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FCC RADIO TEST REPORT

Applicant's company	**Abocom Systems, Inc.**
Applicant Address	No.77, Yu-Yih Rd., Chu-Nan, Miao-Lih County 35059, Taiwan R.O.C.
FCC ID	**MQ4AMB7220**
Manufacturer's company	**Abocom Systems, Inc.**
Manufacturer Address	No.77, Yu-Yih Rd., Chu-Nan, Miao-Lih County 35059, Taiwan R.O.C.

Product Name	2x2 11ac+BT4.0 Wi-Fi Module
Brand Name	AboCom
Model No.	AMB7220
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5150 ~ 5250 MHz / 5725 ~ 5850 MHz
Received Date	Jan. 15, 2016
Final Test Date	Jan. 26, 2016
Submission Type	Original Equipment

Statement

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

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

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

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

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

TAF
Testing Laboratory
1190

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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR611516AB	Rev. 01	Initial issue of report	Mar. 09, 2016

1. VERIFICATION OF COMPLIANCE

Product Name	:	2x2 11ac+BT4.0 Wi-Fi Module
Brand Name	:	AboCom
Model No.	:	AMB7220
Applicant	:	Abocom Systems, Inc.
Test Rule Part(s)	:	47 CFR FCC Part 15 Subpart E § 15.407

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Jan. 15, 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	12.42 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	0.53 dB
4.5	15.407(a)	Power Spectral Density	Complies	0.78 dB
4.6	15.407(b)	Radiated Emissions	Complies	3.06 dB
4.7	15.407(b)	Band Edge Emissions	Complies	0.09 dB
4.8	15.407(g)	Frequency Stability	Complies	-
4.9	15.203	Antenna Requirements	Complies	-

3. GENERAL INFORMATION

3.1. Product Details

Items	Description
Product Type	IEEE 802.11a: WLAN (1TX, 1RX) IEEE 802.11n/ac: WLAN (2TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	From host system
Modulation	IEEE 802.11a: OFDM IEEE 802.11n/ac: see the below table
Data Modulation	IEEE 802.11a/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) IEEE 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)
Data Rate (Mbps)	IEEE 802.11a: OFDM (6/9/12/18/24/36/48/54) IEEE 802.11n/ac: see the below table
Frequency Range	5150 ~ 5250 MHz / 5725 ~ 5850 MHz
Channel Number	9 for 20MHz bandwidth ; 4 for 40MHz bandwidth 2 for 80MHz bandwidth
Channel Band Width (99%)	Band 1: IEEE 802.11a: 31.87 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 30.04 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 38.78 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.25 MHz Band 4: IEEE 802.11a: 33.69 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 32.04 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 38.06 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.25 MHz
Maximum Conducted Output Power	Band 1: IEEE 802.11a: 22.36 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 23.45 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 22.12 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 17.19 dBm Band 4: IEEE 802.11a: 22.19 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 24.46 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 21.76 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 17.34 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

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

Antenna and Band width

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

IEEE 11n/ac Spec.

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

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

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

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

3.2. Accessories

N/A

3.3. Table for Filed Antenna

For WiFi Antenna:

Ant.	Brand	P/NO	Antenna Type	Connector	Gain (dBi)		
					2.4GHz	5GHz	
						Band1	Band4
1	WHA YU	-	Printed Antenna	I-PEX	3.8	1.4	1.9
2	WHA YU	-	Printed Antenna	I-PEX	2.6	1.1	1.2

For Bluetooth Antenna:

Ant.	Brand	P/NO	Antenna Type	Connector	Gain (dBi)
3	WHA YU	C068-510500-A	PCB Antenna	MHF	3.84

Note: The EUT has three antennas.

For WiFi Antenna:

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

Only Ant. 1 can be used as transmitting antenna and receiving antenna.

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

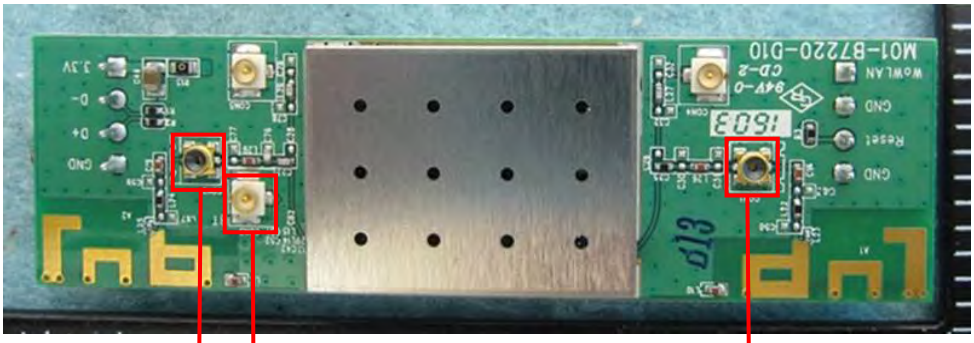
Ant. 1 and Ant. 2 will transmit/receive the same signal simultaneously.

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

For Bluetooth Antenna:

For Bluetooth mode (1TX, 1RX):

Only Ant. 3 can be used as transmitting antenna and receiving antenna.



3.4. Table for Carrier Frequencies

There are three bandwidth systems.

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

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

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

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

3.5. Table for Test Modes

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

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

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

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

The following test modes were performed for all tests:

For Conducted Emission test:

Mode 1. EUT + 2.4G + BT with Ant.

Mode 2. EUT + 5G + BT with Ant.

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 in X-axis + 2.4G + BT with Ant.

Mode 2. EUT in Y-axis + 2.4G + BT with Ant.

Mode 3. EUT in Z-axis + 2.4G + BT with Ant.

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

Mode 4. EUT in Z-axis + 5G + BT with Ant.

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

For Radiated Emission test (Above 1GHz):

The EUT was performed at X axis, Y axis and Z axis position, and the worst case was found at X axis. So the measurement will follow this same test configuration.

Mode 1. CTX - EUT in X-axis

For Radiated Emission Co-location Test:

Mode 1. 2.4GHz WLAN Function + Bluetooth Function

Mode 2. 5GHz WLAN Function + Bluetooth Function

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

The EUT could be applied with 2.4GHz WLAN function, 5GHz WLAN function and Bluetooth function; therefore Co-location Maximum Permissible Exposure (Please refer to FA611516) and Radiated Emission Co-location (please refer to Appendix B) tests are added for simultaneously transmit between 2.4GHz WLAN function, 5GHz WLAN function and Bluetooth function.

3.6. Table for Testing Locations

Test Site Location					
Address:	No.8, Lane 724, Bo-ai St., Jhubei City, Hsinchu County 302, Taiwan, R.O.C.				
TEL:	886-3-656-9065				
FAX:	886-3-656-9085				
Test Site No.	**Site Category**	**Location**	**FCC Reg. No.**	**IC File No.**	**VCCI Reg. No**
03CH01-CB	SAC	Hsin Chu	262045	IC 4086D	-
CO02-CB	Conduction	Hsin Chu	262045	IC 4086D	-
TH01-CB	OVEN Room	Hsin Chu	-	-	-

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

3.7. Table for Supporting Units

For Test Site No: CO02-CB

Support Unit	Brand	Model	FCC ID
AP Router	Planex	GW-AP54SGX	KA220030603014-1
Bluetooth keyboard	Microsoft	1390	C3K1390
NB	DELL	E6430	DoC
Mouse	Logitech	M-U0026	DoC
Earphone	SHYARO CHI	MIC-04	N/A
Fixture	Abocom	AM7221T-X10	N/A

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

Support Unit	Brand	Model	FCC ID
AP Router	Netgear	R6300V2	PY313200227
Bluetooth keyboard	iCooky	SK068	DoC
NB	DELL	E4300	DoC
Mouse	Logitech	M-U0026	DoC
Earphone	e-Power	S90W	N/A
Fixture	Abocom	AM7221T-X10	N/A

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

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	DoC
Fixture	Abocom	AM7221T-X10	N/A

For Test Site No: TH01-CB

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	DoC
Fixture	Abocom	AM7221T-X10	N/A

3.8. Table for Parameters of Test Software Setting

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

Test Software Version	MT7662 QA Version 1.0.3.13					
Mode	Test Frequency (MHz)					
	NCB: 20MHz					
	5180 MHz	5200 MHz	5240 MHz	5745 MHz	5785 MHz	5825 MHz
802.11a	25	2C	23	24	2C	27
802.11ac MCS0/Nss1 VHT20	26/29	2A/2D	26/29	23/24	2C/2D	26/27
Mode	NCB: 40MHz					
802.11ac MCS0/Nss1 VHT40	5190 MHz		5230 MHz	5755 MHz		5795 MHz
	1D/20		25/28	1E/1F		26/27
Mode	NCB: 80MHz					
802.11ac MCS0/Nss1 VHT80	5210 MHz			5775 MHz		
	1B/1E			1E/1F		

3.9. EUT Operation during Test

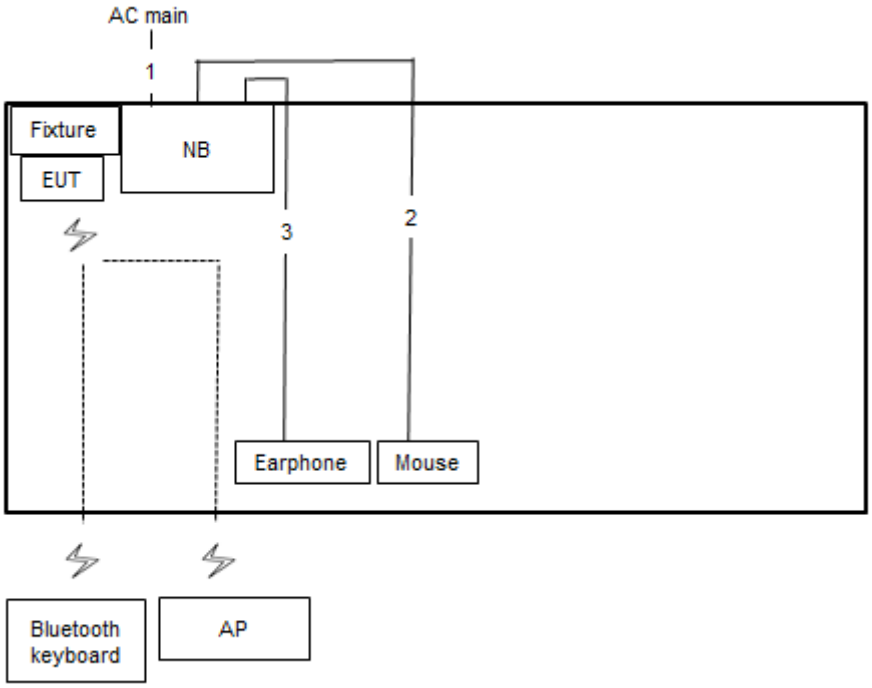
The EUT was programmed to be in continuously transmitting mode.

3.10. Duty Cycle

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11a	1.430	1.650	86.67	0.62	0.70
802.11ac MCS0/Nss1 VHT20	1.353	1.572	86.07	0.65	0.74
802.11ac MCS0/Nss1 VHT40	0.637	0.879	72.47	1.40	1.57
802.11ac MCS0/Nss1 VHT80	0.301	0.538	55.95	2.52	3.32

3.11. Test Configurations

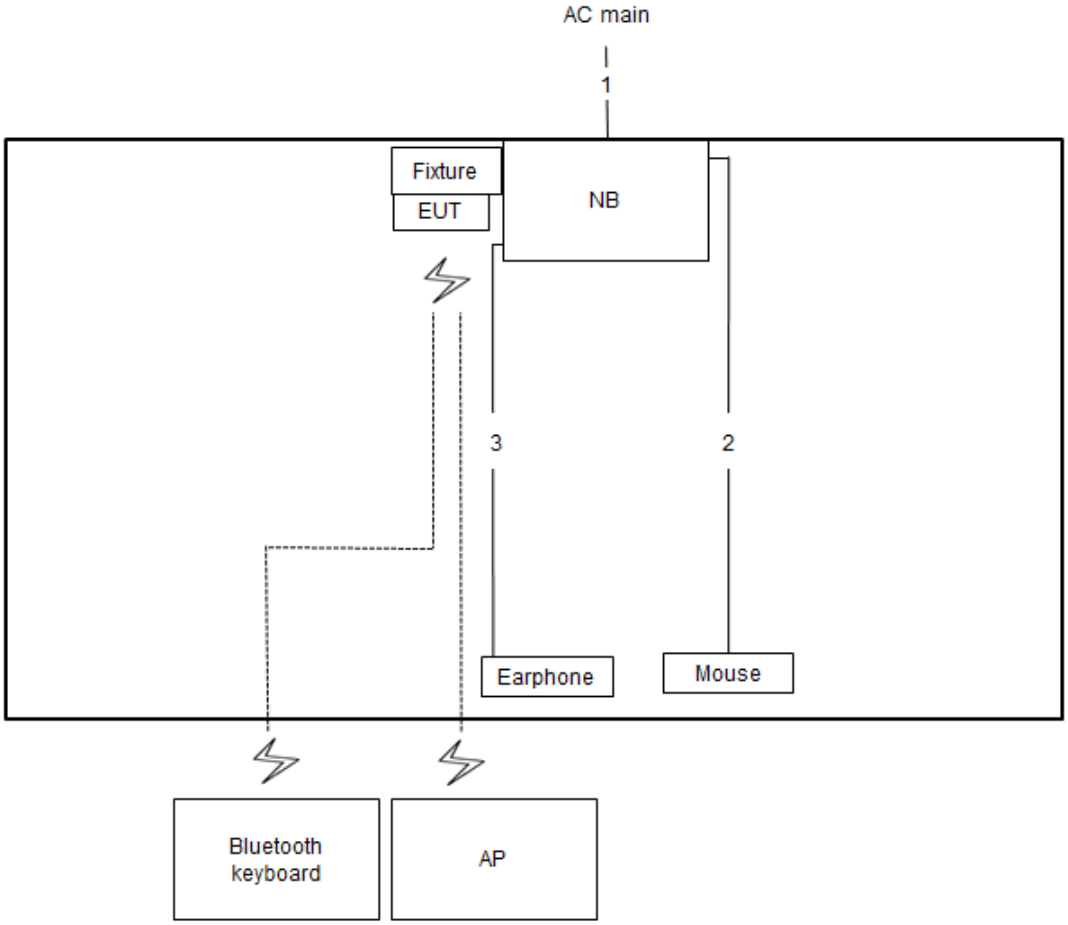
3.11.1. AC Power Line Conduction Emissions Test Configuration



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

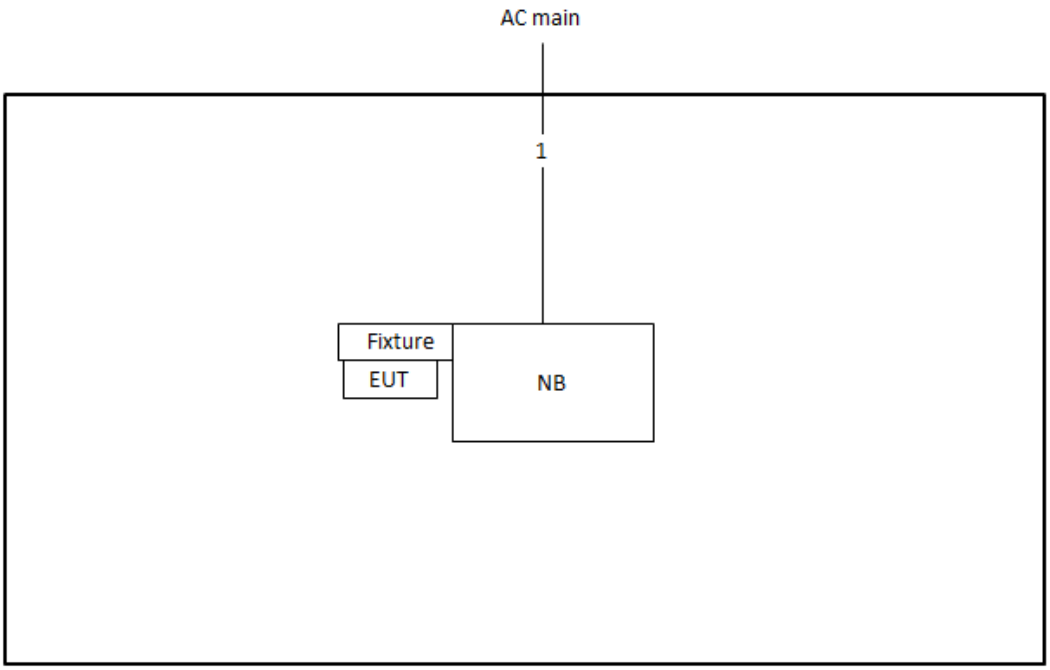
3.11.2. Radiation Emissions Test Configuration

Test Configuration: 30MHz ~1GHz



Item	Connection	Shielded	Length
1	Power cable	No	2.6m
2	USB cable	Yes	1.8m
3	Audio cable	No	1.4m

