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FCC RADIO TEST REPORT

Applicant's company	**Acer Incorporated**
Applicant Address	8F, 88, Sec 1, Hsin Tai Wu Rd, Hsichih, Taipei Hsien, 221 Taiwan
FCC ID	**HLZPDW1**
Manufacturer's company	**Wistron NeWeb Corporation**
Manufacturer Address	20 Park Ave. II, Hsinchu Science park, Hsinchu 308, Taiwan

Product Name	Acer ProDock
Brand Name	acer
Model No.	PDW1
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5150 ~ 5250 MHz / 5725 ~ 5850 MHz
Received Date	Sep. 24, 2015
Final Test Date	Dec. 05, 2015
Submission Type	Original Equipment

Statement

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

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

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

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.10-2013**, **47 CFR FCC Part 15 Subpart E, KDB789033 D02 v01r01, KDB662911 D01 v02r01, KDB644545 D03 v01.**

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

TAF
Testing Laboratory
1190

Table of Contents

History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR592324AB	Rev. 01	Initial issue of report	Feb. 05, 2016

1. VERIFICATION OF COMPLIANCE

Product Name	:	Acer ProDock
Brand Name	:	acer
Model No.	:	PDW1
Applicant	:	Acer Incorporated
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 Sep. 24, 2015 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

Sam Chen
SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart E				
Part	**Rule Section**	**Description of Test**	**Result**	**Under Limit**
4.1	15.207	AC Power Line Conducted Emissions	Complies	10.44 dB
4.2	15.407(a)	26dB Spectrum Bandwidth and 99% Occupied Bandwidth	Complies	-
4.3	15.407(e)	6dB Spectrum Bandwidth	Complies	-
4.4	15.407(a)	Maximum Conducted Output Power	Complies	5.87 dB
4.5	15.407(a)	Power Spectral Density	Complies	3.50 dB
4.6	15.407(b)	Radiated Emissions	Complies	2.56 dB
4.7	15.407(b)	Band Edge Emissions	Complies	0.08 dB
4.8	15.407(g)	Frequency Stability	Complies	-
4.9	15.203	Antenna Requirements	Complies	-

3. GENERAL INFORMATION

3.1. Product Details

Items	Description
Product Type	WLAN (3TX, 3RX)
Radio Type	Intentional Transceiver
Power Type	From adapter
Modulation	IEEE 802.11a: OFDM IEEE 802.11n/ac: see the below table
Data Modulation	IEEE 802.11a/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) IEEE 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)
Data Rate (Mbps)	IEEE 802.11a: OFDM (6/9/12/18/24/36/48/54) IEEE 802.11n/ac: see the below table
Frequency Range	5150 ~ 5250 MHz / 5725 ~ 5850 MHz
Channel Number	9 for 20MHz bandwidth ; 4 for 40MHz bandwidth 2 for 80MHz bandwidth
Channel Band Width (99%)	Band 1: IEEE 802.11a: 19.71 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 18.76 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 36.90 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.83 MHz Band 4: IEEE 802.11a: 17.80 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 18.32 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.63 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 74.38 MHz
Maximum Conducted Output Power	Band 1: IEEE 802.11a: 23.29 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 21.95 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 21.29 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 18.04 dBm Band 4: IEEE 802.11a: 24.13 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 22.62 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 22.85 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 19.79 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Note: This device contains 60GHz WiGig transmitter module FCC ID: PPD-QCA9008-SBD1.

Items	Description	
Communication Mode	☒ IP Based (Load Based)	☐ Frame Based
Beamforming Function	☐ With beamforming	☒ Without beamforming
Operate Condition	☒ Indoor	☐ Outdoor

Antenna and Band width

Antenna	Three (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)	3	MCS 0-23
802.11n (HT40)	3	MCS 0-23
802.11ac (VHT20)	3	MCS 0-9/Nss1-3
802.11ac (VHT40)	3	MCS 0-9/Nss1-3
802.11ac (VHT80)	3	MCS 0-9/Nss1-3

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

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

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

3.2. Accessories

Power	Brand	Model	Rating	Remark
Adapter	acer	PA-1450-26	Input: 100-240Vac, 50-60Hz, 1.2A Output: 19Vdc, 2.37A	With cable (Non-shielded, 1.4m)
Others				
Power cable: Non-shielded, 1.8m				

3.3. Table for Filed Antenna

Ant.	Brand	Model No.	Part Number	Antenna Type	Connector	Gain (dBi)	
						2.4GHz	5GHz
1	WNC	XKAB-RF1	48XKAB06.SGA	PCB Antenna	I-PEX	2.43	3.99
2	WNC	XKAB-RF1	48XKAB05.SGA	PCB Antenna	I-PEX	2.53	4.86
3	WNC	XKAB-RF1	48XKAB04.SGA	PCB Antenna	I-PEX	2.73	4.91

Note: The EUT has three antennas.

For 2.4GHz function:

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

Only Chain 2 can be used as transmitting/receiving.

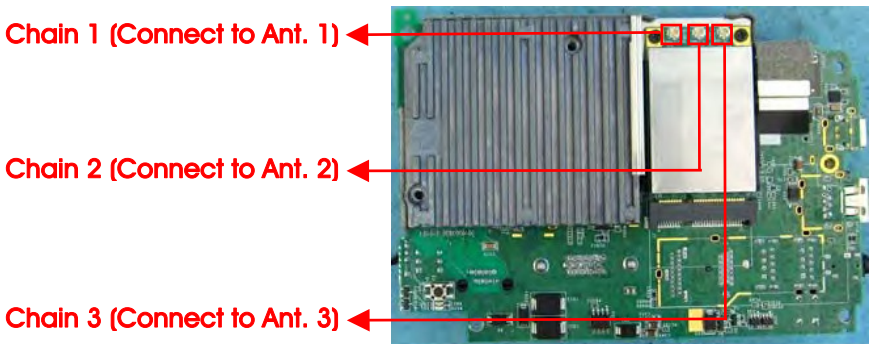
For IEEE 802.11g/n mode (3TX/3RX):

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

For 5GHz function:

For IEEE 802.11a/n/ac mode (3TX/3RX):

Chain 1, Chain 2 and Chain 3 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	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	1+2+3
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2+3
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2+3
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2+3
Power Spectral Density	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	1+2+3
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2+3
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2+3
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2+3
26dB Spectrum Bandwidth & 99% Occupied Bandwidth Measurement	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	1+2+3
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2+3
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2+3
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2+3
6dB Spectrum Bandwidth Measurement	11a/BPSK	Band 4	6Mbps	149/157/165	1+2+3
	11ac VHT20	Band 4	MCS0/Nss1	149/157/165	1+2+3
	11ac VHT40	Band 4	MCS0/Nss1	151/159	1+2+3
	11ac VHT80	Band 4	MCS0/Nss1	155	1+2+3
Radiated Emission Below 1GHz	Normal Link		-	-	-
Radiated Emission Above 1GHz	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	1+2+3
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2+3
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2+3
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2+3

Band Edge Emission	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	1+2+3
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2+3
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2+3
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2+3
Frequency Stability	20 MHz	Band 1&4	-	40/157	2
	40 MHz	Band 1&4	-	38/151	2
	80 MHz	Band 1&4	-	42/155	2

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

2. All the specification of test configurations and test mode was base on customer's request.

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

The following test modes were performed for all tests:

AC Power Line Conducted Emissions	
Test Mode	Description
1	HDMI mode with 2.4GHz WLAN function + 60GHz WiGig function
2	HDMI mode with 5GHz WLAN function + 60GHz WiGig function
Mode 2 has been evaluated to be the worst case among Mode 1~2, thus measurement for Mode 3 will follow this same test mode.	
3	VGA mode with 5GHz WLAN function + 60GHz WiGig function
Mode 2 generated the worst test result, so it was recorded in this report.	

Radiated Emissions below 1GHz	
Test Mode	Description
1	HDMI mode with 2.4GHz WLAN function + 60GHz WiGig function
2	HDMI mode with 5GHz WLAN function + 60GHz WiGig function
Mode 1 has been evaluated to be the worst case among Mode 1~2, thus measurement for Mode 3 will follow this same test mode.	
3	VGA mode with 2.4GHz WLAN function + 60GHz WiGig function
Mode 1 generated the worst test result, so it was recorded in this report.	

Co-location MPE and Radiated Emission Co-location	
The EUT could be applied with 2.4GHz WLAN function, 5GHz WLAN function and 60GHz WiGig function; therefore Co-location Maximum Permissible Exposure (Please refer to FA592324) and Radiated Emission Co-location (please refer to Appendix B) tests are added for simultaneously transmit between 2.4GHz WLAN function, 5GHz WLAN function and 60GHz WiGig function.	
Test Mode	Description
1	2.4GHz WLAN function + 60GHz WiGig function
2	5GHz WLAN function + 60GHz WiGig function

3.6. Table for Testing Locations

Test Site Location					
Address:	No.8, Lane 724, Bo-ai St., Jhubei City, Hsinchu County 302, Taiwan, R.O.C.				
TEL:	886-3-656-9065				
FAX:	886-3-656-9085				
Test Site No.	**Site Category**	**Location**	**FCC Reg. No.**	**IC File No.**	**VCCI Reg. No**
03CH01-CB	SAC	Hsin Chu	262045	IC 4086D	-
CO01-CB	Conduction	Hsin Chu	262045	IC 4086D	-
TH01-CB	OVEN Room	Hsin Chu	-	-	-

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

3.7. Table for Supporting Units

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

Support Unit	Brand	Model	FCC ID
Notebook*3	DELL	E4300	DoC
Wireless Keyboard	Logitech	K240	DoC
Wireless Mouse	Logitech	M212	DoC
Flash disk3.0*2	Transcend	JF700	DoC
Flash disk3.0	Silicon Power	B06	DoC
LCD TV	SONY	KLV-32U300A	DoC
LCD Monitor	DELL	E1913C	DoC
AD card	USI	W0096-AC+AD	DoC
BT dongle	Logitech	C-U0011	DoC

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

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E4300	DoC

For Test Site No: CO01-CB

Support Unit	Brand	Model	FCC ID
LCD TV	HERAN	HD-24DC1	N/A
LCD Monitor	DELL	E1913C	DoC
Notebook*3	DELL	E6430	DoC
AD card	USI	W0096-AC+AD	DoC
Flash disk3.0*4	Transcend	JetFlash-700	DoC

3.8. Table for Parameters of Test Software Setting

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

Test Software Version	ART2-GUI v2.3					
Mode	Test Frequency (MHz)					
	NCB: 20MHz					
	5180 MHz	5200 MHz	5240 MHz	5745 MHz	5785 MHz	5825 MHz
802.11a	17.5	17	15.5	20	21	20.5
802.11ac MCS0/Nss1 VHT20	15.5	15.5	14.5	18	18.5	18.5
Mode	NCB: 40MHz					
802.11ac MCS0/Nss1 VHT40	5190 MHz		5230 MHz		5755 MHz	5795 MHz
	15		16		15.5	17
Mode	NCB: 80MHz					
802.11ac MCS0/Nss1 VHT80	5210 MHz				5775 MHz	
	14				14.5	

3.9. EUT Operation during Test

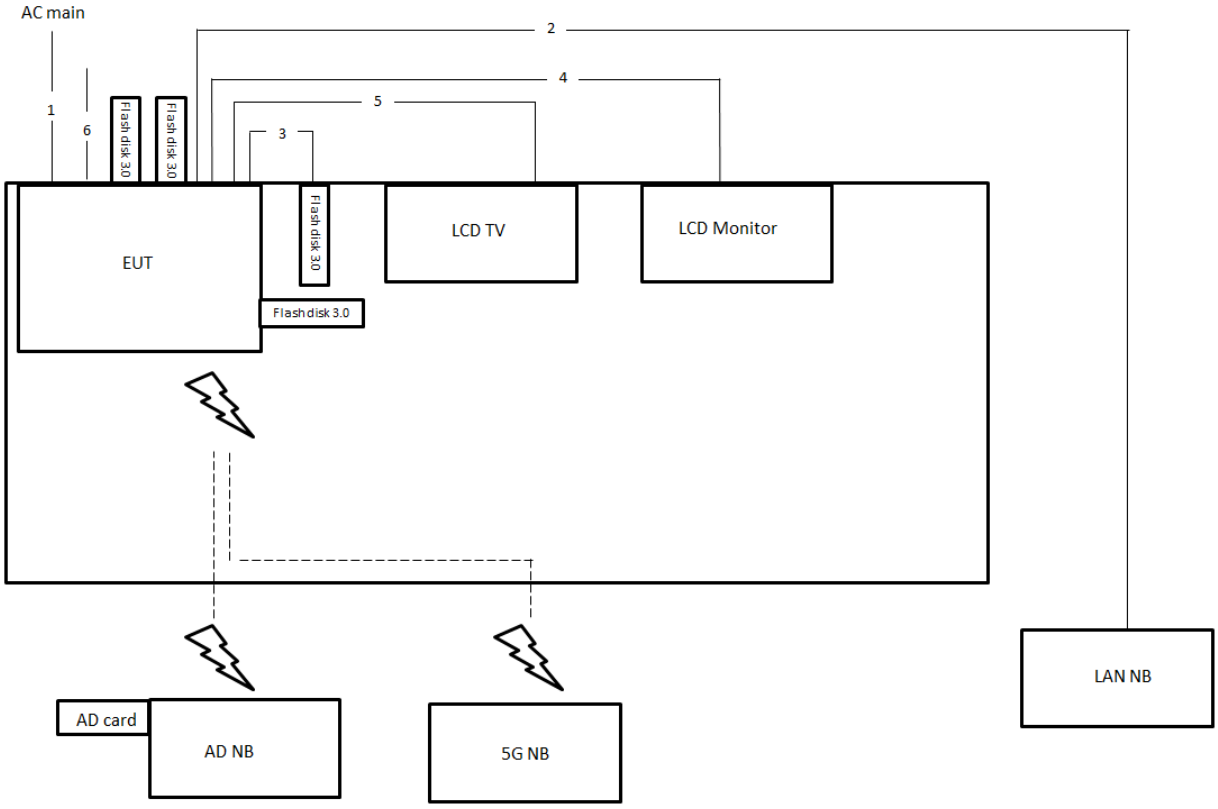
The EUT was programmed to be in continuously transmitting mode.

3.10. Duty Cycle

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11a	2.040	2.100	97.14	0.13	0.49
802.11ac MCS0/Nss1 VHT20	1.910	1.970	96.95	0.13	0.52
802.11ac MCS0/Nss1 VHT40	0.936	1.002	93.41	0.30	1.07
802.11ac MCS0/Nss1 VHT80	0.456	0.519	87.86	0.56	2.19

3.11. Test Configurations

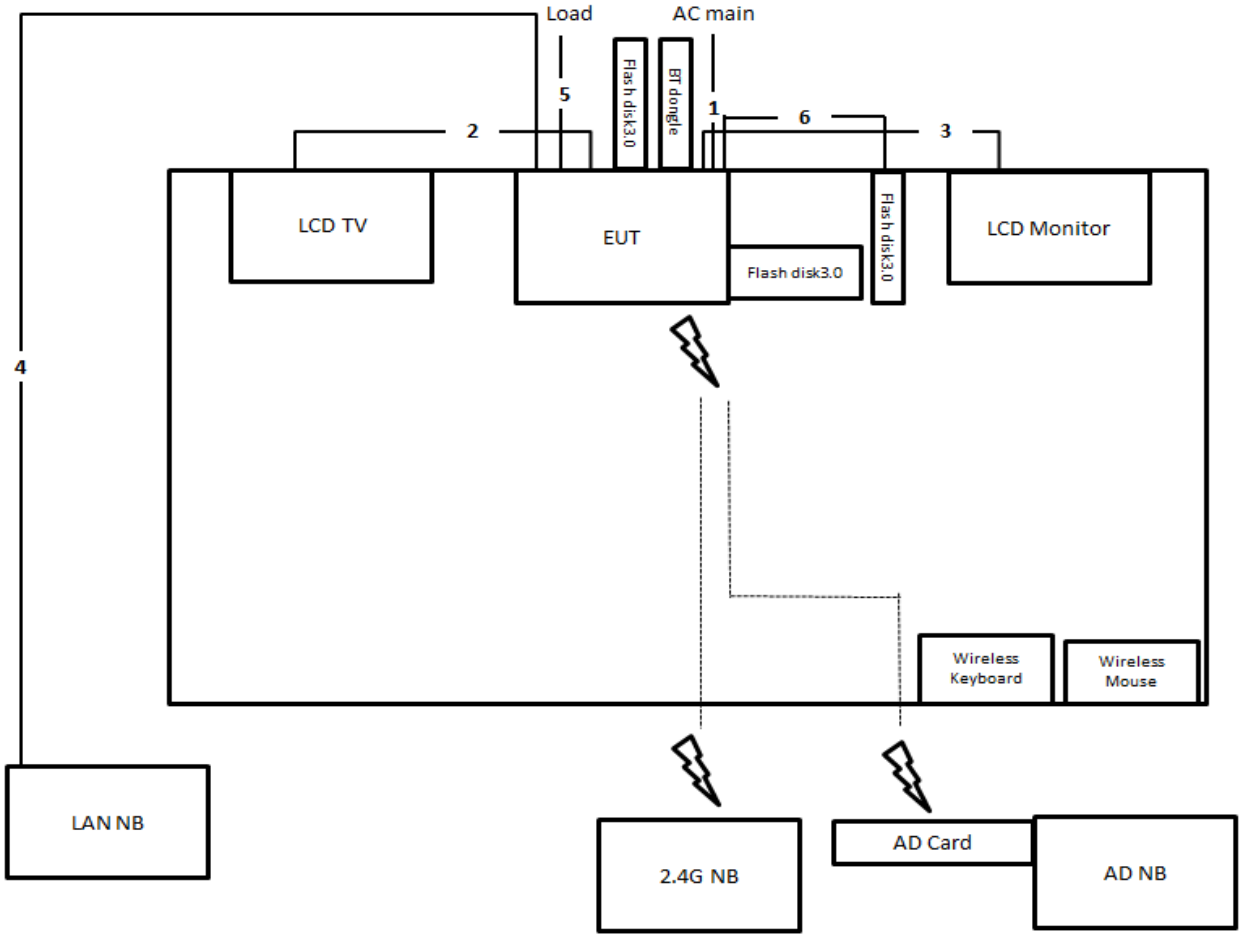
3.11.1. AC Power Line Conduction Emissions Test Configuration



