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

FCC RADIO TEST REPORT

Applicant's company	**Ruckus Wireless, Inc.**
Applicant Address	350 West Java Drive Sunnyvale, California 94089 U.S.A
FCC ID	**S9GR310**
Manufacturer's company	**Lite-On Network Communication (Dongguan) Limited**
Manufacturer Address	30#Keji Rd., Yin Hu Industrial Area, Qingxi Town, DongGuan City, Guangdong, China

Product Name	ZoneFlex R310 Access Point
Brand Name	Ruckus
Model No.	R310
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5150 ~ 5250 MHz / 5725 ~ 5850 MHz
Received Date	Aug. 28, 2015
Final Test Date	Oct. 19, 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 v01, KDB662911 D01 v02r01, KDB644545 D03 v01.**

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

Testing Laboratory
1190

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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR590833AB	Rev. 01	Initial issue of report	Nov. 04, 2015

1. VERIFICATION OF COMPLIANCE

Product Name	:	ZoneFlex R310 Access Point
Brand Name	:	Ruckus
Model No.	:	R310
Applicant	:	Ruckus Wireless, Inc.
Test Rule Part(s)	:	47 CFR FCC Part 15 Subpart E § 15.407

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Aug. 28, 2015 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

Sam Chen

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	11.58 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	5.80 dB
4.5	15.407(a)	Power Spectral Density	Complies	6.21 dB
4.6	15.407(b)	Radiated Emissions	Complies	4.12 dB
4.7	15.407(b)	Band Edge Emissions	Complies	0.02 dB
4.8	15.407(g)	Frequency Stability	Complies	-
4.9	15.203	Antenna Requirements	Complies	-

3. GENERAL INFORMATION

3.1. Product Details

Items	Description
Product Type	WLAN (2TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	From power adapter or PoE
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: 16.84 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 18.06 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 36.61 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.54 MHz Band 4: IEEE 802.11a: 16.93 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 18.40 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.62 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.54 MHz
Maximum Conducted Output Power	Band 1: IEEE 802.11a: 24.20 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 24.13 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 24.04 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 19.48 dBm Band 4: IEEE 802.11a: 24.18 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 24.10 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 24.07 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 20.38 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Items	Description	
Communication Mode	☒ IP Based (Load Based)	☐ Frame Based
Beamforming Function	☐ With beamforming	☒ Without beamforming
Operating Mode	☐ Outdoor access point	
	☒ Indoor access point	
	☐ Fixed point-to-point access points	
	☐ Mobile and portable client devices	

Antenna and Band width

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

IEEE 11n/ac Spec.

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

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

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

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

3.2. Accessories

N/A

3.3. Table for Filed Antenna

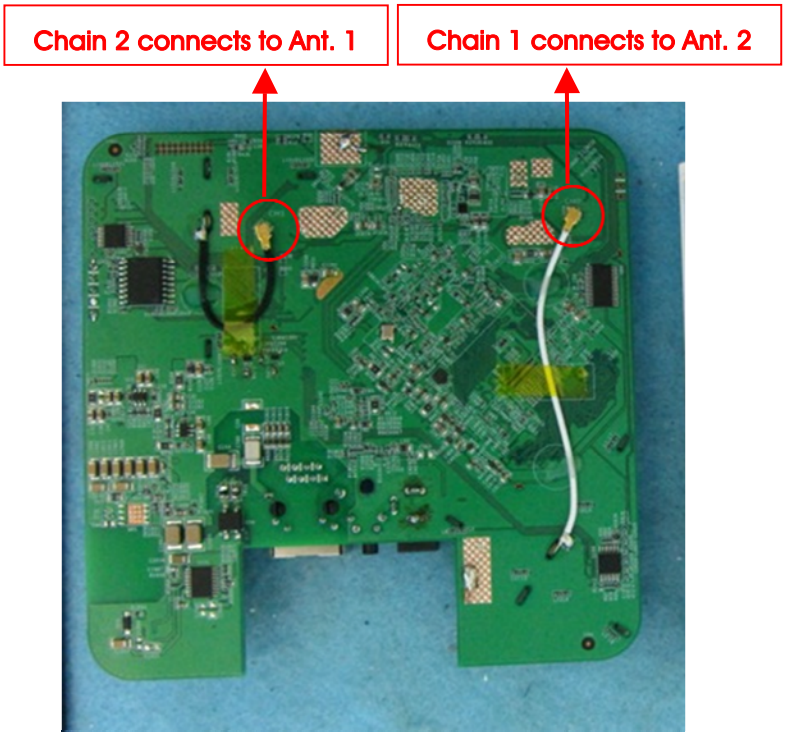
Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	
					2.4GHz	5GHz
1	Ruckus	R310	PCB Antenna	I-PEX	0	3
2	Ruckus	R310	PCB Antenna	I-PEX	0	3

Note: The EUT has two antennas.

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

Chain 1 and Chain 2 can be used as transmitting/receiving antenna.

Chain 1 and Chain 2 could transmit/receive simultaneously.



3.4. Table for Carrier Frequencies

There are three bandwidth systems.

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

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

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

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

3.5. Table for Test Modes

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

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

Band Edge Emission	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	1+2
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2
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 : VHT20/VHT40 covers HT20/HT40, due to same modulation. The power setting for 802.11n HT20 and HT40 are the same or lower than 802.11ac VHT20 and VHT40.

The following test modes were performed for all tests:

For Conducted Emission test:

Mode 1: EUT with Adapter

For Radiated Emission test<Below 1GHz>:

Mode 1: EUT with Adapter in Y axis

Mode 2: EUT with Adapter in Z axis

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

Mode 3: EUT with PoE in Z axis

Mode 2 generated the worst test result, so it was recorded in this report.

For Radiated Emission test<Above 1GHz>:

Radiated Emissions above 1GHz test was performed at its 2-axis (Y-axis and Z-axis). Z-axis was the worst case, so it's recorded in this report.

Mode 1: CTX + Place EUT in Z axis

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

The EUT could be applied with 2.4GHz WLAN function and 5GHz WLAN function; therefore Co-location Maximum Permissible Exposure (Please refer to FA590833) and Radiated Emission Co-location (please refer to Appendix B) tests are added for simultaneously transmit between 2.4GHz WLAN function and 5GHz WLAN function.

Note: The PoE and Adapter below are for measurement only, would not be marketed.

Power	Brand	Model	FCC ID
Adapter	Ruckus	HK-AD-120A100-US	N/A
PoE	Ruckus	740-64214-001	N/A

Note: The test configuration, test mode and test software were written in this test report are designated by the applicant.

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: CO01-CB

Support Unit	Brand	Model	FCC ID
NB*2	DELL	E6430	DoC
PC	DELL	T3400	DoC
LCD monitor	DELL	1704FPTt	DoC
Keyboard	iCooky	SK068	DoC
Mouse	Logitech	M-U0026	DoC
Modem	ACEEX	DM1414	IFAXDM1414
Printer	EPSON	LQ-300+	N/A
Adapter	Ruckus	HK-AD-120A100-US	N/A

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

Support Unit	Brand	Model	FCC ID
NB*3	DELL	E4300	DoC
Adapter	Ruckus	HK-AD-120A100-US	N/A

For Test Site No: 03CH01-CB (Above1GHz)

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	DoC
Adapter	Ruckus	HK-AD-120A100-US	N/A

For Test Site No: TH01-CB

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	DoC
Adapter	Ruckus	HK-AD-120A100-US	N/A

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 Version2.3					
Mode	Test Frequency (MHz)					
	NCB: 20MHz					
	5180 MHz	5200 MHz	5240 MHz	5745 MHz	5785 MHz	5825 MHz
802.11a	18.5	18.5	18.5	18.5	19	18.5
802.11ac MCS0/Nss1 VHT20	18.5	18.5	18.5	18.5	19	18.5
Mode	NCB: 40MHz					
802.11ac MCS0/Nss1 VHT40	5190 MHz		5230 MHz		5755 MHz	5795 MHz
	19		19		19	19.5
Mode	NCB: 80MHz					
802.11ac MCS0/Nss1 VHT80	5210 MHz				5775 MHz	
	15.5				16	

3.9. EUT Operation during Test

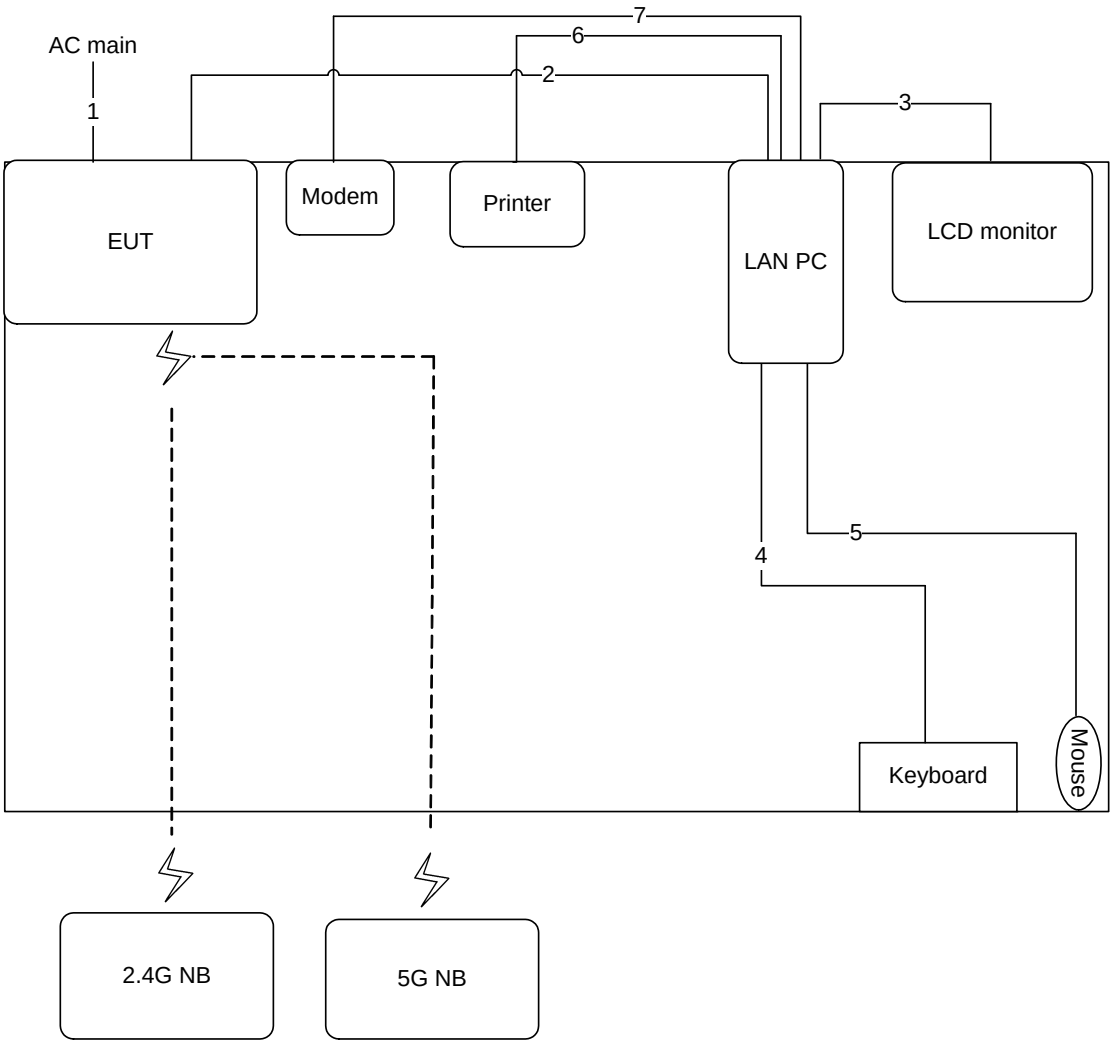
The EUT was programmed to be in continuously transmitting mode.

3.10. Duty Cycle

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11a	2.022	2.087	96.87	0.14	0.49
802.11ac MCS0/Nss1 VHT20	1.882	1.947	96.67	0.15	0.53
802.11ac MCS0/Nss1 VHT40	0.903	1.000	90.35	0.44	1.11
802.11ac MCS0/Nss1 VHT80	0.417	0.509	81.93	0.87	2.40

3.11. Test Configurations

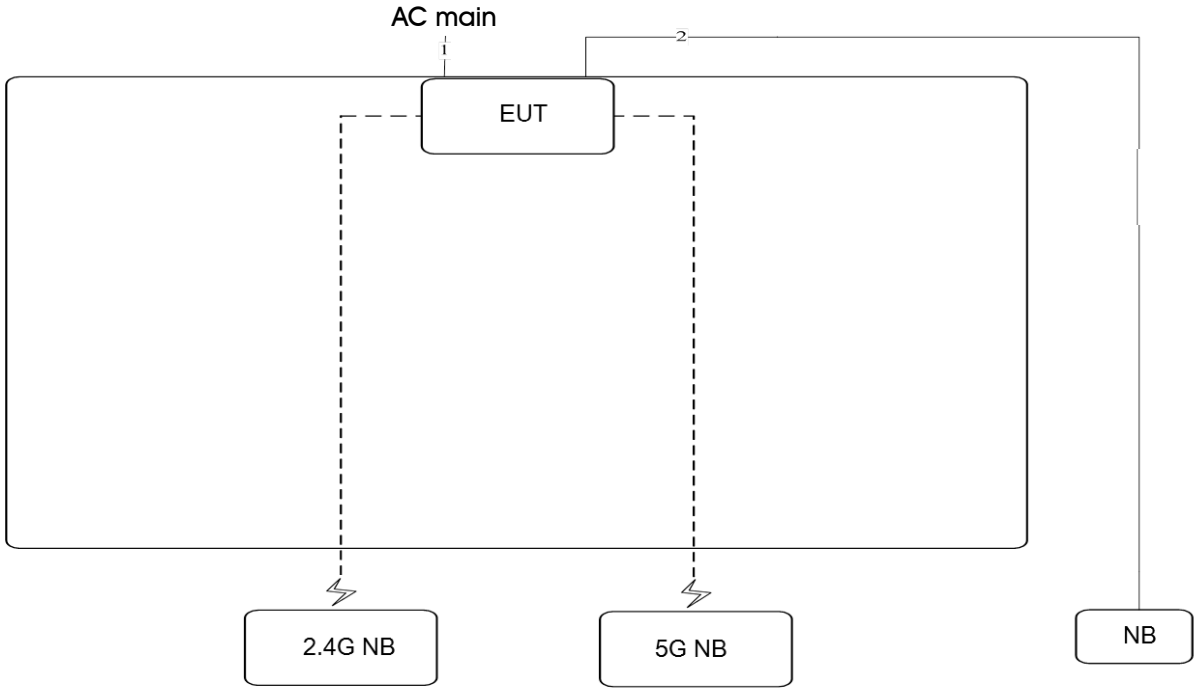
3.11.1. AC Power Line Conduction Emissions Test Configuration



Item	Connection	Shielded	Length
1	Power cable	No	1.8m
2	RJ-45 cable	No	3m
3	VGA cable	Yes	1.8m
4	USB cable	Yes	1.8m
5	USB cable	Yes	1.8m
6	USB cable	Yes	1.8m
7	RS-232 cable	Yes	1.8m

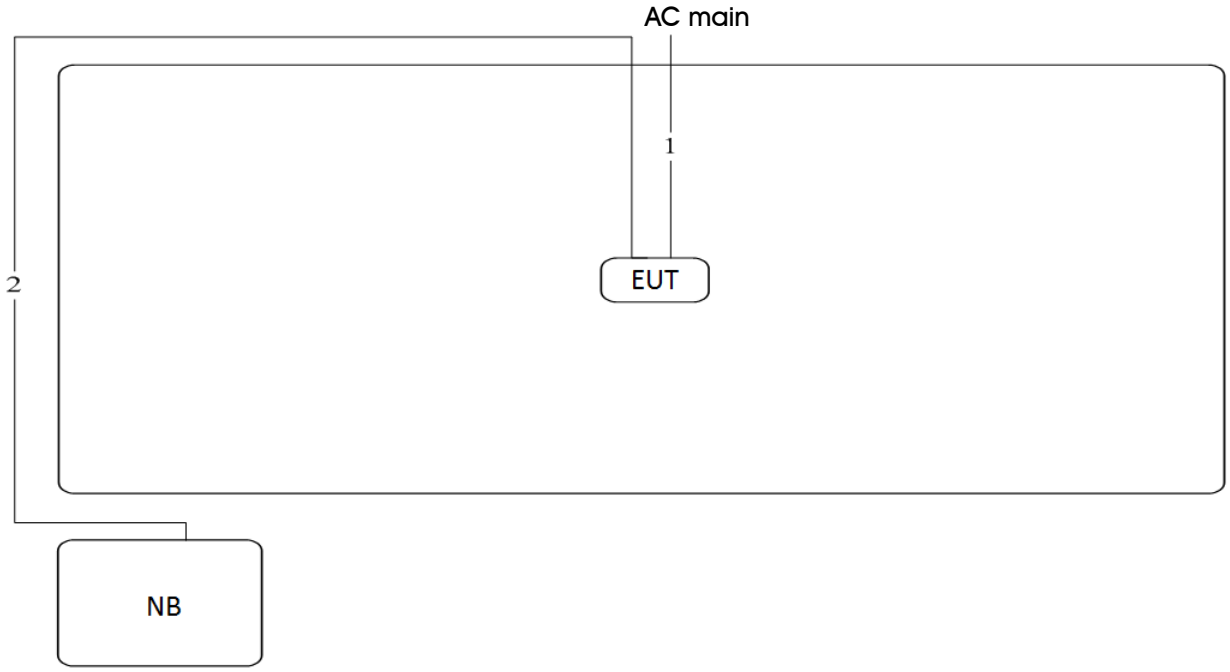
3.11.2. Radiation Emissions Test Configuration

