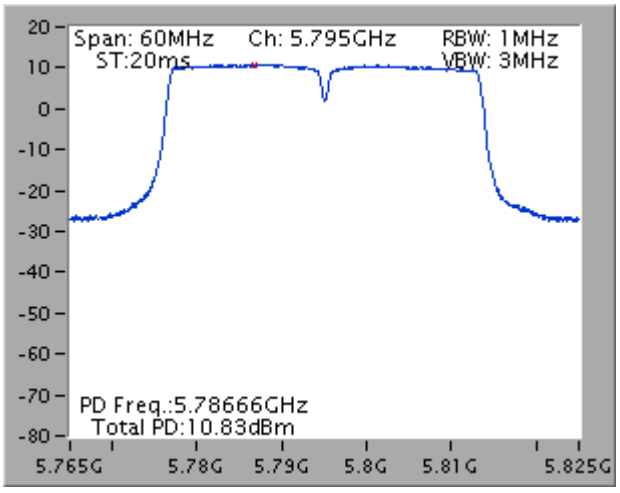
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5785 MHz



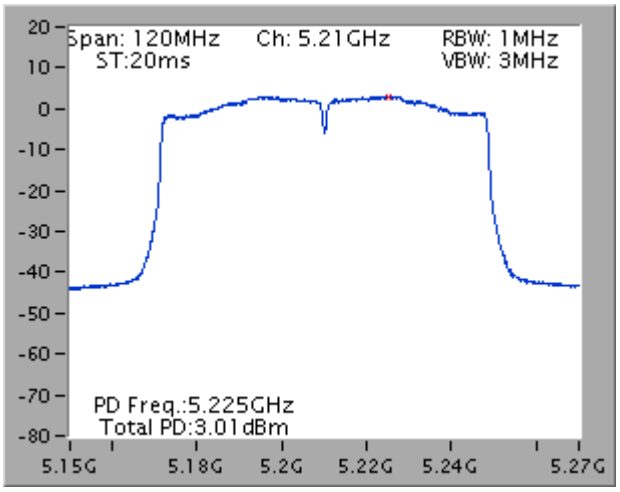
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5230 MHz



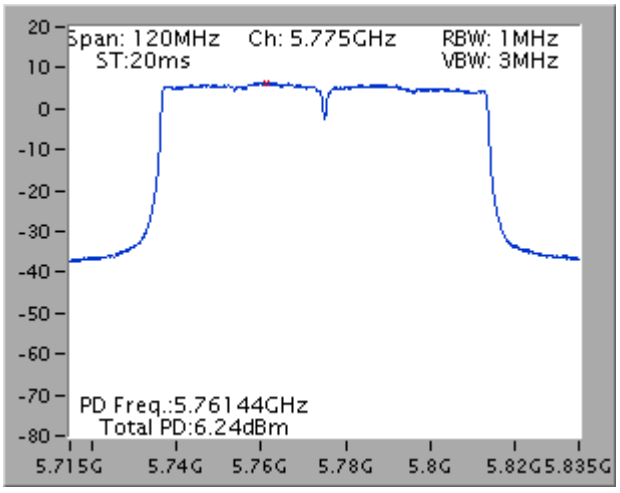
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5795 MHz



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



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



4.6. Radiated Emissions Measurement

4.6.1. Limit

For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

For transmitters operating in the 5.725-5.85 GHz band: all emissions 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 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

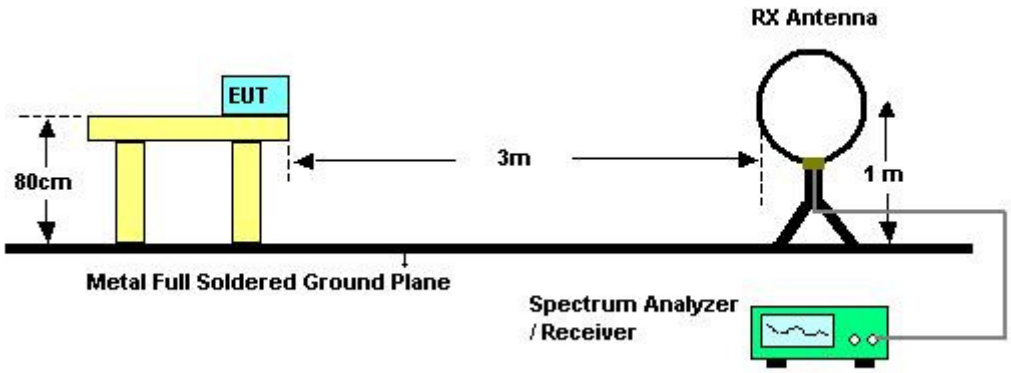
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.6.3. Test Procedures

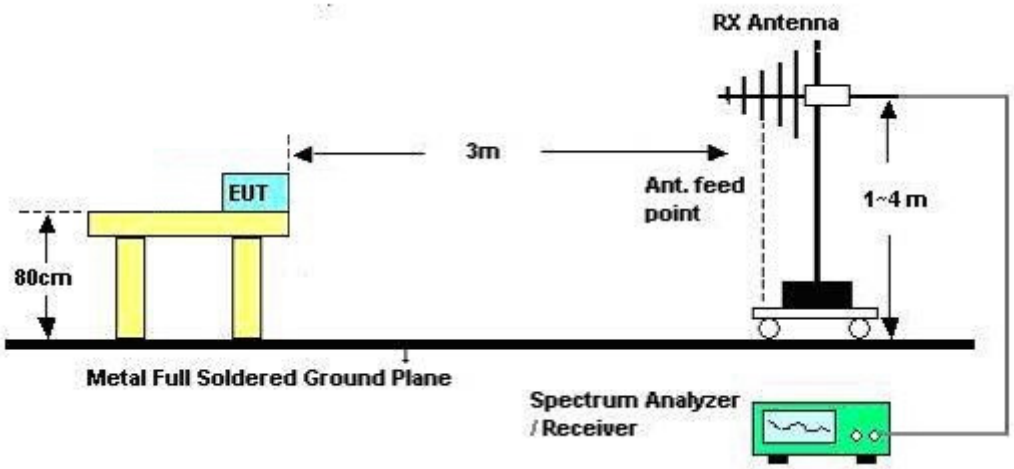
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 1m & 3m far away from the turntable.
2. Power on the EUT and all the supporting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

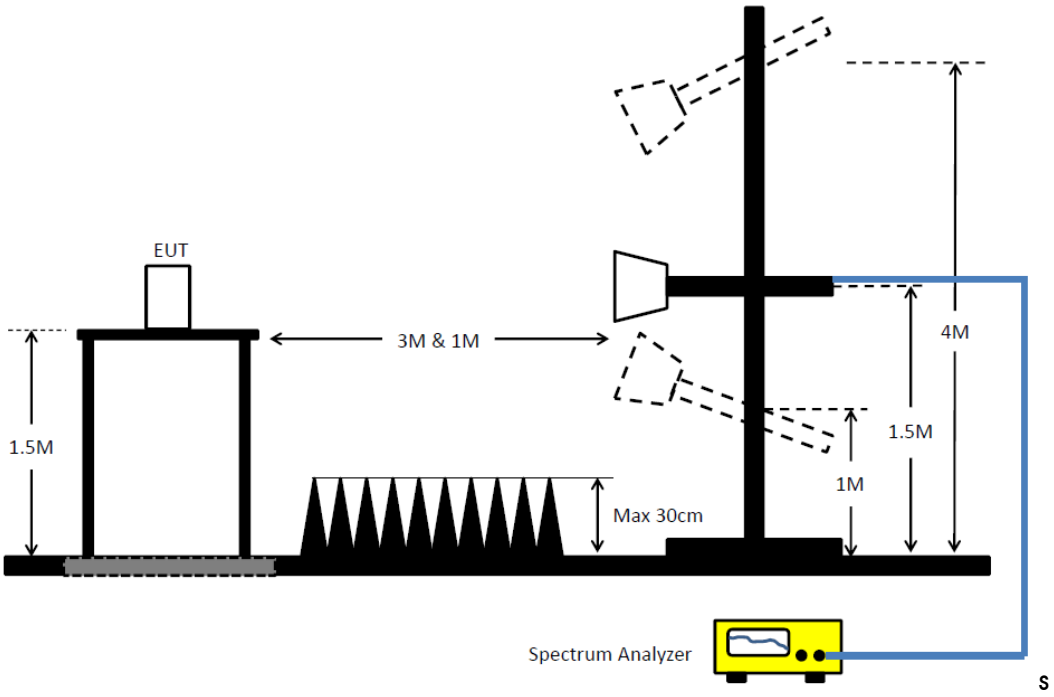
For Radiated Emissions: 9kHz ~30MHz



For Radiated Emissions: 30MHz~1GHz



For Radiated Emissions: Above 1GHz



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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	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	Normal Link / Mode 1
Test Date	Feb. 06, 2017		

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.

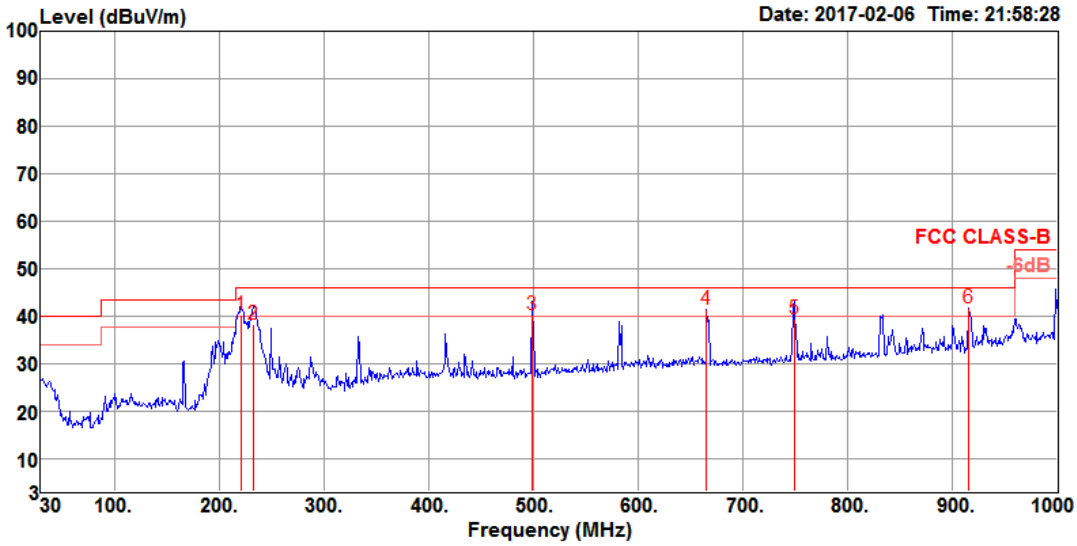
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

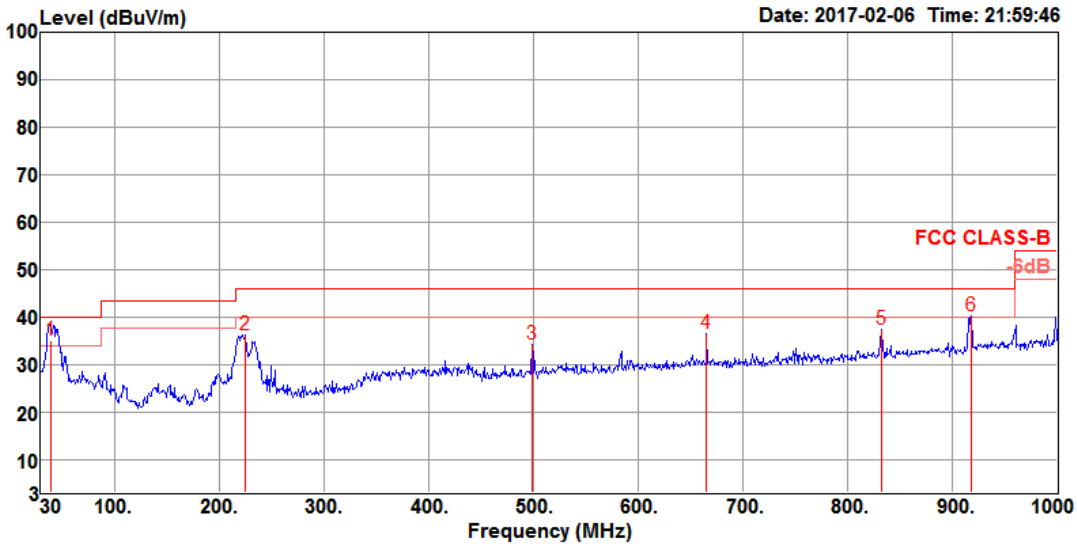
Temperature	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	Normal Link / Mode 1

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	221.09	40.34	46.00	-5.66	54.00	1.68	16.99	32.33	123	134	QP	HORIZONTAL
2	232.73	38.12	46.00	-7.88	51.00	1.72	17.73	32.33	100	330	QP	HORIZONTAL
3	498.51	40.25	46.00	-5.75	46.01	2.57	23.97	32.30	210	36	QP	HORIZONTAL
4	665.35	41.44	46.00	-4.56	44.82	2.98	26.03	32.39	125	164	Peak	HORIZONTAL
5	748.77	39.26	46.00	-6.74	42.00	3.16	26.38	32.28	123	197	QP	HORIZONTAL
6	915.61	41.56	46.00	-4.44	41.74	3.52	27.83	31.53	100	169	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	38.73	34.92	40.00	-5.08	46.00	0.69	20.93	32.70	100	222	QP	VERTICAL
2	224.97	36.29	46.00	-9.71	49.70	1.70	17.22	32.33	100	302	Peak	VERTICAL
3	498.51	34.32	46.00	-11.68	40.08	2.57	23.97	32.30	200	108	Peak	VERTICAL
4	665.35	36.38	46.00	-9.62	39.76	2.98	26.03	32.39	300	106	Peak	VERTICAL
5	832.19	37.28	46.00	-8.72	38.74	3.36	27.20	32.02	200	341	Peak	VERTICAL
6	917.55	40.13	46.00	-5.87	40.31	3.52	27.83	31.53	200	70	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.