Item	Connection	Shielded	Length
1	Power cable	No	3.2m
2	RJ-45 cable	No	10m
3	USB cable	Yes	0.2m
4	Display cable	Yes	3m
5	HDMI cable	Yes	3m
6	VGA cable	Yes	3m

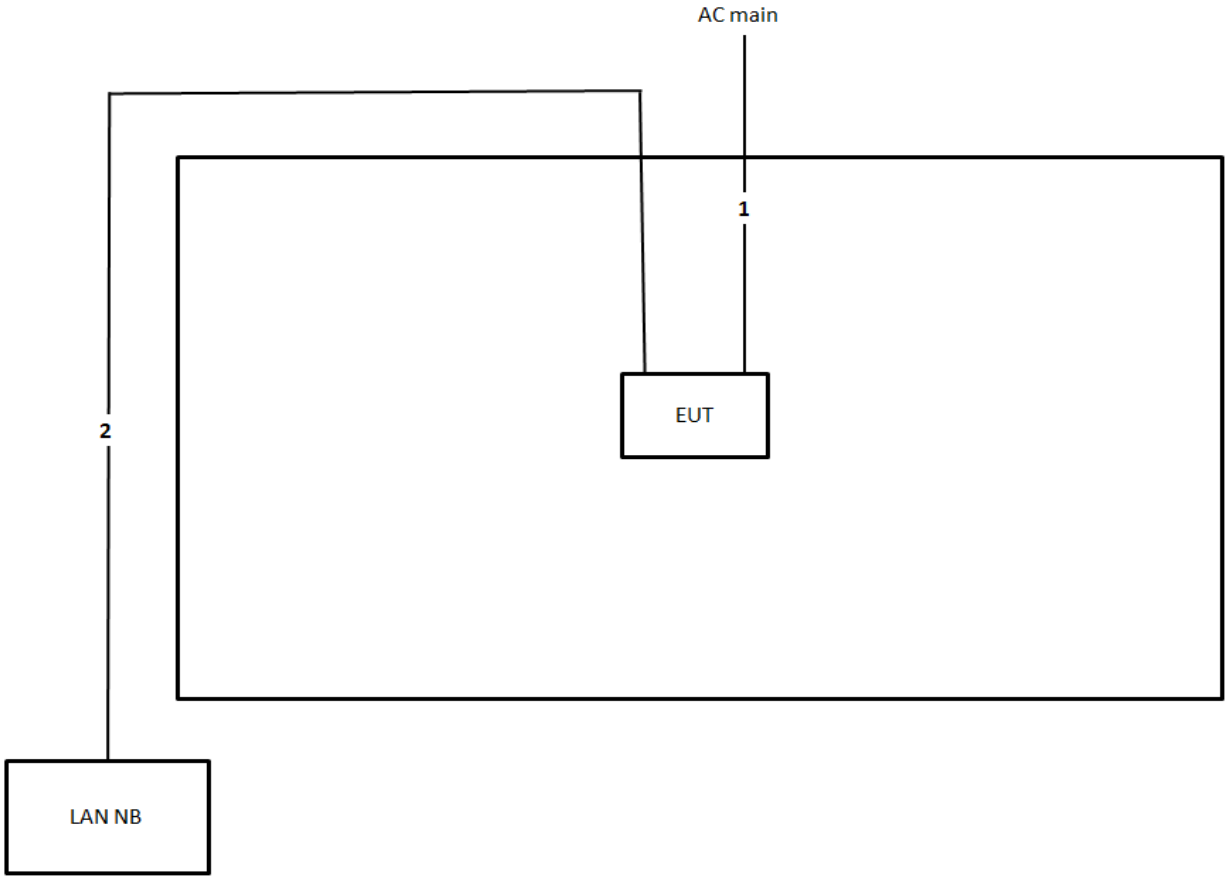
3.11.2. Radiation Emissions Test Configuration

Test Configuration: 30MHz~1GHz



Item	Connection	Shielded	Length
1	Power cable	No	3.2m
2	HDMI cable	Yes	3m
3	Display cable	Yes	3m
4	RJ-45 cable	No	10m
5	VGA cable	Yes	3m
6	USB cable	Yes	0.2m

Test Configuration: above 1GHz



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

4. TEST RESULT

4.1. AC Power Line Conducted Emissions Measurement

4.1.1. Limit

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

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

4.1.2. Measuring Instruments and Setting

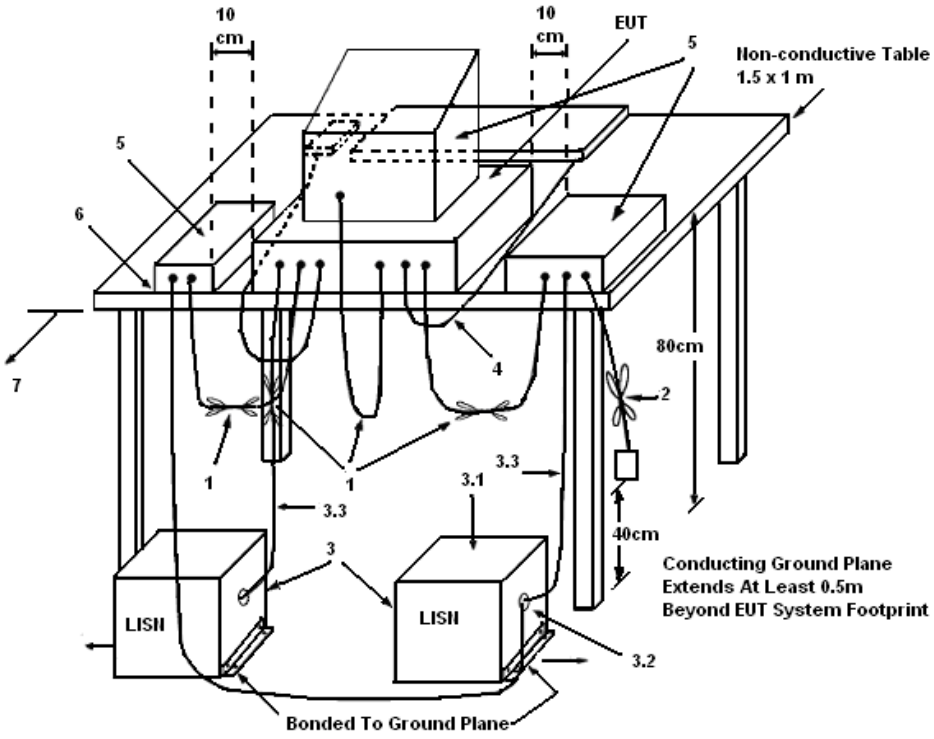
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

4.1.3. Test Procedures

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

4.1.4. Test Setup Layout



LEGEND:

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

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

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

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

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

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

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

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

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

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

4.1.5. Test Deviation

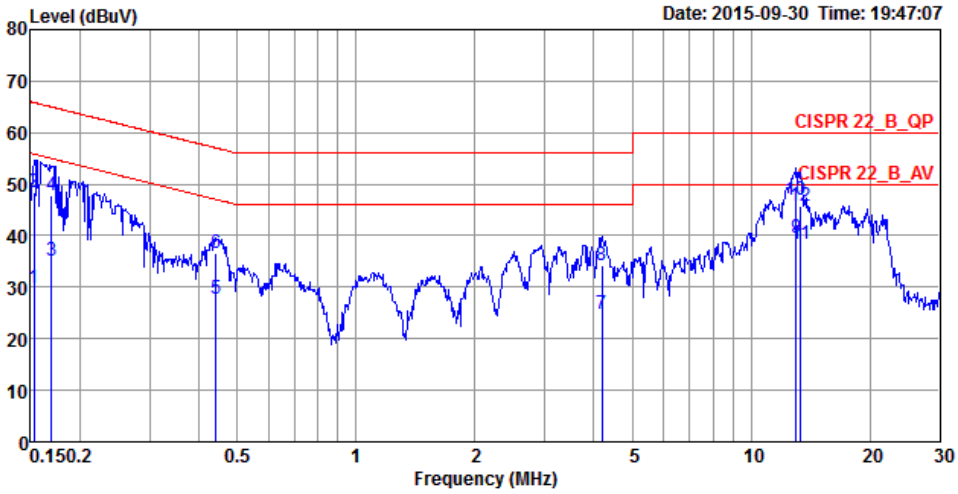
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

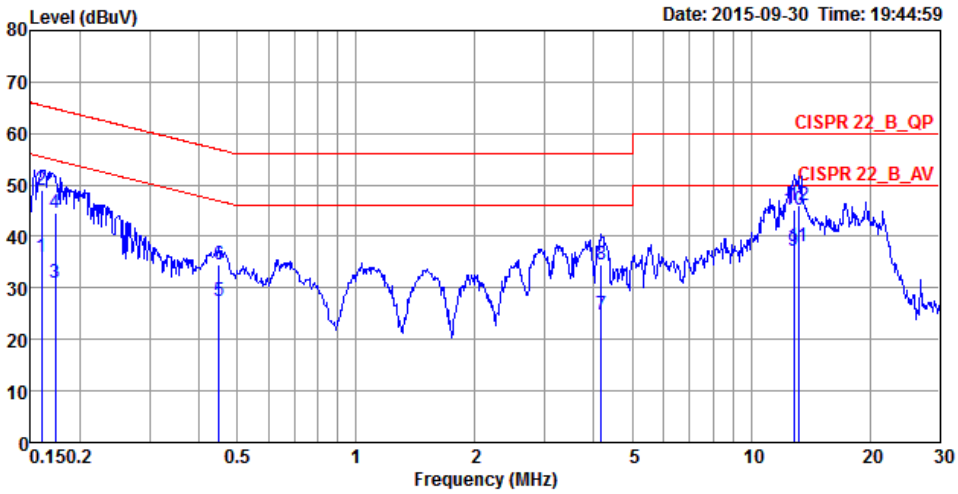
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	24°C	Humidity	60%
Test Engineer	Edison Lin	Phase	Line
Configuration	Normal Link	Test Mode	Mode 2



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1532	29.87	-25.95	55.82	19.92	9.93	0.02	LINE	Average
2	0.1532	48.45	-17.37	65.82	38.50	9.93	0.02	LINE	QP
3	0.1694	35.10	-19.89	54.99	25.15	9.93	0.02	LINE	Average
4	0.1694	47.81	-17.18	64.99	37.86	9.93	0.02	LINE	QP
5	0.4421	27.65	-19.37	47.02	17.68	9.93	0.04	LINE	Average
6	0.4421	36.61	-20.41	57.02	26.64	9.93	0.04	LINE	QP
7	4.2018	24.93	-21.07	46.00	14.82	10.03	0.08	LINE	Average
8	4.2018	34.36	-21.64	56.00	24.25	10.03	0.08	LINE	QP
9	12.9885	39.56	-10.44	50.00	29.03	10.28	0.25	LINE	Average
10	12.9885	47.07	-12.93	60.00	36.54	10.28	0.25	LINE	QP
11	13.3372	38.24	-11.76	50.00	27.70	10.29	0.25	LINE	Average
12	13.3372	45.65	-14.35	60.00	35.11	10.29	0.25	LINE	QP

Temperature	24°C	Humidity	60%
Test Engineer	Edison Lin	Phase	Neutral
Configuration	Normal Link	Test Mode	Mode 2



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1598	35.94	-19.53	55.47	26.14	9.78	0.02	NEUTRAL	Average
2	0.1598	48.91	-16.56	65.47	39.11	9.78	0.02	NEUTRAL	QP
3	0.1731	31.08	-23.73	54.81	21.28	9.78	0.02	NEUTRAL	Average
4	0.1731	44.54	-20.27	64.81	34.74	9.78	0.02	NEUTRAL	QP
5	0.4492	27.58	-19.31	46.89	17.75	9.79	0.04	NEUTRAL	Average
6	0.4492	34.56	-22.33	56.89	24.73	9.79	0.04	NEUTRAL	QP
7	4.1796	24.77	-21.23	46.00	14.81	9.88	0.08	NEUTRAL	Average
8	4.1796	34.42	-21.58	56.00	24.46	9.88	0.08	NEUTRAL	QP
9	12.8516	37.23	-12.77	50.00	26.91	10.07	0.25	NEUTRAL	Average
10	12.8516	45.22	-14.78	60.00	34.90	10.07	0.25	NEUTRAL	QP
11	13.1966	38.07	-11.93	50.00	27.74	10.08	0.25	NEUTRAL	Average
12	13.1966	46.02	-13.98	60.00	35.69	10.08	0.25	NEUTRAL	QP

Note:

Level = Read Level + LISN Factor + Cable Loss.

4.2. 26dB Bandwidth and 99% Occupied Bandwidth Measurement

4.2.1. Limit

No restriction limits.

4.2.2. Measuring Instruments and Setting

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

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

4.2.3. Test Procedures

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

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

4.2.4. Test Setup Layout

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

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

4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

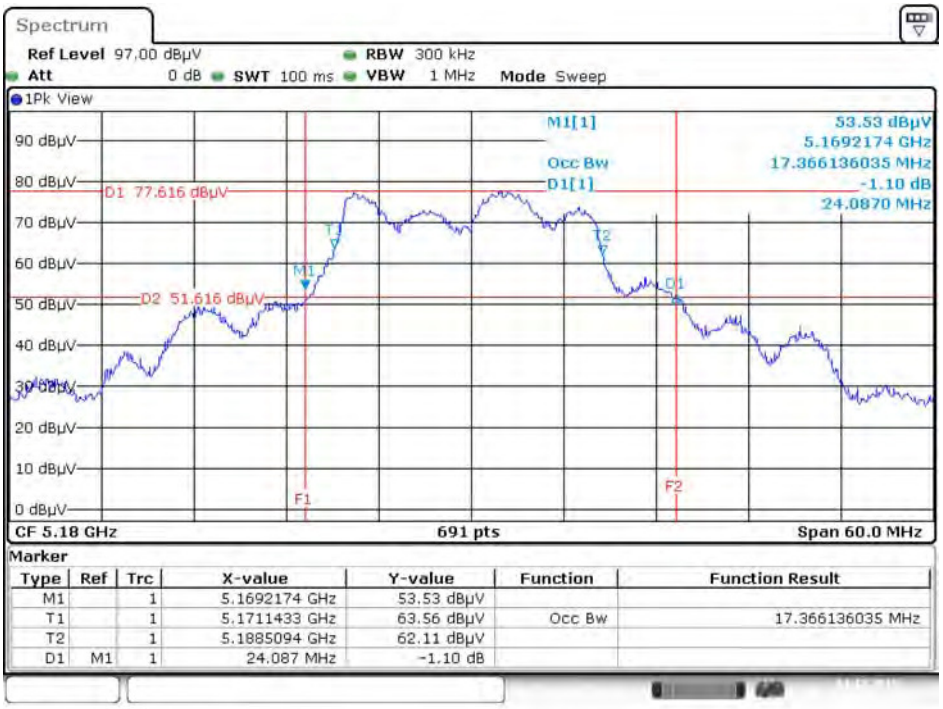
The EUT was programmed to be in continuously transmitting mode.

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

Temperature	25°C	Humidity	55%
Test Engineer	Roki Liu		

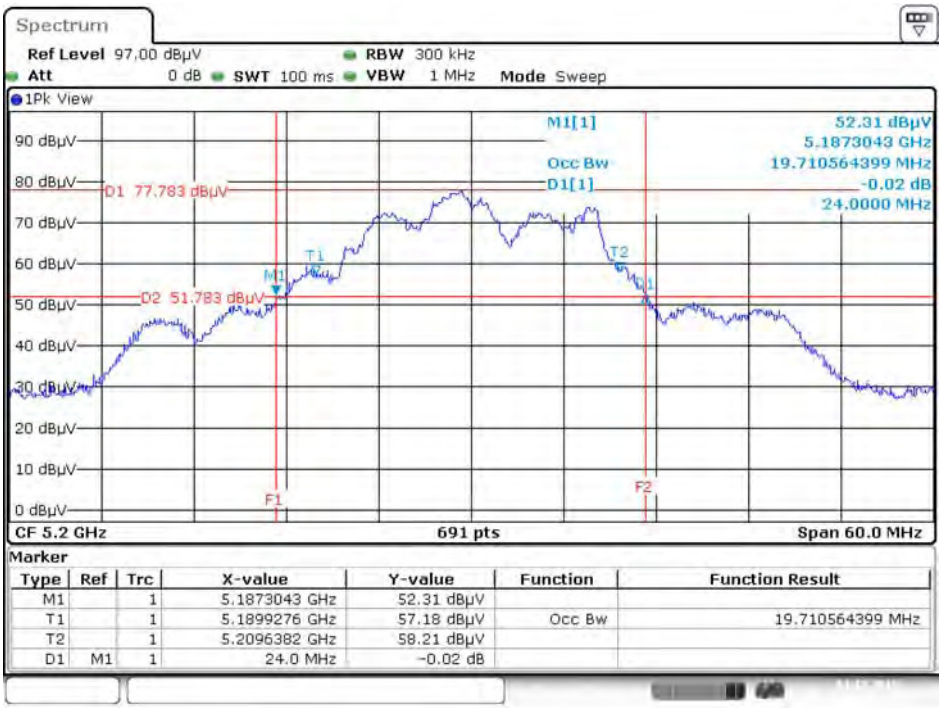
Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5180 MHz	24.09	17.37
	5200 MHz	24.00	19.71
	5240 MHz	23.91	17.19
	5745 MHz	23.30	17.80
	5785 MHz	24.26	16.58
	5825 MHz	23.57	17.02
802.11ac MCS0/Nss1 VHT20	5180 MHz	24.70	17.80
	5200 MHz	28.26	17.89
	5240 MHz	25.22	18.76
	5745 MHz	24.00	18.23
	5785 MHz	20.96	17.63
	5825 MHz	23.65	18.32
802.11ac MCS0/Nss1 VHT40	5190 MHz	42.17	35.02
	5230 MHz	47.39	36.90
	5755 MHz	42.03	36.32
	5795 MHz	46.67	37.63
802.11ac MCS0/Nss1 VHT80	5210 MHz	85.80	75.83
	5775 MHz	82.61	74.38

