SPORTON International Inc.
No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.
Ph: 886-3-327-3456 / FAX: 886-3-327-0973 / www.sporton.com.tw

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	**TE7C5400**
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	AC5400 Wirelesss Tri-Band MU-MIMO Gigabit Router
Brand Name	TP-LINK
Model No.	Archer C5400
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5150 ~ 5250 MHz / 5725 ~ 5850 MHz
Received Date	Oct. 28, 2015
Final Test Date	May 20, 2016
Submission Type	Class II Change

Statement

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

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

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

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

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

Testing Laboratory
1190

Table of Contents

1. VERIFICATION OF COMPLIANCE 1
2. SUMMARY OF THE TEST RESULT 2
3. GENERAL INFORMATION 3
3.1. Product Details 3
3.2. Accessories 5
3.3. Table for Filed Antenna 6
3.4. Table for Carrier Frequencies 7
3.5. Table for Test Modes 8
3.6. Table for Testing Locations 9
3.7. Table for Class II Change 10
3.8. Table for Supporting Units 11
3.9. Table for Parameters of Test Software Setting 12
3.10. EUT Operation during Test 13
3.11. Duty Cycle 13
3.12. Test Configurations 14
4. TEST RESULT 18
4.1. AC Power Line Conducted Emissions Measurement 18
4.2. 26dB Bandwidth and 99% Occupied Bandwidth Measurement 22
4.3. 6dB Spectrum Bandwidth Measurement 35
4.4. Maximum Conducted Output Power Measurement 42
4.5. Power Spectral Density Measurement 46
4.6. Radiated Emissions Measurement 58
4.7. Band Edge Emissions Measurement 85
4.8. Frequency Stability Measurement 96
4.9. Antenna Requirements 103
5. LIST OF MEASURING EQUIPMENTS 104
6. MEASUREMENT UNCERTAINTY 105
APPENDIX A. TEST PHOTOS ..... A1 ~ A4

History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR5N0101-01AB	Rev. 01	Initial issue of report	Jul. 13, 2016

1. VERIFICATION OF COMPLIANCE

Product Name	:	AC5400 Wirelesss Tri-Band MU-MIMO Gigabit Router
Brand Name	:	TP-LINK
Model No.	:	Archer C5400
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 Oct. 28, 2015 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

Sam Chen

Sam Chen

SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart E			
Part	Rule Section	Description of Test	Result
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 Band Width (99%)	**<For Non-Beamforming Mode>** Band 4: IEEE 802.11a: 17.71 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 17.89 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 36.90 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.54 MHz **<For Beamforming Mode>** Band 1: IEEE 802.11ac MCS0/Nss1 (VHT20): 18.06 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 36.76 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 74.67 MHz Band 4: IEEE 802.11ac MCS0/Nss1 (VHT20): 18.15 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 36.90 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 76.12 MHz

Maximum Conducted Output Power	**<For Non-Beamforming Mode>** Band 4: IEEE 802.11a: 29.86 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 29.90 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 29.92 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 29.08 dBm **<For Beamforming Mode>** Band 1: IEEE 802.11ac MCS0/Nss1 (VHT20): 28.05 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 28.10 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 24.15 dBm Band 4: IEEE 802.11ac MCS0/Nss1 (VHT20): 28.10 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 28.12 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 28.04 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 802.11n/ac in 2.4GHz /5GHz.	☐ Without beamforming
Operate Condition	☒ Indoor	☐ Outdoor

Antenna and Band width

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

IEEE 11n/ac Spec.

Protocol	Number of Transmit Chains (NTX)	Data Rate / MCS
802.11n (HT20)	4	MCS 0-31
802.11n (HT40)	4	MCS 0-31
802.11ac (VHT20)	4	MCS0-11/Nss1-4
802.11ac (VHT40)	4	MCS0-11/Nss1-4
802.11ac (VHT80)	4	MCS0-11/Nss1-4

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

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

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

3.2. Accessories

Power	Brand	Model No.	Rating	Remark
Adapter	Huntkey	HKA06012050-7G	Input: 100-240Vac, 50/60Hz, 1.5A Output: 12.0Vdc, 5.0A	Cable (Non-shielded, 1.4m)
Other				
Power cable*1: Non-shielded, 1.8m				

3.3. Table for Filed Antenna

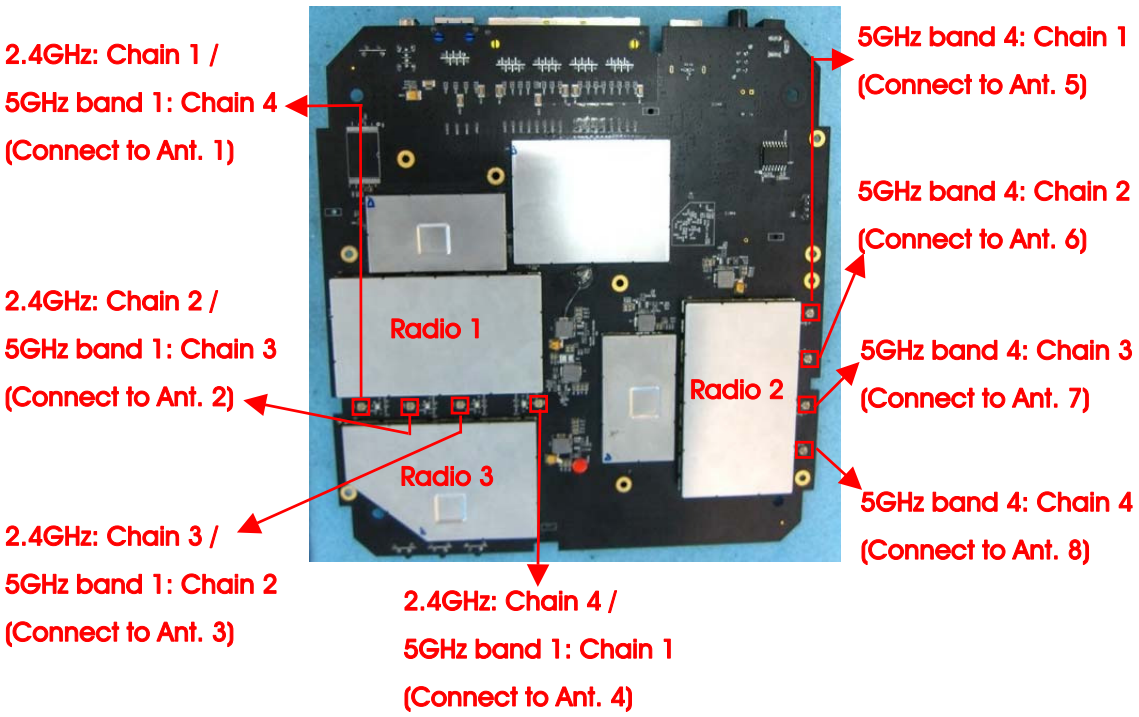
Ant.	Brand	Product Number	Antenna Type	Connector	Gain (dBi)	
					2.4GHz	5GHz
1	TP-LINK	3101500737	PCB Antenna	I-PEX	1.8	1.8
2	TP-LINK	3101500737	PCB Antenna	I-PEX	1.8	1.8
3	TP-LINK	3101500737	PCB Antenna	I-PEX	1.8	1.8
4	TP-LINK	3101500737	PCB Antenna	I-PEX	1.8	1.8
5	TP-LINK	3101500734	PCB Antenna	I-PEX	-	1.8
6	TP-LINK	3101500734	PCB Antenna	I-PEX	-	1.8
7	TP-LINK	3101500734	PCB Antenna	I-PEX	-	1.8
8	TP-LINK	3101500734	PCB Antenna	I-PEX	-	1.8

Note: 1. The EUT has eight antennas.

2. The EUT has three radios. (Radio 1 supports 5GHz band 1 WLAN function, Radio 2 supports 5GHz band 4 WLAN function and Radio 3 supports 2.4GHz WLAN function.)

3. The EUT supports WLAN (4TX, 4RX):

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



3.4. Table for Carrier Frequencies

There are three bandwidth systems.

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

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

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

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

3.5. Table for Test Modes

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

Test Items	Mode		Data Rate	Channel	Chain
AC Power Conducted Emission	Normal Link		-	-	-
Max. Conducted Output Power Power Spectral Density 26dB Spectrum Bandwidth & 99% Occupied Bandwidth Measurement 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
6dB Spectrum Bandwidth Measurement	<For Non-Beamforming Mode>				
	11a/BPSK	Band 4	6Mbps	149/157/165	1+2+3+4
	11ac VHT20	Band 4	MCS0/Nss1	149/157/165	1+2+3+4
	11ac VHT40	Band 4	MCS0/Nss1	151/159	1+2+3+4
	11ac VHT80	Band 4	MCS0/Nss1	155	1+2+3+4
	<For Beamforming Mode>				
	11ac VHT20	Band 4	MCS0/Nss1	149/157/165	1+2+3+4
	11ac VHT40	Band 4	MCS0/Nss1	151/159	1+2+3+4
	11ac VHT80	Band 4	MCS0/Nss1	155	1+2+3+4
Radiated Emission Below 1GHz	Normal Link		-	-	-
Frequency Stability	20 MHz	Band 1&4	-	40/157	1
	40 MHz	Band 1&4	-	38/151	1
	80 MHz	Band 1&4	-	42/155	1

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

2.There are two modes of EUT, one is beamforming function, and the other is non-beamforming function for 802.11n/ac. Test results of beamforming function was recorded in this report, test results of non-beamforming function for band 1 was recorded in Report No.:FR5N0101AB.

The following test modes were performed for all tests:

The following test modes were performed for all tests:

For AC Power Line Conducted Emissions test:

Mode 1. Normal Link

For Radiated Emissions Below 1GHz test:

Mode 1. Normal Link - Place EUT in Y axis

Mode 2. Normal Link - Place EUT in Z axis

Mode 2 is the worst case, so it was selected to record in this test report.

For Radiated Emissions Above 1GHz test:

Mode 1. EUT in Y axis + folded the antenna.

Mode 2. EUT in Z axis + folded the antenna.

Mode 3. EUT in Y axis + antenna in 90°

Mode 4. EUT in Z axis + antenna in 90°

Mode 1 has been evaluated to be the worst case after evaluating. Consequently, measurement will follow this same test mode.

For Co-location MPE Test:

The EUT could be applied with 2.4GHz WLAN function, 5GHz band 1 WLAN function and 5GHz band 4 WLAN function; therefore Co-location Maximum Permissible Exposure (Please refer to FA5N0101-01) is added for simultaneously transmit among 2.4GHz WLAN function, 5GHz band 1 WLAN function and 5GHz band 4 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: FR5N0101AA and FR5N0101AB

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

Modifications	Performance Checking
1. Adding an adapter (Model name: HKA0012050-7G).	AC Power Line Conducted Emissions Radiated Emissions Below 1GHz
2. Removing Repeater function.	Do not effect the test results.
3. Adding beam-forming function for 802.11n/ac.	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
4. Updating test rule of 5GHz Band 4 to "15.407 (b)(4)(i) of New Rules (ET Docket No. 13–49; FCC 16–24)" from "Old Rules".	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

3.8. Table for Supporting Units

For Test Site No: CO01-CB

Support Unit	Brand	Model	FCC ID
NB*5	DELL	E6430	DoC
Flash Disk	Silicon Power	I-Series	DoC
Flash Disk3.0	Transcend	JetFlash-700	DoC

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

Support Unit	Brand	Model	FCC ID
NB *2	DELL	E4300	DoC
NB *3	Apple	Mac Book	DoC
Flash Disk	Silicon Power	Touch 835	DoC
Flash Disk3.0	Transcend	JetFlash-700	DoC

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

Support Unit	Brand	Model	FCC ID
NB*2	DELL	E4300	DoC
WLAN module (RX Device)	Boardcom	BCM943162ZP	QDS-BRCM1075

For Test Site No: TH01-CB and 03CH01-CB (above 1GHz) / For Non-Beamforming Mode

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	DoC

3.9. Table for Parameters of Test Software Setting

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

<For Non-Beamforming Mode>

Test Software Version	Mtool_2.0.2.8		
Mode	Test Frequency (MHz)		
	NCB: 20MHz		
	5745 MHz	5785 MHz	5825 MHz
802.11a	94	93	93
802.11ac MCS0/Nss1 VHT20	89	94	93
Mode	NCB: 40MHz		
802.11ac MCS0/Nss1 VHT40	5755 MHz	5795 MHz	
	94	94	
Mode	NCB: 80MHz		
802.11ac MCS0/Nss1 VHT80	5775 MHz		
	90		

<For Beamforming Mode>

Test Software Version	Telnet					
Mode	Test Frequency (MHz)					
	NCB: 20MHz					
	5180 MHz	5200 MHz	5240 MHz	5745 MHz	5785 MHz	5825 MHz
802.11ac MCS0/Nss1 VHT20	80	83	83	75	85	85
Mode	NCB: 40MHz					
802.11ac MCS0/Nss1 VHT40	5190 MHz	5230 MHz	5755 MHz	5795 MHz		
	66	83	86	86		
Mode	NCB: 80MHz					
802.11ac MCS0/Nss1 VHT80	5210 MHz	5775 MHz				
	66	86				

3.10. EUT Operation during Test

<For Non-Beamforming Mode>

The EUT was programmed to be in continuously transmitting mode.

<For Beamforming Mode>

For Conducted Mode:

The EUT was programmed to be in continuously transmitting mode.

For Radiated Mode:

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

The program was executed as follows:

1. During the test, the EUT operation to normal function.
2. Executed command fixed test channel under DOS、LanTest20.
3. Executed "Lantest.exe " to link with the remote workstation to receive and transmit packet by RX Device and transmit duty cycle no less 98%

3.11. Duty Cycle

<For Non-Beamforming Mode>

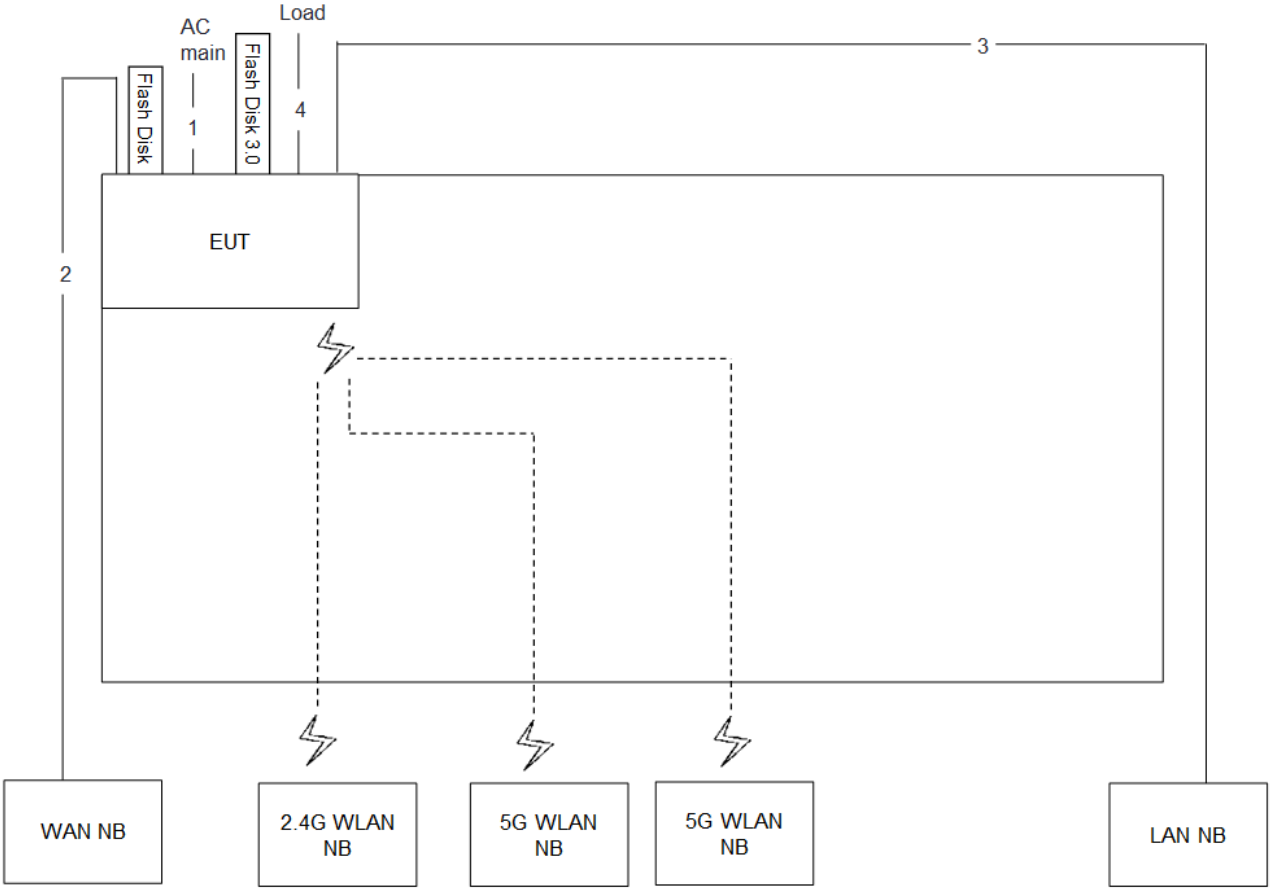
Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11a	2.070	2.090	99.04%	0.04	0.01
802.11ac MCS0/Nss1 VHT20	1.930	1.950	98.97%	0.04	0.01
802.11ac MCS0/Nss1 VHT40	0.940	0.984	95.53%	0.20	1.06
802.11ac MCS0/Nss1 VHT80	0.428	0.488	87.70%	0.57	2.34

<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	3.828	3.938	97.21%	0.12	0.26
802.11ac MCS0/Nss1 VHT40	4.590	4.725	97.14%	0.13	0.22
802.11ac MCS0/Nss1 VHT80	5.046	5.365	94.05%	0.27	0.20

3.12. Test Configurations

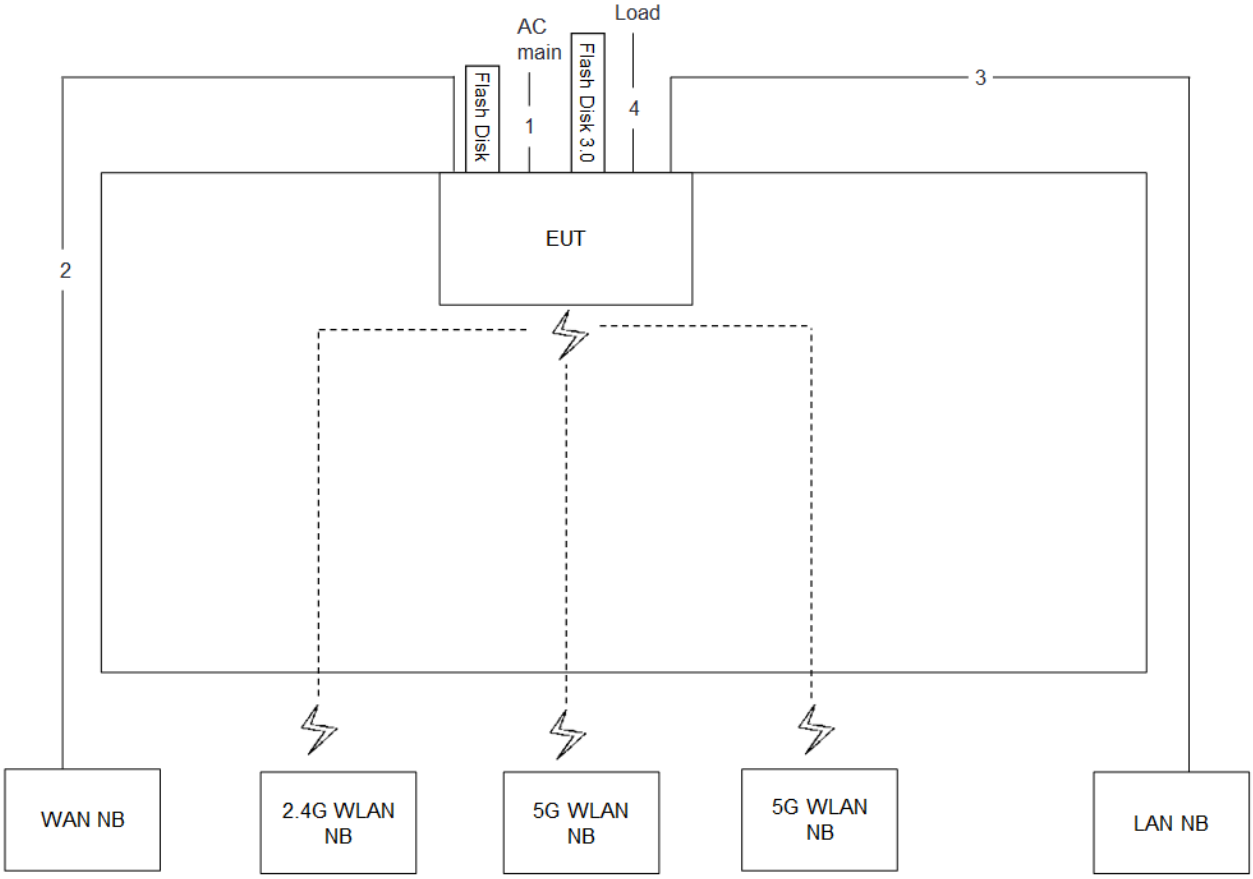
3.12.1. AC Power Line Conduction Emissions Test Configuration



