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	**NETGEAR, Inc.**
Applicant Address	350 East Plumeria Drive, San Jose, California 95134, USA
FCC ID	**PY313200231**

Product Name	WiFi Range Extender
Brand Name	NETGEAR
Model No.	EX6100, EX6000
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5250 ~ 5350MHz / 5470 ~ 5725MHz
Received Date	Oct. 14, 2013
Final Test Date	Mar. 27, 2015
Submission Type	Class II Change

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 v01, KDB662911 D01 v02r01, KDB644545 D03 v01.**

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

Testing Laboratory
1190

Table of Contents

History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR3O1622-01	Rev. 01	Initial issue of report	Apr. 27, 2015

1. VERIFICATION OF COMPLIANCE

Product Name	:	WiFi Range Extender
Brand Name	:	NETGEAR
Model No.	:	EX6100, EX6000
Applicant	:	NETGEAR, 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 Oct. 14, 2013 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	14.92 dB
4.2	15.407(a)	26dB Spectrum Bandwidth and 99% Occupied Bandwidth	Complies	-
4.3	15.407(a)	Maximum Conducted Output Power	Complies	0.02 dB
4.4	15.407(a)	Power Spectral Density	Complies	0.04 dB
4.5	15.407(b)	Radiated Emissions	Complies	0.07 dB
4.6	15.407(b)	Band Edge Emissions	Complies	0.07 dB
4.7	15.407(g)	Frequency Stability	Complies	-
4.8	15.203	Antenna Requirements	Complies	-

Note: AC power line conducted emissions test results and radiated emissions below 1GHz test results are based on original report: FR3O1622.

3. GENERAL INFORMATION

3.1. Product Details

Items	Description
Product Type	WLAN (1TX, 1RX)
Radio Type	Intentional Transceiver
Power Type	From internal power supply
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	5250 ~ 5350MHz / 5470 ~ 5725MHz
Channel Number	12 for 20MHz bandwidth ; 5 for 40MHz bandwidth 2 for 80MHz bandwidth
Channel Band Width (99%)	Band 2: IEEE 802.11a: 17.13 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 17.85 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.25 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.70 MHz Band 3: IEEE 802.11a: 16.86 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 17.61 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 36.80 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.70 MHz
Maximum Conducted Output Power	Band 2: IEEE 802.11a: 23.84 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 23.98 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 23.87 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 15.09 dBm Band 3: IEEE 802.11a: 23.81 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 23.81 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 23.81 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 16.22 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
TPC Function	☒ With TPC	☐ Without TPC
Weather Band (5600~5650MHz)	☐ With 5600~5650MHz	☒ Without 5600~5650MHz
Beamforming Function	☐ With beamforming	☒ Without beamforming
Operating Mode	☐ Outdoor access point	
	☒ Indoor access point	
	☐ Fixed point-to-point access points	
	☐ Mobile and portable client devices	

Antenna and Band width

Antenna	Single (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)	1	MCS 0-7
802.11n (HT40)	1	MCS 0-7
802.11ac (VHT20)	1	MCS 0-9/Nss1
802.11ac (VHT40)	1	MCS 0-9/Nss1
802.11ac (VHT80)	1	MCS 0-9/Nss1

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

Description
RJ-45 cable*1: Non-shielded, 1.5m

3.3. Table for Filed Antenna

Ant.	Brand	Model No.	Type	Connector	Gain (dBi)		Remark
					2.4GHz	5GHz Band 1, Band 4	
1	Master Wave	X6100-98242	Dipole	I-PEX	3.31	-	External
2	Foxconn	FX01H74-0G-EF	PCB	I-PEX	3.66	-	Internal
3	Master Wave	X6100-98242	Dipole	I-PEX	-	5	External

Ant.	5GHz Band 2~Band 3			
	Frequency	Gain (dBi)	Frequency	Gain (dBi)
3	5260 MHz	3.7	5510 MHz	3.4
	5270 MHz	3.7	5530 MHz	3.6
	5290 MHz	4.0	5550 MHz	3.6
	5300 MHz	4.0	5580 MHz	2.9
	5310 MHz	4.1	5670 MHz	3.3
	5320 MHz	4.1	5700 MHz	3.5
	5500 MHz	3.2	-	-

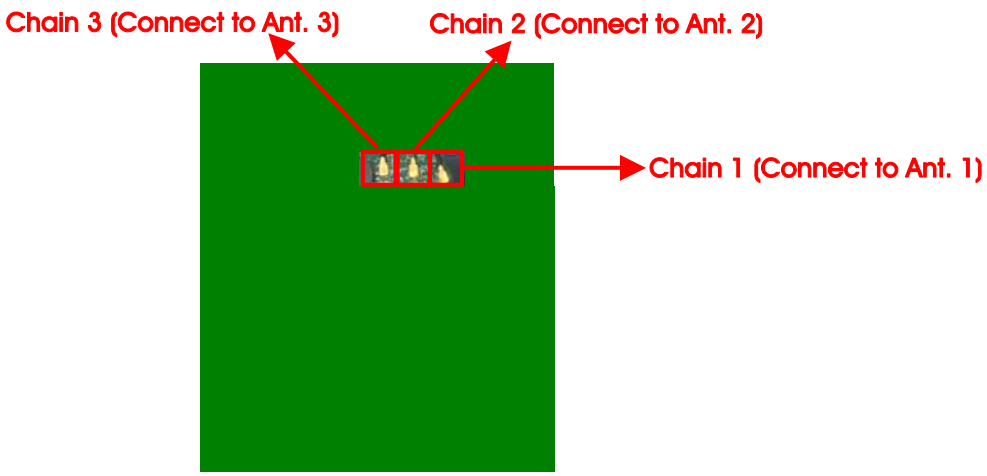
Note: There are three antennas provided to this EUT and all of them can be used as transmitting and receiving antenna

For 2.4GHz Band (2TX/2RX):

Chain 1 and Chain 2 could transmit/receive simultaneously.

For 5GHz Band (1TX/1RX):

Only Chain 3 can be used as transmitting/receiving antenna.



3.4. Table for Carrier Frequencies

There are three bandwidth systems.

For 20MHz bandwidth systems, use Channel 52, 56, 60, 64, 100, 104, 108, 112, 116, 132, 136, 140.

For 40MHz bandwidth systems, use Channel 54, 62, 102, 110, 134.

For 80MHz bandwidth systems, use Channel 58, 106.

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
5250~5350 MHz Band 2	52	5260 MHz	60	5300 MHz
	54	5270 MHz	62	5310 MHz
	56	5280 MHz	64	5320 MHz
	58	5290 MHz	-	-
5470~5725 MHz Band 3	100	5500 MHz	112	5560 MHz
	102	5510 MHz	116	5580 MHz
	104	5520 MHz	132	5660 MHz
	106	5530 MHz	134	5670 MHz
	108	5540 MHz	136	5680 MHz
	110	5550 MHz	140	5700 MHz

3.5. Table for Test Modes

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

Test Items	Mode		Data Rate	Channel	Chain
AC Power Conducted Emission	Normal Link		-	-	-
Max. Conducted Output Power	11a/BPSK	Band 2-3	6Mbps	52/60/64/100/116/140	3
	11ac VHT20	Band 2-3	MCS0/Nss1	52/60/64/100/116/140	3
	11ac VHT40	Band 2-3	MCS0/Nss1	54/62/102/110/134	3
	11ac VHT80	Band 2-3	MCS0/Nss1	58/106	3
Power Spectral Density	11a/BPSK	Band 2-3	6Mbps	52/60/64/100/116/140	3
	11ac VHT20	Band 2-3	MCS0/Nss1	52/60/64/100/116/140	3
	11ac VHT40	Band 2-3	MCS0/Nss1	54/62/102/110/134	3
	11ac VHT80	Band 2-3	MCS0/Nss1	58/106	3
26dB Spectrum Bandwidth 99% Occupied Bandwidth Measurement	11a/BPSK	Band 2-3	6Mbps	52/60/64/100/116/140	3
	11ac VHT20	Band 2-3	MCS0/Nss1	52/60/64/100/116/140	3
	11ac VHT40	Band 2-3	MCS0/Nss1	54/62/102/110/134	3
	11ac VHT80	Band 2-3	MCS0/Nss1	58/106	3
Radiated Emission Above 1GHz	11a/BPSK	Band 2-3	6Mbps	52/60/64/100/116/140	3
	11ac VHT20	Band 2-3	MCS0/Nss1	52/60/64/100/116/140	3
	11ac VHT40	Band 2-3	MCS0/Nss1	54/62/102/110/134	3
	11ac VHT80	Band 2-3	MCS0/Nss1	58/106	3
Radiated Emission Below 1GHz	Normal Link		-	-	-
Band Edge Emission	11a/BPSK	Band 2-3	6Mbps	52/60/64/100/140	3
	11ac VHT20	Band 2-3	MCS0/Nss1	52/60/64/100/140	3
	11ac VHT40	Band 2-3	MCS0/Nss1	54/62/102/110/134	3
	11ac VHT80	Band 2-3	MCS0/Nss1	58/106	3
Frequency Stability	20 MHz	Band 2-3	-	60/116	3
	40 MHz	Band 2-3	-	62/110	3
	80 MHz	Band 2-3	-	58/106	3

Note: VHT20/VHT40 covers HT20/HT40, due to same modulation.

The following test modes were performed for all tests:

For Radiated Emissions Below 1GHz test:

Mode 1. Place EUT in X axis

Mode 2. Place EUT in Y axis

Mode 3. Place EUT in Z axis

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

For Radiated Emission Above 1GHz test:

The EUT was performed at 3-axis and the worst-case was found at Y axis.

So the measurement will follow this same mode.

3.6. Table for Testing Locations

Test Site Location					
Address:	No.8, Lane 724, Bo-ai St., Jhubei City, Hsinchu County 302, Taiwan, R.O.C.				
TEL:	886-3-656-9065				
FAX:	886-3-656-9085				
Test Site No.	**Site Category**	**Location**	**FCC Reg. No.**	**IC File No.**	**VCCI Reg. No**
03CH01-CB	SAC	Hsin Chu	262045	IC 4086D	-
CO01-CB	Conduction	Hsin Chu	262045	IC 4086D	-
TH01-CB	OVEN Room	Hsin Chu	-	-	-

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

3.7. Table for Multiple Listing

The model numbers in the following table are all refer to the identical product.

Model No.	Description
EX6100	The models are identical except for the housing colors as marketing strategy.
EX6000	

3.8. Table for Class II Change

This product is an extension of original one reported under Sporton project number: FR3O1622

Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
1. Adding Band 2 and Band 3 (5250~5350 MHz, 5470~5725 MHz) for this device. 2. Adding a new model number "EX6000", and it shares the same PCBA as original model number "EX6100". It only changes housing color for different marketing strategy.	1. 26dB Spectrum Bandwidth and 99% Occupied Bandwidth. 2. Maximum Conducted Output Power. 3. Power Spectral Density. 4. Radiated Emissions Above 1GHz. 5. Band Edge Emissions. 6. Frequency Stability. 7. Maximum Permissible Exposure.

Note: Maximum Permissible Exposure of 5GHz Band (DTS) and 2.4GHz Band are based on original test report (please refer to Appendix B).

3.9. Table for Supporting Units

For Test Site No: CO01-CB

Support Unit	Brand	Model	FCC ID
Notebook*3	DELL	E6430	QDS-BRCM1049LE
Wireless AP	Planex	GW-AP54SGX	N/A

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

Support Unit	Brand	Model	FCC ID
Notebook	DELL	M1340	E2K4965AGNM
Notebook	DELL	E6430	QDS-BRCM1049LE
Notebook	DELL	D420	E2KWM3945ABG
Wireless ac AP	Netgear	R6300V2	PY31300227

For Test Site No: 03CH01-CB (Above 1GHz) and TH01-CB

Support Unit	Brand	Model	FCC ID
Notebook	DELL	M1330	DoC

3.10. 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	MT7xxE QA V2.0.5.0					
Mode	Test Frequency (MHz)					
	NCB: 20MHz					
	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
802.11a	1D	1D	19	16	1A	18
802.11ac MCS0/Nss1 VHT20	1F	1F	1B	17	1B	18
Mode	NCB: 40MHz					
802.11ac MCS0/Nss1 VHT40	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz	
	1F	14	0D	1B	1B	
Mode	NCB: 80MHz					
802.11ac MCS0/Nss1 VHT80	5290 MHz		5530 MHz			
	0C		0B			

3.11. EUT Operation during Test

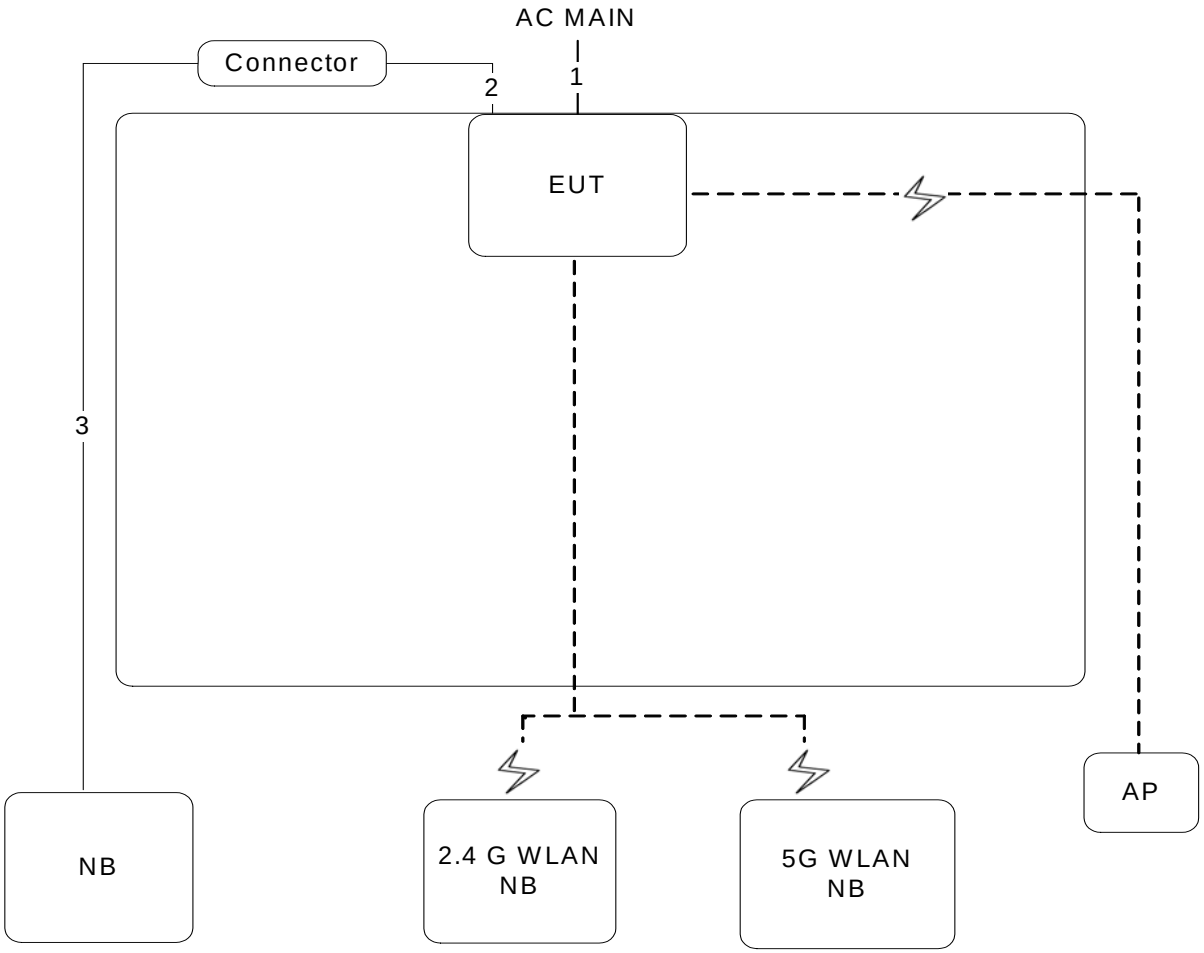
The EUT was programmed to be in continuously transmitting mode.