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



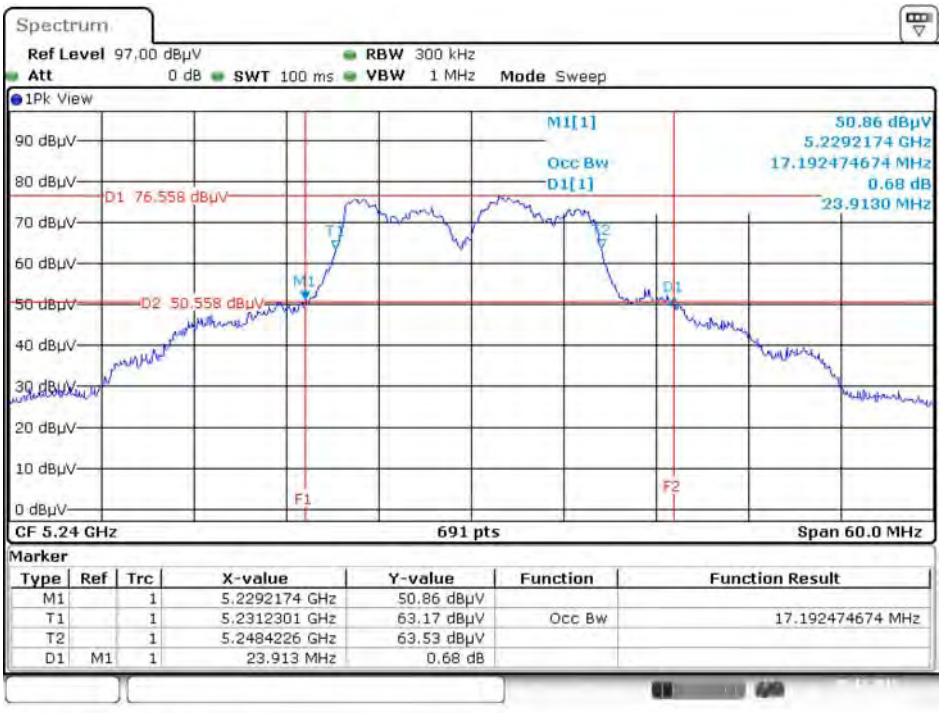
Date: 4.DEC.2015 23:58:25

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



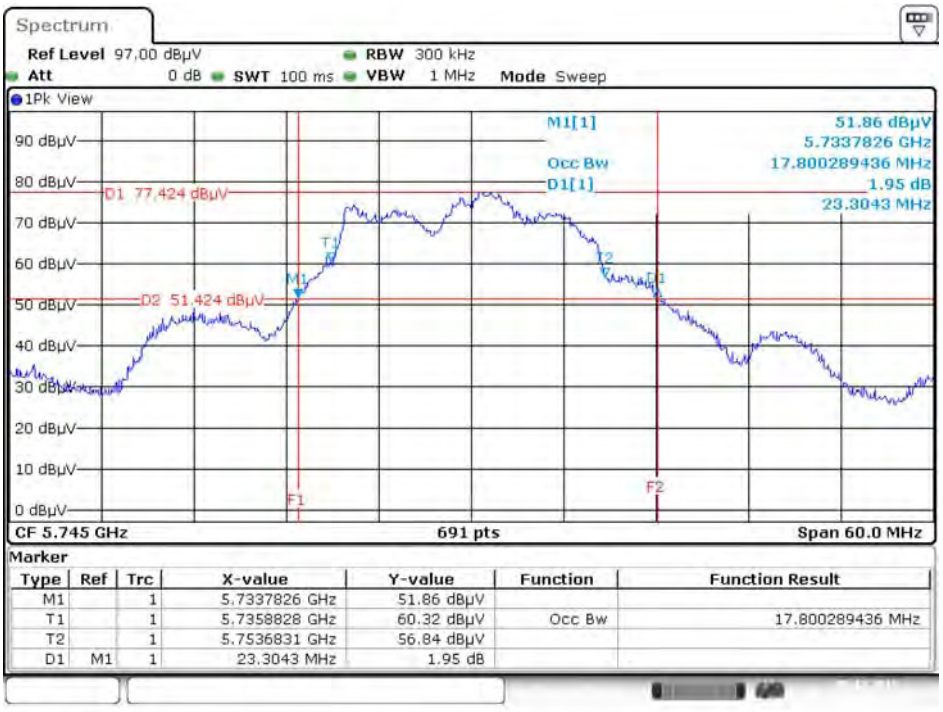
Date: 4.DEC.2015 23:59:44

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



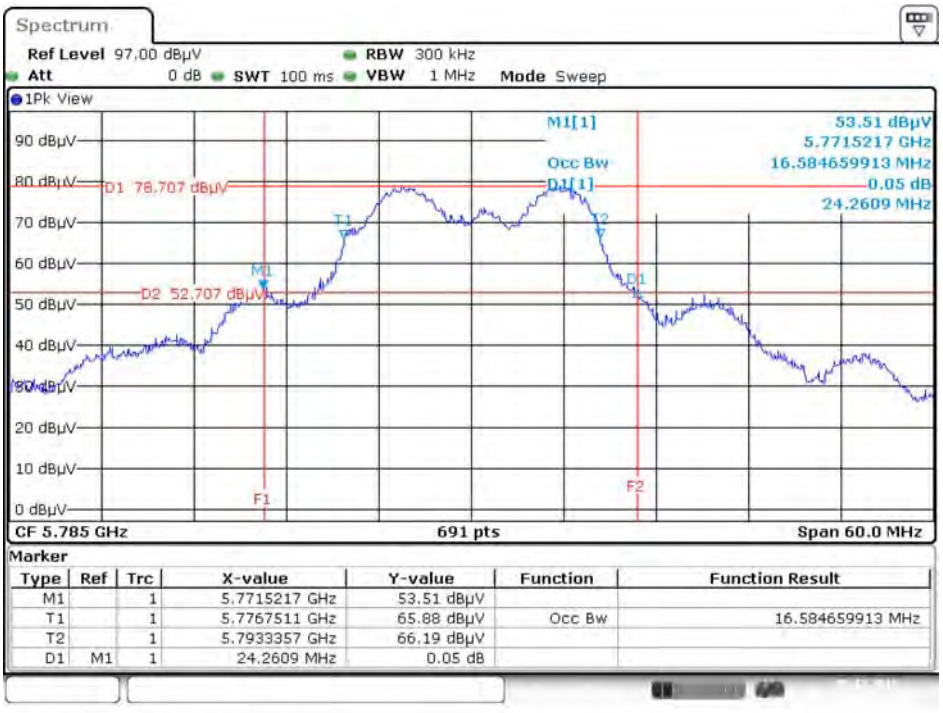
Date: 5.DEC.2015 00:00:29

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



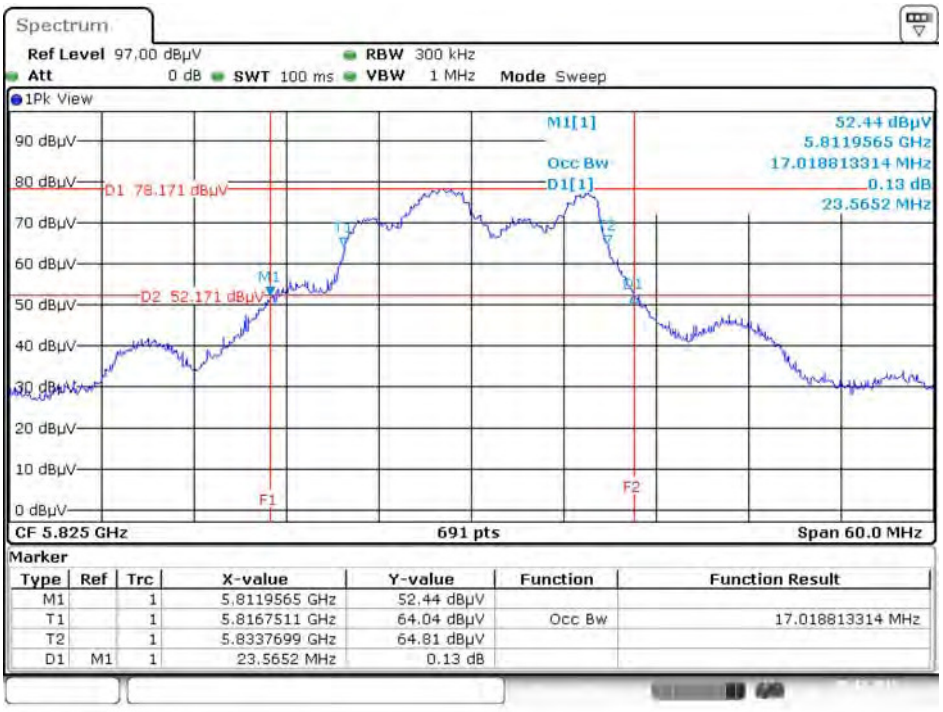
Date: 5.DEC.2015 00:01:26

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



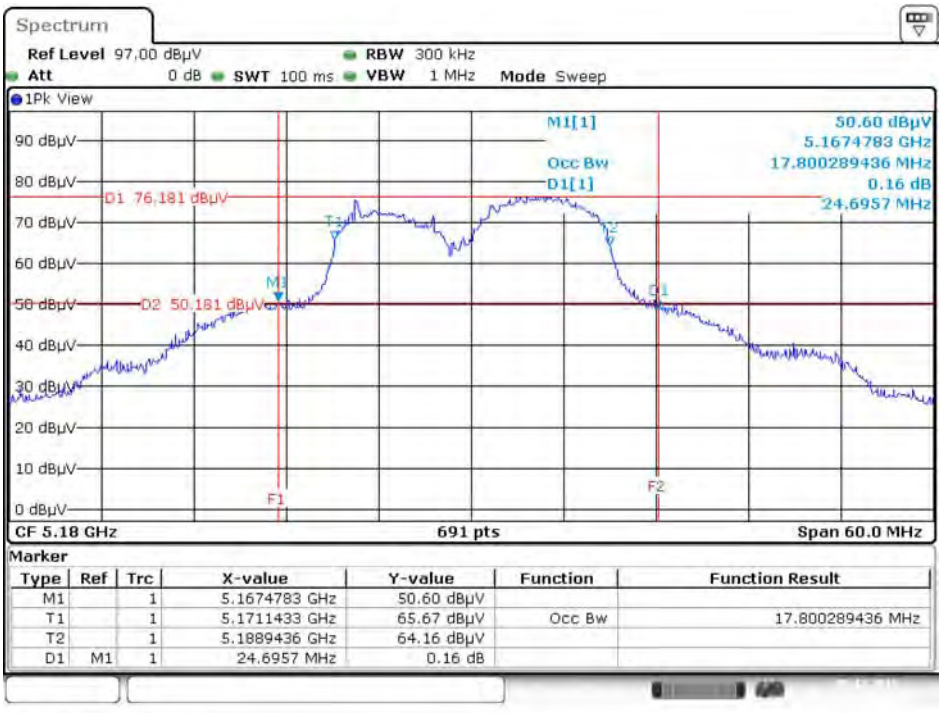
Date: 5.DEC.2015 00:02:18

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



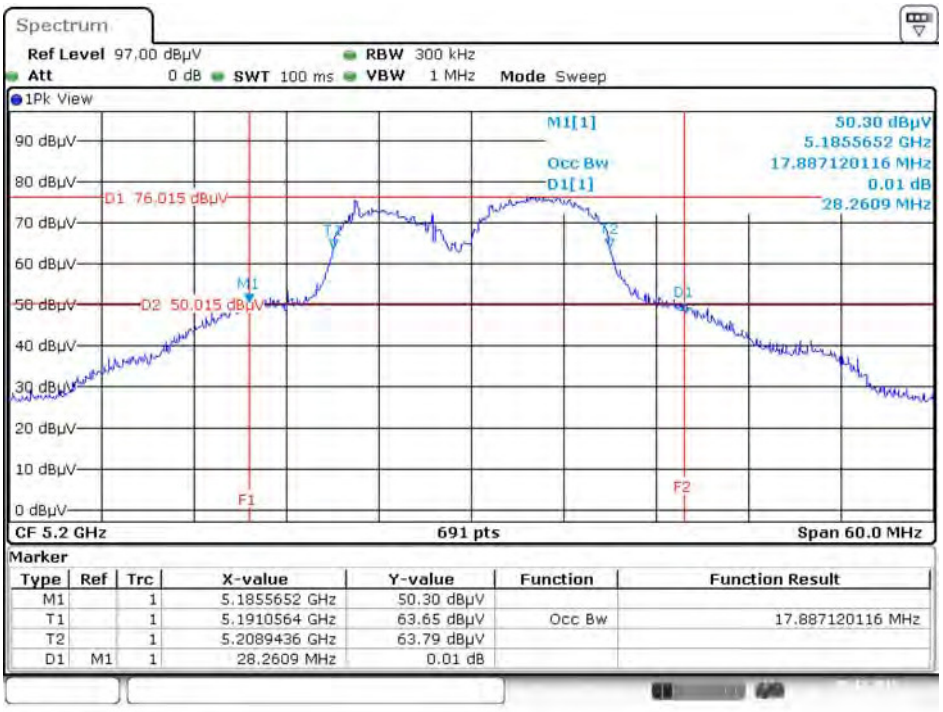
Date: 5.DEC.2015 00:03:09

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



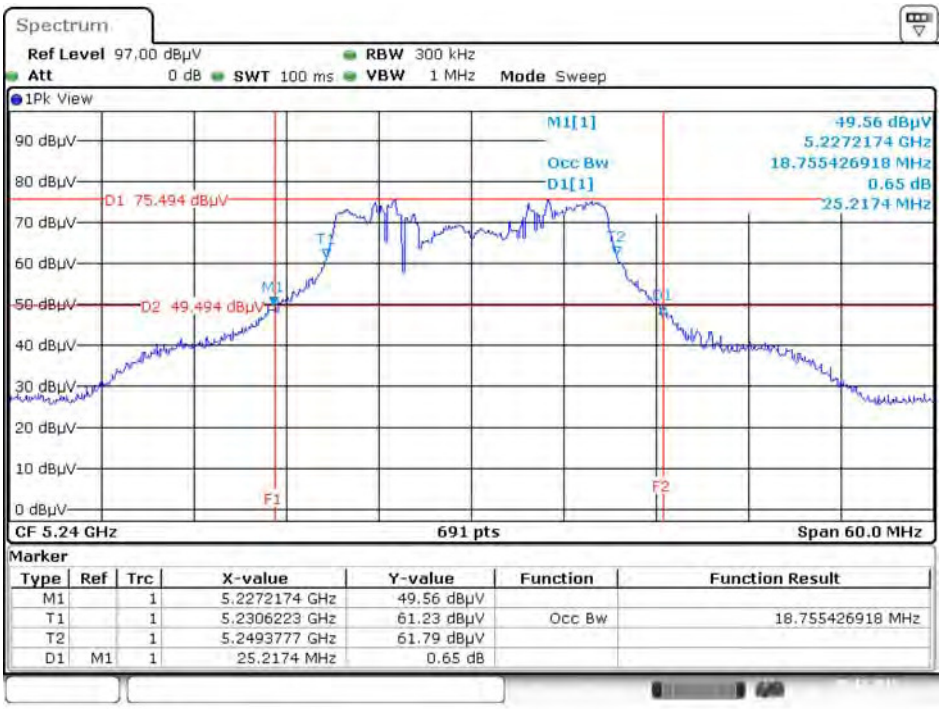
Date: 5.DEC.2015 00:04:05

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



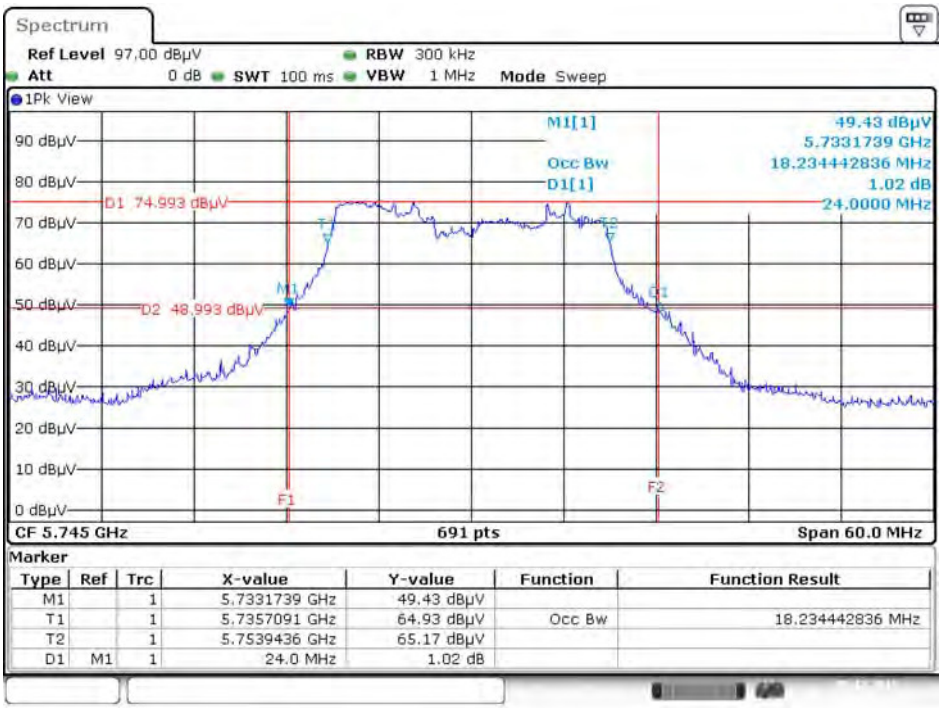
Date: 5.DEC.2015 00:04:54

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



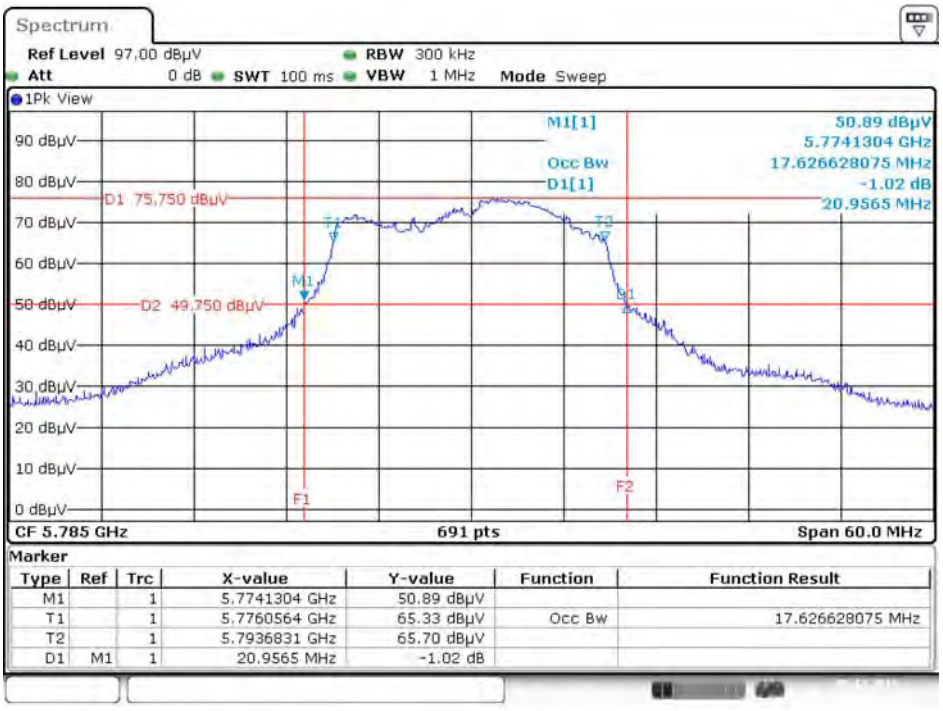
Date: 5.DEC.2015 00:05:45

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



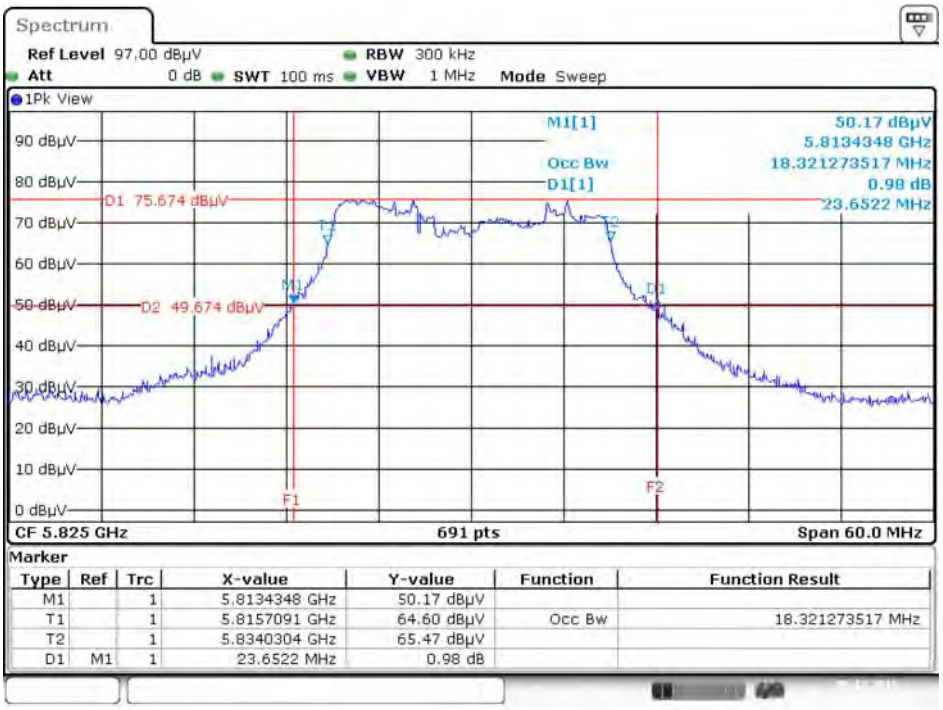
Date: 5.DEC.2015 00:43:34

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



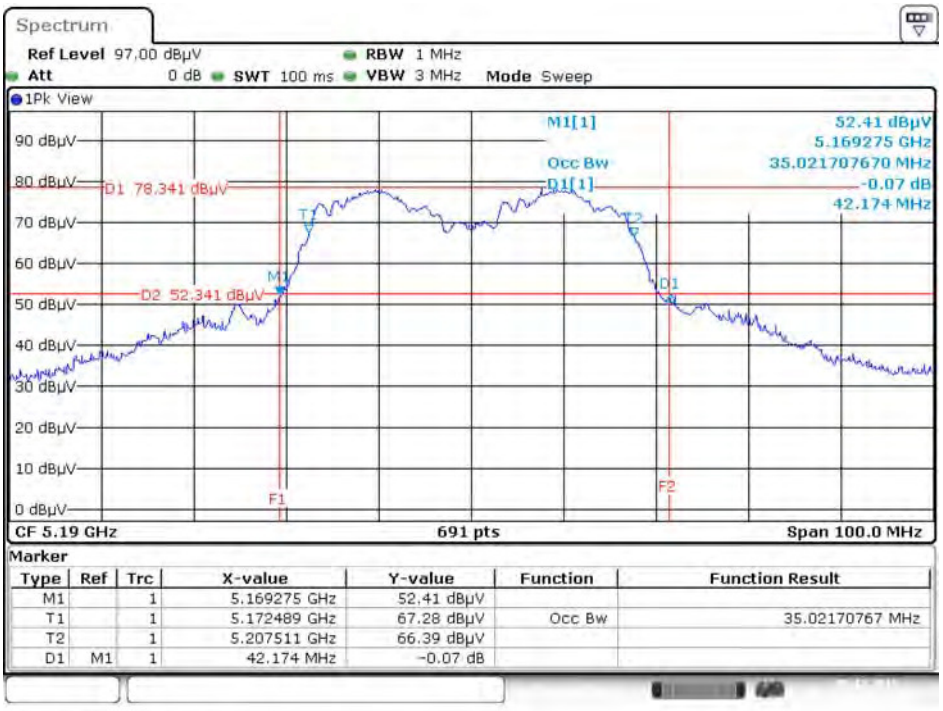
Date: 5.DEC.2015 00:44:27

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



