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

FCC RADIO TEST REPORT

Applicant's company	**Hitron Technologies Inc.**
Applicant Address	No.1-8, Li-Hsin 1st Rd. Hsinchu Science Park, Hsinchu 300, Taiwan
FCC ID	**U4P-CGNM2252**
Manufacturer's company	**Hitron Technologies Inc.**
Manufacturer Address	No.1-8, Li-Hsin 1st Rd. Hsinchu Science Park, Hsinchu 300, Taiwan

Product Name	Wireless Cable Gateway
Brand Name	hitron
Model No.	CGNM-2252 & CGNM-3552
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5150 ~ 5250 MHz / 5725 ~ 5850 MHz
Received Date	Mar. 23, 2016
Final Test Date	May 19, 2016
Submission Type	Original Equipment

Statement

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

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

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

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.10-2013**, **47 CFR FCC Part 15 Subpart E, KDB789033 D02 v01r02, KDB662911 D01 v02r01, KDB644545 D03 v01.**

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

TAF
Testing Laboratory
1190

Table of Contents

History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR642211AB	Rev. 01	Initial issue of report	Jun. 14, 2016

1. VERIFICATION OF COMPLIANCE

Product Name	:	Wireless Cable Gateway
Brand Name	:	hitron
Model No.	:	CGNM-2252 & CGNM-3552
Applicant	:	Hitron Technologies 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 Mar. 23, 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**
4.1	15.207	AC Power Line Conducted Emissions	Complies
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
4.5	15.407(a)	Power Spectral Density	Complies
4.6	15.407(b)	Radiated Emissions	Complies
4.7	15.407(b)	Band Edge Emissions	Complies
4.8	15.407(g)	Frequency Stability	Complies
4.9	15.203	Antenna Requirements	Complies

3. GENERAL INFORMATION

3.1. Product Details

Items	Description
Product Type	WLAN (3TX, 3RX)
Radio Type	Intentional Transceiver
Power Type	From power adapter
Modulation	IEEE 802.11a: OFDM IEEE 802.11n/ac: see the below table
Data Modulation	IEEE 802.11a/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) IEEE 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)
Data Rate (Mbps)	IEEE 802.11a: OFDM (6/9/12/18/24/36/48/54) IEEE 802.11n/ac: see the below table
Frequency Range	5150 ~ 5250 MHz / 5725 ~ 5850 MHz
Channel Number	9 for 20MHz bandwidth ; 4 for 40MHz bandwidth 2 for 80MHz bandwidth
Channel Band Width (99%)	Band 1: IEEE 802.11a: 16.93 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 17.71 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.92 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 76.12 MHz Band 4: IEEE 802.11a: 21.53 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 22.14 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 35.75 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 74.38 MHz
Maximum Conducted Output Power	Band 1: IEEE 802.11a: 27.65 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 27.79 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 29.22 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 21.49 dBm Band 4: IEEE 802.11a: 29.74 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 29.81 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 26.26 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 21.77 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

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

Antenna and Band width

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

IEEE 11n/ac Spec.

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

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

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

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

3.2. Accessories

Power	Brand	Model	Rating
Adapter	AtechOEM	ADS0306-W120250	Input: 100-240V ~ 50-60Hz 1.0A Output: 12V, 2.5A
Other			
Pedestal*1			

3.3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)		
					2.4GHz	5GHz	
						Band 1	Band 4
1	Airgain	N2420GS-T-PK1-G65U	PIFA Antenna	I-PEX	6.25	-	-
2	Airgain	N2420GS-T-PK1-G100U	PIFA Antenna	I-PEX	3.45	-	-
3	Airgain	N2420GS-T-PK1-G160UR2	PIFA Antenna	I-PEX	4.93	-	-
4	Airgain	N5x20BS-T-PK1-G150U	PIFA Antenna	I-PEX	-	3.09	3.09
5	Airgain	N5x20B-T-PK1-B85U	PIFA Antenna	I-PEX	-	4.21	4.21
6	Airgain	N5x20BS-T-PK1-G40U	PIFA Antenna	I-PEX	-	3.80	3.80

Note: The EUT has six antennas.

For 2.4GHz function:

For IEEE 802.11b/g/n mode:

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

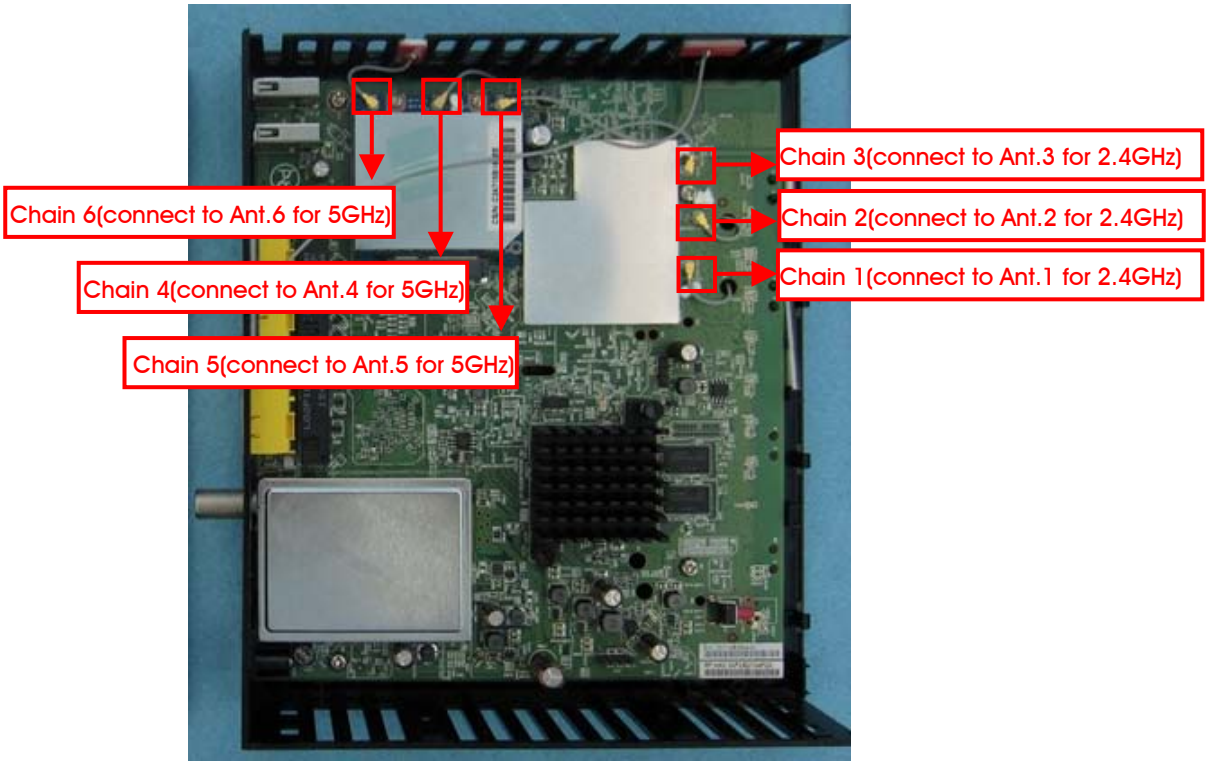
Chain 1, Chain 2 and Chain 3 could transmit/receive simultaneously.

For 5GHz function:

For IEEE 802.11a/n/ac mode:

Chain 4, Chain 5 and Chain 6 can be used as transmitting/receiving antenna.

Chain 4, Chain 5 and Chain 6 could transmit/receive simultaneously.



3.4. Table for Carrier Frequencies

There are three bandwidth systems.

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

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

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

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

3.5. Table for Test Modes

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

Test Items	Mode		Data Rate	Channel	Chain
AC Power Conducted Emission	CTX		-	-	-
Max. Conducted Output Power	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	4+5+6
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	4+5+6
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	4+5+6
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	4+5+6
Power Spectral Density	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	4+5+6
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	4+5+6
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	4+5+6
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	4+5+6
26dB Spectrum Bandwidth & 99% Occupied Bandwidth Measurement	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	4+5+6
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	4+5+6
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	4+5+6
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	4+5+6
6dB Spectrum Bandwidth Measurement	11a/BPSK	Band 4	6Mbps	149/157/165	4+5+6
	11ac VHT20	Band 4	MCS0/Nss1	149/157/165	4+5+6
	11ac VHT40	Band 4	MCS0/Nss1	151/159	4+5+6
	11ac VHT80	Band 4	MCS0/Nss1	155	4+5+6
Radiated Emission Below 1GHz	CTX		-	-	-
Radiated Emission Above 1GHz	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	4+5+6
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	4+5+6
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	4+5+6
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	4+5+6

Band Edge Emission	11a/BPSK	Band 1&4	6Mbps	36/40/48/149/157/165	4+5+6
	11ac VHT20	Band 1&4	MCS0/Nss1	36/40/48/149/157/165	4+5+6
	11ac VHT40	Band 1&4	MCS0/Nss1	38/46/151/159	4+5+6
	11ac VHT80	Band 1&4	MCS0/Nss1	42/155	4+5+6
Frequency Stability	20 MHz	Band 1&4	-	40/157	4
	40 MHz	Band 1&4	-	38/151	4
	80 MHz	Band 1&4	-	42/155	4

Note: The EUT can only use Y axis position.

The following test modes were performed for all tests:

For Conducted Emission and Radiated Emission (Below 1GHz) test:

Test Mode 1: CTX - 2.4GHz

Test Mode 2: CTX - 5GHz

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

For Co-location MPE:

The EUT could be applied with 2.4GHz WLAN function and 5GHz WLAN function; therefore Co-location Maximum Permissible Exposure (Please refer to FA642211) test is added for simultaneously transmit between 2.4GHz WLAN function and 5GHz WLAN function.

3.6. Table for Multiple Listing

Model Name	Description
CGNM-2252 & CGNM-3552	All the models are identical; the different model names served as marketing strategy.

3.7. Table for Testing Locations

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

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

3.8. Table for Supporting Units

For Test Site No: 03CH01-CB and TH01-CB

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	DoC

For Test Site No: CO01-CB

Support Unit	Brand	Model	FCC ID
NB	DELL	E6430	DoC
Flash Disk3.0*2	Transcend	JetFlash-700	DoC

3.9. Table for Parameters of Test Software Setting

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

Test Software Version	ART2-GUI					
Mode	Test Frequency (MHz)					
	NCB: 20MHz					
	5180 MHz	5200 MHz	5240 MHz	5745 MHz	5785 MHz	5825 MHz
802.11a	20	21	21	20	24	20
802.11ac MCS0/Nss1 VHT20	20	21	21	20	24	20
Mode	**NCB: 40MHz**					
802.11ac MCS0/Nss1 VHT40	5190 MHz		5230 MHz	5755 MHz		5795 MHz
	17		23	19		20
Mode	**NCB: 80MHz**					
802.11ac MCS0/Nss1 VHT80	5210 MHz			5775 MHz		
	16			16		

3.10. EUT Operation during Test

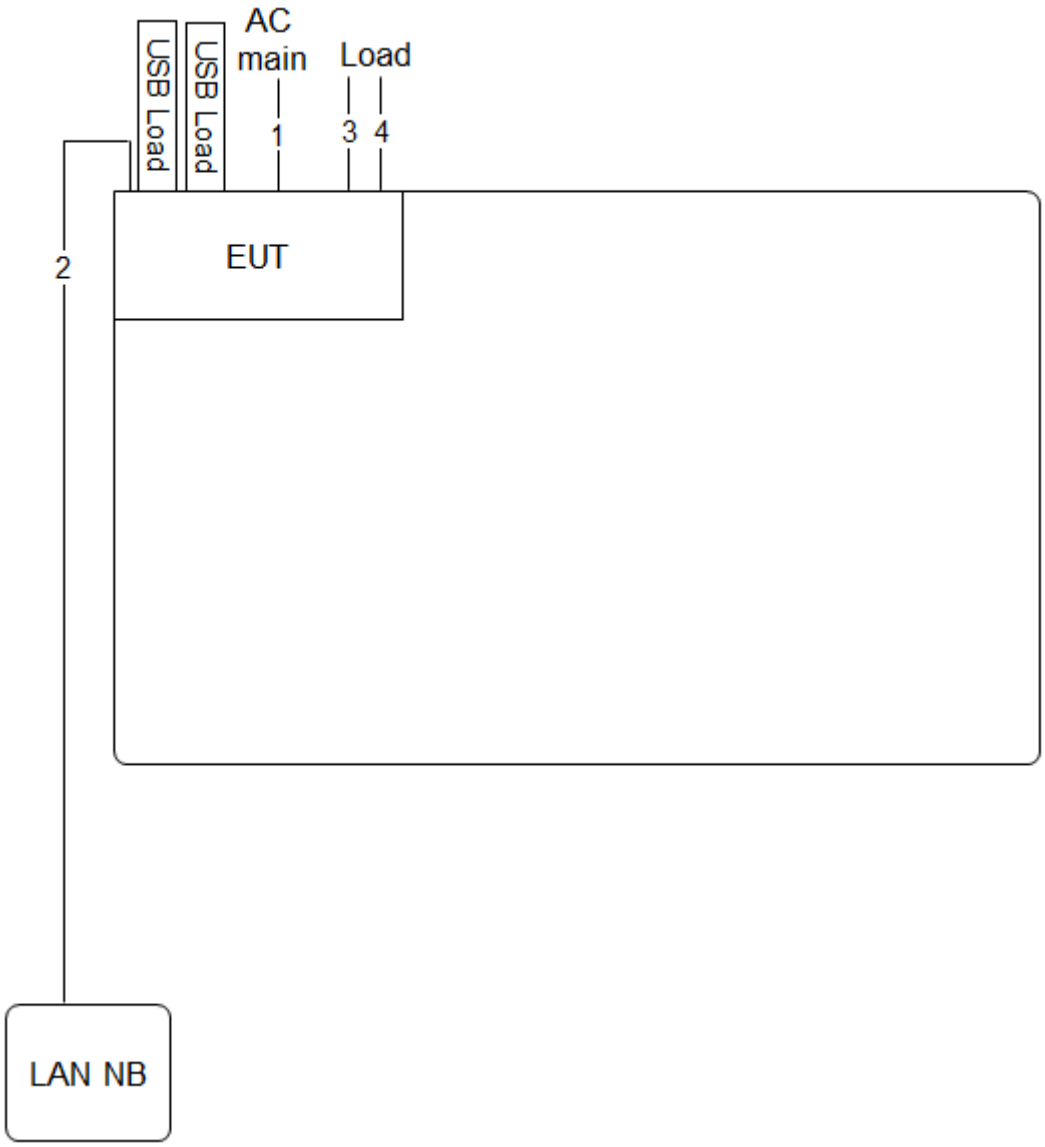
The EUT was programmed to be in continuously transmitting mode.

