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FCC RADIO TEST REPORT

Applicant's company	**ASUSTeK COMPUTER INC.**
Applicant Address	4F, No. 150, Li-Te Rd., Peitou, Taipei 112, Taiwan
FCC ID	**MSQ-RT0M00**
Manufacturer's company (1)	**ASKEY TECHNOLOGH(JIANGSU)LTD.**
Manufacturer Address	N0.1388, JiaoTong Road, WuKiang Economic-Technological Development Area,Jangus Province,P.R.C
Manufacturer's company (2)	**Compal Networking (KunShan) Co., LTD.**
Manufacturer Address	No. 520, Nabbang Rd., Economic & Technical Development Zone Kunshan, Jiangsu Province China

Product Name	Wireless-AC3200 Tri-band Gigabit Router
Brand Name	ASUS
Model No.	RT-AC3200, RT-AC3200R, RT-AC3200W
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5150 ~ 5250MHz
Received Date	Jul. 17, 2014
Final Test Date	Dec. 16, 2014
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 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
FR471703AB	Rev. 01	Initial issue of report	Dec. 18, 2014

Certificate No.: CB10312058

1. CERTIFICATE OF COMPLIANCE

Product Name	:	Wireless-AC3200 Tri-band Gigabit Router
Brand Name	:	ASUS
Model No.	:	RT-AC3200, RT-AC3200R, RT-AC3200W
Applicant	:	ASUSTeK COMPUTER 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 Jul. 17, 2014 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

Sam Chen
SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart E				
Part	**Rule Section**	**Description of Test**	**Result**	**Under Limit**
4.1	15.207	AC Power Line Conducted Emissions	Complies	12.56 dB
4.2	15.407(a)	26dB Spectrum Bandwidth and 99% Occupied Bandwidth	Complies	-
4.3	15.407(a)	Maximum Conducted Output Power	Complies	0.13 dB
4.4	15.407(a)	Power Spectral Density	Complies	0.07 dB
4.5	15.407(b)	Radiated Emissions	Complies	4.04 dB
4.6	15.407(b)	Band Edge Emissions	Complies	1.02 dB
4.7	15.407(g)	Frequency Stability	Complies	-
4.8	15.203	Antenna Requirements	Complies	-

Note: This device supports Bridge Mode in Band 1 and Band 4.

3. GENERAL INFORMATION

3.1. Product Details

IEEE 802.11n/ac

Items	Description
Product Type	WLAN (3TX, 3RX)
Radio Type	Intentional Transceiver
Power Type	From power adapter
Modulation	see the below table for IEEE 802.11n/ac
Data Modulation	For 802.11n: OFDM (BPSK / QPSK / 16QAM / 64QAM) For 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)
Data Rate (Mbps)	see the below table for IEEE 802.11n/ac
Frequency Range	5150 ~ 5250MHz
Channel Number	4 for 20MHz bandwidth ; 2 for 40MHz bandwidth 1 for 80MHz bandwidth
Channel Band Width (99%)	<For Non-Beamforming Mode> 802.11ac MCS0/Nss1 (VHT20): 18.40 MHz ; 802.11ac MCS0/Nss1 (VHT40): 36.80 MHz ; 802.11ac MCS0/Nss1 (VHT80): 75.52 MHz <For Beamforming Mode> 802.11ac MCS0/Nss1 (VHT20): 18.40 MHz ; 802.11ac MCS0/Nss1 (VHT40): 37.44 MHz ; 802.11ac MCS0/Nss1 (VHT80): 76.16 MHz
Maximum Conducted Output Power	<For Non-Beamforming Mode> 802.11ac MCS0/Nss1 (VHT20): 27.93 dBm ; 802.11ac MCS0/Nss1 (VHT40): 27.64 dBm ; 802.11ac MCS0/Nss1 (VHT80): 20.59 dBm <For Beamforming Mode> 802.11ac MCS0/Nss1 (VHT20): 27.73 dBm ; 802.11ac MCS0/Nss1 (VHT40): 27.64 dBm ; 802.11ac MCS0/Nss1 (VHT80): 20.80 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

IEEE 802.11a

Items	Description
Product Type	WLAN (3TX, 3RX)
Radio Type	Intentional Transceiver
Power Type	From power adapter
Modulation	OFDM for IEEE 802.11a
Data Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	OFDM (6/9/12/18/24/36/48/54)
Frequency Range	5150 ~ 5250MHz
Channel Number	4
Channel Band Width (99%)	17.44 MHz
Maximum Conducted Output Power	28.13 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 for 802 11n/ac in 2.4GHz/5GHz.	☐ 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	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 support 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, 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 No.	Rating
Adapter 1 (Fixed plug)	PI	AD883J20	Input: 100-240V~50/60Hz 1.0A Output: 19V, 2.37A
Adapter 2 (Fixed plug)	Delta	ADP-45BW B	Input: 100-240V~50-60Hz 1.2A Output: 19V, 2.37A
Others			
RJ-45 Cable*1: Shielded, 1.5m			

3.3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)			Remark
					2.4GHz	5GHz (Band 1)	5GHz (Band 4)	
1	M.gear	C660-510331-A	Dipole Ant.	Reversed-SMA	-	-	3.47	support single band
2	M.gear	C660-510331-A	Dipole Ant.	Reversed-SMA	-	-	3.47	support single band
3	PSA	RFDPA181300SBLB805	Dipole Ant.	Reversed-SMA	2.6	3.37	2.89	support dual band
4	M.gear	C660-510331-A	Dipole Ant.	Reversed-SMA	-	-	3.47	support single band
5	M.gear	C660-510324-A	Dipole Ant.	Reversed-SMA	1.87	3.23	3.33	support dual band

Note 1: Above antennas are the same type antenna, thus only the highest antenna gain Ant. 3 for 2.4GHz/5GHz band1 and Ant. 1, 2, 4 for 5GHz band 4 tested and recorded in the report.

Note 2:

<For 2.4GHz and 5GHz Band 1>

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

Chain 3, Chain 5 and Chain 6 can be used as transmitting/receiving antenna.

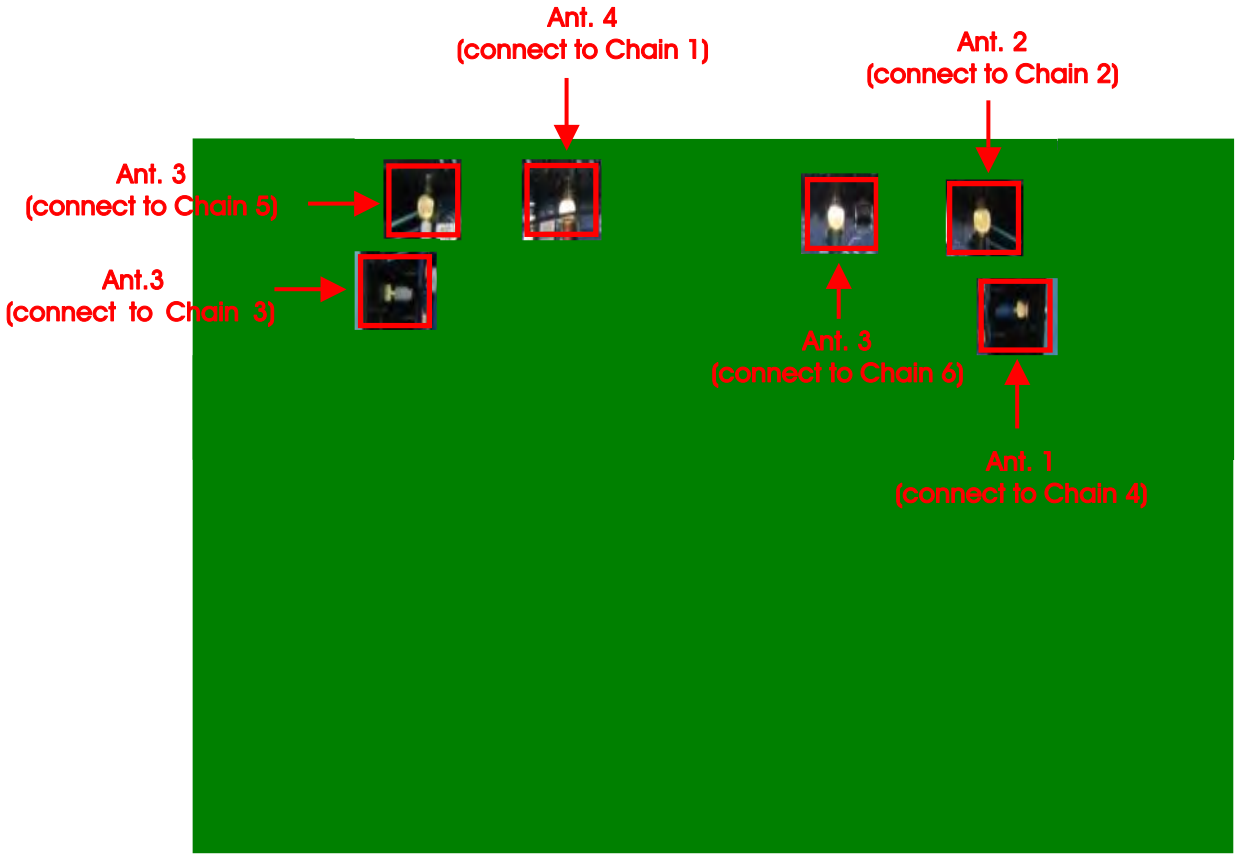
Chain 3, Chain 5 and Chain 6 could transmit/receive simultaneously.

<For 5GHz Band 4>

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

Chain 1, Chain 2 and Chain 4 can be used as transmitting/receiving antenna.

Chain 1, Chain 2 and Chain 4 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.

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

For 80MHz bandwidth systems, use Channel 42.

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	-	-

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	11ac VHT20	Band 1	MCS0/Nss1	36/40/48	3+5+6
	11ac VHT40	Band 1	MCS0/Nss1	38/46	3+5+6
	11ac VHT80	Band 1	MCS0/Nss1	42	3+5+6
	11a/BPSK	Band 1	6Mbps	36/40/48	3+5+6
Power Spectral Density	11ac VHT20	Band 1	MCS0/Nss1	36/40/48	3+5+6
	11ac VHT40	Band 1	MCS0/Nss1	38/46	3+5+6
	11ac VHT80	Band 1	MCS0/Nss1	42	3+5+6
	11a/BPSK	Band 1	6Mbps	36/40/48	3+5+6
26dB Spectrum Bandwidth 99% Occupied Bandwidth Measurement	11ac VHT20	Band 1	MCS0/Nss1	36/40/48	3+5+6
	11ac VHT40	Band 1	MCS0/Nss1	38/46	3+5+6
	11ac VHT80	Band 1	MCS0/Nss1	42	3+5+6
	11a/BPSK	Band 1	6Mbps	36/40/48	3+5+6
Radiated Emission Below 1GHz	CTX		-	-	-
Radiated Emission Above 1GHz	11ac VHT20	Band 1	MCS0/Nss1	36/40/48	3+5+6
	11ac VHT40	Band 1	MCS0/Nss1	38/46	3+5+6
	11ac VHT80	Band 1	MCS0/Nss1	42	3+5+6
	11a/BPSK	Band 1	6Mbps	36/40/48	3+5+6
Band Edge Emission	11ac VHT20	Band 1	MCS0/Nss1	36/40/48	3+5+6
	11ac VHT40	Band 1	MCS0/Nss1	38/46	3+5+6
	11ac VHT80	Band 1	MCS0/Nss1	42	3+5+6
	11a/BPSK	Band 1	6Mbps	36/40/48	3+5+6
Frequency Stability	Un-modulation		-	40	3+5+6

Note 1: VHT20/VHT40 covers HT20/HT40, due to same modulation.

Note 2: There are two modes of EUT, one is beamforming mode, and the other is non-beamforming mode for 802 11n/ac in 2.4GHz / 5GHz. Beamforming mode and non-beamforming mode has been test and record in this test report.

The following test modes were performed for all tests:

For Conducted Emission test:

The EUT has two SKU (SKU 1 and SKU 2). After evaluating, SKU2 was the worst case, Consequently, measurement for Conducted Emission will follow this same test mode

Mode 1. CTX: EUT (SKU 2) + Adapter 1

Mode 2. CTX: EUT (SKU 2) + Adapter 2

Mode 2 is the worst case, so it was selected to record in this test report.

For Radiated Emission <Below 1GHz>test:

The EUT has two SKU (SKU 1 and SKU 2). After evaluating, SKU1 was the worst case, Consequently, measurement for Radiated Emission <Below 1GHz> will follow this same test mode

Mode 1. CTX: EUT (SKU 1) + 2.4GHz + Adapter 1

Mode 2. CTX: EUT (SKU 1) + 5GHz Band 1 + Adapter 1

Mode 3. CTX: EUT (SKU 1) + 5GHz Band 4 + Adapter 1

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

Mode 4: CTX: EUT (SKU 1) + 5GHz Band 4 + Adapter 2

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

For Radiated Emission <Above 1GHz>test:

Mode 1. CTX: EUT

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

The EUT could be applied with WLAN 2.4GHz+5GHz band1+5GHz band4 function; therefore Co-location Maximum Permissible Exposure (Please refer to Appendix C) and Radiated Emission Co-location (please refer to Appendix D) tests are added for simultaneously transmit among WLAN 2.4GHz+5GHz band1+5GHz band4 function

3.6. Table for Testing Locations

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

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

Brand Name	Model Name	Description
ASUS	RT-AC3200	All the models are identical, the difference model for difference brand served as marketing strategy.
	RT-AC3200R	
	RT-AC3200W	

From the above models, model: RT-AC3200 was selected as representative model for the test and its data was recorded in this report.

3.8. Table for SKU List

The EUT has two SKU which are identical to each other in all aspects except for the following table:

SKU	Description
1	The difference between SKU 1 and SKU 2 is LAN transformer
2	

3.9. Table for Housing List

The EUT has two housing and which are identical to each other in all aspects except for the following table:

Housing	With Hole	Without Hole
1	V	X
2	X	V

From the above models, model: housing 2 was selected as representative model for the test and its data was recorded in this report.

3.10. Table for Supporting Units

For Test Site No: 03CH01-CB <Below 1GHz>

Support Unit	Brand	Model	FCC ID
NB	DELL	M1330	E2K4965AGNM

<For Non-Beamforming Mode>

For Test Site No: 03CH01-CB <Above 1GHz>

Support Unit	Brand	Model	FCC ID
NB	DELL	M1330	E2K4965AGNM

<For Beamforming Mode>

For Test Site No: 03CH01-CB <Above 1GHz>

Support Unit	Brand	Model	FCC ID
NB	DELL	M1330	E2K4965AGNM
NB	DELL	M1340	E2K4965AGNM
WLAN ac Dongle	Netgear	A6200	PY31220200

For Test Site No: CO01-CB

Support Unit	Brand	Model	FCC ID
NB	DELL	E6430	DoC

For Test Site No: TH01-CB

Support Unit	Brand	Model	FCC ID
NB	DELL	E6220	DoC

3.11. 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.

