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FCC RADIO TEST REPORT

Applicant's company	**Broadcom Corporation**
Applicant Address	190 Mathilda Place Sunnyvale CA 94086 U.S.A.
FCC ID	**QDS-BRCM1082**
Manufacturer's company	**Broadcom Corporation**
Manufacturer Address	190 Mathilda Place Sunnyvale CA 94086 U.S.A.

Product Name	802.11abgn/11ac WLAN + Bluetooth PCI-E Mini Card
Brand Name	Broadcom
Model No.	BCM94360HMB
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5150 ~ 5350MHz / 5470 ~ 5725MHz
Received Date	Mar. 12, 2014
Final Test Date	Sep. 29, 2014
Submission Type	Class II Change
Operating Mode	Client (without radar detection function)

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 C63.10-2009**, **47 CFR FCC Part 15 Subpart E, KDB789033 D01 v01r04, KDB662911 D01 v02r01, KDB644545 D01 v01r02.**

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

Testing Laboratory
1190

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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR431243-03AB	Rev. 01	Initial issue of report	Sep. 18, 2014
FR431243-03AB	Rev. 02	Adding Radiated Emissions Above 1G test result	Sep. 29, 2014

Certificate No.: CB10309039

1. CERTIFICATE OF COMPLIANCE

Product Name	:	**802.11abgn/11ac WLAN + Bluetooth PCI-E Mini Card**
Brand Name	:	**Broadcom**
Model No.	:	**BCM94360HMB**
Applicant	:	**Broadcom Corporation**
Test Rule Part(s)	:	**47 CFR FCC Part 15 Subpart E § 15.407**

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Mar. 12, 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	15.407(a)	Maximum Conducted Output Power	Complies	0.11 dB
4.2	15.407(b)	Radiated Emissions	Complies	3.81 dB
4.3	15.407(b)	Band Edge Emissions	Complies	0.10 dB
4.4	15.203	Antenna Requirements	Complies	-

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 ~ 5350MHz / 5470 ~ 5725MHz
Channel Number	20 for 20MHz bandwidth ; 10 for 40MHz bandwidth 5 for 80MHz bandwidth
Maximum Conducted Output Power	For non-beamforming mode: Band 1: 802.11ac MCS0/Nss1 (VHT20): 14.50 dBm ; 802.11ac MCS0/Nss1 (VHT40): 16.89 dBm ; 802.11ac MCS0/Nss1 (VHT80): 16.69 dBm Band 2: 802.11ac MCS0/Nss1 (VHT20): 19.59 dBm ; 802.11ac MCS0/Nss1 (VHT40): 22.56 dBm ; 802.11ac MCS0/Nss1 (VHT80): 15.97 dBm Band 3: 802.11ac MCS0/Nss1 (VHT20): 19.42 dBm ; 802.11ac MCS0/Nss1 (VHT40): 23.22 dBm ; 802.11ac MCS0/Nss1 (VHT80): 23.69 dBm For beamforming mode: Band 1: 802.11ac MCS0/Nss1 (VHT20): 14.31 dBm ; 802.11ac MCS0/Nss1 (VHT40): 14.10 dBm ; 802.11ac MCS0/Nss1 (VHT80): 14.06 dBm Band 2: 802.11ac MCS0/Nss1 (VHT20): 19.59 dBm ; 802.11ac MCS0/Nss1 (VHT40): 19.62 dBm ; 802.11ac MCS0/Nss1 (VHT80): 16.93 dBm

	Band 3: 802.11ac MCS0/Nss1 (VHT20): 19.42 dBm ; 802.11ac MCS0/Nss1 (VHT40): 19.18 dBm ; 802.11ac MCS0/Nss1 (VHT80): 19.24 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 ~ 5350MHz / 5470 ~ 5725MHz
Channel Number	20
Maximum Conducted Output Power	Band 1: 14.56 dBm ; Band 2: 19.60 dBm ; Band 3: 19.54 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

Note: 1. The product has beamforming function for 802.11n/ac VHT20 VHT40 VHT80 in 5GHz.

2. The MIMO transmission mode is correlated.

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

3.2. Accessories

N/A

3.3. Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)				
					2.4G	5G B1	5G B2	5G B3	5G B4
1	INPAQ	DAM-I6-H-C3-800-14-17	Dipole	MMCX PLUG	3.59	2.35	3.59	2.66	2.79

Note: The EUT has one antenna.

<For 2.4GHz Band>

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

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

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

<For 5GHz Band>

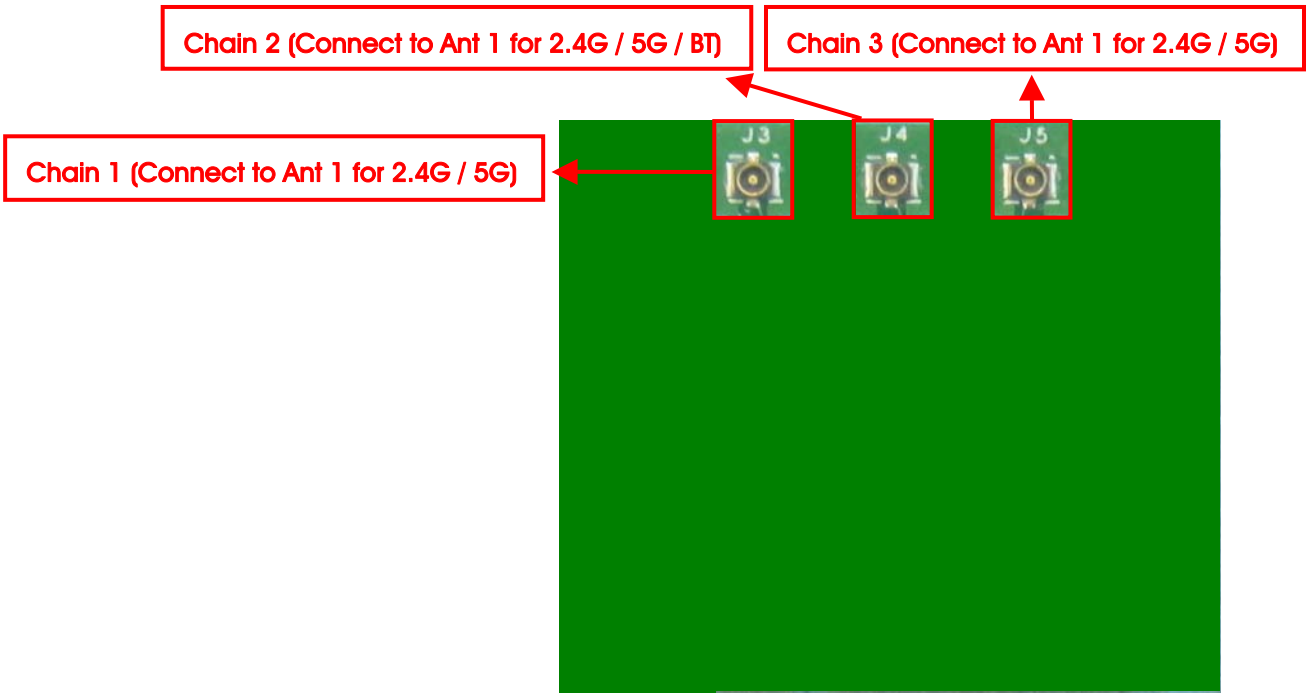
For IEEE 802.11a/n/ac mode (3TX/3RX)

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

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

For Bluetooth mode (1TX/1RX)

Only Chain 2 can be used as transmitting/receiving antenna.



3.4. Table for Carrier Frequencies

There are three bandwidth systems.

For 20MHz bandwidth systems, use Channel 36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 144.

For 40MHz bandwidth systems, use Channel 38, 46, 54, 62, 102, 110, 118, 126, 134, 142.

For 80MHz bandwidth systems, use Channel 42, 58, 106, 122, 138.

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	-	-
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	124	5620 MHz
	102	5510 MHz	126	5630 MHz
	104	5520 MHz	128	5640 MHz
	106	5530 MHz	132	5660 MHz
	108	5540 MHz	134	5670 MHz
	110	5550 MHz	136	5680 MHz
	112	5560 MHz	138	5690 MHz
	116	5580 MHz	140	5700 MHz
	118	5590 MHz	142	5710 MHz
	120	5600 MHz	144	5720 MHz
	122	5610 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
Max. Conducted Output Power	For non-beamforming mode				
	11ac VHT20	Band 1-3	MCS0/Nss1	36/40/48/52/60/64/100/116/140/144	1+2+3
	11ac VHT40	Band 1-3	MCS0/Nss1	38/46/54/62/102/110/134/142	1+2+3
	11ac VHT80	Band 1-3	MCS0/Nss1	42/58/106/122/138	1+2+3
	11a/BPSK	Band 1-3	6Mbps	36/40/48/52/60/64/100/116/140/144	1+2+3
	For beamforming mode				
	11ac VHT20	Band 1-3	MCS0/Nss1	36/40/48/52/60/64/100/116/140/144	1+2+3
	11ac VHT40	Band 1-3	MCS0/Nss1	38/46/54/62/102/110/134/142	1+2+3
	11ac VHT80	Band 1-3	MCS0/Nss1	42/58/106/122/138	1+2+3
Radiated Emission Below 1GHz	Normal Link		-	-	-
Radiated Emission Above 1GHz	For non-beamforming mode				
	11ac VHT40	Band 1-2	MCS0/Nss1	46/54	1+2+3
	11ac VHT80	Band 3	MCS0/Nss1	138	1+2+3
	For beamforming mode				
	11ac VHT20	Band 1/3	MCS0/Nss1	40/140	1+2+3
	11ac VHT40	Band 2	MCS0/Nss1	54	1+2+3

Band Edge Emission	For non-beamforming mode				
	11ac VHT20	Band 1-3	MCS0/Nss1	36/40/48/52/60/64/100/116/140/144	1+2+3
	11ac VHT40	Band 1-3	MCS0/Nss1	38/46/54/62/102/110/134/142	1+2+3
	11ac VHT80	Band 1-3	MCS0/Nss1	42/58/106/122/138	1+2+3
	11a/BPSK	Band 1-3	6Mbps	36/40/48/52/60/64/100/116/140/144	1+2+3
	For beamforming mode				
	11ac VHT20	Band 1-3	MCS0/Nss1	36/40/48/52/60/64/100/116/140/144	1+2+3
	11ac VHT40	Band 1-3	MCS0/Nss1	38/46/54/62/102/110/134/142	1+2+3
	11ac VHT80	Band 1-3	MCS0/Nss1	42/58/106/122/138	1+2+3

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

The following test modes were performed for all tests:

For Radiated Emission Below 1GHz test:

Mode 1. 2.4GHz WLAN function + Bluetooth function

Mode 2. 5GHz WLAN function + Bluetooth function

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

For Co-location test:

Mode 1. 2.4GHz WLAN function + Bluetooth function

Mode 2. 5GHz WLAN function + Bluetooth function

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

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

3.6. Table for Testing Locations

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

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

3.7. Table for Class II Change

This product is an extension of original one reported under Sporton project number: FR431243AB
Below is the table for the change of the product with respect to the original one.