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

<For Non-Beamforming Mode>

Temperature	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	IEEE 802.11a CH 48 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jan. 03, 2017 ~ Feb. 02, 2017		

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	15629.20	44.36	54.00	-9.64	40.64	13.01	38.37	47.66	192	277	Average	HORIZONTAL
2	15631.53	57.81	74.00	-16.19	54.09	13.01	38.37	47.66	192	277	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	15719.89	44.27	54.00	-9.73	40.53	13.04	38.35	47.65	218	73	Average	VERTICAL
2	15721.45	57.03	74.00	-16.97	53.29	13.04	38.35	47.65	218	73	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	IEEE 802.11a CH 149 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jan. 03, 2017 ~ Feb. 02, 2017		

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	11470.00	55.71	74.00	-18.29	52.45	11.79	39.21	47.74	151	222	Peak	HORIZONTAL
2	11478.40	42.24	54.00	-11.76	39.00	11.79	39.21	47.76	151	222	Average	HORIZONTAL
3	17233.60	62.52	68.20	-5.68	54.98	13.44	41.40	47.30	113	63	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	11474.30	53.97	74.00	-20.03	50.73	11.79	39.21	47.76	150	301	Peak	VERTICAL
2	11491.10	42.17	54.00	-11.83	38.91	11.82	39.20	47.76	150	301	Average	VERTICAL
3	17238.10	68.19	68.20	-0.01	60.65	13.44	41.40	47.30	105	13	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	IEEE 802.11a CH 157 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jan. 03, 2017 ~ Feb. 02, 2017		

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	11575.52	55.31	74.00	-18.69	52.11	11.86	39.15	47.81	297	52	Peak	HORIZONTAL
2	11578.88	41.51	54.00	-12.49	38.31	11.86	39.15	47.81	297	52	Average	HORIZONTAL
3	17357.76	56.88	68.20	-11.32	49.24	13.47	41.52	47.35	112	65	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	11577.32	42.54	54.00	-11.46	39.34	11.86	39.15	47.81	104	223	Average	VERTICAL
2	11577.76	56.07	74.00	-17.93	52.87	11.86	39.15	47.81	104	223	Peak	VERTICAL
3	17352.50	67.99	68.20	-0.21	60.35	13.47	41.52	47.35	103	0	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	IEEE 802.11a CH 165 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jan. 03, 2017 ~ Feb. 02, 2017		

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	11667.80	42.40	54.00	-11.60	39.28	11.93	39.07	47.88	152	181	Average	HORIZONTAL
2	11675.00	55.82	74.00	-18.18	52.70	11.93	39.07	47.88	152	181	Peak	HORIZONTAL
3	17480.20	61.08	68.20	-7.12	53.26	13.51	41.70	47.39	126	67	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	11645.20	55.73	74.00	-18.27	52.59	11.91	39.09	47.86	128	7	Peak	VERTICAL
2	11646.60	43.48	54.00	-10.52	40.34	11.91	39.09	47.86	128	7	Average	VERTICAL
3	17477.30	68.05	68.20	-0.15	60.23	13.51	41.70	47.39	122	183	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jan. 03, 2017 ~ Feb. 02, 2017		

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	11483.68	55.47	74.00	-18.53	52.21	11.82	39.20	47.76	135	324	Peak	HORIZONTAL
2	11484.08	42.32	54.00	-11.68	39.06	11.82	39.20	47.76	135	324	Average	HORIZONTAL
3	17234.76	60.61	68.20	-7.59	53.07	13.44	41.40	47.30	214	123	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	11482.44	56.26	74.00	-17.74	53.02	11.79	39.21	47.76	150	91	Peak	VERTICAL
2	11487.72	42.34	54.00	-11.66	39.08	11.82	39.20	47.76	150	91	Average	VERTICAL
3	17234.80	68.17	68.20	-0.03	60.63	13.44	41.40	47.30	101	1	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jan. 03, 2017 ~ Feb. 02, 2017		

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	11568.28	42.40	54.00	-11.60	39.20	11.86	39.15	47.81	105	224	Average	HORIZONTAL
2	11568.36	54.24	74.00	-19.76	51.04	11.86	39.15	47.81	105	224	Peak	HORIZONTAL
3	17349.48	62.05	68.20	-6.15	54.41	13.47	41.52	47.35	105	0	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	11567.48	41.95	54.00	-12.05	38.75	11.86	39.15	47.81	100	0	Average	VERTICAL
2	11573.00	55.32	74.00	-18.68	52.12	11.86	39.15	47.81	100	0	Peak	VERTICAL
3	17349.40	67.97	68.20	-0.23	60.33	13.47	41.52	47.35	108	4	Peak	VERTICAL

Temperature	24℃	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jan. 03, 2017 ~ Feb. 02, 2017		

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	11643.96	55.47	74.00	-18.53	52.33	11.91	39.09	47.86	149	265	Peak	HORIZONTAL
2	11645.24	42.58	54.00	-11.42	39.44	11.91	39.09	47.86	149	265	Average	HORIZONTAL
3	17472.12	61.04	68.20	-7.16	53.22	13.51	41.70	47.39	116	344	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	11648.20	55.43	74.00	-18.57	52.29	11.91	39.09	47.86	115	224	Peak	VERTICAL
2	11648.44	43.30	54.00	-10.70	40.16	11.91	39.09	47.86	115	224	Average	VERTICAL
3	17473.80	68.03	68.20	-0.17	60.21	13.51	41.70	47.39	116	186	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jan. 03, 2017 ~ Feb. 02, 2017		

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	11500.36	42.28	54.00	-11.72	39.02	11.82	39.20	47.76	128	15	Average	HORIZONTAL
2	11508.08	54.41	74.00	-19.59	51.15	11.82	39.20	47.76	128	15	Peak	HORIZONTAL
3	17265.92	62.45	68.20	-5.75	54.83	13.46	41.46	47.30	109	60	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	11500.00	55.09	74.00	-18.91	51.83	11.82	39.20	47.76	231	0	Peak	VERTICAL
2	11500.88	42.06	54.00	-11.94	38.80	11.82	39.20	47.76	231	0	Average	VERTICAL
3	17274.64	68.01	68.20	-0.19	60.39	13.46	41.46	47.30	108	3	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jan. 03, 2017 ~ Feb. 02, 2017		

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	11580.36	55.69	74.00	-18.31	52.49	11.86	39.15	47.81	132	245	Peak	HORIZONTAL
2	11590.44	42.78	54.00	-11.22	39.60	11.89	39.12	47.83	132	245	Average	HORIZONTAL
3	17381.16	63.50	68.20	-4.70	55.79	13.48	41.58	47.35	100	157	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	11583.76	43.65	54.00	-10.35	40.45	11.89	39.12	47.81	113	223	Average	VERTICAL
2	11594.00	56.91	74.00	-17.09	53.73	11.89	39.12	47.83	113	223	Peak	VERTICAL
3	17381.68	68.00	68.20	-0.20	60.29	13.48	41.58	47.35	109	160	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jan. 03, 2017 ~ Feb. 02, 2017		

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	11549.00	47.28	74.00	-26.72	44.08	11.84	39.17	47.81	122	212	Peak	HORIZONTAL
2	11559.32	33.27	54.00	-20.73	30.07	11.86	39.15	47.81	122	212	Average	HORIZONTAL
3	17323.72	55.64	68.20	-12.56	47.97	13.47	41.52	47.32	157	137	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	11558.16	33.08	54.00	-20.92	29.88	11.86	39.15	47.81	142	252	Average	VERTICAL
2	11560.00	47.08	74.00	-26.92	43.88	11.86	39.15	47.81	142	252	Peak	VERTICAL
3	17324.40	59.35	68.20	-8.85	51.68	13.47	41.52	47.32	111	2	Peak	VERTICAL

<For Beamforming Mode>

Temperature	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jan. 03, 2017 ~ Feb. 02, 2017		

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	15531.20	57.17	74.00	-16.83	41.92	11.97	38.15	34.87	104	117	Peak	HORIZONTAL
2	15536.76	43.78	54.00	-10.22	28.53	11.97	38.15	34.87	104	117	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	15541.76	43.87	54.00	-10.13	28.62	11.97	38.15	34.87	128	42	Average	VERTICAL
2	15548.44	57.43	74.00	-16.57	42.20	11.97	38.13	34.87	128	42	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 40 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jan. 03, 2017 ~ Feb. 02, 2017		

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	15597.80	56.40	74.00	-17.60	41.22	11.99	38.06	34.87	140	126	Peak	HORIZONTAL
2	15598.12	43.68	54.00	-10.32	28.50	11.99	38.06	34.87	140	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	15603.24	43.75	54.00	-10.25	28.55	12.01	38.06	34.87	130	185	Average	VERTICAL
2	15603.88	57.20	74.00	-16.80	42.00	12.01	38.06	34.87	130	185	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 48 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jan. 03, 2017 ~ Feb. 02, 2017		

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	15721.28	43.93	54.00	-10.07	28.88	12.05	37.89	34.89	145	247	Average	HORIZONTAL
2	15727.68	57.12	74.00	-16.88	42.07	12.05	37.89	34.89	145	247	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	15719.08	57.72	74.00	-16.28	42.67	12.05	37.89	34.89	273	315	Peak	VERTICAL
2	15728.32	44.15	54.00	-9.85	29.10	12.05	37.89	34.89	273	315	Average	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jan. 03, 2017 ~ Feb. 02, 2017		

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	11484.60	56.15	74.00	-17.85	41.66	10.33	38.79	34.63	114	225	Peak	HORIZONTAL
2	11490.88	42.88	54.00	-11.12	28.39	10.33	38.79	34.63	114	225	Average	HORIZONTAL
3	17227.68	62.23	68.20	-5.97	42.02	12.72	42.56	35.07	156	187	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	11488.00	43.06	54.00	-10.94	28.57	10.33	38.79	34.63	129	310	Average	VERTICAL
2	11493.44	56.83	74.00	-17.17	42.34	10.33	38.79	34.63	129	310	Peak	VERTICAL
3	17233.08	66.59	68.20	-1.61	46.38	12.72	42.56	35.07	150	373	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jan. 03, 2017 ~ Feb. 02, 2017		

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	11575.48	55.61	74.00	-18.39	41.07	10.36	38.83	34.65	140	161	Peak	HORIZONTAL
2	11577.16	42.97	54.00	-11.03	28.43	10.36	38.83	34.65	140	161	Average	HORIZONTAL
3	17363.72	63.06	68.20	-5.14	42.06	12.78	43.28	35.06	150	199	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	11567.60	43.40	54.00	-10.60	28.86	10.36	38.83	34.65	123	157	Average	VERTICAL
2	11568.40	56.56	74.00	-17.44	42.02	10.36	38.83	34.65	123	157	Peak	VERTICAL
3	17346.88	67.28	68.20	-0.92	46.39	12.76	43.19	35.06	120	358	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jan. 03, 2017 ~ Feb. 02, 2017		

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	11642.08	43.76	54.00	-10.24	39.56	0.00	38.86	34.66	153	248	Average	HORIZONTAL
2	11646.48	57.74	74.00	-16.26	53.54	0.00	38.86	34.66	153	248	Peak	HORIZONTAL
3	17457.60	52.43	68.20	-15.77	43.74	0.00	43.73	35.04	120	56	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	11648.84	46.41	54.00	-7.59	31.82	10.39	38.86	34.66	196	175	Average	VERTICAL
2	11650.64	56.93	74.00	-17.07	42.34	10.39	38.86	34.66	196	175	Peak	VERTICAL
3	17475.00	67.30	68.20	-0.90	45.69	12.83	43.82	35.04	114	168	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jan. 03, 2017 ~ Feb. 02, 2017		

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	15562.08	46.71	54.00	-7.29	31.49	11.99	38.10	34.87	131	304	Average	HORIZONTAL
2	15575.40	56.79	74.00	-17.21	41.57	11.99	38.10	34.87	131	304	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	15565.52	46.83	54.00	-7.17	31.61	11.99	38.10	34.87	168	242	Average	VERTICAL
2	15571.48	58.00	74.00	-16.00	42.78	11.99	38.10	34.87	168	242	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 46 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jan. 03, 2017 ~ Feb. 02, 2017		