Test Configuration: above 1GHz



Item	Connection	Shielded	Length
1	Power cable	No	2.6m

4. TEST RESULT

4.1. AC Power Line Conducted Emissions Measurement

4.1.1. Limit

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

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

4.1.2. Measuring Instruments and Setting

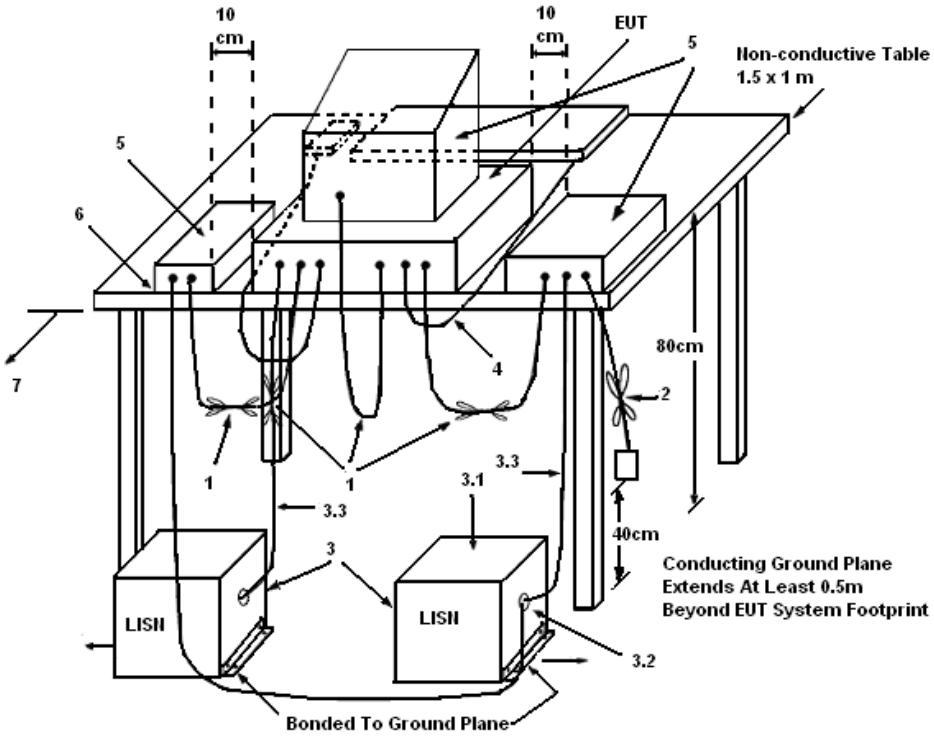
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

4.1.3. Test Procedures

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

4.1.4. Test Setup Layout



LEGEND:

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

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

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

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

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

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

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

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

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

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

4.1.5. Test Deviation

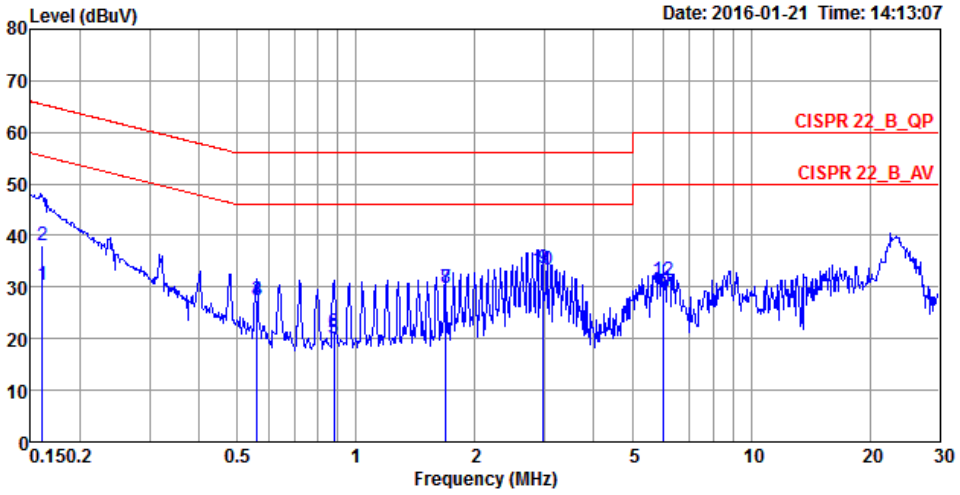
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

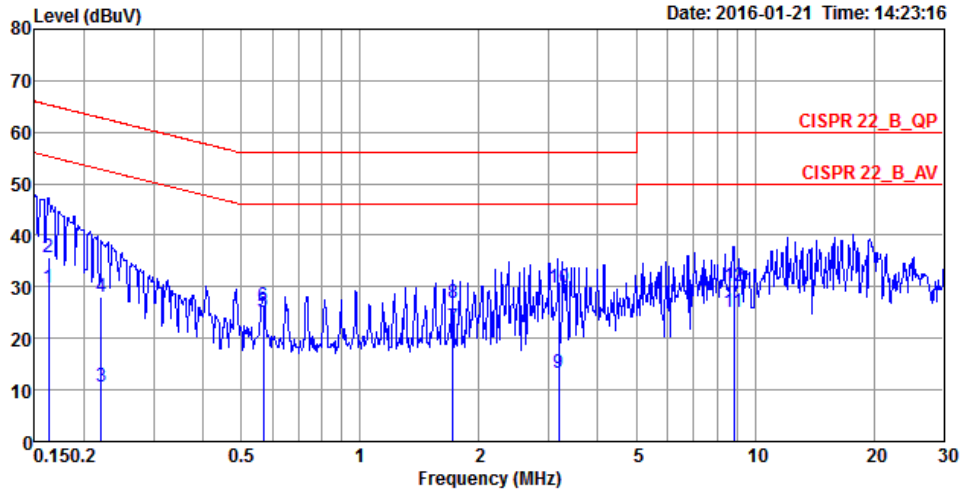
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	24°C	Humidity	55%
Test Engineer	Da Deng	Phase	Line
Configuration	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1607	30.55	-24.88	55.43	20.43	9.96	0.16	Average	LINE
2	0.1607	38.18	-27.25	65.43	28.06	9.96	0.16	QP	LINE
3	0.5611	27.54	-18.46	46.00	17.32	10.02	0.20	Average	LINE
4	0.5611	27.55	-28.45	56.00	17.33	10.02	0.20	QP	LINE
5	0.8803	20.19	-25.81	46.00	9.96	10.04	0.19	Average	LINE
6	0.8803	21.37	-34.63	56.00	11.14	10.04	0.19	QP	LINE
7	1.6905	29.76	-16.24	46.00	19.45	10.07	0.24	Average	LINE
8	1.6905	29.92	-26.08	56.00	19.61	10.07	0.24	QP	LINE
9	2.9790	33.58	-12.42	46.00	23.19	10.10	0.29	Average	LINE
10	2.9790	33.30	-22.70	56.00	22.91	10.10	0.29	QP	LINE
11	5.9685	29.44	-20.56	50.00	18.96	10.13	0.35	Average	LINE
12	5.9685	31.35	-28.65	60.00	20.87	10.13	0.35	QP	LINE

Temperature	24°C	Humidity	55%
Test Engineer	Da Deng	Phase	Neutral
Configuration	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1624	29.96	-25.38	55.34	19.84	9.96	0.16	Average	NEUTRAL
2	0.1624	35.77	-29.57	65.34	25.65	9.96	0.16	QP	NEUTRAL
3	0.2208	10.57	-42.22	52.79	0.43	9.96	0.18	Average	NEUTRAL
4	0.2208	28.02	-34.77	62.79	17.88	9.96	0.18	QP	NEUTRAL
5	0.5701	25.15	-20.85	46.00	14.98	9.97	0.20	Average	NEUTRAL
6	0.5701	26.18	-29.82	56.00	16.01	9.97	0.20	QP	NEUTRAL
7	1.7162	22.03	-23.97	46.00	11.80	9.99	0.24	Average	NEUTRAL
8	1.7162	26.95	-29.05	56.00	16.72	9.99	0.24	QP	NEUTRAL
9	3.1816	13.36	-32.64	46.00	3.05	10.01	0.30	Average	NEUTRAL
10	3.1816	29.68	-26.32	56.00	19.37	10.01	0.30	QP	NEUTRAL
11	8.8223	24.96	-25.04	50.00	14.46	10.13	0.37	Average	NEUTRAL
12	8.8223	30.02	-29.98	60.00	19.52	10.13	0.37	QP	NEUTRAL

Note:

Level = Read Level + LISN Factor + Cable Loss.

4.2. 26dB Bandwidth and 99% Occupied Bandwidth Measurement

4.2.1. Limit

No restriction limits.

4.2.2. Measuring Instruments and Setting

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

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

4.2.3. Test Procedures

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

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

4.2.4. Test Setup Layout

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

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

4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

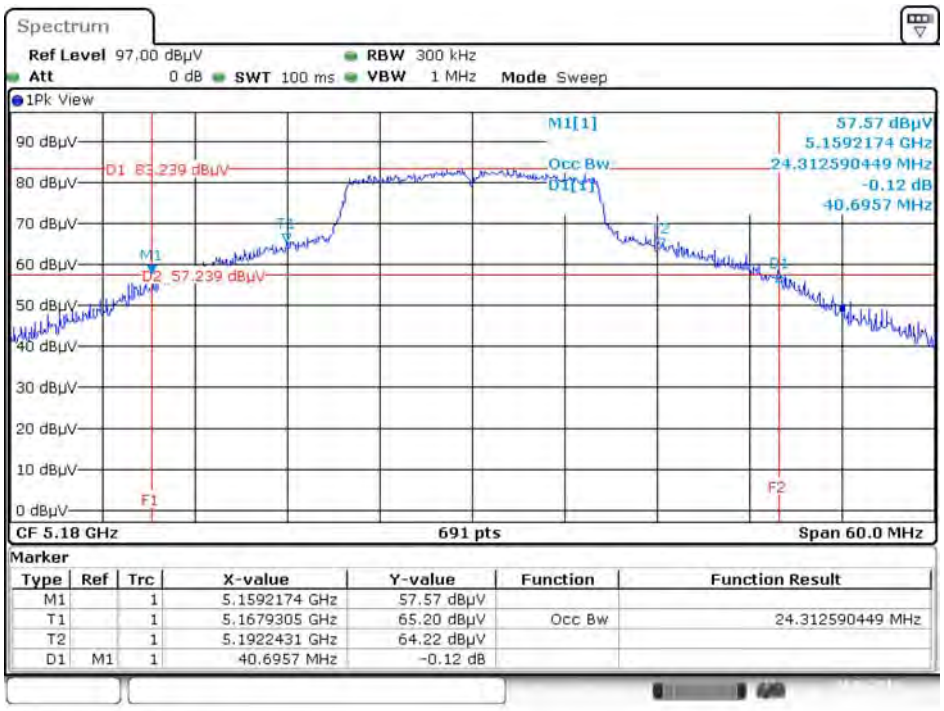
The EUT was programmed to be in continuously transmitting mode.

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

Temperature	25°C	Humidity	58%
Test Engineer	Serway Li / Peter Wu		

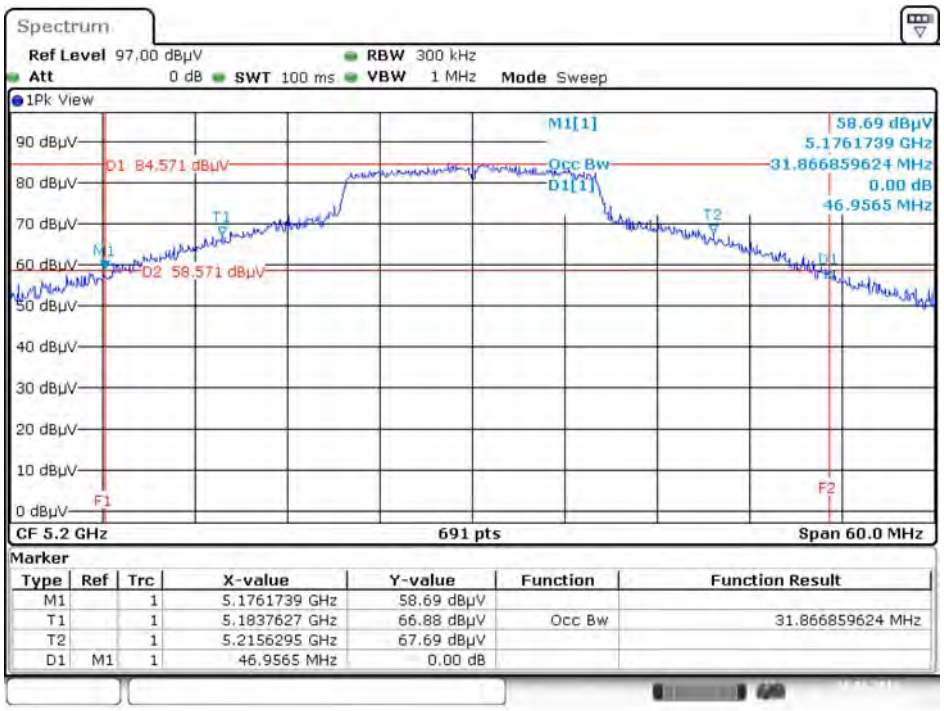
Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5180 MHz	40.70	24.31
	5200 MHz	46.96	31.87
	5240 MHz	34.17	19.71
	5745 MHz	37.65	19.62
	5785 MHz	50.70	33.69
	5825 MHz	44.78	30.56
802.11ac MCS0/Nss1 VHT20	5180 MHz	37.65	19.10
	5200 MHz	45.30	30.04
	5240 MHz	37.30	19.28
	5745 MHz	26.61	17.97
	5785 MHz	46.87	32.04
	5825 MHz	33.65	18.49
802.11ac MCS0/Nss1 VHT40	5190 MHz	41.59	36.47
	5230 MHz	81.45	38.78
	5755 MHz	41.74	36.47
	5795 MHz	80.73	38.06
802.11ac MCS0/Nss1 VHT80	5210 MHz	80.87	75.25
	5775 MHz	80.58	75.25