Item	Connection	Shielded	Length
1	Power cable	No	3.2m
2	RJ-45 cable	No	10m
3	RJ-45 cable	No	10m
4	RJ-45 cable*3	No	1.5m

3.12.2. Radiation Emissions Test Configuration

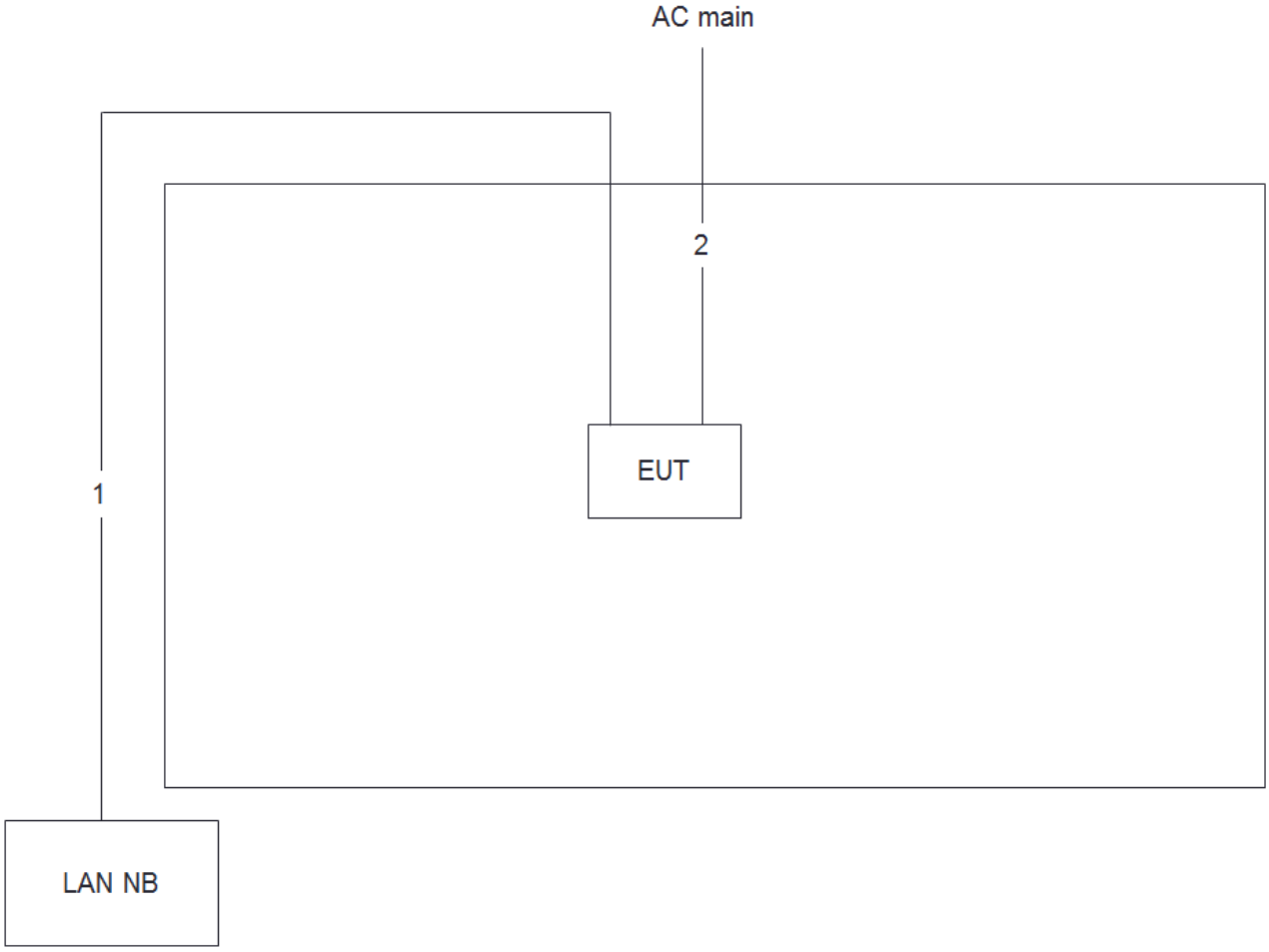
Test Configuration: 30MHz ~1GHz



Item	Connection	Shielded	Length
1	Power cable	No	3.2m
2	RJ-45 cable	No	10m
3	RJ-45 cable	No	10m
4	RJ-45 cable*3	No	1.5m

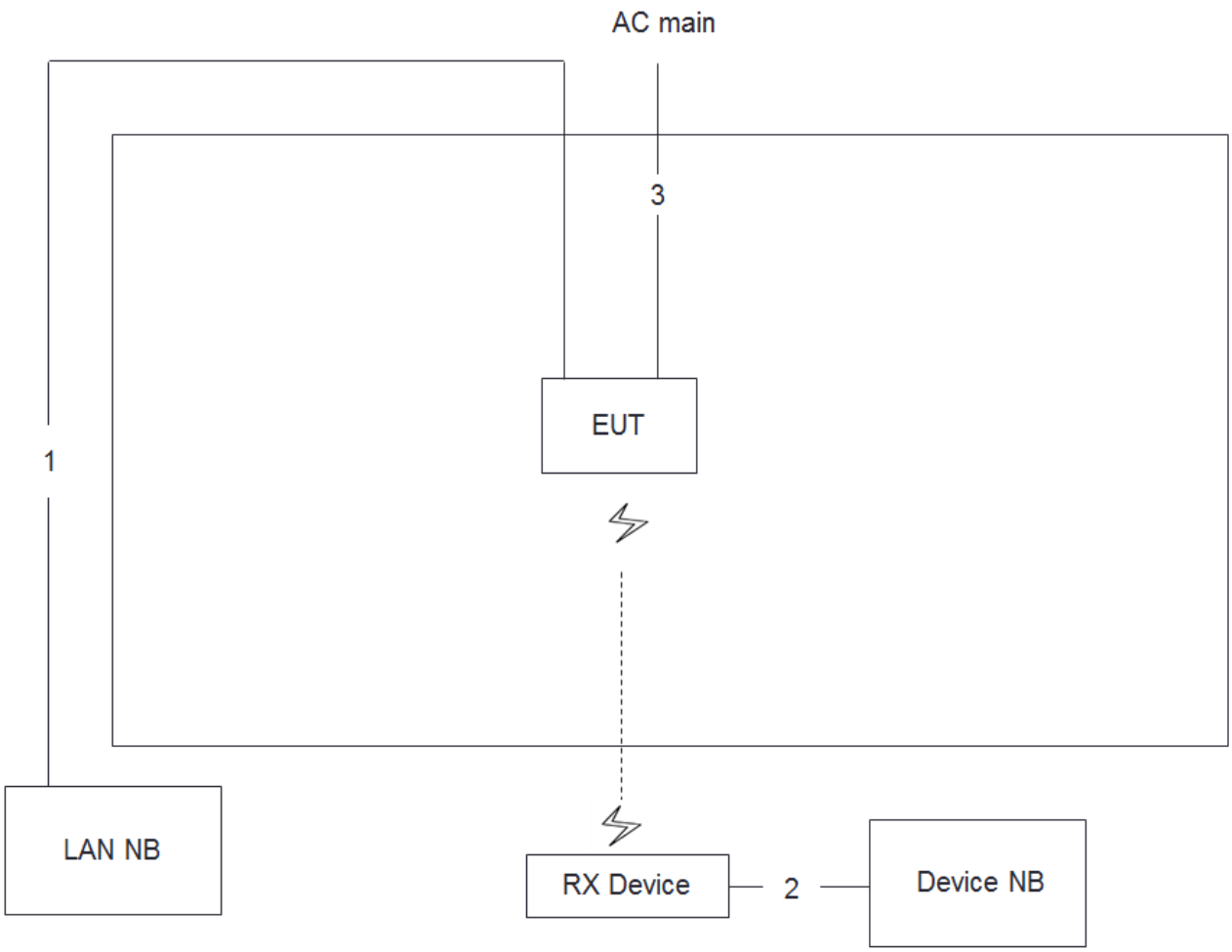
Test Configuration: above 1GHz

For Non-Beamforming Mode:



Item	Connection	Shielded	Length
1	RJ-45 cable	No	10m
2	Power cable	No	3.2m

For Beamforming Mode:



Item	Connection	Shielded	Length
1	RJ-45 cable	No	10m
2	RJ-45 cable	No	1.5m
3	Power cable	No	3.2m

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

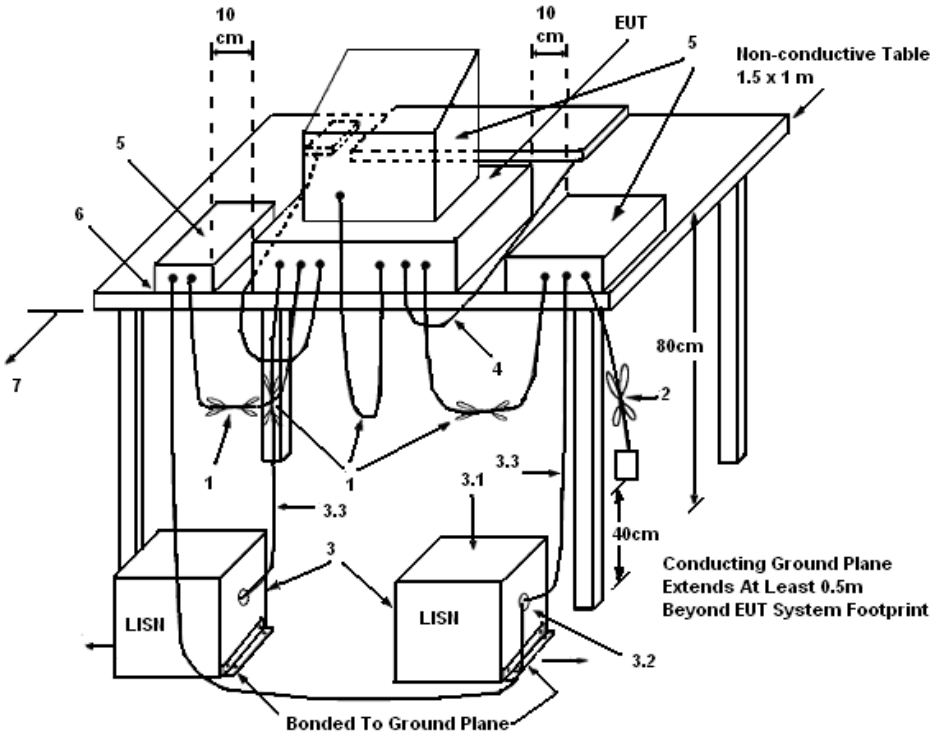
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

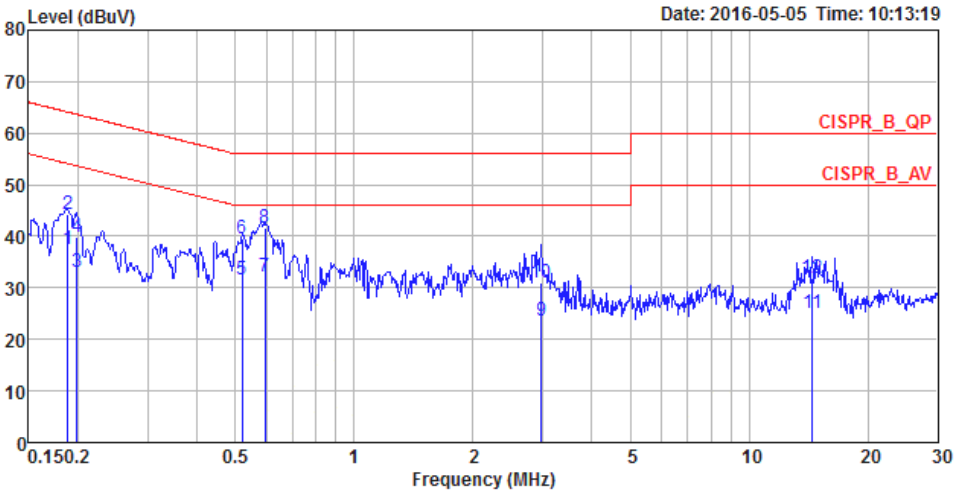
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

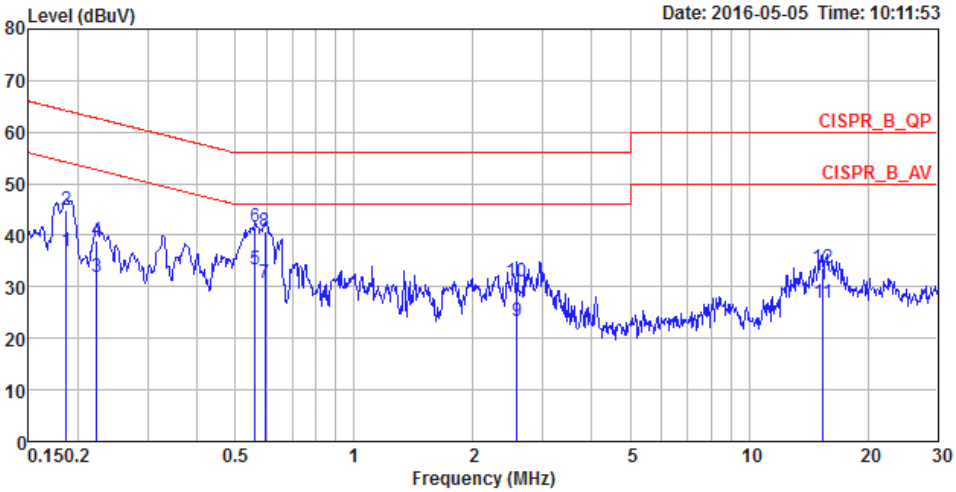
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	20°C	Humidity	60%
Test Engineer	Deven Huang	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	0.1884	37.40	-16.71	54.11	27.46	9.92	0.02	LINE	Average
2	0.1884	44.27	-19.84	64.11	34.33	9.92	0.02	LINE	QP
3	0.1986	32.97	-20.70	53.67	23.03	9.92	0.02	LINE	Average
4	0.1986	39.90	-23.77	63.67	29.96	9.92	0.02	LINE	QP
5	0.5210	31.71	-14.29	46.00	21.75	9.92	0.04	LINE	Average
6	0.5210	39.63	-16.37	56.00	29.67	9.92	0.04	LINE	QP
7	0.5948	32.07	-13.93	46.00	22.10	9.93	0.04	LINE	Average
8	0.5948	41.58	-14.42	56.00	31.61	9.93	0.04	LINE	QP
9	2.9776	23.72	-22.28	46.00	13.70	9.97	0.05	LINE	Average
10	2.9776	31.08	-24.92	56.00	21.06	9.97	0.05	LINE	QP
11	14.4404	25.02	-24.98	50.00	14.54	10.22	0.26	LINE	Average
12	14.4404	31.85	-28.15	60.00	21.37	10.22	0.26	LINE	QP

Temperature	20°C	Humidity	60%
Test Engineer	Deven Huang	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	0.1864	37.05	-17.15	54.20	27.11	9.92	0.02	NEUTRAL	Average
2	0.1864	45.01	-19.19	64.20	35.07	9.92	0.02	NEUTRAL	QP
3	0.2232	31.75	-20.95	52.70	21.80	9.92	0.03	NEUTRAL	Average
4	0.2232	38.95	-23.75	62.70	29.00	9.92	0.03	NEUTRAL	QP
5	0.5611	33.26	-12.74	46.00	23.29	9.93	0.04	NEUTRAL	Average
6	0.5611	41.49	-14.51	56.00	31.52	9.93	0.04	NEUTRAL	QP
7	0.5948	30.85	-15.15	46.00	20.88	9.93	0.04	NEUTRAL	Average
8	0.5948	40.66	-15.34	56.00	30.69	9.93	0.04	NEUTRAL	QP
9	2.5807	23.25	-22.75	46.00	13.23	9.97	0.05	NEUTRAL	Average
10	2.5807	31.03	-24.97	56.00	21.01	9.97	0.05	NEUTRAL	QP
11	15.3883	26.87	-23.13	50.00	16.37	10.24	0.26	NEUTRAL	Average
12	15.3883	33.72	-26.28	60.00	23.22	10.24	0.26	NEUTRAL	QP

Note:

Level = Read Level + LISN Factor + Cable Loss.

4.2. 26dB Bandwidth and 99% Occupied Bandwidth Measurement

4.2.1. Limit

No restriction limits.

