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	**Accton Technology Corporation**
Applicant Address	No. 1, Creation Rd. III, Science-based Industrial Park Hsin Chu 30077, Taiwan R.O.C.
FCC ID	**HED-ML6035G3**
Manufacturer's company (1)	**Joy Technology (Shen Zhen) Co. Ltd**
Manufacturer Address	HengKeng Ind., Shangpai, Shangwu, Aiqun Rd., Shiyan Town, Shenzhen 518108 China
Manufacturer's company (2)	**Accton Technology Corporation**
Manufacturer Address	No. 1, Creation Rd. III, Science-based Industrial Park Hsin Chu 30077, Taiwan R.O.C.

Product Name	Metrolinq Outdoor 60GHz PTP + 5 GHz
Brand Name	IgniteNet
Model No.	ML-60-35, ML-60-35-1, ML-60-19, ML-60-19-1
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5150 ~ 5250 MHz / 5725 ~ 5850 MHz
Received Date	Mar. 10, 2016
Final Test Date	Apr. 25, 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 v01r02, 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
FR5M2614-03	Rev. 01	Initial issue of report	May 04, 2016
FR5N2614-03	Rev. 02	Adding model name: ML-60-19, ML-60-19-1	May 05, 2016

1. VERIFICATION OF COMPLIANCE

Product Name	:	Metrolinq Outdoor 60GHz PTP + 5 GHz
Brand Name	:	IgniteNet
Model No.	:	ML-60-35, ML-60-35-1, ML-60-19, ML-60-19-1
Applicant	:	Accton Technology Corporation
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 Mar. 10, 2016 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

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	6.32 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	6.11 dB
4.5	15.407(a)	Power Spectral Density	Complies	8.10 dB
4.6	15.407(b)	Radiated Emissions	Complies	0.20 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 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: 19.28 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 18.06 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.34 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.25 MHz Band 4: IEEE 802.11a: 17.37MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 17.89 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.34 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.25 MHz
Maximum Conducted Output Power	Band 1: IEEE 802.11a: 9.28 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 9.14 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 6.15 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 5.28 dBm Band 4: IEEE 802.11a: 11.79 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 11.35 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 11.24 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 9.52 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Note 1: This device contains transmitter 60GHz module FCC ID: HED-ML60MDSB

Note 2: WLAN and 60G do not work at the same time.

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	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

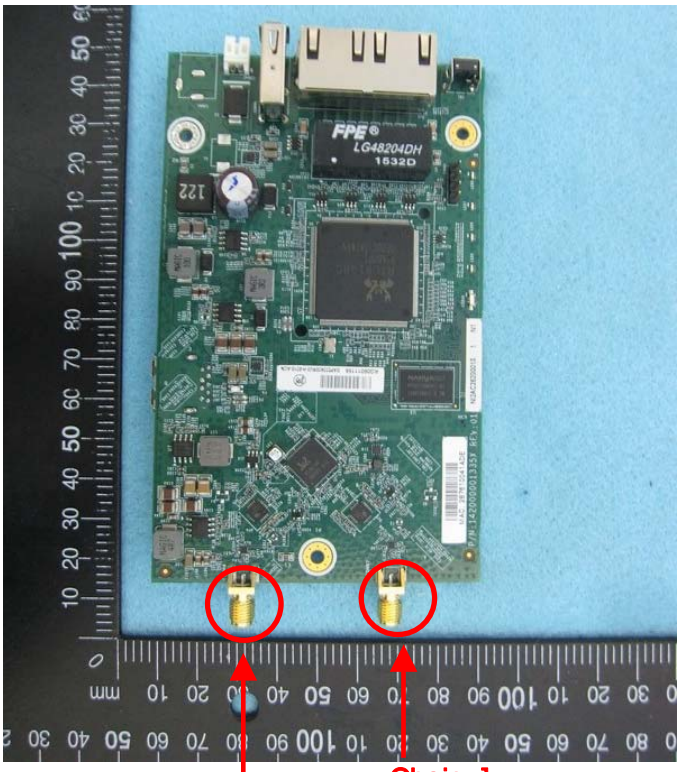
Ant.	Brand	P/N	Antenna Type	Connector	Gain (dBi)		Remark
					Band 1	Band 4	
1	Accton	123400001084A	Dish Ant.	N/A	15.7	18.1	Internal
Ant.	**Brand**	**P/N**	**Antenna Type**	**Connector**	**Gain (dBi)**		**Remark**
2	Accton	FD5-14	Dish Ant.	Dual RPSMA pigtails	14		External

Note: Ant. 1 & Ant. 2 are the same type antennas, only the higher gain antenna "Ant. 1" was tested.

For IEEE 802.11a/n/ac Mode (2X/2RX)

Chain 1 and Chain 2 can be use as transmitting antenna

Chain 1 and Chain 2 can be used as receiving antennas.



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	CTX		-	-	-
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	CTX		-	-	-
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	1
	40 MHz	Band 1&4	-	38/151	1
	80 MHz	Band 1&4	-	42/155	1

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

Note 2: The EUT can used at Y-axis only.

Note 3: The power of EUT is supplied by PoE. But the PoE is for measurement only, and it would not be marketed.

Equipment	Brand Name	Model Name
PoE	GME	GME241DA-240100G

The following test modes were performed for all tests:

For Conducted Emission test:

Mode 1: CTX - Place EUT in Y axis - 5GHz + Internal Ant.

For Radiated Emission test:

Mode 1: CTX - Place EUT in Y axis - 5GHz + Internal Ant.

3.6. Table for Testing Locations

Test Site Location					
Address:	No.8, Lane 724, Bo-ai St., Jhubei City, Hsinchu County 302, Taiwan, R.O.C.				
TEL:	886-3-656-9065				
FAX:	886-3-656-9085				
Test Site No.	**Site Category**	**Location**	**FCC Designation No.**	**IC File No.**	**VCCI Reg. No**
03CH01-CB	SAC	Hsin Chu	TW0006	IC 4086D	-
CO01-CB	Conduction	Hsin Chu	TW0006	IC 4086D	-
TH01-CB	OVEN Room	Hsin Chu	-	-	-

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

3.7. Table for Multiple Listing

The EUT has four model names which are identical to each other in all aspects except for the following table:

Model Name	5GHz	60GHz	Remark
ML-60-35 / ML-60-19	Internal / Dish Ant.	Internal / Dish Ant.	Outdoor use
ML-60-35-1 / ML-60-19-1	External / Dish Ant.	Internal / Dish Ant.	

From the above models, model number: ML-60-35 was selected as representative model for the test and its data was recorded in this report.

3.8. Table for Supporting Units

For Test Site No: CO01-CB

Support Unit	Brand	Model	FCC ID
Flash disk	Transcend	604108 8255	DoC
PoE	GME	GME241DA-240100G	DoC
NB	DELL	E6430	DoC

For Test Site No: 03CH01-CB

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	DoC
PoE	GME	GME241DA-240100G	DoC

For Test Site No: TH01-CB

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	DoC
PoE	GME	GME241DA-240100G	DoC

3.9. Table for Parameters of Test Software Setting

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

Test Software Version	MP_TEST Application 1.3.8.0					
Mode	Test Frequency (MHz)					
	NCB: 20MHz					
	5180 MHz	5200 MHz	5240 MHz	5745 MHz	5785 MHz	5825 MHz
802.11a	15/17	23/21	20/15	15/12	14/10	12/8
802.11ac MCS0/Nss1 VHT20	12/16	6/7	23/17	16/12	14/10	11/8
Mode	**NCB: 40MHz**					
802.11ac MCS0/Nss1 VHT40	5190 MHz		5230 MHz	5755 MHz		5795 MHz
	15/18		15/10	15/11		14/11
Mode	**NCB: 80MHz**					
802.11ac MCS0/Nss1 VHT80	5210 MHz			5775 MHz		
	14/14			12/8		

3.10. EUT Operation during Test

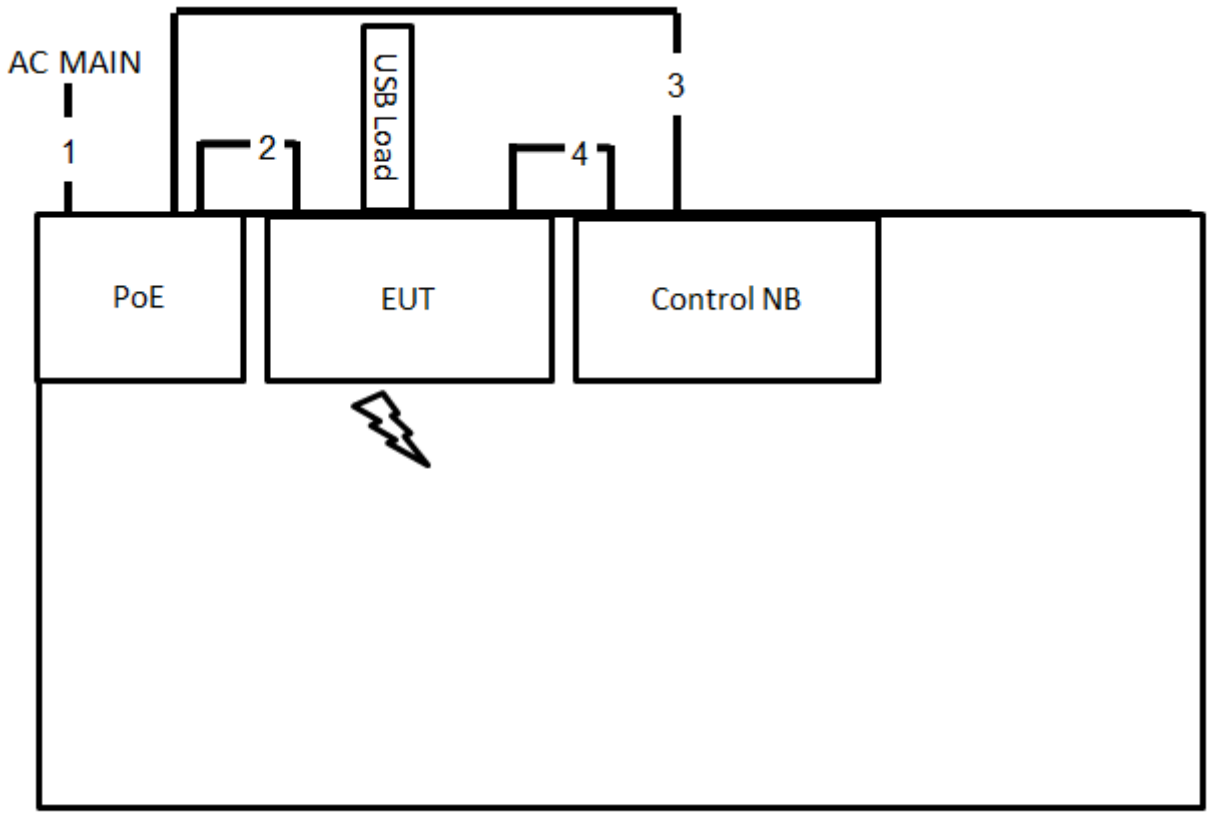
The EUT was programmed to be in continuously transmitting mode.

3.11. 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/Nss1 VHT20	1.000	1.000	100.00%	0.00	0.01
802.11ac MCS0/Nss1 VHT40	1.000	1.000	100.00%	0.00	0.01
802.11ac MCS0/Nss1 VHT80	1.000	1.000	100.00%	0.00	0.01

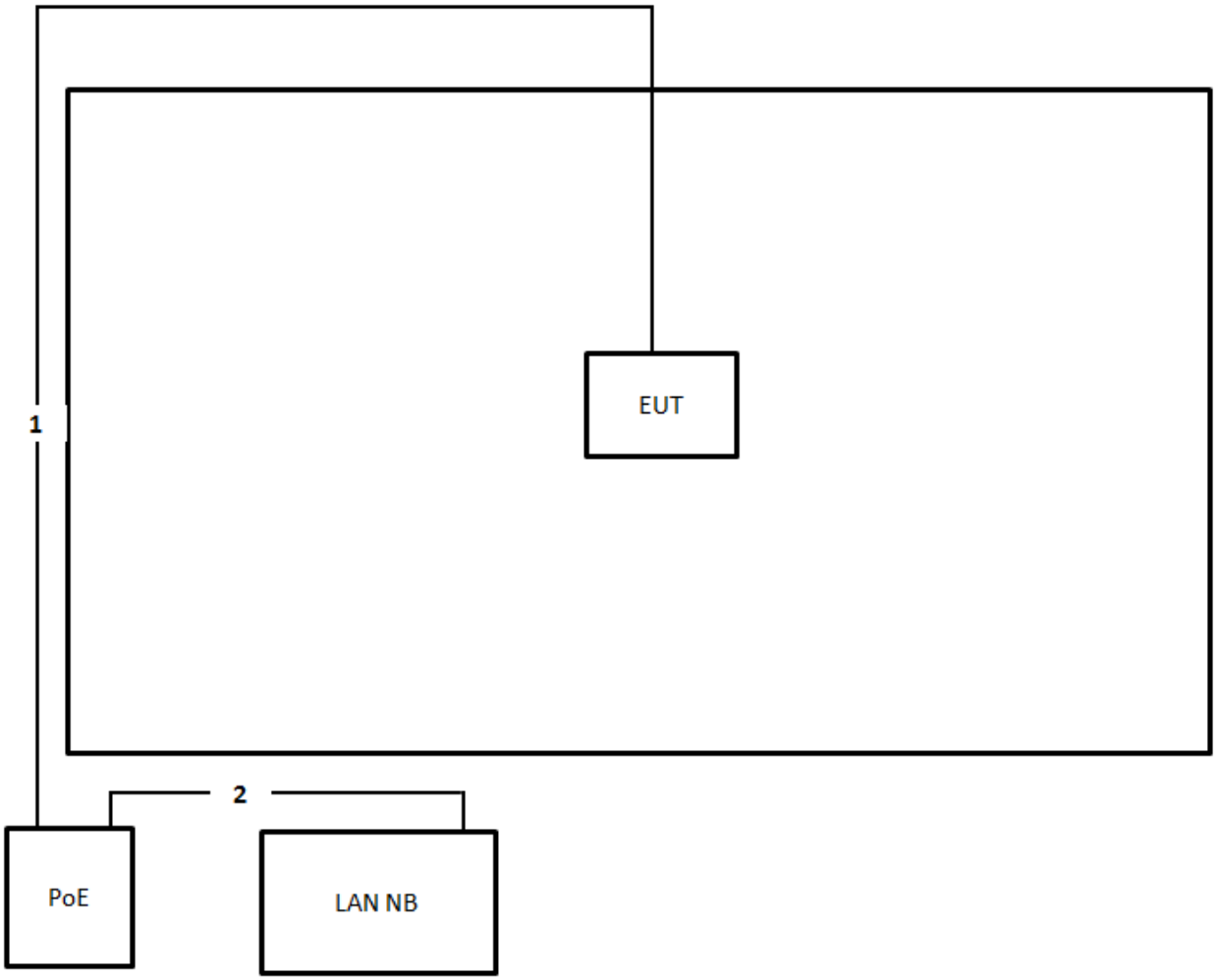
3.12. Test Configurations

3.12.1. AC Power Line Conduction Emissions Test Configuration



Item	Connection	Shield	Length
1	Power cable	No	0.8m
2	RJ-45 cable	No	1.5m
3	RJ-45 cable	No	3m
4	Console cable	Yes	2m

3.12.2. Radiation Emissions Test Configuration



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

4. TEST RESULT

4.1. AC Power Line Conducted Emissions Measurement

4.1.1. Limit

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

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

4.1.2. Measuring Instruments and Setting

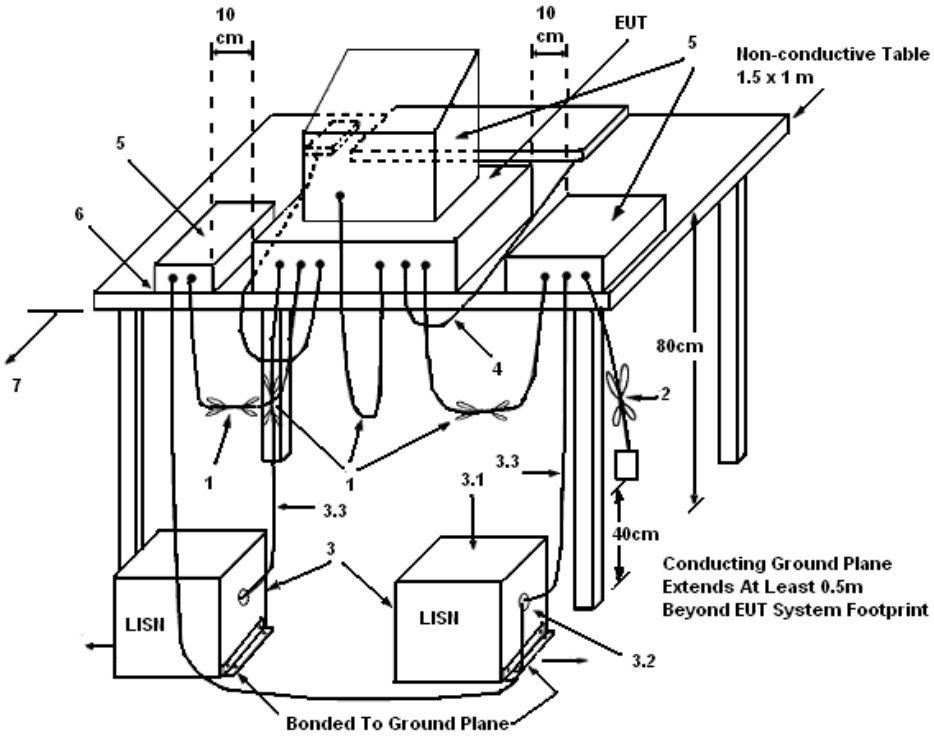
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

4.1.3. Test Procedures

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

4.1.4. Test Setup Layout



LEGEND:

