



SPORTON International Inc.

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

FCC RADIO TEST REPORT

Applicant's company	Broadcom Corporation
Applicant Address	190 Mathilda Place Sunnyvale CA 94086 U.S.A.
FCC ID	QDS-BRCM1075
Manufacturer's company	Broadcom Corporation
Manufacturer Address	190 Mathilda Place Sunnyvale CA 94086 U.S.A.

Product Name	Broadcom 802.11a/b/g/n/ac WLAN + Bluetooth 4.0 NGFF2230 Mini Card
Brand Name	Broadcom
Model No.	BCM943162ZP
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5150 ~ 5350MHz / 5470 ~ 5725MHz
Received Date	Dec. 25, 2013
Final Test Date	Apr. 28, 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 (5150 ~ 5350MHz / 5470 ~ 5725MHz) 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 C63.4-2003, 47 CFR FCC Part 15 Subpart E, KDB 789033 D01 v01r03, KDB 662911 D01 v02r01, KDB644545 D01v01r02.

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



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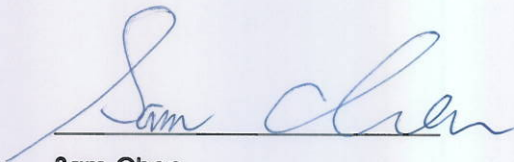
History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR3D2546-02AB	Rev. 01	Initial issue of report	Apr. 30, 2014
FR3D2546-02AB	Rev. 02	Revising the model name of antenna to "PCA-4077-25GC1-A1" from "PCA-4077-25GC1-A1-RT".	May 05, 2014

1. CERTIFICATE OF COMPLIANCE

Product Name : Broadcom 802.11a/b/g/n/ac WLAN + Bluetooth 4.0 NGFF2230 Mini Card
Brand Name : Broadcom
Model No. : BCM943162ZP
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 Dec. 25, 2013 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.



Sam Chen

SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart E				
Part	Rule Section	Description of Test	Result	Under Limit
4.1	15.407(a)	Maximum Conducted Output Power	Complies	0.06 dB
4.2	15.407(a)	Power Spectral Density	Complies	0.24 dB
4.3	15.407(a)	Peak Excursion	Complies	2.63 dB
4.4	15.407(b)	Radiated Emissions	Complies	0.17 dB
4.5	15.407(b)	Band Edge Emissions	Complies	0.04 dB
4.6	15.203	Antenna Requirements	Complies	-

3. GENERAL INFORMATION

3.1. Product Details

IEEE 802.11n / ac

Items	Description
Product Type	WLAN (1TX, 1RX)
Radio Type	Intentional Transceiver
Power Type	From host system
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
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

IEEE 802.11a

Items	Description
Product Type	WLAN (1TX, 1RX)
Radio Type	Intentional Transceiver
Power Type	From host system
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
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Antenna and Band width

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

IEEE 11n / ac Spec.

Protocol	Number of Transmit Chains (NTX)	Data Rate / MCS
802.11n (HT20)	1	MCS 0-7
802.11n (HT40)	1	MCS 0-7
802.11ac (VHT20)	1	MCS 0-9/Nss1
802.11ac (VHT40)	1	MCS 0-9/Nss1
802.11ac (VHT80)	1	MCS 0-9/Nss1

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

Then EUT 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:

11a: IEEE 802.11a, HT20/HT40: IEEE 802.11n, VHT20/VHT40/VHT80: IEEE 802.11ac

3.2. Accessories

N/A

3.3. Table for Filed Antenna

Set	Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)				
						2.4GHz	5GHz B1	5GHz B2	5GHz B3	5GHz B4
1	1	MAG.LAYERS	PCA-4077-25GC1-A1	WLAN/BT antenna	IPEX A13	3.33	5.85	5.85	6.21	6.21
	2	MAG.LAYERS	PCA-4077-25GC1-A1	WLAN/BT antenna	IPEX A13	3.33	5.85	5.85	6.21	6.21

Note1: The each set has two antennas.

For 2.4G:

For IEEE 802.11b/g/n mode (1TX/1RX)

The EUT supports the antenna with TX/RX diversity function.

Both Chain 1 and Chain 2 can be used as transmitting/receiving antenna, but only one antenna can be used as transmitting/receiving antenna at the same time.

Chain 1 generated the worst case than Chain 2, so it tested and recorded in the report.

For 5G:

For IEEE 802.11a/n/ac mode (1TX/1RX)

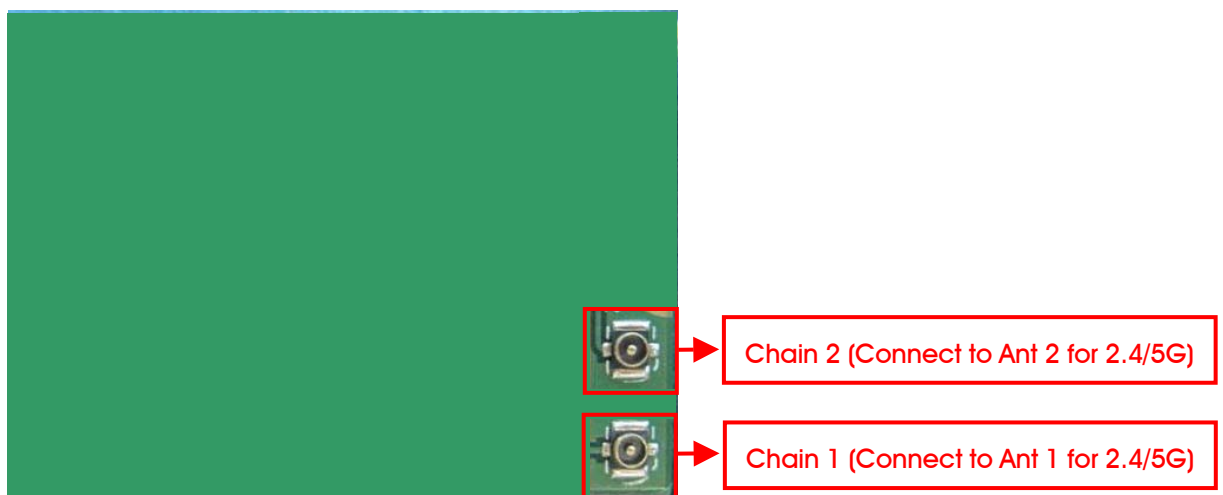
The EUT supports the antenna with TX/RX diversity function.

Both Chain 1 and Chain 2 can be used as transmitting/receiving antenna, but only one antenna can be used as transmitting/receiving antenna at the same time.

Chain 1 generated the worst case than Chain 2, so it tested and recorded in the report.

For Bluetooth mode (1TX/1RX)

Only Chain 1 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 Product Information

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

3.6. 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	11ac 20MHz	Band 1-3	MCS0/Nss1	36/40/48/52/60/64/ 100/116/140/144	1
	11ac 40MHz	Band 1-3	MCS0/Nss1	38/46/54/62/ 102/110/134/142	1
	11ac 80MHz	Band 1-3	MCS0/Nss1	42/58/106/122/138	1
	11a/BPSK	Band 1-3	6Mbps	36/40/48/52/60/64/ 100/116/140/144	1
Power Spectral Density	11ac 20MHz	Band 1-3	MCS0/Nss1	36/40/48/52/60/64/ 100/116/140/144	1
	11ac 40MHz	Band 1-3	MCS0/Nss1	38/46/54/62/ 102/110/134/142	1
	11ac 80MHz	Band 1-3	MCS0/Nss1	42/58/106/122/138	1
	11a/BPSK	Band 1-3	6Mbps	36/40/48/52/60/64/ 100/116/140/144	1
Peak Excursion	11ac 20MHz	Band 1-3	MCS0/Nss1	48/52/116	1
	11ac 40MHz	Band 1-3	MCS0/Nss1	46/54/110	1
	11ac 80MHz	Band 1-3	MCS0/Nss1	42/58/138	1
	11a/BPSK	Band 1-3	6Mbps	40/52/144	1
Radiated Emission Below 1GHz	Normal Link		-	-	-
Radiated Emission Above 1GHz	11ac 20MHz	Band 1-3	MCS0/Nss1	36/40/48/52/60/64/ 100/116/140/144	1
	11ac 40MHz	Band 1-3	MCS0/Nss1	38/46/54/62/ 102/110/134/142	1
	11ac 80MHz	Band 1-3	MCS0/Nss1	42/58/106/122/138	1
	11a/BPSK	Band 1-3	6Mbps	36/40/48/52/60/64/ 100/116/140/144	1
Band Edge Emission	11ac 20MHz	Band 1-3	MCS0/Nss1	36/40/48/52/60/64/ 100/116/140/144	1
	11ac 40MHz	Band 1-3	MCS0/Nss1	38/46/54/62/ 102/110/134/142	1

	11ac 80MHz	Band 1-3	MCS0/Nss1	42/58/106/122/138	1
	11a/BPSK	Band 1-3	6Mbps	36/40/48/52/60/64/ 100/116/140/144	1

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. Normal Link -2.4GHz WLAN function + Bluetooth function

Mode 2. Normal Link -5GHz WLAN function + Bluetooth function

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

For Radiated Emission Above 1GHz test:

Mode 1. CTX-EUT

3.7. Table for Testing Locations

Test Site Location					
Address:	No.8, Lane 724, Bo-ai St., Jhubei City, Hsinchu County 302, Taiwan, R.O.C.				
TEL:	886-3-656-9065				
FAX:	886-3-656-9085				
Test Site No.	Site Category	Location	FCC 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).

3.8. Table for Class II Change

This product is an extension of original one reported under Sporton project number: FR3D2546AB

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

Modifications	Performance Checking
1. Adding a new antenna (Brand: MAG. LAYERS, Model No.: PCA-4077-25GC1-A1) for this device. 2. The application of this module increases to portable host equipment. The module is limited to use the new antenna (Brand: MAG. LAYERS, Model No.: PCA-4077-25GC1-A1) when it is defined as portable device.	1. Output Power Measurement 2. Power Spectral Density Measurement 3. Peak Excursion Measurement 4. Radiated Emissions 5. Band Edge

Note: New antenna and original antenna are the same type, but the gain of new antenna is higher than the original one in 5GHz. Thus, we checked the test items above.

3.9. Table for Supporting Units

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

Support Unit	Brand	Model	FCC ID
Wireless AP	Planex	GW-AP54SGX	N/A
NB	DELL	E6430	DoC
NB	DELL	E6220	DoC
Mouse	Logitech	M-U0026	DoC
Earphone	SHYARO CHI	MIC-04	N/A
Test fixture*2	Broadcom	BCM9NGFF2EC_1	N/A
Broadcom 802.11a/b/g/n/ac WLAN + Bluetooth 4.0 NGFF2230 Mini Card (Device)	Broadcom	BCM943162ZP	QDS-BRCM1075

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

Support Unit	Brand	Model	FCC ID
NB	DELL	E6220	DoC
Test fixture	Broadcom	BCM9NGFF2EC_1	N/A

For Test Site No: TH01-CB

Support Unit	Brand	Model	FCC ID
NB	DELL	E6510	N/A
Test fixture	Broadcom	BCM9NGFF2EC_1	N/A

3.10. Table for Parameters of Test Software Setting

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

Power Parameters of IEEE 802.11ac MCS0/Nss1 20MHz

Test Software Version	Mtool 2.0.1.5									
Frequency	5180 MHz	5200 MHz	5240 MHz	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz	5720 MHz
MCS0/Nss1 20MHz	67	70	70	86	84	68	63	79	64	80

Power Parameters of IEEE 802.11ac MCS0/Nss1 40MHz

Test Software Version	Mtool 2.0.1.5							
Frequency	5190 MHz	5230 MHz	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz	5710 MHz
MCS0/Nss1 40MHz	49	69	72	63	47	81	69	86

Power Parameters of IEEE 802.11ac MCS0/Nss1 80MHz

Test Software Version	Mtool 2.0.1.5				
Frequency	5210 MHz	5290 MHz	5530 MHz	5610 MHz	5690 MHz
MCS0/Nss1 80MHz	50	63	55	76	86

Power Parameters of IEEE 802.11a

Test Software Version	Mtool 2.0.1.5									
Frequency	5180 MHz	5200 MHz	5240 MHz	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz	5720 MHz
802.11a	69	70	70	86	86	71	67	78	66	83

3.11. EUT Operation during Test

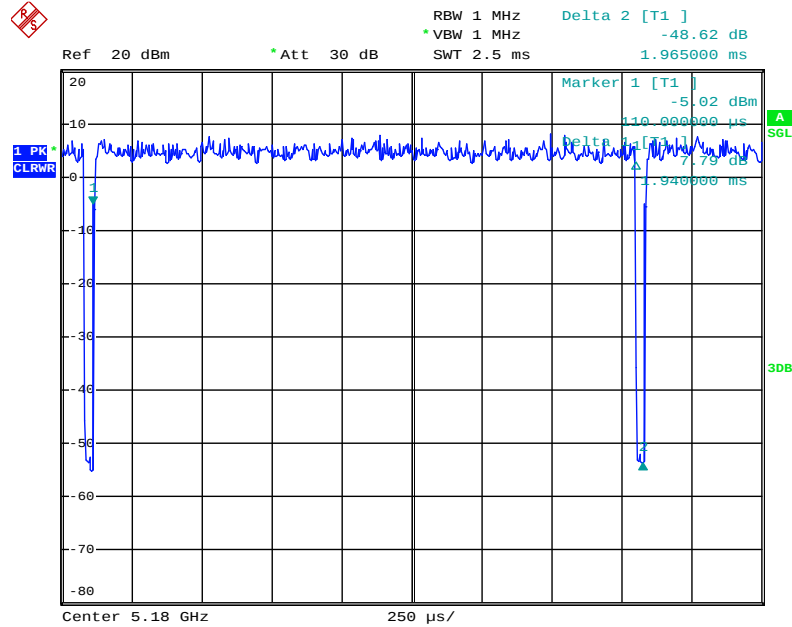
The EUT was programmed to be in continuously transmitting mode.