Test Configuration: 30MHz ~1GHz



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

Test Configuration: above 1GHz



Item	Connection	Shielded	Length(m)
1	Power cable	No	1.8m
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

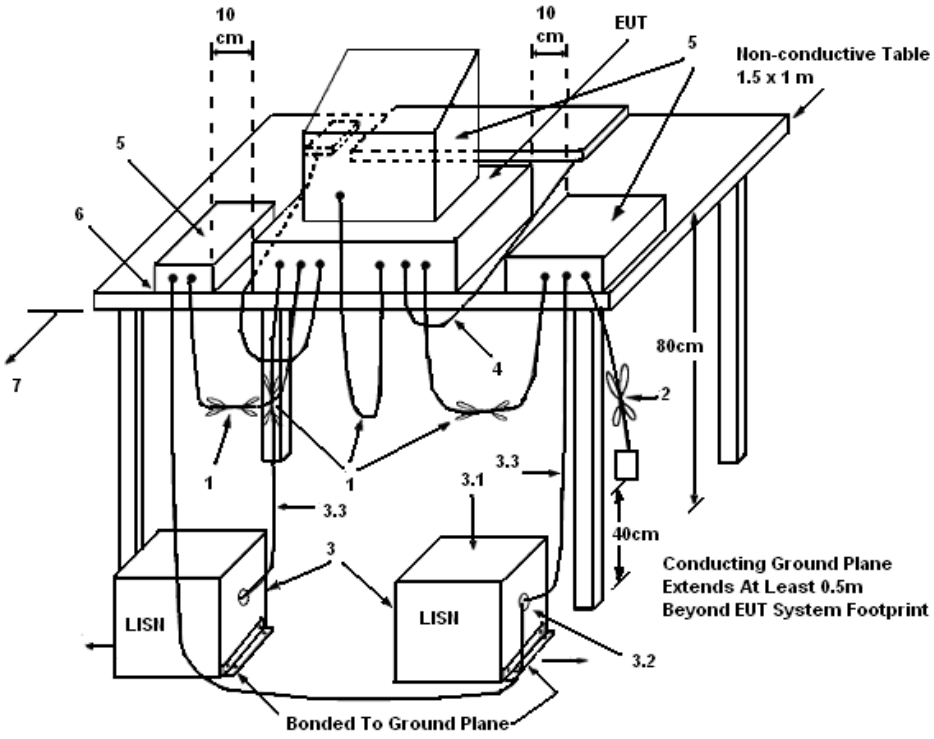
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

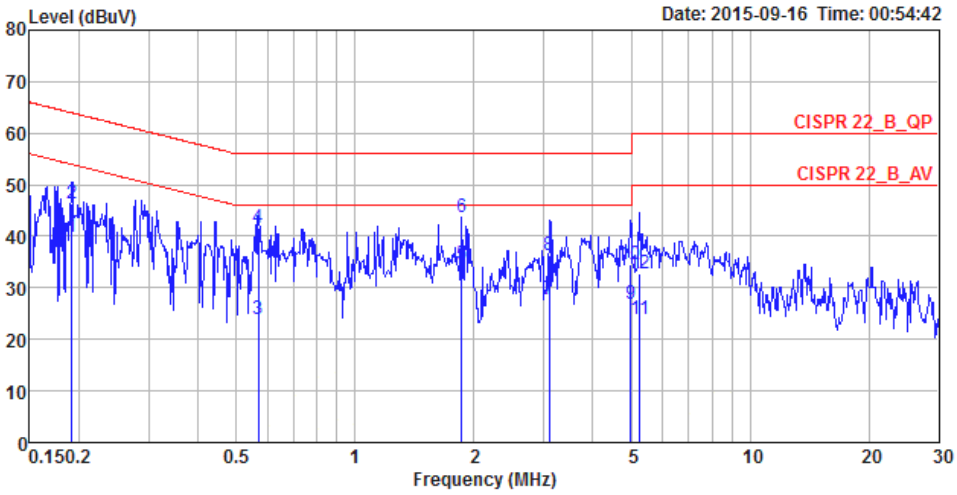
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

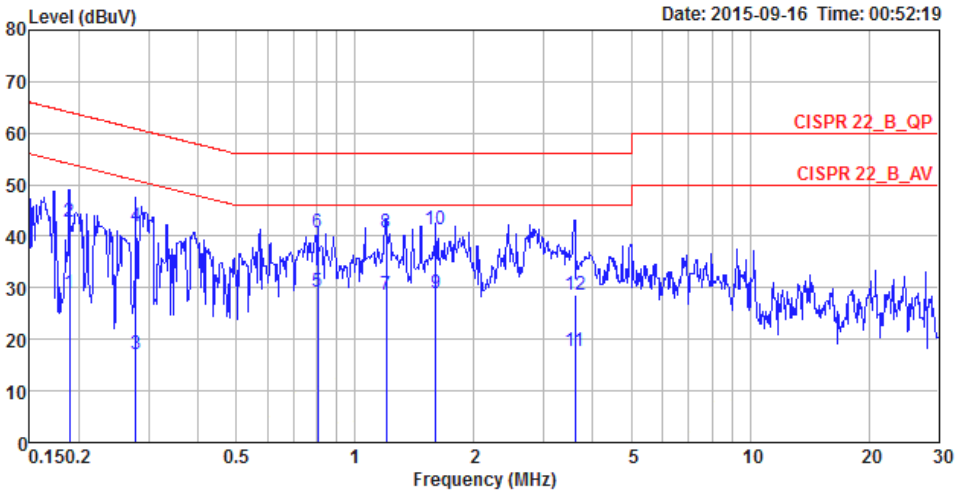
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	23°C	Humidity	65%
Test Engineer	Deven Huang	Phase	Line
Configuration	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1914	39.72	-14.26	53.98	29.77	9.93	0.02	LINE	Average
2	0.1914	46.23	-17.75	63.98	36.28	9.93	0.02	LINE	QP
3	0.5701	23.80	-22.20	46.00	13.82	9.94	0.04	LINE	Average
4	0.5701	41.48	-14.52	56.00	31.50	9.94	0.04	LINE	QP
5	1.8581	34.42	-11.58	46.00	24.37	9.99	0.06	LINE	Average
6	1.8581	43.84	-12.16	56.00	33.79	9.99	0.06	LINE	QP
7	3.1066	27.69	-18.31	46.00	17.63	10.01	0.05	LINE	Average
8	3.1066	36.40	-19.60	56.00	26.34	10.01	0.05	LINE	QP
9	4.9782	26.77	-19.23	46.00	16.61	10.06	0.10	LINE	Average
10	4.9782	34.55	-21.45	56.00	24.39	10.06	0.10	LINE	QP
11	5.2491	23.92	-26.08	50.00	13.74	10.07	0.11	LINE	Average
12	5.2491	32.88	-27.12	60.00	22.70	10.07	0.11	LINE	QP

Temperature	23°C	Humidity	65%
Test Engineer	Deven Huang	Phase	Neutral
Configuration	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1894	28.84	-25.22	54.06	19.03	9.79	0.02	NEUTRAL	Average
2	0.1894	42.77	-21.29	64.06	32.96	9.79	0.02	NEUTRAL	QP
3	0.2788	17.07	-33.78	50.85	7.24	9.79	0.04	NEUTRAL	Average
4	0.2788	41.82	-19.03	60.85	31.99	9.79	0.04	NEUTRAL	QP
5	0.8045	29.35	-16.65	46.00	19.50	9.81	0.04	NEUTRAL	Average
6	0.8045	40.74	-15.26	56.00	30.89	9.81	0.04	NEUTRAL	QP
7	1.1970	28.73	-17.27	46.00	18.86	9.82	0.05	NEUTRAL	Average
8	1.1970	40.72	-15.28	56.00	30.85	9.82	0.05	NEUTRAL	QP
9	1.6020	29.08	-16.92	46.00	19.19	9.83	0.06	NEUTRAL	Average
10	1.6020	41.36	-14.64	56.00	31.47	9.83	0.06	NEUTRAL	QP
11	3.6034	17.81	-28.19	46.00	7.88	9.87	0.06	NEUTRAL	Average
12	3.6034	28.77	-27.23	56.00	18.84	9.87	0.06	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

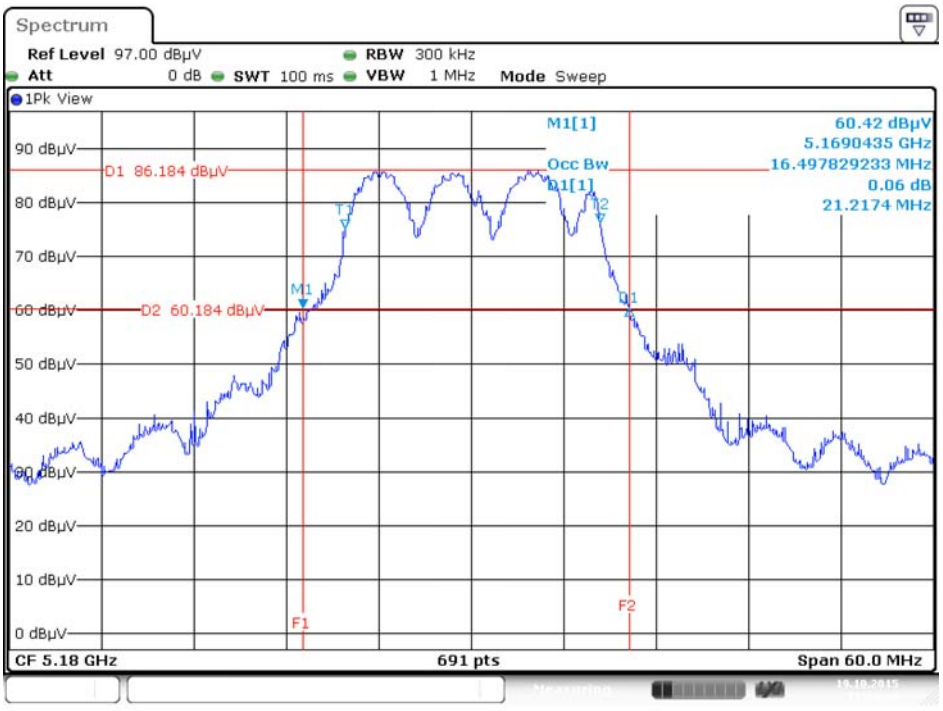
The EUT was programmed to be in continuously transmitting mode.

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

Temperature	20°C	Humidity	64%
Test Engineer	Roki Liu		

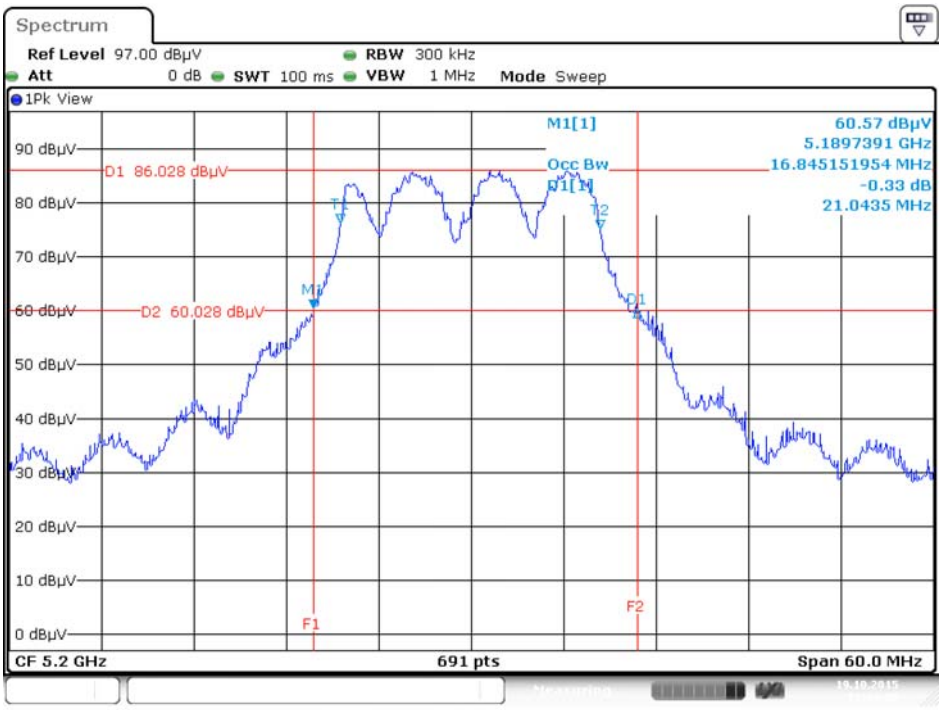
Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5180 MHz	21.21	16.49
	5200 MHz	21.04	16.84
	5240 MHz	21.65	16.75
	5745 MHz	21.56	15.89
	5785 MHz	20.95	16.93
	5825 MHz	21.30	16.06
802.11ac MCS0/Nss1 VHT20	5180 MHz	23.04	18.06
	5200 MHz	21.65	17.97
	5240 MHz	20.86	17.71
	5745 MHz	24.08	18.40
	5785 MHz	22.95	18.23
	5825 MHz	22.08	18.23
802.11ac MCS0/Nss1 VHT40	5190 MHz	43.47	36.61
	5230 MHz	43.62	36.46
	5755 MHz	45.36	37.62
	5795 MHz	45.21	37.33
802.11ac MCS0/Nss1 VHT80	5210 MHz	84.05	75.54
	5775 MHz	82.02	75.54