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

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

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

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

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

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

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

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

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

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

4.1.5. Test Deviation

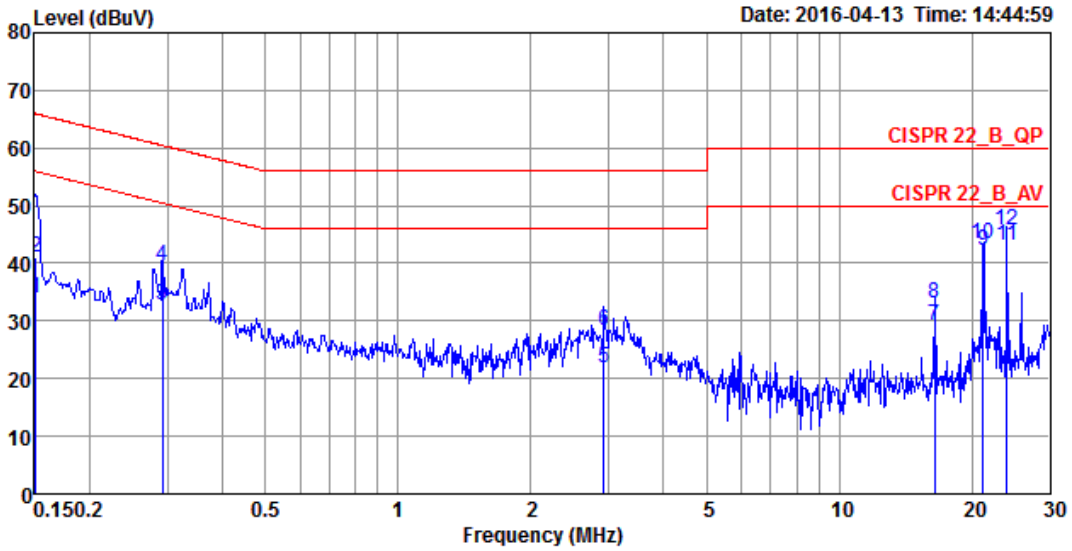
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

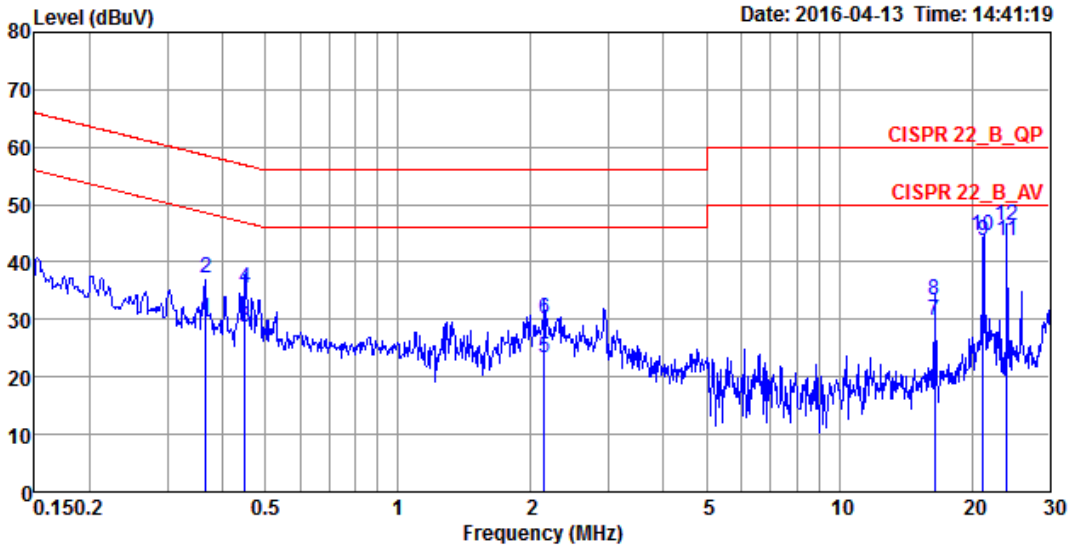
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	23°C	Humidity	61%
Test Engineer	Edison Lin	Phase	Line
Configuration	CTX		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1508	33.93	-22.03	55.96	23.89	10.02	0.02	LINE	Average
2	0.1508	40.95	-25.01	65.96	30.91	10.02	0.02	LINE	QP
3	0.2924	32.88	-17.58	50.46	22.92	9.92	0.04	LINE	Average
4	0.2924	39.49	-20.97	60.46	29.53	9.92	0.04	LINE	QP
5	2.9307	21.79	-24.21	46.00	11.77	9.97	0.05	LINE	Average
6	2.9307	28.42	-27.58	56.00	18.40	9.97	0.05	LINE	QP
7	16.4631	29.21	-20.79	50.00	18.70	10.25	0.26	LINE	Average
8	16.4631	33.12	-26.88	60.00	22.61	10.25	0.26	LINE	QP
9	21.1681	42.33	-7.67	50.00	31.73	10.34	0.26	LINE	Average
10	21.1681	43.46	-16.54	60.00	32.86	10.34	0.26	LINE	QP
11	24.0023	43.05	-6.95	50.00	32.37	10.41	0.27	LINE	Average
12	24.0023	45.80	-14.20	60.00	35.12	10.41	0.27	LINE	QP

Temperature	23°C	Humidity	61%
Test Engineer	Edison Lin	Phase	Neutral
Configuration	CTX		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.3673	30.24	-18.32	48.56	20.28	9.92	0.04	NEUTRAL	Average
2	0.3673	37.10	-21.46	58.56	27.14	9.92	0.04	NEUTRAL	QP
3	0.4491	28.70	-18.19	46.89	18.74	9.92	0.04	NEUTRAL	Average
4	0.4491	35.50	-21.39	56.89	25.54	9.92	0.04	NEUTRAL	QP
5	2.1439	23.32	-22.68	46.00	13.30	9.96	0.06	NEUTRAL	Average
6	2.1439	30.11	-25.89	56.00	20.09	9.96	0.06	NEUTRAL	QP
7	16.4631	29.80	-20.20	50.00	19.29	10.25	0.26	NEUTRAL	Average
8	16.4631	33.40	-26.60	60.00	22.89	10.25	0.26	NEUTRAL	QP
9	21.1676	43.68	-6.32	50.00	33.08	10.34	0.26	NEUTRAL	Average
10	21.1676	44.69	-15.31	60.00	34.09	10.34	0.26	NEUTRAL	QP
11	24.0018	43.61	-6.39	50.00	32.93	10.41	0.27	NEUTRAL	Average
12	24.0018	46.29	-13.71	60.00	35.61	10.41	0.27	NEUTRAL	QP

Note:

Level = Read Level + LISN Factor + Cable Loss.

4.2. 26dB Bandwidth and 99% Occupied Bandwidth Measurement

4.2.1. Limit

No restriction limits.

4.2.2. Measuring Instruments and Setting

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

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

4.2.3. Test Procedures

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

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

4.2.4. Test Setup Layout

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

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

4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

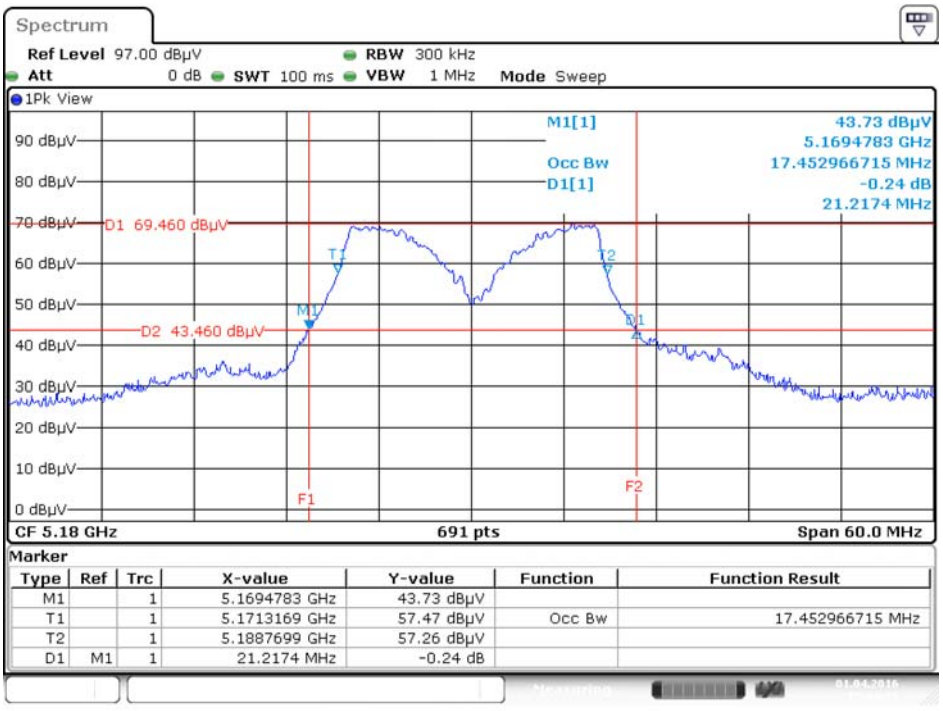
The EUT was programmed to be in continuously transmitting mode.

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

Temperature	25℃	Humidity	45%
Test Engineer	Gino Huang		

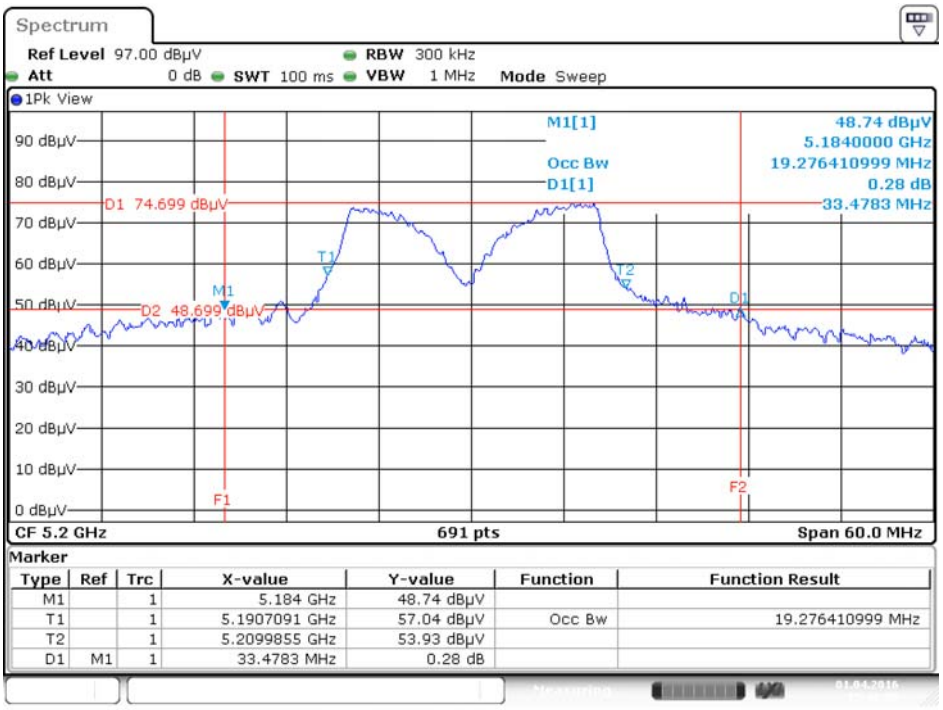
Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5180 MHz	21.22	17.45
	5200 MHz	33.48	19.28
	5240 MHz	23.04	18.06
	5745 MHz	21.30	17.37
	5785 MHz	21.30	17.37
	5825 MHz	21.22	17.37
802.11ac MCS0/Nss1 VHT20	5180 MHz	21.83	17.89
	5200 MHz	21.83	17.97
	5240 MHz	27.39	18.06
	5745 MHz	21.83	17.89
	5785 MHz	21.83	17.89
	5825 MHz	21.74	17.89
802.11ac MCS0/Nss1 VHT40	5190 MHz	45.36	37.34
	5230 MHz	45.51	37.34
	5755 MHz	45.51	37.34
	5795 MHz	45.36	37.34
802.11ac MCS0/Nss1 VHT80	5210 MHz	82.90	75.25
	5775 MHz	82.90	75.25