3.12. Test Signal Duty Cycle

Band	Mode	TX-on (ms)	TX-on+TX-off (ms)	TX-on/(TX-on+TX-off)x100=Duty cycle (%)
5G	802.11ac MCS0/Nss1 20MHz	1.94	1.965	98.73
	802.11ac MCS0/Nss1 40MHz	0.96	0.985	97.46
	802.11ac MCS0/Nss1 80MHz	0.46	0.485	94.85
	802.11a	2.075	2.1	98.81

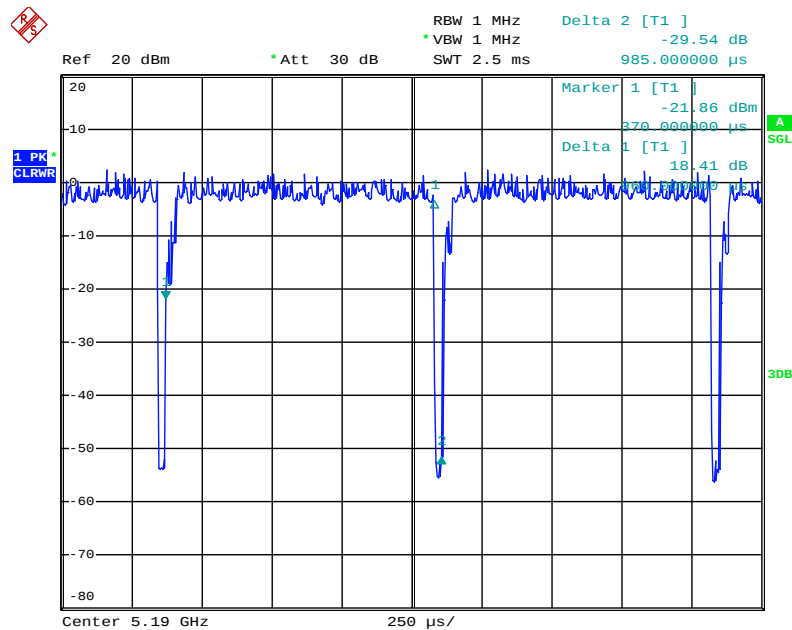
3.13. Plots of Duty Cycle

IEEE 802.11ac MCS0/Nss1 20MHz



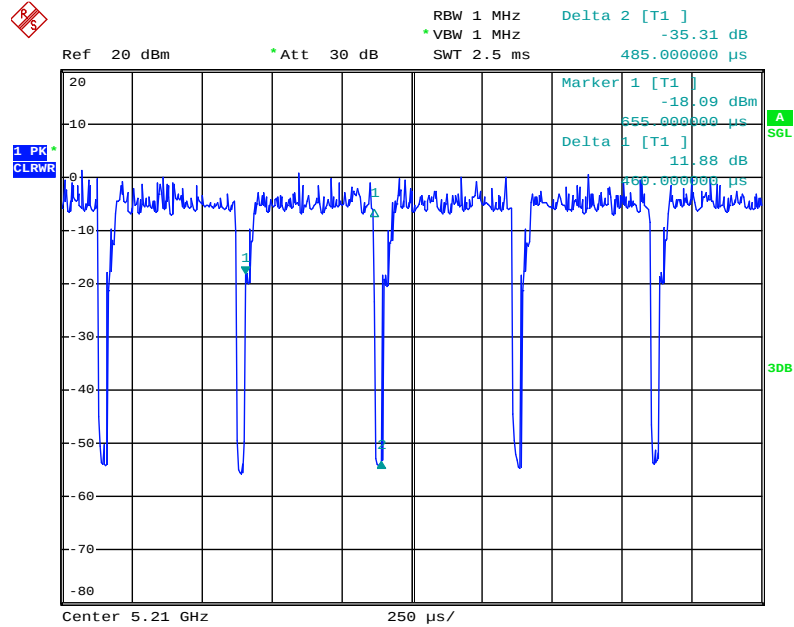
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IEEE 802.11ac MCS0/Nss1 40MHz



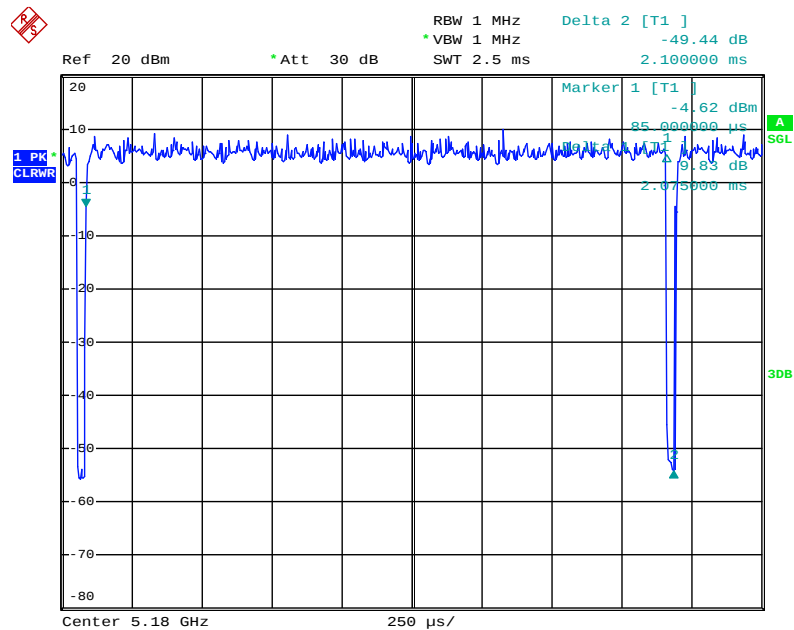
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IEEE 802.11ac MCS0/Nss1 80MHz



Date: 22.JAN.2014 23:45:34

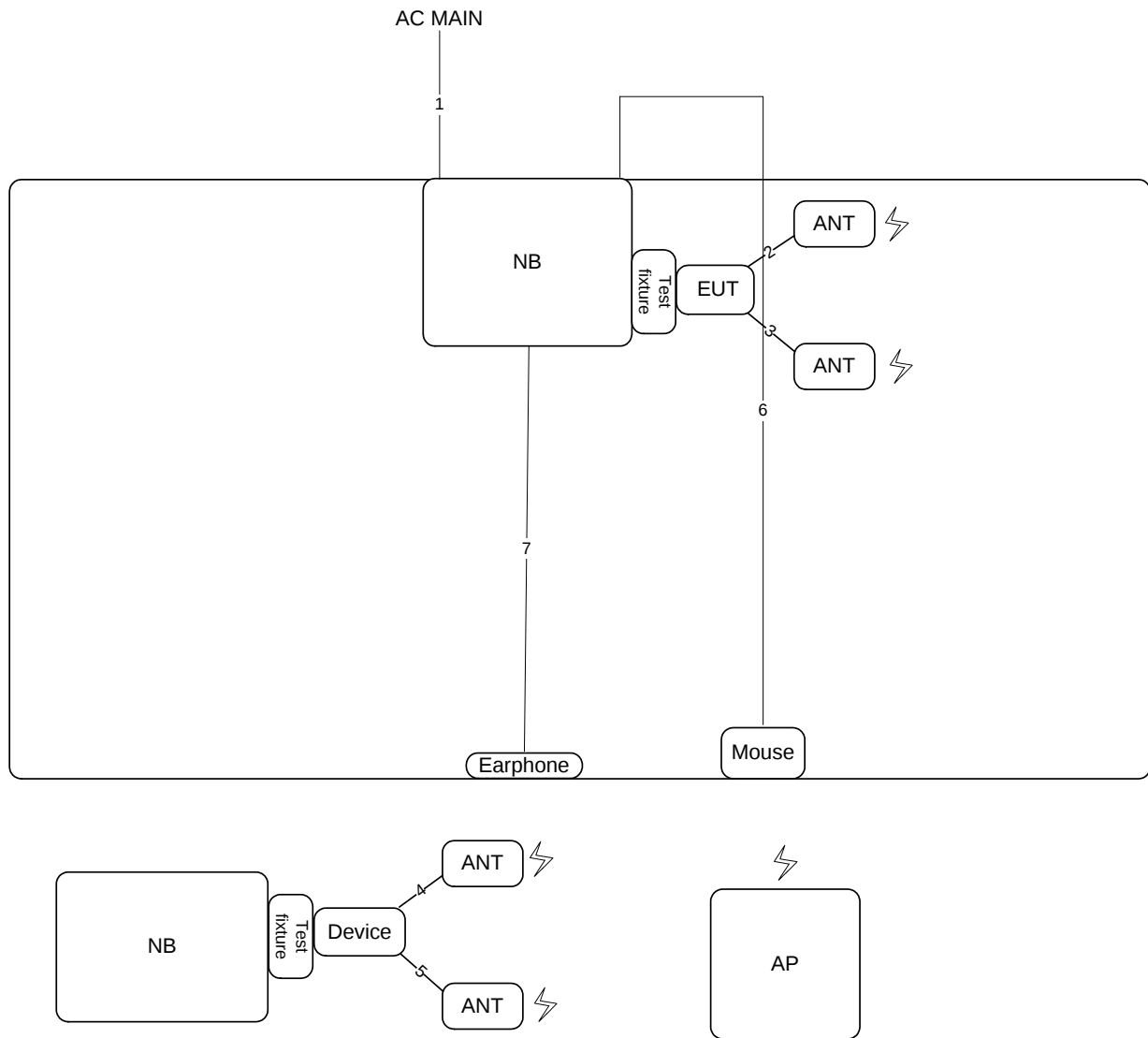
IEEE 802.11a



Date: 22.JAN.2014 23:37:24

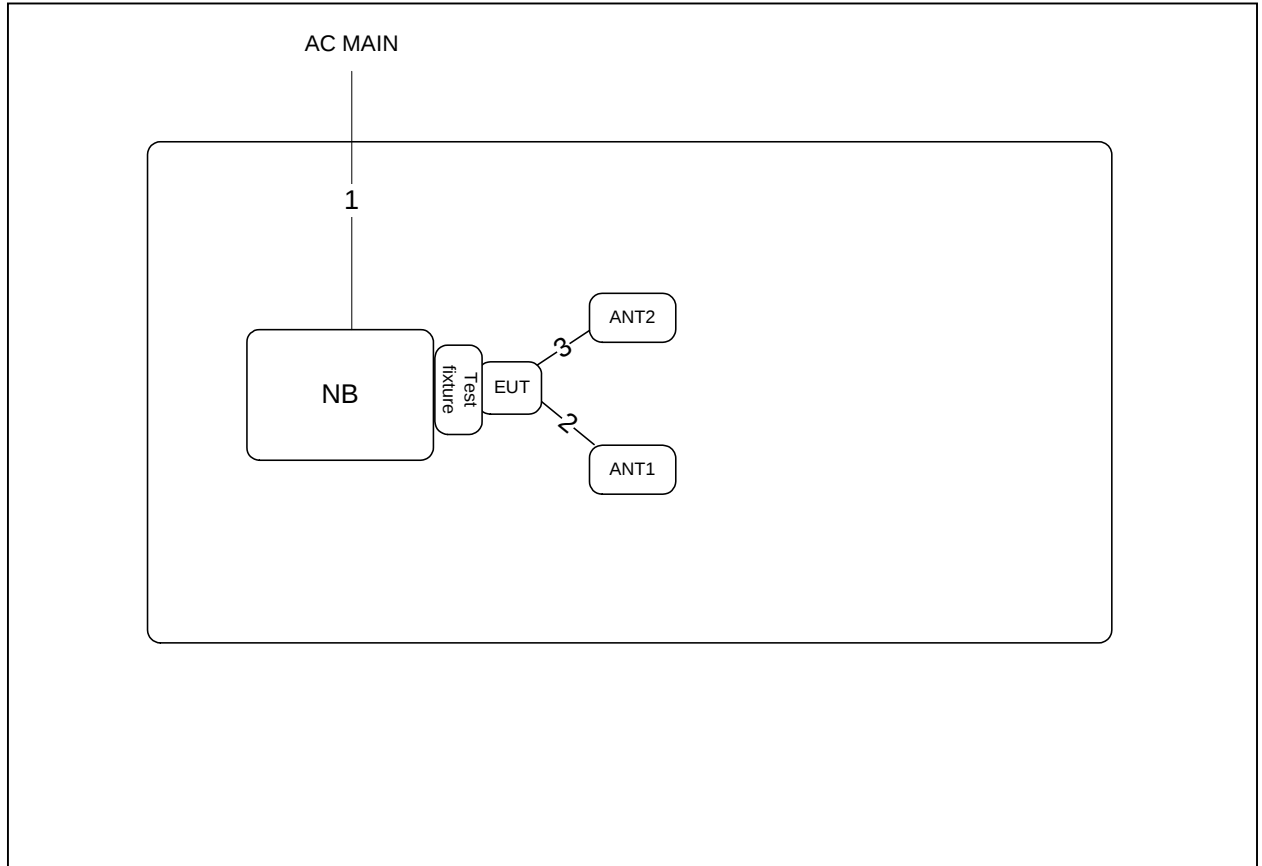
3.14. Test Configurations

3.14.1. Radiation Emissions Below 1GHz Test Configuration



Item	Connection	Shielded	Length
1	Power cable	No	2.6m
2	ANT cable	Yes	0.2m
3	ANT cable	Yes	0.2m
4	ANT cable	Yes	0.2m
5	ANT cable	Yes	0.2m
6	USB cable	Yes	1.8m
7	Audio cable	No	1.1m

3.14.2. Radiation Emissions Above 1GHz Test Configuration



Item	Connection	Shielded	Length
1	Power cable	No	2.6m
2	ANT cable	Yes	0.2m
3	ANT cable	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 $4 \text{ dBm} + 10\log B$, 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 peak 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 $11 \text{ dBm} + 10\log B$, 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 peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

4.1.2. Measuring Instruments and Setting

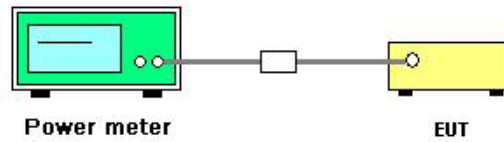
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

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 KDB 789033 D01 v01r03 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - Part 15, Subpart E, section (E) Maximum conducted output power => (3) Method PM (Measurement using an RF average power meter) Multiple antenna systems was performed in accordance with KDB 662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
3. 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	53%
Test Engineer	Magic Lai	Configurations	IEEE 802.11ac
Test Date	Apr. 28, 2014		

Configuration IEEE 802.11ac MCS0/Nss1 20MHz

Channel	Frequency	Duty Factor (dB)	Conducted Power (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	0.06	16.25	17.00	Complies
40	5200 MHz		16.79	17.00	Complies
48	5240 MHz		16.86	17.00	Complies
52	5260 MHz		21.25	24.00	Complies
60	5300 MHz		20.79	24.00	Complies
64	5320 MHz		16.69	24.00	Complies
100	5500 MHz		16.29	23.79	Complies
116	5580 MHz		19.78	23.79	Complies
140	5700 MHz		15.45	23.79	Complies
144	5720 MHz		19.23	23.79	Complies

Note: ANT Gain=6.21dBi> 6dBi, so the conducted power limit =24-(6.21dBi-6)=23.79dBm

Configuration IEEE 802.11ac MCS0/Nss1 40MHz

Channel	Frequency	Duty Factor (dB)	Conducted Power (dBm)	Max. Limit (dBm)	Result
38	5190 MHz	0.11	11.53	17.00	Complies
46	5230 MHz		16.79	17.00	Complies
54	5270 MHz		18.05	24.00	Complies
62	5310 MHz		15.55	24.00	Complies
102	5510 MHz		12.05	23.79	Complies
110	5550 MHz		21.05	23.79	Complies
134	5670 MHz		17.32	23.79	Complies
142	5710 MHz		20.87	23.79	Complies

Note: ANT Gain=6.21dBi> 6dBi, so the conducted power limit =24-(6.21dBi-6)=23.79dBm

Configuration IEEE 802.11ac MCS0/Nss1 80MHz

Channel	Frequency	Duty Factor (dB)	Conducted Power (dBm)	Max. Limit (dBm)	Result
42	5210 MHz	0.23	11.86	17.00	Complies
58	5290 MHz		15.35	24.00	Complies
106	5530 MHz		14.04	23.79	Complies
122	5610 MHz		18.21	23.79	Complies
138	5690 MHz		20.17	23.79	Complies

Note: ANT Gain=6.21dBi> 6dBi, so the conducted power limit =24-(6.21dBi-6)=23.79dBm

Temperature	20°C	Humidity	53%
Test Engineer	Magic Lai	Configurations	IEEE 802.11a
Test Date	Apr. 28, 2014		

Configuration IEEE 802.11a

Channel	Frequency	Duty Factor (dB)	Conducted Power (dBm)	Max. Limit (dBm)	Result
36	5180 MHz	0.05	16.70	17.00	Complies
40	5200 MHz		16.94	17.00	Complies
48	5240 MHz		16.91	17.00	Complies
52	5260 MHz		21.23	24.00	Complies
60	5300 MHz		21.22	24.00	Complies
64	5320 MHz		17.58	24.00	Complies
100	5500 MHz		17.34	23.79	Complies
116	5580 MHz		18.58	23.79	Complies
140	5700 MHz		16.01	23.79	Complies
144	5720 MHz		20.15	23.79	Complies

Note: ANT Gain=6.21 dBi > 6dBi, so the conducted power limit = 24-(6.21 dBi-6)=23.79dBm

4.2. Power Spectral Density Measurement

4.2.1. Limit

The power spectral density is defined as the highest level of power in dBm per MHz generated by the transmitter within the power envelope. The following table is power spectral density limits and decrease power density limit rule refer to section 4.1.1.

