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FCC RADIO TEST REPORT

Applicant's company	**LITE-ON Technology Corp.**
Applicant Address	Bldg. C, 90, Chien 1 Rd., Chung-Ho, New Taipei City, 23585 Taiwan
FCC ID	**PPQ-O90N**
Manufacturer's company	**Lite-On Network Communication (Dongguan) Limited**
Manufacturer Address	30#Keji Rd.,Yin Hu Industrial Area,Qingxi Town,DongGuan City,Guangdong,China

Product Name	Access Point
Brand Name	MOJO
Model No.	O-90-N
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. 25, 2016
Final Test Date	Apr. 20, 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

Table of Contents

History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR631907AB	Rev. 01	Initial issue of report	May 04, 2016

1. VERIFICATION OF COMPLIANCE

Product Name	:	Access Point
Brand Name	:	MOJO
Model No.	:	O-90-N
Applicant	:	LITE-ON Technology Corp.
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. 25, 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	3.06 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	0.86 dB
4.5	15.407(a)	Power Spectral Density	Complies	0.01 dB
4.6	15.407(b)	Radiated Emissions	Complies	0.81 dB
4.7	15.407(b)	Band Edge Emissions	Complies	0.01 dB
4.8	15.407(g)	Frequency Stability	Complies	-
4.9	15.203	Antenna Requirements	Complies	-

3. GENERAL INFORMATION

3.1. Product Details

Items	Description
Product Type	WLAN (3TX, 3RX)
Radio Type	Intentional Transceiver
Power Type	From Internal Power Supply or PoE
Modulation	IEEE 802.11a: OFDM IEEE 802.11n/ac: see the below table
Data Modulation	IEEE 802.11a/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) IEEE 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)
Data Rate (Mbps)	IEEE 802.11a: OFDM (6/9/12/18/24/36/48/54) IEEE 802.11n/ac: see the below table
Frequency Range	5150 ~ 5250 MHz / 5725 ~ 5850 MHz
Channel Number	9 for 20MHz bandwidth ; 4 for 40MHz bandwidth 2 for 80MHz bandwidth
Channel Band Width (99%)	Band 1: IEEE 802.11a: 16.58 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 17.97 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 36.47 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.25 MHz Band 4: IEEE 802.11a: 16.85 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 18.49 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 35.17 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 73.52 MHz
Maximum Conducted Output Power	Band 1: IEEE 802.11a: 24.48 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 24.48 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 27.45 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 15.26 dBm Band 4: IEEE 802.11a: 27.88 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 27.88 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 24.27 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 15.83 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

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

Antenna and Band width

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

IEEE 11n/ac Spec.

Protocol	Number of Transmit Chains (NTX)	Data Rate / MCS
802.11n (HT20)	3	MCS 0-23
802.11n (HT40)	3	MCS 0-23
802.11ac (VHT20)	3	MCS 0-9/Nss1-3
802.11ac (VHT40)	3	MCS 0-9/Nss1-3
802.11ac (VHT80)	3	MCS 0-9/Nss1-3

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

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

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

3.2. Accessories

Power cable*1, Non-shielded, 5m.

3.3. Table for Filed Antenna

Ant.	Brand	Model No.	Antenna Type	Connector	Gain (dBi)	
					2.4GHz	5GHz
1	LITE-ON	WP939i	PCB Antenna	MMCX	5.87	9.76
2	LITE-ON	WP939i	PCB Antenna	MMCX	6.16	9.56
3	LITE-ON	WP939i	PCB Antenna	MMCX	5.86	8.64
Correlated Composite Gain (3TX 1S)					8.77	11.69
Uncorrelated Composite Gain (3TX 3S)					4.39	7.26

Note: The EUT has three antennas.

For 2.4GHz function:

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

Chain 1, Chain 2 and Chain 3 can be used as transmitting/receiving antenna.

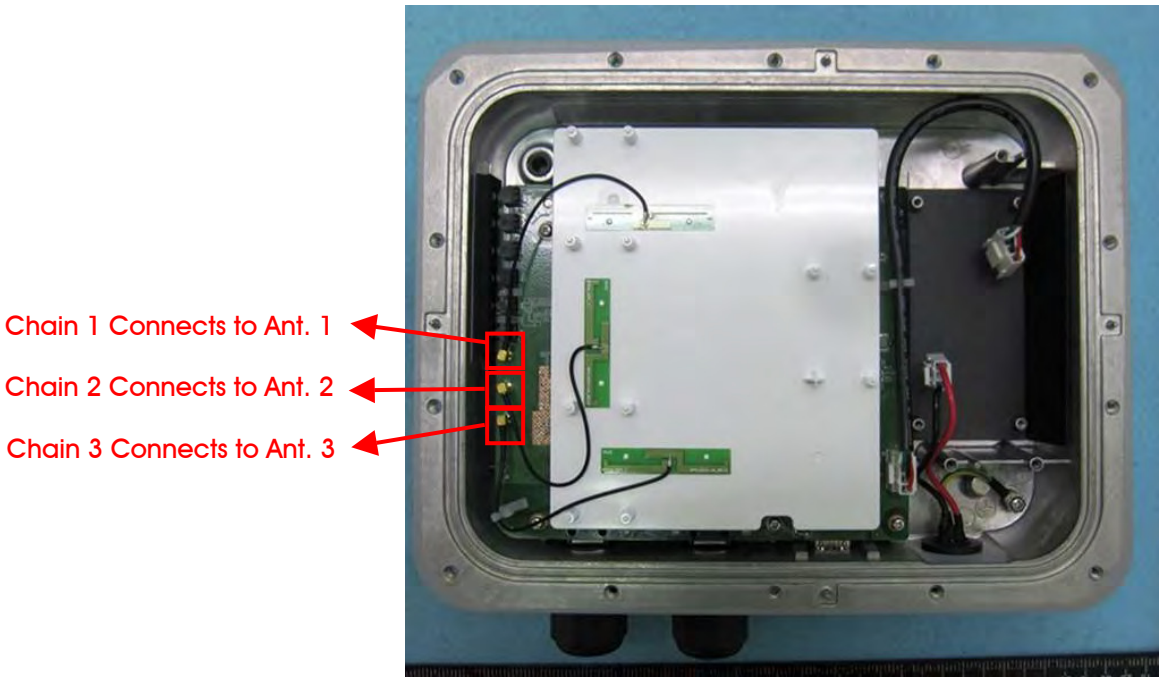
Chain 1, Chain 2 and Chain 3 could transmit/receive simultaneously.

For 5GHz function:

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

Chain 1, Chain 2 and Chain 3 can be used as transmitting/receiving antenna.

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



3.4. Table for Carrier Frequencies

There are three bandwidth systems.

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

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

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

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

3.5. Table for Test Modes

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

Test Items	Mode		Data Rate	Channel	Chain
AC Power Conducted Emission	Normal Link		-	-	-
Max. Conducted Output Power	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	1+2+3
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2+3
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2+3
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2+3
Power Spectral Density	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	1+2+3
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2+3
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2+3
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2+3
26dB Spectrum Bandwidth & 99% Occupied Bandwidth Measurement	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	1+2+3
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2+3
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2+3
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2+3
6dB Spectrum Bandwidth Measurement	11a/BPSK	Band 4	6Mbps	149/157/165	1+2+3
	11ac VHT20	Band 4	MCS0/Nss1	149/157/165	1+2+3
	11ac VHT40	Band 4	MCS0/Nss1	151/159	1+2+3
	11ac VHT80	Band 4	MCS0/Nss1	155	1+2+3
Radiated Emission Below 1GHz	Normal Link		-	-	-
Radiated Emission Above 1GHz	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	1+2+3
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	1+2+3
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	1+2+3
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	1+2+3

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

The following test modes were performed for all tests:

For Conducted Emission test:

Mode 1. EUT with AC Power Supply 1

Mode 2. EUT with AC Power Supply 2

Mode 3. EUT with PoE

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

For Radiated Emission test (Below 1GHz):

Mode 1. EUT with AC Power Supply 1 in Y-axis

Mode 2. EUT with AC Power Supply 1 in Z-axis

Mode 1 has been evaluated to be the worst case among Mode 1～2, thus measurement for Mode 3 ～ 4 will follow this same test mode.

Mode 3. EUT with AC Power Supply 2 in Y-axis

Mode 4. EUT with PoE in Y-axis

Mode 3 is the worst case, so it was selected to record in this test report.

For Radiated Emission test (Above1GHz):

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

Mode 1: CTX - EUT in Y-axis

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

The EUT could be applied with 2.4GHz WLAN function and 5GHz WLAN function; therefore Co-location Maximum Permissible Exposure (Please refer to FA631907) and Radiated Emission Co-location (please refer to Appendix B) tests are added for simultaneously transmit between 2.4GHz WLAN function and 5GHz WLAN function.

For Radiated Emission Co-location mode:

Mode 1. 2.4G+5G EUT in Y-axis

Mode 2. 2.4G+5G EUT in Z-axis

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

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 AC Power Supply

The EUT with two kinds of AC power supply system:

AC Power Supply System	Brand Name	Model Name
AC Power Supply 1	FSP	FSP045-1P65
AC Power Supply 2	ASIAN POWER	NW-30A54

3.8. Table for Supporting Units

For Test Site No: CO01-CB

Support Unit	Brand	Model	FCC ID
NB*5	DELL	E6430	DoC
Device	MOJO	O-90-N	DoC

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

Support Unit	Brand	Model	FCC ID
NB*3	DELL	E4300	DoC
NB*2	Apple	Mac Book	DoC
Device	MOJO	O-90-N	DoC

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

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	DoC
PoE	Microsemi	PD-9501-10G	DoC

For Test Site No: TH01-CB

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	DoC

3.9. Table for Parameters of Test Software Setting

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

Test Software Version	Artgui					
Mode	Test Frequency (MHz)					
	NCB: 20MHz					
	5180 MHz	5200 MHz	5240 MHz	5745 MHz	5785 MHz	5825 MHz
802.11a	18.5	18.5	18.5	20	24	21
802.11ac MCS0/Nss1 VHT20	18	18	18.5	19	24	20
Mode	NCB: 40MHz					
802.11ac MCS0/Nss1 VHT40	5190 MHz		5230 MHz		5755 MHz	5795 MHz
	12.5		22.5		14	20
Mode	NCB: 80MHz					
802.11ac MCS0/Nss1 VHT80	5210 MHz				5775 MHz	
	11				12	

3.10. EUT Operation during Test

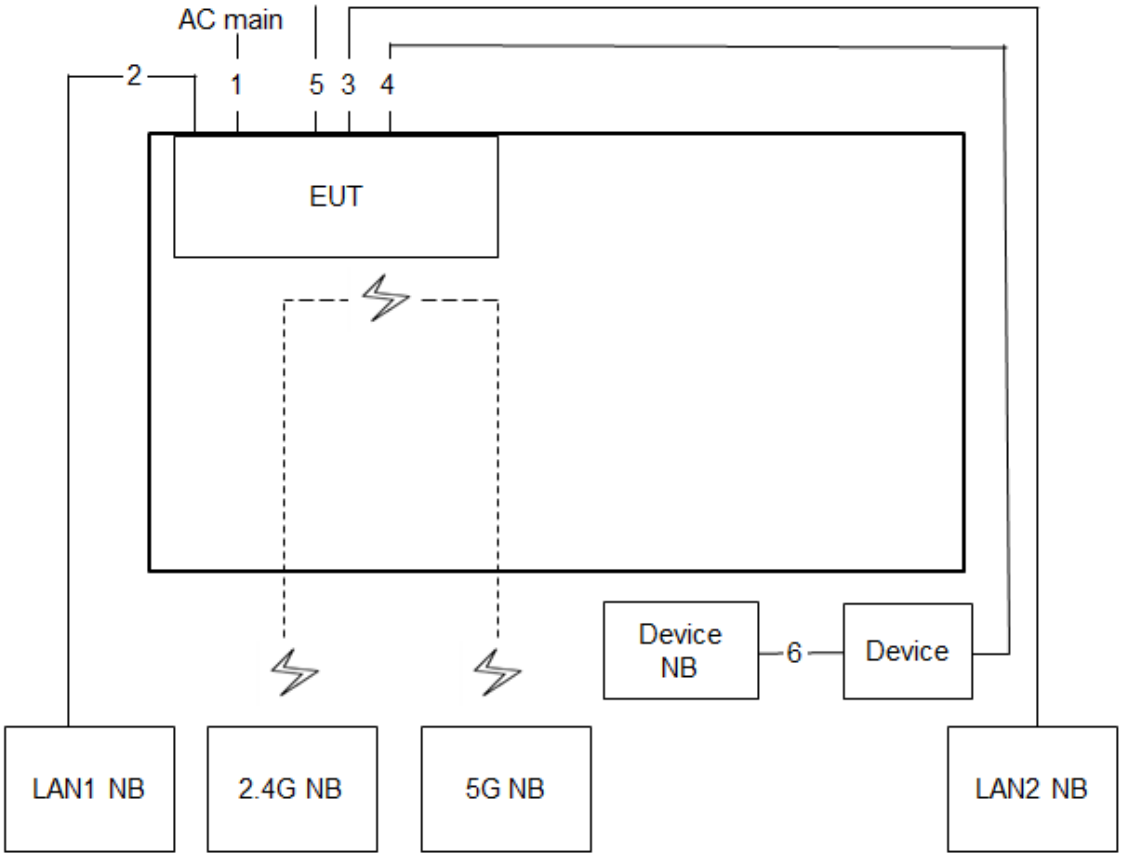
The EUT was programmed to be in continuously transmitting mode.

3.11. Duty Cycle

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11a	2.020	2.100	96.19	0.17	0.50
802.11ac MCS0/Nss1 VHT20	1.890	2.040	92.65	0.33	0.53
802.11ac MCS0/Nss1 VHT40	0.924	1.000	92.40	0.34	1.08
802.11ac MCS0/Nss1 VHT80	0.460	0.520	88.46	0.53	2.17

3.12. Test Configurations

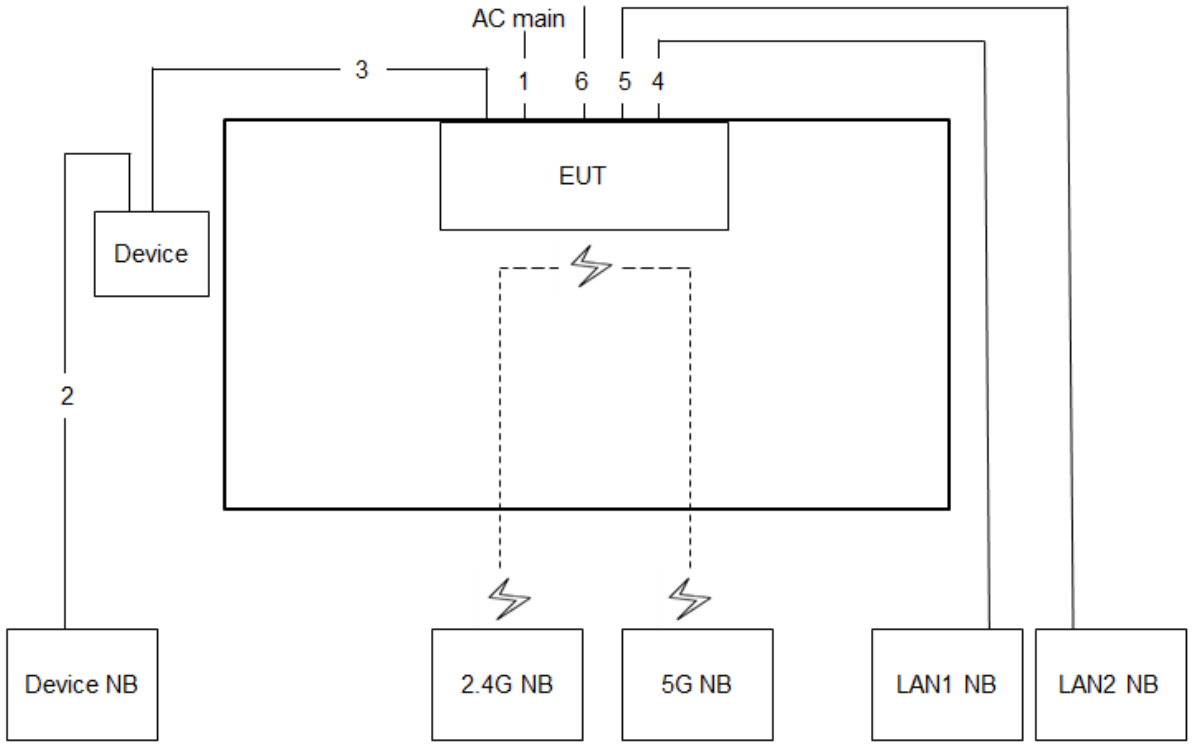
3.12.1. AC Power Line Conduction Emissions Test Configuration



Item	Connection	Shielded	Length
1	Power cable	No	5m
2	RJ-45 cable	No	10m
3	RJ-45 cable	No	10m
4	Fiber cable	No	10m
5	Ground cable	Yes	1.5m
6	RJ-45 cable	No	1.5m