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



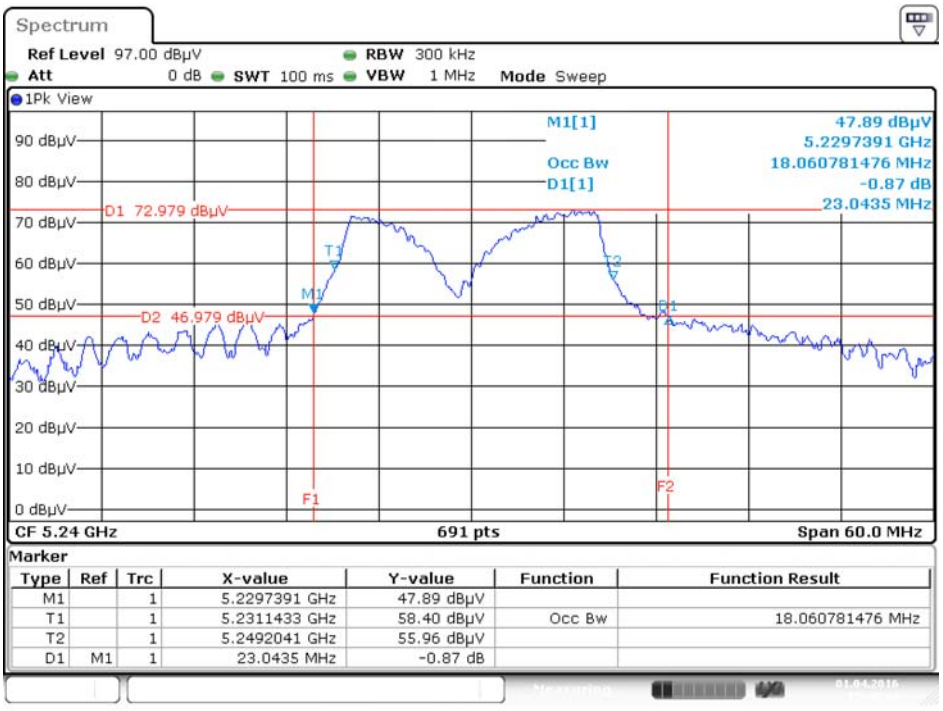
Date: 1.APR.2016 15:44:31

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



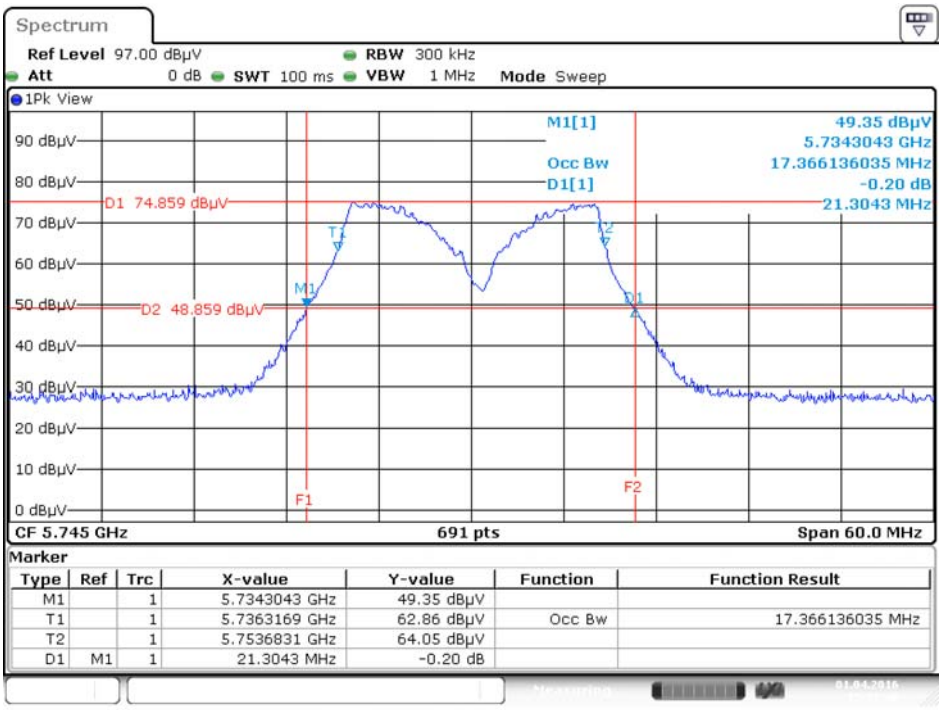
Date: 1.APR.2016 15:42:59

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



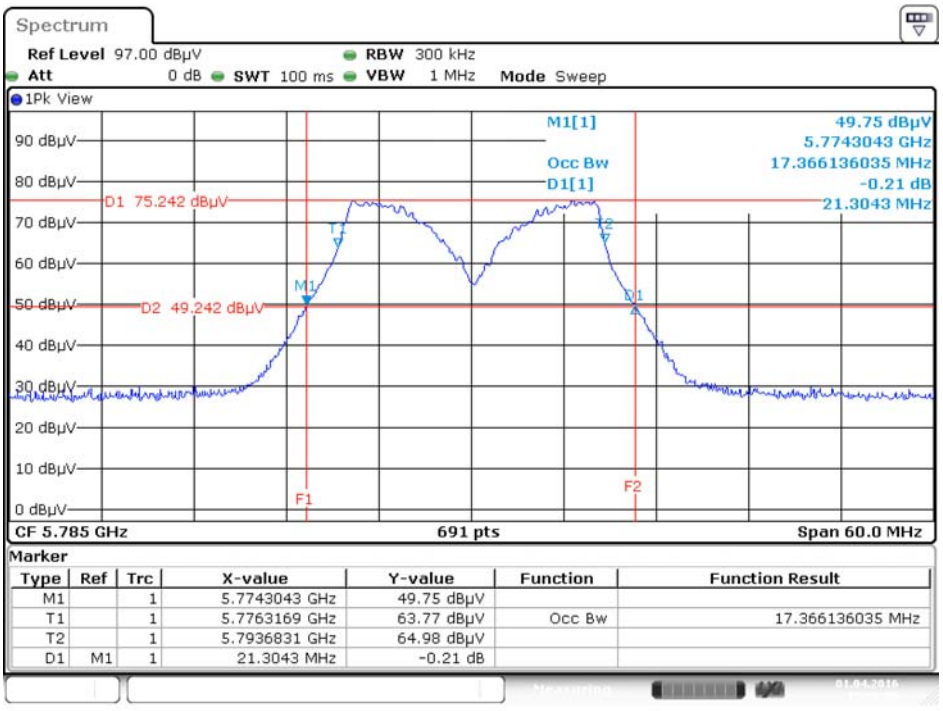
Date: 1.APR.2016 15:45:35

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



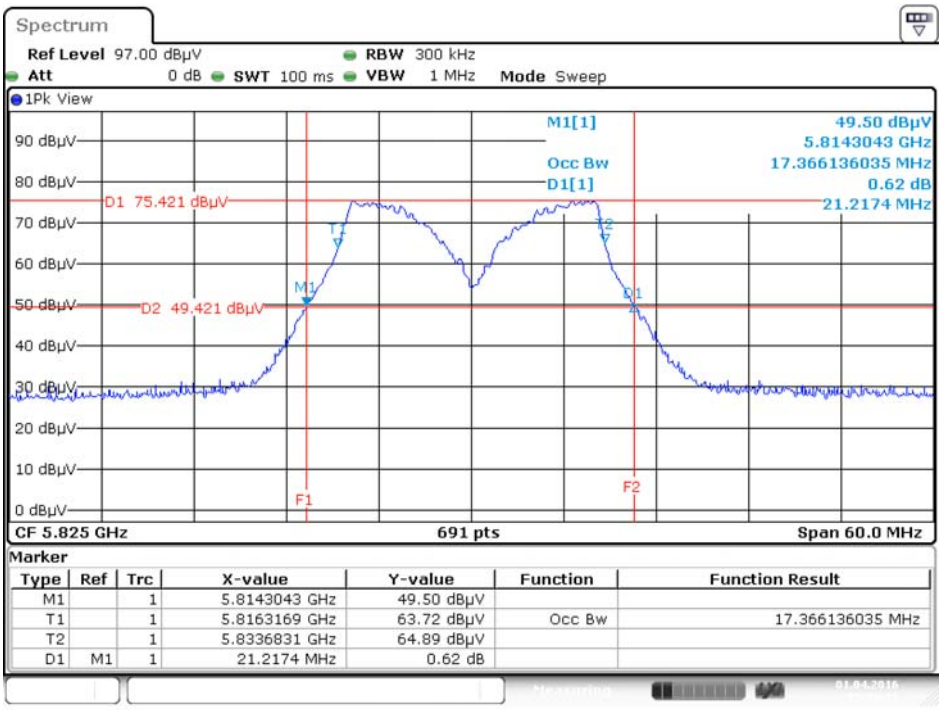
Date: 1.APR.2016 15:57:40

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



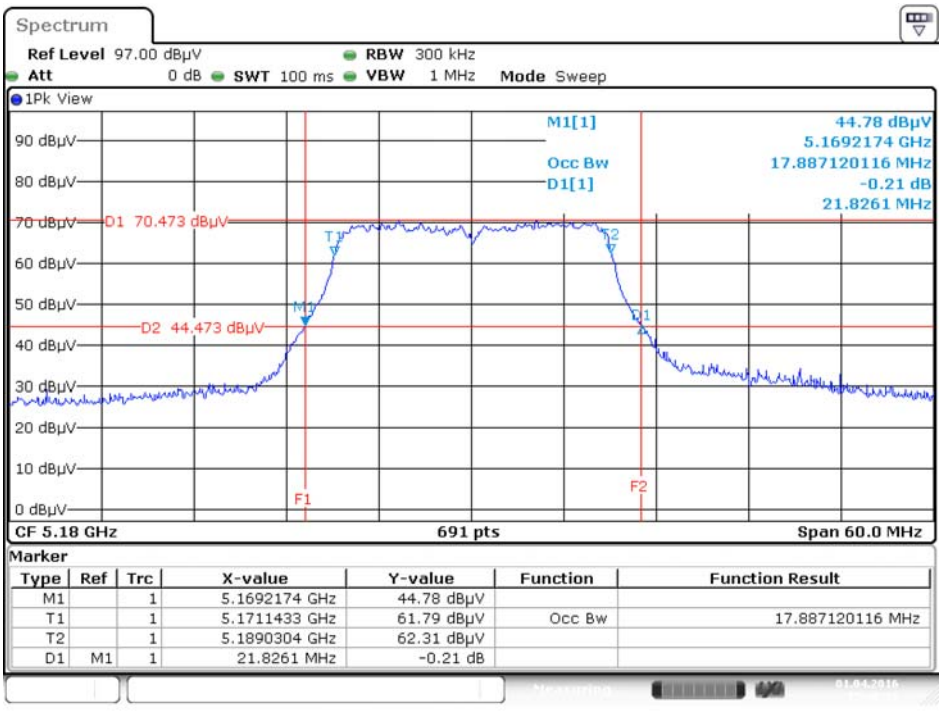
Date: 1.APR.2016 15:58:51

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



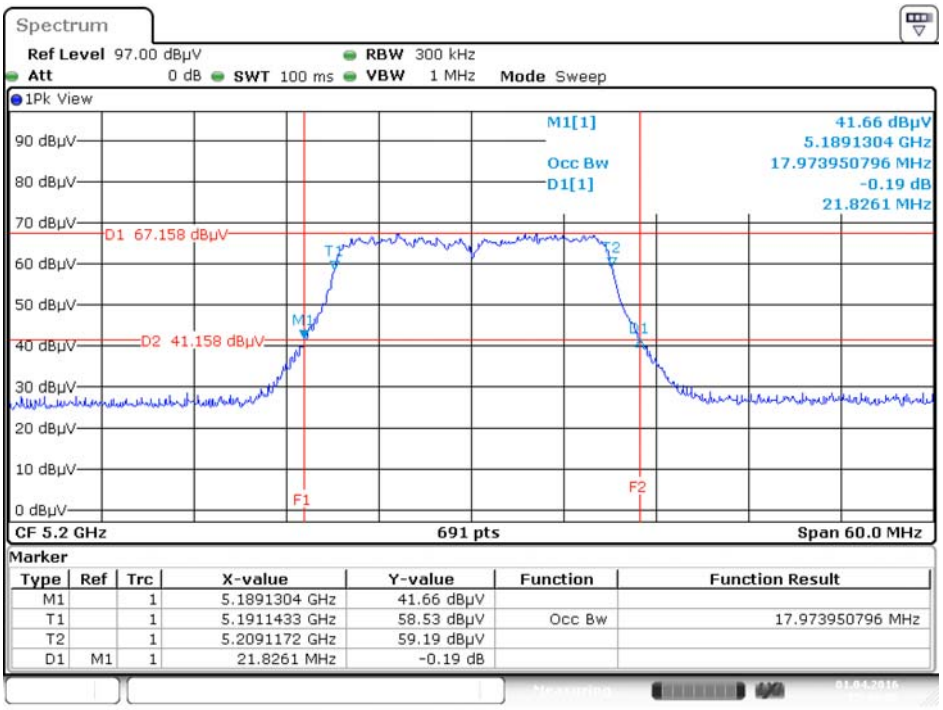
Date: 1.APR.2016 15:59:51

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



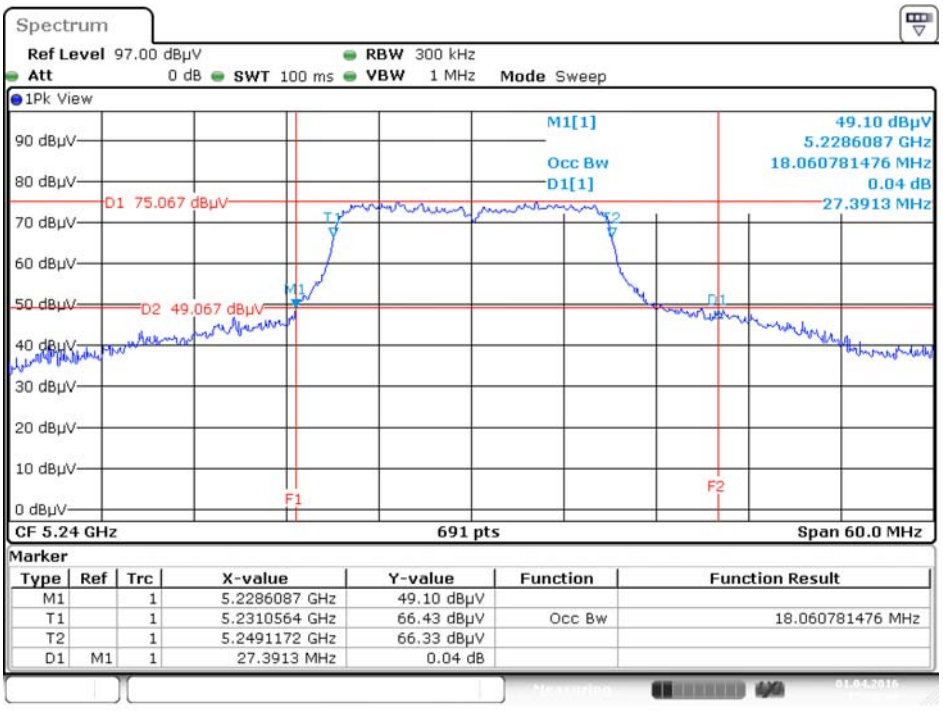
Date: 1.APR.2016 15:48:11

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



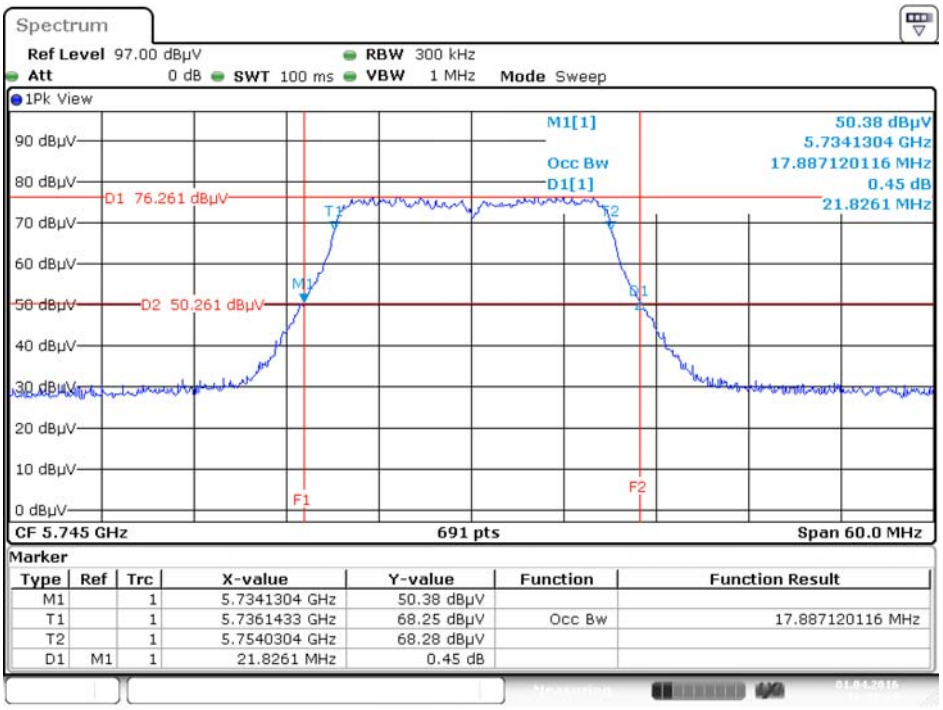
Date: 1.APR.2016 15:49:26

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



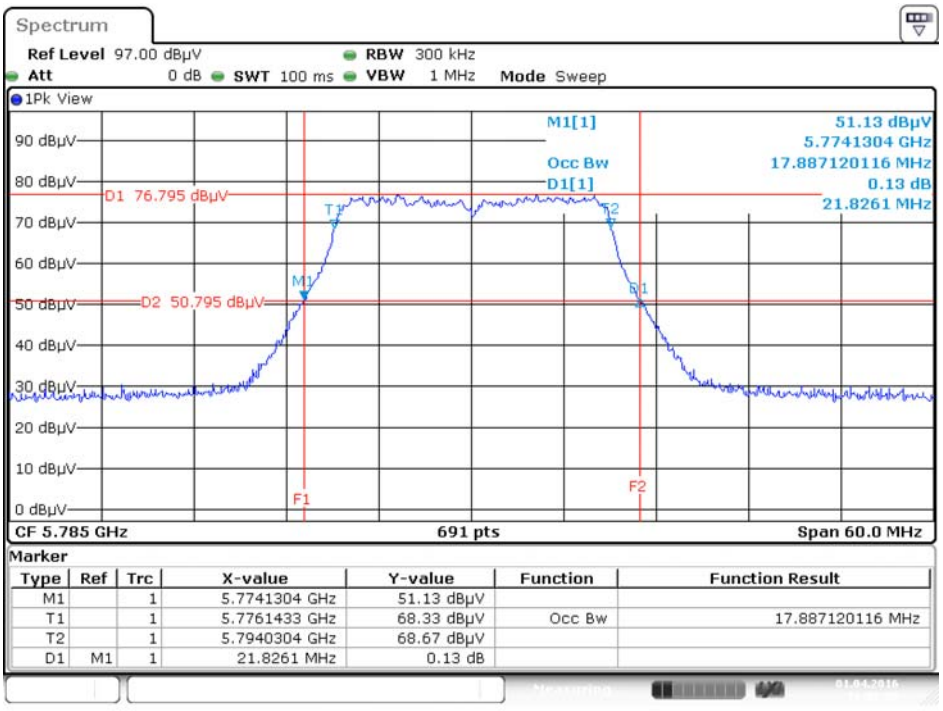
Date: 1.APR.2016 15:50:34

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



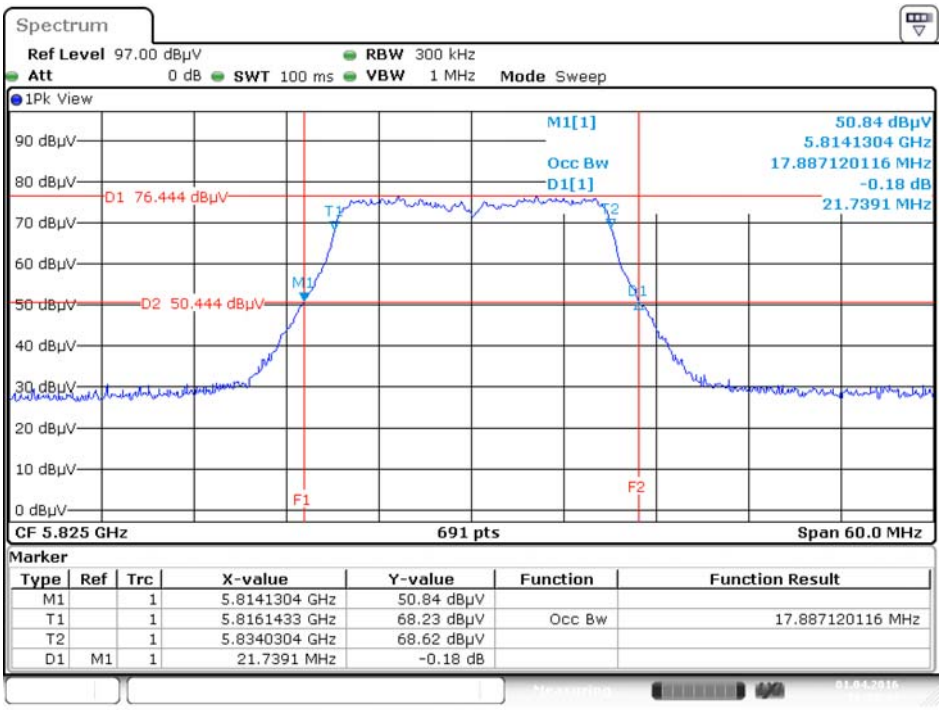
Date: 1.APR.2016 16:01:14

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



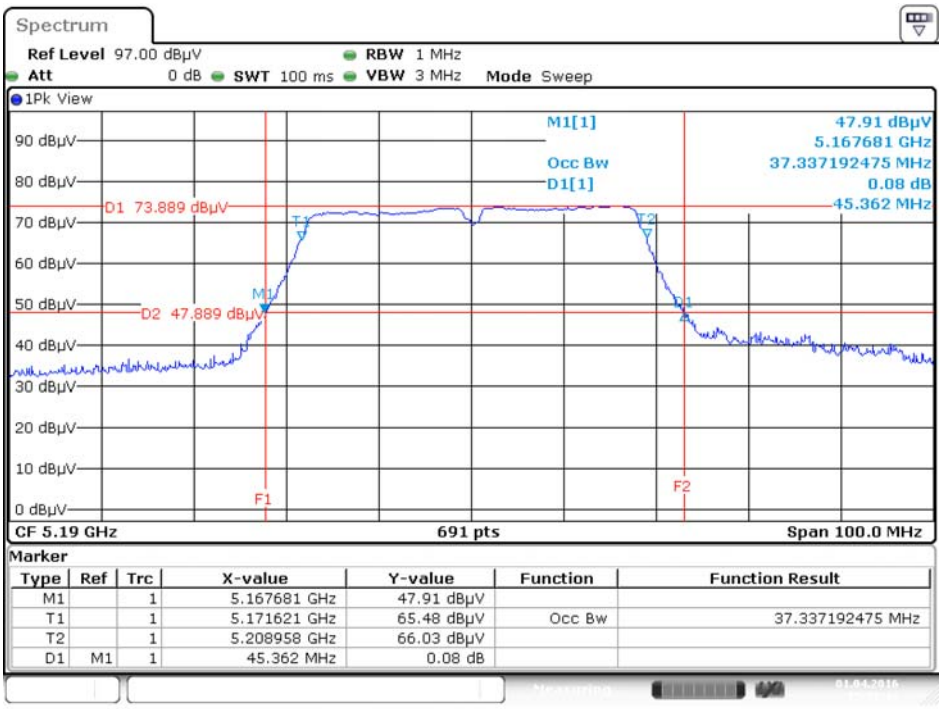
Date: 1.APR.2016 16:02:20

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



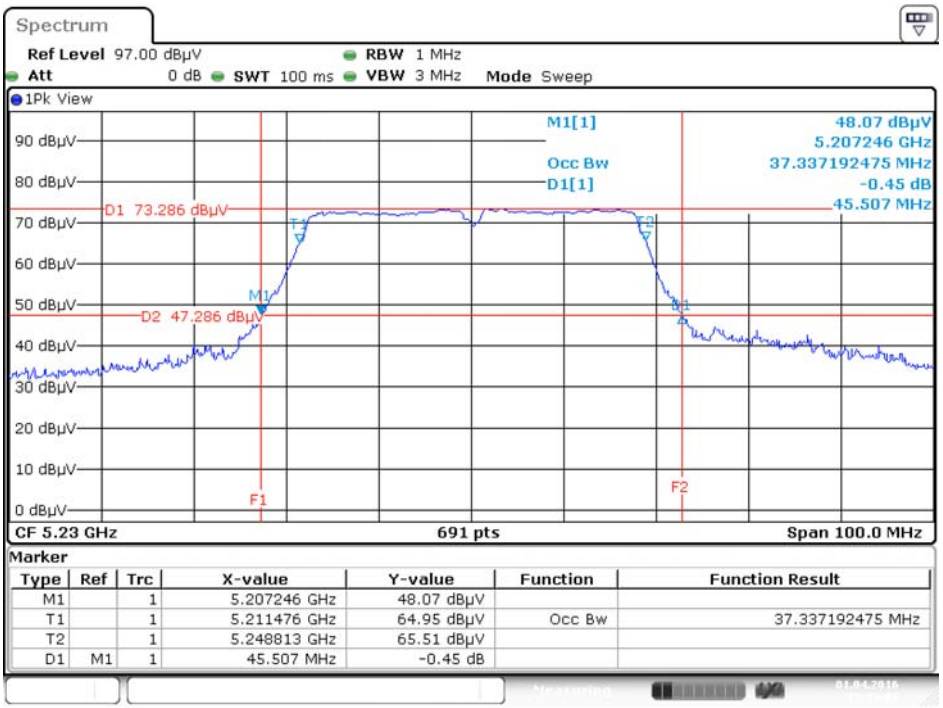
Date: 1.APR.2016 16:03:43

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



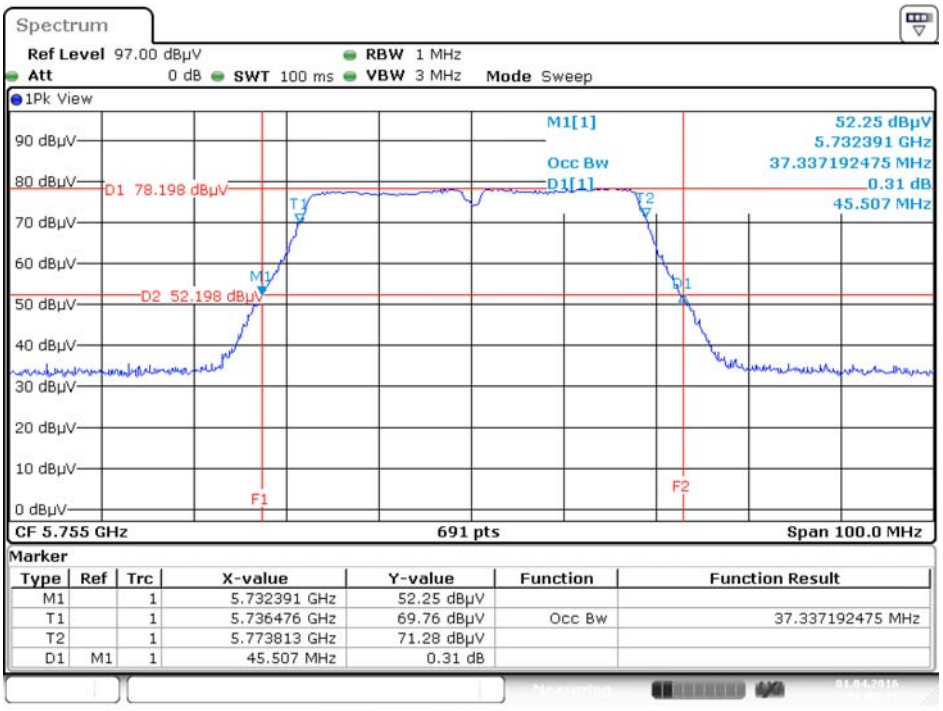
Date: 1.APR.2016 15:52:41

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



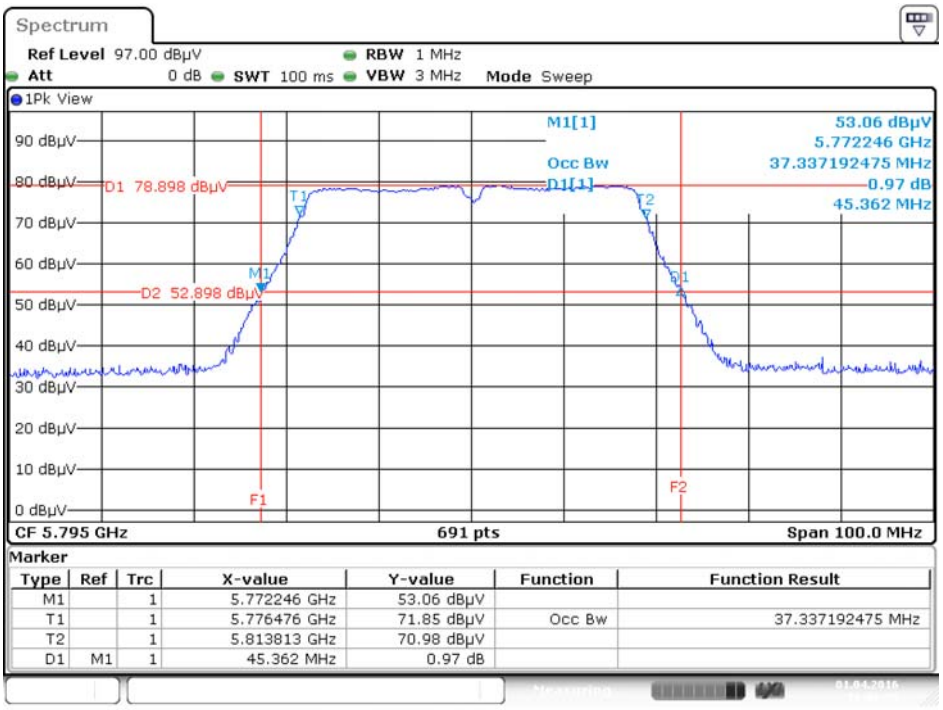
Date: 1.APR.2016 15:54:01

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



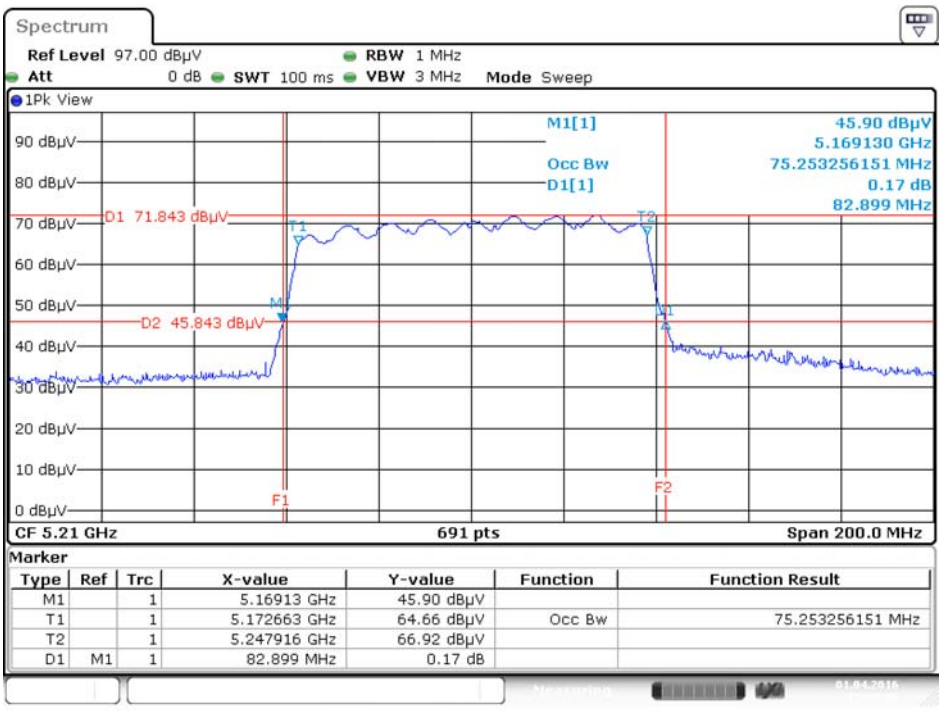
Date: 1.APR.2016 16:05:14