Frequency Range	Power Spectral Density limit (dBm/MHz)
5.15~5.25 GHz	4
5.25-5.35 GHz	11
5.470-5.725 GHz	11

4.2.2. Measuring Instruments and Setting

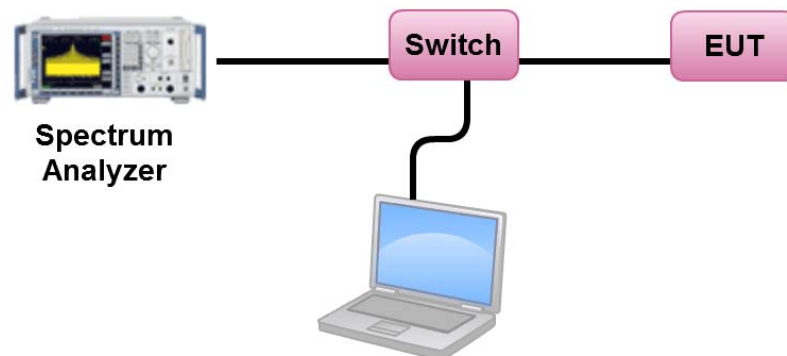
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.2.3. Test Procedures

1. The transmitter output (antenna port) was connected RF switch to the spectrum analyzer.
2. Test was performed in accordance with KDB 789033 D01 v01r03 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices – Part 15, Subpart E, section © Maximum conducted output power => (d) Method SA-2 (trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).
3. Multiple antenna systems was performed in accordance KDB 662911 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.

4.2.4. Test Setup Layout



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 Power Spectral Density

Temperature	20°C	Humidity	53%
Test Engineer	Magic Lai	Configurations	IEEE 802.11n
Test Date	Apr. 28, 2014		

Configuration IEEE 802.11ac MCS0/Nss1 20MHz / Chain 1

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	2.77	4.00	Complies
40	5200 MHz	3.62	4.00	Complies
48	5240 MHz	3.29	4.00	Complies
52	5260 MHz	7.78	11.00	Complies
60	5300 MHz	7.33	11.00	Complies
64	5320 MHz	3.28	11.00	Complies
100	5500 MHz	2.44	10.79	Complies
116	5580 MHz	5.79	10.79	Complies
140	5700 MHz	1.88	10.79	Complies
144	5720 MHz	5.58	10.79	Complies

Note: ANT Gain=6.21dBi >6dBi, So Band3 Limit = 11-(6.21-6)=10.79dBm/MHz

Configuration IEEE 802.11ac MCS0/Nss1 40MHz / Chain 1

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	-4.37	4.00	Complies
46	5230 MHz	0.24	4.00	Complies
54	5270 MHz	1.53	11.00	Complies
62	5310 MHz	-0.60	11.00	Complies
102	5510 MHz	-4.89	10.79	Complies
110	5550 MHz	3.70	10.79	Complies
134	5670 MHz	0.63	10.79	Complies
142	5710 MHz	4.06	10.79	Complies

Note: ANT Gain=6.21dBi >6dBi, So Band3 Limit = 11-(6.21-6)=10.79dBm/MHz

Configuration IEEE 802.11ac MCS0/Nss1 80MHz / Chain 1

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
42	5210 MHz	-7.38	4.00	Complies
58	5290 MHz	-3.87	11.00	Complies
106	5530 MHz	-5.95	10.79	Complies
122	5610 MHz	-0.74	10.79	Complies
138	5690 MHz	0.30	10.79	Complies

Note: ANT Gain=6.21dBi >6dBi, So Band3 Limit = 11-(6.21-6)=10.79dBm/MHz

Temperature	20°C	Humidity	53%
Test Engineer	Magic Lai	Configurations	IEEE 802.11a
Test Date	Apr. 28, 2014		

Configuration IEEE 802.11a / Chain 1

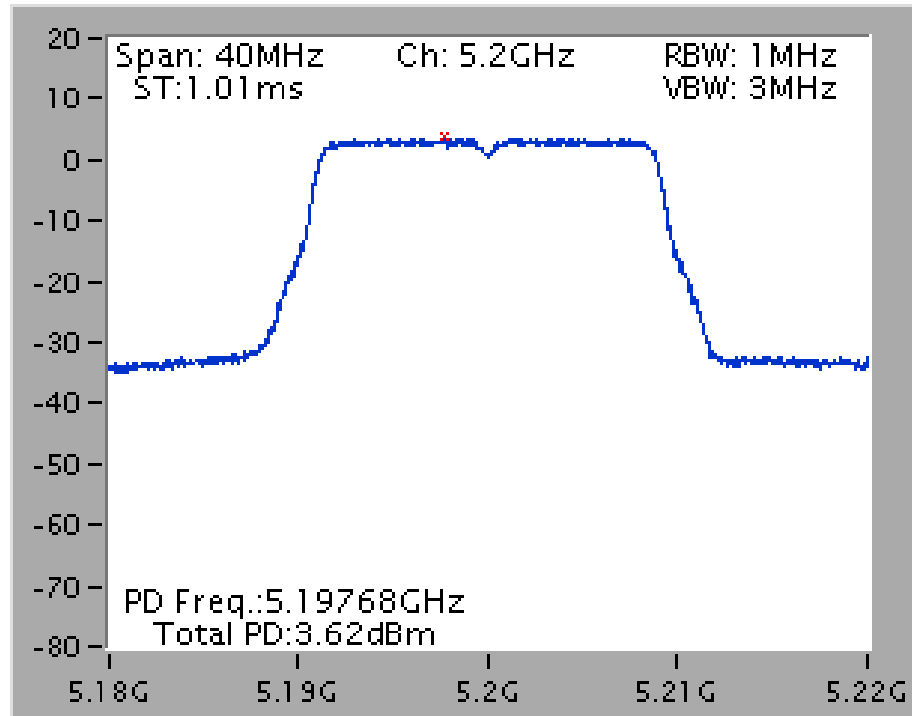
Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	3.76	4.00	Complies
40	5200 MHz	3.69	4.00	Complies
48	5240 MHz	3.39	4.00	Complies
52	5260 MHz	8.01	11.00	Complies
60	5300 MHz	7.59	11.00	Complies
64	5320 MHz	4.40	11.00	Complies
100	5500 MHz	3.28	10.79	Complies
116	5580 MHz	5.82	10.79	Complies
140	5700 MHz	2.58	10.79	Complies
144	5720 MHz	6.54	10.79	Complies

Note: ANT Gain=6.21dBi >6dBi, So Band3 Limit = 11-(6.21-6)=10.79dBm/MHz

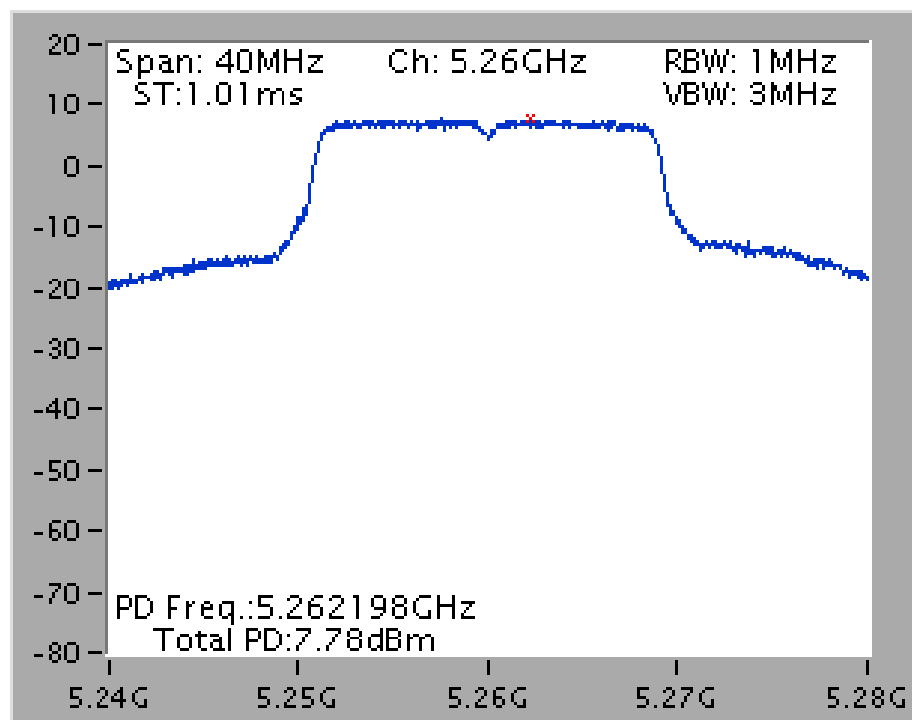
Note: All the test values were listed in the report.

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

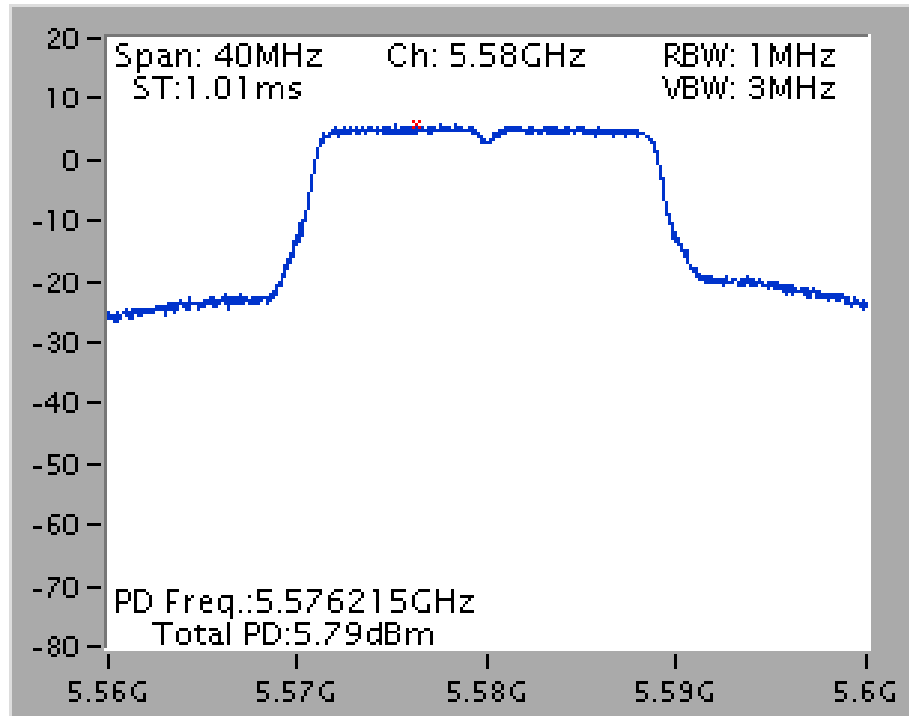
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 20MHz / Chain 1 / 5200 MHz



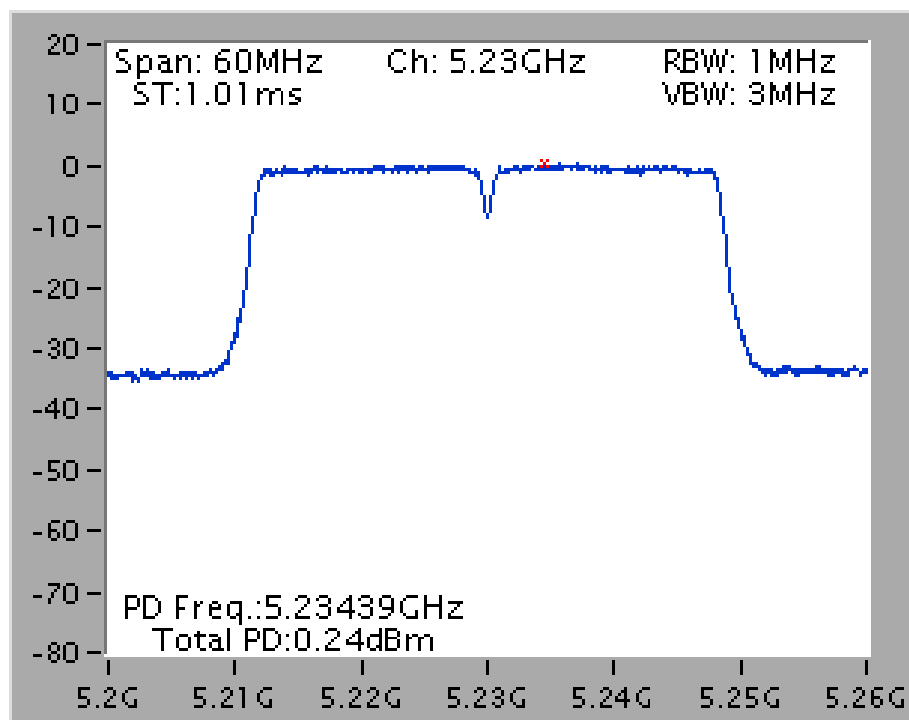
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 20MHz / Chain 1 / 5260 MHz



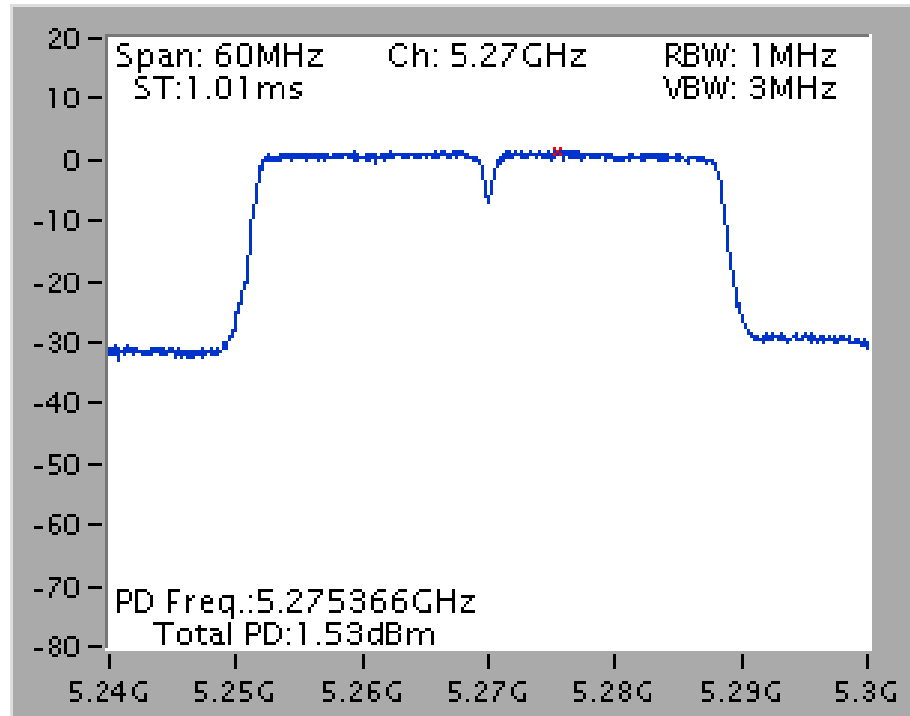
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 20MHz / Chain 1 / 5580 MHz