3.11. Duty Cycle

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11a	2.020	2.100	96.19%	0.17	0.50
802.11ac MCS0/Nss1 VHT20	1.900	2.020	94.06%	0.27	0.53
802.11ac MCS0/Nss1 VHT40	0.910	1.000	91.00%	0.41	1.10
802.11ac MCS0/Nss1 VHT80	0.442	0.518	85.33%	0.69	2.26

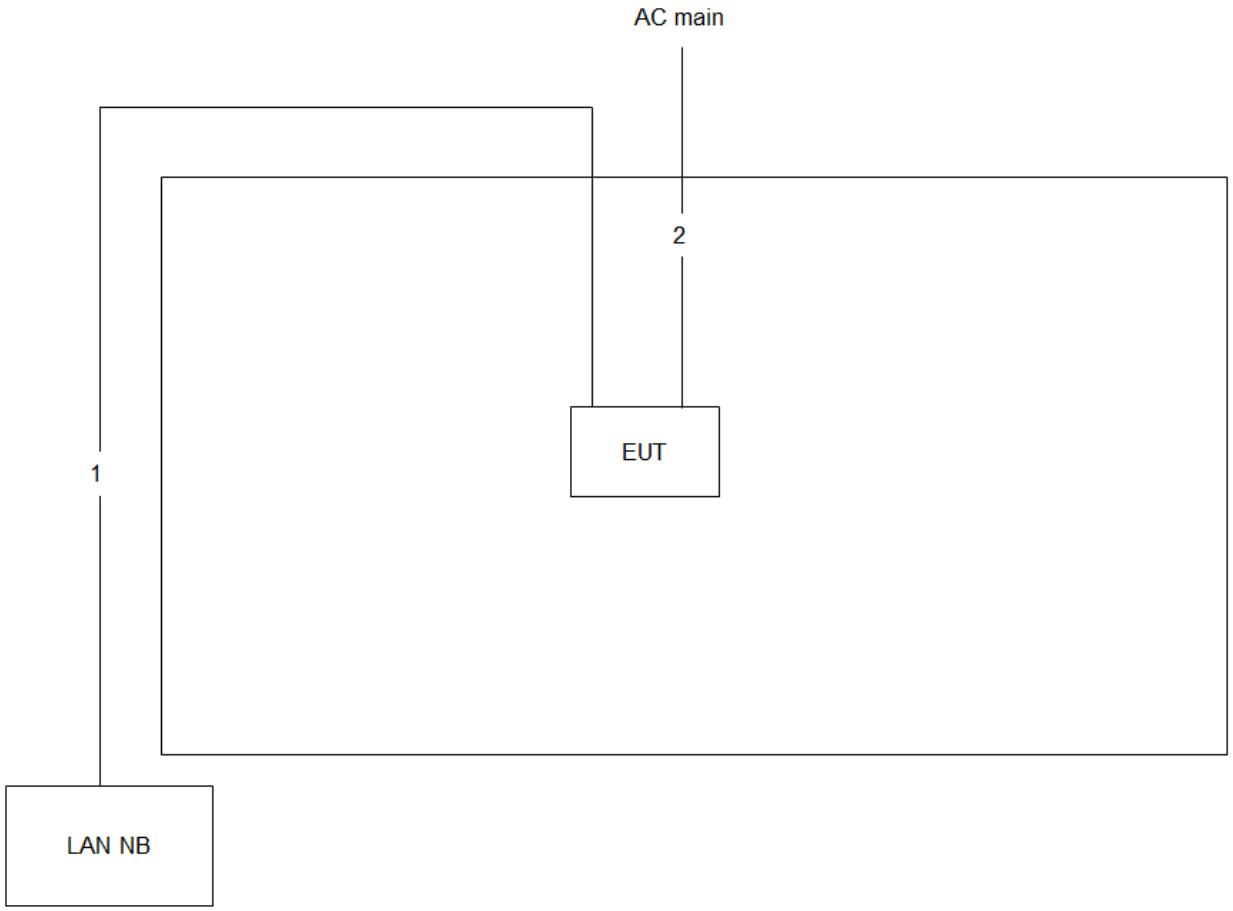
3.12. Test Configurations

3.12.1. AC Power Line Conduction Emissions Test Configuration



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

3.12.2. Radiation Emissions Test Configuration



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

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

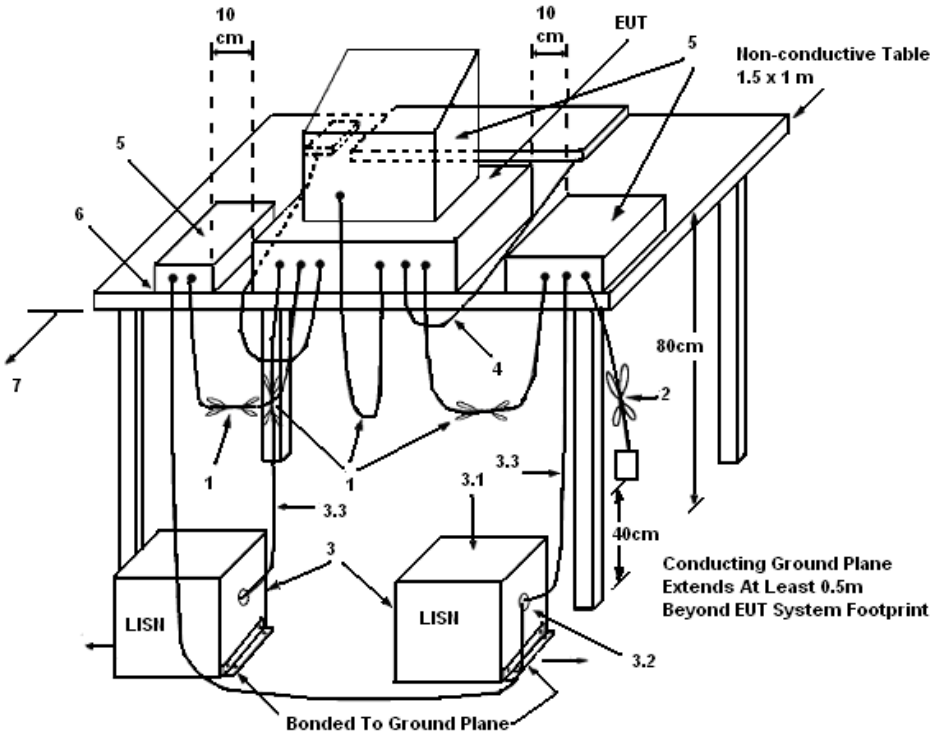
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

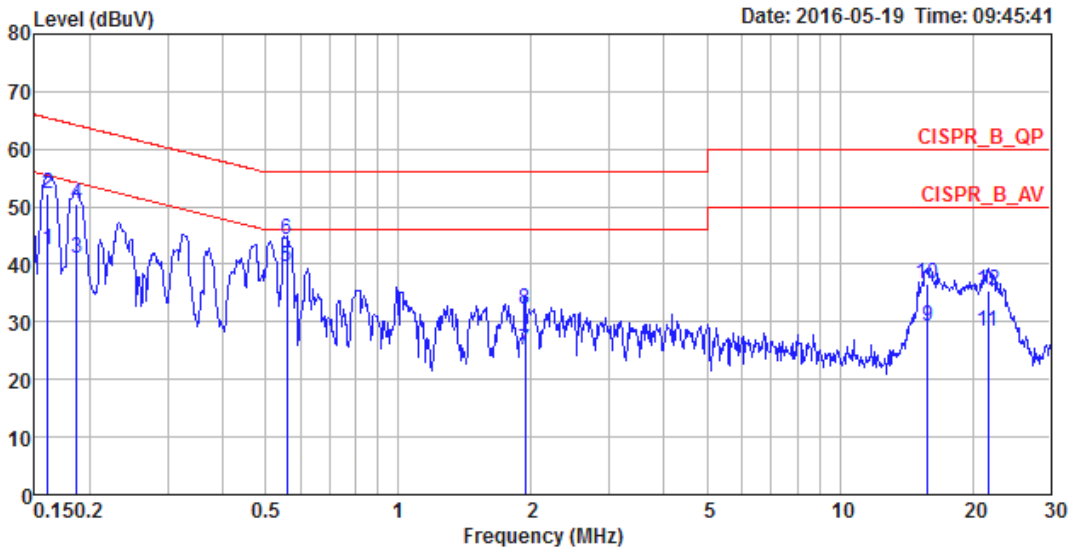
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

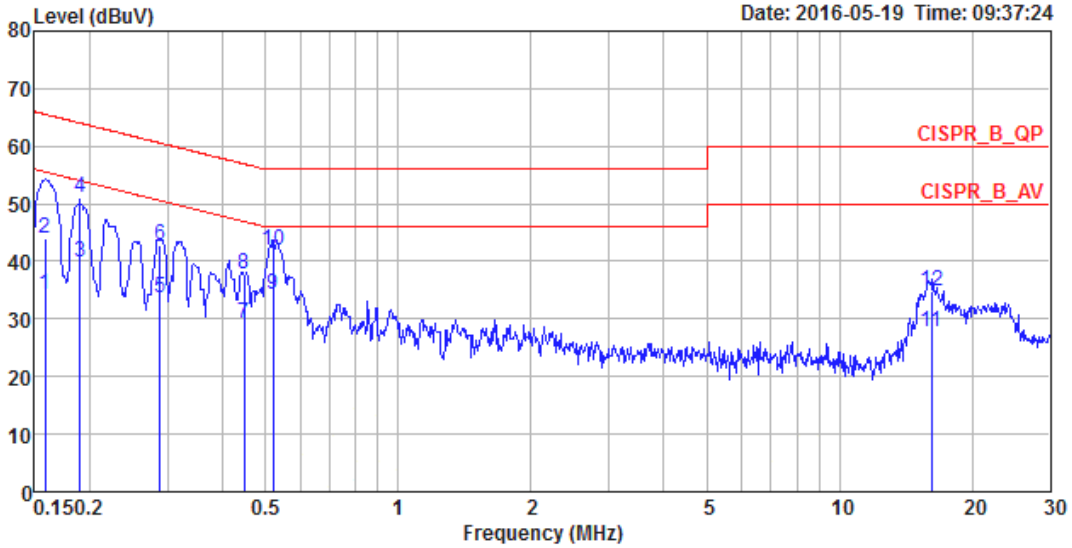
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	25°C	Humidity	59%
Test Engineer	Da Deng	Phase	Line
Configuration	CTX / Mode 1		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1607	42.46	-12.97	55.43	32.42	10.02	0.02	LINE	Average
2	0.1607	52.24	-13.19	65.43	42.20	10.02	0.02	LINE	QP
3	0.1864	41.15	-13.05	54.20	31.21	9.92	0.02	LINE	Average
4	0.1864	50.34	-13.86	64.20	40.40	9.92	0.02	LINE	QP
5	0.5581	39.58	-6.42	46.00	29.61	9.93	0.04	LINE	Average
6	0.5581	44.21	-11.79	56.00	34.24	9.93	0.04	LINE	QP
7	1.9386	25.02	-20.98	46.00	15.00	9.96	0.06	LINE	Average
8	1.9386	32.31	-23.69	56.00	22.29	9.96	0.06	LINE	QP
9	15.8014	29.36	-20.64	50.00	18.86	10.24	0.26	LINE	Average
10	15.8014	36.50	-23.50	60.00	26.00	10.24	0.26	LINE	QP
11	21.7149	28.37	-21.63	50.00	17.76	10.35	0.26	LINE	Average
12	21.7149	35.45	-24.55	60.00	24.84	10.35	0.26	LINE	QP

Temperature	25°C	Humidity	59%
Test Engineer	Da Deng	Phase	Neutral
Configuration	CTX / Mode 1		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1582	34.23	-21.33	55.56	24.19	10.02	0.02	NEUTRAL	Average
2	0.1582	44.02	-21.54	65.56	33.98	10.02	0.02	NEUTRAL	QP
3	0.1904	39.91	-14.11	54.02	29.97	9.92	0.02	NEUTRAL	Average
4	0.1904	51.16	-12.86	64.02	41.22	9.92	0.02	NEUTRAL	QP
5	0.2878	33.72	-16.87	50.59	23.76	9.92	0.04	NEUTRAL	Average
6	0.2878	42.66	-17.93	60.59	32.70	9.92	0.04	NEUTRAL	QP
7	0.4480	29.21	-17.70	46.91	19.25	9.92	0.04	NEUTRAL	Average
8	0.4480	37.77	-19.14	56.91	27.81	9.92	0.04	NEUTRAL	QP
9	0.5210	34.25	-11.75	46.00	24.29	9.92	0.04	NEUTRAL	Average
10	0.5210	41.91	-14.09	56.00	31.95	9.92	0.04	NEUTRAL	QP
11	16.1399	27.83	-22.17	50.00	17.32	10.25	0.26	NEUTRAL	Average
12	16.1399	34.98	-25.02	60.00	24.47	10.25	0.26	NEUTRAL	QP

Note:

Level = Read Level + LISN Factor + Cable Loss.

4.2. 26dB Bandwidth and 99% Occupied Bandwidth Measurement

4.2.1. Limit

No restriction limits.

4.2.2. Measuring Instruments and Setting

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

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

4.2.3. Test Procedures

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

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

4.2.4. Test Setup Layout

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

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

4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

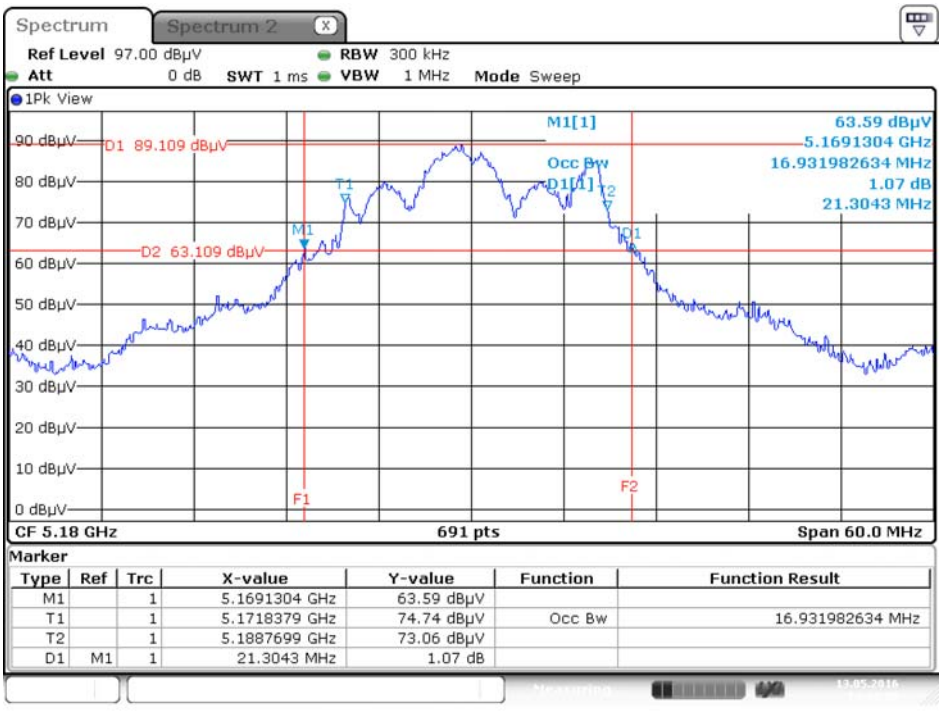
The EUT was programmed to be in continuously transmitting mode.

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

Temperature	24°C	Humidity	60%
Test Engineer	Clemens Fang		

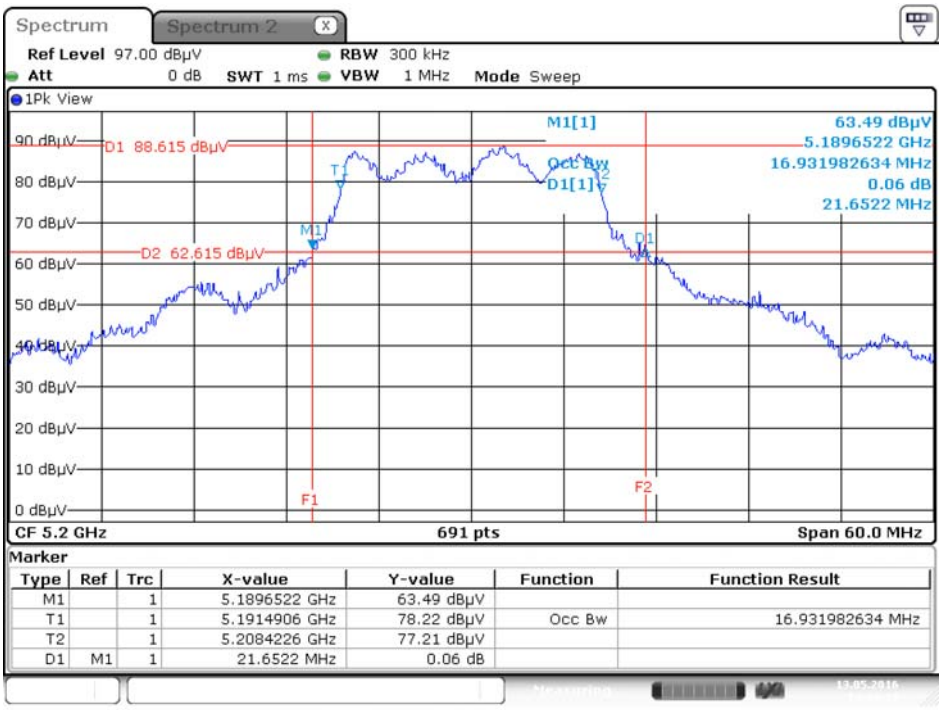
Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5180 MHz	21.30	16.93
	5200 MHz	21.65	16.93
	5240 MHz	22.00	16.85
	5745 MHz	21.74	16.76
	5785 MHz	33.22	21.53
	5825 MHz	22.52	16.67
802.11ac MCS0/Nss1 VHT20	5180 MHz	22.00	17.71
	5200 MHz	23.91	17.71
	5240 MHz	20.78	17.54
	5745 MHz	21.30	17.80
	5785 MHz	32.26	22.14
	5825 MHz	20.52	17.80
802.11ac MCS0/Nss1 VHT40	5190 MHz	43.48	36.76
	5230 MHz	46.09	37.92
	5755 MHz	41.30	35.75
	5795 MHz	40.87	35.60
802.11ac MCS0/Nss1 VHT80	5210 MHz	82.32	76.12
	5775 MHz	82.03	74.38

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 4 + Chain 5 + Chain 6 / 5180 MHz