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



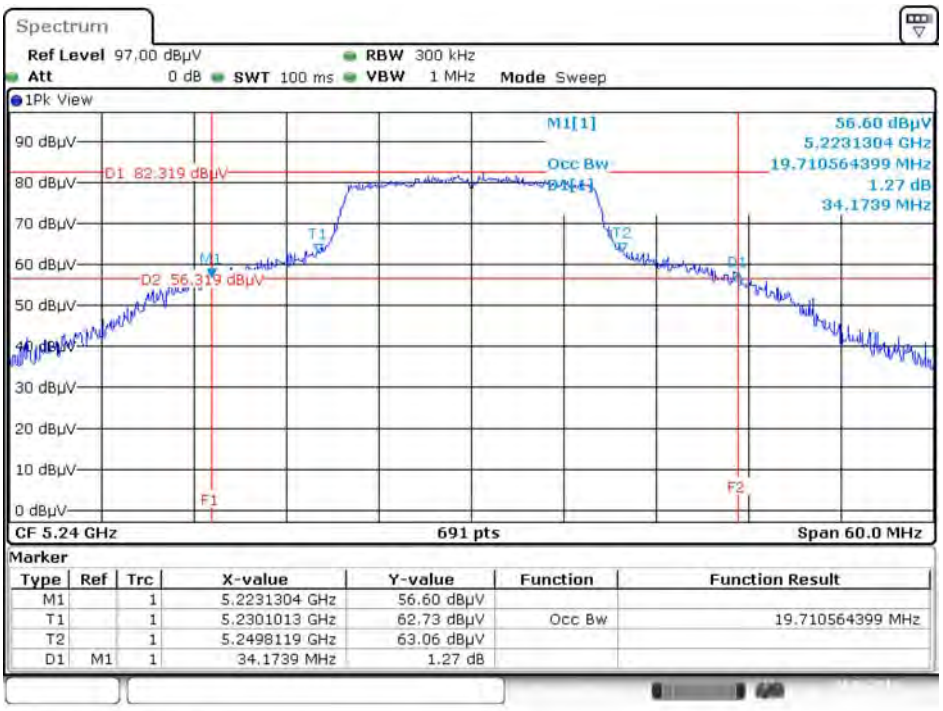
Date: 26.JAN.2016 14:05:14

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



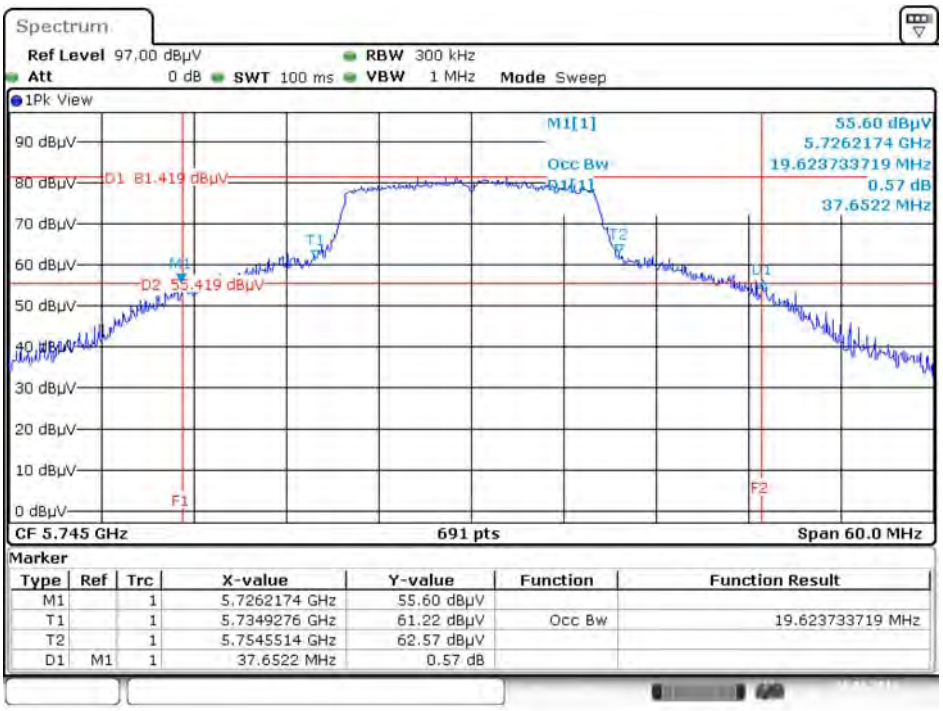
Date: 26.JAN.2016 14:11:48

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



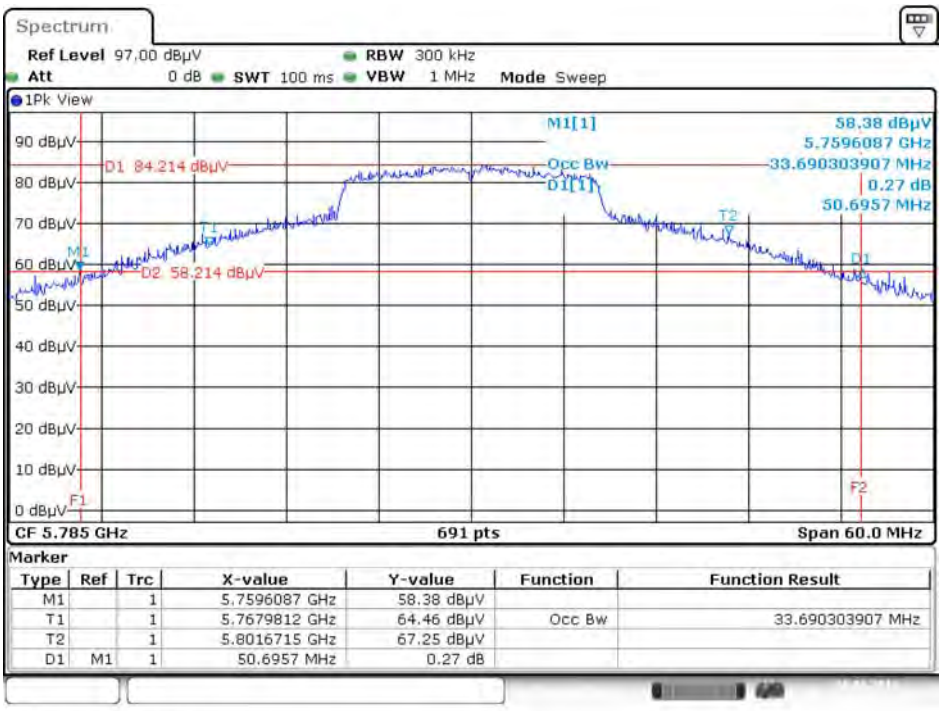
Date: 26.JAN.2016 14:14:47

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



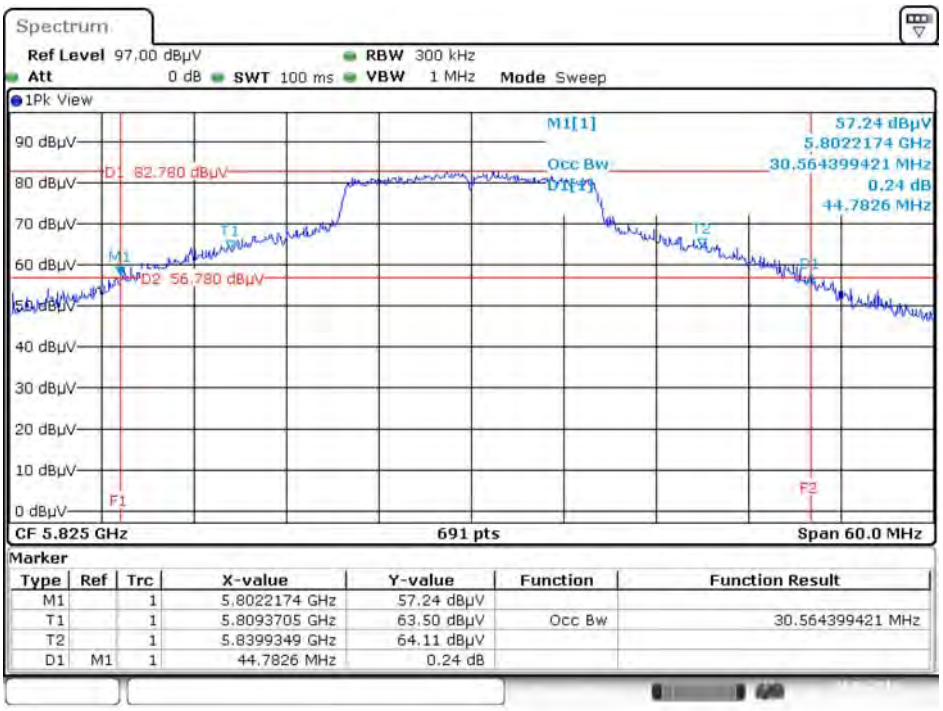
Date: 26.JAN.2016 14:17:02

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



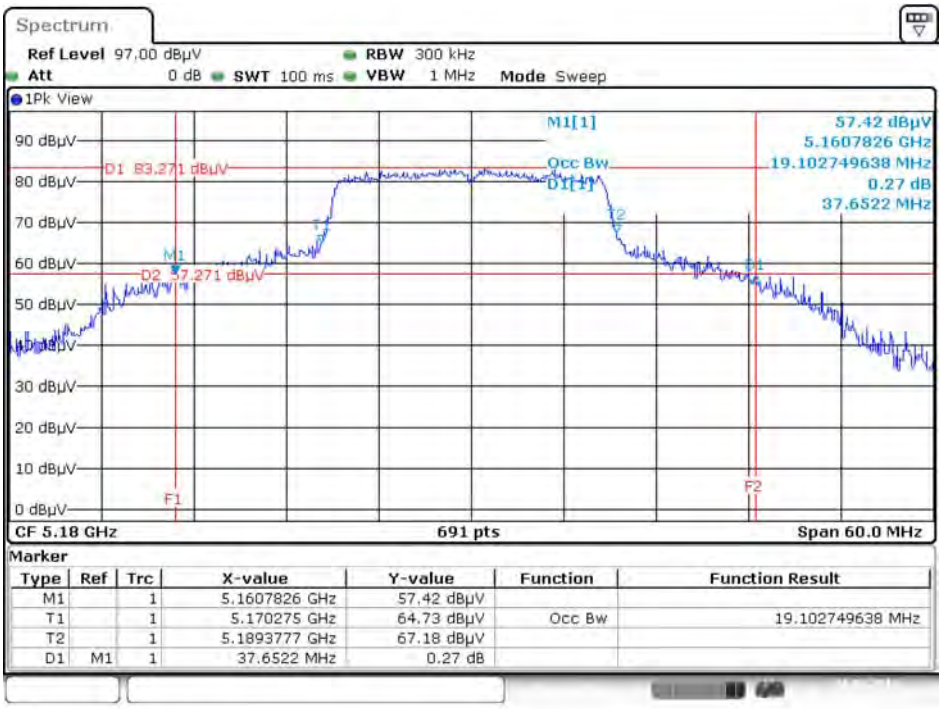
Date: 26.JAN.2016 14:18:34

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



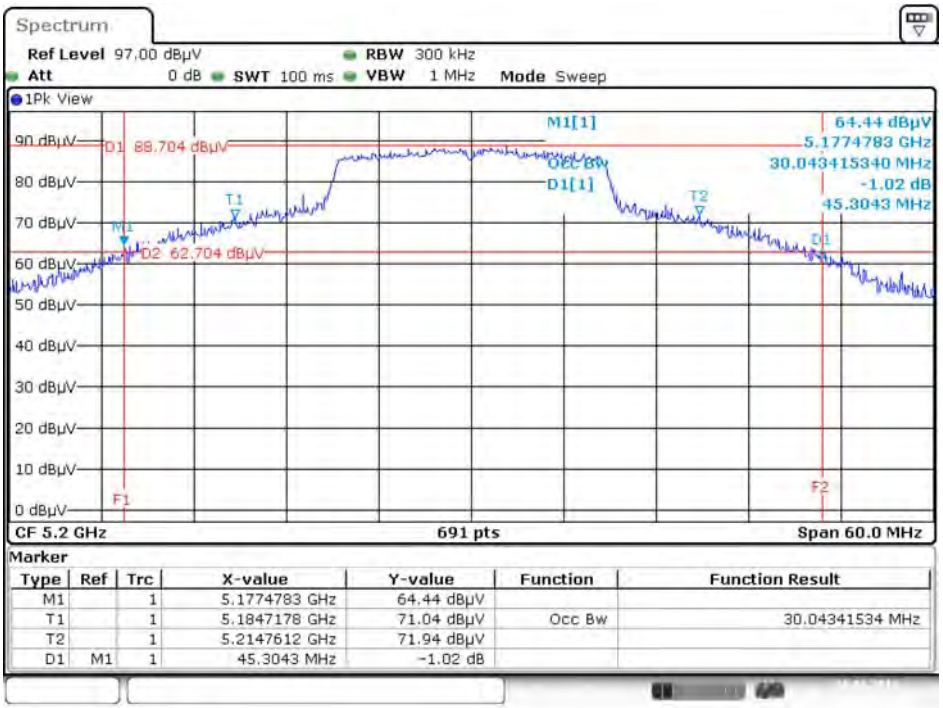
Date: 26.JAN.2016 14:20:00

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



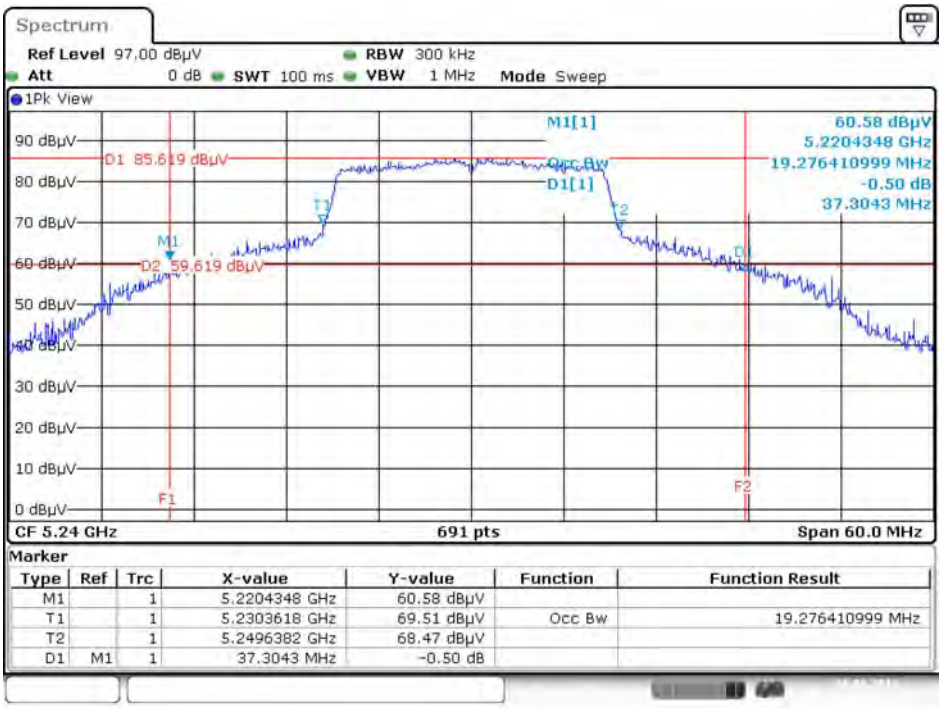
Date: 26.JAN.2016 14:22:17

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



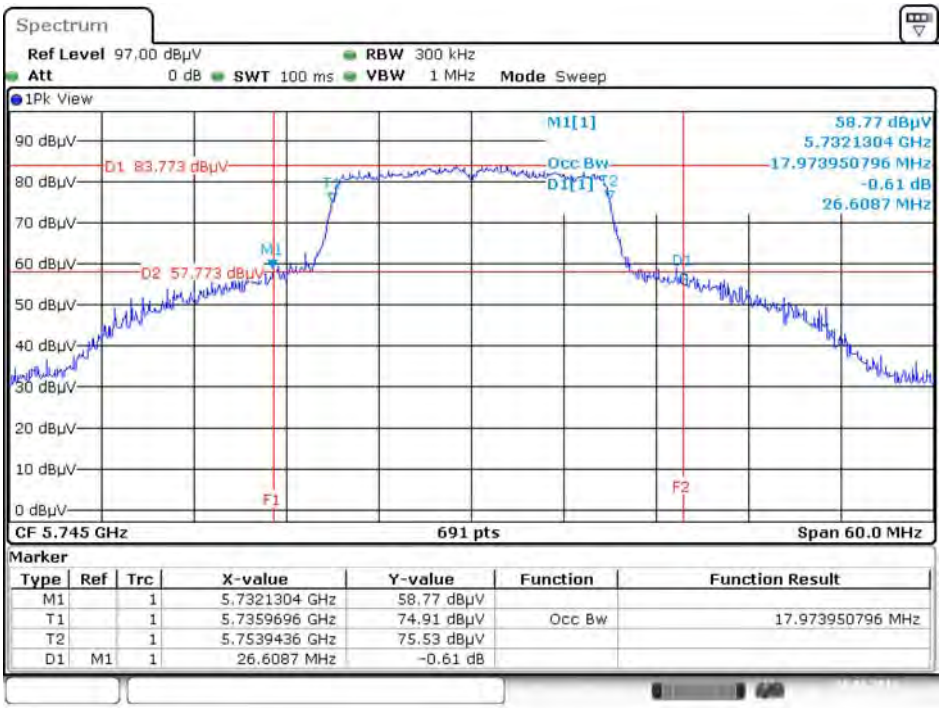
Date: 26.JAN.2016 14:23:35

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



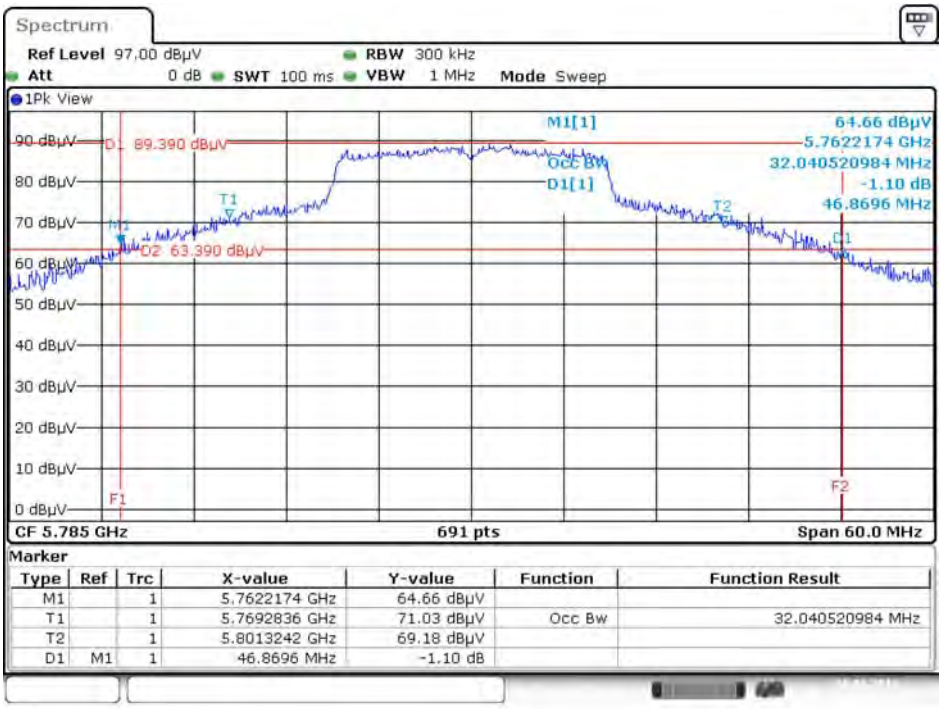
Date: 26.JAN.2016 14:29:09

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



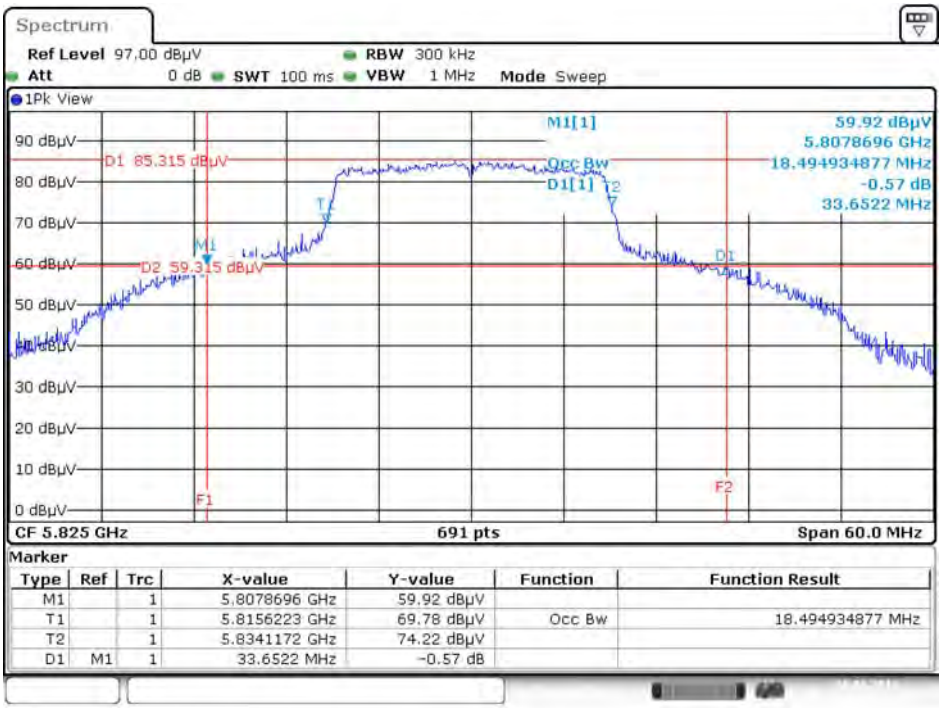
Date: 26.JAN.2016 14:30:46

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



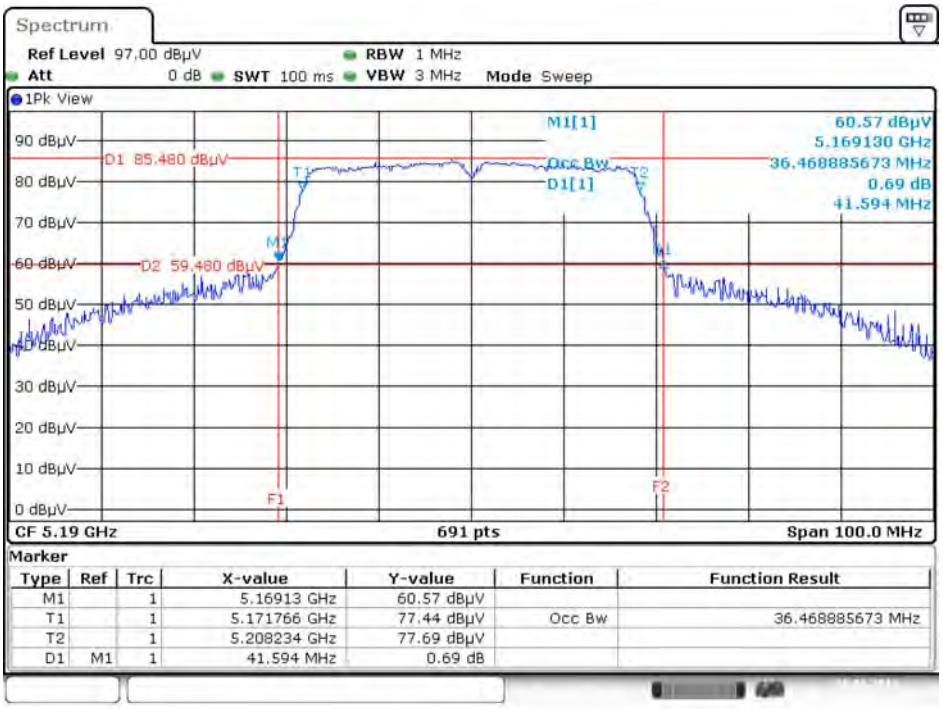
Date: 26.JAN.2016 14:32:39

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



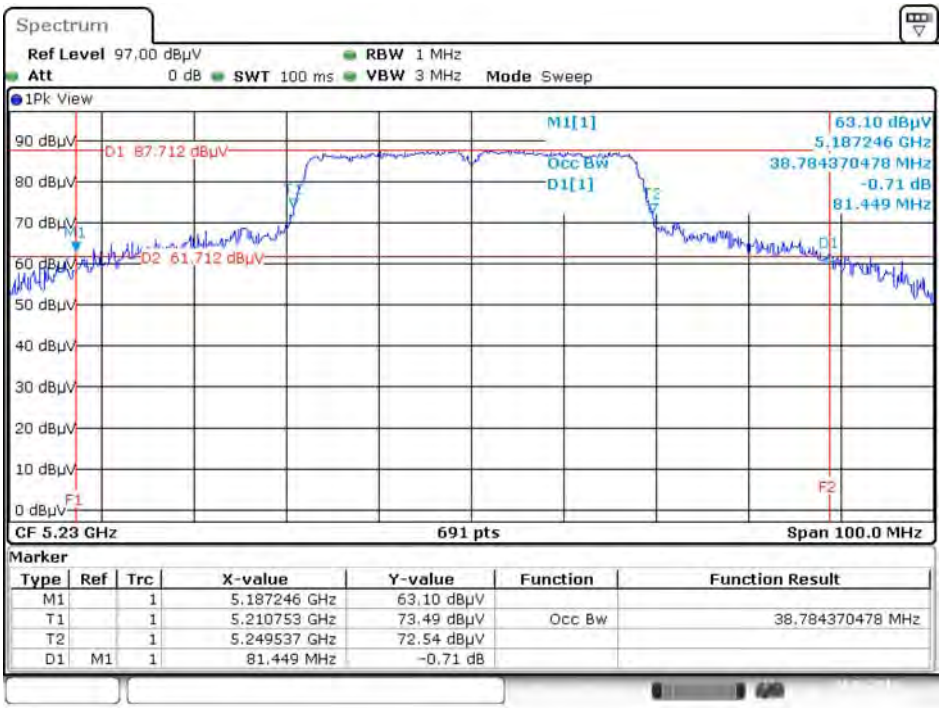
Date: 26.JAN.2016 14:34:23

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



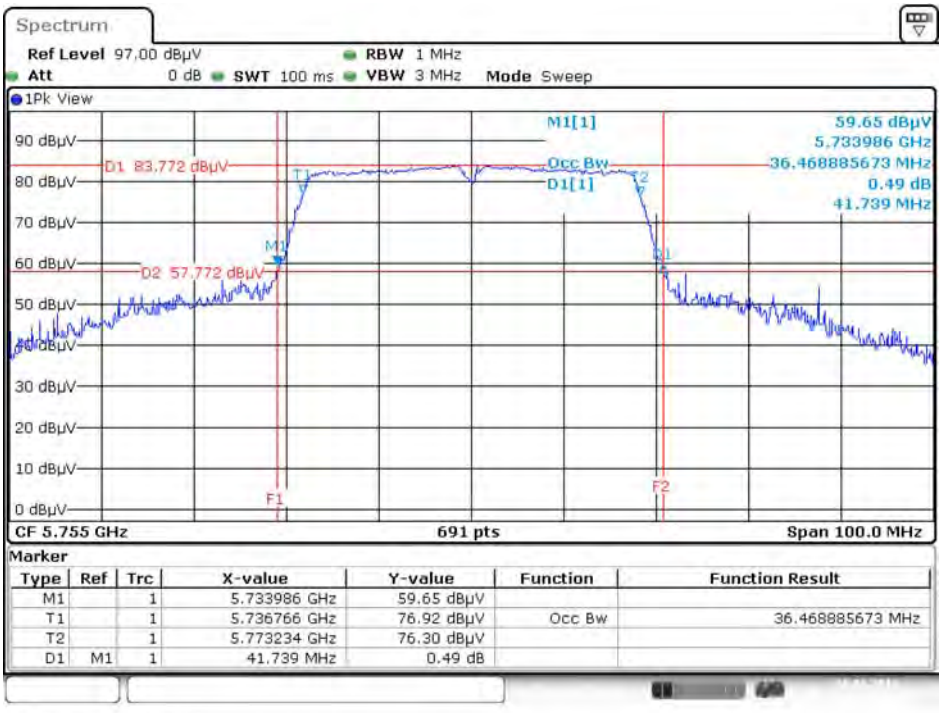
Date: 26.JAN.2016 14:36:39

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



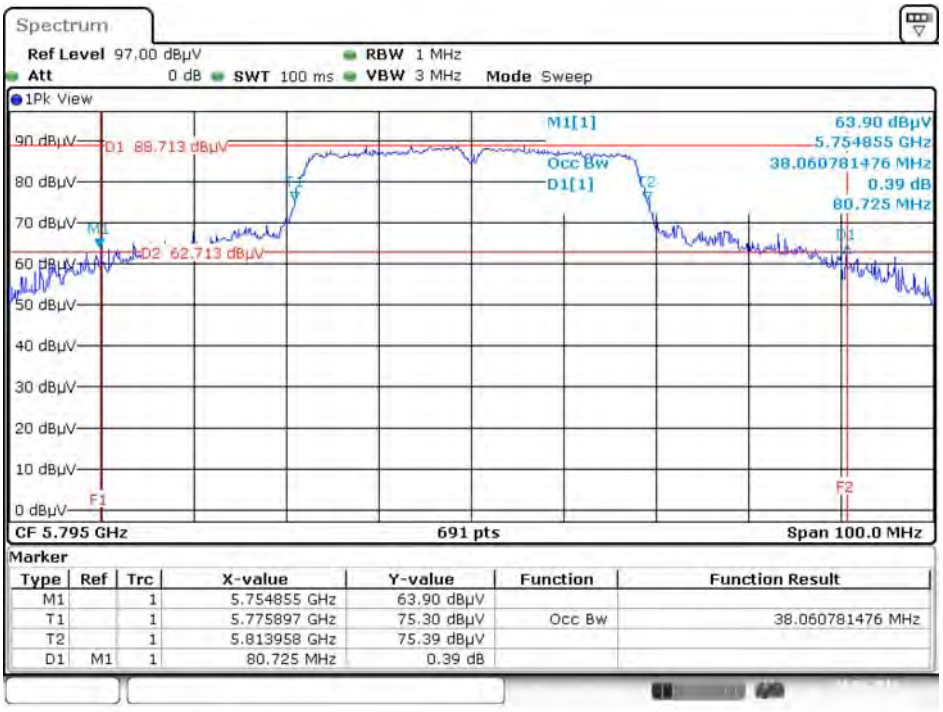
