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FCC RADIO TEST REPORT

Applicant's company	**Kodak Alaris Inc**
Applicant Address	2400 Mount Read Blvd. Rochester, NY 14615 USA
FCC ID	**2AA9A-AU7520**
Manufacturer's company	**Abocom Systems, Inc.**
Manufacturer Address	No.77, Yu-Yih Rd., Chu-Nan, Miao-Lih County 35059, Taiwan R.O.C.

Product Name	2T2R 802.11b/g/n +AC dongle
Brand Name	Kodak
Model No.	AU7520
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5150 ~ 5250 MHz / 5725 ~ 5850 MHz
Received Date	Dec. 17, 2015
Final Test Date	Feb. 18, 2016
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

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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR5D0919AB	Rev. 01	Initial issue of report	Mar. 09, 2016

1. VERIFICATION OF COMPLIANCE

Product Name	:	2T2R 802.11b/g/n +AC dongle
Brand Name	:	Kodak
Model No.	:	AU7520
Applicant	:	Kodak Alaris 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 Dec. 17, 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	20.48 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	6.71 dB
4.5	15.407(a)	Power Spectral Density	Complies	0.83 dB
4.6	15.407(b)	Radiated Emissions	Complies	5.40 dB
4.7	15.407(b)	Band Edge Emissions	Complies	0.13 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	IEEE 802.11a: WLAN (1TX, 1RX) IEEE 802.11n/ac: WLAN (2TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	From host system
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: 35.51 MHz IEEE 802.11ac MCS0/Nss2 (VHT20): 31.00 MHz IEEE 802.11ac MCS0/Nss2 (VHT40): 43.42 MHz IEEE 802.11ac MCS0/Nss2 (VHT80): 75.54 MHz Band 4: IEEE 802.11a: 34.12 MHz IEEE 802.11ac MCS0/Nss2 (VHT20): 26.48 MHz IEEE 802.11ac MCS0/Nss2 (VHT40): 52.10 MHz IEEE 802.11ac MCS0/Nss2 (VHT80): 75.54 MHz
Maximum Conducted Output Power	Band 1: IEEE 802.11a: 16.16 dBm IEEE 802.11ac MCS0/Nss2 (VHT20): 17.27 dBm IEEE 802.11ac MCS0/Nss2 (VHT40): 17.02 dBm IEEE 802.11ac MCS0/Nss2 (VHT80): 16.63 dBm Band 4: IEEE 802.11a: 12.76 dBm IEEE 802.11ac MCS0/Nss2 (VHT20): 14.60 dBm IEEE 802.11ac MCS0/Nss2 (VHT40): 14.51 dBm IEEE 802.11ac MCS0/Nss2 (VHT80): 14.42 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

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

Antenna and Band width

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

IEEE 11n/ac Spec.

Protocol	Number of Transmit Chains (NTX)	Data Rate / MCS
802.11n (HT20)	2	MCS 8-15
802.11n (HT40)	2	MCS 8-15
802.11ac (VHT20)	2	MCS 0-9/Nss2
802.11ac (VHT40)	2	MCS 0-9/Nss2
802.11ac (VHT80)	2	MCS 0-9/Nss2

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	-	-	Printed Antenna	N/A	2.5	3.6
2	-	-	Printed Antenna	N/A	-0.8	3.9

The EUT has two antennas.

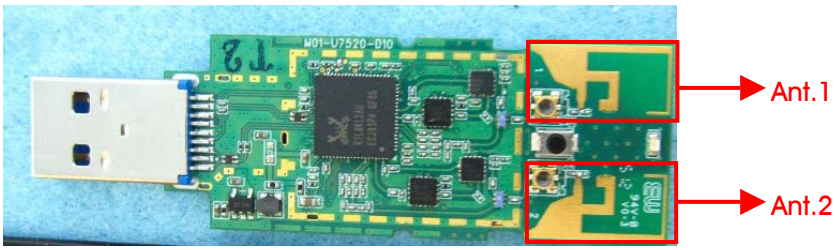
For IEEE 802.11a/b/g mode (1TX/1RX):

Only Ant.1 can be use as transmit and receive antenna.

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

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

Ant.1 and Ant.2 could both 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	Ant.
AC Power Conducted Emission	Normal Link		-	-	-
Max. Conducted Output Power	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	1
	11ac VHT20	Band 1&4	MCS0/Nss2	36/40/48/149/157/165	1+2
	11ac VHT40	Band 1&4	MCS0/Nss2	38/46/151/159	1+2
	11ac VHT80	Band 1&4	MCS0/Nss2	42/155	1+2
Power Spectral Density	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	1
	11ac VHT20	Band 1&4	MCS0/Nss2	36/40/48/149/157/165	1+2
	11ac VHT40	Band 1&4	MCS0/Nss2	38/46/151/159	1+2
	11ac VHT80	Band 1&4	MCS0/Nss2	42/155	1+2
26dB Spectrum Bandwidth & 99% Occupied Bandwidth Measurement	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	1
	11ac VHT20	Band 1&4	MCS0/Nss2	36/40/48/149/157/165	1+2
	11ac VHT40	Band 1&4	MCS0/Nss2	38/46/151/159	1+2
	11ac VHT80	Band 1&4	MCS0/Nss2	42/155	1+2
6dB Spectrum Bandwidth Measurement	11a/BPSK	Band 4	6Mbps	149/157/165	1
	11ac VHT20	Band 4	MCS0/Nss2	149/157/165	1+2
	11ac VHT40	Band 4	MCS0/Nss2	151/159	1+2
	11ac VHT80	Band 4	MCS0/Nss2	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
	11ac VHT20	Band 1&4	MCS0/Nss2	36/40/48/149/157/165	1+2
	11ac VHT40	Band 1&4	MCS0/Nss2	38/46/151/159	1+2
	11ac VHT80	Band 1&4	MCS0/Nss2	42/155	1+2

Band Edge Emission	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	1
	11ac VHT20	Band 1&4	MCS0/Nss2	36/40/48/149/157/165	1+2
	11ac VHT40	Band 1&4	MCS0/Nss2	38/46/151/159	1+2
	11ac VHT80	Band 1&4	MCS0/Nss2	42/155	1+2
Frequency Stability	20 MHz	Band 1&4	-	40/157	1
	40 MHz	Band 1&4	-	38/151	1
	80 MHz	Band 1&4	-	42/155	1

Note: 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 AC Power Line Conducted Emissions test:

Mode 1. 2.4GHz WLAN function

Mode 2. 5GHz WLAN function

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

For Radiated Emission below 1GHz test:

Mode 1. 2.4GHz WLAN function (EUT in Z axis)

Mode 2. 5GHz WLAN function (EUT in Z axis)

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

For Radiated Emission above 1GHz test:

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

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
Wireless ac AP	Netgear	R6300V2	PY313200227
NB	DELL	E4300	DoC
Mouse	Logitech	M-U0026	DoC
Earphone	SHYARO CHI	MIC-04	N/A

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
AP	Planex	GW-AP54SGX	KA220030603014-1
Notebook	DELL	E6430	DoC
Mouse	Logitech	M-U0026	DoC
Earphone	SHYARO CHI	MIC-04	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	REALTEK					
Mode	Test Frequency (MHz)					
	NCB: 20MHz					
	5180 MHz	5200 MHz	5240 MHz	5745 MHz	5785 MHz	5825 MHz
802.11a	32	32	30	26	27	26
802.11ac MCS0/Nss2 VHT20	29/30	29/31	27/29	25/26	25/26	25/26
Mode	NCB: 40MHz					
802.11ac MCS0/Nss2 VHT40	5190 MHz		5230 MHz		5755 MHz	5795 MHz
	31/32		29/31		26/28	26/28
Mode	NCB: 80MHz					
802.11ac MCS0/Nss2 VHT80	5210 MHz				5775 MHz	
	30/31				27/28	

3.9. EUT Operation during Test

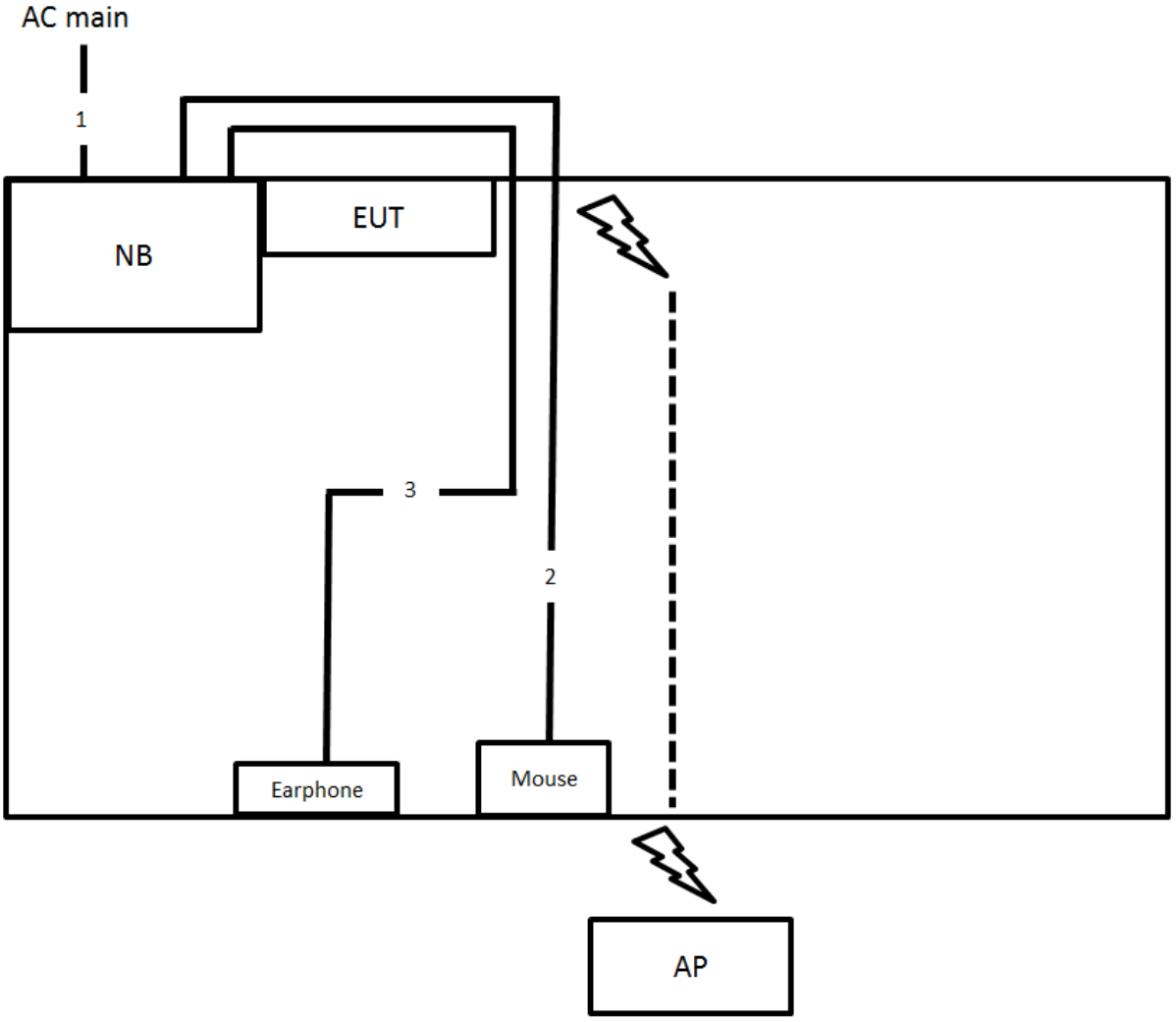
The EUT was programmed to be in continuously transmitting mode.

3.10. Duty Cycle

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11a	1.000	1.000	100.00	0.00	0.01
802.11ac MCS0/Nss2 VHT20	1.000	1.000	100.00	0.00	0.01
802.11ac MCS0/Nss2 VHT40	1.000	1.000	100.00	0.00	0.01
802.11ac MCS0/Nss2 VHT80	1.000	1.000	100.00	0.00	0.01

3.11. Test Configurations

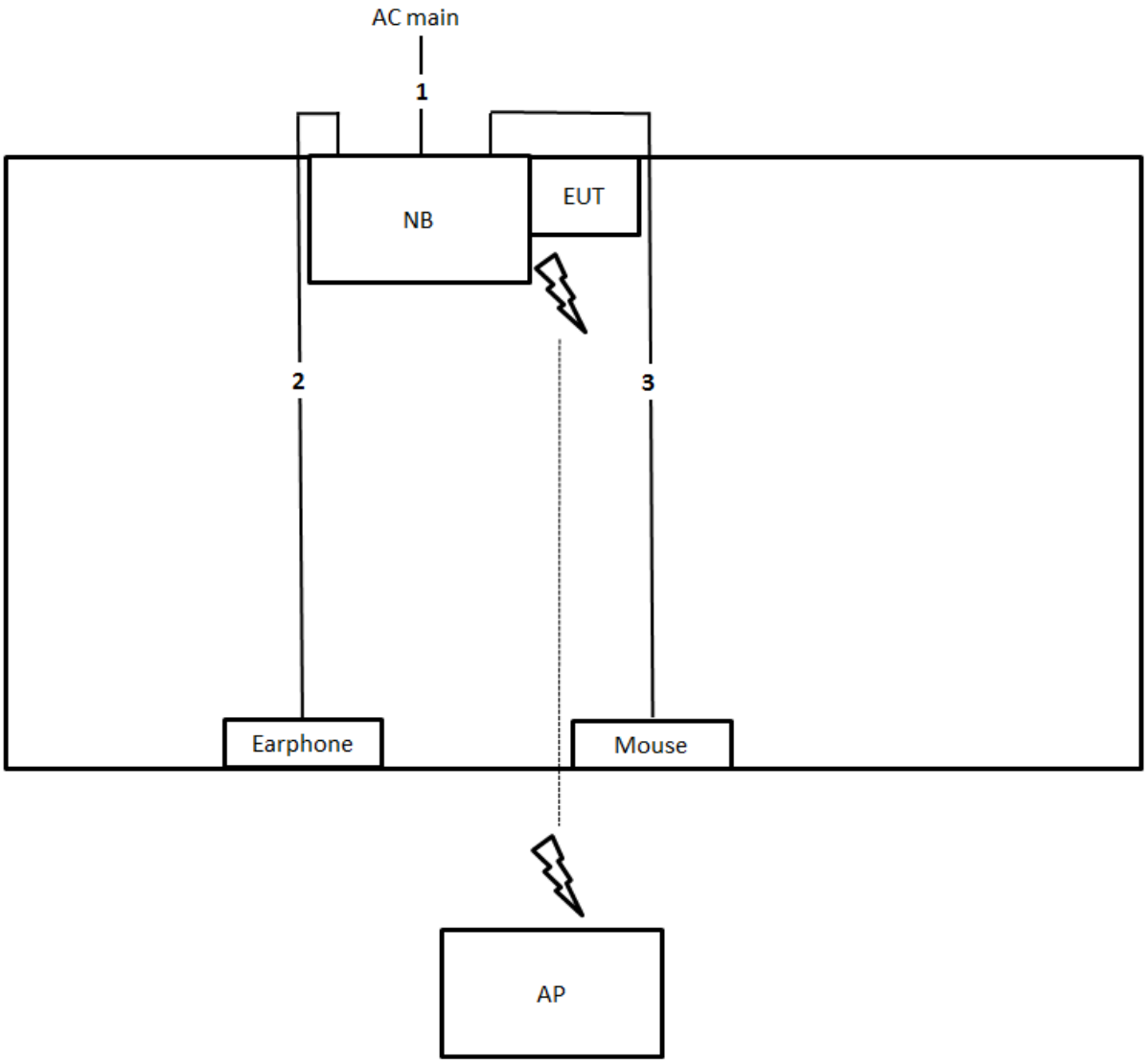
3.11.1. AC Power Line Conduction Emissions Test Configuration



Item	Connection	Shielded	Length
1	Power cable	No	2.6m
2	USB cable	Yes	1.8m
3	Audio cable	No	1.5m

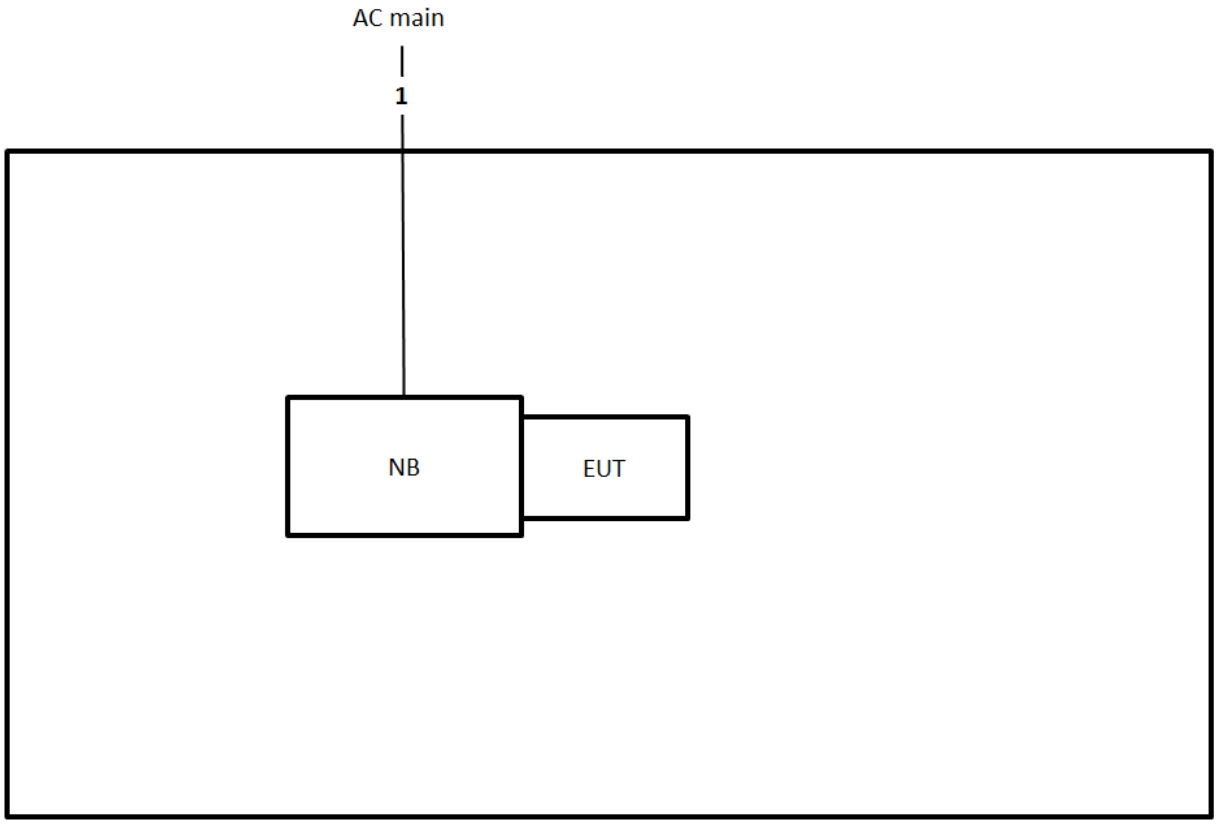
3.11.2. Radiation Emissions Test Configuration