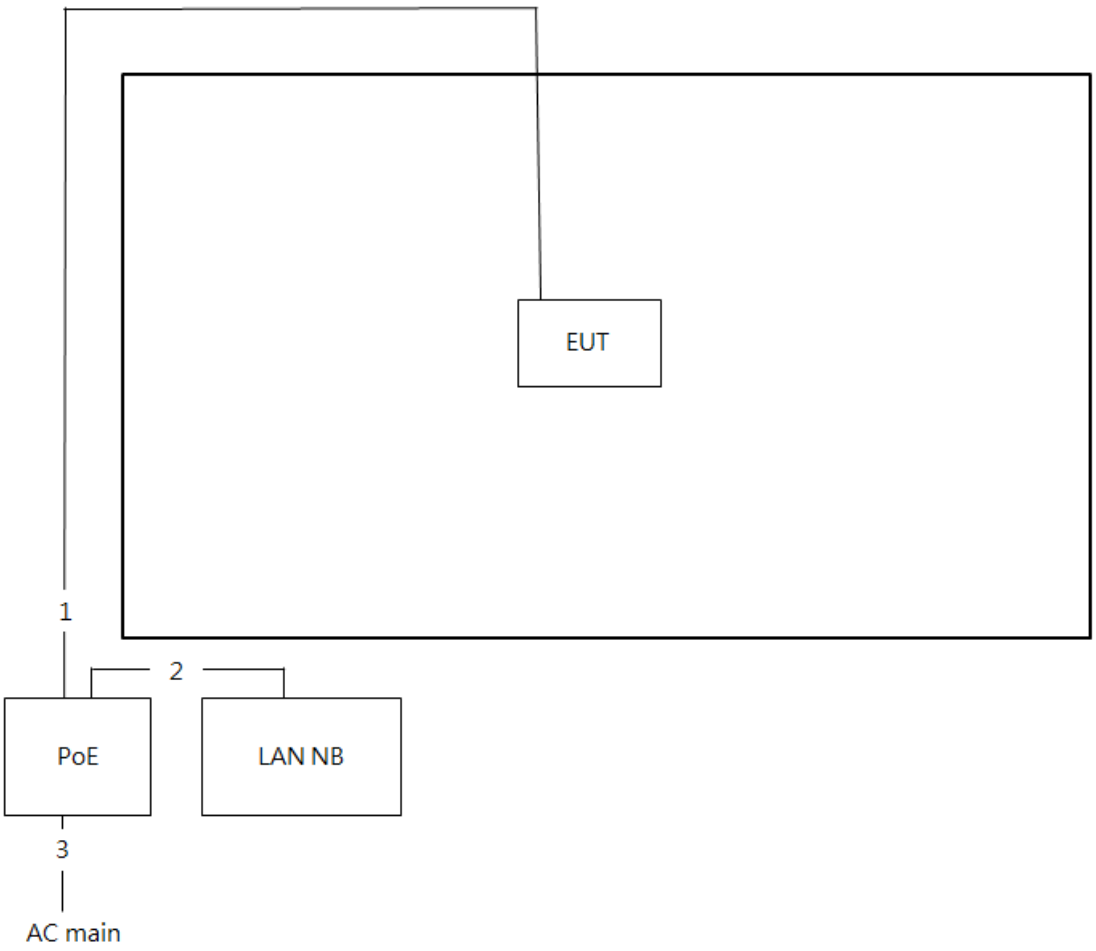
3.12.2. Radiation Emissions Test Configuration

Test Configuration: 30MHz ~1GHz



Item	Connection	Shielded	Length
1	Power cable	No	5m
2	RJ-45 cable	No	1.5m
3	Fiber cable	No	10m
4	RJ-45 cable	No	10m
5	RJ-45 cable	No	10m
6	Ground cable	Yes	1.5m

Test Configuration: above 1GHz



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

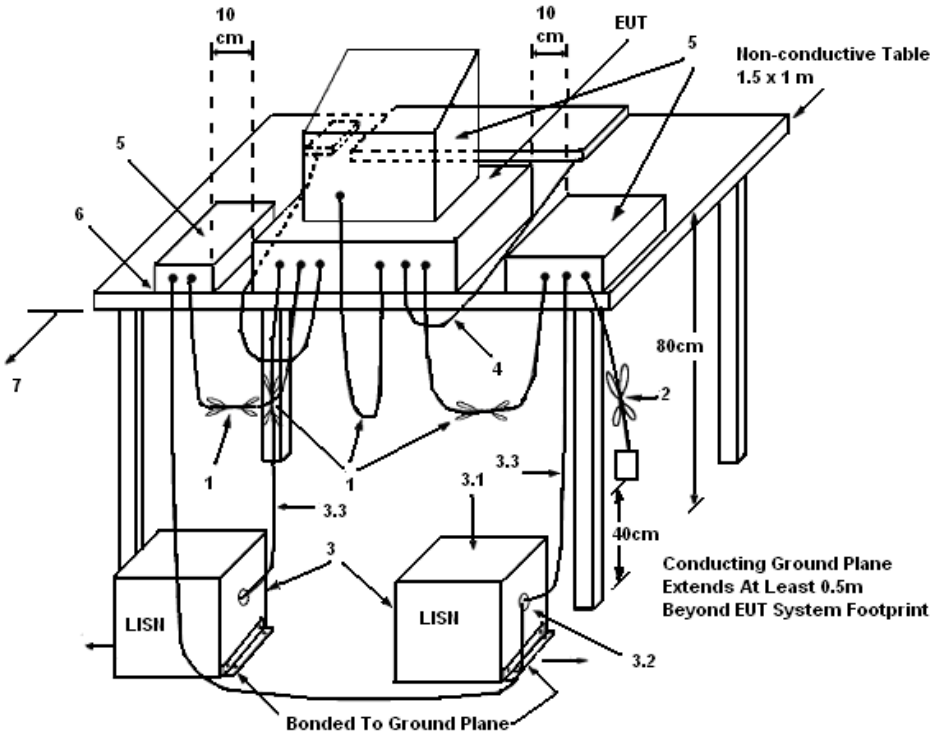
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

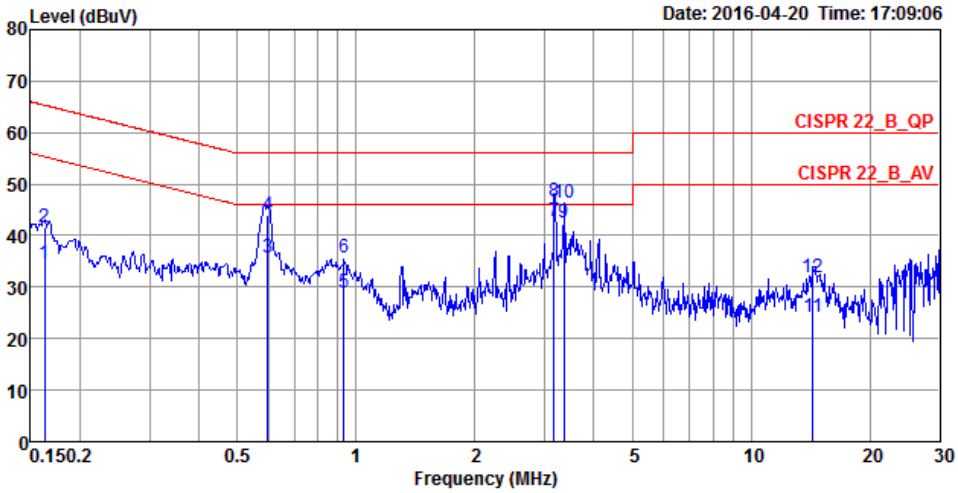
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

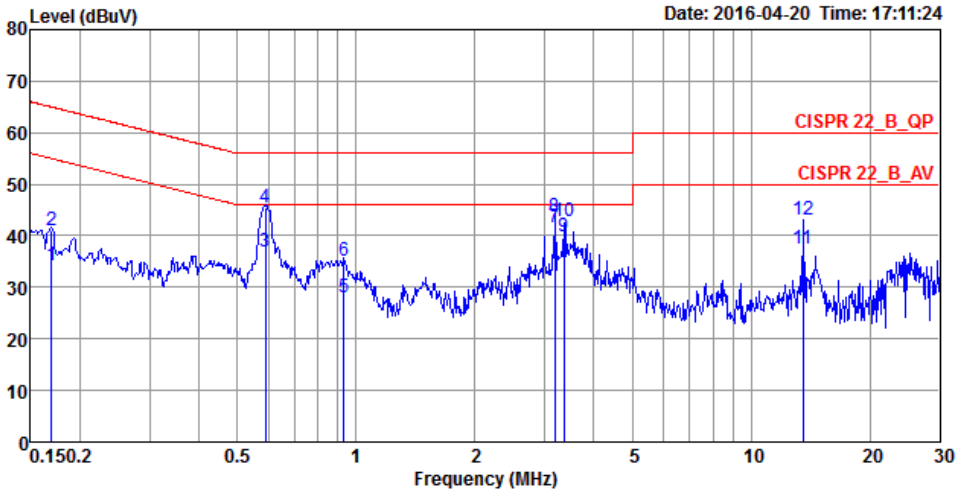
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	24°C	Humidity	60%
Test Engineer	Deven Huang	Phase	Line
Configuration	Normal Link	Test Mode	Mode 1



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1624	34.39	-20.95	55.34	24.35	10.02	0.02	LINE	Average
2	0.1624	41.59	-23.75	65.34	31.55	10.02	0.02	LINE	QP
3	0.5979	35.85	-10.15	46.00	25.88	9.93	0.04	LINE	Average
4	0.5979	44.06	-11.94	56.00	34.09	9.93	0.04	LINE	QP
5	0.9331	28.94	-17.06	46.00	18.95	9.94	0.05	LINE	Average
6	0.9331	35.72	-20.28	56.00	25.73	9.94	0.05	LINE	QP
7	3.1722	42.94	-3.06	46.00	32.91	9.98	0.05	LINE	Average
8	3.1722	46.69	-9.31	56.00	36.66	9.98	0.05	LINE	QP
9	3.3607	42.46	-3.54	46.00	32.42	9.98	0.06	LINE	Average
10	3.3607	46.26	-9.74	56.00	36.22	9.98	0.06	LINE	QP
11	14.3641	24.11	-25.89	50.00	13.63	10.22	0.26	LINE	Average
12	14.3641	31.95	-28.05	60.00	21.47	10.22	0.26	LINE	QP

Temperature	24°C	Humidity	60%
Test Engineer	Deven Huang	Phase	Neutral
Configuration	Normal Link	Test Mode	Mode 1



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1694	34.16	-20.83	54.99	24.12	10.02	0.02	NEUTRAL	Average
2	0.1694	41.00	-23.99	64.99	30.96	10.02	0.02	NEUTRAL	QP
3	0.5885	36.89	-9.11	46.00	26.92	9.93	0.04	NEUTRAL	Average
4	0.5885	45.33	-10.67	56.00	35.36	9.93	0.04	NEUTRAL	QP
5	0.9331	28.03	-17.97	46.00	18.04	9.94	0.05	NEUTRAL	Average
6	0.9331	35.23	-20.77	56.00	25.24	9.94	0.05	NEUTRAL	QP
7	3.1790	41.57	-4.43	46.00	31.54	9.98	0.05	NEUTRAL	Average
8	3.1790	43.83	-12.17	56.00	33.80	9.98	0.05	NEUTRAL	QP
9	3.3655	39.93	-6.07	46.00	29.89	9.98	0.06	NEUTRAL	Average
10	3.3655	42.87	-13.13	56.00	32.83	9.98	0.06	NEUTRAL	QP
11	13.5599	37.48	-12.52	50.00	27.02	10.21	0.25	NEUTRAL	Average
12	13.5599	43.06	-16.94	60.00	32.60	10.21	0.25	NEUTRAL	QP

Note:

Level = Read Level + LISN Factor + Cable Loss.

4.2. 26dB Bandwidth and 99% Occupied Bandwidth Measurement

4.2.1. Limit

No restriction limits.

4.2.2. Measuring Instruments and Setting

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

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

4.2.3. Test Procedures

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

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

4.2.4. Test Setup Layout

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

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

4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

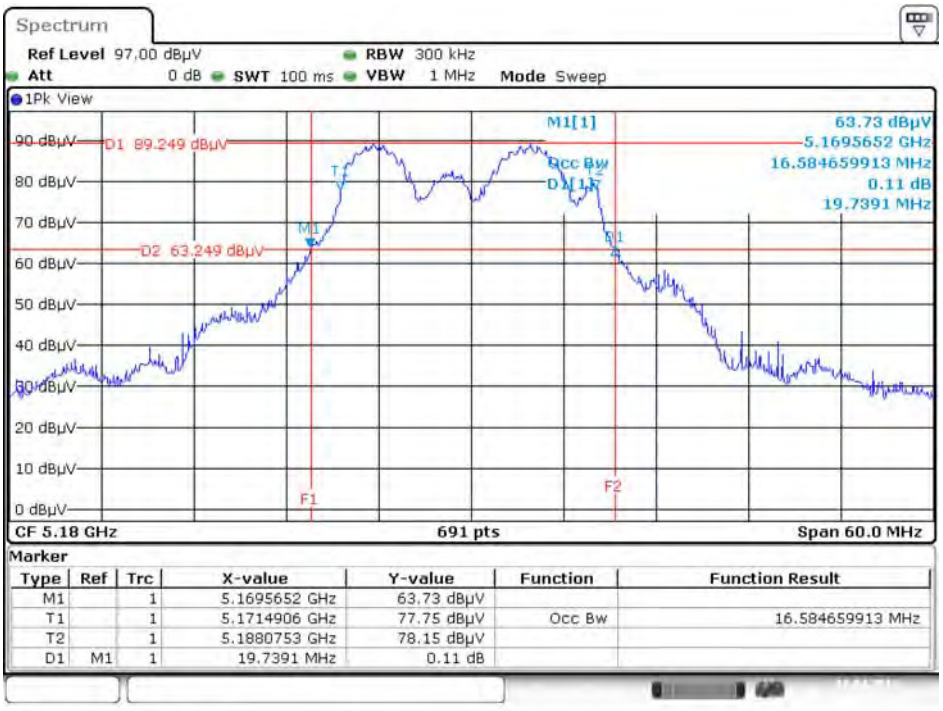
The EUT was programmed to be in continuously transmitting mode.

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

Temperature	23°C	Humidity	63%
Test Engineer	Peter Wu		

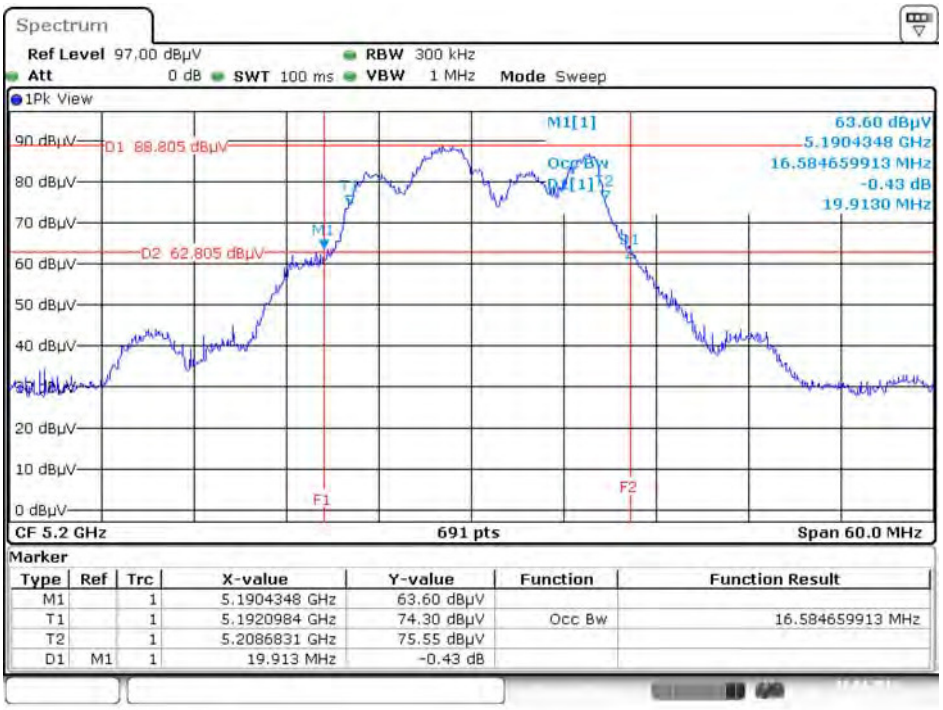
Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5180 MHz	19.74	16.58
	5200 MHz	19.91	16.58
	5240 MHz	19.74	16.58
	5745 MHz	20.78	16.85
	5785 MHz	21.65	16.76
	5825 MHz	20.70	16.85
802.11ac MCS0/Nss1 VHT20	5180 MHz	19.74	17.02
	5200 MHz	21.65	17.97
	5240 MHz	20.70	17.63
	5745 MHz	20.17	17.54
	5785 MHz	23.30	18.49
	5825 MHz	20.61	17.45
802.11ac MCS0/Nss1 VHT40	5190 MHz	41.74	36.03
	5230 MHz	44.93	36.47
	5755 MHz	40.29	35.17
	5795 MHz	40.73	35.02
802.11ac MCS0/Nss1 VHT80	5210 MHz	82.90	75.25
	5775 MHz	81.16	73.52