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	15703.12	46.34	54.00	-7.66	31.26	12.05	37.91	34.88	150	206	Average	HORIZONTAL
2	15719.76	57.31	74.00	-16.69	42.26	12.05	37.89	34.89	150	206	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	15701.20	57.60	74.00	-16.40	42.52	12.05	37.91	34.88	167	156	Peak	VERTICAL
2	15704.88	46.54	54.00	-7.46	31.46	12.05	37.91	34.88	167	156	Average	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jan. 03, 2017 ~ Feb. 02, 2017		

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	11534.96	43.12	54.00	-10.88	28.61	10.34	38.81	34.64	155	74	Average	HORIZONTAL
2	11592.40	56.02	74.00	-17.98	41.48	10.37	38.83	34.66	155	74	Peak	HORIZONTAL
3	17368.44	64.34	68.20	-3.86	43.34	12.78	43.28	35.06	180	214	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	11572.24	43.19	54.00	-10.81	28.65	10.36	38.83	34.65	143	121	Average	VERTICAL
2	11587.28	57.40	74.00	-16.60	42.86	10.37	38.83	34.66	143	121	Peak	VERTICAL
3	17366.52	65.44	68.20	-2.76	44.44	12.78	43.28	35.06	185	213	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jan. 03, 2017 ~ Feb. 02, 2017		

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	11643.56	56.91	74.00	-17.09	42.32	10.39	38.86	34.66	123	201	Peak	HORIZONTAL
2	11655.00	43.04	54.00	-10.96	28.44	10.40	38.86	34.66	123	201	Average	HORIZONTAL
3	17471.72	66.17	68.20	-2.03	44.56	12.83	43.82	35.04	156	287	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	11643.60	57.12	74.00	-16.88	42.53	10.39	38.86	34.66	148	293	Peak	VERTICAL
2	11647.44	43.19	54.00	-10.81	28.60	10.39	38.86	34.66	148	293	Average	VERTICAL
3	17478.56	66.74	68.20	-1.46	45.13	12.83	43.82	35.04	181	234	Peak	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jan. 03, 2017 ~ Feb. 02, 2017		

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	15625.16	56.87	74.00	-17.13	41.71	12.01	38.03	34.88	126	222	Peak	HORIZONTAL
2	15630.20	44.13	54.00	-9.87	28.99	12.01	38.01	34.88	126	222	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	15632.88	57.76	74.00	-16.24	42.62	12.01	38.01	34.88	145	151	Peak	VERTICAL
2	15633.56	44.02	54.00	-9.98	28.88	12.01	38.01	34.88	145	151	Average	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	Jan. 03, 2017 ~ Feb. 02, 2017		

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	11542.52	56.50	74.00	-17.50	41.99	10.34	38.81	34.64	142	136	Peak	HORIZONTAL
2	11552.28	43.10	54.00	-10.90	28.57	10.36	38.82	34.65	142	136	Average	HORIZONTAL
3	17316.28	62.14	68.20	-6.06	41.43	12.76	43.01	35.06	162	222	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	11541.00	56.19	74.00	-17.81	41.68	10.34	38.81	34.64	126	188	Peak	VERTICAL
2	11555.08	43.18	54.00	-10.82	28.65	10.36	38.82	34.65	126	188	Average	VERTICAL
3	17318.84	63.16	68.20	-5.04	42.45	12.76	43.01	35.06	140	241	Peak	VERTICAL

Note:

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

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

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

4.7. Band Edge Emissions Measurement

4.7.1. Limit

For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

For transmitters operating in the 5.725-5.85 GHz band: all emissions 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

4.7.2. 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:

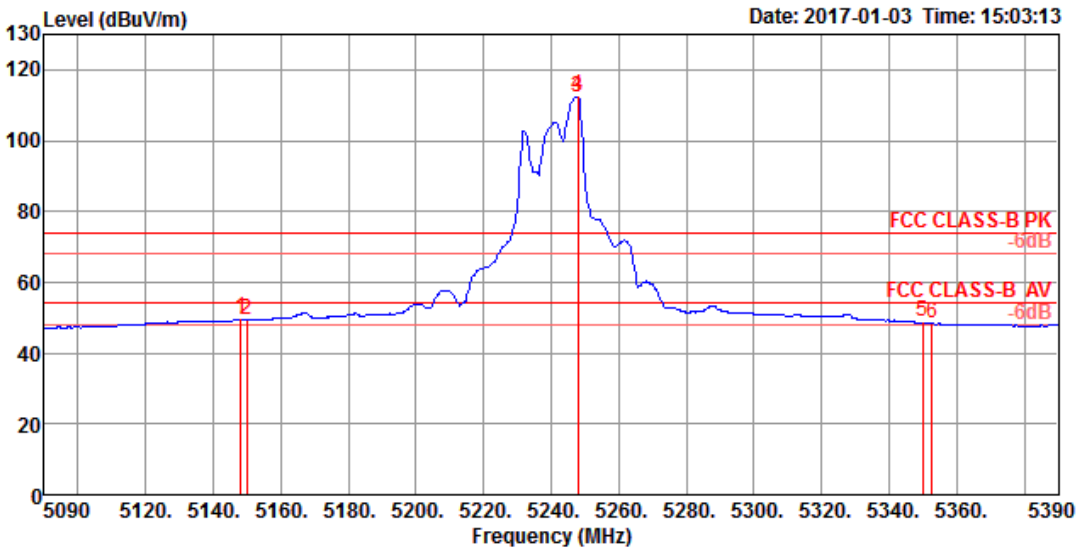
The EUT was programmed to be in beamforming transmitting mode.

4.7.7. Test Result of Band Edge and Fundamental Emissions

<For Non-Beamforming Mode>

Temperature	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	IEEE 802.11a CH 48 / Chain 1 + Chain 2 + Chain 3 + Chain 4

Channel 48

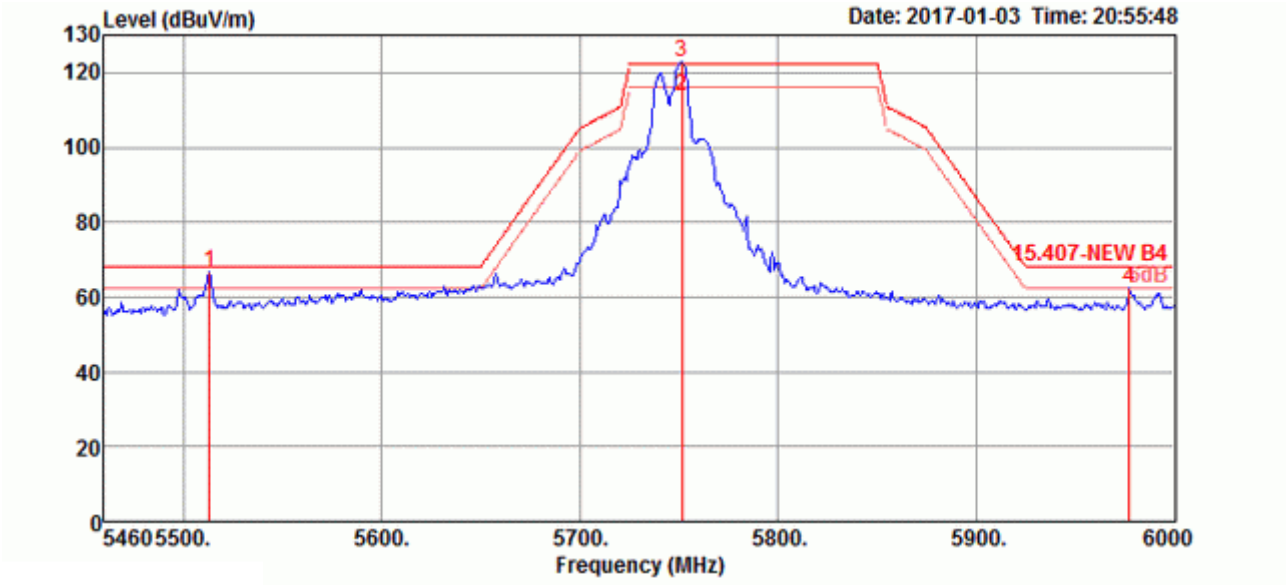


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5148.20	49.72	74.00	-24.28	57.62	8.23	33.17	49.30	150	100	Peak	VERTICAL
2	5150.00	49.36	54.00	-4.64	57.26	8.23	33.17	49.30	150	100	Average	VERTICAL
3 @	5247.80	112.26			119.97	8.26	33.36	49.33	150	100	Average	VERTICAL
4 @	5247.80	112.79			120.50	8.26	33.36	49.33	150	100	Peak	VERTICAL
5	5350.00	48.75	74.00	-25.25	56.41	8.17	33.53	49.36	150	100	Peak	VERTICAL
6	5352.80	48.41	54.00	-5.59	56.07	8.17	33.53	49.36	150	100	Average	VERTICAL

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

Temperature	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	IEEE 802.11a CH 149, 157, 165 / Chain 1 + Chain 2 + Chain 3 + Chain 4

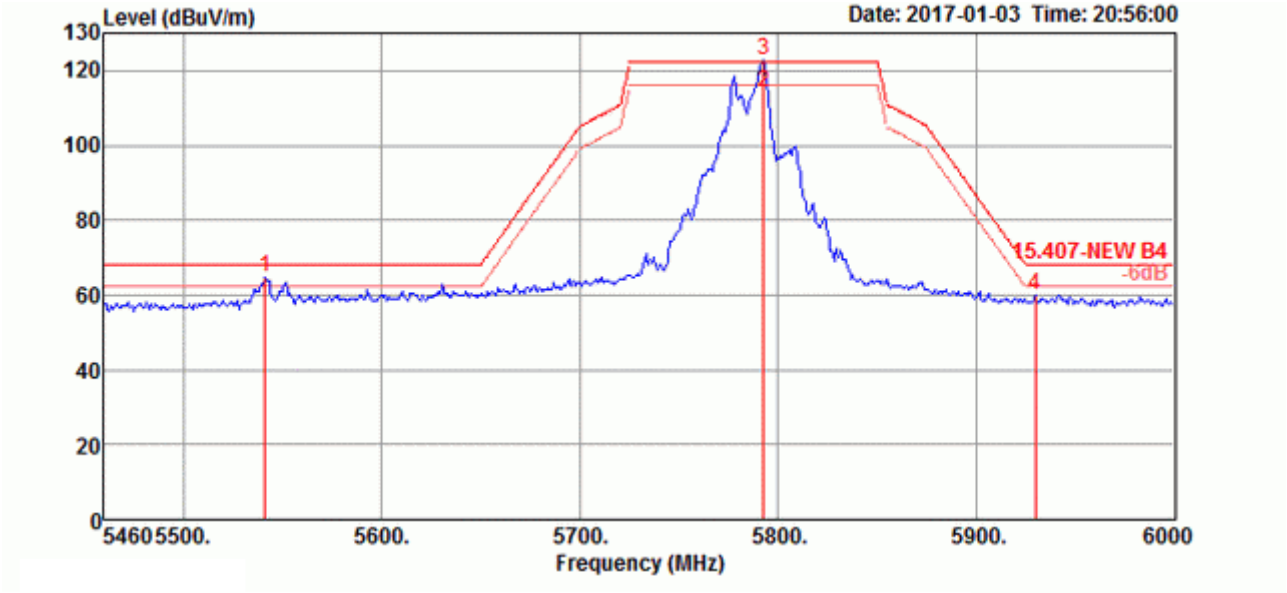
Channel 149



	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	5512.92	66.66	68.20	-1.54	73.78	8.43	33.85	49.40	150	178	Peak	VERTICAL
2	5751.60	113.73			120.35	8.34	34.50	49.46	150	178	Average	VERTICAL
3 @	5751.60	122.80			129.42	8.34	34.50	49.46	150	178	Peak	VERTICAL
4	5977.32	62.36	68.20	-5.84	67.98	8.74	35.15	49.51	150	178	Peak	VERTICAL