Date: 26.JAN.2016 14:46:58

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



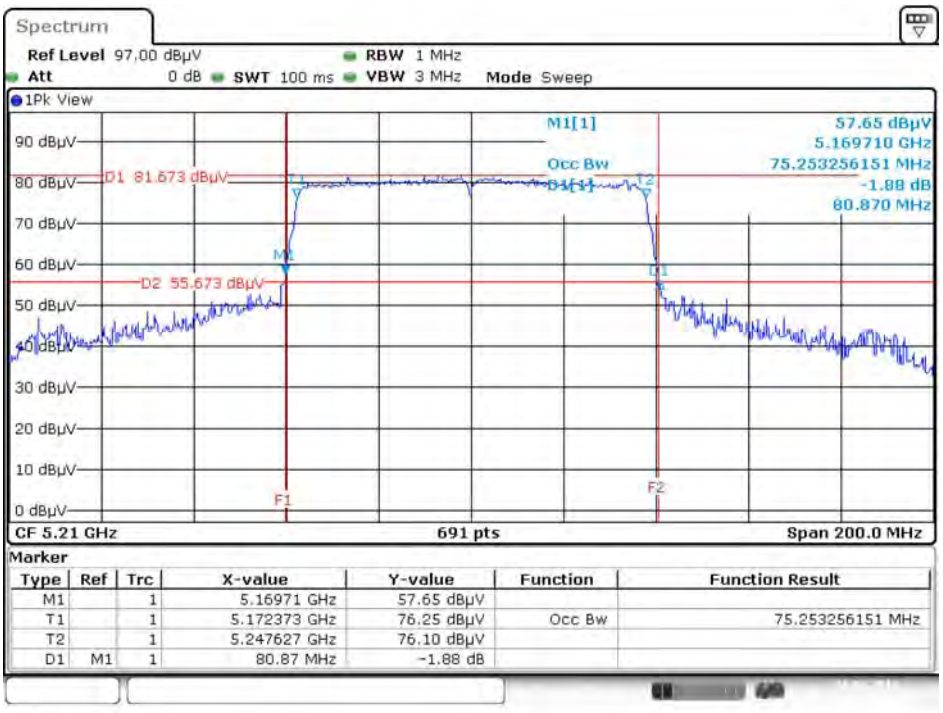
Date: 26.JAN.2016 14:43:30

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



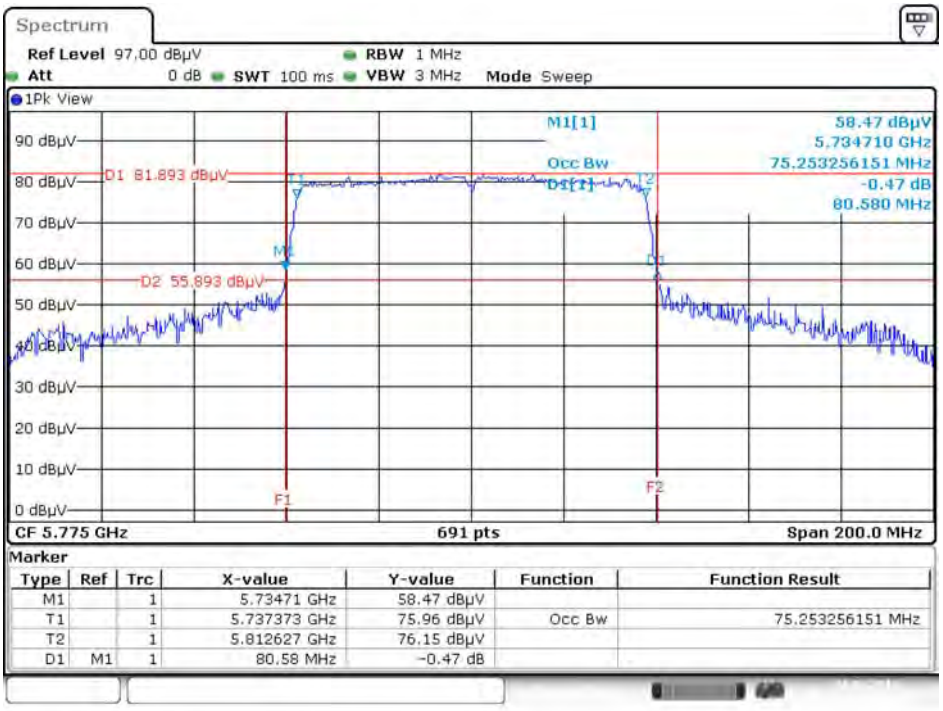
Date: 26.JAN.2016 14:50:13

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



Date: 26.JAN.2016 14:56:31

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



Date: 26.JAN.2016 15:11:00

4.3. 6dB Spectrum Bandwidth Measurement

4.3.1. Limit

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

4.3.2. Measuring Instruments and Setting

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

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

4.3.3. Test Procedures

For Radiated 6dB Bandwidth Measurement:

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

4.3.4. Test Setup Layout

For Radiated 6dB Bandwidth Measurement:

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

4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.3.7. Test Result of 6dB Spectrum Bandwidth

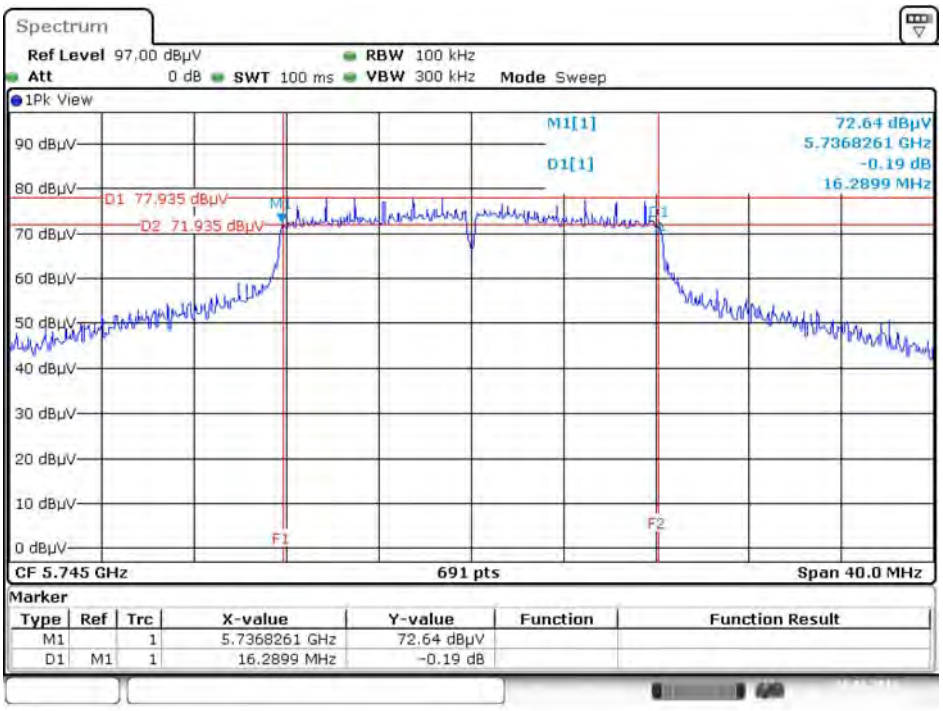
Temperature	25°C	Humidity	58%
Test Engineer	Serway Li / Peter Wu		

Mode	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11a	5745 MHz	16.29	500	Complies
	5785 MHz	16.29	500	Complies
	5825 MHz	16.35	500	Complies
802.11ac MCS0/Nss1 VHT20	5745 MHz	16.99	500	Complies
	5785 MHz	17.57	500	Complies
	5825 MHz	17.28	500	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	35.36	500	Complies
	5795 MHz	34.20	500	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	73.91	500	Complies

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

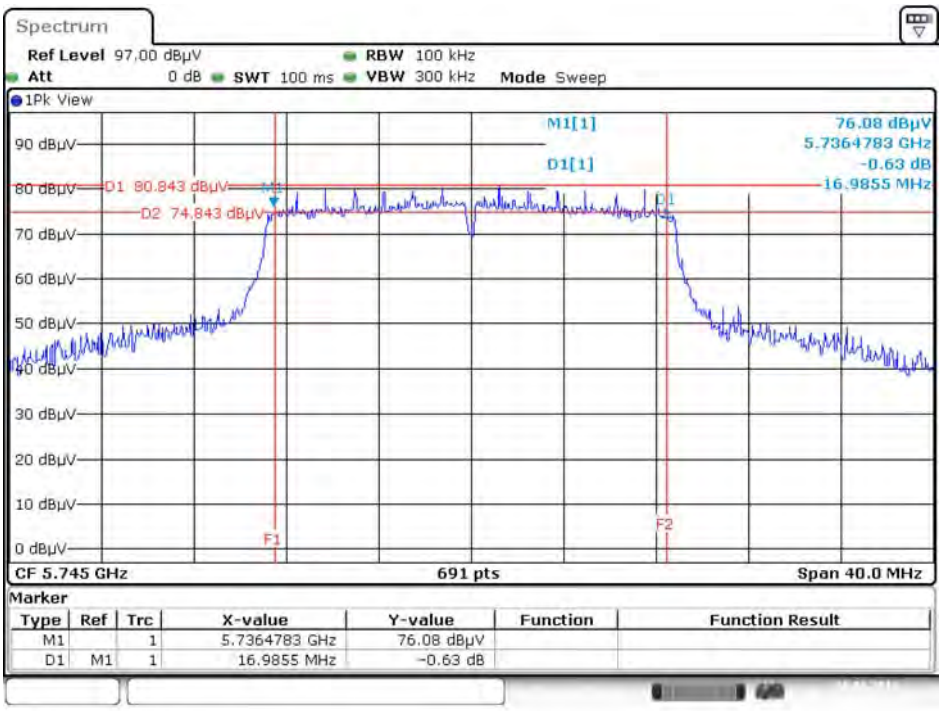
For plots, only the channel with worse result was shown.