Modifications	Performance Checking
Adding a dipole antenna	1. Maximum Conducted Output Power 2. Radiated Emissions 3. Band Edge Emissions 4. Co-location Maximum Permissible Exposure 5. Radiated Emission Co-location

3.8. Table for Supporting Units

For Test Site No: 03CH01-CB

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E4300	RSE-TG233
Notebook	DELL	M1340	E2K4965AGNM
Mouse	Logitech	M-B0001	HC238HR00XY
Earphone	E-BOOKI	E-EPC040	N/A
Fixture	Broadcom	BCM9MC2EC	N/A
RF module	Broadcom	BCM94360HMB	QDS-BRCM1082

For Test Site No: TH01-CB

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E6430	DoC
Fixture	Broadcom	BCM9MC2EC	N/A

3.9. Table for Parameters of Test Software Setting

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

For non-beamforming mode:

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT20

Test Software Version	Manual Tool Version : 2.0.1.6									
Frequency	5180 MHz	5200 MHz	5240 MHz	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz	5720 MHz
MCS0/Nss1 VHT20	42	42	41	63	63	63	63	63	65	65

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT40

Test Software Version	Manual Tool Version : 2.0.1.6							
Frequency	5190 MHz	5230 MHz	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz	5710 MHz
MCS0/Nss1 VHT40	51	52	75	54	57	75	68	78

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT80

Test Software Version	Manual Tool Version : 2.0.1.6				
Frequency	5210 MHz	5290 MHz	5530 MHz	5610 MHz	5690 MHz
MCS0/Nss1 VHT80	48	48	53	72	80

Power Parameters of IEEE 802.11a

Test Software Version	Manual Tool Version : 2.0.1.6									
Frequency	5180 MHz	5200 MHz	5240 MHz	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz	5720 MHz
802.11a	42	41	41	63	62	62	63	63	65	65

For beamforming mode:

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT20

Test Software Version	Manual Tool Version : 2.0.1.6									
Frequency	5180 MHz	5200 MHz	5240 MHz	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz	5720 MHz
MCS0/Nss1 VHT20	41	41	41	63	63	63	63	63	65	60

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT40

Test Software Version	Manual Tool Version : 2.0.1.6							
Frequency	5190 MHz	5230 MHz	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz	5710 MHz
MCS0/Nss1 VHT40	40	40	65	45	55	62	62	62

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT80

Test Software Version	Manual Tool Version : 2.0.1.6				
Frequency	5210 MHz	5290 MHz	5530 MHz	5610 MHz	5690 MHz
MCS0/Nss1 VHT80	40	52	55	62	62

3.10. 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 Wireless AP and transmit duty cycle no less 98%

3.11. Duty Cycle

For non-beamforming mode:

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11ac MCS0/Nss1 VHT20	1.906	2.004	95.11	0.22	0.52
802.11ac MCS0/Nss1 VHT40	0.954	0.978	97.55	0.11	1.05
802.11ac MCS0/Nss1 VHT80	0.457	0.481	95.01	0.22	2.19
802.11a	2.060	2.092	98.47	0.07	0.01

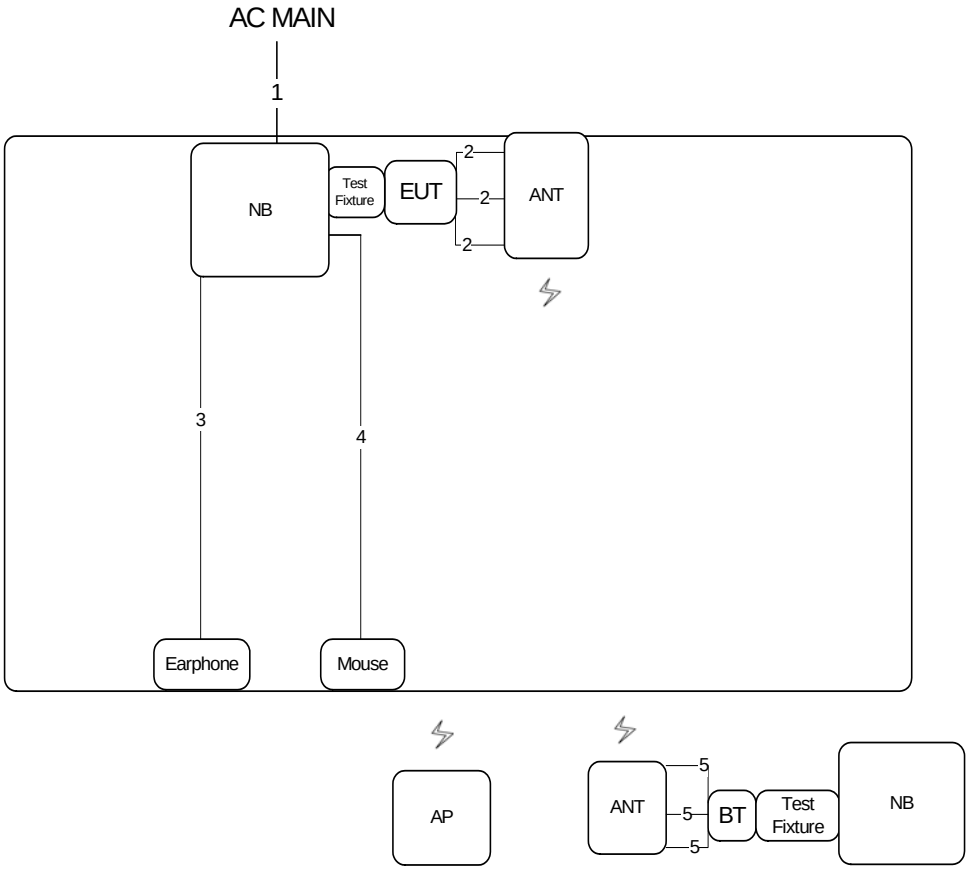
For beamforming mode:

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11ac MCS0/Nss1 VHT20	1.841	1.928	95.49	0.20	0.54
802.11ac MCS0/Nss1 VHT40	0.942	1.014	92.90	0.32	1.06
802.11ac MCS0/Nss1 VHT80	0.449	0.486	92.39	0.34	2.23

3.12. Test Configurations

3.12.1. Radiation Emissions Test Configuration

Test Configuration: 30MHz~1GHz



Item	Connection	Shielded	Length(m)
1	AC power cable	No	2.6m
2	ANT cable *3	Yes	0.2m
3	Audio cable	No	1.1m
4	USB cable	Yes	1.8m
5	ANT cable*3	Yes	0.2m

4. TEST RESULT

4.1. Maximum Conducted Output Power Measurement

4.1.1. Limit

For the band 5.15~5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW (17dBm) or 4 dBm + 10log B, where B is the 26 dB emissions bandwidth in MHz. 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.

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

For the band 5.725~5.825 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W or 17 dBm + 10 log B, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 17 dBm in any 1□MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain up to 23 dBi without any corresponding reduction in the transmitter peak output power or peak power spectral density. For fixed, point-to-point U-NII transmitters that employ a directional antenna gain greater than 23 dBi, a 1 dB reduction in peak transmitter power and peak power spectral density for each 1 dB of antenna gain in excess of 23 dBi would be required.

4.1.2. Measuring Instruments and Setting

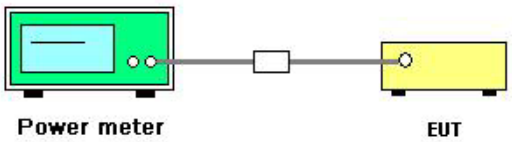
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Detector	AVERAGE

4.1.3. Test Procedures

1. The transmitter output (antenna port) was connected to the power meter.
2. Test was performed in accordance with KDB789033 D01 v01r04 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.

4.1.4. Test Setup Layout



4.1.5. Test Deviation

There is no deviation with the original standard.