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

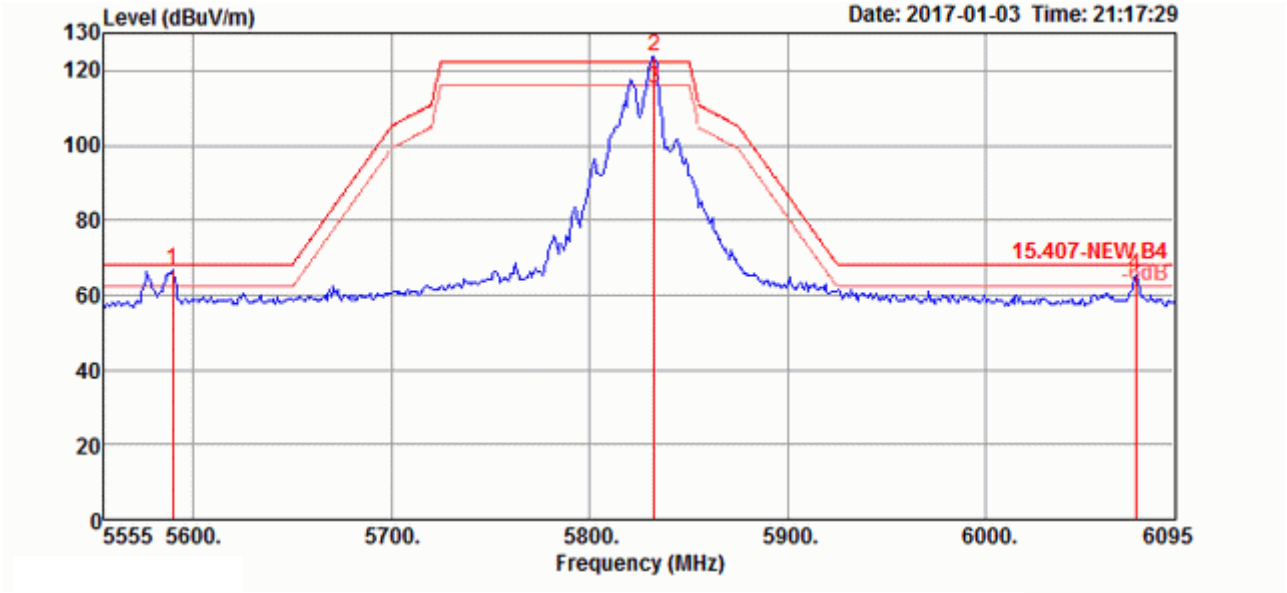
Channel 157



	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	5541.00	64.66	68.20	-3.54	71.71	8.47	33.89	49.41	150	173	Peak	VERTICAL
2	5792.64	114.16			120.74	8.25	34.64	49.47	150	173	Average	VERTICAL
3 @	5792.64	122.82			129.40	8.25	34.64	49.47	150	173	Peak	VERTICAL
4	5929.80	60.20	68.20	-8.00	66.08	8.60	35.01	49.49	150	173	Peak	VERTICAL

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

Channel 165

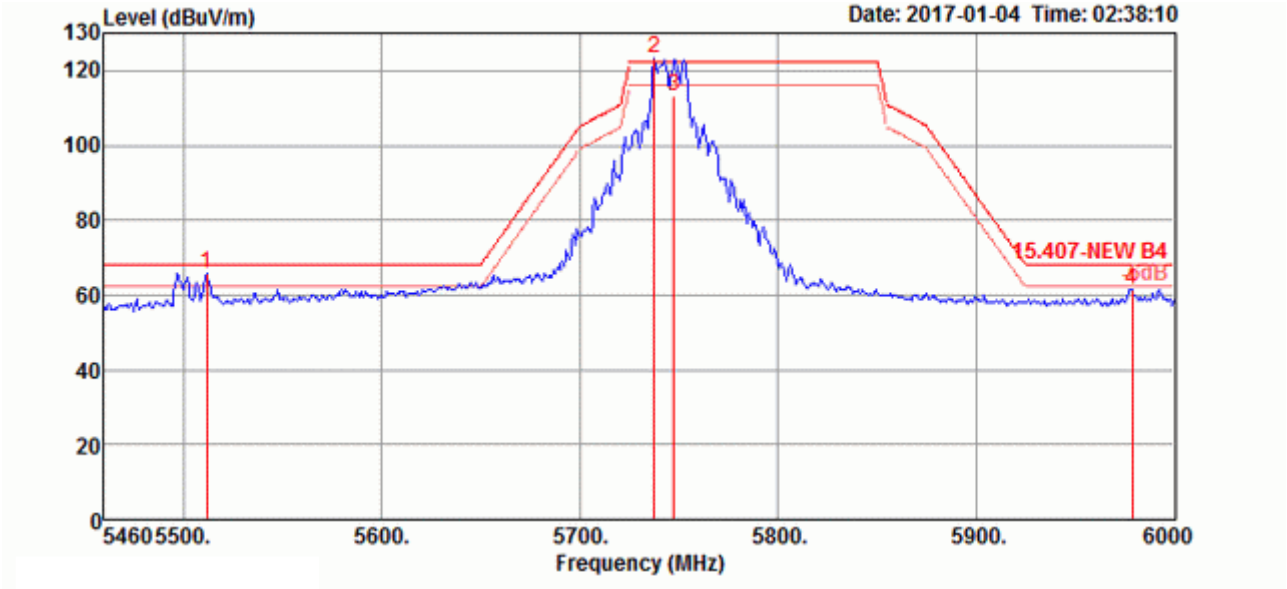


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5589.56	66.58	68.20	-1.62	73.39	8.58	34.03	49.42	194	174		VERTICAL
2 @	5832.56	123.63			130.03	8.34	34.73	49.47	194	174		VERTICAL
3	5832.56	115.07			121.47	8.34	34.73	49.47	194	174	Average	VERTICAL
4	6075.56	65.12	68.20	-3.08	70.48	8.84	35.29	49.49	194	174		VERTICAL

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

Temperature	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149, 157, 165 / Chain 1 + Chain 2 + Chain 3 + Chain 4

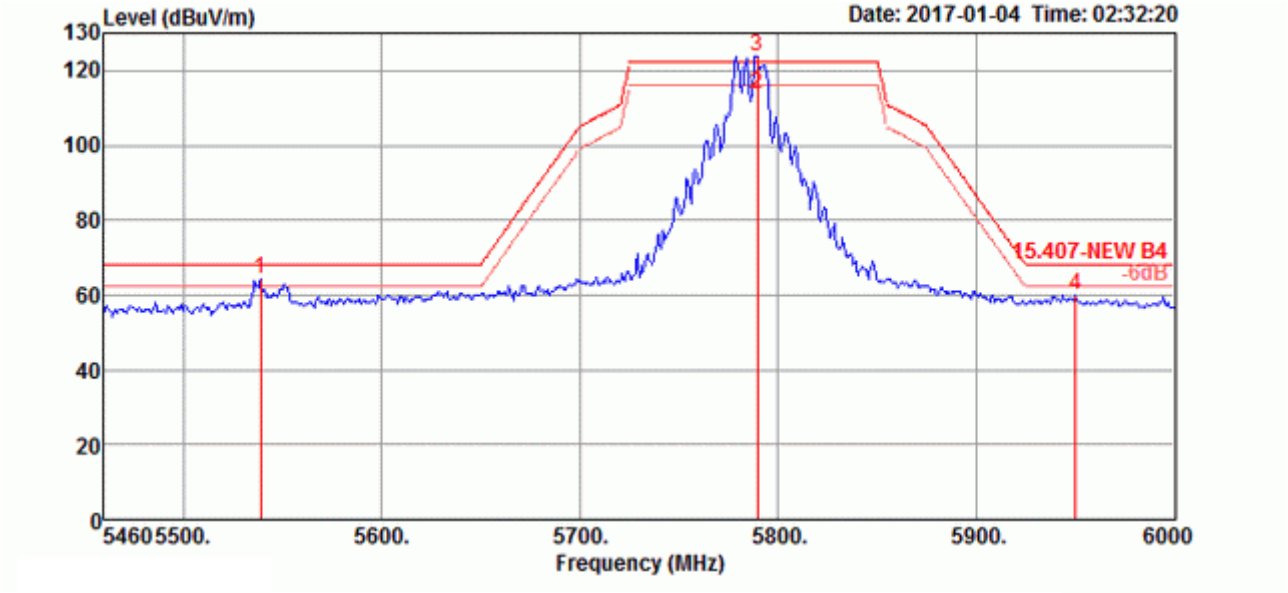
Channel 149



	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	5511.84	65.79	68.20	-2.41	72.91	8.43	33.85	49.40	150	193	Peak	VERTICAL
2 @	5737.56	123.07			129.70	8.37	34.45	49.45	150	193	Peak	VERTICAL
3	5747.28	113.23			119.85	8.34	34.50	49.46	150	193	Average	VERTICAL
4	5978.40	61.64	68.20	-6.56	67.26	8.74	35.15	49.51	150	193	Peak	VERTICAL

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

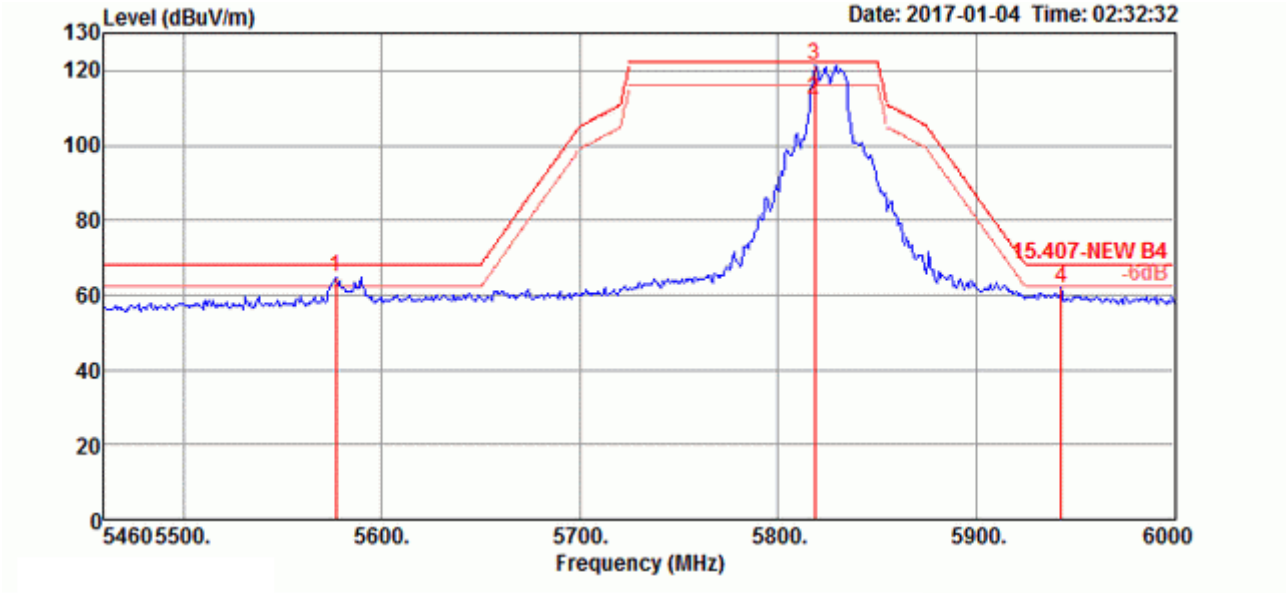
Channel 157



	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	5538.84	64.24	68.20	-3.96	71.29	8.47	33.89	49.41	185	175	Peak	VERTICAL
2	5789.40	113.77			120.35	8.25	34.64	49.47	185	175	Average	VERTICAL
3 @	5789.40	123.90			130.48	8.25	34.64	49.47	185	175	Peak	VERTICAL
4	5950.32	59.98	68.20	-8.22	65.77	8.65	35.06	49.50	185	175	Peak	VERTICAL

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

Channel 165

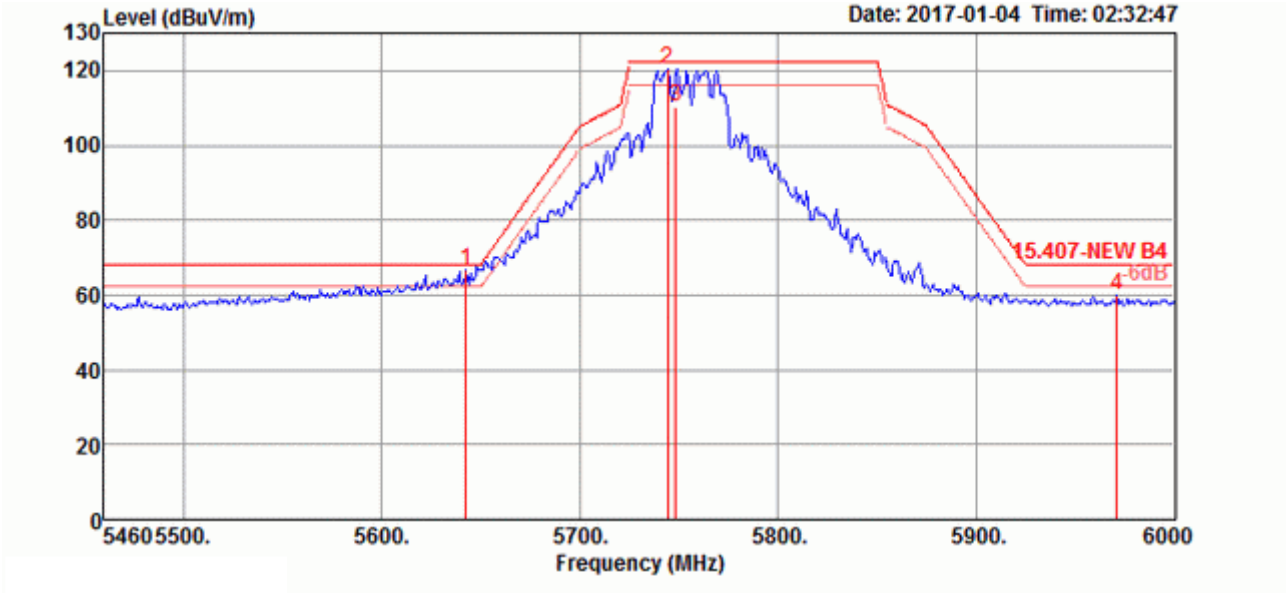


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5576.64	64.70	68.20	-3.50	71.51	8.58	34.03	49.42	150	179	Peak	VERTICAL
2	5818.56	112.15			118.64	8.29	34.69	49.47	150	179	Average	VERTICAL
3	5818.56	121.36			127.85	8.29	34.69	49.47	150	179	Peak	VERTICAL
4	5942.76	61.97	68.20	-6.23	67.76	8.65	35.06	49.50	150	179	Peak	VERTICAL