3.12. Duty Cycle

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11a	1.000	1.000	100.00	0.00	0.01
802.11ac MCS0/Nss1 VHT20	1.000	1.000	100.00	0.00	0.01
802.11ac MCS0/Nss1 VHT40	1.000	1.000	100.00	0.00	0.01
802.11ac MCS0/Nss1 VHT80	1.000	1.000	100.00	0.00	0.01

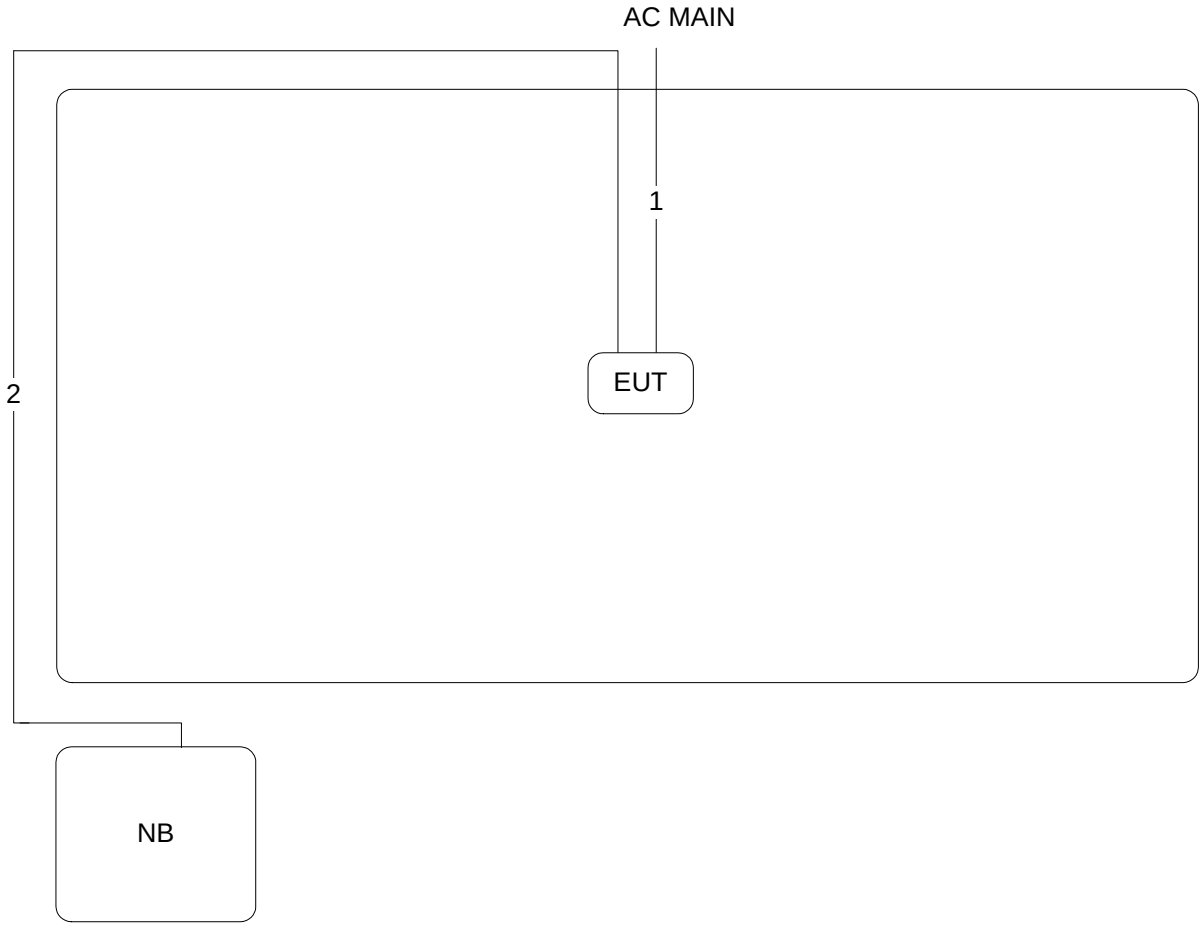
3.13. Test Configurations

3.13.1. AC Power Line Conduction and Radiation Emissions (30MHz~1GHz) Test Configuration



Item	Connection	Shielded	Length
1	Power cable	No	1.8m
2	RJ-45 cable	No	1.5m
3	RJ-45 cable	No	10m

3.13.2. Radiation Emissions (Above 1GHz) Test Configuration



Item	Connection	Shielded	Length
1	Power cable	No	1.8m
2	RJ-45 cable	No	10m

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

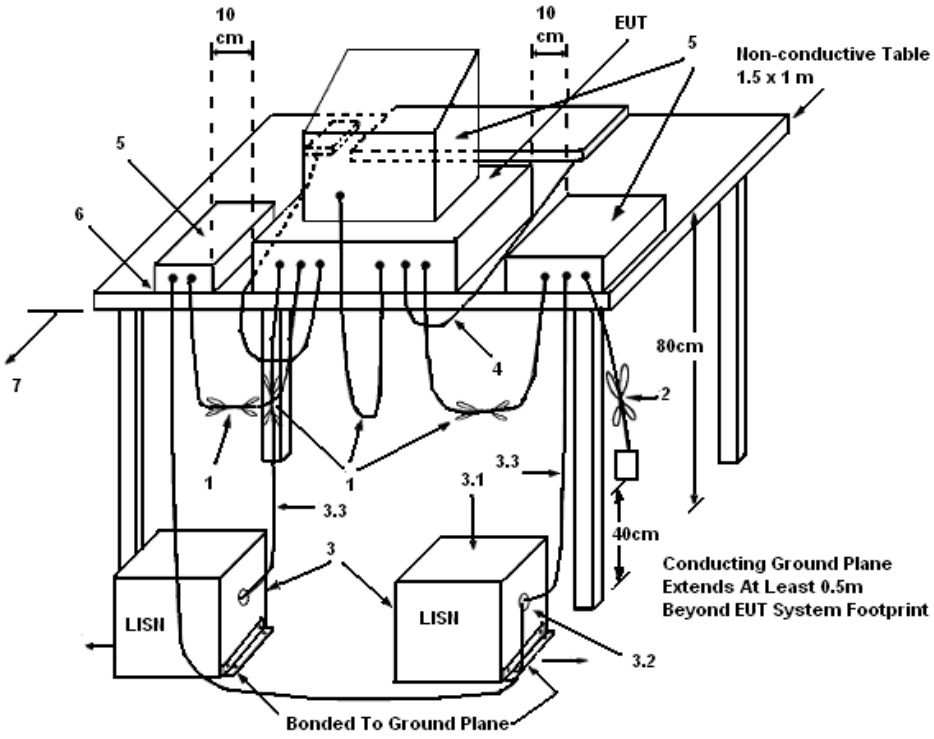
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

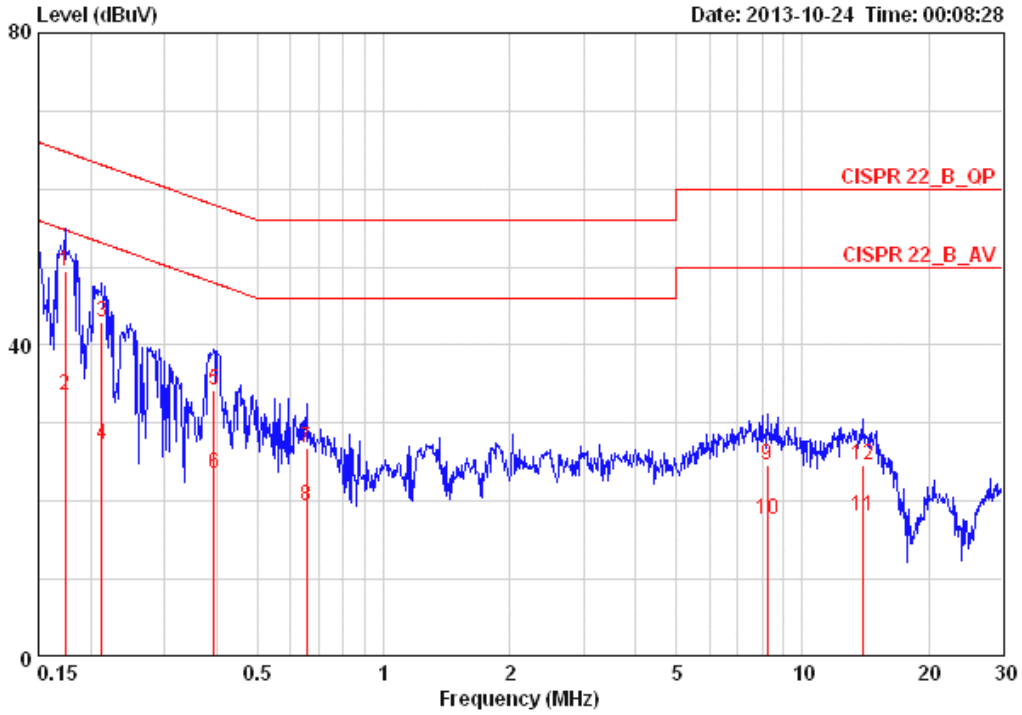
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

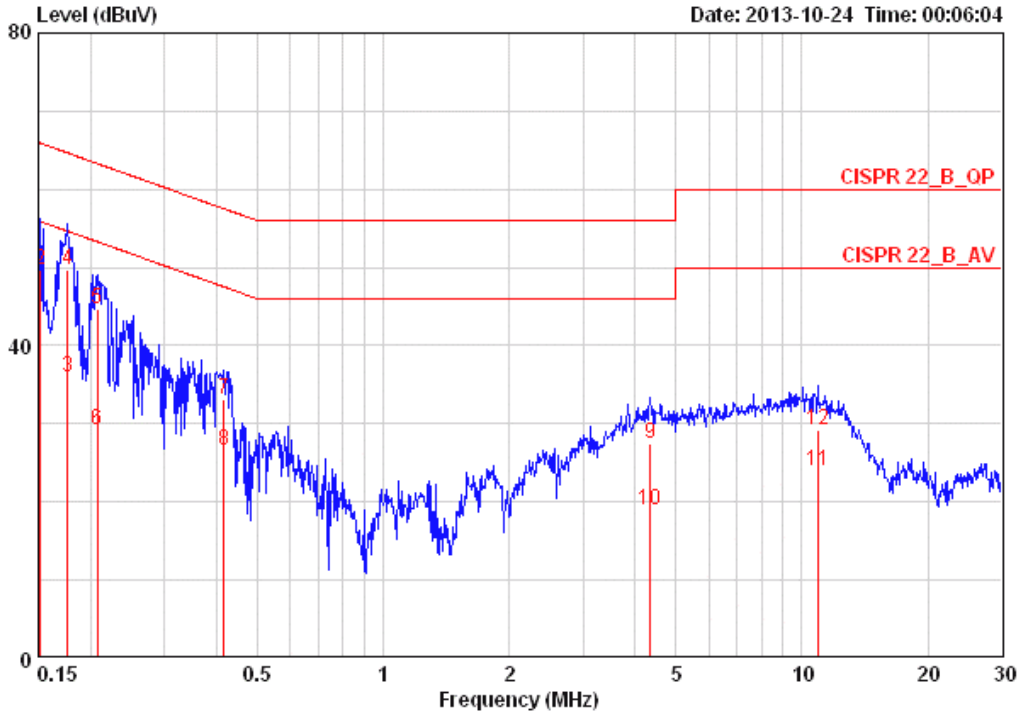
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	24°C	Humidity	55%
Test Engineer	Hank Yang	Phase	Line
Configuration	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.17399	49.41	-15.36	64.77	49.07	0.15	0.19	LINE	QP
2	0.17399	33.56	-21.21	54.77	33.22	0.15	0.19	LINE	AVERAGE
3	0.21279	42.97	-20.13	63.10	42.62	0.15	0.20	LINE	QP
4	0.21279	27.14	-25.96	53.10	26.79	0.15	0.20	LINE	AVERAGE
5	0.39344	34.24	-23.75	57.99	33.89	0.15	0.20	LINE	QP
6	0.39344	23.50	-24.49	47.99	23.15	0.15	0.20	LINE	AVERAGE
7	0.65430	26.83	-29.17	56.00	26.47	0.16	0.20	LINE	QP
8	0.65430	19.48	-26.52	46.00	19.12	0.16	0.20	LINE	AVERAGE
9	8.235	24.61	-35.39	60.00	24.01	0.30	0.30	LINE	QP
10	8.235	17.57	-32.43	50.00	16.97	0.30	0.30	LINE	AVERAGE
11	13.915	18.03	-31.97	50.00	17.24	0.39	0.40	LINE	AVERAGE
12	13.915	24.54	-35.46	60.00	23.75	0.39	0.40	LINE	QP

Temperature	24°C	Humidity	55%
Test Engineer	Hank Yang	Phase	Neutral
Configuration	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.15160	28.30	-27.61	55.91	28.04	0.08	0.18	NEUTRAL	AVERAGE
2	0.15160	49.78	-16.13	65.91	49.52	0.08	0.18	NEUTRAL	QP
3	0.17584	35.92	-18.76	54.68	35.65	0.08	0.19	NEUTRAL	AVERAGE
4 @	0.17584	49.76	-14.92	64.68	49.49	0.08	0.19	NEUTRAL	QP
5	0.20723	44.72	-18.60	63.32	44.44	0.08	0.20	NEUTRAL	QP
6	0.20723	29.13	-24.19	53.32	28.85	0.08	0.20	NEUTRAL	AVERAGE
7	0.41705	33.08	-24.43	57.51	32.80	0.08	0.20	NEUTRAL	QP
8	0.41705	26.52	-20.99	47.51	26.24	0.08	0.20	NEUTRAL	AVERAGE
9	4.338	27.41	-28.59	56.00	26.97	0.14	0.31	NEUTRAL	QP
10	4.338	19.04	-26.96	46.00	18.60	0.14	0.31	NEUTRAL	AVERAGE
11	10.905	23.87	-26.13	50.00	23.24	0.25	0.38	NEUTRAL	AVERAGE
12	10.905	29.28	-30.72	60.00	28.65	0.25	0.38	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 4.5.4.

4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

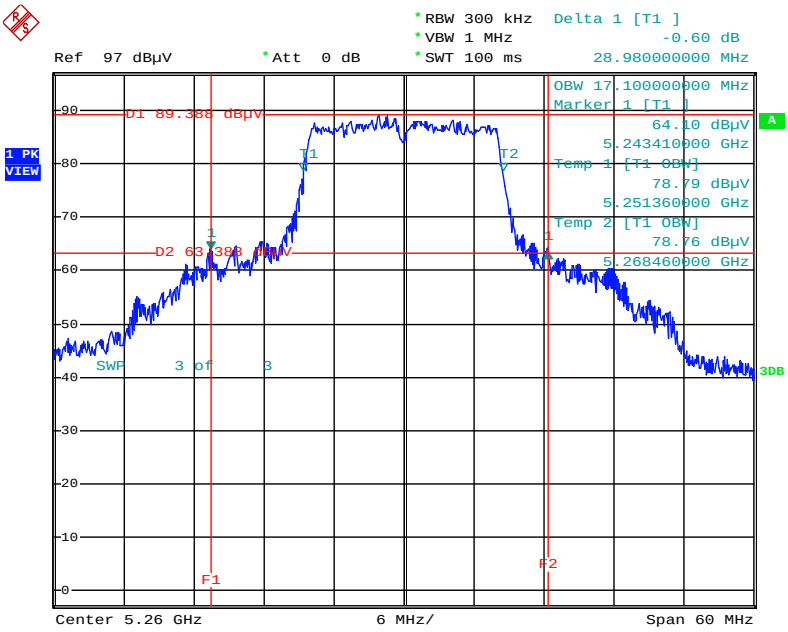
The EUT was programmed to be in continuously transmitting mode.