Test Configuration: 30MHz~1GHz



Item	Connection	Shielded	Length
1	Power cable	No	2.6m
2	Audio cable	No	1.1m
3	USB cable	Yes	1.8m

Test Configuration: above 1GHz



Item	Connection	Shielded	Length
1	Power cable	No	2.6m

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

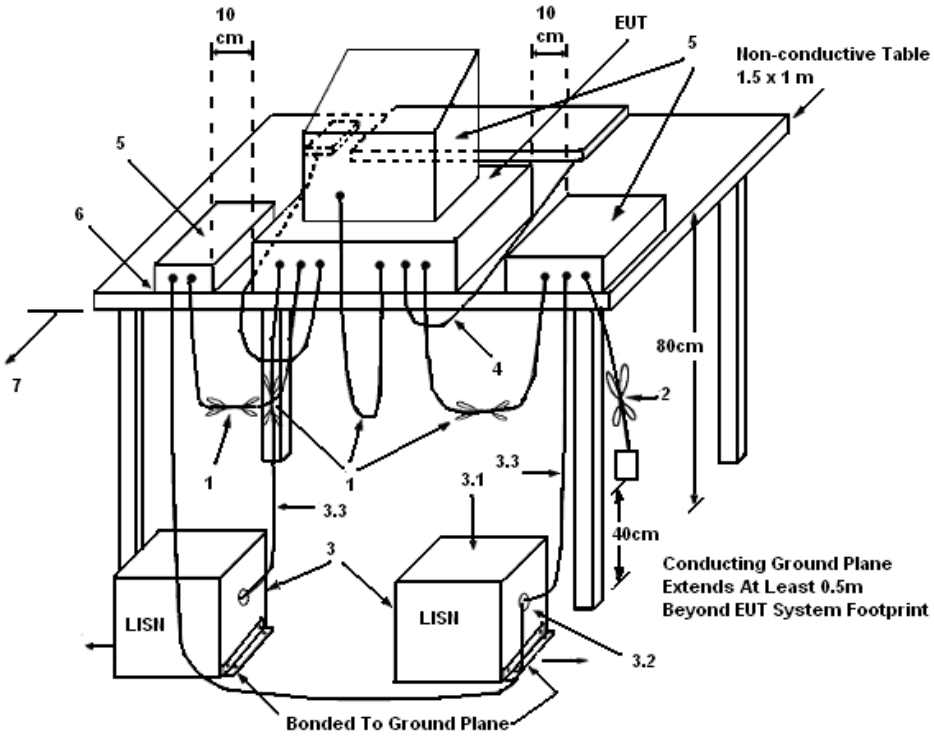
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

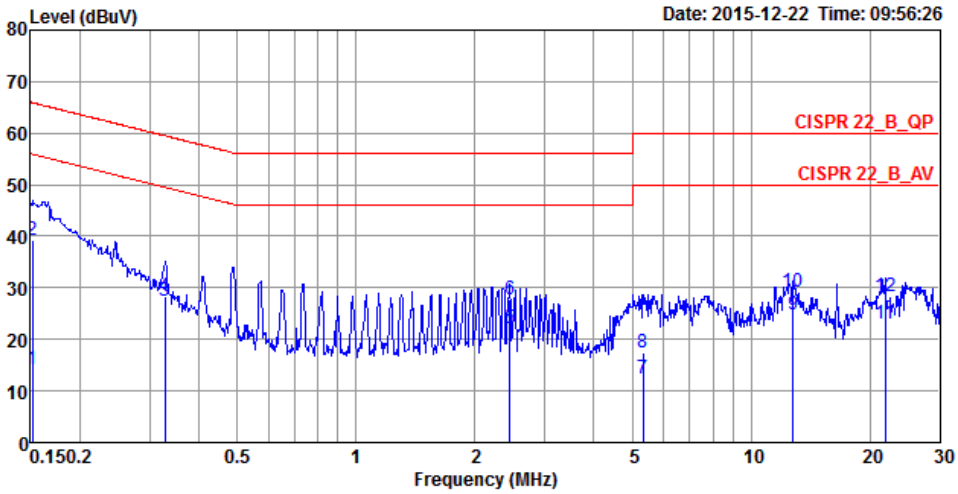
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

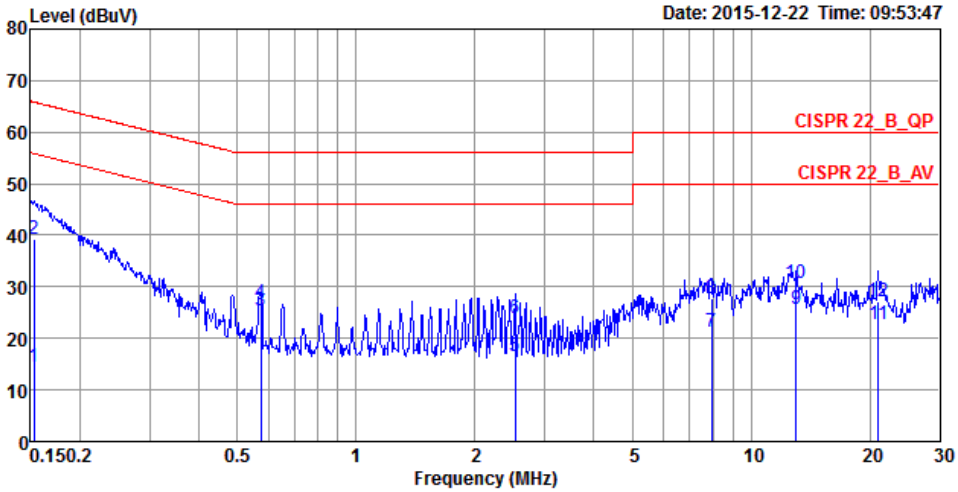
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	23°C	Humidity	56%
Test Engineer	Sollo Luo	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	0.1516	14.15	-41.76	55.91	4.20	9.93	0.02	LINE	Average
2	0.1516	39.17	-26.74	65.91	29.22	9.93	0.02	LINE	QP
3	0.3286	27.41	-22.08	49.49	17.44	9.93	0.04	LINE	Average
4	0.3286	28.30	-31.19	59.49	18.33	9.93	0.04	LINE	QP
5	2.4476	22.16	-23.84	46.00	12.11	10.00	0.05	LINE	Average
6	2.4476	27.79	-28.21	56.00	17.74	10.00	0.05	LINE	QP
7	5.3332	12.42	-37.58	50.00	2.25	10.07	0.10	LINE	Average
8	5.3332	17.56	-42.44	60.00	7.39	10.07	0.10	LINE	QP
9	12.7837	24.75	-25.25	50.00	14.23	10.27	0.25	LINE	Average
10	12.7837	29.10	-30.90	60.00	18.58	10.27	0.25	LINE	QP
11	21.8303	22.91	-27.09	50.00	12.16	10.49	0.26	LINE	Average
12	21.8303	28.33	-31.67	60.00	17.58	10.49	0.26	LINE	QP

Temperature	23°C	Humidity	56%
Test Engineer	Sollo Luo	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	0.1532	14.44	-41.38	55.82	4.64	9.78	0.02	NEUTRAL	Average
2	0.1532	39.18	-26.64	65.82	29.38	9.78	0.02	NEUTRAL	QP
3	0.5731	25.52	-20.48	46.00	15.68	9.80	0.04	NEUTRAL	Average
4	0.5731	26.98	-29.02	56.00	17.14	9.80	0.04	NEUTRAL	QP
5	2.5266	16.67	-29.33	46.00	6.77	9.85	0.05	NEUTRAL	Average
6	2.5266	23.88	-32.12	56.00	13.98	9.85	0.05	NEUTRAL	QP
7	7.9353	21.30	-28.70	50.00	11.16	9.97	0.17	NEUTRAL	Average
8	7.9353	27.88	-32.12	60.00	17.74	9.97	0.17	NEUTRAL	QP
9	12.9885	25.77	-24.23	50.00	15.45	10.07	0.25	NEUTRAL	Average
10	12.9885	30.72	-29.28	60.00	20.40	10.07	0.25	NEUTRAL	QP
11	21.0355	22.67	-27.33	50.00	12.21	10.20	0.26	NEUTRAL	Average
12	21.0355	27.20	-32.80	60.00	16.74	10.20	0.26	NEUTRAL	QP

Note:

Level = Read Level + LISN Factor + Cable Loss.

4.2. 26dB Bandwidth and 99% Occupied Bandwidth Measurement

4.2.1. Limit

No restriction limits.

4.2.2. Measuring Instruments and Setting

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

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

4.2.3. Test Procedures

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

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

4.2.4. Test Setup Layout

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

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

4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

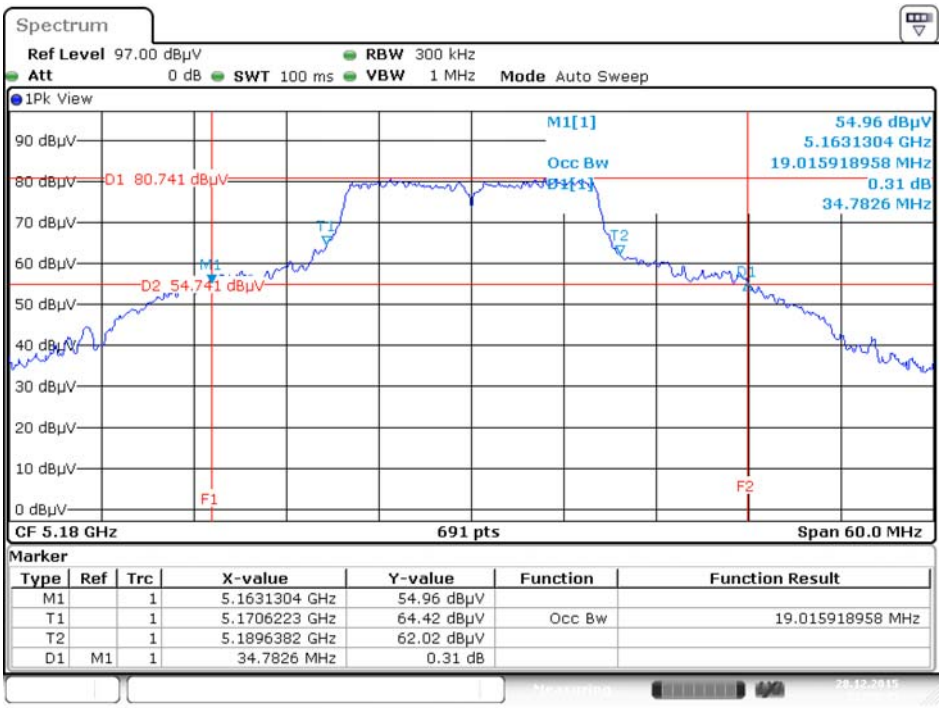
The EUT was programmed to be in continuously transmitting mode.

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

Temperature	25℃	Humidity	58%
Test Engineer	Peter Lin		

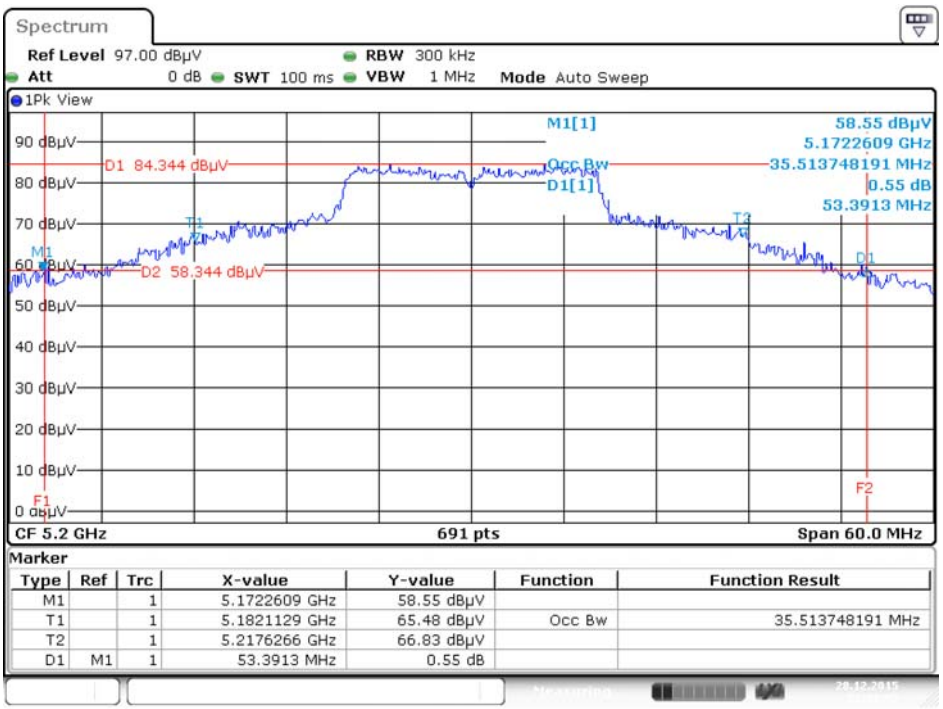
Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5180 MHz	34.78	19.02
	5200 MHz	53.39	35.51
	5240 MHz	32.87	21.39
	5745 MHz	21.39	16.85
	5785 MHz	46.35	34.12
	5825 MHz	26.52	17.19
802.11ac MCS0/Nss2 VHT20	5180 MHz	44.78	29.87
	5200 MHz	47.04	31.00
	5240 MHz	39.04	22.14
	5745 MHz	30.09	18.32
	5785 MHz	42.96	26.48
	5825 MHz	34.17	18.41
802.11ac MCS0/Nss2 VHT40	5190 MHz	44.49	37.19
	5230 MHz	88.26	43.42
	5755 MHz	44.78	37.05
	5795 MHz	91.30	52.10
802.11ac MCS0/Nss2 VHT80	5210 MHz	80.87	75.54
	5775 MHz	81.45	75.54