4.2.2. Measuring Instruments and Setting

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

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

4.2.3. Test Procedures

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

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

4.2.4. Test Setup Layout

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

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

4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

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

Temperature	26℃	Humidity	74%
Test Engineer	Paul Chen		

<For Non-Beamforming Mode>

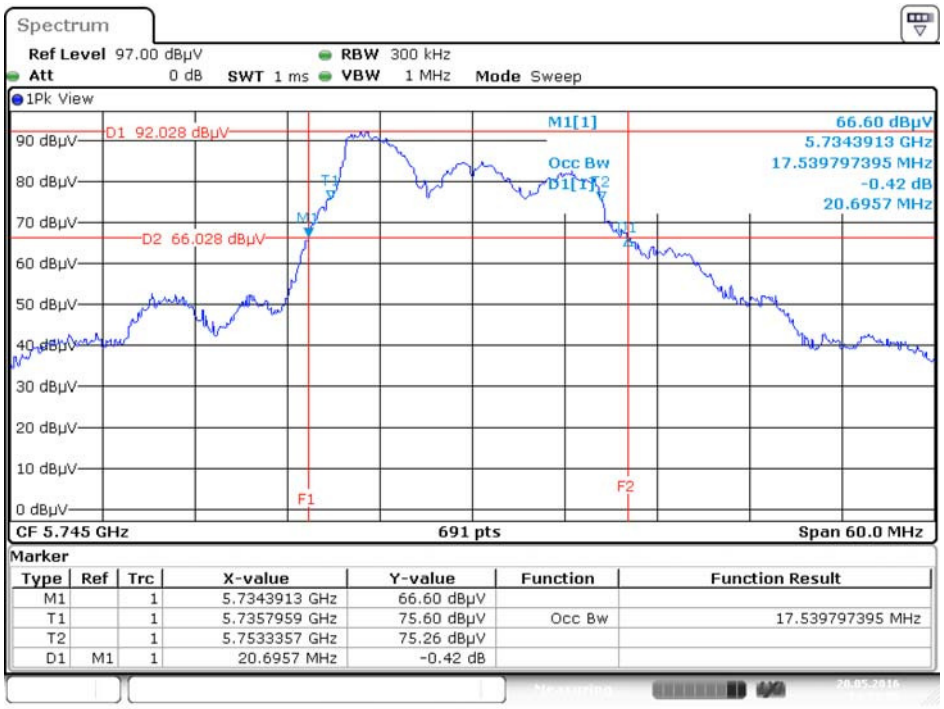
Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5745 MHz	20.70	17.54
	5785 MHz	23.48	17.71
	5825 MHz	19.39	17.19
802.11ac MCS0/Nss1 VHT20	5745 MHz	21.22	17.54
	5785 MHz	22.09	17.89
	5825 MHz	21.04	17.63
802.11ac MCS0/Nss1 VHT40	5755 MHz	40.44	36.90
	5795 MHz	41.74	36.47
802.11ac MCS0/Nss1 VHT80	5775 MHz	80.58	75.54

<For Beamforming Mode>

Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11ac MCS0/Nss1 VHT20	5180 MHz	21.48	18.06
	5200 MHz	21.57	17.97
	5240 MHz	21.57	18.06
	5745 MHz	21.57	18.06
	5785 MHz	21.57	17.97
	5825 MHz	21.57	18.15
802.11ac MCS0/Nss1 VHT40	5190 MHz	40.73	36.61
	5230 MHz	40.58	36.76
	5755 MHz	40.58	36.90
	5795 MHz	41.01	36.76
802.11ac MCS0/Nss1 VHT80	5210 MHz	80.00	74.67
	5775 MHz	80.87	76.12

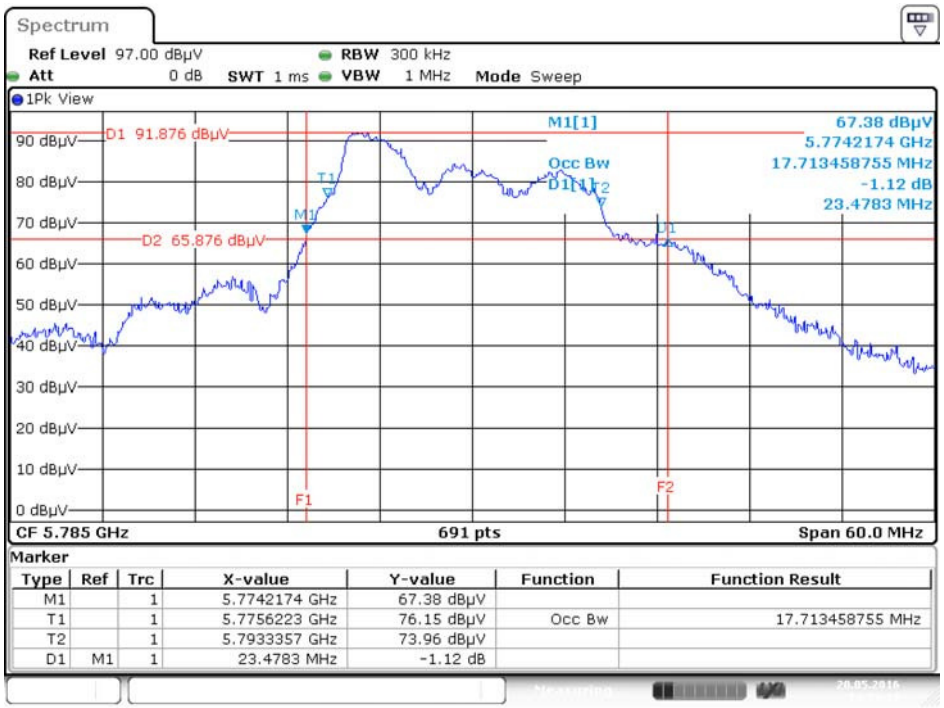
<For Non-Beamforming Mode>

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



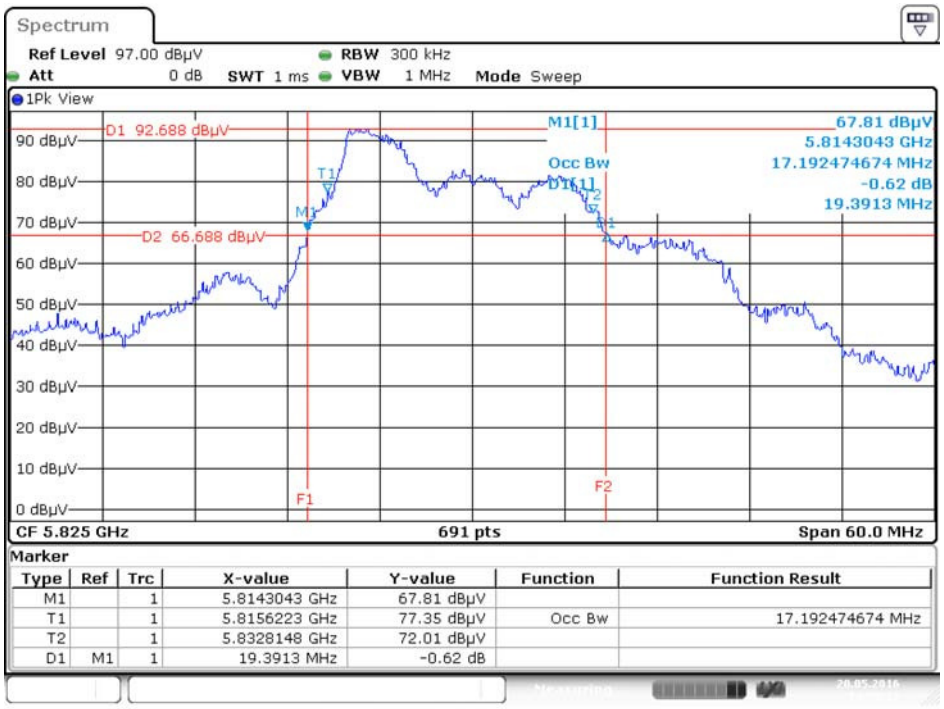
Date: 20.MAY.2016 14:53:05

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



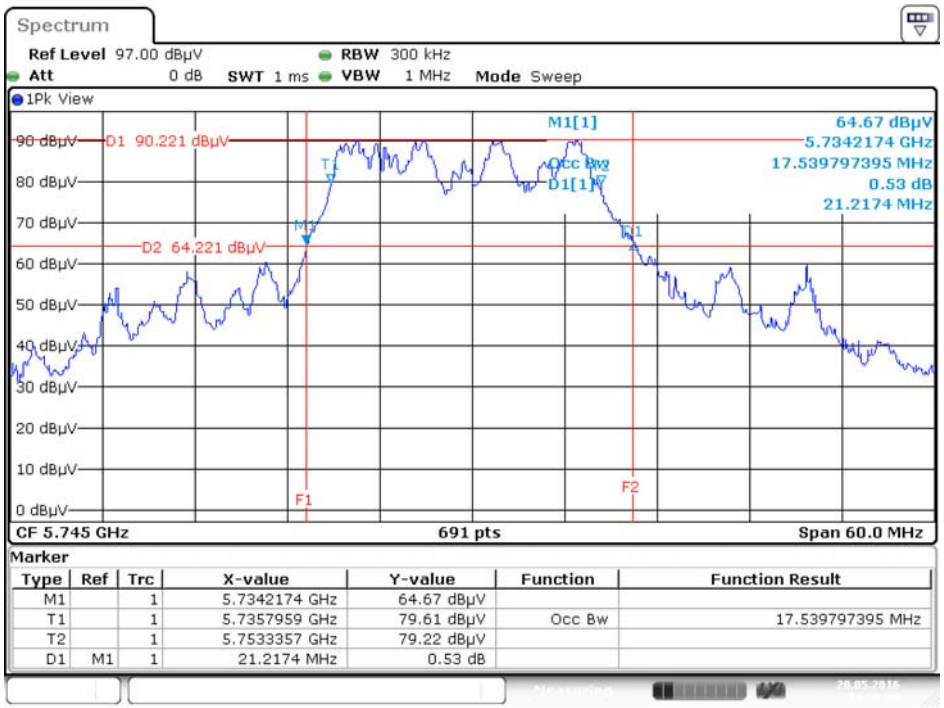
Date: 20.MAY.2016 14:54:19

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



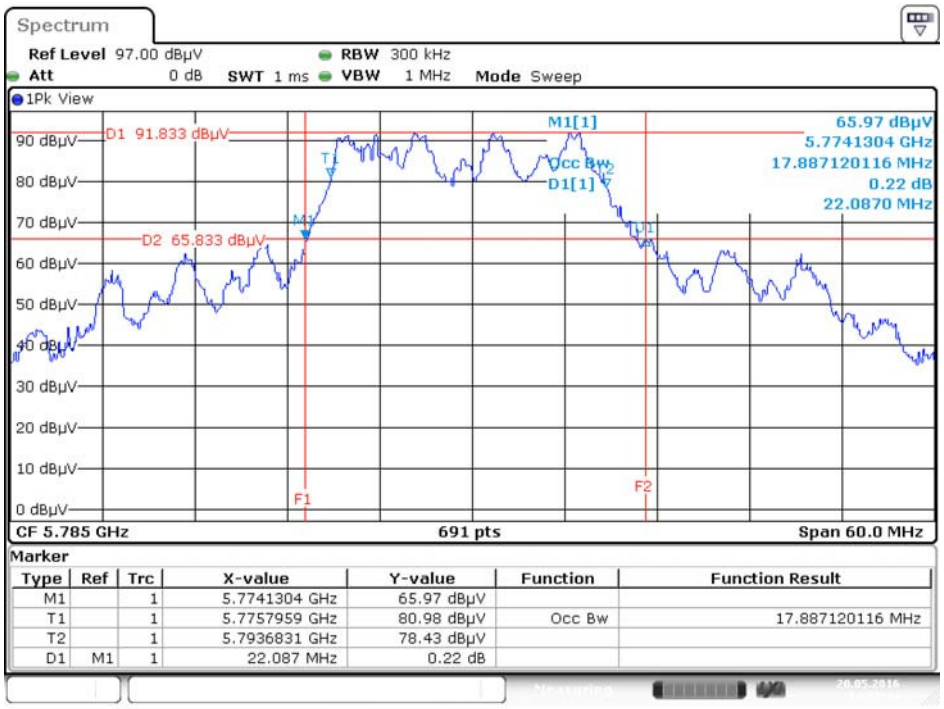
Date: 20.MAY.2016 14:55:17

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



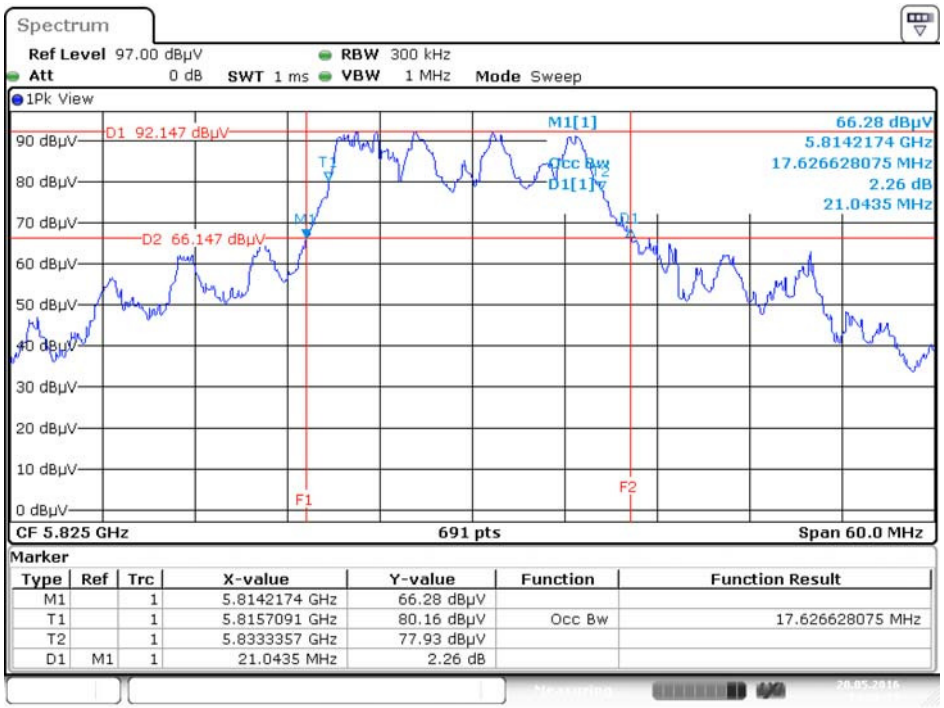
Date: 20.MAY.2016 14:58:33

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



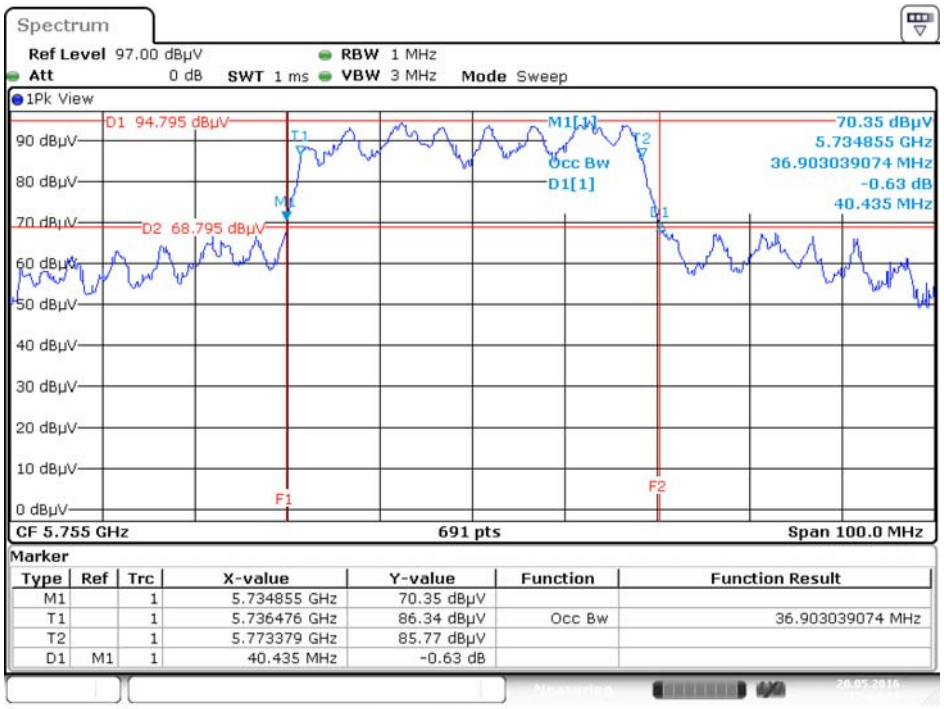
Date: 20.MAY.2016 14:57:43

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



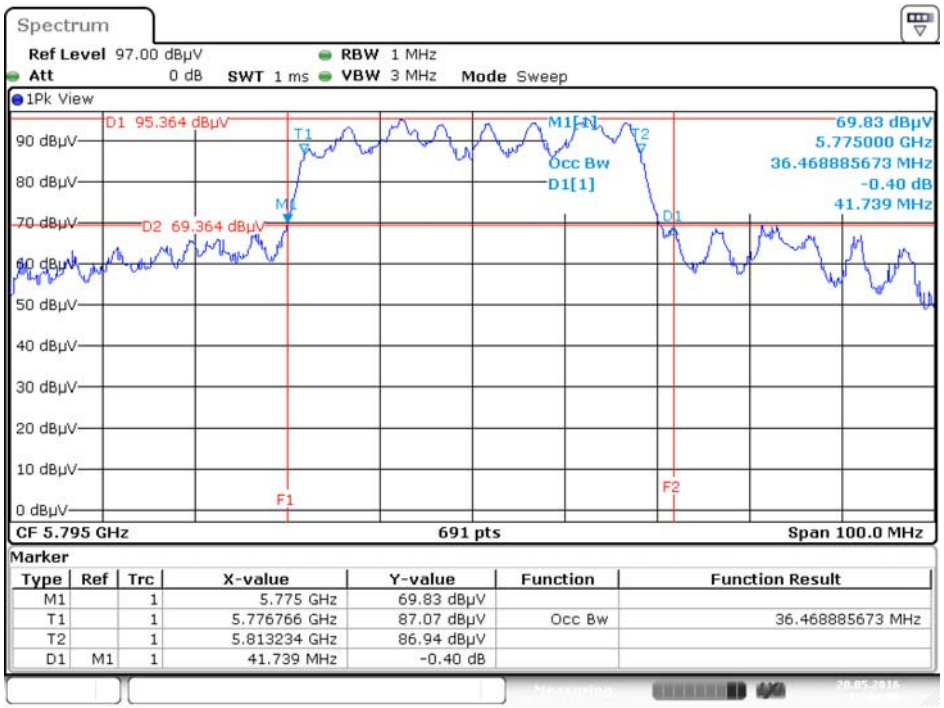
Date: 20.MAY.2016 14:56:39

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



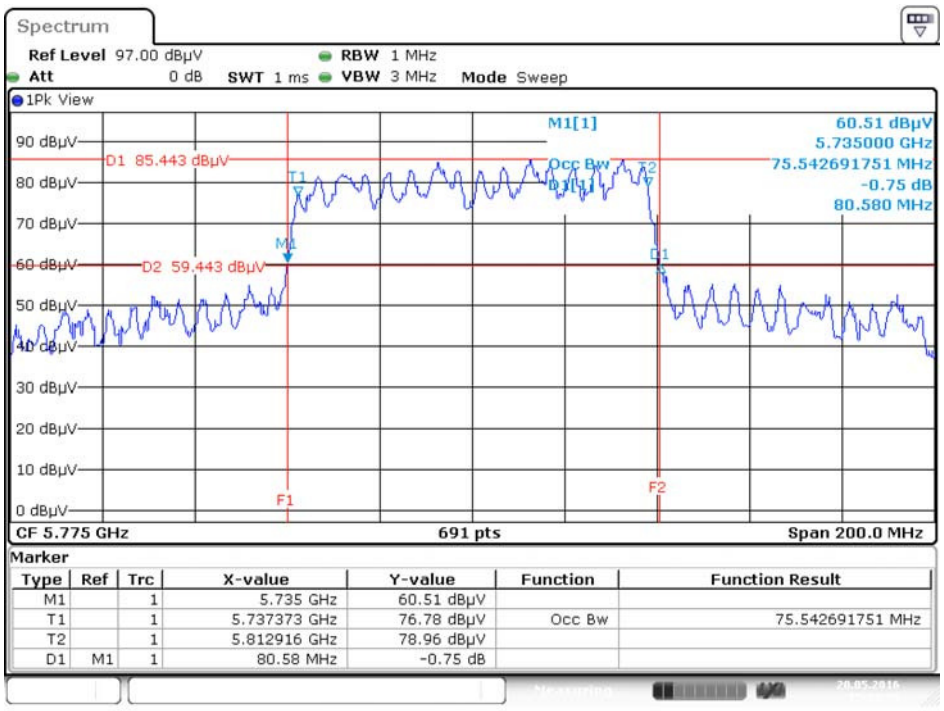
Date: 20.MAY.2016 15:00:10

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: 20.MAY.2016 15:00:59

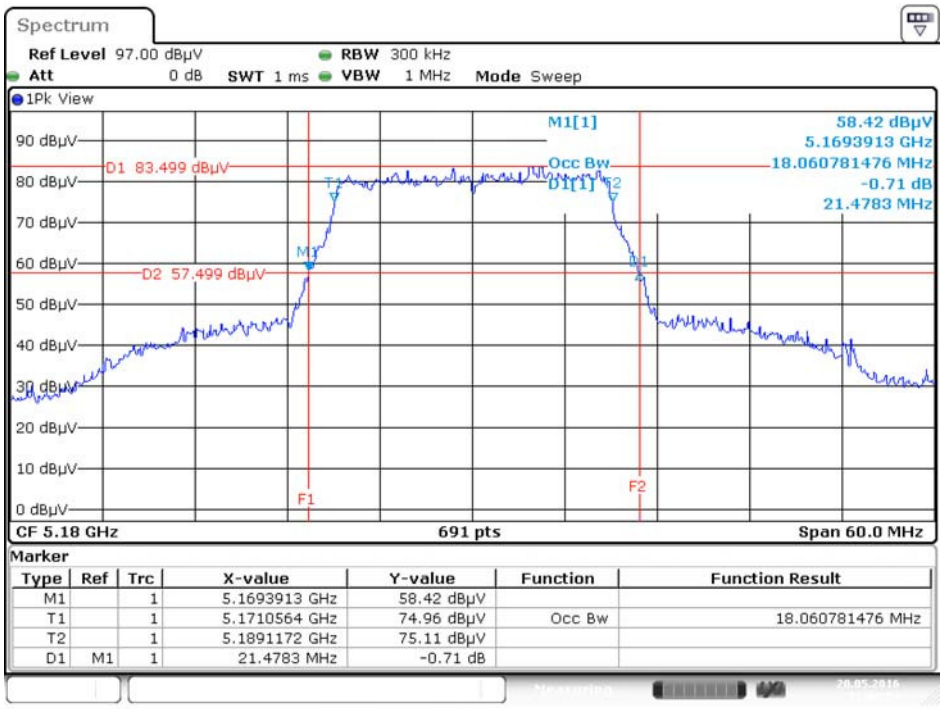
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5775 MHz