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

Temperature	20°C	Humidity	60%
Test Engineer	Lucas Huang		

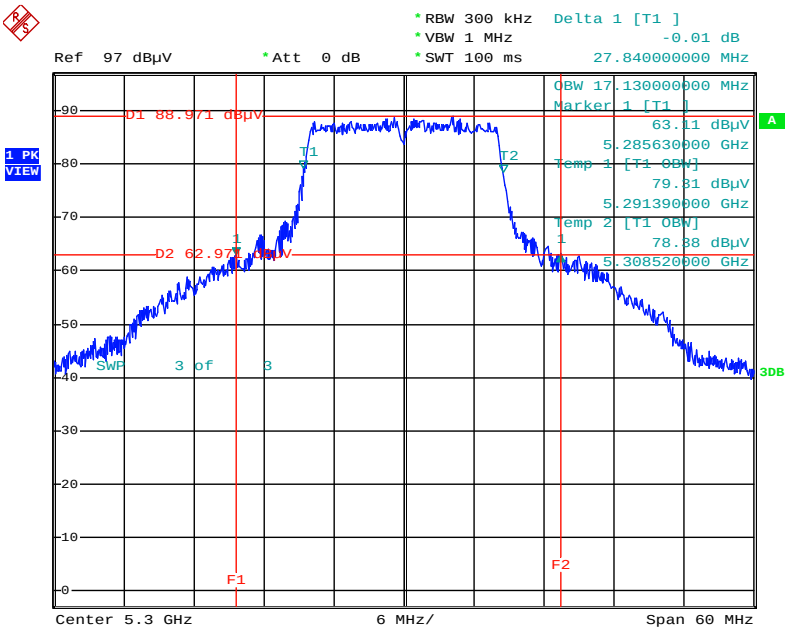
Mode	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
802.11a	5260 MHz	28.98	17.10
	5300 MHz	27.84	17.13
	5320 MHz	19.95	16.77
	5500 MHz	19.86	16.74
	5580 MHz	23.01	16.86
	5700 MHz	19.80	16.68
802.11ac MCS0/Nss1 VHT20	5260 MHz	31.86	17.85
	5300 MHz	33.03	17.79
	5320 MHz	20.58	17.61
	5500 MHz	20.61	17.61
	5580 MHz	20.40	17.61
	5700 MHz	20.40	17.58
802.11ac MCS0/Nss1 VHT40	5270 MHz	71.80	37.25
	5310 MHz	41.95	36.55
	5510 MHz	41.90	36.60
	5550 MHz	50.70	36.70
	5670 MHz	41.80	36.80
802.11ac MCS0/Nss1 VHT80	5290 MHz	82.10	75.70
	5530 MHz	82.00	75.70