4.1.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.1.7. Test Result of Maximum Conducted Output Power

Temperature	20°C	Humidity	52%
Test Engineer	Jim Huang	Configurations	IEEE 802.11a/ac
Test Date	Sep. 02, 2014		

For non-beamforming mode:

Configuration IEEE 802.11ac MCS0/Nss1 VHT20

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
36	5180 MHz	9.45	10.06	9.66	14.50	17.00	Complies
40	5200 MHz	9.29	10.15	9.63	14.48	17.00	Complies
48	5240 MHz	9.09	10.10	9.36	14.31	17.00	Complies
52	5260 MHz	14.38	15.22	14.58	19.51	24.00	Complies
60	5300 MHz	14.32	15.29	14.78	19.59	24.00	Complies
64	5320 MHz	14.25	15.12	14.42	19.38	24.00	Complies
100	5500 MHz	14.12	14.87	14.46	19.27	24.00	Complies
116	5580 MHz	14.19	14.73	14.25	19.17	24.00	Complies
140	5700 MHz	14.58	14.60	14.75	19.42	24.00	Complies
144	5720 MHz	14.57	14.53	14.77	19.40	24.00	Complies

Straddle channel complies with output power limit of Band 3 & Band4										
CH	26dB BW (MHz)	99% OBW (MHz)	26dB BW F1 (MHz)	99% OBW T1 (MHz)	UNII B3 BW (MHz)	UNII B4 BW (MHz)	Total Conducted Output Power (dBm)	UNII B3 Limit (dBm)	UNII B4 Limit (dBm)	Result
144	21.28	18.08	5709.76	5711.04	15.24	6.04	19.40	22.83	24.81	Complies

Note:

UNII B3 limit: 24dBm or 11+10log(B)

UNII B4 limit: 30dBm or 17+10log(B)

Configuration IEEE 802.11ac MCS0/Nss1 VHT40

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
38	5190 MHz	11.58	12.59	11.86	16.80	17.00	Complies
46	5230 MHz	11.66	12.70	11.92	16.89	17.00	Complies
54	5270 MHz	17.11	18.54	17.58	22.56	24.00	Complies
62	5310 MHz	12.07	12.98	12.44	17.28	24.00	Complies
102	5510 MHz	13.1	13.78	13.02	18.08	24.00	Complies
110	5550 MHz	17.16	18.86	16.98	22.52	24.00	Complies
134	5670 MHz	15.66	17.28	15.56	21.01	24.00	Complies
142	5710 MHz	17.74	19.72	17.55	23.22	24.00	Complies

Straddle channel complies with output power limit of Band 3 & Band4										
CH	26dB BW (MHz)	99% OBW (MHz)	26dB BW F1 (MHz)	99% OBW T1 (MHz)	UNII B3 BW (MHz)	UNII B4 BW (MHz)	Total Conducted Output Power (dBm)	UNII B3 Limit (dBm)	UNII B4 Limit (dBm)	Result
142	79.68	49.60	5671.93	5686.00	53.07	26.61	23.22	24.00	30.00	Complies

Note:

UNII B3 limit: 24dBm or 11+10log(B)

UNII B4 limit: 30dBm or 17+10log(B)

Configuration IEEE 802.11ac MCS0/Nss1 VHT80

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
42	5210 MHz	11.19	12.78	11.62	16.69	17.00	Complies
58	5290 MHz	10.72	11.81	10.98	15.97	24.00	Complies
106	5530 MHz	12.06	12.69	12.17	17.09	24.00	Complies
122	5610 MHz	16.48	17.96	16.45	21.79	24.00	Complies
138	5690 MHz	18.54	19.71	18.38	23.69	24.00	Complies

Straddle channel complies with output power limit of Band 3 & Band4										
CH	26dB BW (MHz)	99% OBW (MHz)	26dB BW F1 (MHz)	99% OBW T1 (MHz)	UNII B3 BW (MHz)	UNII B4 BW (MHz)	Total Conducted Output Power (dBm)	UNII B3 Limit (dBm)	UNII B4 Limit (dBm)	Result
138	181.76	110.08	5600.40	5635.60	124.60	57.16	23.69	24.00	30.00	Complies

Note:

UNII B3 limit: 24dBm or 11+10log(B)

UNII B4 limit: 30dBm or 17+10log(B)

Configuration IEEE 802.11a

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
36	5180 MHz	9.58	10.05	9.72	14.56	17.00	Complies
40	5200 MHz	9.15	9.81	9.31	14.20	16.98	Complies
48	5240 MHz	8.89	9.95	9.41	14.21	17.00	Complies
52	5260 MHz	14.56	15.05	14.86	19.60	24.00	Complies
60	5300 MHz	14.17	15.12	14.51	19.39	24.00	Complies
64	5320 MHz	14.05	15.18	14.52	19.38	24.00	Complies
100	5500 MHz	14.22	15.11	14.58	19.42	24.00	Complies
116	5580 MHz	14.34	15.08	14.52	19.43	24.00	Complies
140	5700 MHz	14.63	14.89	14.77	19.54	24.00	Complies
144	5720 MHz	14.74	14.68	14.82	19.52	24.00	Complies

Note: Ch40 Conducted Output power limit=4+10log(B);4+10log(19.84)=16.98dBm<17dBm, so Ch40 power limt=16.98dBm

Straddle channel complies with output power limit of Band 3 & Band4										
CH	26dB BW (MHz)	99% OBW (MHz)	26dB BW F1 (MHz)	99% OBW T1 (MHz)	UNII B3 BW (MHz)	UNII B4 BW (MHz)	Total Conducted Output Power (dBm)	UNII B3 Limit (dBm)	UNII B4 Limit (dBm)	Result
144	20.48	17.12	5709.76	5711.36	15.24	5.24	19.52	22.83	24.19	Complies

Note:

UNII B3 limit: 24dBm or 11+10log(B)

UNII B4 limit: 30dBm or 17+10log(B)

Temperature	20°C	Humidity	52%
Test Engineer	Jim Huang	Configurations	IEEE 802.11ac
Test Date	Sep. 02, 2014		

For beamforming mode:

Configuration IEEE 802.11ac MCS0/Nss1 VHT20

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
36	5180 MHz	9.21	9.78	9.46	14.26	15.88	Complies
40	5200 MHz	9.19	9.92	9.43	14.30	15.88	Complies
48	5240 MHz	9.09	10.10	9.36	14.31	15.88	Complies
52	5260 MHz	14.38	15.22	14.58	19.51	21.64	Complies
60	5300 MHz	14.32	15.29	14.78	19.59	21.64	Complies
64	5320 MHz	14.25	15.12	14.42	19.38	21.64	Complies
100	5500 MHz	14.12	14.87	14.46	19.27	22.57	Complies
116	5580 MHz	14.19	14.73	14.25	19.17	22.57	Complies
140	5700 MHz	14.58	14.60	14.75	19.42	22.57	Complies
144	5720 MHz	13.20	13.87	13.04	18.16	21.35	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{ANT}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.12dBi >6dBi,So Band1 Limit =17-(7.12-6)=15.88dBm

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{ANT}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.36dBi >6dBi,So Band2 Limit =24-(8.36-6)=21.64dBm

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{ANT}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.43dBi >6dBi,So Band3 Limit =24-(7.43-6)=22.57dBm

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{ANT}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.43dBi >6dBi,So CH144 power Limit =24 or 11+10log(15.08)-(7.43-6)=21.35dBm

Straddle channel complies with output power limit of Band 3 & Band4										
CH	26dB BW (MHz)	99% OBW (MHz)	26dB BW F1 (MHz)	99% OBW T1 (MHz)	UNII B3 BW (MHz)	UNII B4 BW (MHz)	Total Conducted Output Power (dBm)	UNII B3 Limit (dBm)	UNII B4 Limit (dBm)	Result
144	20.48	18.08	5709.92	5711.04	15.08	5.40	18.16	21.35	22.89	Complies

Note:

UNII B3 limit: 24dBm or 11+10log(B)

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{ANT}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.43dBi >6dBi,So CH144 power Limit =24 or 11+10log(15.08)-(7.43-6)=21.35dBm

UNII B4 limit: 30dBm or 17+10log(B)

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{ANT}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.56dBi >6dBi,So CH144 power Limit =30 or 17+10log(5.40)-(7.56-6)=22.89dBm

Configuration IEEE 802.11ac MCS0/Nss1 VHT40

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
38	5190 MHz	8.51	10.15	9.17	14.10	15.88	Complies
46	5230 MHz	8.39	10.16	9.01	14.02	15.88	Complies
54	5270 MHz	13.93	15.87	14.52	19.62	21.64	Complies
62	5310 MHz	9.38	11.16	10.19	15.08	21.64	Complies
102	5510 MHz	11.81	13.65	12.38	17.45	22.57	Complies
110	5550 MHz	13.66	15.40	13.93	19.17	22.57	Complies
134	5670 MHz	13.65	15.34	13.85	19.12	22.57	Complies
142	5710 MHz	13.58	15.48	13.91	19.18	22.57	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{pol}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.12dBi >6dBi,So Band1 Limit =17-(7.12-6)=15.88dBm

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{pol}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.36dBi >6dBi,So Band2 Limit =24-(8.36-6)=21.64dBm

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{pol}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.43dBi >6dBi,So Band3 Limit =24-(7.43-6)=22.57dBm

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{pol}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.43dBi >6dBi,So CH142 power Limit =24 or 11+10log(34.84)-(7.43-6)=22.57dBm

Straddle channel complies with output power limit of Band 3 & Band4										
CH	26dB BW (MHz)	99% OBW (MHz)	26dB BW F1 (MHz)	99% OBW T1 (MHz)	UNII B3 BW (MHz)	UNII B4 BW (MHz)	Total Conducted Output Power (dBm)	UNII B3 Limit (dBm)	UNII B4 Limit (dBm)	Result
142	42.88	36.8	5690.16	5691.76	34.84	8.04	19.18	22.57	24.62	Complies

Note:

UNII B3 limit: 24dBm or 11+10log(B)

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{pol}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.43dBi >6dBi,So CH142 power Limit =24 or 11+10log(34.84)-(7.43-6)=22.57dBm

UNII B4 limit: 30dBm or 17+10log(B)

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{pol}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.56dBi >6dBi,So CH142 power Limit =30 or 17+10log(8.04)-(7.56-6)=24.62dBm

Configuration IEEE 802.11ac MCS0/Nss1 VHT80

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
42	5210 MHz	8.62	10.02	9.11	14.06	15.88	Complies
58	5290 MHz	11.54	13.05	11.71	16.93	21.64	Complies
106	5530 MHz	12.07	13.58	12.32	17.48	22.57	Complies
122	5610 MHz	13.92	15.46	13.83	19.24	22.57	Complies
138	5690 MHz	13.82	15.25	14.05	19.19	22.57	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{ANT}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.12dBi >6dBi,So Band1 Limit =17-(7.12-6)=15.88dBm

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{ANT}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.36dBi >6dBi,So Band2 Limit =24-(8.36-6)=21.64dBm

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{ANT}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.43dBi >6dBi,So Band3 Limit =24-(7.43-6)=22.57dBm

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{ANT}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.43dBi >6dBi,So CH144 power Limit =24 or 11+10log(82.36)-(7.43-6)=22.57dBm

Straddle channel complies with output power limit of Band 3 & Band4										
CH	26dB BW (MHz)	99% OBW (MHz)	26dB BW F1 (MHz)	99% OBW T1 (MHz)	UNII B3 BW (MHz)	UNII B4 BW (MHz)	Total Conducted Output Power (dBm)	UNII B3 Limit (dBm)	UNII B4 Limit (dBm)	Result
138	89.60	76.8	5642.64	5651.6	82.36	7.24	19.19	22.57	24.17	Complies