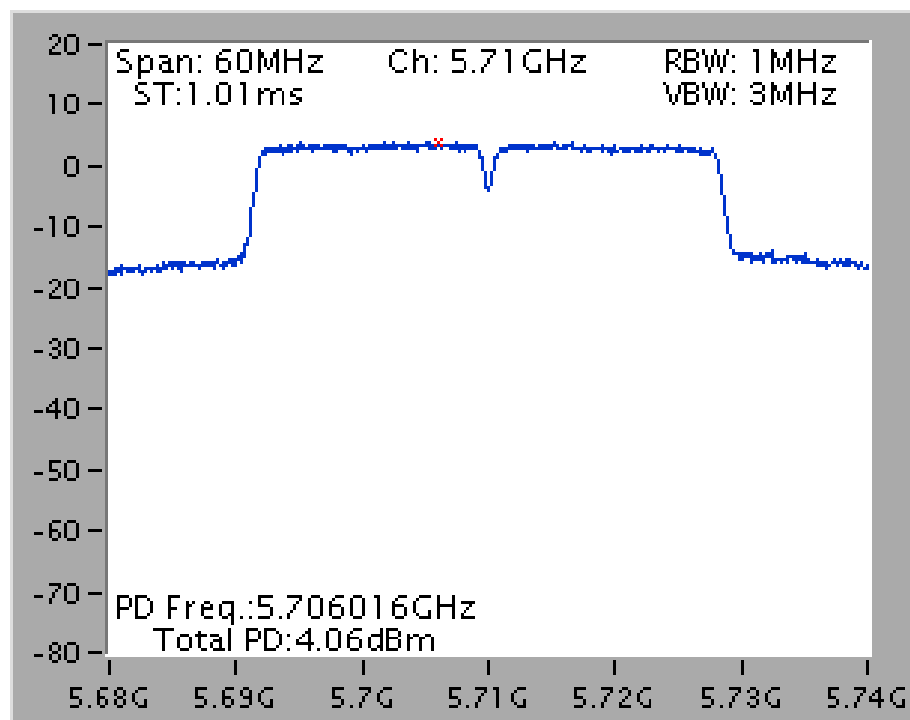
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 40MHz / Chain 1 / 5230 MHz



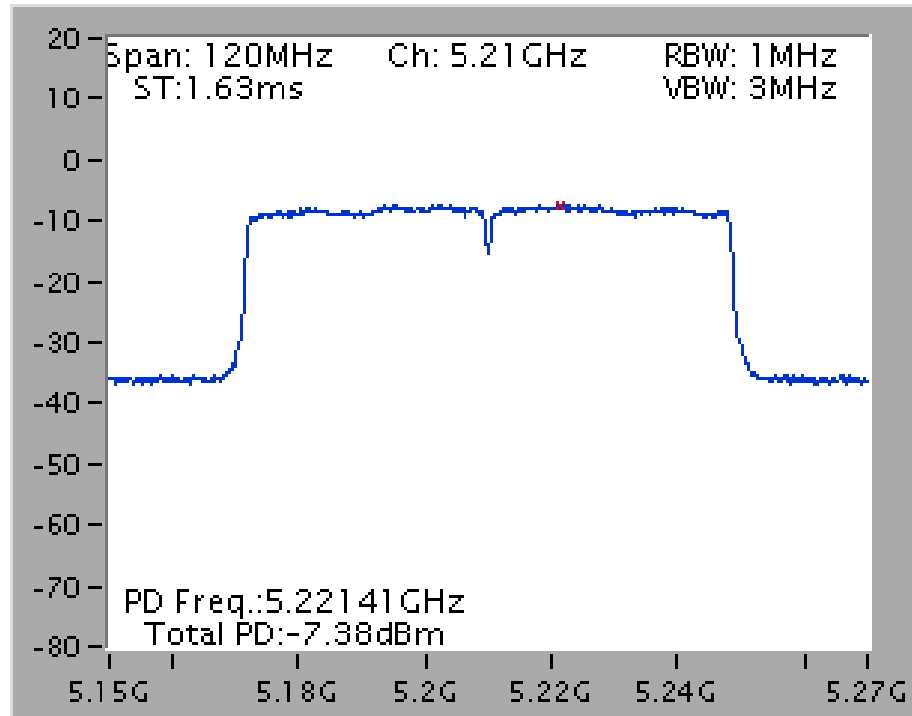
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 40MHz / Chain 1 / 5270 MHz



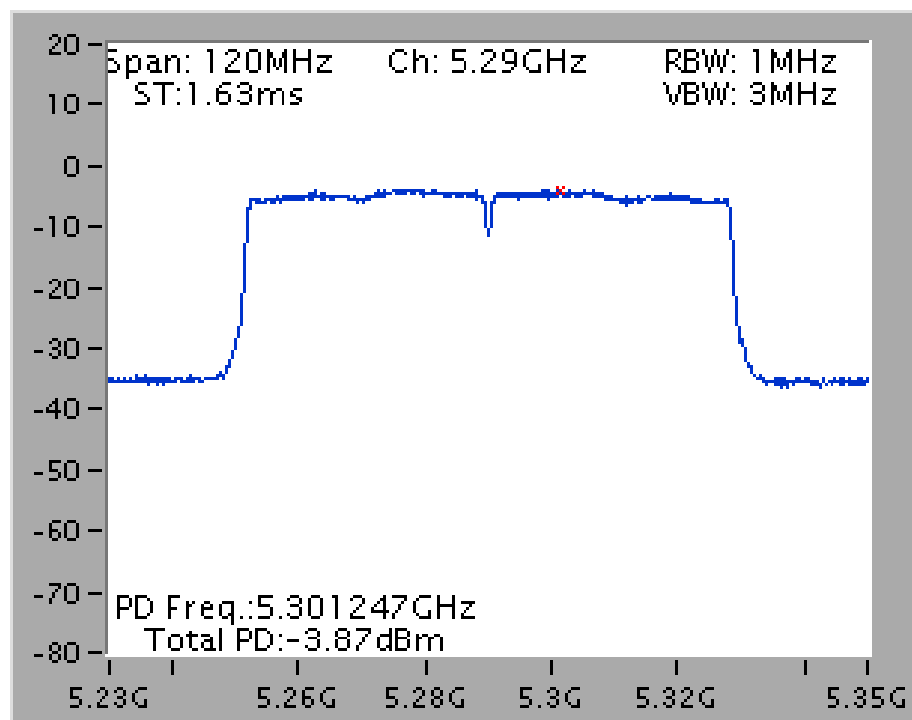
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 40MHz / Chain 1 / 5710 MHz



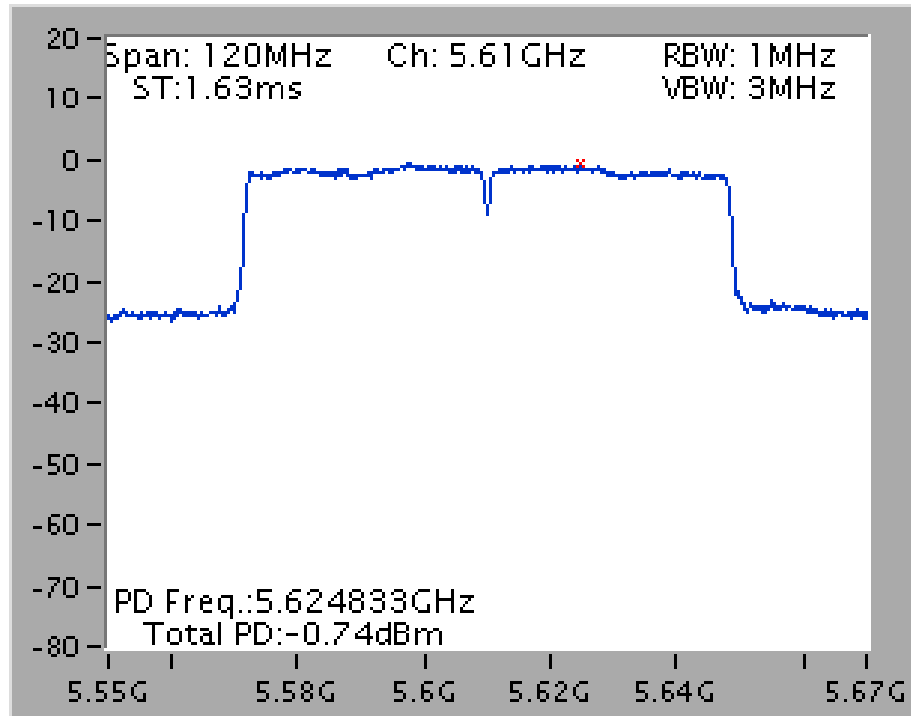
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 80MHz / Chain 1 / 5210 MHz



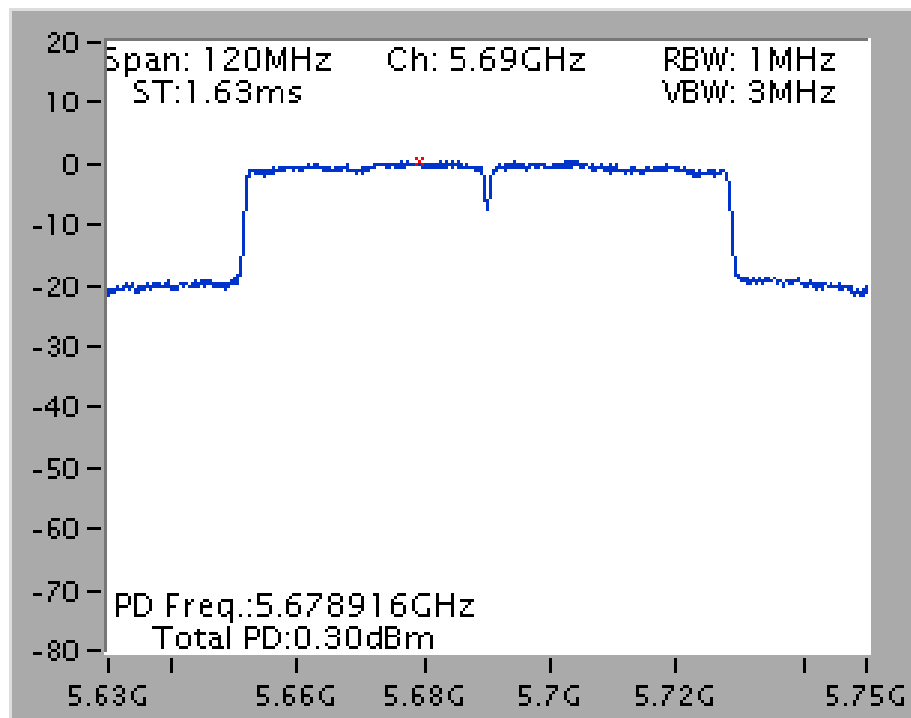
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 80MHz / Chain 1 / 5290 MHz



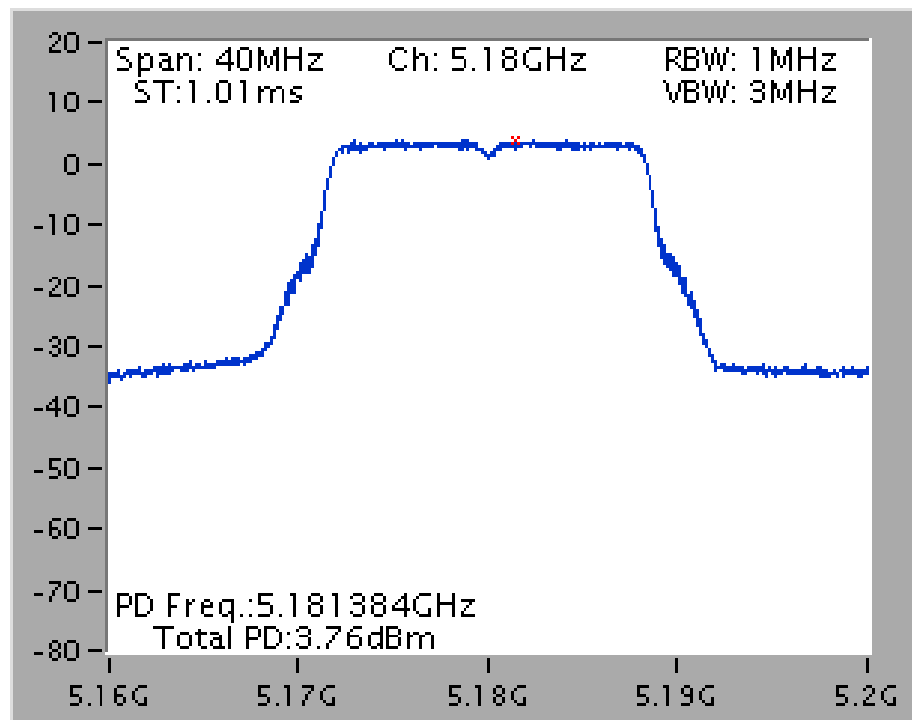
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 80MHz / Chain 1 / 5610 MHz



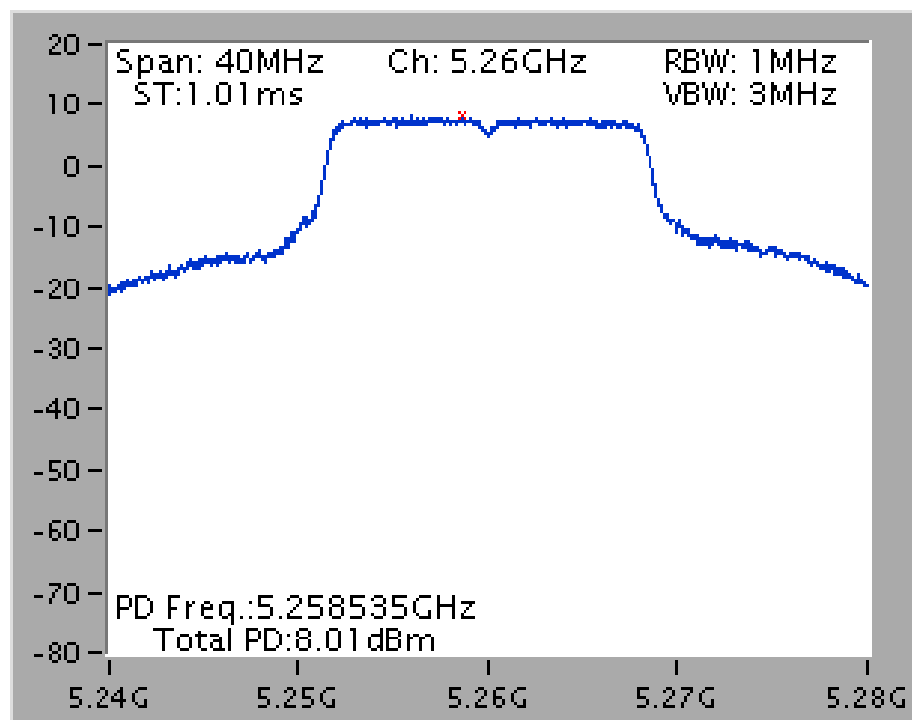
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 80MHz / Chain 1 / 5690 MHz