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 3 / 5260 MHz



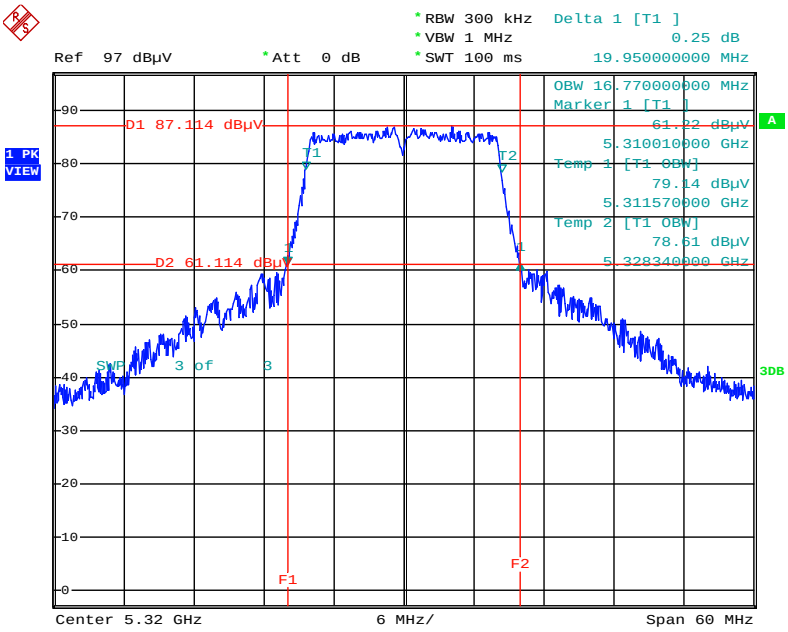
Date: 27.MAR.2015 00:40:59

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 3 / 5300 MHz



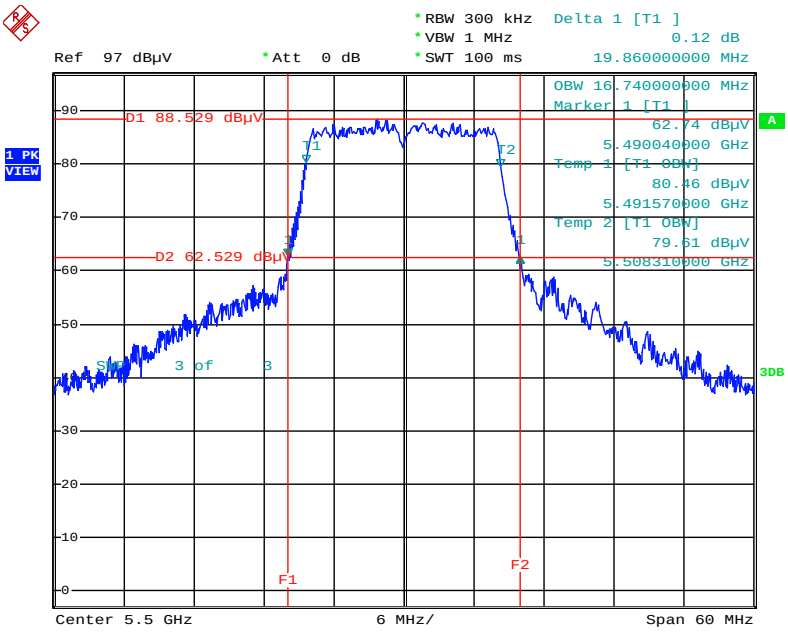
Date: 27.MAR.2015 00:42:29

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 3 / 5320 MHz



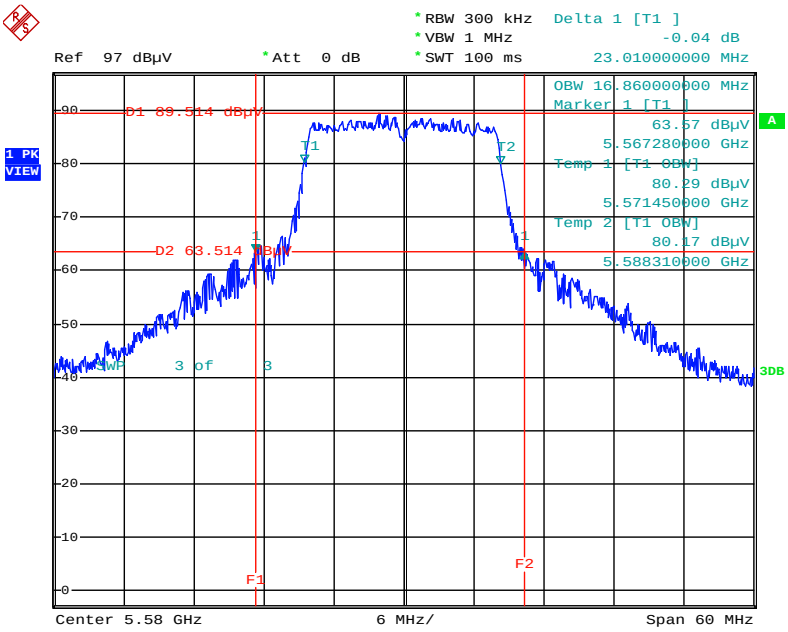
Date: 27.MAR.2015 00:44:12

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 3 / 5500 MHz



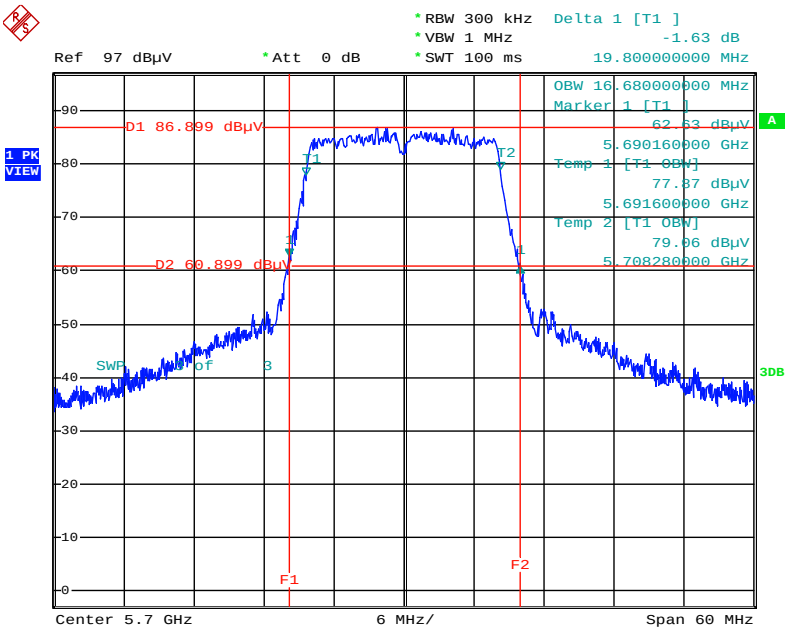
Date: 27.MAR.2015 00:45:47

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 3 / 5580 MHz



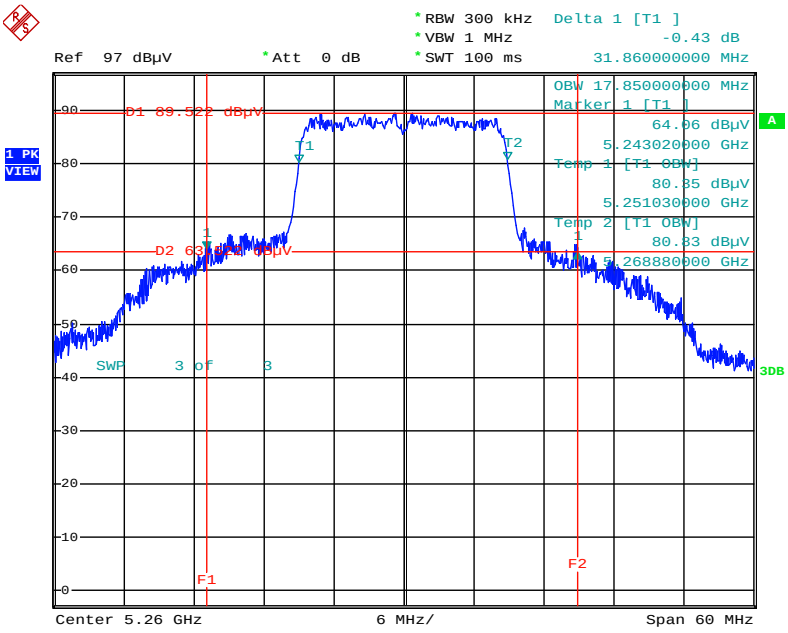
Date: 27.MAR.2015 00:47:20

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 3 / 5700 MHz



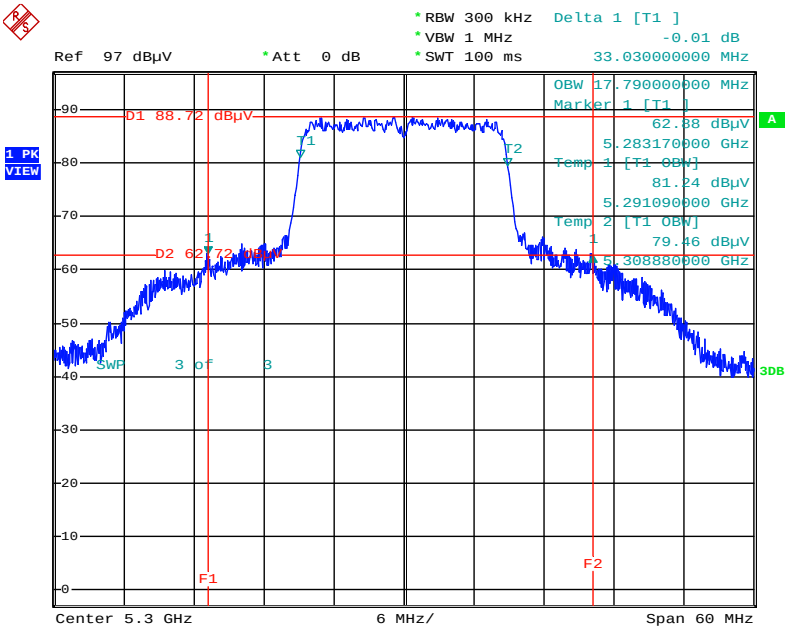
Date: 27.MAR.2015 00:48:13

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3 / 5260 MHz



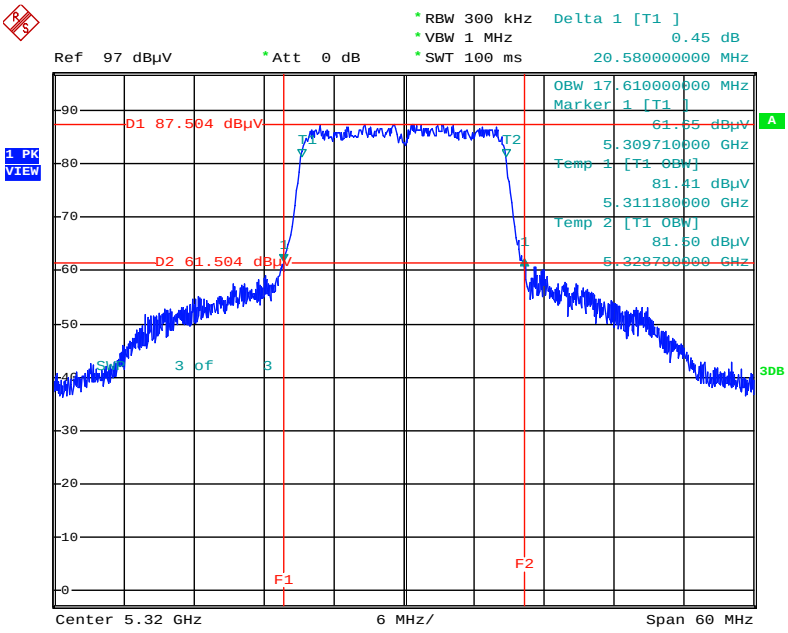
Date: 27.MAR.2015 00:50:01

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3 / 5300 MHz



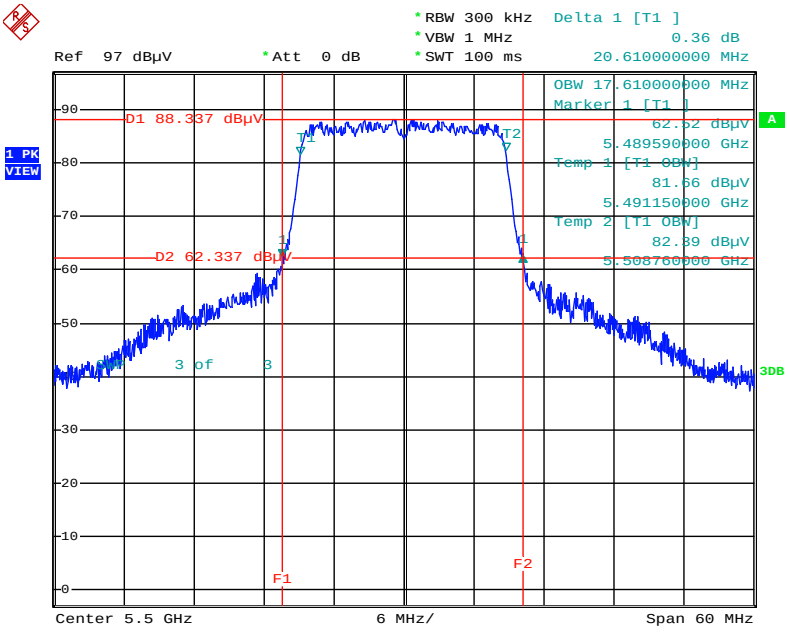
Date: 27.MAR.2015 00:51:23

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3 / 5320 MHz



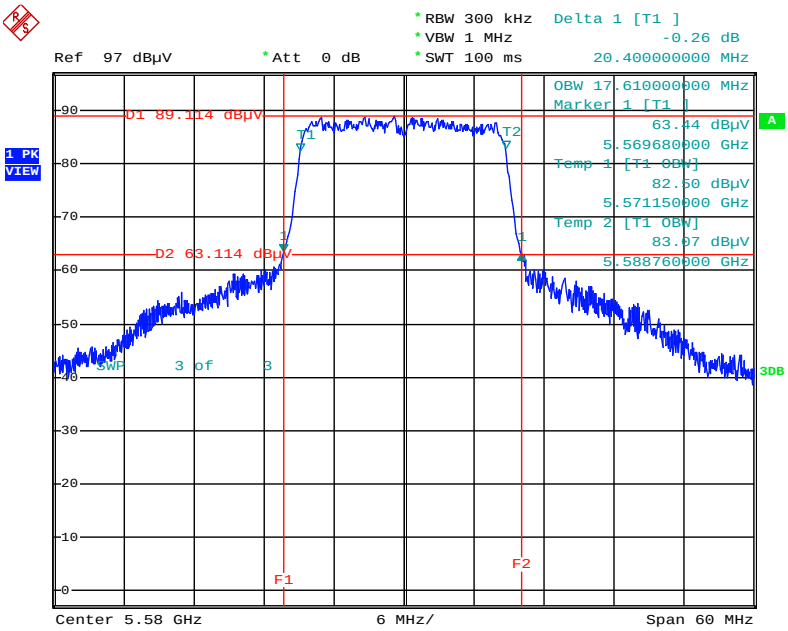
Date: 27.MAR.2015 00:52:05

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3 / 5500 MHz



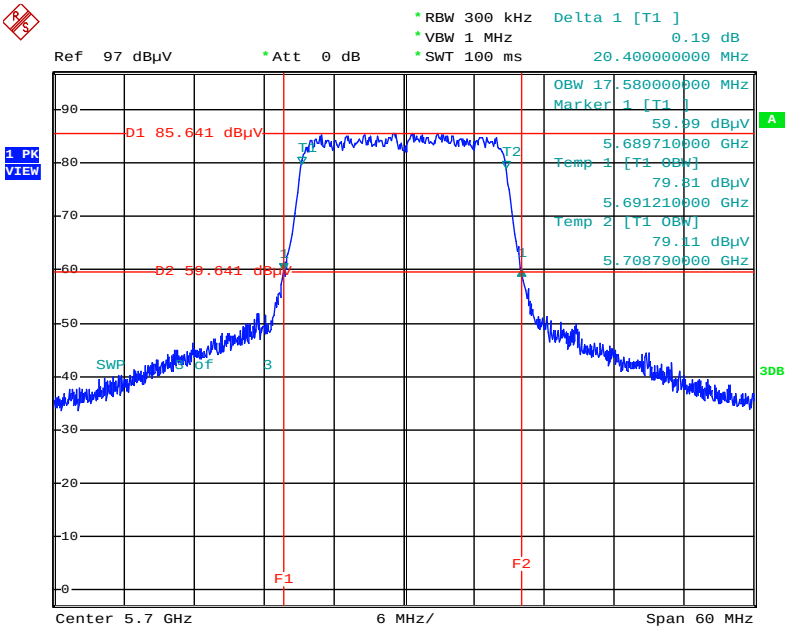
Date: 27.MAR.2015 00:52:45

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3 / 5580 MHz



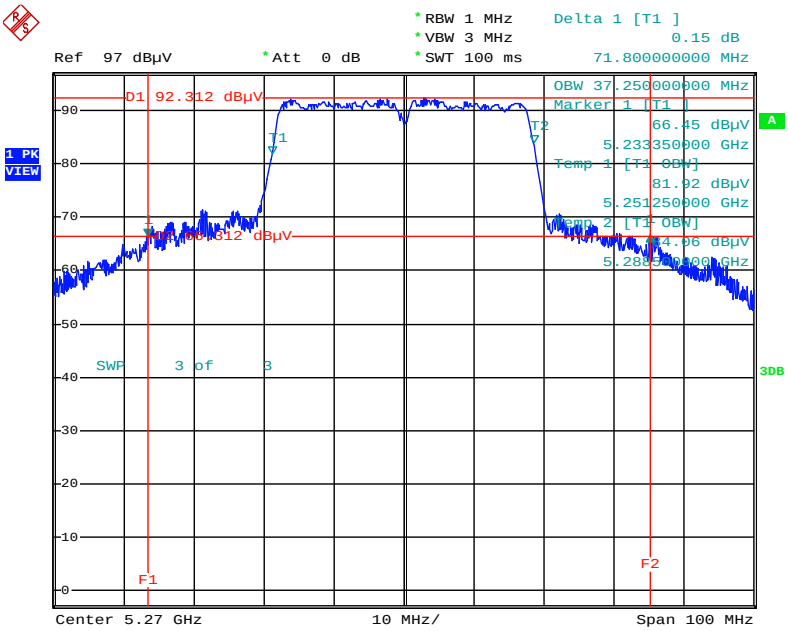
Date: 27.MAR.2015 00:53:27

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3 / 5700 MHz



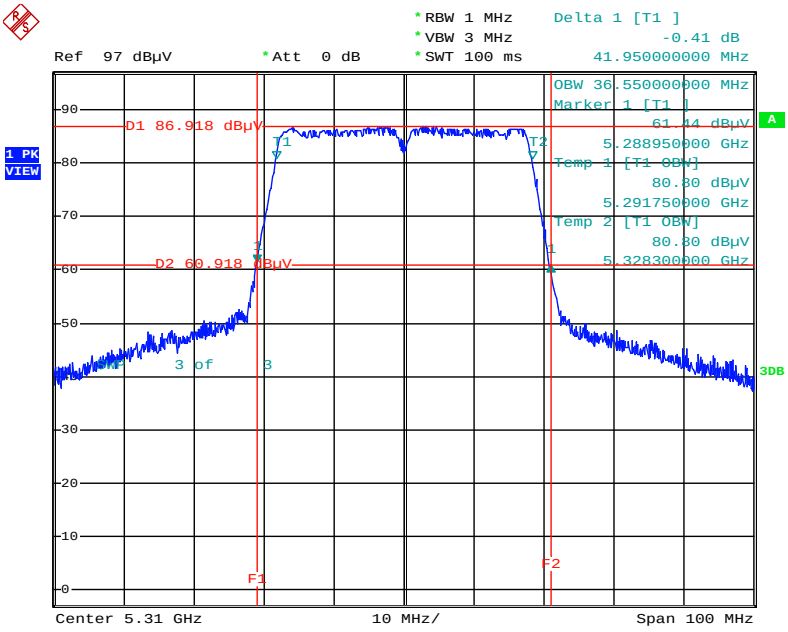
Date: 27.MAR.2015 00:54:12

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3 / 5270 MHz



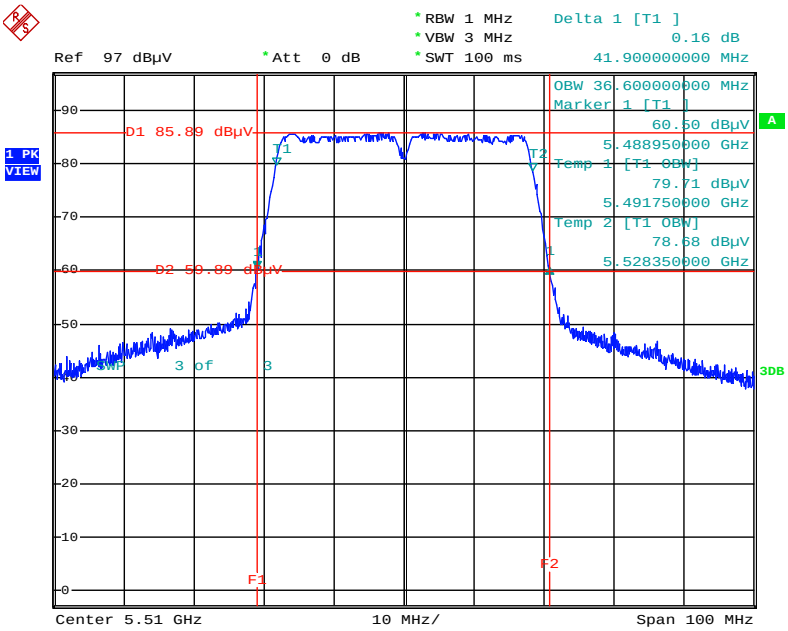
Date: 27.MAR.2015 00:55:44

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3 / 5310 MHz



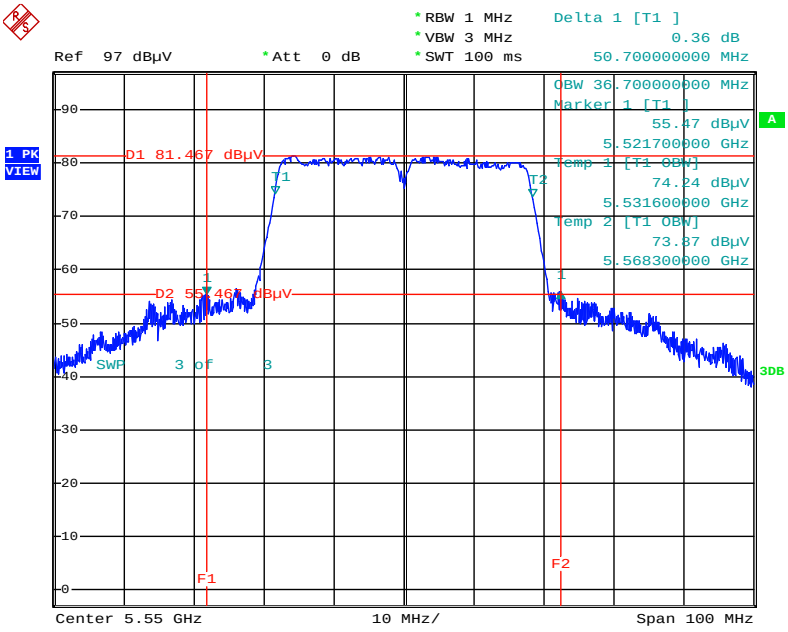
Date: 27.MAR.2015 00:56:44

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3 / 5510 MHz



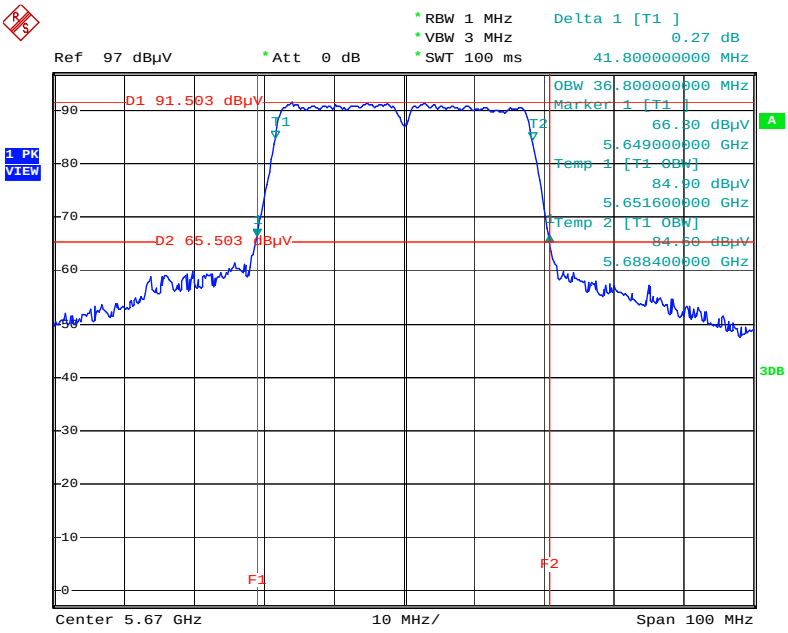
Date: 27.MAR.2015 00:57:43

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3 / 5550 MHz



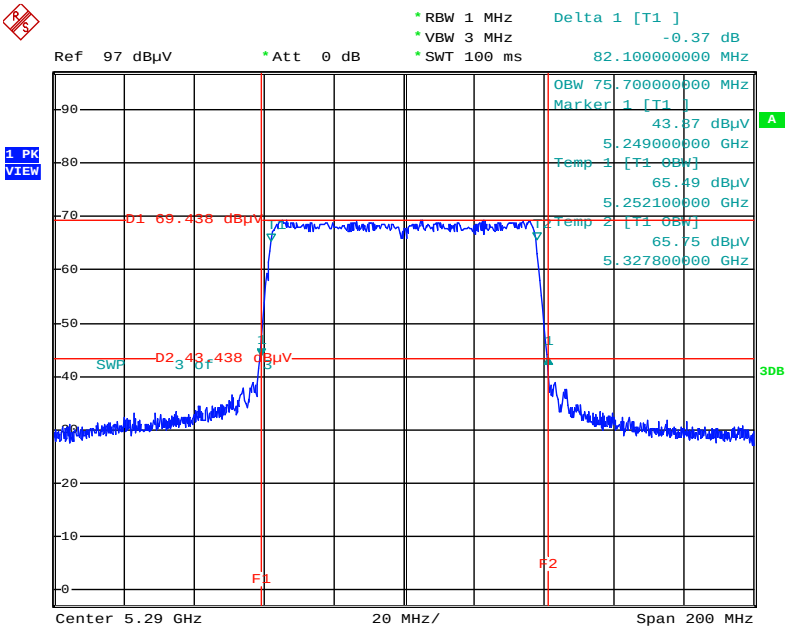
Date: 27.MAR.2015 01:00:19

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3 / 5670 MHz



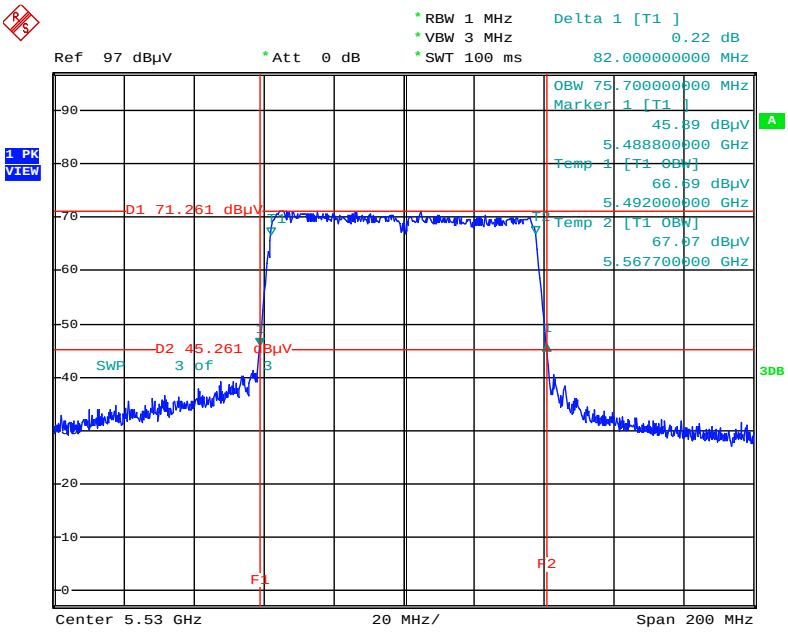
Date: 27.MAR.2015 14:55:34

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 3 / 5290 MHz



Date: 27.MAR.2015 01:01:30

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 3 / 5530 MHz



Date: 27.MAR.2015 01:02:36

4.3. Maximum Conducted Output Power Measurement

4.3.1. Limit

Frequency Band		Limit
☒	5.25-5.35 GHz	The maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW (24dBm) or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz. 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.
☒	5.470-5.725 GHz	

4.3.2. Measuring Instruments and Setting

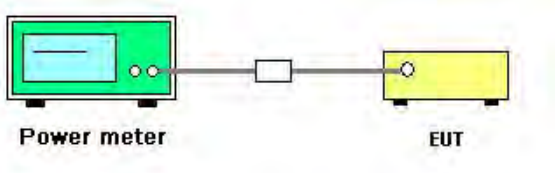
Please refer to section 5 of equipments list in this report The following table is the setting of the power meter.