Date: 20.MAY.2016 15:03:35

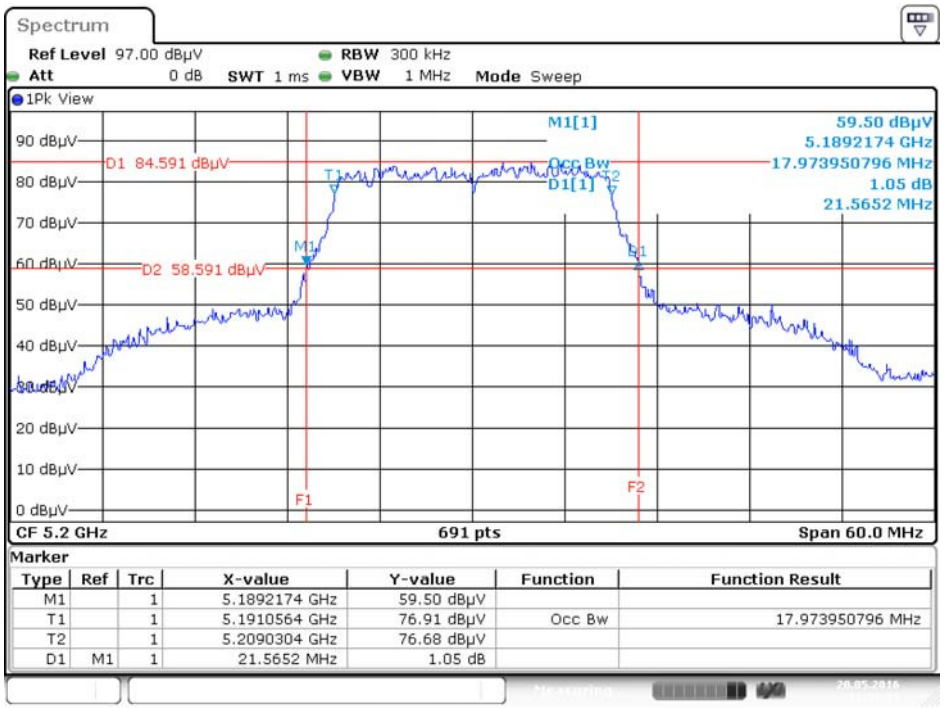
<For Beamforming Mode>

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



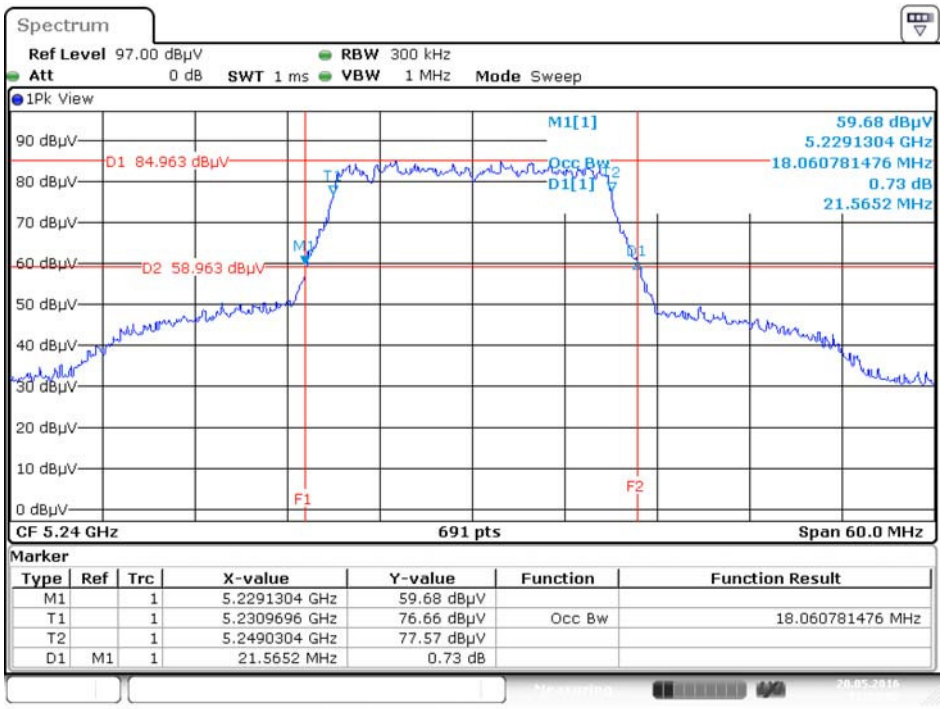
Date: 20.MAY.2016 12:00:54

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



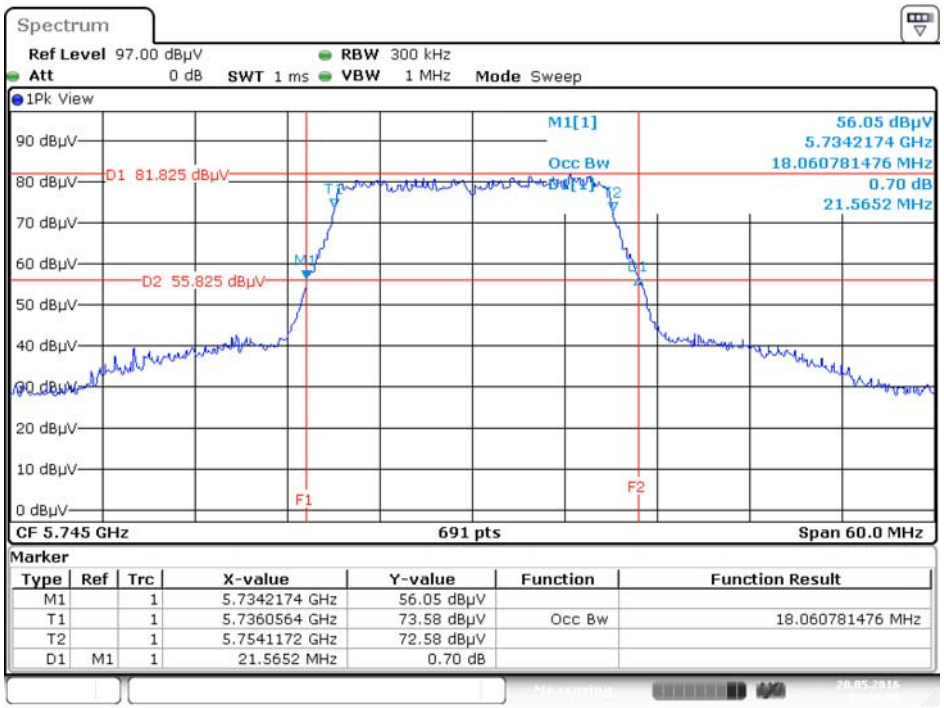
Date: 20.MAY.2016 12:01:52

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



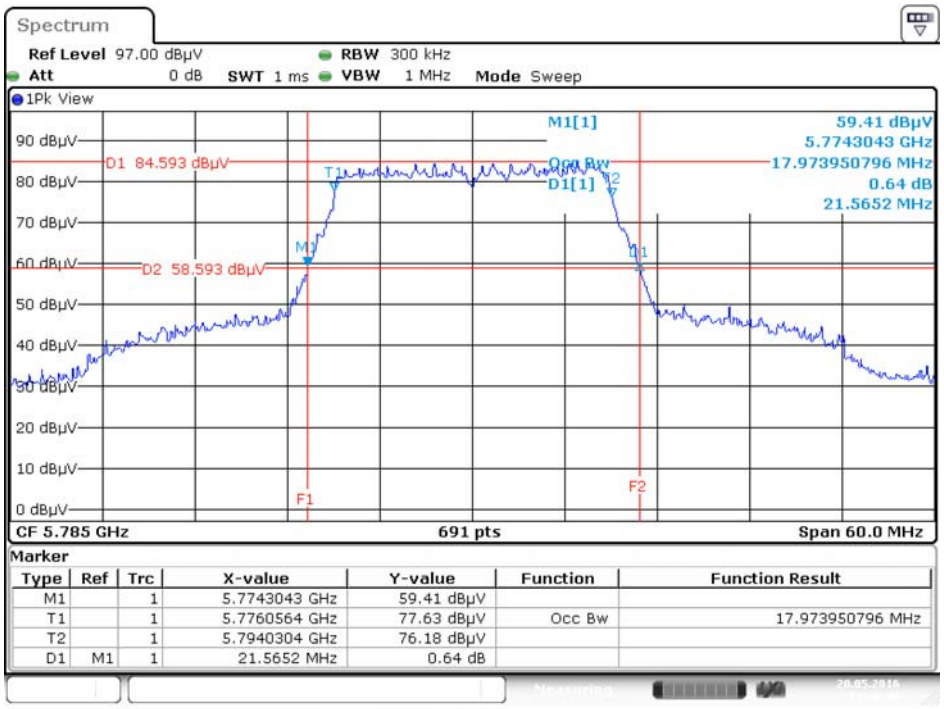
Date: 20.MAY.2016 12:03:02

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



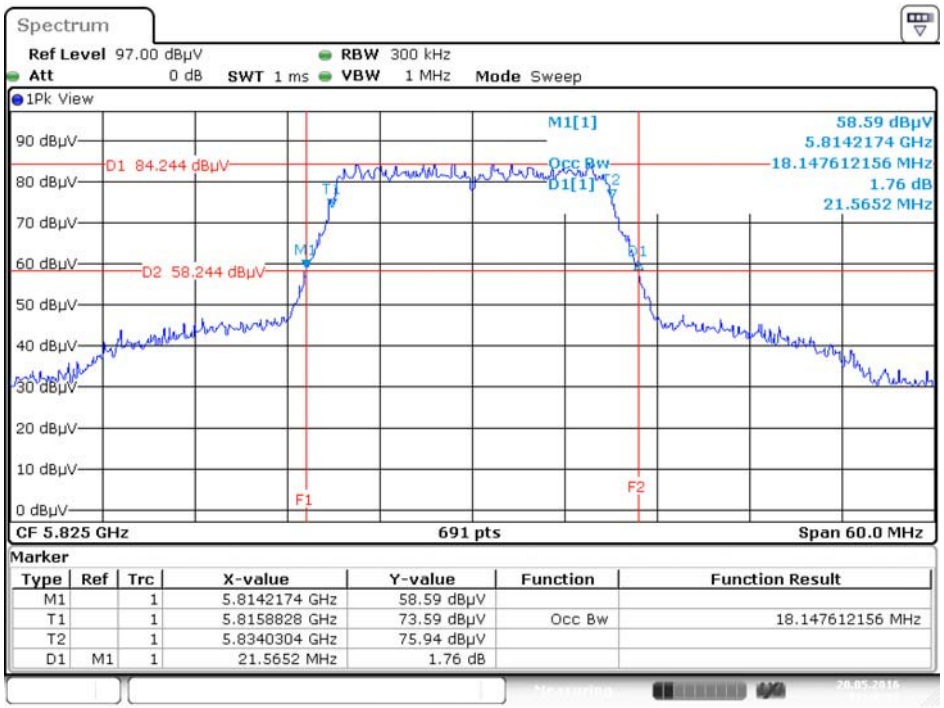
Date: 20.MAY.2016 13:44:08

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



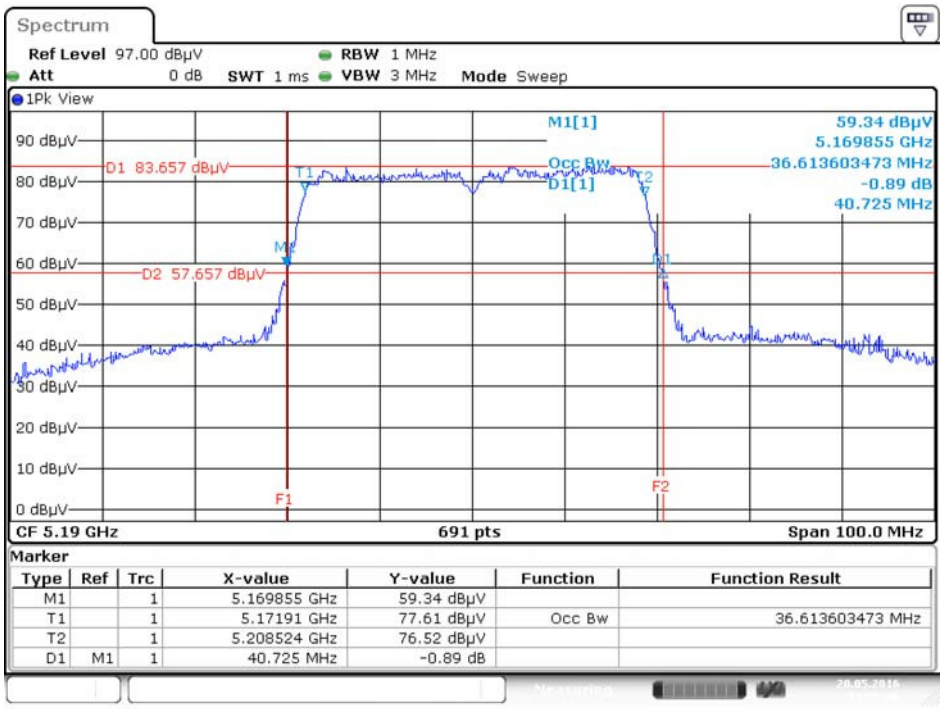
Date: 20.MAY.2016 13:46:49

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



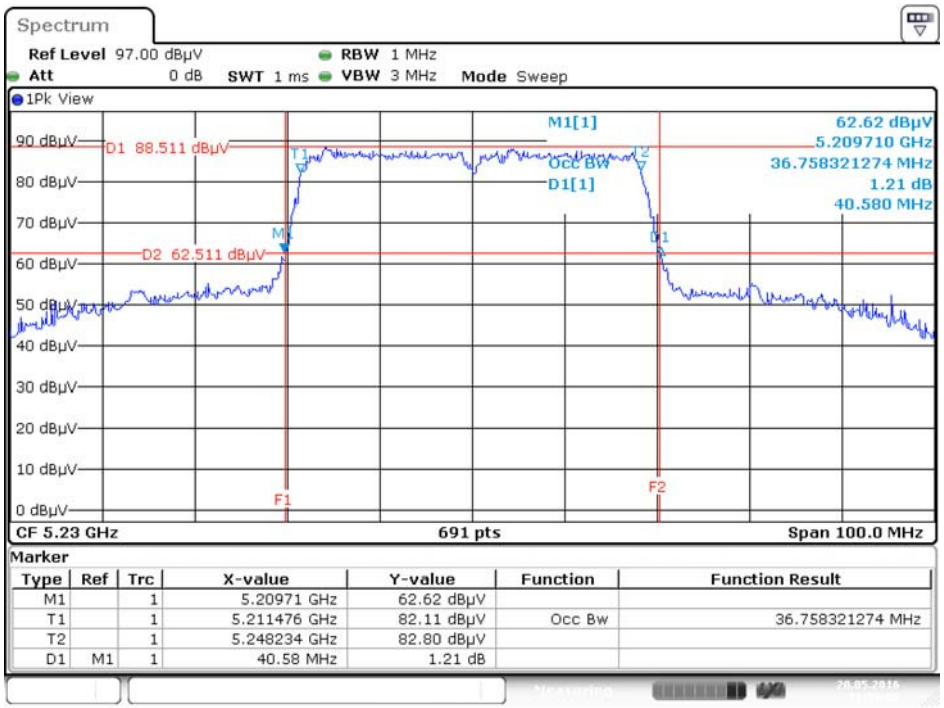
Date: 20.MAY.2016 13:48:12

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



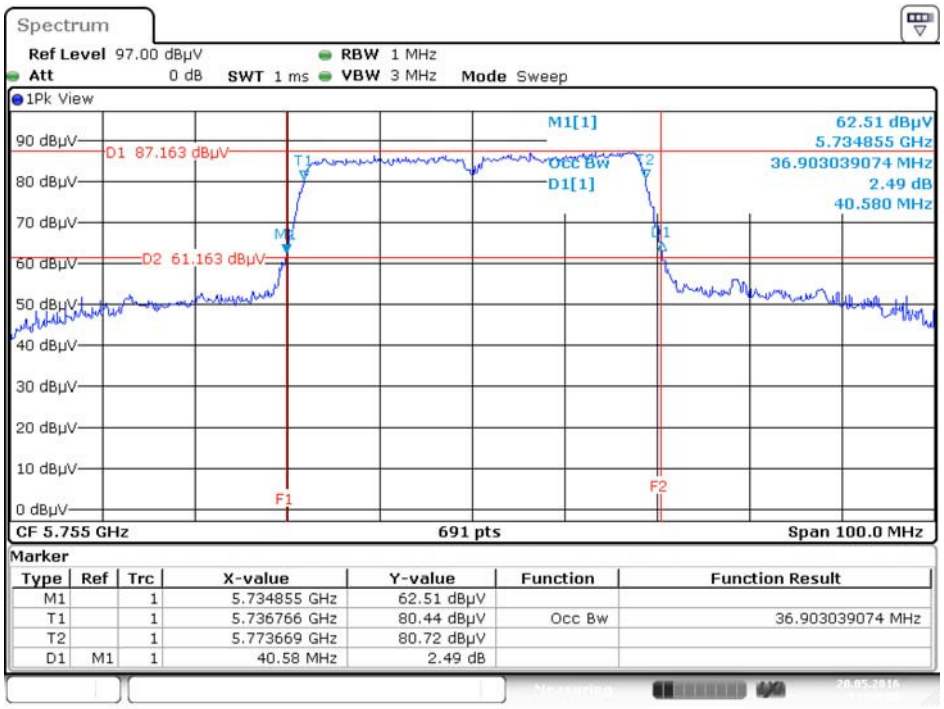
Date: 20.MAY.2016 11:58:47

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



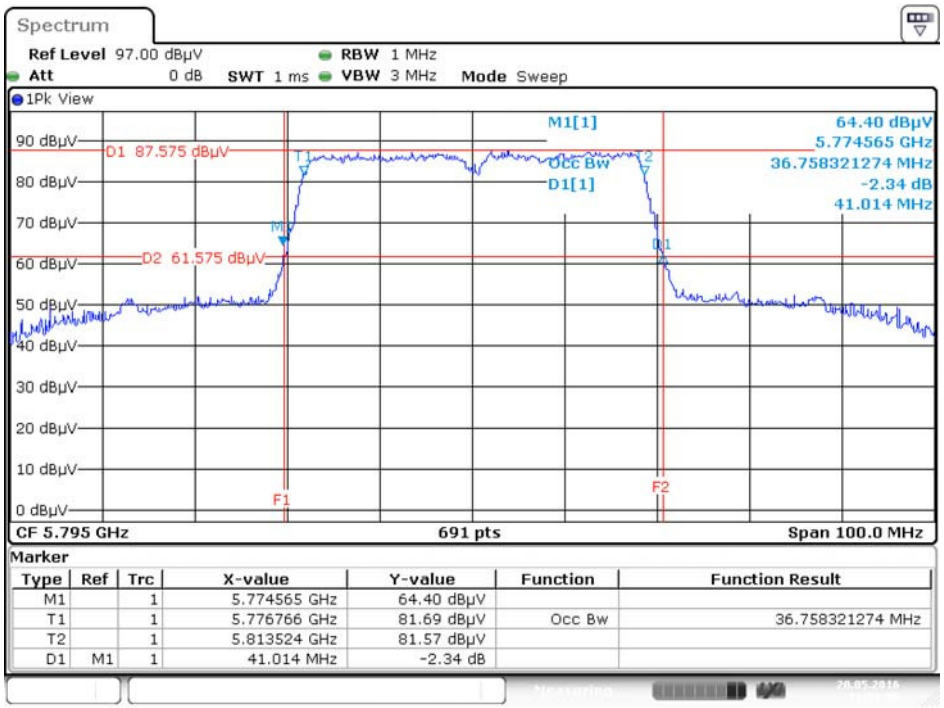
Date: 20.MAY.2016 11:59:36

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



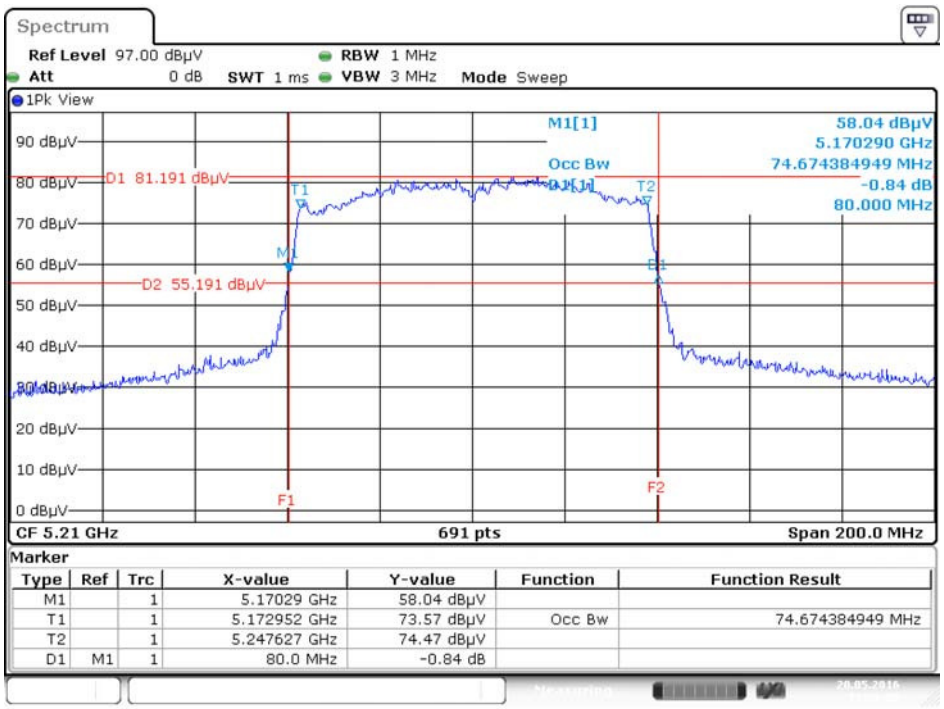
Date: 20.MAY.2016 13:50:00

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



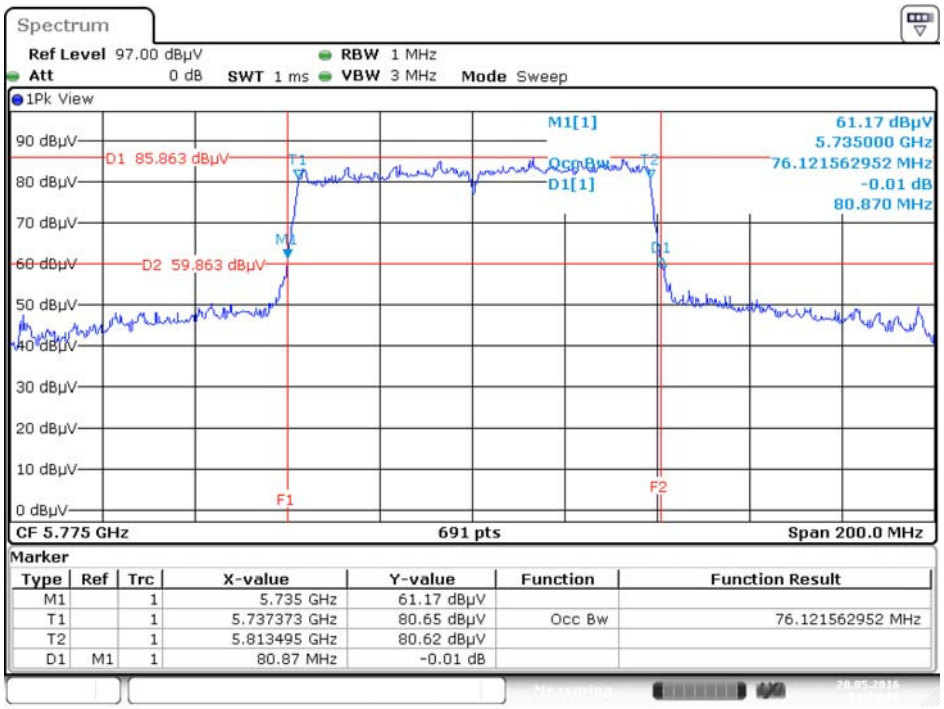
Date: 20.MAY.2016 13:51:05

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: 20.MAY.2016 11:56:21

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: 20.MAY.2016 13:52:15

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 v01r02 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (C) Emission Bandwidth.