<For Non-Beamforming Mode>

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT20

Test Software Version	Mtool 2.0.1.8		
Frequency	5180 MHz	5200 MHz	5240 MHz
MCS0/Nss1 VHT20	87	91	92

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT40

Test Software Version	Mtool 2.0.1.8	
Frequency	5190 MHz	5230 MHz
MCS0/Nss1 VHT40	71	92

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT80

Test Software Version	Mtool 2.0.1.8
Frequency	5210 MHz
MCS0/Nss1 VHT80	58

Power Parameters of IEEE 802.11a

Test Software Version	Mtool 2.0.1.8		
Frequency	5180 MHz	5200 MHz	5240 MHz
802.11a	89	92	91

<For Beamforming Mode>

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT20

Test Software Version	Mtool 2.0.1.8		
Frequency	5180 MHz	5200 MHz	5240 MHz
MCS0/Nss1 VHT20	81	90	82

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT40

Test Software Version	Mtool 2.0.1.8	
Frequency	5190 MHz	5230 MHz
MCS0/Nss1 VHT40	71	92

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT80

Test Software Version	Mtool 2.0.1.8
Frequency	5210 MHz
MCS0/Nss1 VHT80	60

3.12. EUT Operation during Test

For non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

For Conducted Mode:

The EUT was programmed to be in continuously transmitting mode.

For Radiated Mode:

During the test, the following programs under WIN XP were executed.

The program was executed as follows:

1. During the test, the EUT operation to normal function.
2. Executed command fixed test channel under DOS.
3. Executed "Lantest.exe " to link with the remote workstation to receive and transmit packet by WLAN ac Dongle and transmit duty cycle no less 98%

3.13. Duty Cycle

<For Non-Beamforming Mode>

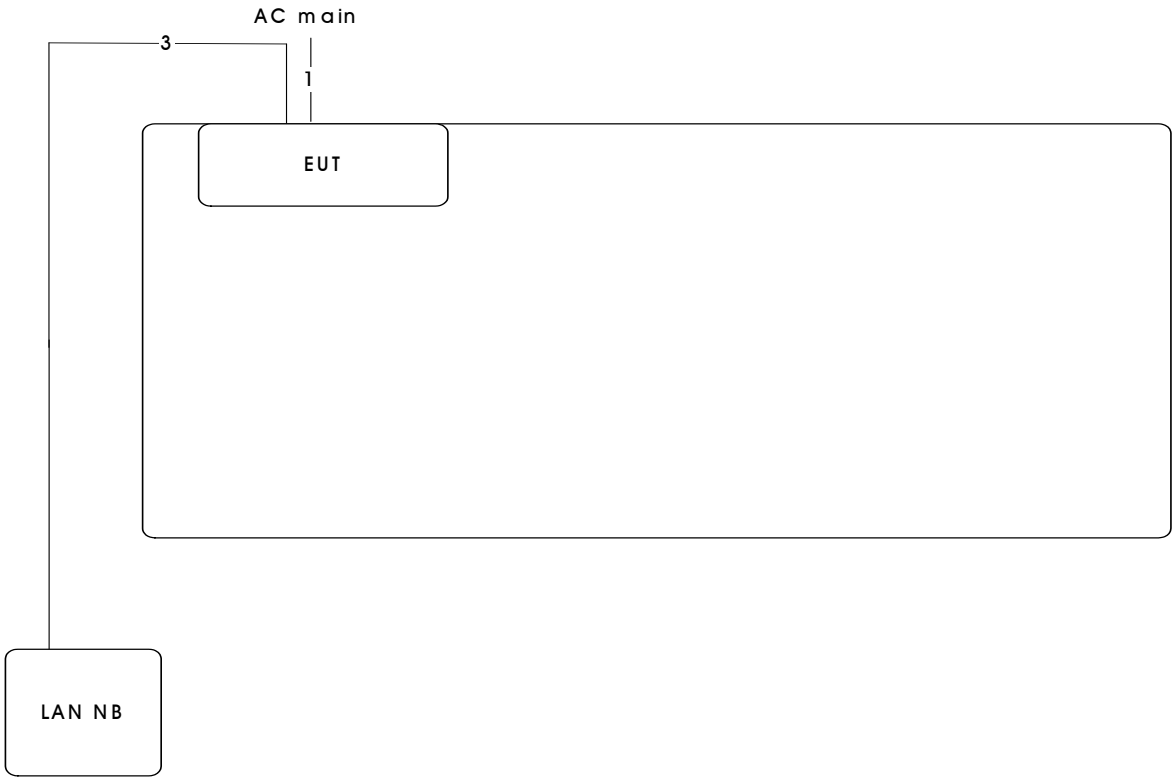
Band	Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
5G	802.11ac MCS0/Nss1 VHT20	1.913	1.928	99.25%	0.03	0.01
	802.11ac MCS0/Nss1 VHT40	0.942	0.964	97.72%	0.10	1.06
	802.11ac MCS0/Nss1 VHT80	0.465	0.480	96.88%	0.14	2.15
	802.11a	2.058	2.073	99.30%	0.03	0.01

<For Beamforming Mode>

Band	Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
5G	802.11ac MCS0/Nss1 VHT20	1.949	2.051	95.04%	0.22	0.51
	802.11ac MCS0/Nss1 VHT40	4.478	4.580	97.78%	0.10	0.22
	802.11ac MCS0/Nss1 VHT80	4.623	4.725	97.84%	0.09	0.22

3.14.Test Configurations

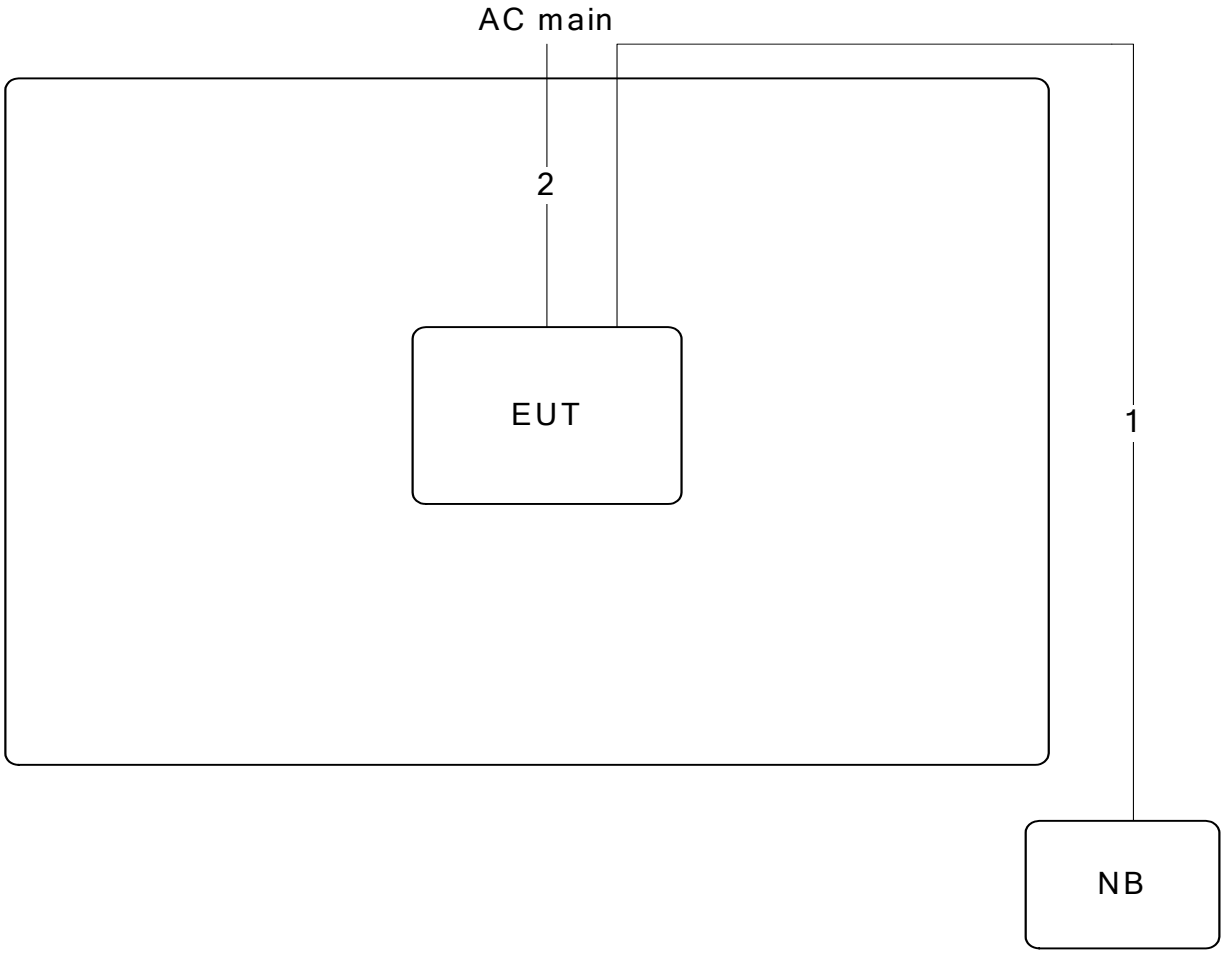
3.14.1. AC Power Line Conduction Emissions Test Configuration