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



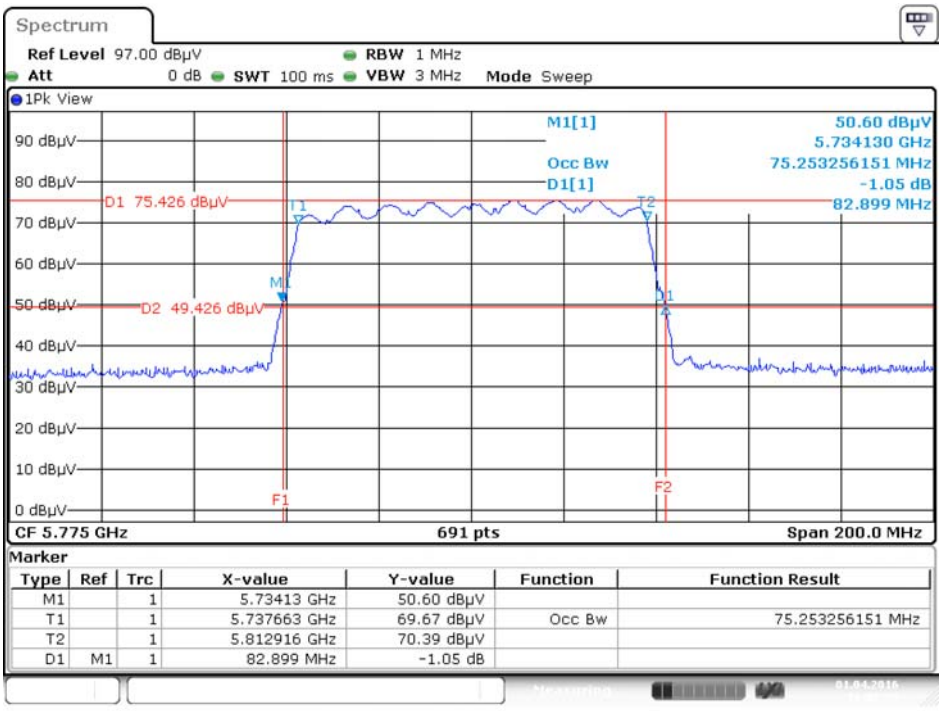
Date: 1.APR.2016 16:06:25

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



Date: 1.APR.2016 15:55:37

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



Date: 1.APR.2016 16:07:52

4.3. 6dB Spectrum Bandwidth Measurement

4.3.1. Limit

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

4.3.2. Measuring Instruments and Setting

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

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

4.3.3. Test Procedures

For Radiated 6dB Bandwidth Measurement:

1. The transmitter was radiated to the spectrum analyzer in peak hold mode.
2. Test was performed in accordance with KDB789033 D02 v01r02 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (C) Bandwidth Measurement.
3. Multiple antenna system was performed in accordance with KDB662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. Measured the spectrum width with power higher than 6dB below carrier.

4.3.4. Test Setup Layout

For Radiated 6dB Bandwidth Measurement:

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

4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.3.7. Test Result of 6dB Spectrum Bandwidth

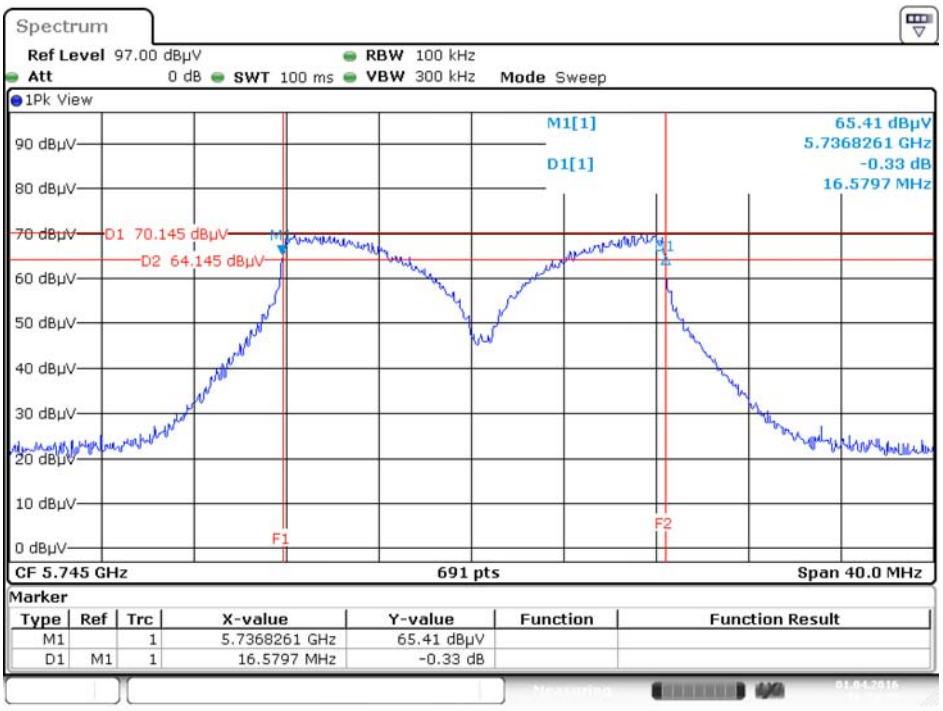
Temperature	25°C	Humidity	45%
Test Engineer	Gino Huang		

Mode	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11a	5745 MHz	16.58	500	Complies
	5785 MHz	16.58	500	Complies
	5825 MHz	16.58	500	Complies
802.11ac MCS0/Nss1 VHT20	5745 MHz	17.68	500	Complies
	5785 MHz	17.74	500	Complies
	5825 MHz	17.80	500	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	36.41	500	Complies
	5795 MHz	36.41	500	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	75.07	500	Complies

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

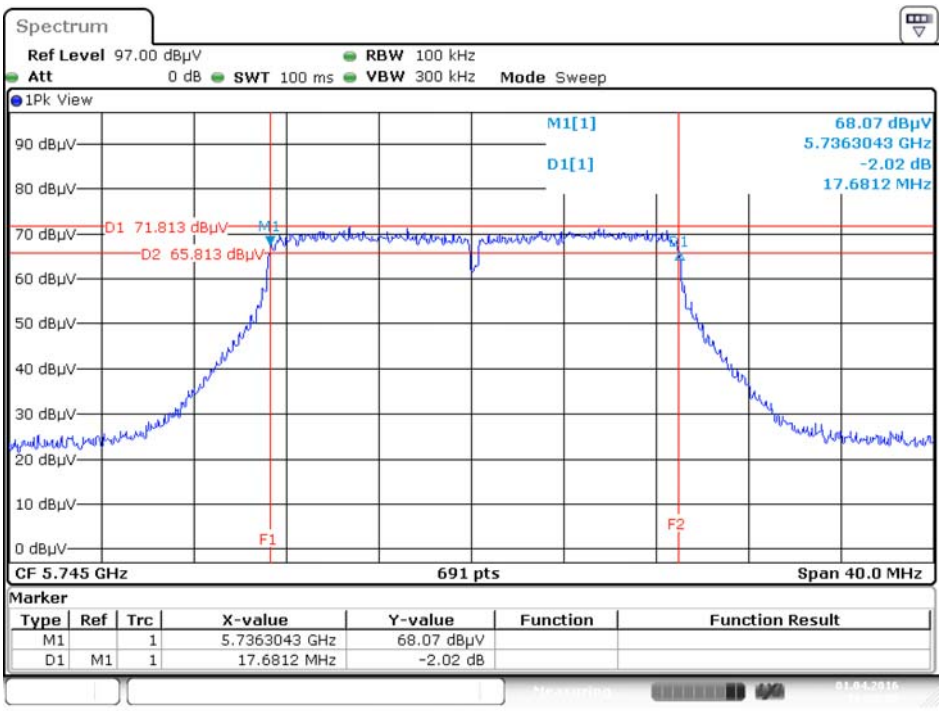
For plots, only the channel with worse result was shown.