3. Multiple antenna system was performed in accordance with KDB662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. Measured the spectrum width with power higher than 6dB below carrier.

4.3.4. 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	26℃	Humidity	74%
Test Engineer	Paul Chen		

<For Non-Beamforming Mode>

Mode	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11a	5745 MHz	8.93	500	Complies
	5785 MHz	7.07	500	Complies
	5825 MHz	2.78	500	Complies
802.11ac MCS0/Nss1 VHT20	5745 MHz	15.83	500	Complies
	5785 MHz	15.48	500	Complies
	5825 MHz	15.71	500	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	30.38	500	Complies
	5795 MHz	30.73	500	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	65.80	500	Complies

<For Beamforming Mode>

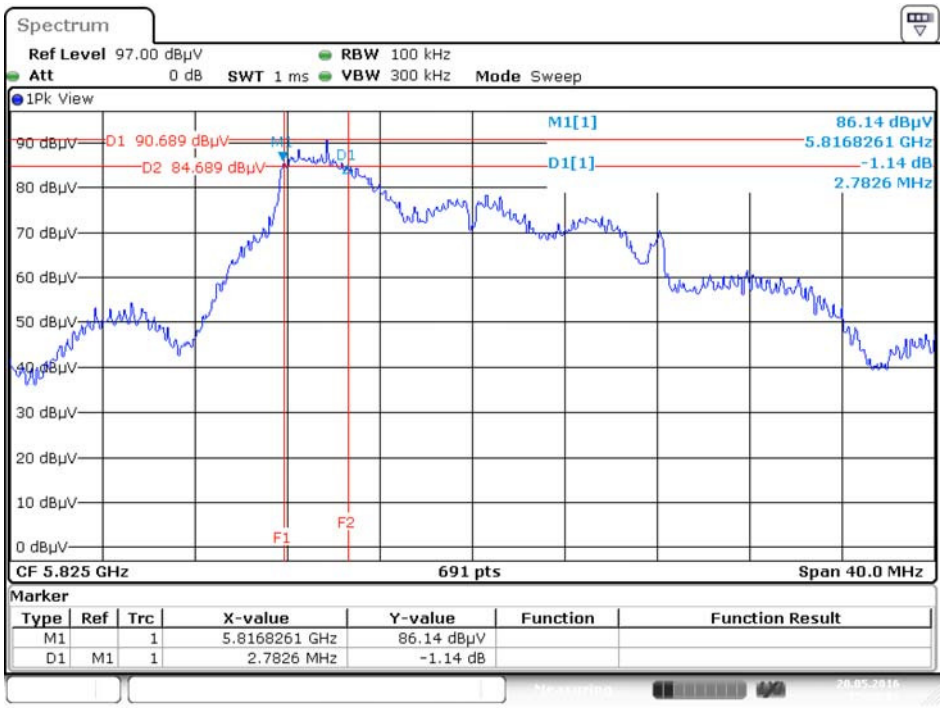
Mode	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11ac MCS0/Nss1 VHT20	5745 MHz	17.62	500	Complies
	5785 MHz	17.57	500	Complies
	5825 MHz	17.33	500	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	35.71	500	Complies
	5795 MHz	36.06	500	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	75.94	500	Complies

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

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

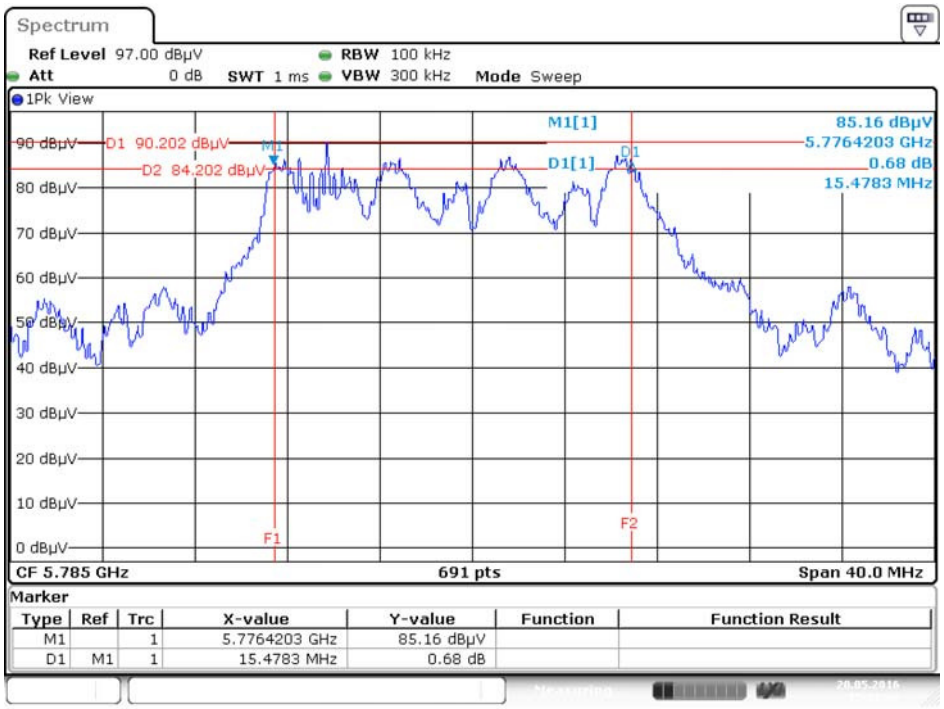
<For Non-Beamforming Mode>

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



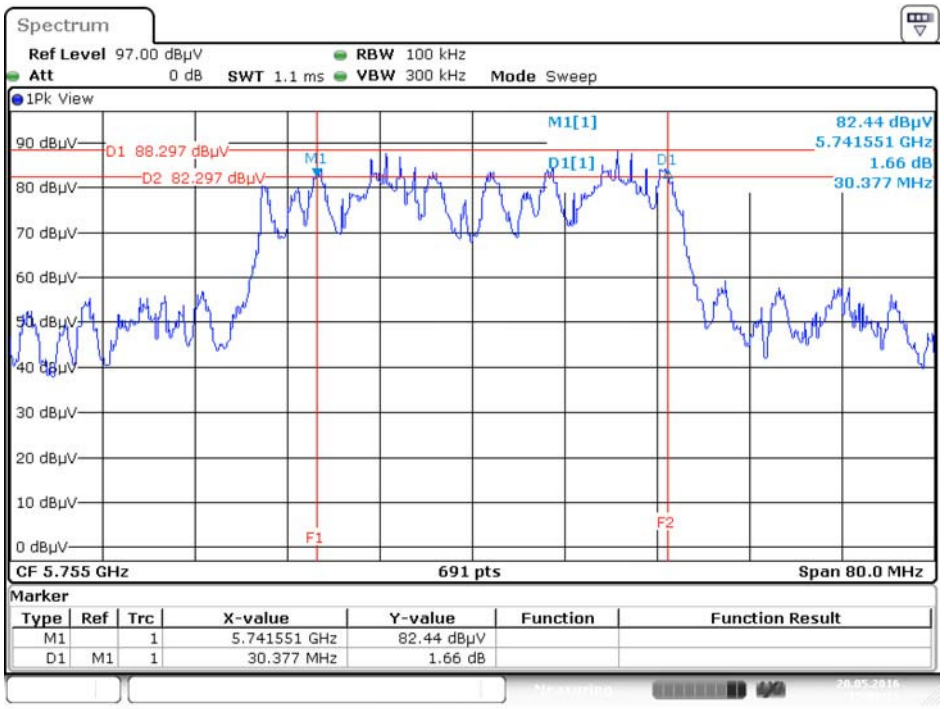
Date: 20.MAY.2016 15:20:01

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



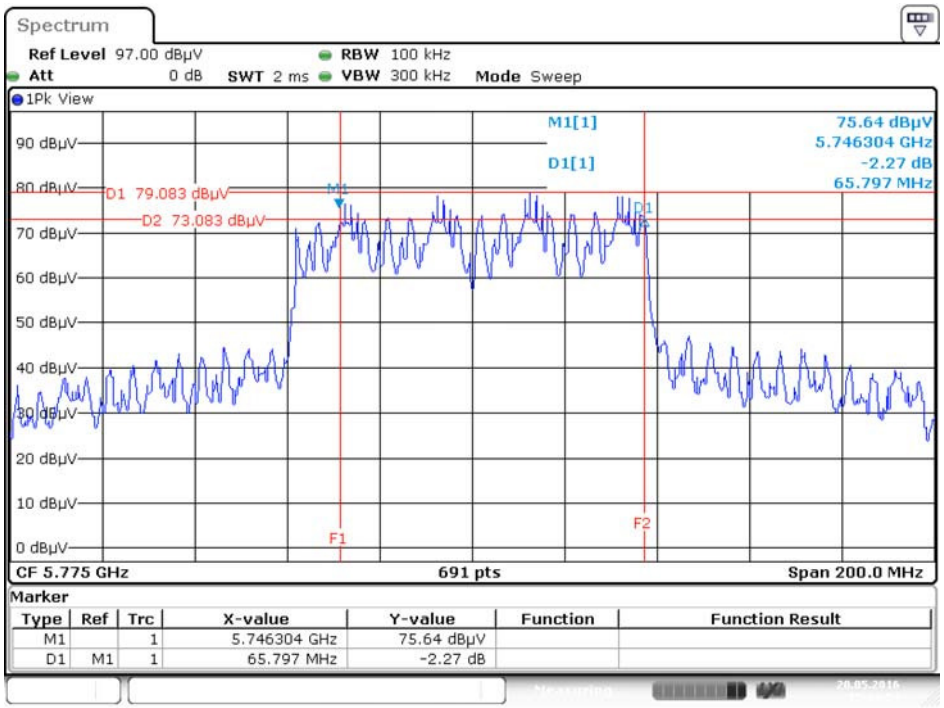
Date: 20.MAY.2016 15:11:48

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



Date: 20.MAY.2016 15:08:20

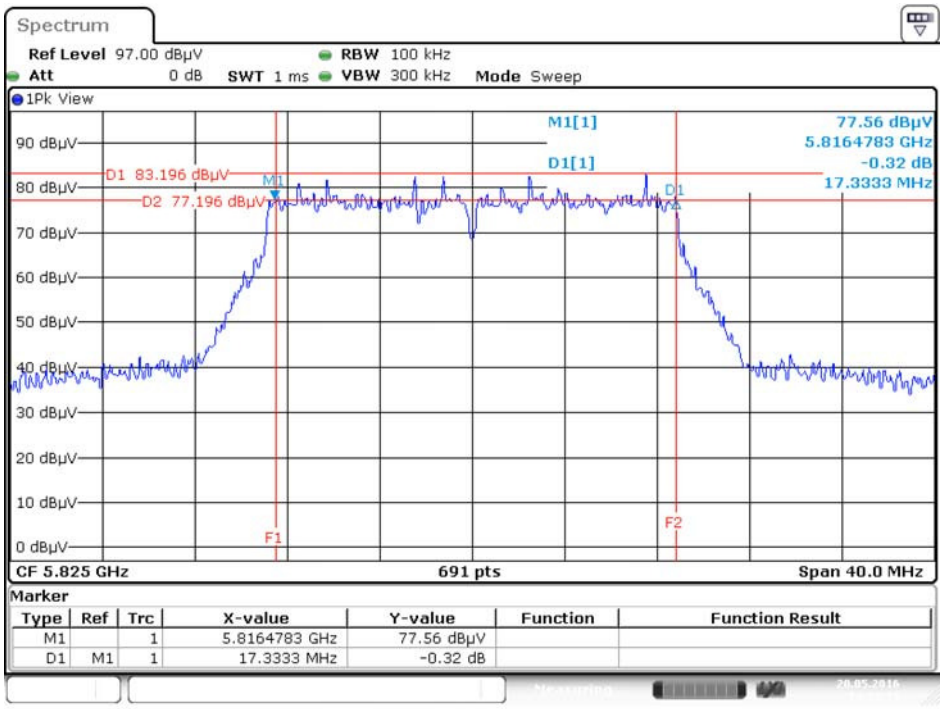
6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5775 MHz