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



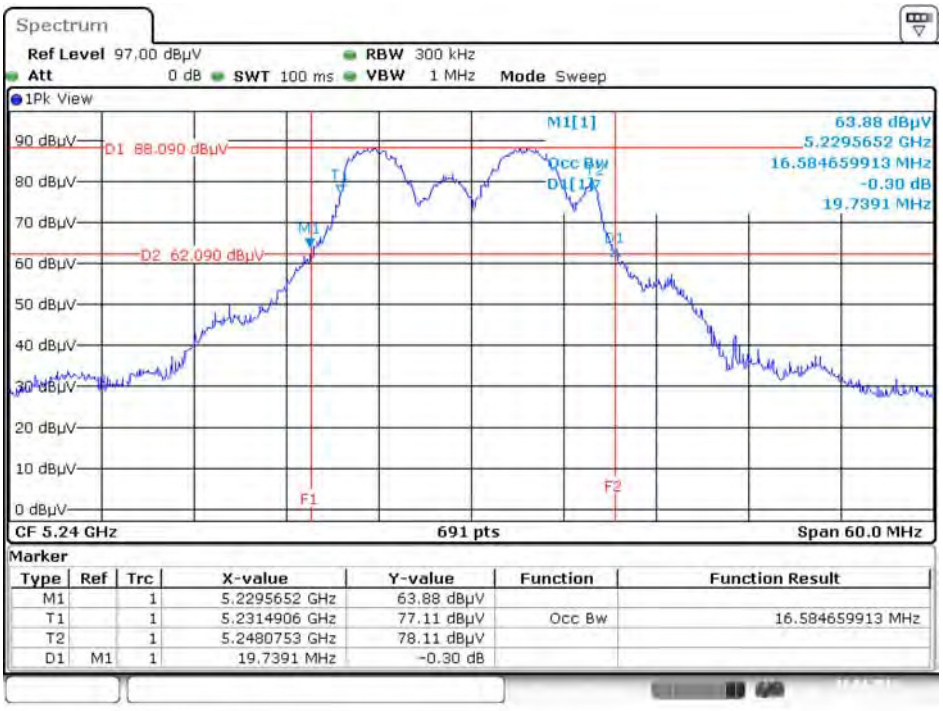
Date: 18.APR.2016 20:43:48

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



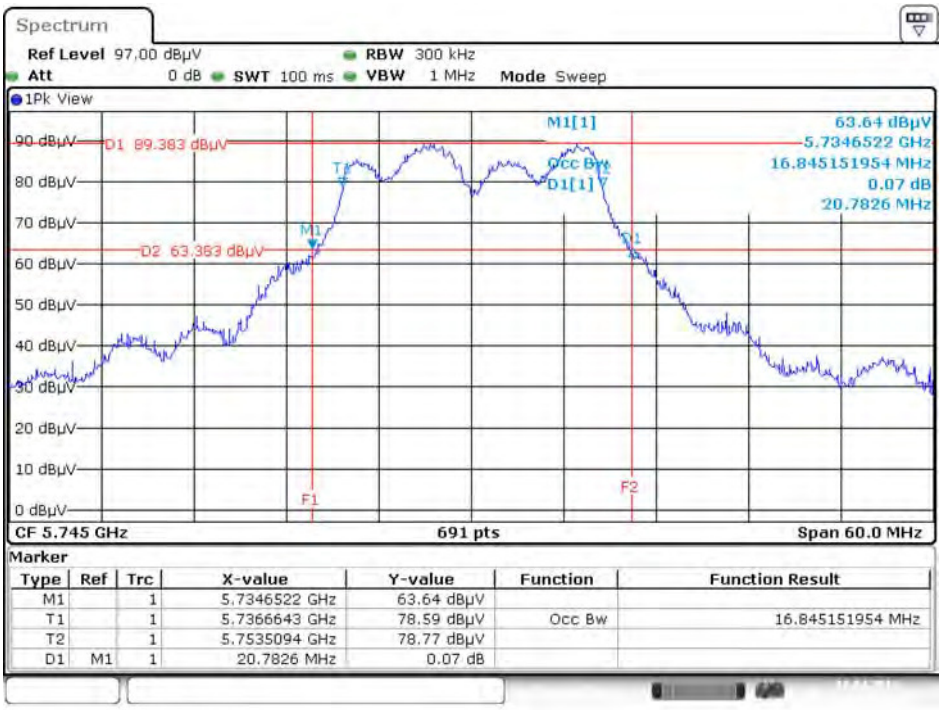
Date: 18.APR.2016 20:44:12

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



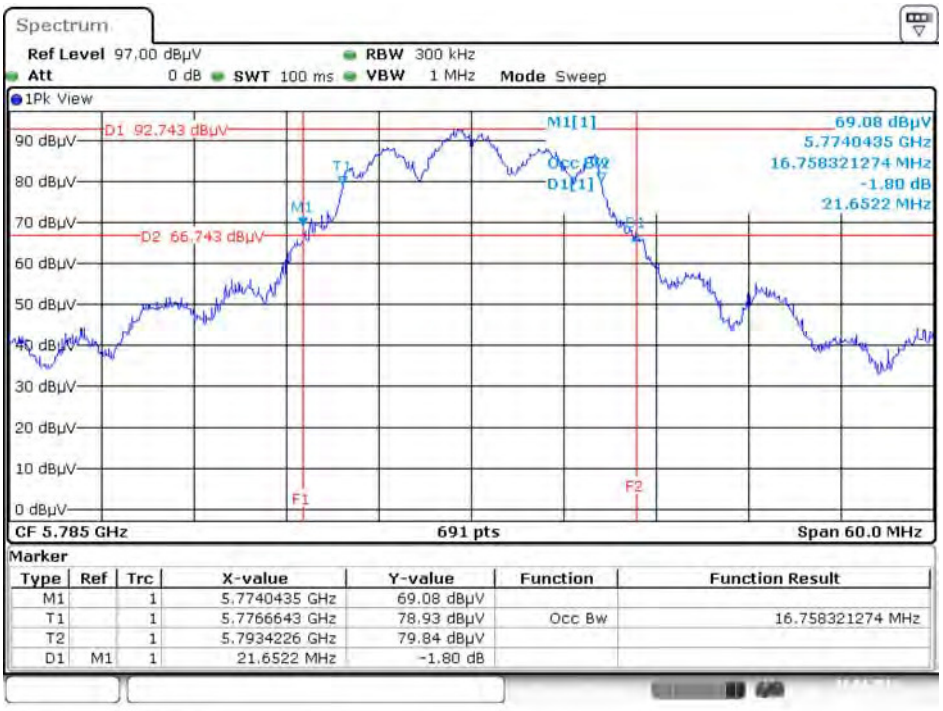
Date: 18.APR.2016 20:44:36

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



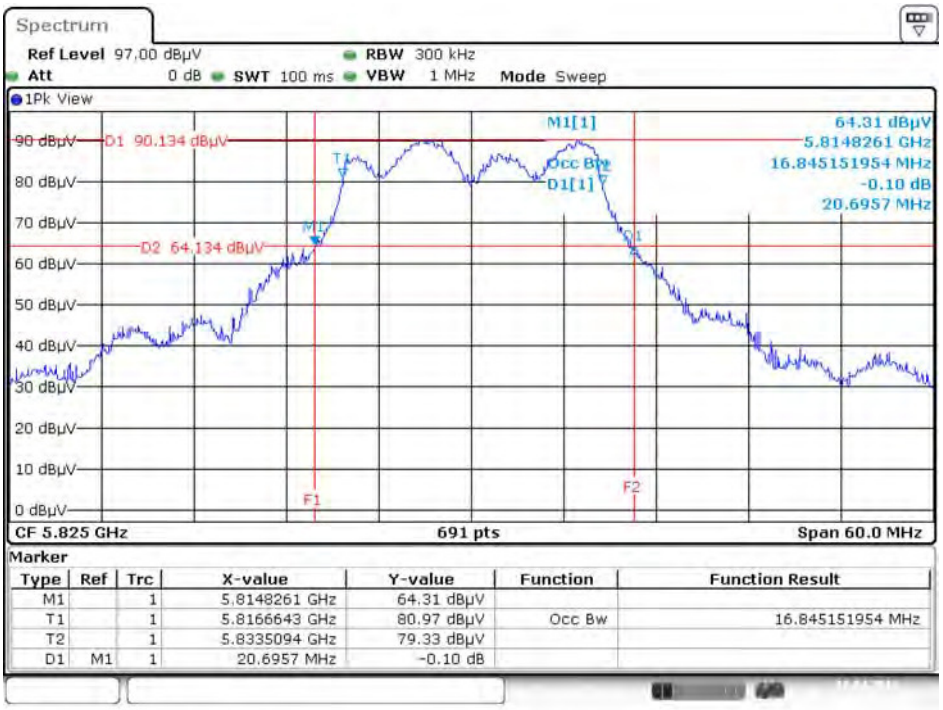
Date: 18.APR.2016 20:45:12

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



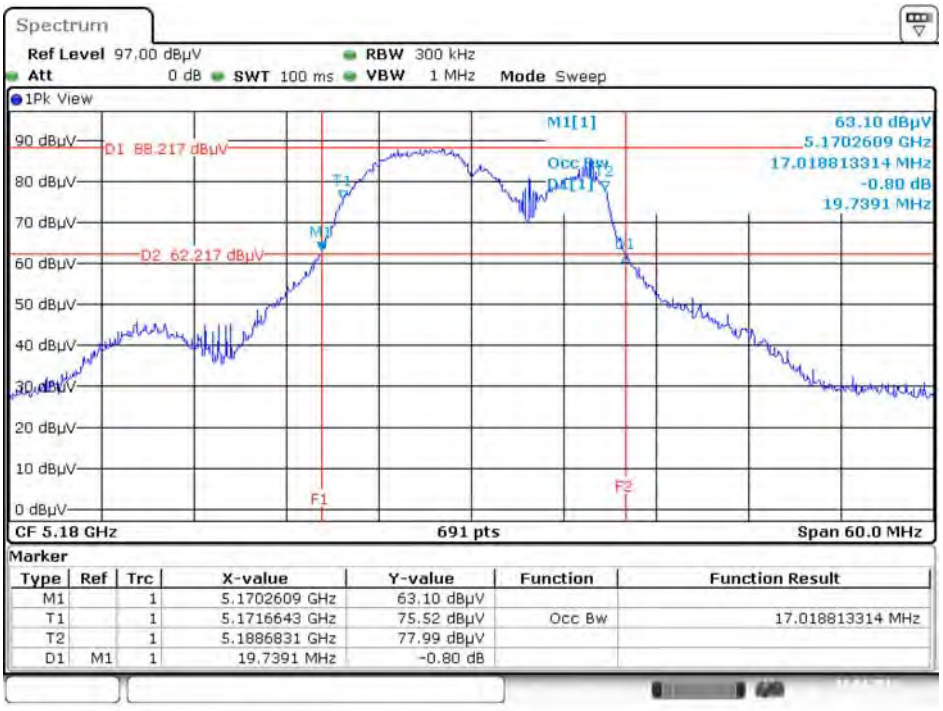
Date: 18.APR.2016 20:45:46

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



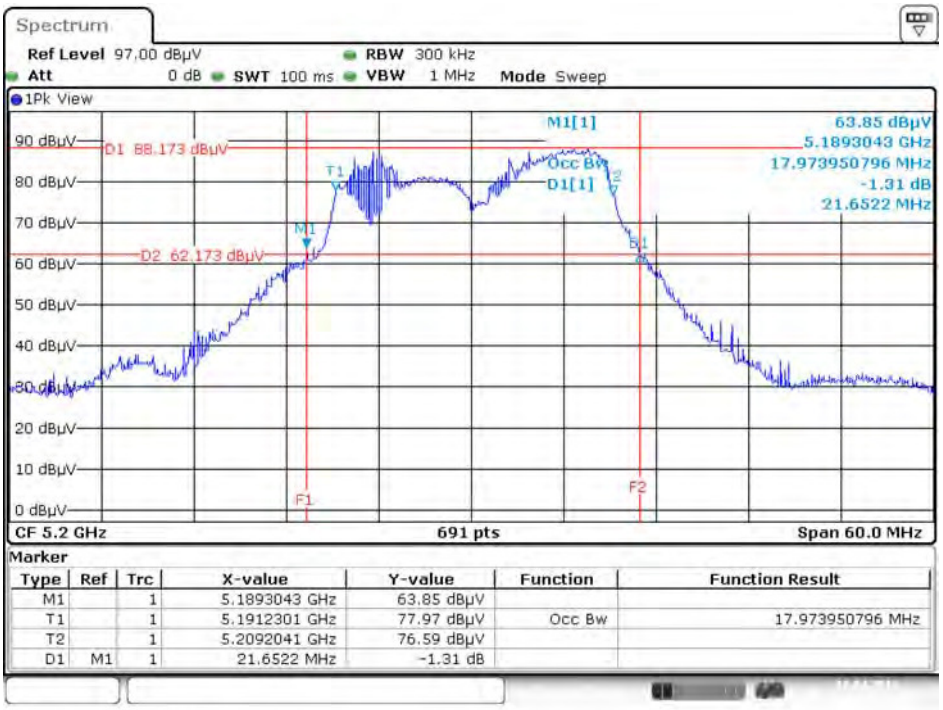
Date: 18.APR.2016 20:46:44

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



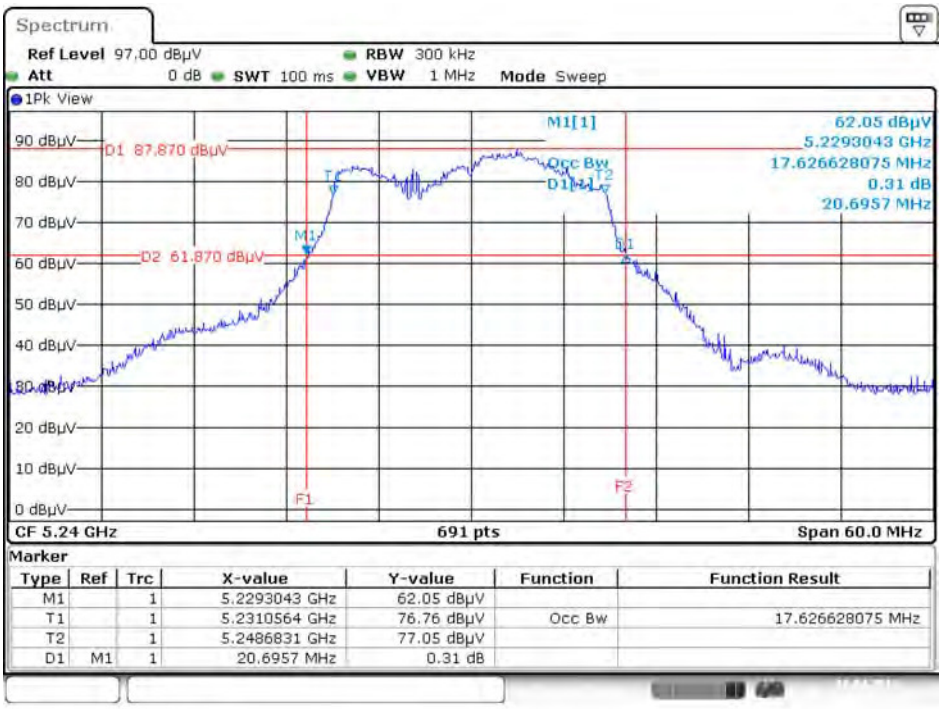
Date: 18.APR.2016 20:56:39

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



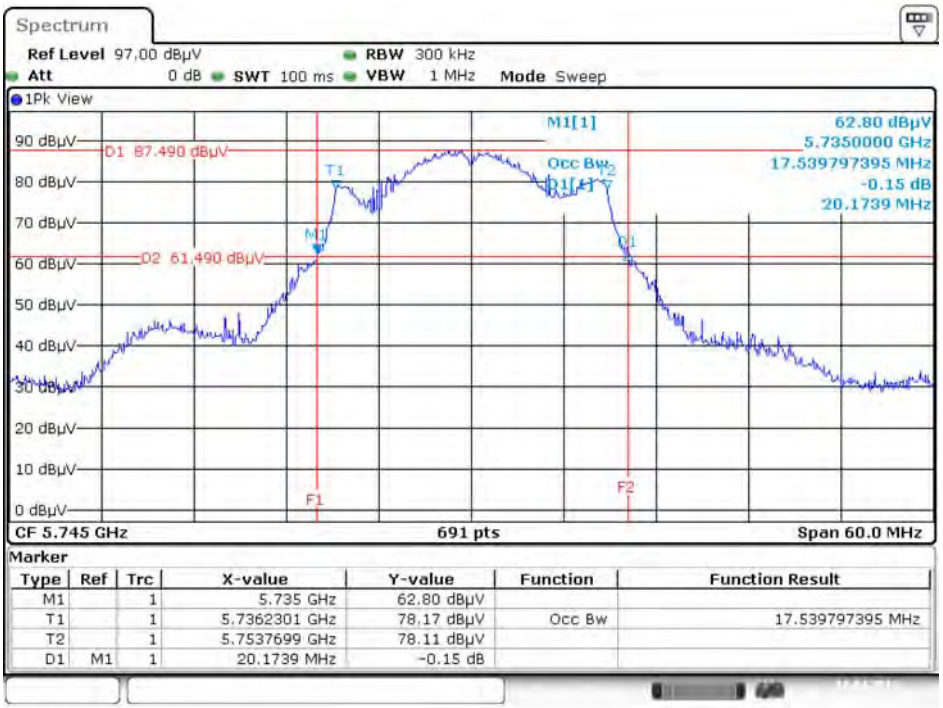
Date: 18.APR.2016 20:56:09

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



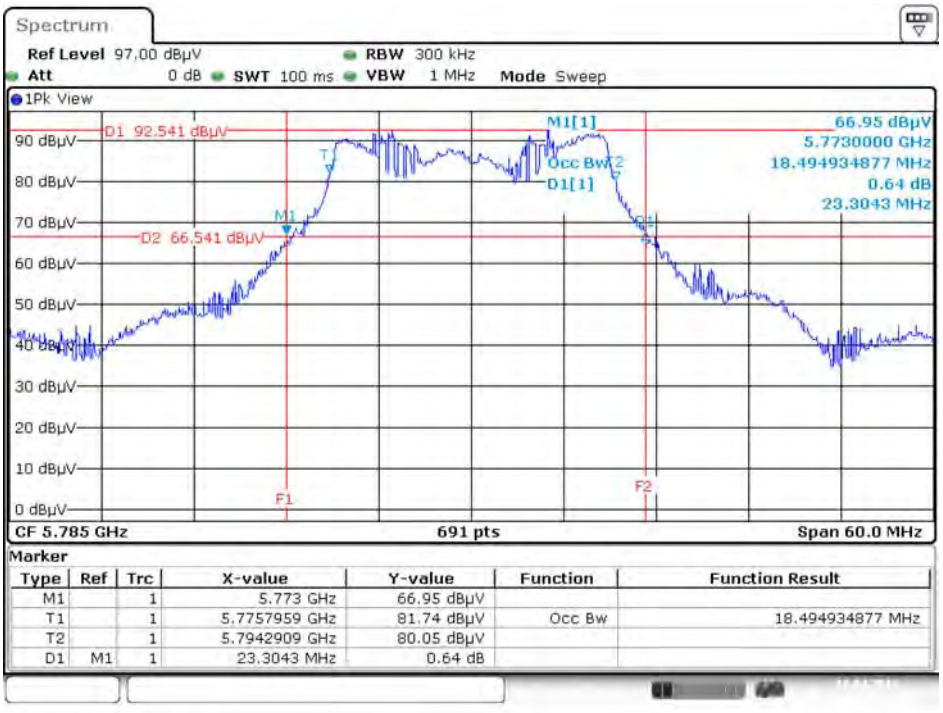
Date: 18.APR.2016 20:55:36

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



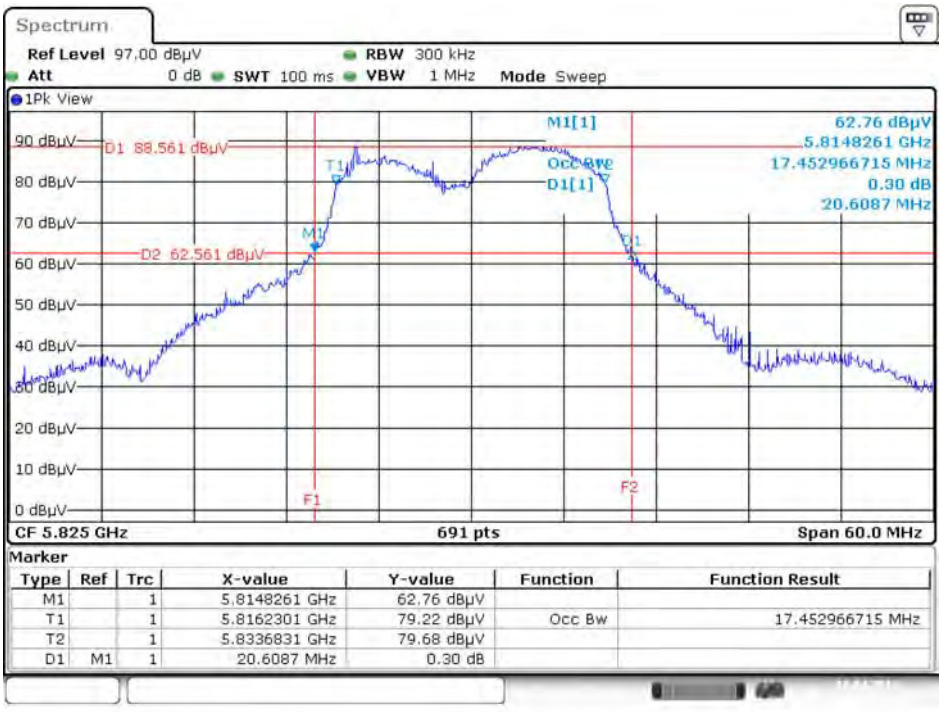
Date: 18.APR.2016 20:54:48

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



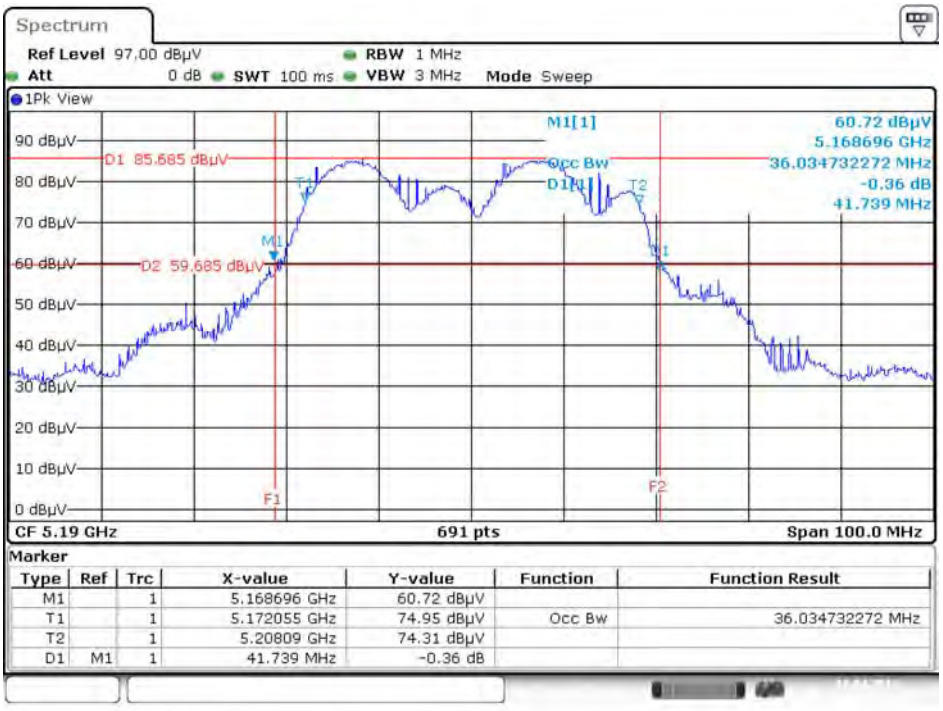
Date: 18.APR.2016 20:54:10

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