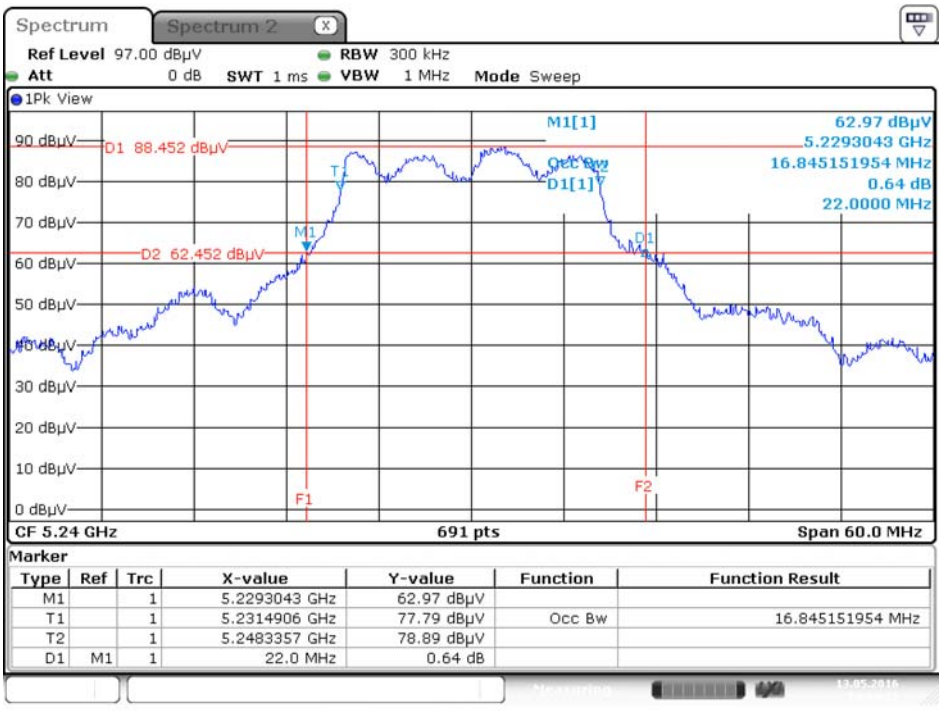
Date: 13.MAY.2016 14:43:21

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 4 + Chain 5 + Chain 6 / 5200 MHz



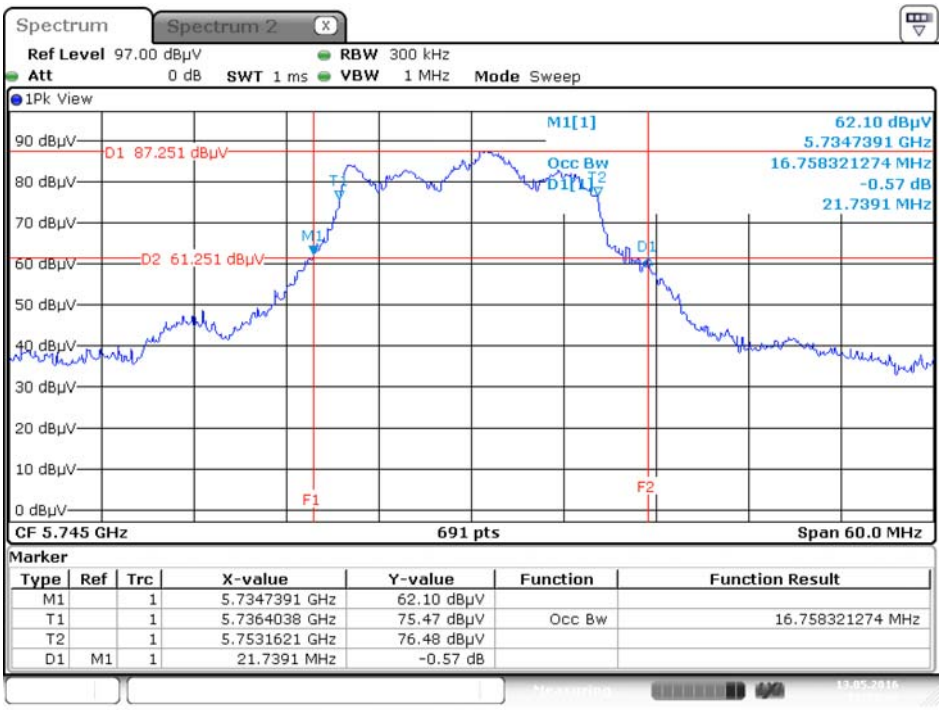
Date: 13.MAY.2016 14:44:10

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 4 + Chain 5 + Chain 6 / 5240 MHz



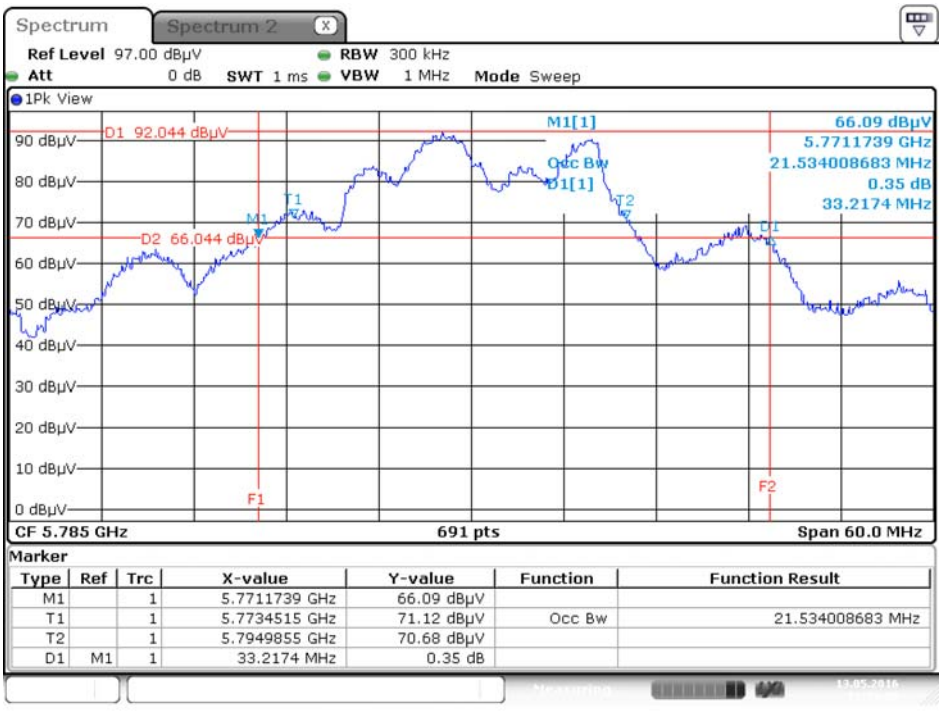
Date: 13.MAY.2016 14:44:32

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 4 + Chain 5 + Chain 6 / 5745 MHz



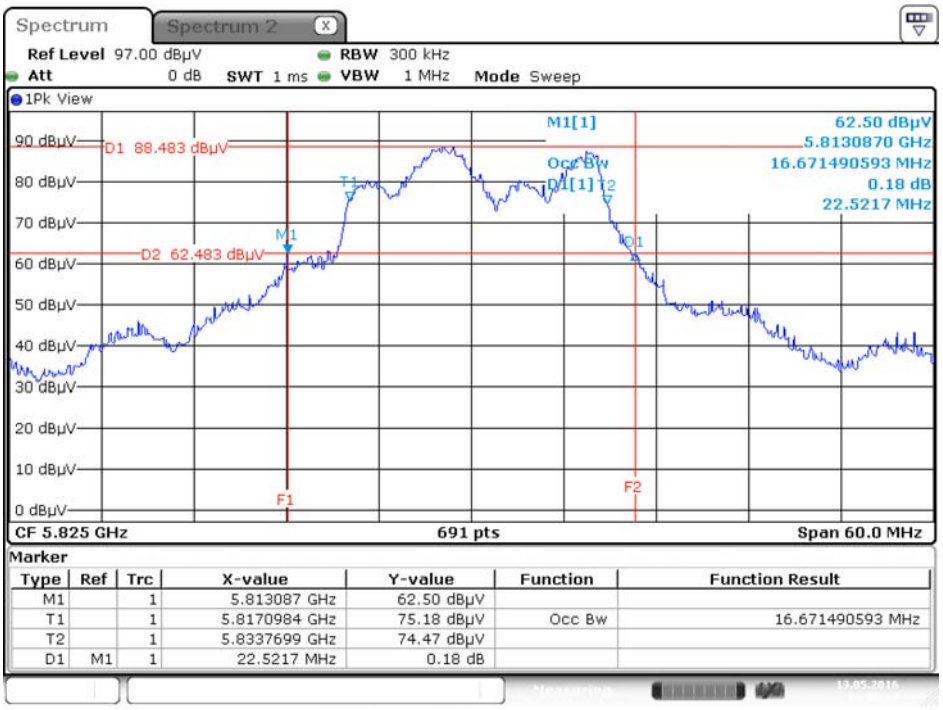
Date: 13.MAY.2016 13:53:47

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 4 + Chain 5 + Chain 6 / 5785 MHz



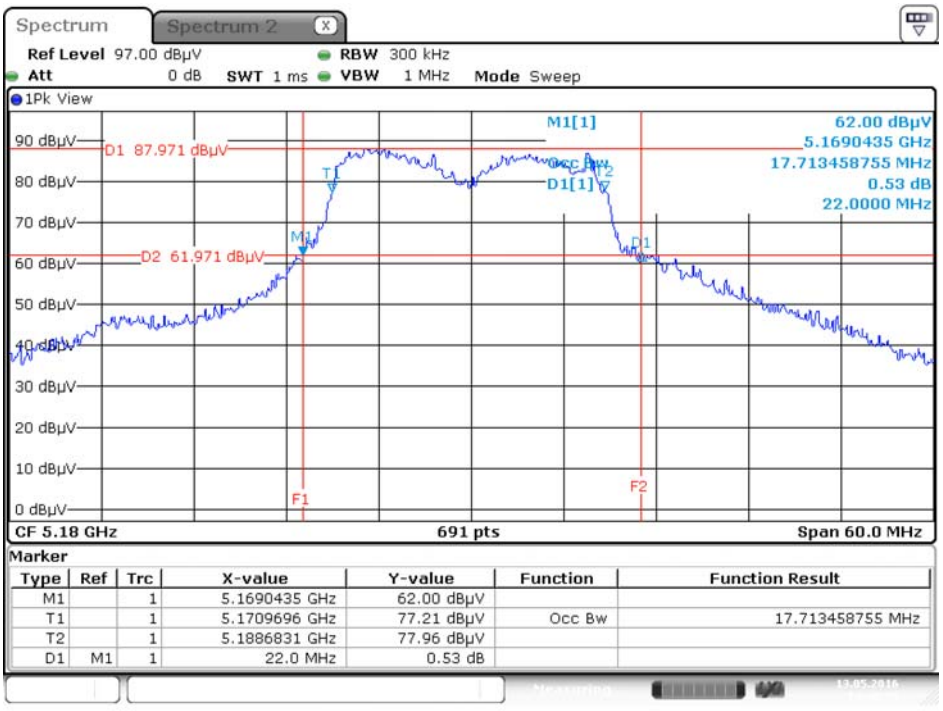
Date: 13.MAY.2016 13:59:09

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 4 + Chain 5 + Chain 6 / 5825 MHz



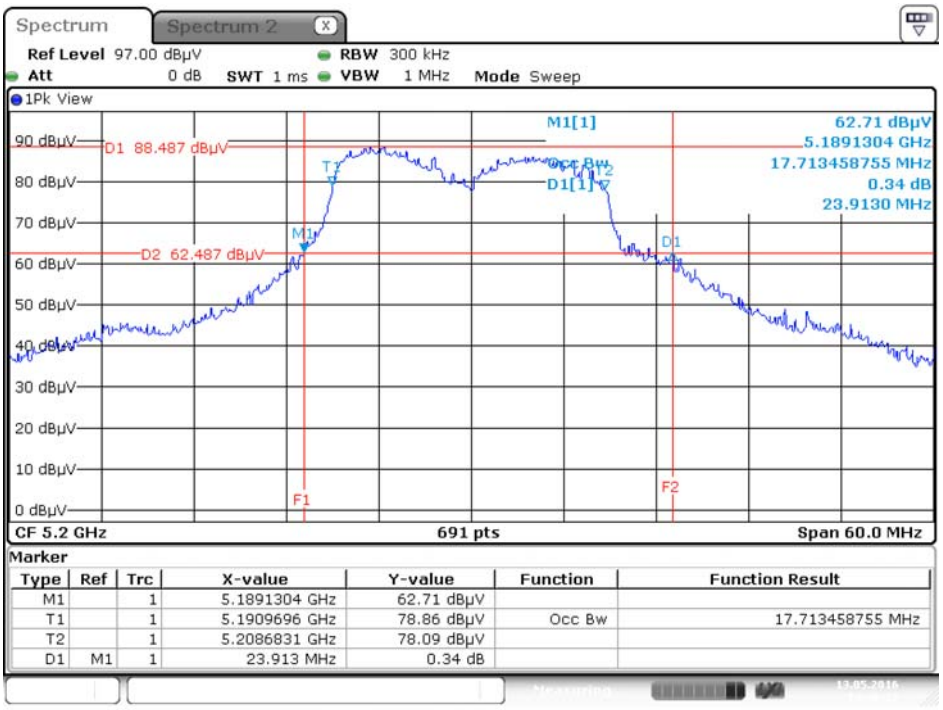
Date: 13.MAY.2016 14:00:14

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 4 + Chain 5 + Chain 6 / 5180 MHz



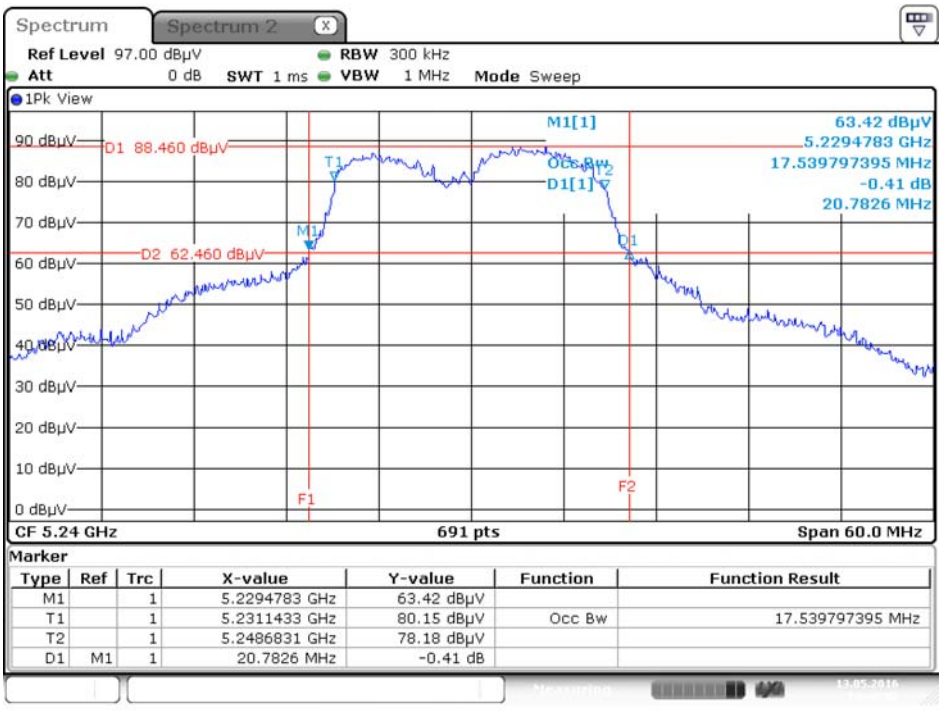
Date: 13.MAY.2016 14:45:35

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 4 + Chain 5 + Chain 6 / 5200 MHz



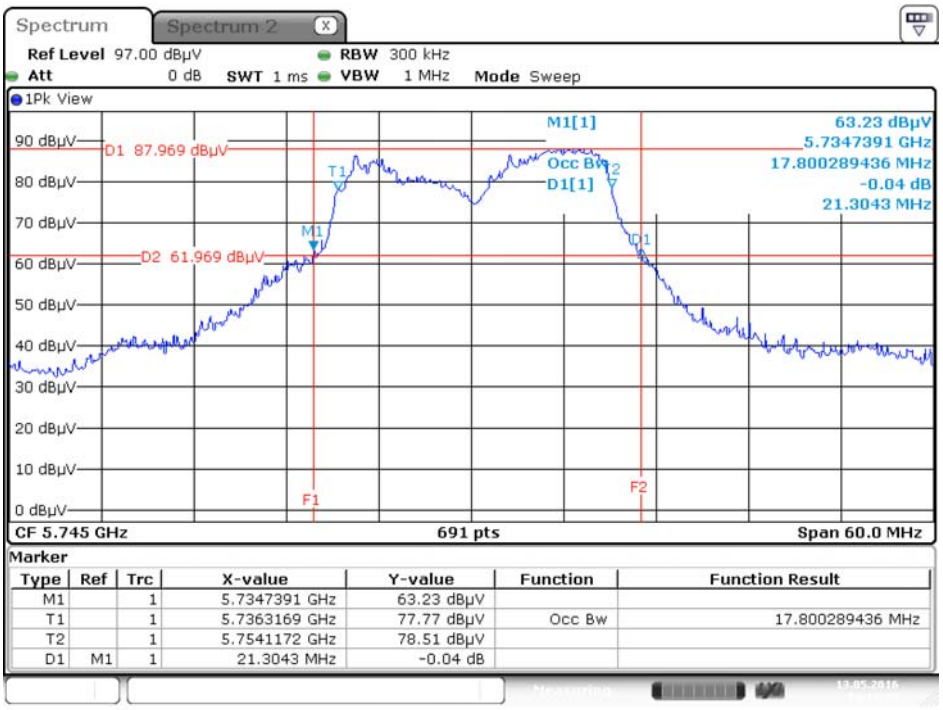
Date: 13.MAY.2016 14:46:17

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 4 + Chain 5 + Chain 6 / 5240 MHz