Item	Connection	Shielded	Length(m)
1	Power cable	No	2.2m
2	RJ-45 cable	No	10m

3.14.2. Radiation Emissions Test Configuration

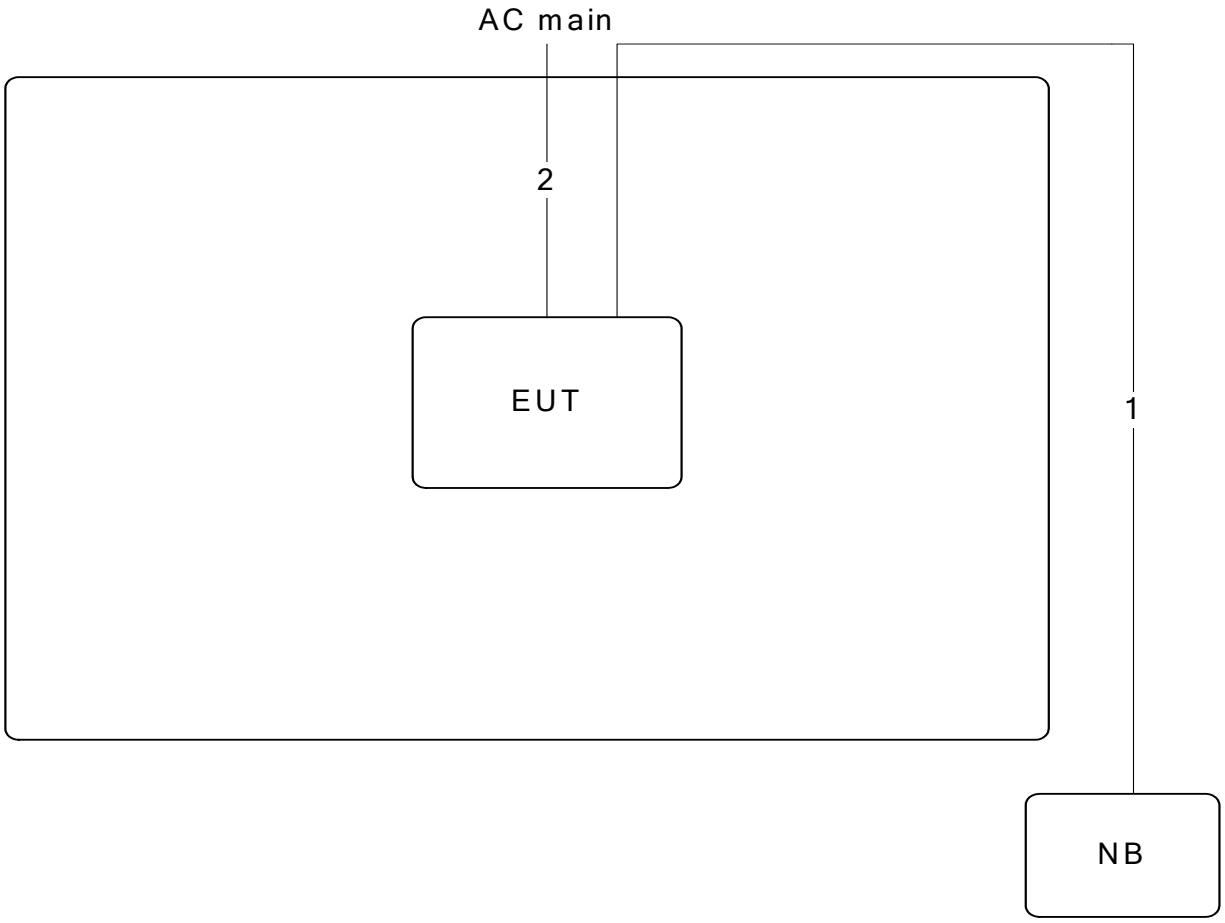
Test Configuration: 30MHz~1GHz



Item	Connection	Shielded	Length(m)
1	RJ-45 cable	No	10m
2	Power cable	No	2.2m

<For Non-Beamforming Mode>

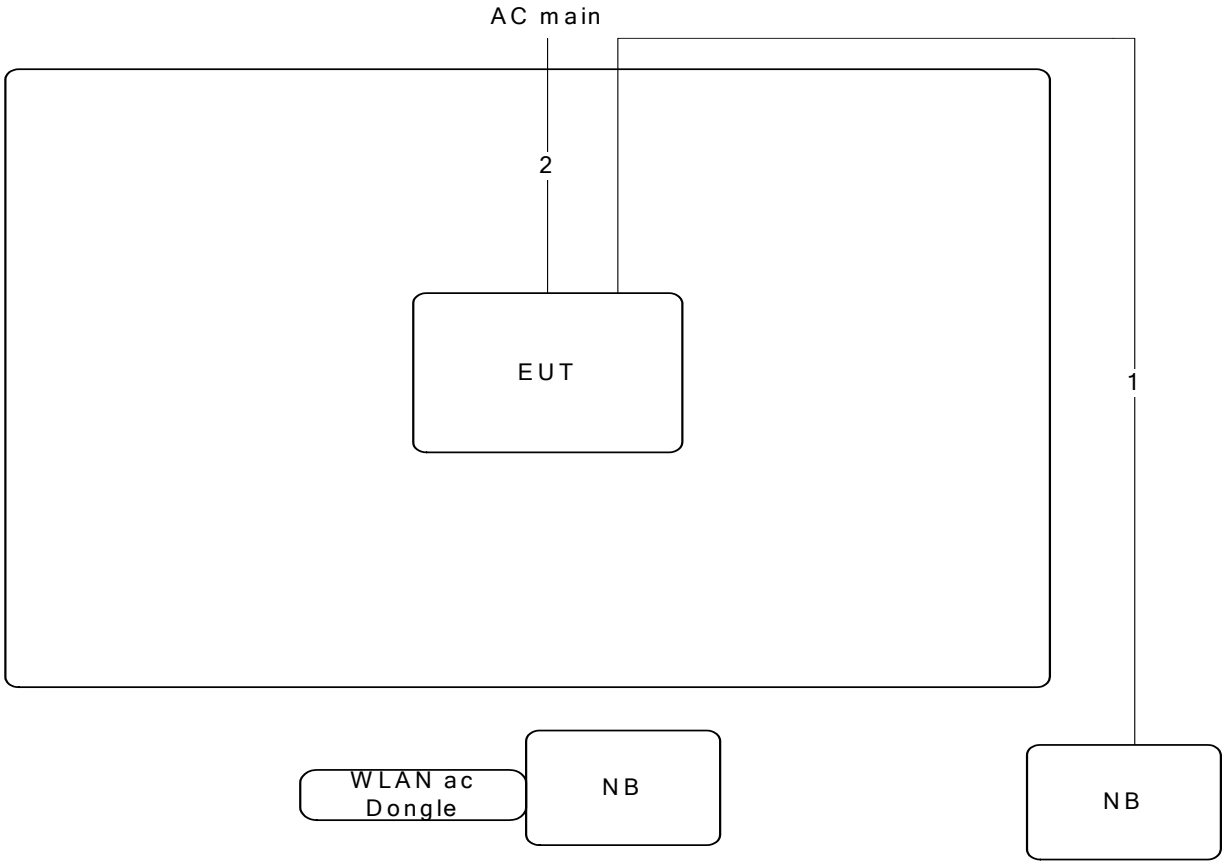
Test Configuration: above 1GHz



Item	Connection	Shielded	Length(m)
1	RJ-45 cable	No	10m
2	Power cable	No	2.2m

<For Beamforming Mode>

Test Configuration: above 1GHz



Item	Connection	Shielded	Length(m)
1	RJ-45 cable	No	10m
2	Power cable	No	2.2m

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

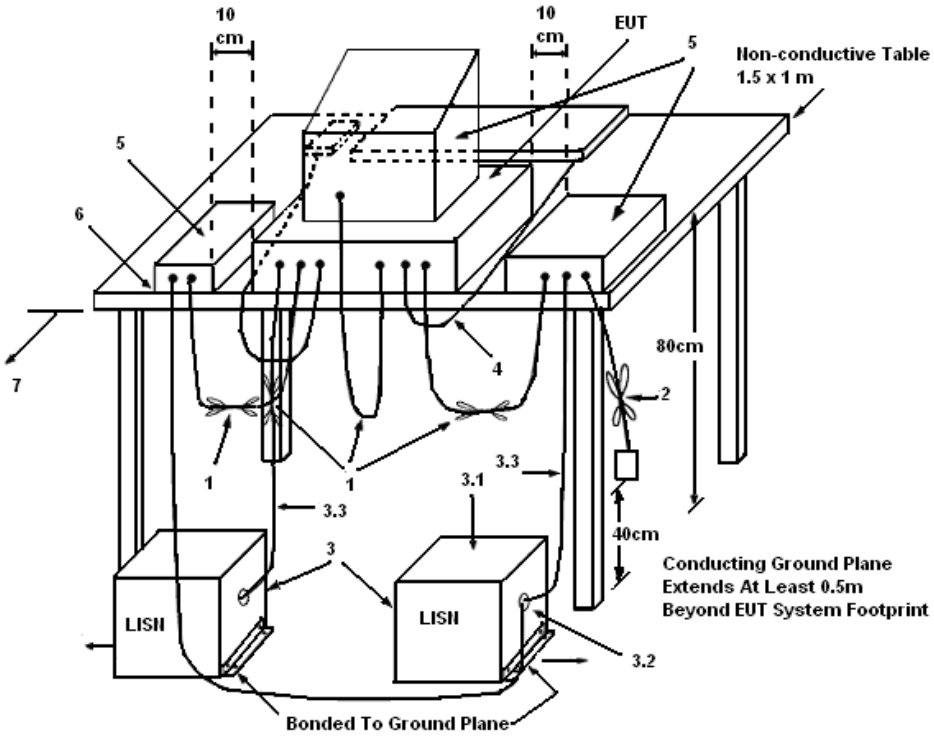
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

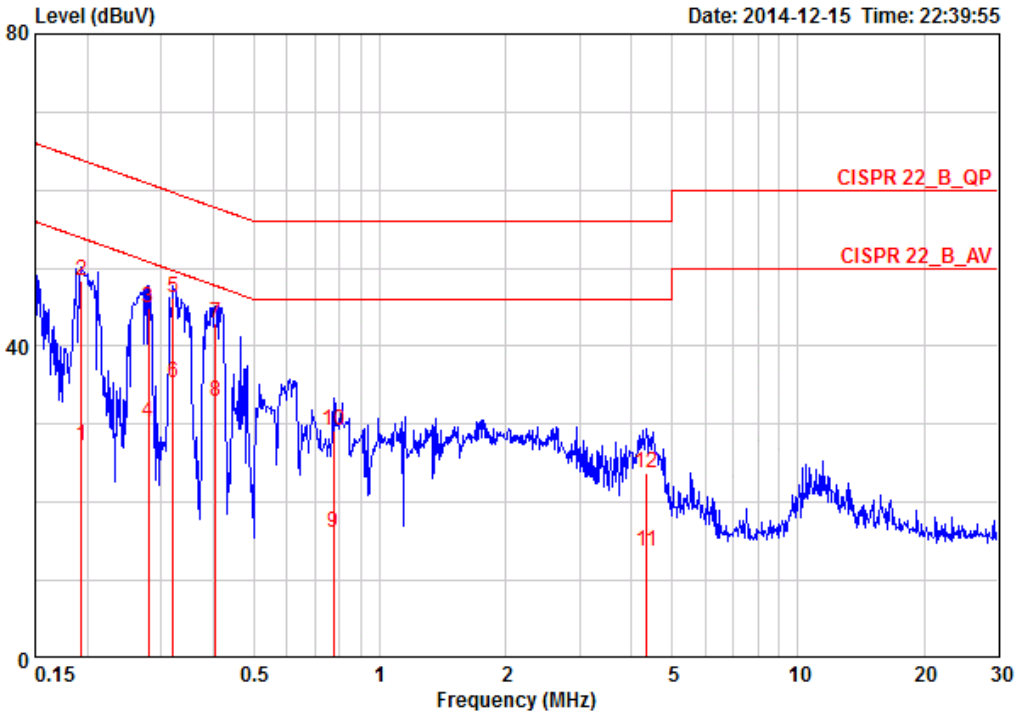
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

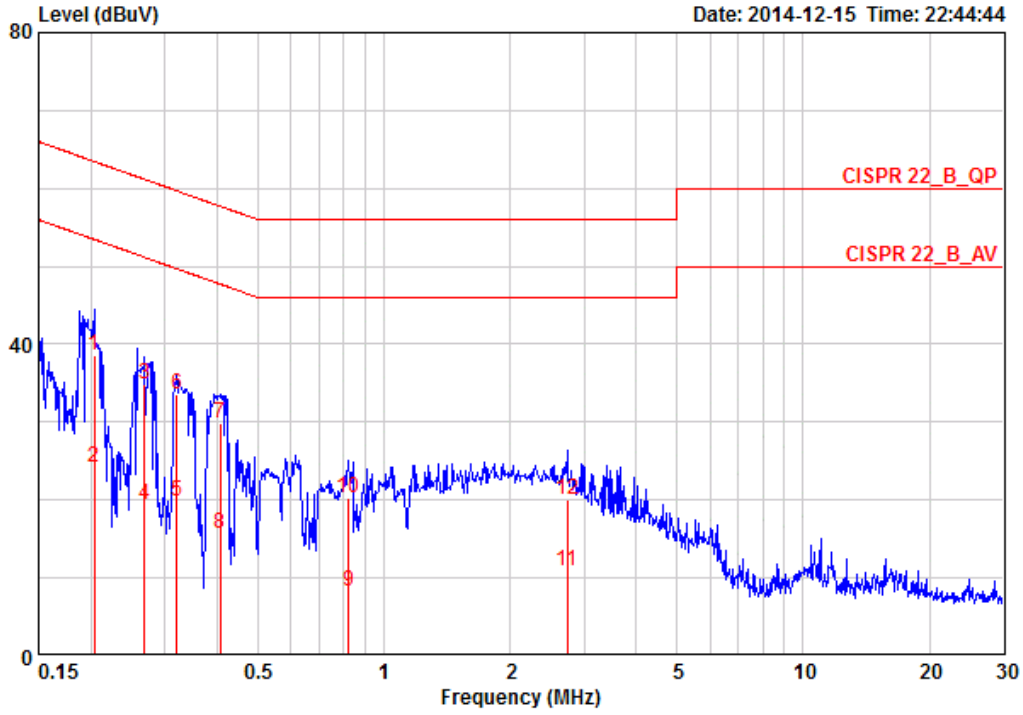
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	24°C	Humidity	58%
Test Engineer	Edison Lin	Phase	Line
Configuration	CTX	Test Mode	Mode 2



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.19344	27.30	-26.58	53.89	17.36	9.78	0.16	AVERAGE	LINE
2 @	0.19344	48.32	-15.56	63.89	38.38	9.78	0.16	QP	LINE
3 @	0.28029	44.95	-15.86	60.81	35.00	9.78	0.17	QP	LINE
4	0.28029	30.25	-20.56	50.81	20.30	9.78	0.17	AVERAGE	LINE
5 @	0.31999	46.15	-13.56	59.71	36.20	9.77	0.18	QP	LINE
6 @	0.31999	35.42	-14.29	49.71	25.47	9.77	0.18	AVERAGE	LINE
7 @	0.40400	42.93	-14.84	57.77	32.98	9.77	0.18	QP	LINE
8 @	0.40400	32.86	-14.91	47.77	22.91	9.77	0.18	AVERAGE	LINE
9	0.77519	16.15	-29.85	46.00	6.19	9.77	0.19	AVERAGE	LINE
10	0.77519	29.22	-26.78	56.00	19.26	9.77	0.19	QP	LINE
11	4.338	13.65	-32.35	46.00	3.64	9.70	0.31	AVERAGE	LINE
12	4.338	23.79	-32.21	56.00	13.78	9.70	0.31	QP	LINE

Temperature	24°C	Humidity	58%
Test Engineer	Edison Lin	Phase	Neutral
Configuration	CTX	Test Mode	Mode 2



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.20396	38.61	-24.84	63.45	38.44	0.00	0.17	QP	NEUTRAL
2	0.20396	24.28	-29.17	53.45	24.11	0.00	0.17	AVERAGE	NEUTRAL
3	0.26866	34.89	-26.27	61.16	34.72	0.00	0.17	QP	NEUTRAL
4	0.26866	19.45	-31.71	51.16	19.28	0.00	0.17	AVERAGE	NEUTRAL
5	0.31999	19.86	-29.85	49.71	19.68	0.00	0.18	AVERAGE	NEUTRAL
6	0.31999	33.68	-26.03	59.71	33.50	0.00	0.18	QP	NEUTRAL
7	0.40615	29.86	-27.87	57.73	29.68	0.00	0.18	QP	NEUTRAL
8	0.40615	15.67	-32.06	47.73	15.49	0.00	0.18	AVERAGE	NEUTRAL
9	0.82172	8.25	-37.75	46.00	8.05	0.00	0.20	AVERAGE	NEUTRAL
10	0.82172	20.18	-35.82	56.00	19.98	0.00	0.20	QP	NEUTRAL
11	2.736	10.89	-35.11	46.00	10.62	0.00	0.27	AVERAGE	NEUTRAL
12	2.736	20.01	-35.99	56.00	19.74	0.00	0.27	QP	NEUTRAL

Note:

Level = Read Level + LISN Factor + Cable Loss

4.2. 26dB Bandwidth and 99% Occupied Bandwidth Measurement

4.2.1. Limit

No restriction limits.

4.2.2. Measuring Instruments and Setting

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

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

4.2.3. Test Procedures

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

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

4.2.4. Test Setup Layout

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

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

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

<For Non-Beamforming Mode>

Temperature	26℃	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11ac

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3+Chain 5+Chain 6

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180 MHz	22.08	18.08
40	5200 MHz	25.60	18.40
48	5240 MHz	29.92	18.08

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3+Chain 5+Chain 6

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
38	5190 MHz	40.32	36.16
46	5230 MHz	59.84	36.80

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 3+Chain 5+Chain 6

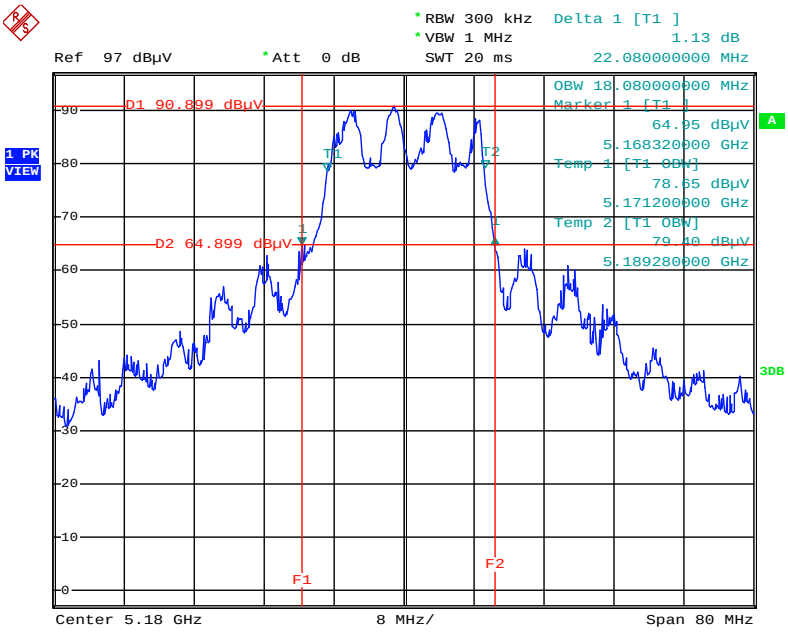
Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
42	5210 MHz	80.64	75.52