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



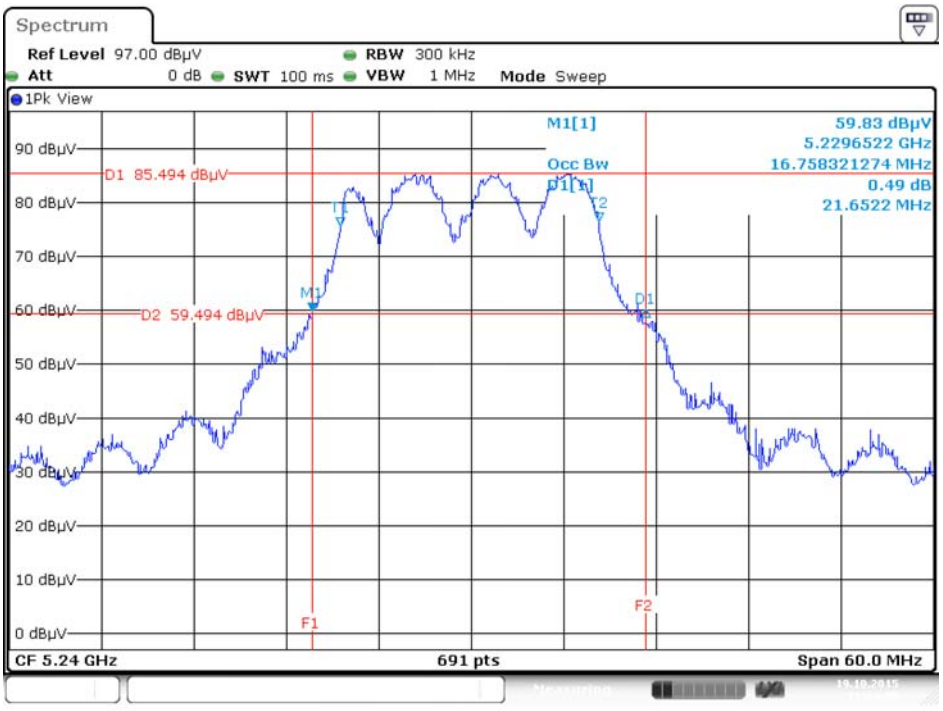
Date: 19.OCT.2015 13:44:34

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



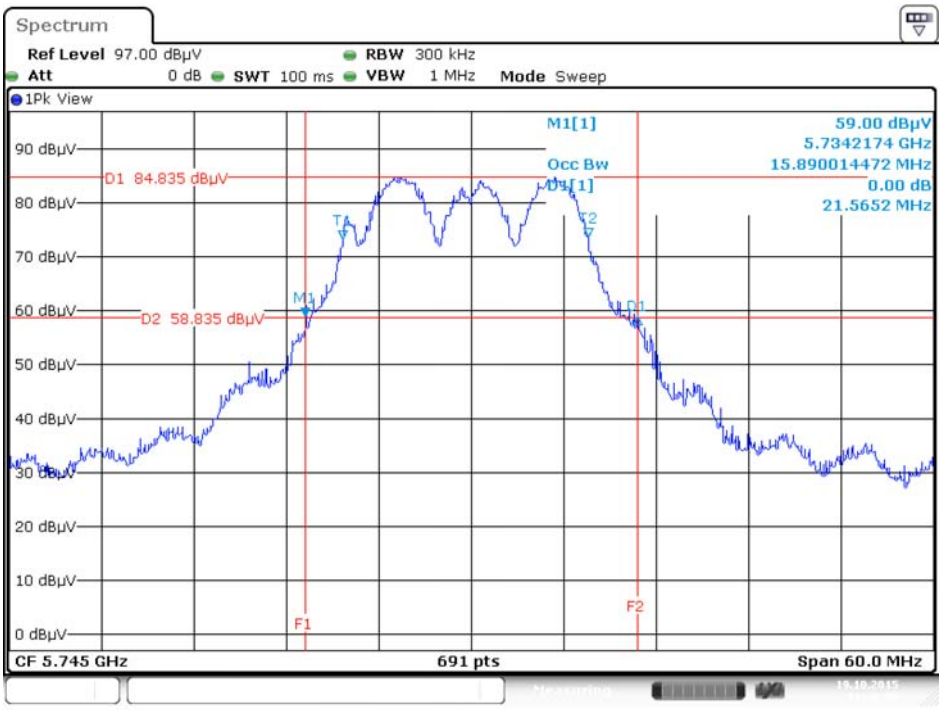
Date: 19.OCT.2015 13:44:09

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



Date: 19.OCT.2015 13:44:58

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



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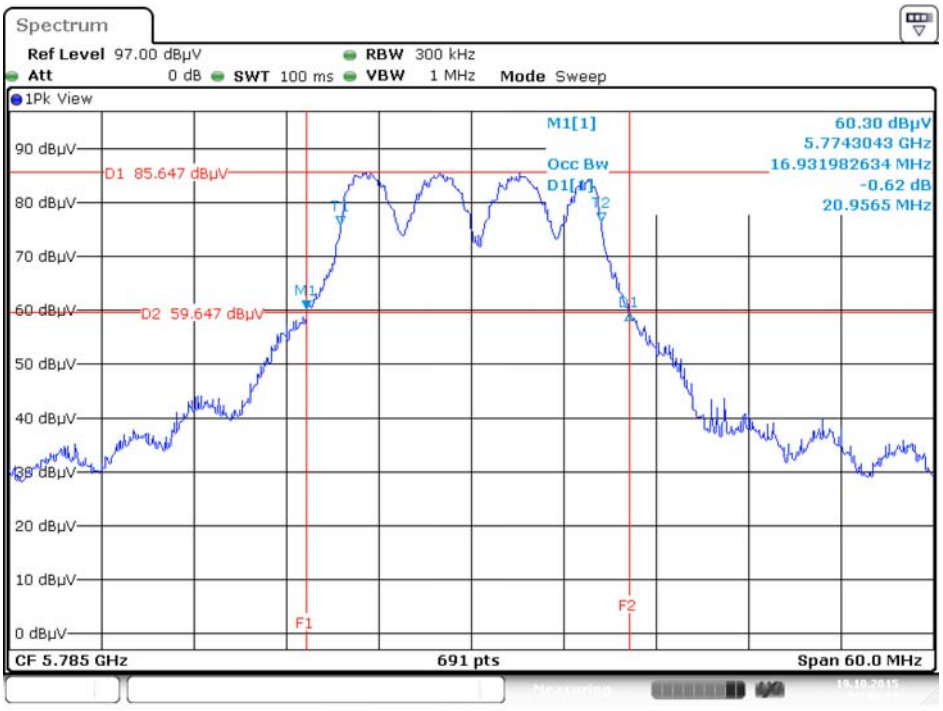
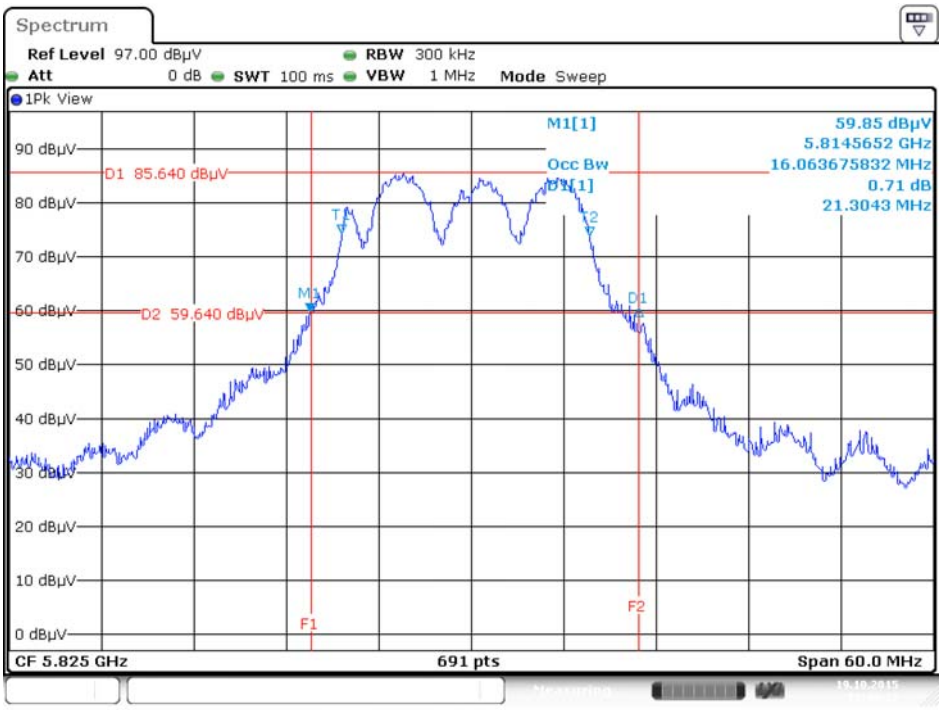
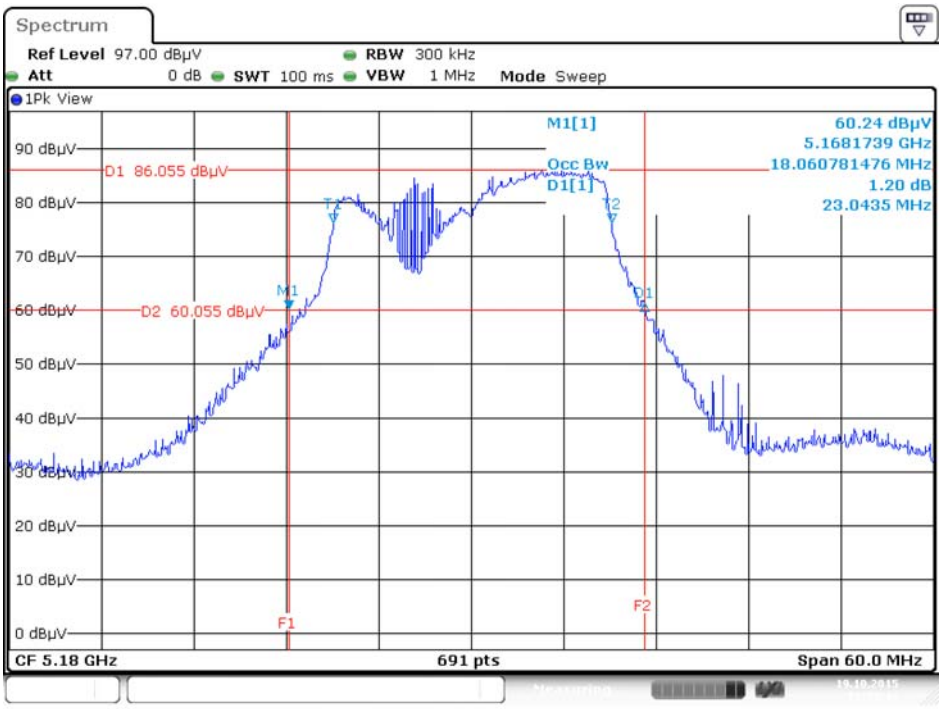
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 / 5785 MHz



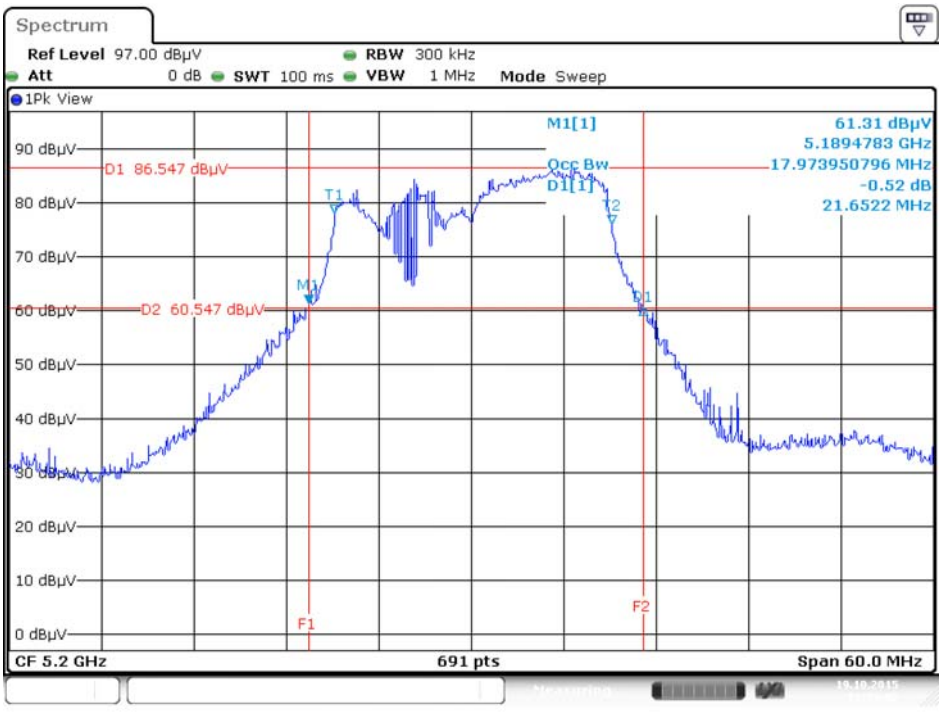
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 / 5825 MHz



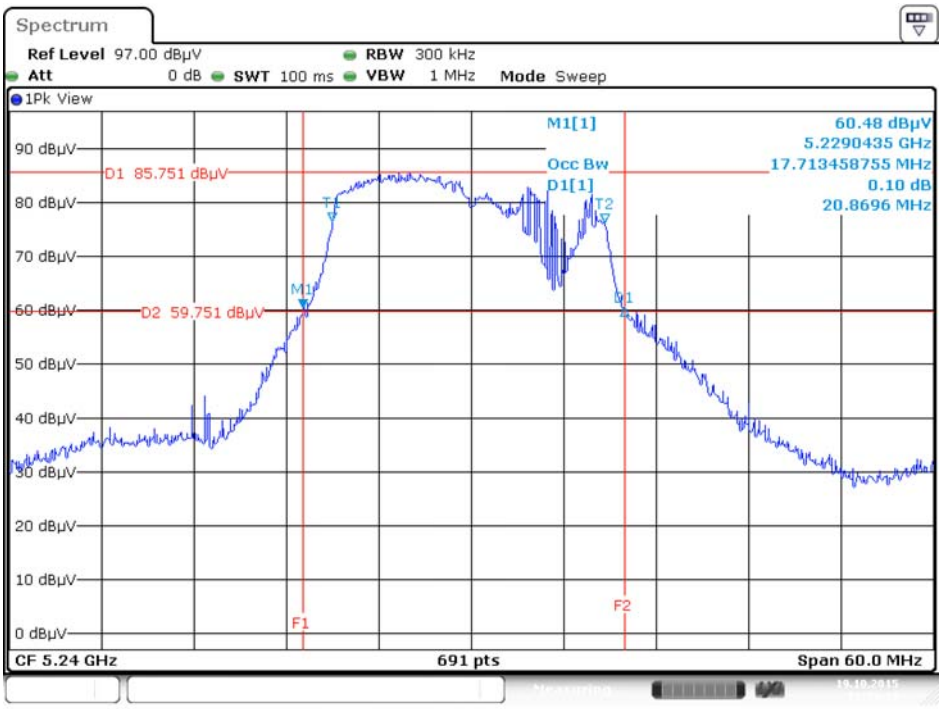
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 / 5180 MHz