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



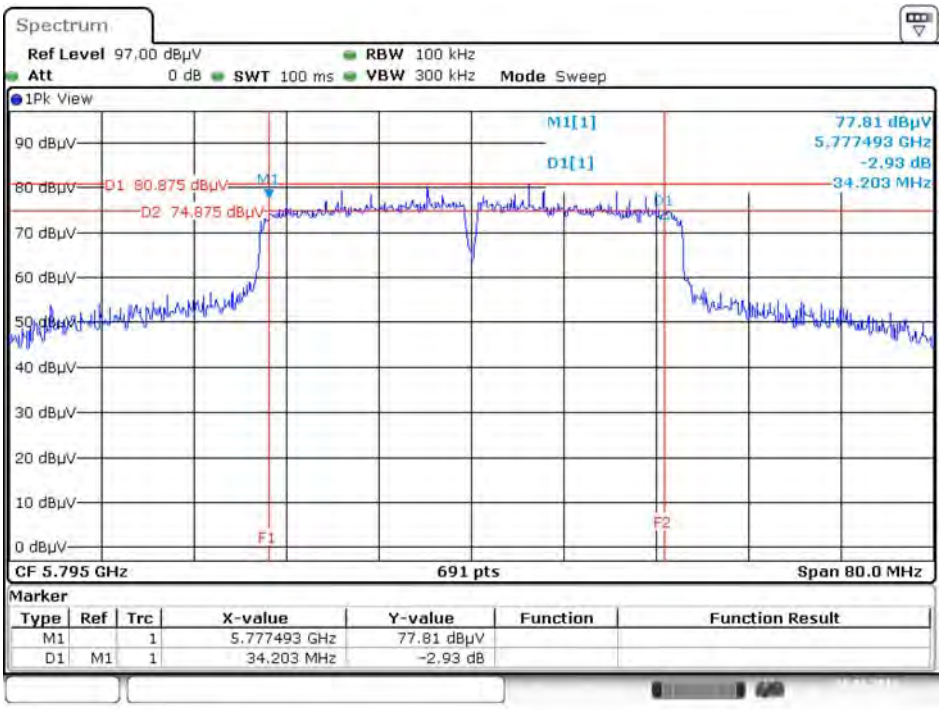
Date: 26.JAN.2016 15:16:54

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



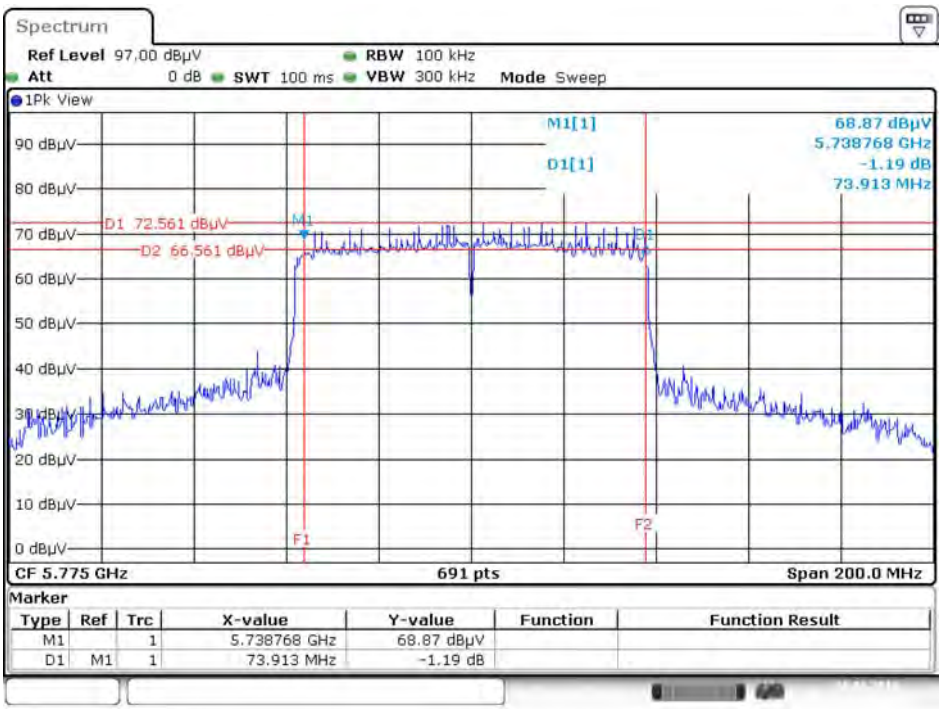
Date: 26.JAN.2016 15:21:43

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2 / 5795MHz



Date: 26.JAN.2016 15:27:57

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



Date: 26.JAN.2016 15:29:40

4.4. Maximum Conducted Output Power Measurement

4.4.1. Limit

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

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

4.4.2. Measuring Instruments and Setting

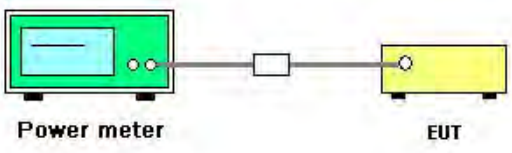
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Detector	AVERAGE

4.4.3. Test Procedures

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

4.4.4. Test Setup Layout



4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.4.7. Test Result of Maximum Conducted Output Power

Temperature	25°C	Humidity	58%
Test Engineer	Serway Li / Peter Wu	Test Date	Jan. 26, 2016

Mode	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
		Ant. 1		
802.11a	5180 MHz	21.49	23.98	Complies
	5200 MHz	22.36	23.98	Complies
	5240 MHz	19.98	23.98	Complies
	5745 MHz	19.39	30.00	Complies
	5785 MHz	22.19	30.00	Complies
	5825 MHz	21.61	30.00	Complies

Mode	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Ant. 1	Ant. 2	Total		
802.11ac MCS0/Nss1 VHT20	5180 MHz	19.16	18.90	22.04	23.98	Complies
	5200 MHz	20.72	20.13	23.45	23.98	Complies
	5240 MHz	19.62	19.35	22.50	23.98	Complies
	5745 MHz	16.70	16.32	19.52	30.00	Complies
	5785 MHz	21.44	21.45	24.46	30.00	Complies
	5825 MHz	18.22	17.98	21.11	30.00	Complies
802.11ac MCS0/Nss1 VHT40	5190 MHz	15.34	15.12	18.24	23.98	Complies
	5230 MHz	19.27	18.95	22.12	23.98	Complies
	5755 MHz	14.78	14.62	17.71	30.00	Complies
	5795 MHz	18.87	18.62	21.76	30.00	Complies
802.11ac MCS0/Nss1 VHT80	5210 MHz	14.23	14.12	17.19	23.98	Complies
	5775 MHz	14.43	14.22	17.34	30.00	Complies

4.5. Power Spectral Density Measurement

4.5.1. Limit

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

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

4.5.2. Measuring Instruments and Setting

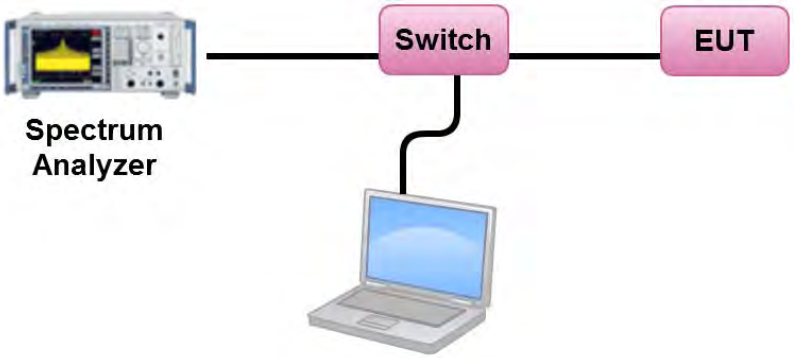
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.5.3. Test Procedures

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

4.5.4. Test Setup Layout



4.5.5. Test Deviation

There is no deviation with the original standard.

4.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.5.7. Test Result of Power Spectral Density

Temperature	25°C	Humidity	58%
Test Engineer	Serway Li / Peter Wu	Test Date	Jan. 26, 2016

Configuration IEEE 802.11a / Ant. 1

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	8.24	11.00	Complies
40	5200 MHz	9.10	11.00	Complies
48	5240 MHz	6.76	11.00	Complies

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	6.10	-3.01	3.09	30.00	Complies
157	5785 MHz	8.97	-3.01	5.96	30.00	Complies
165	5825 MHz	8.38	-3.01	5.37	30.00	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	8.77	11.00	Complies
40	5200 MHz	10.22	11.00	Complies
48	5240 MHz	9.29	11.00	Complies

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	6.30	-3.01	3.29	30.00	Complies
157	5785 MHz	11.16	-3.01	8.15	30.00	Complies
165	5825 MHz	7.93	-3.01	4.92	30.00	Complies

Note:

Band 1 = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{ch}}\left\{\sum_{k=1}^{N_{SS}} g_{jk}\right\}^2}{N_{ANT}}\right]$ =4.26dBi <6dBi, so the limit doesn't reduce.

Band 4 = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{ch}}\left\{\sum_{k=1}^{N_{SS}} g_{jk}\right\}^2}{N_{ANT}}\right]$ =4.57dBi <6dBi, so the limit doesn't reduce.

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2

Channel	Frequency	Power Density (dBm/MHz)		Max. Limit (dBm/MHz)		Result
38	5190 MHz	2.09		11.00		Complies
46	5230 MHz	5.91		11.00		Complies
Channel	**Frequency**	**Power Density (dBm/MHz)**	**10log(500kHz/RBW) Factor (dB)**	**Power Density (dBm/500kHz)**	**Power Density Limit (dBm/500kHz)**	**Result**
151	5755 MHz	1.46	-3.01	-1.55	30.00	Complies
159	5795 MHz	5.56	-3.01	2.55	30.00	Complies

Note:

Band 1 = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{ch}}\left\{\sum_{i=1}^{N_{ANT}} g_{ji}\right\}^2}{N_{ANT}}\right]$ =4.26dBi <6dBi, so the limit doesn't reduce.

Band 4 = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{ch}}\left\{\sum_{i=1}^{N_{ANT}} g_{ji}\right\}^2}{N_{ANT}}\right]$ =4.57dBi <6dBi, so the limit doesn't reduce.

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 1 + Ant. 2

Channel	Frequency	Power Density (dBm/MHz)		Max. Limit (dBm/MHz)		Result
42	5210 MHz	-1.92		11.00		Complies
Channel	**Frequency**	**Power Density (dBm/MHz)**	**10log(500kHz/RBW) Factor (dB)**	**Power Density (dBm/500kHz)**	**Power Density Limit (dBm/500kHz)**	**Result**
155	5775 MHz	-1.74	-3.01	-4.75	30.00	Complies

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

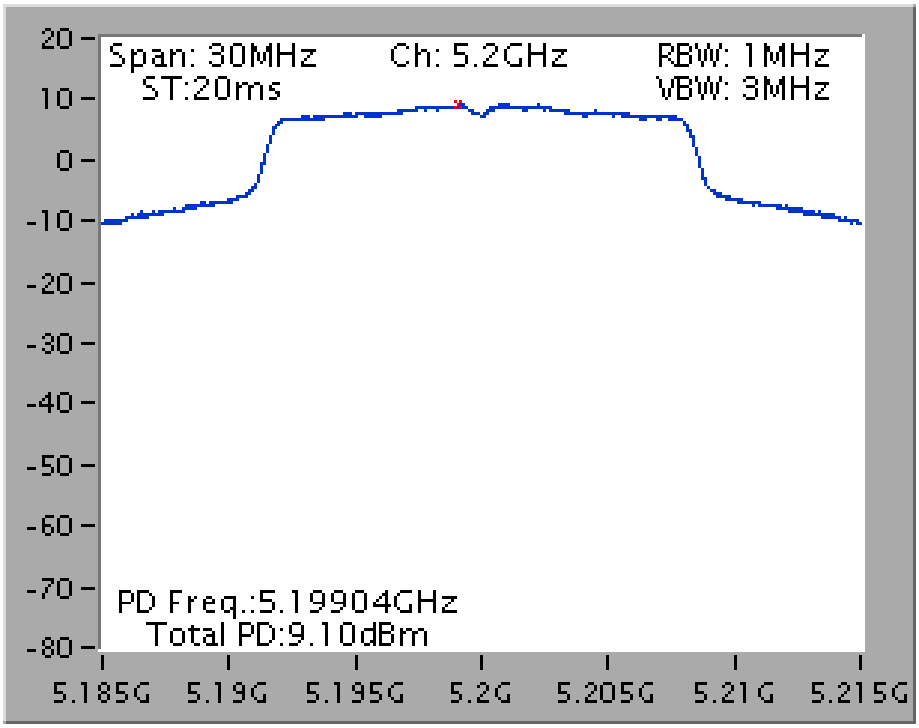
For plots, only the channel with worse result was shown.

Note:

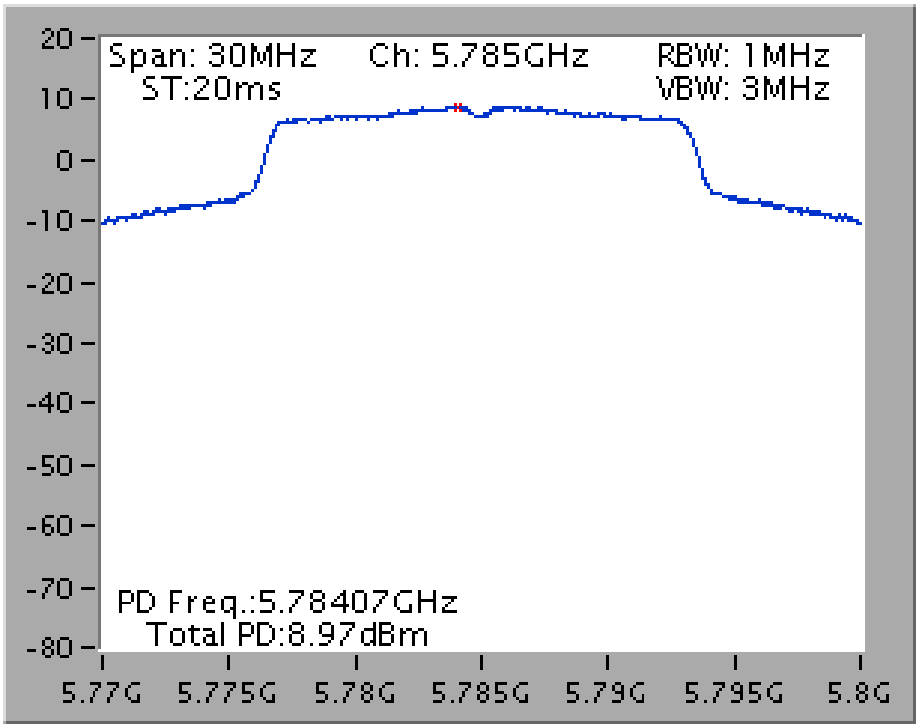
Band 1 = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{ch}}\left\{\sum_{i=1}^{N_{ANT}} g_{ji}\right\}^2}{N_{ANT}}\right]$ =4.26dBi <6dBi, so the limit doesn't reduce.

Band 4 = $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{ch}}\left\{\sum_{i=1}^{N_{ANT}} g_{ji}\right\}^2}{N_{ANT}}\right]$ =4.57dBi <6dBi, so the limit doesn't reduce.