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

Temperature	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151, 159 / Chain 1 + Chain 2 + Chain 3 + Chain 4

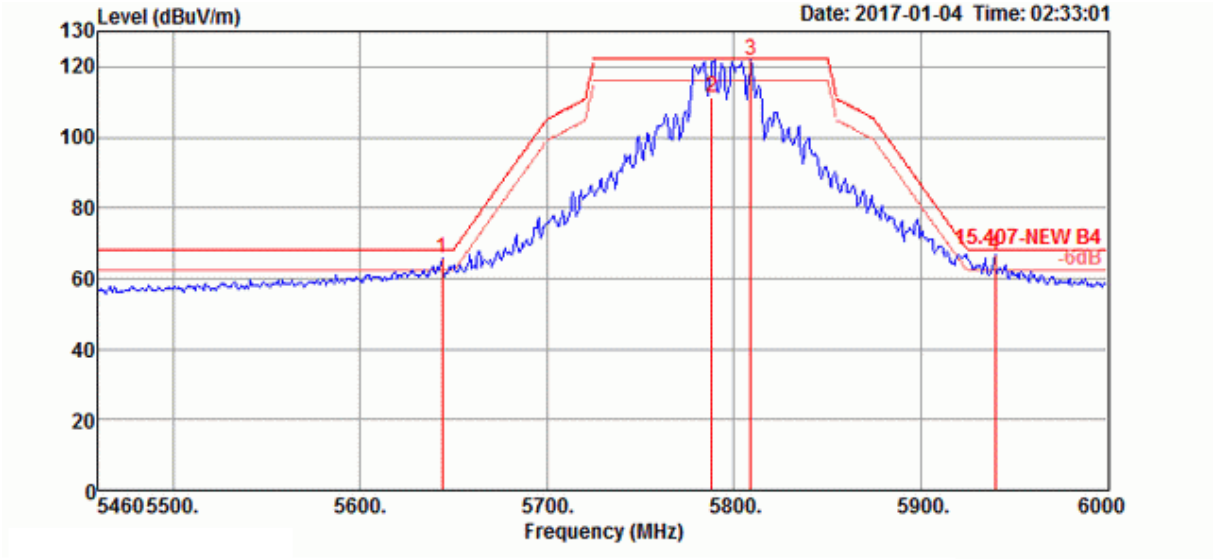
Channel 151



	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	5642.52	66.83	68.20	-1.37	73.51	8.53	34.22	49.43	151	177	Peak	VERTICAL
2	5744.04	120.47			127.08	8.34	34.50	49.45	151	177	Peak	VERTICAL
3	5748.36	110.57			117.19	8.34	34.50	49.46	151	177	Average	VERTICAL
4	5970.84	60.14	68.20	-8.06	65.84	8.69	35.11	49.50	151	177	Peak	VERTICAL

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

Channel 159

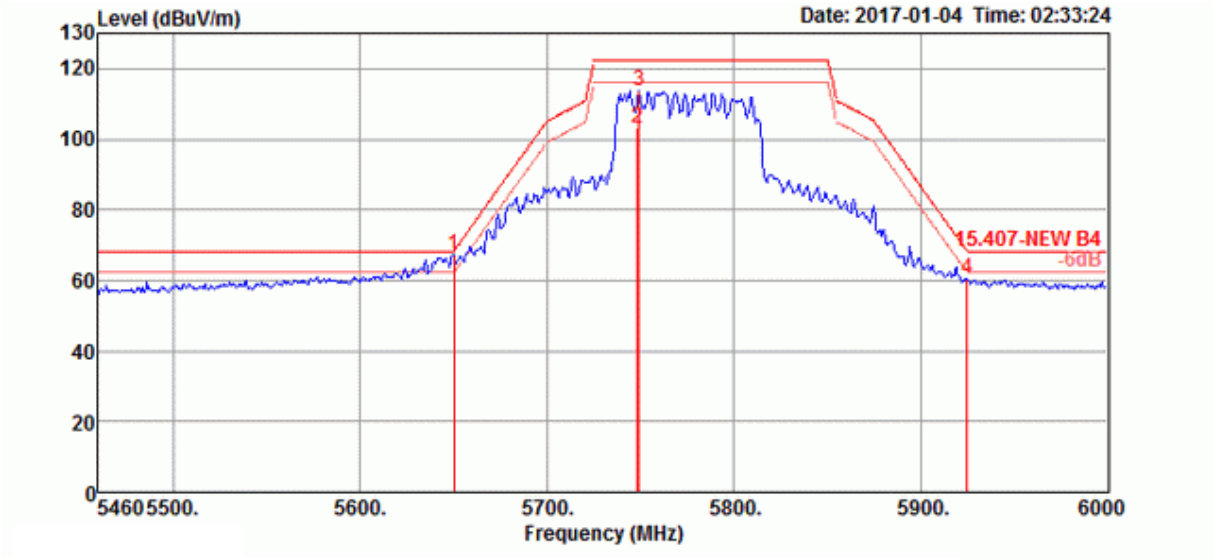


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5643.60	65.75	68.20	-2.45	72.43	8.53	34.22	49.43	168	176	Peak	VERTICAL
2	5788.32	111.31			117.91	8.28	34.59	49.47	168	176	Average	VERTICAL
3	5808.84	122.02			128.51	8.29	34.69	49.47	168	176	Peak	VERTICAL
4	5939.52	66.66	68.20	-1.54	72.55	8.60	35.01	49.50	168	176	Peak	VERTICAL

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

Temperature	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 1 + Chain 2 + Chain 3 + Chain 4

Channel 155



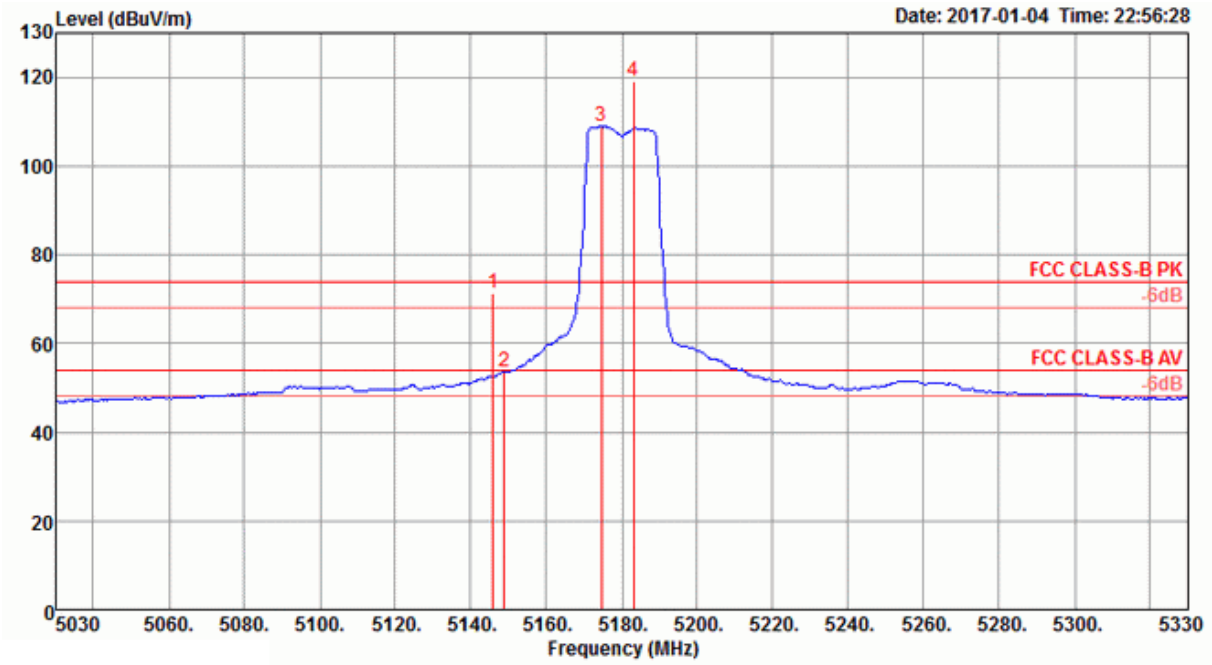
	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5650.08	67.28	68.26	-0.98	73.96	8.53	34.22	49.43	150	178	Peak	VERTICAL
2	5748.36	103.30			109.92	8.34	34.50	49.46	150	178	Average	VERTICAL
3	5749.44	113.60			120.22	8.34	34.50	49.46	150	178	Peak	VERTICAL
4	5924.94	60.32	68.24	-7.92	66.20	8.60	35.01	49.49	150	178	Peak	VERTICAL

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

<For Beamforming Mode>

Temperature	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36, 40, 48 / Chain 1 + Chain 2 + Chain 3 + Chain 4

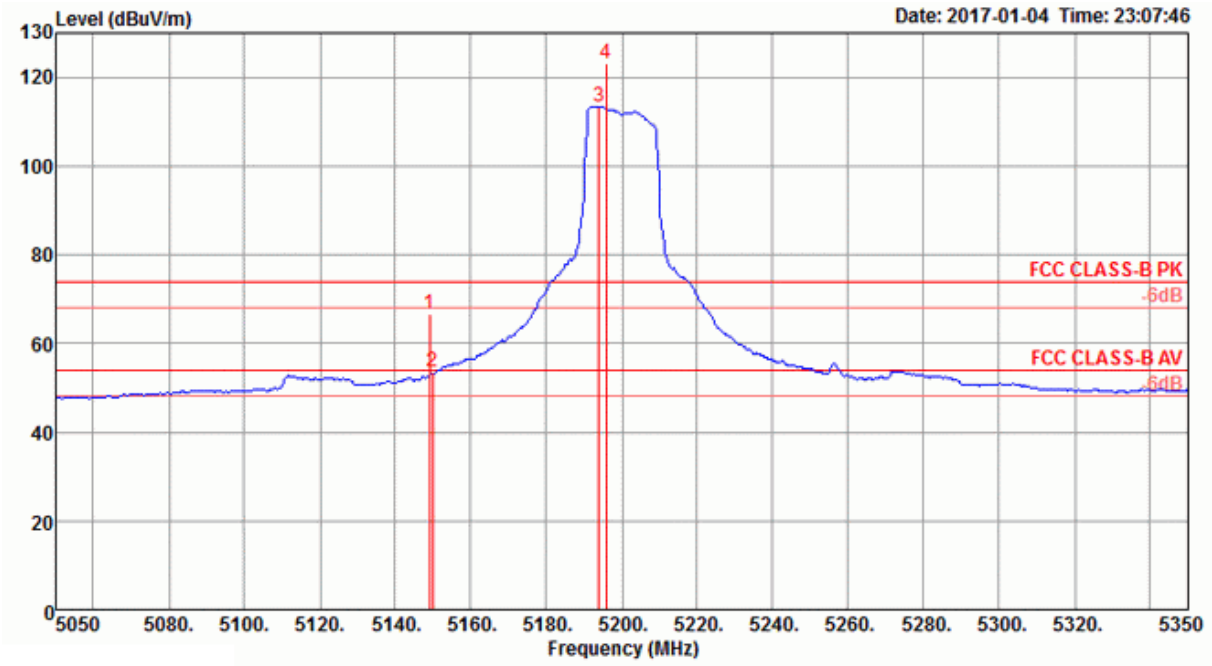
Channel 36



	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	5145.80	71.32	74.00	-2.68	64.27	6.48	33.51	32.94	176	111	Peak	VERTICAL
2	5148.80	53.47	54.00	-0.53	46.42	6.48	33.51	32.94	176	111	Average	VERTICAL
3 @	5174.60	108.98			101.84	6.51	33.56	32.93	176	111	Average	VERTICAL
4 @	5183.00	118.96			111.82	6.51	33.56	32.93	176	111	Peak	VERTICAL