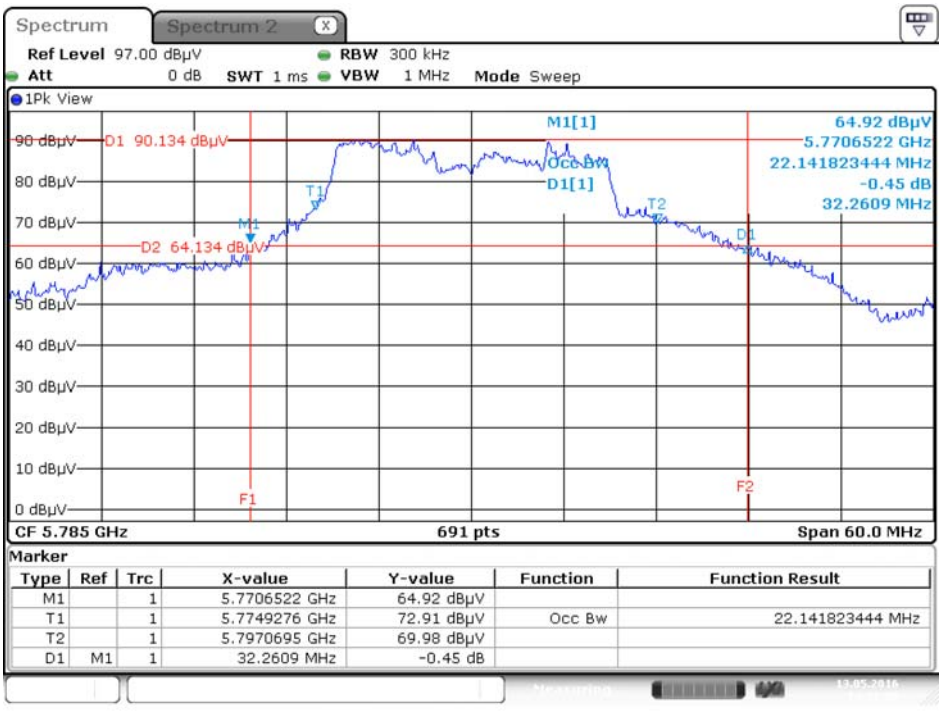
Date: 13.MAY.2016 14:45:02

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 4 + Chain 5 + Chain 6 / 5745 MHz



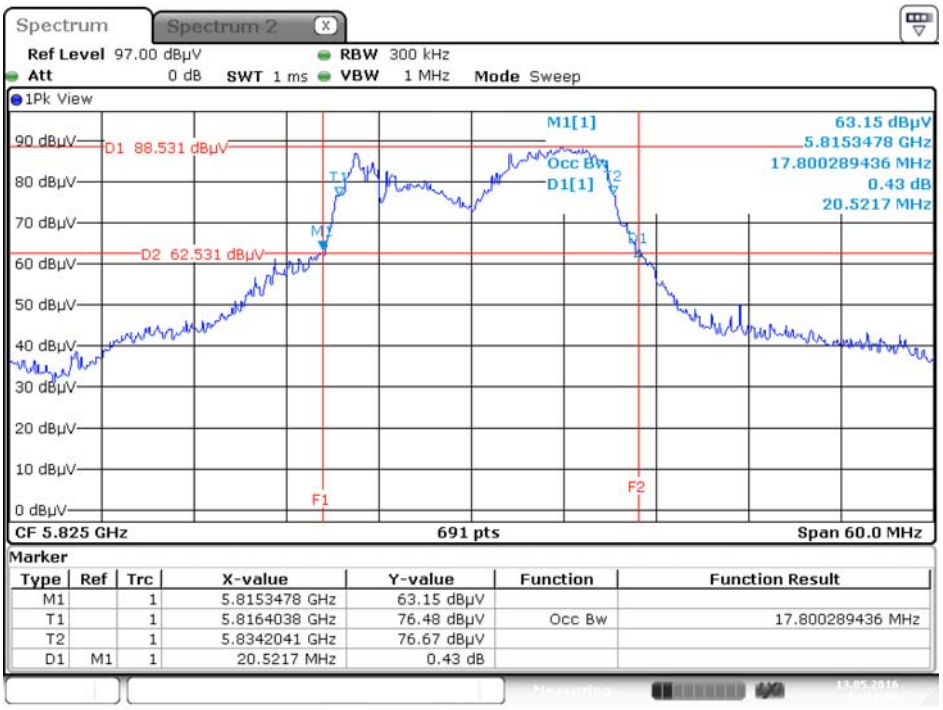
Date: 13.MAY.2016 14:10:35

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 4 + Chain 5 + Chain 6 / 5785 MHz



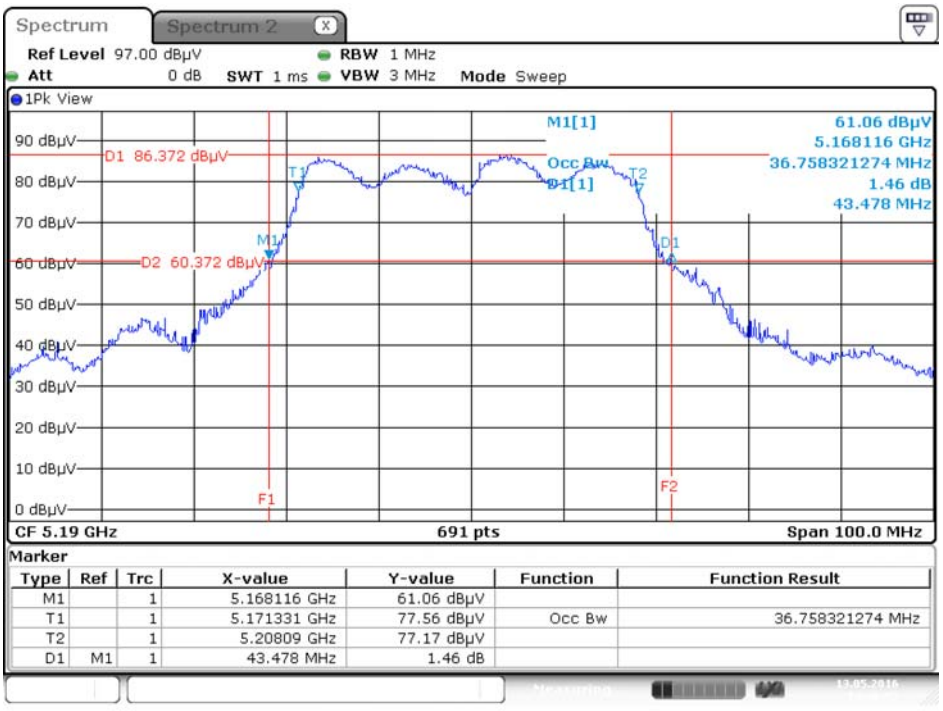
Date: 13.MAY.2016 14:11:09

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 4 + Chain 5 + Chain 6 / 5825 MHz



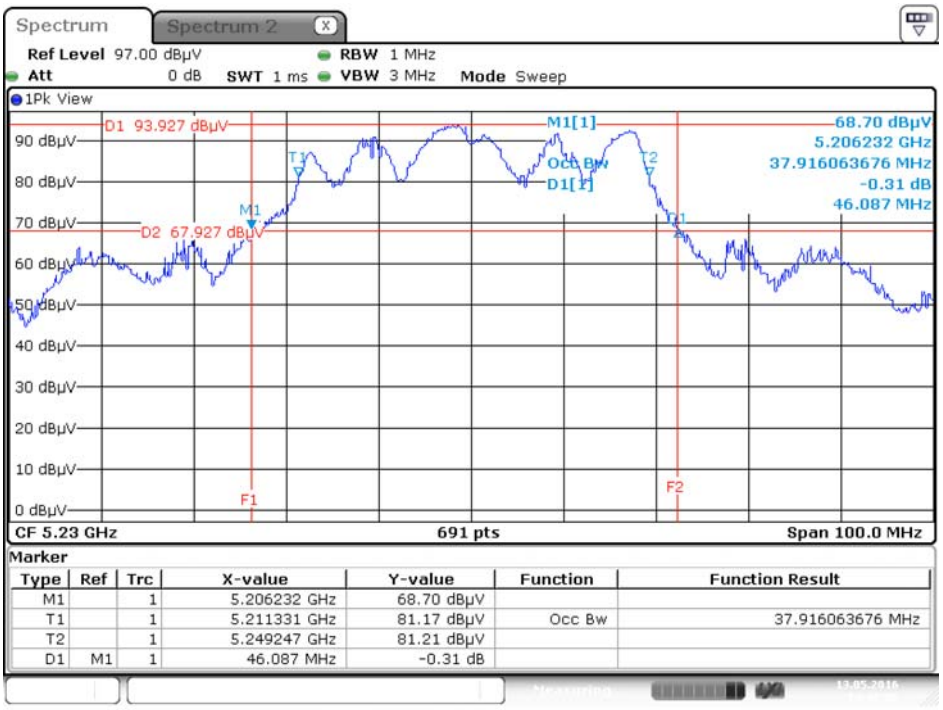
Date: 13.MAY.2016 14:12:06

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 4 + Chain 5 + Chain 6 / 5190 MHz



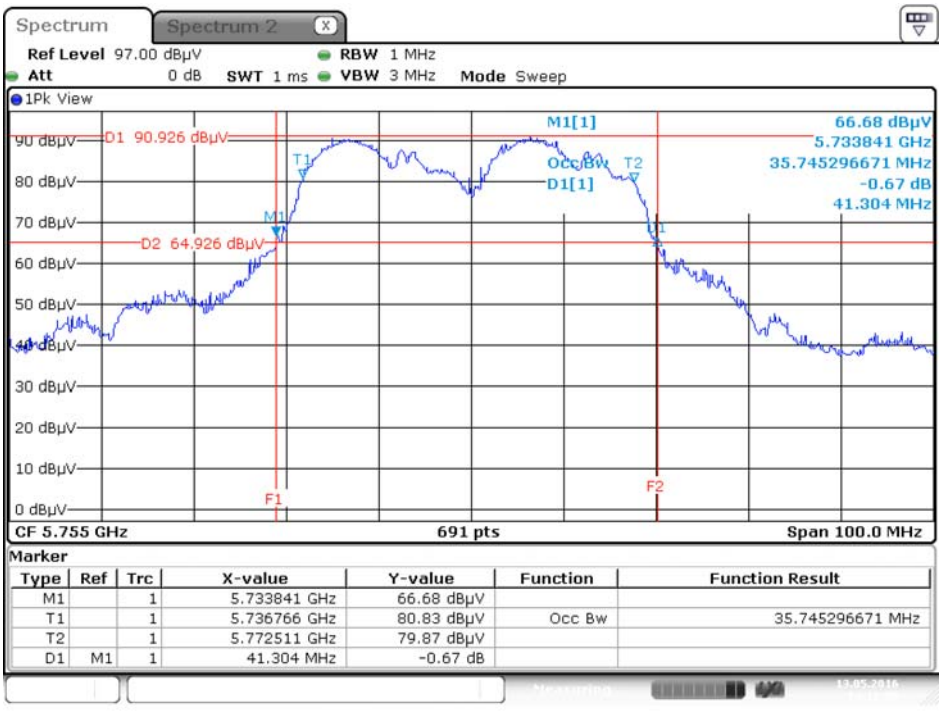
Date: 13.MAY.2016 14:46:52

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 4 + Chain 5 + Chain 6 / 5230 MHz



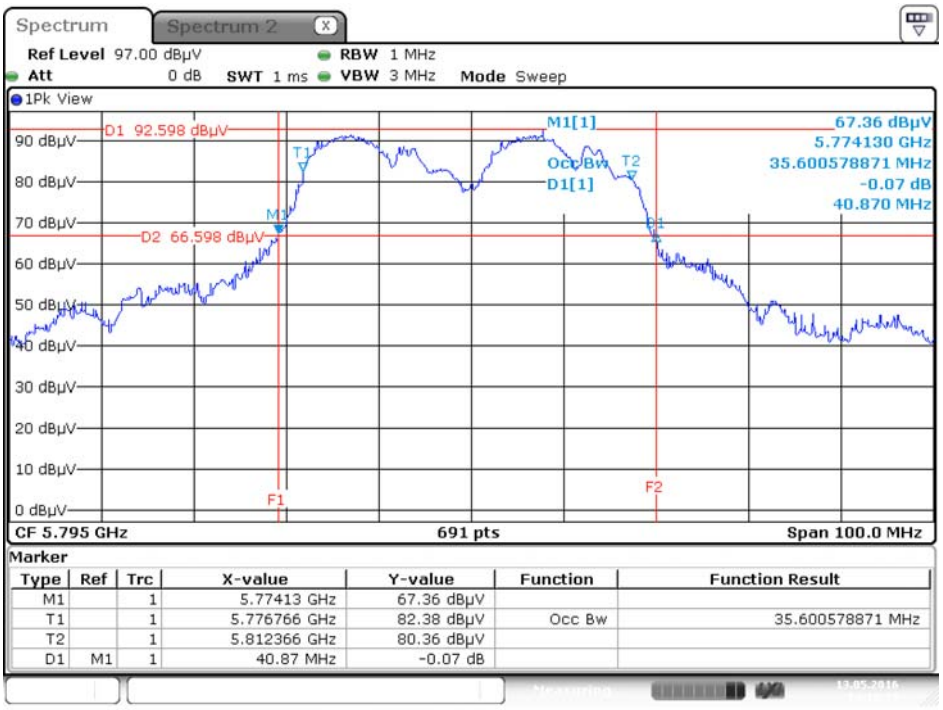
Date: 13.MAY.2016 14:47:26

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 4 + Chain 5 + Chain 6 / 5755 MHz



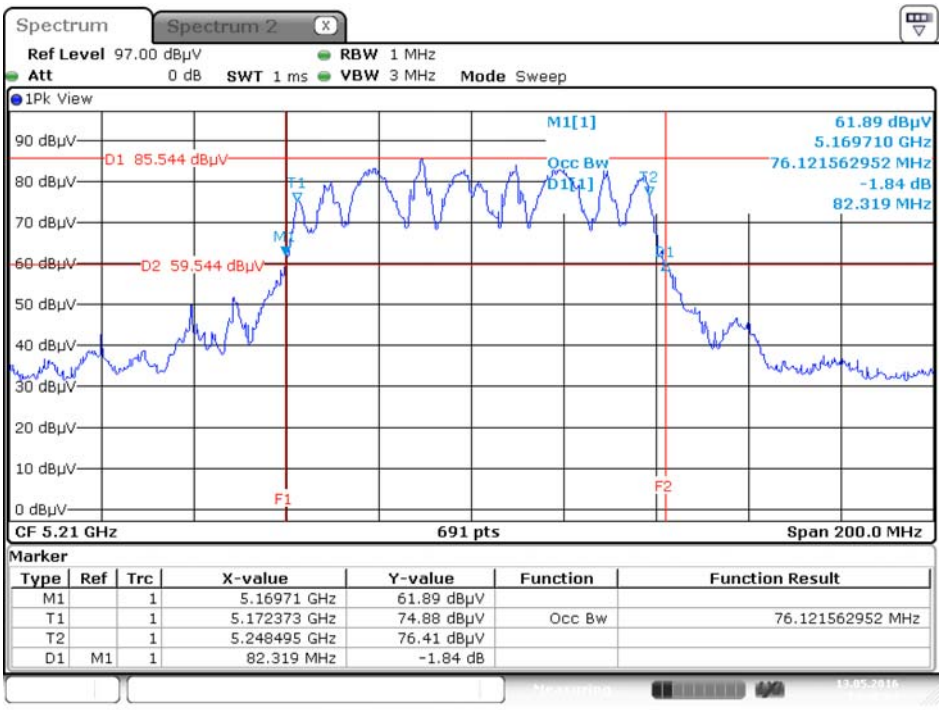
Date: 13.MAY.2016 14:12:50

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 4 + Chain 5 + Chain 6 / 5795 MHz