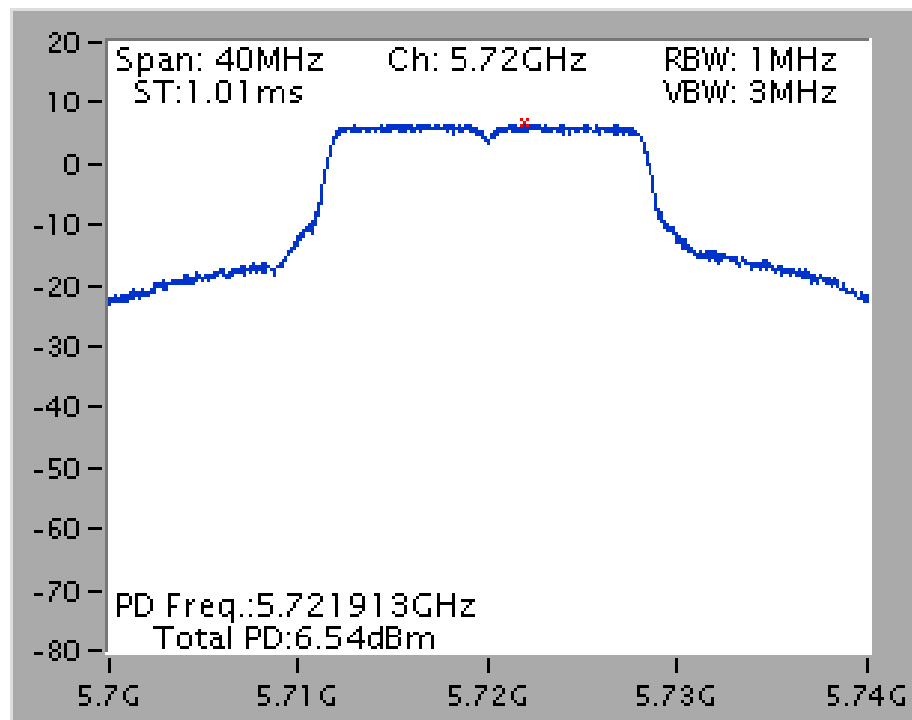
Power Density Plot on Configuration IEEE 802.11a / Chain 1 / 5180 MHz



Power Density Plot on Configuration IEEE 802.11a / Chain 1 / 5260 MHz



Power Density Plot on Configuration IEEE 802.11a / Chain 1 / 5720 MHz



4.3. Peak Excursion Measurement

4.3.1. Limit

The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emissions bandwidth whichever is less.

4.3.2. Measuring Instruments and Setting

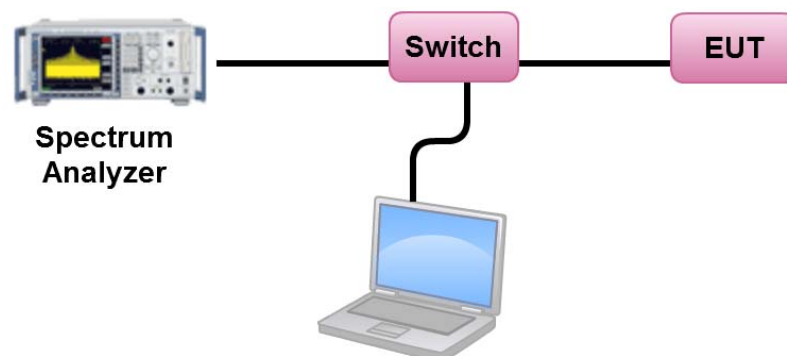
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RBW	1 MHz (Peak Trace) / 1 MHz (Average Trace)
VBW	≥ 3 MHz (Peak Trace) / ≥ 3 MHz (Average Trace)
Detector	Peak (Peak Trace) / RMS (Average Trace)
Trace	Trace: Max hold (Peak Trace) / Trace Average Sweep Count 100 (Average Trace)
Sweep Time	AUTO

4.3.3. Test Procedures

- Trace A, Set RBW = 1MHz, VBW = 3MHz, Span >26dB bandwidth, Max. hold.
- Delta Mark trace A Maximum frequency and trace B same frequency.
- Repeat the above procedure until measurements for all frequencies were complete.
- Testing each modulation mode on a single channel in single operating band at single output port.
All signal types need test (DSSS, OFDM). All modulation types need test (BPSK, QPSK, 16-QAM, 64-QAM, 256-QAM). All bandwidth modes need test.

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 Peak Excursion

Temperature	20°C	Humidity	53%
Test Engineer	Magic Lai	Configurations	IEEE 802.11ac

Configuration IEEE 802.11ac 20MHz / Chain 1

Modulation	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
BPSK (MCS0)	5240MHz	8.84	13	Complies
QPSK (MCS1)	5240MHz	9.05	13	Complies
16QAM (MCS3)	5240MHz	8.83	13	Complies
64QAM (MCS5)	5240MHz	9.35	13	Complies
256QAM (MCS8)	5240MHz	9.90	13	Complies
BPSK (MCS0)	5260MHz	9.27	13	Complies
QPSK (MCS1)	5260MHz	8.93	13	Complies
16QAM (MCS3)	5260MHz	8.66	13	Complies
64QAM (MCS5)	5260MHz	9.57	13	Complies
256QAM (MCS8)	5260MHz	9.88	13	Complies
BPSK (MCS0)	5580MHz	8.88	13	Complies
QPSK (MCS1)	5580MHz	8.93	13	Complies
16QAM (MCS3)	5580MHz	9.05	13	Complies
64QAM (MCS5)	5580MHz	9.55	13	Complies
256QAM (MCS8)	5580MHz	10.37	13	Complies

Configuration IEEE 802.11ac 40MHz / Chain 1

Modulation	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
BPSK (MCS0)	5230MHz	9.27	13	Complies
QPSK (MCS1)	5230MHz	9.12	13	Complies
16QAM (MCS3)	5230MHz	9.47	13	Complies
64QAM (MCS5)	5230MHz	10.00	13	Complies
256QAM (MCS8)	5230MHz	9.79	13	Complies
BPSK (MCS0)	5270MHz	9.11	13	Complies
QPSK (MCS1)	5270MHz	8.57	13	Complies
16QAM (MCS3)	5270MHz	9.41	13	Complies
64QAM (MCS5)	5270MHz	9.85	13	Complies
256QAM (MCS8)	5270MHz	10.02	13	Complies
BPSK (MCS0)	5550MHz	9.34	13	Complies
QPSK (MCS1)	5550MHz	8.50	13	Complies
16QAM (MCS3)	5550MHz	9.67	13	Complies
64QAM (MCS5)	5550MHz	9.57	13	Complies
256QAM (MCS8)	5550MHz	10.29	13	Complies

Configuration IEEE 802.11ac 80MHz / Chain 1

Modulation	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
BPSK (MCS0)	5210MHz	8.84	13	Complies
QPSK (MCS1)	5210MHz	9.34	13	Complies
16QAM (MCS3)	5210MHz	9.77	13	Complies
64QAM (MCS5)	5210MHz	9.59	13	Complies
256QAM (MCS8)	5210MHz	9.22	13	Complies
BPSK (MCS0)	5290MHz	9.30	13	Complies
QPSK (MCS1)	5290MHz	9.38	13	Complies
16QAM (MCS3)	5290MHz	10.23	13	Complies
64QAM (MCS5)	5290MHz	9.86	13	Complies
256QAM (MCS8)	5290MHz	9.93	13	Complies
BPSK (MCS0)	5690MHz	9.70	13	Complies
QPSK (MCS1)	5690MHz	9.23	13	Complies
16QAM (MCS3)	5690MHz	9.87	13	Complies
64QAM (MCS5)	5690MHz	9.86	13	Complies
256QAM (MCS8)	5690MHz	9.77	13	Complies

Temperature	20°C	Humidity	53%
Test Engineer	Magic Lai	Configurations	IEEE 802.11a

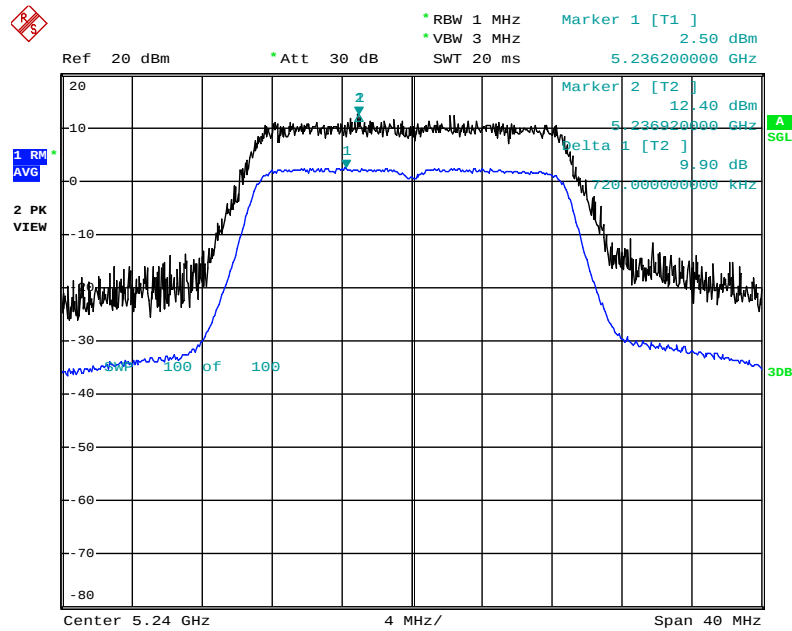
Configuration IEEE 802.11a / Chain 1

Modulation	Frequency	Peak Excursion (dB)	Max. Limit (dB)	Result
BPSK (6Mbps)	5200MHz	9.11	13	Complies
QPSK (12Mbps)	5200MHz	8.94	13	Complies
16QAM (24Mbps)	5200MHz	9.16	13	Complies
64QAM (48Mbps)	5200MHz	8.79	13	Complies
BPSK (6Mbps)	5260MHz	8.73	13	Complies
QPSK (12Mbps)	5260MHz	8.65	13	Complies
16QAM (24Mbps)	5260MHz	8.59	13	Complies
64QAM (48Mbps)	5260MHz	8.78	13	Complies
BSPK(6Mbps)	5720MHz	9.03	13	Complies
QPSK(12Mbps)	5720MHz	8.51	13	Complies
16QAM(24Mbps)	5720MHz	8.44	13	Complies
64QAM(48Mbps)	5720MHz	8.53	13	Complies

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

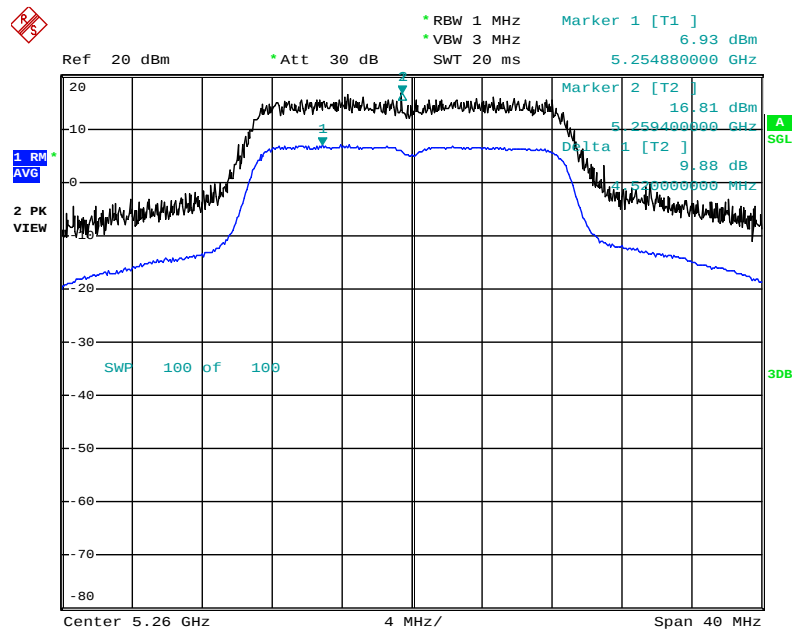
For plots, only the modulation with worse result was shown.

Peak Excursion Plot on Configuration IEEE 802.11ac 20MHz / Chain 1 / 256QAM(MCS8) / 5240 MHz



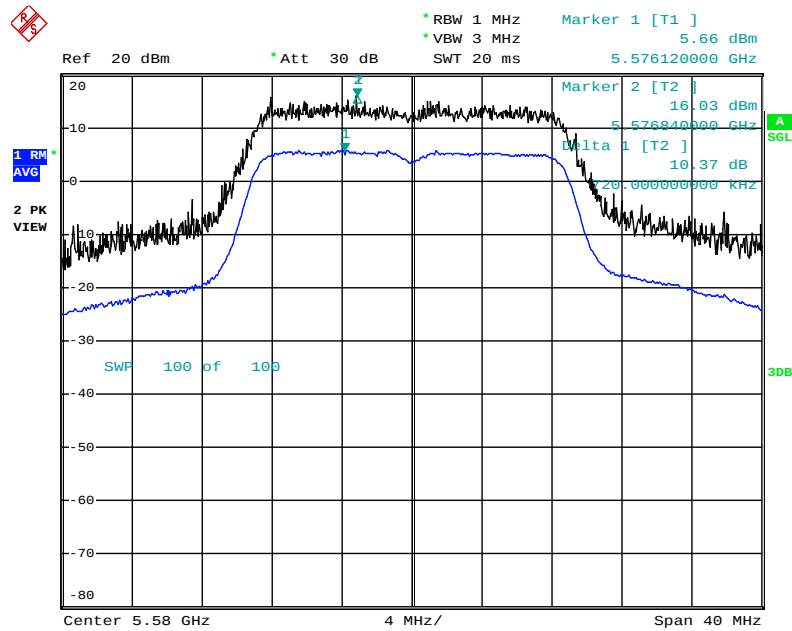
Date: 23.JAN.2014 00:48:58

Peak Excursion Plot on Configuration IEEE 802.11ac 20MHz / Chain 1 / 256QAM(MCS8) / 5260 MHz