Note:

UNII B3 limit: 24dBm or 11+10log(B)

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{ANT}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.43dBi >6dBi,So CH138 power Limit =24 or 11+10log(82.36)-(7.43-6)=22.57dBm

UNII B4 limit: 30dBm or 17+10log(B)

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{ANT}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =7.56dBi >6dBi,So CH138 power Limit =30 or 17+10log(7.24)-(7.56-6)=24.17dBm

4.2. Radiated Emissions Measurement

4.2.1. Limit

For transmitters operating in the 5.15-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed a -27dBm peak limit or average 54dBuV/m and peak 74dBuV/m limits. For transmitters operating in the 5.470-5.725 GHz band: all emissions outside of the 5.470-5.725 GHz band shall not exceed a -27dBm peak limit or average 54dBuV/m and peak 74dBuV/m limits. For transmitters operating in the 5.725-5.825 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz (78.3dBuV/m at 3m). 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

4.2.2. 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

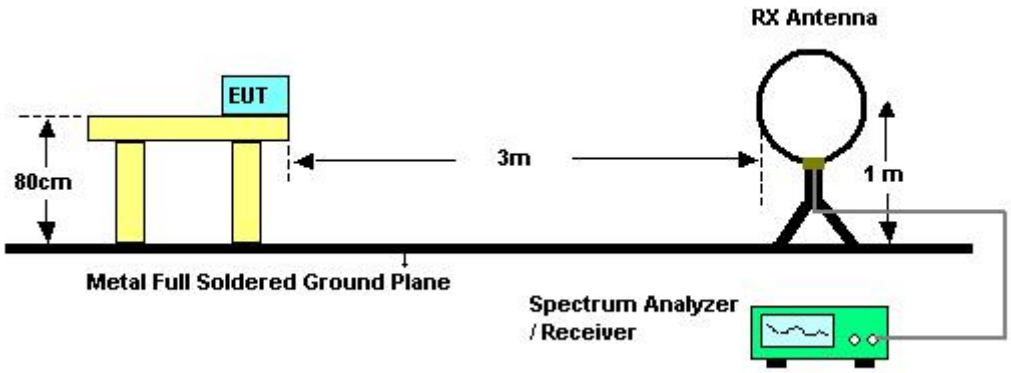
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.2.3. Test Procedures

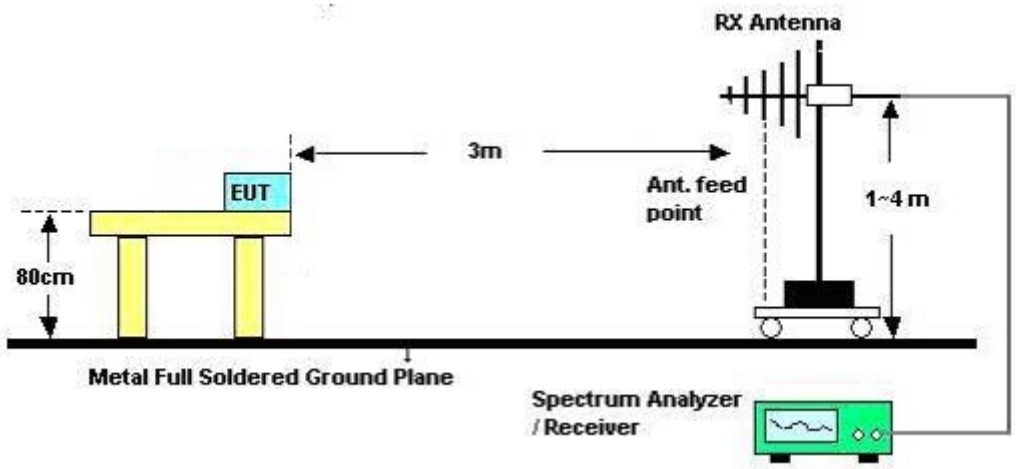
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting 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.

4.2.4. Test Setup Layout

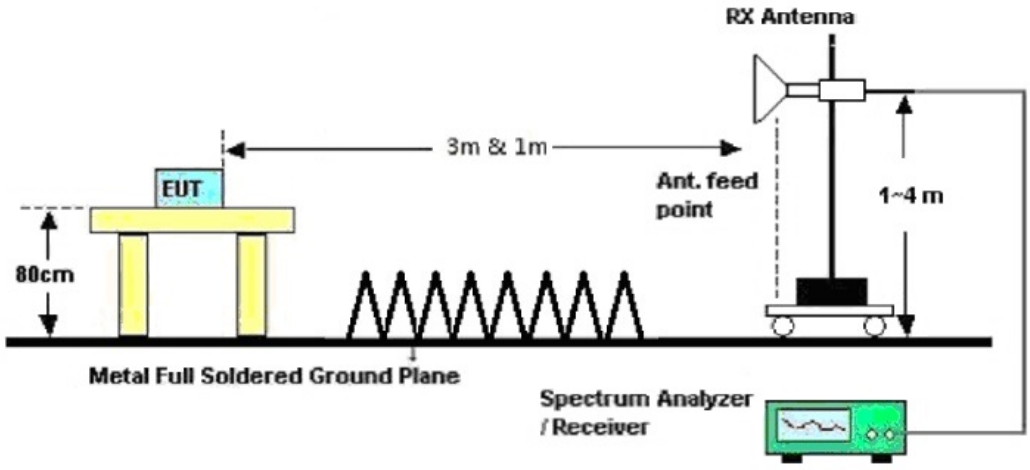
For Radiated Emissions: 9kHz ~30MHz



For Radiated Emissions: 30MHz~1GHz



For Radiated Emissions: Above 1GHz



4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. 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.

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

Temperature	24°C	Humidity	51%
Test Engineer	Jim Huang	Configurations	Normal Link
Test Date	Sep. 02, 2014		

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.

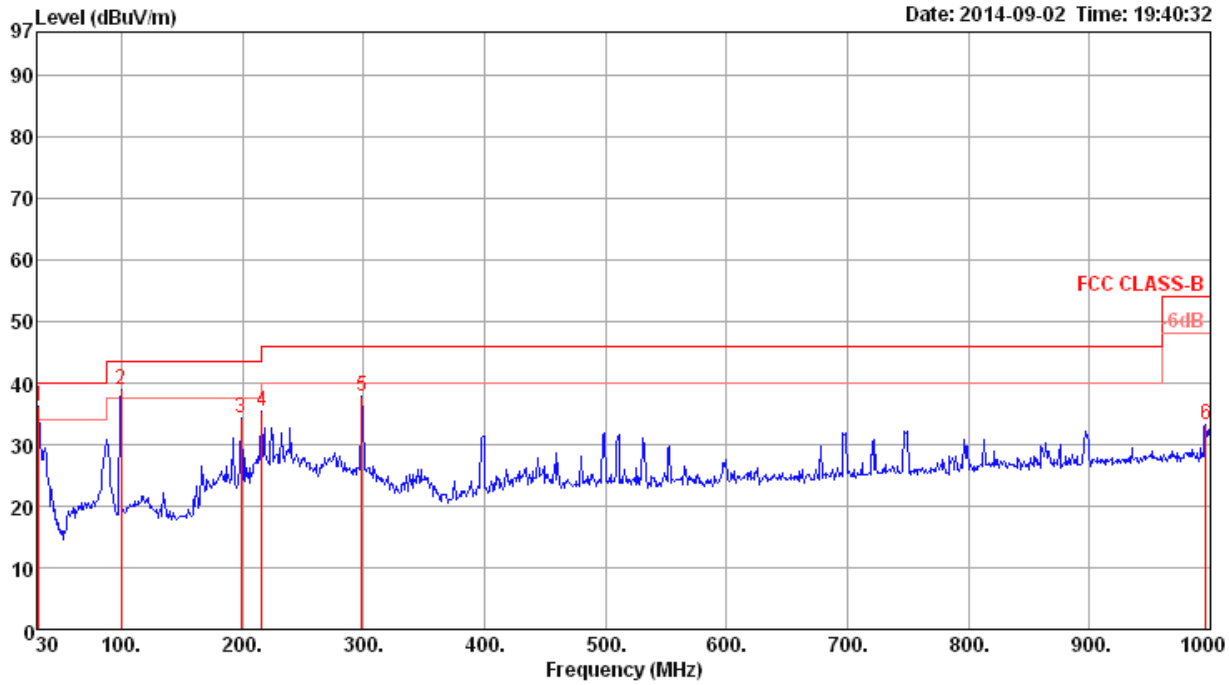
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

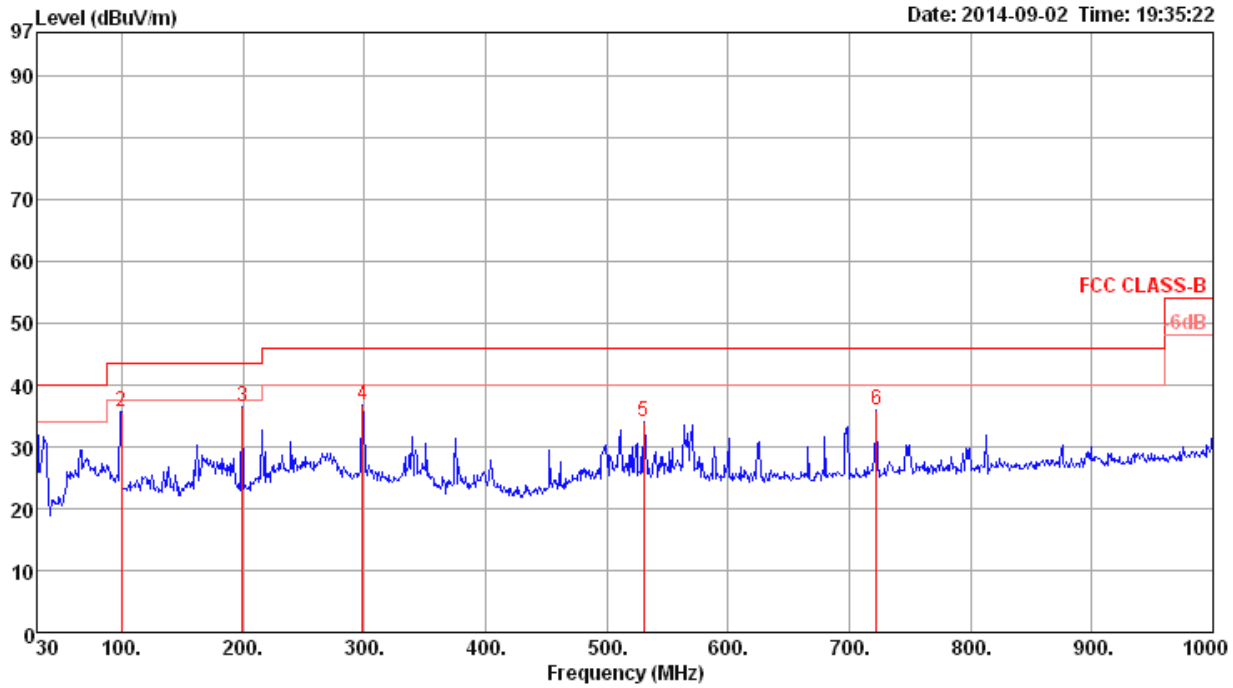
Temperature	24°C	Humidity	51%
Test Engineer	Jim Huang	Configurations	Normal Link