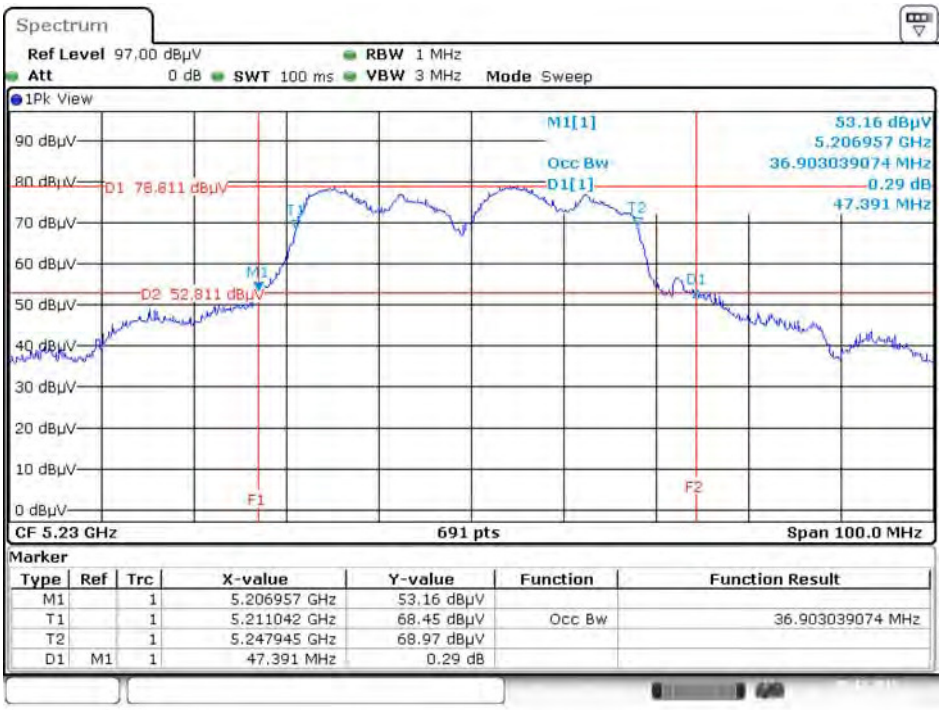
Date: 5.DEC.2015 00:45:23

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



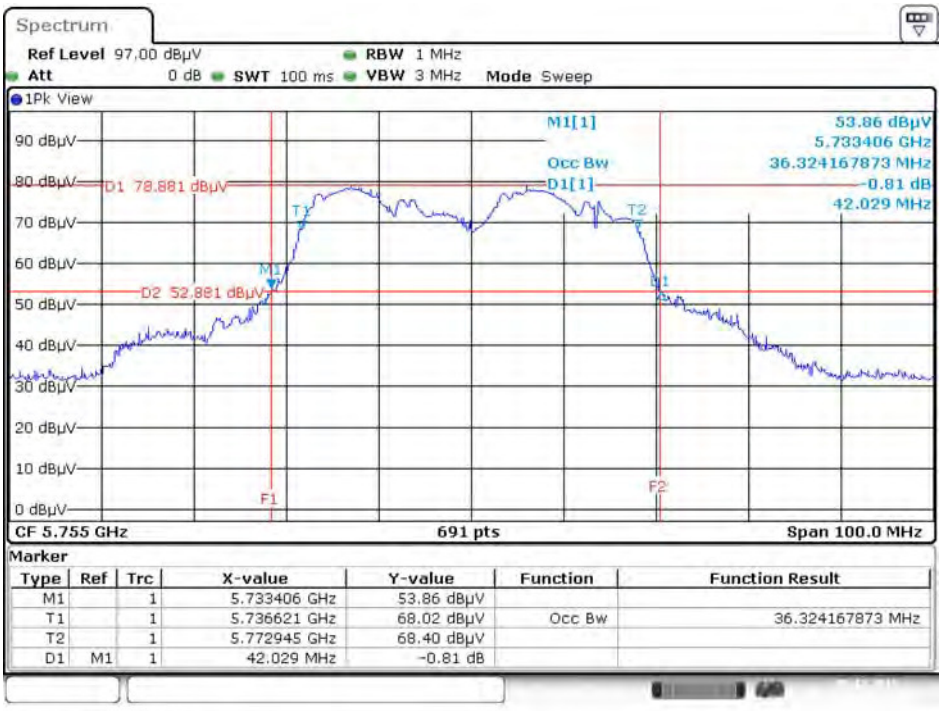
Date: 5.DEC.2015 00:46:29

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



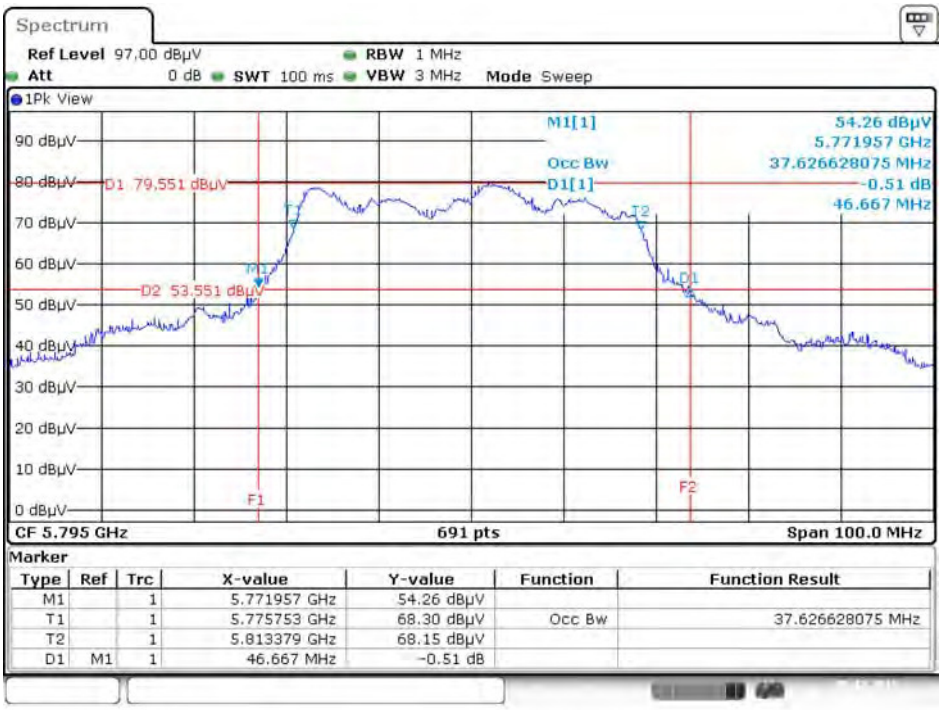
Date: 5.DEC.2015 00:47:23

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



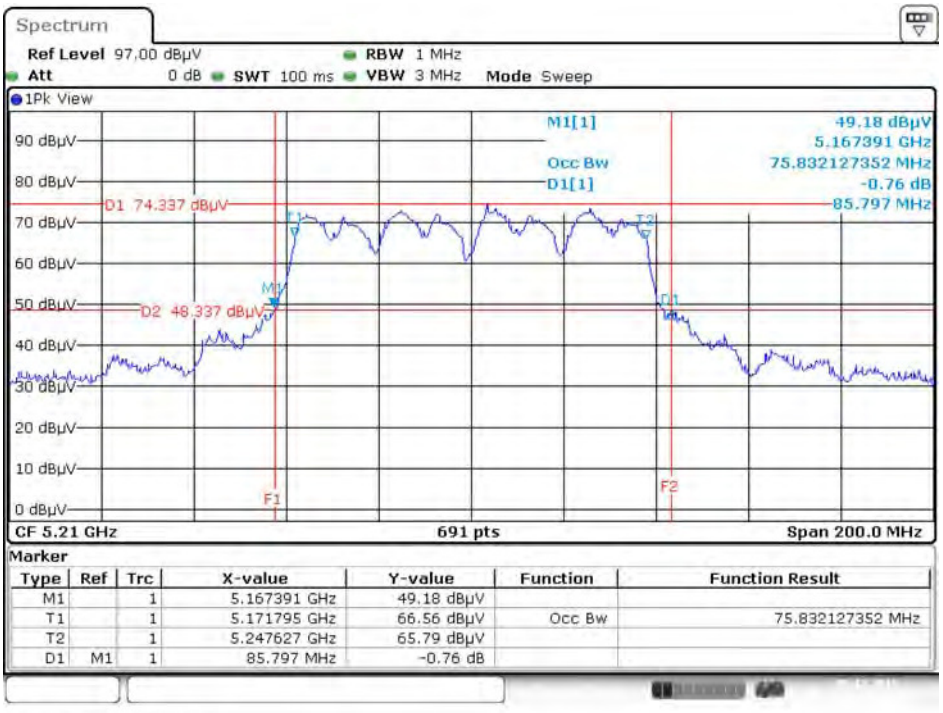
Date: 5.DEC.2015 00:48:30

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



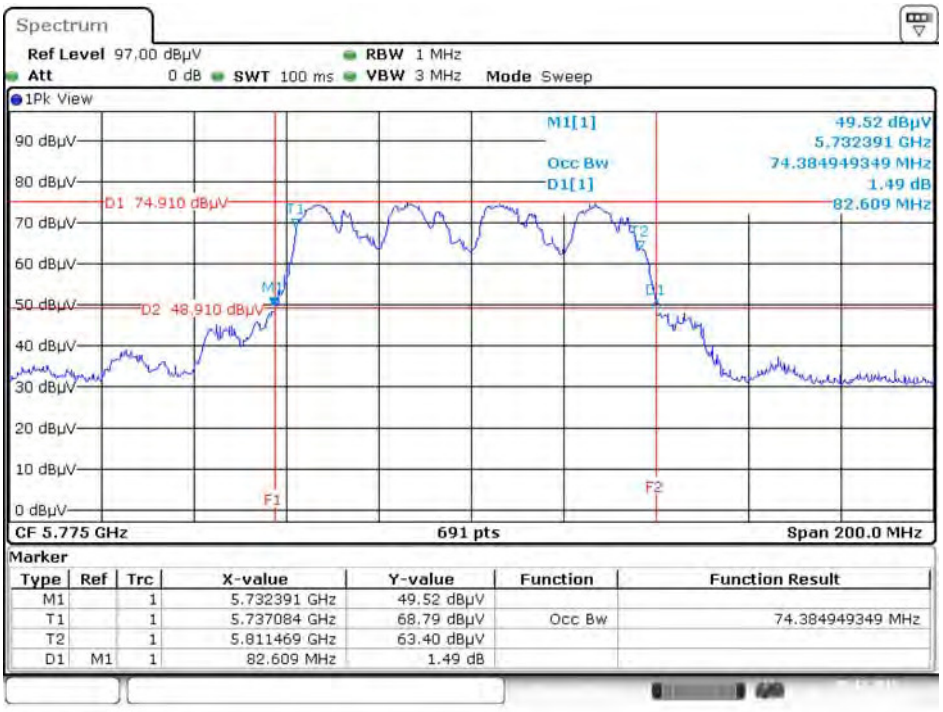
Date: 5.DEC.2015 00:50:02

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



Date: 5.DEC.2015 00:51:59

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



Date: 5.DEC.2015 00:53:20

4.3. 6dB Spectrum Bandwidth Measurement

4.3.1. Limit

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

4.3.2. Measuring Instruments and Setting

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

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

4.3.3. Test Procedures

For Radiated 6dB Bandwidth Measurement:

1. The transmitter was radiated to the spectrum analyzer in peak hold mode.
2. Test was performed in accordance with KDB789033 D02 v01r01 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (C) Emission Bandwidth.
3. Multiple antenna system was performed in accordance with KDB662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. Measured the spectrum width with power higher than 6dB below carrier.