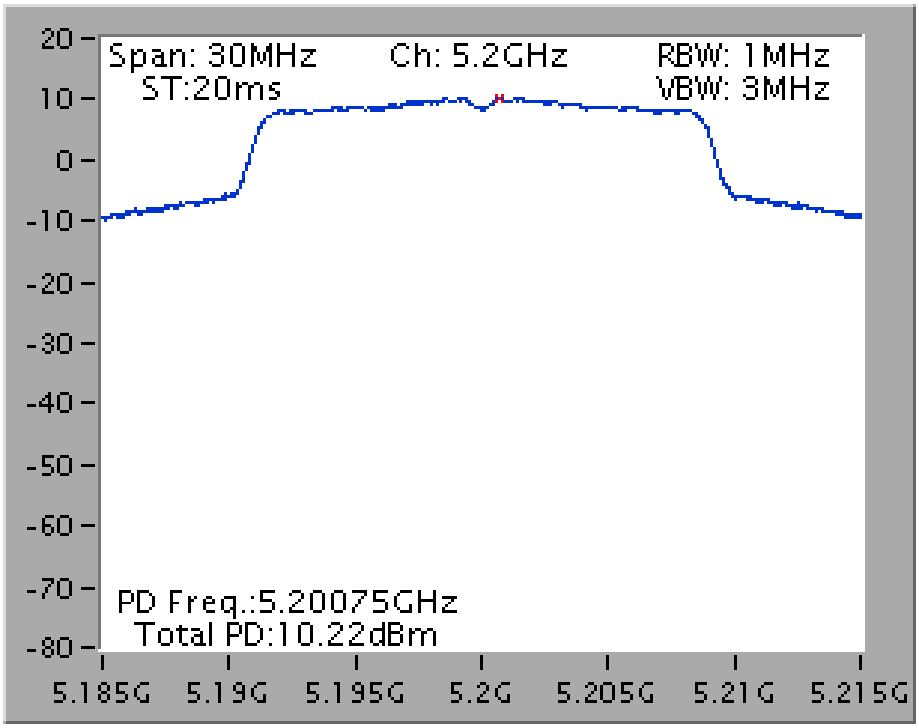
Power Density Plot on Configuration IEEE 802.11a / Ant. 1 / 5200 MHz



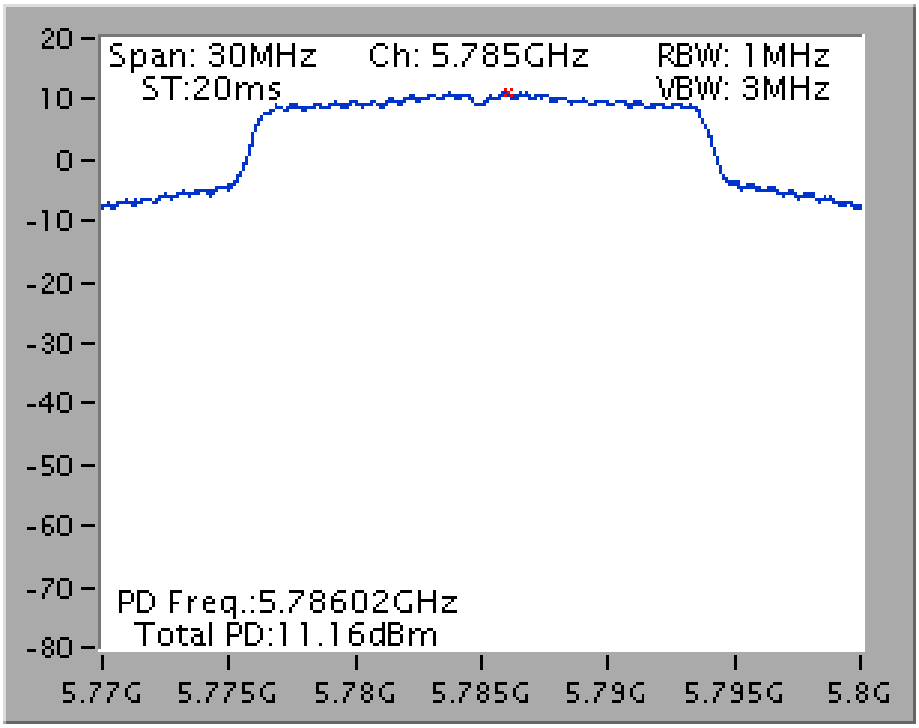
Power Density Plot on Configuration IEEE 802.11a / Ant. 1 / 5785 MHz



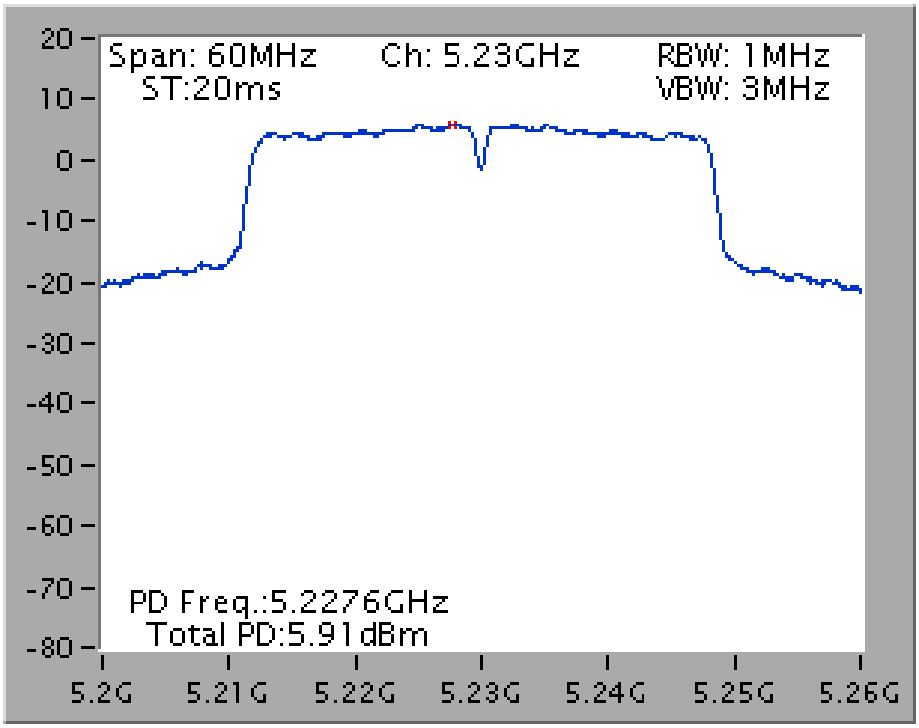
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2 / 5200 MHz



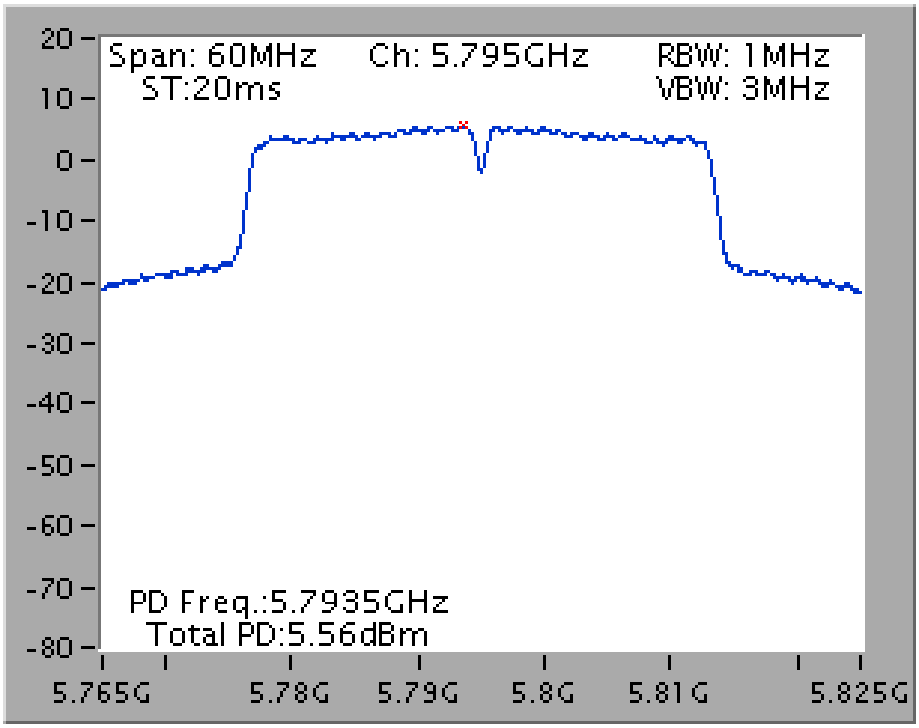
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2 / 5785 MHz



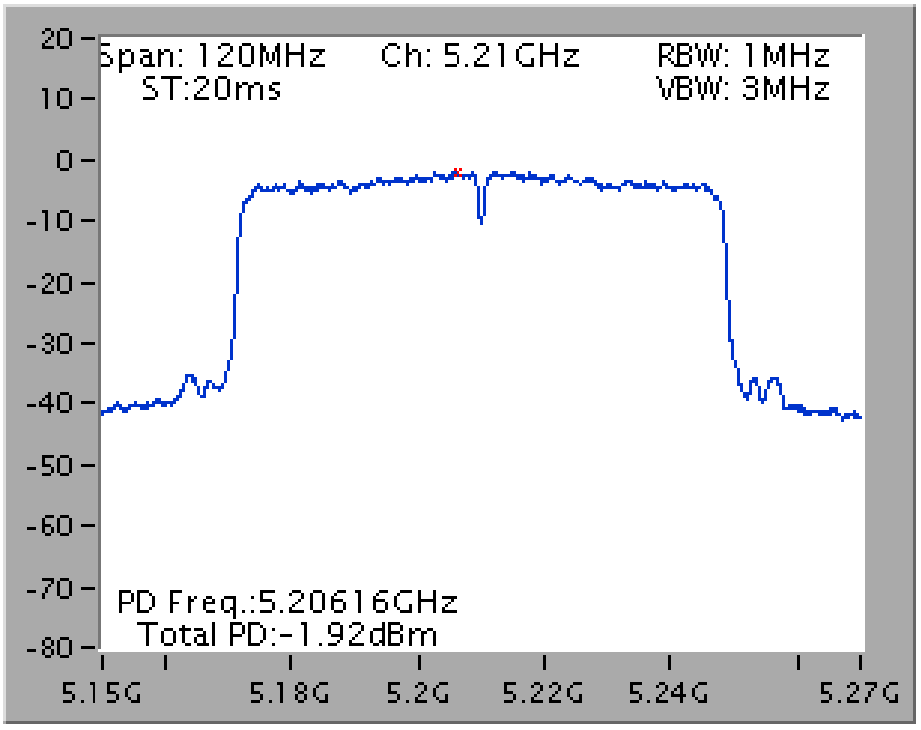
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2 / 5230 MHz



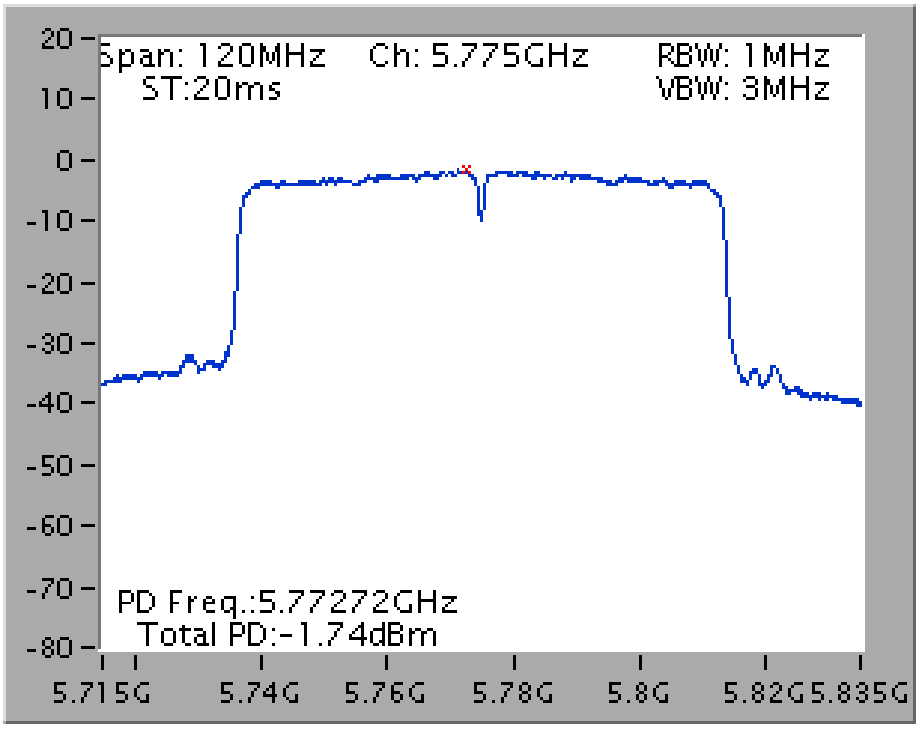
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2 / 5795 MHz



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



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



4.6. Radiated Emissions Measurement

4.6.1. Limit

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

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

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

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

4.6.2. Measuring Instruments and Setting

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

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

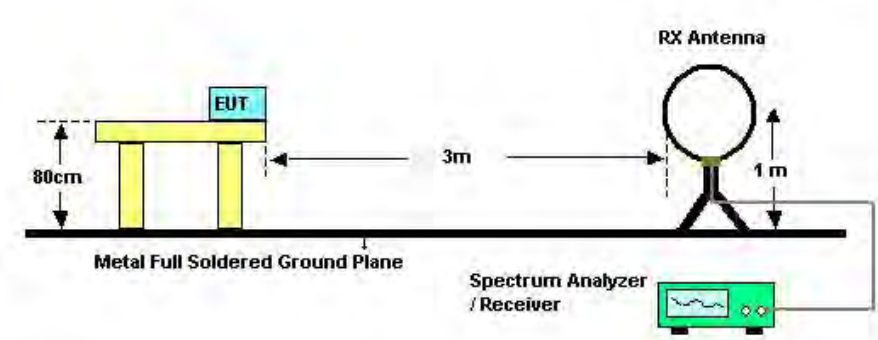
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.6.3. Test Procedures

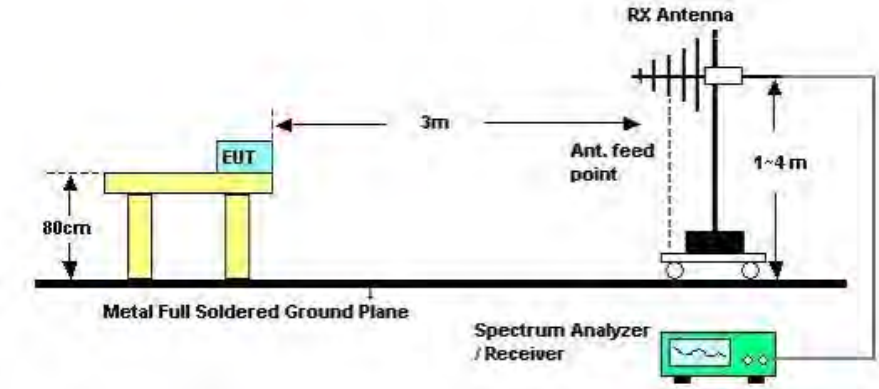
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 1m & 3m far away from the turntable.
2. Power on the EUT and all the supporting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

4.6.4. Test Setup Layout

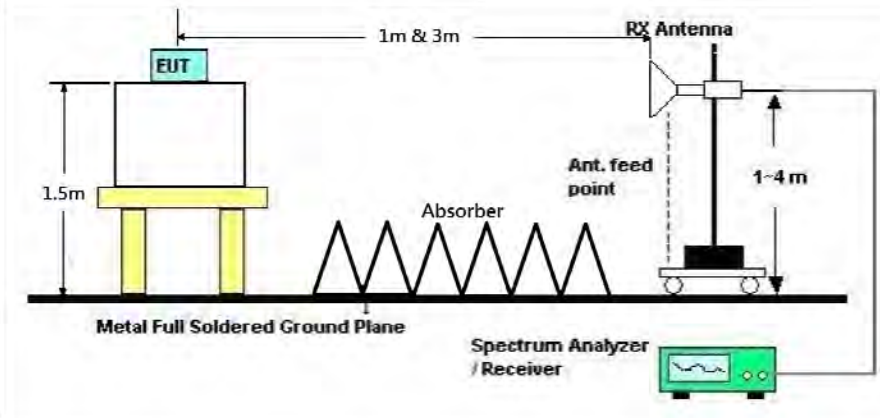
For Radiated Emissions: 9kHz ~30MHz



For Radiated Emissions: 30MHz~1GHz



For Radiated Emissions: Above 1GHz



4.6.5. Test Deviation

There is no deviation with the original standard.

4.6.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

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

Temperature	17°C	Humidity	38%
Test Engineer	Paul Chen	Configurations	Normal Link
Test Date	Jan. 22, 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.

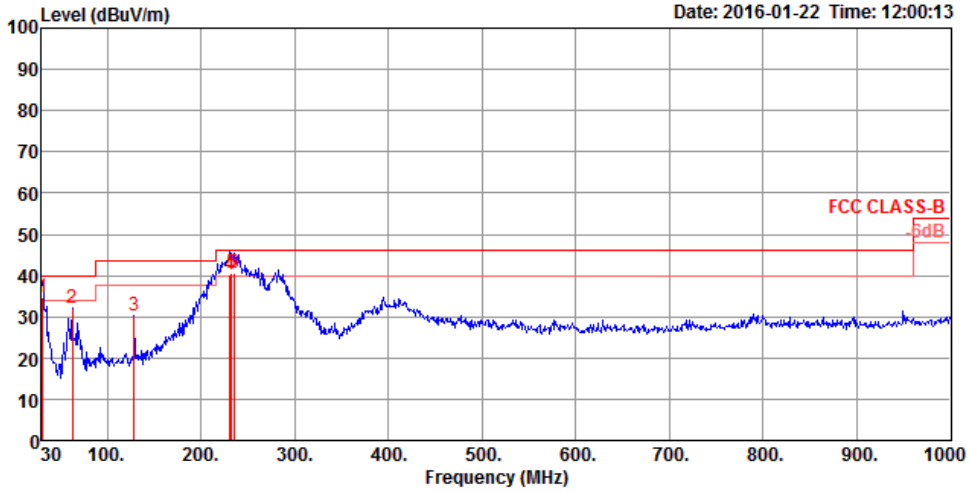
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

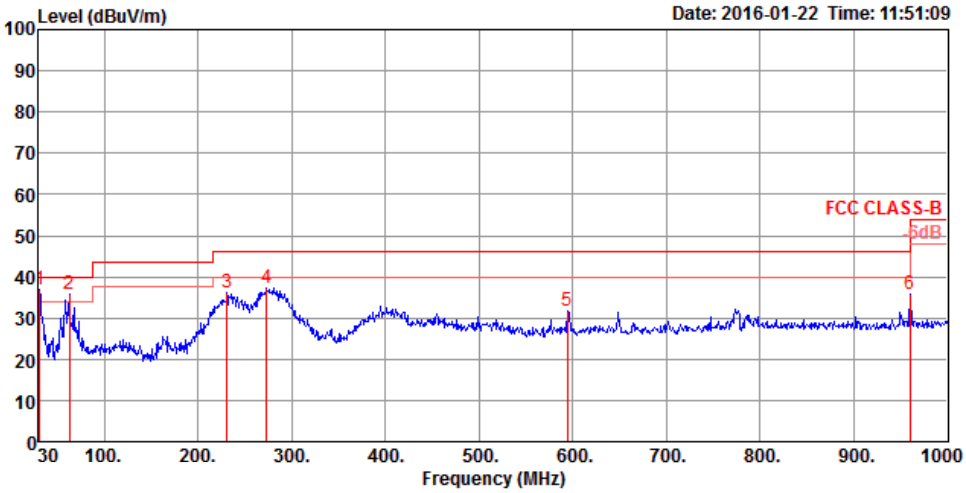
Temperature	17°C	Humidity	38%
Test Engineer	Paul Chen	Configurations	Normal Link
Test Mode	Mode 3		