Power Meter Parameter	Setting
Detector	AVERAGE

4.3.3. Test Procedures

1. The transmitter output (antenna port) was connected to the power meter.
2. Test was performed in accordance with KDB789033 D02 v01 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.

4.3.4. Test Setup Layout



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 Maximum Conducted Output Power

Temperature	20°C	Humidity	60%
Test Engineer	Lucas Huang	Test Date	Mar. 27, 2015

Mode	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain 3		
802.11a	5260 MHz	23.82	24.00	Complies
	5300 MHz	23.84	24.00	Complies
	5320 MHz	21.74	24.00	Complies
	5500 MHz	22.62	23.98	Complies
	5580 MHz	23.81	24.00	Complies
	5700 MHz	21.21	23.97	Complies
802.11ac MCS0/Nss1 VHT20	5260 MHz	23.98	24.00	Complies
	5300 MHz	23.95	24.00	Complies
	5320 MHz	22.19	24.00	Complies
	5500 MHz	22.51	24.00	Complies
	5580 MHz	23.81	24.00	Complies
	5700 MHz	20.59	24.00	Complies
802.11ac MCS0/Nss1 VHT40	5270 MHz	23.87	24.00	Complies
	5310 MHz	18.90	24.00	Complies
	5510 MHz	17.34	24.00	Complies
	5550 MHz	23.81	24.00	Complies
	5670 MHz	22.48	24.00	Complies
802.11ac MCS0/Nss1 VHT80	5290 MHz	15.09	24.00	Complies
	5530 MHz	16.22	24.00	Complies

Note: 1. 802.11a 5500 MHz power limit=11+10*log(B) or 24dBm;11+10*log(19.86)=23.98dBm<24dBm, so limit=23.98dBm.

2. 802.11a 5700 MHz power limit=11+10*log(B) or 24dBm;11+10*log(19.80)=23.97dBm<24dBm, so limit=23.97dBm.

4.4. Power Spectral Density Measurement

4.4.1. Limit

The following table is power spectral density limits and decrease power density limit rule refer to section 4.3.1.

Frequency Band		Limit
☒	5.25-5.35 GHz	11 dBm/MHz
☒	5.470-5.725 GHz	11 dBm/MHz

4.4.2. Measuring Instruments and Setting

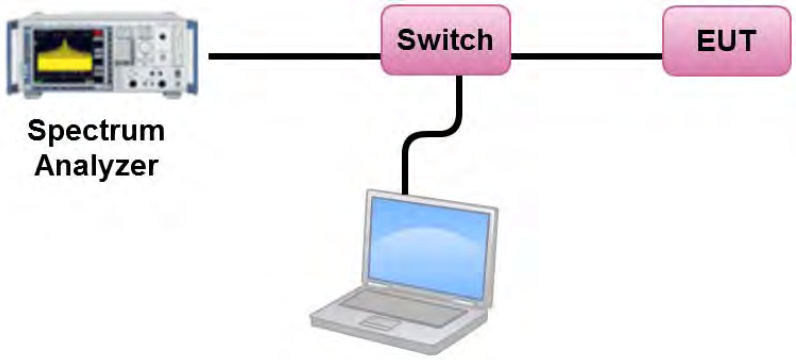
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.4.3. 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 v01 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.

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 Power Spectral Density

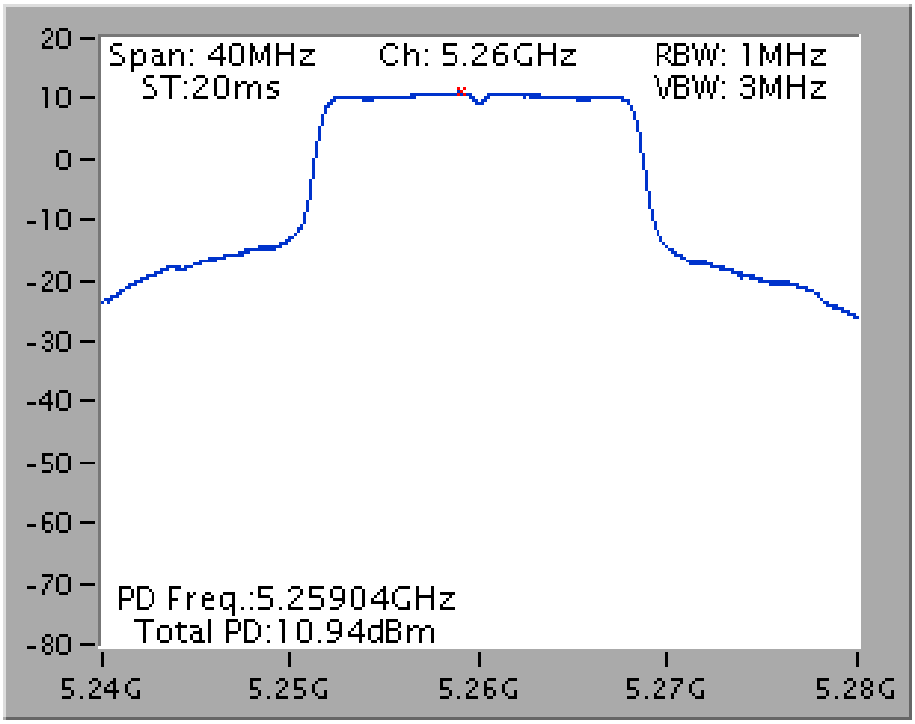
Temperature	20°C	Humidity	60%
Test Engineer	Lucas Huang	Test Date	Mar. 27, 2015

Mode	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
802.11a	5260 MHz	10.94	11.00	Complies
	5300 MHz	10.89	11.00	Complies
	5320 MHz	8.98	11.00	Complies
	5500 MHz	9.81	11.00	Complies
	5580 MHz	10.84	11.00	Complies
	5700 MHz	8.37	11.00	Complies
802.11ac MCS0/Nss1 VHT20	5260 MHz	10.96	11.00	Complies
	5300 MHz	10.95	11.00	Complies
	5320 MHz	9.23	11.00	Complies
	5500 MHz	9.52	11.00	Complies
	5580 MHz	10.83	11.00	Complies
	5700 MHz	7.55	11.00	Complies
802.11ac MCS0/Nss1 VHT40	5270 MHz	7.55	11.00	Complies
	5310 MHz	2.62	11.00	Complies
	5510 MHz	1.20	11.00	Complies
	5550 MHz	7.51	11.00	Complies
	5670 MHz	6.39	11.00	Complies
802.11ac MCS0/Nss1 VHT80	5290 MHz	-4.00	11.00	Complies
	5530 MHz	-2.67	11.00	Complies

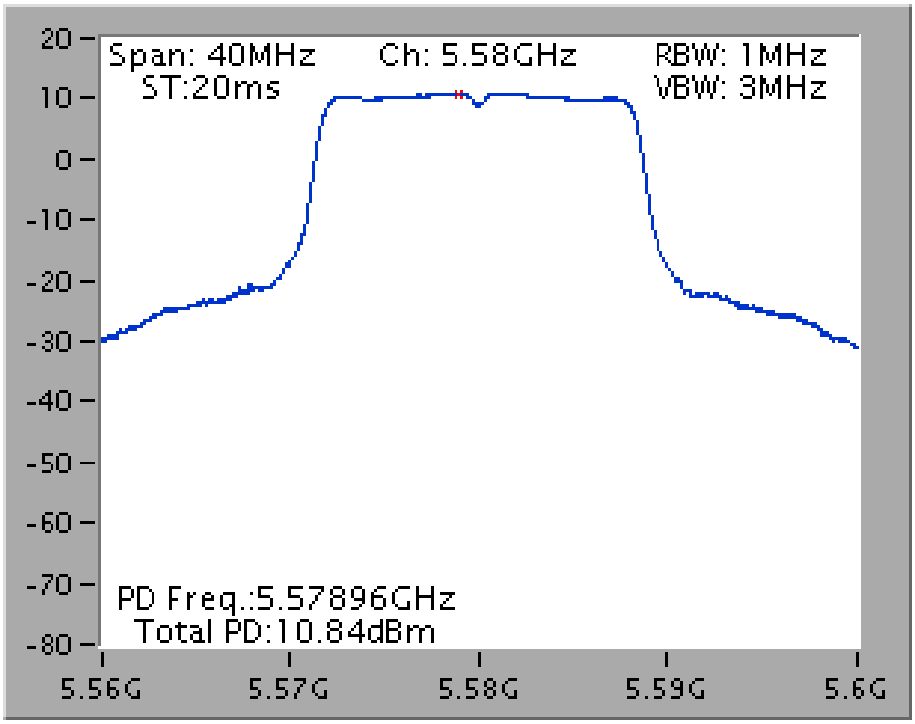
Note: All the test values were listed in the report.

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

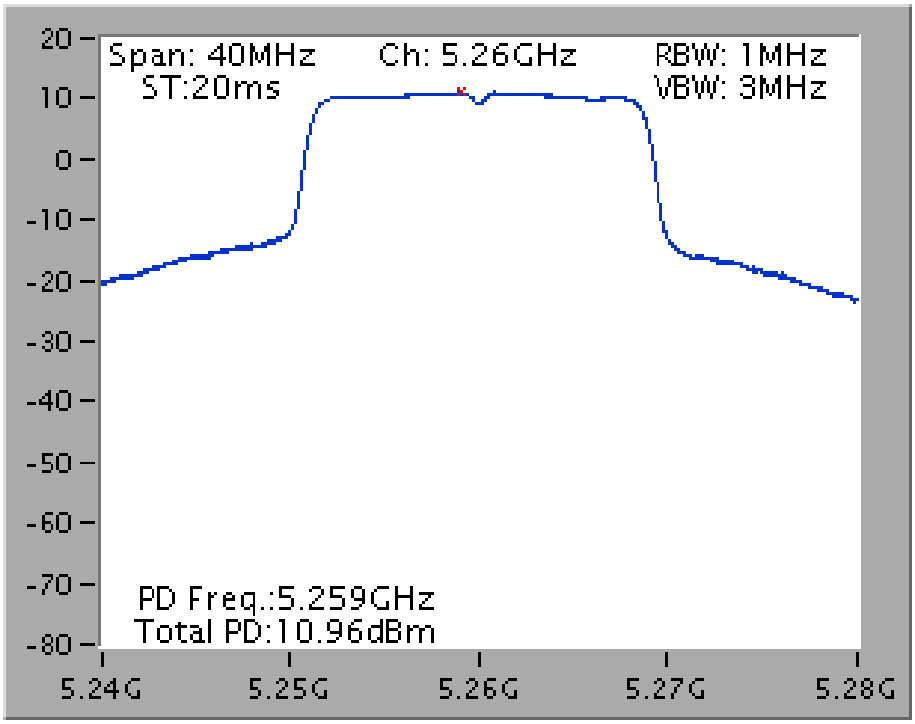
Power Density Plot on Configuration IEEE 802.11a / Chain 3 / 5260 MHz



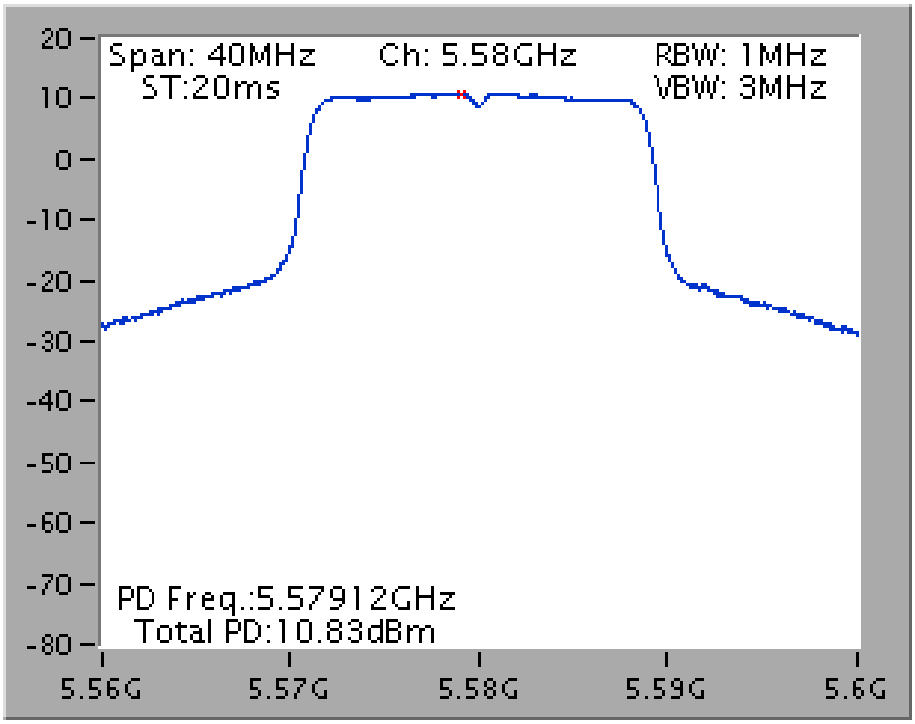
Power Density Plot on Configuration IEEE 802.11a / Chain 3 / 5580 MHz



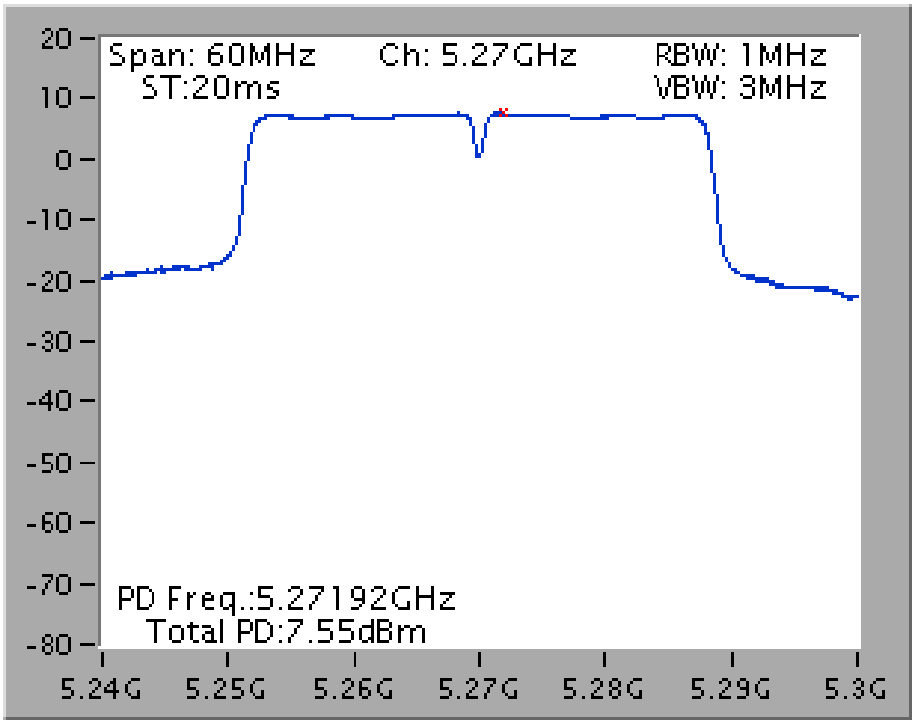
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3 / 5260 MHz