Temperature	26°C	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11a

Configuration IEEE 802.11a / Chain 3+Chain 5+Chain 6

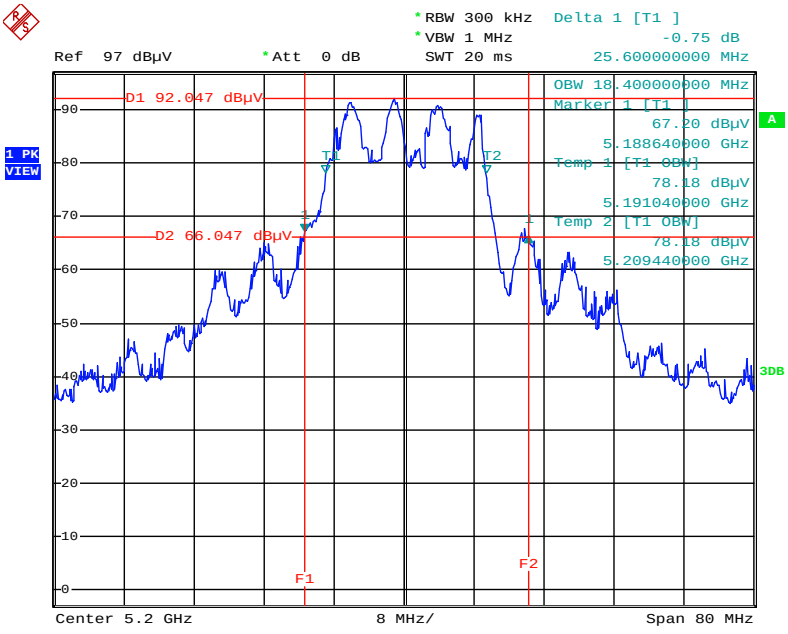
Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180 MHz	21.92	17.28
40	5200 MHz	29.92	17.44
48	5240 MHz	29.60	17.28

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3+Chain 5+Chain 6 / 5180 MHz



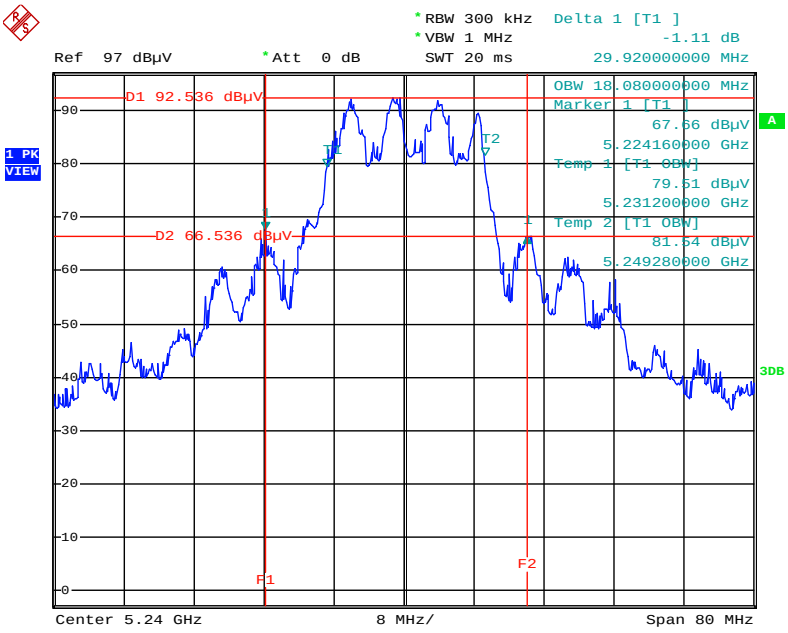
Date: 7.NOV.2014 19:14:50

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3+Chain 5+Chain 6 / 5200 MHz



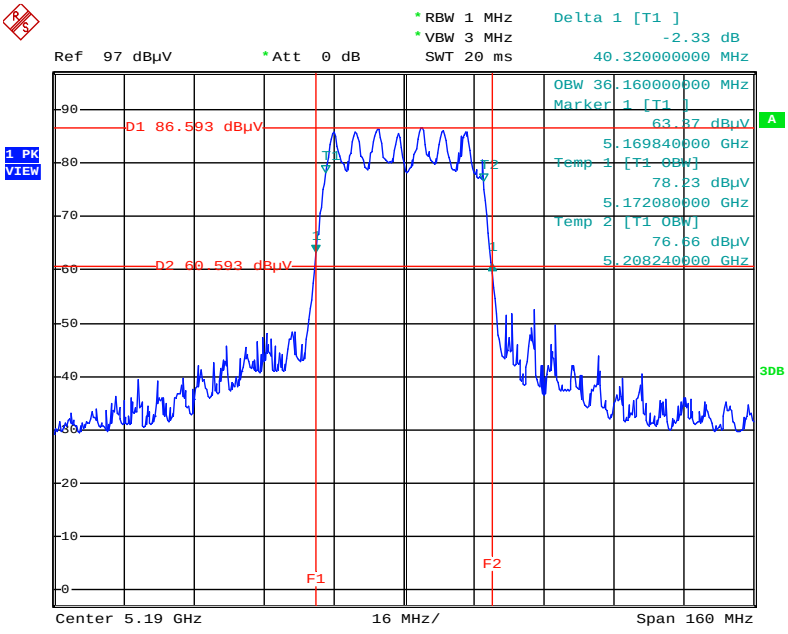
Date: 7.NOV.2014 19:16:33

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3+Chain 5+Chain 6 / 5240 MHz



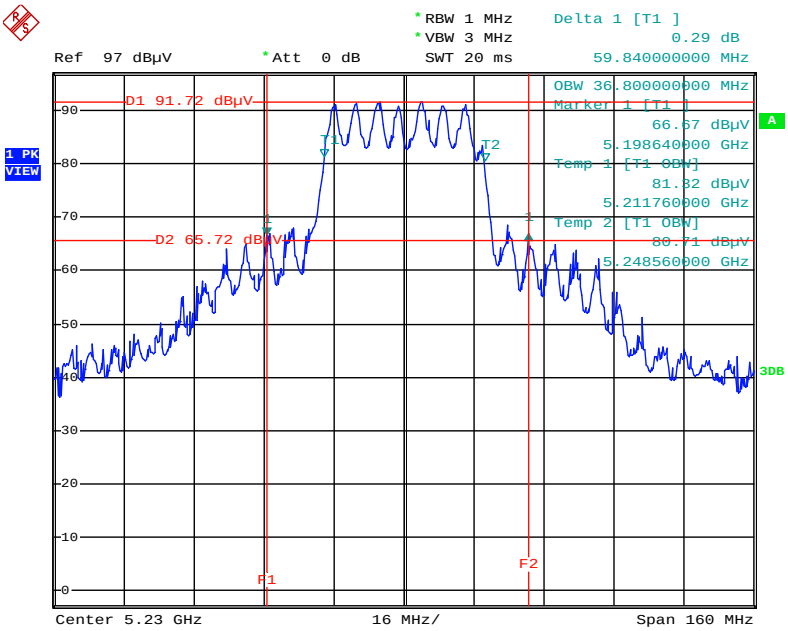
Date: 7.NOV.2014 19:17:32

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3+Chain 5+Chain 6 / 5190 MHz



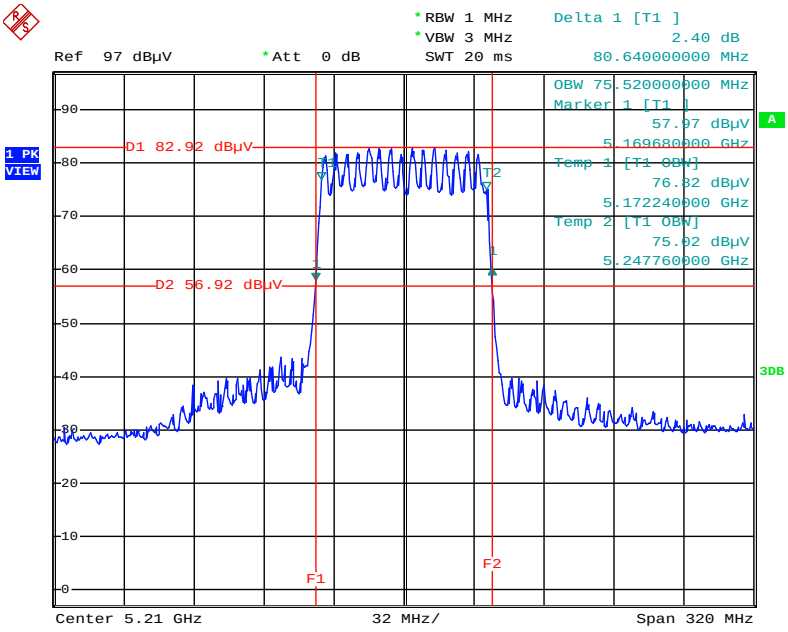
Date: 25.NOV.2014 02:18:08

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3+Chain 5+Chain 6 / 5230 MHz



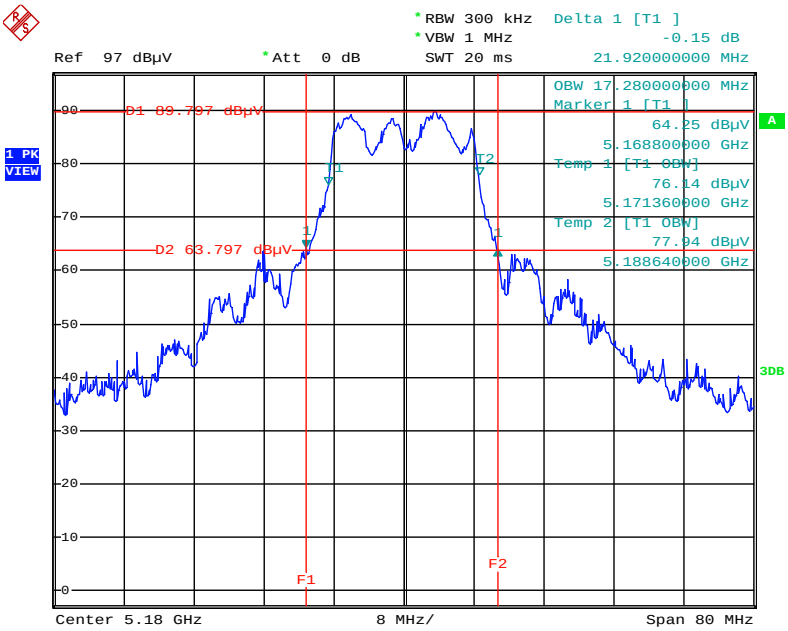
Date: 25.NOV.2014 02:20:48

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 3+Chain 5+Chain 6 / 5210 MHz



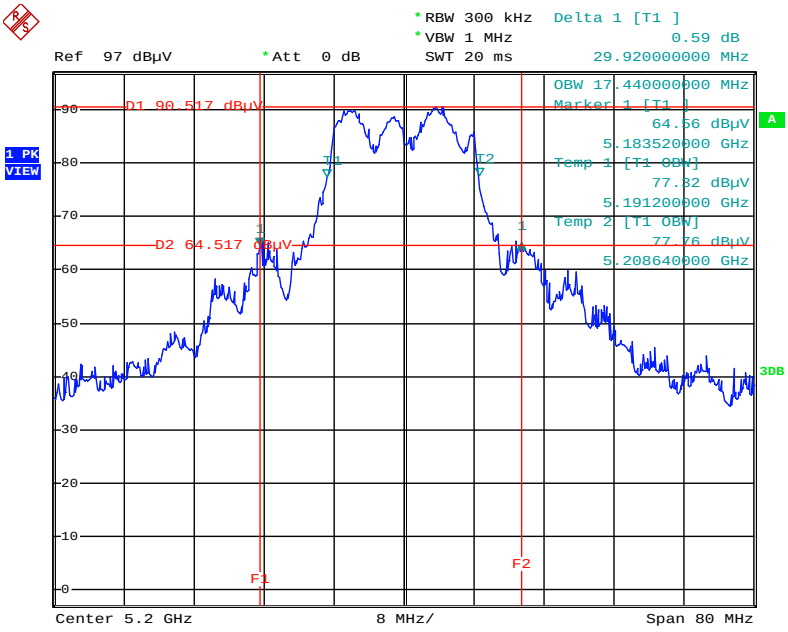
Date: 7.NOV.2014 19:35:01

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 3+Chain 5+Chain 6 / 5180 MHz



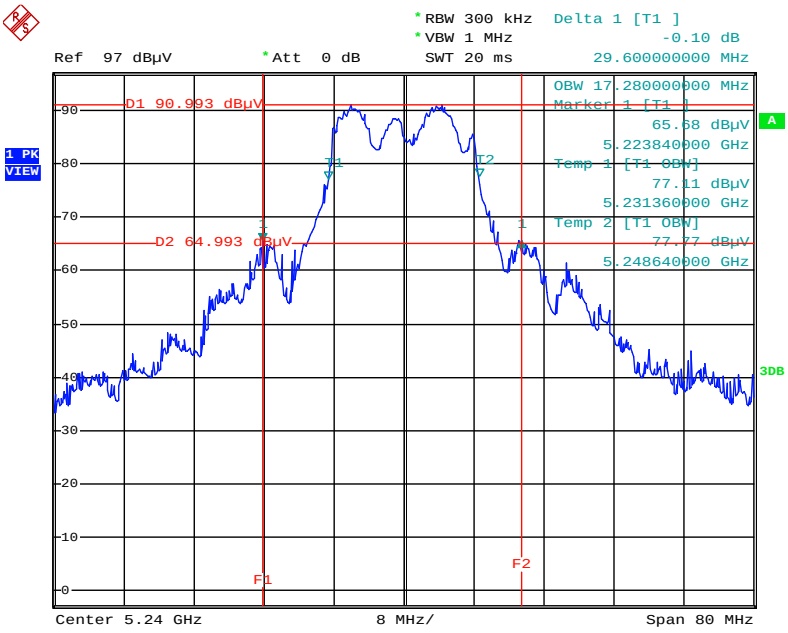
Date: 7.NOV.2014 19:12:07

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 3+Chain 5+Chain 6 / 5200 MHz



Date: 7.NOV.2014 19:06:24

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 3+Chain 5+Chain 6 / 5240 MHz



Date: 7.NOV.2014 19:09:07

<For Beamforming Mode>

Temperature	26°C	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11ac

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3+Chain 5+Chain 6

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180 MHz	20.80	18.08
40	5200 MHz	23.84	18.40
48	5240 MHz	20.80	18.08