Date: 20.MAY.2016 15:04:53

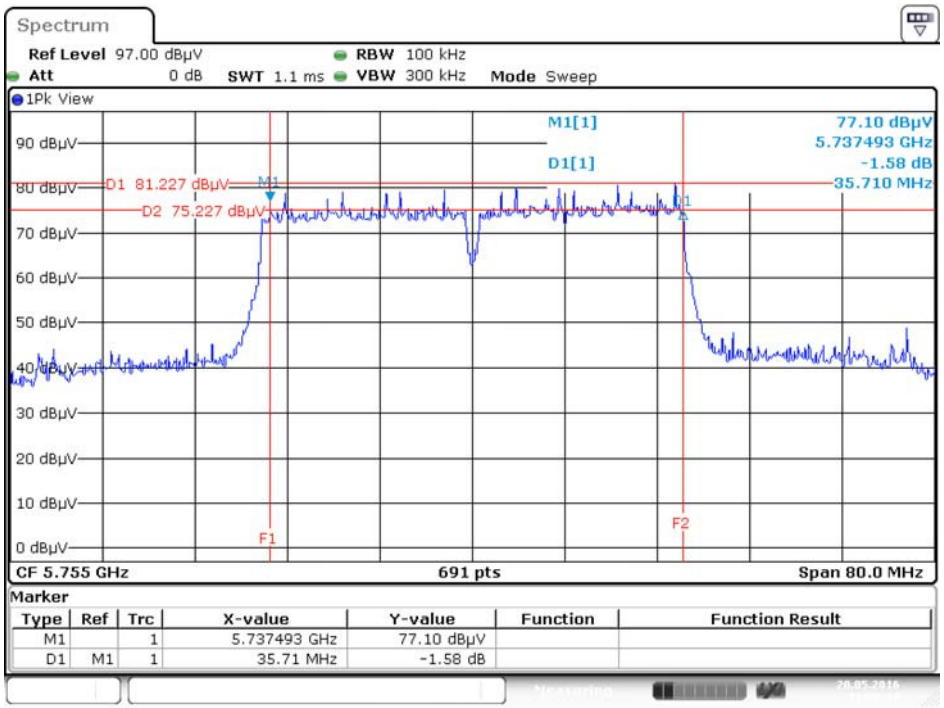
<For Beamforming Mode>

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



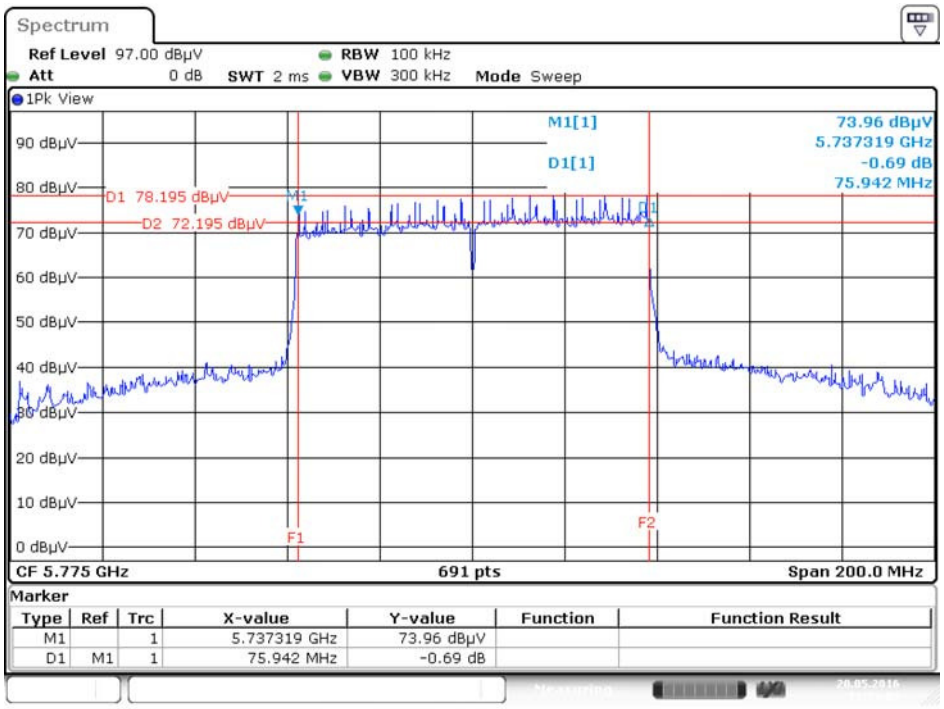
Date: 20.MAY.2016 14:03:15

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



Date: 20.MAY.2016 13:58:11

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



Date: 20.MAY.2016 13:59:03

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

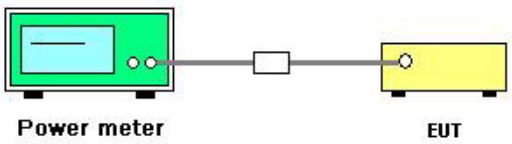
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Detector	AVERAGE

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

4.4.4. 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	26°C	Humidity	74%
Test Engineer	Paul Chen	Test Date	May 20, 2016

<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	23.46	23.53	23.66	24.52	29.83	30.00	Complies
	5785 MHz	23.26	23.74	23.51	24.71	29.86	30.00	Complies
	5825 MHz	23.48	23.86	23.32	24.48	29.83	30.00	Complies
802.11ac MCS0/Nss1 VHT20	5745 MHz	22.26	22.12	22.14	23.05	28.43	30.00	Complies
	5785 MHz	23.18	23.72	23.66	24.79	29.90	30.00	Complies
	5825 MHz	23.56	23.99	23.21	24.57	29.88	30.00	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	23.59	23.48	23.87	24.45	29.88	30.00	Complies
	5795 MHz	23.51	23.62	23.74	24.63	29.92	30.00	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	22.26	23.49	22.56	23.74	29.08	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	20.91	20.57	20.93	21.54	27.02	28.18	Complies
	5200 MHz	21.67	22.23	21.94	22.26	28.05	28.18	Complies
	5240 MHz	21.28	22.48	22.19	21.98	28.03	28.18	Complies
	5745 MHz	18.74	18.69	18.84	19.52	24.98	28.18	Complies
	5785 MHz	21.57	22.03	21.84	22.52	28.02	28.18	Complies
	5825 MHz	21.53	22.17	21.72	22.78	28.10	28.18	Complies
802.11ac MCS0/Nss1 VHT40	5190 MHz	18.57	17.98	17.82	19.03	24.40	28.18	Complies
	5230 MHz	22.11	22.42	21.51	22.24	28.10	28.18	Complies
	5755 MHz	21.74	21.62	21.99	22.57	28.02	28.18	Complies
	5795 MHz	21.57	22.23	22.02	22.53	28.12	28.18	Complies
802.11ac MCS0/Nss1 VHT80	5210 MHz	17.86	18.26	18.12	18.28	24.15	28.18	Complies
	5775 MHz	21.31	22.21	21.74	22.68	28.04	28.18	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.82 dBi, so limit=30-(7.82-6)=28.18 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

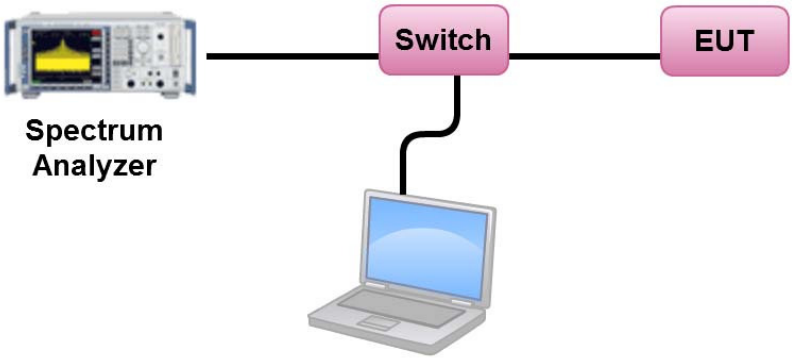
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.5.4. 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	26°C	Humidity	74%
Test Engineer	Paul Chen		

<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	16.78	-3.01	13.77	28.18	Complies
157	5785 MHz	16.83	-3.01	13.82	28.18	Complies
165	5825 MHz	16.80	-3.01	13.79	28.18	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.82 dBi, so limit=30-(7.82-6)=28.18 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	15.41	-3.01	12.40	28.18	Complies
157	5785 MHz	16.85	-3.01	13.84	28.18	Complies
165	5825 MHz	16.86	-3.01	13.85	28.18	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.82 dBi, so limit=30-(7.82-6)=28.18 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	13.81	-3.01	10.80	28.18	Complies
159	5795 MHz	13.91	-3.01	10.90	28.18	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.82 dBi, so limit=30-(7.82-6)=28.18 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	10.07	-3.01	7.06	28.18	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.82 dBi, so limit=30-(7.82-6)=28.18 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	13.93	15.18	Complies
40	5200 MHz	14.99	15.18	Complies
48	5240 MHz	14.87	15.18	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.82 dBi, so limit=17-(7.82-6)=15.18 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	11.90	-3.01	8.89	28.18	Complies
157	5785 MHz	14.94	-3.01	11.93	28.18	Complies
165	5825 MHz	15.04	-3.01	12.03	28.18	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.82 dBi, so limit=30-(7.82-6)=28.18 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	8.38	15.18	Complies
46	5230 MHz	12.06	15.18	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.82 dBi, so limit=17-(7.82-6)=15.18 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	11.98	-3.01	8.97	28.18	Complies
159	5795 MHz	12.03	-3.01	9.02	28.18	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.82 dBi, so limit=30-(7.82-6)=28.18 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	5.13	15.18	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.82 dBi, so limit=17-(7.82-6)=15.18 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	9.01	-3.01	6.00	28.18	Complies

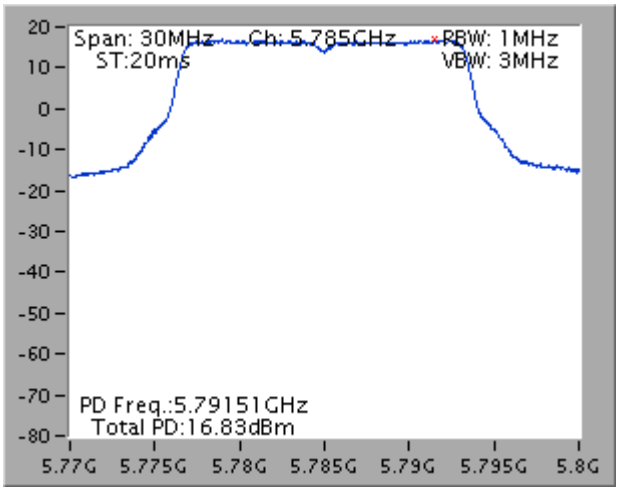
Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.82 dBi, so limit=30-(7.82-6)=28.18 dBm/500kHz.

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

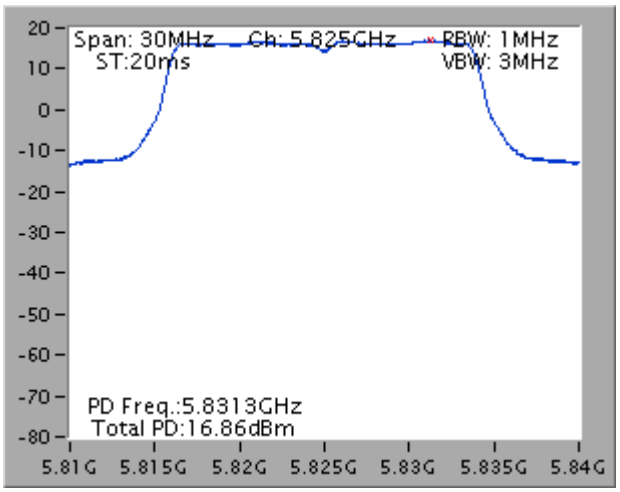
For plots, only the channel with worse result was shown.

<For Non-Beamforming Mode>

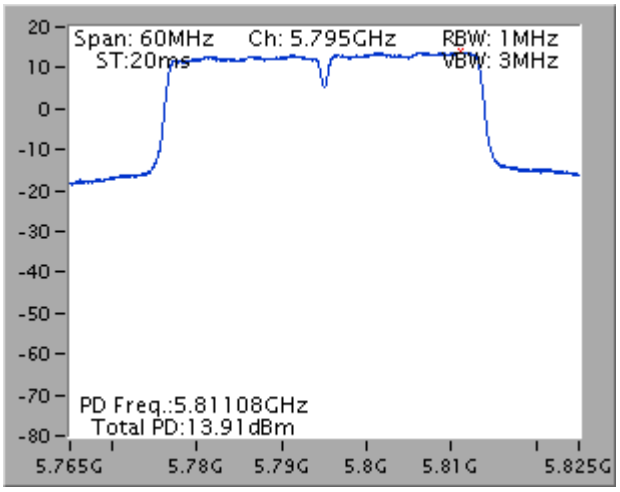
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5785 MHz



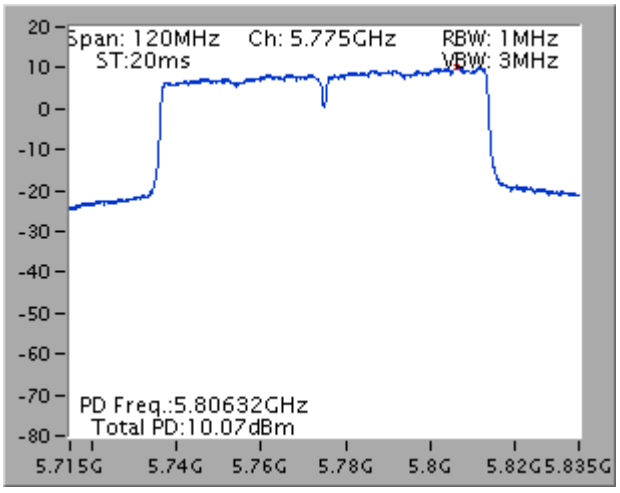
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5825 MHz



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

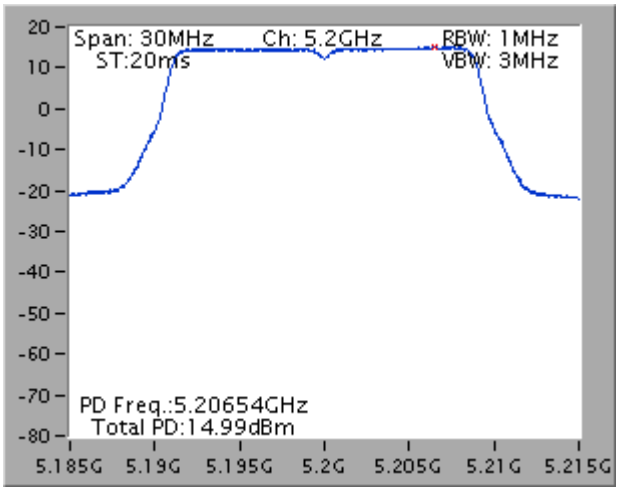


Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5775 MHz

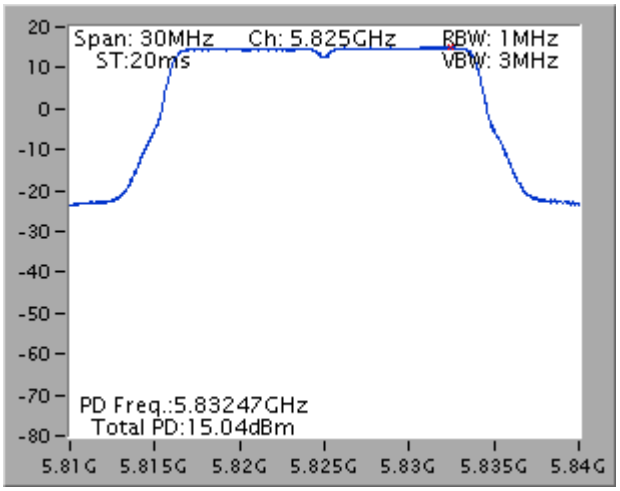


<For Beamforming Mode>

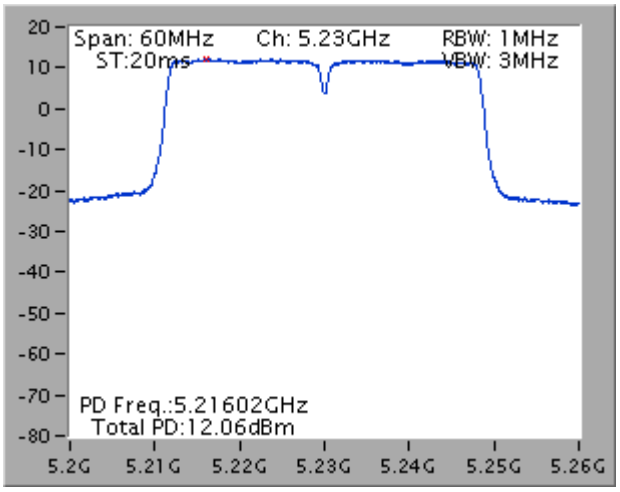
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5200 MHz



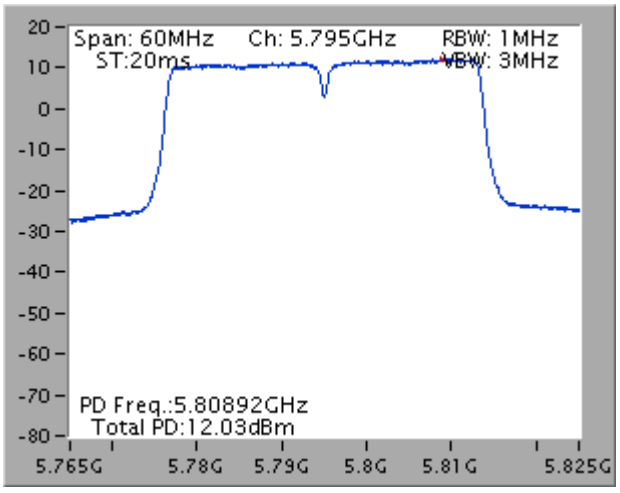
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5825 MHz



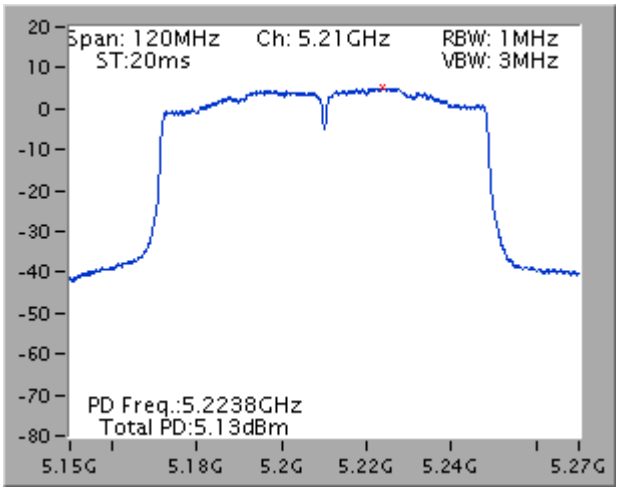
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5230 MHz



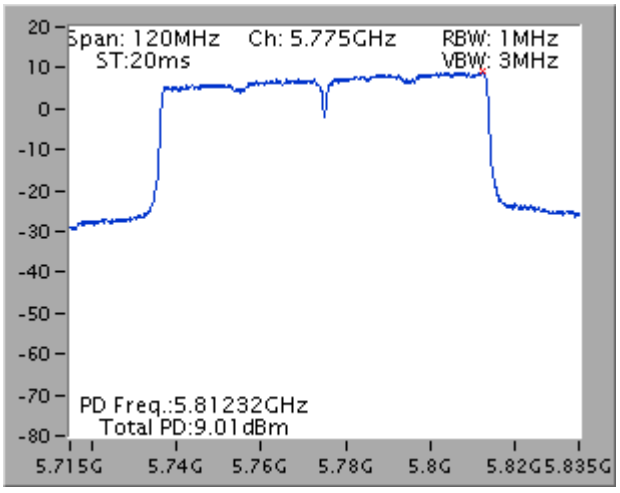
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 + Chain 4 / 5795 MHz



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

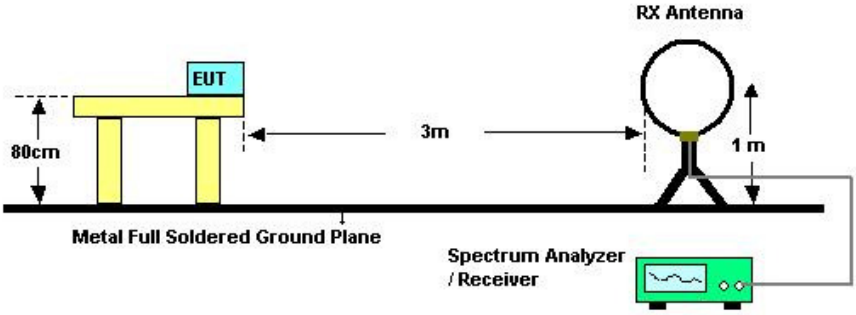
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.6.3. Test Procedures

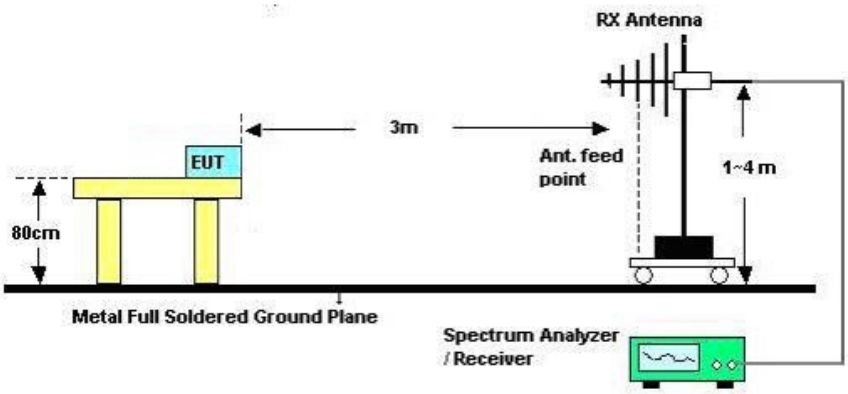
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 1m & 3m far away from the turntable.
2. Power on the EUT and all the supporting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

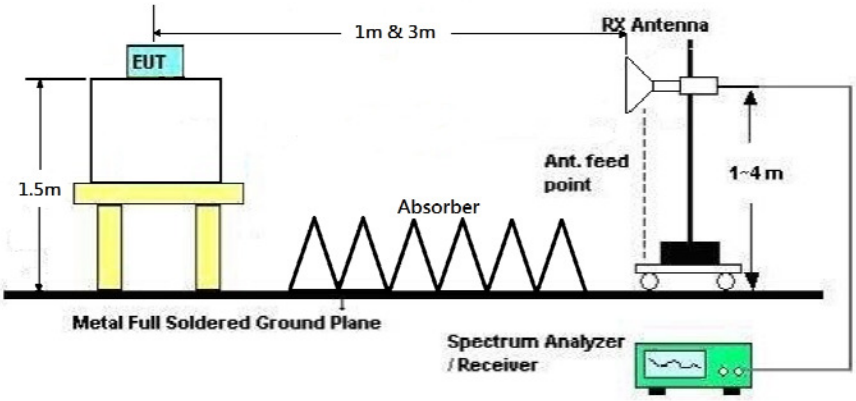
For Radiated Emissions: 9kHz ~30MHz



For Radiated Emissions: 30MHz~1GHz



For Radiated Emissions: Above 1GHz



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	23°C	**Humidity**	54%
Test Engineer	John Tang, Stim Song	**Configurations**	Normal Link
Test Date	May 09, 2016	**Test Mode**	Mode 2

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.