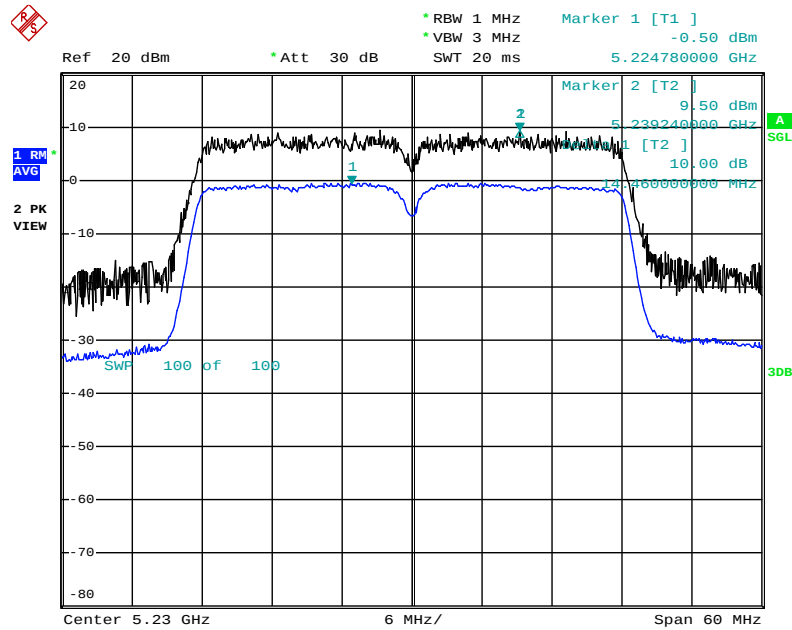
Date: 23.JAN.2014 00:50:11

Peak Excursion Plot on Configuration IEEE 802.11ac 20MHz / Chain 1 / 256QAM(MCS8) / 5580 MHz



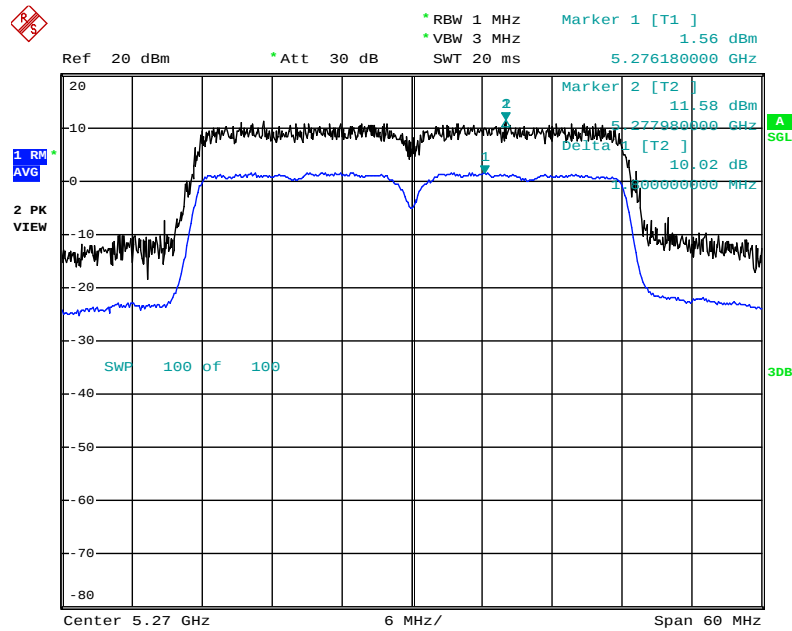
Date: 22.APR.2014 17:08:00

Peak Excursion Plot on Configuration IEEE 802.11ac 40MHz / Chain 1 / 64QAM(MCS5) / 5230 MHz



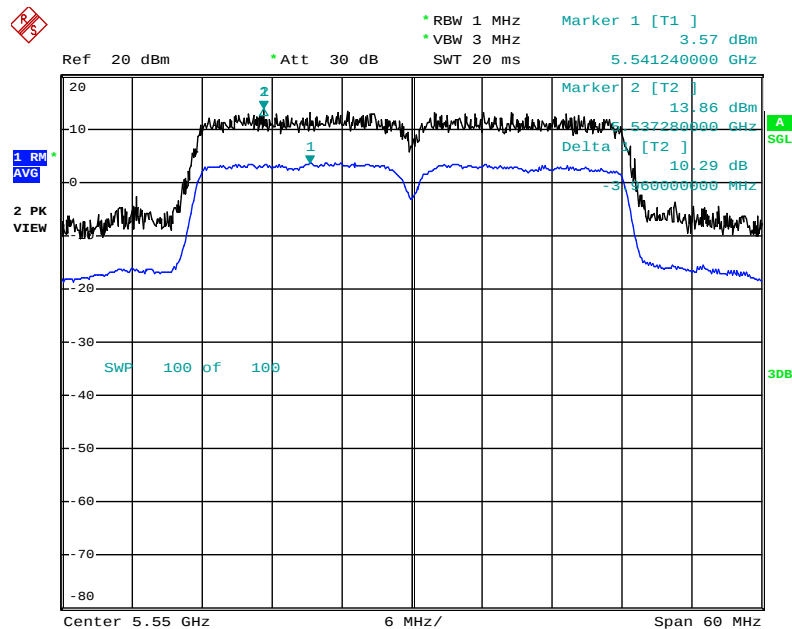
Date: 23.JAN.2014 00:59:21

Peak Excursion Plot on Configuration IEEE 802.11ac 40MHz / Chain 1 / 256QAM(MCS8) / 5270 MHz



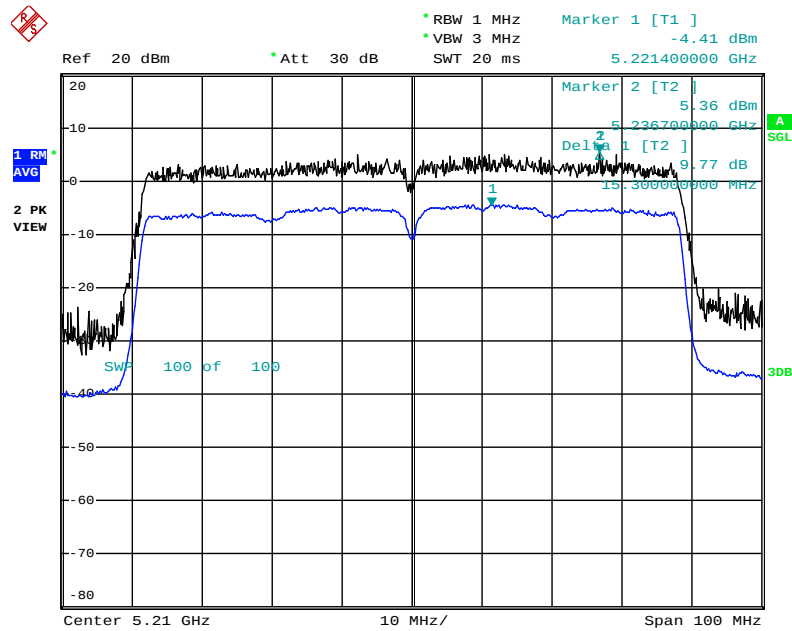
Date: 23.JAN.2014 01:00:41

Peak Excursion Plot on Configuration IEEE 802.11ac 40MHz / Chain 1 / 256QAM(MCS8) / 5550 MHz



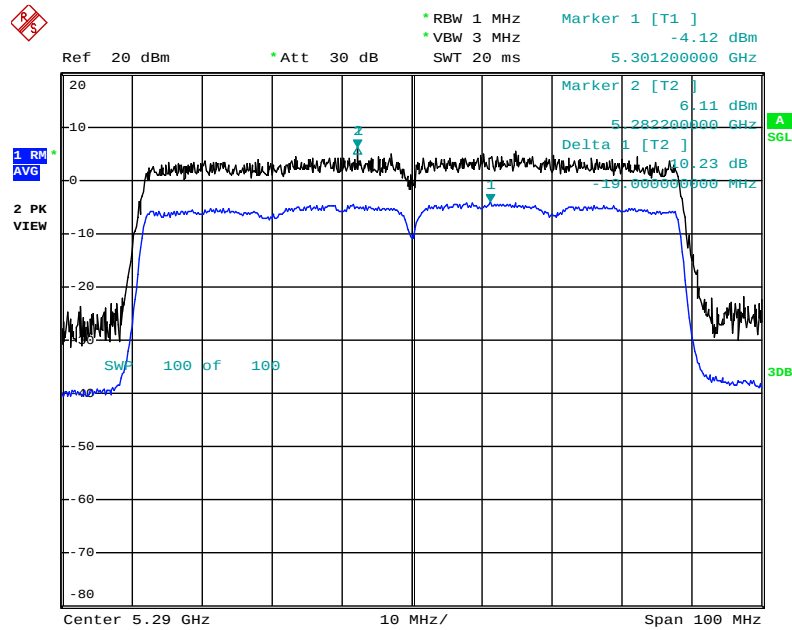
Date: 22.APR.2014 17:12:19

Peak Excursion Plot on Configuration IEEE 802.11ac 80MHz / Chain 1 / 16QAM(MCS3) / 5210 MHz



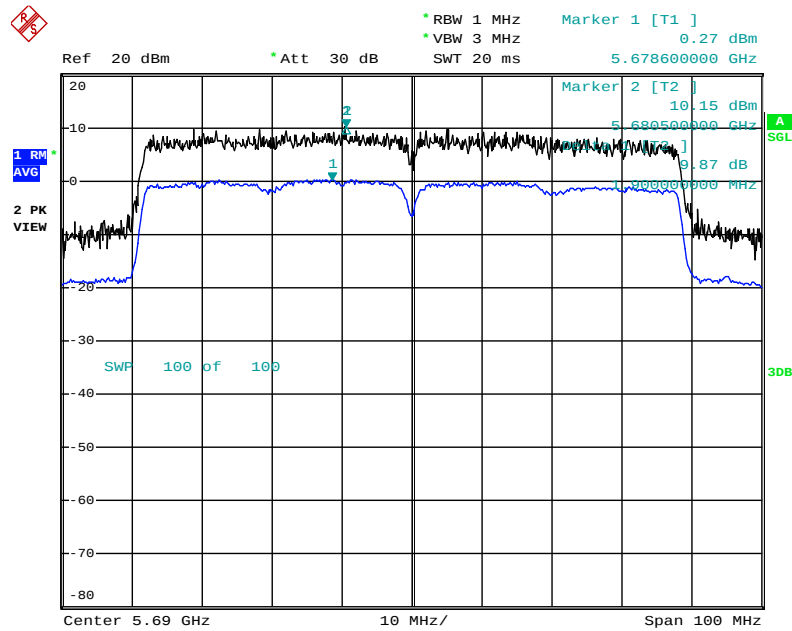
Date: 23.JAN.2014 01:07:13

Peak Excursion Plot on Configuration IEEE 802.11ac 80MHz / Chain 1 / 16QAM(MCS3) / 5290 MHz



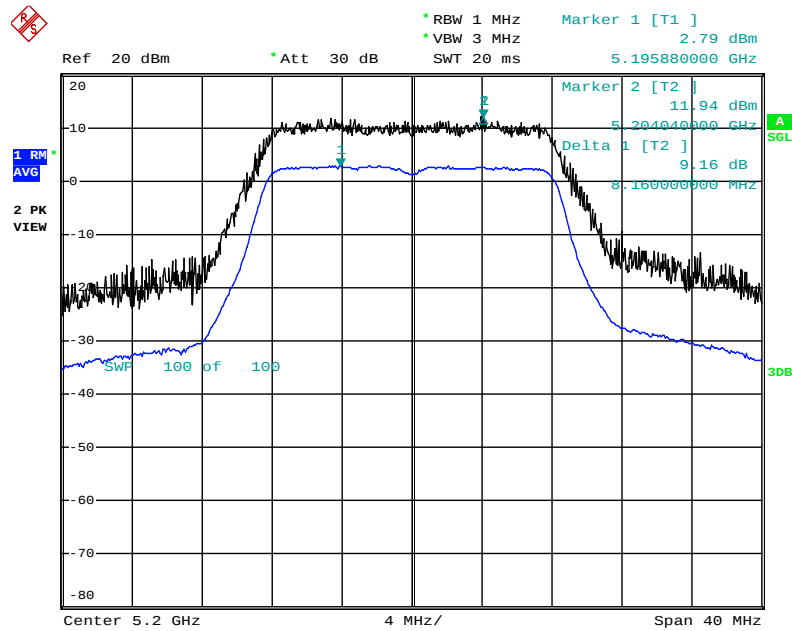
Date: 23.JAN.2014 01:09:48

Peak Excursion Plot on Configuration IEEE 802.11ac 80MHz / Chain 1 / 16QAM(MCS3) / 5690 MHz



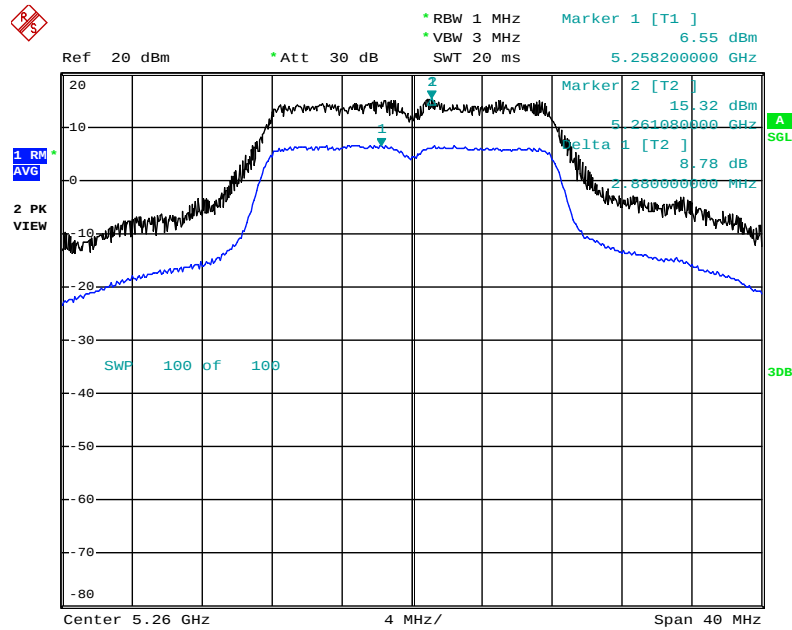
Date: 29.JAN.2014 16:25:11

Peak Excursion Plot on Configuration IEEE 802.11a / Chain 1 / 16QAM(24Mbps) / 5200 MHz



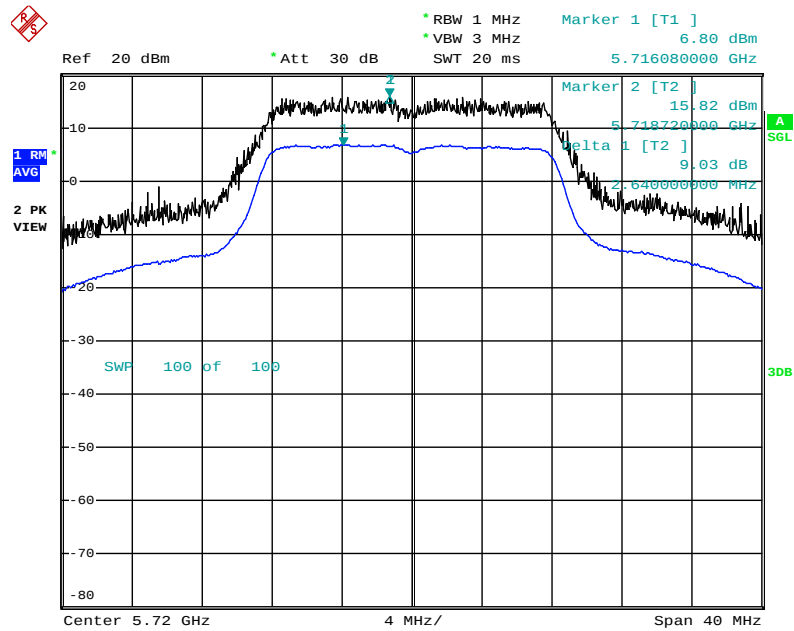
Date: 22.APR.2014 16:59:15

Peak Excursion Plot on Configuration IEEE 802.11a / Chain 1 / 64QAM(48Mbps) / 5260 MHz