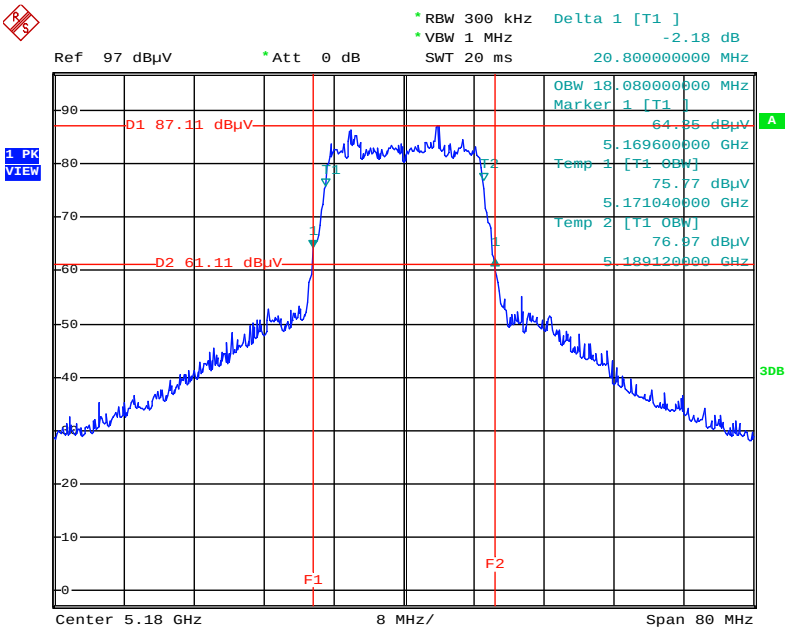
Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3+Chain 5+Chain 6

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
38	5190 MHz	40.96	37.12
46	5230 MHz	70.40	37.44

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 3+Chain 5+Chain 6

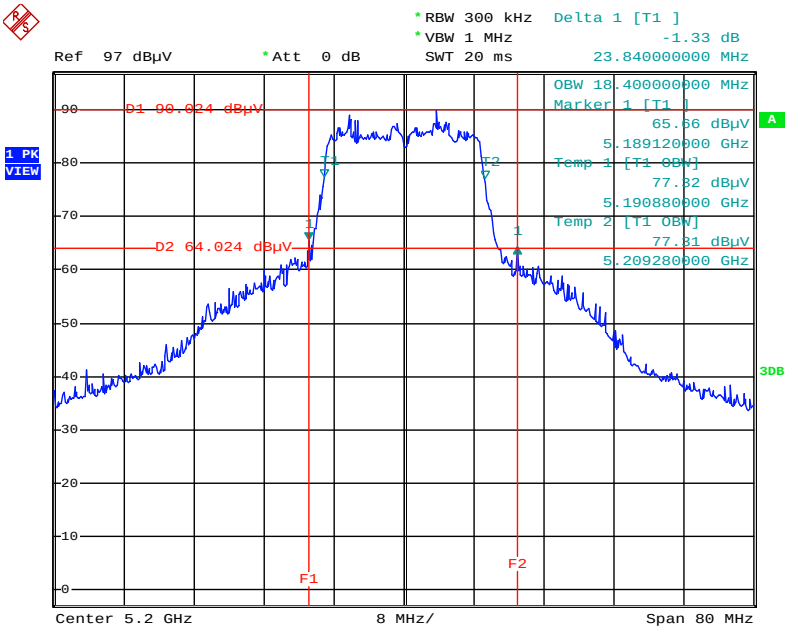
Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
42	5210 MHz	81.28	76.16

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3+Chain 5+Chain 6 / 5180 MHz



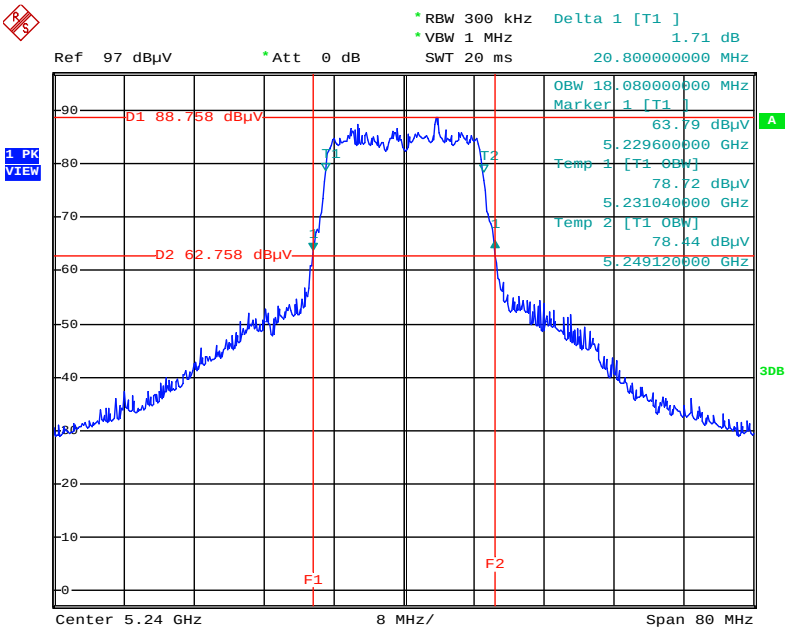
Date: 7.NOV.2014 20:03:20

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3+Chain 5+Chain 6 / 5200 MHz



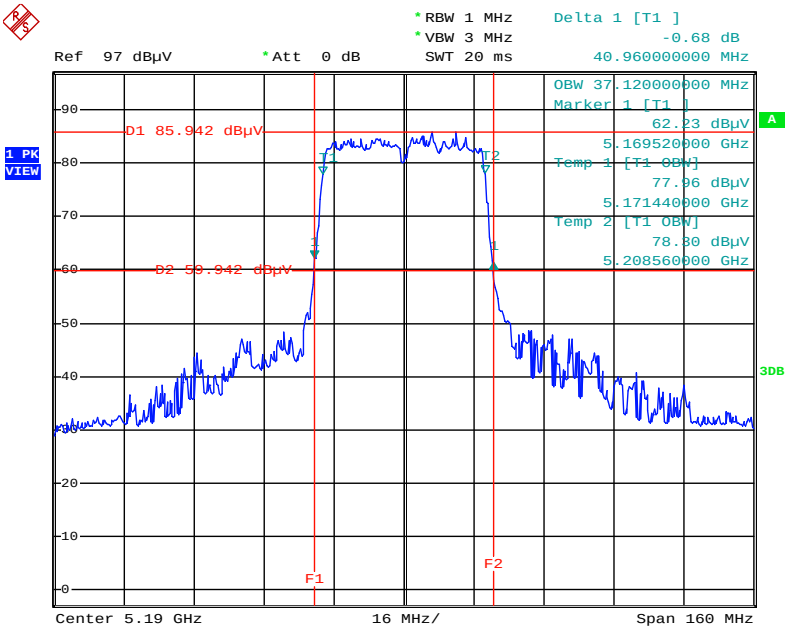
Date: 7.NOV.2014 20:04:59

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3+Chain 5+Chain 6 / 5240 MHz



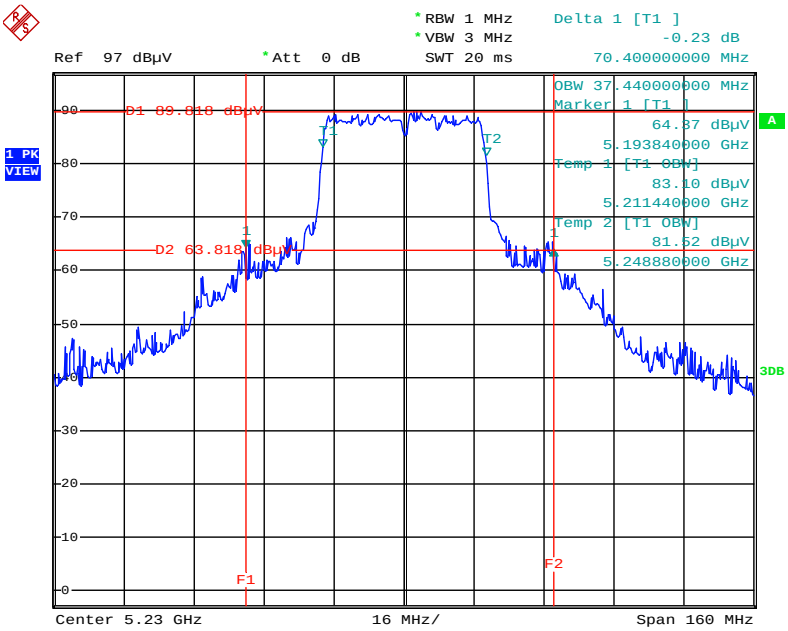
Date: 7.NOV.2014 20:06:08

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3+Chain 5+Chain 6 / 5190 MHz



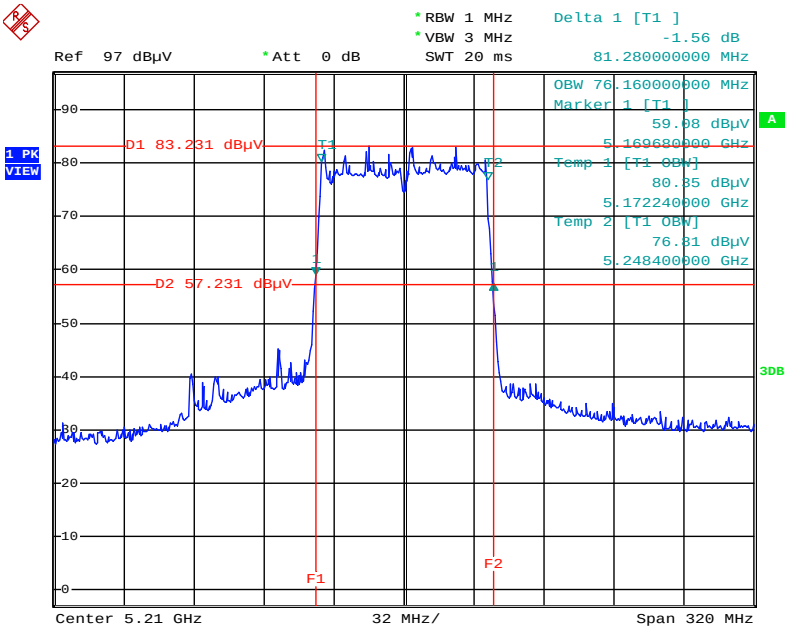
Date: 25.NOV.2014 02:12:03

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3+Chain 5+Chain 6 / 5230 MHz



Date: 25.NOV.2014 02:13:46

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 3+Chain 5+Chain 6 / 5210 MHz



Date: 7.NOV.2014 20:12:30

4.3. Maximum Conducted Output Power Measurement

4.3.1. 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.

4.3.2. Measuring Instruments and Setting

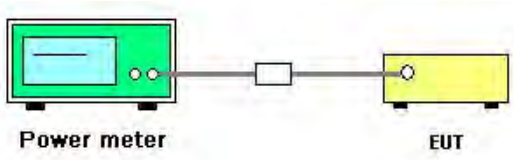
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

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

<For Non-Beamforming Mode>

Temperature	26°C	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11ac
Test Date	Dec. 07, 2014		

Configuration IEEE 802.11ac MCS0/Nss1 VHT20

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 3	Chain 5	Chain 6	Total		
36	5180 MHz	22.12	22.03	22.59	27.02	30.00	Complies
40	5200 MHz	23.32	22.81	23.32	27.93	30.00	Complies
48	5240 MHz	23.39	22.69	23.31	27.91	30.00	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT40

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 3	Chain 5	Chain 6	Total		
38	5190 MHz	18.32	18.28	18.49	23.14	30.00	Complies
46	5230 MHz	22.97	22.54	23.09	27.64	30.00	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT80

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 3	Chain 5	Chain 6	Total		
42	5210 MHz	15.81	15.51	16.11	20.59	30.00	Complies

Temperature	26°C	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11a
Test Date	Dec. 07, 2014		

Configuration IEEE 802.11a

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 3	Chain 5	Chain 6	Total		
36	5180 MHz	22.86	22.51	22.87	27.52	30.00	Complies
40	5200 MHz	23.58	22.98	23.48	28.13	30.00	Complies
48	5240 MHz	23.32	22.78	23.49	27.98	30.00	Complies

<For Beamforming Mode>

Temperature	26°C	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11ac
Test Date	Dec. 07, 2014		

Configuration IEEE 802.11ac MCS0/Nss1 VHT20

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 3	Chain 5	Chain 6	Total		
36	5180 MHz	20.88	20.78	21.01	25.66	27.86	Complies
40	5200 MHz	23.01	22.75	23.12	27.73	27.86	Complies
48	5240 MHz	20.95	20.81	21.18	25.75	27.86	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{i=1}^{N_{ANT}}\left\{\sum_{k=1}^{N_{SS}} g_{i,k}\right\}^2}{N_{ANT}}\right]$ =8.14dBi > 6dBi,So Band1 Limit =30-(8.14-6)=27.86dBm

Configuration IEEE 802.11ac MCS0/Nss1 VHT40

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 3	Chain 5	Chain 6	Total		
38	5190 MHz	18.32	18.28	18.49	23.14	27.86	Complies
46	5230 MHz	22.97	22.54	23.09	27.64	27.86	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{i=1}^{N_{ANT}}\left\{\sum_{k=1}^{N_{SS}} g_{i,k}\right\}^2}{N_{ANT}}\right]$ =8.14dBi > 6dBi,So Band1 Limit =30-(8.14-6)=27.86dBm

Configuration IEEE 802.11ac MCS0/Nss1 VHT80

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 3	Chain 5	Chain 6	Total		
42	5210 MHz	16.01	15.82	16.25	20.80	27.86	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{i=1}^{N_{ANT}}\left\{\sum_{k=1}^{N_{SS}} g_{i,k}\right\}^2}{N_{ANT}}\right]$ =8.14dBi > 6dBi,So Band1 Limit =30-(8.14-6)=27.86dBm

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
5.15~5.25 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

4.4.2. Measuring Instruments and Setting

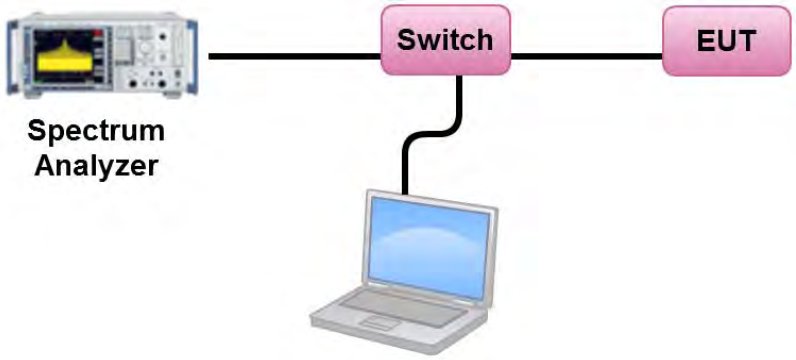
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