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



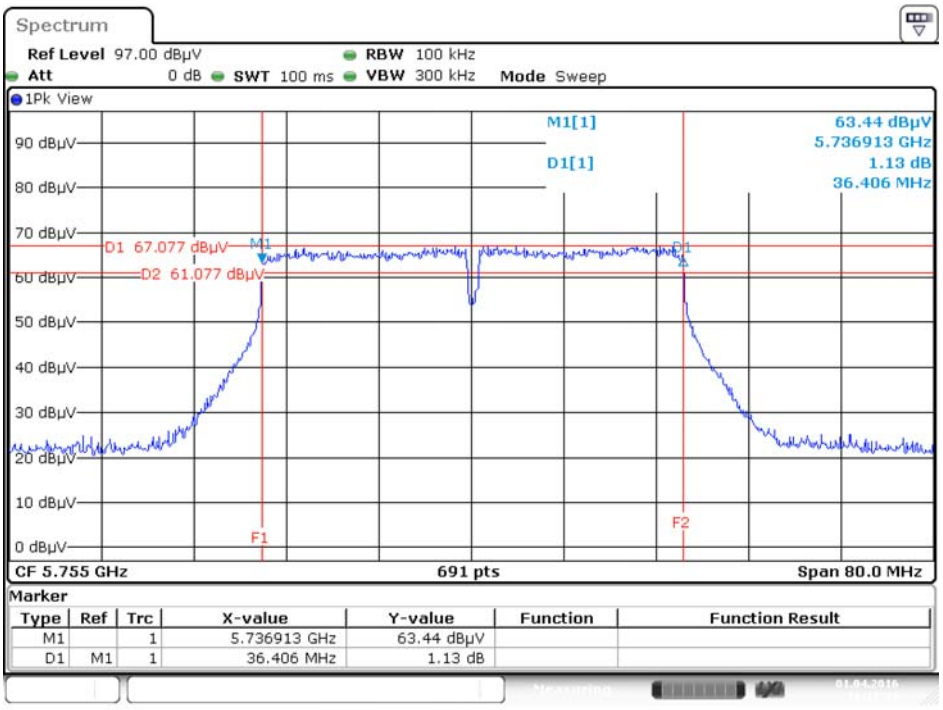
Date: 1.APR.2016 16:23:29

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



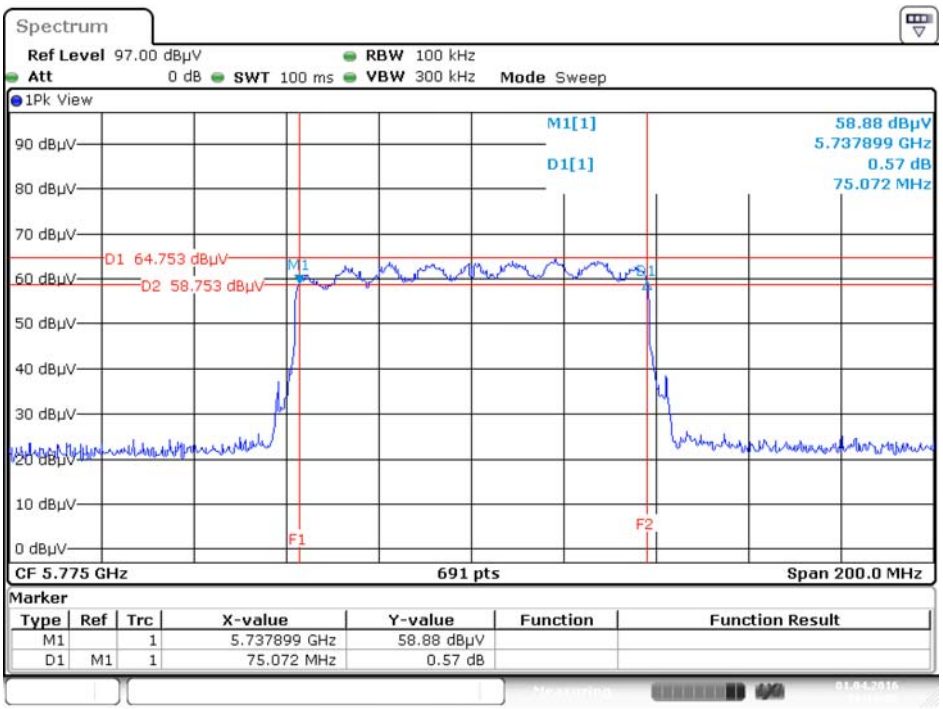
Date: 1.APR.2016 16:20:00

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



Date: 1.APR.2016 16:17:20

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



Date: 1.APR.2016 16:14:26

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

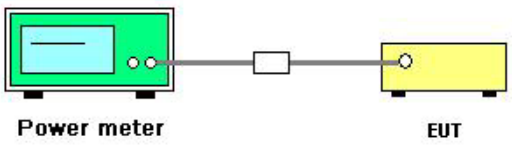
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

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

4.4.4. Test Setup Layout



4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.4.7. Test Result of Maximum Conducted Output Power

Temperature	25°C	Humidity	45%
Test Engineer	Gino Huang	Test Date	Mar. 17, 2016~Apr. 01, 2016

Mode	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
802.11a	5180 MHz	2.45	3.14	5.82	20.30	Complies
	5200 MHz	6.43	6.11	9.28	20.30	Complies
	5240 MHz	4.83	5.37	8.12	20.30	Complies
	5745 MHz	8.23	8.42	11.34	17.90	Complies
	5785 MHz	9.02	8.28	11.68	17.90	Complies
	5825 MHz	9.33	8.16	11.79	17.90	Complies
802.11ac MCS0/Nss1 VHT20	5180 MHz	1.04	2.56	4.88	20.30	Complies
	5200 MHz	-1.18	0.05	2.49	20.30	Complies
	5240 MHz	5.81	6.42	9.14	20.30	Complies
	5745 MHz	8.53	8.15	11.35	17.90	Complies
	5785 MHz	8.36	7.79	11.09	17.90	Complies
	5825 MHz	8.67	7.89	11.31	17.90	Complies
802.11ac MCS0/Nss1 VHT40	5190 MHz	2.22	3.89	6.15	20.30	Complies
	5230 MHz	2.09	2.56	5.34	20.30	Complies
	5755 MHz	7.38	7.21	10.31	17.90	Complies
	5795 MHz	8.51	7.92	11.24	17.90	Complies
802.11ac MCS0/Nss1 VHT80	5210 MHz	1.51	2.92	5.28	20.30	Complies
	5775 MHz	6.69	6.33	9.52	17.90	Complies

Note:B1: Ant. Gain =15.70 dBi, so limit =30-(15.70-6)=20.30 dBm

Note:B4: Ant. Gain =18.10 dBi, so limit =30-(18.10-6)=17.90 dBm

4.5. Power Spectral Density Measurement

4.5.1. Limit

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

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

4.5.2. Measuring Instruments and Setting

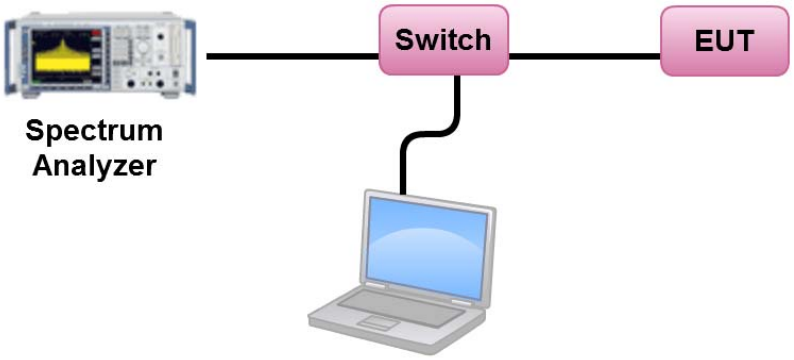
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.5.4. Test Setup Layout



4.5.5. Test Deviation

There is no deviation with the original standard.

4.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.5.7. Test Result of Power Spectral Density

Temperature	25°C	Humidity	45%
Test Engineer	Gino Huang	Test Date	Mar. 17, 2016~Apr. 01, 2016

Configuration IEEE 802.11a / Chain 1 + Chain 2

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	-7.54	4.29	Complies
40	5200 MHz	-3.81	4.29	Complies
48	5240 MHz	-4.97	4.29	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =18.71dBi, so limit =17-(18.71-6)=4.29 dBm/MHz

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	-1.87	-3.01	-4.88	14.89	Complies
157	5785 MHz	-1.74	-3.01	-4.75	14.89	Complies
165	5825 MHz	-1.34	-3.01	-4.35	14.89	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =21.11dBi, so limit =30-(21.11-6)=14.89 dBm/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	-8.45	4.29	Complies
40	5200 MHz	-10.69	4.29	Complies
48	5240 MHz	-4.03	4.29	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =18.71dBi, so limit =17-(18.71-6)=4.29 dBm/MHz

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	-1.75	-3.01	-4.76	14.89	Complies
157	5785 MHz	-2.22	-3.01	-5.23	14.89	Complies
165	5825 MHz	-1.83	-3.01	-4.84	14.89	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =21.11dBi, so limit =30-(21.11-6)=14.89 dBm/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	-10.28	4.29	Complies
46	5230 MHz	-10.85	4.29	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =18.71dBi, so limit =17-(18.71-6)=4.29 dBm/MHz

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
151	5755 MHz	-5.87	-3.01	-8.88	14.89	Complies
159	5795 MHz	-4.88	-3.01	-7.89	14.89	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =21.11dBi, so limit =30-(21.11-6)=14.89 dBm/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	-13.97	4.29	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =18.71dBi, so limit =17-(18.71-6)=4.29 dBm/MHz

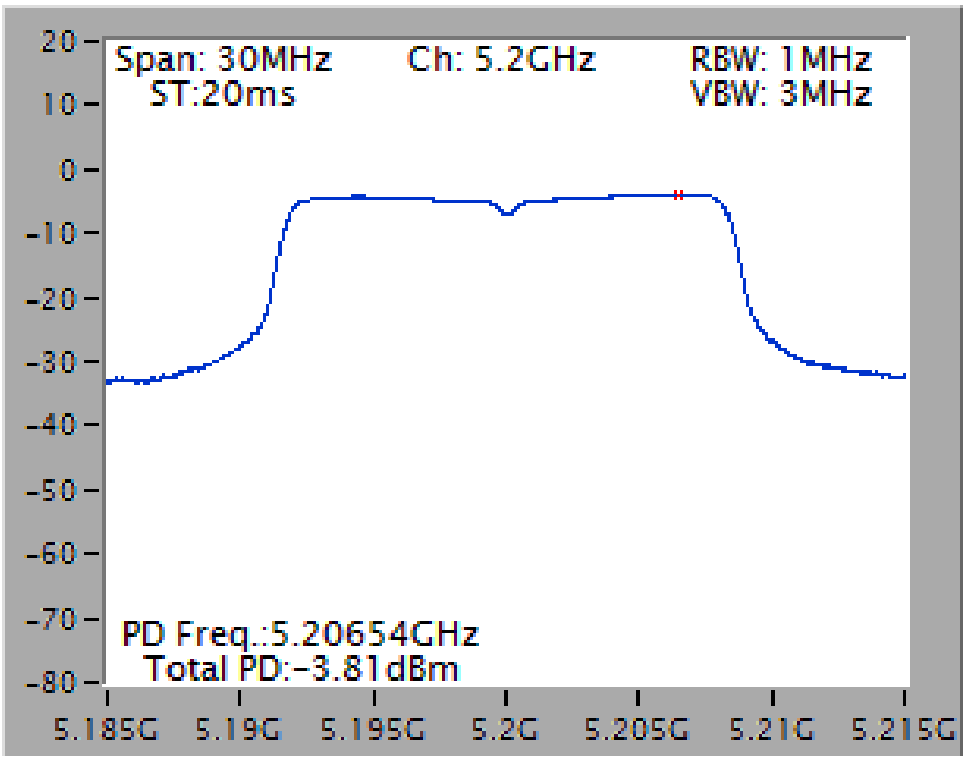
Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
155	5775 MHz	-9.63	-3.01	-12.64	14.89	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =21.11dBi, so limit =30-(21.11-6)=14.89 dBm/500kHz

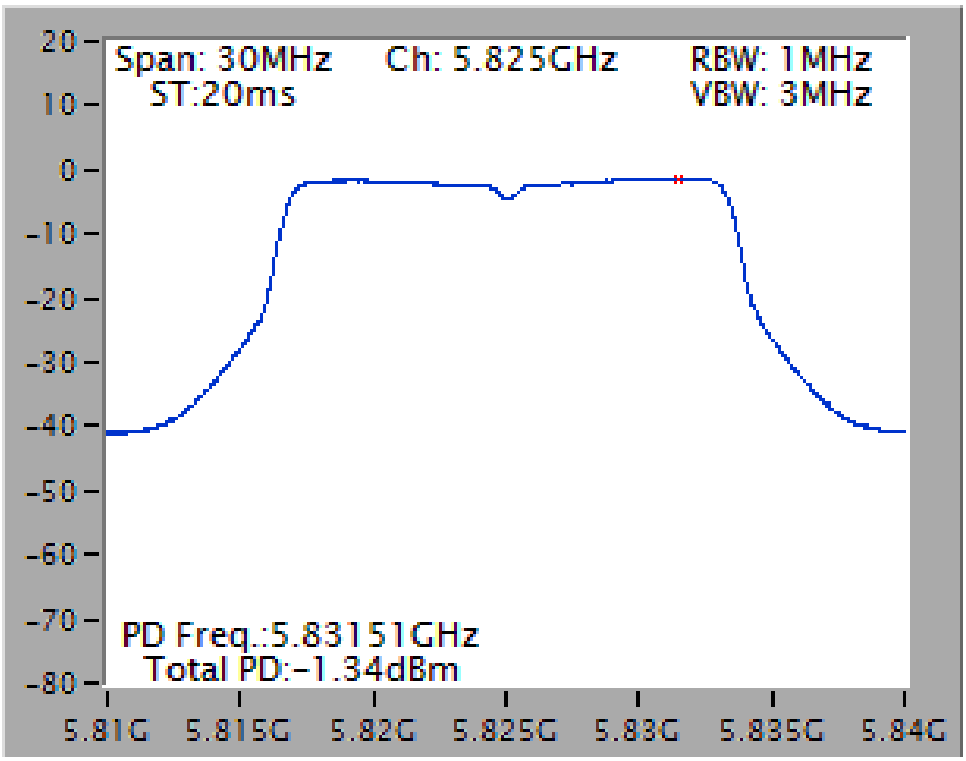
Note: All the test values were listed in the report.

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

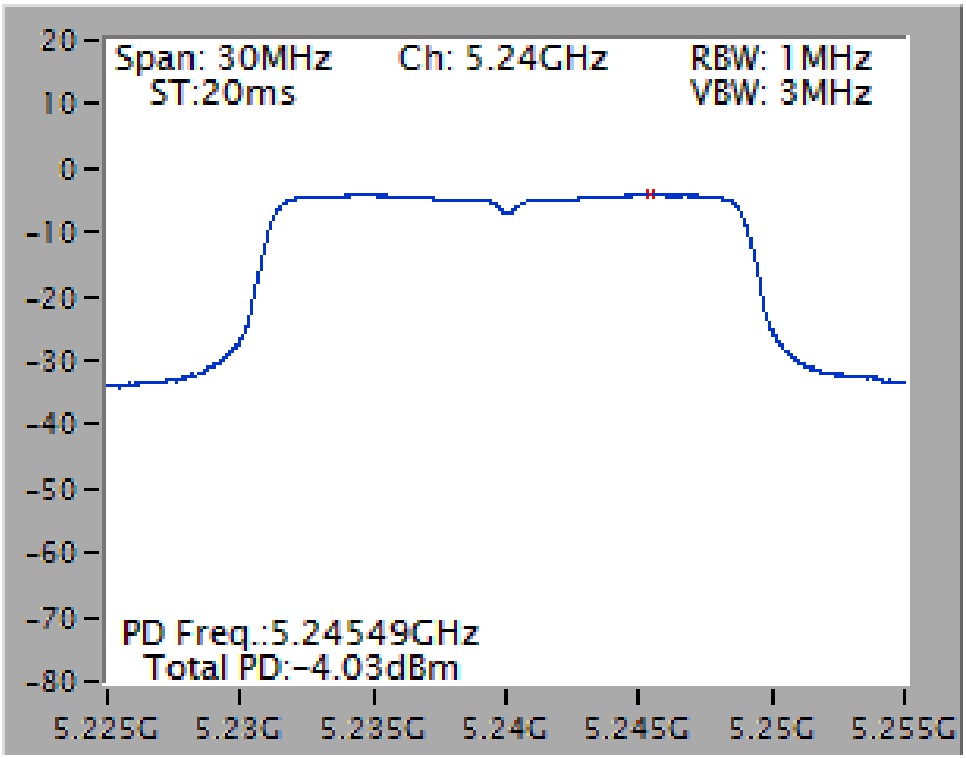
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 / 5200 MHz



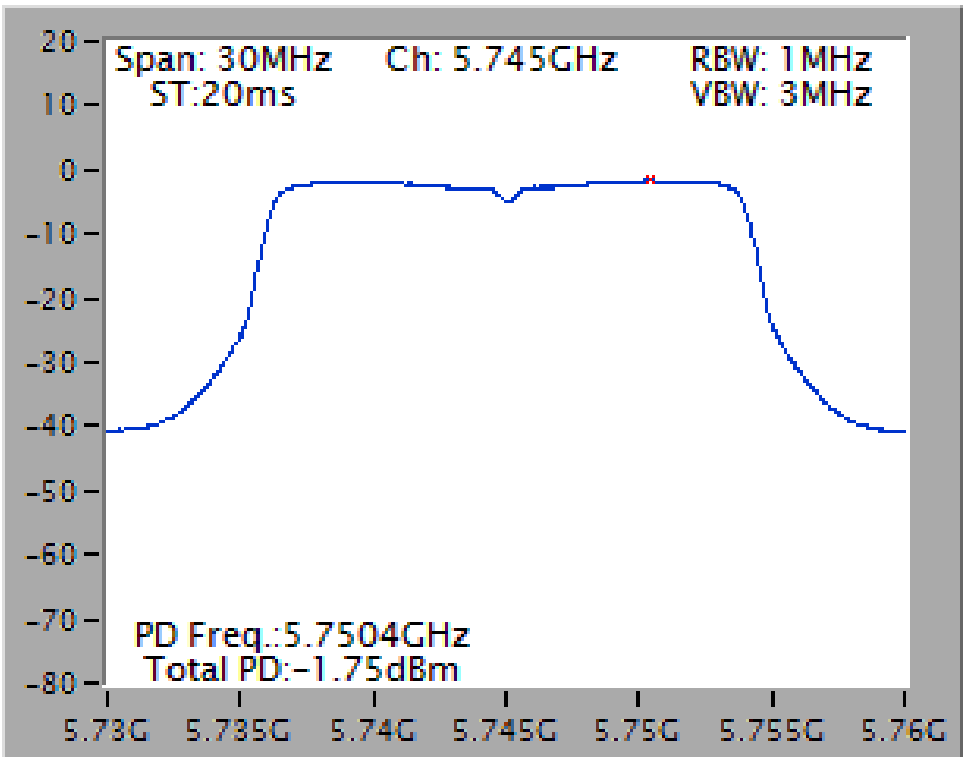
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 / 5825 MHz