4.3.4. Test Setup Layout

For Radiated 6dB Bandwidth Measurement:

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

4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.3.7. Test Result of 6dB Spectrum Bandwidth

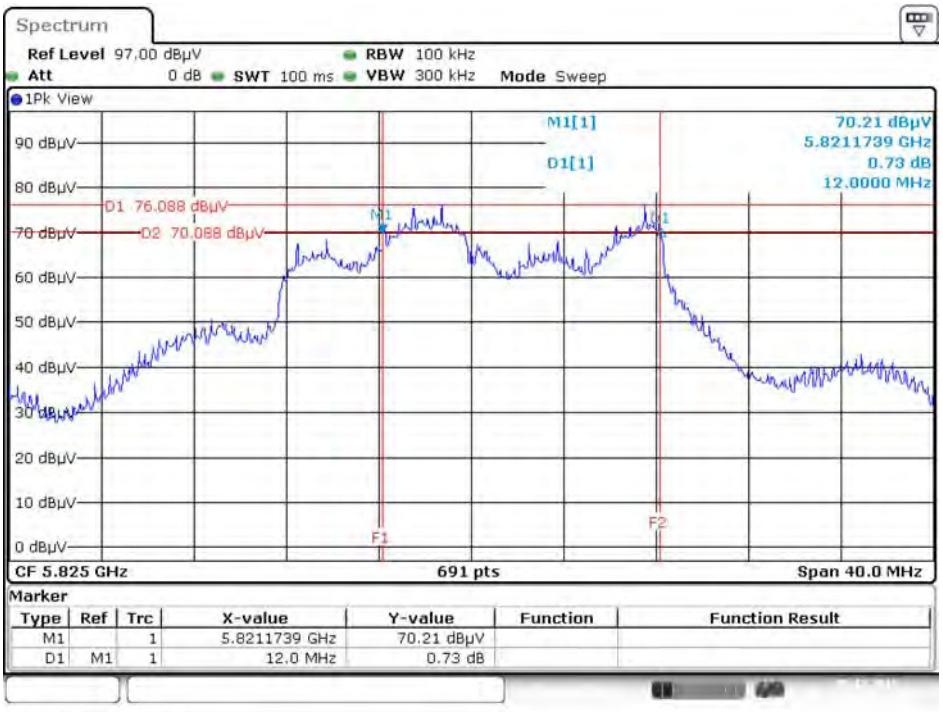
Temperature	25℃	Humidity	55%
Test Engineer	Roki Liu		

Mode	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11a	5745 MHz	13.16	500	Complies
	5785 MHz	13.80	500	Complies
	5825 MHz	12.00	500	Complies
802.11ac MCS0/Nss1 VHT20	5745 MHz	16.35	500	Complies
	5785 MHz	16.35	500	Complies
	5825 MHz	16.35	500	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	31.65	500	Complies
	5795 MHz	32.00	500	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	71.59	500	Complies

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

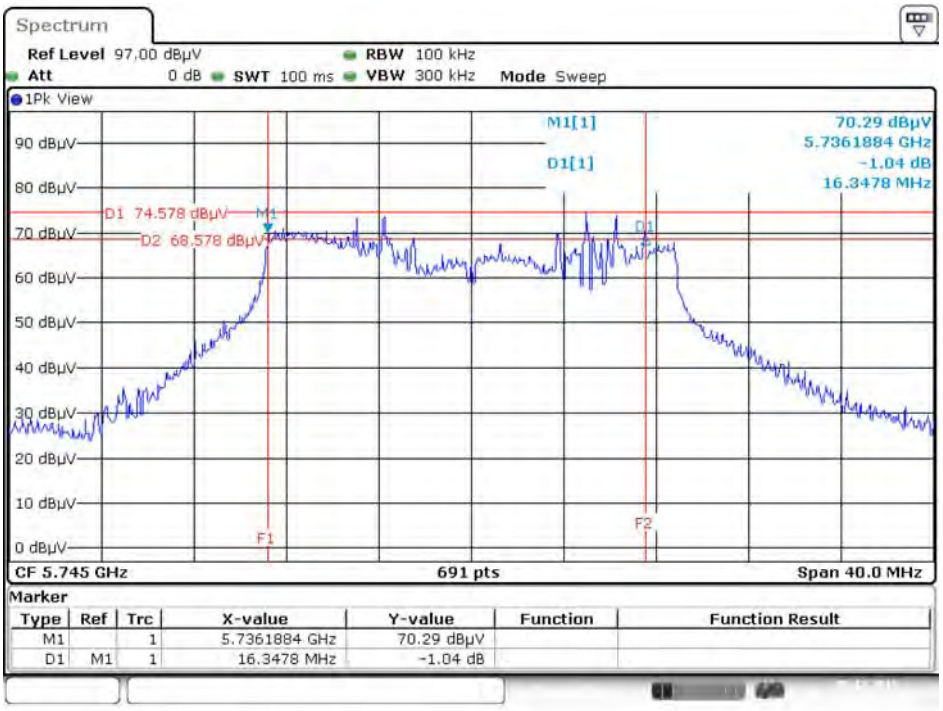
For plots, only the channel with worse result was shown.

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



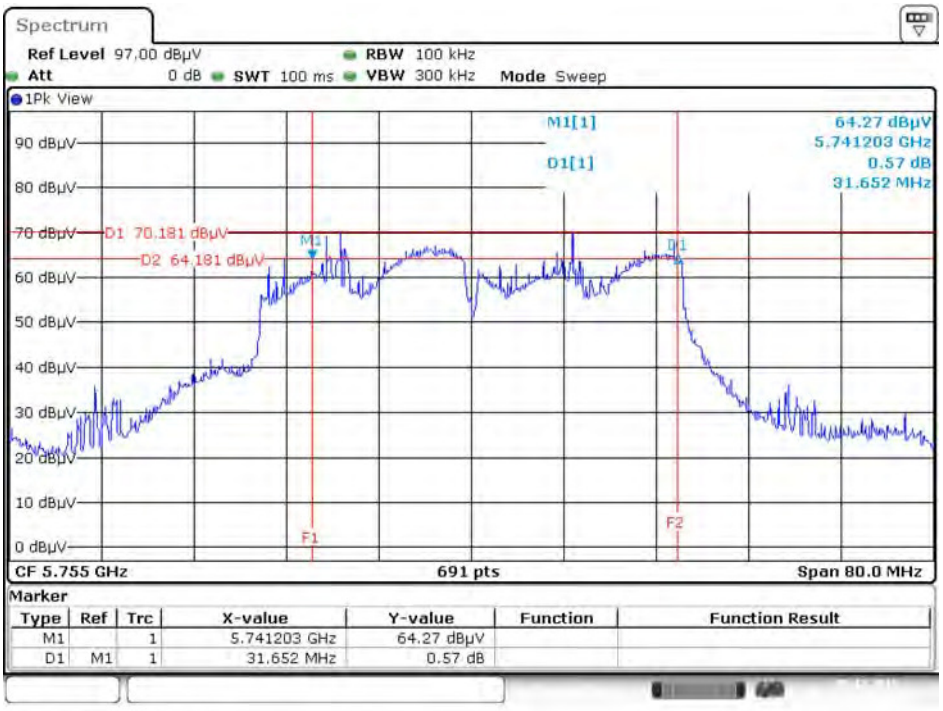
Date: 5.DEC.2015 01:06:45

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

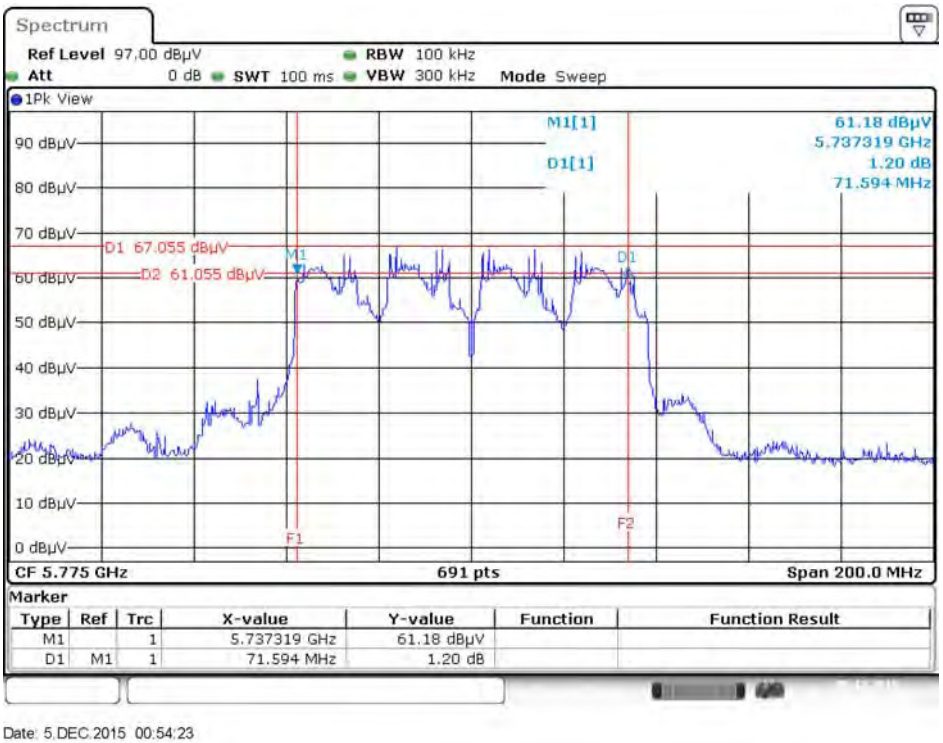


Date: 5.DEC.2015 01:01:53

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



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



4.4. Maximum Conducted Output Power Measurement

4.4.1. Limit

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

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

4.4.2. Measuring Instruments and Setting

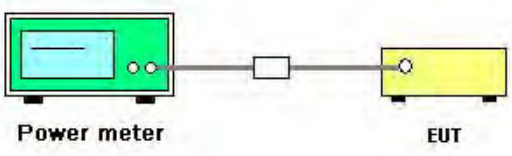
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Detector	AVERAGE

4.4.3. Test Procedures

1. The transmitter output (antenna port) was connected to the power meter.
2. Test was performed in accordance with KDB789033 D02 v01r01 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (E) Maximum conducted output power =>3. Measurement using a Power Meter (PM) =>b) Method PM-G (Measurement using a gated RF average power meter).
3. Multiple antenna systems was performed in accordance with KDB662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. When measuring maximum conducted output power with multiple antenna systems, add every result of the values by mathematic formula.

4.4.4. Test Setup Layout



4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.4.7. Test Result of Maximum Conducted Output Power

Temperature	25°C	Humidity	55%
Test Engineer	Roki Liu	Test Date	Oct. 09, 2015

Mode	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
802.11a	5180 MHz	18.19	17.38	19.68	23.29	30.00	Complies
	5200 MHz	17.76	17.31	19.59	23.11	30.00	Complies
	5240 MHz	16.11	16.33	17.49	21.46	30.00	Complies
	5745 MHz	18.56	18.79	18.12	23.27	30.00	Complies
	5785 MHz	19.15	19.57	19.35	24.13	30.00	Complies
	5825 MHz	18.49	19.32	18.51	23.56	30.00	Complies
802.11ac MCS0/Nss1 VHT20	5180 MHz	16.49	15.73	18.66	21.92	30.00	Complies
	5200 MHz	16.49	15.74	18.72	21.95	30.00	Complies
	5240 MHz	15.42	15.06	18.67	21.48	30.00	Complies
	5745 MHz	17.08	17.75	18.35	22.53	30.00	Complies
	5785 MHz	17.62	18.13	17.78	22.62	30.00	Complies
	5825 MHz	16.55	18.16	17.39	22.19	30.00	Complies
802.11ac MCS0/Nss1 VHT40	5190 MHz	14.32	13.82	15.02	19.19	30.00	Complies
	5230 MHz	15.48	14.67	18.45	21.29	30.00	Complies
	5755 MHz	15.98	16.28	13.78	20.25	30.00	Complies
	5795 MHz	17.81	18.62	17.74	22.85	30.00	Complies
802.11ac MCS0/Nss1 VHT80	5210 MHz	12.81	12.58	14.22	18.04	30.00	Complies
	5775 MHz	14.63	15.97	14.27	19.79	30.00	Complies

4.5. Power Spectral Density Measurement

4.5.1. Limit

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

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

4.5.2. Measuring Instruments and Setting

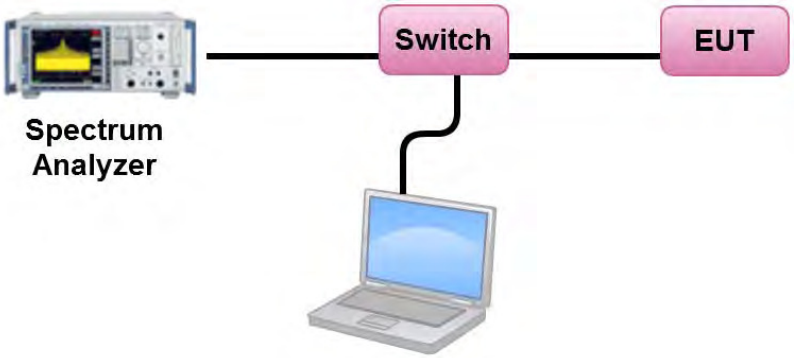
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.5.3. Test Procedures

1. The transmitter output (antenna port) was connected RF switch to the spectrum analyzer.
2. Test was performed in accordance with KDB789033 D02 v01r01 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (F) Maximum Power Spectral Density (PSD).
3. Multiple antenna systems was performed in accordance KDB662911 D01 v02r01 in-Band Power Spectral Density (PSD) Measurements (a) Measure and sum the spectra across the outputs.
4. When measuring first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3 and so on up to the Nth output to obtain the value for the first frequency bin of the summed spectrum. The summed spectrum value for each of the other frequency bins is computed in the same way.
5. For 5.725~5.85 GHz, the measured result of PSD level must add 10log(500kHz/RBW) and the final result should ≤ 30 dBm.

4.5.4. Test Setup Layout



4.5.5. Test Deviation

There is no deviation with the original standard.

4.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.5.7. Test Result of Power Spectral Density

Temperature	25°C	Humidity	55%
Test Engineer	Roki Liu	Test Date	Oct. 09, 2015

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	10.13	13.63	Complies
40	5200 MHz	9.92	13.63	Complies
48	5240 MHz	8.30	13.63	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.37dBi >6dBi, so limit=17 – (9.37 – 6)=13.63dBm/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	10.04	-3.01	7.03	26.63	Complies
157	5785 MHz	10.68	-3.01	7.67	26.63	Complies
165	5825 MHz	10.27	-3.01	7.26	26.63	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.37dBi >6dBi, so limit=30 – (9.37 – 6)=26.63dBm/500kHz.

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	8.58	13.63	Complies
40	5200 MHz	8.60	13.63	Complies
48	5240 MHz	8.13	13.63	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.37dBi >6dBi, so limit=17 – (9.37 – 6)=13.63dBm/MHz.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	9.22	-3.01	6.21	26.63	Complies
157	5785 MHz	9.35	-3.01	6.34	26.63	Complies
165	5825 MHz	8.81	-3.01	5.80	26.63	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.37dBi >6dBi, so limit=30 – (9.37 – 6)=26.63dBm/500kHz.

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	2.81	13.63	Complies
46	5230 MHz	4.98	13.63	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.37dBi >6dBi, so limit=17 – (9.37 – 6)=13.63dBm/MHz.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
151	5755 MHz	3.88	-3.01	0.87	26.63	Complies
159	5795 MHz	6.52	-3.01	3.51	26.63	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.37dBi >6dBi, so limit=30 – (9.37 – 6)=26.63dBm/500kHz.

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
42	5210 MHz	-0.97	13.63	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.37dBi >6dBi, so limit=17 – (9.37 – 6)=13.63dBm/MHz.

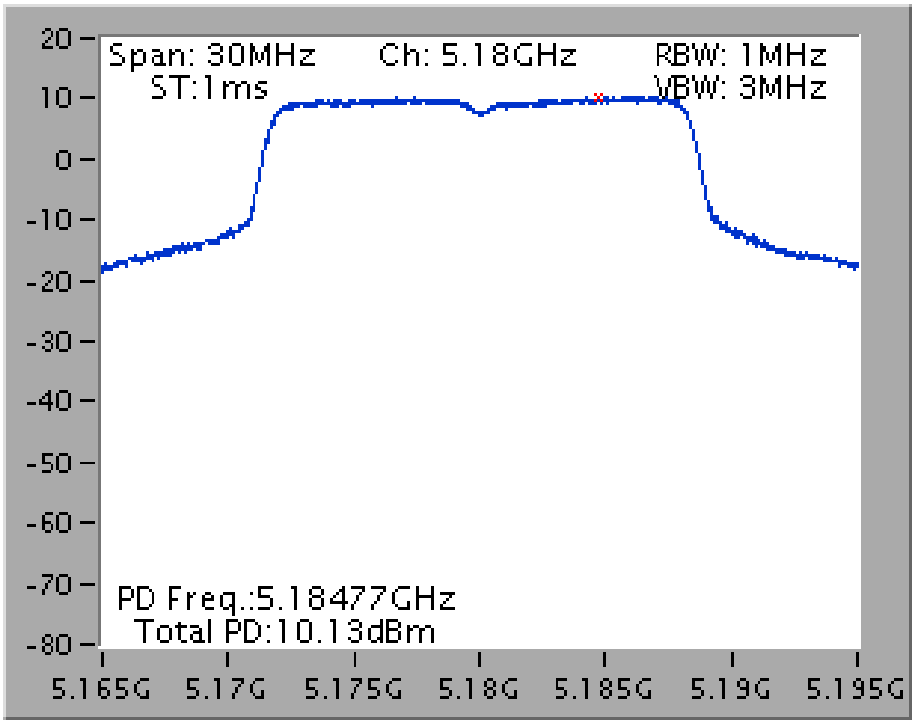
Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
155	5775 MHz	0.78	-3.01	-2.23	26.63	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.37dBi >6dBi, so limit=30 – (9.37 – 6)=26.63dBm/500kHz.