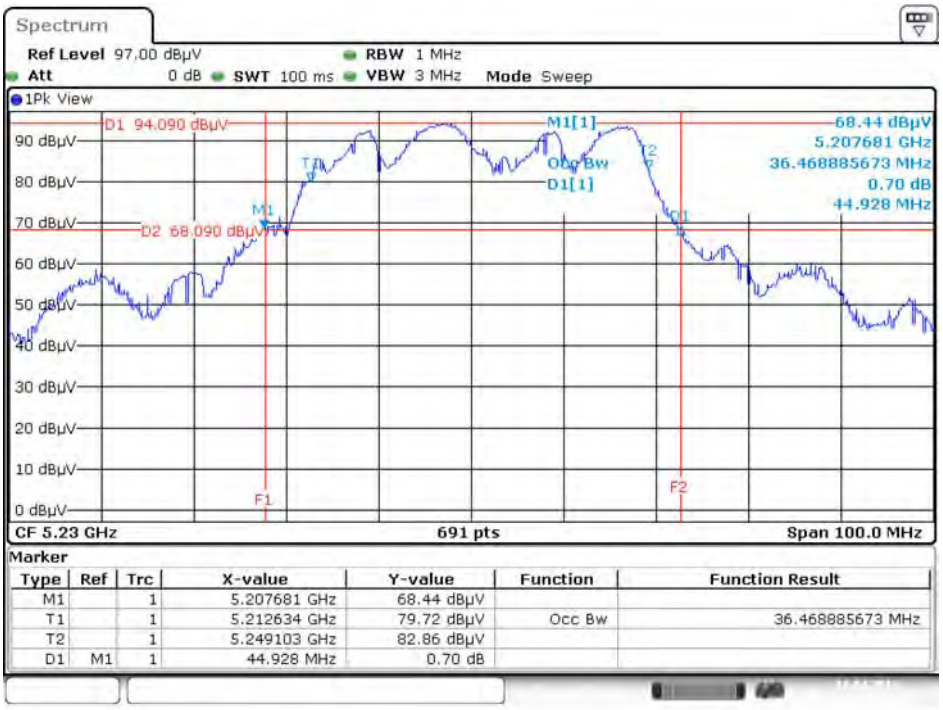
Date: 18.APR.2016 20:53:34

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



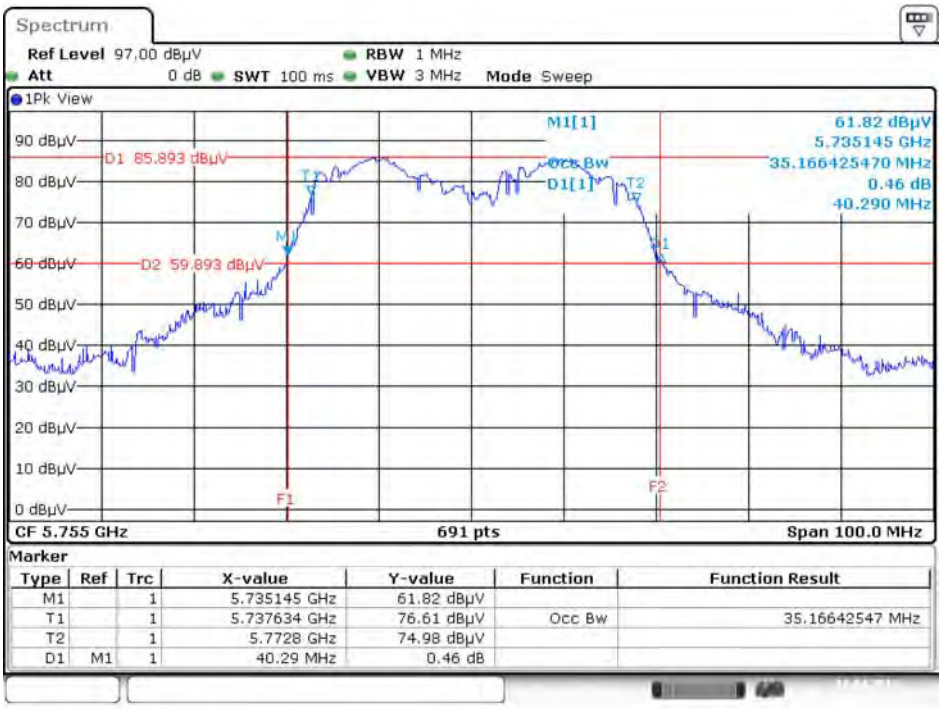
Date: 18.APR.2016 21:06:50

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



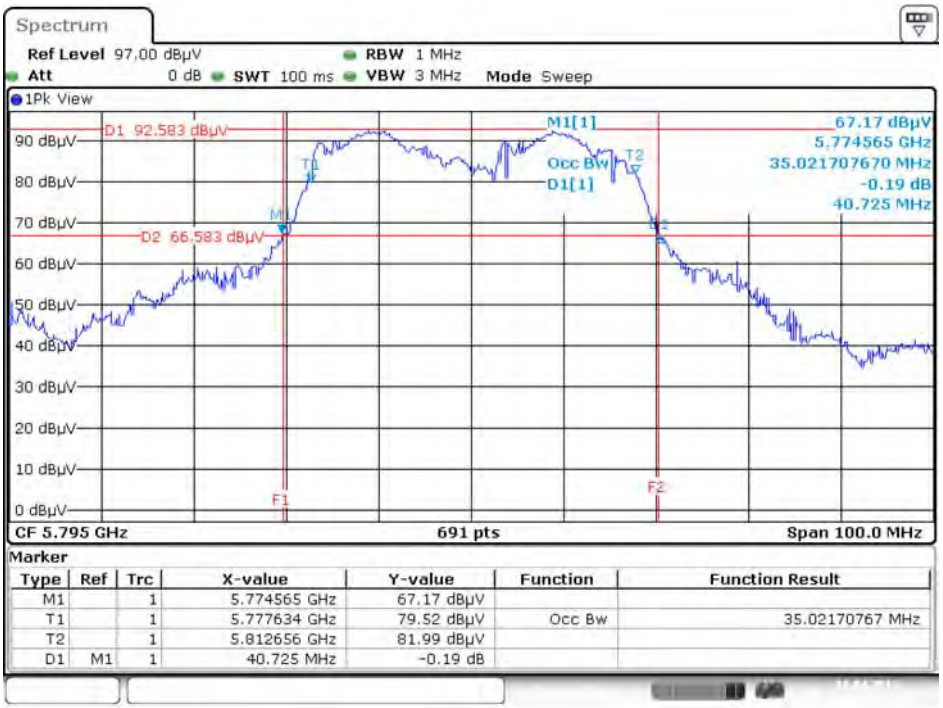
Date: 18.APR.2016 21:07:27

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



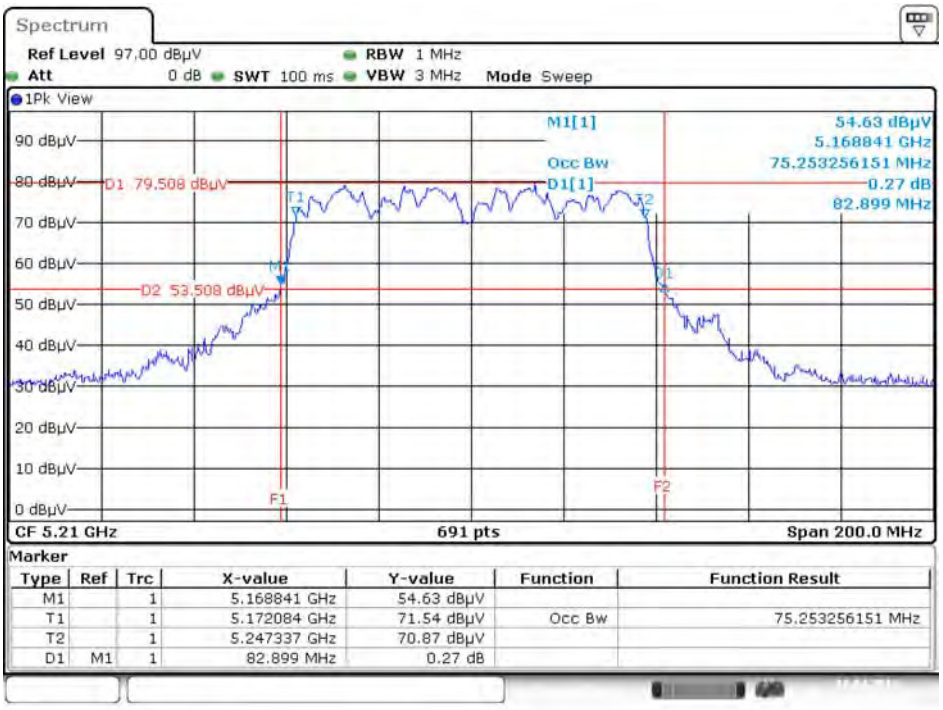
Date: 18.APR.2016 21:08:34

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



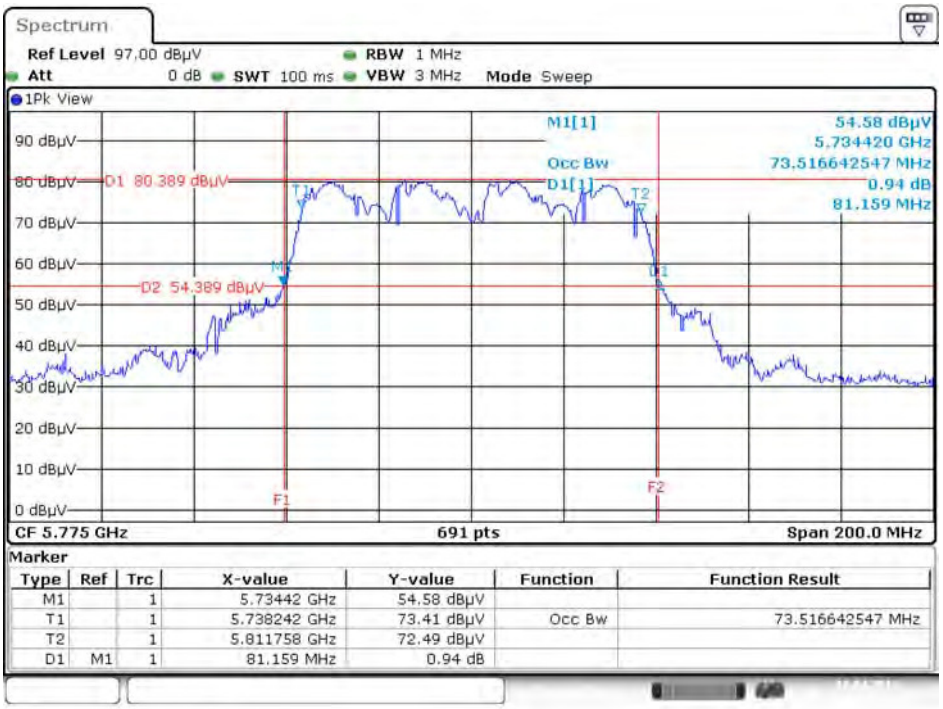
Date: 18.APR.2016 21:09:15

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



Date: 18.APR.2016 21:18:51

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



Date: 18.APR.2016 21:19:43

4.3. 6dB Spectrum Bandwidth Measurement

4.3.1. Limit

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

4.3.2. Measuring Instruments and Setting

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

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

4.3.3. Test Procedures

For Radiated 6dB Bandwidth Measurement:

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

4.3.4. Test Setup Layout

For Radiated 6dB Bandwidth Measurement:

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

4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

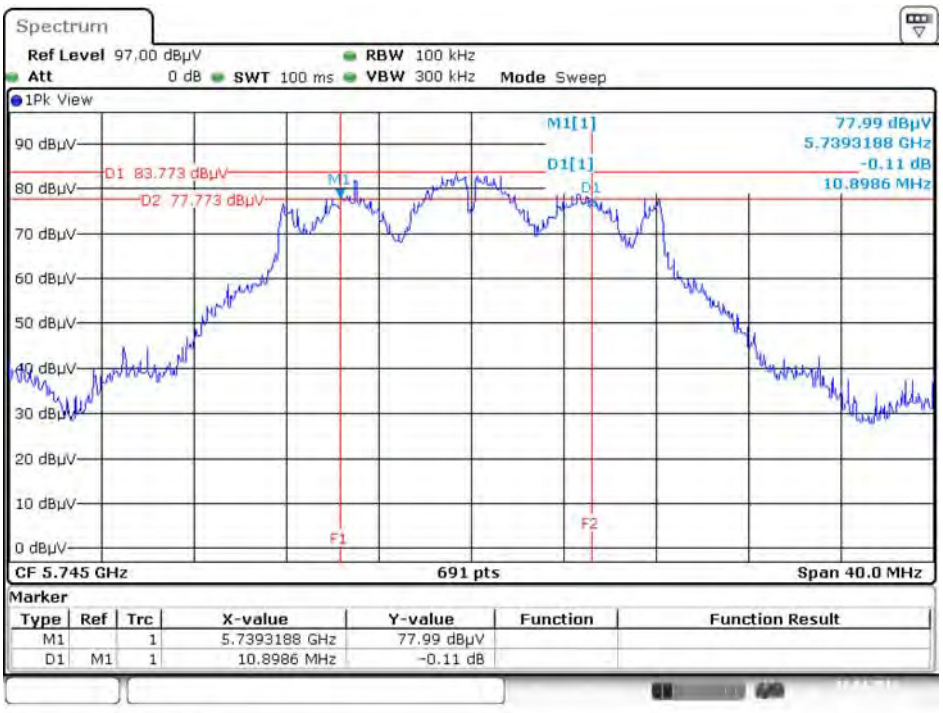
The EUT was programmed to be in continuously transmitting mode.