Date: 22.APR.2014 17:00:49

Peak Excursion Plot on Configuration IEEE 802.11a / Chain 1 / BPSK (6Mbps) / 5720 MHz



Date: 29.JAN.2014 16:11:41

4.4. Radiated Emissions Measurement

4.4.1. 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. 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

4.4.2. 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)	1 MHz / 3MHz for Peak, Please refer to below table for Average
RBW / VBW (Emission in non-restricted band)	1 MHz / 3MHz for peak

Mode	On Time(ms)	On+Off Time(ms)	Duty Cycle(%)	1/T Minimum VBW (kHz)
802.11a	2.075	2.100	98.81%	0.01
802.11ac VHT20	1.940	1.965	98.73%	0.01
802.11ac VHT40	0.960	0.985	97.46%	1.04
802.11ac VHT80	0.460	0.485	94.85%	2.17

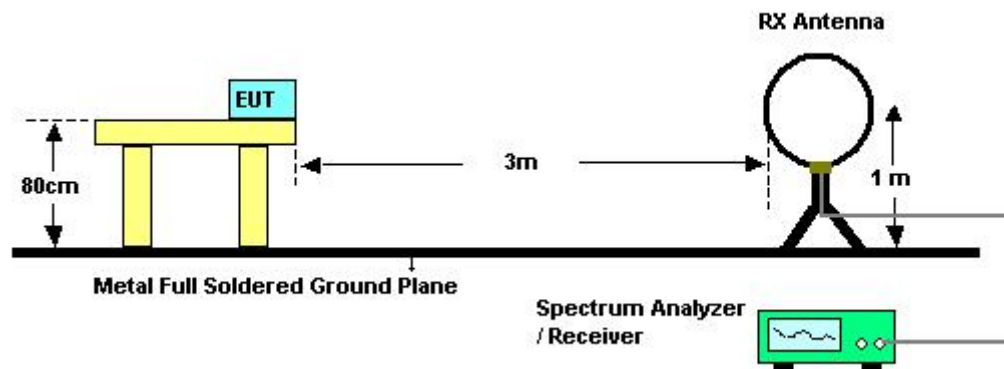
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.4.3. Test Procedures

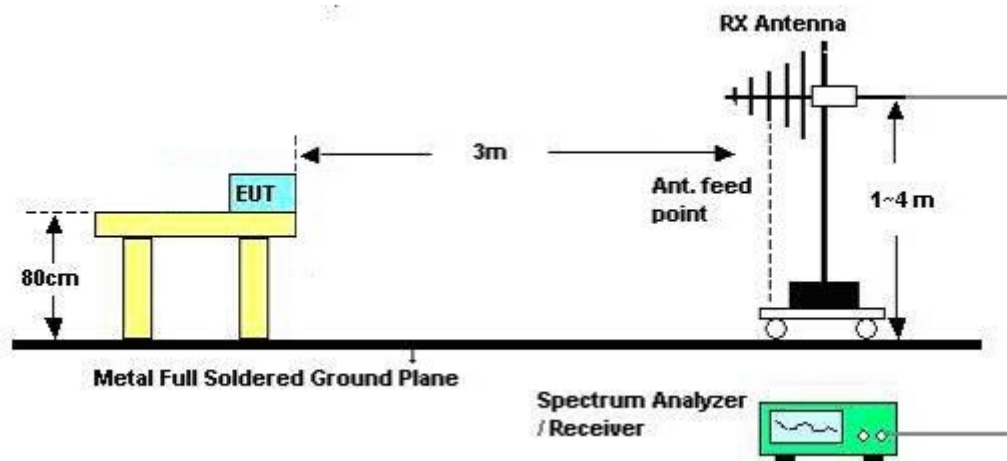
1. Configure the EUT according to ANSI C63.4. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting 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 RBW for peak reading. Then 1MHz RBW and 10Hz VBW for average reading in spectrum analyzer.
7. When the radiated emissions limits are expressed in terms of the average value of the emissions, and pulsed operation is employed, the measurement field strength shall be determined by averaging over one complete pulse train, including blanking intervals, as long as the pulse train does not exceed 0.1 seconds. As an alternative (provided the transmitter operates for longer than 0.1 seconds) or in cases where the pulse train exceeds 0.1 seconds, the measured field strength shall be determined from the average absolute voltage during a 0.1 second interval during which the field strength is at its maximum value.
8. 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.
9. 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.
10. 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.

4.4.4. Test Setup Layout

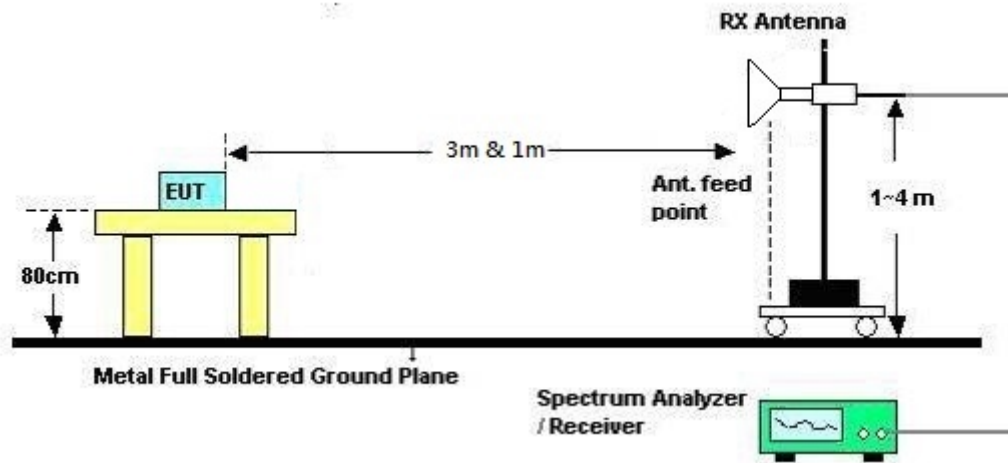
For Radiated Emissions: 9kHz ~30MHz



For Radiated Emissions: 30MHz~1GHz



For Radiated Emissions: Above 1GHz



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

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	Normal Link
Test Date	Apr. 18, 2014	Test Mode	Mode 2

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.

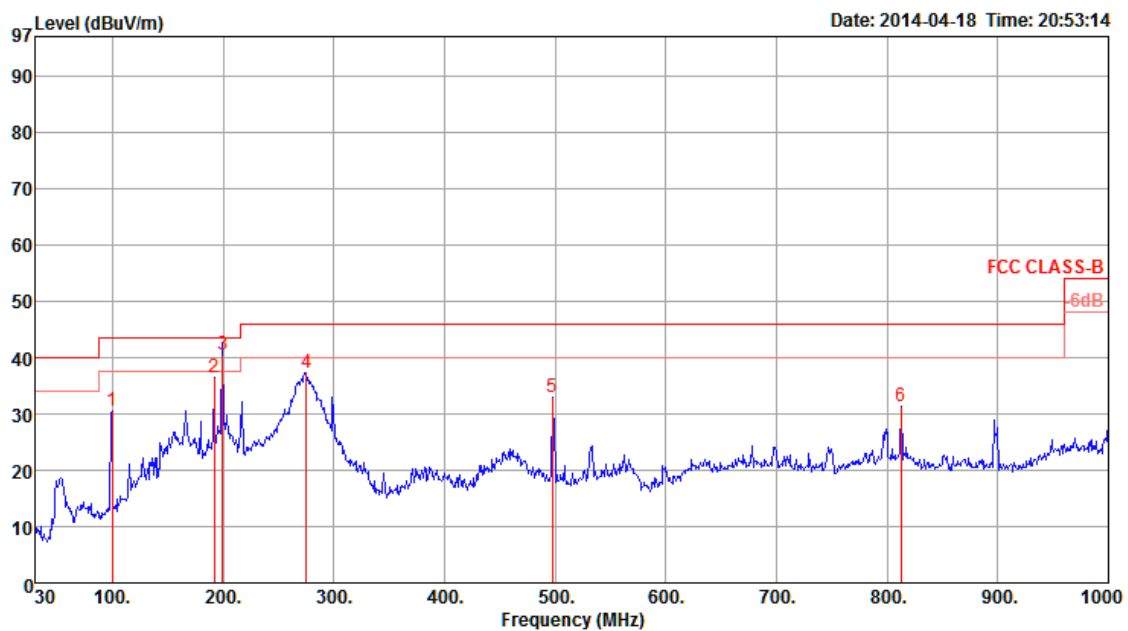
Distance extrapolation factor = $40 \log (\text{specific distance} / \text{test distance})$ (dB);

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

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

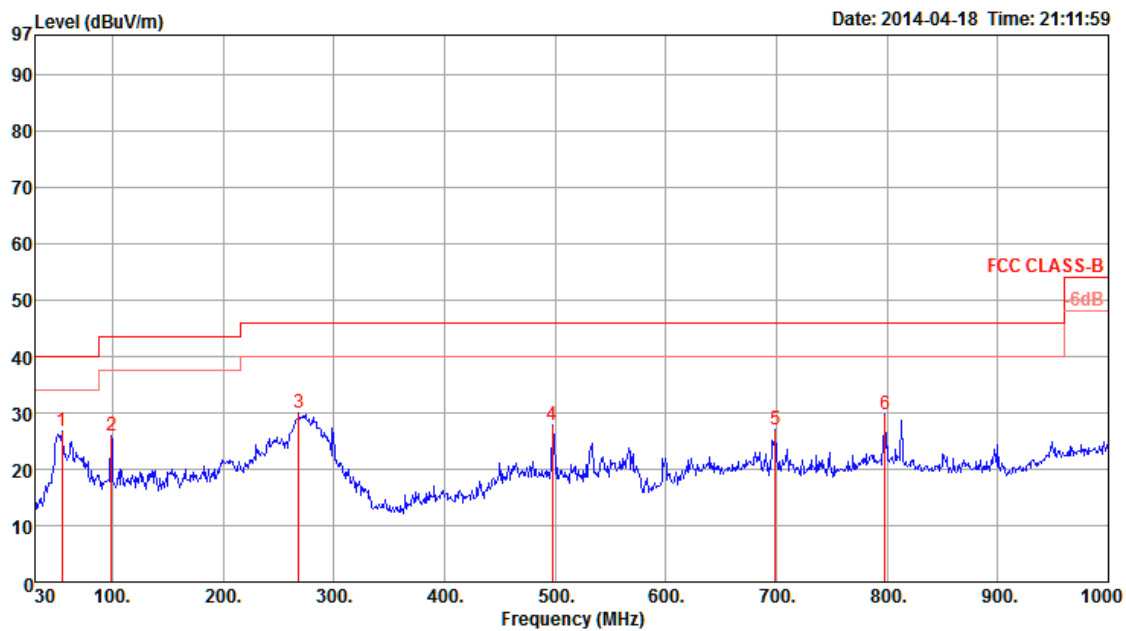
Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	Normal Link
Test Mode	Mode 2		

Horizontal



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	99.84	30.41	43.50	-13.09	52.27	1.50	11.40	27.82 Peak	0	100	HORIZONTAL
2	191.99	36.38	43.50	-7.12	56.24	2.06	10.08	27.30 Peak	0	100	HORIZONTAL
3	199.75	40.44	43.50	-3.06	58.70	2.09	10.40	27.25 QP	252	100	HORIZONTAL
4	275.41	37.35	46.00	-8.65	54.11	2.51	13.85	26.89 Peak	0	100	HORIZONTAL
5	497.54	33.04	46.00	-12.96	46.84	3.37	17.76	27.93 Peak	0	100	HORIZONTAL
6	812.79	31.35	46.00	-14.65	39.21	4.38	21.30	26.89 Peak	0	100	HORIZONTAL

Vertical



	Freq	Level	Limit	Over	Read	CableAntenna	Preamp	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	54.25	26.71	40.00	-13.29	52.39	1.12	8.00	27.90 Peak	360	400	VERTICAL
2	98.87	25.84	43.50	-17.66	47.93	1.49	11.20	27.82 Peak	360	400	VERTICAL
3	268.62	30.07	46.00	-15.93	47.03	2.48	13.91	26.90 Peak	360	400	VERTICAL
4	497.54	27.74	46.00	-18.26	41.54	3.37	17.76	27.93 Peak	360	400	VERTICAL
5	699.30	26.99	46.00	-19.01	36.94	4.16	19.90	27.09 Peak	360	400	VERTICAL
6	798.24	29.85	46.00	-16.15	37.42	4.35	21.18	26.90 Peak	360	400	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.

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

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 20MHz CH 36 / Chain 1
Test Date	Apr. 15, 2014		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	Remark	deg	cm
1	15536.62	40.55	54.00	-13.45	28.75	7.85	38.67	34.72	Average	190	100 HORIZONTAL
2	15543.92	54.26	74.00	-19.74	42.46	7.86	38.66	34.72	Peak	190	100 HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	Remark	deg	cm
1	15541.62	40.80	54.00	-13.20	29.00	7.85	38.67	34.72	Average	61	100 VERTICAL
2	15542.80	53.64	74.00	-20.36	41.84	7.85	38.67	34.72	Peak	61	100 VERTICAL

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 20MHz CH 40 / Chain 1
Test Date	Apr. 15, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15597.82	52.96	74.00	-21.04	41.23	7.88	38.62	34.77	Peak	165	100	HORIZONTAL
2	15599.14	40.32	54.00	-13.68	28.61	7.88	38.62	34.79	Average	165	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	15599.34	40.41	54.00	-13.59	28.70	7.88	38.62	34.79	Average	251	100 VERTICAL
2	15600.36	53.14	74.00	-20.86	41.43	7.88	38.62	34.79	Peak	251	100 VERTICAL

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 20MHz CH 48 / Chain 1
Test Date	Apr. 15, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	15717.38	51.68	74.00	-22.32	40.12	7.92	38.52	34.88	Peak	283	100 HORIZONTAL
2	15721.02	39.43	54.00	-14.57	27.87	7.92	38.52	34.88	Average	283	100 HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	15719.12	51.64	74.00	-22.36	40.08	7.92	38.52	34.88	Peak	199	100 VERTICAL
2	15720.60	39.24	54.00	-14.76	27.68	7.92	38.52	34.88	Average	199	100 VERTICAL

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 20MHz CH 52 / Chain 1
Test Date	Apr. 15, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	15782.62	39.48	54.00	-14.52	28.01	7.94	38.47	34.94	Average	72	100	HORIZONTAL
2	15783.22	52.44	74.00	-21.56	40.97	7.94	38.47	34.94	Peak	72	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	15776.40	39.66	54.00	-14.34	28.17	7.93	38.48	34.92	Average	30	100 VERTICAL
2	15776.90	52.00	74.00	-22.00	40.51	7.93	38.48	34.92	Peak	30	100 VERTICAL