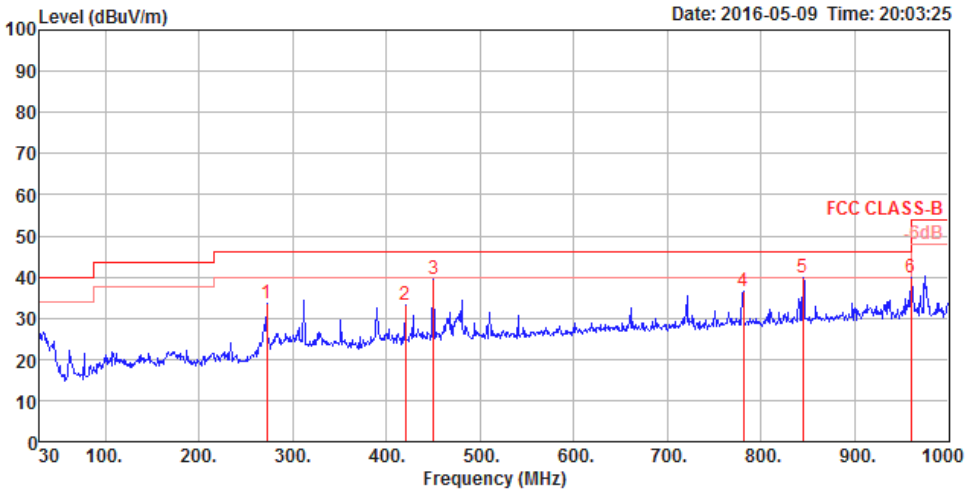
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

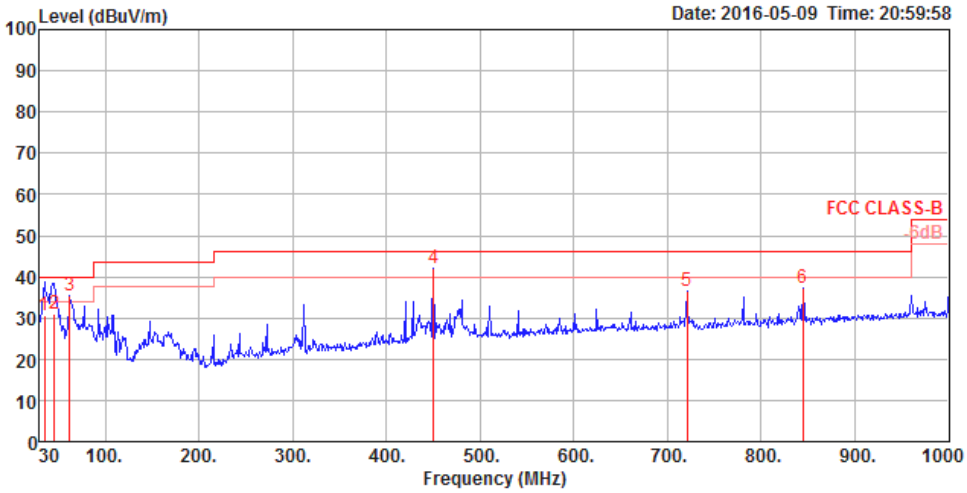
Temperature	23°C	Humidity	54%
Test Engineer	John Tang, Stim Song	Configurations	Normal Link
Test Mode	Mode 2		

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	272.50	33.64	46.00	-12.36	44.91	1.40	19.62	32.29	125	292	Peak	HORIZONTAL
2	419.94	33.34	46.00	-12.66	40.98	1.78	22.91	32.33	100	178	Peak	HORIZONTAL
3	450.01	39.37	46.00	-6.63	46.67	1.84	23.20	32.34	100	46	Peak	HORIZONTAL
4	780.78	36.45	46.00	-9.55	39.65	2.42	26.64	32.26	125	58	Peak	HORIZONTAL
5	844.80	39.90	46.00	-6.10	42.08	2.51	27.33	32.02	125	64	Peak	HORIZONTAL
6	960.23	39.78	54.00	-14.22	40.08	2.69	28.20	31.19	100	88	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	34.85	30.47	40.00	-9.53	39.00	0.52	23.35	32.40	100	272	QP	VERTICAL
2	45.52	31.07	40.00	-8.93	46.00	0.60	16.88	32.41	100	185	QP	VERTICAL
3	62.01	35.30	40.00	-4.70	53.47	0.69	13.54	32.40	125	334	Peak	VERTICAL
4	450.01	42.10	46.00	-3.90	49.40	1.84	23.20	32.34	125	163	Peak	VERTICAL
5	720.64	36.52	46.00	-9.48	40.42	2.32	26.12	32.34	100	5	Peak	VERTICAL
6	844.80	37.30	46.00	-8.70	39.48	2.51	27.33	32.02	200	358	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	23°C	Humidity	54%
Test Engineer	John Tang, Stim Song	Test Date	May 02, 2016 ~ May 10, 2016
Configurations	IEEE 802.11a CH 149 / Chain 1 + Chain 2 + Chain 3 + Chain 4		

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	11488.70	56.63	74.00	-17.37	40.93	10.75	39.70	34.75	128	67	Peak	HORIZONTAL
2	11493.20	47.86	54.00	-6.14	32.16	10.75	39.70	34.75	128	67	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	11485.02	57.38	74.00	-16.62	41.68	10.75	39.70	34.75	187	264	Peak	VERTICAL
2	11494.28	45.17	54.00	-8.83	29.47	10.75	39.70	34.75	187	264	Average	VERTICAL

Temperature	23℃	Humidity	54%
Test Engineer	John Tang, Stim Song	Test Date	May 02, 2016 ~ May 10, 2016
Configurations	IEEE 802.11a CH 157 / Chain 1 + Chain 2 + Chain 3 + Chain 4		

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	11568.74	48.60	54.00	-5.40	32.95	10.76	39.65	34.76	169	200	Average	HORIZONTAL
2	11568.74	62.15	74.00	-11.85	46.50	10.76	39.65	34.76	169	200	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	11571.02	56.81	74.00	-17.19	41.16	10.76	39.65	34.76	177	84	Peak	VERTICAL
2	11571.94	44.49	54.00	-9.51	28.84	10.76	39.65	34.76	177	84	Average	VERTICAL

Temperature	23℃	Humidity	54%
Test Engineer	John Tang, Stim Song	Test Date	May 02, 2016 ~ May 10, 2016
Configurations	IEEE 802.11a CH 165 / Chain 1 + Chain 2 + Chain 3 + Chain 4		

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	11647.20	59.59	74.00	-14.41	44.00	10.77	39.59	34.77	213	80	Peak	HORIZONTAL
2	11649.04	46.99	54.00	-7.01	31.40	10.77	39.59	34.77	213	80	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	11645.04	45.31	54.00	-8.69	29.72	10.77	39.59	34.77	156	236	Average	VERTICAL
2	11652.92	56.90	74.00	-17.10	41.34	10.77	39.57	34.78	156	236	Peak	VERTICAL

Temperature	23℃	Humidity	54%
Test Engineer	John Tang, Stim Song	Test Date	May 02, 2016 ~ May 10, 2016
Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Chain 1 + Chain 2 + Chain 3 + Chain 4		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11490.04	57.00	74.00	-17.00	41.30	10.75	39.70	34.75	153	178	Peak	HORIZONTAL
2	11493.20	44.85	54.00	-9.15	29.15	10.75	39.70	34.75	153	178	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	11485.16	56.60	74.00	-17.40	40.90	10.75	39.70	34.75	159	78	Peak	VERTICAL
2	11493.36	43.86	54.00	-10.14	28.16	10.75	39.70	34.75	159	78	Average	VERTICAL

Temperature	23℃	Humidity	54%
Test Engineer	John Tang, Stim Song	Test Date	May 02, 2016 ~ May 10, 2016
Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Chain 1 + Chain 2 + Chain 3 + Chain 4		

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	11568.04	47.43	54.00	-6.57	31.78	10.76	39.65	34.76	170	39	Average	HORIZONTAL
2	11569.96	56.80	74.00	-17.20	41.15	10.76	39.65	34.76	170	39	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	11570.68	46.96	54.00	-7.04	31.31	10.76	39.65	34.76	147	230	Average	VERTICAL
2	11573.26	56.92	74.00	-17.08	41.27	10.76	39.65	34.76	147	230	Peak	VERTICAL

Temperature	23℃	Humidity	54%
Test Engineer	John Tang, Stim Song	Test Date	May 02, 2016 ~ May 10, 2016
Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Chain 1 + Chain 2 + Chain 3 + Chain 4		

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	11648.52	58.67	74.00	-15.33	43.08	10.77	39.59	34.77	183	78	Peak	HORIZONTAL
2	11652.72	46.01	54.00	-7.99	30.45	10.77	39.57	34.78	183	78	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	11646.76	61.91	74.00	-12.09	46.32	10.77	39.59	34.77	142	298	Peak	VERTICAL
2	11651.82	48.82	54.00	-5.18	33.26	10.77	39.57	34.78	142	298	Average	VERTICAL

Temperature	23℃	Humidity	54%
Test Engineer	John Tang, Stim Song	Test Date	May 02, 2016 ~ May 10, 2016
Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Chain 1 + Chain 2 + Chain 3 + Chain 4		

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	11506.54	60.46	74.00	-13.54	44.76	10.75	39.70	34.75	228	200	Peak	HORIZONTAL
2	11507.90	47.47	54.00	-6.53	31.77	10.75	39.70	34.75	228	200	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	11509.10	56.84	74.00	-17.16	41.14	10.75	39.70	34.75	185	34	Peak	VERTICAL
2	11511.16	46.88	54.00	-7.12	31.18	10.75	39.70	34.75	185	34	Average	VERTICAL

Temperature	23℃	Humidity	54%
Test Engineer	John Tang, Stim Song	Test Date	May 02, 2016 ~ May 10, 2016
Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Chain 1 + Chain 2 + Chain 3 + Chain 4		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11591.66	46.24	54.00	-7.76	30.63	10.76	39.62	34.77	145	87	Average	HORIZONTAL
2	11593.18	57.50	74.00	-16.50	41.89	10.76	39.62	34.77	145	87	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	11590.64	44.24	54.00	-9.76	28.63	10.76	39.62	34.77	179	230	Average	VERTICAL
2	11593.08	56.94	74.00	-17.06	41.33	10.76	39.62	34.77	179	230	Peak	VERTICAL

Temperature	23°C	Humidity	54%
Test Engineer	John Tang, Stim Song	Test Date	May 02, 2016 ~ May 10, 2016
Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 1 + Chain 2 + Chain 3 + Chain 4		

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	11552.06	57.64	74.00	-16.36	41.99	10.76	39.65	34.76	248	61	Peak	HORIZONTAL
2	11552.24	44.47	54.00	-9.53	28.82	10.76	39.65	34.76	248	61	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	11546.06	43.49	54.00	-10.51	27.83	10.75	39.67	34.76	164	169	Average	VERTICAL
2	11551.94	55.76	74.00	-18.24	40.11	10.76	39.65	34.76	164	169	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.

<For Beamforming Mode>

Temperature	23℃	Humidity	54%
Test Engineer	John Tang, Stim Song	Test Date	May 02, 2016 ~ May 10, 2016
Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36 / Chain 1 + Chain 2 + Chain 3 + Chain 4		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15525.80	55.60	74.00	-18.40	40.85	11.23	38.16	34.64	84	127	Peak	HORIZONTAL
2	15559.00	42.76	54.00	-11.24	27.97	11.24	38.23	34.68	84	127	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15527.20	42.72	54.00	-11.28	27.97	11.23	38.16	34.64	211	134	Average	VERTICAL
2	15560.50	55.76	74.00	-18.24	40.97	11.24	38.23	34.68	211	134	Peak	VERTICAL

Temperature	23℃	Humidity	54%
Test Engineer	John Tang, Stim Song	Test Date	May 02, 2016 ~ May 10, 2016
Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 40 / Chain 1 + Chain 2 + Chain 3 + Chain 4		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15578.50	58.51	74.00	-15.49	43.72	11.24	38.23	34.68	123	121	Peak	HORIZONTAL
2	15608.10	46.11	54.00	-7.89	31.25	11.25	38.29	34.68	123	121	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15575.00	45.94	54.00	-8.06	31.15	11.24	38.23	34.68	326	133	Average	VERTICAL
2	15615.00	58.76	74.00	-15.24	43.95	11.25	38.29	34.73	326	133	Peak	VERTICAL

Temperature	23℃	Humidity	54%
Test Engineer	John Tang, Stim Song	Test Date	May 02, 2016 ~ May 10, 2016
Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 48 / Chain 1 + Chain 2 + Chain 3 + Chain 4		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15709.60	59.78	74.00	-14.22	44.86	11.27	38.42	34.77	289	136	Peak	HORIZONTAL
2	15713.80	46.48	54.00	-7.52	31.60	11.27	38.42	34.81	289	136	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15716.00	58.99	74.00	-15.01	44.11	11.27	38.42	34.81	18	140	Peak	VERTICAL
2	15721.50	46.94	54.00	-7.06	32.06	11.27	38.42	34.81	18	140	Average	VERTICAL

Temperature	23℃	Humidity	54%
Test Engineer	John Tang, Stim Song	Test Date	May 02, 2016 ~ May 10, 2016
Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Chain 1 + Chain 2 + Chain 3 + Chain 4		

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	11481.48	55.28	74.00	-18.72	39.62	10.74	39.66	34.74	142	143	Peak	HORIZONTAL
2	11491.56	43.69	54.00	-10.31	27.99	10.75	39.70	34.75	142	143	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	11485.52	55.85	74.00	-18.15	40.15	10.75	39.70	34.75	169	287	Peak	VERTICAL
2	11486.12	43.74	54.00	-10.26	28.04	10.75	39.70	34.75	169	287	Average	VERTICAL

Temperature	23℃	Humidity	54%
Test Engineer	John Tang, Stim Song	Test Date	May 02, 2016 ~ May 10, 2016
Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Chain 1 + Chain 2 + Chain 3 + Chain 4		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11569.00	45.36	54.00	-8.64	29.71	10.76	39.65	34.76	155	352	Average	HORIZONTAL
2	11573.30	56.66	74.00	-17.34	41.01	10.76	39.65	34.76	155	352	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	11574.30	45.58	54.00	-8.42	29.93	10.76	39.65	34.76	166	186	Average	VERTICAL
2	11587.30	56.00	74.00	-18.00	40.39	10.76	39.62	34.77	166	186	Peak	VERTICAL

Temperature	23℃	Humidity	54%
Test Engineer	John Tang, Stim Song	Test Date	May 02, 2016 ~ May 10, 2016
Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Chain 1 + Chain 2 + Chain 3 + Chain 4		

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	11643.60	46.29	54.00	-7.71	30.70	10.77	39.59	34.77	175	155	Average	HORIZONTAL
2	11649.50	57.56	74.00	-16.44	41.97	10.77	39.59	34.77	175	155	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	11644.80	58.12	74.00	-15.88	42.53	10.77	39.59	34.77	158	278	Peak	VERTICAL
2	11646.20	46.34	54.00	-7.66	30.75	10.77	39.59	34.77	158	278	Average	VERTICAL

Temperature	23℃	Humidity	54%
Test Engineer	John Tang, Stim Song	Test Date	May 02, 2016 ~ May 10, 2016
Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38 / Chain 1 + Chain 2 + Chain 3 + Chain 4		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15574.90	58.49	74.00	-15.51	43.70	11.24	38.23	34.68	296	154	Peak	HORIZONTAL
2	15575.40	46.14	54.00	-7.86	31.35	11.24	38.23	34.68	296	154	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15567.70	46.18	54.00	-7.82	31.39	11.24	38.23	34.68	25	147	Average	VERTICAL
2	15572.70	58.91	74.00	-15.09	44.12	11.24	38.23	34.68	25	147	Peak	VERTICAL

Temperature	23℃	Humidity	54%
Test Engineer	John Tang, Stim Song	Test Date	May 02, 2016 ~ May 10, 2016
Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 46 / Chain 1 + Chain 2 + Chain 3 + Chain 4		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15574.90	58.49	74.00	-15.51	43.70	11.24	38.23	34.68	296	154	Peak	HORIZONTAL
2	15575.40	46.14	54.00	-7.86	31.35	11.24	38.23	34.68	296	154	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15567.70	46.18	54.00	-7.82	31.39	11.24	38.23	34.68	25	147	Average	VERTICAL
2	15572.70	58.91	74.00	-15.09	44.12	11.24	38.23	34.68	25	147	Peak	VERTICAL

Temperature	23℃	Humidity	54%
Test Engineer	John Tang, Stim Song	Test Date	May 02, 2016 ~ May 10, 2016
Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Chain 1 + Chain 2 + Chain 3 + Chain 4		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11509.60	56.51	74.00	-17.49	40.81	10.75	39.70	34.75	144	146	Peak	HORIZONTAL
2	11509.64	45.68	54.00	-8.32	29.98	10.75	39.70	34.75	144	146	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	11501.16	47.88	54.00	-6.12	32.18	10.75	39.70	34.75	166	298	Average	VERTICAL
2	11509.96	63.92	74.00	-10.08	48.22	10.75	39.70	34.75	166	298	Peak	VERTICAL

Temperature	23℃	Humidity	54%
Test Engineer	John Tang, Stim Song	Test Date	May 02, 2016 ~ May 10, 2016
Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Chain 1 + Chain 2 + Chain 3 + Chain 4		