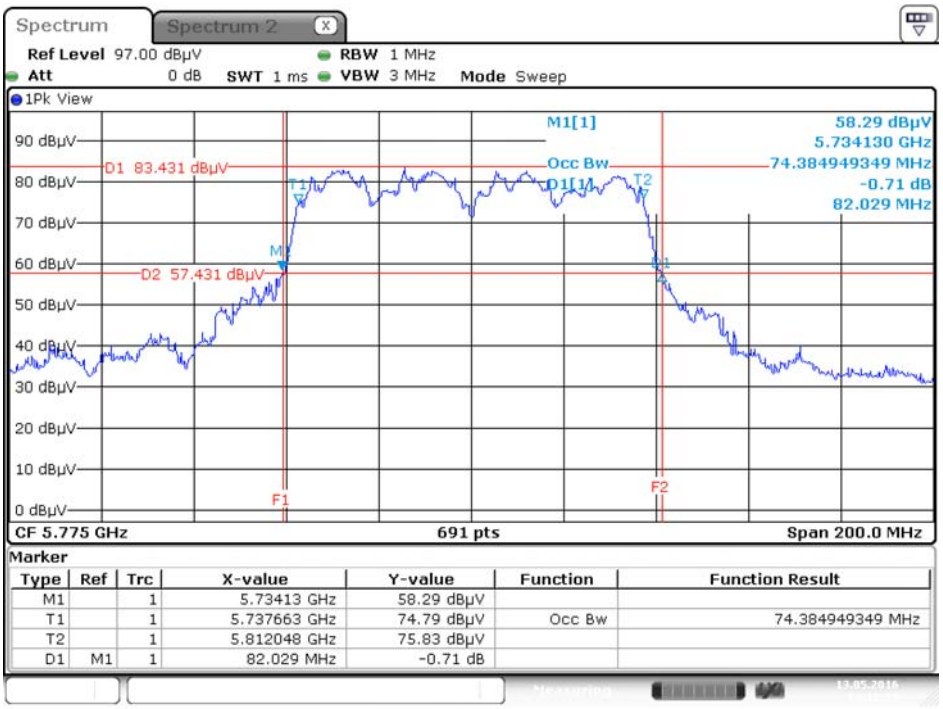
Date: 13.MAY.2016 14:13:34

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 4 + Chain 5 + Chain 6 / 5210 MHz



Date: 13.MAY.2016 14:48:04

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 4 + Chain 5 + Chain 6 / 5775 MHz



Date: 13.MAY.2016 14:18:14

4.3. 6dB Spectrum Bandwidth Measurement

4.3.1. Limit

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

4.3.2. Measuring Instruments and Setting

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

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

4.3.3. Test Procedures

For Radiated 6dB Bandwidth Measurement:

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

4.3.4. Test Setup Layout

For Radiated 6dB Bandwidth Measurement:

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

4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.3.7. Test Result of 6dB Spectrum Bandwidth

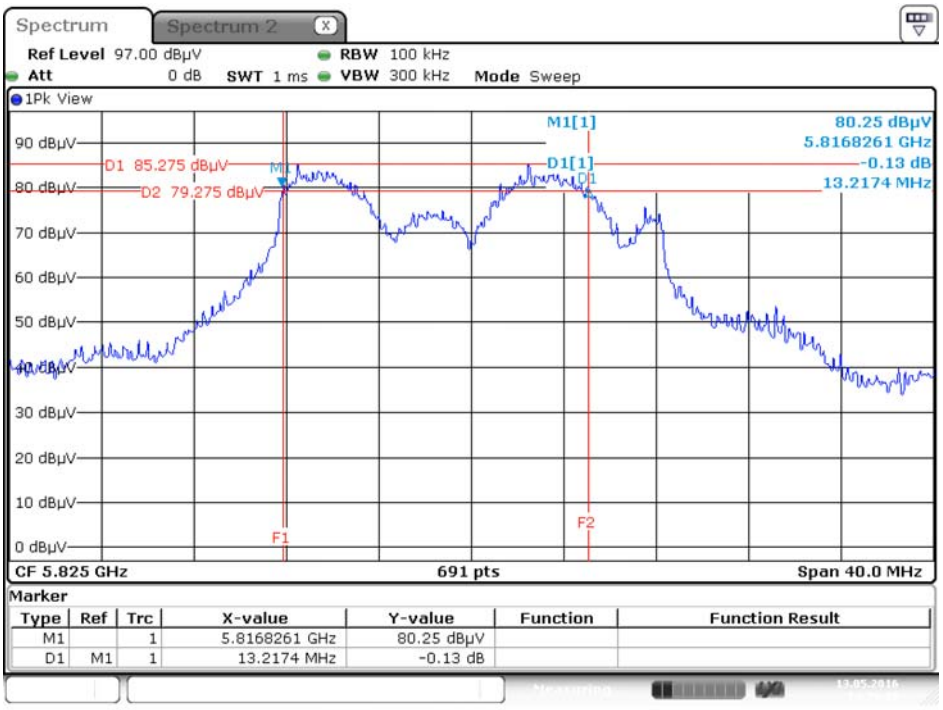
Temperature	24°C	Humidity	60%
Test Engineer	Clemens Fang		

Mode	Frequency	6dB Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11a	5745 MHz	13.80	500	Complies
	5785 MHz	15.77	500	Complies
	5825 MHz	13.22	500	Complies
802.11ac MCS0/Nss1 VHT20	5745 MHz	15.36	500	Complies
	5785 MHz	16.35	500	Complies
	5825 MHz	16.41	500	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	32.70	500	Complies
	5795 MHz	32.70	500	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	71.30	500	Complies

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

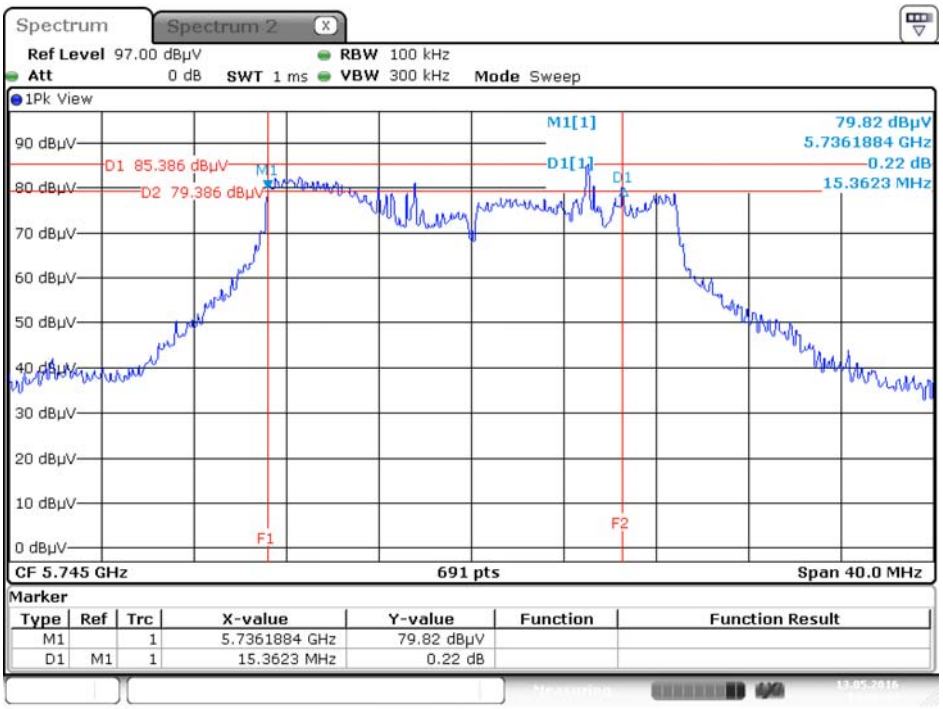
For plots, only the channel with worse result was shown.

6 dB Bandwidth Plot on Configuration IEEE 802.11a / Chain 4 + Chain 5 + Chain 6 / 5825 MHz



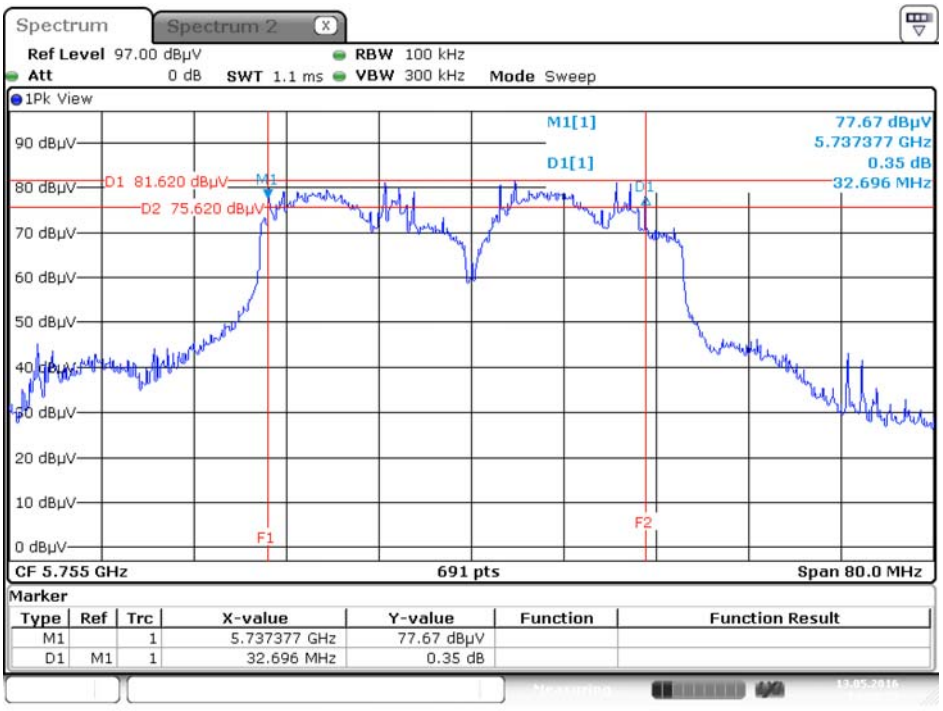
Date: 13.MAY.2016 14:29:38

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 4 + Chain 5 + Chain 6 / 5745 MHz



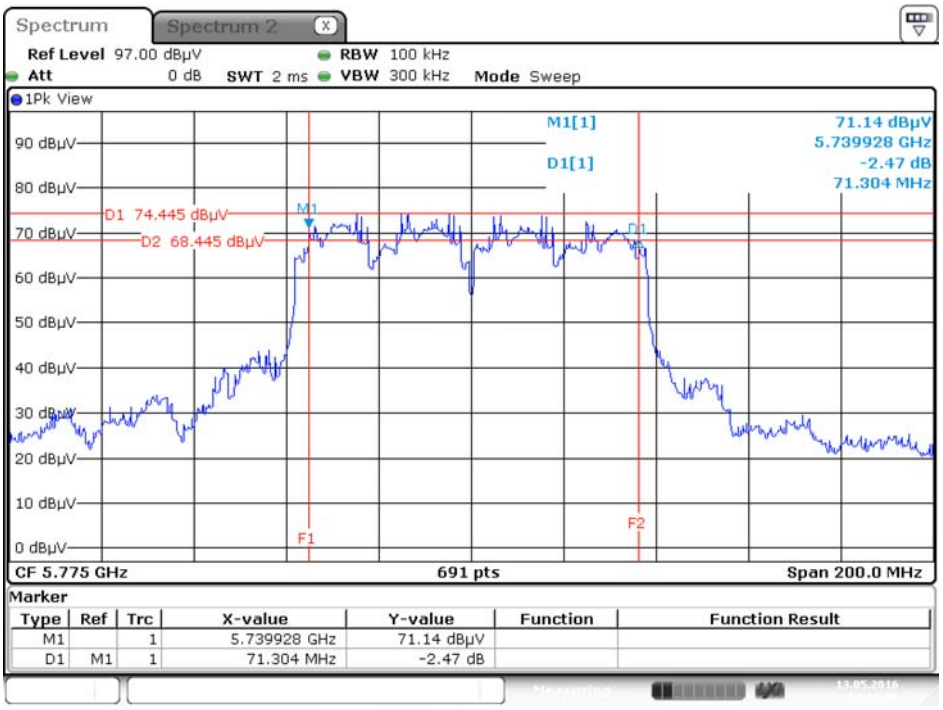
Date: 13.MAY.2016 14:26:44

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 4 + Chain 5 + Chain 6 / 5755MHz



Date: 13.MAY.2016 14:20:23

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 4 + Chain 5 + Chain 6 / 5775 MHz



Date: 13.MAY.2016 14:19:37

4.4. Maximum Conducted Output Power Measurement

4.4.1. Limit

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

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

4.4.2. Measuring Instruments and Setting

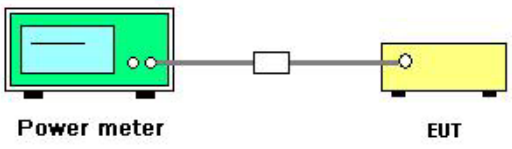
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Detector	AVERAGE

4.4.3. Test Procedures

1. The transmitter output (antenna port) was connected to the power meter.
2. Test was performed in accordance with KDB789033 D02 v01r02 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (E) Maximum conducted output power =>3. Measurement using a Power Meter (PM) =>b) Method PM-G (Measurement using a gated RF average power meter).
3. Multiple antenna systems was performed in accordance with KDB662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. When measuring maximum conducted output power with multiple antenna systems, add every result of the values by mathematic formula.

4.4.4. Test Setup Layout



4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.4.7. Test Result of Maximum Conducted Output Power

Temperature	24°C	Humidity	60%
Test Engineer	Clemens Fang	Test Date	May 12, 2016 ~ May 13, 2016

Mode	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 4	Chain 5	Chain 6	Total		
802.11a	5180 MHz	21.29	20.74	21.83	26.08	30.00	Complies
	5200 MHz	22.46	22.92	23.16	27.63	30.00	Complies
	5240 MHz	22.45	22.97	23.18	27.65	30.00	Complies
	5745 MHz	21.02	21.09	21.56	26.00	30.00	Complies
	5785 MHz	24.14	25.56	25.08	29.74	30.00	Complies
	5825 MHz	22.65	21.86	21.55	26.82	30.00	Complies
802.11ac MCS0/Nss1 VHT20	5180 MHz	22.88	22.23	22.35	27.27	30.00	Complies
	5200 MHz	22.55	23.17	23.30	27.79	30.00	Complies
	5240 MHz	22.30	23.32	23.31	27.77	30.00	Complies
	5745 MHz	22.54	21.93	21.68	26.84	30.00	Complies
	5785 MHz	24.54	25.36	25.16	29.81	30.00	Complies
	5825 MHz	22.27	21.45	21.64	26.57	30.00	Complies
802.11ac MCS0/Nss1 VHT40	5190 MHz	17.95	18.13	18.09	22.83	30.00	Complies
	5230 MHz	23.99	24.53	24.79	29.22	30.00	Complies
	5755 MHz	20.87	20.63	20.03	25.30	30.00	Complies
	5795 MHz	22.19	21.12	21.05	26.26	30.00	Complies
802.11ac MCS0/Nss1 VHT80	5210 MHz	16.82	16.65	16.68	21.49	30.00	Complies
	5775 MHz	17.51	17.14	16.25	21.77	30.00	Complies

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

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

4.5. Power Spectral Density Measurement

4.5.1. Limit

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

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

4.5.2. Measuring Instruments and Setting

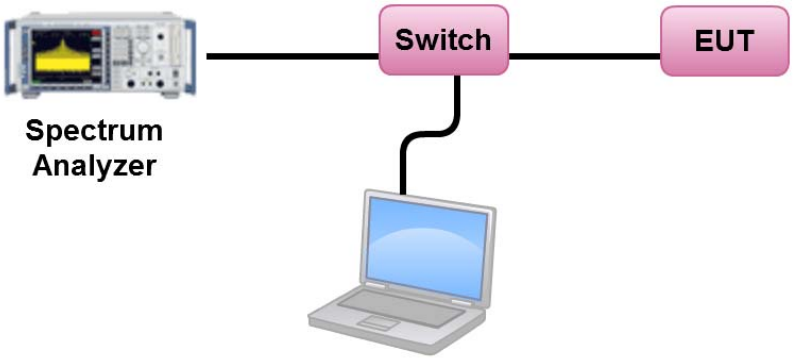
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.5.3. Test Procedures

1. The transmitter output (antenna port) was connected RF switch to the spectrum analyzer.
2. Test was performed in accordance with KDB789033 D02 v01r02 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (F) Maximum Power Spectral Density (PSD).
3. Multiple antenna systems was performed in accordance KDB662911 D01 v02r01 in-Band Power Spectral Density (PSD) Measurements and sum the spectra across the outputs.
4. For 5.725~5.85 GHz, the measured result of PSD level must add 10log(500kHz/RBW) and the final result should ≤ 30 dBm.