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant. 1 / 5180 MHz



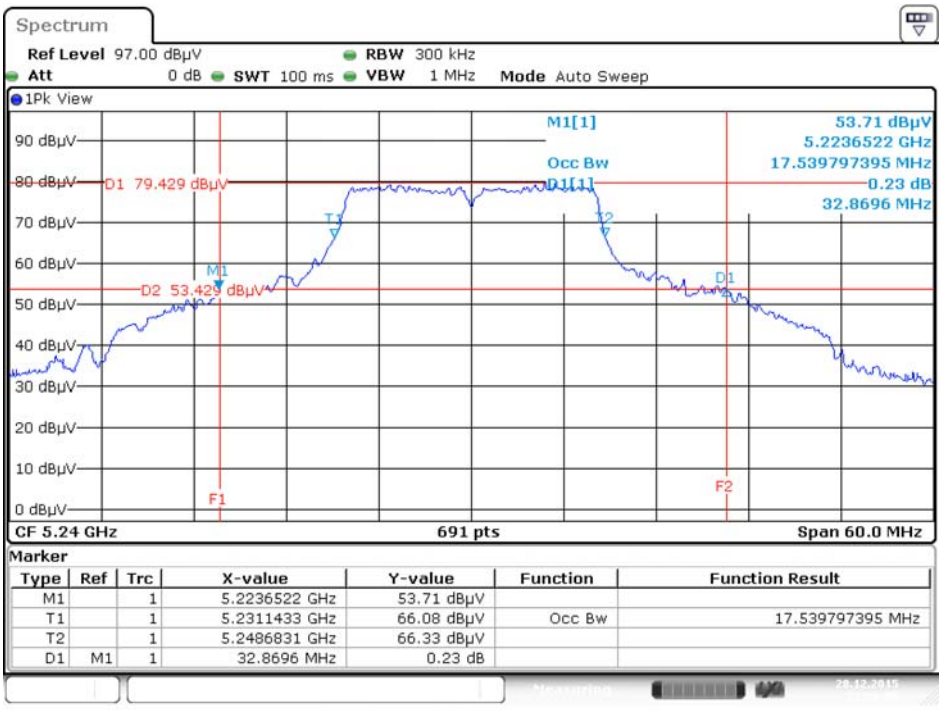
Date: 28.DEC.2015 22:25:45

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant. 1 / 5200 MHz



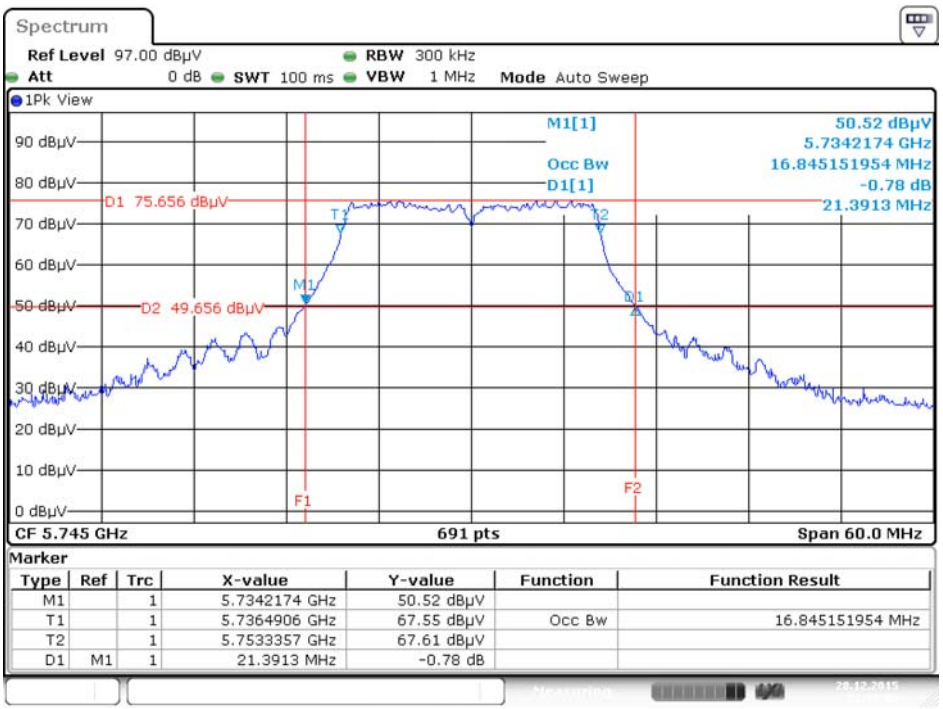
Date: 28.DEC.2015 22:32:52

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant. 1 / 5240 MHz



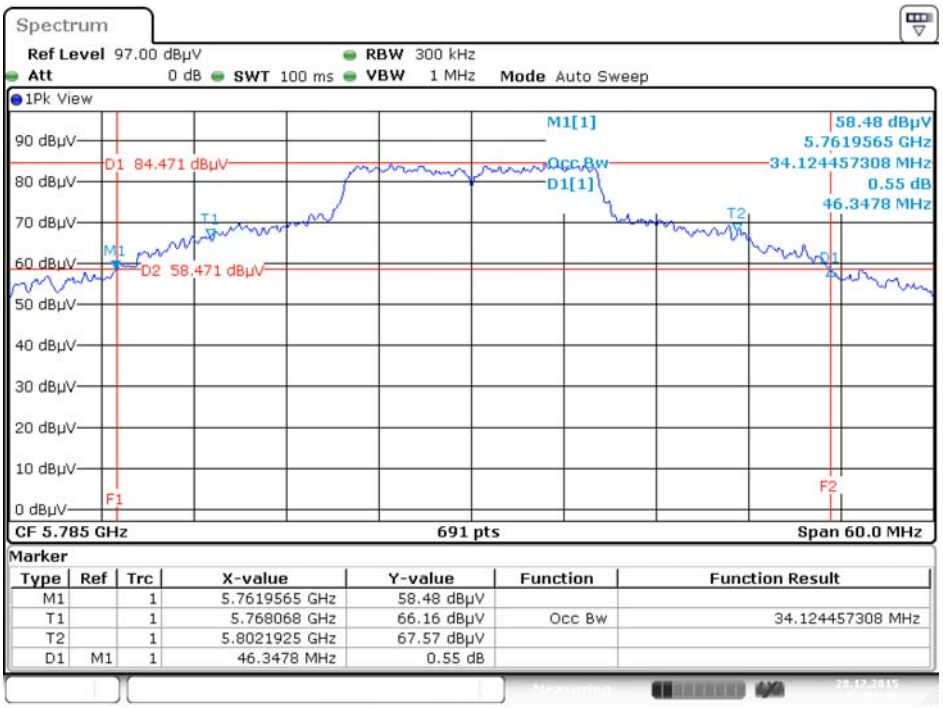
Date: 28.DEC.2015 22:36:05

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant. 1 / 5745 MHz



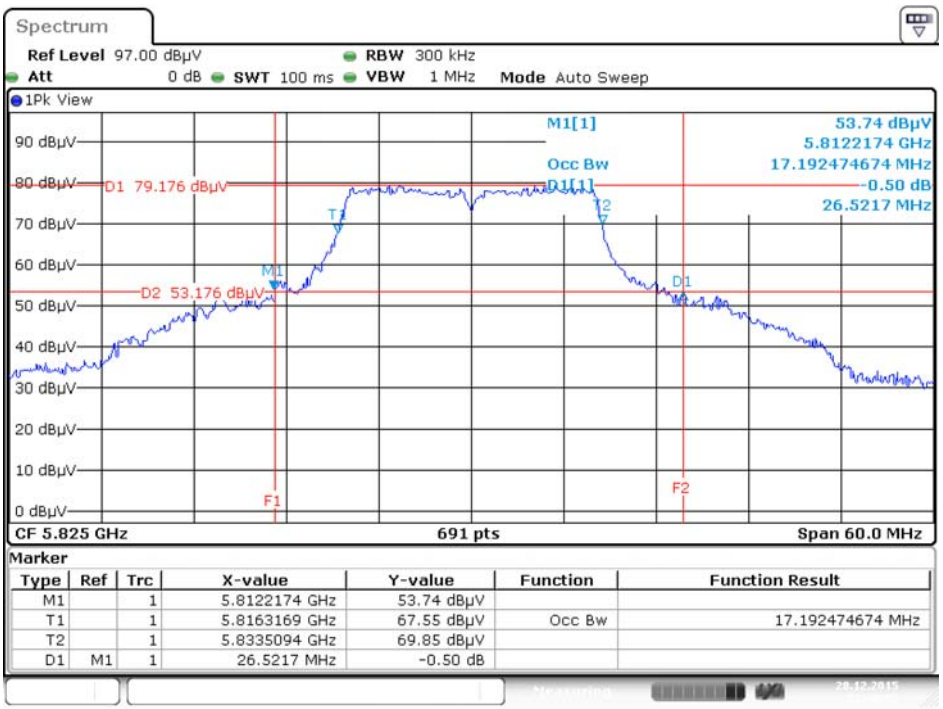
Date: 28.DEC.2015 22:37:03

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant. 1 / 5785 MHz



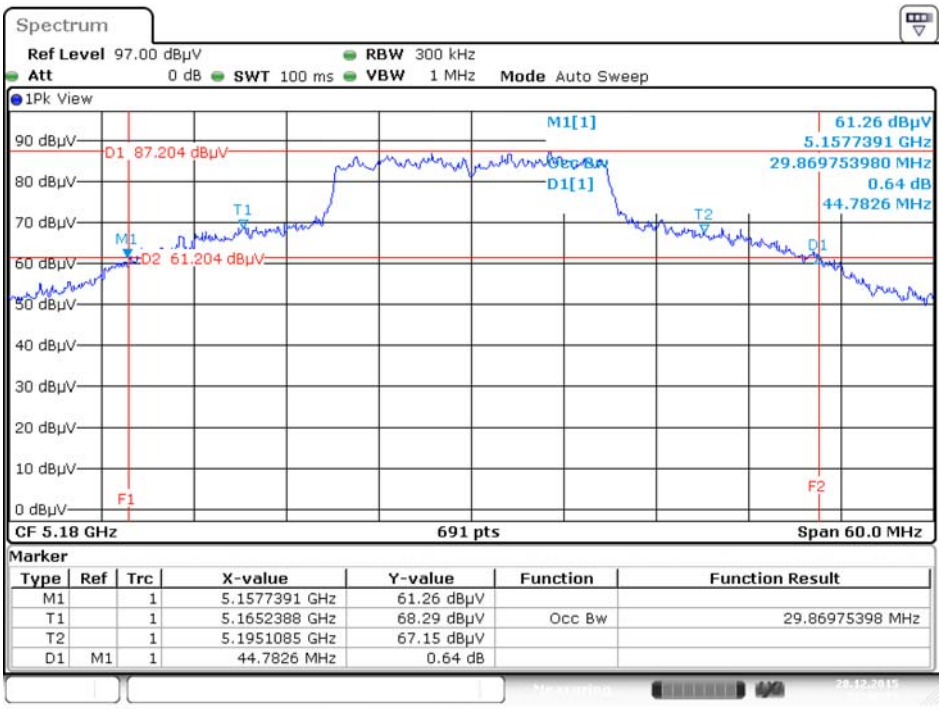
Date: 28.DEC.2015 22:38:08

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant. 1 / 5825 MHz



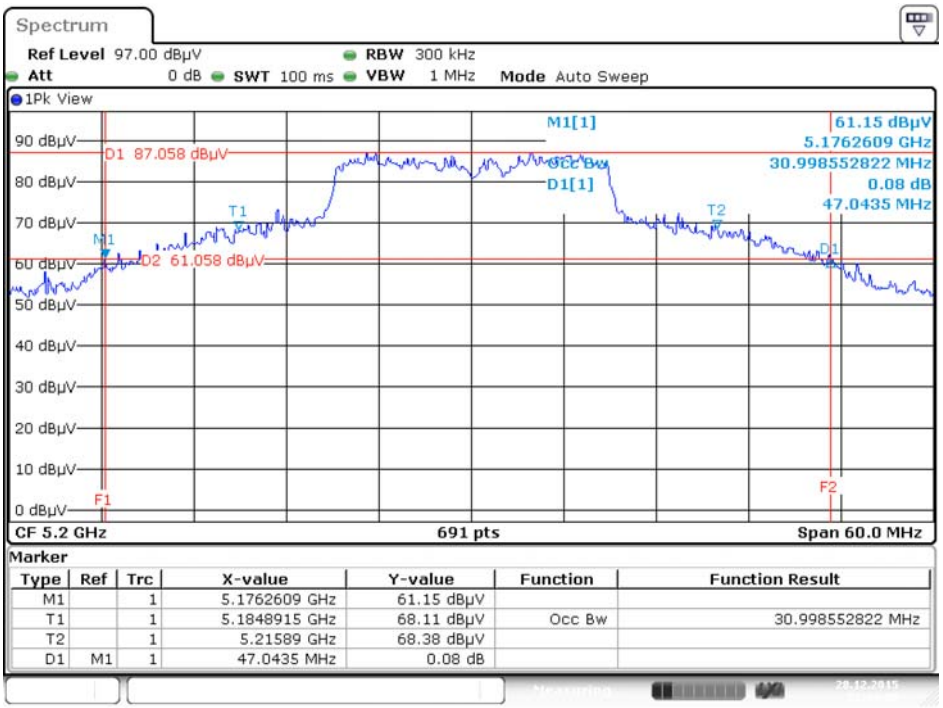
Date: 28.DEC.2015 22:40:52

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT20 / Ant. 1 + Ant. 2 / 5180 MHz



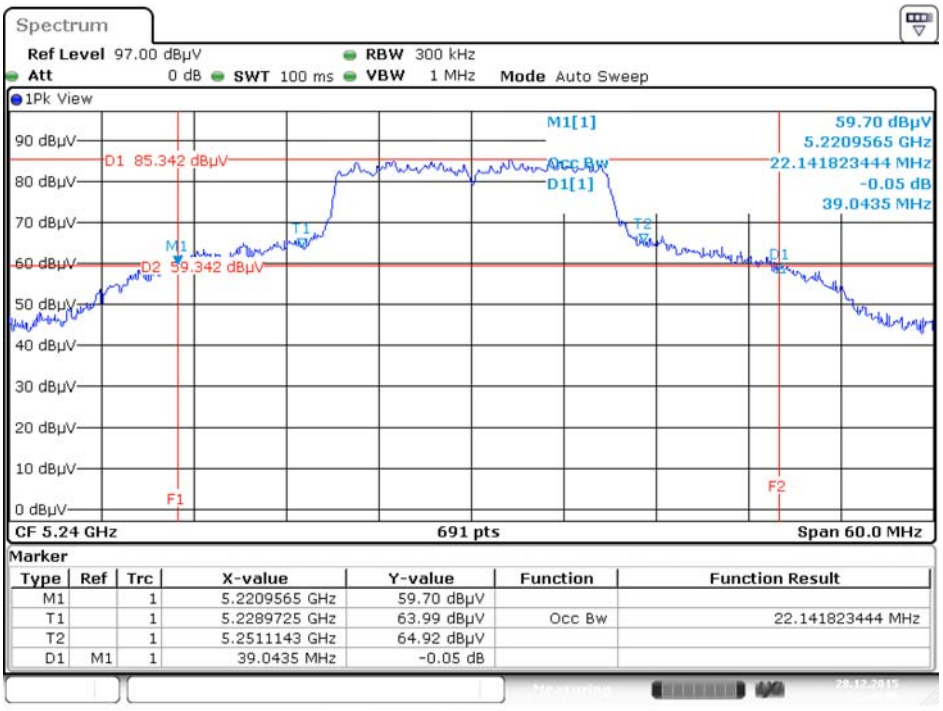
Date: 28.DEC.2015 22:42:31

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT20 / Ant. 1 + Ant. 2 / 5200 MHz



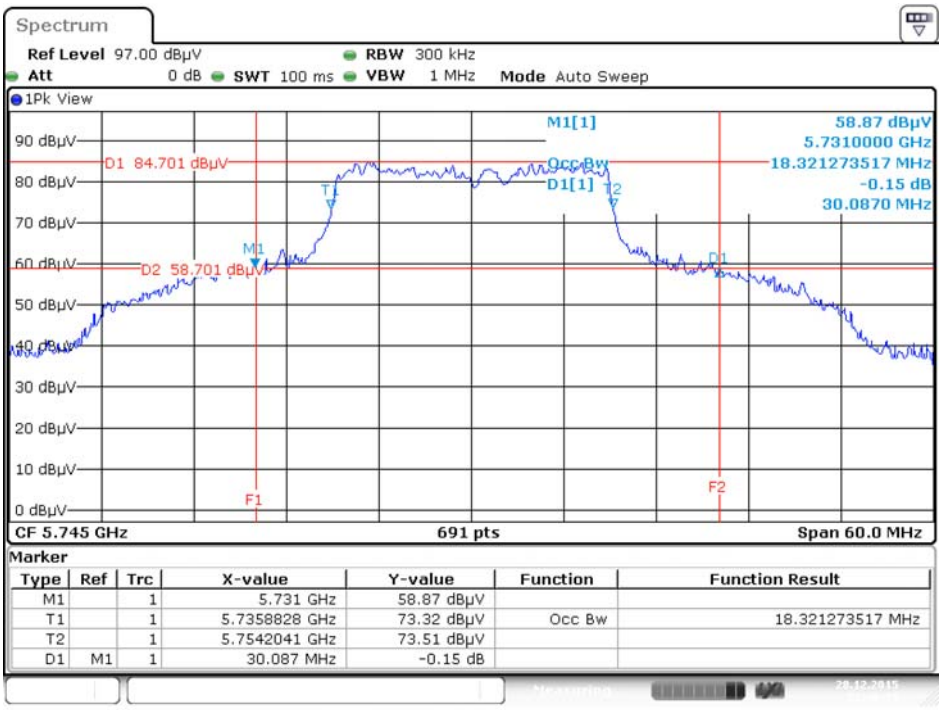
Date: 28.DEC.2015 22:44:08

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT20 / Ant. 1 + Ant. 2 / 5240 MHz