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	31.94	36.19	40.00	-3.81	45.65	0.65	17.69	27.80	Peak	100	0	HORIZONTAL
2	99.84	38.83	43.50	-4.67	54.27	1.17	10.99	27.60	Peak	100	0	HORIZONTAL
3	198.78	34.33	43.50	-9.17	50.53	1.66	9.25	27.11	Peak	100	0	HORIZONTAL
4	216.24	35.28	46.00	-10.72	50.38	1.70	10.27	27.07	Peak	100	0	HORIZONTAL
5	298.69	37.84	46.00	-8.16	49.36	2.03	13.35	26.90	Peak	100	0	HORIZONTAL
6	996.12	33.14	54.00	-20.86	35.21	3.69	21.26	27.02	Peak	100	0	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	30.00	33.85	40.00	-6.15	42.28	0.61	18.76	27.80	Peak	400	0	VERTICAL
2	99.84	35.70	43.50	-7.80	51.14	1.17	10.99	27.60	Peak	400	0	VERTICAL
3	199.75	36.54	43.50	-6.96	52.93	1.66	9.05	27.10	Peak	400	0	VERTICAL
4	298.69	36.84	46.00	-9.16	48.36	2.03	13.35	26.90	Peak	400	0	VERTICAL
5	530.52	33.98	46.00	-12.02	41.37	2.74	17.97	28.10	Peak	400	0	VERTICAL
6	722.58	36.05	46.00	-9.95	41.57	3.15	19.24	27.91	Peak	400	0	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.

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

Note: Only selected maximum output power for each band to test and recorded in this test report.

For non-beamforming mode:

Temperature	24°C	Humidity	51%
Test Engineer	Satoshi Yang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH46 / Chain 1 + Chain 2 + Chain 3
Test Date	Sep. 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	15691.47	57.81	74.00	-16.19	46.21	7.90	38.55	34.85	Peak	320	100	HORIZONTAL
2	15695.41	43.34	54.00	-10.66	31.74	7.90	38.55	34.85	Average	320	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	15691.77	58.01	74.00	-15.99	46.41	7.90	38.55	34.85	Peak	320	100	VERTICAL
2	15694.33	43.56	54.00	-10.44	31.96	7.90	38.55	34.85	Average	320	100	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Satoshi Yang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 54 / Chain 1 + Chain 2 + Chain 3
Test Date	Sep. 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	15809.32	44.11	54.00	-9.89	32.68	7.95	38.45	34.97	Average	320	100	HORIZONTAL
2	15811.67	54.87	74.00	-19.13	43.44	7.95	38.45	34.97	Peak	320	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	15811.34	54.97	74.00	-19.03	43.54	7.95	38.45	34.97	Peak	320	100	VERTICAL
2	15811.87	43.90	54.00	-10.10	32.47	7.95	38.45	34.97	Average	320	100	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Satoshi Yang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 138 / Chain 1 + Chain 2 + Chain 3
Test Date	Sep. 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	11386.52	36.69	54.00	-17.31	26.38	6.68	38.30	34.67	Average	320	100	HORIZONTAL
2	11387.67	49.88	74.00	-24.12	39.57	6.68	38.30	34.67	Peak	320	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	11384.32	38.99	54.00	-15.01	28.68	6.68	38.30	34.67	Average	320	100	VERTICAL
2	11385.32	44.98	74.00	-29.02	34.67	6.68	38.30	34.67	Peak	320	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	24°C	Humidity	51%
Test Engineer	Satoshi Yang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 40 / Chain 1 + Chain 2 + Chain 3
Test Date	Sep. 22, 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	15590.52	45.72	54.00	-8.28	33.99	7.87	38.63	34.77	Average	22	100	HORIZONTAL
2	15605.76	60.95	74.00	-13.05	49.24	7.88	38.62	34.79	Peak	22	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	15590.76	45.71	54.00	-8.29	33.98	7.87	38.63	34.77	Average	338	100	VERTICAL
2	15608.84	58.67	74.00	-15.33	46.96	7.88	38.62	34.79	Peak	338	100	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Satoshi Yang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 54 / Chain 1 + Chain 2 + Chain 3
Test Date	Sep. 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	15812.32	54.67	74.00	-19.33	43.24	7.95	38.45	34.97	Peak	320	100	HORIZONTAL
2	15812.32	43.92	54.00	-10.08	32.49	7.95	38.45	34.97	Average	320	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	15810.56	56.57	74.00	-17.43	45.14	7.95	38.45	34.97	Peak	320	100	VERTICAL
2	15811.21	43.06	54.00	-10.94	31.63	7.95	38.45	34.97	Average	320	100	VERTICAL

Temperature	24°C	Humidity	51%
Test Engineer	Satoshi Yang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 140 / Chain 1 + Chain 2 + Chain 3
Test Date	Sep. 22, 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	11399.82	51.96	74.00	-22.04	38.31	9.19	39.50	35.04	Peak	100	203	HORIZONTAL
2	11401.42	39.96	54.00	-14.04	26.31	9.19	39.50	35.04	Average	100	203	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	11400.92	45.12	54.00	-8.88	31.47	9.19	39.50	35.04	Average	100	205	VERTICAL
2	11401.42	59.46	74.00	-14.54	45.81	9.19	39.50	35.04	Peak	100	205	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.

4.3. Band Edge Emissions Measurement

4.3.1. Limit

For transmitters operating in the 5.15-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed a -27dBm peak limit or average 54dBuV/m and peak 74dBuV/m limits. For transmitters operating in the 5.470-5.725 GHz band: all emissions outside of the 5.470-5.725 GHz band shall not exceed a -27dBm peak limit or average 54dBuV/m and peak 74dBuV/m limits. For transmitters operating in the 5.725-5.825 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of -17 dBm/MHz (78.3dBuV/m at 3m). 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

4.3.2. Measuring Instruments and Setting

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

4.3.3. Test Procedures

1. The test procedure is the same as section 4.2.3, only the frequency range investigated is limited to 100MHz around bandedges.

4.3.4. Test Setup Layout

This test setup layout is the same as that shown in section 4.2.4.

4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. 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.

4.3.7. Test Result of Band Edge and Fundamental Emissions

For non-beamforming mode:

Temperature	24°C	Humidity	51%
Test Engineer	Satoshi Yang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36, 40, 48 / Chain 1 + Chain 2 + Chain 3
Test Date	Aug. 29, 2014		

Channel 36

	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	5149.20	54.95	74.00	-19.05	52.09	4.34	33.14	34.62	Peak	166	133	VERTICAL
2	5150.00	42.41	54.00	-11.59	39.55	4.34	33.14	34.62	Average	166	133	VERTICAL
3	5178.67	105.15			102.22	4.36	33.19	34.62	Peak	166	133	VERTICAL
4	5178.67	94.63			91.70	4.36	33.19	34.62	Average	166	133	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	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	5147.20	53.21	74.00	-20.79	50.35	4.34	33.14	34.62	Peak	164	146	VERTICAL
2	5150.00	41.82	54.00	-12.18	38.96	4.34	33.14	34.62	Average	164	146	VERTICAL
3	5198.60	104.19			101.22	4.37	33.22	34.62	Peak	164	146	VERTICAL
4	5198.67	94.03			91.06	4.37	33.22	34.62	Average	164	146	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	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	5149.20	53.16	74.00	-20.84	50.30	4.34	33.14	34.62	Peak	148	116	VERTICAL
2	5150.00	42.25	54.00	-11.75	39.39	4.34	33.14	34.62	Average	148	116	VERTICAL
3	5238.33	94.48			91.44	4.39	33.27	34.62	Average	148	116	VERTICAL
4	5238.67	104.68			101.64	4.39	33.27	34.62	Peak	148	116	VERTICAL

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

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Temperature	24°C	Humidity	51%
Test Engineer	Satoshi Yang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 52, 60, 64 / Chain 1 + Chain 2 + Chain 3
Test Date	Aug. 29, 2014		

Channel 52

	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	5258.00	111.17			108.09	4.40	33.30	34.62	Peak	149	114	VERTICAL
2	5258.67	100.52			97.39	4.42	33.33	34.62	Average	149	114	VERTICAL
3	5350.80	56.17	74.00	-17.83	52.86	4.47	33.46	34.62	Peak	149	114	VERTICAL
4	5418.80	45.43	54.00	-8.57	41.96	4.52	33.57	34.62	Average	149	114	VERTICAL

Item 1, 2 are the fundamental frequency at 5260 MHz.