4.5.4. Test Setup Layout



4.5.5. Test Deviation

There is no deviation with the original standard.

4.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.5.7. Test Result of Power Spectral Density

Temperature	24°C	Humidity	60%
Test Engineer	Clemens Fang		

Configuration IEEE 802.11a / Chain 4 + Chain 5 + Chain 6

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	12.85	14.52	Complies
40	5200 MHz	14.33	14.52	Complies
48	5240 MHz	14.44	14.52	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.48dBi, so limit=17-(8.48-6)=14.52 dBm/MHz.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	12.79	-3.01	9.78	27.52	Complies
157	5785 MHz	16.71	-3.01	13.70	27.52	Complies
165	5825 MHz	13.77	-3.01	10.76	27.52	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.48dBi, so limit=30-(8.48-6)=27.52 dBm/500kHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 4 + Chain 5 + Chain 6

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	13.91	14.52	Complies
40	5200 MHz	14.42	14.52	Complies
48	5240 MHz	14.35	14.52	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.48dBi, so limit=17-(8.48-6)=14.52 dBm/MHz.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
149	5745 MHz	13.50	-3.01	10.49	27.52	Complies
157	5785 MHz	16.69	-3.01	13.68	27.52	Complies
165	5825 MHz	13.24	-3.01	10.23	27.52	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.48dBi, so limit=30-(8.48-6)=27.52 dBm/500kHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 4 + Chain 5 + Chain 6

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	6.73	14.52	Complies
46	5230 MHz	13.13	14.52	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.48dBi, so limit=17-(8.48-6)=14.52 dBm/MHz.

Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
151	5755 MHz	9.25	-3.01	6.24	27.52	Complies
159	5795 MHz	10.18	-3.01	7.17	27.52	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.48dBi, so limit=30-(8.48-6)=27.52 dBm/500kHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 4 + Chain 5 + Chain 6

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
42	5210 MHz	2.37	14.52	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.48dBi, so limit=17-(8.48-6)=14.52 dBm/MHz.

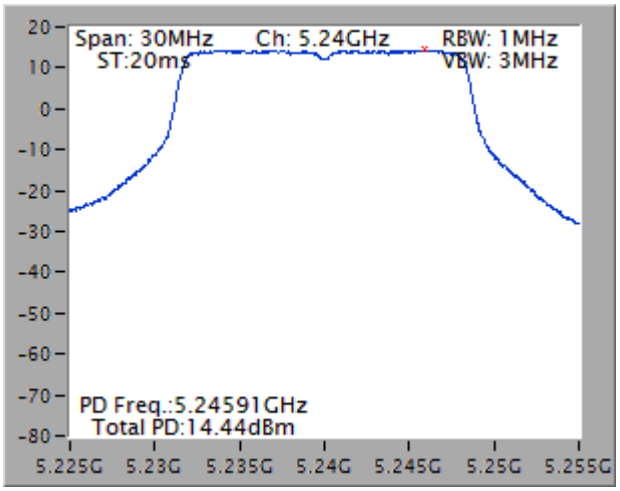
Channel	Frequency	Power Density (dBm/MHz)	10log(500kHz/RBW) Factor (dB)	Power Density (dBm/500kHz)	Power Density Limit (dBm/500kHz)	Result
155	5775 MHz	2.64	-3.01	-0.37	27.52	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.48dBi, so limit=30-(8.48-6)=27.52 dBm/500kHz.

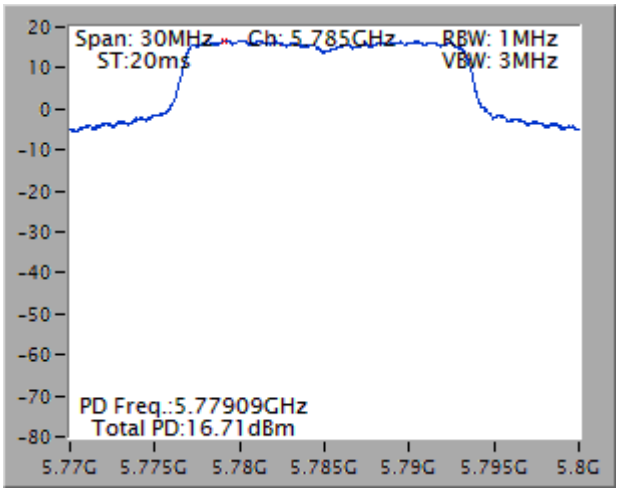
Note: All the test values were listed in the report.

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

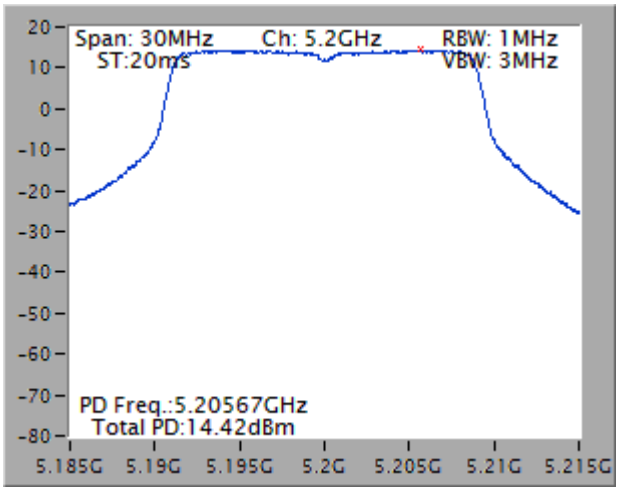
Power Density Plot on Configuration IEEE 802.11a / Chain 4 + Chain 5 + Chain 6 / 5240 MHz



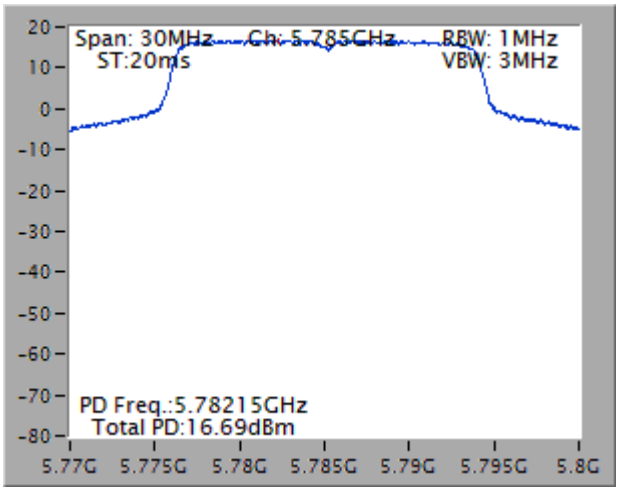
Power Density Plot on Configuration IEEE 802.11a / Chain 4 + Chain 5 + Chain 6 / 5785 MHz



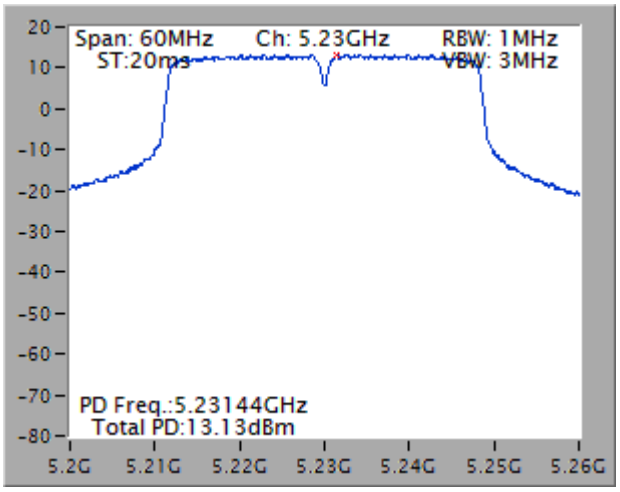
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 4 + Chain 5 + Chain 6 / 5200 MHz



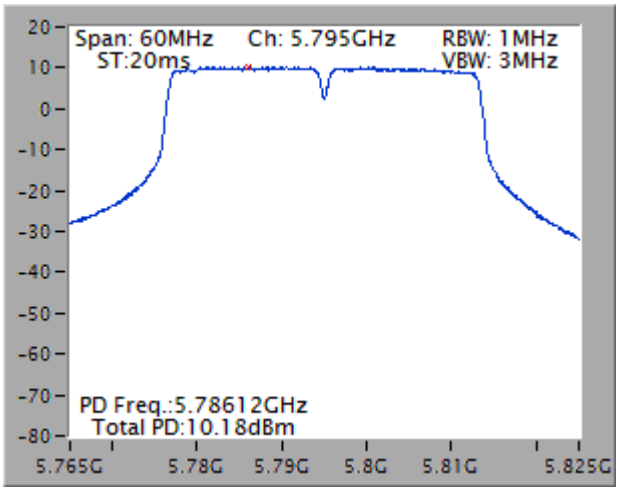
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 4 + Chain 5 + Chain 6 / 5785 MHz



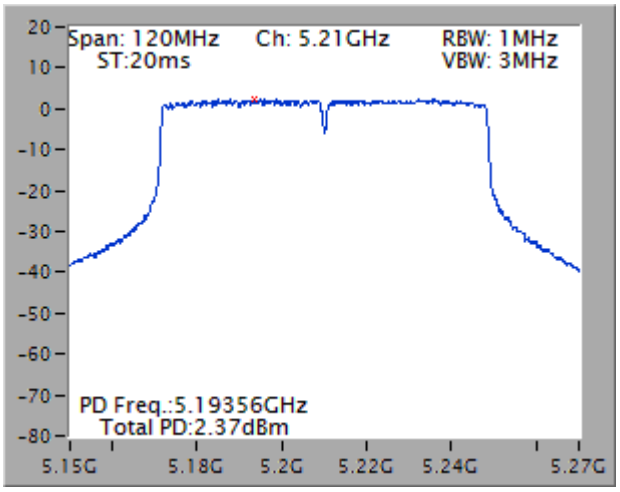
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 4 + Chain 5 + Chain 6 / 5230 MHz



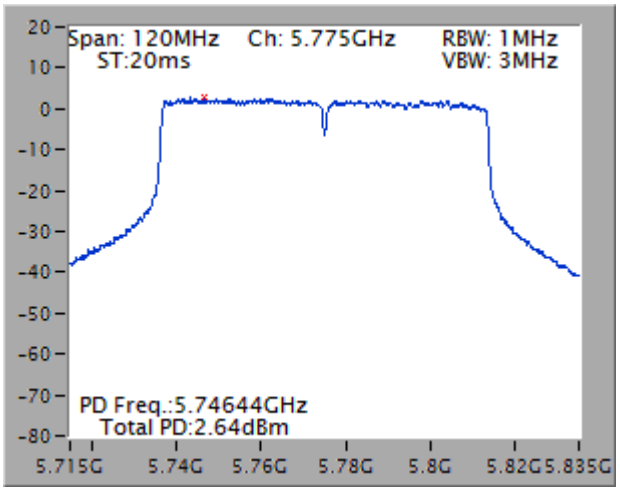
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 4 + Chain 5 + Chain 6 / 5795 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 4 + Chain 5 + Chain 6 / 5210 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 4 + Chain 5 + Chain 6 / 5775 MHz



4.6. Radiated Emissions Measurement

4.6.1. Limit

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

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

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

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

4.6.2. Measuring Instruments and Setting

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

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

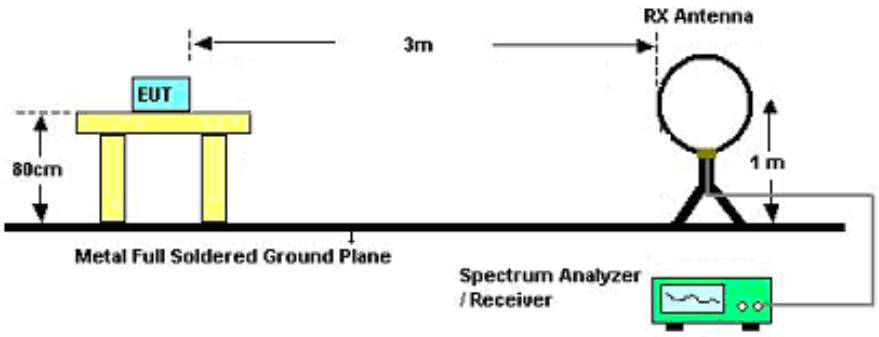
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.6.3. Test Procedures

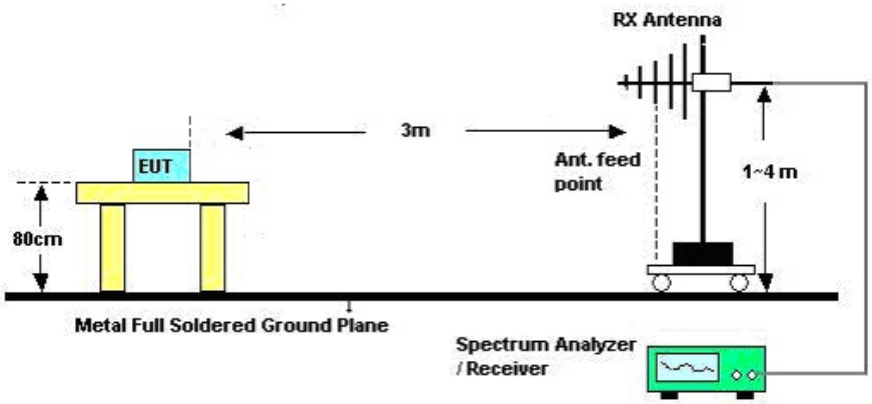
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 1m & 3m far away from the turntable.
2. Power on the EUT and all the supporting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

4.6.4. Test Setup Layout

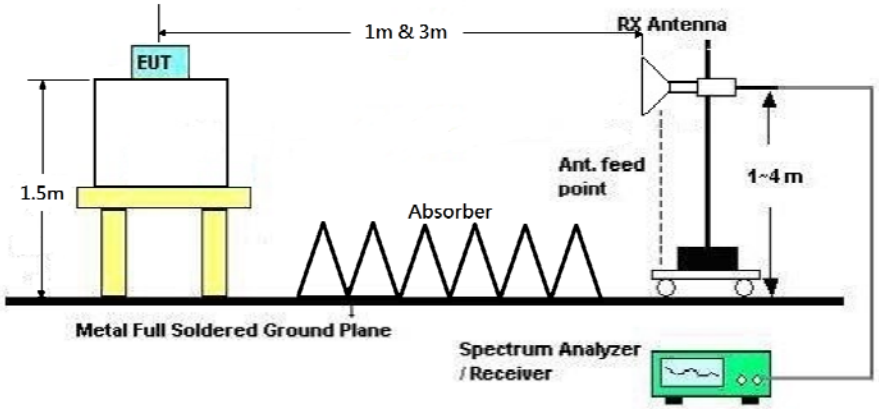
For Radiated Emissions: 9kHz ~30MHz



For Radiated Emissions: 30MHz~1GHz



For Radiated Emissions: Above 1GHz



4.6.5. Test Deviation

There is no deviation with the original standard.