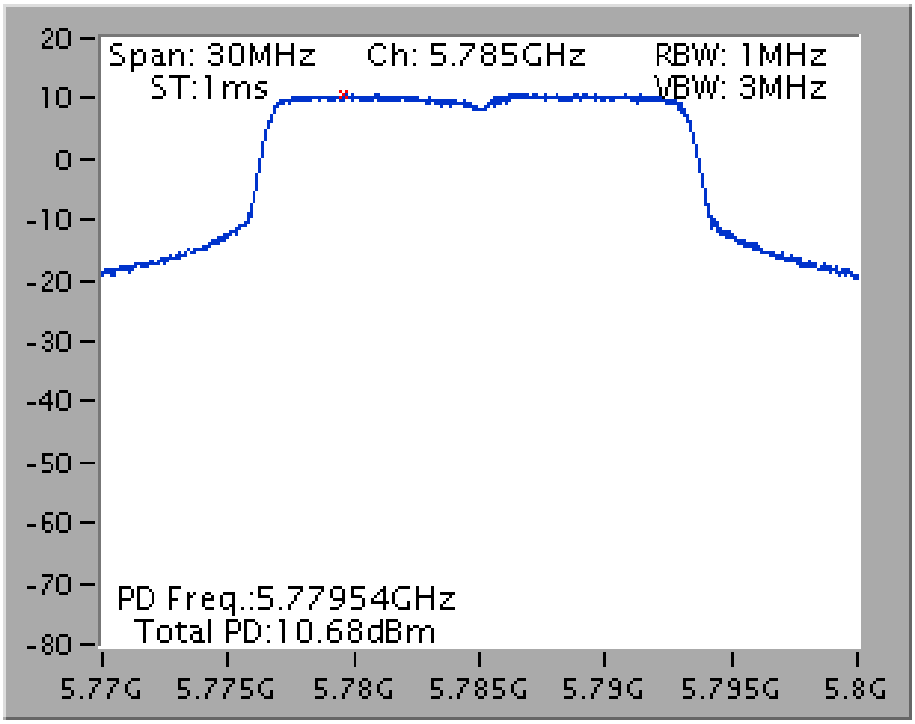
Note: All the test values were listed in the report.

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

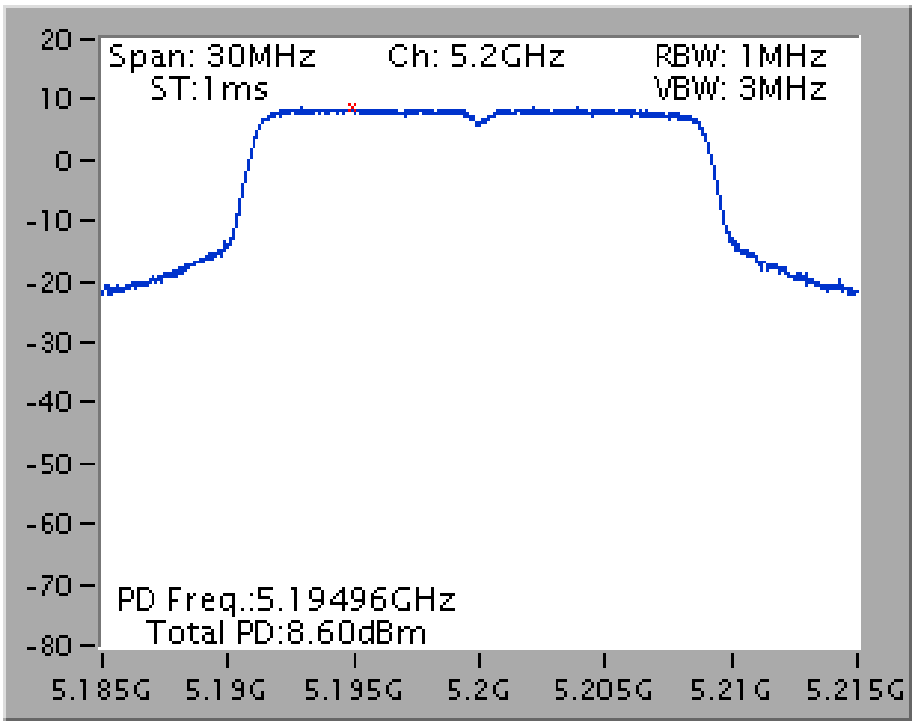
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 / 5180 MHz



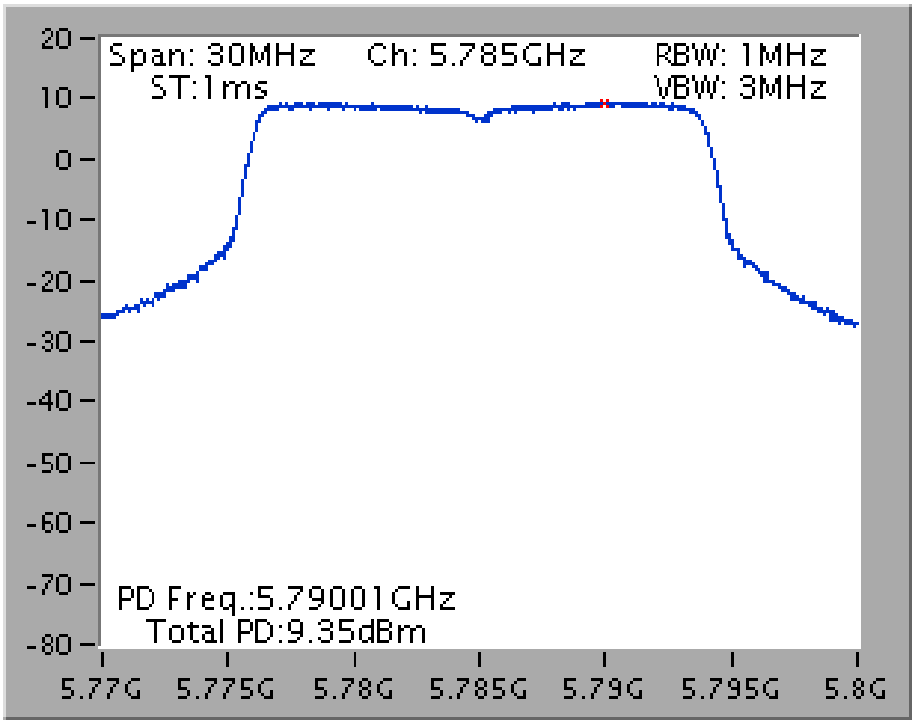
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 / 5785 MHz



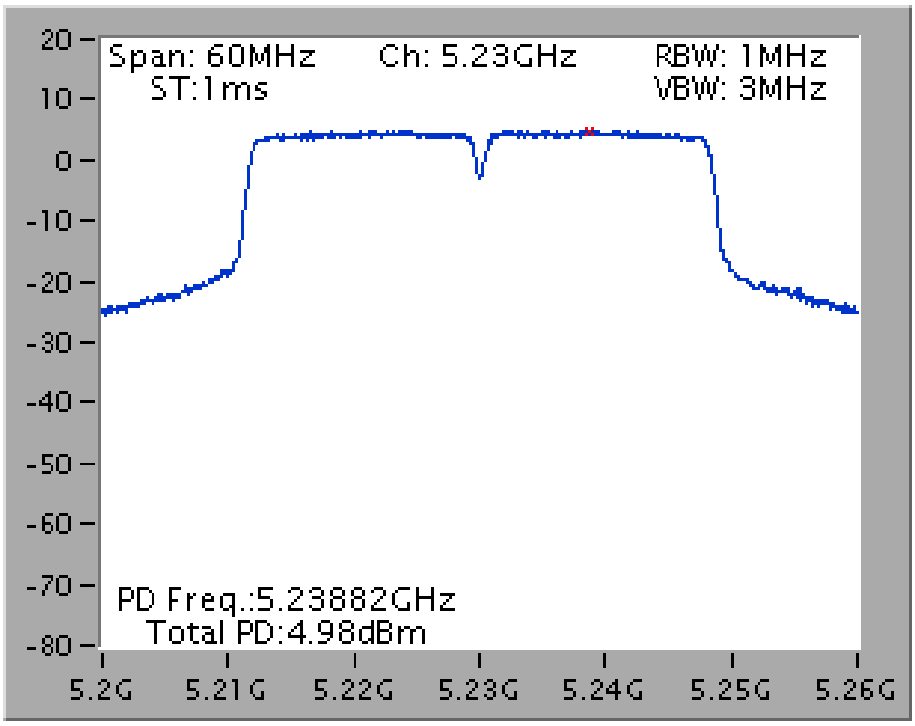
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 / 5200 MHz



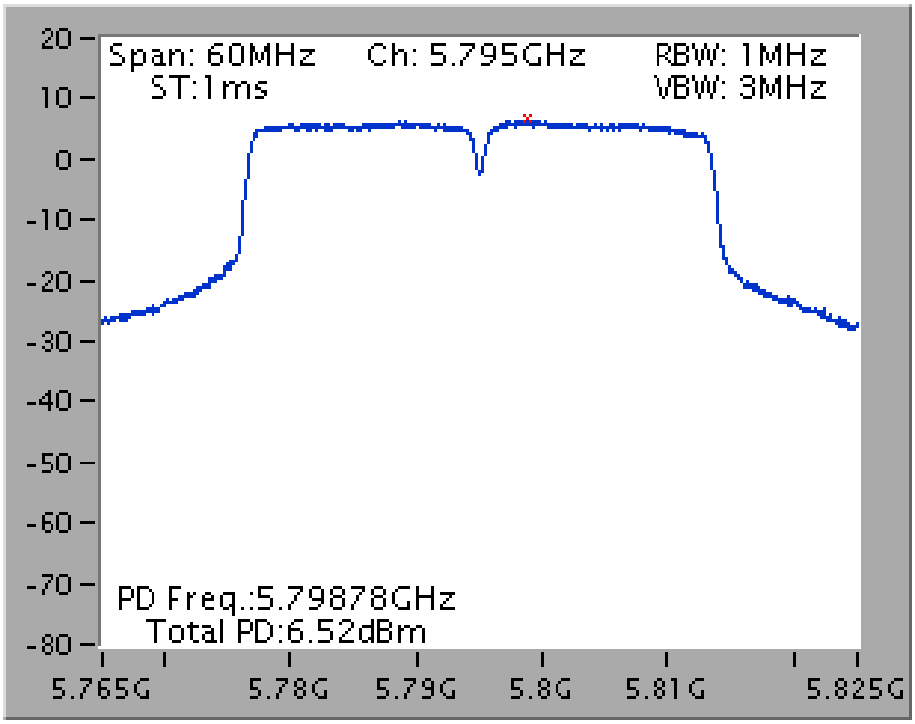
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 / 5785 MHz



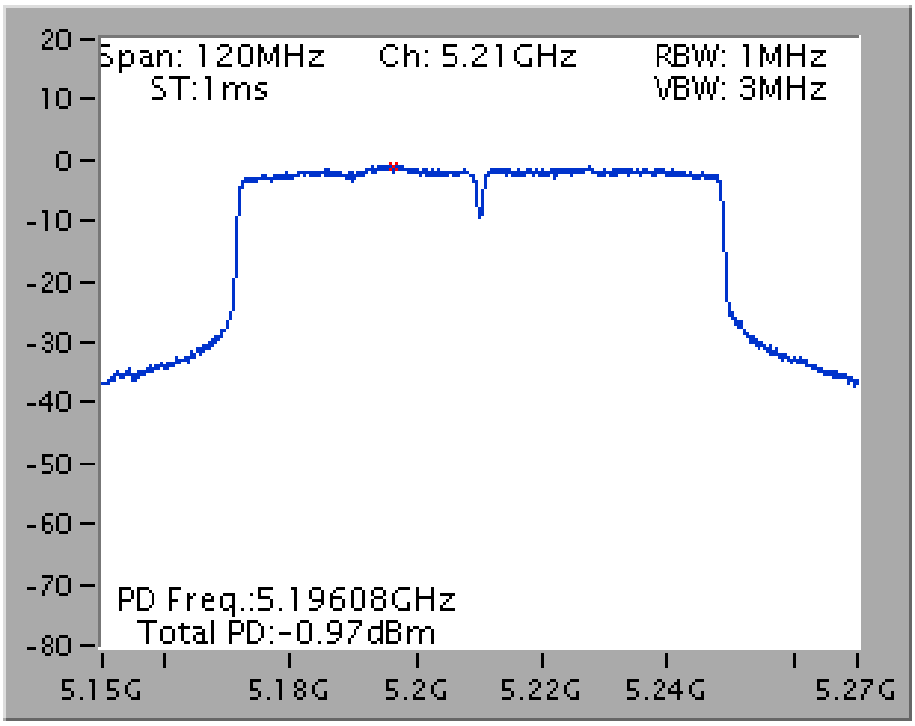
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 / 5230 MHz



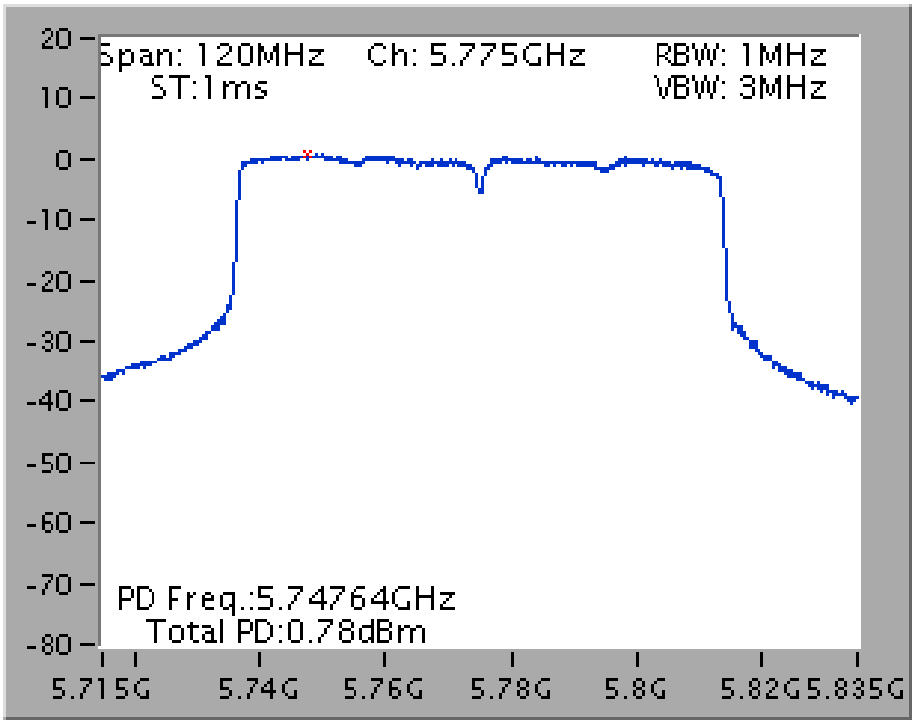
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 / 5795 MHz



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



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



4.6. Radiated Emissions Measurement

4.6.1. Limit

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

For transmitters operating in the 5.725-5.85 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz.

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

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

4.6.2. Measuring Instruments and Setting

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

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

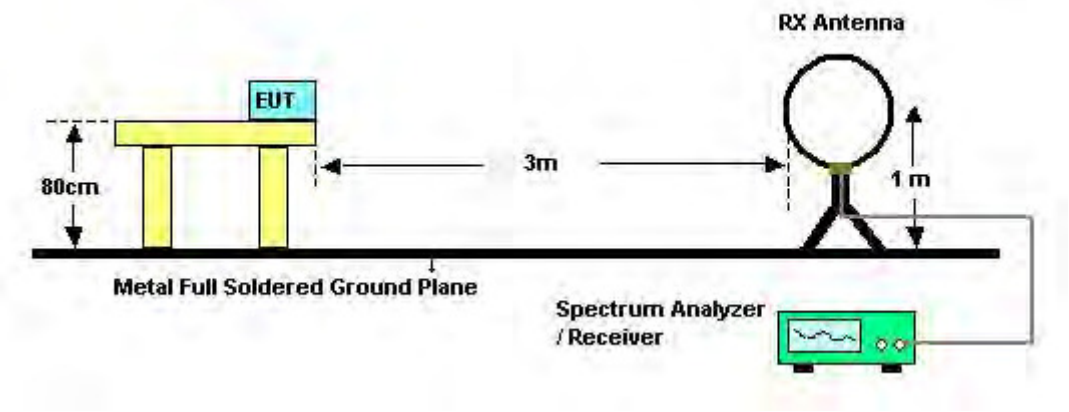
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.6.3. Test Procedures

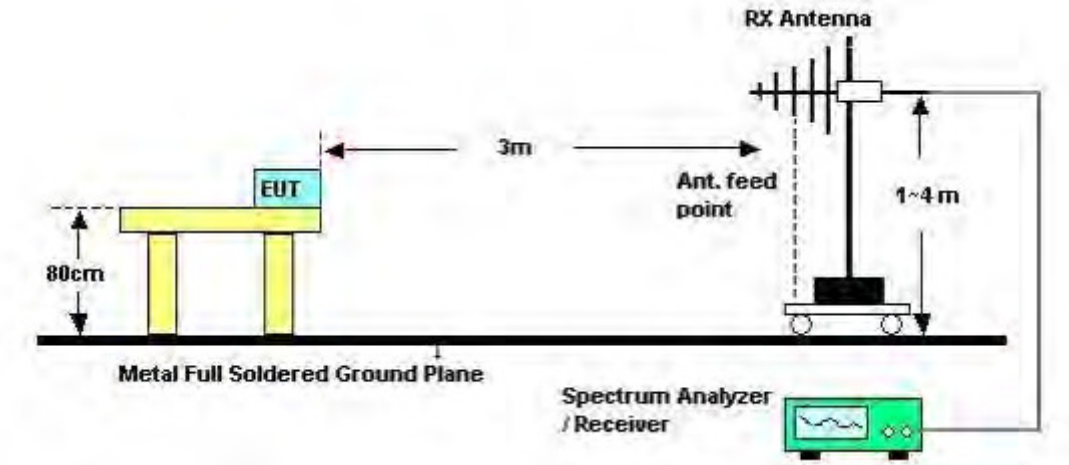
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 1m & 3m far away from the turntable.
2. Power on the EUT and all the supporting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

4.6.4. Test Setup Layout

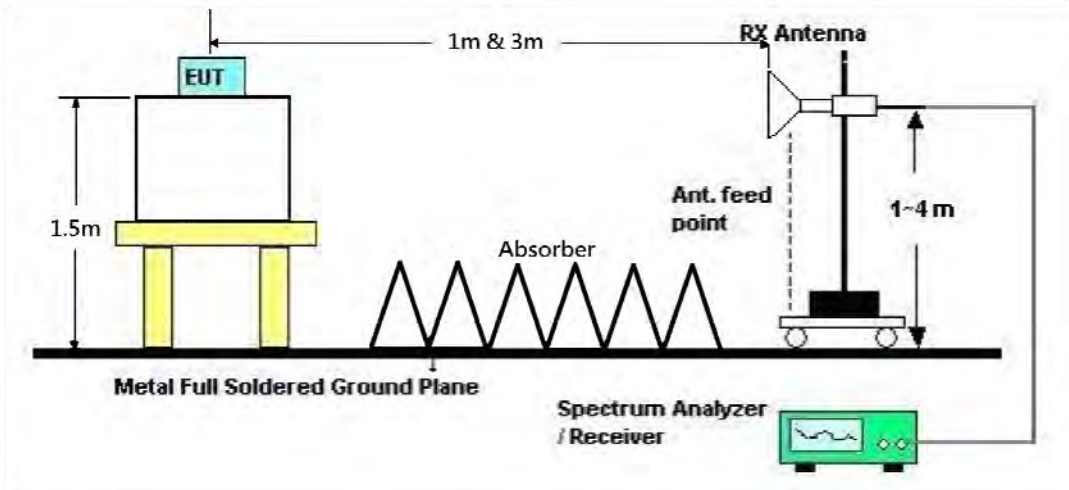
For Radiated Emissions: 9kHz ~30MHz



For Radiated Emissions: 30MHz~1GHz



For Radiated Emissions: Above 1GHz



4.6.5. Test Deviation

There is no deviation with the original standard.