<For Non-Beamforming Mode>

Temperature	26°C	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11ac
Test Date	Dec. 07, 2014		

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3+Chain 5+Chain 6

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	13.91	14.86	Complies
40	5200 MHz	14.29	14.86	Complies
48	5240 MHz	14.47	14.86	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.14dBi > 6dBi,So Band1 Limit =17-(8.14-6)=14.86Bm/MHz

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3+Chain 5+Chain 6

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	6.41	14.86	Complies
46	5230 MHz	11.28	14.86	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.14dBi > 6dBi,So Band1 Limit =17-(8.14-6)=14.86Bm/MHz

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 3+Chain 5+Chain 6

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
42	5210 MHz	0.95	14.86	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.14dBi > 6dBi,So Band1 Limit =17-(8.14-6)=14.86Bm/MHz

Temperature	26°C	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11a
Test Date	Dec. 07, 2014		

Configuration IEEE 802.11a / Chain 3+Chain 5+Chain 6

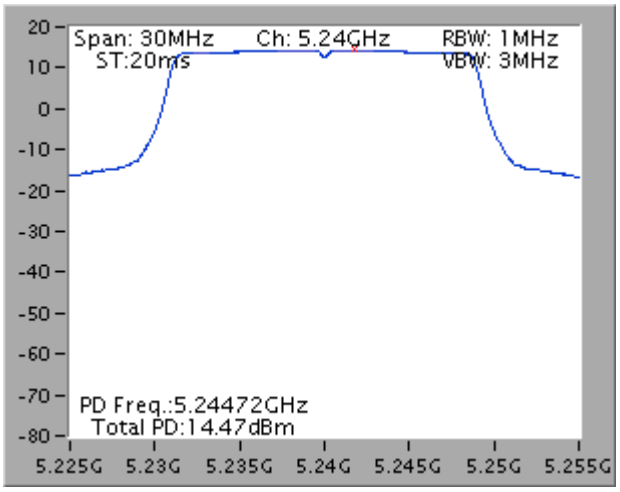
Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	14.28	14.86	Complies
40	5200 MHz	14.79	14.86	Complies
48	5240 MHz	14.34	14.86	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{ANT}}\left\{\sum_{k=1}^{N_{SS}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.14dBi > 6dBi,So Band1 Limit =17-(8.14-6)=14.86Bm/MHz

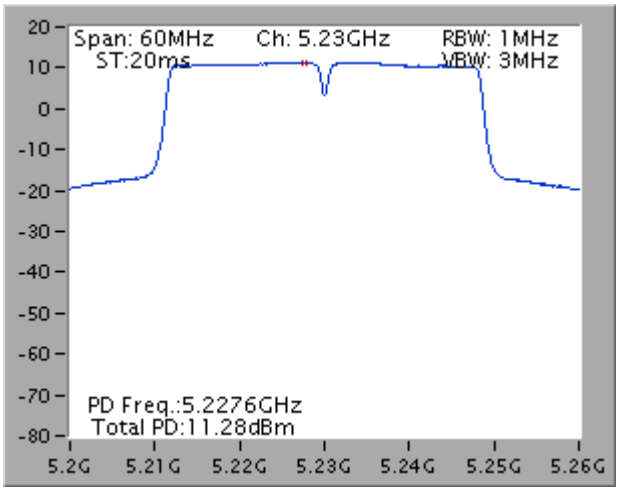
Note: All the test values were listed in the report.

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

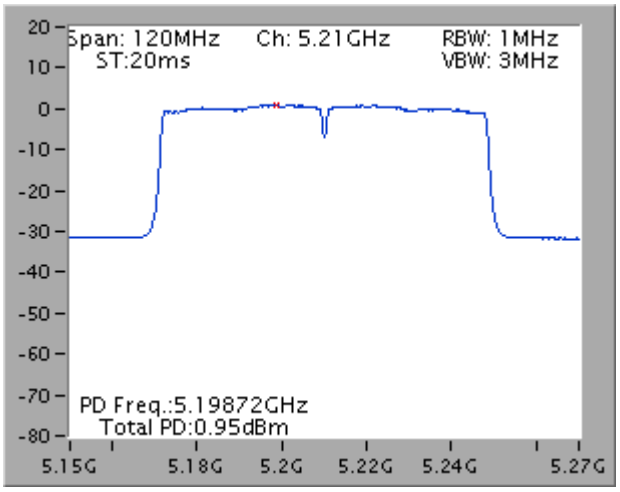
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3+Chain 5+Chain 6 / 5240 MHz



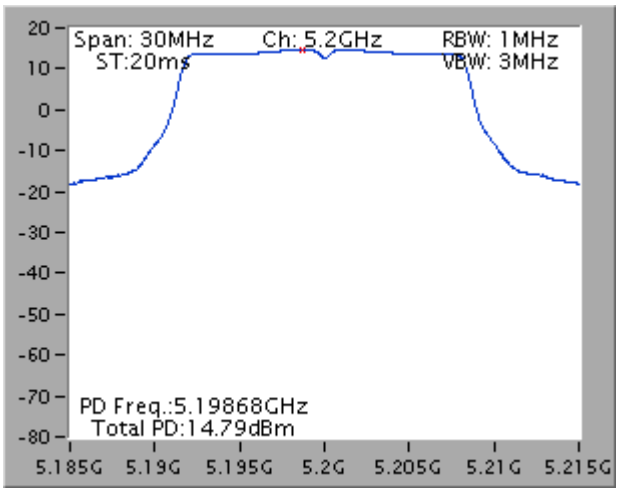
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3+Chain 5+Chain 6 / 5230 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 3+Chain 5+Chain 6 / 5210 MHz



Power Density Plot on Configuration IEEE 802.11a / Chain 3+Chain 5+Chain 6 / 5200 MHz



<For Beamforming Mode>

Temperature	26°C	Humidity	63%
Test Engineer	Wen Chao	Configurations	IEEE 802.11ac
Test Date	Dec. 07, 2014		

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3+Chain 5+Chain 6

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	11.86	14.86	Complies
40	5200 MHz	14.18	14.86	Complies
48	5240 MHz	12.44	14.86	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{i=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{MSQ}} g_{i,k}\right\}^2}{N_{ANT}}\right]$ =8.14dBi > 6dBi,So Band1 Limit =17-(8.14-6)=14.86Bm/MHz

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3+Chain 5+Chain 6

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	6.41	14.86	Complies
46	5230 MHz	11.14	14.86	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{i=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{MSQ}} g_{i,k}\right\}^2}{N_{ANT}}\right]$ =8.14dBi > 6dBi,So Band1 Limit =17-(8.14-6)=14.86Bm/MHz

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 3+Chain 5+Chain 6

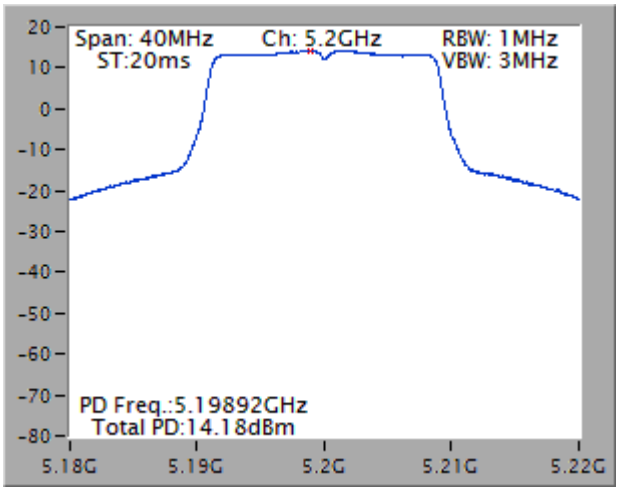
Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
42	5210 MHz	0.60	14.86	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{i=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{MSQ}} g_{i,k}\right\}^2}{N_{ANT}}\right]$ =8.14dBi > 6dBi,So Band1 Limit =17-(8.14-6)=14.86Bm/MHz

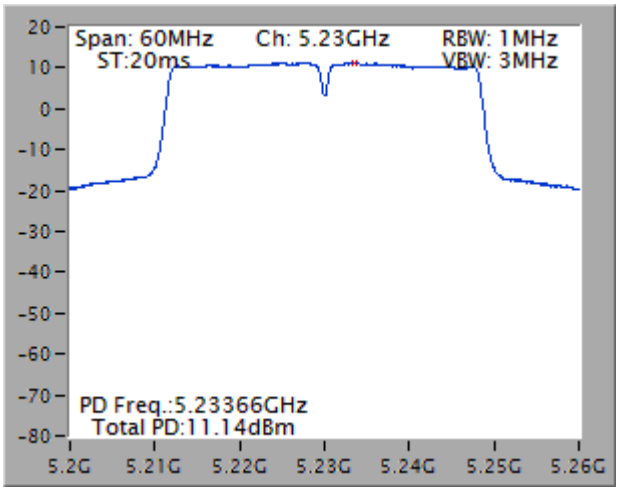
Note: All the test values were listed in the report.

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

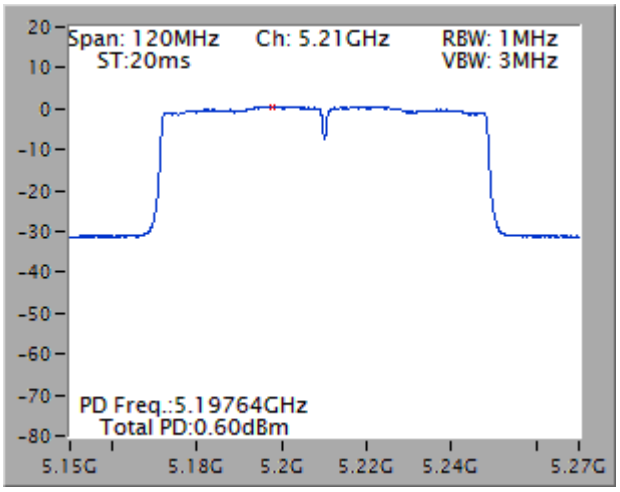
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 3+Chain 5+Chain 6 / 5200 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 3+Chain 5+Chain 6 / 5230 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 3+Chain 5+Chain 6 / 5210 MHz



4.5. Radiated Emissions Measurement

4.5.1. 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.

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

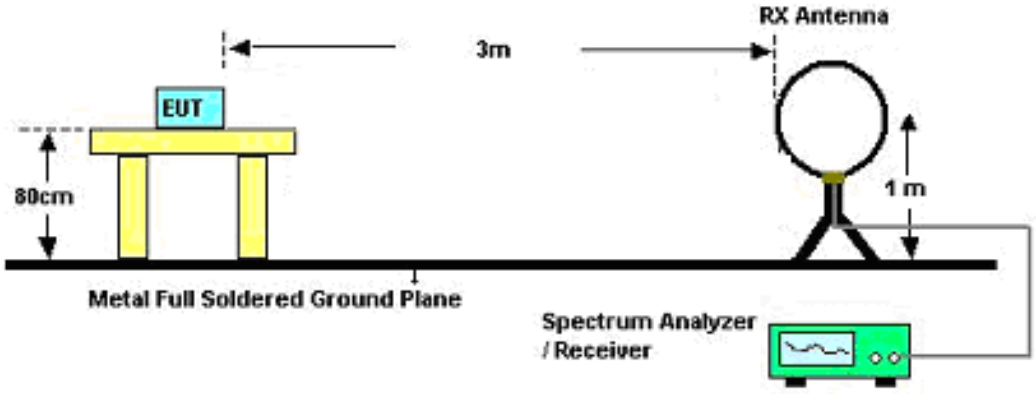
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.5.3. Test Procedures

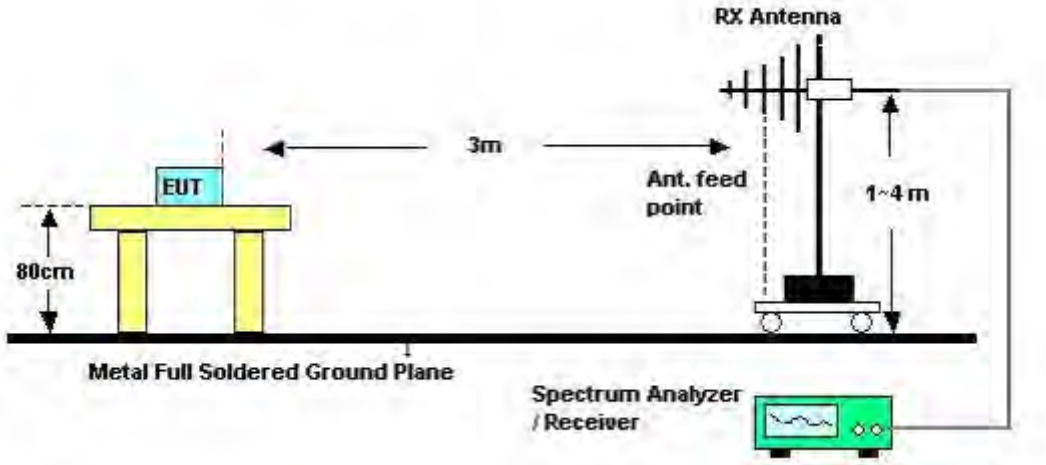
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting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

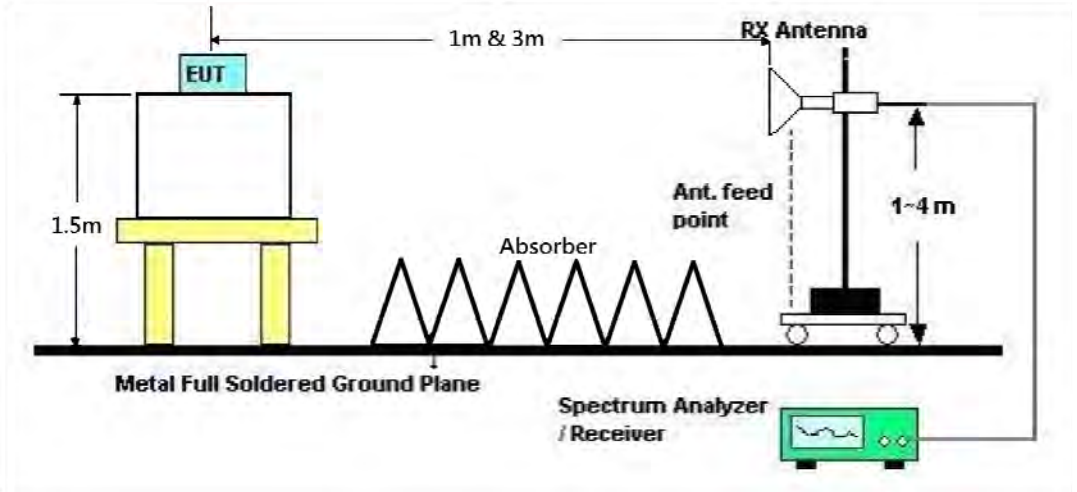
For Radiated Emissions: 9kHz ~30MHz



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

For Non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

The EUT was programmed to be in beamforming transmitting mode.