4.3.7. Test Result of 6dB Spectrum Bandwidth

Temperature	23°C	Humidity	63%
Test Engineer	Peter Wu		

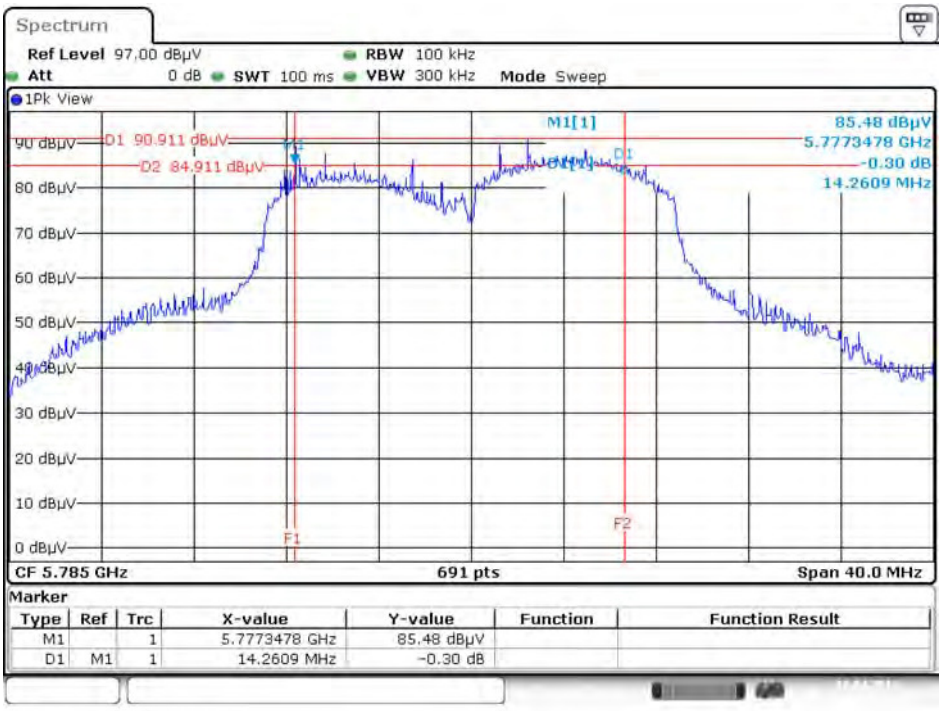
Mode	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11a	5745 MHz	10.90	500	Complies
	5785 MHz	11.30	500	Complies
	5825 MHz	15.59	500	Complies
802.11ac MCS0/Nss1 VHT20	5745 MHz	16.00	500	Complies
	5785 MHz	14.26	500	Complies
	5825 MHz	15.01	500	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	31.54	500	Complies
	5795 MHz	32.58	500	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	70.44	500	Complies

6 dB Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 / 5745 MHz



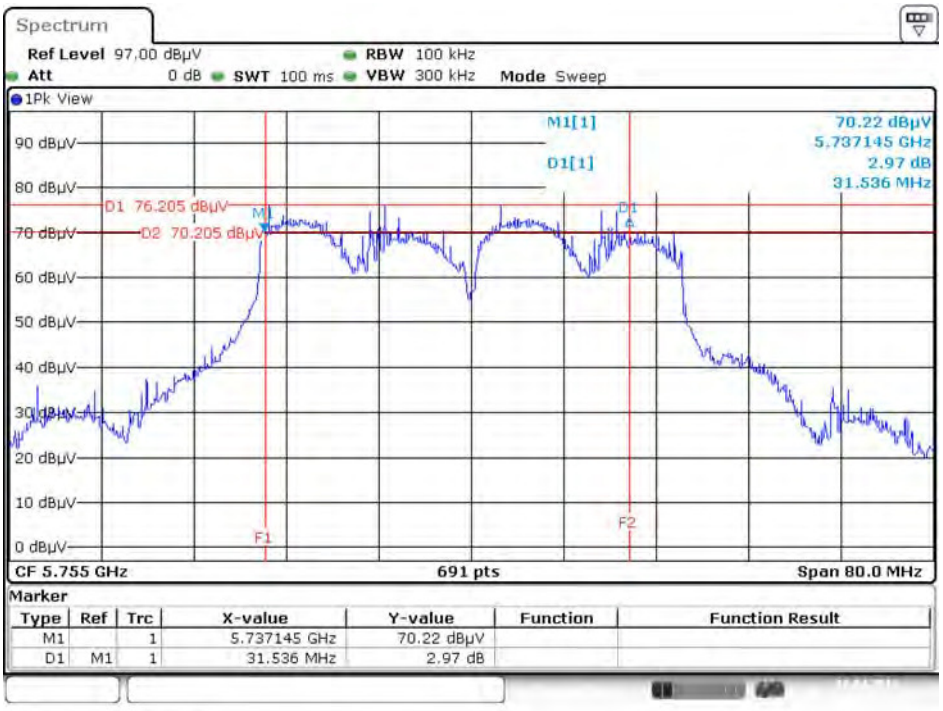
Date: 18.APR.2016 20:49:45

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



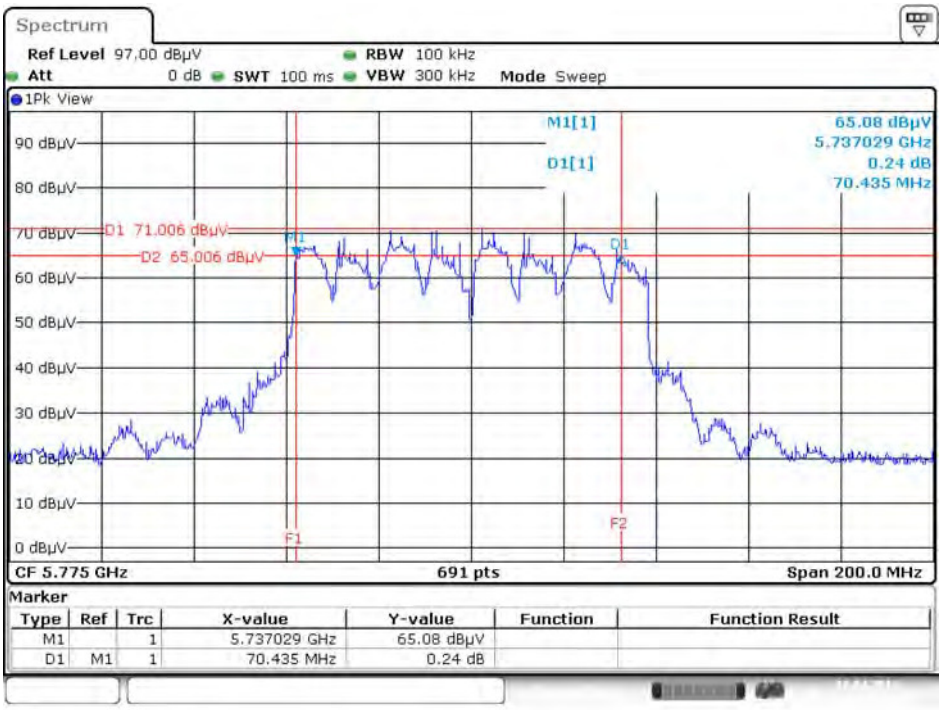
Date: 18.APR.2016 20:52:03

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



Date: 18.APR.2016 21:11:12

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



Date: 18.APR.2016 21:16:39

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

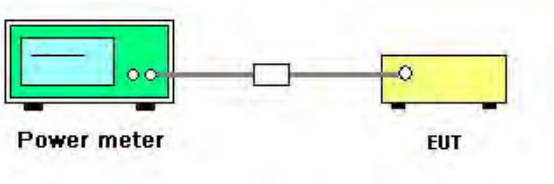
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

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	23	Humidity	63
Test Engineer	Peter Wu	Test Date	Apr. 12, 2016~Apr. 18, 2016

Mode	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
802.11a	5180 MHz	19.46	19.13	19.69	24.20	28.74	Complies
	5200 MHz	19.45	19.03	19.53	24.11	28.74	Complies
	5240 MHz	20.12	19.32	19.64	24.48	28.74	Complies
	5745 MHz	19.78	18.64	19.32	24.04	28.74	Complies
	5785 MHz	23.39	22.32	23.53	27.88	28.74	Complies
	5825 MHz	20.34	19.37	20.45	24.85	28.74	Complies
802.11ac MCS0/Nss1 VHT20	5180 MHz	19.46	19.13	19.69	24.20	28.74	Complies
	5200 MHz	19.45	19.03	19.53	24.11	28.74	Complies
	5240 MHz	20.12	19.32	19.64	24.48	28.74	Complies
	5745 MHz	19.78	18.64	19.32	24.04	28.74	Complies
	5785 MHz	23.39	22.32	23.53	27.88	28.74	Complies
	5825 MHz	20.34	19.37	20.45	24.85	28.74	Complies
802.11ac MCS0/Nss1 VHT40	5190 MHz	13.02	12.47	12.95	17.59	28.74	Complies
	5230 MHz	22.68	22.45	22.89	27.45	28.74	Complies
	5755 MHz	13.87	12.97	13.85	18.35	28.74	Complies
	5795 MHz	19.55	18.97	19.93	24.27	28.74	Complies
802.11ac MCS0/Nss1 VHT80	5210 MHz	10.7	10.68	10.05	15.26	28.74	Complies
	5775 MHz	11.32	10.78	11.05	15.83	28.74	Complies

Note: Uncorrelated Composite Gain=7.26>6dBi, so limit=30-(7.26-6)=28.74dBm.

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

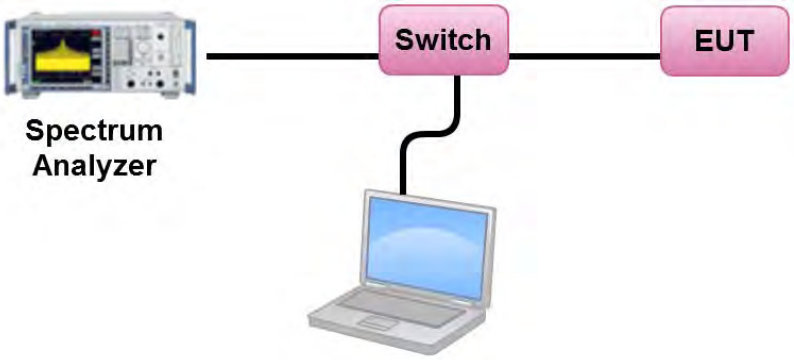
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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	23°C	Humidity	63%
Test Engineer	Peter Wu		

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	11.18	11.31	Complies
40	5200 MHz	11.25	11.31	Complies
48	5240 MHz	11.23	11.31	Complies

Note: Correlated Composite Gain=11.69dBi >6dBi, so limit=17– (11.69 – 6)=11.31dBm/MHz.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	11.67	-3.01	8.66	24.31	Complies
157	5785 MHz	14.95	-3.01	11.94	24.31	Complies
165	5825 MHz	12.74	-3.01	9.73	24.31	Complies

Note: Correlated Composite Gain=11.69dBi >6dBi, so limit=30– (11.69 – 6)=24.31dBm/500kHz.

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	11.05	11.31	Complies
40	5200 MHz	11.11	11.31	Complies
48	5240 MHz	11.25	11.31	Complies

Note: Correlated Composite Gain=11.69dBi >6dBi, so limit=17– (11.69 – 6)=11.31dBm/MHz.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	10.68	-3.01	7.67	24.31	Complies
157	5785 MHz	14.80	-3.01	11.79	24.31	Complies
165	5825 MHz	11.71	-3.01	8.70	24.31	Complies

Note: Correlated Composite Gain=11.69dBi >6dBi, so limit=30– (11.69 – 6)=24.31dBm/500kHz.

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	1.27	11.31	Complies
46	5230 MHz	11.30	11.31	Complies

Note: Correlated Composite Gain=11.69dBi >6dBi, so limit=17– (11.69 – 6)=11.31dBm/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	1.87	-3.01	-1.14	24.31	Complies
159	5795 MHz	8.02	-3.01	5.01	24.31	Complies

Note: Correlated Composite Gain=11.69dBi >6dBi, so limit=30– (11.69 – 6)=24.31dBm/500kHz.

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

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
42	5210 MHz	-3.89	11.31	Complies

Note: Correlated Composite Gain=11.69dBi >6dBi, so limit=17– (11.69 – 6)=11.31dBm/MHz.

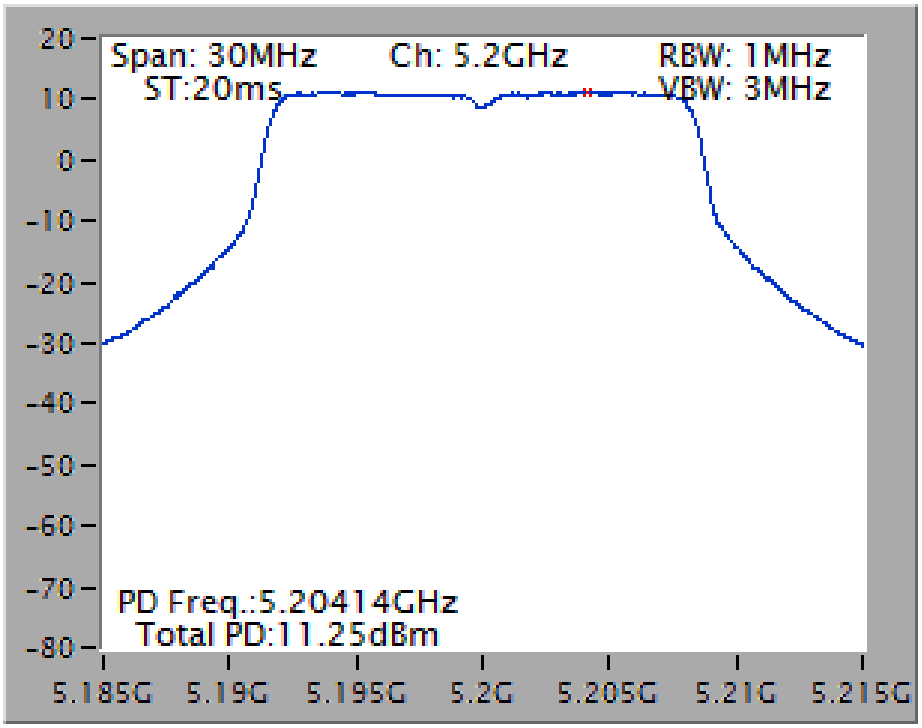
Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
155	5775 MHz	-3.76	-3.01	-6.77	24.31	Complies

Note: Correlated Composite Gain=11.69dBi >6dBi, so limit=30– (11.69 – 6)=24.31dBm/500kHz.