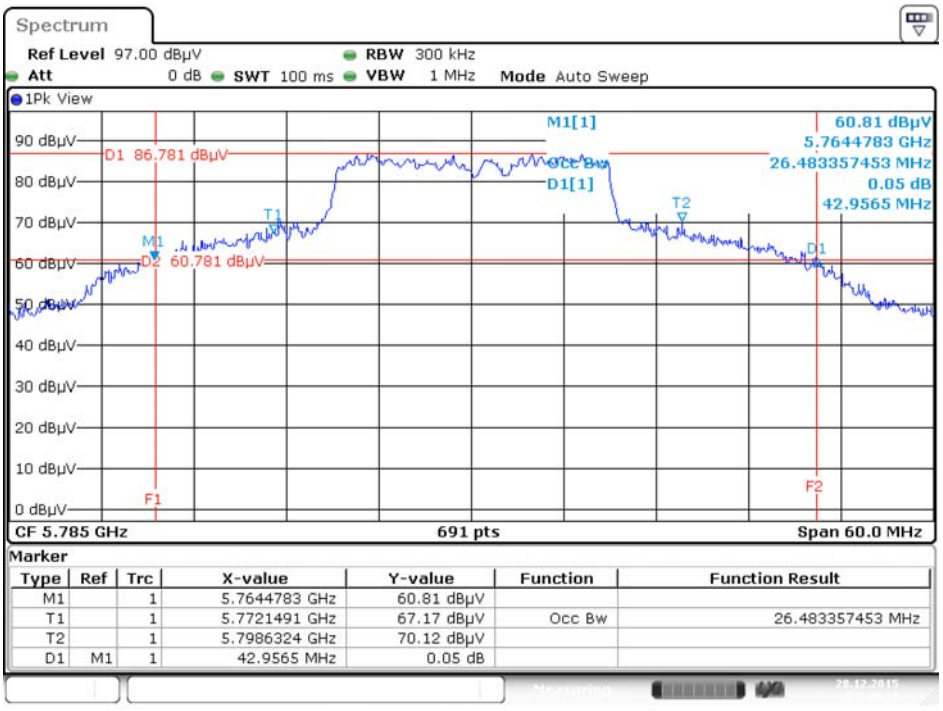
Date: 28.DEC.2015 22:45:05

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



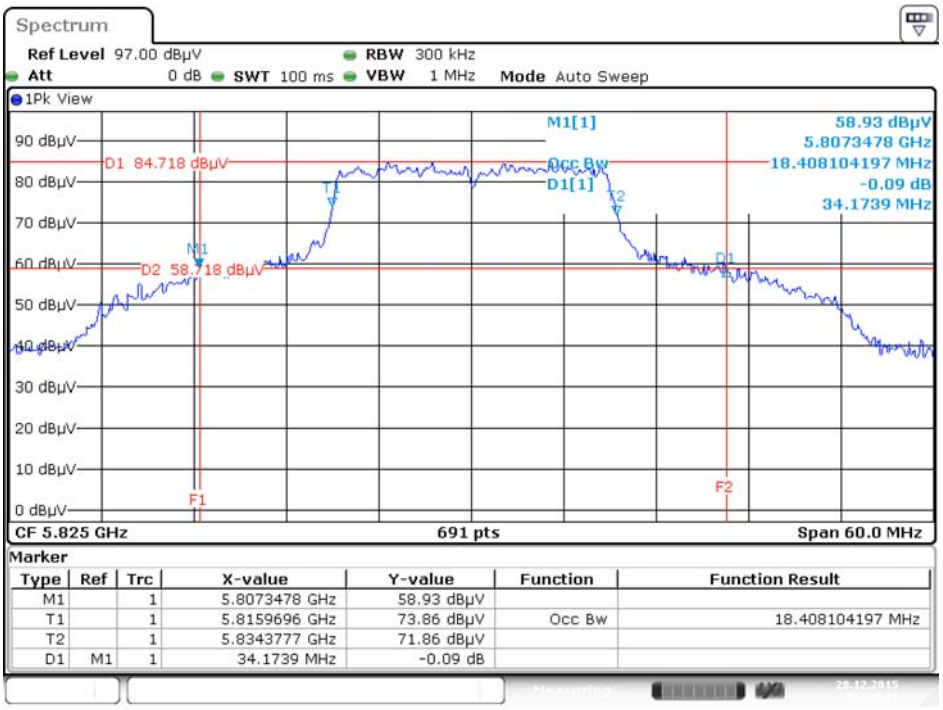
Date: 28.DEC.2015 22:46:15

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



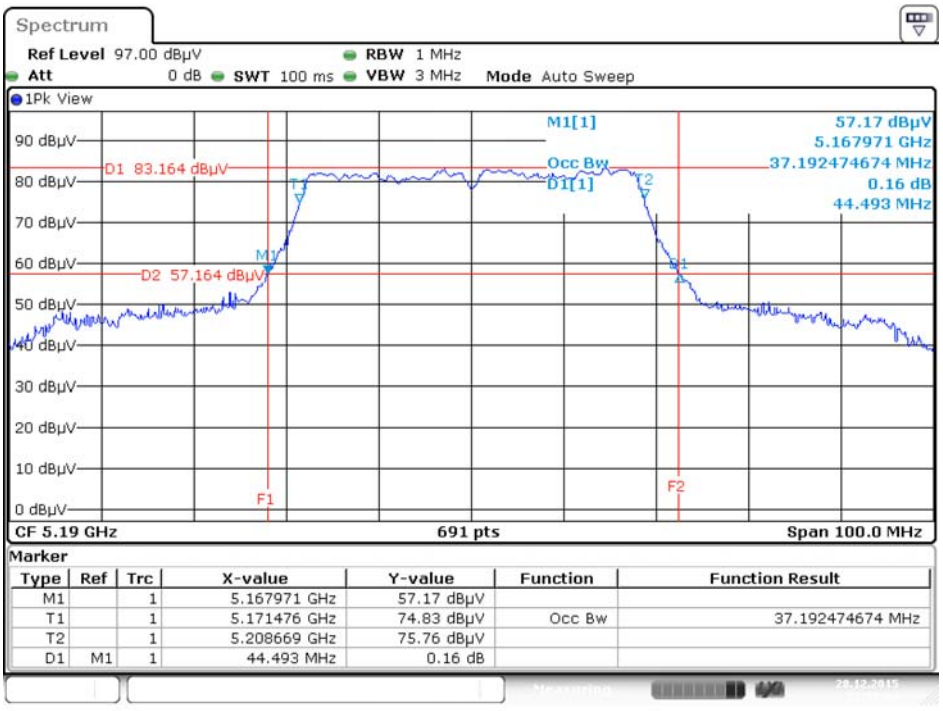
Date: 28.DEC.2015 22:49:10

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



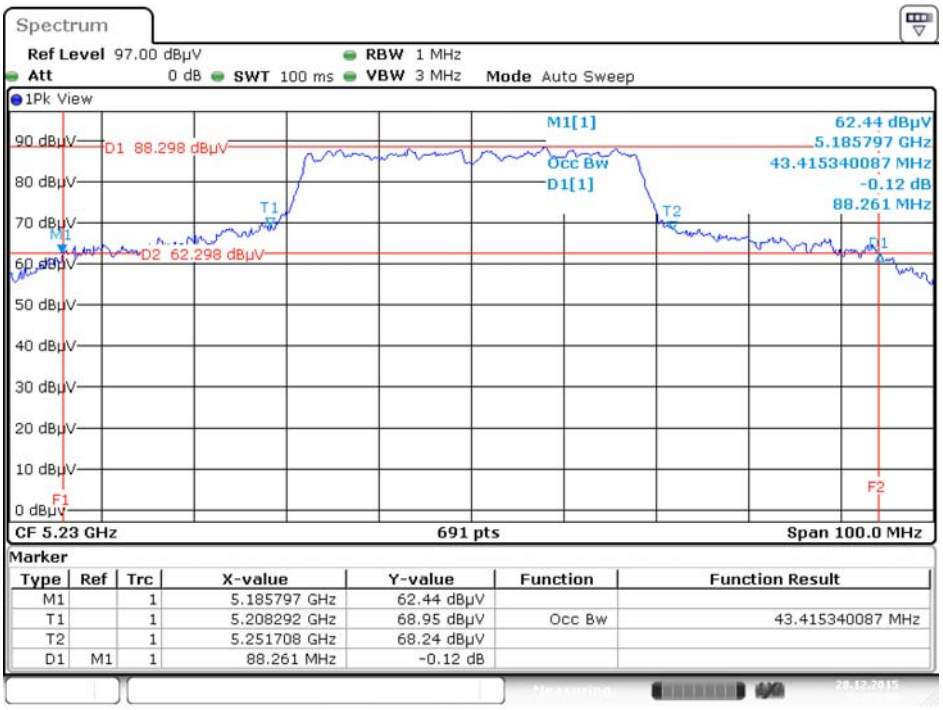
Date: 28.DEC.2015 22:50:17

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT40 / Ant. 1 + Ant. 2 / 5190 MHz



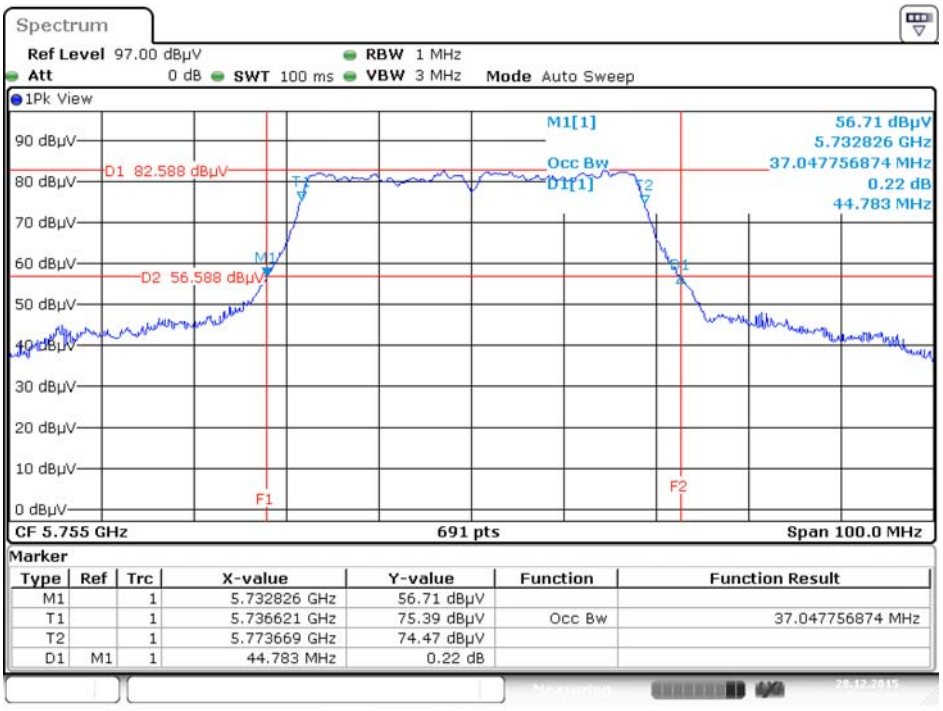
Date: 28.DEC.2015 22:52:05

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT40 / Ant. 1 + Ant. 2 / 5230 MHz



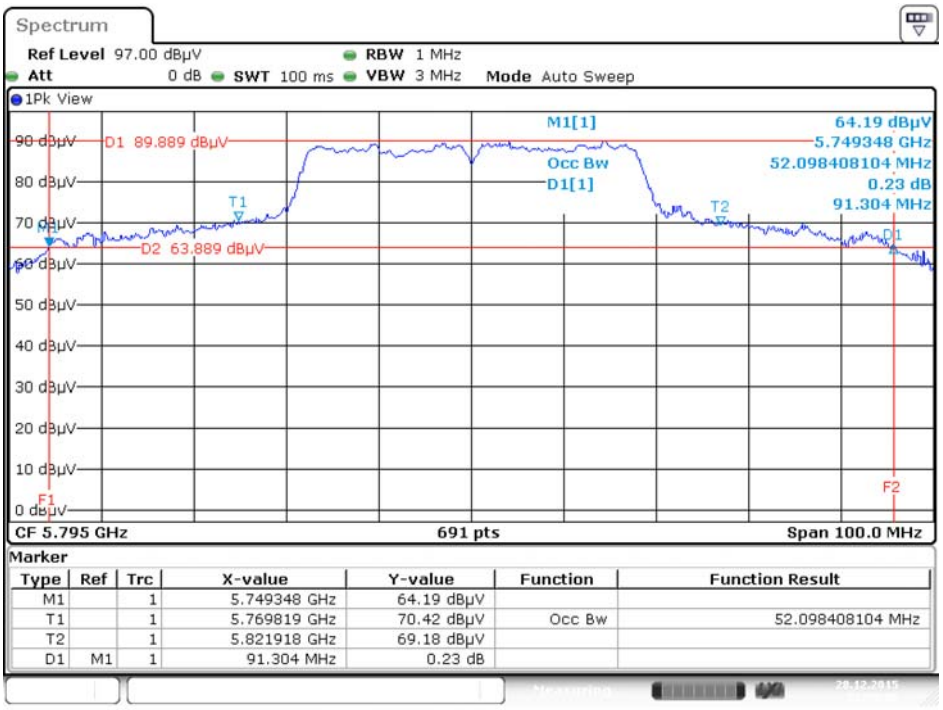
Date: 28.DEC.2015 22:53:00

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



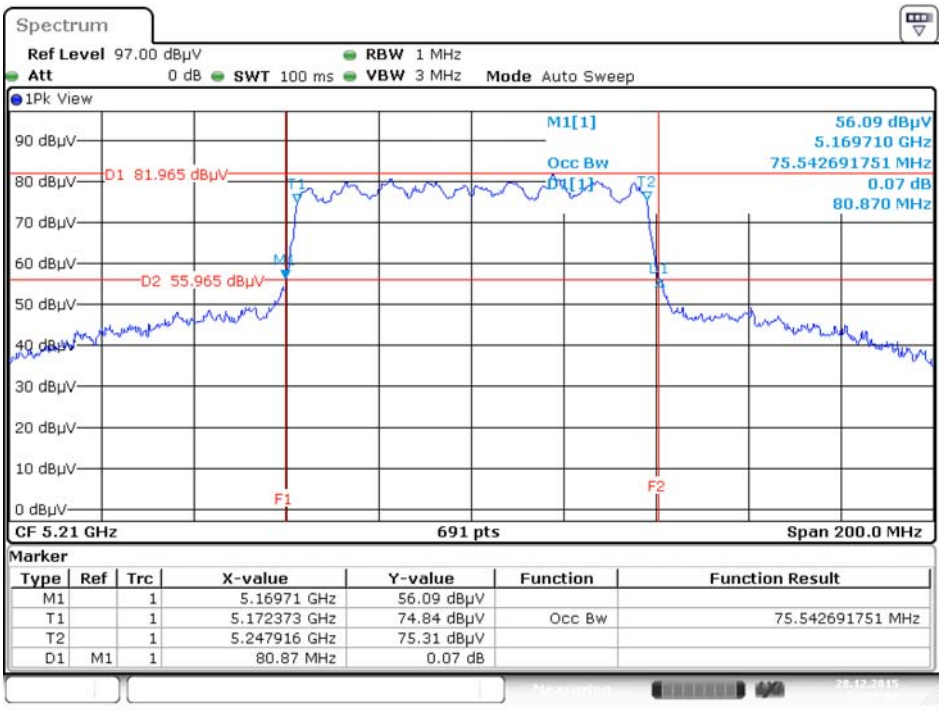
Date: 28.DEC.2015 22:54:30

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



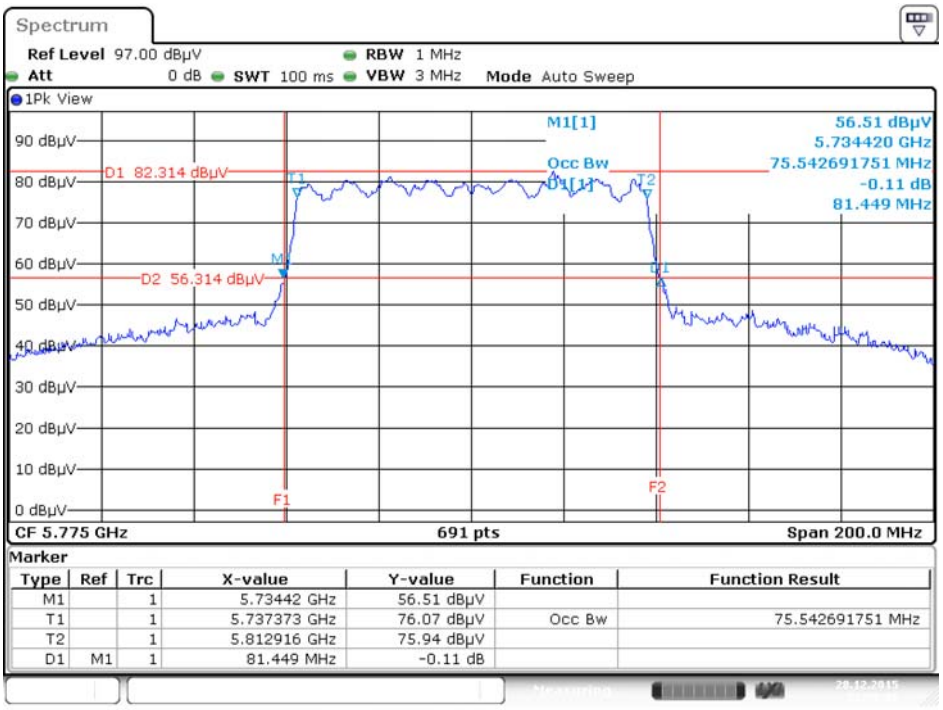
Date: 28.DEC.2015 22:55:37

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT80 / Ant. 1 + Ant. 2 / 5210 MHz



Date: 28.DEC.2015 22:57:07

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



Date: 28.DEC.2015 22:58:17

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

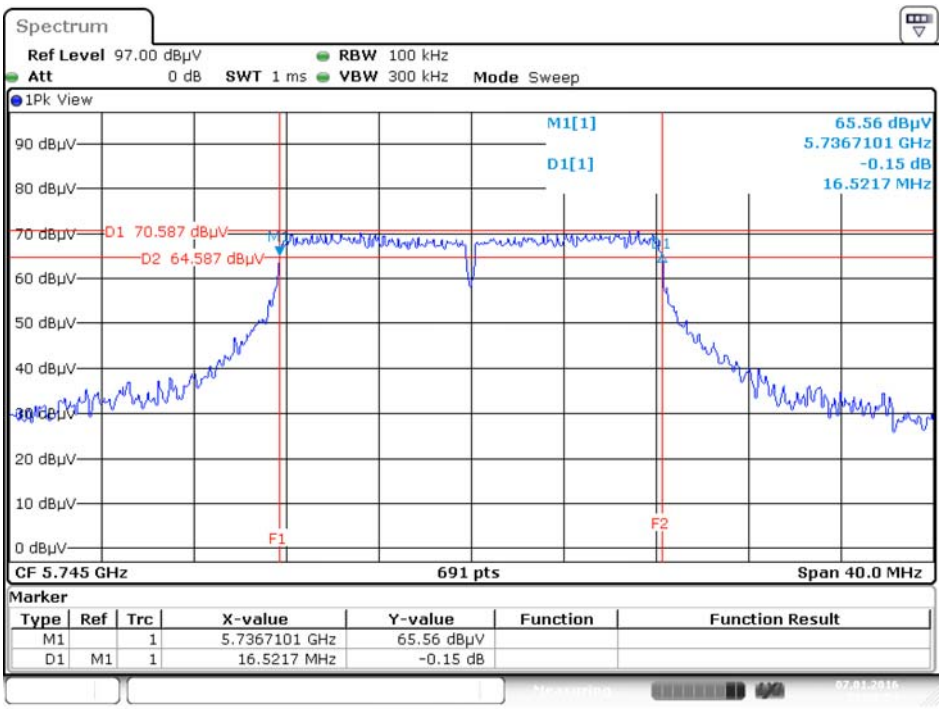
Temperature	25℃	Humidity	58%
Test Engineer	Peter Lin		