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

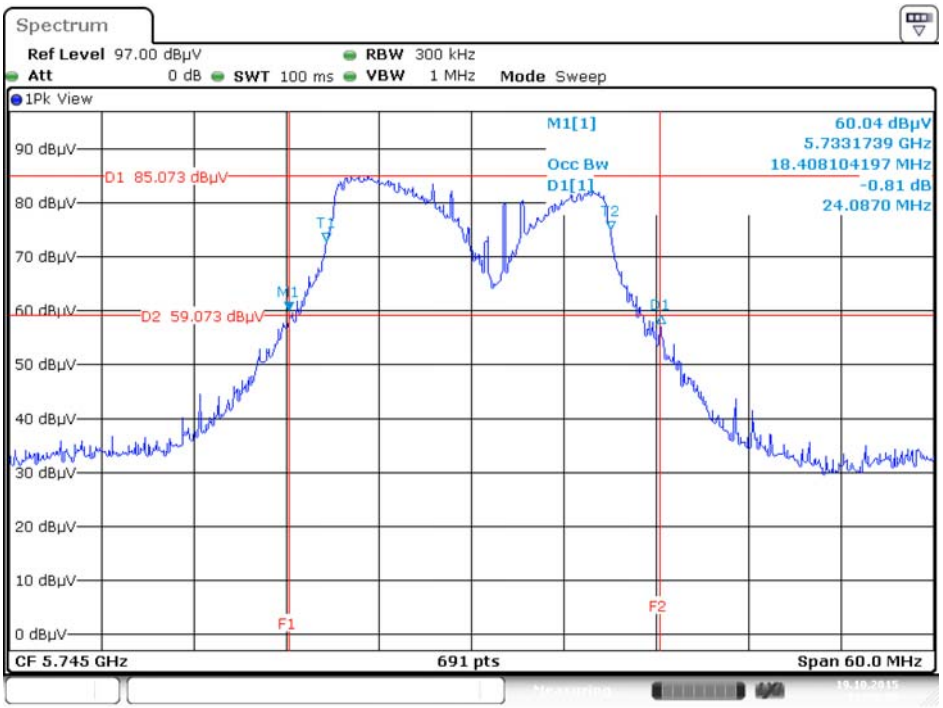


26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 / 5240 MHz



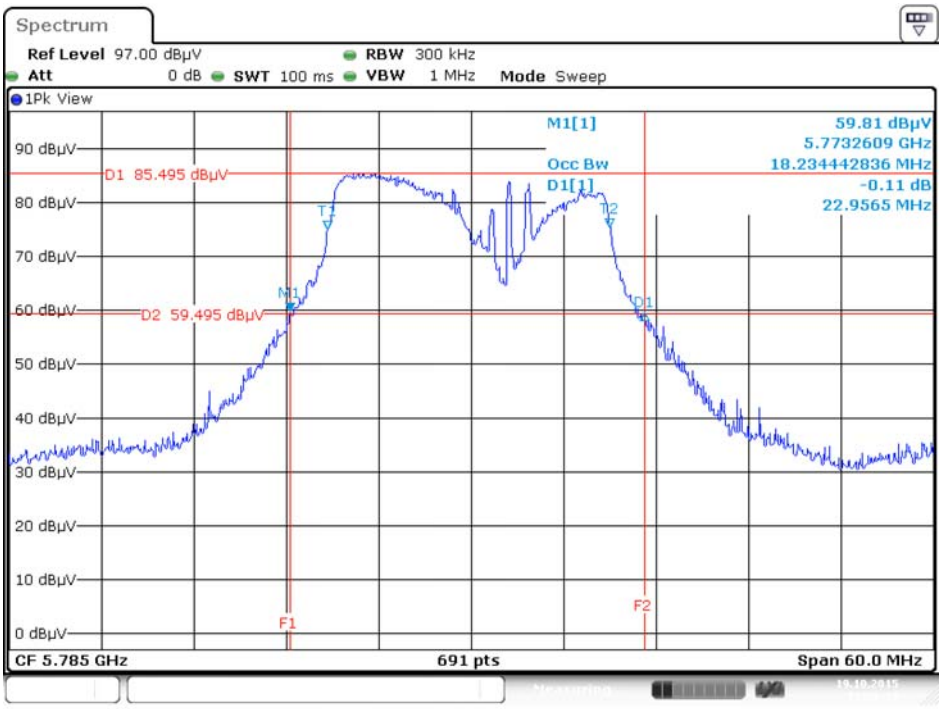
Date: 19.OCT.2015 13:54:18

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

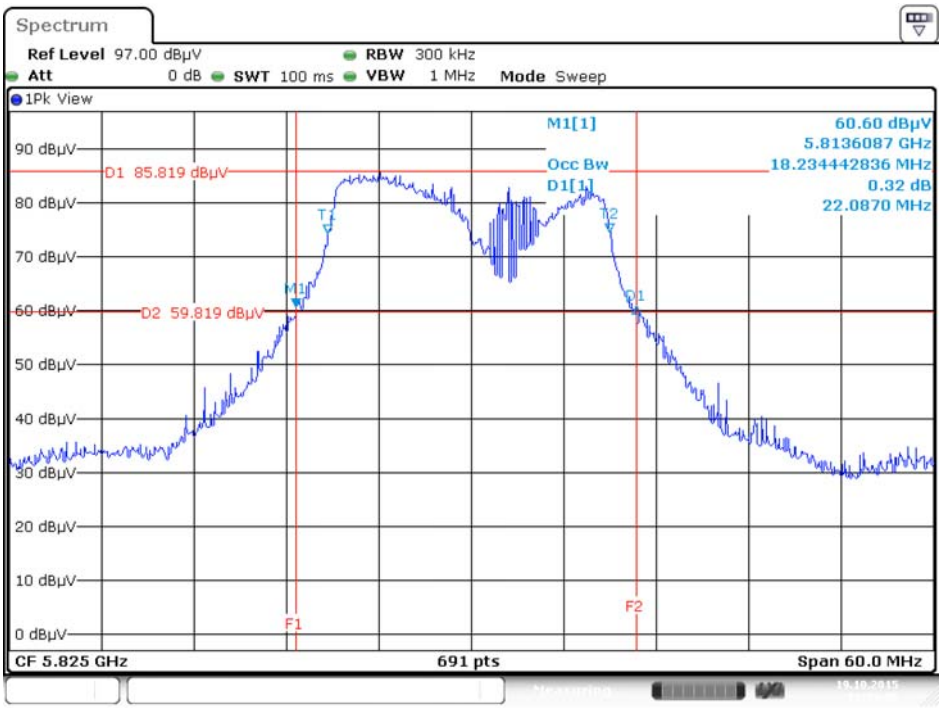


Date: 19.OCT.2015 13:55:59

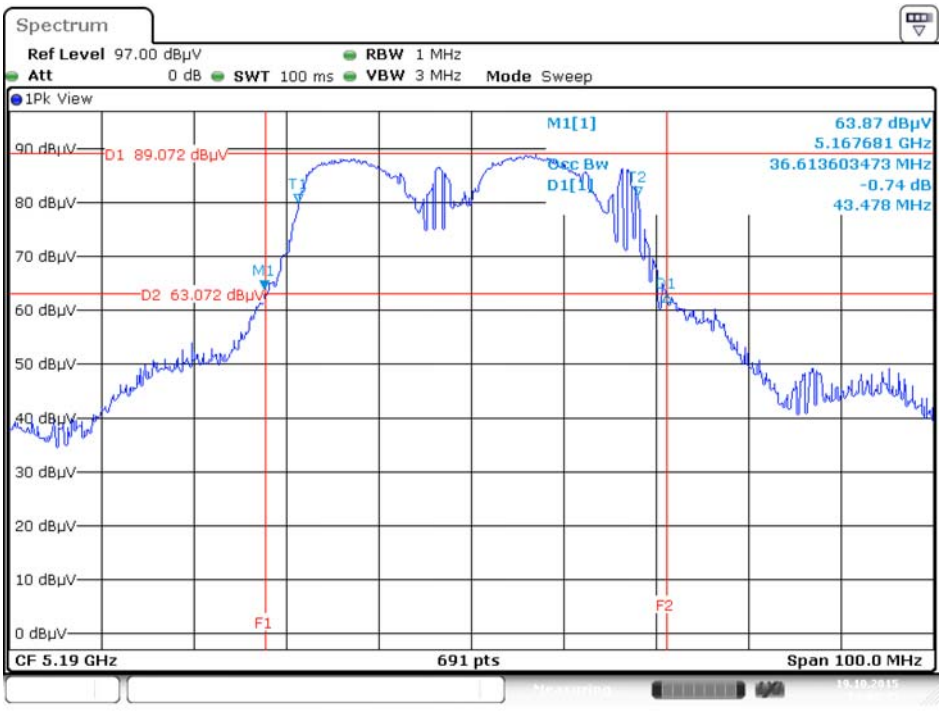
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 / 5785 MHz



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



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



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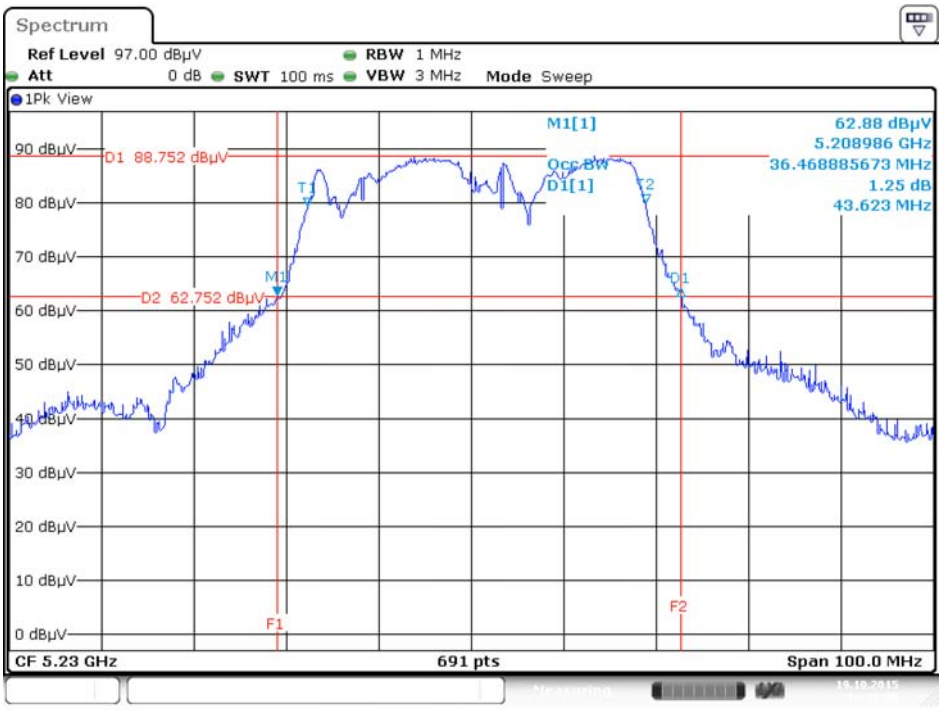
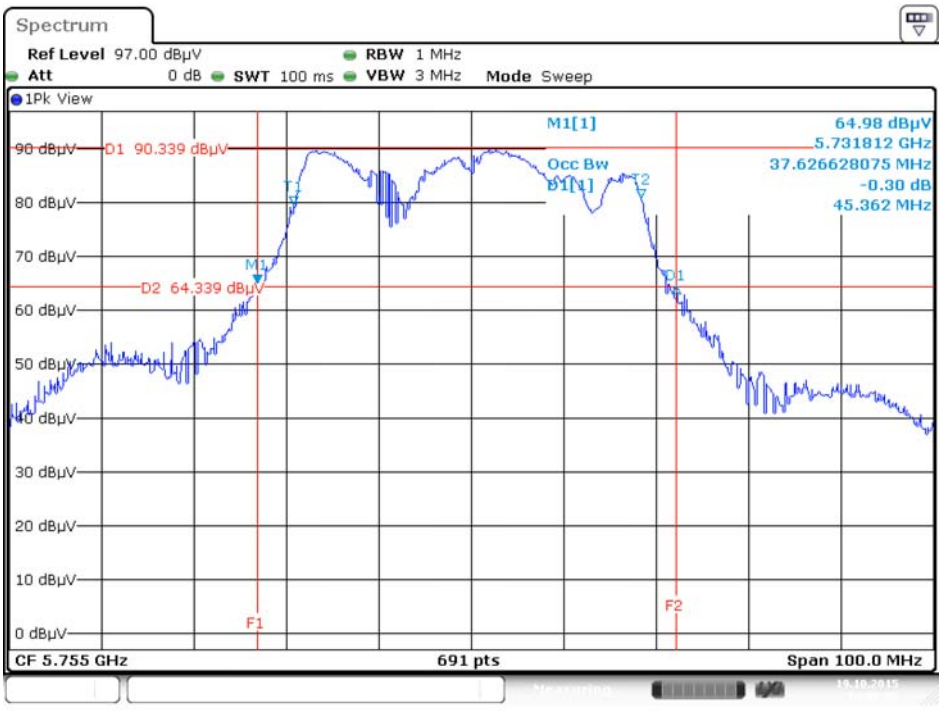
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 / 5230 MHz



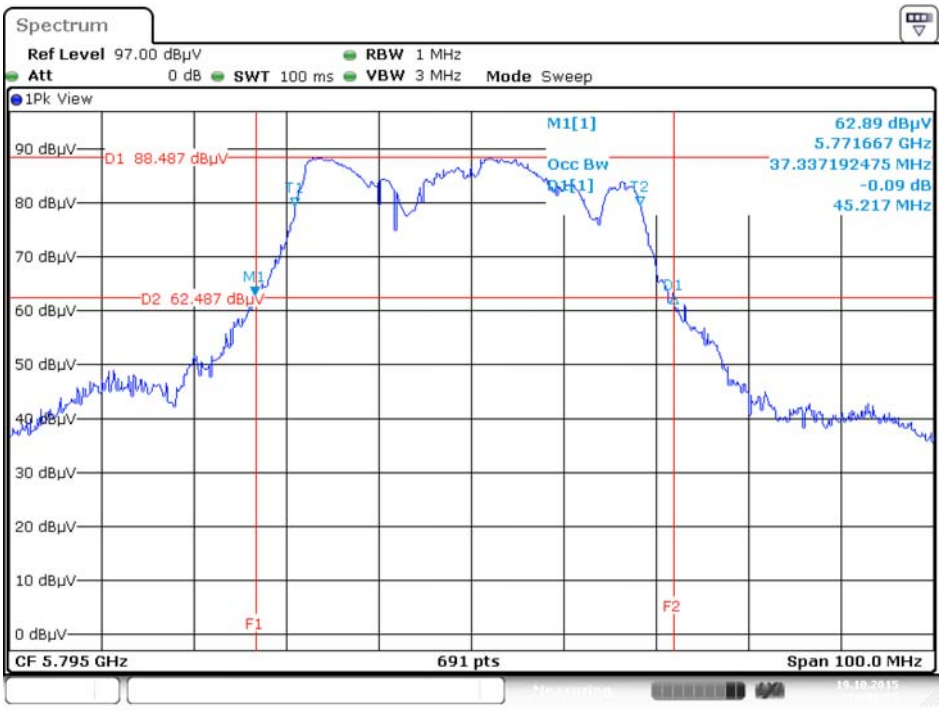
Date: 19.OCT.2015 14:01:05

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



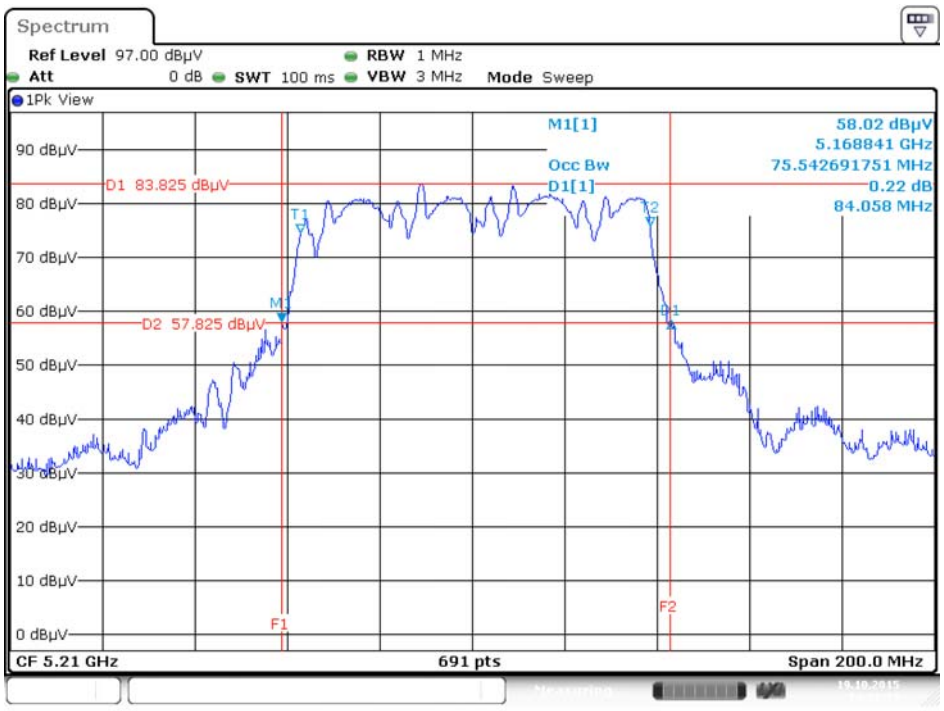
Date: 19.OCT.2015 14:02:27

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



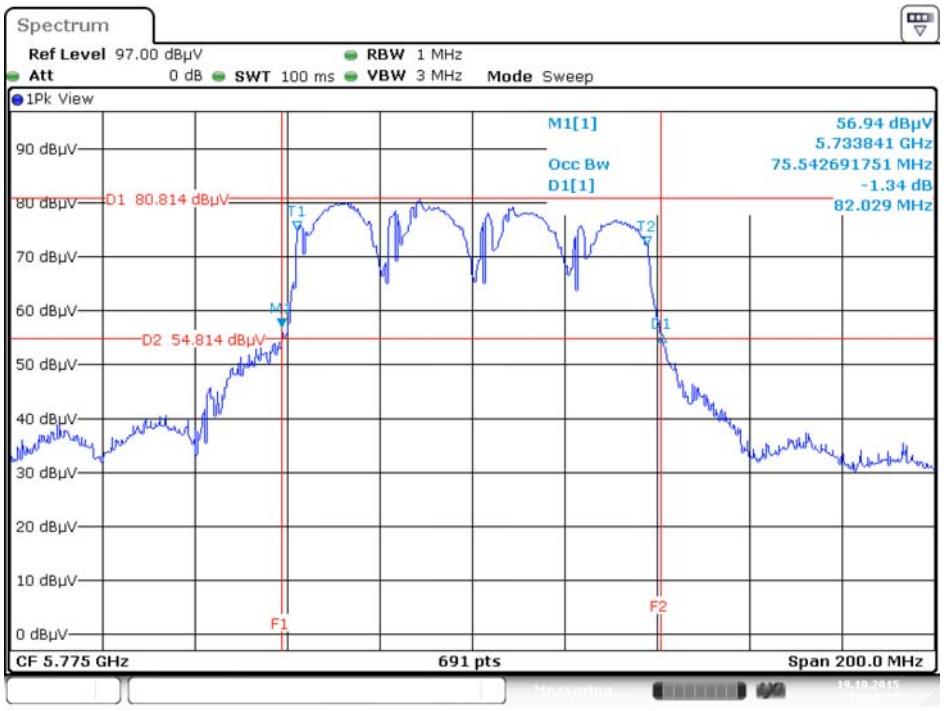
Date: 19.OCT.2015 14:02:51

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



Date: 19.OCT.2015 14:11:13

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



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4.3. 6dB Spectrum Bandwidth Measurement

4.3.1. Limit

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

4.3.2. Measuring Instruments and Setting

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

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

4.3.3. Test Procedures

For Radiated 6dB Bandwidth Measurement:

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

4.3.4. Test Setup Layout

For Radiated 6dB Bandwidth Measurement:

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

4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.3.7. Test Result of 6dB Spectrum Bandwidth