Channel 60

	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	5298.33	100.57			97.37	4.44	33.38	34.62	Average	149	115	VERTICAL
2	5303.33	111.06			107.86	4.44	33.38	34.62	Peak	149	115	VERTICAL
3	5373.60	58.09	74.00	-15.91	54.74	4.48	33.49	34.62	Peak	149	115	VERTICAL
4	5378.40	47.65	54.00	-6.35	44.27	4.49	33.51	34.62	Average	149	115	VERTICAL

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

Channel 64

	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	5318.33	110.78			107.54	4.45	33.41	34.62	Peak	150	116	VERTICAL
2	5318.67	100.96			97.72	4.45	33.41	34.62	Average	150	116	VERTICAL
3	5350.00	62.81	74.00	-11.19	59.50	4.47	33.46	34.62	Peak	150	116	VERTICAL
4	5350.00	48.23	54.00	-5.77	44.92	4.47	33.46	34.62	Average	150	116	VERTICAL

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

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Temperature	24°C	Humidity	51%
Test Engineer	Satoshi Yang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 100, 140, 144 / Chain 1 + Chain 2 + Chain 3
Test Date	Aug. 29, 2014		

Channel 100

	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	5424.00	57.59	74.00	-16.41	54.12	4.52	33.57	34.62	Peak	16	124	VERTICAL
2	5424.00	46.78	54.00	-7.22	43.31	4.52	33.57	34.62	Average	16	124	VERTICAL
3	5469.60	62.78	74.00	-11.22	59.20	4.55	33.65	34.62	Peak	16	124	VERTICAL
4	5470.00	47.23	54.00	-6.77	43.65	4.55	33.65	34.62	Average	16	124	VERTICAL
5	5499.00	110.55			106.90	4.57	33.70	34.62	Peak	16	124	VERTICAL
6	5499.00	100.82			97.17	4.57	33.70	34.62	Average	16	124	VERTICAL

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

Channel 140

	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	5697.67	99.67			95.36	4.70	34.27	34.66	Average	257	156	VERTICAL
2	5698.33	109.01			104.70	4.70	34.27	34.66	Peak	257	156	VERTICAL
3	5725.00	59.73	74.00	-14.27	55.31	4.72	34.37	34.67	Peak	257	156	VERTICAL
4	5725.00	46.84	54.00	-7.16	42.42	4.72	34.37	34.67	Average	257	156	VERTICAL

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

Channel 144

	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	5722.50	109.17			104.75	4.72	34.37	34.67	Peak	255	117	VERTICAL
2	5722.50	99.06			94.64	4.72	34.37	34.67	Average	255	117	VERTICAL
3	5845.00	56.99	68.20	-11.21	52.16	4.80	34.73	34.70	Peak	255	117	VERTICAL

Item 1, 2 are the fundamental frequency at 5720 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Temperature	24°C	Humidity	51%
Test Engineer	Satoshi Yang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38, 46 / Chain 1 + Chain 2 + Chain 3
Test Date	Aug. 29, 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	5148.00	66.51	74.00	-7.49	63.65	4.34	33.14	34.62	Peak	165	146	VERTICAL
2	5149.20	50.80	54.00	-3.20	47.94	4.34	33.14	34.62	Average	165	146	VERTICAL
3	5193.67	93.84			90.87	4.37	33.22	34.62	Average	165	146	VERTICAL
4	5204.00	104.64			101.67	4.37	33.22	34.62	Peak	165	146	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	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	5148.40	43.46	54.00	-10.54	40.60	4.34	33.14	34.62	Average	149	115	VERTICAL
2	5148.80	53.92	74.00	-20.08	51.06	4.34	33.14	34.62	Peak	149	115	VERTICAL
3	5224.00	104.73			101.72	4.38	33.25	34.62	Peak	149	115	VERTICAL
4	5233.67	94.38			91.34	4.39	33.27	34.62	Average	149	115	VERTICAL

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

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Temperature	24°C	Humidity	51%
Test Engineer	Satoshi Yang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 54, 62 / Chain 1 + Chain 2 + Chain 3
Test Date	Aug. 29, 2014		

Channel 54

	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	5273.33	100.15			97.02	4.42	33.33	34.62	Average	150	114	VERTICAL
2	5274.00	110.79			107.66	4.42	33.33	34.62	Peak	150	114	VERTICAL
3	5350.00	49.47	54.00	-4.53	46.16	4.47	33.46	34.62	Average	150	114	VERTICAL
4	5352.80	66.46	74.00	-7.54	63.15	4.47	33.46	34.62	Peak	150	114	VERTICAL

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

Channel 62

	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	5314.33	105.71			102.47	4.45	33.41	34.62	Peak	170	100	VERTICAL
2	5314.33	95.11			91.87	4.45	33.41	34.62	Average	170	100	VERTICAL
3	5350.00	53.83	54.00	-0.17	50.52	4.47	33.46	34.62	Average	170	100	VERTICAL
4	5353.20	69.05	74.00	-4.95	65.74	4.47	33.46	34.62	Peak	170	100	VERTICAL

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

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Temperature	24°C	Humidity	51%
Test Engineer	Satoshi Yang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 102, 110 / Chain 1 + Chain 2 + Chain 3
Test Date	Aug. 29, 2014		

Channel 102

	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	5459.60	63.15	74.00	-10.85	59.61	4.54	33.62	34.62	Peak	175	110	VERTICAL
2	5460.00	47.15	54.00	-6.85	43.61	4.54	33.62	34.62	Average	175	110	VERTICAL
3	5468.40	68.99	74.00	-5.01	65.41	4.55	33.65	34.62	Peak	175	110	VERTICAL
4	5468.40	53.61	54.00	-0.39	50.03	4.55	33.65	34.62	Average	175	110	VERTICAL
5	5514.00	107.23			103.53	4.58	33.75	34.63	Peak	175	110	VERTICAL
6	5514.00	96.59			92.89	4.58	33.75	34.63	Average	175	110	VERTICAL

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

Channel 110

	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	5458.00	58.46	74.00	-15.54	54.92	4.54	33.62	34.62	Peak	176	109	VERTICAL
2	5458.80	47.60	54.00	-6.40	44.06	4.54	33.62	34.62	Average	176	109	VERTICAL
3	5464.40	47.94	54.00	-6.06	44.36	4.55	33.65	34.62	Average	176	109	VERTICAL
4	5468.40	60.20	74.00	-13.80	56.62	4.55	33.65	34.62	Peak	176	109	VERTICAL
5	5554.00	111.30			107.48	4.60	33.86	34.64	Peak	176	109	VERTICAL
6	5554.00	101.08			97.26	4.60	33.86	34.64	Average	176	109	VERTICAL

Item 5, 6 are the fundamental frequency at 5550 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Temperature	24°C	Humidity	51%
Test Engineer	Satoshi Yang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 134, 142 / Chain 1 + Chain 2 + Chain 3
Test Date	Aug. 29, 2014		

Channel 134

	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	5663.33	105.95			101.77	4.67	34.17	34.66	Peak	273	123	VERTICAL
2	5663.67	96.11			91.93	4.67	34.17	34.66	Average	273	123	VERTICAL
3	5725.00	46.09	54.00	-7.91	41.67	4.72	34.37	34.67	Average	273	123	VERTICAL
4	5725.80	60.57	74.00	-13.43	56.15	4.72	34.37	34.67	Peak	273	123	VERTICAL

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

Channel 142

	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	5707.50	109.81			105.45	4.71	34.32	34.67	Peak	252	118	VERTICAL
2	5707.50	99.37			95.01	4.71	34.32	34.67	Average	252	118	VERTICAL
3	5850.00	56.56	74.00	-17.44	51.73	4.80	34.73	34.70	Peak	252	118	VERTICAL
4	5859.00	45.39	54.00	-8.61	40.49	4.81	34.79	34.70	Average	252	118	VERTICAL

Item 1, 2 are the fundamental frequency at 5710 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Temperature	24°C	Humidity	51%
Test Engineer	Satoshi Yang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42, 58, 106 / Chain 1 + Chain 2 + Chain 3
Test Date	Aug. 29, 2014		

Channel 42

	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	5148.00	59.96	74.00	-14.04	57.10	4.34	33.14	34.62	Peak	148	115	VERTICAL
2	5148.00	48.51	54.00	-5.49	45.65	4.34	33.14	34.62	Average	148	115	VERTICAL
3	5218.33	100.55			97.54	4.38	33.25	34.62	Peak	148	115	VERTICAL
4	5223.33	90.58			87.57	4.38	33.25	34.62	Average	148	115	VERTICAL

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

Channel 58

	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	5314.17	100.78			97.54	4.45	33.41	34.62	Peak	154	100	VERTICAL
2	5314.17	90.95			87.71	4.45	33.41	34.62	Average	154	100	VERTICAL
3	5350.00	53.41	54.00	-0.59	50.10	4.47	33.46	34.62	Average	154	100	VERTICAL
4	5353.00	66.02	74.00	-7.98	62.71	4.47	33.46	34.62	Peak	154	100	VERTICAL

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

Channel 106

	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	5444.00	63.92	74.00	-10.08	60.42	4.53	33.59	34.62	Peak	164	109	VERTICAL
2	5458.00	50.51	54.00	-3.49	46.97	4.54	33.62	34.62	Average	164	109	VERTICAL
3	5466.00	66.22	74.00	-7.78	62.64	4.55	33.65	34.62	Peak	164	109	VERTICAL
4	5468.00	53.27	54.00	-0.73	49.69	4.55	33.65	34.62	Average	164	109	VERTICAL
5	5538.33	100.94			97.18	4.59	33.80	34.63	Peak	164	109	VERTICAL
6	5538.33	92.04			88.28	4.59	33.80	34.63	Average	164	109	VERTICAL

Item 5, 6 are the fundamental frequency at 5530 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Temperature	24°C	Humidity	51%
Test Engineer	Satoshi Yang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 122, 138 / Chain 1 + Chain 2 + Chain 3
Test Date	Aug. 29, 2014		

Channel 122

	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	5457.00	56.81	74.00	-17.19	53.27	4.54	33.62	34.62	Peak	176	121	VERTICAL
2	5459.00	46.36	54.00	-7.64	42.82	4.54	33.62	34.62	Average	176	121	VERTICAL
3	5466.00	59.87	74.00	-14.13	56.29	4.55	33.65	34.62	Peak	176	121	VERTICAL
4	5469.00	47.03	54.00	-6.97	43.45	4.55	33.65	34.62	Average	176	121	VERTICAL
5	5619.17	97.07			93.01	4.65	34.06	34.65	Average	176	121	VERTICAL
6	5620.00	106.63			102.57	4.65	34.06	34.65	Peak	176	121	VERTICAL

Item 5, 6 are the fundamental frequency at 5610 MHz.