Mode	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11a	5745 MHz	16.52	500	Complies
	5785 MHz	16.52	500	Complies
	5825 MHz	16.52	500	Complies
802.11ac MCS0/Nss2 VHT20	5745 MHz	17.74	500	Complies
	5785 MHz	17.68	500	Complies
	5825 MHz	17.68	500	Complies
802.11ac MCS0/Nss2 VHT40	5755 MHz	36.41	500	Complies
	5795 MHz	36.41	500	Complies
802.11ac MCS0/Nss2 VHT80	5775 MHz	75.94	500	Complies

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

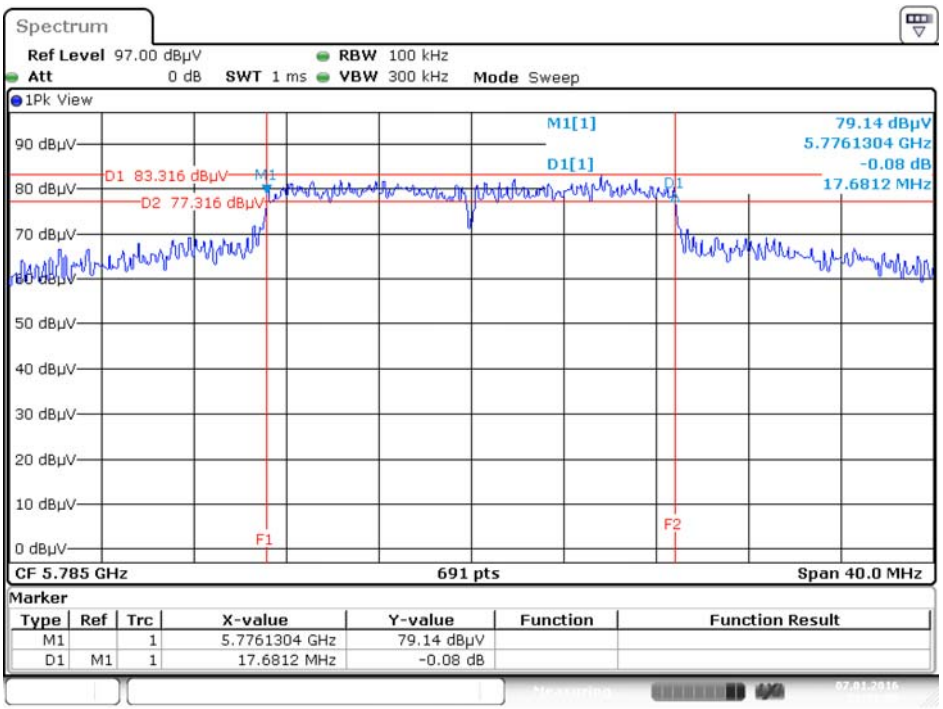
For plots, only the channel with worse result was shown.

6 dB Bandwidth Plot on Configuration IEEE 802.11a / Ant. 1 / 5745 MHz



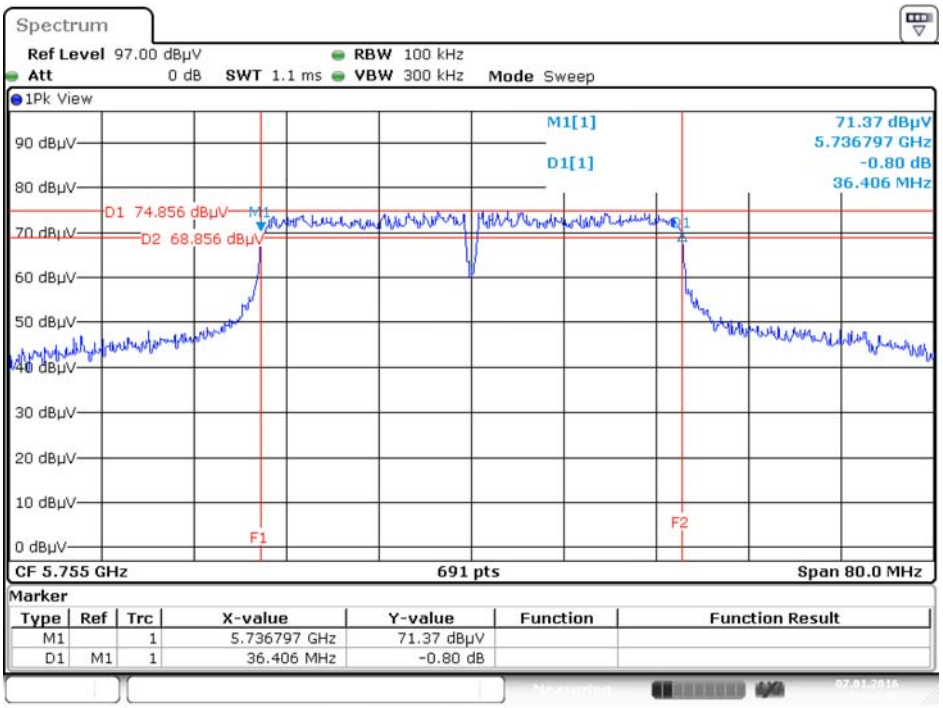
Date: 7.JAN.2016 23:28:55

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT20 / Ant. 1 + Ant. 2 / 5785 MHz



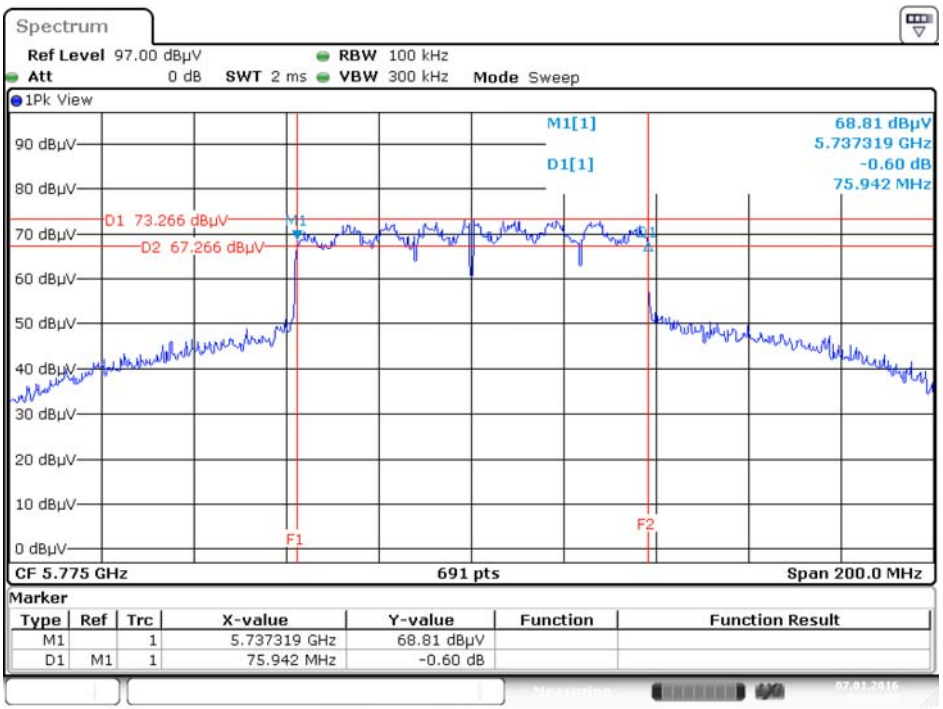
Date: 7.JAN.2016 23:31:58

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT40 / Ant. 1 + Ant. 2 / 5755 MHz



Date: 7.JAN.2016 23:34:05

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT80 / Ant. 1 + Ant. 2 / 5775 MHz



Date: 7.JAN.2016 23:35:55

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

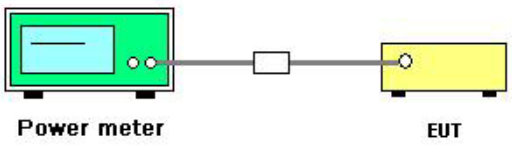
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

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	58%
Test Engineer	Peter Lin	Test Date	Dec. 28, 2015~Feb. 18, 2016

Mode	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
		Ant. 1		
802.11a	5180 MHz	15.63	23.98	Complies
	5200 MHz	16.16	23.98	Complies
	5240 MHz	15.58	23.98	Complies
	5745 MHz	12.07	30.00	Complies
	5785 MHz	12.76	30.00	Complies
	5825 MHz	12.61	30.00	Complies

Mode	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Ant. 1	Ant. 2	Total		
802.11ac MCS0/Nss2 VHT20	5180 MHz	14.86	12.43	16.82	23.98	Complies
	5200 MHz	15.14	13.16	17.27	23.98	Complies
	5240 MHz	14.81	12.32	16.75	23.98	Complies
	5745 MHz	11.61	10.89	14.28	30.00	Complies
	5785 MHz	11.87	11.24	14.58	30.00	Complies
	5825 MHz	11.88	11.28	14.60	30.00	Complies
802.11ac MCS0/Nss2 VHT40	5190 MHz	15.01	12.70	17.02	23.98	Complies
	5230 MHz	14.66	12.45	16.70	23.98	Complies
	5755 MHz	11.52	10.96	14.26	30.00	Complies
	5795 MHz	11.67	11.32	14.51	30.00	Complies
802.11ac MCS0/Nss2 VHT80	5210 MHz	14.78	12.03	16.63	23.98	Complies
	5775 MHz	11.74	11.05	14.42	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

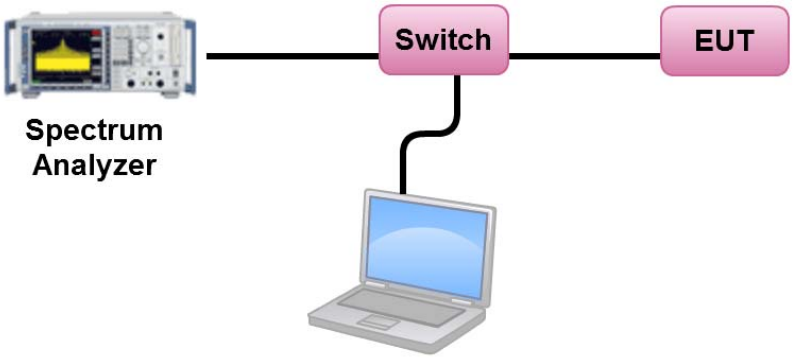
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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	58%
Test Engineer	Peter Lin	Test Date	Dec. 28, 2015~Feb. 18, 2016

Configuration IEEE 802.11a / Ant. 1

Channel	Frequency	Power Density (dBm/MHz)		Max. Limit (dBm/MHz)		Result
36	5180 MHz	7.20		11.00		Complies
40	5200 MHz	8.95		11.00		Complies
48	5240 MHz	6.52		11.00		Complies
Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	3.76	-3.01	0.75	30.00	Complies
157	5785 MHz	9.02	-3.01	6.01	30.00	Complies
165	5825 MHz	6.80	-3.01	3.79	30.00	Complies

Configuration IEEE 802.11ac MCS0/Nss2 VHT20 / Ant. 1 + Ant. 2

Channel	Frequency	Power Density (dBm/MHz)		Max. Limit (dBm/MHz)		Result
36	5180 MHz	9.78		11.00		Complies
40	5200 MHz	10.17		11.00		Complies
48	5240 MHz	9.32		11.00		Complies
Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	8.60	-3.01	5.59	30.00	Complies
157	5785 MHz	9.51	-3.01	6.50	30.00	Complies
165	5825 MHz	8.79	-3.01	5.78	30.00	Complies

Configuration IEEE 802.11ac MCS0/Nss2 VHT40 / Ant. 1 + Ant. 2

Channel	Frequency	Power Density (dBm/MHz)		Max. Limit (dBm/MHz)		Result
38	5190 MHz	4.80		11.00		Complies
46	5230 MHz	6.75		11.00		Complies
Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
151	5755 MHz	3.52	-3.01	0.51	30.00	Complies
159	5795 MHz	6.72	-3.01	3.71	30.00	Complies

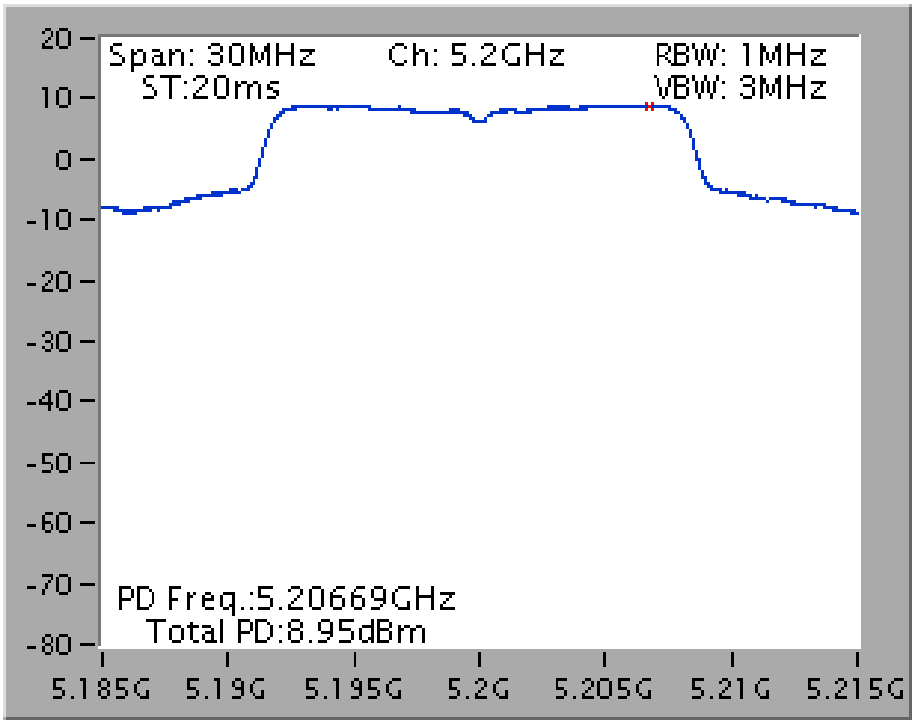
Configuration IEEE 802.11ac MCS0/Nss2 VHT80 / Ant. 1 + Ant. 2

Channel	Frequency	Power Density (dBm/MHz)		Max. Limit (dBm/MHz)		Result
42	5210 MHz	1.37		11.00		Complies
Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
155	5775 MHz	0.20	-3.01	-2.81	30.00	Complies

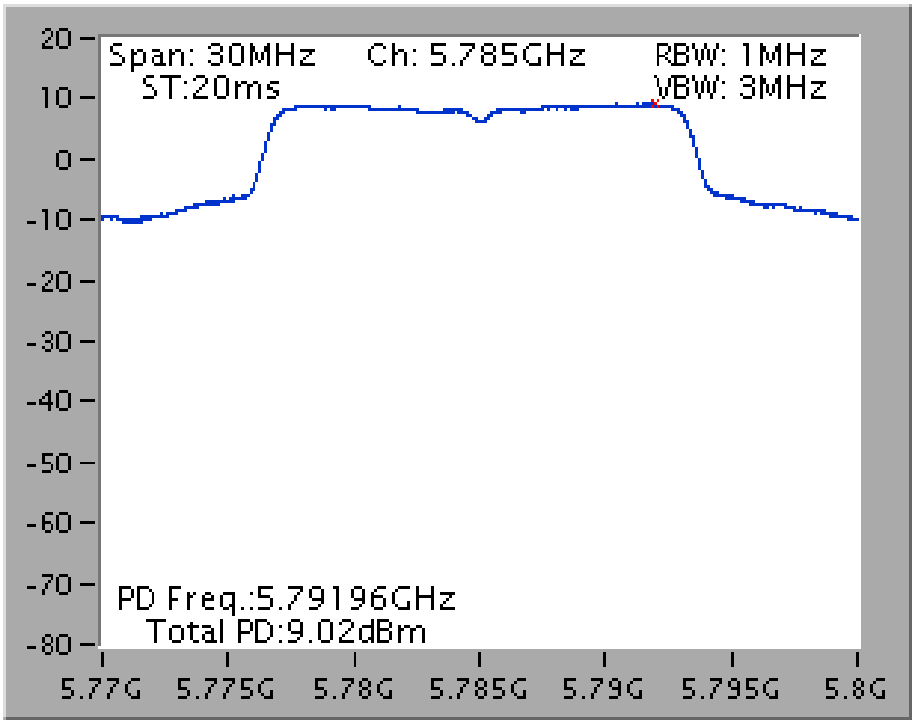
Note: All the test values were listed in the report.