4.6.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

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

Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang	Configurations	CTX / Mode 1
Test Date	May 18, 2016		

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

Note:

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

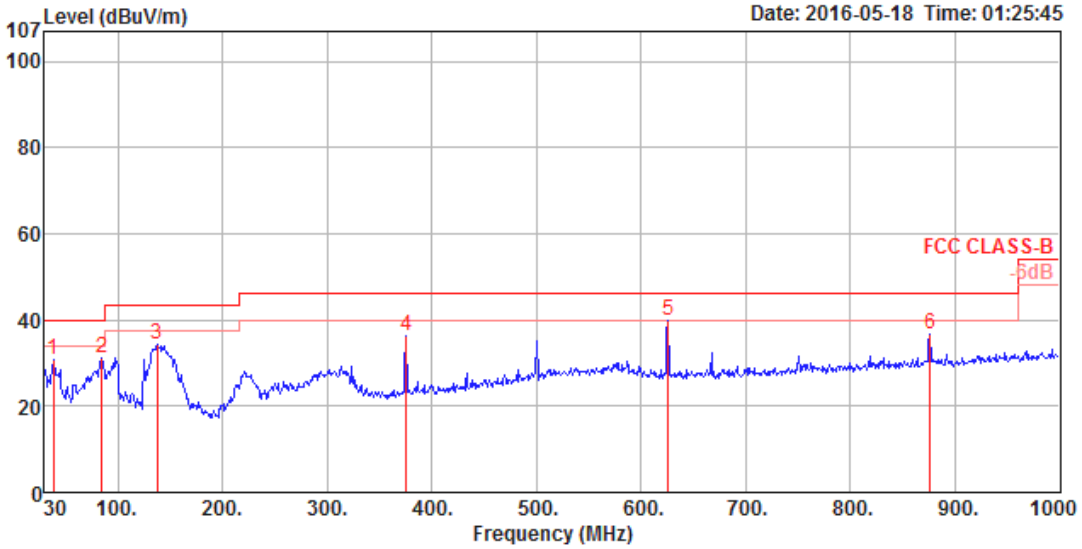
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

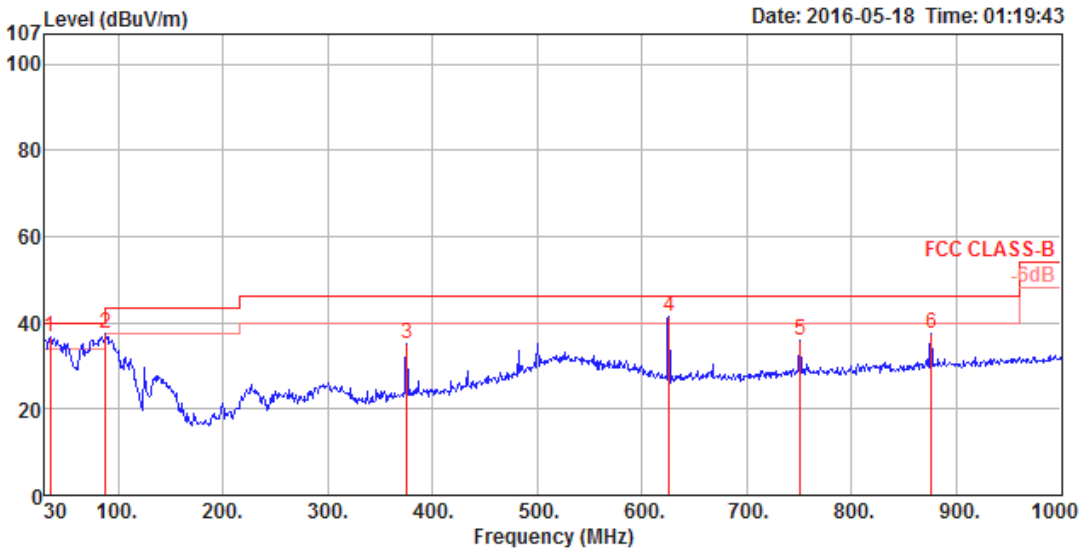
Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang	Configurations	CTX / Mode 1

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	38.73	30.69	40.00	-9.31	42.49	0.62	20.21	32.63	100	0	Peak	HORIZONTAL
2	84.32	31.20	40.00	-8.80	48.99	0.92	13.87	32.58	150	128	Peak	HORIZONTAL
3	137.67	34.49	43.50	-9.01	48.20	1.15	17.70	32.56	150	128	Peak	HORIZONTAL
4	375.32	36.47	46.00	-9.53	45.48	1.90	21.63	32.54	100	253	Peak	HORIZONTAL
5	625.58	39.86	46.00	-6.14	45.03	2.44	25.06	32.67	100	286	Peak	HORIZONTAL
6	875.84	36.73	46.00	-9.27	38.53	2.89	27.30	31.99	200	293	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	34.85	36.81	40.00	-3.19	46.28	0.60	22.57	32.64	125	174	Peak	VERTICAL
2	88.20	37.65	43.50	-5.85	54.75	0.94	14.54	32.58	100	2	Peak	VERTICAL
3	375.32	35.15	46.00	-10.85	44.16	1.90	21.63	32.54	150	4	Peak	VERTICAL
4	625.58	41.55	46.00	-4.45	46.72	2.44	25.06	32.67	100	270	Peak	VERTICAL
5	750.71	35.97	46.00	-10.03	39.67	2.69	26.10	32.49	100	296	Peak	VERTICAL
6	875.84	37.34	46.00	-8.66	39.14	2.89	27.30	31.99	100	272	Peak	VERTICAL

Note:

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

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

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

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

Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11a CH 36 / Chain 4 + Chain 5 + Chain 6
Test Date	Mar. 24, 2016 ~ May 18, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15535.92	61.61	74.00	-12.39	44.04	14.67	38.25	35.35	166	154	Peak	HORIZONTAL
2	15541.92	48.04	54.00	-5.96	30.47	14.67	38.25	35.35	166	154	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	15537.58	48.26	54.00	-5.74	30.69	14.67	38.25	35.35	179	107	Average	VERTICAL
2	15542.15	61.16	74.00	-12.84	43.59	14.67	38.25	35.35	179	107	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11a CH 40 / Chain 4 + Chain 5 + Chain 6
Test Date	Mar. 24, 2016 ~ May 18, 2016		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	15600.28	49.47	54.00	-4.53	31.95	14.69	38.19	35.36	160	333	Average	HORIZONTAL
2	15600.48	60.82	74.00	-13.18	43.33	14.71	38.14	35.36	160	333	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	15600.00	61.51	74.00	-12.49	43.99	14.69	38.19	35.36	158	316	Peak	VERTICAL
2	15600.16	50.28	54.00	-3.72	32.76	14.69	38.19	35.36	158	316	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11a CH 48 / Chain 4 + Chain 5 + Chain 6
Test Date	Mar. 24, 2016 ~ May 18, 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	15719.84	60.52	74.00	-13.48	43.12	14.75	38.03	35.38	168	336	Peak	HORIZONTAL
2	15720.84	47.25	54.00	-6.75	29.85	14.75	38.03	35.38	168	336	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	15721.12	48.11	54.00	-5.89	30.71	14.75	38.03	35.38	160	270	Average	VERTICAL
2	15722.00	61.84	74.00	-12.16	44.44	14.75	38.03	35.38	160	270	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11a CH 149 / Chain 4 + Chain 5 + Chain 6
Test Date	Mar. 24, 2016 ~ May 18, 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	11493.92	56.06	74.00	-17.94	38.38	12.91	40.00	35.23	179	186	Peak	HORIZONTAL
2	11494.08	48.23	54.00	-5.77	30.55	12.91	40.00	35.23	179	186	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	11491.40	47.67	54.00	-6.33	29.99	12.91	40.00	35.23	189	270	Average	VERTICAL
2	11491.92	60.17	74.00	-13.83	42.49	12.91	40.00	35.23	189	270	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11a CH 157 / Chain 4 + Chain 5 + Chain 6
Test Date	Mar. 24, 2016 ~ May 18, 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	11564.48	66.63	74.00	-7.37	49.05	12.94	39.87	35.23	157	180	Peak	HORIZONTAL
2	11569.84	52.55	54.00	-1.45	34.97	12.94	39.87	35.23	157	180	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	11566.00	50.78	54.00	-3.22	33.20	12.94	39.87	35.23	151	232	Average	VERTICAL
2	11575.80	64.19	74.00	-9.81	46.61	12.94	39.87	35.23	151	232	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11a CH 165 / Chain 4 + Chain 5 + Chain 6
Test Date	Mar. 24, 2016 ~ May 18, 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	11653.48	60.78	74.00	-13.22	43.35	12.98	39.67	35.22	178	180	Peak	HORIZONTAL
2	11654.48	47.91	54.00	-6.09	30.48	12.98	39.67	35.22	178	180	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	11645.00	61.90	74.00	-12.10	44.42	12.97	39.73	35.22	181	219	Peak	VERTICAL
2	11646.68	48.21	54.00	-5.79	30.73	12.97	39.73	35.22	181	219	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36 / Chain 4 + Chain 5 + Chain 6
Test Date	Mar. 24, 2016 ~ May 18, 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	15530.00	46.41	54.00	-7.59	28.84	14.67	38.25	35.35	174	145	Average	HORIZONTAL
2	15537.84	57.26	74.00	-16.74	39.69	14.67	38.25	35.35	174	145	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	15530.00	47.48	54.00	-6.52	29.91	14.67	38.25	35.35	162	112	Average	VERTICAL
2	15543.56	58.30	74.00	-15.70	40.73	14.67	38.25	35.35	162	112	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 40 / Chain 4 + Chain 5 + Chain 6
Test Date	Mar. 24, 2016 ~ May 18, 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	15604.56	59.93	74.00	-14.07	42.44	14.71	38.14	35.36	164	274	Peak	HORIZONTAL
2	15605.60	47.71	54.00	-6.29	30.22	14.71	38.14	35.36	164	274	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	15605.56	48.93	54.00	-5.07	31.44	14.71	38.14	35.36	151	271	Average	VERTICAL
2	15607.20	59.46	74.00	-14.54	41.97	14.71	38.14	35.36	151	271	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 48 / Chain 4 + Chain 5 + Chain 6
Test Date	Mar. 24, 2016 ~ May 18, 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	15721.76	55.79	74.00	-18.21	38.39	14.75	38.03	35.38	172	299	Peak	HORIZONTAL
2	15722.44	46.10	54.00	-7.90	28.70	14.75	38.03	35.38	172	299	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	15711.12	57.91	74.00	-16.09	40.50	14.75	38.03	35.37	154	268	Peak	VERTICAL
2	15722.52	46.98	54.00	-7.02	29.58	14.75	38.03	35.38	154	268	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Chain 4 + Chain 5 + Chain 6
Test Date	Mar. 24, 2016 ~ May 18, 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	11488.40	50.55	54.00	-3.45	32.87	12.91	40.00	35.23	159	176	Average	HORIZONTAL
2	11498.20	62.97	74.00	-11.03	45.29	12.91	40.00	35.23	159	176	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11489.64	51.30	54.00	-2.70	33.62	12.91	40.00	35.23	140	252	Average	VERTICAL
2	11490.39	65.03	74.00	-8.97	47.35	12.91	40.00	35.23	140	252	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Chain 4 + Chain 5 + Chain 6
Test Date	Mar. 24, 2016 ~ May 18, 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	11568.40	67.87	74.00	-6.13	50.29	12.94	39.87	35.23	153	175	Peak	HORIZONTAL
2	11568.80	53.69	54.00	-0.31	36.11	12.94	39.87	35.23	153	175	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11563.80	52.43	54.00	-1.57	34.85	12.94	39.87	35.23	152	231	Average	VERTICAL
2	11580.40	66.68	74.00	-7.32	49.10	12.94	39.87	35.23	152	231	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Chain 4 + Chain 5 + Chain 6
Test Date	Mar. 24, 2016 ~ May 18, 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	11658.60	50.14	54.00	-3.86	32.71	12.98	39.67	35.22	153	360	Average	HORIZONTAL
2	11659.60	64.08	74.00	-9.92	46.65	12.98	39.67	35.22	153	360	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	11642.84	64.58	74.00	-9.42	47.10	12.97	39.73	35.22	159	231	Peak	VERTICAL
2	11643.44	50.28	54.00	-3.72	32.80	12.97	39.73	35.22	159	231	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38 / Chain 4 + Chain 5 + Chain 6
Test Date	Mar. 24, 2016 ~ May 18, 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	15550.16	45.76	54.00	-8.24	28.19	14.67	38.25	35.35	166	182	Average	HORIZONTAL
2	15561.44	54.30	74.00	-19.70	36.78	14.69	38.19	35.36	166	182	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	15550.00	46.78	54.00	-7.22	29.21	14.67	38.25	35.35	154	174	Average	VERTICAL
2	15577.04	55.40	74.00	-18.60	37.88	14.69	38.19	35.36	154	174	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 46 / Chain 4 + Chain 5 + Chain 6
Test Date	Mar. 24, 2016 ~ May 18, 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	15670.16	45.12	54.00	-8.88	27.68	14.73	38.08	35.37	171	185	Average	HORIZONTAL
2	15703.04	53.45	74.00	-20.55	36.04	14.75	38.03	35.37	171	185	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	15683.44	54.69	74.00	-19.31	37.25	14.73	38.08	35.37	166	178	Peak	VERTICAL
2	15708.32	45.15	54.00	-8.85	27.74	14.75	38.03	35.37	166	178	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Chain 4 + Chain 5 + Chain 6
Test Date	Mar. 24, 2016 ~ May 18, 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	11514.08	60.18	74.00	-13.82	42.50	12.91	40.00	35.23	163	157	Peak	HORIZONTAL
2	11514.16	47.10	54.00	-6.90	29.42	12.91	40.00	35.23	163	157	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	11505.96	60.35	74.00	-13.65	42.67	12.91	40.00	35.23	158	146	Peak	VERTICAL
2	11514.12	47.73	54.00	-6.27	30.05	12.91	40.00	35.23	158	146	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Chain 4 + Chain 5 + Chain 6
Test Date	Mar. 24, 2016 ~ May 18, 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	11596.40	48.54	54.00	-5.46	31.01	12.95	39.80	35.22	172	190	Average	HORIZONTAL
2	11599.30	61.77	74.00	-12.23	44.24	12.95	39.80	35.22	172	190	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	11584.64	48.48	54.00	-5.52	30.95	12.95	39.80	35.22	154	230	Average	VERTICAL
2	11586.28	61.59	74.00	-12.41	44.06	12.95	39.80	35.22	154	230	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42 / Chain 4 + Chain 5 + Chain 6
Test Date	Mar. 24, 2016 ~ May 18, 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	15625.10	45.91	54.00	-8.09	28.42	14.71	38.14	35.36	179	183	Average	HORIZONTAL
2	15625.10	53.21	74.00	-20.79	35.72	14.71	38.14	35.36	179	183	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	15625.00	46.72	54.00	-7.28	29.23	14.71	38.14	35.36	157	175	Average	VERTICAL
2	15625.00	54.95	74.00	-19.05	37.46	14.71	38.14	35.36	157	175	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 4 + Chain 5 + Chain 6
Test Date	Mar. 24, 2016 ~ May 18, 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	11540.40	47.13	54.00	-6.87	29.51	12.92	39.93	35.23	161	180	Average	HORIZONTAL
2	11571.90	60.43	74.00	-13.57	42.85	12.94	39.87	35.23	161	180	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	11545.84	59.94	74.00	-14.06	42.32	12.92	39.93	35.23	159	178	Peak	VERTICAL
2	11548.48	46.79	54.00	-7.21	29.17	12.92	39.93	35.23	159	178	Average	VERTICAL

Note:

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

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

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

4.7. Band Edge Emissions Measurement

4.7.1. Limit

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

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

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

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

4.7.2. Measuring Instruments and Setting

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

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

4.7.3. Test Procedures

The test procedure is the same as section 4.6.3.

4.7.4. Test Setup Layout

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

4.7.5. Test Deviation

There is no deviation with the original standard.

4.7.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.7.7. Test Result of Band Edge and Fundamental Emissions

Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11a CH 36, 40, 48 / Chain 4 + Chain 5 + Chain 6
Test Date	Mar. 24, 2016 ~ May 18, 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	5149.60	66.59	74.00	-7.41	59.33	8.68	31.52	32.94	152	239	Peak	HORIZONTAL
2	5150.00	53.66	54.00	-0.34	46.40	8.68	31.52	32.94	152	239	Average	HORIZONTAL
3	5179.20	105.34			98.05	8.68	31.55	32.94	152	239	Average	HORIZONTAL
4	5179.20	114.98			107.69	8.68	31.55	32.94	152	239	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	53.32	54.00	-0.68	46.06	8.68	31.52	32.94	154	264	Average	HORIZONTAL
2	5150.00	67.60	74.00	-6.40	60.34	8.68	31.52	32.94	154	264	Peak	HORIZONTAL
3	5206.00	110.49			103.17	8.69	31.57	32.94	154	264	Average	HORIZONTAL
4	5206.00	120.51			113.19	8.69	31.57	32.94	154	264	Peak	HORIZONTAL

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

Channel 48

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5145.00	58.82	74.00	-15.18	51.56	8.68	31.52	32.94	155	316	Peak	VERTICAL
2	5150.00	46.50	54.00	-7.50	39.24	8.68	31.52	32.94	155	316	Average	VERTICAL
3	5239.00	107.25			99.90	8.70	31.59	32.94	155	316	Average	VERTICAL
4	5239.00	116.78			109.43	8.70	31.59	32.94	155	316	Peak	VERTICAL
5	5350.00	47.93	54.00	-6.07	40.44	8.74	31.68	32.93	155	316	Average	VERTICAL
6	5356.00	61.10	74.00	-12.90	53.59	8.75	31.69	32.93	155	316	Peak	VERTICAL

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

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11a CH 149, 157, 165 / Chain 4 + Chain 5 + Chain 6
Test Date	Mar. 24, 2016 ~ May 18, 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	5714.60	67.91	68.20	-0.29	59.92	8.93	32.06	33.00	156	360	Peak	VERTICAL
2	5725.00	74.50	78.20	-3.70	66.50	8.92	32.08	33.00	156	360	Peak	VERTICAL
3	5743.40	103.79			95.80	8.90	32.10	33.01	156	360	Average	VERTICAL
4	5744.60	114.12			106.13	8.90	32.10	33.01	156	360	Peak	VERTICAL