Channel 138

	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	5681.67	97.75			93.51	4.68	34.22	34.66	Average	218	146	VERTICAL
2	5692.50	106.93			102.62	4.70	34.27	34.66	Peak	218	146	VERTICAL
3	5850.00	45.70	54.00	-8.30	40.87	4.80	34.73	34.70	Average	218	146	VERTICAL
4	5853.00	56.49	74.00	-17.51	51.66	4.80	34.73	34.70	Peak	218	146	VERTICAL

Item 1, 2 are the fundamental frequency at 5690 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Note:

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

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

Temperature	24°C	Humidity	51%
Test Engineer	Satoshi Yang	Configurations	IEEE 802.11a CH 36, 40, 48 / Chain 1 + Chain 2 + Chain 3
Test Date	Aug. 29, 2014		

Channel 36

	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	5103.60	41.41	54.00	-12.59	38.66	4.31	33.06	34.62	Average	147	104	VERTICAL
2	5150.00	53.55	74.00	-20.45	50.69	4.34	33.14	34.62	Peak	147	104	VERTICAL
3	5184.40	105.02			102.09	4.36	33.19	34.62	Peak	147	104	VERTICAL
4	5184.40	94.69			91.76	4.36	33.19	34.62	Average	147	104	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	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	5123.20	53.37	74.00	-20.63	50.55	4.33	33.11	34.62	Peak	150	117	VERTICAL
2	5125.20	40.53	54.00	-13.47	37.71	4.33	33.11	34.62	Average	150	117	VERTICAL
3	5203.33	103.32			100.35	4.37	33.22	34.62	Peak	150	117	VERTICAL
4	5203.33	93.04			90.07	4.37	33.22	34.62	Average	150	117	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	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	5146.40	51.12	74.00	-22.88	48.26	4.34	33.14	34.62	Peak	206	131	VERTICAL
2	5150.00	39.48	54.00	-14.52	36.62	4.34	33.14	34.62	Average	206	131	VERTICAL
3	5238.67	102.68			99.64	4.39	33.27	34.62	Peak	206	131	VERTICAL
4	5239.00	92.08			89.04	4.39	33.27	34.62	Average	206	131	VERTICAL

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

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Temperature	24°C	Humidity	51%
Test Engineer	Satoshi Yang	Configurations	IEEE 802.11a CH 52, 60, 64 / Chain 1 + Chain 2 + Chain 3
Test Date	Aug. 29, 2014		

Channel 52

	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	5254.17	109.86			106.78	4.40	33.30	34.62	Peak	149	115	VERTICAL
2	5263.33	99.19			96.06	4.42	33.33	34.62	Average	149	115	VERTICAL
3	5413.00	58.04	74.00	-15.96	54.57	4.52	33.57	34.62	Peak	149	115	VERTICAL
4	5415.00	44.24	54.00	-9.76	40.77	4.52	33.57	34.62	Average	149	115	VERTICAL

Item 1, 2 are the fundamental frequency at 5260 MHz.

Channel 60

	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	5298.67	108.65			105.45	4.44	33.38	34.62	Peak	204	142	VERTICAL
2	5299.00	98.00			94.80	4.44	33.38	34.62	Average	204	142	VERTICAL
3	5378.40	57.23	74.00	-16.77	53.85	4.49	33.51	34.62	Peak	204	142	VERTICAL
4	5378.80	45.17	54.00	-8.83	41.79	4.49	33.51	34.62	Average	204	142	VERTICAL

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

Channel 64

	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	5322.33	110.20			106.96	4.45	33.41	34.62	Peak	168	129	VERTICAL
2	5322.33	99.45			96.21	4.45	33.41	34.62	Average	168	129	VERTICAL
3	5350.00	60.22	74.00	-13.78	56.91	4.47	33.46	34.62	Peak	168	129	VERTICAL
4	5402.80	47.14	54.00	-6.86	43.72	4.50	33.54	34.62	Average	168	129	VERTICAL

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

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Temperature	24°C	Humidity	51%
Test Engineer	Satoshi Yang	Configurations	IEEE 802.11a CH 100, 140, 144 / Chain 1 + Chain 2 + Chain 3
Test Date	Aug. 29, 2014		

Channel 100

	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	5422.00	46.35	54.00	-7.65	42.88	4.52	33.57	34.62	Average	176	112	VERTICAL
2	5458.80	58.87	74.00	-15.13	55.33	4.54	33.62	34.62	Peak	176	112	VERTICAL
3	5469.20	61.24	74.00	-12.76	57.66	4.55	33.65	34.62	Peak	176	112	VERTICAL
4	5470.00	46.35	54.00	-7.65	42.77	4.55	33.65	34.62	Average	176	112	VERTICAL
5	5502.33	110.88			107.24	4.57	33.70	34.63	Peak	176	112	VERTICAL
6	5502.33	99.99			96.35	4.57	33.70	34.63	Average	176	112	VERTICAL

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

Channel 140

	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	5695.33	97.95			93.64	4.70	34.27	34.66	Average	257	119	VERTICAL
2	5696.00	109.25			104.94	4.70	34.27	34.66	Peak	257	119	VERTICAL
3	5727.00	60.02	74.00	-13.98	55.60	4.72	34.37	34.67	Peak	257	119	VERTICAL
4	5775.00	46.07	54.00	-7.93	41.47	4.75	34.53	34.68	Average	257	119	VERTICAL

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

Channel 144

	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	5726.67	108.92			104.50	4.72	34.37	34.67	Peak	221	118	VERTICAL
2	5727.50	99.53			95.11	4.72	34.37	34.67	Average	221	118	VERTICAL
3	5872.00	58.36	68.20	-9.84	53.40	4.82	34.84	34.70	Peak	221	118	VERTICAL

Item 1, 2 are the fundamental frequency at 5720 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

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	24°C	Humidity	51%
Test Engineer	Satoshi Yang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36, 40, 48 / Chain 1 + Chain 2 + Chain 3
Test Date	Aug. 30, 2014		

Channel 36

	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	5138.00	52.73	74.00	-21.27	49.91	4.33	33.11	34.62	Peak	343	100	VERTICAL
2	5150.00	40.05	54.00	-13.95	37.19	4.34	33.14	34.62	Average	343	100	VERTICAL
3	5179.20	101.63			98.70	4.36	33.19	34.62	Peak	343	100	VERTICAL
4	5181.60	91.80			88.87	4.36	33.19	34.62	Average	343	100	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	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	5125.20	42.63	54.00	-11.37	39.81	4.33	33.11	34.62	Average	349	147	VERTICAL
2	5138.40	54.56	74.00	-19.44	51.74	4.33	33.11	34.62	Peak	349	147	VERTICAL
3	5202.00	94.43			91.46	4.37	33.22	34.62	Average	349	147	VERTICAL
4	5202.80	105.89			102.92	4.37	33.22	34.62	Peak	349	147	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	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	5150.00	53.58	74.00	-20.42	50.72	4.34	33.14	34.62	Peak	208	100	VERTICAL
2	5150.00	41.46	54.00	-12.54	38.60	4.34	33.14	34.62	Average	208	100	VERTICAL
3	5238.80	102.61			99.57	4.39	33.27	34.62	Peak	208	100	VERTICAL
4	5239.20	93.17			90.13	4.39	33.27	34.62	Average	208	100	VERTICAL

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

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Temperature	24°C	Humidity	51%
Test Engineer	Satoshi Yang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 52, 60, 64 / Chain 1 + Chain 2 + Chain 3
Test Date	Aug. 30, 2014		

Channel 52

	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	5266.00	108.31			105.18	4.42	33.33	34.62	Peak	148	100	VERTICAL
2	5268.00	98.93			95.80	4.42	33.33	34.62	Average	148	100	VERTICAL
3	5414.00	56.90	74.00	-17.10	53.43	4.52	33.57	34.62	Peak	148	100	VERTICAL
4	5419.00	45.08	54.00	-8.92	41.61	4.52	33.57	34.62	Average	148	100	VERTICAL

Item 1, 2 are the fundamental frequency at 5260 MHz.

Channel 60

	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	5293.20	99.70			96.50	4.44	33.38	34.62	Average	332	100	VERTICAL
2	5299.20	110.05			106.85	4.44	33.38	34.62	Peak	332	100	VERTICAL
3	5371.60	57.89	74.00	-16.11	54.54	4.48	33.49	34.62	Peak	332	100	VERTICAL
4	5372.40	46.57	54.00	-7.43	43.22	4.48	33.49	34.62	Average	332	100	VERTICAL

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

Channel 64

	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	5317.20	100.16			96.92	4.45	33.41	34.62	Average	174	144	VERTICAL
2	5318.40	109.71			106.47	4.45	33.41	34.62	Peak	174	144	VERTICAL
3	5350.00	60.99	74.00	-13.01	57.68	4.47	33.46	34.62	Peak	174	144	VERTICAL
4	5399.20	46.89	54.00	-7.11	43.47	4.50	33.54	34.62	Average	174	144	VERTICAL

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

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Temperature	24°C	Humidity	51%
Test Engineer	Satoshi Yang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 100, 140, 144 / Chain 1 + Chain 2 + Chain 3
Test Date	Aug. 30, 2014		

Channel 100

	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	5418.00	59.37	74.00	-14.63	55.90	4.52	33.57	34.62	Peak	165	100	VERTICAL
2	5421.20	48.04	54.00	-5.96	44.57	4.52	33.57	34.62	Average	165	100	VERTICAL
3	5470.00	62.52	74.00	-11.48	58.94	4.55	33.65	34.62	Peak	165	100	VERTICAL
4	5470.00	47.99	54.00	-6.01	44.41	4.55	33.65	34.62	Average	165	100	VERTICAL
5	5498.80	100.15			96.50	4.57	33.70	34.62	Average	165	100	VERTICAL
6	5500.40	110.30			106.65	4.57	33.70	34.62	Peak	165	100	VERTICAL

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

Channel 140

	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	5702.40	108.61			104.24	4.71	34.32	34.66	Peak	213	104	VERTICAL
2	5703.20	97.79			93.42	4.71	34.32	34.66	Average	213	104	VERTICAL
3	5725.00	59.67	74.00	-14.33	55.25	4.72	34.37	34.67	Peak	213	104	VERTICAL
4	5725.00	46.96	54.00	-7.04	42.54	4.72	34.37	34.67	Average	213	104	VERTICAL