4.6.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

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

Temperature	27°C	Humidity	53%
Test Engineer	YC Chen	Configurations	Normal Link
Test Date	Nov. 06, 2015	Test Mode	Mode 1

Freq. (MHz)	Level (dBuV)	Over Limit (dB)	Limit Line (dBuV)	Remark
-	-	-	-	See Note

Note:

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

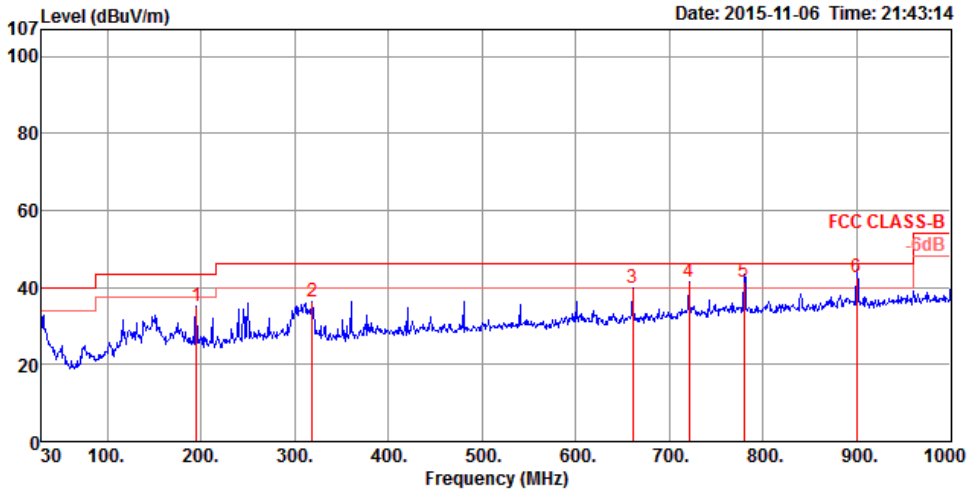
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

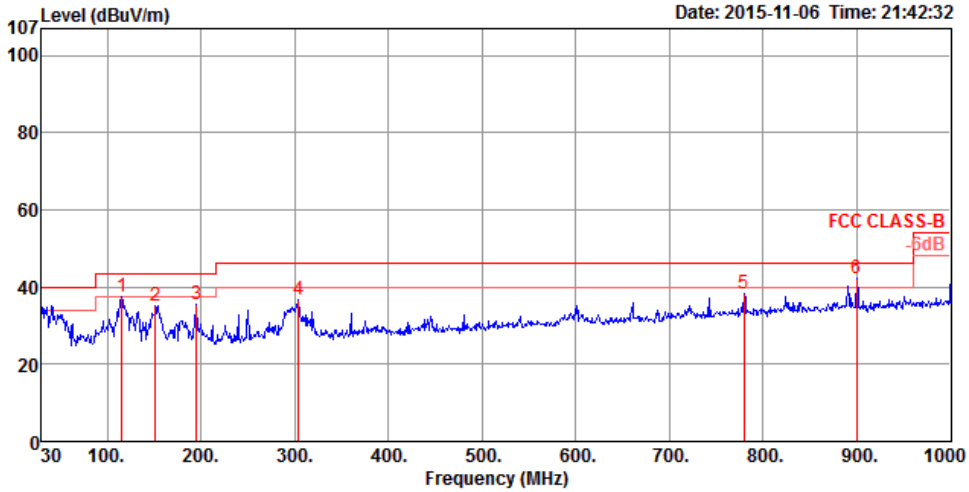
Temperature	27°C	Humidity	53%
Test Engineer	YC Chen	Configurations	Normal Link
Test Mode	Mode 1		

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		cm	deg	
1	194.90	35.31	43.50	-8.19	56.23	1.70	32.55	9.93	HORIZONTAL	100	55	Peak
2	319.06	36.50	46.00	-9.50	52.49	2.09	32.52	14.44	HORIZONTAL	150	163	Peak
3	660.50	40.06	46.00	-5.94	50.19	2.95	32.63	19.55	HORIZONTAL	150	316	Peak
4	720.64	41.46	46.00	-4.54	51.03	3.06	32.56	19.93	HORIZONTAL	150	204	Peak
5	779.81	41.38	46.00	-4.62	50.17	3.20	32.43	20.44	HORIZONTAL	150	316	QP
6	900.09	42.77	46.00	-3.23	49.66	3.37	31.86	21.60	HORIZONTAL	100	183	QP

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		cm	deg	
1	115.36	37.55	43.50	-5.95	56.21	1.39	32.57	12.52	VERTICAL	100	0	Peak
2	151.25	35.05	43.50	-8.45	54.92	1.55	32.56	11.14	VERTICAL	100	326	Peak
3	194.90	35.53	43.50	-7.97	56.45	1.70	32.55	9.93	VERTICAL	100	355	Peak
4	304.51	36.78	46.00	-9.22	53.22	2.05	32.52	14.03	VERTICAL	150	7	Peak
5	779.81	38.31	46.00	-7.69	47.10	3.20	32.43	20.44	VERTICAL	200	333	Peak
6	900.09	42.30	46.00	-3.70	49.19	3.37	31.86	21.60	VERTICAL	100	277	Peak

Note:

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

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

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

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

Temperature	27°C	Humidity	53%
Test Engineer	YC Chen	Configurations	IEEE 802.11a CH 36 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 30, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15539.28	46.44	54.00	-7.56	31.28	12.49	38.39	35.72	173	233	HORIZONTAL	Average
2	15541.75	60.90	74.00	-13.10	45.74	12.49	38.39	35.72	173	233	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15538.11	59.61	74.00	-14.39	44.45	12.49	38.39	35.72	175	318	VERTICAL	Peak
2	15539.43	46.26	54.00	-7.74	31.10	12.49	38.39	35.72	175	318	VERTICAL	Average

Temperature	27°C	Humidity	53%
Test Engineer	YC Chen	Configurations	IEEE 802.11a CH 40 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 30, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15599.16	59.71	74.00	-14.29	44.54	12.52	38.38	35.73	164	118	HORIZONTAL	Peak
2	15599.88	46.59	54.00	-7.41	31.42	12.52	38.38	35.73	164	118	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15599.04	46.41	54.00	-7.59	31.24	12.52	38.38	35.73	180	224	VERTICAL	Average
2	15599.14	60.13	74.00	-13.87	44.96	12.52	38.38	35.73	180	224	VERTICAL	Peak

Temperature	27°C	Humidity	53%
Test Engineer	YC Chen	Configurations	IEEE 802.11a CH 48 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 30, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15721.26	45.79	54.00	-8.21	30.59	12.60	38.35	35.75	166	110	HORIZONTAL	Average
2	15722.45	60.26	74.00	-13.74	45.06	12.60	38.35	35.75	166	110	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15717.65	46.03	54.00	-7.97	30.83	12.60	38.35	35.75	173	148	VERTICAL	Average
2	15719.46	59.17	74.00	-14.83	43.97	12.60	38.35	35.75	173	148	VERTICAL	Peak

Temperature	27°C	Humidity	53%
Test Engineer	YC Chen	Configurations	IEEE 802.11a CH 149 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 30, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11490.02	47.95	54.00	-6.05	32.14	10.94	39.20	34.33	165	281	HORIZONTAL	Average
2	11490.39	60.88	74.00	-13.12	45.07	10.94	39.20	34.33	165	281	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11490.52	61.78	74.00	-12.22	45.97	10.94	39.20	34.33	175	322	VERTICAL	Peak
2	11490.55	48.27	54.00	-5.73	32.46	10.94	39.20	34.33	175	322	VERTICAL	Average

Temperature	27°C	Humidity	53%
Test Engineer	YC Chen	Configurations	IEEE 802.11a CH 157 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 30, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11569.34	48.93	54.00	-5.07	33.17	10.98	39.15	34.37	164	314	HORIZONTAL	Average
2	11570.68	62.99	74.00	-11.01	47.23	10.98	39.15	34.37	164	314	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11570.44	63.43	74.00	-10.57	47.67	10.98	39.15	34.37	158	359	VERTICAL	Peak
2	11571.30	49.54	54.00	-4.46	33.78	10.98	39.15	34.37	158	359	VERTICAL	Average

Temperature	27°C	Humidity	53%
Test Engineer	YC Chen	Configurations	IEEE 802.11a CH 165 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 30, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11647.14	50.98	54.00	-3.02	35.29	11.01	39.09	34.41	173	313	HORIZONTAL	Average
2	11648.40	64.28	74.00	-9.72	48.59	11.01	39.09	34.41	173	313	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11650.68	66.85	74.00	-7.15	51.16	11.01	39.09	34.41	160	356	VERTICAL	Peak
2	11651.52	51.44	54.00	-2.56	35.75	11.03	39.07	34.41	160	356	VERTICAL	Average

Temperature	27°C	Humidity	53%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 30, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15536.54	59.32	74.00	-14.68	44.16	12.49	38.39	35.72	157	232	HORIZONTAL	Peak
2	15539.40	46.62	54.00	-7.38	31.46	12.49	38.39	35.72	157	232	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15536.56	60.72	74.00	-13.28	45.56	12.49	38.39	35.72	159	277	VERTICAL	Peak
2	15544.30	46.58	54.00	-7.42	31.42	12.49	38.39	35.72	159	277	VERTICAL	Average

Temperature	27°C	Humidity	53%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 40 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 30, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15597.00	46.58	54.00	-7.42	31.41	12.52	38.38	35.73	166	155	HORIZONTAL	Average
2	15600.18	60.59	74.00	-13.41	45.42	12.52	38.38	35.73	166	155	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15600.10	46.75	54.00	-7.25	31.58	12.52	38.38	35.73	169	174	VERTICAL	Average
2	15603.38	59.33	74.00	-14.67	44.14	12.55	38.37	35.73	169	174	VERTICAL	Peak

Temperature	27°C	Humidity	53%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 48 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 30, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15716.68	59.89	74.00	-14.11	44.69	12.60	38.35	35.75	159	131	HORIZONTAL	Peak
2	15718.68	45.72	54.00	-8.28	30.52	12.60	38.35	35.75	159	131	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15720.16	58.88	74.00	-15.12	43.68	12.60	38.35	35.75	163	130	VERTICAL	Peak
2	15721.00	46.59	54.00	-7.41	31.39	12.60	38.35	35.75	163	130	VERTICAL	Average

Temperature	27°C	Humidity	53%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 30, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11487.88	46.93	54.00	-7.07	31.12	10.94	39.20	34.33	204	281	HORIZONTAL	Average
2	11489.10	60.05	74.00	-13.95	44.24	10.94	39.20	34.33	204	281	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11491.12	47.60	54.00	-6.40	31.79	10.94	39.20	34.33	166	318	VERTICAL	Average
2	11492.86	60.24	74.00	-13.76	44.43	10.94	39.20	34.33	166	318	VERTICAL	Peak

Temperature	27°C	Humidity	53%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 30, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11568.72	61.30	74.00	-12.70	45.54	10.98	39.15	34.37	170	283	HORIZONTAL	Peak
2	11569.20	48.05	54.00	-5.95	32.29	10.98	39.15	34.37	170	283	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11571.88	47.80	54.00	-6.20	32.04	10.98	39.15	34.37	176	319	VERTICAL	Average
2	11572.54	61.79	74.00	-12.21	46.03	10.98	39.15	34.37	176	319	VERTICAL	Peak

Temperature	27°C	Humidity	53%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 30, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11650.34	59.66	74.00	-14.34	43.97	11.01	39.09	34.41	168	282	HORIZONTAL	Peak
2	11651.24	46.82	54.00	-7.18	31.13	11.03	39.07	34.41	168	282	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11650.94	47.63	54.00	-6.37	31.94	11.03	39.07	34.41	172	320	VERTICAL	Average
2	11651.38	61.10	74.00	-12.90	45.41	11.03	39.07	34.41	172	320	VERTICAL	Peak

Temperature	27°C	Humidity	53%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 30, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15570.48	47.03	54.00	-6.97	31.86	12.52	38.38	35.73	163	328	HORIZONTAL	Average
2	15572.86	59.76	74.00	-14.24	44.59	12.52	38.38	35.73	163	328	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15568.10	60.30	74.00	-13.70	45.13	12.52	38.38	35.73	166	344	VERTICAL	Peak
2	15573.40	46.98	54.00	-7.02	31.81	12.52	38.38	35.73	166	344	VERTICAL	Average

Temperature	27°C	Humidity	53%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 46 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 30, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15689.48	45.80	54.00	-8.20	30.61	12.57	38.36	35.74	151	222	HORIZONTAL	Average
2	15692.20	58.73	74.00	-15.27	43.52	12.60	38.35	35.74	151	222	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15690.02	45.94	54.00	-8.06	30.75	12.57	38.36	35.74	170	246	VERTICAL	Average
2	15693.10	59.00	74.00	-15.00	43.79	12.60	38.35	35.74	170	246	VERTICAL	Peak

Temperature	27°C	Humidity	53%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 30, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11510.10	45.67	54.00	-8.33	29.88	10.94	39.20	34.35	177	234	HORIZONTAL	Average
2	11511.58	58.23	74.00	-15.77	42.44	10.94	39.20	34.35	177	234	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11505.14	45.71	54.00	-8.29	29.90	10.94	39.20	34.33	181	313	VERTICAL	Average
2	11513.94	58.44	74.00	-15.56	42.65	10.94	39.20	34.35	181	313	VERTICAL	Peak

Temperature	27°C	Humidity	53%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 30, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11587.08	60.74	74.00	-13.26	45.02	10.99	39.12	34.39	177	310	HORIZONTAL	Peak
2	11589.16	47.61	54.00	-6.39	31.89	10.99	39.12	34.39	177	310	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11588.44	59.32	74.00	-14.68	43.60	10.99	39.12	34.39	182	323	VERTICAL	Peak
2	11590.88	46.72	54.00	-7.28	31.00	10.99	39.12	34.39	182	323	VERTICAL	Average

Temperature	27°C	Humidity	53%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 30, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15626.58	59.20	74.00	-14.80	44.01	12.55	38.37	35.73	166	244	HORIZONTAL	Peak
2	15634.04	46.16	54.00	-7.84	30.97	12.55	38.37	35.73	166	244	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15625.54	46.21	54.00	-7.79	31.02	12.55	38.37	35.73	152	282	VERTICAL	Average
2	15629.14	59.13	74.00	-14.87	43.94	12.55	38.37	35.73	152	282	VERTICAL	Peak

Temperature	27°C	Humidity	53%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 30, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11547.60	57.72	74.00	-16.28	41.96	10.96	39.17	34.37	165	299	HORIZONTAL	Peak
2	11549.64	44.51	54.00	-9.49	28.75	10.96	39.17	34.37	165	299	HORIZONTAL	Average

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11547.32	44.75	54.00	-9.25	28.99	10.96	39.17	34.37	176	353	VERTICAL	Average
2	11550.30	58.25	74.00	-15.75	42.49	10.98	39.15	34.37	176	353	VERTICAL	Peak

Note:

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

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

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

4.7. Band Edge Emissions Measurement

4.7.1. Limit

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

For transmitters operating in the 5.725-5.85 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz.

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

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

4.7.2. Measuring Instruments and Setting

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

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

4.7.3. Test Procedures

1. The test procedure is the same as section 4.6.3.

4.7.4. Test Setup Layout

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

4.7.5. Test Deviation

There is no deviation with the original standard.