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

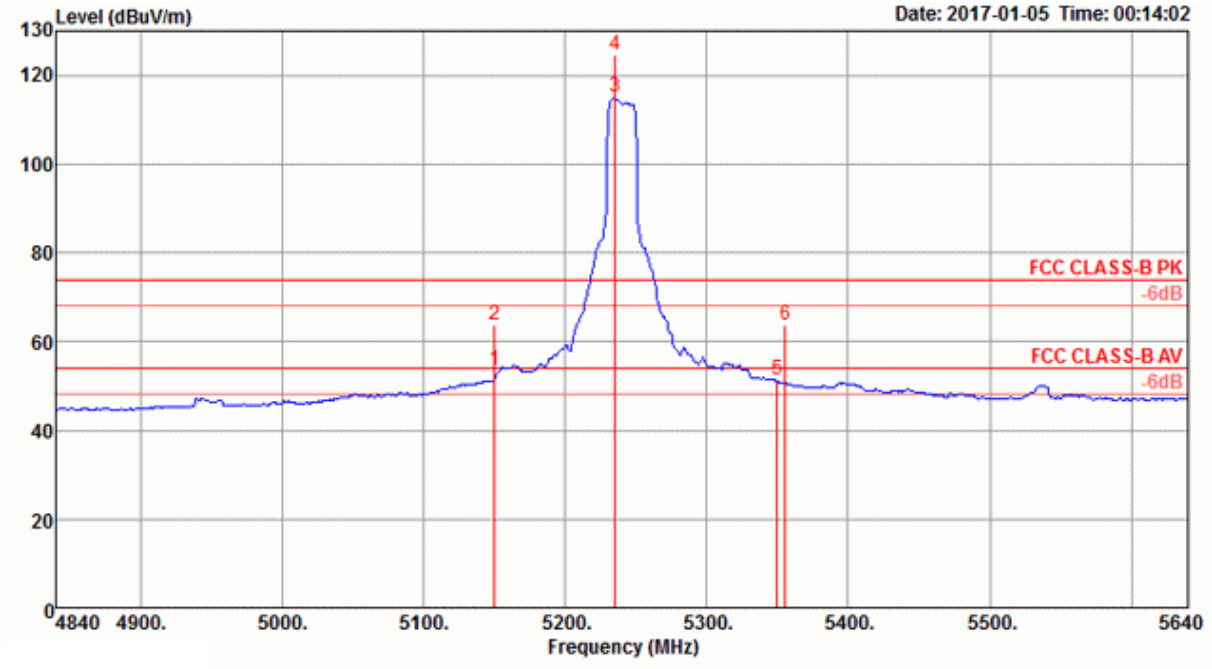
Channel 40



	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	5149.00	66.79	74.00	-7.21	59.74	6.48	33.51	32.94	147	87	Peak	VERTICAL
2	5150.00	53.46	54.00	-0.54	46.41	6.48	33.51	32.94	147	87	Average	VERTICAL
3 @	5194.00	113.39			106.21	6.53	33.58	32.93	147	87	Average	VERTICAL
4 @	5195.80	123.05			115.87	6.53	33.58	32.93	147	87	Peak	VERTICAL

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

Channel 48

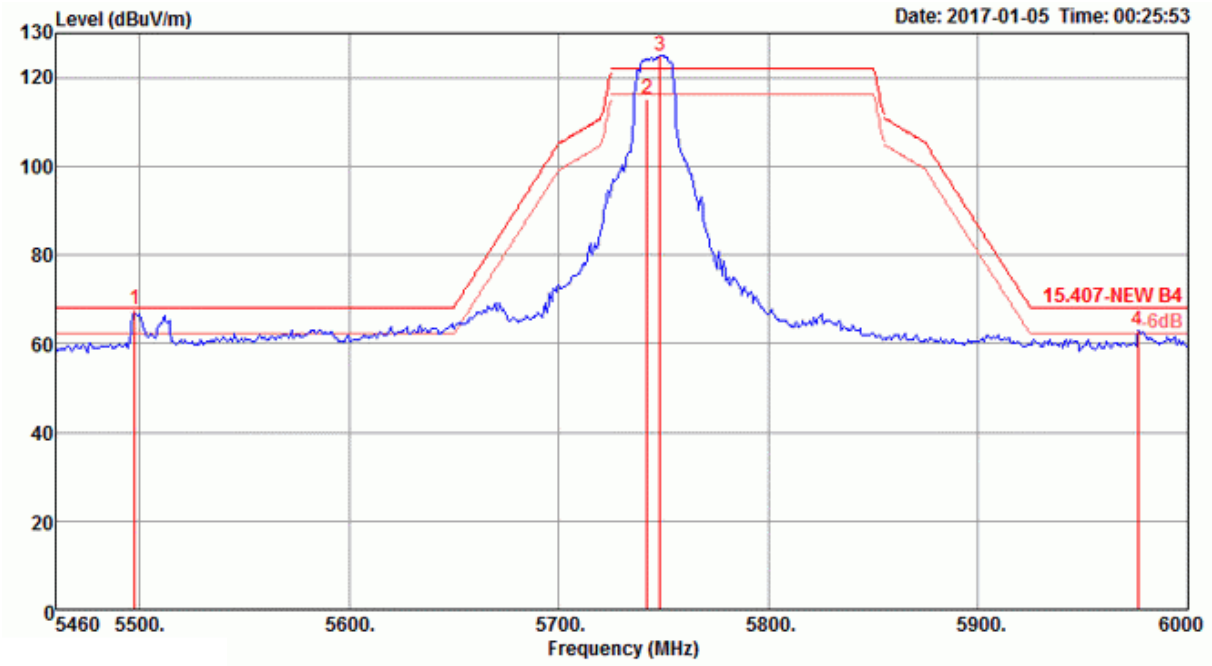


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5150.00	53.57	54.00	-0.43	46.52	6.48	33.51	32.94	163	199	Average	VERTICAL
2	5150.00	63.81	74.00	-10.19	56.76	6.48	33.51	32.94	163	199	Peak	VERTICAL
3 @	5235.20	115.21			107.95	6.55	33.63	32.92	163	199	Average	VERTICAL
4 @	5235.20	124.50			117.24	6.55	33.63	32.92	163	199	Peak	VERTICAL
5	5350.00	51.57	54.00	-2.43	44.10	6.58	33.79	32.90	163	199	Average	VERTICAL
6	5355.20	63.65	74.00	-10.35	56.17	6.59	33.79	32.90	163	199	Peak	VERTICAL

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

Temperature	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149, 157, 165 / Chain 1 + Chain 2 + Chain 3 + Chain 4

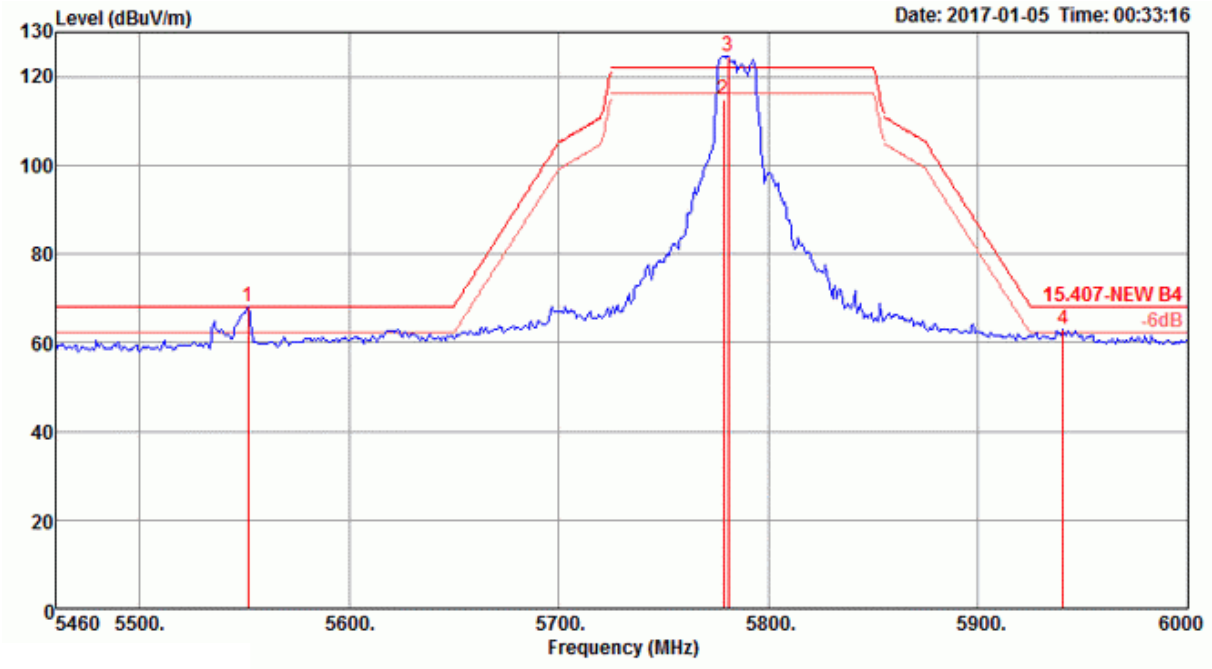
Channel 149



	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	5497.80	67.71	68.20	-0.49	59.87	6.71	34.00	32.87	154	147	Peak	VERTICAL
2	5741.88	115.05			107.01	6.83	34.10	32.89	154	147	Average	VERTICAL
3 @	5748.36	125.08			117.05	6.83	34.10	32.90	154	147	Peak	VERTICAL
4	5976.24	62.99	68.20	-5.21	54.62	7.10	34.19	32.92	154	147	Peak	VERTICAL

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

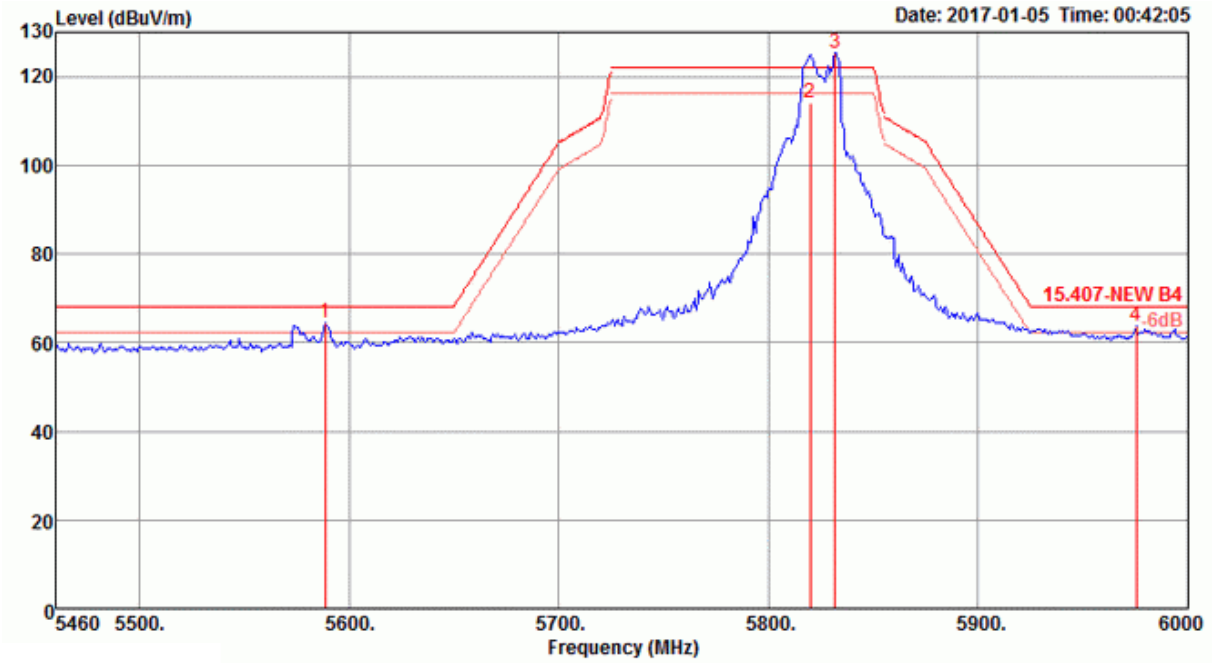
Channel 157



	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	5551.80	68.06	68.20	-0.14	60.17	6.75	34.02	32.88	196	177	Peak	VERTICAL
2	5778.60	114.92			106.87	6.84	34.11	32.90	196	177	Average	VERTICAL
3 @	5780.76	124.61			116.56	6.84	34.11	32.90	196	177	Peak	VERTICAL
4	5940.60	62.85	68.20	-5.35	54.55	7.03	34.18	32.91	196	177	Peak	VERTICAL