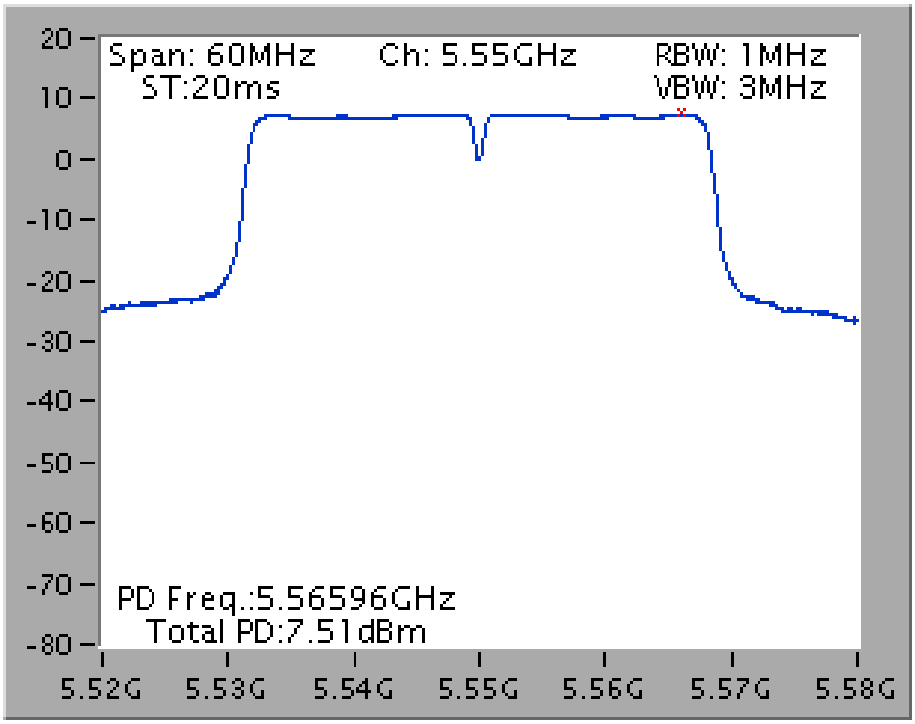
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3 / 5580 MHz



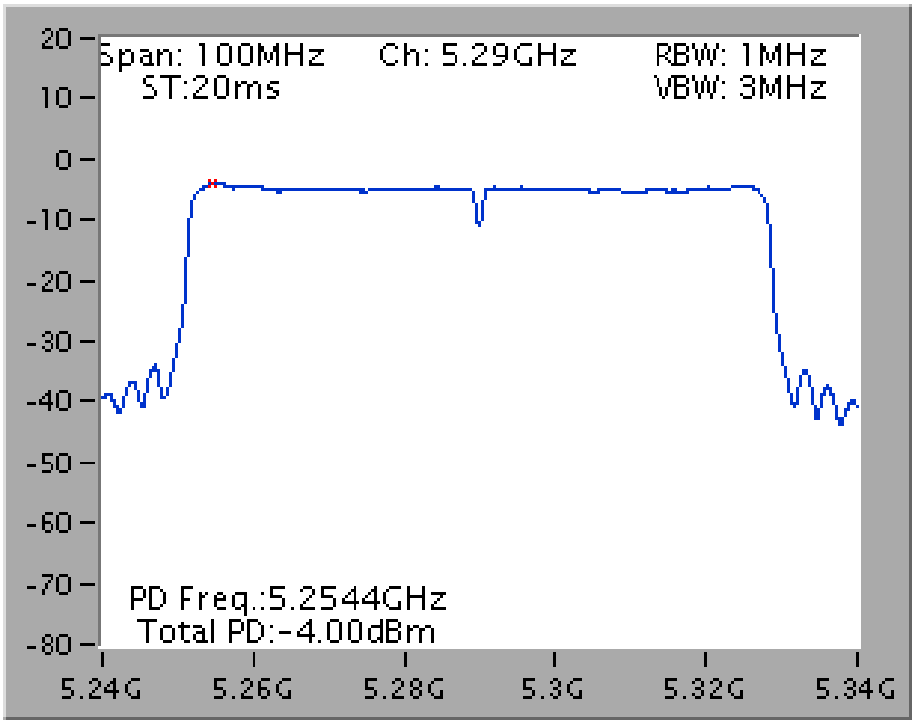
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3 / 5270 MHz



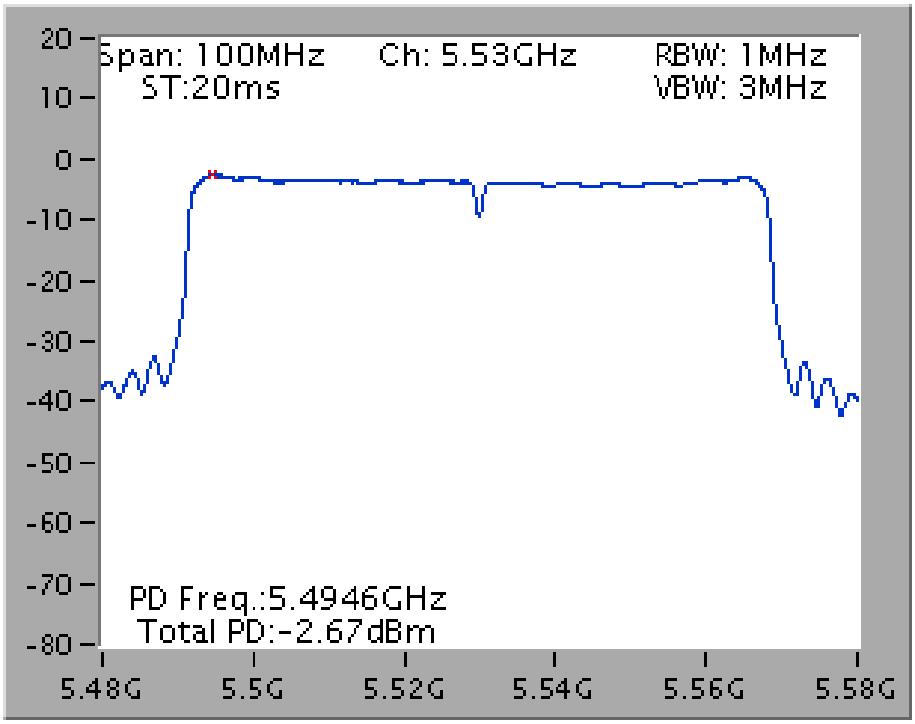
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3 / 5550 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 3 / 5290 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 3 / 5530 MHz



4.5. Radiated Emissions Measurement

4.5.1. Limit

For transmitters operating in the 5.25-5.35 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 5.470-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band 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

4.5.2. 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

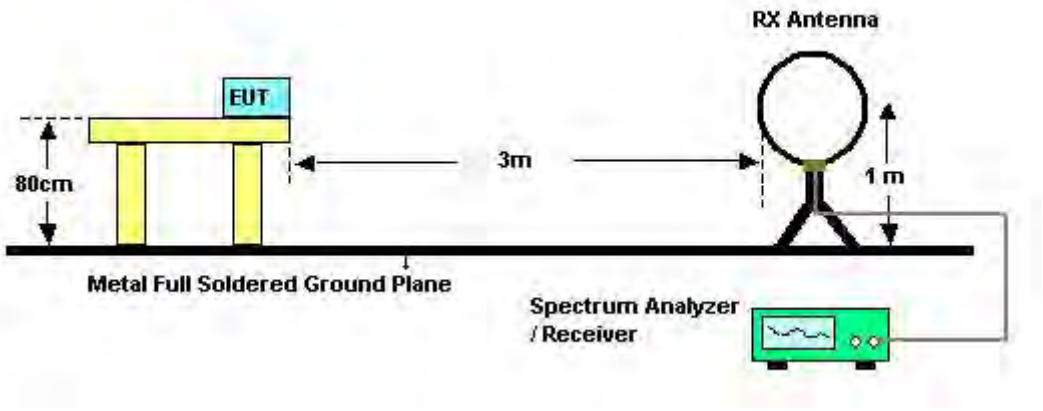
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.5.3. Test Procedures

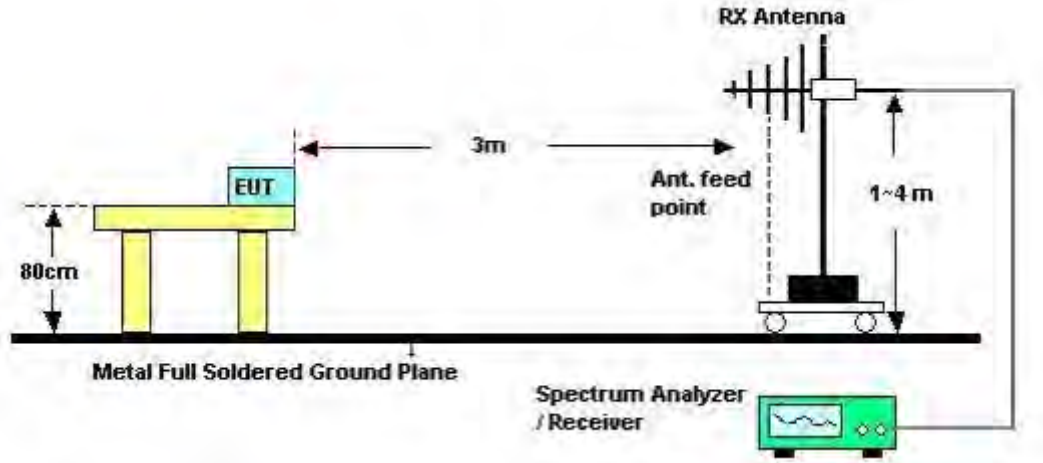
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 1m & 3m far away from the turntable.
2. Power on the EUT and all the supporting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

4.5.4. Test Setup Layout

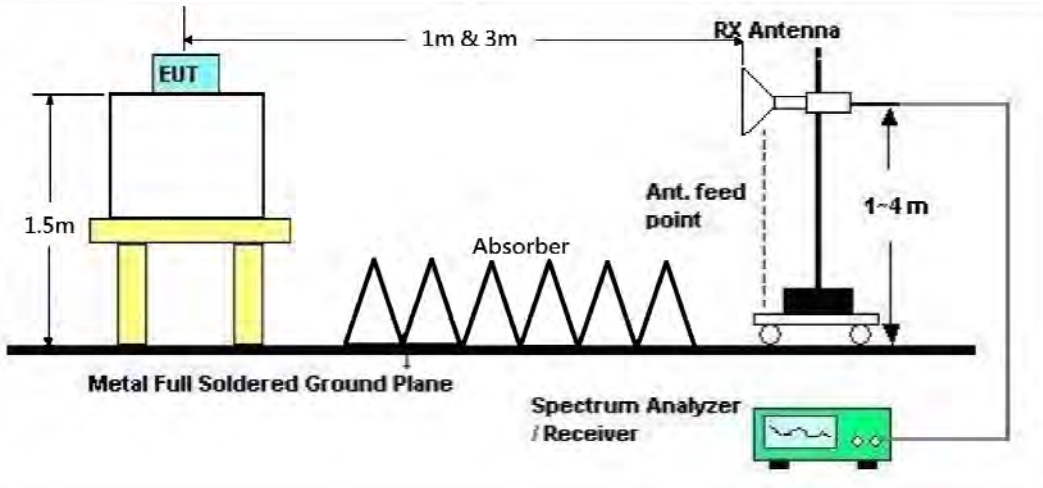
For Radiated Emissions: 9kHz ~30MHz



For Radiated Emissions: 30MHz~1GHz



For Radiated Emissions: Above 1GHz



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

Temperature	25°C	Humidity	54%
Test Engineer	Nick Peng	Configurations	Normal Link
Test Date	Nov. 01, 2013		

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.

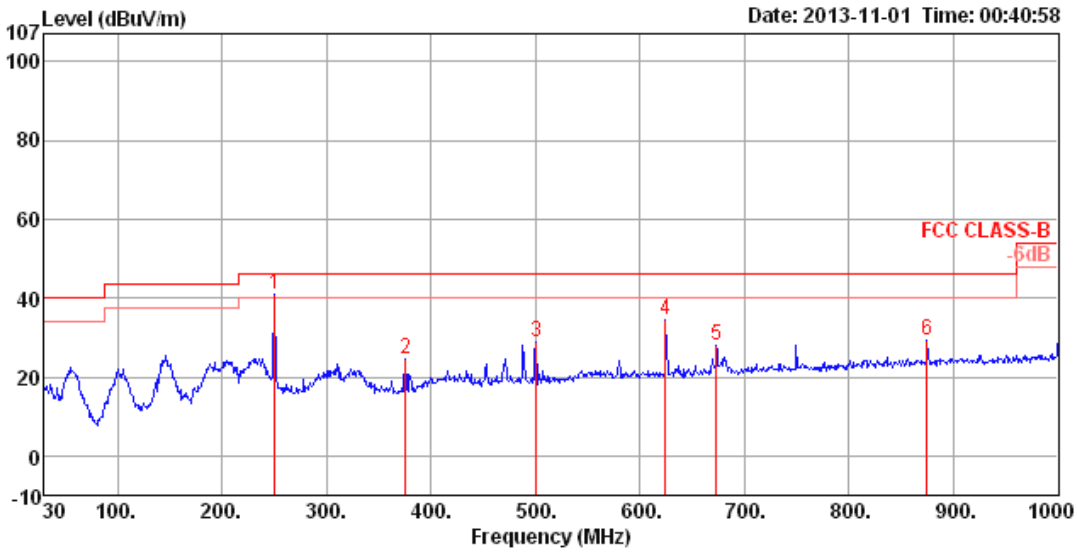
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

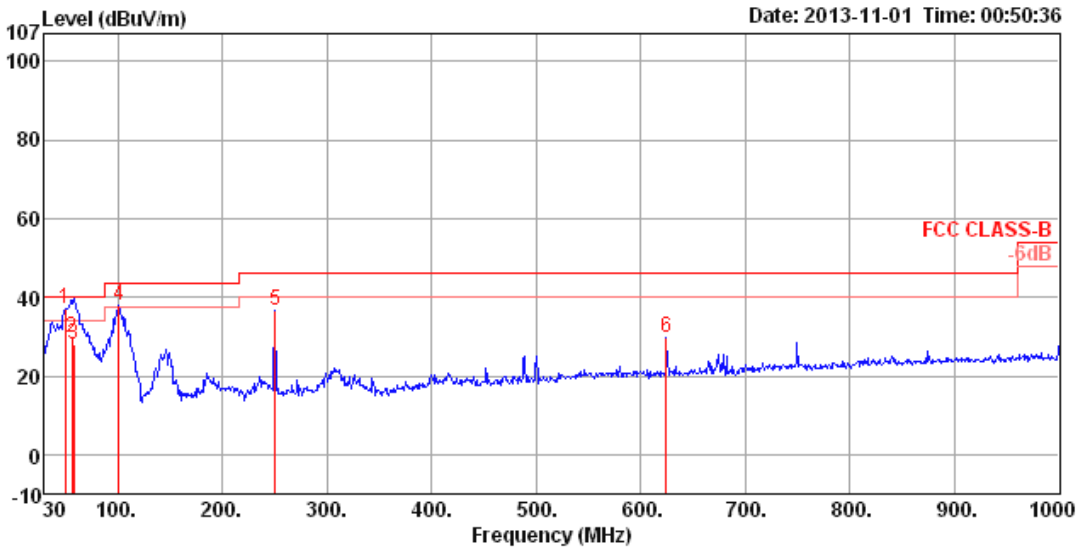
Temperature	25°C	Humidity	54%
Test Engineer	Nick Peng	Configurations	Normal Link

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	250.19	40.78	46.00	-5.22	58.46	1.90	11.91	31.49	150	44	HORIZONTAL	Peak
2	375.32	24.58	46.00	-21.42	38.64	2.44	14.93	31.43	100	64	HORIZONTAL	Peak
3	500.45	28.79	46.00	-17.21	40.46	2.82	16.92	31.41	150	201	HORIZONTAL	Peak
4	624.61	34.61	46.00	-11.39	44.22	3.18	18.61	31.40	150	78	HORIZONTAL	Peak
5	673.11	28.17	46.00	-17.83	37.41	3.32	18.81	31.37	100	34	HORIZONTAL	Peak
6	874.87	29.43	46.00	-16.57	36.45	3.89	20.24	31.15	150	211	HORIZONTAL	Peak

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	49.40	36.99	40.00	-3.01	60.07	0.83	7.88	31.79	100	228	VERTICAL	Peak
2	56.19	29.89	40.00	-10.11	55.10	0.87	5.70	31.78	100	30	VERTICAL	QP
3	58.13	27.87	40.00	-12.13	53.46	0.88	5.31	31.78	125	133	VERTICAL	QP
4	100.81	38.10	43.50	-5.40	58.07	1.19	10.44	31.60	125	22	VERTICAL	Peak
5	250.19	36.66	46.00	-9.34	54.34	1.90	11.91	31.49	125	126	VERTICAL	Peak
6	624.61	29.87	46.00	-16.13	39.48	3.18	18.61	31.40	150	88	VERTICAL	Peak

Note:

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

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

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

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

Temperature	25°C	Humidity	54%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11a CH 52 / Chain 3
Test Date	Mar. 20, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg		
1	15781.66	60.38	63.54	-3.16	44.13	38.00	13.07	34.82	154	230	HORIZONTAL	Average
2	15787.38	73.85	83.54	-9.69	57.62	37.99	13.07	34.83	154	230	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg		
1	15779.64	77.10	83.54	-6.44	60.83	38.02	13.07	34.82	153	220	VERTICAL	Peak
2	15782.46	62.88	63.54	-0.66	46.68	37.95	13.07	34.82	153	220	VERTICAL	Average

Temperature	25℃	Humidity	54%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11a CH 60 / Chain 3
Test Date	Mar. 20, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10599.94	55.00	63.54	-8.54	45.41	6.21	38.38	35.00	65	164	Average	HORIZONTAL
2	10602.26	69.29	83.54	-14.25	59.69	6.21	38.38	34.99	65	164	Peak	HORIZONTAL
3	15896.64	71.10	83.54	-12.44	60.07	7.68	38.38	35.03	241	160	Peak	HORIZONTAL
4	15897.57	56.85	63.54	-6.69	45.82	7.68	38.38	35.03	241	160	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10600.00	49.97	63.54	-13.57	40.38	6.21	38.38	35.00	355	195	Average	VERTICAL
2	10602.32	64.46	83.54	-19.08	54.86	6.21	38.38	34.99	355	195	Peak	VERTICAL
3	15902.26	56.81	63.54	-6.73	45.78	7.69	38.37	35.03	228	186	Average	VERTICAL
4	15902.55	71.38	83.54	-12.16	60.35	7.69	38.37	35.03	228	186	Peak	VERTICAL

Temperature	25℃	Humidity	54%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11a CH 64 / Chain 3
Test Date	Mar. 20, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10636.29	66.05	83.54	-17.49	56.42	6.23	38.37	34.97	68	165	Peak	HORIZONTAL
2	10639.88	51.84	63.54	-11.70	42.21	6.23	38.37	34.97	68	165	Average	HORIZONTAL
3	15959.19	46.25	63.54	-17.29	35.32	7.70	38.33	35.10	22	161	Average	HORIZONTAL
4	15961.45	62.14	83.54	-21.40	51.21	7.70	38.33	35.10	22	161	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10636.18	61.89	83.54	-21.65	52.26	6.23	38.37	34.97	48	160	Peak	VERTICAL
2	10640.06	48.94	63.54	-14.60	39.31	6.23	38.37	34.97	48	160	Average	VERTICAL
3	15957.28	43.65	63.54	-19.89	32.72	7.70	38.33	35.10	250	173	Average	VERTICAL
4	15961.33	61.39	83.54	-22.15	50.46	7.70	38.33	35.10	250	173	Peak	VERTICAL

Temperature	25℃	Humidity	54%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11a CH 100 / Chain 3
Test Date	Mar. 20, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11000.06	57.71	63.54	-5.83	47.72	6.40	38.30	34.71	75	163	Average	HORIZONTAL
2	11002.14	73.37	83.54	-10.17	63.38	6.40	38.30	34.71	75	163	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10999.83	55.73	63.54	-7.81	45.74	6.40	38.30	34.71	39	162	Average	VERTICAL
2	11002.26	69.58	83.54	-13.96	59.59	6.40	38.30	34.71	39	162	Peak	VERTICAL

Temperature	25℃	Humidity	54%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11a CH 116 / Chain 3
Test Date	Mar. 20, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg		
1	11156.38	76.71	83.54	-6.83	60.79	40.10	10.84	35.02	156	184	HORIZONTAL	Peak
2	11160.14	63.46	63.54	-0.08	47.54	40.10	10.84	35.02	156	184	HORIZONTAL	Average
3	16738.70	57.49	63.54	-6.05	39.05	40.07	13.62	35.25	143	156	HORIZONTAL	Average
4	16741.59	71.81	83.54	-11.73	53.35	40.08	13.63	35.25	143	156	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg		
1	11156.09	71.84	83.54	-11.70	55.90	40.12	10.84	35.02	155	272	VERTICAL	Peak
2	11160.07	58.68	63.54	-4.86	42.76	40.10	10.84	35.02	155	272	VERTICAL	Average
3	16738.55	58.73	63.54	-4.81	40.25	40.10	13.62	35.24	154	148	VERTICAL	Average
4	16741.45	72.95	83.54	-10.59	54.47	40.10	13.63	35.25	154	148	VERTICAL	Peak

Temperature	25℃	Humidity	54%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11a CH 140 / Chain 3
Test Date	Mar. 20, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11399.83	56.38	63.54	-7.16	46.24	6.51	38.30	34.67	77	163	Average	HORIZONTAL
2	11400.41	69.92	83.54	-13.62	59.78	6.51	38.30	34.67	77	163	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11399.94	53.77	63.54	-9.77	43.63	6.51	38.30	34.67	34	159	Average	VERTICAL
2	11401.10	66.93	83.54	-16.61	56.79	6.51	38.30	34.67	34	159	Peak	VERTICAL
3	15900.52	55.16	63.54	-8.38	44.13	7.69	38.37	35.03	223	188	Average	VERTICAL
4	15906.37	71.24	83.54	-12.30	60.23	7.69	38.37	35.05	223	188	Peak	VERTICAL

Temperature	25℃	Humidity	54%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 52 / Chain 3
Test Date	Mar. 20, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg		
1	15782.97	58.71	63.54	-4.83	42.46	38.00	13.07	34.82	158	126	HORIZONTAL	Average
2	15786.51	75.46	83.54	-8.08	59.21	38.00	13.07	34.82	158	126	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg		
1	15783.04	63.02	63.54	-0.52	46.82	37.95	13.07	34.82	159	219	VERTICAL	Average
2	15786.44	79.78	83.54	-3.76	63.58	37.95	13.07	34.82	159	219	VERTICAL	Peak

Temperature	25℃	Humidity	54%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 60 / Chain 3
Test Date	Mar. 20, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10597.92	71.21	83.54	-12.33	61.62	6.21	38.38	35.00	65	166	Peak	HORIZONTAL
2	10600.70	56.21	63.54	-7.33	46.62	6.21	38.38	35.00	65	166	Average	HORIZONTAL
3	15895.60	56.11	63.54	-7.43	45.08	7.68	38.38	35.03	41	164	Average	HORIZONTAL
4	15906.48	73.03	83.54	-10.51	62.02	7.69	38.37	35.05	41	164	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10598.03	66.62	83.54	-16.92	57.03	6.21	38.38	35.00	53	160	Peak	VERTICAL
2	10599.42	52.68	63.54	-10.86	43.09	6.21	38.38	35.00	53	160	Average	VERTICAL
3	15903.88	54.47	63.54	-9.07	43.44	7.69	38.37	35.03	226	184	Average	VERTICAL
4	15906.42	72.08	83.54	-11.46	61.07	7.69	38.37	35.05	226	184	Peak	VERTICAL

Temperature	25℃	Humidity	54%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 64 / Chain 3
Test Date	Mar. 20, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10639.25	66.99	83.54	-16.55	57.36	6.23	38.37	34.97	71	164	Peak	HORIZONTAL
2	10639.65	51.00	63.54	-12.54	41.37	6.23	38.37	34.97	71	164	Average	HORIZONTAL
3	15958.84	64.13	83.54	-19.41	53.20	7.70	38.33	35.10	22	164	Peak	HORIZONTAL
4	15964.34	46.92	63.54	-16.62	35.99	7.70	38.33	35.10	22	164	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10639.02	62.85	83.54	-20.69	53.22	6.23	38.37	34.97	52	160	Peak	VERTICAL
2	10639.65	48.27	63.54	-15.27	38.64	6.23	38.37	34.97	52	160	Average	VERTICAL
3	15958.55	43.55	63.54	-19.99	32.62	7.70	38.33	35.10	252	175	Average	VERTICAL
4	15958.84	62.93	83.54	-20.61	52.00	7.70	38.33	35.10	252	175	Peak	VERTICAL

Temperature	25℃	Humidity	54%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 100 / Chain 3
Test Date	Mar. 20, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10999.19	72.91	83.54	-10.63	62.92	6.40	38.30	34.71	74	164	Peak	HORIZONTAL
2	10999.65	57.55	63.54	-5.99	47.56	6.40	38.30	34.71	74	164	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10998.15	69.39	83.54	-14.15	59.40	6.40	38.30	34.71	40	161	Peak	VERTICAL
2	10999.71	55.16	63.54	-8.38	45.17	6.40	38.30	34.71	40	161	Average	VERTICAL

Temperature	25°C	Humidity	54%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 116 / Chain 3
Test Date	Mar. 20, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg		
1	11157.90	78.81	83.54	-4.73	62.89	40.10	10.84	35.02	159	46	HORIZONTAL	Peak
2	11159.93	63.47	63.54	-0.07	47.55	40.10	10.84	35.02	159	46	HORIZONTAL	Average
3	16740.29	55.76	63.54	-7.78	37.31	40.07	13.63	35.25	164	213	HORIZONTAL	Average
4	16746.51	71.91	83.54	-11.63	53.44	40.09	13.63	35.25	164	213	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg		
1	11159.71	60.63	63.54	-2.91	44.71	40.10	10.84	35.02	165	269	VERTICAL	Average
2	11162.61	75.42	83.54	-8.12	59.50	40.10	10.84	35.02	165	269	VERTICAL	Peak
3	16735.73	57.40	63.54	-6.14	38.92	40.10	13.62	35.24	164	214	VERTICAL	Average
4	16746.51	74.13	83.54	-9.41	55.65	40.10	13.63	35.25	164	214	VERTICAL	Peak

Temperature	25℃	Humidity	54%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 140 / Chain 3
Test Date	Mar. 20, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11399.13	70.20	83.54	-13.34	60.06	6.51	38.30	34.67	68	163	Peak	HORIZONTAL
2	11399.48	54.59	63.54	-8.95	44.45	6.51	38.30	34.67	68	163	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11399.19	67.17	83.54	-16.37	57.03	6.51	38.30	34.67	31	159	Peak	VERTICAL
2	11399.54	51.73	63.54	-11.81	41.59	6.51	38.30	34.67	31	159	Average	VERTICAL

Temperature	25℃	Humidity	54%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 54 / Chain 3
Test Date	Mar. 20, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15807.34	65.67	83.54	-17.87	54.54	7.65	38.45	34.97	242	160	Peak	HORIZONTAL
2	15813.13	51.95	63.54	-11.59	40.82	7.65	38.45	34.97	242	160	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15807.45	64.67	83.54	-18.87	53.54	7.65	38.45	34.97	208	161	Peak	VERTICAL
2	15813.01	49.86	63.54	-13.68	38.73	7.65	38.45	34.97	208	161	Average	VERTICAL

Temperature	25℃	Humidity	54%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 62 / Chain 3
Test Date	Mar. 20, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10618.96	56.28	83.54	-27.26	46.67	6.22	38.38	34.99	63	166	Peak	HORIZONTAL
2	10619.65	43.05	63.54	-20.49	33.44	6.22	38.38	34.99	63	166	Average	HORIZONTAL
3	15926.17	56.42	83.54	-27.12	45.42	7.69	38.36	35.05	305	169	Peak	HORIZONTAL
4	15940.49	44.28	63.54	-19.26	33.32	7.70	38.34	35.08	305	169	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	10593.84	53.91	83.54	-29.63	44.33	6.20	38.38	35.00	264	163	Peak	VERTICAL
2	10620.23	43.06	63.54	-20.48	33.45	6.22	38.38	34.99	264	163	Average	VERTICAL
3	15928.92	44.19	63.54	-19.35	33.19	7.69	38.36	35.05	305	163	Average	VERTICAL
4	15931.01	56.13	83.54	-27.41	45.16	7.69	38.36	35.08	305	163	Peak	VERTICAL

Temperature	25℃	Humidity	54%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 102 / Chain 3
Test Date	Mar. 20, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11019.51	40.55	63.54	-22.99	30.56	6.40	38.30	34.71	359	169	Average	HORIZONTAL
2	11021.16	53.43	83.54	-30.11	43.44	6.40	38.30	34.71	359	169	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11019.80	45.42	63.54	-18.12	35.43	6.40	38.30	34.71	42	162	Average	VERTICAL
2	11020.98	58.25	83.54	-25.29	48.26	6.40	38.30	34.71	42	162	Peak	VERTICAL

Temperature	25℃	Humidity	54%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 110 / Chain 3
Test Date	Mar. 20, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11099.88	61.64	63.54	-1.90	51.61	6.43	38.30	34.70	76	178	Average	HORIZONTAL
2	11100.81	74.00	83.54	-9.54	63.97	6.43	38.30	34.70	76	178	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11099.88	56.38	63.54	-7.16	46.35	6.43	38.30	34.70	302	159	Average	VERTICAL
2	11100.81	68.04	83.54	-15.50	58.01	6.43	38.30	34.70	302	159	Peak	VERTICAL

Temperature	25℃	Humidity	54%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 134 / Chain 3
Test Date	Mar. 20, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11337.34	67.44	83.54	-16.10	57.33	6.49	38.30	34.68	74	162	Peak	HORIZONTAL
2	11340.00	56.80	63.54	-6.74	46.69	6.49	38.30	34.68	74	162	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11340.00	51.52	63.54	-12.02	41.41	6.49	38.30	34.68	286	161	Average	VERTICAL
2	11340.46	63.19	83.54	-20.35	53.07	6.49	38.30	34.67	286	161	Peak	VERTICAL

Temperature	25℃	Humidity	54%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 58 / Chain 3
Test Date	Mar. 20, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15830.06	43.70	63.54	-19.84	32.59	7.66	38.44	34.99	191	167	Average	HORIZONTAL
2	15834.54	57.12	83.54	-26.42	46.03	7.66	38.42	34.99	191	167	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15879.70	56.27	83.54	-27.27	45.23	7.67	38.40	35.03	220	160	Peak	VERTICAL
2	15904.30	44.86	63.54	-18.68	33.83	7.69	38.37	35.03	218	160	Average	VERTICAL

Temperature	25℃	Humidity	54%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 106 / Chain 3
Test Date	Mar. 20, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11059.86	41.29	63.54	-22.25	31.27	6.42	38.30	34.70	139	173	Average	HORIZONTAL
2	11079.39	54.11	83.54	-29.43	44.09	6.42	38.30	34.70	139	173	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11060.00	41.52	63.54	-22.02	31.50	6.42	38.30	34.70	139	166	Average	VERTICAL
2	11074.33	54.71	83.54	-28.83	44.69	6.42	38.30	34.70	291	166	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. Band Edge Emissions Measurement

4.6.1. Limit

For transmitters operating in the 5.25-5.35 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 5.470-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band 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 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

4.6.3. Test Procedures

The test procedure is the same as section 4.5.3, only the frequency range investigated is limited to 100MHz around bandedges.

4.6.4. Test Setup Layout

This test setup layout is the same as that shown in section 4.5.4.

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. Test Result of Band Edge and Fundamental Emissions

Temperature	25°C	Humidity	54%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11a CH 52, 60, 64 / Chain 3
Test Date	Mar. 19, 2015 / Mar. 20, 2015		

Channel 52

	Freq	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg		
1	5150.00	69.73	83.54	-13.81	30.88	31.52	7.33	0.00	163	288	VERTICAL	Peak
2	5150.00	56.80	63.54	-6.74	17.95	31.52	7.33	0.00	163	288	VERTICAL	Average
3	5258.70	128.58			89.54	31.61	7.43	0.00	163	288	VERTICAL	Peak
4	5259.13	118.31			79.27	31.61	7.43	0.00	163	288	VERTICAL	Average
5	5350.00	72.42	83.54	-11.12	33.22	31.68	7.52	0.00	163	288	VERTICAL	Peak
6	5350.00	59.21	63.54	-4.33	20.01	31.68	7.52	0.00	163	288	VERTICAL	Average

Item 3, 4 are the fundamental frequency at 5260 MHz.