4.7.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.7.7. Test Result of Band Edge and Fundamental Emissions

Temperature	27°C	Humidity	53%
Test Engineer	YC Chen	Configurations	IEEE 802.11a CH 36, 40, 48 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 30, 2015		

Channel 36

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5149.20	58.87	74.00	-15.13	52.80	7.24	33.17	34.34	261	163	VERTICAL	Peak
2	5150.00	45.65	54.00	-8.35	39.58	7.24	33.17	34.34	261	163	VERTICAL	Average
3	5178.80	95.66			89.48	7.29	33.23	34.34	261	163	VERTICAL	Average
4	5178.80	106.24			100.06	7.29	33.23	34.34	261	163	VERTICAL	Peak

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

Channel 40

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5150.00	43.86	54.00	-10.14	37.79	7.24	33.17	34.34	226	172	VERTICAL	Average
2	5150.00	55.88	74.00	-18.12	49.81	7.24	33.17	34.34	226	172	VERTICAL	Peak
3	5194.00	107.18			100.95	7.32	33.25	34.34	226	172	VERTICAL	Peak
4	5194.80	96.82			90.59	7.32	33.25	34.34	226	172	VERTICAL	Average

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

Channel 48

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5140.40	57.41	74.00	-16.59	51.38	7.22	33.15	34.34	214	276	HORIZONTAL	Peak
2	5150.00	43.14	54.00	-10.86	37.07	7.24	33.17	34.34	214	276	HORIZONTAL	Average
3	5243.60	95.17			88.80	7.36	33.34	34.33	214	276	HORIZONTAL	Average
4	5244.20	105.44			99.07	7.36	33.34	34.33	214	276	HORIZONTAL	Peak
5	5350.00	45.11	54.00	-8.89	38.44	7.46	33.53	34.32	214	276	HORIZONTAL	Average
6	5356.00	57.97	74.00	-16.03	51.27	7.47	33.55	34.32	214	276	HORIZONTAL	Peak

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

Temperature	27°C	Humidity	53%
Test Engineer	YC Chen	Configurations	IEEE 802.11a CH 149, 157, 165 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 30, 2015		

Channel 149

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5714.60	65.23	68.20	-2.97	57.30	7.88	34.41	34.36	235	138	VERTICAL	Peak
2	5725.00	77.58	78.20	-0.62	69.62	7.87	34.45	34.36	235	138	VERTICAL	Peak
3	5744.20	96.32			88.32	7.86	34.50	34.36	235	138	VERTICAL	Average
4	5744.20	107.00			99.00	7.86	34.50	34.36	235	138	VERTICAL	Peak

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

Channel 157

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5711.80	58.96	68.20	-9.24	51.03	7.88	34.41	34.36	220	296	HORIZONTAL	Peak
2	5721.40	57.97	78.20	-20.23	50.04	7.88	34.41	34.36	220	296	HORIZONTAL	Peak
3	5787.40	99.63			91.56	7.86	34.59	34.38	220	296	HORIZONTAL	Average
4	5787.80	109.79			101.72	7.86	34.59	34.38	220	296	HORIZONTAL	Peak
5	5853.20	59.38	78.20	-18.82	51.15	7.84	34.78	34.39	220	296	HORIZONTAL	Peak
6	5862.80	59.58	68.20	-8.62	51.31	7.83	34.83	34.39	220	296	HORIZONTAL	Peak

Item 3, 4 are the fundamental frequency at 5785 MHz.

Channel 165

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5820.20	107.57			99.41	7.85	34.69	34.38	330	134	VERTICAL	Peak
2	5829.80	97.37			89.18	7.84	34.73	34.38	330	134	VERTICAL	Average
3	5850.00	62.63	78.20	-15.57	54.40	7.84	34.78	34.39	330	134	VERTICAL	Peak
4	5862.60	60.03	68.20	-8.17	51.76	7.83	34.83	34.39	330	134	VERTICAL	Peak

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

Temperature	27°C	Humidity	53%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36, 40, 48 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 30, 2015		

Channel 36

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5138.00	57.79	74.00	-16.21	51.77	7.22	33.15	34.35	225	170	VERTICAL	Peak
2	5150.00	44.84	54.00	-9.16	38.77	7.24	33.17	34.34	225	170	VERTICAL	Average
3	5179.20	95.09			88.91	7.29	33.23	34.34	225	170	VERTICAL	Average
4	5179.20	105.20			99.02	7.29	33.23	34.34	225	170	VERTICAL	Peak

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

Channel 40

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5148.40	56.56	74.00	-17.44	50.49	7.24	33.17	34.34	285	140	VERTICAL	Peak
2	5150.00	43.30	54.00	-10.70	37.23	7.24	33.17	34.34	285	140	VERTICAL	Average
3	5198.40	95.05			88.82	7.32	33.25	34.34	285	140	VERTICAL	Average
4	5199.20	106.37			100.14	7.32	33.25	34.34	285	140	VERTICAL	Peak

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

Channel 48

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5148.80	57.40	74.00	-16.60	51.33	7.24	33.17	34.34	292	160	VERTICAL	Peak
2	5150.00	43.56	54.00	-10.44	37.49	7.24	33.17	34.34	292	160	VERTICAL	Average
3	5237.00	94.82			88.46	7.36	33.34	34.34	292	160	VERTICAL	Average
4	5237.60	104.96			98.60	7.36	33.34	34.34	292	160	VERTICAL	Peak
5	5356.60	58.18	74.00	-15.82	51.48	7.47	33.55	34.32	292	160	VERTICAL	Peak
6	5379.20	45.60	54.00	-8.40	38.85	7.49	33.58	34.32	292	160	VERTICAL	Average

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

Temperature	27°C	Humidity	53%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149, 157, 165 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 30, 2015		

Channel 149

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5715.00	60.38	68.20	-7.82	52.45	7.88	34.41	34.36	322	118	VERTICAL	Peak
2	5725.00	71.13	78.20	-7.07	63.17	7.87	34.45	34.36	322	118	VERTICAL	Peak
3	5738.60	106.89			98.93	7.87	34.45	34.36	322	118	VERTICAL	Peak
4	5739.00	95.64			87.64	7.86	34.50	34.36	322	118	VERTICAL	Average

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

Channel 157

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5709.00	58.62	68.20	-9.58	50.69	7.88	34.41	34.36	220	290	HORIZONTAL	Peak
2	5719.80	58.88	78.20	-19.32	50.95	7.88	34.41	34.36	220	290	HORIZONTAL	Peak
3	5781.00	96.47			88.39	7.86	34.59	34.37	220	290	HORIZONTAL	Average
4	5781.40	106.41			98.33	7.86	34.59	34.37	220	290	HORIZONTAL	Peak
5	5850.40	58.94	78.20	-19.26	50.71	7.84	34.78	34.39	220	290	HORIZONTAL	Peak
6	5865.20	59.79	68.20	-8.41	51.52	7.83	34.83	34.39	220	290	HORIZONTAL	Peak

Item 3, 4 are the fundamental frequency at 5785 MHz.

Channel 165

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5833.00	106.57			98.38	7.84	34.73	34.38	221	301	HORIZONTAL	Peak
2	5833.40	96.44			88.25	7.84	34.73	34.38	221	301	HORIZONTAL	Average
3	5852.60	62.02	78.20	-16.18	53.79	7.84	34.78	34.39	221	301	HORIZONTAL	Peak
4	5860.00	60.41	68.20	-7.79	52.14	7.83	34.83	34.39	221	301	HORIZONTAL	Peak

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

Temperature	27°C	Humidity	53%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38, 46 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 30, 2015		

Channel 38

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5150.00	53.92	54.00	-0.08	47.85	7.24	33.17	34.34	222	164	VERTICAL	Average
2	5150.00	69.77	74.00	-4.23	63.70	7.24	33.17	34.34	222	164	VERTICAL	Peak
3	5183.40	100.98			94.80	7.29	33.23	34.34	222	164	VERTICAL	Peak
4	5184.60	91.55			85.37	7.29	33.23	34.34	222	164	VERTICAL	Average

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

Channel 46

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5146.40	56.99	74.00	-17.01	50.92	7.24	33.17	34.34	347	148	VERTICAL	Peak
2	5150.00	43.94	54.00	-10.06	37.87	7.24	33.17	34.34	347	148	VERTICAL	Average
3	5240.20	103.29			96.93	7.36	33.34	34.34	347	148	VERTICAL	Peak
4	5240.80	93.42			87.06	7.36	33.34	34.34	347	148	VERTICAL	Average
5	5350.00	45.82	54.00	-8.18	39.15	7.46	33.53	34.32	347	148	VERTICAL	Average
6	5368.00	59.59	74.00	-14.41	52.89	7.47	33.55	34.32	347	148	VERTICAL	Peak

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

Temperature	27°C	Humidity	53%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151, 159 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 30, 2015		

Channel 151

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5715.00	67.51	68.20	-0.69	59.58	7.88	34.41	34.36	302	120	VERTICAL	Peak
2	5724.40	70.66	78.20	-7.54	62.70	7.87	34.45	34.36	302	120	VERTICAL	Peak
3	5761.60	101.95			93.91	7.86	34.55	34.37	302	120	VERTICAL	Peak
4	5769.40	91.33			83.29	7.86	34.55	34.37	302	120	VERTICAL	Average
5	5854.20	58.56	78.20	-19.64	50.33	7.84	34.78	34.39	302	120	VERTICAL	Peak
6	5869.20	59.26	68.20	-8.94	50.99	7.83	34.83	34.39	302	120	VERTICAL	Peak

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

Channel 159

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5710.20	60.48	68.20	-7.72	52.55	7.88	34.41	34.36	234	298	HORIZONTAL	Peak
2	5720.00	59.44	78.20	-18.76	51.51	7.88	34.41	34.36	234	298	HORIZONTAL	Peak
3	5784.20	94.59			86.52	7.86	34.59	34.38	234	298	HORIZONTAL	Average
4	5784.80	104.48			96.41	7.86	34.59	34.38	234	298	HORIZONTAL	Peak
5	5853.20	62.13	78.20	-16.07	53.90	7.84	34.78	34.39	234	298	HORIZONTAL	Peak
6	5861.60	61.24	68.20	-6.96	52.97	7.83	34.83	34.39	234	298	HORIZONTAL	Peak

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

Temperature	27°C	Humidity	53%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42, 155 / Chain 1 + Chain 2 + Chain 3
Test Date	Nov. 30, 2015		

Channel 42

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5144.00	65.21	74.00	-8.79	59.14	7.24	33.17	34.34	222	169	VERTICAL	Peak
2	5146.00	53.68	54.00	-0.32	47.61	7.24	33.17	34.34	222	169	VERTICAL	Average
3	5185.00	87.50			81.32	7.29	33.23	34.34	222	169	VERTICAL	Average
4	5197.00	96.93			90.70	7.32	33.25	34.34	222	169	VERTICAL	Peak

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	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5715.00	66.93	68.20	-1.27	59.00	7.88	34.41	34.36	217	177	VERTICAL	Peak
2	5724.00	70.58	78.20	-7.62	62.62	7.87	34.45	34.36	217	177	VERTICAL	Peak
3	5755.00	89.02			81.03	7.86	34.50	34.37	217	177	VERTICAL	Average
4	5764.00	101.54			93.50	7.86	34.55	34.37	217	177	VERTICAL	Peak
5	5857.00	62.31	78.20	-15.89	54.04	7.83	34.83	34.39	217	177	VERTICAL	Peak
6	5861.00	62.68	68.20	-5.52	54.41	7.83	34.83	34.39	217	177	VERTICAL	Peak

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

Note:

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

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

4.8. Frequency Stability Measurement

4.8.1. Limit

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

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

4.8.2. Measuring Instruments and Setting

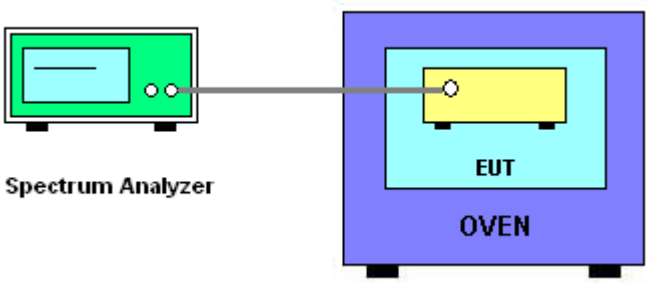
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.8.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.
5. fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 10^6 ppm and the limit is less than ±20ppm (IEEE 802.11nspecification).
6. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
7. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
8. Extreme temperature is 0°C~35°C.

4.8.4. Test Setup Layout



4.8.5. Test Deviation

There is no deviation with the original standard.

4.8.6. EUT Operation during Test

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

4.8.7. Test Result of Frequency Stability

Temperature	25°C	Humidity	55%
Test Engineer	Roki Liu	Test Date	Oct. 09, 2015

Mode: 20 MHz / Chain 2

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5200 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5199.9736	5199.9722	5199.9704	5199.9683
110.00	5199.9724	5199.9711	5199.9695	5199.9676
93.50	5199.9710	5199.9699	5199.9687	5199.9665
Max. Deviation (MHz)	0.0290	0.0301	0.0313	0.0335
Max. Deviation (ppm)	5.58	5.79	6.02	6.44
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5200 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5199.9680	5199.9668	5199.9649	5199.9627
10	5199.9667	5199.9654	5199.9639	5199.9621
20	5199.9655	5199.9642	5199.9626	5199.9607
30	5199.9641	5199.9630	5199.9616	5199.9600
35	5199.9625	5199.9610	5199.9594	5199.9574
Max. Deviation (MHz)	0.0375	0.0390	0.0406	0.0426
Max. Deviation (ppm)	7.21	7.50	7.81	8.19
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5784.9753	5784.9739	5784.9721	5784.9700
110.00	5784.9741	5784.9728	5784.9712	5784.9693
93.50	5784.9727	5784.9716	5784.9704	5784.9682
Max. Deviation (MHz)	0.0273	0.0284	0.0296	0.0318
Max. Deviation (ppm)	4.72	4.91	5.12	5.50
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5784.9742	5784.9730	5784.9711	5784.9689
10	5784.9729	5784.9716	5784.9701	5784.9683
20	5784.9717	5784.9704	5784.9688	5784.9669
30	5784.9703	5784.9692	5784.9678	5784.9662
35	5784.9687	5784.9672	5784.9656	5784.9636
Max. Deviation (MHz)	0.0313	0.0328	0.0344	0.0364
Max. Deviation (ppm)	5.41	5.67	5.95	6.29
Result	Complies			

Mode: 40 MHz / Chain 2

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5190 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5189.9683	5189.9669	5189.9651	5189.9630
110.00	5189.9671	5189.9658	5189.9642	5189.9623
93.50	5189.9657	5189.9646	5189.9634	5189.9612
Max. Deviation (MHz)	0.0343	0.0354	0.0366	0.0388
Max. Deviation (ppm)	6.61	6.82	7.05	7.48
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5190 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5189.9723	5189.9711	5189.9692	5189.9670
10	5189.9710	5189.9697	5189.9682	5189.9664
20	5189.9698	5189.9685	5189.9669	5189.9650
30	5189.9684	5189.9673	5189.9659	5189.9643
35	5189.9668	5189.9653	5189.9637	5189.9617
Max. Deviation (MHz)	0.0332	0.0347	0.0363	0.0383
Max. Deviation (ppm)	6.40	6.69	6.99	7.38
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5754.9756	5754.9742	5754.9724	5754.9703
110.00	5754.9744	5754.9731	5754.9715	5754.9696
93.50	5754.9730	5754.9719	5754.9707	5754.9685
Max. Deviation (MHz)	0.0270	0.0281	0.0293	0.0315
Max. Deviation (ppm)	4.69	4.88	5.09	5.47
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5754.9766	5754.9754	5754.9735	5754.9713
10	5754.9753	5754.9740	5754.9725	5754.9707
20	5754.9741	5754.9728	5754.9712	5754.9693
30	5754.9727	5754.9716	5754.9702	5754.9686
35	5754.9711	5754.9696	5754.9680	5754.9660
Max. Deviation (MHz)	0.0289	0.0304	0.0320	0.0340
Max. Deviation (ppm)	5.02	5.28	5.56	5.91
Result	Complies			

Mode: 80 MHz / Chain 2

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5210 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5209.9801	5209.9787	5209.9769	5209.9748
110.00	5209.9789	5209.9776	5209.9760	5209.9741
93.50	5209.9775	5209.9764	5209.9752	5209.9730
Max. Deviation (MHz)	0.0225	0.0236	0.0248	0.0270
Max. Deviation (ppm)	4.32	4.53	4.76	5.18
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5210 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5209.9814	5209.9802	5209.9783	5209.9761
10	5209.9801	5209.9788	5209.9773	5209.9755
20	5209.9789	5209.9776	5209.9760	5209.9741
30	5209.9775	5209.9764	5209.9750	5209.9734
35	5209.9759	5209.9744	5209.9728	5209.9708
Max. Deviation (MHz)	0.0241	0.0256	0.0272	0.0292
Max. Deviation (ppm)	4.63	4.91	5.22	5.60
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5774.9779	5774.9765	5774.9747	5774.9726
110.00	5774.9767	5774.9754	5774.9738	5774.9719
93.50	5774.9753	5774.9742	5774.9730	5774.9708
Max. Deviation (MHz)	0.0247	0.0258	0.0270	0.0292
Max. Deviation (ppm)	4.28	4.47	4.68	5.06
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5774.9795	5774.9783	5774.9764	5774.9742
10	5774.9782	5774.9769	5774.9754	5774.9736
20	5774.9770	5774.9757	5774.9741	5774.9722
30	5774.9756	5774.9745	5774.9731	5774.9715
35	5774.9740	5774.9725	5774.9709	5774.9689
Max. Deviation (MHz)	0.0260	0.0275	0.0291	0.0311
Max. Deviation (ppm)	4.50	4.76	5.04	5.39
Result	Complies			

4.9. Antenna Requirements

4.9.1. Limit

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

4.9.2. Antenna Connector Construction

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

5. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMI Test Receiver	R&S	ESCS 30	100355	9kHz ~ 2.75GHz	Apr. 22, 2015	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Dec. 02, 2014	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Dec. 02, 2014	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	150kHz ~ 30MHz	Dec. 03, 2014	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	Conduction (CO01-CB)
Bilog Antenna	Schaffner	CBL6112D	37880	20MHz ~ 2GHz	Sep. 03, 2015	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Oct. 22, 2015	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 21, 2015	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Feb. 24, 2015	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 12, 2015	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 18, 2016	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26GHz ~ 40GHz	Feb.10, 2015	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Oct. 27, 2015	Radiation (03CH01-CB)
EMI Receiver	Agilent	N9038A	MY52260123	9kHz ~ 8.4GHz	Jan. 21, 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	1 GHz ~ 40 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-2	N/A	1 GHz ~ 40 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 12, 2015*	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 12, 2014	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-7	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-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. 15, 2014	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. 15, 2014	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. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Power Sensor	Agilent	U2021XA	MY54320014	50MHz~18GHz	Mar. 23, 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%