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

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Hang	Configurations	CTX
Test Date	Dec. 16, 2014	Test Mode	Mode 3

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

Note:

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

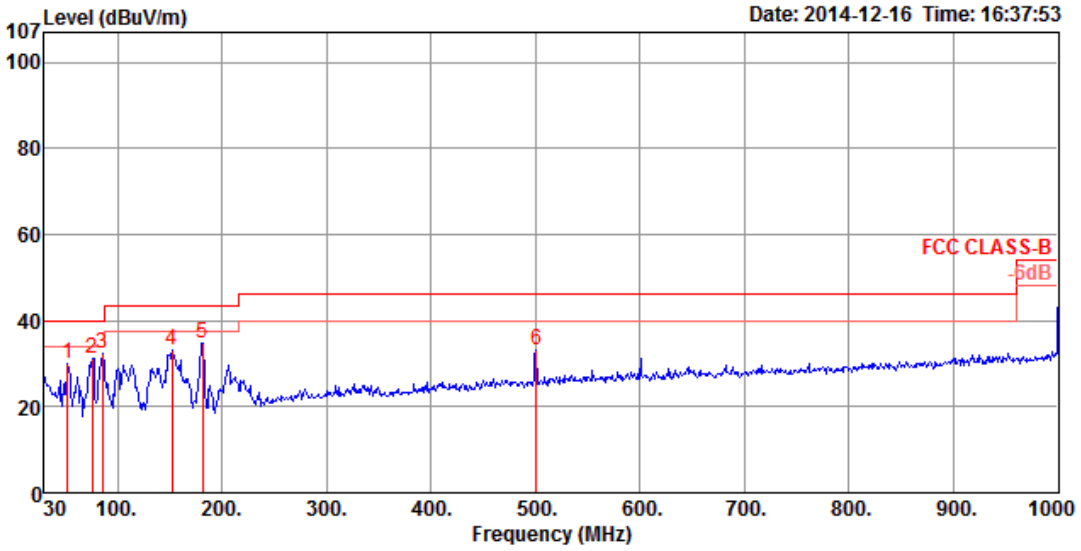
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

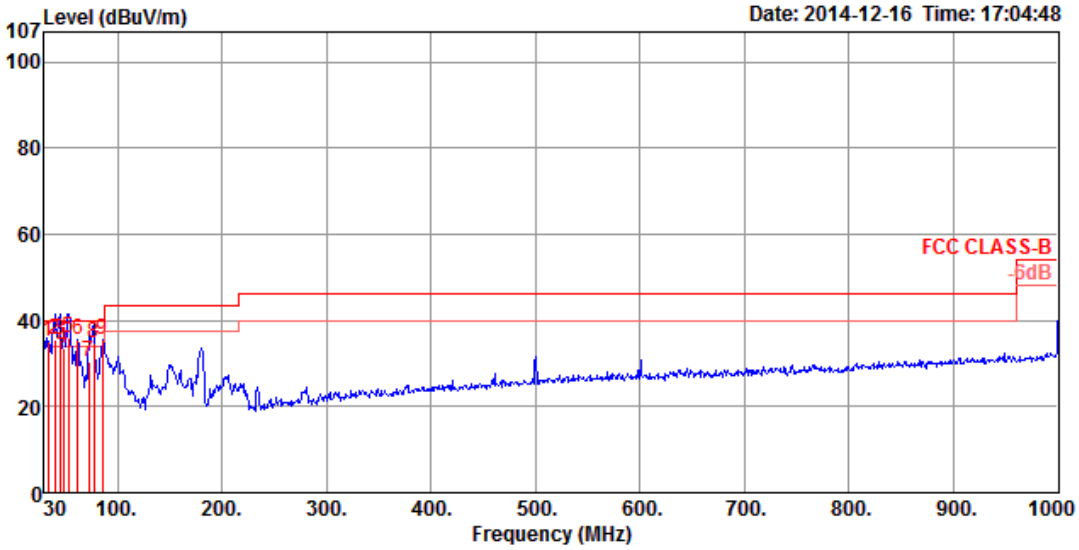
Temperature	26°C	Humidity	68%
Test Engineer	Lucas Hang	Configurations	CTX
Test Mode	Mode 3		

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	52.31	29.83	40.00	-10.17	53.38	0.51	32.52	8.46	HORIZONTAL	273	400	Peak
2	75.59	31.39	40.00	-8.61	55.87	0.63	32.37	7.26	HORIZONTAL	289	400	Peak
3	85.29	32.35	40.00	-7.65	55.66	0.66	32.44	8.47	HORIZONTAL	277	400	Peak
4	152.22	33.00	43.50	-10.50	53.38	0.88	32.35	11.09	HORIZONTAL	288	200	Peak
5	181.32	34.83	43.50	-8.67	56.57	0.97	32.30	9.59	HORIZONTAL	288	200	Peak
6	500.45	33.17	46.00	-12.83	46.17	1.60	32.41	17.81	HORIZONTAL	156	100	Peak

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Preamp Factor	Antenna Factor	Pol/Phase	T/Pos	A/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB	dB/m		deg	cm	
1	33.88	35.07	40.00	-4.93	49.46	0.42	32.41	17.60	VERTICAL	154	100	Peak
2	39.70	35.51	40.00	-4.49	53.46	0.44	32.49	14.10	VERTICAL	1	100	QP
3	44.55	35.37	40.00	-4.63	56.12	0.48	32.43	11.20	VERTICAL	318	100	QP
4	48.43	33.56	40.00	-6.44	55.84	0.49	32.50	9.73	VERTICAL	313	100	QP
5	53.28	35.90	40.00	-4.10	59.55	0.52	32.51	8.34	VERTICAL	318	100	QP
6	62.01	35.37	40.00	-4.63	60.51	0.57	32.51	6.80	VERTICAL	360	125	Peak
7	72.68	30.44	40.00	-9.56	55.24	0.62	32.44	7.02	VERTICAL	182	200	QP
8	77.53	34.62	40.00	-5.38	58.96	0.64	32.36	7.38	VERTICAL	222	100	QP
9	85.29	35.72	40.00	-4.28	59.10	0.66	32.44	8.40	VERTICAL	175	125	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)

<For Non-Beamforming Mode>

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36 / Chain 3+Chain 5+Chain 6
Test Date	Oct. 26, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10358.02	42.79	54.00	-11.21	29.82	8.54	39.75	35.32	Average	170	169	HORIZONTAL
2	10361.40	55.94	74.00	-18.06	42.97	8.54	39.75	35.32	Peak	170	169	HORIZONTAL
3	15539.41	44.27	54.00	-9.73	30.97	10.77	38.12	35.59	Average	168	271	HORIZONTAL
4	15541.62	57.41	74.00	-16.59	44.11	10.77	38.12	35.59	Peak	168	271	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10358.60	56.03	74.00	-17.97	43.06	8.54	39.75	35.32	Peak	158	124	VERTICAL
2	10358.78	42.91	54.00	-11.09	29.94	8.54	39.75	35.32	Average	158	124	VERTICAL
3	15538.71	45.27	54.00	-8.73	31.97	10.77	38.12	35.59	Average	168	109	VERTICAL
4	15541.87	58.08	74.00	-15.92	44.78	10.77	38.12	35.59	Peak	168	109	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 40 / Chain 3+Chain 5+Chain 6
Test Date	Oct. 26, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10398.05	42.68	54.00	-11.32	29.60	8.55	39.81	35.28	Average	167	236	HORIZONTAL
2	10401.80	57.03	74.00	-16.97	43.95	8.55	39.81	35.28	Peak	167	236	HORIZONTAL
3	15600.01	45.04	54.00	-8.96	31.80	10.78	38.04	35.58	Average	170	199	HORIZONTAL
4	15602.39	56.96	74.00	-17.04	43.72	10.78	38.04	35.58	Peak	170	199	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10401.01	43.56	54.00	-10.44	30.48	8.55	39.81	35.28	Average	157	164	VERTICAL
2	10401.64	56.84	74.00	-17.16	43.76	8.55	39.81	35.28	Peak	157	164	VERTICAL
3	15598.25	44.02	54.00	-9.98	30.78	10.78	38.04	35.58	Average	170	125	VERTICAL
4	15599.47	57.10	74.00	-16.90	43.86	10.78	38.04	35.58	Peak	170	125	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 48 / Chain 3+Chain 5+Chain 6
Test Date	Oct. 26, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	15731.29	42.65	54.00	-11.35	31.41	7.63	38.51	34.90	Average	13	100	HORIZONTAL
2	15735.99	55.59	74.00	-18.41	44.35	7.63	38.51	34.90	Peak	13	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	15727.31	42.53	54.00	-11.47	31.29	7.62	38.52	34.90	Average	333	100	VERTICAL
2	15738.16	56.04	74.00	-17.96	44.80	7.63	38.51	34.90	Peak	333	100	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38 / Chain 3+Chain 5+Chain 6
Test Date	Oct. 26, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	15575.93	43.96	54.00	-10.04	32.23	7.86	38.64	34.77	Average	180	154	HORIZONTAL
2	15576.97	56.48	74.00	-17.52	44.75	7.86	38.64	34.77	Peak	180	154	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	15567.63	45.95	54.00	-8.05	34.19	7.86	38.64	34.74	Average	209	8995	VERTICAL
2	15577.35	58.87	74.00	-15.13	47.14	7.86	38.64	34.77	Peak	209	154	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 46 / Chain 3+Chain 5+Chain 6
Test Date	Oct. 26, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	15671.77	55.02	74.00	-18.98	43.69	7.60	38.56	34.83	Peak	43	100	HORIZONTAL
2	15713.52	42.59	54.00	-11.41	31.33	7.62	38.52	34.88	Average	43	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10463.96	43.05	54.00	-10.95	29.79	8.56	39.94	35.24	Average	176	205	VERTICAL
2	10465.24	55.60	74.00	-18.40	42.34	8.56	39.94	35.24	Peak	176	205	VERTICAL
3	15687.65	57.31	74.00	-16.69	44.17	10.79	37.91	35.56	Peak	169	125	VERTICAL
4	15691.29	44.93	54.00	-9.07	31.82	10.79	37.88	35.56	Average	169	125	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42 / Chain 3+Chain 5+Chain 6
Test Date	Oct. 26, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	15607.35	55.44	74.00	-18.56	44.03	7.58	38.62	34.79	Peak	65	100	HORIZONTAL
2	15608.15	42.73	54.00	-11.27	31.32	7.58	38.62	34.79	Average	65	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	15607.13	42.58	54.00	-11.42	31.17	7.58	38.62	34.79	Average	263	100	VERTICAL
2	15610.83	55.37	74.00	-18.63	43.96	7.58	38.62	34.79	Peak	263	100	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.

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11a CH 36 / Chain 3+Chain 5+Chain 6
Test Date	Oct. 26, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10358.51	42.86	54.00	-11.14	29.89	8.54	39.75	35.32	Average	186	196	HORIZONTAL
2	10359.23	56.06	74.00	-17.94	43.09	8.54	39.75	35.32	Peak	186	196	HORIZONTAL
3	15538.65	44.31	54.00	-9.69	31.01	10.77	38.12	35.59	Average	159	315	HORIZONTAL
4	15540.33	57.11	74.00	-16.89	43.81	10.77	38.12	35.59	Peak	159	315	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10359.75	55.67	74.00	-18.33	42.70	8.54	39.75	35.32	Peak	156	256	VERTICAL
2	10361.71	43.45	54.00	-10.55	30.48	8.54	39.75	35.32	Average	156	256	VERTICAL
3	15541.02	45.30	54.00	-8.70	32.00	10.77	38.12	35.59	Average	143	176	VERTICAL
4	15541.43	57.69	74.00	-16.31	44.39	10.77	38.12	35.59	Peak	143	176	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11a CH 40 / Chain 3+Chain 5+Chain 6
Test Date	Oct. 26, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10399.10	42.80	54.00	-11.20	29.72	8.55	39.81	35.28	Average	171	169	HORIZONTAL
2	10399.36	56.16	74.00	-17.84	43.08	8.55	39.81	35.28	Peak	171	169	HORIZONTAL
3	15598.32	57.64	74.00	-16.36	44.40	10.78	38.04	35.58	Peak	164	204	HORIZONTAL
4	15598.45	44.12	54.00	-9.88	30.88	10.78	38.04	35.58	Average	164	204	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10399.93	43.44	54.00	-10.56	30.36	8.55	39.81	35.28	Average	176	86	VERTICAL
2	10401.13	56.24	74.00	-17.76	43.16	8.55	39.81	35.28	Peak	176	86	VERTICAL
3	15598.31	44.17	54.00	-9.83	30.93	10.78	38.04	35.58	Average	169	166	VERTICAL
4	15599.75	57.60	74.00	-16.40	44.36	10.78	38.04	35.58	Peak	169	166	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11a CH 48 / Chain 3+Chain 5+Chain 6
Test Date	Oct. 26, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	15729.84	55.39	74.00	-18.61	44.15	7.62	38.52	34.90	Peak	11	100	HORIZONTAL
2	15734.33	42.61	54.00	-11.39	31.37	7.63	38.51	34.90	Average	11	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	15706.54	55.47	74.00	-18.53	44.20	7.62	38.53	34.88	Peak	346	100	VERTICAL
2	15727.09	42.67	54.00	-11.33	31.43	7.62	38.52	34.90	Average	346	100	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.