Channel 60

	Freq	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg		
1	5298.26	128.67			89.56	31.64	7.47	0.00	160	286	VERTICAL	Peak
2	5299.13	119.07			79.96	31.64	7.47	0.00	160	286	VERTICAL	Average
3	5350.00	77.02	83.54	-6.52	37.82	31.68	7.52	0.00	160	286	VERTICAL	Peak
4	5352.03	63.22	63.54	-0.32	24.02	31.68	7.52	0.00	160	286	VERTICAL	Average

Item 1, 2 are the fundamental frequency at 5300 MHz.

Channel 64

	Freq	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg		
1	5320.58	114.68			75.54	31.65	7.49	0.00	159	288	VERTICAL	Average
2	5323.18	124.31			85.16	31.65	7.50	0.00	159	288	VERTICAL	Peak
3	5350.00	78.18	83.54	-5.36	38.98	31.68	7.52	0.00	159	288	VERTICAL	Peak
4	5350.00	63.05	63.54	-0.49	23.85	31.68	7.52	0.00	159	288	VERTICAL	Average

Item 1, 2 are the fundamental frequency at 5320 MHz.

Temperature	25°C	Humidity	54%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11a CH 100, 140 / Chain 3
Test Date	Mar. 19, 2015		

Channel 100

	Freq	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg		
1	5460.00	73.78	83.54	-9.76	34.40	31.76	7.62	0.00	157	289	VERTICAL	Peak
2	5460.00	60.55	63.54	-2.99	21.17	31.76	7.62	0.00	157	289	VERTICAL	Average
3	5468.70	78.54	83.54	-5.00	39.13	31.78	7.63	0.00	157	289	VERTICAL	Peak
4	5470.00	62.82	63.54	-0.72	23.41	31.78	7.63	0.00	157	289	VERTICAL	Average
5	5501.59	115.03			75.57	31.80	7.66	0.00	157	289	VERTICAL	Average
6	5504.05	124.58			85.12	31.80	7.66	0.00	157	289	VERTICAL	Peak

Item 5, 6 are the fundamental frequency at 5500 MHz.

Channel 140

	Freq	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg		
1	5697.54	123.78			83.96	32.04	7.78	0.00	162	276	VERTICAL	Peak
2	5698.55	114.03			74.21	32.04	7.78	0.00	162	276	VERTICAL	Average
3	5725.00	80.14	83.54	-3.40	40.27	32.08	7.79	0.00	162	276	VERTICAL	Peak
4	5725.00	63.43	63.54	-0.11	23.56	32.08	7.79	0.00	162	276	VERTICAL	Average

Item 1, 2 are the fundamental frequency at 5700 MHz.

Temperature	25°C	Humidity	54%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 52, 60, 64 / Chain 3
Test Date	Mar. 19, 2015 / Mar. 20, 2015		

Channel 52

	Freq	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg		
1	5150.00	70.00	83.54	-13.54	31.15	31.52	7.33	0.00	162	284	VERTICAL	Peak
2	5150.00	57.18	63.54	-6.36	18.33	31.52	7.33	0.00	162	284	VERTICAL	Average
3	5261.30	128.24			89.19	31.61	7.44	0.00	162	284	VERTICAL	Peak
4	5263.04	117.55			78.49	31.62	7.44	0.00	162	284	VERTICAL	Average
5	5350.00	71.01	83.54	-12.53	31.81	31.68	7.52	0.00	162	284	VERTICAL	Peak
6	5350.00	59.45	63.54	-4.09	20.25	31.68	7.52	0.00	162	284	VERTICAL	Average

Item 3, 4 are the fundamental frequency at 5260 MHz.

Channel 60

	Freq	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg		
1	5299.42	118.33			79.22	31.64	7.47	0.00	161	284	VERTICAL	Average
2	5300.58	128.77			89.66	31.64	7.47	0.00	161	284	VERTICAL	Peak
3	5351.16	63.04	63.54	-0.50	23.84	31.68	7.52	0.00	161	284	VERTICAL	Average
4	5351.45	80.51	83.54	-3.03	41.31	31.68	7.52	0.00	161	284	VERTICAL	Peak

Item 1, 2 are the fundamental frequency at 5300 MHz.

Channel 64

	Freq	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg		
1	5321.59	114.89			75.75	31.65	7.49	0.00	160	278	VERTICAL	Average
2	5323.33	124.86			85.69	31.67	7.50	0.00	160	278	VERTICAL	Peak
3	5350.00	63.35	63.54	-0.19	24.15	31.68	7.52	0.00	160	278	VERTICAL	Average
4	5352.60	80.01	83.54	-3.53	40.81	31.68	7.52	0.00	160	278	VERTICAL	Peak

Item 1, 2 are the fundamental frequency at 5320 MHz.

Temperature	25°C	Humidity	54%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 100, 140 / Chain 3
Test Date	Mar. 19, 2015		

Channel 100

	Freq	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg		
1	5460.00	76.03	83.54	-7.51	36.65	31.76	7.62	0.00	164	280	VERTICAL	Peak
2	5460.00	60.31	63.54	-3.23	20.93	31.76	7.62	0.00	164	280	VERTICAL	Average
3	5470.00	79.00	83.54	-4.54	39.59	31.78	7.63	0.00	164	280	VERTICAL	Peak
4	5470.00	63.18	63.54	-0.36	23.77	31.78	7.63	0.00	164	280	VERTICAL	Average
5	5496.96	124.45			84.99	31.80	7.66	0.00	164	280	VERTICAL	Peak
6	5497.25	114.31			74.85	31.80	7.66	0.00	164	280	VERTICAL	Average

Item 5, 6 are the fundamental frequency at 5500 MHz.

Channel 140

	Freq	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg		
1	5696.96	123.06			83.24	32.04	7.78	0.00	160	276	VERTICAL	Peak
2	5700.43	113.07			73.25	32.04	7.78	0.00	160	276	VERTICAL	Average
3	5725.00	63.45	63.54	-0.09	23.58	32.08	7.79	0.00	160	276	VERTICAL	Average
4	5725.72	77.85	83.54	-5.69	37.98	32.08	7.79	0.00	160	276	VERTICAL	Peak

Item 1, 2 are the fundamental frequency at 5700 MHz.

Temperature	25°C	Humidity	54%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 54, 62 / Chain 3
Test Date	Mar. 19, 2015		

Channel 54

	Freq	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg		
1	5267.97	124.58			85.52	31.62	7.44	0.00	163	285	VERTICAL	Peak
2	5271.45	114.28			75.21	31.62	7.45	0.00	163	285	VERTICAL	Average
3	5350.00	76.40	83.54	-7.14	37.20	31.68	7.52	0.00	163	285	VERTICAL	Peak
4	5350.00	63.47	63.54	-0.07	24.27	31.68	7.52	0.00	163	285	VERTICAL	Average

Item 1, 2 are the fundamental frequency at 5270 MHz.

Channel 62

	Freq	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg		
1	5307.68	118.83			79.71	31.64	7.48	0.00	162	283	VERTICAL	Peak
2	5308.26	108.53			69.40	31.65	7.48	0.00	162	283	VERTICAL	Average
3	5350.00	75.24	83.54	-8.30	36.04	31.68	7.52	0.00	162	283	VERTICAL	Peak
4	5350.00	63.18	63.54	-0.36	23.98	31.68	7.52	0.00	162	283	VERTICAL	Average

Item 1, 2 are the fundamental frequency at 5310 MHz.

Temperature	25°C	Humidity	54%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 102, 110, 134 / Chain 3
Test Date	Mar. 19, 2015		

Channel 102

	Freq	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg		
1	5460.00	72.18	83.54	-11.36	32.80	31.76	7.62	0.00	158	290	VERTICAL	Peak
2	5460.00	59.76	63.54	-3.78	20.38	31.76	7.62	0.00	158	290	VERTICAL	Average
3	5470.00	78.80	83.54	-4.74	39.39	31.78	7.63	0.00	158	290	VERTICAL	Peak
4	5470.00	63.44	63.54	-0.10	24.03	31.78	7.63	0.00	158	290	VERTICAL	Average
5	5507.97	116.96			77.50	31.80	7.66	0.00	158	290	VERTICAL	Peak
6	5508.26	106.38			66.91	31.80	7.67	0.00	158	290	VERTICAL	Average

Item 5, 6 are the fundamental frequency at 5510 MHz.

Channel 110

	Freq	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg		
1	5460.00	75.95	83.54	-7.59	36.57	31.76	7.62	0.00	160	290	VERTICAL	Peak
2	5460.00	63.00	63.54	-0.54	23.62	31.76	7.62	0.00	160	290	VERTICAL	Average
3	5468.55	77.40	77.74	-0.34	37.99	31.78	7.63	0.00	160	290	VERTICAL	Peak
4	5547.68	125.14			85.59	31.86	7.69	0.00	160	290	VERTICAL	Peak
5	5548.26	114.59			75.04	31.86	7.69	0.00	160	290	VERTICAL	Average

Item 4, 5 are the fundamental frequency at 5550 MHz.

Channel 134

	Freq	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg		
1	5667.97	122.53			82.77	32.00	7.76	0.00	156	282	VERTICAL	Peak
2	5671.45	111.90			72.14	32.00	7.76	0.00	156	282	VERTICAL	Average
3	5725.00	63.37	63.54	-0.17	23.50	32.08	7.79	0.00	156	282	VERTICAL	Average
4	5725.29	78.39	83.54	-5.15	38.52	32.08	7.79	0.00	156	282	VERTICAL	Peak

Item 1, 2 are the fundamental frequency at 5670 MHz.

Temperature	25°C	Humidity	54%
Test Engineer	Kenneth Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 58, 106 / Chain 3
Test Date	Mar. 19, 2015		

Channel 58

	Freq	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg		
1	5295.21	111.93			72.82	31.64	7.47	0.00	161	291	VERTICAL	Peak
2	5325.31	101.55			62.38	31.67	7.50	0.00	161	291	VERTICAL	Average
3	5350.00	73.02	83.54	-10.52	33.82	31.68	7.52	0.00	161	291	VERTICAL	Peak
4	5350.00	61.53	63.54	-2.01	22.33	31.68	7.52	0.00	161	291	VERTICAL	Average

Item 1, 2 are the fundamental frequency at 5290 MHz.

Channel 106

	Freq	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg		
1	5460.00	75.73	83.54	-7.81	36.35	31.76	7.62	0.00	159	284	VERTICAL	Peak
2	5460.00	63.47	63.54	-0.07	24.09	31.76	7.62	0.00	159	284	VERTICAL	Average
3	5461.32	77.65	77.74	-0.09	38.27	31.76	7.62	0.00	159	284	VERTICAL	Peak
4	5494.54	102.42			62.98	31.79	7.65	0.00	159	284	VERTICAL	Average
5	5516.25	112.51			73.02	31.82	7.67	0.00	159	284	VERTICAL	Peak

Item 4, 5 are the fundamental frequency at 5530 MHz.

Note:

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

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

4.7. Frequency Stability Measurement

4.7.1. 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).

4.7.2. Measuring Instruments and Setting

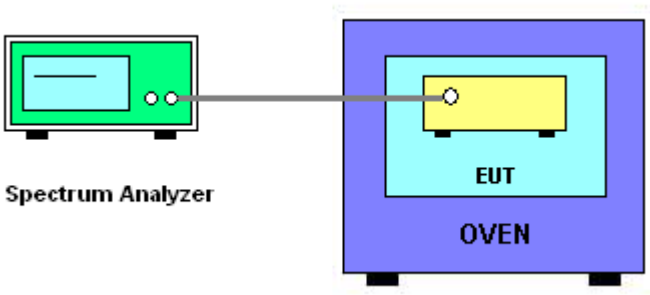
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.7.3. 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. The test extreme voltage is to change the primary supply voltage from 85 to 115 percent of the nominal value
7. Extreme temperature is 0°C~40°C.

4.7.4. Test Setup Layout



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 un-modulation transmitting mode.

4.7.7. Test Result of Frequency Stability

Temperature	20°C	Humidity	60%
Test Engineer	Lucas Huang	Test Date	Mar. 27, 2015

Mode: 20 MHz

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)	
(V)	5300 MHz	5580 MHz
126.50	5299.9600	5579.9600
110.00	5299.9500	5579.9600
93.50	5299.9600	5579.9500
Max. Deviation (MHz)	0.0500	0.0500
Max. Deviation (ppm)	9.43	8.96

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)	
(°C)	5300 MHz	5580 MHz
0	5300.0000	5580.0100
10	5300.0000	5580.0000
20	5299.9600	5579.9600
30	5299.9600	5579.9400
40	5299.9500	5579.9600
Max. Deviation (MHz)	0.0500	0.0600
Max. Deviation (ppm)	9.43	10.75

Mode: 40 MHz

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)	
(V)	5310 MHz	5550 MHz
126.50	5309.9600	5549.9600
110.00	5309.9600	5549.9400
93.50	5309.9700	5549.9600
Max. Deviation (MHz)	0.0400	0.0600
Max. Deviation (ppm)	7.53	10.81

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)	
(°C)	5310 MHz	5550 MHz
0	5310.0100	5550.0100
10	5310.0200	5550.0200
20	5309.9600	5549.9600
30	5309.9400	5549.9500
40	5309.9600	5549.9600
Max. Deviation (MHz)	0.060	0.050
Max. Deviation (ppm)	11.30	9.01

Mode: 80 MHz

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)	
(V)	5290 MHz	5530 MHz
126.50	5289.9600	5529.9100
110.00	5289.9700	5529.9600
93.50	5289.9600	5529.9700
Max. Deviation (MHz)	0.0400	0.0900
Max. Deviation (ppm)	7.56	16.27

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)	
(°C)	5290 MHz	5530 MHz
0	5290.0100	5530.0200
10	5290.0300	5530.0100
20	5289.9600	5529.9600
30	5289.9400	5529.9500
40	5289.9600	5529.9600
Max. Deviation (MHz)	0.0600	0.0500
Max. Deviation (ppm)	11.34	9.04

4.8. Antenna Requirements

4.8.1. 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.

4.8.2. Antenna Connector Construction

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

5. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
EMI Test Receiver	R&S	ESCS 30	100355	9kHz ~ 2.75GHz	Apr. 12, 2013	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Nov. 26, 2012	Conduction (CO01-CB)
V- LISN	Schwarzbeck	NSLK 8127	8127478	9kHz ~ 30MHz	Jul. 17, 2013	Conduction (CO01-CB)
Impulsbegrenzer Pulse Limiter	Rohde&Schwarz	ESH3-Z2	100430	9kHz~30MHz	Feb. 21, 2013	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	0.15MHz~30MHz	Dec. 04, 2012	Conduction (CO01-CB)
Software	Audix	E3	5.410e	-	-	Conduction (CO01-CB)
BILOG ANTENNA	Schaffner	CBL6112D	22021	20MHz ~ 2GHz	Apr. 16, 2013	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9 kHz - 30 MHz	Nov. 05, 2012*	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Oct. 28, 2014	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Aug. 22, 2014	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Nov. 27, 2012	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 12, 2015	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26GHz ~ 40GHz	Nov. 25, 2014	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Nov. 06, 2014	Radiation (03CH01-CB)
EMI Test Receiver	R&S	ESCS 30	100355	9kHz ~ 2.75GHz	Apr. 12, 2013	Radiation (03CH01-CB)
Turn Table	INN CO	CO 2000	N/A	0 ~ 360 degree	N.C.R.	Radiation (03CH01-CB)
Antenna Mast	INN CO	CO 2000	N/A	1 m ~ 4 m	N.C.R.	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz - 1 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18 GHz	Nov. 15, 2014	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-17	N/A	1 GHz ~ 18 GHz	Nov. 15, 2014	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-1	N/A	1 GHz ~ 40 GHz	Nov. 15, 2014	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-2	N/A	1 GHz ~ 40 GHz	Nov. 15, 2014	Radiation (03CH01-CB)
Thermometer	HTC-1	HTC-1	TP-1	-50℃~70℃	Mar. 11, 2015	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec.12, 2014	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 03, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-7	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-8	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-9	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 03, 2014	Conducted (TH01-CB)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
Thermometer	HTC-1	HTC-1	TP-8	-50℃~70℃	Mar. 05, 2015	Conducted (TH01-CB)

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

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

6. MEASUREMENT UNCERTAINTY

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	2.4 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%