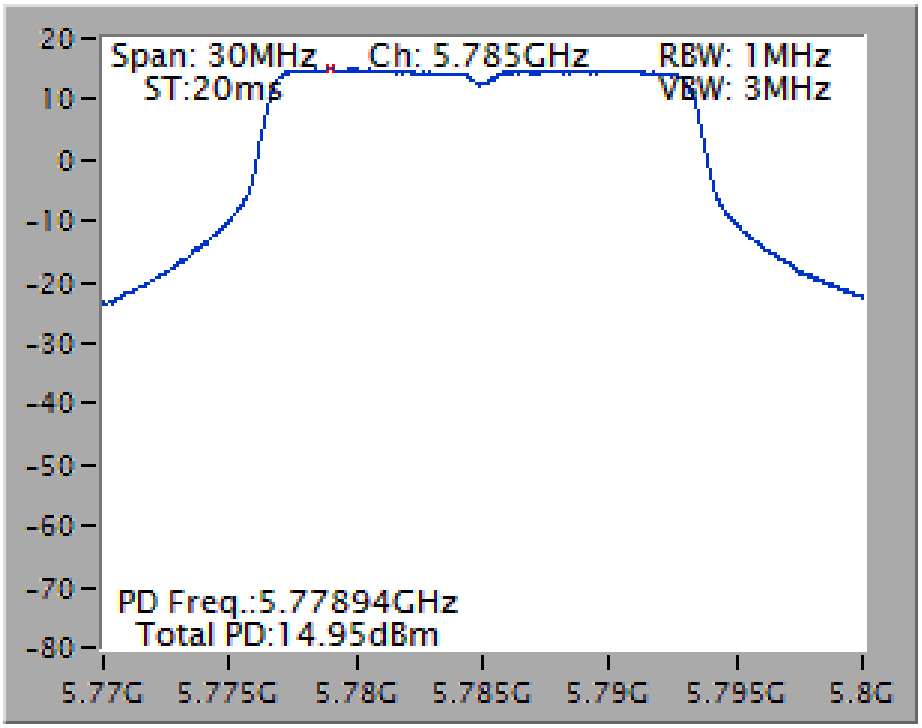
Note: All the test values were listed in the report.

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

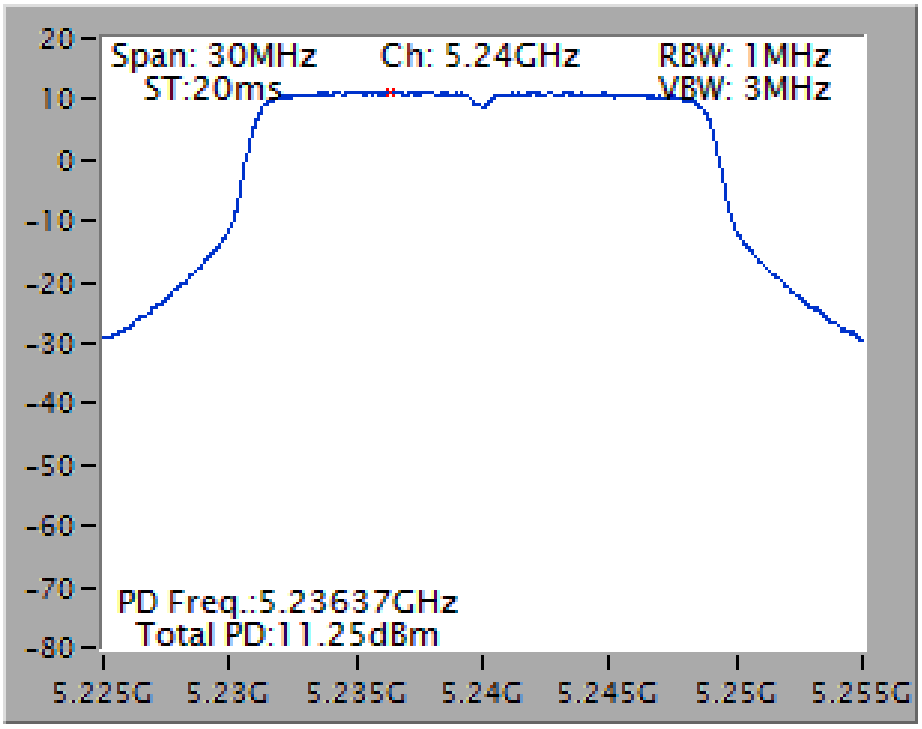
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 / 5200 MHz



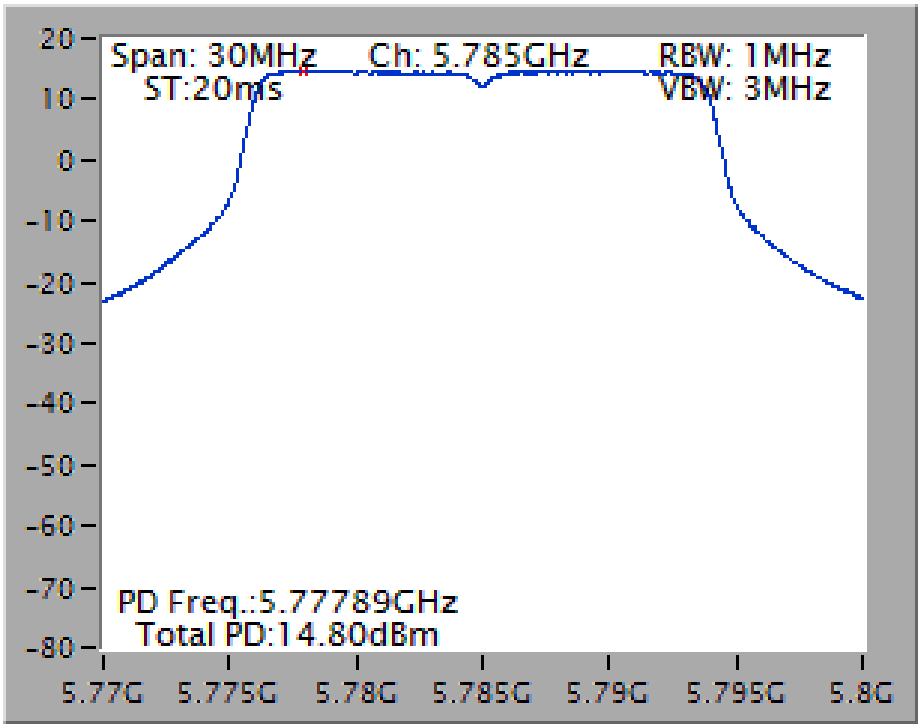
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 / 5785 MHz



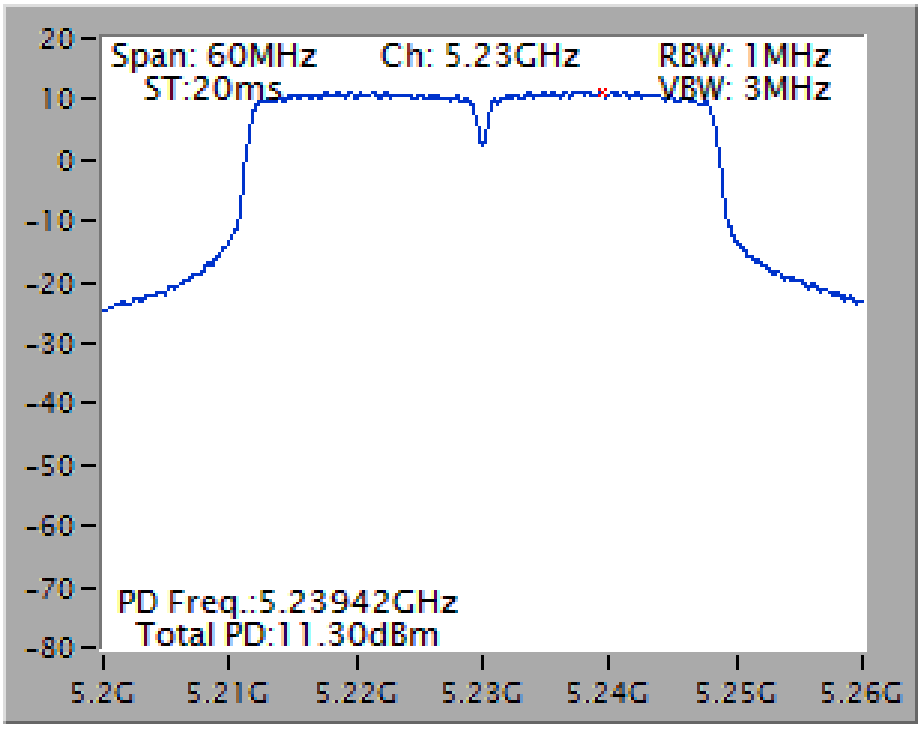
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 / 5240 MHz



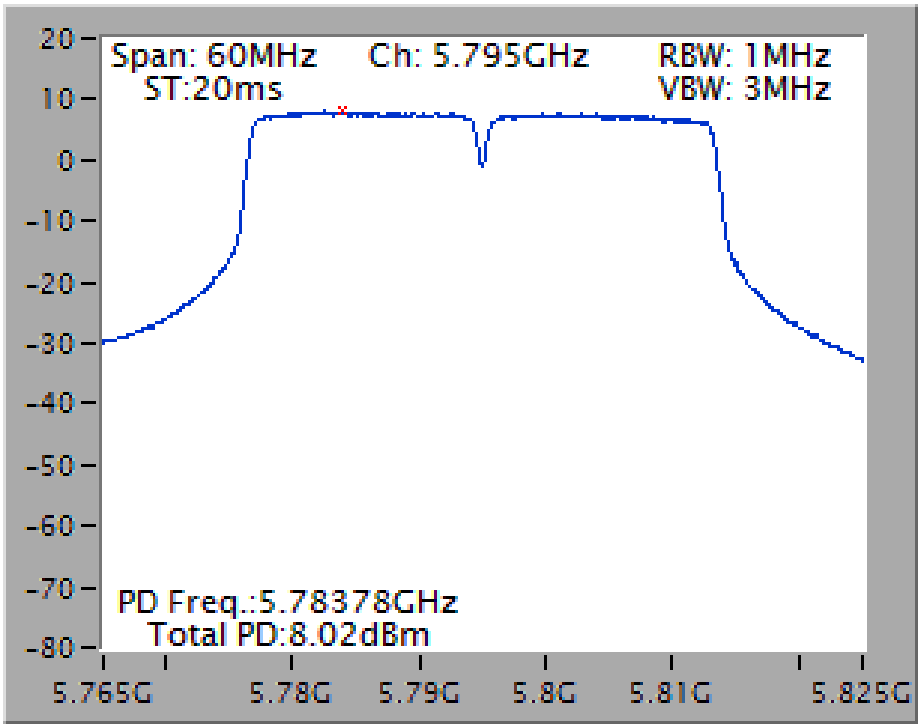
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 + Chain 3 / 5785 MHz



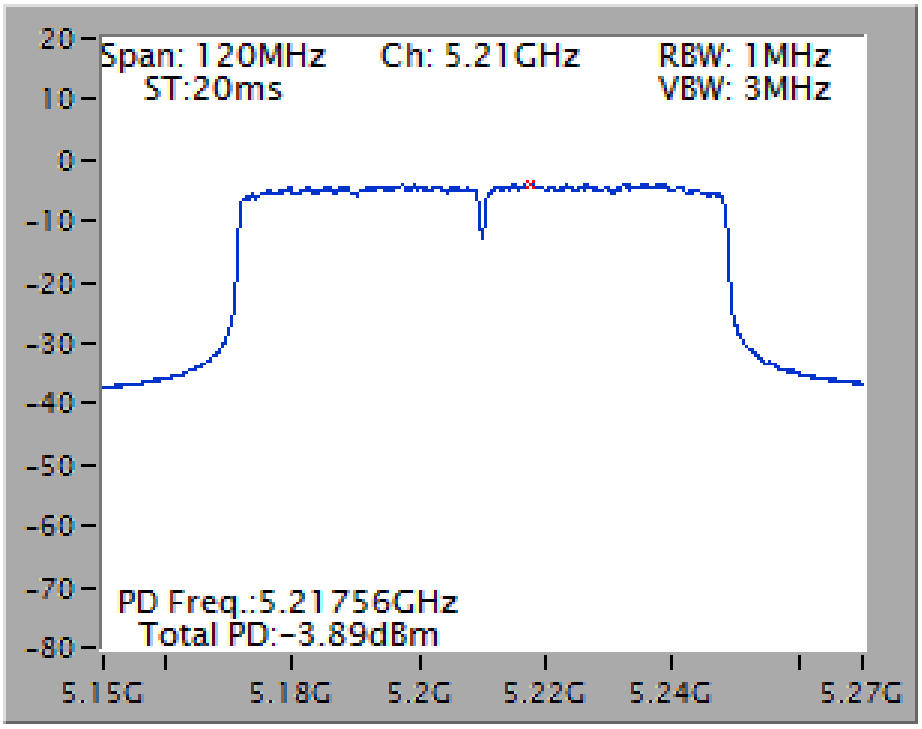
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 / 5230 MHz



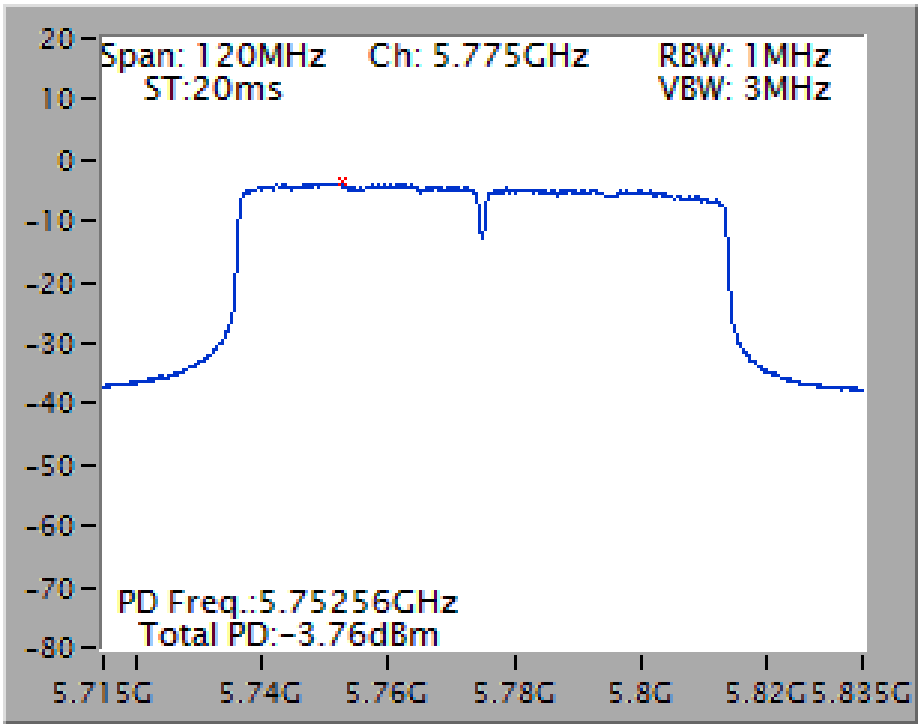
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 + Chain 3 / 5795 MHz



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



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



4.6. Radiated Emissions Measurement

4.6.1. Limit

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

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

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

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

4.6.2. Measuring Instruments and Setting

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

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

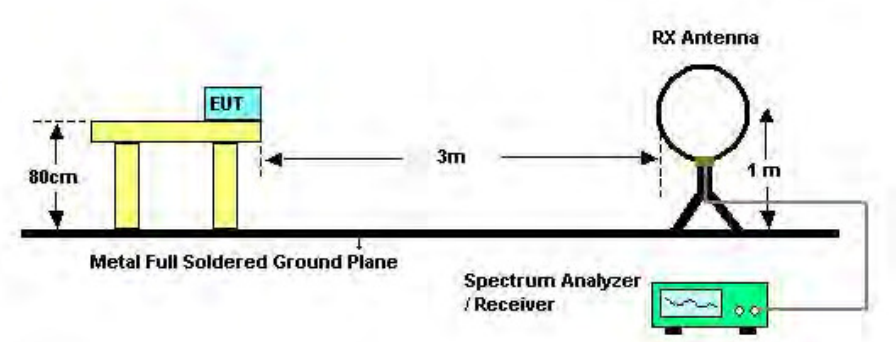
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.6.3. Test Procedures

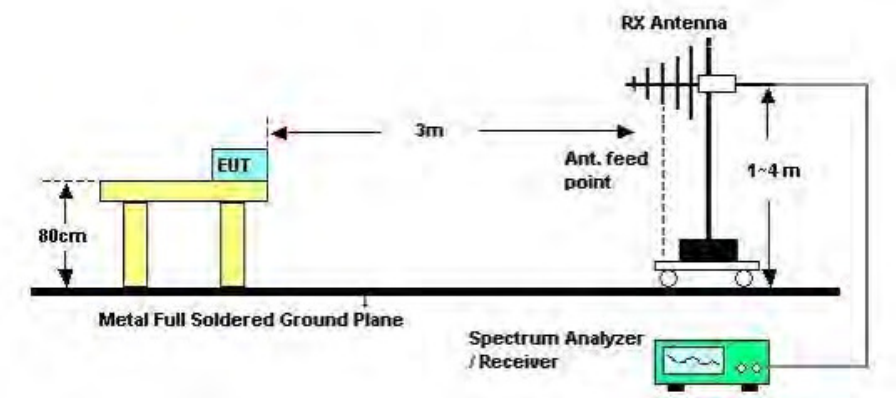
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 1m & 3m far away from the turntable.
2. Power on the EUT and all the supporting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

4.6.4. Test Setup Layout

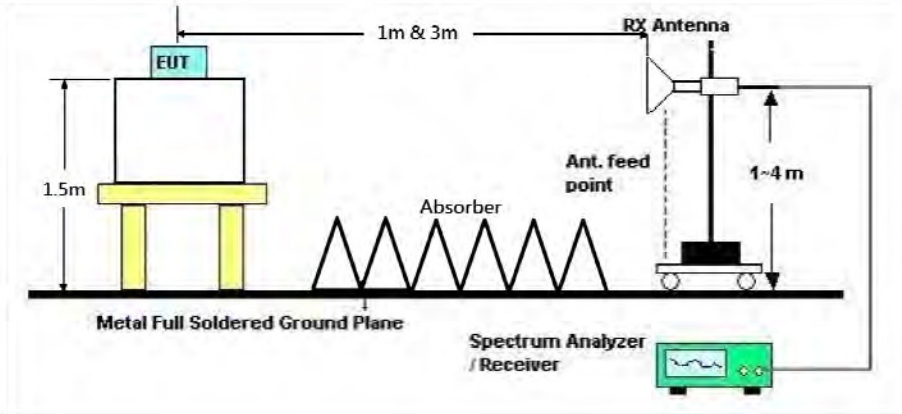
For Radiated Emissions: 9kHz ~30MHz



For Radiated Emissions: 30MHz~1GHz



For Radiated Emissions: Above 1GHz



4.6.5. Test Deviation

There is no deviation with the original standard.