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

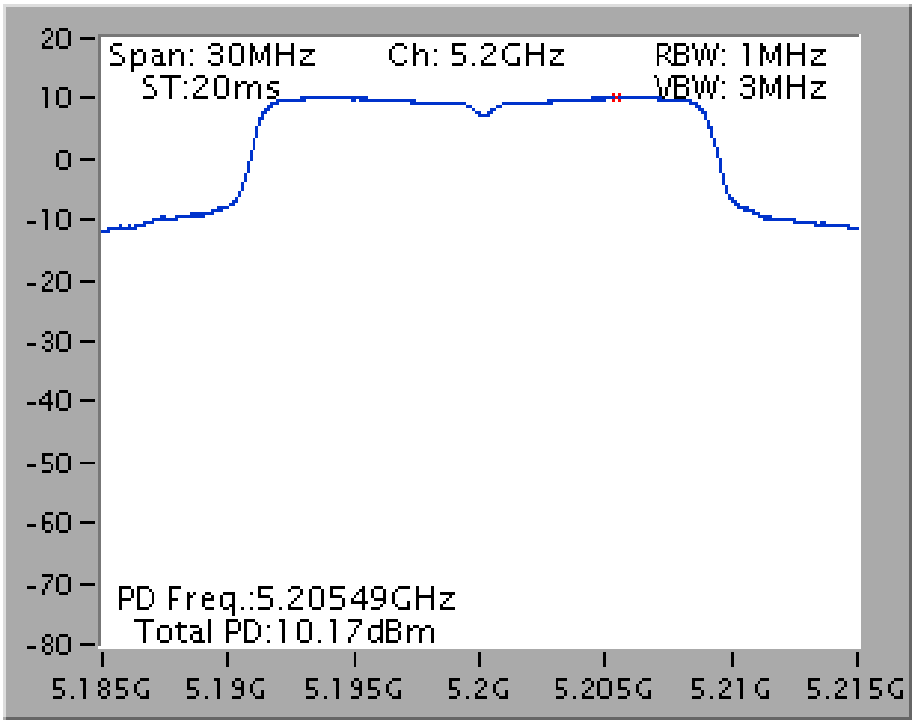
Power Density Plot on Configuration IEEE 802.11a / Ant. 1 / 5200 MHz



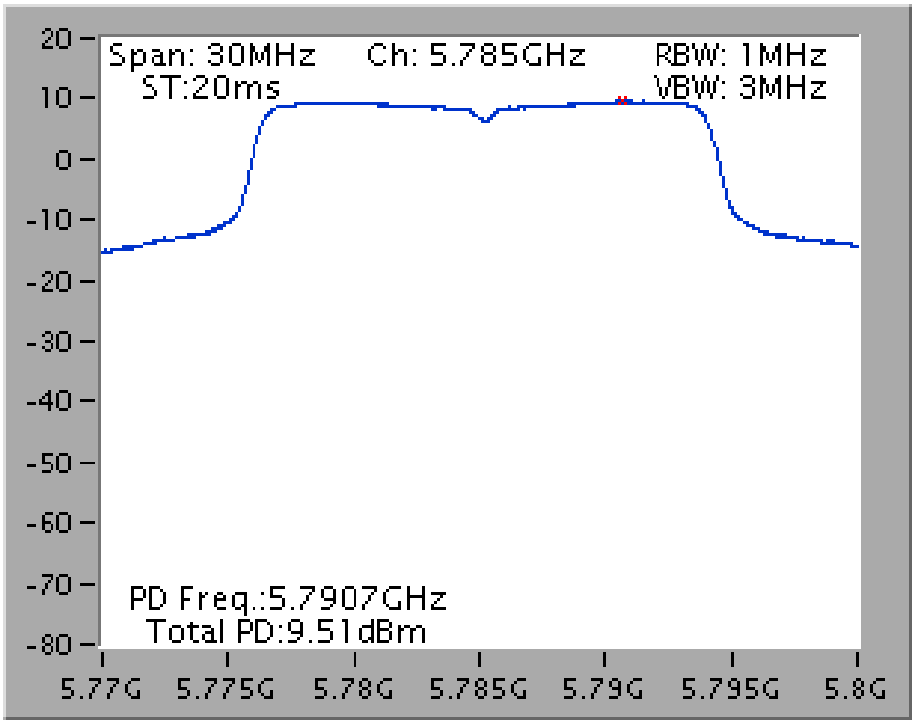
Power Density Plot on Configuration IEEE 802.11a / Ant. 1 / 5785 MHz



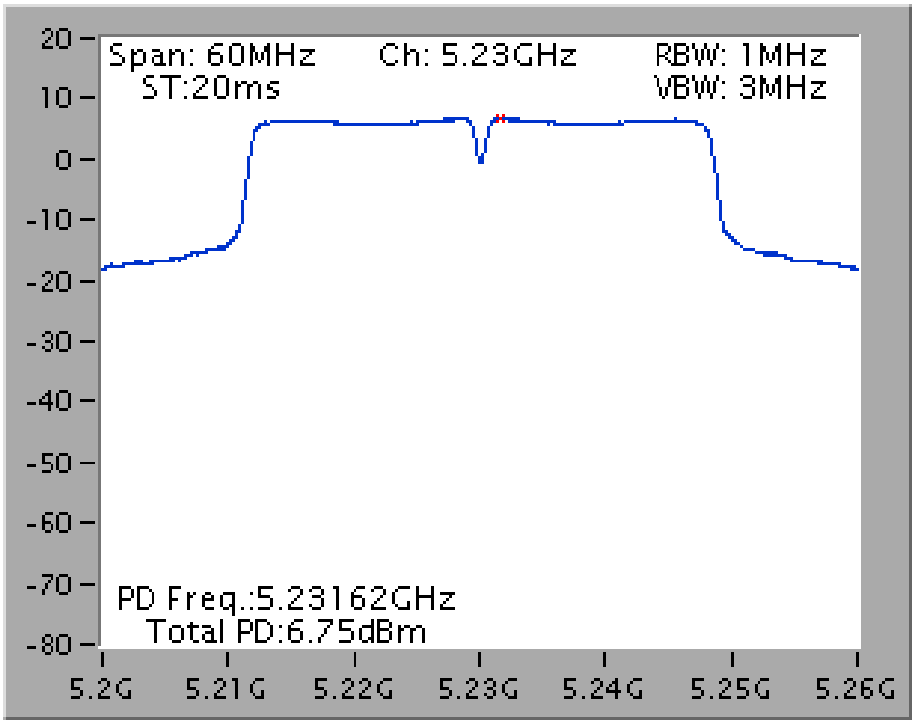
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT20 / Ant. 1 + Ant. 2 / 5200 MHz



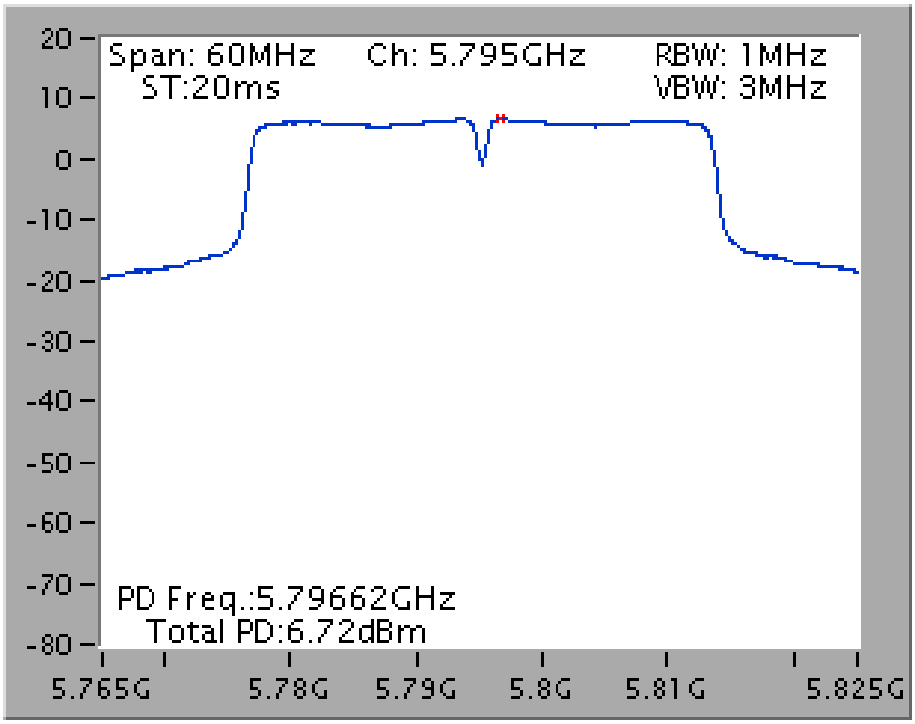
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT20 / Ant. 1 + Ant. 2 / 5785 MHz



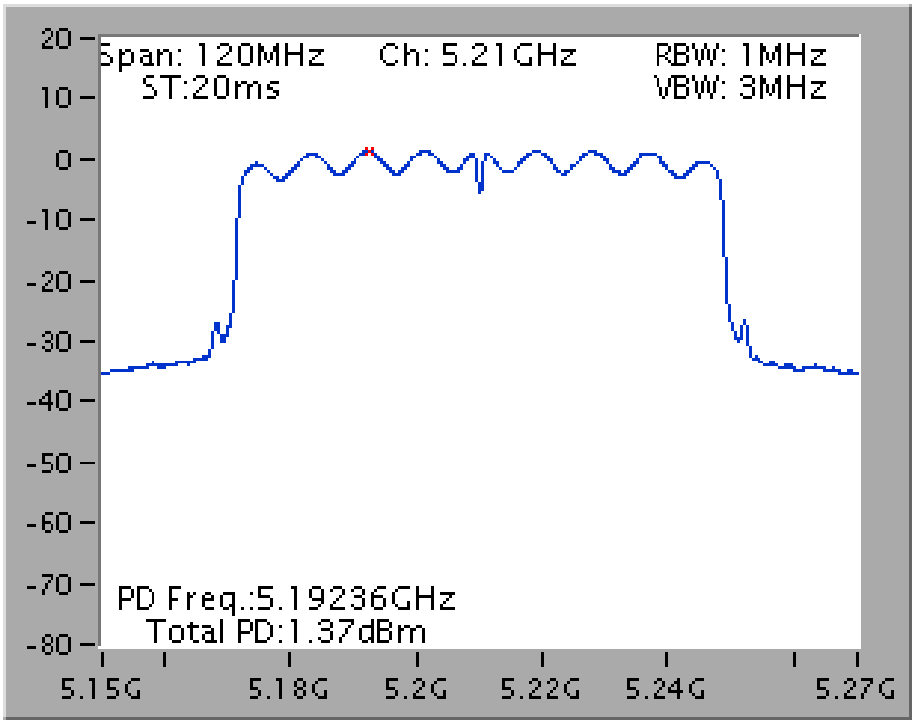
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT40 / Ant. 1 + Ant. 2 / 5230 MHz



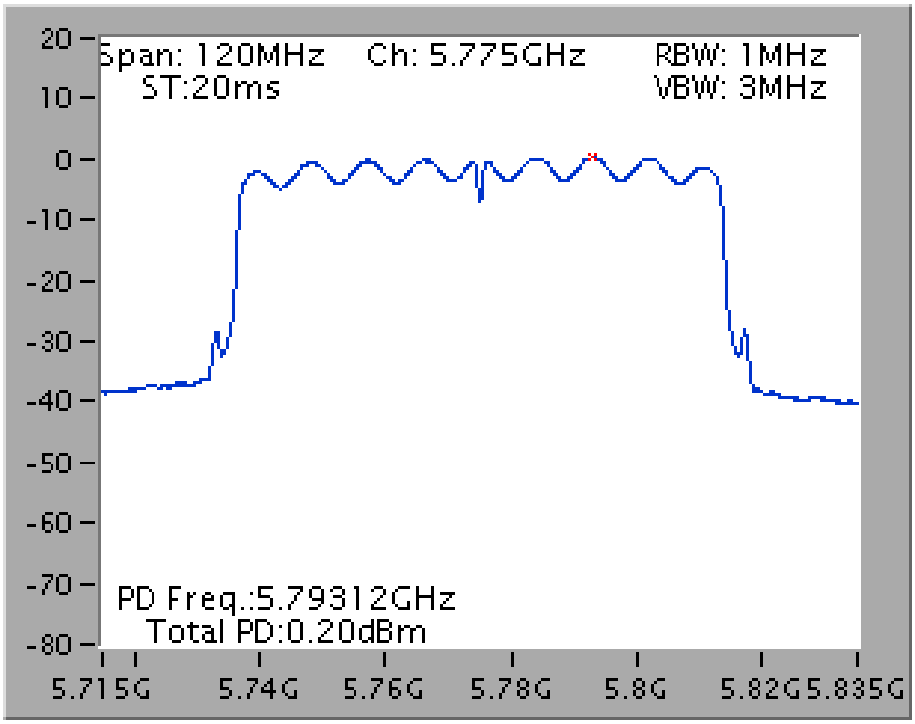
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT40 / Ant. 1 + Ant. 2 / 5795 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT80 / Ant. 1 + Ant. 2 / 5210 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss2 VHT80 / Ant. 1 + Ant. 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

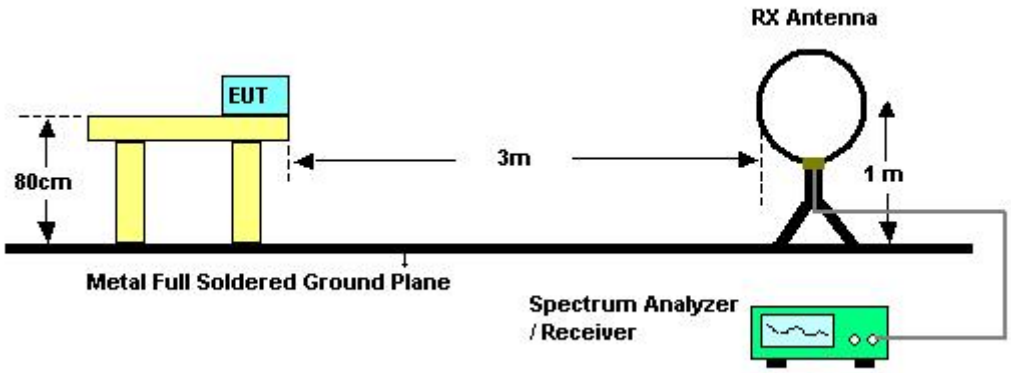
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.6.3. Test Procedures

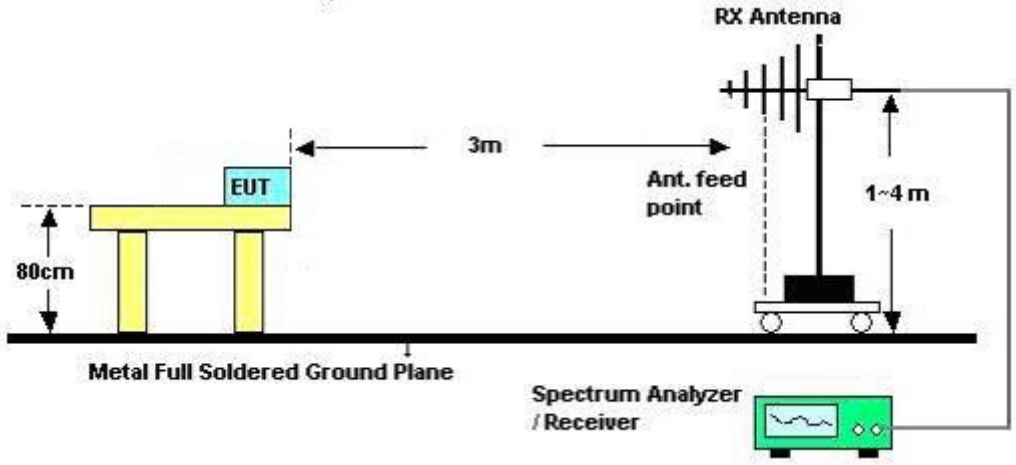
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 1m & 3m far away from the turntable.
2. Power on the EUT and all the supporting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

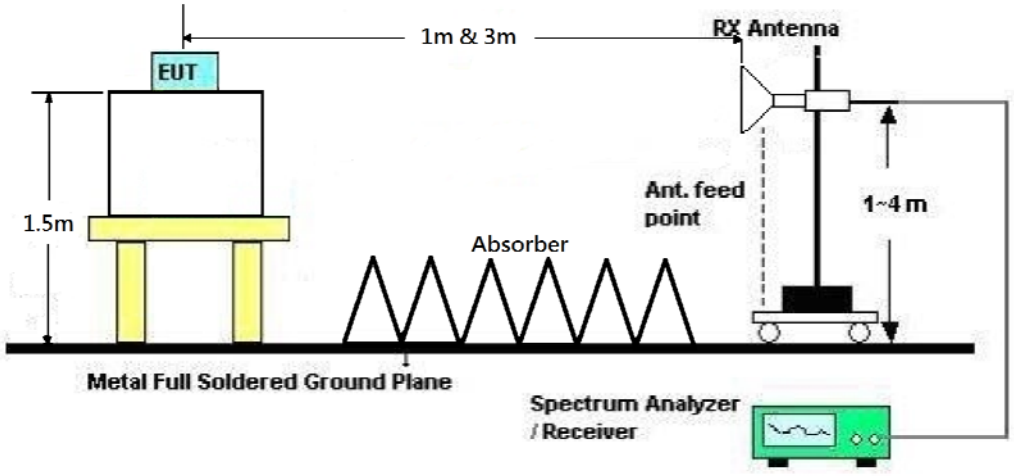
For Radiated Emissions: 9kHz ~30MHz



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	22°C	Humidity	55%
Test Engineer	Eddie Weng	Configurations	Normal Link
Test Date	Dec. 19, 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.