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	30.97	34.75	40.00	-5.25	41.52	0.50	25.13	32.40	100	62	QP	HORIZONTAL
2	62.98	32.11	40.00	-7.89	50.35	0.70	13.46	32.40	200	187	Peak	HORIZONTAL
3	128.94	30.43	43.50	-13.07	42.99	0.98	18.83	32.37	150	236	Peak	HORIZONTAL
4	230.79	40.13	46.00	-5.87	53.56	1.30	17.58	32.31	150	80	QP	HORIZONTAL
5	232.73	40.59	46.00	-5.41	53.87	1.30	17.73	32.31	150	230	QP	HORIZONTAL
6	235.64	40.55	46.00	-5.45	53.53	1.31	18.02	32.31	200	207	QP	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	30.97	36.94	40.00	-3.06	43.71	0.50	25.13	32.40	100	257	Peak	VERTICAL
2	62.98	35.71	40.00	-4.29	53.95	0.70	13.46	32.40	150	266	Peak	VERTICAL
3	230.79	36.21	46.00	-9.79	49.64	1.30	17.58	32.31	200	140	Peak	VERTICAL
4	273.47	37.43	46.00	-8.57	48.68	1.41	19.63	32.29	200	2	Peak	VERTICAL
5	594.54	31.55	46.00	-14.45	36.50	2.11	25.35	32.41	100	359	Peak	VERTICAL
6	960.23	35.79	54.00	-18.21	36.09	2.69	28.20	31.19	100	126	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	17°C	Humidity	38%
Test Engineer	Paul Chen	Configurations	IEEE 802.11a CH 36 / Ant. 1
Test Date	Jan. 22, 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	15540.93	61.98	74.00	-12.02	43.00	14.34	38.13	33.49	224	316	Peak	HORIZONTAL
2	15542.47	48.02	54.00	-5.98	29.04	14.34	38.13	33.49	224	316	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	15537.82	63.42	74.00	-10.58	44.44	14.34	38.13	33.49	164	52	Peak	VERTICAL
2	15542.13	49.90	54.00	-4.10	30.92	14.34	38.13	33.49	164	52	Average	VERTICAL

Temperature	17°C	Humidity	38%
Test Engineer	Paul Chen	Configurations	IEEE 802.11a CH 40 / Ant. 1
Test Date	Jan. 22, 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	15595.02	60.34	74.00	-13.66	41.46	14.36	38.05	33.53	135	196	Peak	HORIZONTAL
2	15600.81	47.49	54.00	-6.51	28.66	14.38	37.98	33.53	135	196	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15596.80	61.74	74.00	-12.26	42.86	14.36	38.05	33.53	192	258	Peak	VERTICAL
2	15601.85	47.39	54.00	-6.61	28.56	14.38	37.98	33.53	192	258	Average	VERTICAL

Temperature	17°C	Humidity	38%
Test Engineer	Paul Chen	Configurations	IEEE 802.11a CH 48 / Ant. 1
Test Date	Jan. 22, 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	15718.41	60.46	74.00	-13.54	41.88	14.41	37.84	33.67	152	105	Peak	HORIZONTAL
2	15719.09	47.14	54.00	-6.86	28.56	14.41	37.84	33.67	152	105	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	15715.57	60.60	74.00	-13.40	42.02	14.41	37.84	33.67	152	174	Peak	VERTICAL
2	15718.02	47.46	54.00	-6.54	28.88	14.41	37.84	33.67	152	174	Average	VERTICAL

Temperature	17°C	Humidity	38%
Test Engineer	Paul Chen	Configurations	IEEE 802.11a CH 149 / Ant. 1
Test Date	Jan. 22, 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	11491.38	59.15	74.00	-14.85	40.23	12.90	39.20	33.18	147	87	Peak	HORIZONTAL
2	11492.14	45.36	54.00	-8.64	26.44	12.90	39.20	33.18	147	87	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	11486.77	45.48	54.00	-8.52	26.56	12.90	39.20	33.18	137	28	Average	VERTICAL
2	11494.64	58.36	74.00	-15.64	39.44	12.90	39.20	33.18	137	28	Peak	VERTICAL

Temperature	17°C	Humidity	38%
Test Engineer	Paul Chen	Configurations	IEEE 802.11a CH 157 / Ant. 1
Test Date	Jan. 22, 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	11569.57	58.87	74.00	-15.13	39.88	12.99	39.20	33.20	106	234	Peak	HORIZONTAL
2	11574.27	45.57	54.00	-8.43	26.58	12.99	39.20	33.20	106	234	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	11567.99	58.51	74.00	-15.49	39.52	12.99	39.20	33.20	123	220	Peak	VERTICAL
2	11574.54	45.95	54.00	-8.05	26.96	12.99	39.20	33.20	123	220	Average	VERTICAL

Temperature	17°C	Humidity	38%
Test Engineer	Paul Chen	Configurations	IEEE 802.11a CH 165 / Ant. 1
Test Date	Jan. 22, 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	11648.13	60.11	74.00	-13.89	41.05	13.08	39.20	33.22	186	300	Peak	HORIZONTAL
2	11650.38	46.11	54.00	-7.89	27.05	13.08	39.20	33.22	186	300	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	11651.45	59.44	74.00	-14.56	40.33	13.13	39.20	33.22	177	52	Peak	VERTICAL
2	11651.48	46.28	54.00	-7.72	27.17	13.13	39.20	33.22	177	52	Average	VERTICAL

Temperature	17°C	Humidity	38%
Test Engineer	Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36 / Ant. 1 + Ant. 2
Test Date	Jan. 22, 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	15541.08	61.13	74.00	-12.87	42.15	14.34	38.13	33.49	135	144	Peak	HORIZONTAL
2	15544.08	47.37	54.00	-6.63	28.39	14.34	38.13	33.49	135	144	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	15536.15	60.27	74.00	-13.73	41.29	14.34	38.13	33.49	151	103	Peak	VERTICAL
2	15542.08	47.62	54.00	-6.38	28.64	14.34	38.13	33.49	151	103	Average	VERTICAL

Temperature	17°C	Humidity	38%
Test Engineer	Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 40 / Ant. 1 + Ant. 2
Test Date	Jan. 22, 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	15596.17	47.32	54.00	-6.68	28.44	14.36	38.05	33.53	119	169	Average	HORIZONTAL
2	15602.98	61.06	74.00	-12.94	42.23	14.38	37.98	33.53	119	169	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	15595.41	60.99	74.00	-13.01	42.11	14.36	38.05	33.53	123	188	Peak	VERTICAL
2	15600.39	47.43	54.00	-6.57	28.55	14.36	38.05	33.53	123	188	Average	VERTICAL

Temperature	17°C	Humidity	38%
Test Engineer	Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 48 / Ant. 1 + Ant. 2
Test Date	Jan. 22, 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	15721.32	47.11	54.00	-6.89	28.53	14.41	37.84	33.67	154	179	Average	HORIZONTAL
2	15724.33	60.60	74.00	-13.40	42.02	14.41	37.84	33.67	154	179	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	15715.22	60.26	74.00	-13.74	41.68	14.41	37.84	33.67	132	123	Peak	VERTICAL
2	15724.11	47.26	54.00	-6.74	28.68	14.41	37.84	33.67	132	123	Average	VERTICAL

Temperature	17°C	Humidity	38%
Test Engineer	Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Ant. 1 + Ant. 2
Test Date	Jan. 22, 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	11485.31	58.20	74.00	-15.80	39.28	12.90	39.20	33.18	185	258	Peak	HORIZONTAL
2	11492.07	45.25	54.00	-8.75	26.33	12.90	39.20	33.18	185	258	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	11492.63	58.64	74.00	-15.36	39.72	12.90	39.20	33.18	166	220	Peak	VERTICAL
2	11493.40	45.61	54.00	-8.39	26.69	12.90	39.20	33.18	166	220	Average	VERTICAL

Temperature	17°C	Humidity	38%
Test Engineer	Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Ant. 1 + Ant. 2
Test Date	Jan. 22, 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	11572.27	45.75	54.00	-8.25	26.76	12.99	39.20	33.20	189	320	Average	HORIZONTAL
2	11573.99	59.33	74.00	-14.67	40.34	12.99	39.20	33.20	189	320	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	11566.63	45.59	54.00	-8.41	26.60	12.99	39.20	33.20	202	294	Average	VERTICAL
2	11573.30	59.19	74.00	-14.81	40.20	12.99	39.20	33.20	202	294	Peak	VERTICAL

Temperature	17°C	Humidity	38%
Test Engineer	Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Ant. 1 + Ant. 2
Test Date	Jan. 22, 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	11646.06	45.99	54.00	-8.01	26.93	13.08	39.20	33.22	143	301	Average	HORIZONTAL
2	11646.89	58.94	74.00	-15.06	39.88	13.08	39.20	33.22	143	301	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11649.65	59.36	74.00	-14.64	40.30	13.08	39.20	33.22	162	334	Peak	VERTICAL
2	11651.69	46.17	54.00	-7.83	27.06	13.13	39.20	33.22	162	334	Average	VERTICAL

Temperature	17°C	Humidity	38%
Test Engineer	Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38 / Ant. 1 + Ant. 2
Test Date	Jan. 22, 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	15565.57	60.85	74.00	-13.15	41.97	14.36	38.05	33.53	130	209	Peak	HORIZONTAL
2	15570.32	47.65	54.00	-6.35	28.77	14.36	38.05	33.53	130	209	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	15570.41	60.69	74.00	-13.31	41.81	14.36	38.05	33.53	125	258	Peak	VERTICAL
2	15570.61	47.62	54.00	-6.38	28.74	14.36	38.05	33.53	125	258	Average	VERTICAL

Temperature	17°C	Humidity	38%
Test Engineer	Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 46 / Ant. 1 + Ant. 2
Test Date	Jan. 22, 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	15689.41	47.18	54.00	-6.82	28.50	14.39	37.91	33.62	104	150	Average	HORIZONTAL
2	15690.16	61.54	74.00	-12.46	42.86	14.39	37.91	33.62	104	150	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	15687.06	61.55	74.00	-12.45	42.87	14.39	37.91	33.62	113	168	Peak	VERTICAL
2	15692.27	47.41	54.00	-6.59	28.78	14.41	37.84	33.62	113	168	Average	VERTICAL

Temperature	17°C	Humidity	38%
Test Engineer	Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Ant. 1 + Ant. 2
Test Date	Jan. 22, 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	11505.21	45.94	54.00	-8.06	27.02	12.90	39.20	33.18	129	172	Average	HORIZONTAL
2	11507.54	59.37	74.00	-14.63	40.45	12.90	39.20	33.18	129	172	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	11507.16	58.87	74.00	-15.13	39.95	12.90	39.20	33.18	121	113	Peak	VERTICAL
2	11512.42	45.70	54.00	-8.30	26.79	12.90	39.20	33.19	121	115	Average	VERTICAL

Temperature	17°C	Humidity	38%
Test Engineer	Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Ant. 1 + Ant. 2
Test Date	Jan. 22, 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	11586.06	45.82	54.00	-8.18	26.79	13.04	39.20	33.21	169	263	Average	HORIZONTAL
2	11587.45	59.16	74.00	-14.84	40.13	13.04	39.20	33.21	169	263	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11590.59	59.44	74.00	-14.56	40.41	13.04	39.20	33.21	144	198	Peak	VERTICAL
2	11590.93	45.72	54.00	-8.28	26.69	13.04	39.20	33.21	144	198	Average	VERTICAL

Temperature	17°C	Humidity	38%
Test Engineer	Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42 / Ant. 1 + Ant. 2
Test Date	Jan. 22, 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	15628.31	47.25	54.00	-6.75	28.47	14.38	37.98	33.58	174	85	Average	HORIZONTAL
2	15630.81	60.71	74.00	-13.29	41.93	14.38	37.98	33.58	174	85	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	15632.01	60.85	74.00	-13.15	42.07	14.38	37.98	33.58	158	119	Peak	VERTICAL
2	15633.92	47.42	54.00	-6.58	28.64	14.38	37.98	33.58	158	119	Average	VERTICAL

Temperature	17°C	Humidity	38%
Test Engineer	Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Ant. 1 + Ant. 2
Test Date	Jan. 22, 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	11549.18	58.90	74.00	-15.10	39.95	12.95	39.20	33.20	138	95	Peak	HORIZONTAL
2	11550.33	45.70	54.00	-8.30	26.71	12.99	39.20	33.20	138	95	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11550.46	45.79	54.00	-8.21	26.80	12.99	39.20	33.20	161	50	Average	VERTICAL
2	11551.32	59.77	74.00	-14.23	40.78	12.99	39.20	33.20	161	50	Peak	VERTICAL

Note:

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

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

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

4.7. Band Edge Emissions Measurement

4.7.1. Limit

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

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

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

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

4.7.2. Measuring Instruments and Setting

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

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

4.7.3. Test Procedures

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

4.7.4. Test Setup Layout

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

4.7.5. Test Deviation

There is no deviation with the original standard.

4.7.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.7.7. Test Result of Band Edge and Fundamental Emissions

Temperature	17°C	Humidity	38%
Test Engineer	Paul Chen	Configurations	IEEE 802.11a CH 36, 40, 48 /Ant. 1
Test Date	Jan. 20, 2016~Jan. 21, 2016		

Channel 36

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5149.00	73.29	74.00	-0.71	66.93	7.78	32.94	31.52	HORIZONTAL	39	250	Peak
2	5149.80	53.73	54.00	-0.27	47.37	7.78	32.94	31.52	HORIZONTAL	39	250	Average
3	5182.20	106.18			99.79	7.78	32.94	31.55	HORIZONTAL	39	250	Peak
4	5183.20	96.72			90.33	7.78	32.94	31.55	HORIZONTAL	39	250	Average

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

Channel 40

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5148.80	62.71	74.00	-11.29	56.35	7.78	32.94	31.52	HORIZONTAL	28	253	Peak
2	5150.00	46.74	54.00	-7.26	40.38	7.78	32.94	31.52	HORIZONTAL	28	253	Average
3	5199.60	98.08			91.68	7.78	32.94	31.56	HORIZONTAL	28	253	Average
4	5202.40	108.07			101.66	7.78	32.94	31.57	HORIZONTAL	28	253	Peak

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

Channel 48

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5144.36	60.65	74.00	-13.35	52.61	7.22	33.74	32.92	175	305	Peak	VERTICAL
2	5150.00	48.79	54.00	-5.21	40.75	7.22	33.74	32.92	175	305	Average	VERTICAL
3	5239.13	97.45			89.13	7.35	33.89	32.92	175	305	Average	VERTICAL
4	5242.60	106.59			98.27	7.35	33.89	32.92	175	305	Peak	VERTICAL
5	5350.00	49.64	54.00	-4.36	41.20	7.30	34.06	32.92	175	305	Average	VERTICAL
6	5354.78	62.94	74.00	-11.06	54.49	7.29	34.08	32.92	175	305	Peak	VERTICAL

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

Temperature	17°C	Humidity	38%
Test Engineer	Paul Chen	Configurations	IEEE 802.11a CH 149, 157, 165 / Ant. 1
Test Date	Jan. 20, 2016		

Channel 149

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5715.00	64.94	68.20	-3.26	57.86	8.02	33.00	32.06	HORIZONTAL	350	252	Peak
2	5725.00	77.95	78.20	-0.25	70.83	8.04	33.00	32.08	HORIZONTAL	350	252	Peak
3	5745.80	94.44			87.30	8.06	33.02	32.10	HORIZONTAL	350	252	Average
4	5747.80	104.79			97.65	8.06	33.02	32.10	HORIZONTAL	350	252	Peak

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

Channel 157

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5710.60	57.67	68.20	-10.53	50.59	8.02	33.00	32.06	HORIZONTAL	349	254	Peak
2	5721.00	63.32	78.20	-14.88	56.24	8.02	33.00	32.06	HORIZONTAL	349	254	Peak
3	5785.80	98.20			90.99	8.10	33.03	32.14	HORIZONTAL	349	254	Average
4	5786.20	108.68			101.47	8.10	33.03	32.14	HORIZONTAL	349	254	Peak
5	5857.40	64.95	78.20	-13.25	57.57	8.19	33.05	32.24	HORIZONTAL	349	254	Peak
6	5869.00	59.98	68.20	-8.22	52.61	8.19	33.06	32.24	HORIZONTAL	349	254	Peak

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

Channel 165

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	5823.40	106.14			98.83	8.16	33.05	32.20	HORIZONTAL	1	243	Peak
2	5825.80	96.22			88.91	8.16	33.05	32.20	HORIZONTAL	1	243	Average
3	5850.20	78.02	78.20	-0.18	70.67	8.18	33.05	32.22	HORIZONTAL	1	243	Peak
4	5861.40	64.68	68.20	-3.52	57.31	8.19	33.06	32.24	HORIZONTAL	1	243	Peak

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

Temperature	17°C	Humidity	38%
Test Engineer	Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36, 40, 48 / Ant. 1 + Ant. 2
Test Date	Jan. 21, 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	5147.11	72.61	74.00	-1.39	64.57	7.22	33.74	32.92	324	11	Peak	HORIZONTAL
2	5150.00	53.79	54.00	-0.21	45.75	7.22	33.74	32.92	324	11	Average	HORIZONTAL
3	5178.84	102.70			94.51	7.32	33.79	32.92	324	11	Average	HORIZONTAL
4	5179.71	112.41			104.22	7.32	33.79	32.92	324	11	Peak	HORIZONTAL