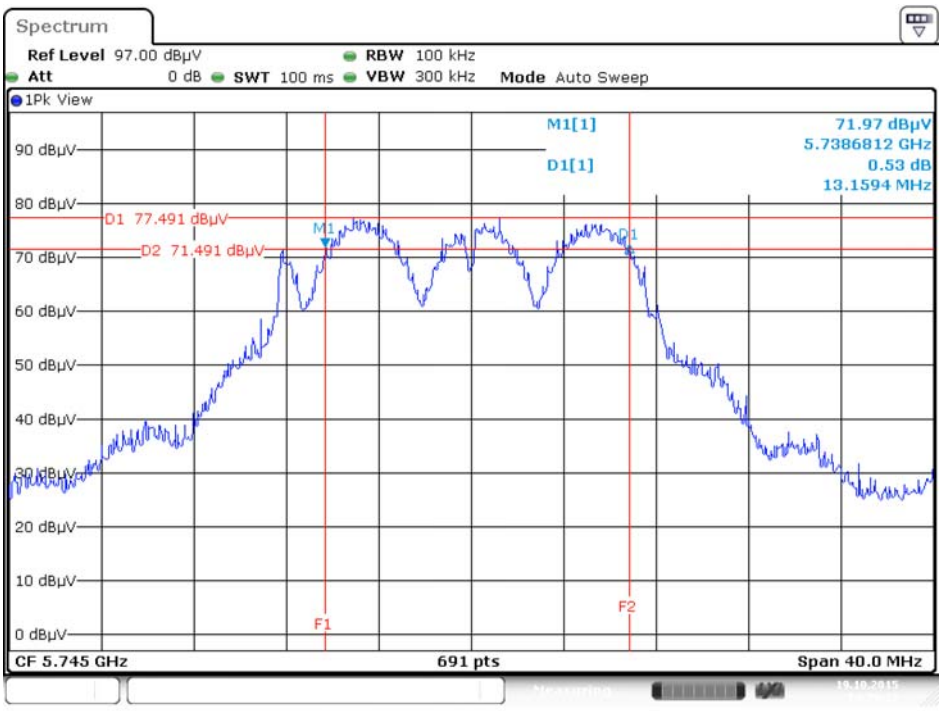
Temperature	20°C	Humidity	64%
Test Engineer	Roki Liu		

Mode	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11a	5745 MHz	13.15	500	Complies
	5785 MHz	16.40	500	Complies
	5825 MHz	15.01	500	Complies
802.11ac MCS0/Nss1 VHT20	5745 MHz	17.62	500	Complies
	5785 MHz	17.56	500	Complies
	5825 MHz	17.56	500	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	34.43	500	Complies
	5795 MHz	34.43	500	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	69.56	500	Complies

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

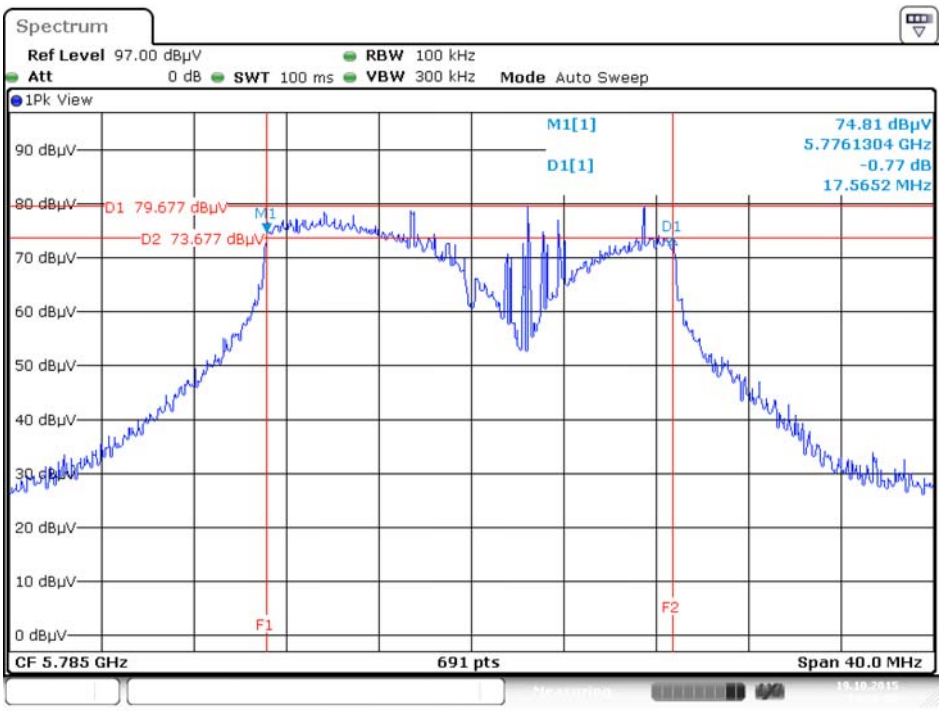
For plots, only the channel with worse result was shown.

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



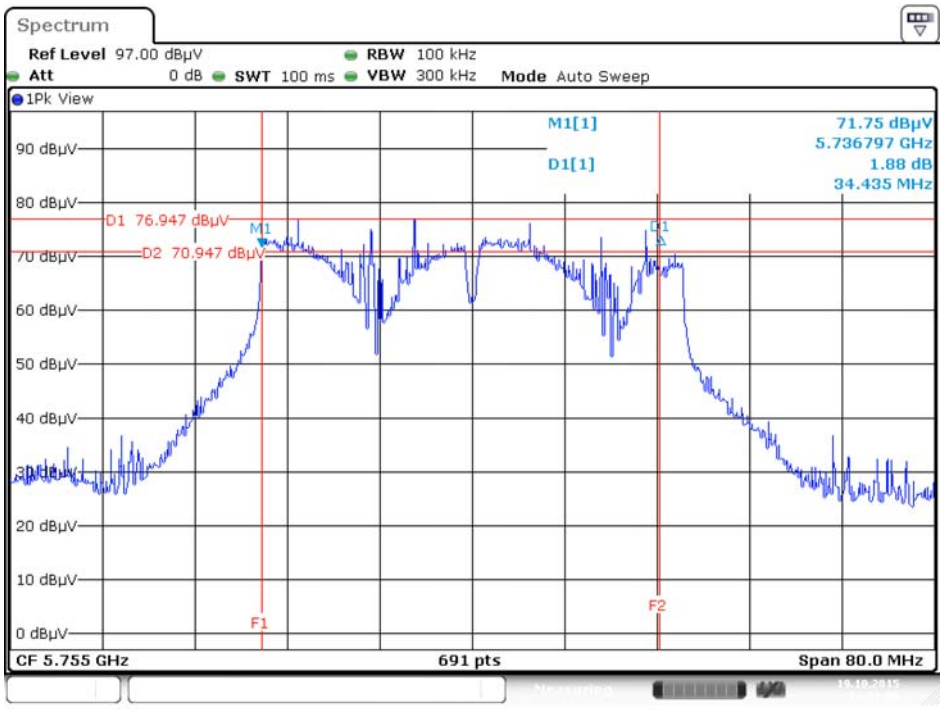
Date: 19.OCT.2015 14:29:17

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



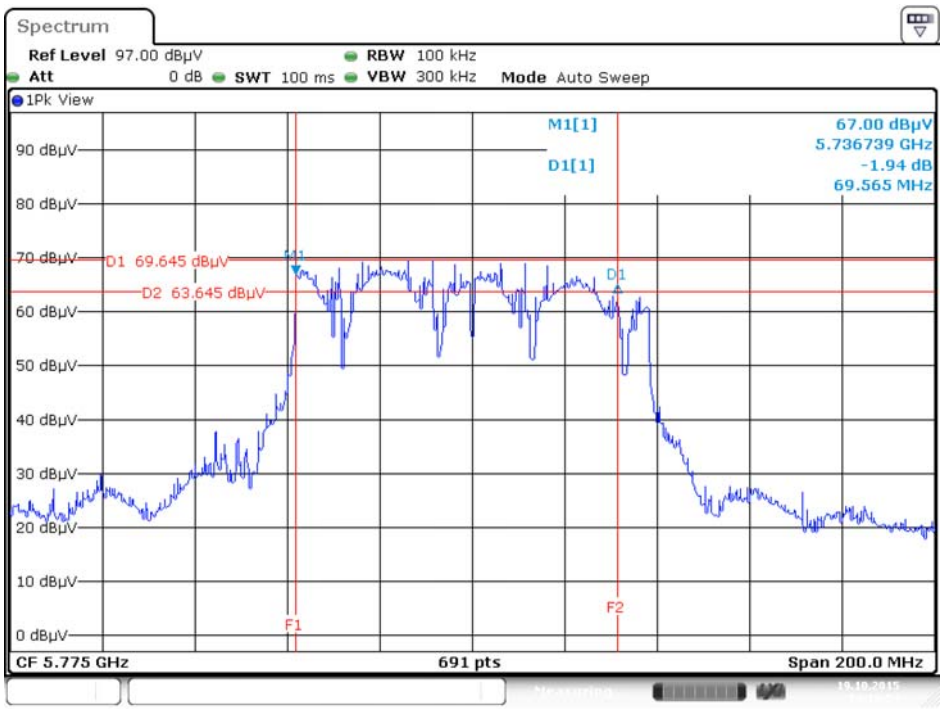
Date: 19.OCT.2015 14:26:29

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



Date: 19.OCT.2015 14:21:56

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



Date: 19.OCT.2015 14:19:54

4.4. Maximum Conducted Output Power Measurement

4.4.1. Limit

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

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

4.4.2. Measuring Instruments and Setting

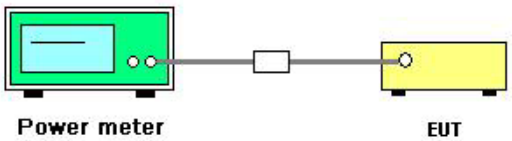
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Detector	AVERAGE

4.4.3. Test Procedures

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

4.4.4. Test Setup Layout



4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.4.7. Test Result of Maximum Conducted Output Power

Temperature	20°C	Humidity	64%
Test Engineer	Roki Liu	Test Date	Sep. 16, 2015

Mode	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
802.11a	5180 MHz	21.04	21.12	24.09	30.00	Complies
	5200 MHz	21.02	21.34	24.19	30.00	Complies
	5240 MHz	21.04	21.33	24.20	30.00	Complies
	5745 MHz	21.21	21.12	24.18	30.00	Complies
	5785 MHz	21.12	21.17	24.16	30.00	Complies
	5825 MHz	21.09	21.12	24.12	30.00	Complies
802.11ac MCS0/Nss1 VHT20	5180 MHz	21.02	21.22	24.13	30.00	Complies
	5200 MHz	21.12	21.06	24.10	30.00	Complies
	5240 MHz	21.04	21.02	24.04	30.00	Complies
	5745 MHz	21.02	21.03	24.04	30.00	Complies
	5785 MHz	21.09	21.08	24.10	30.00	Complies
	5825 MHz	21.05	20.94	24.01	30.00	Complies
802.11ac MCS0/Nss1 VHT40	5190 MHz	20.46	20.93	23.71	30.00	Complies
	5230 MHz	21.04	21.02	24.04	30.00	Complies
	5755 MHz	20.52	20.15	23.35	30.00	Complies
	5795 MHz	21.08	21.04	24.07	30.00	Complies
802.11ac MCS0/Nss1 VHT80	5210 MHz	16.58	16.36	19.48	30.00	Complies
	5775 MHz	17.51	17.22	20.38	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

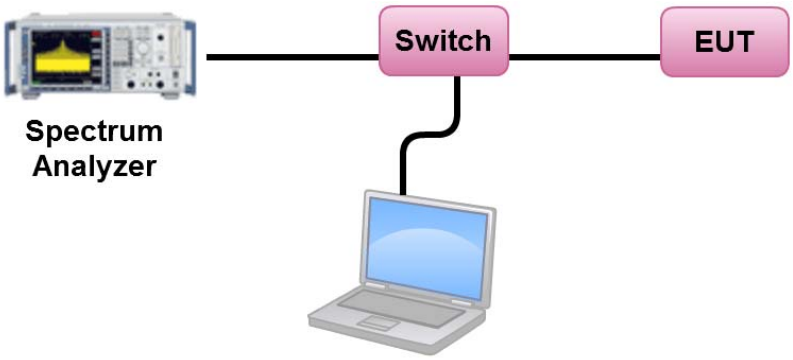
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.5.4. Test Setup Layout



4.5.5. Test Deviation

There is no deviation with the original standard.

4.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.5.7. Test Result of Power Spectral Density

Temperature	20°C	Humidity	64%
Test Engineer	Roki Liu		

Configuration IEEE 802.11a / Chain 1 + Chain 2

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	10.78	16.99	Complies
40	5200 MHz	10.67	16.99	Complies
48	5240 MHz	10.60	16.99	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ = 6.01dBi, so limit=17-(6.01-6)=16.99dBm/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	10.47	-3.01	7.46	29.99	Complies
157	5785 MHz	10.86	-3.01	7.85	29.99	Complies
165	5825 MHz	10.46	-3.01	7.45	29.99	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ = 6.01dBi, so limit=30-(6.01-6)=29.99dBm/500kHz

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	10.48	16.99	Complies
40	5200 MHz	10.42	16.99	Complies
48	5240 MHz	10.21	16.99	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$ = 6.01dBi, so limit=17-(6.01-6)=16.99dBm/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	10.30	-3.01	7.29	29.99	Complies
157	5785 MHz	10.58	-3.01	7.57	29.99	Complies
165	5825 MHz	10.32	-3.01	7.31	29.99	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$ = 6.01dBi, so limit=30-(6.01-6)=29.99dBm/500kHz

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	7.57	16.99	Complies
46	5230 MHz	7.50	16.99	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ = 6.01dBi, so limit=17-(6.01-6)=16.99dBm/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	7.20	-3.01	4.19	29.99	Complies
159	5795 MHz	7.75	-3.01	4.74	29.99	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ = 6.01dBi, so limit=30-(6.01-6)=29.99dBm/500kHz

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
42	5210 MHz	0.29	16.99	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$ = 6.01dBi, so limit=17-(6.01-6)=16.99dBm/MHz

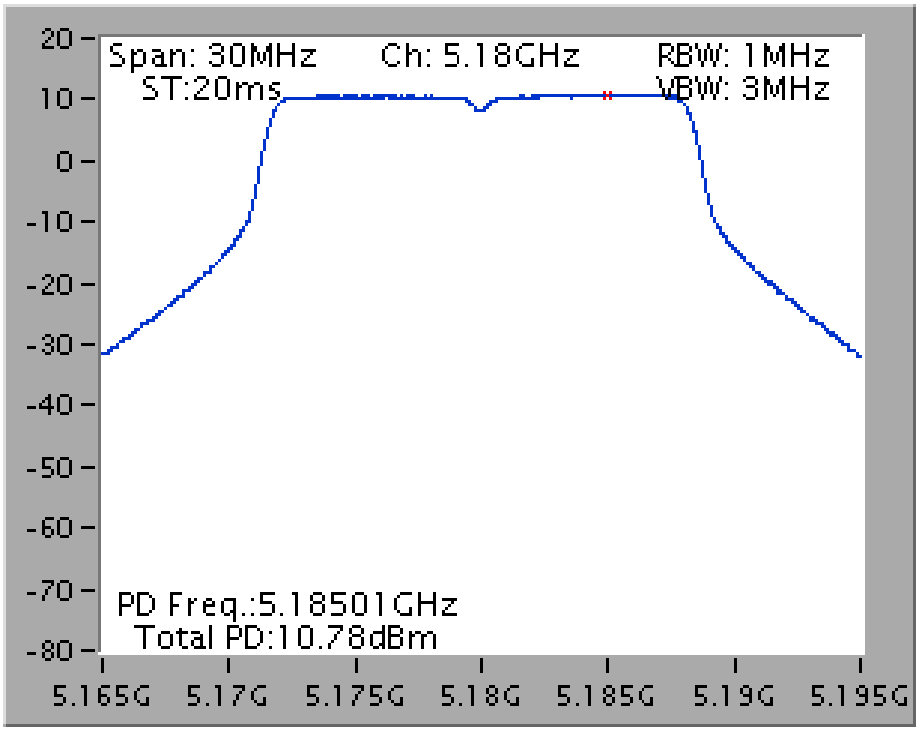
Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
155	5775 MHz	1.10	-3.01	-1.91	29.99	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$ = 6.01dBi, so limit=30-(6.01-6)=29.99dBm/500kHz

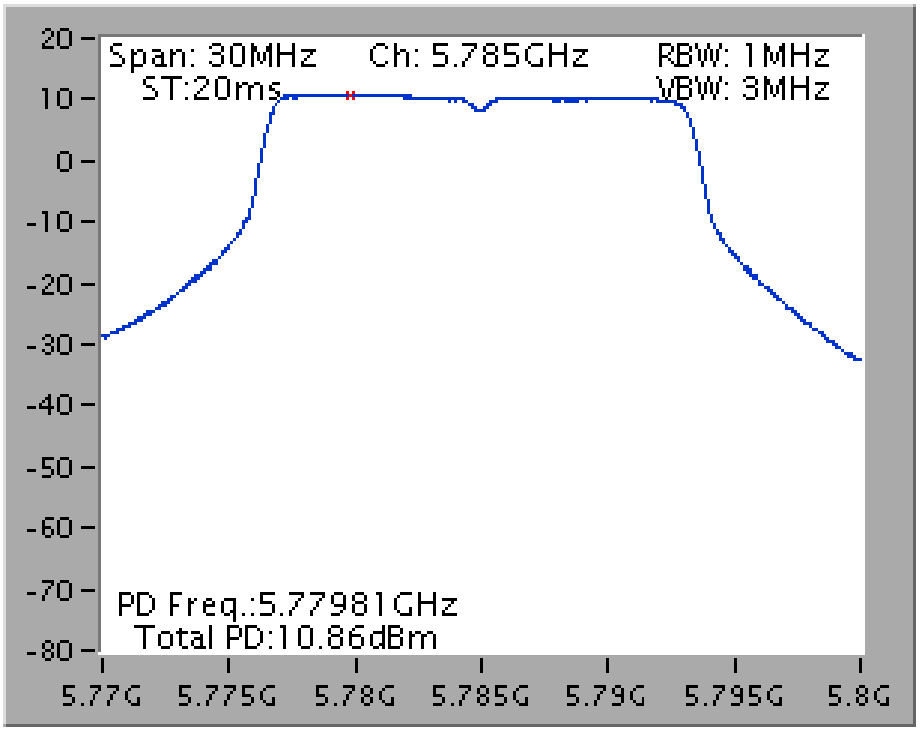
Note: All the test values were listed in the report.