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

Channel 165

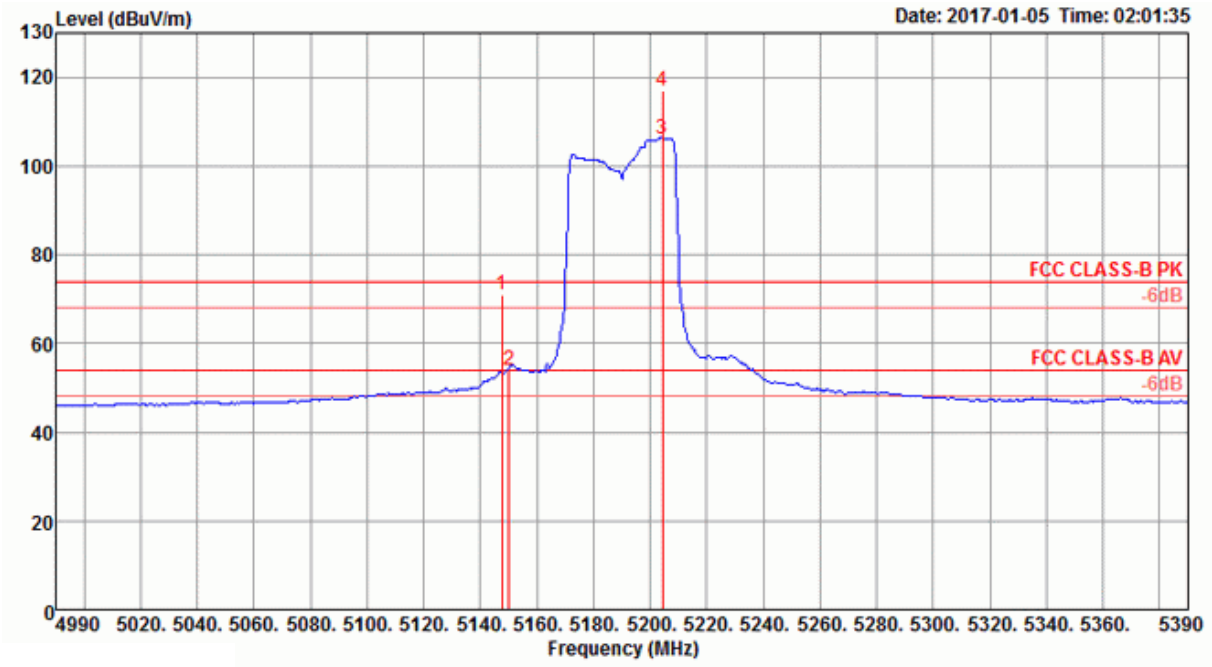


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5588.52	64.63	68.20	-3.57	56.70	6.78	34.03	32.88	233	166	Peak	VERTICAL
2	5819.64	114.07			105.98	6.86	34.13	32.90	233	166	Average	VERTICAL
3 @	5831.52	125.45			117.33	6.89	34.13	32.90	233	166	Peak	VERTICAL
4	5975.16	63.57	68.20	-4.63	55.23	7.07	34.19	32.92	233	166	Peak	VERTICAL

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

Temperature	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38, 46 / Chain 1 + Chain 2 + Chain 3 + Chain 4

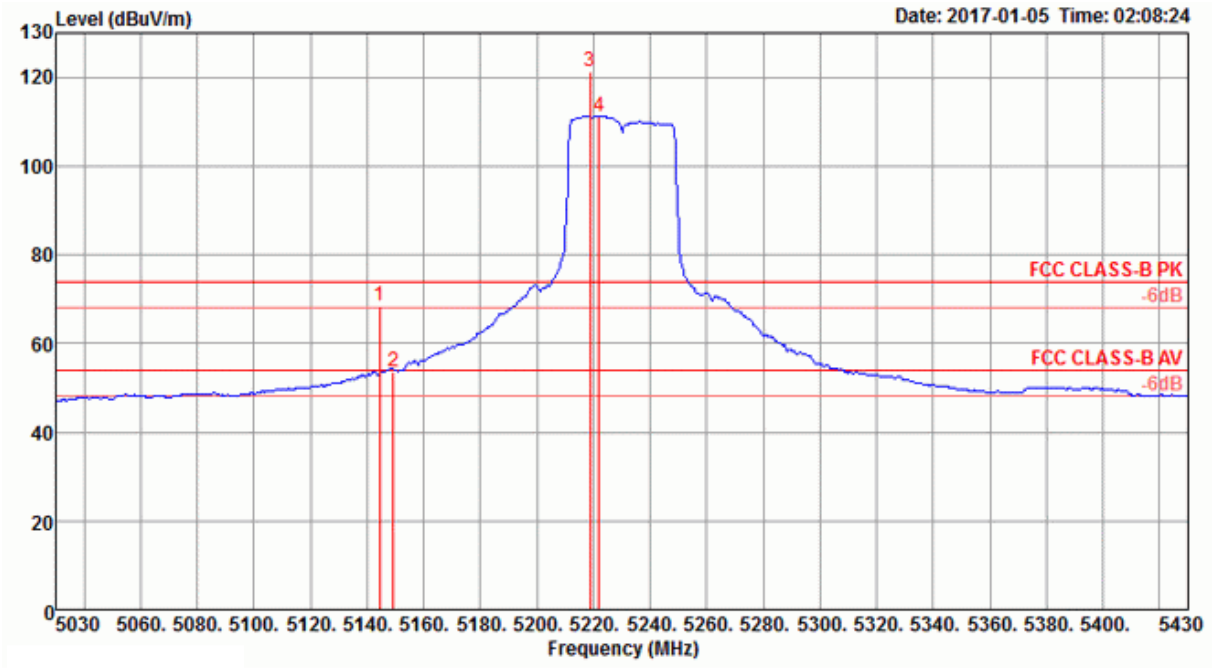
Channel 38



	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	5147.60	71.04	74.00	-2.96	63.99	6.48	33.51	32.94	193	341	Peak	VERTICAL
2	5150.00	53.82	54.00	-0.18	46.77	6.48	33.51	32.94	193	341	Average	VERTICAL
3 @	5204.40	106.24			99.05	6.54	33.58	32.93	193	341	Average	VERTICAL
4 @	5204.40	116.86			109.67	6.54	33.58	32.93	193	341	Peak	VERTICAL

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

Channel 46

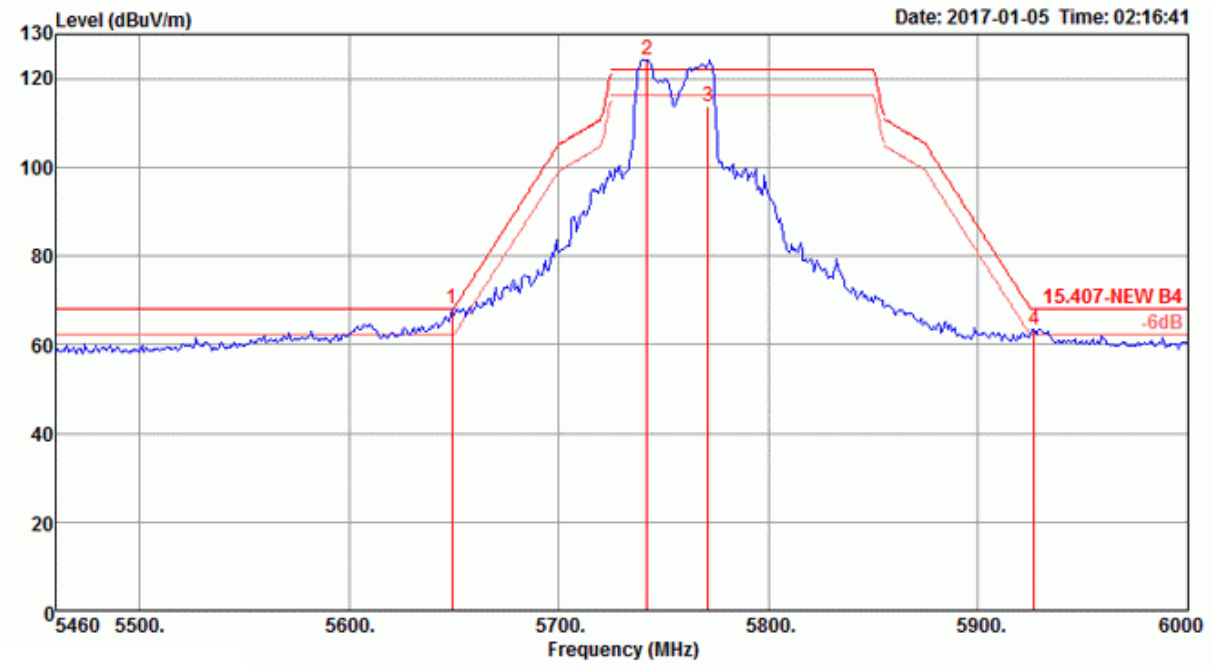


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5144.40	68.48	74.00	-5.52	61.43	6.48	33.51	32.94	109	201	Peak	VERTICAL
2	5149.20	53.56	54.00	-0.44	46.51	6.48	33.51	32.94	109	201	Average	VERTICAL
3 @	5218.80	121.35			114.14	6.54	33.60	32.93	109	201	Peak	VERTICAL
4 @	5222.00	111.32			104.11	6.54	33.60	32.93	109	201	Average	VERTICAL

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

Temperature	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151, 159 / Chain 1 + Chain 2 + Chain 3 + Chain 4

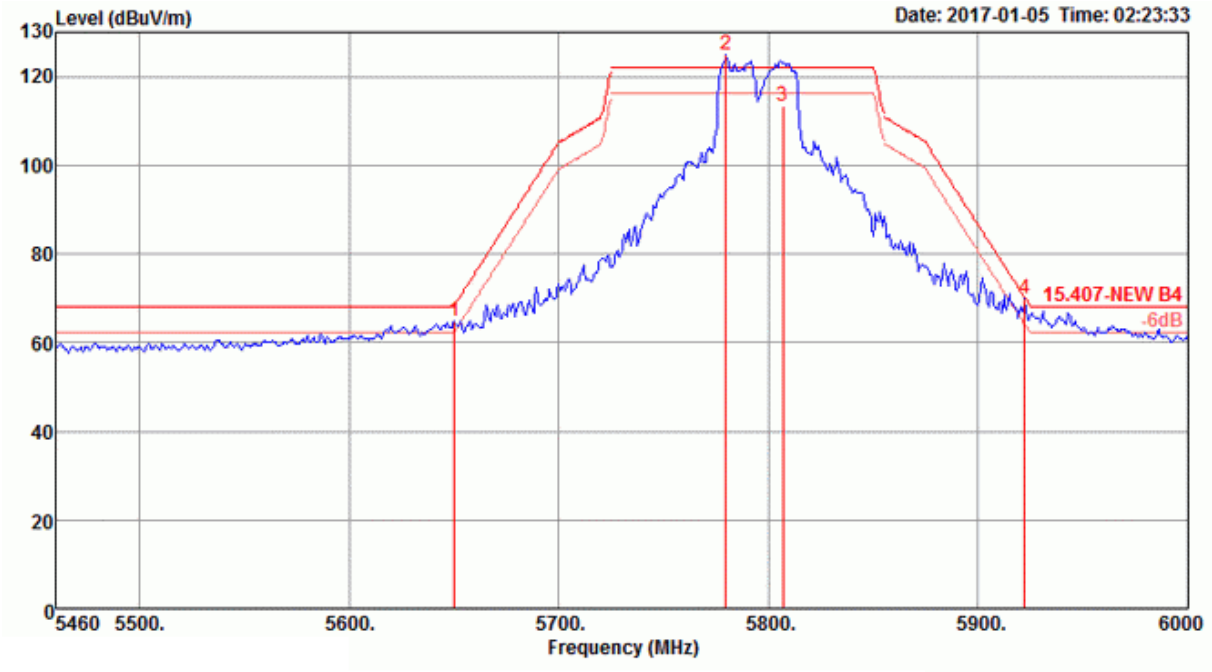
Channel 151



	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	5649.00	68.18	68.20	-0.02	60.19	6.81	34.06	32.88	212	175	Peak	VERTICAL
2 @	5741.88	124.26			116.22	6.83	34.10	32.89	212	175	Peak	VERTICAL
3	5771.04	113.74			105.70	6.83	34.11	32.90	212	175	Average	VERTICAL
4	5926.56	63.54	68.20	-4.66	55.25	7.03	34.17	32.91	212	175	Peak	VERTICAL

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

Channel 159

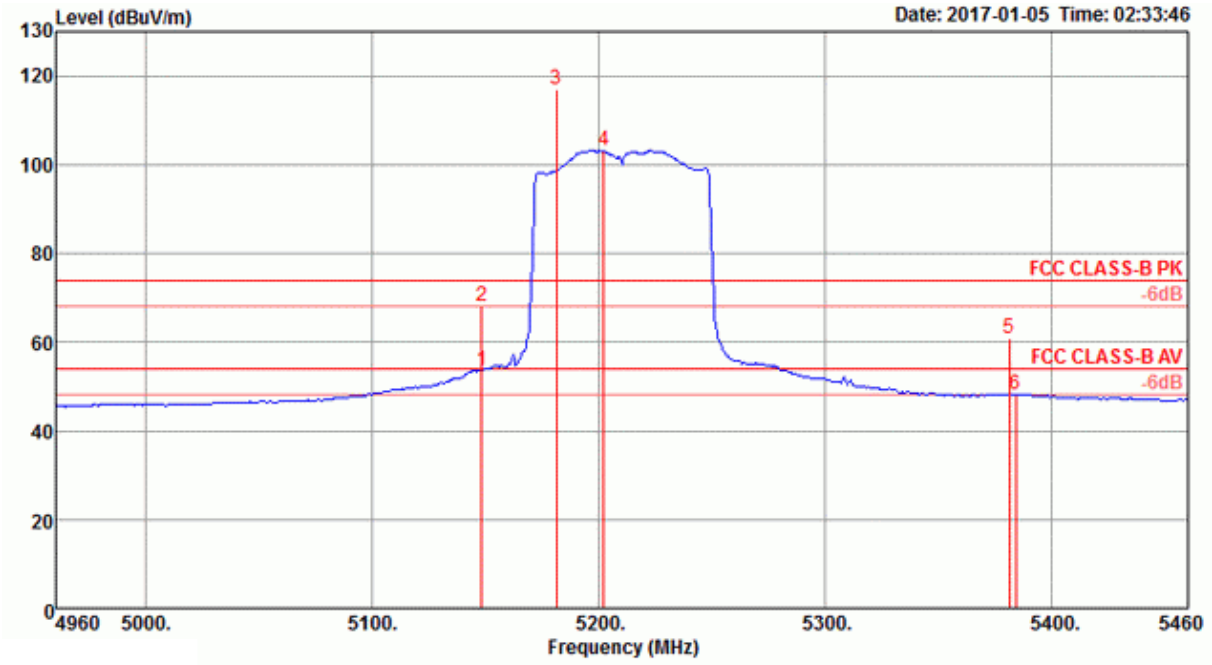


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5650.08	64.88	68.26	-3.38	56.89	6.81	34.06	32.88	202	176	Peak	VERTICAL
2 @	5779.68	124.78			116.73	6.84	34.11	32.90	202	176	Peak	VERTICAL
3	5806.68	113.29			105.21	6.86	34.12	32.90	202	176	Average	VERTICAL
4	5922.24	70.04	70.23	-0.19	61.78	7.00	34.17	32.91	202	176	Peak	VERTICAL