4.6.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

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

Temperature	22°C	Humidity	54%
Test Engineer	John Tang	Configurations	Normal Link
Test Date	Apr. 19, 2016	Test Mode	Mode 3

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.

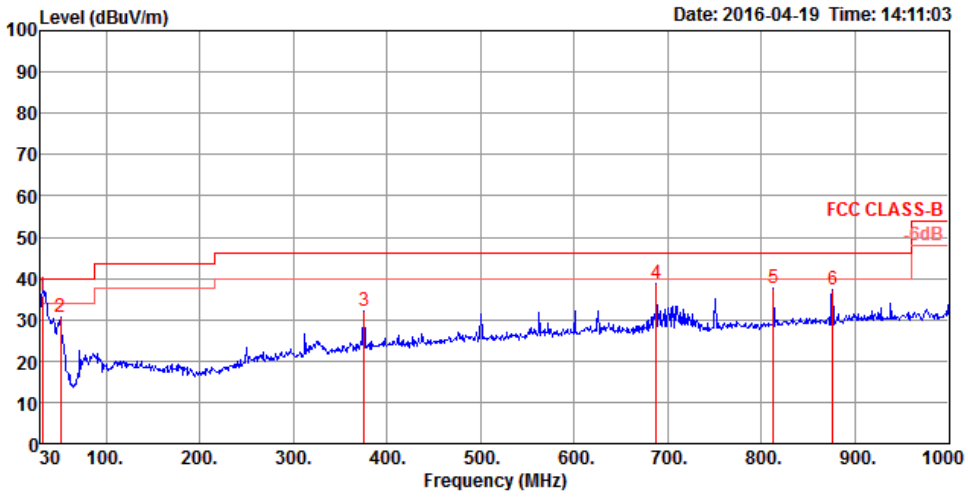
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

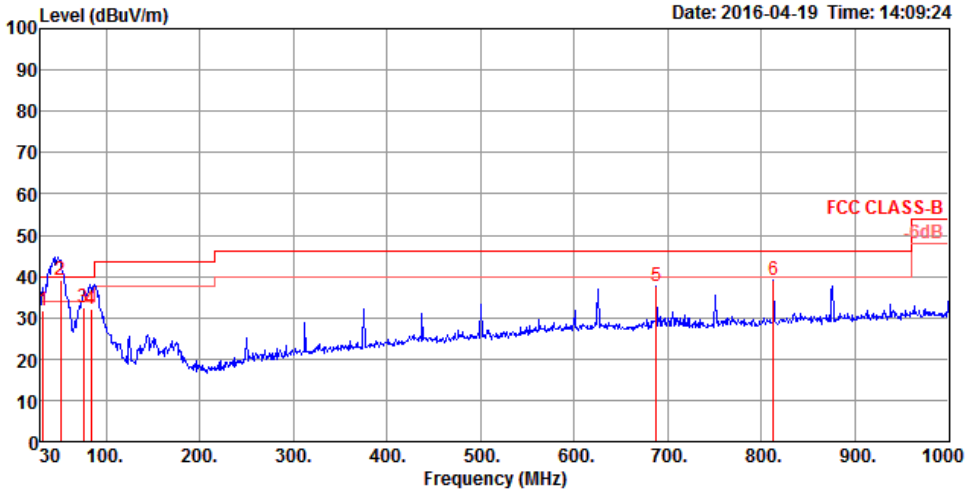
Temperature	22°C	Humidity	54%
Test Engineer	John Tang	Configurations	Normal Link
Test Mode	Mode 3		

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	31.94	35.76	40.00	-4.24	43.00	0.50	24.66	32.40	150	162	QP	HORIZONTAL
2	51.34	30.58	40.00	-9.42	47.63	0.62	14.74	32.41	200	328	Peak	HORIZONTAL
3	375.32	32.00	46.00	-14.00	40.57	1.67	22.08	32.32	100	8	Peak	HORIZONTAL
4	687.66	38.77	46.00	-7.23	42.94	2.25	25.95	32.37	150	3	Peak	HORIZONTAL
5	812.79	37.70	46.00	-8.30	40.43	2.48	26.97	32.18	100	353	Peak	HORIZONTAL
6	875.84	37.30	46.00	-8.70	39.06	2.55	27.55	31.86	100	345	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	32.58	31.75	40.00	-8.25	39.29	0.51	24.35	32.40	150	104	QP	VERTICAL
2	50.98	39.19	40.00	-0.81	56.20	0.62	14.78	32.41	100	296	QP	VERTICAL
3	75.59	32.46	40.00	-7.54	50.80	0.75	13.31	32.40	150	195	QP	VERTICAL
4	83.76	32.25	40.00	-7.75	49.50	0.80	14.35	32.40	100	205	QP	VERTICAL
5	687.66	37.81	46.00	-8.19	41.98	2.25	25.95	32.37	150	360	Peak	VERTICAL
6	812.79	38.99	46.00	-7.01	41.72	2.48	26.97	32.18	100	282	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	John Tang	Configurations	IEEE 802.11a CH 36 / Chain 1 + Chain 2 + Chain 3
Test Date	Apr. 12, 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	15535.48	48.25	54.00	-5.75	31.56	13.38	38.45	35.14	157	233	Average	HORIZONTAL
2	15550.00	60.75	74.00	-13.25	44.06	13.38	38.45	35.14	157	233	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	15538.96	61.39	74.00	-12.61	44.70	13.38	38.45	35.14	125	278	Peak	VERTICAL
2	15544.52	48.55	54.00	-5.45	31.86	13.38	38.45	35.14	125	278	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	John Tang	Configurations	IEEE 802.11a CH 40 / Chain 1 + Chain 2 + Chain 3
Test Date	Apr. 12, 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	15600.40	61.30	74.00	-12.70	44.69	13.38	38.39	35.16	178	237	Peak	HORIZONTAL
2	15609.44	48.30	54.00	-5.70	31.77	13.38	38.34	35.19	178	237	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	15603.16	48.95	54.00	-5.05	32.42	13.38	38.34	35.19	202	295	Average	VERTICAL
2	15608.40	61.81	74.00	-12.19	45.28	13.38	38.34	35.19	202	295	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	John Tang	Configurations	IEEE 802.11a CH 48 / Chain 1 + Chain 2 + Chain 3
Test Date	Apr. 12, 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	15710.16	47.57	54.00	-6.43	31.19	13.39	38.23	35.24	136	120	Average	HORIZONTAL
2	15718.64	60.32	74.00	-13.68	43.94	13.39	38.23	35.24	136	120	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	15711.40	60.78	74.00	-13.22	44.40	13.39	38.23	35.24	154	167	Peak	VERTICAL
2	15713.08	47.60	54.00	-6.40	31.22	13.39	38.23	35.24	154	167	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	John Tang	Configurations	IEEE 802.11a CH 149 / Chain 1 + Chain 2 + Chain 3
Test Date	Apr. 12, 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	11481.44	43.60	54.00	-10.40	27.94	10.74	39.66	34.74	182	103	Average	HORIZONTAL
2	11497.04	56.28	74.00	-17.72	40.58	10.75	39.70	34.75	182	103	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	11490.40	43.39	54.00	-10.61	27.69	10.75	39.70	34.75	149	89	Average	VERTICAL
2	11497.04	56.44	74.00	-17.56	40.74	10.75	39.70	34.75	149	89	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	John Tang	Configurations	IEEE 802.11a CH 157 / Chain 1 + Chain 2 + Chain 3
Test Date	Apr. 12, 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	11567.36	56.66	74.00	-17.34	41.01	10.76	39.65	34.76	152	140	Peak	HORIZONTAL
2	11574.16	43.49	54.00	-10.51	27.84	10.76	39.65	34.76	152	140	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	11563.08	56.62	74.00	-17.38	40.97	10.76	39.65	34.76	165	172	Peak	VERTICAL
2	11573.60	43.65	54.00	-10.35	28.00	10.76	39.65	34.76	165	172	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	John Tang	Configurations	IEEE 802.11a CH 165 / Chain 1 + Chain 2 + Chain 3
Test Date	Apr. 12, 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	11640.04	56.94	74.00	-17.06	41.35	10.77	39.59	34.77	175	160	Peak	HORIZONTAL
2	11643.28	43.63	54.00	-10.37	28.04	10.77	39.59	34.77	175	160	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	11655.36	43.56	54.00	-10.44	28.00	10.77	39.57	34.78	140	200	Average	VERTICAL
2	11655.96	56.28	74.00	-17.72	40.72	10.77	39.57	34.78	140	200	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	John Tang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36 / Chain 1 + Chain 2 + Chain 3
Test Date	Apr. 12, 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	15535.96	48.00	54.00	-6.00	31.31	13.38	38.45	35.14	178	181	Average	HORIZONTAL
2	15541.68	62.10	74.00	-11.90	45.41	13.38	38.45	35.14	178	181	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	15533.00	48.04	54.00	-5.96	31.35	13.38	38.45	35.14	149	120	Average	VERTICAL
2	15537.00	61.05	74.00	-12.95	44.36	13.38	38.45	35.14	149	120	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	John Tang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 40 / Chain 1 + Chain 2 + Chain 3
Test Date	Apr. 12, 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	15608.48	60.83	74.00	-13.17	44.30	13.38	38.34	35.19	162	175	Peak	HORIZONTAL
2	15609.64	48.07	54.00	-5.93	31.54	13.38	38.34	35.19	162	175	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	15599.68	48.25	54.00	-5.75	31.64	13.38	38.39	35.16	182	221	Average	VERTICAL
2	15599.92	60.95	74.00	-13.05	44.34	13.38	38.39	35.16	182	221	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	John Tang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 48 / Chain 1 + Chain 2 + Chain 3
Test Date	Apr. 12, 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	15711.04	60.16	74.00	-13.84	43.78	13.39	38.23	35.24	183	205	Peak	HORIZONTAL
2	15712.88	47.35	54.00	-6.65	30.97	13.39	38.23	35.24	183	205	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	15713.84	47.26	54.00	-6.74	30.88	13.39	38.23	35.24	149	253	Average	VERTICAL
2	15723.80	60.80	74.00	-13.20	44.42	13.39	38.23	35.24	149	253	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	John Tang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Chain 1 + Chain 2 + Chain 3
Test Date	Apr. 12, 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	11483.44	56.61	74.00	-17.39	40.95	10.74	39.66	34.74	172	133	Peak	HORIZONTAL
2	11496.80	43.19	54.00	-10.81	27.49	10.75	39.70	34.75	172	133	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	11487.92	43.26	54.00	-10.74	27.56	10.75	39.70	34.75	174	148	Average	VERTICAL
2	11488.96	56.21	74.00	-17.79	40.51	10.75	39.70	34.75	174	148	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	John Tang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Chain 1 + Chain 2 + Chain 3
Test Date	Apr. 12, 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	11560.24	56.49	74.00	-17.51	40.84	10.76	39.65	34.76	150	92	Peak	HORIZONTAL
2	11574.76	43.55	54.00	-10.45	27.90	10.76	39.65	34.76	150	92	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	11576.92	43.52	54.00	-10.48	27.87	10.76	39.65	34.76	163	158	Average	VERTICAL
2	11578.12	56.14	74.00	-17.86	40.49	10.76	39.65	34.76	163	158	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	John Tang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Chain 1 + Chain 2 + Chain 3
Test Date	Apr. 12, 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	11645.20	56.89	74.00	-17.11	41.30	10.77	39.59	34.77	155	151	Peak	HORIZONTAL
2	11658.28	43.67	54.00	-10.33	28.11	10.77	39.57	34.78	155	151	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	11652.40	43.61	54.00	-10.39	28.05	10.77	39.57	34.78	148	118	Average	VERTICAL
2	11657.84	56.61	74.00	-17.39	41.05	10.77	39.57	34.78	148	118	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	John Tang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38 / Chain 1 + Chain 2 + Chain 3
Test Date	Apr. 12, 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	15571.20	60.64	74.00	-13.36	44.03	13.38	38.39	35.16	152	118	Peak	HORIZONTAL
2	15579.56	47.74	54.00	-6.26	31.13	13.38	38.39	35.16	152	118	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	15564.68	47.84	54.00	-6.16	31.23	13.38	38.39	35.16	141	100	Average	VERTICAL
2	15576.32	61.32	74.00	-12.68	44.71	13.38	38.39	35.16	141	100	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	John Tang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 46 / Chain 1 + Chain 2 + Chain 3
Test Date	Apr. 12, 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	15689.68	60.78	74.00	-13.22	44.32	13.39	38.28	35.21	172	133	Peak	HORIZONTAL
2	15692.08	47.15	54.00	-6.85	30.77	13.39	38.23	35.24	172	133	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	15685.12	60.46	74.00	-13.54	44.00	13.39	38.28	35.21	157	154	Peak	VERTICAL
2	15699.24	47.14	54.00	-6.86	30.76	13.39	38.23	35.24	157	154	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	John Tang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Chain 1 + Chain 2 + Chain 3
Test Date	Apr. 12, 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	11503.32	43.28	54.00	-10.72	27.58	10.75	39.70	34.75	135	132	Average	HORIZONTAL
2	11504.84	56.80	74.00	-17.20	41.10	10.75	39.70	34.75	135	132	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	11512.20	56.98	74.00	-17.02	41.28	10.75	39.70	34.75	164	151	Peak	VERTICAL
2	11519.20	43.19	54.00	-10.81	27.53	10.75	39.67	34.76	164	151	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	John Tang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Chain 1 + Chain 2 + Chain 3
Test Date	Apr. 12, 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	11588.20	56.81	74.00	-17.19	41.20	10.76	39.62	34.77	153	194	Peak	HORIZONTAL
2	11593.00	43.73	54.00	-10.27	28.12	10.76	39.62	34.77	153	194	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	11585.28	57.48	74.00	-16.52	41.87	10.76	39.62	34.77	141	158	Peak	VERTICAL
2	11593.20	43.73	54.00	-10.27	28.12	10.76	39.62	34.77	141	158	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	John Tang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42 / Chain 1 + Chain 2 + Chain 3
Test Date	Apr. 12, 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	15620.16	47.97	54.00	-6.03	31.44	13.38	38.34	35.19	169	218	Average	HORIZONTAL
2	15624.40	60.79	74.00	-13.21	44.26	13.38	38.34	35.19	169	218	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15620.00	48.22	54.00	-5.78	31.69	13.38	38.34	35.19	148	169	Average	VERTICAL
2	15622.56	61.41	74.00	-12.59	44.88	13.38	38.34	35.19	148	169	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	John Tang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 1 + Chain 2 + Chain 3
Test Date	Apr. 12, 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	11554.16	56.41	74.00	-17.59	40.76	10.76	39.65	34.76	194	125	Peak	HORIZONTAL
2	11555.80	43.38	54.00	-10.62	27.73	10.76	39.65	34.76	194	125	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	11543.56	56.33	74.00	-17.67	40.67	10.75	39.67	34.76	180	154	Peak	VERTICAL
2	11553.36	43.28	54.00	-10.72	27.63	10.76	39.65	34.76	180	154	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

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	John Tang	Configurations	IEEE 802.11a CH 36, 40, 48 / Chain 1 + Chain 2 + Chain 3
Test Date	Apr. 11, 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	5140.40	65.18	74.00	-8.82	57.77	7.48	34.84	34.91	192	17	Peak	HORIZONTAL
2	5150.00	53.87	54.00	-0.13	46.45	7.48	34.85	34.91	192	17	Average	HORIZONTAL
3	5178.00	120.52			113.07	7.48	34.88	34.91	192	17	Peak	HORIZONTAL
4	5179.20	110.22			102.77	7.48	34.88	34.91	192	17	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	5148.00	65.03	74.00	-8.97	57.61	7.48	34.85	34.91	184	44	Peak	VERTICAL
2	5148.80	53.64	54.00	-0.36	46.22	7.48	34.85	34.91	184	44	Average	VERTICAL
3	5197.60	125.70			118.23	7.48	34.90	34.91	184	44	Peak	VERTICAL
4	5207.20	115.93			108.44	7.49	34.91	34.91	184	44	Average	VERTICAL

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	5076.00	64.55	74.00	-9.45	57.19	7.48	34.78	34.90	213	16	Peak	VERTICAL
2	5103.00	52.87	54.00	-1.13	45.48	7.48	34.81	34.90	213	16	Average	VERTICAL
3	5238.00	124.43			116.90	7.50	34.94	34.91	213	16	Peak	VERTICAL
4	5239.00	114.97			107.44	7.50	34.94	34.91	213	16	Average	VERTICAL
5	5416.00	64.93	74.00	-9.07	57.13	7.61	35.11	34.92	213	16	Peak	VERTICAL
6	5435.00	53.57	54.00	-0.43	45.69	7.66	35.14	34.92	213	16	Average	VERTICAL

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

Temperature	22°C	Humidity	54%
Test Engineer	John Tang	Configurations	IEEE 802.11a CH 149, 157, 165 / Chain 1 + Chain 2 + Chain 3
Test Date	Apr. 12, 2016		