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

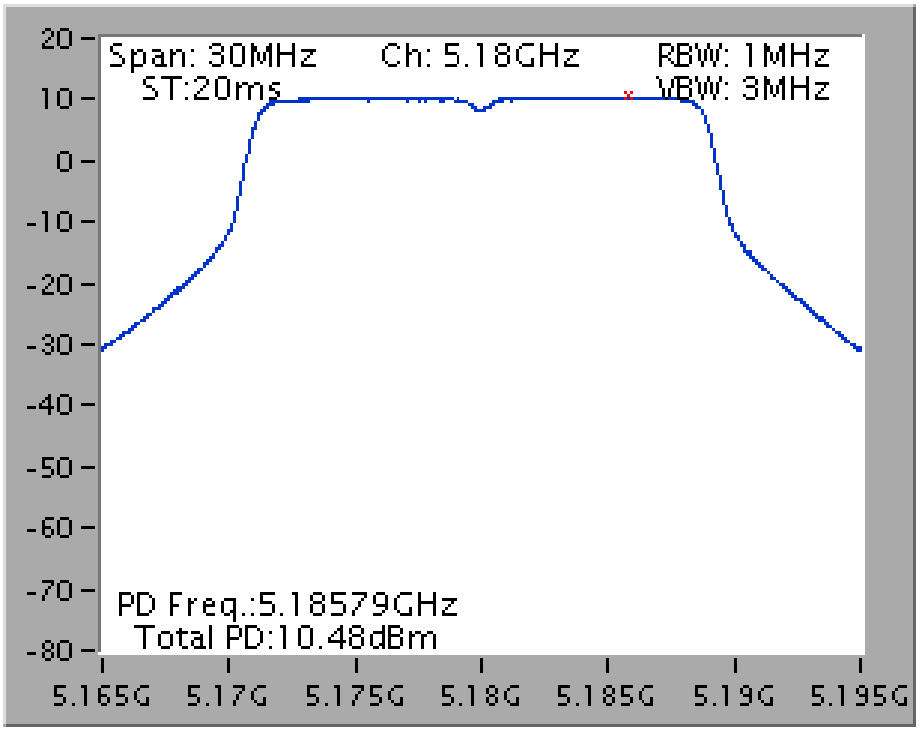
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 / 5180 MHz



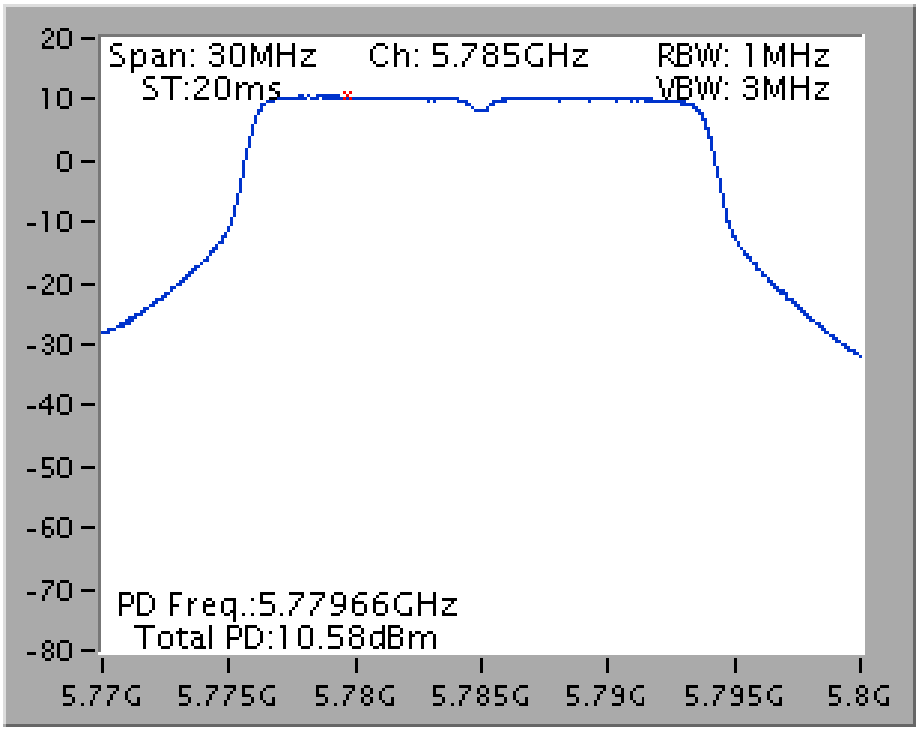
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 / 5785 MHz



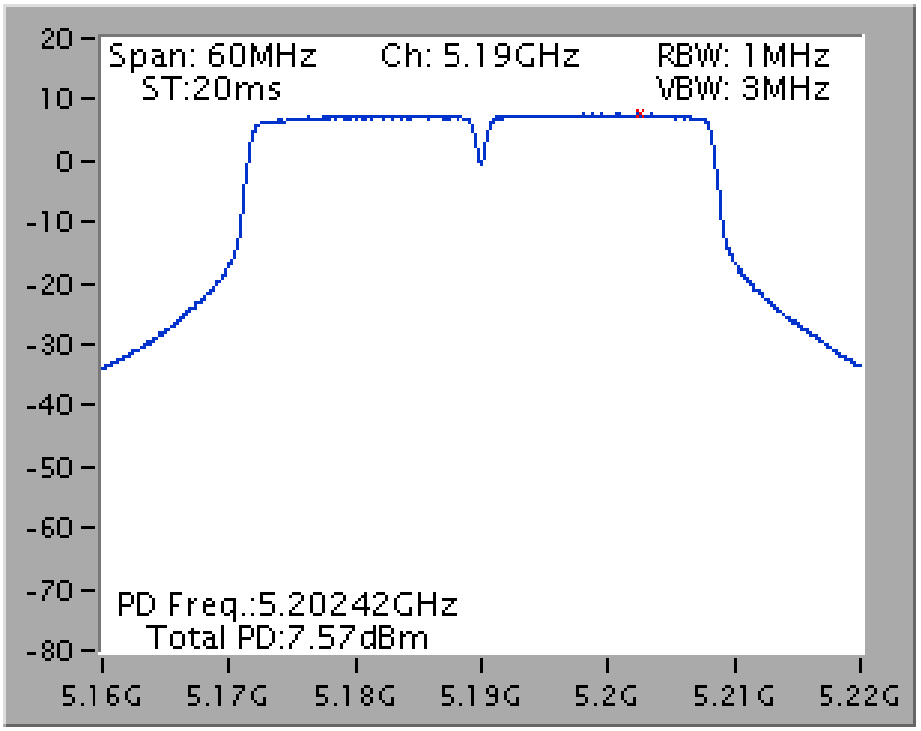
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 / 5180 MHz



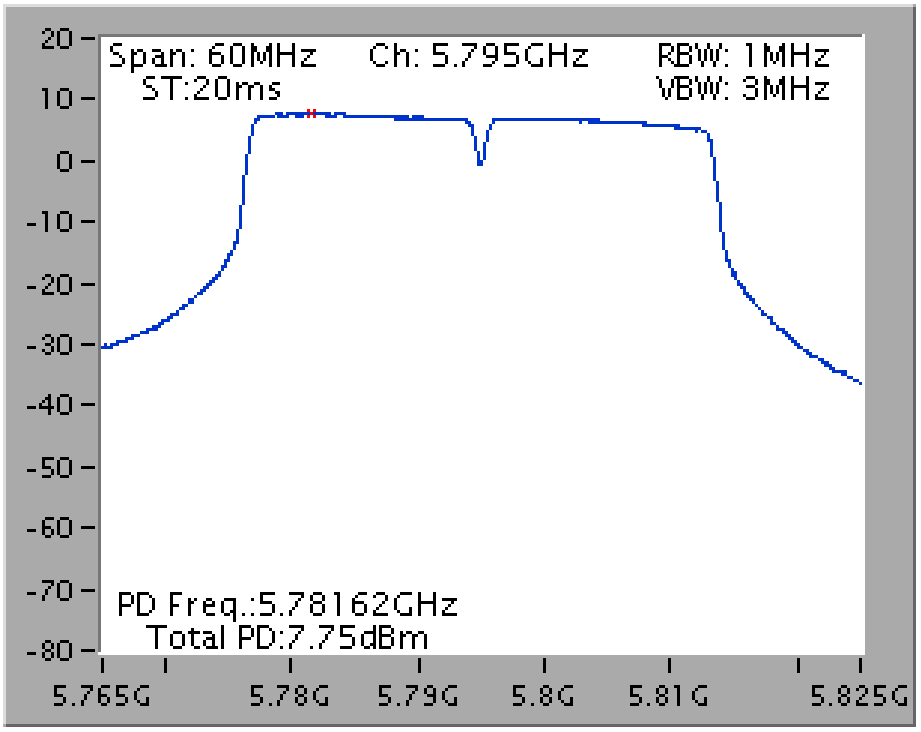
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 / 5785 MHz



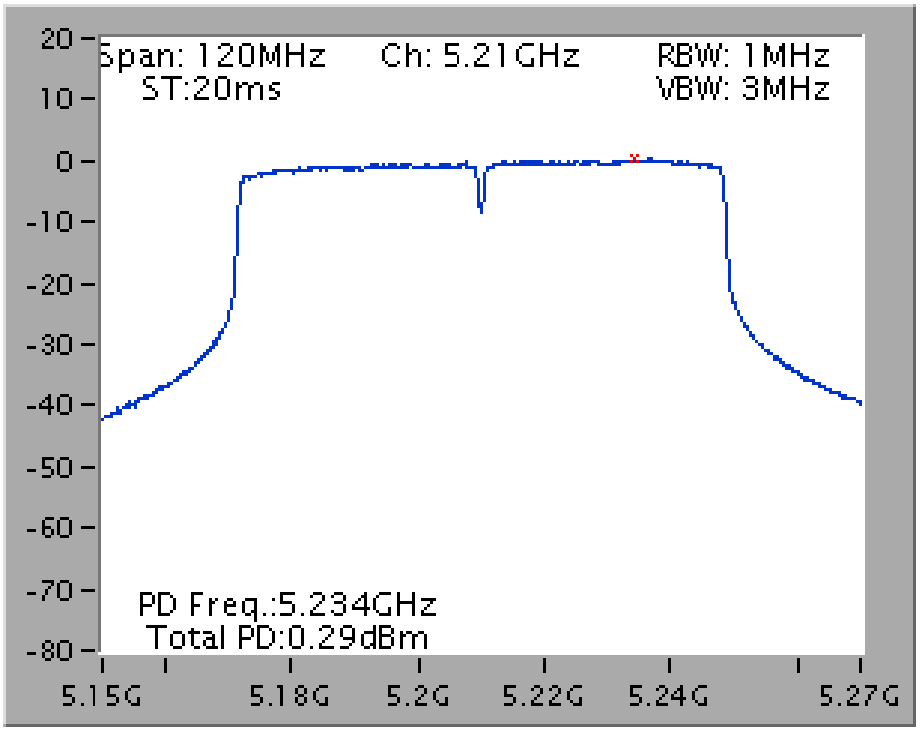
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 / 5190 MHz



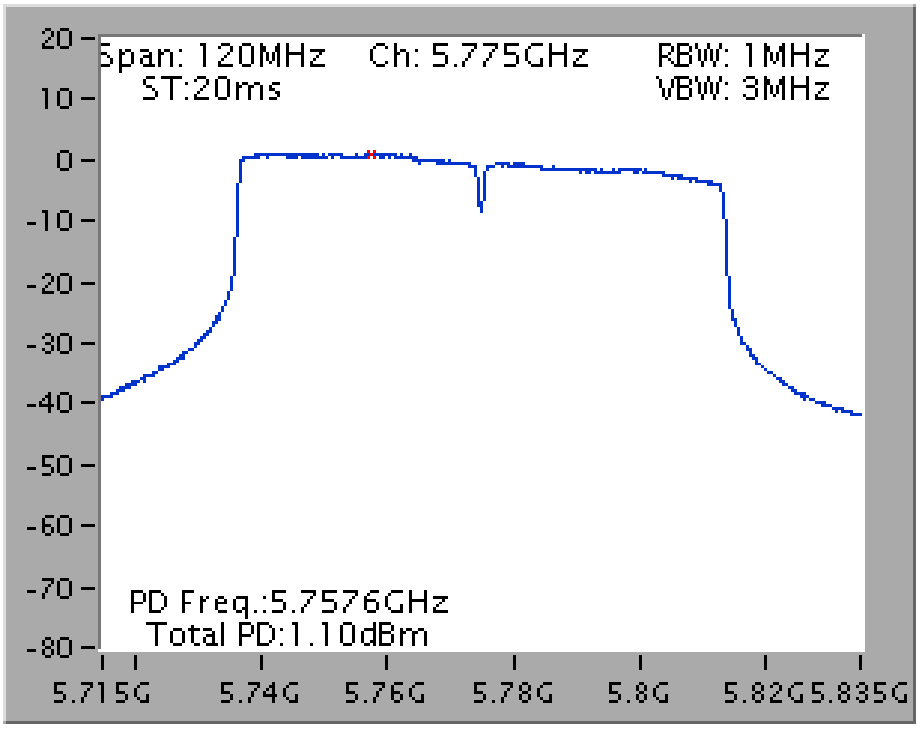
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 / 5795 MHz



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



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



4.6. Radiated Emissions Measurement

4.6.1. Limit

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

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

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

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

4.6.2. Measuring Instruments and Setting

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

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

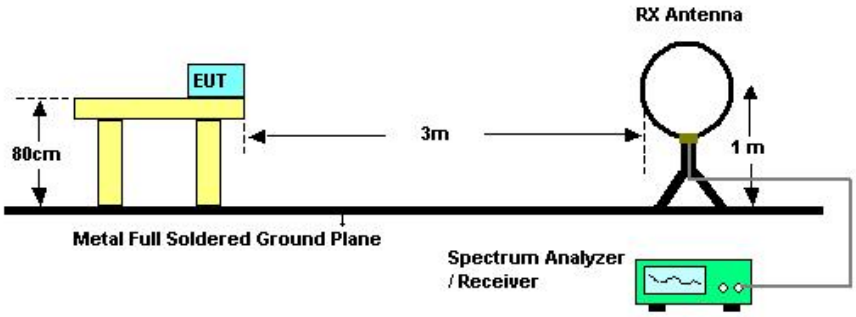
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.6.3. Test Procedures

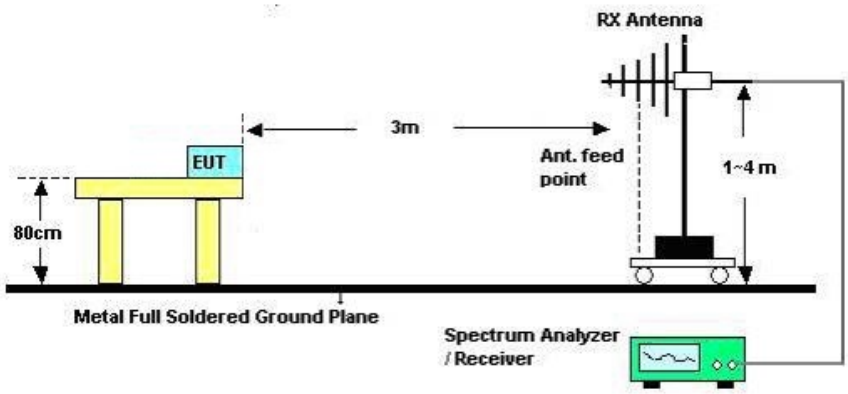
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 1m & 3m far away from the turntable.
2. Power on the EUT and all the supporting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

4.6.4. Test Setup Layout

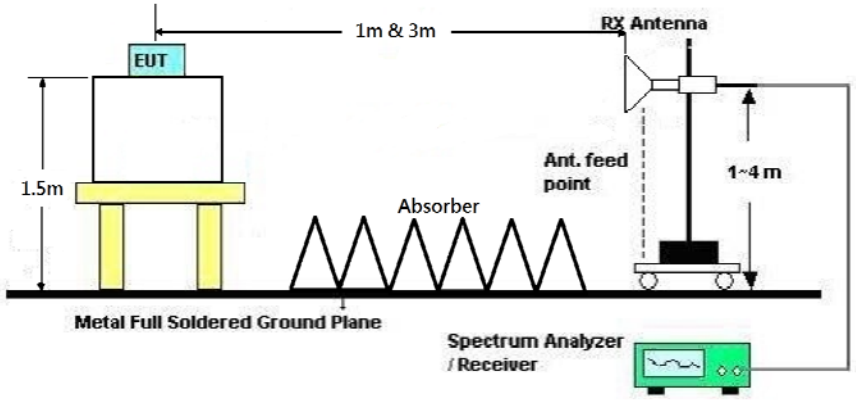
For Radiated Emissions: 9kHz ~30MHz



For Radiated Emissions: 30MHz~1GHz



For Radiated Emissions: Above 1GHz



4.6.5. Test Deviation

There is no deviation with the original standard.