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

Temperature	24°C	Humidity	51%
Test Engineer	Nyle Chang, Mason Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42, 155 / Chain 1 + Chain 2 + Chain 3 + Chain 4

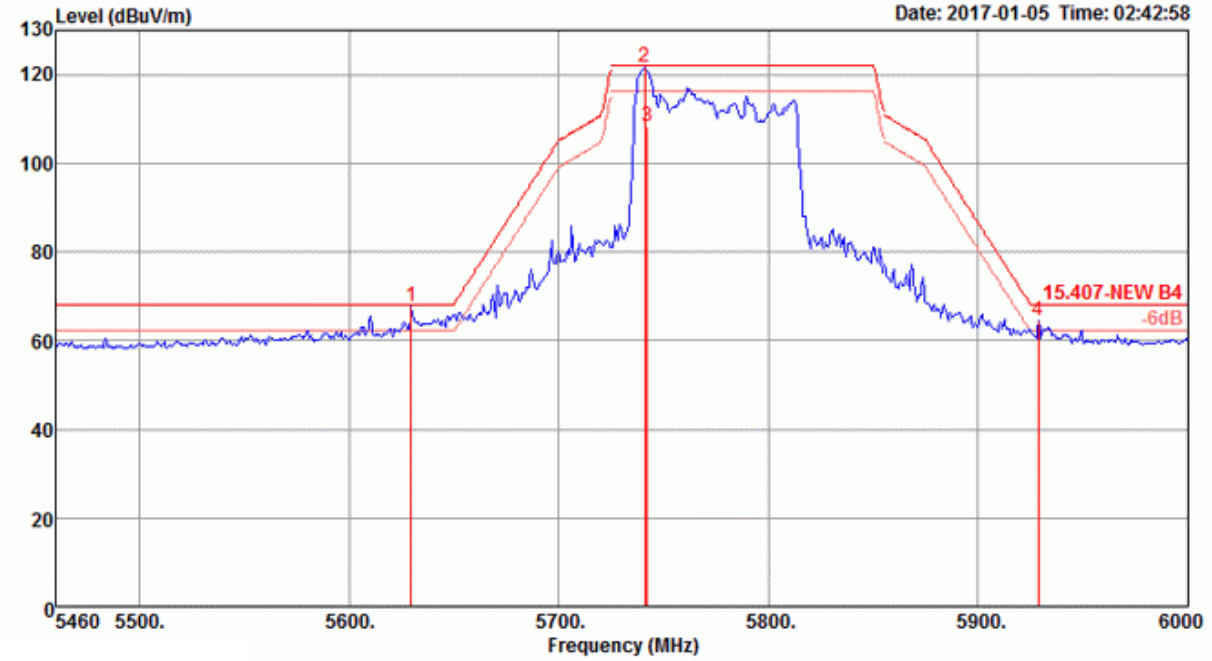
Channel 42



	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	5148.00	53.44	54.00	-0.56	46.39	6.48	33.51	32.94	113	200	Average	VERTICAL
2	5148.00	68.24	74.00	-5.76	61.19	6.48	33.51	32.94	113	200	Peak	VERTICAL
3 @	5181.00	116.88			109.74	6.51	33.56	32.93	113	200	Peak	VERTICAL
4 @	5202.00	103.16			95.97	6.54	33.58	32.93	113	200	Average	VERTICAL
5	5381.00	60.77	74.00	-13.23	53.23	6.59	33.84	32.89	113	200	Peak	VERTICAL
6	5384.00	48.27	54.00	-5.73	40.73	6.59	33.84	32.89	113	200	Average	VERTICAL

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

Channel 155



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5629.56	67.78	68.20	-0.42	59.80	6.81	34.05	32.88	175	179	Peak	VERTICAL
2	5740.80	121.55			113.51	6.83	34.10	32.89	175	179	Peak	VERTICAL
3	5741.88	108.27			100.23	6.83	34.10	32.89	175	179	Average	VERTICAL
4	5928.72	64.53	68.20	-3.67	56.24	7.03	34.17	32.91	175	179	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

4.8. Frequency Stability Measurement

4.8.1. Limit

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

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

4.8.2. Measuring Instruments and Setting

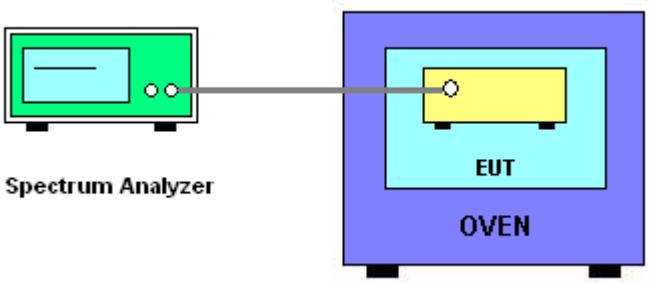
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.8.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.
5. fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 10^6 ppm and the limit is less than ±20ppm (IEEE 802.11nspecification).
6. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
7. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
8. Extreme temperature is 0°C~40°C.

4.8.4. Test Setup Layout



4.8.5. Test Deviation

There is no deviation with the original standard.

4.8.6. EUT Operation during Test

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

4.8.7. Test Result of Frequency Stability

Temperature	25°C	Humidity	45%
Test Engineer	Serway Li	Test Date	Jan. 10, 2017

Mode: 20 MHz / Chain 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5200 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5199.9903	5199.9889	5199.9871	5199.9850
110.00	5199.9891	5199.9878	5199.9862	5199.9843
93.50	5199.9877	5199.9866	5199.9854	5199.9832
Max. Deviation (MHz)	0.0123	0.0134	0.0146	0.0168
Max. Deviation (ppm)	2.37	2.58	2.81	3.23
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5200 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5199.9916	5199.9904	5199.9885	5199.9863
10	5199.9903	5199.9890	5199.9875	5199.9857
20	5199.9891	5199.9878	5199.9862	5199.9843
30	5199.9877	5199.9866	5199.9852	5199.9836
40	5199.9861	5199.9846	5199.9830	5199.9810
Max. Deviation (MHz)	0.0139	0.0154	0.0170	0.0190
Max. Deviation (ppm)	2.67	2.96	3.27	3.65
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5784.9896	5784.9887	5784.9881	5784.9874
110.00	5784.9891	5784.9883	5784.9875	5784.9865
93.50	5784.9884	5784.9880	5784.9873	5784.9871
Max. Deviation (MHz)	0.0116	0.0120	0.0127	0.0135
Max. Deviation (ppm)	2.01	2.07	2.20	2.33
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5784.9916	5784.9911	5784.9904	5784.9902
10	5784.9909	5784.9901	5784.9896	5784.9891
20	5784.9891	5784.9882	5784.9874	5784.9864
30	5784.9877	5784.9867	5784.9863	5784.9860
40	5784.9874	5784.9871	5784.9862	5784.9858
Max. Deviation (MHz)	0.0126	0.0133	0.0138	0.0142
Max. Deviation (ppm)	2.18	2.30	2.39	2.45
Result	Complies			

Mode: 40 MHz / Chain 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5190 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5189.9920	5189.9906	5189.9888	5189.9867
110.00	5189.9908	5189.9895	5189.9879	5189.9860
93.50	5189.9894	5189.9883	5189.9871	5189.9849
Max. Deviation (MHz)	0.0106	0.0117	0.0129	0.0151
Max. Deviation (ppm)	2.04	2.25	2.49	2.91
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5190 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5189.9933	5189.9921	5189.9902	5189.9880
10	5189.9920	5189.9907	5189.9892	5189.9874
20	5189.9908	5189.9895	5189.9879	5189.9860
30	5189.9894	5189.9883	5189.9869	5189.9853
40	5189.9878	5189.9863	5189.9847	5189.9827
Max. Deviation (MHz)	0.0122	0.0137	0.0153	0.0173
Max. Deviation (ppm)	2.35	2.64	2.95	3.33
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5754.9895	5754.9890	5754.9889	5754.9884
110.00	5754.9891	5754.9886	5754.9877	5754.9868
93.50	5754.9890	5754.9886	5754.9880	5754.9875
Max. Deviation (MHz)	0.0110	0.0114	0.0123	0.0132
Max. Deviation (ppm)	1.91	1.98	2.14	2.29
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5754.9912	5754.9902	5754.9901	5754.9896
10	5754.9910	5754.9902	5754.9899	5754.9890
20	5754.9891	5754.9887	5754.9886	5754.9876
30	5754.9877	5754.9874	5754.9867	5754.9857
40	5754.9859	5754.9849	5754.9840	5754.9834
Max. Deviation (MHz)	0.0141	0.0151	0.0160	0.0166
Max. Deviation (ppm)	2.45	2.62	2.78	2.88
Result	Complies			

Mode: 80 MHz / Chain 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5210 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5209.9920	5209.9906	5209.9888	5209.9867
110.00	5209.9908	5209.9895	5209.9879	5209.9860
93.50	5209.9894	5209.9883	5209.9871	5209.9849
Max. Deviation (MHz)	0.0106	0.0117	0.0129	0.0151
Max. Deviation (ppm)	2.03	2.25	2.48	2.90
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5210 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5209.9933	5209.9921	5209.9902	5209.9880
10	5209.9920	5209.9907	5209.9892	5209.9874
20	5209.9908	5209.9895	5209.9879	5209.9860
30	5209.9894	5209.9883	5209.9869	5209.9853
40	5209.9878	5209.9863	5209.9847	5209.9827
Max. Deviation (MHz)	0.0122	0.0137	0.0153	0.0173
Max. Deviation (ppm)	2.34	2.63	2.94	3.32
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5774.9899	5774.9894	5774.9889	5774.9884
110.00	5774.9891	5774.9882	5774.9878	5774.9874
93.50	5774.9882	5774.9881	5774.9875	5774.9871
Max. Deviation (MHz)	0.0118	0.0119	0.0125	0.0129
Max. Deviation (ppm)	2.04	2.06	2.16	2.23
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5774.9908	5774.9902	5774.9892	5774.9886
10	5774.9894	5774.9893	5774.9889	5774.9885
20	5774.9891	5774.9885	5774.9875	5774.9865
30	5774.9877	5774.9876	5774.9874	5774.9867
40	5774.9874	5774.9869	5774.9860	5774.9855
Max. Deviation (MHz)	0.0126	0.0131	0.0140	0.0145
Max. Deviation (ppm)	2.18	2.27	2.42	2.51
Result	Complies			

4.9. Antenna Requirements

4.9.1. Limit

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

4.9.2. Antenna Connector Construction

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

5. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMI Receiver	Agilent	N9038A	My52260123	9kHz ~ 8.45GHz	Jan. 27, 2016	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Dec. 14, 2016	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Dec. 23, 2015	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	150kHz ~ 30MHz	May 24, 2016	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	Conduction (CO01-CB)
BILOG ANTENNA with 6dB Attenator	TESEQ & EMCI	CBL6112D & N-6-06	37880 & AT-N0609	20MHz ~ 2GHz	Aug. 30, 2016	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 16, 2016*	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Nov. 10, 2016	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 25, 2016	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Mar. 15, 2016	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 18, 2016	Radiation (03CH01-CB)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Jun. 28, 2016	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Nov. 21, 2016	Radiation (03CH01-CB)
EMI Test	R&S	ESCS	100355	9kHz ~ 2.75GHz	May 16, 2016	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-16+17	N/A	30 MHz ~ 1 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16+17	N/A	1 GHz ~ 18 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#1	N/A	18GHz ~ 40 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G#2	N/A	18GHz ~ 40 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 26, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-7	1 GHz –26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-8	1 GHz –26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-9	1 GHz –26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz –26.5 GHz	Oct. 24, 2016	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 22, 2016	Conducted (TH01-CB)

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

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

N.C.R means Non-Calibration required.

6. MEASUREMENT UNCERTAINTY

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	3.2 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.7 dB	Confidence levels of 95%
Output Power Measurement	1.33 dB	Confidence levels of 95%
Power Density Measurement	1.27 dB	Confidence levels of 95%
Bandwidth Measurement	9.74×10^{-8}	Confidence levels of 95%
Frequency Stability	6.06×10^{-8}	Confidence levels of 95%