Channel 149

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5711.40	68.08	68.20	-0.12	59.97	7.81	35.24	34.94	189	307	Peak	VERTICAL
2	5722.20	73.26	78.20	-4.94	65.16	7.79	35.25	34.94	189	307	Peak	VERTICAL
3	5741.00	110.23			102.15	7.77	35.25	34.94	189	307	Average	VERTICAL
4	5750.60	120.14			112.06	7.77	35.25	34.94	189	307	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	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5696.20	63.84	68.20	-4.36	55.72	7.82	35.24	34.94	177	311	Peak	VERTICAL
2	5724.60	64.25	78.20	-13.95	56.15	7.79	35.25	34.94	177	311	Peak	VERTICAL
3	5790.60	113.57			105.55	7.71	35.26	34.95	177	311	Average	VERTICAL
4	5790.60	123.72			115.70	7.71	35.26	34.95	177	311	Peak	VERTICAL
5	5850.00	64.86	78.20	-13.34	56.75	7.80	35.27	34.96	177	311	Peak	VERTICAL
6	5860.00	63.45	68.20	-4.75	55.32	7.82	35.27	34.96	177	311	Peak	VERTICAL

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

Channel 165

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5819.00	122.20			114.15	7.74	35.26	34.95	188	334	Peak	VERTICAL
2	5829.80	111.68			103.59	7.77	35.27	34.95	188	334	Average	VERTICAL
3	5850.60	72.75	78.20	-5.45	64.64	7.80	35.27	34.96	188	334	Peak	VERTICAL
4	5863.00	67.94	68.20	-0.26	59.81	7.82	35.27	34.96	188	334	Peak	VERTICAL

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

Temperature	22°C	Humidity	54%
Test Engineer	John Tang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36, 40, 48 / Chain 1 + Chain 2 + Chain 3
Test Date	Apr. 11, 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	5150.00	53.99	54.00	-0.01	46.57	7.48	34.85	34.91	187	46	Average	VERTICAL
2	5150.00	65.24	74.00	-8.76	57.82	7.48	34.85	34.91	187	46	Peak	VERTICAL
3	5186.40	118.98			111.53	7.48	34.88	34.91	187	46	Peak	VERTICAL
4	5187.60	109.22			101.75	7.48	34.90	34.91	187	46	Average	VERTICAL

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	5148.80	65.51	74.00	-8.49	58.09	7.48	34.85	34.91	203	11	Peak	VERTICAL
2	5150.00	53.87	54.00	-0.13	46.45	7.48	34.85	34.91	203	11	Average	VERTICAL
3	5194.80	116.01			108.54	7.48	34.90	34.91	203	11	Average	VERTICAL
4	5195.20	125.94			118.47	7.48	34.90	34.91	203	11	Peak	VERTICAL

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	5076.00	66.56	74.00	-7.44	59.20	7.48	34.78	34.90	185	45	Peak	VERTICAL
2	5078.00	53.84	54.00	-0.16	46.48	7.48	34.78	34.90	185	45	Average	VERTICAL
3	5238.00	124.83			117.30	7.50	34.94	34.91	185	45	Peak	VERTICAL
4	5239.00	115.52			107.99	7.50	34.94	34.91	185	45	Average	VERTICAL
5	5402.00	66.68	74.00	-7.32	58.88	7.61	35.11	34.92	185	45	Peak	VERTICAL
6	5469.00	53.94	54.00	-0.06	45.97	7.72	35.17	34.92	185	45	Average	VERTICAL

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

Temperature	22°C	Humidity	54%
Test Engineer	John Tang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149, 157, 165 / Chain 1 + Chain 2 + Chain 3
Test Date	Apr. 12, 2016		

Channel 149

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5707.40	66.95	68.20	-1.25	58.84	7.81	35.24	34.94	196	334	Average	VERTICAL
2	5725.00	77.93	78.20	-0.27	69.83	7.79	35.25	34.94	196	334	Average	VERTICAL
3	5747.00	120.47			112.39	7.77	35.25	34.94	196	334	Average	VERTICAL
4	5747.00	110.91			102.83	7.77	35.25	34.94	196	334	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	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5713.80	67.89	68.20	-0.31	59.78	7.81	35.24	34.94	200	332	Peak	VERTICAL
2	5725.00	65.48	78.20	-12.72	57.38	7.79	35.25	34.94	200	332	Peak	VERTICAL
3	5787.80	125.40			117.36	7.73	35.26	34.95	200	332	Peak	VERTICAL
4	5788.60	114.90			106.86	7.73	35.26	34.95	200	332	Average	VERTICAL
5	5850.00	64.31	78.20	-13.89	56.20	7.80	35.27	34.96	200	332	Peak	VERTICAL
6	5861.40	63.89	68.20	-4.31	55.76	7.82	35.27	34.96	200	332	Peak	VERTICAL

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

Channel 165

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5823.00	122.00			113.91	7.77	35.27	34.95	155	311	Peak	VERTICAL
2	5824.20	111.81			103.72	7.77	35.27	34.95	155	311	Average	VERTICAL
3	5851.00	72.14	78.20	-6.06	64.03	7.80	35.27	34.96	155	311	Peak	VERTICAL
4	5861.40	67.87	68.20	-0.33	59.74	7.82	35.27	34.96	155	311	Peak	VERTICAL

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

Temperature	22°C	Humidity	54%
Test Engineer	John Tang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38, 46 / Chain 1 + Chain 2 + Chain 3
Test Date	Apr. 11, 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	5148.80	53.98	54.00	-0.02	46.56	7.48	34.85	34.91	192	16	Average	VERTICAL
2	5148.80	67.16	74.00	-6.84	59.74	7.48	34.85	34.91	192	16	Peak	VERTICAL
3	5184.40	110.90			103.45	7.48	34.88	34.91	192	16	Peak	VERTICAL
4	5184.80	100.80			93.35	7.48	34.88	34.91	192	16	Average	VERTICAL

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

Channel 46

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5149.60	65.73	74.00	-8.27	58.31	7.48	34.85	34.91	201	14	Peak	VERTICAL
2	5150.00	53.68	54.00	-0.32	46.26	7.48	34.85	34.91	201	14	Average	VERTICAL
3	5214.40	120.42			112.93	7.49	34.91	34.91	201	14	Peak	VERTICAL
4	5233.00	110.49			102.96	7.50	34.94	34.91	201	14	Average	VERTICAL

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

Temperature	22°C	Humidity	54%
Test Engineer	John Tang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151, 159 / Chain 1 + Chain 2 + Chain 3
Test Date	Apr. 12, 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	5714.20	67.94	68.20	-0.26	59.83	7.81	35.24	34.94	205	331	Peak	VERTICAL
2	5725.00	72.27	78.20	-5.93	64.17	7.79	35.25	34.94	205	331	Peak	VERTICAL
3	5743.40	109.78			101.70	7.77	35.25	34.94	205	331	Peak	VERTICAL
4	5748.60	102.77			94.69	7.77	35.25	34.94	205	331	Average	VERTICAL

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

Channel 159

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5702.60	67.89	68.20	-0.31	59.77	7.82	35.24	34.94	184	26	Peak	VERTICAL
2	5722.20	64.62	78.20	-13.58	56.52	7.79	35.25	34.94	184	26	Peak	VERTICAL
3	5783.80	115.06			107.02	7.73	35.26	34.95	184	26	Peak	VERTICAL
4	5796.60	105.25			97.23	7.71	35.26	34.95	184	26	Average	VERTICAL
5	5852.20	64.36	78.20	-13.84	56.25	7.80	35.27	34.96	184	26	Peak	VERTICAL
6	5874.20	67.02	68.20	-1.18	58.85	7.85	35.28	34.96	184	26	Peak	VERTICAL

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

Temperature	22°C	Humidity	54%
Test Engineer	John Tang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42, 155 / Chain 1 + Chain 2 + Chain 3
Test Date	Apr. 11, 2016~Apr. 12, 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	5146.00	53.72	54.00	-0.28	46.30	7.48	34.85	34.91	161	14	Average	VERTICAL
2	5146.00	65.49	74.00	-8.51	58.07	7.48	34.85	34.91	161	14	Peak	VERTICAL
3	5199.00	106.20			98.73	7.48	34.90	34.91	161	14	Peak	VERTICAL
4	5204.00	95.85			88.36	7.49	34.91	34.91	161	14	Average	VERTICAL
5	5381.00	49.91	54.00	-4.09	42.18	7.57	35.08	34.92	161	14	Average	VERTICAL
6	5391.00	61.57	74.00	-12.43	53.82	7.58	35.09	34.92	161	14	Peak	VERTICAL

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

Channel 155

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5711.00	68.12	68.20	-0.08	60.01	7.81	35.24	34.94	186	310	Peak	VERTICAL
2	5725.00	74.05	78.20	-4.15	65.95	7.79	35.25	34.94	186	310	Peak	VERTICAL
3	5753.00	105.89			97.81	7.77	35.25	34.94	186	310	Average	VERTICAL
4	5764.00	109.02			100.97	7.75	35.25	34.95	186	310	Peak	VERTICAL
5	5850.00	64.04	78.20	-14.16	55.93	7.80	35.27	34.96	186	310	Peak	VERTICAL
6	5982.00	62.19	68.20	-6.01	53.84	8.02	35.30	34.97	186	310	Peak	VERTICAL

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

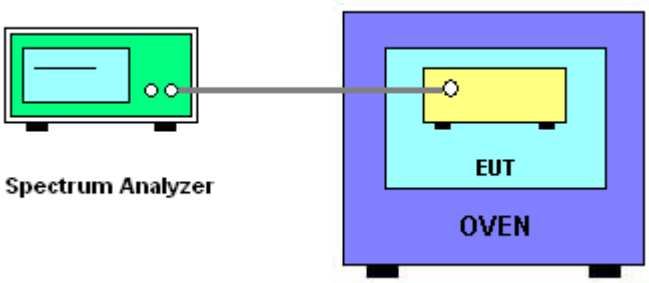
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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 -20°C~65°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	23°C	Humidity	63%
Test Engineer	Peter Wu	Test Date	Apr. 12, 2016~Apr. 18, 2016

Mode: 20 MHz / Chain 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5200 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5199.9911	5199.9906	5199.9897	5199.9891
110.00	5199.9906	5199.9901	5199.9891	5199.9884
93.50	5199.9903	5199.9901	5199.9893	5199.9887
Max. Deviation (MHz)	0.0097	0.0099	0.0109	0.0116
Max. Deviation (ppm)	1.87	1.90	2.10	2.23
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5200 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-20	5200.0048	5200.0034	5200.0016	5199.9993
-10	5200.0032	5200.0019	5200.0002	5199.9978
0	5200.0017	5200.0005	5199.9989	5199.9970
10	5200.0003	5199.9991	5199.9972	5199.9950
20	5199.9990	5199.9977	5199.9962	5199.9944
30	5199.9978	5199.9965	5199.9949	5199.9930
40	5199.9964	5199.9953	5199.9939	5199.9923
50	5199.9948	5199.9933	5199.9917	5199.9897
60	5199.9947	5199.9935	5199.9920	5199.9893
65	5199.9931	5199.9919	5199.9904	5199.9877
Max. Deviation (MHz)	0.0069	0.0081	0.0096	0.0123
Max. Deviation (ppm)	1.33	1.56	1.85	2.37
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5784.9918	5784.9909	5784.9899	5784.9894
110.00	5784.9913	5784.9907	5784.9903	5784.9896
93.50	5784.9903	5784.9898	5784.9888	5784.9883
Max. Deviation (MHz)	0.0097	0.0102	0.0112	0.0117
Max. Deviation (ppm)	1.68	1.76	1.94	2.02
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-20	5784.9995	5784.9981	5784.9963	5784.9940
-10	5784.9979	5784.9966	5784.9949	5784.9925
0	5784.9964	5784.9952	5784.9936	5784.9917
10	5784.9950	5784.9938	5784.9919	5784.9897
20	5784.9937	5784.9924	5784.9909	5784.9891
30	5784.9925	5784.9912	5784.9896	5784.9877
40	5784.9911	5784.9900	5784.9886	5784.9870
50	5784.9895	5784.9880	5784.9864	5784.9844
60	5784.9894	5784.9882	5784.9867	5784.9840
65	5784.9878	5784.9866	5784.9851	5784.9824
Max. Deviation (MHz)	0.0122	0.0134	0.0149	0.0176
Max. Deviation (ppm)	2.11	2.32	2.58	3.04
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	5190.0002	5189.9992	5189.9987	5189.9986
110.00	5189.9992	5189.9982	5189.9978	5189.9974
93.50	5189.9984	5189.9979	5189.9977	5189.9972
Max. Deviation (MHz)	0.0016	0.0021	0.0023	0.0028
Max. Deviation (ppm)	0.31	0.40	0.44	0.54
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5190 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-20	5190.0044	5190.0030	5190.0012	5189.9989
-10	5190.0028	5190.0015	5189.9998	5189.9974
0	5190.0013	5190.0001	5189.9985	5189.9966
10	5189.9999	5189.9987	5189.9968	5189.9946
20	5189.9986	5189.9973	5189.9958	5189.9940
30	5189.9974	5189.9961	5189.9945	5189.9926
40	5189.9960	5189.9949	5189.9935	5189.9919
50	5189.9944	5189.9929	5189.9913	5189.9893
60	5189.9943	5189.9931	5189.9916	5189.9889
65	5189.9927	5189.9915	5189.9900	5189.9873
Max. Deviation (MHz)	0.0073	0.0085	0.0100	0.0127
Max. Deviation (ppm)	1.41	1.64	1.93	2.45
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5754.9920	5754.9914	5754.9910	5754.9903
110.00	5754.9918	5754.9912	5754.9903	5754.9897
93.50	5754.9911	5754.9905	5754.9901	5754.9891
Max. Deviation (MHz)	0.0089	0.0095	0.0099	0.0109
Max. Deviation (ppm)	1.55	1.65	1.72	1.89
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-20	5755.0023	5755.0009	5754.9991	5754.9968
-10	5755.0007	5754.9994	5754.9977	5754.9953
0	5754.9992	5754.9980	5754.9964	5754.9945
10	5754.9978	5754.9966	5754.9947	5754.9925
20	5754.9965	5754.9952	5754.9937	5754.9919
30	5754.9953	5754.9940	5754.9924	5754.9905
40	5754.9939	5754.9928	5754.9914	5754.9898
50	5754.9923	5754.9908	5754.9892	5754.9872
60	5754.9922	5754.9910	5754.9895	5754.9868
65	5754.9906	5754.9894	5754.9879	5754.9852
Max. Deviation (MHz)	0.0094	0.0106	0.0121	0.0148
Max. Deviation (ppm)	1.63	1.84	2.10	2.57
Result	Complies			

Mode: 80 MHz / Chain 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5210 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5209.9918	5209.9908	5209.9906	5209.9898
110.00	5209.9911	5209.9905	5209.9897	5209.9887
93.50	5209.9908	5209.9904	5209.9894	5209.9885
Max. Deviation (MHz)	0.0092	0.0096	0.0106	0.0115
Max. Deviation (ppm)	1.77	1.84	2.03	2.21
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5210 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-20	5209.9988	5209.9974	5209.9956	5209.9933
-10	5209.9972	5209.9959	5209.9942	5209.9918
0	5209.9957	5209.9945	5209.9929	5209.9910
10	5209.9943	5209.9931	5209.9912	5209.9890
20	5209.9930	5209.9917	5209.9902	5209.9884
30	5209.9918	5209.9905	5209.9889	5209.9870
40	5209.9904	5209.9893	5209.9879	5209.9863
50	5209.9888	5209.9873	5209.9857	5209.9837
60	5209.9887	5209.9875	5209.9860	5209.9833
65	5209.9871	5209.9859	5209.9844	5209.9817
Max. Deviation (MHz)	0.0129	0.0141	0.0156	0.0183
Max. Deviation (ppm)	2.48	2.71	2.99	3.51
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5774.9974	5774.9965	5774.9963	5774.9961
110.00	5774.9964	5774.9955	5774.9949	5774.9941
93.50	5774.9955	5774.9945	5774.9935	5774.9933
Max. Deviation (MHz)	0.0045	0.0055	0.0065	0.0067
Max. Deviation (ppm)	0.78	0.95	1.13	1.16
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-20	5775.0111	5775.0097	5775.0079	5775.0056
-10	5775.0095	5775.0082	5775.0065	5775.0041
0	5775.0080	5775.0068	5775.0052	5775.0033
10	5775.0066	5775.0054	5775.0035	5775.0013
20	5775.0053	5775.0040	5775.0025	5775.0007
30	5775.0041	5775.0028	5775.0012	5774.9993
40	5775.0027	5775.0016	5775.0002	5774.9986
50	5775.0011	5774.9996	5774.9980	5774.9960
60	5775.0010	5774.9998	5774.9983	5774.9956
65	5774.9994	5774.9982	5774.9967	5774.9940
Max. Deviation (MHz)	0.0111	0.0097	0.0079	0.0060
Max. Deviation (ppm)	1.92	1.68	1.37	1.04
Result	Complies			

4.9. Antenna Requirements

4.9.1. Limit

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

4.9.2. Antenna Connector Construction

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

5. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMI Receiver	Agilent	N9038A	My52260123	9kHz ~ 8.45GHz	Jan. 27, 2016	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Dec. 08, 2015	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Dec. 23, 2015	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	150kHz ~ 30MHz	May 25, 2015	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	Conduction (CO01-CB)
BILOG ANTENNA	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 Receiver	Agilent	N9038A	MY52260123	9kHz ~ 8.4GHz	Jan. 27, 2016	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)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-7	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-8	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-9	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 02, 2015	Conducted (TH01-CB)

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

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

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

6. MEASUREMENT UNCERTAINTY

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