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

Channel 157

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5715.00	67.63	68.20	-0.57	59.64	8.93	32.06	33.00	154	354	Peak	HORIZONTAL
2	5725.00	73.54	78.20	-4.66	65.54	8.92	32.08	33.00	154	354	Peak	HORIZONTAL
3	5781.00	119.32			111.33	8.88	32.14	33.03	154	354	Peak	HORIZONTAL
4	5791.00	109.51			101.52	8.86	32.16	33.03	154	354	Average	HORIZONTAL
5	5850.00	71.68	78.20	-6.52	63.60	8.91	32.22	33.05	154	354	Peak	HORIZONTAL
6	5860.00	68.10	68.20	-0.10	59.99	8.93	32.24	33.06	154	354	Peak	HORIZONTAL

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

Channel 165

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5819.80	114.92			106.90	8.88	32.18	33.04	154	354	Peak	HORIZONTAL
2	5826.20	105.06			97.01	8.90	32.20	33.05	154	354	Average	HORIZONTAL
3	5850.60	77.18	78.20	-1.02	69.10	8.91	32.22	33.05	154	354	Peak	HORIZONTAL
4	5860.00	53.64	54.00	-0.36	45.53	8.93	32.24	33.06	154	354	Average	HORIZONTAL
5	5860.00	70.06	74.00	-3.94	61.95	8.93	32.24	33.06	154	354	Peak	HORIZONTAL

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

Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36, 40, 48 / Chain 4 + Chain 5 + Chain 6
Test Date	Mar. 24, 2016 ~ May 18, 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	5148.80	66.02	74.00	-7.98	58.76	8.68	31.52	32.94	154	255	Peak	HORIZONTAL
2	5150.00	53.51	54.00	-0.49	46.25	8.68	31.52	32.94	154	255	Average	HORIZONTAL
3	5178.80	114.63			107.34	8.68	31.55	32.94	154	255	Peak	HORIZONTAL
4	5179.20	105.04			97.75	8.68	31.55	32.94	154	255	Average	HORIZONTAL

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

Channel 40

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5148.40	53.15	54.00	-0.85	45.89	8.68	31.52	32.94	154	261	Average	HORIZONTAL
2	5150.00	69.14	74.00	-4.86	61.88	8.68	31.52	32.94	154	261	Peak	HORIZONTAL
3	5207.20	109.47			102.15	8.69	31.57	32.94	154	261	Average	HORIZONTAL
4	5208.00	120.38			113.06	8.69	31.57	32.94	154	261	Peak	HORIZONTAL

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

Channel 48

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5144.00	59.26	74.00	-14.74	52.00	8.68	31.52	32.94	154	313	Peak	VERTICAL
2	5150.00	46.99	54.00	-7.01	39.73	8.68	31.52	32.94	154	313	Average	VERTICAL
3	5233.00	105.40			98.05	8.70	31.59	32.94	154	313	Average	VERTICAL
4	5245.00	114.67			107.31	8.70	31.59	32.93	154	313	Peak	VERTICAL
5	5350.00	48.68	54.00	-5.32	41.19	8.74	31.68	32.93	154	313	Average	VERTICAL
6	5352.00	61.64	74.00	-12.36	54.15	8.74	31.68	32.93	154	313	Peak	VERTICAL

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

Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149, 157, 165 / Chain 4 + Chain 5 + Chain 6
Test Date	Mar. 24, 2016 ~ May 18, 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	5711.80	67.99	68.20	-0.21	60.00	8.93	32.06	33.00	157	346	Peak	HORIZONTAL
2	5723.40	71.30	78.20	-6.90	63.30	8.92	32.08	33.00	157	346	Peak	HORIZONTAL
3	5751.40	105.57			97.59	8.90	32.10	33.02	157	346	Average	HORIZONTAL
4	5751.40	115.80			107.82	8.90	32.10	33.02	157	346	Peak	HORIZONTAL

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

Channel 157

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5712.00	66.27	68.20	-1.93	58.28	8.93	32.06	33.00	155	353	Peak	HORIZONTAL
2	5721.00	64.41	78.20	-13.79	56.42	8.93	32.06	33.00	155	353	Peak	HORIZONTAL
3	5791.00	109.64			101.65	8.86	32.16	33.03	155	353	Average	HORIZONTAL
4	5791.00	119.57			111.58	8.86	32.16	33.03	155	353	Peak	HORIZONTAL
5	5851.00	70.79	78.20	-7.41	62.71	8.91	32.22	33.05	155	353	Peak	HORIZONTAL
6	5870.00	67.50	68.20	-0.70	59.39	8.93	32.24	33.06	155	353	Peak	HORIZONTAL

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

Channel 165

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5820.20	105.60			97.58	8.88	32.18	33.04	156	358	Average	HORIZONTAL
2	5830.20	116.61			108.56	8.90	32.20	33.05	156	355	Peak	HORIZONTAL
3	5850.00	77.25	78.20	-0.95	69.17	8.91	32.22	33.05	156	355	Peak	HORIZONTAL
4	5861.00	68.03	68.20	-0.17	59.92	8.93	32.24	33.06	156	355	Peak	HORIZONTAL

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

Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38, 46 / Chain 4 + Chain 5 + Chain 6
Test Date	Mar. 24, 2016 ~ May 18, 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	5150.00	53.66	54.00	-0.34	46.40	8.68	31.52	32.94	153	234	Average	HORIZONTAL
2	5150.00	65.92	74.00	-8.08	58.66	8.68	31.52	32.94	153	234	Peak	HORIZONTAL
3	5192.00	97.58			90.28	8.68	31.56	32.94	153	234	Average	HORIZONTAL
4	5192.00	107.46			100.16	8.68	31.56	32.94	153	234	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	5147.00	49.92	54.00	-4.08	42.66	8.68	31.52	32.94	153	261	Average	HORIZONTAL
2	5148.00	62.36	74.00	-11.64	55.10	8.68	31.52	32.94	153	261	Peak	HORIZONTAL
3	5237.00	104.97			97.62	8.70	31.59	32.94	153	261	Average	HORIZONTAL
4	5237.00	114.61			107.26	8.70	31.59	32.94	153	261	Peak	HORIZONTAL

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

Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151, 159 / Chain 4 + Chain 5 + Chain 6
Test Date	Mar. 24, 2016 ~ May 18, 2016		

Channel 151

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5715.00	68.06	68.20	-0.14	60.07	8.93	32.06	33.00	154	348	Peak	HORIZONTAL
2	5725.00	75.01	78.20	-3.19	67.01	8.92	32.08	33.00	154	348	Peak	HORIZONTAL
3	5756.00	108.75			100.76	8.89	32.12	33.02	154	348	Peak	HORIZONTAL
4	5757.00	99.22			91.23	8.89	32.12	33.02	154	348	Average	HORIZONTAL
5	5852.00	60.23	78.20	-17.97	52.15	8.91	32.22	33.05	154	348	Peak	HORIZONTAL
6	5861.00	61.31	68.20	-6.89	53.20	8.93	32.24	33.06	154	348	Peak	HORIZONTAL

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

Channel 159

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5706.00	61.73	68.20	-6.47	53.74	8.93	32.06	33.00	155	356	Peak	VERTICAL
2	5725.00	66.78	78.20	-11.42	58.78	8.92	32.08	33.00	155	356	Peak	VERTICAL
3	5784.00	102.10			94.11	8.88	32.14	33.03	155	356	Average	VERTICAL
4	5784.00	112.28			104.29	8.88	32.14	33.03	155	356	Peak	VERTICAL
5	5852.00	72.13	78.20	-6.07	64.05	8.91	32.22	33.05	155	356	Peak	VERTICAL
6	5862.00	67.97	68.20	-0.23	59.86	8.93	32.24	33.06	155	356	Peak	VERTICAL

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

Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42, 155 / Chain 4 + Chain 5 + Chain 6
Test Date	Mar. 24, 2016 ~ May 18, 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	5141.00	65.05	74.00	-8.95	57.79	8.69	31.51	32.94	156	234	Peak	HORIZONTAL
2	5150.00	53.68	54.00	-0.32	46.42	8.68	31.52	32.94	156	234	Average	HORIZONTAL
3	5195.00	105.02			97.72	8.68	31.56	32.94	156	234	Peak	HORIZONTAL
4	5241.00	94.37			87.02	8.70	31.59	32.94	156	234	Average	HORIZONTAL
5	5350.00	48.29	54.00	-5.71	40.80	8.74	31.68	32.93	156	234	Average	HORIZONTAL
6	5353.00	60.03	74.00	-13.97	52.54	8.74	31.68	32.93	156	234	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	5715.00	68.06	68.20	-0.14	60.07	8.93	32.06	33.00	153	273	Peak	HORIZONTAL
2	5725.00	73.04	78.20	-5.16	65.04	8.92	32.08	33.00	153	273	Peak	HORIZONTAL
3	5745.00	93.41			85.42	8.90	32.10	33.01	153	273	Average	HORIZONTAL
4	5761.00	103.60			95.61	8.89	32.12	33.02	153	273	Peak	HORIZONTAL
5	5857.00	61.75	78.20	-16.45	53.63	8.93	32.24	33.05	153	273	Peak	HORIZONTAL
6	5862.00	61.24	68.20	-6.96	53.13	8.93	32.24	33.06	153	273	Peak	HORIZONTAL

Item 3, 4 are the fundamental frequency at 5775 MHz.

Note:

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

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

4.8. Frequency Stability Measurement

4.8.1. Limit

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

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

4.8.2. Measuring Instruments and Setting

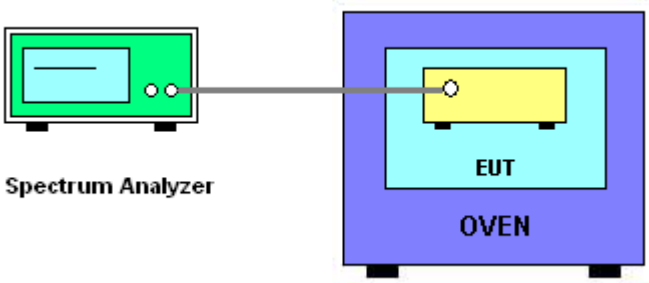
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.8.3. Test Procedures

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

4.8.4. Test Setup Layout



4.8.5. Test Deviation

There is no deviation with the original standard.

4.8.6. EUT Operation during Test

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

4.8.7. Test Result of Frequency Stability

Temperature	24°C	Humidity	60%
Test Engineer	Clemens Fang	Test Date	May 12, 2016 ~ May 13, 2016

Mode: 20 MHz / Chain 4

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5200 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5199.9730	5199.9719	5199.9704	5199.9684
110.00	5199.9718	5199.9705	5199.9689	5199.9670
93.50	5199.9704	5199.9695	5199.9681	5199.9663
Max. Deviation (MHz)	0.0296	0.0305	0.0319	0.0337
Max. Deviation (ppm)	5.70	5.87	6.14	6.48
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5200 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5199.9743	5199.9729	5199.9710	5199.9688
10	5199.9730	5199.9717	5199.9702	5199.9684
20	5199.9718	5199.9705	5199.9689	5199.9670
30	5199.9704	5199.9693	5199.9679	5199.9663
40	5199.9689	5199.9676	5199.9660	5199.9641
Max. Deviation (MHz)	0.0328	0.0340	0.0355	0.0378
Max. Deviation (ppm)	6.31	6.54	6.83	7.27
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5784.9739	5784.9728	5784.9713	5784.9693
110.00	5784.9727	5784.9714	5784.9698	5784.9679
93.50	5784.9713	5784.9704	5784.9690	5784.9672
Max. Deviation (MHz)	0.0288	0.0297	0.0311	0.0329
Max. Deviation (ppm)	4.97	5.13	5.37	5.68
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5785 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5784.9752	5784.9738	5784.9719	5784.9697
10	5784.9739	5784.9726	5784.9711	5784.9693
20	5784.9727	5784.9714	5784.9698	5784.9679
30	5784.9713	5784.9702	5784.9688	5784.9672
40	5784.9698	5784.9685	5784.9669	5784.9650
Max. Deviation (MHz)	0.0320	0.0332	0.0347	0.0370
Max. Deviation (ppm)	5.52	5.73	5.99	6.39
Result	Complies			

Mode: 40 MHz / Chain 4

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5190 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5189.9717	5189.9706	5189.9691	5189.9671
110.00	5189.9705	5189.9692	5189.9676	5189.9657
93.50	5189.9691	5189.9682	5189.9668	5189.9650
Max. Deviation (MHz)	0.0309	0.0318	0.0332	0.0350
Max. Deviation (ppm)	5.96	6.13	6.40	6.75
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5190 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5189.9730	5189.9716	5189.9697	5189.9675
10	5189.9717	5189.9704	5189.9689	5189.9671
20	5189.9705	5189.9692	5189.9676	5189.9657
30	5189.9691	5189.9680	5189.9666	5189.9650
40	5189.9676	5189.9663	5189.9647	5189.9628
Max. Deviation (MHz)	0.0341	0.0353	0.0368	0.0391
Max. Deviation (ppm)	6.57	6.81	7.09	7.54
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5754.9691	5754.9680	5754.9665	5754.9645
110.00	5754.9679	5754.9666	5754.9650	5754.9631
93.50	5754.9665	5754.9656	5754.9642	5754.9624
Max. Deviation (MHz)	0.0335	0.0344	0.0358	0.0376
Max. Deviation (ppm)	5.83	5.98	6.23	6.54
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5755 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5754.9704	5754.9690	5754.9671	5754.9649
10	5754.9691	5754.9678	5754.9663	5754.9645
20	5754.9679	5754.9666	5754.9650	5754.9631
30	5754.9665	5754.9654	5754.9640	5754.9624
40	5754.9650	5754.9637	5754.9621	5754.9602
Max. Deviation (MHz)	0.0367	0.0379	0.0394	0.0417
Max. Deviation (ppm)	6.38	6.59	6.85	7.25
Result	Complies			

Mode: 80 MHz / Chain 4

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5210 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5209.9699	5209.9688	5209.9673	5209.9653
110.00	5209.9687	5209.9674	5209.9658	5209.9639
93.50	5209.9673	5209.9664	5209.9650	5209.9632
Max. Deviation (MHz)	0.0327	0.0336	0.0350	0.0368
Max. Deviation (ppm)	6.27	6.44	6.71	7.06
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5210 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5209.9712	5209.9698	5209.9679	5209.9657
10	5209.9699	5209.9686	5209.9671	5209.9653
20	5209.9687	5209.9674	5209.9658	5209.9639
30	5209.9673	5209.9662	5209.9648	5209.9632
40	5209.9658	5209.9645	5209.9629	5209.9610
Max. Deviation (MHz)	0.0359	0.0371	0.0386	0.0409
Max. Deviation (ppm)	6.88	7.11	7.40	7.84
Result	Complies			

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)			
(V)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
126.50	5774.9678	5774.9667	5774.9652	5774.9632
110.00	5774.9666	5774.9653	5774.9637	5774.9618
93.50	5774.9652	5774.9643	5774.9629	5774.9611
Max. Deviation (MHz)	0.0348	0.0357	0.0371	0.0389
Max. Deviation (ppm)	6.03	6.19	6.43	6.74
Result	Complies			

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)			
(°C)	5775 MHz			
	0 Minute	2 Minute	5 Minute	10 Minute
0	5774.9691	5774.9677	5774.9658	5774.9636
10	5774.9678	5774.9665	5774.9650	5774.9632
20	5774.9666	5774.9653	5774.9637	5774.9618
30	5774.9652	5774.9641	5774.9627	5774.9611
40	5774.9637	5774.9624	5774.9608	5774.9589
Max. Deviation (MHz)	0.0380	0.0392	0.0407	0.0430
Max. Deviation (ppm)	6.59	6.79	7.05	7.45
Result	Complies			

4.9. Antenna Requirements

4.9.1. Limit

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

4.9.2. Antenna Connector Construction

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

5. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMI Receiver	Agilent	N9038A	My52260123	9kHz ~ 8.45GHz	Jan. 27, 0216	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Dec. 08, 2015	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Dec. 23, 2015	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	150kHz ~ 30MHz	May 25, 2015	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	Conduction (CO01-CB)
BILOG ANTENNA	TESEQ	CBL6112D	37880	20MHz ~ 2GHz	Sep. 03, 2015	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 16, 2016*	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Oct. 22, 2015	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 21, 2015	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Mar. 15, 2016	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 18, 2016	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26GHz ~ 40GHz	Nov. 13, 2015	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Oct. 27, 2015	Radiation (03CH01-CB)
EMI Receiver	Agilent	N9038A	MY52260123	9kHz ~ 8.4GHz	Jan. 27, 2016	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz ~ 1 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-17	N/A	1 GHz ~ 18 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-1	N/A	18GHz ~ 40 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-2	N/A	18GHz ~ 40 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
Test Software	Audix	E3	6.2009-l0-7	N/A	N/A	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 09, 2015	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-7	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-8	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-9	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 02, 2015	Conducted (TH01-CB)

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

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

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

6. MEASUREMENT UNCERTAINTY

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