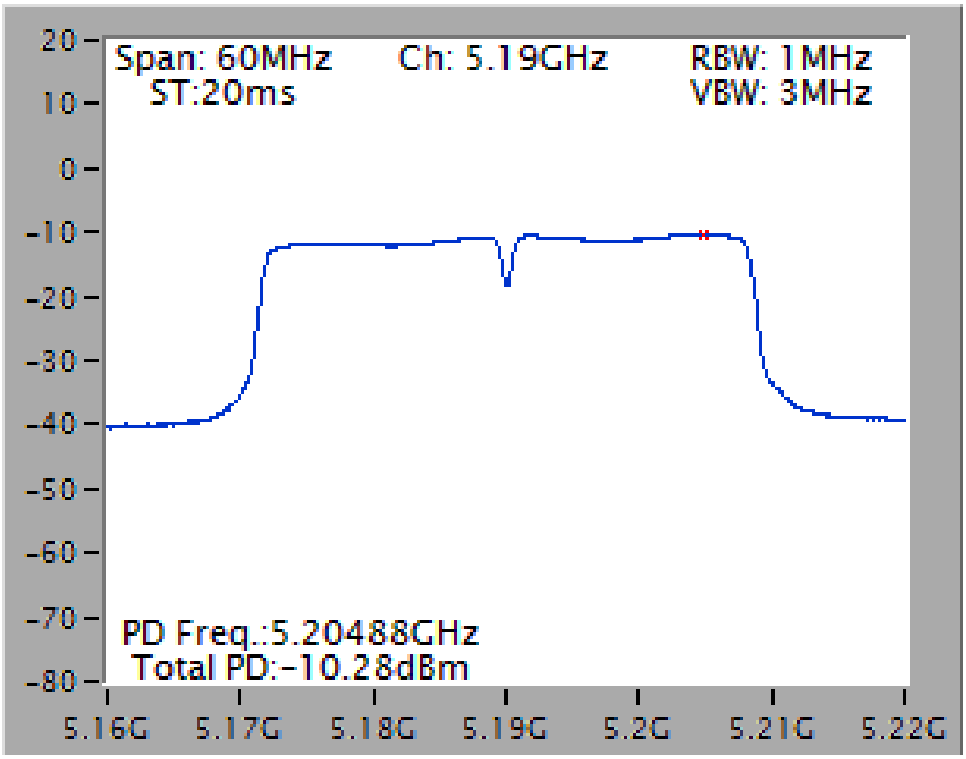
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 / 5240 MHz



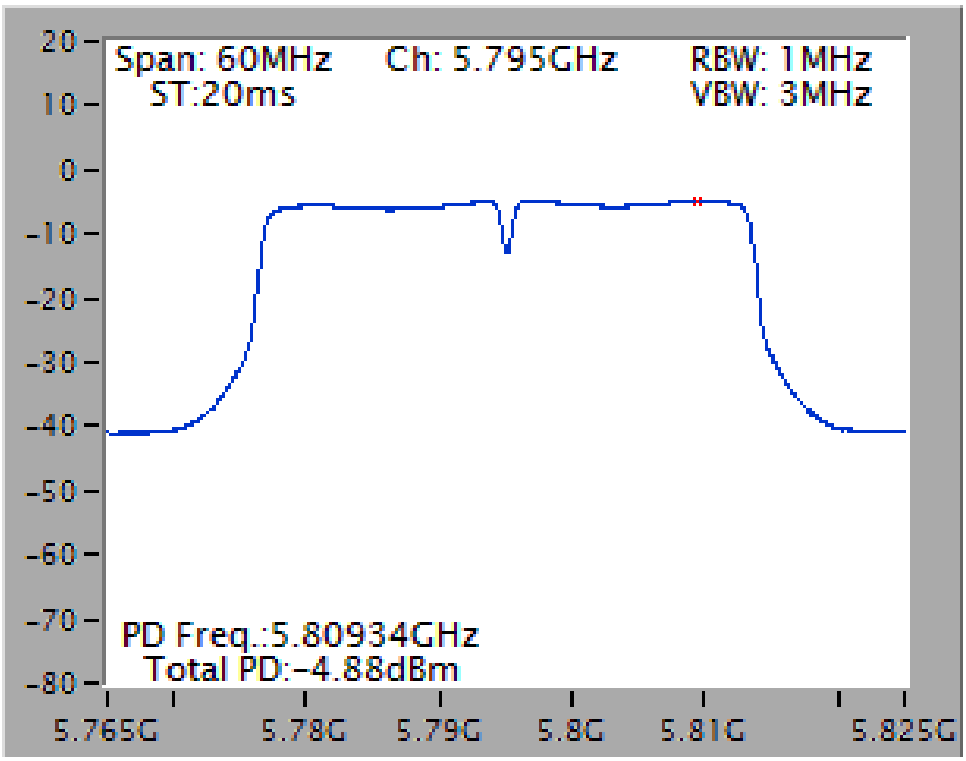
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2/ 5745 MHz



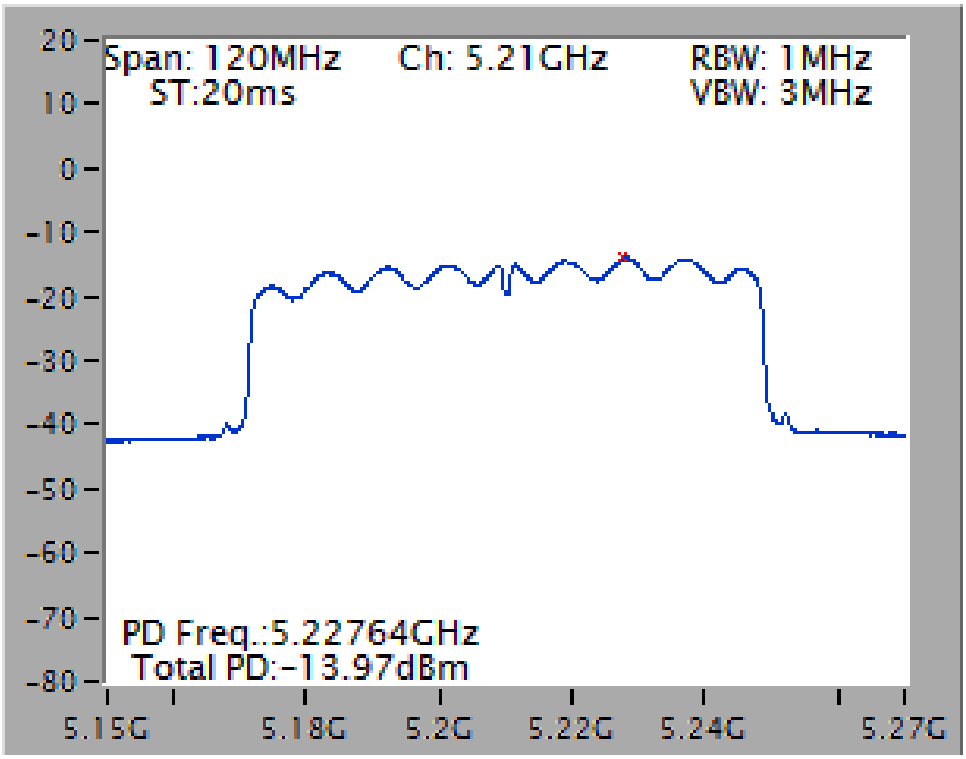
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 / 5190 MHz



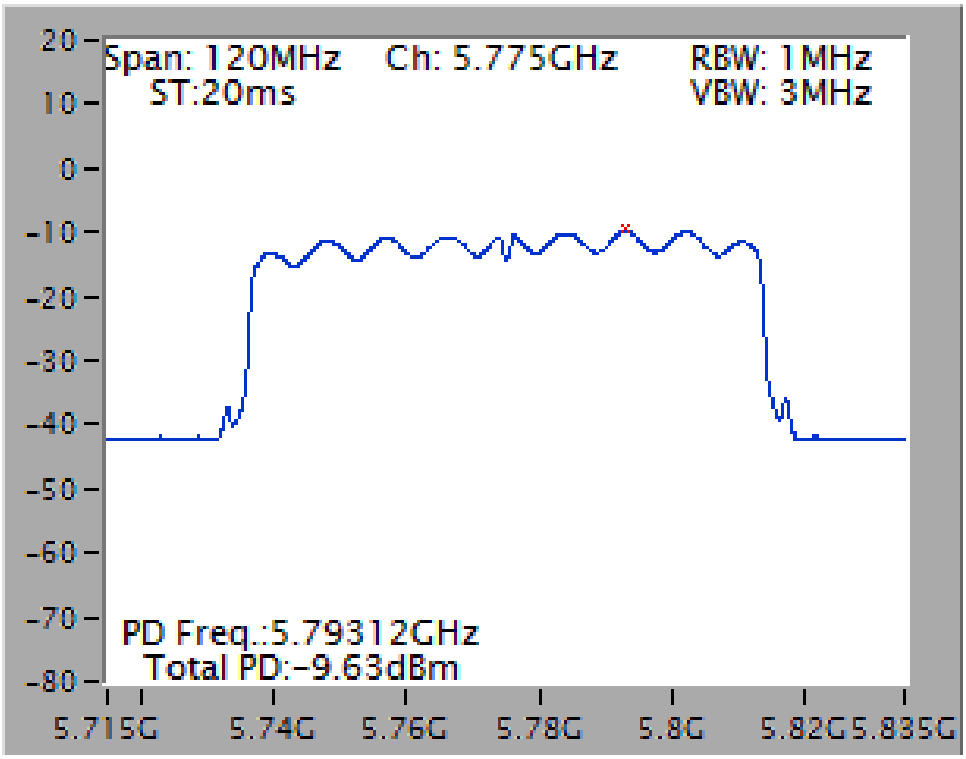
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2/ 5795 MHz



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

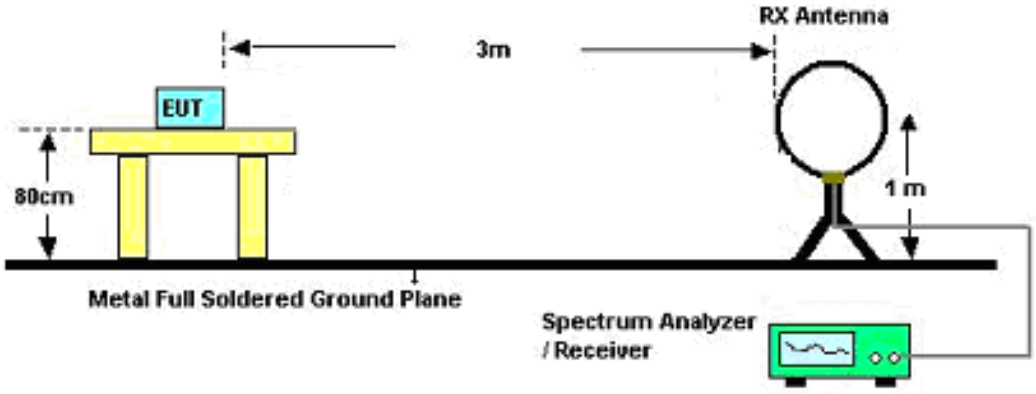
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.6.3. Test Procedures

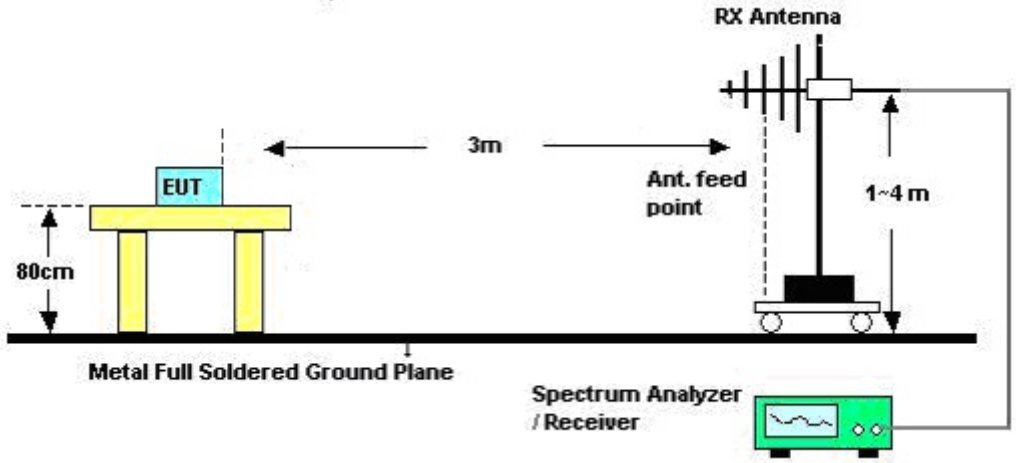
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 1m & 3m far away from the turntable.
2. Power on the EUT and all the supporting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

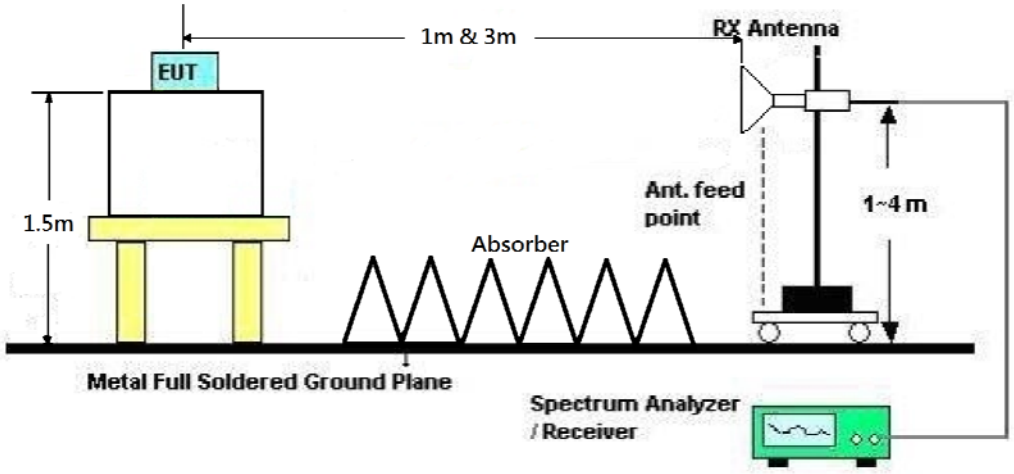
For Radiated Emissions: 9kHz ~30MHz



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	22°C	Humidity	54%
Test Engineer	DK Chang	Configurations	CTX
Test Date	Apr. 25, 2016		

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.