<For Beamforming Mode>

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36 / Chain 3+Chain 5+Chain 6
Test Date	Oct. 26, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15541.36	42.98	54.00	-11.02	29.68	10.77	38.12	35.59	Average	156	58	HORIZONTAL
2	15547.00	56.01	74.00	-17.99	42.70	10.78	38.12	35.59	Peak	156	58	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15533.81	43.11	54.00	-10.89	29.78	10.77	38.15	35.59	Average	178	260	VERTICAL
2	15543.01	55.72	74.00	-18.28	42.42	10.77	38.12	35.59	Peak	178	260	VERTICAL

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 40 / Chain 3+Chain 5+Chain 6
Test Date	Oct. 26, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15593.46	43.05	54.00	-10.95	29.81	10.78	38.04	35.58	Average	164	143	HORIZONTAL
2	15599.88	56.58	74.00	-17.42	43.34	10.78	38.04	35.58	Peak	164	143	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15606.11	43.17	54.00	-10.83	29.96	10.78	38.01	35.58	Average	158	323	VERTICAL
2	15608.02	56.69	74.00	-17.31	43.47	10.78	38.01	35.57	Peak	158	323	VERTICAL

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 48 / Chain 3+Chain 5+Chain 6
Test Date	Oct. 26, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15711.29	43.06	54.00	-10.94	29.98	10.79	37.85	35.56	Average	158	147	HORIZONTAL
2	15724.92	55.73	74.00	-18.27	42.65	10.79	37.85	35.56	Peak	158	147	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15710.88	43.77	54.00	-10.23	30.69	10.79	37.85	35.56	Average	179	302	VERTICAL
2	15711.29	56.07	74.00	-17.93	42.99	10.79	37.85	35.56	Peak	179	302	VERTICAL

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38 / Chain 3+Chain 5+Chain 6
Test Date	Oct. 26, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15553.04	43.07	54.00	-10.93	29.76	10.78	38.12	35.59	Average	172	24	HORIZONTAL
2	15563.46	55.68	74.00	-18.32	42.39	10.78	38.09	35.58	Peak	172	24	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15577.18	42.97	54.00	-11.03	29.70	10.78	38.07	35.58	Average	166	279	VERTICAL
2	15578.97	56.05	74.00	-17.95	42.78	10.78	38.07	35.58	Peak	166	279	VERTICAL

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 46 / Chain 3+Chain 5+Chain 6
Test Date	Oct. 26, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15677.41	43.30	54.00	-10.70	30.16	10.79	37.91	35.56	Average	166	43	HORIZONTAL
2	15710.84	56.52	74.00	-17.48	43.44	10.79	37.85	35.56	Peak	166	43	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15677.26	55.90	74.00	-18.10	42.76	10.79	37.91	35.56	Peak	162	347	VERTICAL
2	15682.33	43.17	54.00	-10.83	30.03	10.79	37.91	35.56	Average	162	347	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42 / Chain 3+Chain 5+Chain 6
Test Date	Oct. 26, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15637.89	56.30	74.00	-17.70	43.10	10.78	37.99	35.57	Peak	180	33	HORIZONTAL
2	15653.52	43.18	54.00	-10.82	30.00	10.79	37.96	35.57	Average	180	33	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	15609.74	55.94	74.00	-18.06	42.72	10.78	38.01	35.57	Peak	160	327	VERTICAL
2	15650.33	43.33	54.00	-10.67	30.15	10.79	37.96	35.57	Average	101	327	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 5.15-5.25 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.

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

1. 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

For Non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

The EUT was programmed to be in beamforming transmitting mode.

4.6.7. Test Result of Band Edge and Fundamental Emissions

<For Non-Beamforming Mode>

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36, 40, 48 / Chain 3+Chain 5+Chain 6
Test Date	Oct. 26, 2014		

Channel 36

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5150.00	52.89	54.00	-1.11	47.95	6.13	34.01	35.20	Average	200	196	VERTICAL
2	5150.00	70.26	74.00	-3.74	65.32	6.13	34.01	35.20	Peak	200	196	VERTICAL
3	5177.97	113.06			108.03	6.15	34.08	35.20	Peak	200	196	VERTICAL
4	5178.84	101.54			96.51	6.15	34.08	35.20	Average	200	196	VERTICAL

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

Channel 40

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5128.29	52.95	54.00	-1.05	48.05	6.12	33.98	35.20	Average	160	201	VERTICAL
2	5149.57	67.00	74.00	-7.00	62.06	6.13	34.01	35.20	Peak	160	201	VERTICAL
3	5198.26	109.82			104.75	6.16	34.11	35.20	Average	160	201	VERTICAL
4	5203.47	120.58			115.51	6.16	34.11	35.20	Peak	160	201	VERTICAL

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

Channel 48

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5141.75	47.66	54.00	-6.34	42.75	6.13	33.98	35.20	Average	165	208	VERTICAL
2	5143.49	61.54	74.00	-12.46	56.60	6.13	34.01	35.20	Peak	165	208	VERTICAL
3	5241.30	111.72			106.56	6.18	34.18	35.20	Average	165	208	VERTICAL
4	5241.30	123.10			117.94	6.18	34.18	35.20	Peak	165	208	VERTICAL

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

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38, 46 / Chain 3+Chain 5+Chain 6
Test Date	Oct. 26, 2014		

Channel 38

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	5147.40	68.40	74.00	-5.60	65.45	4.34	33.14	34.53	Peak	355	214	VERTICAL
2	5147.68	52.96	54.00	-1.04	50.01	4.34	33.14	34.53	Average	355	214	VERTICAL
3	5188.26	112.46			109.44	4.36	33.19	34.53	Peak	355	214	VERTICAL
4	5192.89	101.10			98.04	4.37	33.22	34.53	Average	355	214	VERTICAL

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

Channel 46

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5148.26	52.94	54.00	-1.06	48.00	6.13	34.01	35.20	Average	164	201	VERTICAL
2	5148.26	65.69	74.00	-8.31	60.75	6.13	34.01	35.20	Peak	164	201	VERTICAL
3	5217.84	105.79			100.67	6.17	34.15	35.20	Average	164	201	VERTICAL
4	5223.63	115.52			110.40	6.17	34.15	35.20	Peak	164	201	VERTICAL

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

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42 / Chain 3+Chain 5+Chain 6
Test Date	Oct. 26, 2014		

Channel 42

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5144.21	52.98	54.00	-1.02	48.04	6.13	34.01	35.20	Average	100	114	VERTICAL
2	5144.21	64.94	74.00	-9.06	60.00	6.13	34.01	35.20	Peak	100	114	VERTICAL
3	5203.49	96.39			91.32	6.16	34.11	35.20	Average	100	114	VERTICAL
4	5204.21	106.09			101.02	6.16	34.11	35.20	Peak	100	114	VERTICAL
5	5350.00	46.84	54.00	-7.16	41.36	6.26	34.42	35.20	Average	100	114	VERTICAL
6	5356.51	59.36	74.00	-14.64	53.88	6.26	34.42	35.20	Peak	100	114	VERTICAL

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

Note:

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

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

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11a CH 36, 40, 48 / Chain 3+Chain 5+Chain 6
Test Date	Oct. 26, 2014		

Channel 36

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5147.40	72.23	74.00	-1.77	67.29	6.13	34.01	35.20	Peak	138	201	VERTICAL
2	5147.68	52.89	54.00	-1.11	47.95	6.13	34.01	35.20	Average	138	201	VERTICAL
3	5182.03	118.15			113.12	6.15	34.08	35.20	Peak	138	201	VERTICAL
4	5182.60	107.45			102.42	6.15	34.08	35.20	Average	138	201	VERTICAL

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

Channel 40

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5121.35	52.87	54.00	-1.13	48.02	6.11	33.94	35.20	Average	153	196	VERTICAL
2	5150.00	66.64	74.00	-7.36	61.70	6.13	34.01	35.20	Peak	153	196	VERTICAL
3	5201.45	109.86			104.79	6.16	34.11	35.20	Average	153	196	VERTICAL
4	5201.45	120.31			115.24	6.16	34.11	35.20	Peak	153	196	VERTICAL

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

Channel 48

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5150.00	48.24	54.00	-5.76	43.30	6.13	34.01	35.20	Average	199	191	VERTICAL
2	5150.00	61.80	74.00	-12.20	56.86	6.13	34.01	35.20	Peak	199	191	VERTICAL
3	5238.84	123.28			118.12	6.18	34.18	35.20	Peak	199	191	VERTICAL
4	5239.42	112.61			107.45	6.18	34.18	35.20	Average	199	191	VERTICAL
5	5398.75	62.05	74.00	-11.95	56.47	6.29	34.49	35.20	Peak	199	191	VERTICAL
6	5400.49	51.17	54.00	-2.83	45.55	6.29	34.53	35.20	Average	199	191	VERTICAL

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

Note:

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

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

<For Beamforming Mode>

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36, 40, 48 / Chain 3+Chain 5+Chain 6
Test Date	Oct. 26, 2014		

Channel 36

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5149.71	68.43	74.00	-5.57	63.49	6.13	34.01	35.20	Peak	208	159	VERTICAL
2	5150.00	52.81	54.00	-1.19	47.87	6.13	34.01	35.20	Average	208	159	VERTICAL
3	5179.13	108.47			103.44	6.15	34.08	35.20	Average	208	159	VERTICAL
4	5181.74	118.11			113.08	6.15	34.08	35.20	Peak	208	159	VERTICAL

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

Channel 40

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5126.27	50.04	54.00	-3.96	45.18	6.12	33.94	35.20	Average	303	318	VERTICAL
2	5147.68	64.99	74.00	-9.01	60.05	6.13	34.01	35.20	Peak	303	318	VERTICAL
3	5200.58	110.87			105.80	6.16	34.11	35.20	Average	303	318	VERTICAL
4	5201.74	120.40			115.33	6.16	34.11	35.20	Peak	303	318	VERTICAL
5	5358.10	63.52	74.00	-10.48	58.04	6.26	34.42	35.20	Peak	303	318	VERTICAL
6	5358.68	52.98	54.00	-1.02	47.50	6.26	34.42	35.20	Average	303	318	VERTICAL

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

Channel 48

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5078.80	48.91	54.00	-5.09	44.15	6.09	33.87	35.20	Average	219	21	VERTICAL
2	5079.38	60.16	74.00	-13.84	55.40	6.09	33.87	35.20	Peak	219	21	VERTICAL
3	5232.47	108.40			103.24	6.18	34.18	35.20	Average	219	21	VERTICAL
4	5235.95	118.19			113.03	6.18	34.18	35.20	Peak	219	21	VERTICAL
5	5391.68	52.93	54.00	-1.07	47.36	6.28	34.49	35.20	Average	219	21	VERTICAL
6	5392.26	62.56	74.00	-11.44	56.99	6.28	34.49	35.20	Peak	219	21	VERTICAL

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

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38, 46 / Chain 3+Chain 5+Chain 6
Test Date	Oct. 26, 2014		

Channel 38

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5144.79	69.04	74.00	-4.96	64.10	6.13	34.01	35.20	Peak	301	286	VERTICAL
2	5150.00	52.82	54.00	-1.18	47.88	6.13	34.01	35.20	Average	301	286	VERTICAL
3	5187.68	113.73			108.70	6.15	34.08	35.20	Peak	301	286	VERTICAL
4	5188.26	102.75			97.72	6.15	34.08	35.20	Average	301	286	VERTICAL

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

Channel 46

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5140.16	65.14	74.00	-8.86	60.23	6.13	33.98	35.20	Peak	237	100	VERTICAL
2	5147.68	52.43	54.00	-1.57	47.49	6.13	34.01	35.20	Average	237	100	VERTICAL
3	5234.05	107.94			102.78	6.18	34.18	35.20	Average	237	100	VERTICAL
4	5234.05	117.69			112.53	6.18	34.18	35.20	Peak	237	100	VERTICAL
5	5372.58	52.78	54.00	-1.22	47.25	6.27	34.46	35.20	Average	237	100	VERTICAL
6	5385.31	63.73	74.00	-10.27	58.16	6.28	34.49	35.20	Peak	237	100	VERTICAL

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

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Hang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42 / Chain 3+Chain 5+Chain 6
Test Date	Oct. 26, 2014		

Channel 42

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5146.09	65.27	74.00	-8.73	60.33	6.13	34.01	35.20	Peak	278	278	VERTICAL
2	5148.70	52.84	54.00	-1.16	47.90	6.13	34.01	35.20	Average	278	278	VERTICAL
3	5181.35	111.11			106.08	6.15	34.08	35.20	Peak	278	278	VERTICAL
4	5196.98	97.03			91.96	6.16	34.11	35.20	Average	278	278	VERTICAL

Item 3, 4 are the fundamental frequency at 5210 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

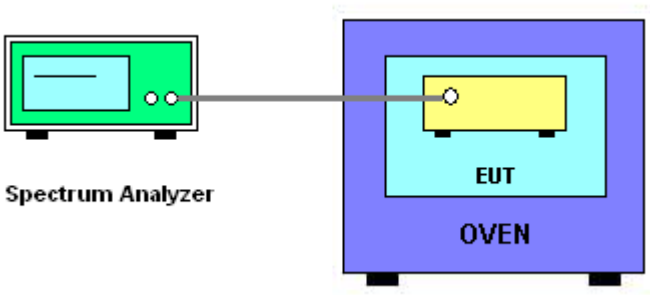
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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	26°C	Humidity	63%
Test Engineer	Wen Chao	Test Date	Nov. 07, 2014

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)
(V)	5200 MHz
126.50	5200.0880
110.00	5200.0920
93.50	5200.0860
Max. Deviation (MHz)	0.092000
Max. Deviation (ppm)	17.69

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)
(°C)	5200 MHz
0	5200.0760
10	5200.0820
20	5200.0880
30	5200.0920
40	5200.0940
Max. Deviation (MHz)	0.094000
Max. Deviation (ppm)	18.08

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. 23, 2014	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Dec. 02, 2013	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Dec. 02, 2013	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	150kHz ~ 30MHz	Dec. 04, 2013	Conduction (CO01-CB)
Software	Audix	E3	5.410e	-	N.C.R.	Conduction (CO01-CB)
BILOG ANTENNA	Schaffner	CBL6112D	22021	20MHz ~ 2GHz	May 26, 2014	Radiation (03CH01-CB)
Loop Antenna	TESEQ	HLA 6120	31244	9 kHz - 30 MHz	Dec. 02, 2012*	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz~18GHz	Nov. 01, 2013	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. 15, 2014	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Dec. 16, 2013	Radiation (03CH01-CB)
Pre-Amplifier	MITEQ	TTA1840-35-HG	1864479	18GHz ~ 40GHz	Apr. 22, 2014	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP40	100019	9kHz~40GHz	Dec. 02, 2013	Radiation (03CH01-CB)
EMI Test Receiver	Agilent	N9038A	MY52260123	9kHz ~ 8GHz	Dec. 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. 15, 2014	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-1	N/A	1 GHz – 26.5 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-2	N/A	1 GHz – 26.5 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-3	N/A	1 GHz - 40 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-4	N/A	1 GHz - 40 GHz	Nov. 17, 2013	Radiation (03CH01-CB)
Signal analyzer	R&S	FSV40	101026	9kHz~40GHz	Aug. 28, 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	High Cable-7	-	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-8	-	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-9	-	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
RF Cable-high	Woken	High Cable-10	-	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-11	-	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
Power Sensor	Anritsu	MA2411B	1126203	300MHz~40GHz	Oct. 06, 2014	Conducted (TH01-CB)
Power Meter	Anritsu	ML2495A	1210004	300MHz~40GHz	Oct. 06, 2014	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)	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%