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	11581.76	46.36	54.00	-7.64	30.71	10.76	39.65	34.76	140	218	Average	HORIZONTAL
2	11593.48	57.58	74.00	-16.42	41.97	10.76	39.62	34.77	140	218	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	11580.76	56.46	74.00	-17.54	40.81	10.76	39.65	34.76	180	89	Peak	VERTICAL
2	11589.48	43.95	54.00	-10.05	28.34	10.76	39.62	34.77	180	89	Average	VERTICAL

Temperature	23℃	Humidity	54%
Test Engineer	John Tang, Stim Song	Test Date	May 02, 2016 ~ May 10, 2016
Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42 / Chain 1 + Chain 2 + Chain 3 + Chain 4		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15620.00	59.21	74.00	-14.79	44.40	11.25	38.29	34.73	87	133	Peak	HORIZONTAL
2	15620.00	47.04	54.00	-6.96	32.23	11.25	38.29	34.73	87	133	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15620.00	58.04	74.00	-15.96	43.23	11.25	38.29	34.73	301	127	Peak	VERTICAL
2	15620.00	46.84	54.00	-7.16	32.03	11.25	38.29	34.73	301	127	Average	VERTICAL

Temperature	23°C	Humidity	54%
Test Engineer	John Tang, Stim Song	Test Date	May 02, 2016 ~ May 10, 2016
Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 1 + Chain 2 + Chain 3 + Chain 4		

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	11541.08	43.84	54.00	-10.16	28.18	10.75	39.67	34.76	112	124	Average	HORIZONTAL
2	11557.76	55.89	74.00	-18.11	40.24	10.76	39.65	34.76	112	124	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	11547.68	57.06	74.00	-16.94	41.40	10.75	39.67	34.76	164	354	Peak	VERTICAL
2	11556.56	44.41	54.00	-9.59	28.76	10.76	39.65	34.76	164	354	Average	VERTICAL

Note:

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

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

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

4.7. Band Edge Emissions Measurement

4.7.1. Limit

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

For transmitters operating in the 5.725-5.85 GHz band: all emissions 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	23°C	Humidity	54%
Test Engineer	John Tang, Stim Song	Test Date	May 02, 2016 ~ May 10, 2016
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	5501.00	67.75	68.20	-0.45	59.70	7.77	35.20	34.92	227	95	Peak	HORIZONTAL
2	5741.00	116.74			108.66	7.77	35.25	34.94	227	95	Average	HORIZONTAL
3	5741.00	125.83			117.75	7.77	35.25	34.94	227	95	Peak	HORIZONTAL

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	5539.00	68.14	68.20	-0.06	60.02	7.83	35.21	34.92	255	272	Peak	HORIZONTAL
2	5791.00	117.68			109.66	7.71	35.26	34.95	255	272	Average	HORIZONTAL
3	5791.00	126.98			118.96	7.71	35.26	34.95	255	272	Peak	HORIZONTAL
4	5932.00	62.20	68.20	-6.00	53.93	7.94	35.29	34.96	255	272	Peak	HORIZONTAL

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	5819.00	119.72			111.67	7.74	35.26	34.95	242	100	Average	HORIZONTAL
2	5819.00	130.28			122.23	7.74	35.26	34.95	242	100	Peak	HORIZONTAL
3	5924.60	68.35	68.49	-0.14	60.08	7.94	35.29	34.96	242	100	Peak	HORIZONTAL
4	5934.20	67.94	68.20	-0.26	59.67	7.94	35.29	34.96	242	100	Peak	HORIZONTAL

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

Temperature	23℃	Humidity	54%
Test Engineer	John Tang, Stim Song	Test Date	May 02, 2016 ~ May 10, 2016
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	5513.00	67.71	68.20	-0.49	59.63	7.80	35.20	34.92	245	271	Peak	HORIZONTAL
2	5744.00	123.65			115.57	7.77	35.25	34.94	245	271	Peak	HORIZONTAL
3	5749.00	113.72			105.64	7.77	35.25	34.94	245	271	Average	HORIZONTAL

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	5550.00	67.80	68.20	-0.40	59.65	7.86	35.21	34.92	244	98	Peak	HORIZONTAL
2	5792.00	115.77			107.75	7.71	35.26	34.95	244	98	Average	HORIZONTAL
3	5792.00	126.44			118.42	7.71	35.26	34.95	244	98	Peak	HORIZONTAL
4	5941.00	63.32	68.20	-4.88	55.05	7.94	35.29	34.96	244	98	Peak	HORIZONTAL

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	5591.00	67.87	68.20	-0.33	59.67	7.91	35.22	34.93	242	275	Peak	HORIZONTAL
2	5819.00	118.98			110.93	7.74	35.26	34.95	242	275	Average	HORIZONTAL
3	5828.60	129.45			121.36	7.77	35.27	34.95	242	275	Peak	HORIZONTAL
4	5935.40	66.43	68.20	-1.77	58.16	7.94	35.29	34.96	242	275	Peak	HORIZONTAL

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

Temperature	23°C	Humidity	54%
Test Engineer	John Tang, Stim Song	Test Date	May 02, 2016 ~ May 10, 2016
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	5646.00	66.23	68.20	-1.97	58.05	7.88	35.23	34.93	249	99	Peak	HORIZONTAL
2	5762.00	124.11			116.06	7.75	35.25	34.95	249	99	Peak	HORIZONTAL
3	5767.00	114.68			106.63	7.75	35.25	34.95	249	99	Average	HORIZONTAL

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	5649.00	65.56	68.20	-2.64	57.38	7.88	35.23	34.93	243	273	Peak	HORIZONTAL
2	5794.00	124.70			116.68	7.71	35.26	34.95	243	273	Peak	HORIZONTAL
3	5809.00	115.04			106.99	7.74	35.26	34.95	243	273	Average	HORIZONTAL
4	5934.00	67.75	68.20	-0.45	59.48	7.94	35.29	34.96	243	273	Peak	HORIZONTAL

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

Temperature	23°C	Humidity	54%
Test Engineer	John Tang, Stim Song	Test Date	May 02, 2016 ~ May 10, 2016
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	5650.00	65.39	68.20	-2.81	57.21	7.88	35.23	34.93	249	307	Peak	HORIZONTAL
2	5794.00	118.91			110.89	7.71	35.26	34.95	249	307	Peak	HORIZONTAL
3	5804.00	107.92			99.90	7.71	35.26	34.95	249	307	Average	HORIZONTAL
4	5923.00	69.20	69.67	-0.47	60.97	7.91	35.28	34.96	249	307	Peak	HORIZONTAL

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

Note:

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

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

<For Beamforming Mode>

Temperature	23℃	Humidity	54%
Test Engineer	John Tang, Stim Song	Test Date	May 02, 2016 ~ May 10, 2016
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	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5148.80	53.66	54.00	-0.34	46.92	7.90	33.31	34.47	97	129	Average	HORIZONTAL
2	5150.00	65.09	74.00	-8.91	58.35	7.90	33.31	34.47	97	129	Peak	HORIZONTAL
3	5188.00	123.48			116.59	7.98	33.38	34.47	97	129	Peak	HORIZONTAL
4	5188.40	115.05			108.16	7.98	33.38	34.47	97	129	Average	HORIZONTAL

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

Channel 40

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5144.00	53.89	54.00	-0.11	47.15	7.90	33.31	34.47	286	102	Average	HORIZONTAL
2	5148.40	64.64	74.00	-9.36	57.90	7.90	33.31	34.47	286	102	Peak	HORIZONTAL
3	5191.60	117.43			110.54	7.98	33.38	34.47	286	102	Average	HORIZONTAL
4	5192.00	126.32			119.43	7.98	33.38	34.47	286	102	Peak	HORIZONTAL

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

Channel 48

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5150.00	63.90	74.00	-10.10	57.16	7.90	33.31	34.47	77	133	Peak	HORIZONTAL
2	5150.00	53.94	54.00	-0.06	47.20	7.90	33.31	34.47	77	133	Average	HORIZONTAL
3	5233.00	117.69			110.77	7.95	33.44	34.47	77	133	Average	HORIZONTAL
4	5235.00	126.86			119.94	7.95	33.44	34.47	77	133	Peak	HORIZONTAL
5	5355.00	51.05	54.00	-2.95	44.03	7.88	33.61	34.47	77	133	Average	HORIZONTAL
6	5361.00	62.40	74.00	-11.60	55.38	7.88	33.61	34.47	77	133	Peak	HORIZONTAL

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

Temperature	23℃	Humidity	54%
Test Engineer	John Tang, Stim Song	Test Date	May 02, 2016 ~ May 10, 2016
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	5513.00	68.00	68.20	-0.20	59.92	7.80	35.20	34.92	199	307	Peak	HORIZONTAL
2	5736.00	112.98			104.88	7.79	35.25	34.94	199	307	Average	HORIZONTAL
3	5737.00	122.05			113.95	7.79	35.25	34.94	199	307	Peak	HORIZONTAL

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	5535.40	68.17	68.20	-0.03	60.05	7.83	35.21	34.92	226	304	Peak	HORIZONTAL
2	5793.40	114.99			106.97	7.71	35.26	34.95	226	304	Average	HORIZONTAL
3	5793.40	124.50			116.48	7.71	35.26	34.95	226	304	Peak	HORIZONTAL
4	5937.40	62.36	68.20	-5.84	54.09	7.94	35.29	34.96	226	304	Peak	HORIZONTAL

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	5589.80	68.07	68.20	-0.13	59.87	7.91	35.22	34.93	221	305	Peak	HORIZONTAL
2	5832.20	130.77			122.68	7.77	35.27	34.95	221	305	Peak	HORIZONTAL
3	5833.40	121.38			113.29	7.77	35.27	34.95	221	305	Average	HORIZONTAL
4	5928.20	65.78	68.20	-2.42	57.51	7.94	35.29	34.96	221	305	Peak	HORIZONTAL

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

Temperature	23°C	Humidity	54%
Test Engineer	John Tang, Stim Song	Test Date	May 02, 2016 ~ May 10, 2016
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	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5149.00	65.13	74.00	-8.87	58.39	7.90	33.31	34.47	84	101	Peak	HORIZONTAL
2	5150.00	53.78	54.00	-0.22	47.04	7.90	33.31	34.47	84	101	Average	HORIZONTAL
3	5196.00	108.12			101.23	7.98	33.38	34.47	84	101	Average	HORIZONTAL
4	5197.00	118.17			111.28	7.98	33.38	34.47	84	101	Peak	HORIZONTAL

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

Channel 46

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5145.00	66.85	74.00	-7.15	60.11	7.90	33.31	34.47	98	142	Peak	HORIZONTAL
2	5148.00	53.69	54.00	-0.31	46.95	7.90	33.31	34.47	98	142	Average	HORIZONTAL
3	5223.00	112.54			105.63	7.96	33.42	34.47	98	142	Average	HORIZONTAL
4	5226.00	122.48			115.57	7.96	33.42	34.47	98	142	Peak	HORIZONTAL

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

Temperature	23°C	Humidity	54%
Test Engineer	John Tang, Stim Song	Test Date	May 02, 2016 ~ May 10, 2016
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	5583.40	65.73	68.20	-2.47	57.53	7.91	35.22	34.93	238	307	Peak	HORIZONTAL
2	5758.60	125.21			117.16	7.75	35.25	34.95	238	307	Peak	HORIZONTAL
3	5759.00	115.21			107.16	7.75	35.25	34.95	238	307	Average	HORIZONTAL

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	5627.00	63.09	68.20	-5.11	54.89	7.90	35.23	34.93	220	306	Peak	HORIZONTAL
2	5792.00	125.64			117.62	7.71	35.26	34.95	220	306	Peak	HORIZONTAL
3	5793.00	115.79			107.77	7.71	35.26	34.95	220	306	Average	HORIZONTAL
4	5942.00	64.98	68.20	-3.22	56.69	7.97	35.29	34.97	220	306	Peak	HORIZONTAL

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

Temperature	23°C	Humidity	54%
Test Engineer	John Tang, Stim Song	Test Date	May 02, 2016 ~ May 10, 2016
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	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5145.00	65.76	74.00	-8.24	59.02	7.90	33.31	34.47	86	114	Peak	HORIZONTAL
2	5150.00	53.96	54.00	-0.04	47.22	7.90	33.31	34.47	86	114	Average	HORIZONTAL
3	5222.00	106.40			99.49	7.96	33.42	34.47	86	114	Average	HORIZONTAL
4	5223.00	115.86			108.95	7.96	33.42	34.47	86	114	Peak	HORIZONTAL
5	5351.00	48.23	54.00	-5.77	41.22	7.89	33.59	34.47	86	114	Average	HORIZONTAL
6	5383.00	60.60	74.00	-13.40	53.57	7.87	33.63	34.47	86	114	Peak	HORIZONTAL

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

Channel 155

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5630.00	66.31	68.20	-1.89	58.11	7.90	35.23	34.93	246	306	Peak	HORIZONTAL
2	5752.00	122.98			114.90	7.77	35.25	34.94	246	306	Peak	HORIZONTAL
3	5784.00	110.64			102.60	7.73	35.26	34.95	246	306	Average	HORIZONTAL
4	5932.00	68.19	68.20	-0.01	59.92	7.94	35.29	34.96	246	306	Peak	HORIZONTAL

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

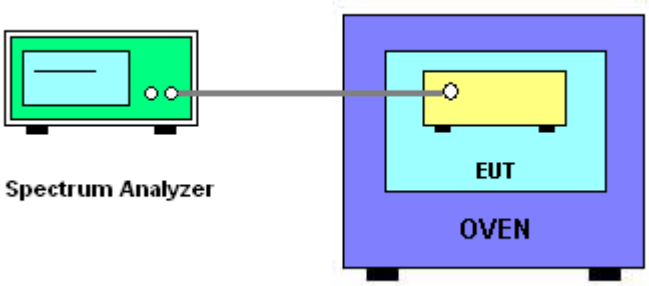
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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	26°C	Humidity	74%
Test Engineer	Paul Chen	Test Date	May 20, 2016

Mode: 20 MHz / Chain 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5200 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5199.9699	5199.9689	5199.9680	5199.9675
110.00	5199.9692	5199.9687	5199.9681	5199.9678
93.50	5199.9683	5199.9678	5199.9677	5199.9672
Max. Deviation (MHz)	0.0317	0.0322	0.0323	0.0328
Max. Deviation (ppm)	6.10	6.20	6.22	6.31
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5200 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5199.9707	5199.9697	5199.9692	5199.9687
10	5199.9694	5199.9688	5199.9684	5199.9681
20	5199.9692	5199.9688	5199.9683	5199.9676
30	5199.9675	5199.9665	5199.9660	5199.9654
40	5199.9668	5199.9658	5199.9655	5199.9654
Max. Deviation (MHz)	0.0352	0.0353	0.0358	0.0364
Max. Deviation (ppm)	6.77	6.79	6.88	7.00
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5784.9693	5784.9687	5784.9683	5784.9673
110.00	5784.9692	5784.9688	5784.9687	5784.9682
93.50	5784.9686	5784.9678	5784.9671	5784.9662
Max. Deviation (MHz)	0.0314	0.0322	0.0329	0.0338
Max. Deviation (ppm)	5.43	5.57	5.69	5.85
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5784.9701	5784.9691	5784.9689	5784.9682
10	5784.9697	5784.9691	5784.9681	5784.9677
20	5784.9692	5784.9691	5784.9684	5784.9680
30	5784.9675	5784.9665	5784.9659	5784.9650
40	5784.9668	5784.9667	5784.9663	5784.9653
Max. Deviation (MHz)	0.0335	0.0341	0.0342	0.0350
Max. Deviation (ppm)	5.79	5.89	5.91	6.05
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	5189.9694	5189.9693	5189.9689	5189.9679
110.00	5189.9692	5189.9689	5189.9680	5189.9677
93.50	5189.9690	5189.9689	5189.9686	5189.9679
Max. Deviation (MHz)	0.0310	0.0311	0.0320	0.0323
Max. Deviation (ppm)	5.98	6.00	6.17	6.23
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5190 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5189.9713	5189.9705	5189.9702	5189.9699
10	5189.9707	5189.9699	5189.9695	5189.9690
20	5189.9692	5189.9687	5189.9678	5189.9675
30	5189.9675	5189.9665	5189.9663	5189.9655
40	5189.9663	5189.9658	5189.9657	5189.9655
Max. Deviation (MHz)	0.0347	0.0348	0.0358	0.0360
Max. Deviation (ppm)	6.69	6.71	6.90	6.94
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5754.9700	5754.9691	5754.9682	5754.9676
110.00	5754.9692	5754.9686	5754.9683	5754.9681
93.50	5754.9686	5754.9684	5754.9674	5754.9668
Max. Deviation (MHz)	0.0314	0.0316	0.0326	0.0332
Max. Deviation (ppm)	5.46	5.49	5.67	5.77
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5754.9714	5754.9706	5754.9701	5754.9696
10	5754.9703	5754.9702	5754.9692	5754.9689
20	5754.9692	5754.9684	5754.9675	5754.9666
30	5754.9675	5754.9672	5754.9666	5754.9661
40	5754.9655	5754.9654	5754.9644	5754.9638
Max. Deviation (MHz)	0.0365	0.0366	0.0367	0.0374
Max. Deviation (ppm)	6.34	6.36	6.38	6.50
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	5209.9695	5209.9690	5209.9686	5209.9684
110.00	5209.9692	5209.9686	5209.9682	5209.9679
93.50	5209.9686	5209.9683	5209.9675	5209.9674
Max. Deviation (MHz)	0.0314	0.0317	0.0325	0.0326
Max. Deviation (ppm)	6.03	6.09	6.24	6.26
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5210 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5209.9703	5209.9701	5209.9697	5209.9694
10	5209.9701	5209.9691	5209.9685	5209.9675
20	5209.9692	5209.9682	5209.9676	5209.9666
30	5209.9675	5209.9673	5209.9665	5209.9664
40	5209.9666	5209.9660	5209.9650	5209.9648
Max. Deviation (MHz)	0.0350	0.0358	0.0365	0.0368
Max. Deviation (ppm)	6.72	6.87	7.01	7.06
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5774.9698	5774.9691	5774.9682	5774.9680
110.00	5774.9692	5774.9688	5774.9681	5774.9680
93.50	5774.9691	5774.9688	5774.9682	5774.9675
Max. Deviation (MHz)	0.0309	0.0312	0.0319	0.0325
Max. Deviation (ppm)	5.35	5.41	5.53	5.63
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5774.9714	5774.9705	5774.9698	5774.9695
10	5774.9696	5774.9694	5774.9690	5774.9681
20	5774.9692	5774.9685	5774.9679	5774.9670
30	5774.9675	5774.9667	5774.9664	5774.9656
40	5774.9658	5774.9653	5774.9648	5774.9640
Max. Deviation (MHz)	0.0351	0.0358	0.0359	0.0366
Max. Deviation (ppm)	6.08	6.20	6.22	6.34
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. 08, 2015	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Dec. 23, 2015	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	150kHz ~ 30MHz	May 25, 2015	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	Conduction (CO01-CB)
BILOG ANTENNA	TESEQ	CBL6112D	37880	20MHz ~ 2GHz	Sep. 03, 2015	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	Oct. 22, 2015	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 21, 2015	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Mar. 15, 2016	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 18, 2016	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26GHz ~ 40GHz	Nov. 13, 2015	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Oct. 27, 2015	Radiation (03CH01-CB)
EMI Test Receiver	Rohde&Schwarz	ESCI	100186	9kHz ~ 3GHz	Jul. 14, 2015	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz ~ 1 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-17	N/A	1 GHz ~ 18 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-1	N/A	18GHz ~ 40 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-2	N/A	18GHz ~ 40 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
Test Software	Audix	E3	6.2009-I0-7	N/A	N/A	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 09, 2015	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 03, 2016	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-7	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-8	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-9	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 02, 2015	Conducted (TH01-CB)

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

"*" 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%