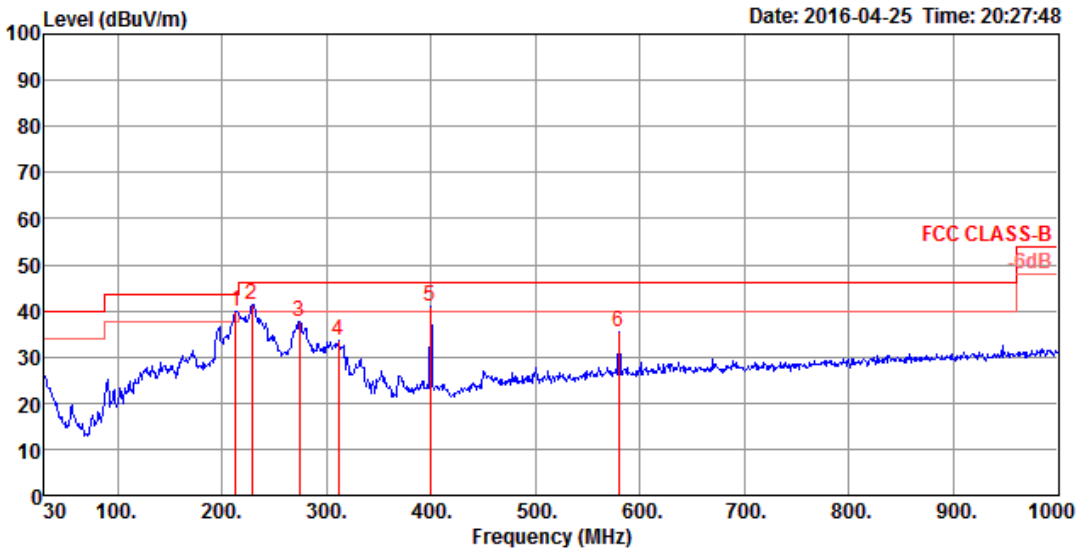
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

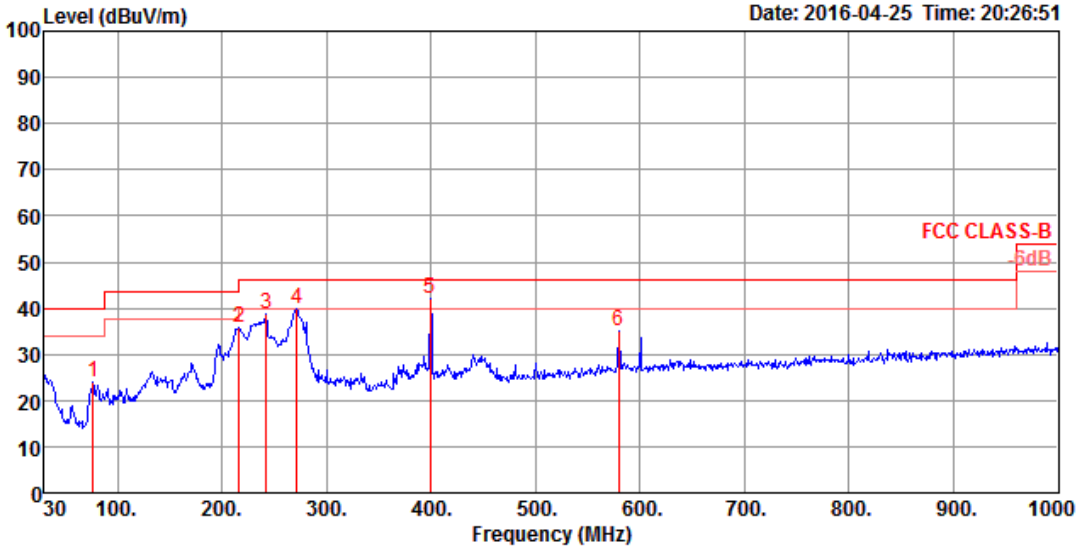
Temperature	22°C	Humidity	54%
Test Engineer	DK Chang	Configurations	CTX

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	213.33	39.98	43.50	-3.52	54.29	1.25	16.76	32.32	100	317	Peak	HORIZONTAL
2	228.85	41.31	46.00	-4.69	54.92	1.29	17.41	32.31	100	325	Peak	HORIZONTAL
3	274.44	37.51	46.00	-8.49	48.75	1.41	19.64	32.29	100	57	Peak	HORIZONTAL
4	311.30	33.48	46.00	-12.52	43.94	1.51	20.32	32.29	100	40	Peak	HORIZONTAL
5	399.57	40.87	46.00	-5.13	48.80	1.73	22.67	32.33	100	108	Peak	HORIZONTAL
6	579.99	35.33	46.00	-10.67	40.47	2.09	25.17	32.40	300	248	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	76.56	23.81	40.00	-16.19	42.09	0.76	13.36	32.40	100	230	Peak	VERTICAL
2	216.24	35.80	46.00	-10.20	50.04	1.26	16.82	32.32	200	360	Peak	VERTICAL
3	242.43	38.69	46.00	-7.31	51.10	1.32	18.58	32.31	200	357	Peak	VERTICAL
4	271.53	39.86	46.00	-6.14	51.14	1.40	19.61	32.29	200	360	Peak	VERTICAL
5	399.57	42.17	46.00	-3.83	50.10	1.73	22.67	32.33	100	191	Peak	VERTICAL
6	579.99	35.08	46.00	-10.92	40.22	2.09	25.17	32.40	100	171	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	22°C	Humidity	54%
Test Engineer	DK Chang	Configurations	IEEE 802.11a CH 36 / Chain 1 + Chain 2
Test Date	Mar. 29, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15537.66	45.45	54.00	-8.55	30.70	11.23	38.16	34.64	360	238	Average	HORIZONTAL
2	15541.98	58.21	74.00	-15.79	43.46	11.23	38.16	34.64	360	238	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15537.96	45.64	54.00	-8.36	30.89	11.23	38.16	34.64	360	182	Average	VERTICAL
2	15541.66	58.77	74.00	-15.23	44.02	11.23	38.16	34.64	360	182	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	DK Chang	Configurations	IEEE 802.11a CH 40 / Chain 1 + Chain 2
Test Date	Mar. 29, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15599.08	47.31	54.00	-6.69	32.52	11.24	38.23	34.68	360	234	Average	HORIZONTAL
2	15604.52	60.54	74.00	-13.46	45.68	11.25	38.29	34.68	360	234	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15599.30	47.97	54.00	-6.03	33.18	11.24	38.23	34.68	3	220	Average	VERTICAL
2	15600.80	61.85	74.00	-12.15	46.99	11.25	38.29	34.68	3	220	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	DK Chang	Configurations	IEEE 802.11a CH 48 / Chain 1 + Chain 2
Test Date	Mar. 29, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15717.68	46.85	54.00	-7.15	31.97	11.27	38.42	34.81	354	161	Average	HORIZONTAL
2	15722.02	60.32	74.00	-13.68	45.44	11.27	38.42	34.81	354	161	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15723.00	64.32	74.00	-9.68	49.44	11.27	38.42	34.81	359	179	Peak	VERTICAL
2	15724.00	49.86	54.00	-4.14	34.98	11.27	38.42	34.81	359	179	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	DK Chang	Configurations	IEEE 802.11a CH 149 / Chain 1 + Chain 2
Test Date	Mar. 29, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11490.18	43.72	54.00	-10.28	30.22	9.62	38.50	34.62	359	200	Average	HORIZONTAL
2	11490.20	55.12	74.00	-18.88	41.62	9.62	38.50	34.62	359	200	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11490.18	43.83	54.00	-10.17	30.33	9.62	38.50	34.62	358	203	Average	VERTICAL
2	11490.76	55.00	74.00	-19.00	41.50	9.62	38.50	34.62	358	203	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	DK Chang	Configurations	IEEE 802.11a CH 157 / Chain 1 + Chain 2
Test Date	Mar. 29, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11570.10	43.49	54.00	-10.51	30.00	9.61	38.53	34.65	18	247	Average	HORIZONTAL
2	11570.12	55.37	74.00	-18.63	41.88	9.61	38.53	34.65	18	247	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11569.98	55.34	74.00	-18.66	41.85	9.61	38.53	34.65	356	218	Peak	VERTICAL
2	11570.24	43.16	54.00	-10.84	29.67	9.61	38.53	34.65	356	218	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	DK Chang	Configurations	IEEE 802.11a CH 165 / Chain 1 + Chain 2
Test Date	Mar. 29, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11649.10	55.97	74.00	-18.03	42.50	9.60	38.55	34.68	1	201	Peak	HORIZONTAL
2	11650.16	43.54	54.00	-10.46	30.07	9.60	38.55	34.68	1	201	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11648.32	55.21	74.00	-18.79	41.74	9.60	38.55	34.68	348	230	Peak	VERTICAL
2	11650.22	43.06	54.00	-10.94	29.59	9.60	38.55	34.68	348	230	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	DK Chang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36 / Chain 1 + Chain 2
Test Date	Mar. 29, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15540.21	62.85	74.00	-11.15	48.10	11.23	38.16	34.64	2	230	Peak	HORIZONTAL
2	15540.21	44.74	54.00	-9.26	29.99	11.23	38.16	34.64	2	230	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15540.88	61.48	74.00	-12.52	46.73	11.23	38.16	34.64	354	250	Peak	VERTICAL
2	15540.88	46.58	54.00	-7.42	31.83	11.23	38.16	34.64	354	250	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	DK Chang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 40 / Chain 1 + Chain 2
Test Date	Mar. 29, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15600.40	60.34	74.00	-13.66	45.55	11.24	38.23	34.68	360	230	Peak	HORIZONTAL
2	15600.40	52.44	54.00	-1.56	37.65	11.24	38.23	34.68	360	230	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15600.72	56.96	74.00	-17.04	42.10	11.25	38.29	34.68	353	198	Peak	VERTICAL
2	15600.72	46.86	54.00	-7.14	32.00	11.25	38.29	34.68	353	198	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	DK Chang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 48 / Chain 1 + Chain 2
Test Date	Mar. 29, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15719.70	64.08	74.00	-9.92	49.20	11.27	38.42	34.81	360	249	Peak	HORIZONTAL
2	15721.40	50.77	54.00	-3.23	35.89	11.27	38.42	34.81	360	249	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15724.20	53.80	54.00	-0.20	38.92	11.27	38.42	34.81	360	198	Average	VERTICAL
2	15727.00	68.52	74.00	-5.48	53.64	11.27	38.42	34.81	360	198	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	DK Chang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Chain 1 + Chain 2
Test Date	Mar. 29, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11490.17	59.43	74.00	-14.57	45.93	9.62	38.50	34.62	354	178	Peak	HORIZONTAL
2	11490.17	50.98	54.00	-3.02	37.48	9.62	38.50	34.62	354	178	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11490.03	57.37	74.00	-16.63	43.87	9.62	38.50	34.62	21	202	Peak	VERTICAL
2	11490.16	48.64	54.00	-5.36	35.14	9.62	38.50	34.62	21	202	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	DK Chang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Chain 1 + Chain 2
Test Date	Mar. 29, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11570.16	58.24	74.00	-15.76	44.75	9.61	38.53	34.65	354	199	Peak	HORIZONTAL
2	11570.20	49.42	54.00	-4.58	35.93	9.61	38.53	34.65	354	199	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11570.21	49.39	54.00	-4.61	35.90	9.61	38.53	34.65	329	258	Average	VERTICAL
2	11570.26	57.23	74.00	-16.77	43.74	9.61	38.53	34.65	329	258	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	DK Chang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Chain 1 + Chain 2
Test Date	Mar. 29, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11650.16	59.28	74.00	-14.72	45.81	9.60	38.55	34.68	0	198	Peak	HORIZONTAL
2	11650.18	52.05	54.00	-1.95	38.58	9.60	38.55	34.68	0	198	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11650.15	50.09	54.00	-3.91	36.62	9.60	38.55	34.68	330	220	Average	VERTICAL
2	11650.20	57.90	74.00	-16.10	44.43	9.60	38.55	34.68	330	220	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	DK Chang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38 / Chain 1 + Chain 2
Test Date	Mar. 29, 2016		

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	15569.21	45.75	54.00	-8.25	30.71	12.52	38.38	35.86	100	87	Average	HORIZONTAL
2	15569.35	59.14	74.00	-14.86	44.10	12.52	38.38	35.86	100	87	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15569.47	45.54	54.00	-8.46	30.50	12.52	38.38	35.86	152	147	Average	VERTICAL
2	15569.83	59.39	74.00	-14.61	44.35	12.52	38.38	35.86	152	147	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	DK Chang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 46 / Chain 1 + Chain 2
Test Date	Mar. 29, 2016		

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	15689.23	58.73	74.00	-15.27	43.66	12.57	38.36	35.86	149	256	Peak	HORIZONTAL
2	15690.29	45.63	54.00	-8.37	30.56	12.57	38.36	35.86	149	256	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	15689.20	59.27	74.00	-14.73	44.20	12.57	38.36	35.86	125	336	Peak	VERTICAL
2	15690.94	45.89	54.00	-8.11	30.80	12.60	38.35	35.86	125	336	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	DK Chang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Chain 1 + Chain 2
Test Date	Mar. 29, 2016		

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	11510.15	49.89	54.00	-4.11	35.67	10.94	39.20	35.92	168	356	Average	HORIZONTAL
2	11510.57	58.71	74.00	-15.29	44.49	10.94	39.20	35.92	168	356	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	11510.10	58.38	74.00	-15.62	44.16	10.94	39.20	35.92	231	14	Peak	VERTICAL
2	11510.19	49.12	54.00	-4.88	34.90	10.94	39.20	35.92	231	14	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	DK Chang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Chain 1 + Chain 2
Test Date	Mar. 29, 2016		

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	11590.13	50.58	54.00	-3.42	36.38	10.99	39.12	35.91	122	349	Average	HORIZONTAL
2	11590.18	58.40	74.00	-15.60	44.20	10.99	39.12	35.91	122	349	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11590.15	50.15	54.00	-3.85	35.95	10.99	39.12	35.91	100	346	Average	VERTICAL
2	11590.22	58.35	74.00	-15.65	44.15	10.99	39.12	35.91	100	346	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	DK Chang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42 / Chain 1 + Chain 2
Test Date	Mar. 29, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15629.84	58.46	74.00	-15.54	43.40	12.55	38.37	35.86	155	331	Peak	HORIZONTAL
2	15630.67	45.49	54.00	-8.51	30.43	12.55	38.37	35.86	155	331	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	15629.53	59.20	74.00	-14.80	44.14	12.55	38.37	35.86	131	222	Peak	VERTICAL
2	15630.96	45.62	54.00	-8.38	30.56	12.55	38.37	35.86	131	222	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	DK Chang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 1 + Chain 2
Test Date	Mar. 29, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11550.19	48.96	54.00	-5.04	35.47	9.61	38.53	34.65	7	202	Average	HORIZONTAL
2	11550.23	57.52	74.00	-16.48	44.03	9.61	38.53	34.65	7	202	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11550.09	58.44	74.00	-15.56	44.97	9.61	38.51	34.65	9	193	Peak	VERTICAL
2	11550.18	50.71	54.00	-3.29	37.22	9.61	38.53	34.65	9	193	Average	VERTICAL

Note:

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

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

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

4.7. Band Edge Emissions Measurement

4.7.1. Limit

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

For transmitters operating in the 5.725-5.85 GHz band: all emissions 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	54%
Test Engineer	DK Chang	Configurations	IEEE 802.11a CH 36, 40, 48 / Chain 1 + Chain 2
Test Date	Mar. 28, 2016		

Channel 36

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5120.00	53.72	54.00	-0.28	46.32	7.48	34.82	34.90	181	358	Average	HORIZONTAL
2	5149.00	67.24	74.00	-6.76	59.82	7.48	34.85	34.91	181	358	Peak	HORIZONTAL
3	5174.00	106.65			99.20	7.48	34.88	34.91	181	358	Peak	HORIZONTAL
4	5186.00	97.63			90.18	7.48	34.88	34.91	181	358	Average	HORIZONTAL

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

Channel 40

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5120.00	52.56	54.00	-1.44	45.16	7.48	34.82	34.90	179	358	Average	HORIZONTAL
2	5146.00	64.04	74.00	-9.96	56.62	7.48	34.85	34.91	179	358	Peak	HORIZONTAL
3	5194.00	101.21			93.74	7.48	34.90	34.91	179	358	Average	HORIZONTAL
4	5194.00	110.78			103.31	7.48	34.90	34.91	179	358	Peak	HORIZONTAL

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

Channel 48

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5120.00	53.63	54.00	-0.37	46.23	7.48	34.82	34.90	183	357	Average	HORIZONTAL
2	5120.00	62.99	74.00	-11.01	55.59	7.48	34.82	34.90	183	357	Peak	HORIZONTAL
3	5246.00	100.81			93.28	7.50	34.94	34.91	183	357	Average	HORIZONTAL
4	5246.00	110.16			102.63	7.50	34.94	34.91	183	357	Peak	HORIZONTAL
5	5356.00	59.83	74.00	-14.17	52.12	7.56	35.06	34.91	183	357	Peak	HORIZONTAL
6	5400.00	48.30	54.00	-5.70	40.55	7.58	35.09	34.92	183	357	Average	HORIZONTAL

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

Temperature	22℃	Humidity	54%
Test Engineer	DK Chang	Configurations	IEEE 802.11a CH 149, 157, 165 / Chain 1 + Chain 2
Test Date	Mar. 28, 2016		

Channel 149

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5673.00	65.11	68.20	-3.09	57.37	7.90	34.35	34.51	359	212	Peak	VERTICAL
2	5725.00	64.61	78.20	-13.59	56.75	7.87	34.50	34.51	359	212	Peak	VERTICAL
3	5751.00	113.49			105.60	7.86	34.55	34.52	359	212	Peak	VERTICAL
4	5751.00	104.21			96.32	7.86	34.55	34.52	359	212	Average	VERTICAL
5	5854.00	64.17	78.20	-14.03	56.06	7.80	34.85	34.54	359	212	Peak	VERTICAL
6	5933.00	65.74	68.20	-2.46	57.45	7.75	35.10	34.56	359	212	Peak	VERTICAL

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

Channel 157

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5700.00	65.35	68.20	-2.85	57.57	7.89	34.40	34.51	358	201	Peak	HORIZONTAL
2	5723.00	64.77	78.20	-13.43	56.91	7.87	34.50	34.51	358	201	Peak	HORIZONTAL
3	5788.00	106.43			98.47	7.84	34.65	34.53	358	201	Average	HORIZONTAL
4	5791.00	115.49			107.49	7.83	34.70	34.53	358	201	Peak	HORIZONTAL
5	5857.00	66.33	78.20	-11.87	58.18	7.79	34.90	34.54	358	201	Peak	HORIZONTAL
6	5865.00	67.77	68.20	-0.43	59.62	7.79	34.90	34.54	358	201	Peak	HORIZONTAL

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

Channel 165

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5819.00	114.98			106.94	7.82	34.75	34.53	359	204	Peak	HORIZONTAL
2	5819.00	105.55			97.51	7.82	34.75	34.53	359	204	Average	HORIZONTAL
3	5858.00	66.58	78.20	-11.62	58.43	7.79	34.90	34.54	359	204	Peak	HORIZONTAL
4	5862.00	67.92	68.20	-0.28	59.77	7.79	34.90	34.54	359	204	Peak	HORIZONTAL

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

Temperature	22°C	Humidity	54%
Test Engineer	DK Chang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36, 40, 48 / Chain 1 + Chain 2
Test Date	Mar. 28, 2016		

Channel 36

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5118.00	59.90	74.00	-14.10	53.25	7.85	33.27	34.47	359	217	Peak	HORIZONTAL
2	5120.00	51.82	54.00	-2.18	45.17	7.85	33.27	34.47	359	217	Average	HORIZONTAL
3	5184.00	98.72			91.89	7.95	33.35	34.47	359	217	Average	HORIZONTAL
4	5188.00	107.85			100.96	7.98	33.38	34.47	359	217	Peak	HORIZONTAL
5	5760.00	65.01	68.20	-3.19	57.08	7.85	34.60	34.52	359	217	Peak	HORIZONTAL