4.6.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

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

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	Normal Link
Test Date	Sep. 14, 2015	Test Mode	Mode 2

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

Note:

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

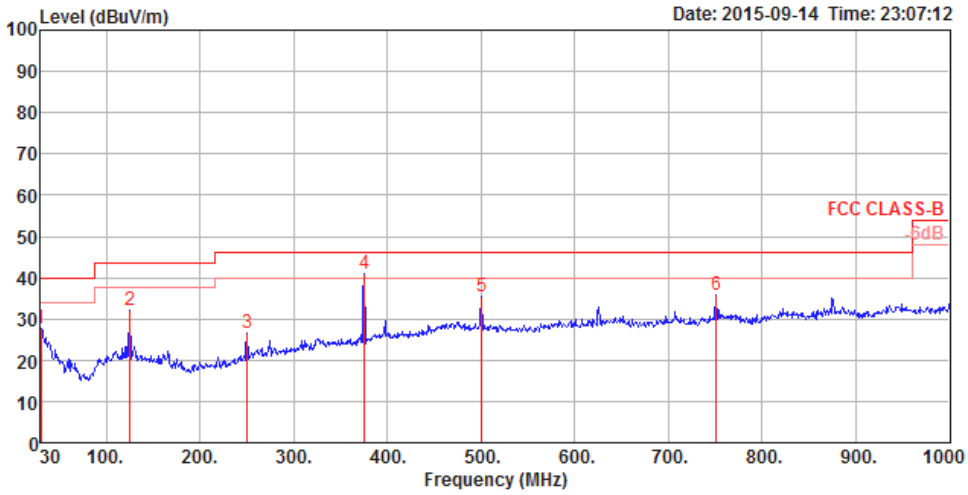
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

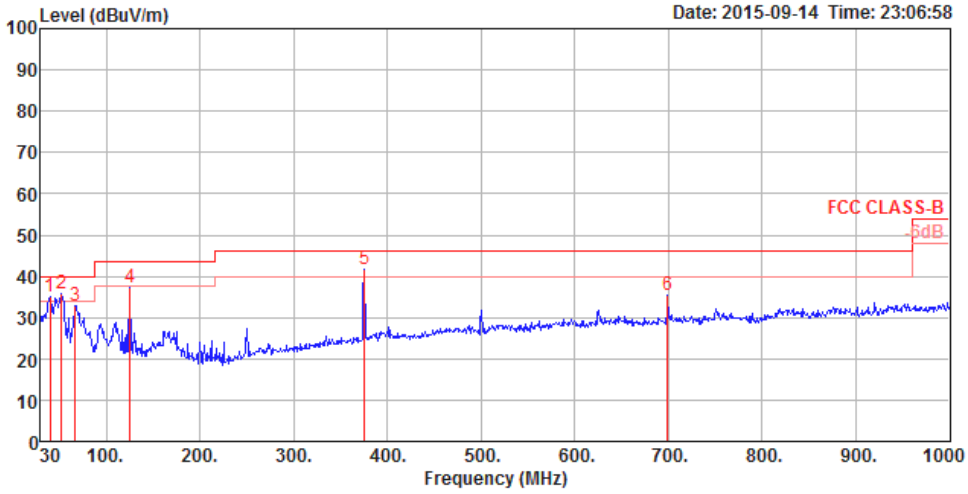
Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	Normal Link
Test Mode	Mode 2		

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	30.00	27.81	40.00	-12.19	39.47	0.64	20.10	32.40	300	136	Peak	HORIZONTAL
2	125.06	32.11	43.50	-11.39	50.69	1.04	12.75	32.37	300	168	Peak	HORIZONTAL
3	250.19	26.47	46.00	-19.53	44.49	1.38	12.90	32.30	150	130	Peak	HORIZONTAL
4	375.32	40.84	46.00	-5.16	55.55	1.68	15.93	32.32	125	359	Peak	HORIZONTAL
5	500.45	35.54	46.00	-10.46	48.16	1.90	17.83	32.35	150	163	Peak	HORIZONTAL
6	750.71	35.95	46.00	-10.05	45.63	2.22	20.40	32.30	125	178	Peak	HORIZONTAL

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	39.70	35.07	40.00	-4.93	52.55	0.67	14.26	32.41	100	294	Peak	VERTICAL
2	52.31	35.63	40.00	-4.37	58.83	0.73	8.48	32.41	125	332	Peak	VERTICAL
3	66.86	32.97	40.00	-7.03	57.73	0.81	6.83	32.40	200	349	Peak	VERTICAL
4	125.06	37.20	43.50	-6.30	55.78	1.04	12.75	32.37	100	261	Peak	VERTICAL
5	375.32	41.88	46.00	-4.12	56.59	1.68	15.93	32.32	100	331	Peak	VERTICAL
6	699.30	35.57	46.00	-10.43	46.09	2.14	19.70	32.36	150	238	Peak	VERTICAL

Note:

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

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

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

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

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11a CH 36 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15535.16	58.94	74.00	-15.06	41.92	12.58	38.14	33.70	156	123	Peak	HORIZONTAL
2	15535.61	45.13	54.00	-8.87	28.11	12.58	38.14	33.70	156	123	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15530.90	45.18	54.00	-8.82	28.16	12.58	38.14	33.70	153	105	Average	VERTICAL
2	15548.75	57.99	74.00	-16.01	41.02	12.58	38.12	33.73	153	105	Peak	VERTICAL

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11a CH 40 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15590.03	58.08	74.00	-15.92	41.19	12.58	38.06	33.75	158	227	Peak	HORIZONTAL
2	15597.95	45.02	54.00	-8.98	28.16	12.58	38.03	33.75	158	227	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15596.96	44.95	54.00	-9.05	28.09	12.58	38.03	33.75	157	141	Average	VERTICAL
2	15605.96	57.89	74.00	-16.11	41.06	12.58	38.03	33.78	157	141	Peak	VERTICAL

Temperature	25℃	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11a CH 48 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15719.07	57.36	74.00	-16.64	40.83	12.57	37.84	33.88	177	207	Peak	HORIZONTAL
2	15720.97	44.78	54.00	-9.22	28.25	12.57	37.84	33.88	177	207	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15719.52	57.90	74.00	-16.10	41.37	12.57	37.84	33.88	162	306	Peak	VERTICAL
2	15720.91	44.89	54.00	-9.11	28.36	12.57	37.84	33.88	162	306	Average	VERTICAL

Temperature	25℃	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11a CH 149 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11489.33	43.36	54.00	-10.64	27.14	10.71	38.88	33.37	170	296	Average	HORIZONTAL
2	11489.51	56.77	74.00	-17.23	40.55	10.71	38.88	33.37	170	296	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11489.63	43.44	54.00	-10.56	27.22	10.71	38.88	33.37	165	272	Average	VERTICAL
2	11490.04	56.51	74.00	-17.49	40.29	10.71	38.88	33.37	165	272	Peak	VERTICAL

Temperature	25℃	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11a CH 157 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11569.05	56.37	74.00	-17.63	40.06	10.75	38.94	33.38	160	290	Peak	HORIZONTAL
2	11570.44	43.17	54.00	-10.83	26.86	10.76	38.94	33.39	160	290	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11570.25	56.05	74.00	-17.95	39.74	10.76	38.94	33.39	163	314	Peak	VERTICAL
2	11570.89	43.27	54.00	-10.73	26.96	10.76	38.94	33.39	163	314	Average	VERTICAL

Temperature	25℃	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11a CH 165 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11649.49	56.86	74.00	-17.14	40.48	10.81	38.98	33.41	152	293	Peak	HORIZONTAL
2	11649.90	43.41	54.00	-10.59	27.03	10.81	38.98	33.41	152	293	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11649.21	57.75	74.00	-16.25	41.37	10.81	38.98	33.41	154	271	Peak	VERTICAL
2	11650.23	43.67	54.00	-10.33	27.29	10.81	38.98	33.41	154	271	Average	VERTICAL

Temperature	25℃	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15540.69	58.11	74.00	-15.89	41.09	12.58	38.14	33.70	152	273	Peak	HORIZONTAL
2	15540.83	44.72	54.00	-9.28	27.70	12.58	38.14	33.70	152	273	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15539.20	58.20	74.00	-15.80	41.18	12.58	38.14	33.70	155	288	Peak	VERTICAL
2	15540.87	44.87	54.00	-9.13	27.85	12.58	38.14	33.70	155	288	Average	VERTICAL

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 40 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15599.09	44.34	54.00	-9.66	27.51	12.58	38.03	33.78	152	268	Average	HORIZONTAL
2	15600.65	57.33	74.00	-16.67	40.50	12.58	38.03	33.78	152	268	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15599.18	57.73	74.00	-16.27	40.90	12.58	38.03	33.78	154	293	Peak	VERTICAL
2	15600.49	44.44	54.00	-9.56	27.61	12.58	38.03	33.78	154	293	Average	VERTICAL

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 48 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15719.40	44.68	54.00	-9.32	28.15	12.57	37.84	33.88	153	249	Average	HORIZONTAL
2	15719.63	57.96	74.00	-16.04	41.43	12.57	37.84	33.88	153	249	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15719.45	57.94	74.00	-16.06	41.41	12.57	37.84	33.88	155	290	Peak	VERTICAL
2	15719.69	44.65	54.00	-9.35	28.12	12.57	37.84	33.88	155	290	Average	VERTICAL

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11490.52	55.78	74.00	-18.22	39.56	10.71	38.88	33.37	150	246	Peak	HORIZONTAL
2	11490.82	43.11	54.00	-10.89	26.89	10.71	38.88	33.37	150	246	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11489.87	43.46	54.00	-10.54	27.24	10.71	38.88	33.37	152	268	Average	VERTICAL
2	11490.81	56.48	74.00	-17.52	40.26	10.71	38.88	33.37	152	268	Peak	VERTICAL

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11570.15	43.27	54.00	-10.73	26.96	10.76	38.94	33.39	157	289	Average	HORIZONTAL
2	11570.74	56.31	74.00	-17.69	40.00	10.76	38.94	33.39	157	289	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11570.23	56.16	74.00	-17.84	39.85	10.76	38.94	33.39	154	269	Peak	VERTICAL
2	11570.49	43.06	54.00	-10.94	26.75	10.76	38.94	33.39	154	269	Average	VERTICAL

Temperature	25℃	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Chain 1 + Chain 2
Test Date	Sep. 11, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11649.32	43.23	54.00	-10.77	26.85	10.81	38.98	33.41	159	283	Average	HORIZONTAL
2	11650.62	56.60	74.00	-17.40	40.21	10.81	38.99	33.41	159	283	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11649.80	57.02	74.00	-16.98	40.64	10.81	38.98	33.41	161	267	Peak	VERTICAL
2	11650.26	43.47	54.00	-10.53	27.09	10.81	38.98	33.41	161	267	Average	VERTICAL

Temperature	25℃	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38 / Chain 1 + Chain 2
Test Date	Sep. 12, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15569.32	58.25	74.00	-15.75	41.31	12.58	38.09	33.73	154	285	Peak	HORIZONTAL
2	15570.49	44.26	54.00	-9.74	27.32	12.58	38.09	33.73	154	285	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15569.96	57.20	74.00	-16.80	40.26	12.58	38.09	33.73	160	300	Peak	VERTICAL
2	15570.65	44.74	54.00	-9.26	27.80	12.58	38.09	33.73	160	300	Average	VERTICAL

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 46 / Chain 1 + Chain 2
Test Date	Sep. 12, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15689.63	44.37	54.00	-9.63	27.74	12.58	37.90	33.85	152	283	Average	HORIZONTAL
2	15689.74	57.34	74.00	-16.66	40.71	12.58	37.90	33.85	152	283	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15689.45	57.32	74.00	-16.68	40.69	12.58	37.90	33.85	152	268	Peak	VERTICAL
2	15690.39	44.59	54.00	-9.41	27.96	12.58	37.90	33.85	152	268	Average	VERTICAL

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Chain 1 + Chain 2
Test Date	Sep. 12, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11509.08	42.81	54.00	-11.19	26.56	10.72	38.90	33.37	156	161	Average	HORIZONTAL
2	11510.14	56.28	74.00	-17.72	40.03	10.72	38.90	33.37	156	161	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11509.28	42.90	54.00	-11.10	26.65	10.72	38.90	33.37	154	174	Average	VERTICAL
2	11510.70	56.05	74.00	-17.95	39.80	10.72	38.90	33.37	154	174	Peak	VERTICAL

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Chain 1 + Chain 2
Test Date	Sep. 12, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11589.75	55.75	74.00	-18.25	39.43	10.76	38.95	33.39	161	162	Peak	HORIZONTAL
2	11590.66	42.84	54.00	-11.16	26.52	10.76	38.95	33.39	161	162	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11589.38	43.10	54.00	-10.90	26.78	10.76	38.95	33.39	158	144	Average	VERTICAL
2	11589.53	56.06	74.00	-17.94	39.74	10.76	38.95	33.39	158	144	Peak	VERTICAL

Temperature	25℃	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42 / Chain 1 + Chain 2
Test Date	Sep. 12, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15630.42	57.43	74.00	-16.57	40.67	12.58	37.98	33.80	156	204	Peak	HORIZONTAL
2	15630.58	44.55	54.00	-9.45	27.79	12.58	37.98	33.80	156	204	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15629.11	44.70	54.00	-9.30	27.94	12.58	37.98	33.80	158	186	Average	VERTICAL
2	15630.29	57.97	74.00	-16.03	41.21	12.58	37.98	33.80	158	186	Peak	VERTICAL

Temperature	25℃	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 1 + Chain 2
Test Date	Sep. 12, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11549.88	56.16	74.00	-17.84	39.86	10.75	38.93	33.38	159	309	Peak	HORIZONTAL
2	11550.03	42.82	54.00	-11.18	26.52	10.75	38.93	33.38	159	309	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11550.15	43.01	54.00	-10.99	26.71	10.75	38.93	33.38	161	287	Average	VERTICAL
2	11550.68	56.14	74.00	-17.86	39.84	10.75	38.93	33.38	161	287	Peak	VERTICAL

Note:

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

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

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

4.7. Band Edge Emissions Measurement

4.7.1. Limit

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

For transmitters operating in the 5.725-5.85 GHz band: all emissions 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	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11a CH 36, 40, 48 / Chain 1 + Chain 2
Test Date	Sep. 10, 2015~Sep. 11, 2015		

Channel 36

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5148.84	46.33	54.00	-7.67	40.42	7.33	32.94	31.52	VERTICAL	274	100	Average
2	5149.13	59.36	74.00	-14.64	53.45	7.33	32.94	31.52	VERTICAL	274	100	Peak
3	5178.84	111.32			105.35	7.36	32.94	31.55	VERTICAL	274	100	Peak
4	5183.18	101.29			95.32	7.36	32.94	31.55	VERTICAL	274	100	Average

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

Channel 40

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5144.79	57.10	74.00	-16.90	51.20	7.32	32.94	31.52	VERTICAL	278	100	Peak
2	5148.84	44.39	54.00	-9.61	38.48	7.33	32.94	31.52	VERTICAL	278	100	Average
3	5197.97	100.19			94.19	7.38	32.94	31.56	VERTICAL	278	100	Average
4	5202.60	110.23			104.22	7.38	32.94	31.57	VERTICAL	278	100	Peak