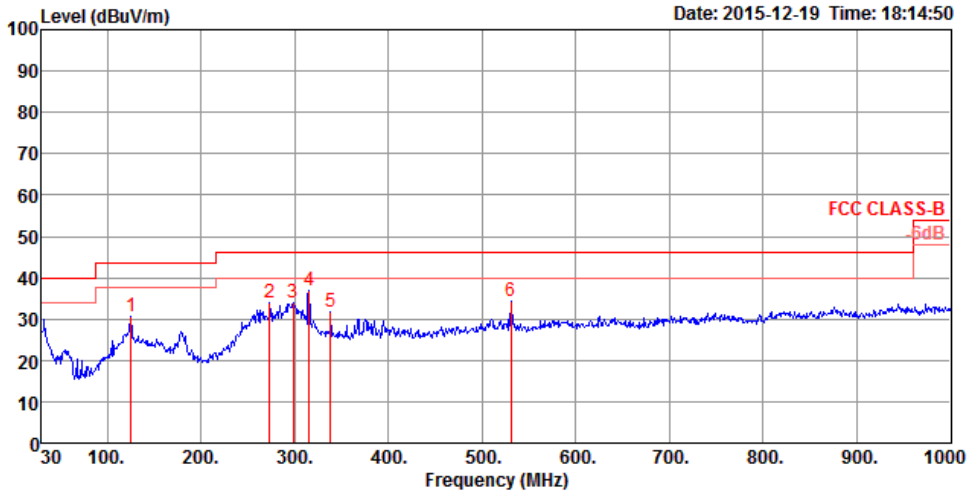
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

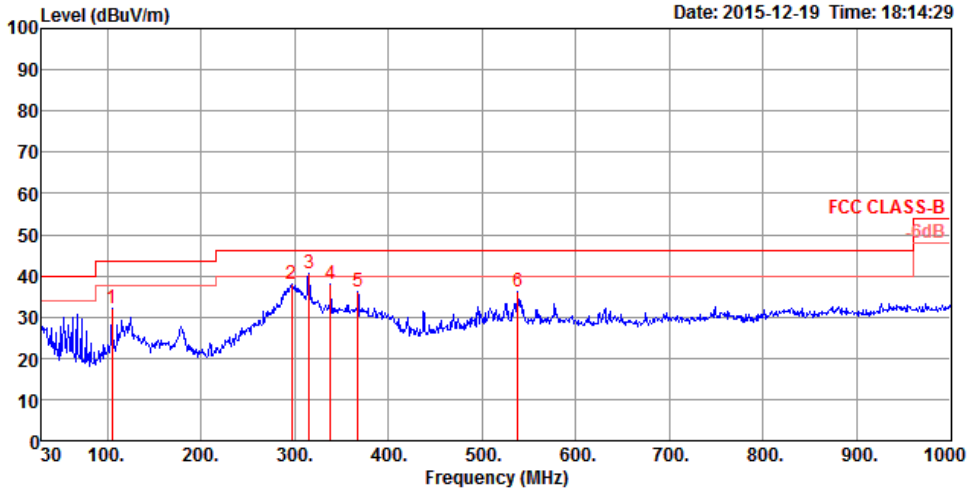
Temperature	22°C	Humidity	55%
Test Engineer	Eddie Weng	Configurations	Normal Link
Test Mode	Mode 1		

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	125.06	30.78	43.50	-12.72	49.43	0.97	12.75	32.37	100	355	Peak	HORIZONTAL
2	273.47	33.84	46.00	-12.16	51.05	1.41	13.67	32.29	125	183	Peak	HORIZONTAL
3	298.69	33.90	46.00	-12.10	50.85	1.47	13.86	32.28	125	79	Peak	HORIZONTAL
4	315.18	36.86	46.00	-9.14	53.28	1.52	14.35	32.29	200	77	Peak	HORIZONTAL
5	338.46	31.62	46.00	-14.38	47.36	1.58	14.98	32.30	125	357	Peak	HORIZONTAL
6	530.52	34.28	46.00	-11.72	46.14	1.99	18.52	32.37	200	188	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	104.69	31.99	43.50	-11.51	51.59	0.88	11.91	32.39	100	127	Peak	VERTICAL
2	296.75	38.10	46.00	-7.90	55.07	1.47	13.84	32.28	200	2	Peak	VERTICAL
3	315.18	40.60	46.00	-5.40	57.02	1.52	14.35	32.29	200	311	Peak	VERTICAL
4	338.46	38.02	46.00	-7.98	53.76	1.58	14.98	32.30	175	354	Peak	VERTICAL
5	367.56	36.29	46.00	-9.71	51.14	1.65	15.82	32.32	200	0	Peak	VERTICAL
6	538.28	36.18	46.00	-9.82	47.93	2.01	18.62	32.38	125	40	Peak	VERTICAL

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	22°C	Humidity	55%
Test Engineer	Eddie Weng	Configurations	IEEE 802.11a CH 36 / Ant. 1
Test Date	Dec. 25, 2015		

Horizontal

	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	15535.00	60.11	74.00	-13.89	44.02	13.19	35.35	38.25	HORIZONTAL	100	168	Peak
2	15541.52	46.37	54.00	-7.63	30.28	13.19	35.35	38.25	HORIZONTAL	100	168	Average

Vertical

	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	15541.22	59.21	74.00	-14.79	43.12	13.19	35.35	38.25	VERTICAL	66	167	Peak
2	15542.68	46.30	54.00	-7.70	30.21	13.19	35.35	38.25	VERTICAL	66	167	Average

Temperature	22°C	Humidity	55%
Test Engineer	Eddie Weng	Configurations	IEEE 802.11a CH 40 / Ant. 1
Test Date	Dec. 25, 2015		

Horizontal

	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	15599.17	46.60	54.00	-7.40	30.56	13.21	35.36	38.19	HORIZONTAL	230	180	Average
2	15600.07	59.65	74.00	-14.35	43.61	13.21	35.36	38.19	HORIZONTAL	230	180	Peak

Vertical

	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	15597.65	46.20	54.00	-7.80	30.16	13.21	35.36	38.19	VERTICAL	150	163	Average
2	15599.05	59.04	74.00	-14.96	43.00	13.21	35.36	38.19	VERTICAL	150	163	Peak

Temperature	22°C	Humidity	55%
Test Engineer	Eddie Weng	Configurations	IEEE 802.11a CH 48 / Ant. 1
Test Date	Dec. 25, 2015		

Horizontal

	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	15718.12	59.35	74.00	-14.65	43.44	13.26	35.38	38.03	HORIZONTAL	276	130	Peak
2	15718.97	46.23	54.00	-7.77	30.32	13.26	35.38	38.03	HORIZONTAL	276	130	Average

Vertical

	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	15717.86	46.25	54.00	-7.75	30.34	13.26	35.38	38.03	VERTICAL	248	133	Average
2	15720.02	59.26	74.00	-14.74	43.35	13.26	35.38	38.03	VERTICAL	248	133	Peak

Temperature	22°C	Humidity	55%
Test Engineer	Eddie Weng	Configurations	IEEE 802.11a CH 149 / Ant. 1
Test Date	Dec. 25, 2015		

Horizontal

	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	11488.07	59.66	74.00	-14.34	43.17	11.72	35.23	40.00	HORIZONTAL	338	154	Peak
2	11491.98	46.41	54.00	-7.59	29.92	11.72	35.23	40.00	HORIZONTAL	338	154	Average

Vertical

	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	11488.93	46.43	54.00	-7.57	29.94	11.72	35.23	40.00	VERTICAL	311	143	Average
2	11490.09	59.54	74.00	-14.46	43.05	11.72	35.23	40.00	VERTICAL	311	143	Peak

Temperature	22°C	Humidity	55%
Test Engineer	Eddie Weng	Configurations	IEEE 802.11a CH 157 / Ant. 1
Test Date	Dec. 25, 2015		

Horizontal

	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	11567.76	46.01	54.00	-7.99	29.62	11.75	35.23	39.87	HORIZONTAL	174	167	Average
2	11571.85	58.49	74.00	-15.51	42.10	11.75	35.23	39.87	HORIZONTAL	174	167	Peak

Vertical

	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	11568.42	58.78	74.00	-15.22	42.39	11.75	35.23	39.87	VERTICAL	165	161	Peak
2	11570.12	46.25	54.00	-7.75	29.86	11.75	35.23	39.87	VERTICAL	165	161	Average

Temperature	22°C	Humidity	55%
Test Engineer	Eddie Weng	Configurations	IEEE 802.11a CH 165 / Ant. 1
Test Date	Dec. 25, 2015		

Horizontal

	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	11648.28	59.18	74.00	-14.82	42.89	11.78	35.22	39.73	HORIZONTAL	282	162	Peak
2	11650.14	45.97	54.00	-8.03	29.68	11.78	35.22	39.73	HORIZONTAL	282	162	Average

Vertical

	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	11652.13	58.84	74.00	-15.16	42.59	11.80	35.22	39.67	VERTICAL	318	130	Peak
2	11652.44	45.72	54.00	-8.28	29.47	11.80	35.22	39.67	VERTICAL	318	130	Average

Temperature	22°C	Humidity	55%
Test Engineer	Eddie Weng	Configurations	IEEE 802.11ac MCS0/Nss2 VHT20 CH 36 / Ant. 1 + Ant. 2
Test Date	Dec. 25, 2015		

Horizontal

	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	15541.45	58.81	74.00	-15.19	42.72	13.19	35.35	38.25	HORIZONTAL	242	153	Peak
2	15542.28	46.27	54.00	-7.73	30.18	13.19	35.35	38.25	HORIZONTAL	242	153	Average

Vertical

	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	15539.29	46.16	54.00	-7.84	30.07	13.19	35.35	38.25	VERTICAL	299	144	Average
2	15541.41	58.79	74.00	-15.21	42.70	13.19	35.35	38.25	VERTICAL	299	144	Peak

Temperature	22°C	Humidity	55%
Test Engineer	Eddie Weng	Configurations	IEEE 802.11ac MCS0/Nss2 VHT20 CH 40 / Ant. 1 + Ant. 2
Test Date	Dec. 25, 2015		

Horizontal

	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	15600.92	59.23	74.00	-14.77	43.22	13.23	35.36	38.14	HORIZONTAL	141	162	Peak
2	15601.86	46.17	54.00	-7.83	30.16	13.23	35.36	38.14	HORIZONTAL	141	162	Average

Vertical

	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	15597.78	58.99	74.00	-15.01	42.95	13.21	35.36	38.19	VERTICAL	176	146	Peak
2	15601.06	45.93	54.00	-8.07	29.92	13.23	35.36	38.14	VERTICAL	176	146	Average

Temperature	22°C	Humidity	55%
Test Engineer	Eddie Weng	Configurations	IEEE 802.11ac MCS0/Nss2 VHT20 CH 48 / Ant. 1 + Ant. 2
Test Date	Dec. 25, 2015		

Horizontal

	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	15719.62	59.07	74.00	-14.93	43.16	13.26	35.38	38.03	HORIZONTAL	106	191	Peak
2	15720.53	46.79	54.00	-7.21	30.88	13.26	35.38	38.03	HORIZONTAL	106	191	Average

Vertical

	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	15717.92	46.86	54.00	-7.14	30.95	13.26	35.38	38.03	VERTICAL	184	184	Average
2	15719.80	60.23	74.00	-13.77	44.32	13.26	35.38	38.03	VERTICAL	184	184	Peak

Temperature	22°C	Humidity	55%
Test Engineer	Eddie Weng	Configurations	IEEE 802.11ac MCS0/Nss2 VHT20 CH 149 / Ant. 1 + Ant. 2
Test Date	Dec. 25, 2015		

Horizontal

	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	11488.18	59.34	74.00	-14.66	42.85	11.72	35.23	40.00	HORIZONTAL	96	189	Peak
2	11491.41	46.37	54.00	-7.63	29.88	11.72	35.23	40.00	HORIZONTAL	96	189	Average

Vertical

	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	11488.99	46.29	54.00	-7.71	29.80	11.72	35.23	40.00	VERTICAL	90	211	Average
2	11489.80	59.24	74.00	-14.76	42.75	11.72	35.23	40.00	VERTICAL	90	211	Peak

Temperature	22°C	Humidity	55%
Test Engineer	Eddie Weng	Configurations	IEEE 802.11ac MCS0/Nss2 VHT20 CH 157 / Ant. 1 + Ant. 2
Test Date	Dec. 25, 2015		

Horizontal

	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	11569.74	59.05	74.00	-14.95	42.66	11.75	35.23	39.87	HORIZONTAL	217	168	Peak
2	11571.67	45.79	54.00	-8.21	29.40	11.75	35.23	39.87	HORIZONTAL	217	168	Average

Vertical

	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	11568.54	59.33	74.00	-14.67	42.94	11.75	35.23	39.87	VERTICAL	183	155	Peak
2	11570.99	45.89	54.00	-8.11	29.50	11.75	35.23	39.87	VERTICAL	183	155	Average

Temperature	22°C	Humidity	55%
Test Engineer	Eddie Weng	Configurations	IEEE 802.11ac MCS0/Nss2 VHT20 CH 165 / Ant. 1 + Ant. 2
Test Date	Dec. 25, 2015		

Horizontal

	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	11648.16	46.02	54.00	-7.98	29.73	11.78	35.22	39.73	HORIZONTAL	354	207	Average
2	11651.42	59.07	74.00	-14.93	42.82	11.80	35.22	39.67	HORIZONTAL	354	207	Peak

Vertical

	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	11651.20	60.41	74.00	-13.59	44.16	11.80	35.22	39.67	VERTICAL	334	218	Peak
2	11651.37	46.82	54.00	-7.18	30.57	11.80	35.22	39.67	VERTICAL	334	218	Average

Temperature	22°C	Humidity	55%
Test Engineer	Eddie Weng	Configurations	IEEE 802.11ac MCS0/Nss2 VHT40 CH 38 / Ant. 1 + Ant. 2
Test Date	Dec. 25, 2015		

Horizontal

	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	15569.74	59.47	74.00	-14.53	43.43	13.21	35.36	38.19	HORIZONTAL	338	189	Peak
2	15570.34	46.25	54.00	-7.75	30.21	13.21	35.36	38.19	HORIZONTAL	338	189	Average

Vertical

	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	15572.08	46.34	54.00	-7.66	30.30	13.21	35.36	38.19	VERTICAL	343	203	Average
2	15572.16	58.92	74.00	-15.08	42.88	13.21	35.36	38.19	VERTICAL	343	203	Peak

Temperature	22°C	Humidity	55%
Test Engineer	Eddie Weng	Configurations	IEEE 802.11ac MCS0/Nss2 VHT40 CH 46 / Ant. 1 + Ant. 2
Test Date	Dec. 25, 2015		

Horizontal

	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	15688.82	59.33	74.00	-14.67	43.37	13.25	35.37	38.08	HORIZONTAL	272	154	Peak
2	15689.81	46.03	54.00	-7.97	30.07	13.25	35.37	38.08	HORIZONTAL	272	154	Average

Vertical

	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	15688.20	46.87	54.00	-7.13	30.91	13.25	35.37	38.08	VERTICAL	300	183	Average
2	15690.17	59.38	74.00	-14.62	43.42	13.25	35.37	38.08	VERTICAL	300	183	Peak

Temperature	22°C	Humidity	55%
Test Engineer	Eddie Weng	Configurations	IEEE 802.11ac MCS0/Nss2 VHT40 CH 151 / Ant. 1 + Ant. 2
Test Date	Dec. 25, 2015		

Horizontal

	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	11511.70	60.59	74.00	-13.41	44.10	11.72	35.23	40.00	HORIZONTAL	96	171	Peak
2	11512.32	46.43	54.00	-7.57	29.94	11.72	35.23	40.00	HORIZONTAL	96	171	Average

Vertical

	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	11507.84	46.33	54.00	-7.67	29.84	11.72	35.23	40.00	VERTICAL	55	167	Average
2	11512.17	59.55	74.00	-14.45	43.06	11.72	35.23	40.00	VERTICAL	55	167	Peak

Temperature	22°C	Humidity	55%
Test Engineer	Eddie Weng	Configurations	IEEE 802.11ac MCS0/Nss2 VHT40 CH 159 / Ant. 1 + Ant. 2
Test Date	Dec. 25, 2015		

Horizontal

	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	11588.89	46.55	54.00	-7.45	30.20	11.77	35.22	39.80	HORIZONTAL	132	184	Average
2	11592.28	59.02	74.00	-14.98	42.67	11.77	35.22	39.80	HORIZONTAL	132	184	Peak

Vertical

	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	11590.12	58.76	74.00	-15.24	42.41	11.77	35.22	39.80	VERTICAL	119	158	Peak
2	11591.01	46.72	54.00	-7.28	30.37	11.77	35.22	39.80	VERTICAL	119	158	Average

Temperature	22°C	Humidity	55%
Test Engineer	Eddie Weng	Configurations	IEEE 802.11ac MCS0/Nss2 VHT80 CH 42 / Ant. 1 + Ant. 2
Test Date	Dec. 25, 2015		

Horizontal

	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	15629.96	59.51	74.00	-14.49	43.50	13.23	35.36	38.14	HORIZONTAL	311	180	Peak
2	15632.37	45.87	54.00	-8.13	29.86	13.23	35.36	38.14	HORIZONTAL	311	180	Average

Vertical

	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	15627.99	45.89	54.00	-8.11	29.88	13.23	35.36	38.14	VERTICAL	277	170	Average
2	15630.24	59.67	74.00	-14.33	43.66	13.23	35.36	38.14	VERTICAL	277	170	Peak

Temperature	22°C	Humidity	55%
Test Engineer	Eddie Weng	Configurations	IEEE 802.11ac MCS0/Nss2 VHT80 CH 155 / Ant. 1 + Ant. 2
Test Date	Dec. 25, 2015		

Horizontal

	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	11551.11	60.34	74.00	-13.66	43.95	11.75	35.23	39.87	HORIZONTAL	353	219	Peak
2	11551.19	46.57	54.00	-7.43	30.18	11.75	35.23	39.87	HORIZONTAL	353	219	Average

Vertical

	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	11550.83	46.31	54.00	-7.69	29.92	11.75	35.23	39.87	VERTICAL	358	195	Average
2	11551.19	59.79	74.00	-14.21	43.40	11.75	35.23	39.87	VERTICAL	358	195	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	22°C	Humidity	55%
Test Engineer	Eddie Weng	Configurations	IEEE 802.11a CH 36, 40, 48 / Ant. 1
Test Date	Dec. 24, 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	5146.99	67.13	74.00	-6.87	60.77	7.78	32.94	31.52	HORIZONTAL	206	100	Peak
2	5150.00	52.52	54.00	-1.48	46.16	7.78	32.94	31.52	HORIZONTAL	206	100	Average
3	5173.59	96.57			90.18	7.78	32.94	31.55	HORIZONTAL	206	100	Average
4	5173.91	106.77			100.38	7.78	32.94	31.55	HORIZONTAL	206	100	Peak