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

Channel 144

	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	5722.00	106.13			101.71	4.72	34.37	34.67	Peak	320	154	VERTICAL
2	5722.00	97.64			93.22	4.72	34.37	34.67	Average	320	154	VERTICAL
3	5850.00	44.38	54.00	-9.62	39.55	4.80	34.73	34.70	Average	320	154	VERTICAL
4	5860.00	56.43	74.00	-17.57	51.53	4.81	34.79	34.70	Peak	320	154	VERTICAL

Item 1, 2 are the fundamental frequency at 5720 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Temperature	24°C	Humidity	51%
Test Engineer	Satoshi Yang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38, 46 / Chain 1 + Chain 2 + Chain 3
Test Date	Aug. 30, 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	5150.00	58.70	74.00	-15.30	55.84	4.34	33.14	34.62	Peak	164	147	VERTICAL
2	5150.00	46.05	54.00	-7.95	43.19	4.34	33.14	34.62	Average	164	147	VERTICAL
3	5201.60	101.91			98.94	4.37	33.22	34.62	Peak	164	147	VERTICAL
4	5202.40	92.29			89.32	4.37	33.22	34.62	Average	164	147	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	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	5144.40	55.46	74.00	-18.54	52.60	4.34	33.14	34.62	Peak	164	147	VERTICAL
2	5150.00	42.55	54.00	-11.45	39.69	4.34	33.14	34.62	Average	164	147	VERTICAL
3	5223.60	91.55			88.54	4.38	33.25	34.62	Average	164	147	VERTICAL
4	5226.40	100.58			97.54	4.39	33.27	34.62	Peak	164	147	VERTICAL

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

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Temperature	24℃	Humidity	51%
Test Engineer	Satoshi Yang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 54, 62 / Chain 1 + Chain 2 + Chain 3
Test Date	Aug. 30, 2014		

Channel 54

	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	5275.40	98.24			95.11	4.42	33.33	34.62	Average	340	103	VERTICAL
2	5285.00	107.81			104.65	4.43	33.35	34.62	Peak	340	103	VERTICAL
3	5356.40	46.71	54.00	-7.29	43.40	4.47	33.46	34.62	Average	340	103	VERTICAL
4	5361.40	57.96	74.00	-16.04	54.61	4.48	33.49	34.62	Peak	340	103	VERTICAL

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

Channel 62

	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	5315.20	94.81			91.57	4.45	33.41	34.62	Average	174	101	VERTICAL
2	5324.00	103.49			100.25	4.45	33.41	34.62	Peak	174	101	VERTICAL
3	5350.00	48.60	54.00	-5.40	45.29	4.47	33.46	34.62	Average	174	101	VERTICAL
4	5352.40	62.96	74.00	-11.04	59.65	4.47	33.46	34.62	Peak	174	101	VERTICAL

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

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Temperature	24°C	Humidity	51%
Test Engineer	Satoshi Yang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 102, 110 / Chain 1 + Chain 2 + Chain 3
Test Date	Aug. 30, 2014		

Channel 102

	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	5459.60	61.42	74.00	-12.58	57.88	4.54	33.62	34.62	Peak	164	100	VERTICAL
2	5460.00	48.83	54.00	-5.17	45.29	4.54	33.62	34.62	Average	164	100	VERTICAL
3	5468.00	70.12	74.00	-3.88	66.54	4.55	33.65	34.62	Peak	164	100	VERTICAL
4	5470.00	53.90	54.00	-0.10	50.32	4.55	33.65	34.62	Average	164	100	VERTICAL
5	5503.20	107.01			103.37	4.57	33.70	34.63	Peak	164	100	VERTICAL
6	5504.80	97.04			93.40	4.57	33.70	34.63	Average	164	100	VERTICAL

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

Channel 110

	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	5456.64	44.26	54.00	-9.74	40.72	4.54	33.62	34.62	Average	175	109	VERTICAL
2	5457.12	56.36	74.00	-17.64	52.82	4.54	33.62	34.62	Peak	175	109	VERTICAL
3	5463.27	56.88	74.00	-17.12	53.30	4.55	33.65	34.62	Peak	175	109	VERTICAL
4	5467.76	45.24	54.00	-8.76	41.66	4.55	33.65	34.62	Average	175	109	VERTICAL
5	5545.19	98.18			94.42	4.59	33.80	34.63	Average	175	109	VERTICAL
6	5546.15	107.79			104.03	4.59	33.80	34.63	Peak	175	109	VERTICAL

Item 5, 6 are the fundamental frequency at 5550 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Temperature	24°C	Humidity	51%
Test Engineer	Satoshi Yang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 134, 142 / Chain 1 + Chain 2 + Chain 3
Test Date	Aug. 30, 2014		

Channel 134

	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	5681.22	106.07			101.83	4.68	34.22	34.66	Peak	275	107	VERTICAL
2	5682.50	96.66			92.42	4.68	34.22	34.66	Average	275	107	VERTICAL
3	5732.37	56.88	74.00	-17.12	52.46	4.72	34.37	34.67	Peak	275	107	VERTICAL
4	5744.55	45.35	54.00	-8.65	40.87	4.73	34.42	34.67	Average	275	107	VERTICAL

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

Channel 142

	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	5692.37	96.28			91.97	4.70	34.27	34.66	Average	268	141	VERTICAL
2	5695.58	105.65			101.34	4.70	34.27	34.66	Peak	268	141	VERTICAL
3	5850.00	43.22	54.00	-10.78	38.39	4.80	34.73	34.70	Average	268	141	VERTICAL
4	5877.24	55.76	74.00	-18.24	50.80	4.82	34.84	34.70	Peak	268	141	VERTICAL

Item 1, 2 are the fundamental frequency at 5710 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Temperature	24°C	Humidity	51%
Test Engineer	Satoshi Yang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 42, 58, 106 / Chain 1 + Chain 2 + Chain 3
Test Date	Aug. 30, 2014		

Channel 42

	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	5148.40	59.77	74.00	-14.23	56.91	4.34	33.14	34.62	Peak	168	148	VERTICAL
2	5150.00	45.89	54.00	-8.11	43.03	4.34	33.14	34.62	Average	168	148	VERTICAL
3	5200.39	98.00			95.03	4.37	33.22	34.62	Peak	168	148	VERTICAL
4	5201.19	87.38			84.41	4.37	33.22	34.62	Average	168	148	VERTICAL

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

Channel 58

	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	5147.60	53.73	74.00	-20.27	50.87	4.34	33.14	34.62	Peak	340	100	VERTICAL
2	5150.00	41.39	54.00	-12.61	38.53	4.34	33.14	34.62	Average	340	100	VERTICAL
3	5294.81	103.20			100.00	4.44	33.38	34.62	Peak	340	100	VERTICAL
4	5317.24	90.97			87.73	4.45	33.41	34.62	Average	340	100	VERTICAL
5	5350.00	52.30	54.00	-1.70	48.99	4.47	33.46	34.62	Average	340	100	VERTICAL
6	5361.22	67.82	74.00	-6.18	64.47	4.48	33.49	34.62	Peak	340	100	VERTICAL

Item 3, 4 are the fundamental frequency at 5290 MHz.

Channel 106

	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	5444.78	65.47	74.00	-8.53	61.97	4.53	33.59	34.62	Peak	157	110	VERTICAL
2	5460.00	49.94	54.00	-4.06	46.40	4.54	33.62	34.62	Average	157	110	VERTICAL
3	5465.19	65.86	74.00	-8.14	62.28	4.55	33.65	34.62	Peak	157	110	VERTICAL
4	5465.19	51.46	54.00	-2.54	47.88	4.55	33.65	34.62	Average	157	110	VERTICAL
5	5538.81	91.53			87.77	4.59	33.80	34.63	Average	157	110	VERTICAL
6	5557.24	102.47			98.65	4.60	33.86	34.64	Peak	157	110	VERTICAL

Item 5, 6 are the fundamental frequency at 5530 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Temperature	24°C	Humidity	51%
Test Engineer	Satoshi Yang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 122, 138 / Chain 1 + Chain 2 + Chain 3
Test Date	Aug. 30, 2014		

Channel 122

	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	5573.94	92.81			88.92	4.62	33.91	34.64	Average	254	145	VERTICAL
2	5622.82	103.48			99.42	4.65	34.06	34.65	Peak	254	145	VERTICAL
3	5725.00	55.53	74.00	-18.47	51.11	4.72	34.37	34.67	Peak	254	145	VERTICAL
4	5725.00	44.79	54.00	-9.21	40.37	4.72	34.37	34.67	Average	254	145	VERTICAL

Item 1, 2 are the fundamental frequency at 5610 MHz.

Channel 138

	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	5676.38	102.98			98.74	4.68	34.22	34.66	Peak	268	106	VERTICAL
2	5676.38	91.96			87.72	4.68	34.22	34.66	Average	268	106	VERTICAL
3	5850.00	43.03	54.00	-10.97	38.20	4.80	34.73	34.70	Average	268	106	VERTICAL
4	5865.22	55.67	74.00	-18.33	50.77	4.81	34.79	34.70	Peak	268	106	VERTICAL

Item 1, 2 are the fundamental frequency at 5690 MHz.

Note: Both antenna polarizations have been tested and only the worst case was recorded in test report.

Note:

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

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

4.4. Antenna Requirements

4.4.1. 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.

4.4.2. 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
BILOG ANTENNA	Schaffner	CBL6112D	22021	20MHz ~ 2GHz	May 26, 2014	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	Nov. 01, 2013	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Dec. 17, 2013	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Nov. 12, 2013	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Dec. 16, 2013	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26GHz ~ 40GHz	Oct. 23, 2013	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. 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	100979	9kHz~40GHz	Nov. 29, 2013	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. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-8	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-9	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-10	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-11	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
Power Sensor	Anritsu	MA2411B	0917223	300MHz~40GHz	Sep. 18, 2013	Conducted (TH01-CB)
Power Meter	Anritsu	ML2495A	1035008	300MHz~40GHz	Sep. 18, 2013	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
Radiated Emission (30MHz ~ 1,000MHz)	3.6 dB	Confidence levels of 95%
Conducted Emission	1.7 dB	Confidence levels of 95%