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

Channel 40

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5150.00	69.09	74.00	-4.91	61.05	7.22	33.74	32.92	250	15	Peak	HORIZONTAL
2	5150.00	52.75	54.00	-1.25	44.71	7.22	33.74	32.92	250	15	Average	HORIZONTAL
3	5198.55	115.59			107.32	7.37	33.82	32.92	250	15	Peak	HORIZONTAL
4	5198.84	106.20			97.93	7.37	33.82	32.92	250	15	Average	HORIZONTAL

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

Channel 48

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5146.96	61.22	74.00	-12.78	53.18	7.22	33.74	32.92	247	48	Peak	HORIZONTAL
2	5150.00	48.97	54.00	-5.03	40.93	7.22	33.74	32.92	247	48	Average	HORIZONTAL
3	5239.13	99.92			91.60	7.35	33.89	32.92	247	48	Average	HORIZONTAL
4	5240.00	109.56			101.24	7.35	33.89	32.92	247	48	Peak	HORIZONTAL
5	5350.00	49.51	54.00	-4.49	41.07	7.30	34.06	32.92	247	48	Average	HORIZONTAL
6	5351.74	62.51	74.00	-11.49	54.07	7.30	34.06	32.92	247	48	Peak	HORIZONTAL

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

Temperature	17°C	Humidity	38%
Test Engineer	Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149, 157, 165 / Ant. 1 + Ant. 2
Test Date	Jan. 21, 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	5711.24	64.08	68.20	-4.12	55.23	7.41	34.43	32.99	264	33	Peak	HORIZONTAL
2	5725.00	77.80	78.20	-0.40	68.97	7.38	34.44	32.99	264	33	Peak	HORIZONTAL
3	5743.55	107.09			98.28	7.35	34.45	32.99	264	33	Peak	HORIZONTAL
4	5745.87	97.49			88.69	7.35	34.45	33.00	264	33	Average	HORIZONTAL

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

Channel 157

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5713.26	61.93	68.20	-6.27	53.08	7.41	34.43	32.99	183	312	Peak	VERTICAL
2	5724.42	62.73	78.20	-15.47	53.90	7.38	34.44	32.99	183	312	Peak	VERTICAL
3	5783.84	113.15			104.41	7.28	34.47	33.01	183	312	Peak	VERTICAL
4	5784.42	102.81			94.07	7.28	34.47	33.01	183	312	Average	VERTICAL
5	5852.03	64.67	78.20	-13.53	55.66	7.52	34.51	33.02	183	312	Peak	VERTICAL
6	5862.32	63.84	68.20	-4.36	54.74	7.61	34.52	33.03	183	312	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	5824.13	112.60			103.69	7.43	34.50	33.02	256	2	Peak	HORIZONTAL
2	5825.58	102.21			93.30	7.43	34.50	33.02	256	2	Average	HORIZONTAL
3	5850.00	77.54	78.20	-0.66	68.53	7.52	34.51	33.02	256	2	Peak	HORIZONTAL
4	5860.00	53.47	54.00	-0.53	44.37	7.61	34.52	33.03	256	2	Average	HORIZONTAL
5	5860.58	69.02	74.00	-4.98	59.92	7.61	34.52	33.03	256	2	Peak	HORIZONTAL

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

Temperature	17°C	Humidity	38%
Test Engineer	Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38, 46 / Ant. 1 + Ant. 2
Test Date	Jan. 21, 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	5149.42	70.63	74.00	-3.37	62.59	7.22	33.74	32.92	250	327	Peak	HORIZONTAL
2	5150.00	53.58	54.00	-0.42	45.54	7.22	33.74	32.92	250	327	Average	HORIZONTAL
3	5191.16	94.88			86.61	7.37	33.82	32.92	250	327	Average	HORIZONTAL
4	5197.24	105.39			97.12	7.37	33.82	32.92	250	327	Peak	HORIZONTAL

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

Channel 46

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5146.96	62.05	74.00	-11.95	54.01	7.22	33.74	32.92	318	340	Peak	HORIZONTAL
2	5150.00	49.29	54.00	-4.71	41.25	7.22	33.74	32.92	318	340	Average	HORIZONTAL
3	5231.74	99.80			91.48	7.35	33.89	32.92	318	340	Average	HORIZONTAL
4	5234.78	110.58			102.26	7.35	33.89	32.92	318	340	Peak	HORIZONTAL

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

Temperature	17°C	Humidity	38%
Test Engineer	Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151, 159 / Ant. 1 + Ant. 2
Test Date	Jan. 21, 2016~Jan. 22, 2016		

Channel 151

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5715.00	69.95	74.00	-4.05	61.10	7.41	34.43	32.99	252	3	Peak	HORIZONTAL
2	5715.00	53.62	54.00	-0.38	44.77	7.41	34.43	32.99	252	3	Average	HORIZONTAL
3	5722.97	73.89	78.20	-4.31	65.06	7.38	34.44	32.99	252	3	Peak	HORIZONTAL
4	5752.97	95.05			86.25	7.35	34.45	33.00	252	3	Average	HORIZONTAL
5	5770.63	105.77			96.99	7.32	34.46	33.00	252	3	Peak	HORIZONTAL

Item 4, 5 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	5711.96	63.54	74.00	-10.46	54.69	7.41	34.43	32.99	304	344	Peak	HORIZONTAL
2	5715.00	51.02	54.00	-2.98	42.17	7.41	34.43	32.99	304	344	Average	HORIZONTAL
3	5724.57	63.97	78.20	-14.23	55.14	7.38	34.44	32.99	304	344	Peak	HORIZONTAL
4	5787.19	110.90			102.16	7.28	34.47	33.01	304	344	Peak	HORIZONTAL
5	5793.70	99.70			90.98	7.25	34.48	33.01	304	344	Average	HORIZONTAL
6	5850.00	71.28	78.20	-6.92	62.27	7.52	34.51	33.02	304	344	Peak	HORIZONTAL
7	5860.00	53.63	54.00	-0.37	44.53	7.61	34.52	33.03	304	344	Average	HORIZONTAL
8	5860.43	68.71	74.00	-5.29	59.61	7.61	34.52	33.03	304	344	Peak	HORIZONTAL

Item 4, 5 are the fundamental frequency at 5795 MHz.

Temperature	17°C	Humidity	38%
Test Engineer	Paul Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42, 155 / Ant. 1 + Ant. 2
Test Date	Jan. 22, 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	5147.11	66.04	74.00	-7.96	58.00	7.22	33.74	32.92	175	279	Peak	HORIZONTAL
2	5150.00	53.69	54.00	-0.31	45.65	7.22	33.74	32.92	175	279	Average	HORIZONTAL
3	5207.11	100.80			92.52	7.36	33.84	32.92	175	279	Peak	HORIZONTAL
4	5207.11	89.87			81.59	7.36	33.84	32.92	175	279	Average	HORIZONTAL
5	5350.00	49.98	54.00	-4.02	41.54	7.30	34.06	32.92	175	279	Average	HORIZONTAL
6	5355.07	61.97	74.00	-12.03	53.52	7.29	34.08	32.92	175	279	Peak	HORIZONTAL

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

Channel 155

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5714.28	69.00	74.00	-5.00	60.15	7.41	34.43	32.99	302	345	Peak	HORIZONTAL
2	5715.00	53.91	54.00	-0.09	45.06	7.41	34.43	32.99	302	345	Average	HORIZONTAL
3	5722.11	71.21	78.20	-6.99	62.36	7.41	34.43	32.99	302	345	Peak	HORIZONTAL
4	5768.49	103.44			94.66	7.32	34.46	33.00	302	345	Peak	HORIZONTAL
5	5770.66	88.99			80.21	7.32	34.46	33.00	302	345	Average	HORIZONTAL
6	5850.00	67.75	78.20	-10.45	58.74	7.52	34.51	33.02	302	345	Peak	HORIZONTAL
7	5860.00	52.89	54.00	-1.11	43.79	7.61	34.52	33.03	302	345	Average	HORIZONTAL
8	5861.45	68.75	74.00	-5.25	59.65	7.61	34.52	33.03	302	345	Peak	HORIZONTAL

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

Note:

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

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

4.8. Frequency Stability Measurement

4.8.1. Limit

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

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

4.8.2. Measuring Instruments and Setting

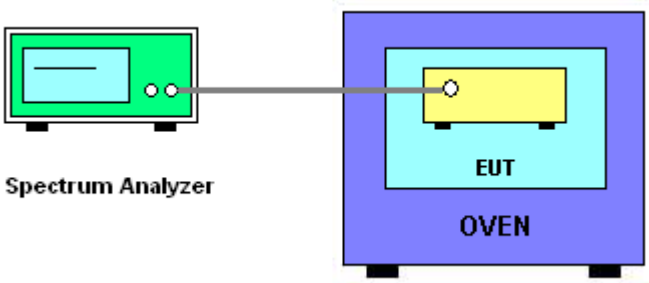
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.8.3. Test Procedures

1. The transmitter output (antenna port) was connected to the spectrum analyzer.
2. EUT have transmitted absence of modulation signal and fixed channelize.
3. Set the spectrum analyzer span to view the entire absence of modulation emissions bandwidth.
4. Set RBW = 10 kHz, VBW = 10 kHz with peak detector and maxhold settings.
5. fc is declaring of channel frequency. Then the frequency error formula is (fc-f)/fc × 10^6 ppm and the limit is less than ±20ppm (IEEE 802.11nspecification).
6. Allow sufficient time (approximately 30 min) for the temperature of the chamber to stabilize, turn the EUT on and measure the operating frequency after 2, 5, and 10 minutes.
7. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
8. Extreme temperature is: -30°C~50°C.

4.8.4. Test Setup Layout



4.8.5. Test Deviation

There is no deviation with the original standard.

4.8.6. EUT Operation during Test

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

4.8.7. Test Result of Frequency Stability

Temperature	25°C	Humidity	58%
Test Engineer	Serway Li / Peter Wu	Test Date	Jan. 26, 2016

Mode: 20 MHz / Ant. 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5200 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5199.9729	5199.9715	5199.9697	5199.9676
110.00	5199.9717	5199.9704	5199.9688	5199.9669
93.50	5199.9703	5199.9692	5199.9680	5199.9658
Max. Deviation (MHz)	0.0297	0.0308	0.0320	0.0342
Max. Deviation (ppm)	5.71	5.92	6.15	6.58
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5200 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-30	5199.9776	5199.9766	5199.9746	5199.9723
-20	5199.9771	5199.9758	5199.9741	5199.9717
-10	5199.9756	5199.9744	5199.9728	5199.9709
0	5199.9742	5199.9730	5199.9711	5199.9689
10	5199.9729	5199.9716	5199.9701	5199.9683
20	5199.9717	5199.9704	5199.9688	5199.9669
30	5199.9703	5199.9692	5199.9678	5199.9662
40	5199.9687	5199.9672	5199.9656	5199.9636
50	5199.9670	5199.9658	5199.9643	5199.9616
Max. Deviation (MHz)	0.0330	0.0342	0.0357	0.0384
Max. Deviation (ppm)	6.35	6.58	6.87	7.38
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5784.9724	5784.9710	5784.9692	5784.9671
110.00	5784.9712	5784.9699	5784.9683	5784.9664
93.50	5784.9698	5784.9687	5784.9675	5784.9653
Max. Deviation (MHz)	0.0302	0.0313	0.0325	0.0347
Max. Deviation (ppm)	5.22	5.41	5.62	6.00
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-30	5784.9824	5784.9810	5784.9798	5784.9771
-20	5784.9823	5784.9810	5784.9793	5784.9769
-10	5784.9808	5784.9796	5784.9780	5784.9761
0	5784.9794	5784.9782	5784.9763	5784.9741
10	5784.9781	5784.9768	5784.9753	5784.9735
20	5784.9769	5784.9756	5784.9740	5784.9721
30	5784.9755	5784.9744	5784.9730	5784.9714
40	5784.9739	5784.9724	5784.9708	5784.9688
50	5784.9722	5784.9710	5784.9695	5784.9668
Max. Deviation (MHz)	0.0278	0.0290	0.0305	0.0332
Max. Deviation (ppm)	4.81	5.01	5.27	5.74
Result	Complies			

Mode: 40 MHz / Ant. 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5190 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5189.9906	5189.9892	5189.9874	5189.9853
110.00	5189.9894	5189.9881	5189.9865	5189.9846
93.50	5189.9880	5189.9869	5189.9857	5189.9835
Max. Deviation (MHz)	0.0120	0.0131	0.0143	0.0165
Max. Deviation (ppm)	2.31	2.52	2.76	3.18
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5190 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-30	5189.9955	5189.9941	5189.9926	5189.9896
-20	5189.9948	5189.9935	5189.9918	5189.9894
-10	5189.9933	5189.9921	5189.9905	5189.9886
0	5189.9919	5189.9907	5189.9888	5189.9866
10	5189.9906	5189.9893	5189.9878	5189.9860
20	5189.9894	5189.9881	5189.9865	5189.9846
30	5189.9880	5189.9869	5189.9855	5189.9839
40	5189.9864	5189.9849	5189.9833	5189.9813
50	5189.9847	5189.9835	5189.9820	5189.9793
Max. Deviation (MHz)	0.0153	0.0165	0.0180	0.0207
Max. Deviation (ppm)	2.95	3.18	3.47	3.99
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5754.9703	5754.9689	5754.9671	5754.9650
110.00	5754.9691	5754.9678	5754.9662	5754.9643
93.50	5754.9677	5754.9666	5754.9654	5754.9632
Max. Deviation (MHz)	0.0323	0.0334	0.0346	0.0368
Max. Deviation (ppm)	5.61	5.80	6.01	6.39
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-30	5754.9753	5754.9739	5754.9726	5754.9695
-20	5754.9745	5754.9732	5754.9715	5754.9691
-10	5754.9730	5754.9718	5754.9702	5754.9683
0	5754.9716	5754.9704	5754.9685	5754.9663
10	5754.9703	5754.9690	5754.9675	5754.9657
20	5754.9691	5754.9678	5754.9662	5754.9643
30	5754.9677	5754.9666	5754.9652	5754.9636
40	5754.9661	5754.9646	5754.9630	5754.9610
50	5754.9644	5754.9632	5754.9617	5754.9590
Max. Deviation (MHz)	0.0356	0.0368	0.0383	0.0410
Max. Deviation (ppm)	6.19	6.39	6.66	7.12
Result	Complies			

Mode: 80 MHz / Ant. 1

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5210 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5209.9838	5209.9824	5209.9806	5209.9785
110.00	5209.9826	5209.9813	5209.9797	5209.9778
93.50	5209.9812	5209.9801	5209.9789	5209.9767
Max. Deviation (MHz)	0.0188	0.0199	0.0211	0.0233
Max. Deviation (ppm)	3.61	3.82	4.05	4.47
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5210 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-30	5209.9882	5209.9875	5209.9868	5209.9833
-20	5209.9880	5209.9867	5209.9850	5209.9826
-10	5209.9865	5209.9853	5209.9837	5209.9818
0	5209.9851	5209.9839	5209.9820	5209.9798
10	5209.9838	5209.9825	5209.9810	5209.9792
20	5209.9826	5209.9813	5209.9797	5209.9778
30	5209.9812	5209.9801	5209.9787	5209.9771
40	5209.9796	5209.9781	5209.9765	5209.9745
50	5209.9779	5209.9767	5209.9752	5209.9725
Max. Deviation (MHz)	0.0221	0.0233	0.0248	0.0275
Max. Deviation (ppm)	4.24	4.47	4.76	5.28
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5774.9738	5774.9724	5774.9706	5774.9685
110.00	5774.9726	5774.9713	5774.9697	5774.9678
93.50	5774.9712	5774.9701	5774.9689	5774.9667
Max. Deviation (MHz)	0.0288	0.0299	0.0311	0.0333
Max. Deviation (ppm)	4.99	5.18	5.39	5.77
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
-30	5774.9788	5774.9778	5774.9762	5774.9732
-20	5774.9780	5774.9767	5774.9750	5774.9726
-10	5774.9765	5774.9753	5774.9737	5774.9718
0	5774.9751	5774.9739	5774.9720	5774.9698
10	5774.9738	5774.9725	5774.9710	5774.9692
20	5774.9726	5774.9713	5774.9697	5774.9678
30	5774.9712	5774.9701	5774.9687	5774.9671
40	5774.9696	5774.9681	5774.9665	5774.9645
50	5774.9679	5774.9667	5774.9652	5774.9625
Max. Deviation (MHz)	0.0321	0.0333	0.0348	0.0375
Max. Deviation (ppm)	5.56	5.77	6.03	6.49
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
LISN	Schwarzbeck	NSLK 8127	8127650	9kHz ~ 30MHz	Nov. 16, 2015	Conduction (CO02-CB)
LISN	Schwarzbeck	NSLK 8127	8127478	9kHz ~ 30MHz	Nov. 13, 2015	Conduction (CO02-CB)
EMI Receiver	Agilent	N9038A	MY52260140	9kHz ~ 8.4GHz	Jan. 18, 2016	Conduction (CO02-CB)
COND Cable	Woken	Cable	01	0.15MHz ~ 30MHz	Dec. 01, 2015	Conduction (CO02-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	Conduction (CO02-CB)
Pulse Limiter	Schwarzbeck	VTSD 9561F	9561-F073	9kHz ~ 30MHz	Sep. 30, 2015	Conduction (CO02-CB)
BILOG ANTENNA	Schaffner	CBL6112D	37880	20MHz ~ 2GHz	Sep. 03, 2015	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 12, 2015*	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Oct. 22, 2015	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 21, 2015	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Feb. 24, 2015	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 18, 2016	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26GHz ~ 40GHz	Feb.10, 2015	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Oct. 27, 2015	Radiation (03CH01-CB)
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-I0-7	N/A	N/A	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 09, 2015	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-7	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-8	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-9	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 02, 2015	Conducted (TH01-CB)

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

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

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

6. MEASUREMENT UNCERTAINTY

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