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

Channel 48

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5148.70	56.58	74.00	-17.42	50.67	7.33	32.94	31.52	VERTICAL	201	123	Peak
2	5150.00	43.73	54.00	-10.27	37.82	7.33	32.94	31.52	VERTICAL	201	123	Average
3	5247.38	101.68			95.58	7.42	32.93	31.61	VERTICAL	201	123	Average
4	5247.38	111.40			105.30	7.42	32.93	31.61	VERTICAL	201	123	Peak
5	5350.00	44.81	54.00	-9.19	38.54	7.52	32.93	31.68	VERTICAL	201	123	Average
6	5366.06	58.17	74.00	-15.83	51.87	7.54	32.93	31.69	VERTICAL	201	123	Peak

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

Temperature	25℃	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11a CH 149, 157, 165 / Chain 1 + Chain 2
Test Date	Sep. 10, 2015		

Channel 149

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5715.00	59.99	68.20	-8.21	53.14	7.79	33.00	32.06	VERTICAL	267	123	Peak
2	5725.00	66.43	78.20	-11.77	59.56	7.79	33.00	32.08	VERTICAL	267	123	Peak
3	5739.50	100.19			93.30	7.80	33.01	32.10	VERTICAL	267	123	Average
4	5749.05	110.65			103.76	7.81	33.02	32.10	VERTICAL	267	123	Peak

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

Channel 157

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5702.84	59.63	68.20	-8.57	52.81	7.78	33.00	32.04	VERTICAL	264	130	Peak
2	5720.37	59.15	78.20	-19.05	52.30	7.79	33.00	32.06	VERTICAL	264	130	Peak
3	5779.50	111.64			104.70	7.83	33.03	32.14	VERTICAL	264	130	Peak
4	5780.08	101.20			94.26	7.83	33.03	32.14	VERTICAL	264	130	Average
5	5851.74	58.34	78.20	-19.86	51.30	7.87	33.05	32.22	VERTICAL	264	130	Peak
6	5875.34	59.17	68.20	-9.03	52.09	7.88	33.06	32.26	VERTICAL	264	130	Peak

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

Channel 165

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5822.68	110.52			103.52	7.85	33.05	32.20	VERTICAL	265	138	Peak
2	5827.32	100.27			93.27	7.85	33.05	32.20	VERTICAL	265	138	Average
3	5852.03	61.68	78.20	-16.52	54.64	7.87	33.05	32.22	VERTICAL	265	138	Peak
4	5862.03	59.79	68.20	-8.41	52.74	7.87	33.06	32.24	VERTICAL	265	138	Peak

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

Temperature	25℃	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36, 40, 48 / Chain 1 + Chain 2
Test Date	Sep. 10, 2015		

Channel 36

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5143.05	60.53	74.00	-13.47	54.63	7.32	32.94	31.52	VERTICAL	272	100	Peak
2	5144.79	47.32	54.00	-6.68	41.42	7.32	32.94	31.52	VERTICAL	272	100	Average
3	5182.89	112.67			106.70	7.36	32.94	31.55	VERTICAL	272	100	Peak
4	5184.63	102.46			96.49	7.36	32.94	31.55	VERTICAL	272	100	Average

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

Channel 40

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5145.37	56.91	74.00	-17.09	51.01	7.32	32.94	31.52	VERTICAL	276	100	Peak
2	5150.00	44.84	54.00	-9.16	38.93	7.33	32.94	31.52	VERTICAL	276	100	Average
3	5192.47	102.22			96.23	7.37	32.94	31.56	VERTICAL	276	100	Average
4	5193.92	111.73			105.74	7.37	32.94	31.56	VERTICAL	276	100	Peak

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

Channel 48

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5126.12	57.71	74.00	-16.29	51.84	7.31	32.94	31.50	VERTICAL	221	138	Peak
2	5130.03	44.13	54.00	-9.87	38.25	7.31	32.94	31.51	VERTICAL	221	138	Average
3	5245.64	112.67			106.59	7.42	32.93	31.59	VERTICAL	221	138	Peak
4	5246.95	102.50			96.40	7.42	32.93	31.61	VERTICAL	221	138	Average
5	5356.95	58.31	74.00	-15.69	52.02	7.53	32.93	31.69	VERTICAL	221	138	Peak
6	5380.39	45.17	54.00	-8.83	38.85	7.55	32.93	31.70	VERTICAL	221	138	Average

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

Temperature	25℃	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149, 157, 165 / Chain 1 + Chain 2
Test Date	Sep. 10, 2015		

Channel 149

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5715.00	65.35	68.20	-2.85	58.50	7.79	33.00	32.06	VERTICAL	351	308	Peak
2	5724.57	74.56	78.20	-3.64	67.69	7.79	33.00	32.08	VERTICAL	351	308	Peak
3	5739.36	105.66			98.77	7.80	33.01	32.10	VERTICAL	351	308	Average
4	5740.66	116.15			109.26	7.80	33.01	32.10	VERTICAL	351	308	Peak

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

Channel 157

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5711.96	63.45	68.20	-4.75	56.60	7.79	33.00	32.06	VERTICAL	350	312	Peak
2	5721.08	63.62	78.20	-14.58	56.77	7.79	33.00	32.06	VERTICAL	350	312	Peak
3	5780.22	117.05			110.11	7.83	33.03	32.14	VERTICAL	350	312	Peak
4	5781.09	106.49			99.55	7.83	33.03	32.14	VERTICAL	350	312	Average
5	5851.74	62.24	78.20	-15.96	55.20	7.87	33.05	32.22	VERTICAL	350	312	Peak
6	5862.17	62.03	68.20	-6.17	54.98	7.87	33.06	32.24	VERTICAL	350	312	Peak

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

Channel 165

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5820.37	105.78			98.79	7.85	33.04	32.18	VERTICAL	350	348	Average
2	5822.68	117.05			110.05	7.85	33.05	32.20	VERTICAL	350	348	Peak
3	5859.26	67.38	78.20	-10.82	60.33	7.87	33.06	32.24	VERTICAL	350	348	Peak
4	5860.58	64.65	68.20	-3.55	57.60	7.87	33.06	32.24	VERTICAL	350	348	Peak

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

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38, 46 / Chain 1 + Chain 2
Test Date	Sep. 10, 2015		

Channel 38

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5147.05	68.20	74.00	-5.80	61.30	6.21	33.74	33.05	250	97	Peak	VERTICAL
2	5147.69	53.46	54.00	-0.54	46.56	6.21	33.74	33.05	250	97	Average	VERTICAL
3	5198.01	100.16			93.12	6.27	33.82	33.05	250	97	Average	VERTICAL
4	5200.26	109.72			102.68	6.27	33.82	33.05	250	97	Peak	VERTICAL

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

Channel 46

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5139.94	57.77	74.00	-16.23	50.91	6.17	33.74	33.05	250	96	Peak	VERTICAL
2	5145.71	46.45	54.00	-7.55	39.55	6.21	33.74	33.05	250	96	Average	VERTICAL
3	5239.62	109.75			102.63	6.30	33.87	33.05	250	96	Peak	VERTICAL
4	5240.58	99.96			92.84	6.30	33.87	33.05	250	96	Average	VERTICAL

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

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151, 159 / Chain 1 + Chain 2
Test Date	Sep. 10, 2015		

Channel 151

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5711.09	67.71	68.20	-0.49	59.59	6.83	34.42	33.13	251	357	Peak	VERTICAL
2	5725.00	70.79	78.20	-7.41	62.66	6.83	34.43	33.13	251	357	Peak	VERTICAL
3	5748.91	99.24			91.08	6.86	34.44	33.14	251	357	Average	VERTICAL
4	5750.19	109.11			100.95	6.86	34.44	33.14	251	357	Peak	VERTICAL

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

Channel 159

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5700.77	59.95	68.20	-8.25	51.84	6.81	34.42	33.12	254	206	Peak	VERTICAL
2	5716.67	60.10	78.20	-18.10	51.98	6.83	34.42	33.13	254	206	Peak	VERTICAL
3	5781.86	108.36			100.15	6.90	34.47	33.16	254	206	Peak	VERTICAL
4	5782.50	98.37			90.16	6.90	34.47	33.16	254	206	Average	VERTICAL
5	5859.94	60.09	78.20	-18.11	51.78	6.97	34.52	33.18	254	206	Peak	VERTICAL
6	5862.89	62.37	68.20	-5.83	54.06	6.97	34.52	33.18	254	206	Peak	VERTICAL

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

Temperature	25°C	Humidity	40%
Test Engineer	Andy Tsai	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42, 155 / Chain 1 + Chain 2
Test Date	Sep. 10, 2015		

Channel 42

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5148.30	53.98	54.00	-0.02	47.08	6.21	33.74	33.05	285	91	Average	VERTICAL
2	5149.10	67.07	74.00	-6.93	60.17	6.21	33.74	33.05	285	91	Peak	VERTICAL
3	5218.81	105.20			98.13	6.27	33.85	33.05	285	91	Peak	VERTICAL
4	5226.83	93.66			86.54	6.30	33.87	33.05	285	91	Average	VERTICAL
5	5398.30	46.84	54.00	-7.16	39.26	6.50	34.14	33.06	285	91	Average	VERTICAL
6	5451.99	59.49	74.00	-14.51	51.73	6.60	34.22	33.06	285	91	Peak	VERTICAL

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

Channel 155

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5715.00	53.61	54.00	-0.39	45.49	6.83	34.42	33.13	266	355	Average	VERTICAL
2	5715.00	69.41	74.00	-4.59	61.29	6.83	34.42	33.13	266	355	Peak	VERTICAL
3	5719.71	72.12	78.20	-6.08	63.99	6.83	34.43	33.13	266	355	Peak	VERTICAL
4	5738.94	94.29			86.13	6.86	34.44	33.14	266	355	Average	VERTICAL
5	5739.74	104.06			95.90	6.86	34.44	33.14	266	355	Peak	VERTICAL
6	5858.81	60.54	78.20	-17.66	52.23	6.97	34.52	33.18	266	355	Peak	VERTICAL
7	5860.74	48.85	54.00	-5.15	40.54	6.97	34.52	33.18	266	355	Average	VERTICAL
8	5860.74	61.12	74.00	-12.88	52.81	6.97	34.52	33.18	266	355	Peak	VERTICAL

Item 4, 5 are the fundamental frequency at 5775 MHz.

Note:

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

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

4.8. Frequency Stability Measurement

4.8.1. Limit

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

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

4.8.2. Measuring Instruments and Setting

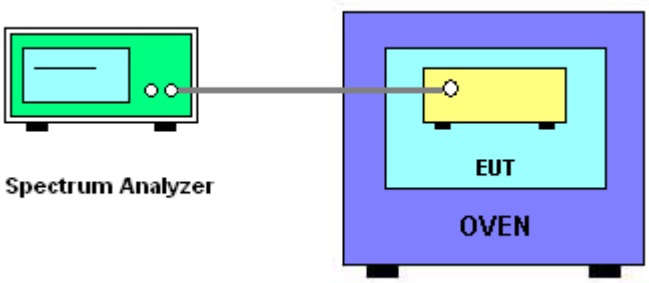
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.8.3. Test Procedures

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

4.8.4. Test Setup Layout



4.8.5. Test Deviation

There is no deviation with the original standard.

4.8.6. EUT Operation during Test

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

4.8.7. Test Result of Frequency Stability

Temperature	20°C	Humidity	64%
Test Engineer	Roki Liu	Test Date	Sep. 16, 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	5199.9952	5199.9938	5199.9920	5199.9899
110.00	5199.9940	5199.9927	5199.9911	5199.9892
93.50	5199.9926	5199.9915	5199.9903	5199.9881
Max. Deviation (MHz)	0.0074	0.0085	0.0097	0.0119
Max. Deviation (ppm)	1.42	1.63	1.87	2.29
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5200 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5199.9965	5199.9953	5199.9934	5199.9912
10	5199.9952	5199.9939	5199.9924	5199.9906
20	5199.9940	5199.9927	5199.9911	5199.9892
30	5199.9926	5199.9915	5199.9901	5199.9885
40	5199.9910	5199.9895	5199.9879	5199.9859
Max. Deviation (MHz)	0.0090	0.0105	0.0121	0.0141
Max. Deviation (ppm)	1.73	2.02	2.33	2.71
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5784.9852	5784.9838	5784.9820	5784.9799
110.00	5784.9840	5784.9827	5784.9811	5784.9792
93.50	5784.9826	5784.9815	5784.9803	5784.9781
Max. Deviation (MHz)	0.0174	0.0185	0.0197	0.0219
Max. Deviation (ppm)	3.01	3.20	3.41	3.79
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5784.9865	5784.9853	5784.9834	5784.9812
10	5784.9852	5784.9839	5784.9824	5784.9806
20	5784.9840	5784.9827	5784.9811	5784.9792
30	5784.9826	5784.9815	5784.9801	5784.9785
40	5784.9810	5784.9795	5784.9779	5784.9759
Max. Deviation (MHz)	0.0190	0.0205	0.0221	0.0241
Max. Deviation (ppm)	3.28	3.54	3.82	4.17
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	5190.0024	5190.0010	5189.9992	5189.9971
110.00	5190.0012	5189.9999	5189.9983	5189.9964
93.50	5189.9998	5189.9987	5189.9975	5189.9953
Max. Deviation (MHz)	0.0024	0.0013	0.0025	0.0047
Max. Deviation (ppm)	0.46	0.25	0.48	0.91
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5190 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5190.0037	5190.0025	5190.0006	5189.9984
10	5190.0024	5190.0011	5189.9996	5189.9978
20	5190.0012	5189.9999	5189.9983	5189.9964
30	5189.9998	5189.9987	5189.9973	5189.9957
40	5189.9982	5189.9967	5189.9951	5189.9931
Max. Deviation (MHz)	0.0037	0.0033	0.0049	0.0069
Max. Deviation (ppm)	0.71	0.64	0.94	1.33
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5755.0022	5755.0008	5754.9990	5754.9969
110.00	5755.0010	5754.9997	5754.9981	5754.9962
93.50	5754.9996	5754.9985	5754.9973	5754.9951
Max. Deviation (MHz)	0.0022	0.0015	0.0027	0.0049
Max. Deviation (ppm)	0.38	0.26	0.47	0.85
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5755.0035	5755.0023	5755.0004	5754.9982
10	5755.0022	5755.0009	5754.9994	5754.9976
20	5755.0010	5754.9997	5754.9981	5754.9962
30	5754.9996	5754.9985	5754.9971	5754.9955
40	5754.9980	5754.9965	5754.9949	5754.9929
Max. Deviation (MHz)	0.0035	0.0035	0.0051	0.0071
Max. Deviation (ppm)	0.61	0.61	0.89	1.23
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	5210.0023	5210.0009	5209.9991	5209.9970
110.00	5210.0011	5209.9998	5209.9982	5209.9963
93.50	5209.9997	5209.9986	5209.9974	5209.9952
Max. Deviation (MHz)	0.0023	0.0014	0.0026	0.0048
Max. Deviation (ppm)	0.44	0.27	0.50	0.92
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5210 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5210.0036	5210.0024	5210.0005	5209.9983
10	5210.0023	5210.0010	5209.9995	5209.9977
20	5210.0011	5209.9998	5209.9982	5209.9963
30	5209.9997	5209.9986	5209.9972	5209.9956
40	5209.9981	5209.9966	5209.9950	5209.9930
Max. Deviation (MHz)	0.0036	0.0034	0.0050	0.0070
Max. Deviation (ppm)	0.69	0.65	0.96	1.34
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5775.0034	5775.0020	5775.0002	5774.9981
110.00	5775.0022	5775.0009	5774.9993	5774.9974
93.50	5775.0008	5774.9997	5774.9985	5774.9963
Max. Deviation (MHz)	0.0034	0.0020	0.0015	0.0037
Max. Deviation (ppm)	0.59	0.35	0.26	0.64
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5775.0047	5775.0035	5775.0016	5774.9994
10	5775.0034	5775.0021	5775.0006	5774.9988
20	5775.0022	5775.0009	5774.9993	5774.9974
30	5775.0008	5774.9997	5774.9983	5774.9967
40	5774.9992	5774.9977	5774.9961	5774.9941
Max. Deviation (MHz)	0.0047	0.0035	0.0039	0.0059
Max. Deviation (ppm)	0.81	0.61	0.68	1.02
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	22021	20MHz ~ 2GHz	May 06, 2015	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Oct. 28, 2014	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 12, 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	WM	TF-130N-R1	923365	26GHz ~ 40GHz	Nov. 25, 2014	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Nov. 06, 2014	Radiation (03CH01-CB)
EMI Receiver	Agilent	N9038A	MY52260123	9kHz ~ 8.4GHz	Jan. 21, 2015	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz ~ 1 GHz	Nov. 15, 2014	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-1	N/A	1 GHz ~ 40 GHz	Nov. 15, 2014	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-2	N/A	1 GHz ~ 40 GHz	Nov. 15, 2014	Radiation (03CH01-CB)
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-8	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-9	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 03, 2014	Conducted (TH01-CB)

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

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

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%