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	5147.76	69.60	74.00	-4.40	63.24	7.78	32.94	31.52	HORIZONTAL	205	100	Peak
2	5150.00	53.63	54.00	-0.37	47.27	7.78	32.94	31.52	HORIZONTAL	205	100	Average
3	5193.27	109.47			103.07	7.78	32.94	31.56	HORIZONTAL	205	100	Peak
4	5206.73	99.20			92.79	7.78	32.94	31.57	HORIZONTAL	205	100	Average

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	5119.81	45.79	54.00	-8.21	39.45	7.78	32.94	31.50	HORIZONTAL	204	100	Average
2	5119.81	58.17	74.00	-15.83	51.83	7.78	32.94	31.50	HORIZONTAL	204	100	Peak
3	5233.75	107.09			100.66	7.78	32.94	31.59	HORIZONTAL	204	100	Peak
4	5234.71	97.46			91.03	7.78	32.94	31.59	HORIZONTAL	204	100	Average
5	5353.46	44.40	54.00	-9.60	37.88	7.77	32.93	31.68	HORIZONTAL	204	100	Average
6	5358.75	57.82	74.00	-16.18	51.29	7.77	32.93	31.69	HORIZONTAL	204	100	Peak

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

Temperature	22°C	Humidity	55%
Test Engineer	Eddie Weng	Configurations	IEEE 802.11a CH 149, 157, 165 / Ant. 1
Test Date	Dec. 24, 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	63.38	68.20	-4.82	56.30	8.02	33.00	32.06	HORIZONTAL	25	100	Peak
2	5725.00	76.87	78.20	-1.33	69.75	8.04	33.00	32.08	HORIZONTAL	25	100	Peak
3	5738.91	105.75			98.60	8.06	33.01	32.10	HORIZONTAL	25	100	Peak
4	5751.41	96.28			89.14	8.06	33.02	32.10	HORIZONTAL	25	100	Average

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	5715.00	67.47	68.20	-0.73	60.39	8.02	33.00	32.06	HORIZONTAL	91	100	Peak
2	5723.94	69.82	78.20	-8.38	62.70	8.04	33.00	32.08	HORIZONTAL	91	100	Peak
3	5777.79	110.38			103.17	8.10	33.03	32.14	HORIZONTAL	91	100	Peak
4	5791.25	99.80			92.55	8.12	33.03	32.16	HORIZONTAL	91	100	Average
5	5854.23	69.70	78.20	-8.50	62.35	8.18	33.05	32.22	HORIZONTAL	91	100	Peak
6	5861.92	66.46	68.20	-1.74	59.09	8.19	33.06	32.24	HORIZONTAL	91	100	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	5818.59	107.10			99.82	8.14	33.04	32.18	HORIZONTAL	88	100	Peak
2	5831.41	97.57			90.26	8.16	33.05	32.20	HORIZONTAL	88	100	Average
3	5850.96	74.88	78.20	-3.32	67.53	8.18	33.05	32.22	HORIZONTAL	88	100	Peak
4	5860.00	67.78	68.20	-0.42	60.41	8.19	33.06	32.24	HORIZONTAL	88	100	Peak

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

Temperature	22°C	Humidity	55%
Test Engineer	Eddie Weng	Configurations	IEEE 802.11ac MCS0/Nss2 VHT20 CH 36, 40, 48 / Ant. 1 + Ant. 2
Test Date	Dec. 25, 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	5150.00	53.19	54.00	-0.81	46.83	7.78	32.94	31.52	HORIZONTAL	194	100	Average
2	5150.00	67.82	74.00	-6.18	61.46	7.78	32.94	31.52	HORIZONTAL	194	100	Peak
3	5182.89	100.15			93.76	7.78	32.94	31.55	HORIZONTAL	194	100	Average
4	5183.21	111.81			105.42	7.78	32.94	31.55	HORIZONTAL	194	100	Peak

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	5147.44	58.54	74.00	-15.46	52.18	7.78	32.94	31.52	HORIZONTAL	195	100	Peak
2	5149.68	45.74	54.00	-8.26	39.38	7.78	32.94	31.52	HORIZONTAL	195	100	Average
3	5194.23	99.61			93.21	7.78	32.94	31.56	HORIZONTAL	195	100	Average
4	5204.49	110.69			104.28	7.78	32.94	31.57	HORIZONTAL	195	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	5106.35	58.08	74.00	-15.92	51.76	7.78	32.94	31.48	HORIZONTAL	190	100	Peak
2	5120.29	44.84	54.00	-9.16	38.50	7.78	32.94	31.50	HORIZONTAL	190	100	Average
3	5235.19	110.77			104.34	7.78	32.94	31.59	HORIZONTAL	190	100	Peak
4	5242.89	99.65			93.21	7.78	32.93	31.59	HORIZONTAL	190	100	Average
5	5355.39	44.66	54.00	-9.34	38.13	7.77	32.93	31.69	HORIZONTAL	190	100	Average
6	5365.96	58.55	74.00	-15.45	52.02	7.77	32.93	31.69	HORIZONTAL	190	100	Peak

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

Temperature	22°C	Humidity	55%
Test Engineer	Eddie Weng	Configurations	IEEE 802.11ac MCS0/Nss2 VHT20 CH 149, 157, 165 / Ant. 1 + Ant. 2
Test Date	Dec. 25, 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	5710.06	61.67	68.20	-6.53	54.59	8.02	33.00	32.06	HORIZONTAL	256	122	Peak
2	5725.00	77.30	78.20	-0.90	70.18	8.04	33.00	32.08	HORIZONTAL	256	122	Peak
3	5752.05	97.37			90.23	8.06	33.02	32.10	HORIZONTAL	256	122	Average
4	5752.05	107.92			100.78	8.06	33.02	32.10	HORIZONTAL	256	122	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	5698.46	60.30	68.20	-7.90	53.25	8.01	33.00	32.04	VERTICAL	205	249	Peak
2	5721.15	58.11	78.20	-20.09	51.03	8.02	33.00	32.06	VERTICAL	205	249	Peak
3	5791.25	89.87			82.62	8.12	33.03	32.16	VERTICAL	205	249	Average
4	5792.21	100.31			93.06	8.12	33.03	32.16	VERTICAL	205	249	Peak
5	5855.77	58.51	78.20	-19.69	51.16	8.18	33.05	32.22	VERTICAL	205	249	Peak
6	5907.60	59.06	68.20	-9.14	51.58	8.25	33.07	32.30	VERTICAL	205	249	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	5832.05	98.41			91.10	8.16	33.05	32.20	HORIZONTAL	96	100	Average
2	5832.05	108.34			101.03	8.16	33.05	32.20	HORIZONTAL	96	100	Peak
3	5850.00	77.86	78.20	-0.34	70.51	8.18	33.05	32.22	HORIZONTAL	96	100	Peak
4	5860.26	67.73	68.20	-0.47	60.36	8.19	33.06	32.24	HORIZONTAL	96	100	Peak

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

Temperature	22°C	Humidity	55%
Test Engineer	Eddie Weng	Configurations	IEEE 802.11ac MCS0/Nss2 VHT40 CH 38, 46 / Ant. 1 + Ant. 2
Test Date	Dec. 25, 2015		

Channel 38

	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	5148.65	67.89	74.00	-6.11	61.53	7.78	32.94	31.52	HORIZONTAL	193	100	Peak
2	5150.00	52.81	54.00	-1.19	46.45	7.78	32.94	31.52	HORIZONTAL	193	100	Average
3	5198.01	104.63			98.23	7.78	32.94	31.56	HORIZONTAL	193	100	Peak
4	5206.03	92.98			86.57	7.78	32.94	31.57	HORIZONTAL	193	100	Average

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

Channel 46

	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	5130.96	58.70	74.00	-15.30	52.35	7.78	32.94	31.51	HORIZONTAL	196	100	Peak
2	5149.71	46.22	54.00	-7.78	39.86	7.78	32.94	31.52	HORIZONTAL	196	100	Average
3	5238.17	107.41			100.98	7.78	32.94	31.59	HORIZONTAL	196	100	Peak
4	5244.90	96.04			89.60	7.78	32.93	31.59	HORIZONTAL	196	100	Average

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

Temperature	22°C	Humidity	55%
Test Engineer	Eddie Weng	Configurations	IEEE 802.11ac MCS0/Nss2 VHT40 CH 151, 159 / Ant. 1 + Ant. 2
Test Date	Dec. 25, 2015		

Channel 151

	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	5713.01	68.07	68.20	-0.13	60.99	8.02	33.00	32.06	HORIZONTAL	46	101	Peak
2	5718.46	71.90	78.20	-6.30	64.82	8.02	33.00	32.06	HORIZONTAL	46	101	Peak
3	5752.12	92.14			85.00	8.06	33.02	32.10	HORIZONTAL	46	101	Average
4	5765.90	102.42			95.25	8.08	33.03	32.12	HORIZONTAL	46	101	Peak

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

Channel 159

	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	5712.79	61.87	68.20	-6.33	54.79	8.02	33.00	32.06	HORIZONTAL	346	105	Peak
2	5722.89	65.60	78.20	-12.60	58.48	8.04	33.00	32.08	HORIZONTAL	346	105	Peak
3	5792.12	94.97			87.72	8.12	33.03	32.16	HORIZONTAL	346	105	Average
4	5803.65	105.45			98.21	8.12	33.04	32.16	HORIZONTAL	346	105	Peak
5	5851.25	70.31	78.20	-7.89	62.96	8.18	33.05	32.22	HORIZONTAL	346	105	Peak
6	5861.35	67.20	68.20	-1.00	59.83	8.19	33.06	32.24	HORIZONTAL	346	105	Peak

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

Temperature	22°C	Humidity	55%
Test Engineer	Eddie Weng	Configurations	IEEE 802.11ac MCS0/Nss2 VHT80 CH 42, 155 / Ant. 1 + Ant. 2
Test Date	Dec. 25, 2015		

Channel 42

	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	5145.10	66.39	74.00	-7.61	60.03	7.78	32.94	31.52	HORIZONTAL	194	100	Peak
2	5150.00	53.53	54.00	-0.47	47.17	7.78	32.94	31.52	HORIZONTAL	194	100	Average
3	5228.27	103.01			96.59	7.78	32.94	31.58	HORIZONTAL	194	100	Peak
4	5237.40	90.77			84.34	7.78	32.94	31.59	HORIZONTAL	194	100	Average
5	5351.03	44.63	54.00	-9.37	38.11	7.77	32.93	31.68	HORIZONTAL	194	100	Average
6	5370.26	57.44	74.00	-16.56	50.90	7.77	32.93	31.70	HORIZONTAL	194	100	Peak

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

Channel 155

	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	5713.30	67.62	68.20	-0.58	60.54	8.02	33.00	32.06	HORIZONTAL	92	100	Peak
2	5724.52	70.07	78.20	-8.13	62.95	8.04	33.00	32.08	HORIZONTAL	92	100	Peak
3	5766.99	100.18			93.01	8.08	33.03	32.12	HORIZONTAL	92	100	Peak
4	5783.81	89.14			81.93	8.10	33.03	32.14	HORIZONTAL	92	100	Average
5	5851.92	70.39	78.20	-7.81	63.04	8.18	33.05	32.22	HORIZONTAL	92	100	Peak
6	5860.00	67.13	68.20	-1.07	59.76	8.19	33.06	32.24	HORIZONTAL	92	100	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

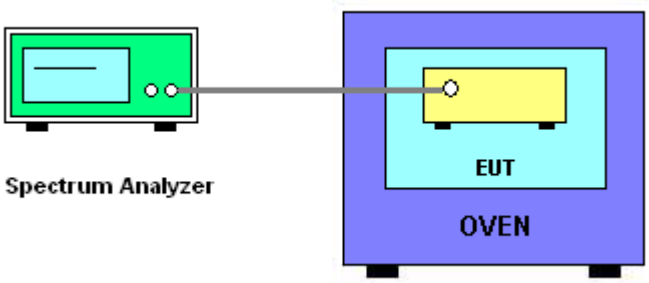
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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~40°C.

4.8.4. Test Setup Layout



4.8.5. Test Deviation

There is no deviation with the original standard.

4.8.6. EUT Operation during Test

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

4.8.7. Test Result of Frequency Stability

Temperature	25°C	Humidity	58%
Test Engineer	Peter Lin	Test Date	Dec. 28, 2015~Feb. 18, 2016

Mode: 20 MHz / Ant. 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5200 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5200.0268	5200.0254	5200.0236	5200.0215
110.00	5200.0256	5200.0243	5200.0227	5200.0208
93.50	5200.0242	5200.0231	5200.0219	5200.0197
Max. Deviation (MHz)	0.0268	0.0254	0.0236	0.0215
Max. Deviation (ppm)	5.16	4.89	4.54	4.14
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5200 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5200.0281	5200.0269	5200.0250	5200.0228
10	5200.0268	5200.0255	5200.0240	5200.0222
20	5200.0256	5200.0243	5200.0227	5200.0208
30	5200.0242	5200.0231	5200.0217	5200.0201
40	5200.0226	5200.0211	5200.0195	5200.0175
Max. Deviation (MHz)	0.0310	0.0297	0.0280	0.0256
Max. Deviation (ppm)	5.97	5.72	5.39	4.93
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5785.0299	5785.0285	5785.0267	5785.0246
110.00	5785.0287	5785.0274	5785.0258	5785.0239
93.50	5785.0273	5785.0262	5785.0250	5785.0228
Max. Deviation (MHz)	0.0298	0.0284	0.0266	0.0246
Max. Deviation (ppm)	5.16	4.92	4.61	4.24
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5785.0312	5785.0300	5785.0281	5785.0259
10	5785.0299	5785.0286	5785.0271	5785.0253
20	5785.0287	5785.0274	5785.0258	5785.0239
30	5785.0273	5785.0262	5785.0248	5785.0232
40	5785.0257	5785.0242	5785.0226	5785.0206
Max. Deviation (MHz)	0.0341	0.0328	0.0311	0.0287
Max. Deviation (ppm)	5.89	5.66	5.37	4.95
Result	Complies			

Mode: 40 MHz / Ant. 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5190 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5190.0281	5190.0267	5190.0249	5190.0228
110.00	5190.0269	5190.0256	5190.0240	5190.0221
93.50	5190.0255	5190.0244	5190.0232	5190.0210
Max. Deviation (MHz)	0.0281	0.0267	0.0249	0.0228
Max. Deviation (ppm)	5.42	5.15	4.80	4.40
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5190 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5190.0294	5190.0282	5190.0263	5190.0241
10	5190.0281	5190.0268	5190.0253	5190.0235
20	5190.0269	5190.0256	5190.0240	5190.0221
30	5190.0255	5190.0244	5190.0230	5190.0214
40	5190.0239	5190.0224	5190.0208	5190.0188
Max. Deviation (MHz)	0.0323	0.0310	0.0293	0.0269
Max. Deviation (ppm)	6.23	5.98	5.65	5.19
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5755.0342	5755.0328	5755.0310	5755.0289
110.00	5755.0330	5755.0317	5755.0301	5755.0282
93.50	5755.0316	5755.0305	5755.0293	5755.0271
Max. Deviation (MHz)	0.0342	0.0328	0.0310	0.0289
Max. Deviation (ppm)	5.94	5.70	5.39	5.02
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5755.0355	5755.0343	5755.0324	5755.0302
10	5755.0342	5755.0329	5755.0314	5755.0296
20	5755.0330	5755.0317	5755.0301	5755.0282
30	5755.0316	5755.0305	5755.0291	5755.0275
40	5755.0300	5755.0285	5755.0269	5755.0249
Max. Deviation (MHz)	0.0384	0.0371	0.0354	0.0330
Max. Deviation (ppm)	6.67	6.45	6.15	5.73
Result	Complies			

Mode: 80 MHz / Ant. 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5210 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5210.0212	5210.0198	5210.0180	5210.0159
110.00	5210.0200	5210.0187	5210.0171	5210.0152
93.50	5210.0186	5210.0175	5210.0163	5210.0141
Max. Deviation (MHz)	0.0212	0.0198	0.0180	0.0159
Max. Deviation (ppm)	4.06	3.79	3.45	3.05
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5210 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5210.0225	5210.0213	5210.0194	5210.0172
10	5210.0212	5210.0199	5210.0184	5210.0166
20	5210.0200	5210.0187	5210.0171	5210.0152
30	5210.0186	5210.0175	5210.0161	5210.0145
40	5210.0170	5210.0155	5210.0139	5210.0119
Max. Deviation (MHz)	0.0254	0.0241	0.0224	0.0200
Max. Deviation (ppm)	4.87	4.62	4.29	3.83
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5775.0316	5775.0302	5775.0284	5775.0263
110.00	5775.0304	5775.0291	5775.0275	5775.0256
93.50	5775.0290	5775.0279	5775.0267	5775.0245
Max. Deviation (MHz)	0.0316	0.0302	0.0284	0.0263
Max. Deviation (ppm)	5.47	5.23	4.92	4.55
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5775.0329	5775.0317	5775.0298	5775.0276
10	5775.0316	5775.0303	5775.0288	5775.0270
20	5775.0304	5775.0291	5775.0275	5775.0256
30	5775.0290	5775.0279	5775.0265	5775.0249
40	5775.0274	5775.0259	5775.0243	5775.0223
Max. Deviation (MHz)	0.0358	0.0345	0.0328	0.0304
Max. Deviation (ppm)	6.20	5.97	5.68	5.26
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. 08, 2015	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127478	9kHz ~ 30MHz	Nov. 13, 2015	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	150kHz ~ 30MHz	May 25, 2015	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	Conduction (CO01-CB)
BILOG ANTENNA	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	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	18GHz ~ 40 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-2	N/A	18GHz ~ 40 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 12, 2015*	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 09, 2015	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-7	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-8	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-9	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 02, 2015	Conducted (TH01-CB)

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

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

N.C.R. means Non-Calibration required.

6. MEASUREMENT UNCERTAINTY

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	3.2 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.7 dB	Confidence levels of 95%