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

Channel 40

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5118.00	61.61	74.00	-12.39	54.96	7.85	33.27	34.47	360	207	Peak	HORIZONTAL
2	5120.00	53.87	54.00	-0.13	47.22	7.85	33.27	34.47	360	207	Average	HORIZONTAL
3	5200.00	99.94			93.05	7.98	33.38	34.47	360	207	Average	HORIZONTAL
4	5208.00	108.97			102.07	7.97	33.40	34.47	360	207	Peak	HORIZONTAL
5	5772.00	64.95	68.20	-3.25	56.99	7.84	34.65	34.53	360	207	Peak	HORIZONTAL

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

Channel 48

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5120.00	51.94	54.00	-2.06	45.29	7.85	33.27	34.47	358	223	Average	HORIZONTAL
2	5149.00	61.03	74.00	-12.97	54.29	7.90	33.31	34.47	358	223	Peak	HORIZONTAL
3	5232.00	113.66			106.74	7.95	33.44	34.47	358	223	Peak	HORIZONTAL
4	5232.00	104.70			97.78	7.95	33.44	34.47	358	223	Average	HORIZONTAL
5	5366.00	61.75	74.00	-12.25	54.73	7.88	33.61	34.47	358	223	Peak	HORIZONTAL
6	5398.00	50.27	54.00	-3.73	43.23	7.86	33.65	34.47	358	223	Average	HORIZONTAL
7	5764.00	67.91	68.20	-0.29	59.98	7.85	34.60	34.52	358	223	Peak	HORIZONTAL

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

Temperature	22°C	Humidity	54%
Test Engineer	DK Chang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149, 157, 165 / Chain 1 + Chain 2
Test Date	Mar. 28, 2016		

Channel 149

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5699.00	68.18	68.20	-0.02	60.40	7.89	34.40	34.51	359	199	Peak	HORIZONTAL
2	5721.00	70.24	78.20	-7.96	62.42	7.88	34.45	34.51	359	199	Peak	HORIZONTAL
3	5721.00	58.29			50.47	7.88	34.45	34.51	359	199	Average	HORIZONTAL
4	5753.00	116.81			108.92	7.86	34.55	34.52	359	199	Peak	HORIZONTAL

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

Channel 157

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5700.00	66.12	68.20	-2.08	58.34	7.89	34.40	34.51	359	200	Peak	VERTICAL
2	5721.00	65.30	78.20	-12.90	57.48	7.88	34.45	34.51	359	200	Peak	VERTICAL
3	5780.00	115.35			107.39	7.84	34.65	34.53	359	200	Peak	VERTICAL
4	5780.00	105.78			97.82	7.84	34.65	34.53	359	200	Average	VERTICAL
5	5857.00	67.34	78.20	-10.86	59.19	7.79	34.90	34.54	359	200	Peak	VERTICAL
6	5864.00	67.83	68.20	-0.37	59.68	7.79	34.90	34.54	359	200	Peak	VERTICAL

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

Channel 165

	Freq	Level	Line	Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5830.00	110.12			102.05	7.81	34.80	34.54	359	210	Average	HORIZONTAL
2	5832.00	119.25			111.18	7.81	34.80	34.54	359	210	Peak	HORIZONTAL
3	5850.00	69.49	78.20	-8.71	61.38	7.80	34.85	34.54	359	210	Peak	HORIZONTAL
4	5862.00	67.83	68.20	-0.37	59.68	7.79	34.90	34.54	359	210	Peak	HORIZONTAL

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

Temperature	22°C	Humidity	54%
Test Engineer	DK Chang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38, 46 / Chain 1 + Chain 2
Test Date	Mar. 28, 2016		

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	5148.33	69.33	74.00	-4.67	65.42	7.24	33.17	36.50	224	360	Peak	HORIZONTAL
2	5150.00	53.72	54.00	-0.28	49.81	7.24	33.17	36.50	224	360	Average	HORIZONTAL
3	5193.21	99.36			95.28	7.32	33.25	36.49	224	360	Average	HORIZONTAL
4	5193.21	104.15			100.07	7.32	33.25	36.49	224	360	Peak	HORIZONTAL
5	5760.51	66.97	68.20	-1.23	60.92	7.86	34.55	36.36	224	360	Peak	HORIZONTAL

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

Channel 46

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5121.03	51.61	54.00	-2.39	47.81	7.19	33.12	36.51	171	0	Average	HORIZONTAL
2	5121.03	59.95	74.00	-14.05	56.15	7.19	33.12	36.51	171	0	Peak	HORIZONTAL
3 0	5233.21	93.13			88.91	7.36	33.34	36.48	171	0	Average	HORIZONTAL
4 0	5233.21	102.27			98.05	7.36	33.34	36.48	171	0	Peak	HORIZONTAL
5	5762.05	67.80	68.20	-0.40	61.75	7.86	34.55	36.36	171	0	Peak	HORIZONTAL

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

Temperature	22°C	Humidity	54%
Test Engineer	DK Chang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151, 159 / Chain 1 + Chain 2
Test Date	Mar. 28, 2016		

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	5715.00	68.04	68.20	-0.16	62.12	7.88	34.41	36.37	193	0	Peak	HORIZONTAL
2	5725.00	70.35	78.20	-7.85	64.40	7.87	34.45	36.37	193	0	Peak	HORIZONTAL
3 0	5756.92	103.87			97.82	7.86	34.55	36.36	193	0	Average	HORIZONTAL
4 0	5765.10	112.95			106.90	7.86	34.55	36.36	193	0	Peak	HORIZONTAL

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	5712.47	64.46	68.20	-3.74	58.54	7.88	34.41	36.37	211	0	Peak	HORIZONTAL
2	5719.39	64.21	78.20	-13.99	58.29	7.88	34.41	36.37	211	0	Peak	HORIZONTAL
3 0	5805.42	116.25			110.06	7.85	34.69	36.35	211	0	Peak	HORIZONTAL
4 0	5808.62	107.20			101.01	7.85	34.69	36.35	211	0	Average	HORIZONTAL
5	5858.30	68.36	78.20	-9.84	62.04	7.83	34.83	36.34	211	0	Peak	HORIZONTAL
6	5860.71	68.07	68.20	-0.13	61.75	7.83	34.83	36.34	211	0	Peak	HORIZONTAL

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

Temperature	22°C	Humidity	54%
Test Engineer	DK Chang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42, 155 / Chain 1 + Chain 2
Test Date	Mar. 28, 2016		

Channel 42

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5148.00	68.35	74.00	-5.65	64.44	7.24	33.17	36.50	227	360	Peak	HORIZONTAL
2	5149.10	53.84	54.00	-0.16	49.93	7.24	33.17	36.50	227	360	Average	HORIZONTAL
3 0	5211.60	85.40			81.28	7.33	33.28	36.49	227	360	Average	HORIZONTAL
4 0	5213.21	94.77			90.65	7.33	33.28	36.49	227	360	Peak	HORIZONTAL
5	5350.00	47.55	54.00	-6.45	43.02	7.46	33.53	36.46	227	360	Average	HORIZONTAL
6	5352.00	60.39	74.00	-13.61	55.86	7.46	33.53	36.46	227	360	Peak	HORIZONTAL
7	5761.28	65.36	68.20	-2.84	59.31	7.86	34.55	36.36	227	360	Peak	HORIZONTAL

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

Channel 155

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5695.00	66.49	68.20	-1.71	58.71	7.89	34.40	34.51	359	199	Peak	HORIZONTAL
2	5721.00	68.03	78.20	-10.17	60.21	7.88	34.45	34.51	359	199	Peak	HORIZONTAL
3	5793.00	113.26			105.26	7.83	34.70	34.53	359	199	Peak	HORIZONTAL
4	5793.00	103.47			95.47	7.83	34.70	34.53	359	199	Average	HORIZONTAL
5	5850.00	67.84	78.20	-10.36	59.73	7.80	34.85	34.54	359	199	Peak	HORIZONTAL
6	5869.00	67.22	68.20	-0.98	59.07	7.79	34.90	34.54	359	199	Peak	HORIZONTAL

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

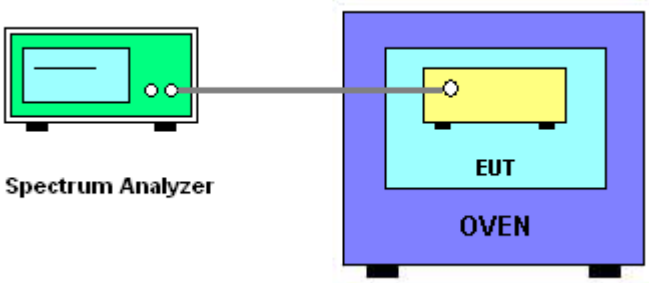
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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 -40°C~70°C.

4.8.4. Test Setup Layout



4.8.5. Test Deviation

There is no deviation with the original standard.

4.8.6. EUT Operation during Test

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

4.8.7. Test Result of Frequency Stability

Temperature	25°C	Humidity	45%
Test Engineer	Gino Huang	Test Date	Mar. 17, 2016~Apr. 01, 2016

Mode: 20 MHz / Chain 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5200 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5200.0915	5200.0910	5200.0900	5200.0892
110.00	5200.0911	5200.0904	5200.0894	5200.0886
93.50	5200.0901	5200.0895	5200.0891	5200.0886
Max. Deviation (MHz)	0.0915	0.0910	0.0900	0.0892
Max. Deviation (ppm)	17.60	17.50	17.31	17.15
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5200 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-40	5200.0859	5200.0854	5200.0849	5200.0839
-30	5200.0856	5200.0854	5200.0845	5200.0848
-20	5200.0869	5200.0868	5200.0865	5200.0864
-10	5200.0886	5200.0884	5200.0881	5200.0878
0	5200.0899	5200.0889	5200.0879	5200.0876
10	5200.0904	5200.0901	5200.0894	5200.0888
20	5200.0911	5200.0902	5200.0895	5200.0888
30	5200.0987	5200.0983	5200.0973	5200.0967
40	5200.0996	5200.0995	5200.0987	5200.0981
50	5200.1003	5200.1002	5200.0999	5200.0994
60	5200.0996	5200.0991	5200.0985	5200.0981
70	5200.1003	5200.0974	5200.0997	5200.0992
Max. Deviation (MHz)	0.1003	0.1002	0.0999	0.0994
Max. Deviation (ppm)	19.29	19.27	19.21	19.12
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5785.0918	5785.0916	5785.0912	5785.0909
110.00	5785.0911	5785.0904	5785.0894	5785.0891
93.50	5785.0906	5785.0900	5785.0893	5785.0892
Max. Deviation (MHz)	0.0918	0.0916	0.0912	0.0909
Max. Deviation (ppm)	15.87	15.83	15.76	15.71
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-40	5785.0856	5785.0849	5785.0851	5785.0846
-30	5785.0855	5785.0858	5785.0854	5785.0849
-20	5785.0872	5785.0867	5785.0866	5785.0856
-10	5785.0878	5785.0869	5785.0859	5785.0857
0	5785.0896	5785.0894	5785.0892	5785.0889
10	5785.0908	5785.0899	5785.0889	5785.0879
20	5785.0911	5785.0910	5785.0900	5785.0895
30	5785.0987	5785.0984	5785.0974	5785.0972
40	5785.1004	5785.0997	5785.0992	5785.0988
50	5785.1008	5785.0998	5785.0988	5785.0980
60	5785.1002	5785.0994	5785.0991	5785.0988
70	5785.1001	5785.0993	5785.0985	5785.0987
Max. Deviation (MHz)	0.1008	0.0998	0.0992	0.0988
Max. Deviation (ppm)	17.42	17.25	17.15	17.08
Result	Complies			

Mode: 40 MHz / Chain 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5190 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5190.0912	5190.0904	5190.0903	5190.0896
110.00	5190.0911	5190.0909	5190.0901	5190.0892
93.50	5190.0901	5190.0899	5190.0896	5190.0892
Max. Deviation (MHz)	0.0912	0.0909	0.0903	0.0896
Max. Deviation (ppm)	17.57	17.51	17.40	17.26
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5190 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-40	5190.0842	5190.0841	5190.0832	5190.0824
-30	5190.0851	5190.0843	5190.0835	5190.0825
-20	5190.0852	5190.0847	5190.0839	5190.0838
-10	5190.0859	5190.0855	5190.0847	5190.0837
0	5190.0879	5190.0877	5190.0869	5190.0863
10	5190.0896	5190.0889	5190.0881	5190.0878
20	5190.0911	5190.0909	5190.0901	5190.0895
30	5190.0987	5190.0979	5190.0977	5190.0975
40	5190.1000	5190.0993	5190.0991	5190.0988
50	5190.1008	5190.1006	5190.1001	5190.0994
60	5190.0994	5190.0993	5190.0988	5190.0986
70	5190.0988	5190.0988	5190.0678	5190.0995
Max. Deviation (MHz)	0.1008	0.1006	0.1001	0.0994
Max. Deviation (ppm)	19.42	19.38	19.29	19.15
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5755.0916	5755.0907	5755.0903	5755.0902
110.00	5755.0911	5755.0905	5755.0899	5755.0898
93.50	5755.0903	5755.0896	5755.0891	5755.0883
Max. Deviation (MHz)	0.0916	0.0907	0.0903	0.0902
Max. Deviation (ppm)	15.92	15.76	15.69	15.67
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-40	5755.0867	5755.0864	5755.0852	5755.0843
-30	5755.0868	5755.0865	5755.0857	5755.0847
-20	5755.0870	5755.0863	5755.0855	5755.0852
-10	5755.0889	5755.0884	5755.0880	5755.0879
0	5755.0892	5755.0887	5755.0882	5755.0878
10	5755.0900	5755.0899	5755.0889	5755.0885
20	5755.0911	5755.0902	5755.0901	5755.0896
30	5755.0987	5755.0977	5755.0974	5755.0973
40	5755.1000	5755.0996	5755.0994	5755.0991
50	5755.1002	5755.1000	5755.0995	5755.0990
60	5755.0090	5755.0995	5755.0987	5755.0984
70	5755.1002	5755.0.957	5755.0993	5755.0987
Max. Deviation (MHz)	0.1002	0.1000	0.0995	0.0991
Max. Deviation (ppm)	17.41	17.38	17.29	17.22
Result	Complies			

Mode: 80 MHz / Chain 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5210 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5210.0914	5210.0908	5210.0905	5210.0898
110.00	5210.0911	5210.0902	5210.0900	5210.0892
93.50	5210.0904	5210.0902	5210.0898	5210.0895
Max. Deviation (MHz)	0.0914	0.0908	0.0905	0.0898
Max. Deviation (ppm)	17.54	17.43	17.37	17.24
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5210 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-40	5210.0871	5210.0871	5210.0870	5210.0863
-30	5210.0878	5210.0872	5210.0871	5210.0864
-20	5210.0883	5210.0877	5210.0872	5210.0871
-10	5210.0884	5210.0881	5210.0874	5210.0866
0	5210.0892	5210.0886	5210.0879	5210.0878
10	5210.0900	5210.0899	5210.0897	5210.0892
20	5210.0911	5210.0907	5210.0904	5210.0898
30	5210.0987	5210.0983	5210.0979	5210.0970
40	5210.1002	5210.0994	5210.0990	5210.0981
50	5210.1018	5210.1010	5210.1008	5210.1000
60	5210.1001	5210.0908	5210.0980	5210.0989
70	5210.1007	5210.0985	5210.1004	5210.0.897
Max. Deviation (MHz)	0.1018	0.1010	0.1008	0.1000
Max. Deviation (ppm)	19.54	19.39	19.35	19.19
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5775.0918	5775.0911	5775.0902	5775.0898
110.00	5775.0911	5775.0904	5775.0902	5775.0893
93.50	5775.0905	5775.0900	5775.0894	5775.0890
Max. Deviation (MHz)	0.0918	0.0911	0.0902	0.0898
Max. Deviation (ppm)	15.90	15.77	15.62	15.55
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-40	5775.0852	5775.0859	5775.0881	5775.0851
-30	5775.0873	5775.0863	5775.0862	5775.0854
-20	5775.0877	5775.0871	5775.0862	5775.0852
-10	5775.0878	5775.0869	5775.0865	5775.0860
0	5775.0895	5775.0885	5775.0883	5775.0880
10	5775.0908	5775.0906	5775.0898	5775.0891
20	5775.0911	5775.0908	5775.0904	5775.0895
30	5775.0987	5775.0978	5775.0975	5775.0970
40	5775.1002	5775.0998	5775.0996	5775.0989
50	5775.1006	5775.0998	5775.0988	5775.0984
60	5775.1007	5775.0996	5775.9840	5775.0988
70	5775.1004	5775.0996	5775.0987	5775.0986
Max. Deviation (MHz)	0.1006	0.0998	0.0996	0.0989
Max. Deviation (ppm)	17.42	17.28	17.25	17.13
Result	Complies			

4.9. Antenna Requirements

4.9.1. Limit

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

4.9.2. Antenna Connector Construction

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

5. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMI Receiver	Agilent	N9038A	My52260123	9kHz ~ 8.45GHz	Jan. 27, 0216	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Dec. 08, 2015	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Dec. 23, 2015	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	150kHz ~ 30MHz	May 25, 2015	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	Conduction (CO01-CB)
BILOG ANTENNA	Schaffner	CBL6112D	37880	20MHz ~ 2GHz	Sep. 03, 2015	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 16, 2016*	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Oct. 22, 2015	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 21, 2015	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Mar. 15, 2016	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 18, 2016	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26GHz ~ 40GHz	Nov. 13, 2015	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Oct. 27, 2015	Radiation (03CH01-CB)
EMI Test Receiver	Rohde&Schwarz	ESCI	100186	9kHz ~ 3GHz	Jul. 14, 2015	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz ~ 1 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-17	N/A	1 GHz ~ 18 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-1	N/A	18GHz ~ 40 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-2	N/A	18GHz ~ 40 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
Test Software	Audix	E3	6.2009-l0-7	N/A	N/A	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 09, 2015	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-7	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-8	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-9	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
RF Cable-high	Woken	RG402	High Cable-10	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 02, 2015	Conducted (TH01-CB)

Note: Calibration Interval of instruments listed above is one year.
"*" Calibration Interval of instruments listed above is two years.
NCR 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%