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 20MHz CH 60 / Chain 1
Test Date	Apr. 15, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	10599.92	44.96	54.00	-9.04	34.98	6.60	38.38	35.00	Average	44	100 HORIZONTAL
2	10602.50	58.87	74.00	-15.13	48.88	6.60	38.38	34.99	Peak	44	100 HORIZONTAL
3	15903.70	53.04	74.00	-20.96	41.72	7.98	38.37	35.03	Peak	72	100 HORIZONTAL
4	15907.60	39.77	54.00	-14.23	28.47	7.98	38.37	35.05	Average	72	100 HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	10600.82	52.82	54.00	-1.18	42.83	6.60	38.38	34.99	Average	325	100 VERTICAL
2	10604.60	67.47	74.00	-6.53	57.48	6.60	38.38	34.99	Peak	325	100 VERTICAL
3	15903.20	52.68	74.00	-21.32	41.36	7.98	38.37	35.03	Peak	94	100 VERTICAL
4	15903.70	39.43	54.00	-14.57	28.11	7.98	38.37	35.03	Average	94	100 VERTICAL

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 20MHz CH 64 / Chain 1
Test Date	Apr. 15, 2014		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	Limit	Level	Loss	Factor	Factor	Remark	deg	cm
1	10638.42	51.53	74.00	-22.47	41.54	6.59	38.37	34.97	Peak	125	100 HORIZONTAL
2	10640.30	42.06	54.00	-11.94	32.07	6.59	38.37	34.97	Average	125	100 HORIZONTAL
3	15962.02	52.35	74.00	-21.65	41.12	8.00	38.33	35.10	Peak	287	100 HORIZONTAL
4	15963.46	39.91	54.00	-14.09	28.68	8.00	38.33	35.10	Average	287	100 HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	Limit	Level	Loss	Factor	Factor	Remark	deg	cm
1	10640.14	46.00	54.00	-8.00	36.01	6.59	38.37	34.97	Average	324	100 VERTICAL
2	10641.14	61.58	74.00	-12.42	51.59	6.59	38.37	34.97	Peak	324	100 VERTICAL
3	15957.26	52.73	74.00	-21.27	41.50	8.00	38.33	35.10	Peak	355	100 VERTICAL
4	15963.86	40.72	54.00	-13.28	29.49	8.00	38.33	35.10	Average	355	100 VERTICAL

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 20MHz CH 100 / Chain 1
Test Date	Apr. 15, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	10995.04	55.81	74.00	-18.19	45.76	6.46	38.30	34.71	Peak	45	100 HORIZONTAL
2	10996.64	41.52	54.00	-12.48	31.47	6.46	38.30	34.71	Average	45	100 HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	10998.10	62.94	74.00	-11.06	52.89	6.46	38.30	34.71	Peak	323	100 VERTICAL
2	10999.40	48.22	54.00	-5.78	38.17	6.46	38.30	34.71	Average	323	100 VERTICAL

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 20MHz CH 116 / Chain 1
Test Date	Apr. 15, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	11160.92	59.95	74.00	-14.05	49.78	6.56	38.30	34.69	Peak	46	100 HORIZONTAL
2	11161.14	46.90	54.00	-7.10	36.73	6.56	38.30	34.69	Average	46	100 HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	11157.18	68.74	74.00	-5.26	58.58	6.55	38.30	34.69	Peak	326	100 VERTICAL
2	11157.76	53.78	54.00	-0.22	43.61	6.56	38.30	34.69	Average	326	100 VERTICAL

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 20MHz CH 140 / Chain 1
Test Date	Apr. 15, 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	11398.60	38.09	54.00	-15.91	27.77	6.69	38.30	34.67	Average	205	100	HORIZONTAL
2	11401.66	50.31	74.00	-23.69	39.99	6.69	38.30	34.67	Peak	205	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	11398.38	46.12	54.00	-7.88	35.80	6.69	38.30	34.67	Average	33	100	VERTICAL
2	11399.58	61.10	74.00	-12.90	50.78	6.69	38.30	34.67	Peak	33	100	VERTICAL

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 20MHz CH 144 / Chain 1
Test Date	Apr. 15, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	11438.96	46.49	54.00	-7.51	36.15	6.71	38.30	34.67 Average	64	100	HORIZONTAL
2	11442.88	58.83	74.00	-15.17	48.49	6.71	38.30	34.67 Peak	64	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	11440.02	53.80	54.00	-0.20	43.46	6.71	38.30	34.67 Average	35	100	VERTICAL
2	11441.60	68.62	74.00	-5.38	58.28	6.71	38.30	34.67 Peak	35	100	VERTICAL

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 40MHz CH 38 / Chain 1
Test Date	Apr. 16, 2014		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	Limit	Level	Loss	Factor	Factor	Remark	deg	cm
1	15565.64	54.39	74.00	-19.61	42.63	7.86	38.64	34.74	Peak	359	100 HORIZONTAL
2	15568.80	40.86	54.00	-13.14	29.10	7.86	38.64	34.74	Average	359	100 HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	Limit	Level	Loss	Factor	Factor	Remark	deg	cm
1	15571.46	53.85	74.00	-20.15	42.09	7.86	38.64	34.74	Peak	170	100 VERTICAL
2	15572.72	40.86	54.00	-13.14	29.10	7.86	38.64	34.74	Average	170	100 VERTICAL

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 40MHz CH 46 / Chain 1
Test Date	Apr. 16, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	15687.34	39.85	54.00	-14.15	28.25	7.90	38.55	34.85	Average	116	100 HORIZONTAL
2	15691.44	53.08	74.00	-20.92	41.48	7.90	38.55	34.85	Peak	116	100 HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	15687.46	40.22	54.00	-13.78	28.62	7.90	38.55	34.85	Average	150	100 VERTICAL
2	15694.94	52.31	74.00	-21.69	40.71	7.90	38.55	34.85	Peak	150	100 VERTICAL

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 40MHz CH 54 / Chain 1
Test Date	Apr. 16, 2014		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	15809.52	39.94	54.00	-14.06	28.51	7.95	38.45	34.97	Average	65	100	HORIZONTAL
2	15814.26	53.63	74.00	-20.37	42.20	7.95	38.45	34.97	Peak	65	100	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	15805.00	39.28	54.00	-14.72	27.85	7.95	38.45	34.97	Average	172	100	VERTICAL
2	15809.92	52.42	74.00	-21.58	40.99	7.95	38.45	34.97	Peak	172	100	VERTICAL

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 40MHz CH 62 / Chain 1
Test Date	Apr. 16, 2014		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	Limit	Level	Loss	Factor	Factor	Remark	deg	cm
1	10621.12	50.63	74.00	-23.37	40.64	6.60	38.38	34.99	Peak	157	100 HORIZONTAL
2	10624.18	38.11	54.00	-15.89	28.12	6.60	38.38	34.99	Average	157	100 HORIZONTAL
3	15925.26	52.55	74.00	-21.45	41.25	7.99	38.36	35.05	Peak	138	100 HORIZONTAL
4	15927.76	40.17	54.00	-13.83	28.87	7.99	38.36	35.05	Average	138	100 HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	Limit	Level	Loss	Factor	Factor	Remark	deg	cm
1	10619.42	54.30	74.00	-19.70	44.31	6.60	38.38	34.99	Peak	326	100 VERTICAL
2	10621.76	41.86	54.00	-12.14	31.87	6.60	38.38	34.99	Average	326	100 VERTICAL
3	15933.24	40.02	54.00	-13.98	28.75	7.99	38.36	35.08	Average	108	100 VERTICAL
4	15934.84	53.22	74.00	-20.78	41.97	7.99	38.34	35.08	Peak	108	100 VERTICAL

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 40MHz CH 102 / Chain 1
Test Date	Apr. 16, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	11020.00	37.91	54.00	-16.09	27.85	6.47	38.30	34.71	Average	196	100 HORIZONTAL
2	11020.24	51.08	74.00	-22.92	41.02	6.47	38.30	34.71	Peak	196	100 HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	11017.78	50.69	74.00	-23.31	40.63	6.47	38.30	34.71	Peak	234	100 VERTICAL
2	11019.96	39.89	54.00	-14.11	29.83	6.47	38.30	34.71	Average	234	100 VERTICAL

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 40MHz CH 110 / Chain 1
Test Date	Apr. 16, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	11095.52	46.83	54.00	-7.17	36.71	6.52	38.30	34.70	Average	43	100 HORIZONTAL
2	11097.30	59.93	74.00	-14.07	49.81	6.52	38.30	34.70	Peak	43	100 HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	11096.42	67.64	74.00	-6.36	57.52	6.52	38.30	34.70	Peak	330	100 VERTICAL
2	11100.62	53.22	54.00	-0.78	43.10	6.52	38.30	34.70	Average	330	100 VERTICAL

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 40MHz CH 134 / Chain 1
Test Date	Apr. 16, 2014		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	11339.58	41.78	54.00	-12.22	31.51	6.65	38.30	34.68	Average	46	103	HORIZONTAL
2	11341.10	54.51	74.00	-19.49	44.23	6.65	38.30	34.67	Peak	46	103	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	11341.68	48.08	54.00	-5.92	37.80	6.65	38.30	34.67	Average	323	100	VERTICAL
2	11341.88	62.42	74.00	-11.58	52.14	6.65	38.30	34.67	Peak	323	100	VERTICAL

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 40MHz CH 142 / Chain 1
Test Date	Apr. 16, 2014		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	Remark	deg	cm
1	11418.20	44.45	54.00	-9.55	34.12	6.70	38.30	34.67	Average	79	100 HORIZONTAL
2	11424.58	51.65	74.00	-22.35	41.32	6.70	38.30	34.67	Peak	79	100 HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	Remark	deg	cm
1	11415.38	68.15	74.00	-5.85	57.82	6.70	38.30	34.67	Peak	325	100 VERTICAL
2	11417.56	52.91	54.00	-1.09	42.58	6.70	38.30	34.67	Average	325	100 VERTICAL

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 80MHz CH 42 / Chain 1
Test Date	Apr. 15, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableLoss	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	15625.14	52.73	74.00	-21.27	41.06	7.88	38.60	34.81	Peak	54	100	HORIZONTAL
2	15631.70	39.36	54.00	-14.64	27.69	7.89	38.59	34.81	Average	54	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15629.58	40.02	54.00	-13.98	28.35	7.89	38.59	34.81	Average	35	100	VERTICAL
2	15631.70	52.64	74.00	-21.36	40.97	7.89	38.59	34.81	Peak	35	100	VERTICAL

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 80MHz CH 58 / Chain 1
Test Date	Apr. 15, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase	
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	15867.00	40.54	54.00	-13.46	29.18	7.97	38.40	35.01	Average	241	100	HORIZONTAL
2	15873.64	53.13	74.00	-20.87	41.77	7.97	38.40	35.01	Peak	241	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm	
1	15866.40	40.69	54.00	-13.31	29.33	7.96	38.41	35.01	Average	20	100 VERTICAL
2	15870.46	53.38	74.00	-20.62	42.02	7.97	38.40	35.01	Peak	20	100 VERTICAL

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 80MHz CH 106 / Chain 1
Test Date	Apr. 15, 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	11058.74	38.14	54.00	-15.86	28.04	6.50	38.30	34.70	Average	218	100	HORIZONTAL
2	11064.50	50.53	74.00	-23.47	40.43	6.50	38.30	34.70	Peak	218	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	11058.96	40.47	54.00	-13.53	30.37	6.50	38.30	34.70	Average	328	140	VERTICAL
2	11063.64	53.45	74.00	-20.55	43.35	6.50	38.30	34.70	Peak	328	140	VERTICAL

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 80MHz CH 122 / Chain 1
Test Date	Apr. 08, 2014		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	dBuV/m	Limit	Level	Loss Factor	Factor	Remark	cm	deg	Pol/Phase
1	11220.37	63.91	74.00	-10.09	50.27	9.07	39.50	34.93	Peak	100	266 HORIZONTAL
2	11220.79	49.25	54.00	-4.75	35.61	9.07	39.50	34.93	Average	100	266 HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		A/Pos	T/Pos	
	MHz	dBuV/m	dBuV/m	Limit	Level	Loss Factor	Factor	Remark	cm	deg	Pol/Phase
1	11220.36	64.86	74.00	-9.14	51.22	9.07	39.50	34.93	Peak	117	344 VERTICAL
2	11220.59	48.77	54.00	-5.23	35.13	9.07	39.50	34.93	Average	117	344 VERTICAL

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 80MHz CH 138 / Chain 1
Test Date	Apr. 15, 2014		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	11381.70	57.35	74.00	-16.65	47.04	6.68	38.30	34.67	Peak	65	100	HORIZONTAL
2	11381.92	43.40	54.00	-10.60	33.09	6.68	38.30	34.67	Average	65	100	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	11375.50	49.87	54.00	-4.13	39.57	6.67	38.30	34.67	Average	325	100	VERTICAL
2	11378.56	65.86	74.00	-8.14	55.55	6.68	38.30	34.67	Peak	325	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	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11a CH 36 / Chain 1
Test Date	Apr. 15, 2014		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp		T/Pos	A/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	deg	cm	Pol/Phase
1	15535.56	54.05	74.00	-19.95	42.25	7.85	38.67	34.72	Peak	126	100	HORIZONTAL
2	15538.62	40.60	54.00	-13.40	28.80	7.85	38.67	34.72	Average	126	100	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp		T/Pos	A/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	deg	cm	Pol/Phase
1	15536.82	53.93	74.00	-20.07	42.13	7.85	38.67	34.72	Peak	334	100	VERTICAL
2	15544.64	40.58	54.00	-13.42	28.78	7.86	38.66	34.72	Average	334	100	VERTICAL

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11a CH 40 / Chain 1
Test Date	Apr. 15, 2014		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	Remark	deg	cm
1	15600.28	39.74	54.00	-14.26	28.03	7.88	38.62	34.79	Average	89	100 HORIZONTAL
2	15602.76	52.99	74.00	-21.01	41.28	7.88	38.62	34.79	Peak	89	100 HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	Remark	deg	cm
1	15599.78	40.30	54.00	-13.70	28.59	7.88	38.62	34.79	Average	221	100 VERTICAL
2	15600.28	52.72	74.00	-21.28	41.01	7.88	38.62	34.79	Peak	221	100 VERTICAL

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11a CH 48 / Chain 1
Test Date	Apr. 15, 2014		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp		T/Pos	A/Pos	
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	Remark	deg	cm	Pol/Phase
1	15718.08	39.25	54.00	-14.75	27.69	7.92	38.52	34.88	Average	280	100	HORIZONTAL
2	15722.58	51.89	74.00	-22.11	40.33	7.92	38.52	34.88	Peak	280	100	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp		T/Pos	A/Pos	
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	Remark	deg	cm	Pol/Phase
1	15717.78	39.10	54.00	-14.90	27.54	7.92	38.52	34.88	Average	174	100	VERTICAL
2	15724.32	51.41	74.00	-22.59	39.85	7.92	38.52	34.88	Peak	174	100	VERTICAL

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11a CH 52 / Chain 1
Test Date	Apr. 15, 2014		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp		T/Pos	A/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	deg	cm	Pol/Phase
1	15778.84	39.65	54.00	-14.35	28.18	7.93	38.48	34.94	Average	314	100	HORIZONTAL
2	15782.48	52.11	74.00	-21.89	40.64	7.94	38.47	34.94	Peak	314	100	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp		T/Pos	A/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	deg	cm	Pol/Phase
1	15776.40	39.70	54.00	-14.30	28.21	7.93	38.48	34.92	Average	184	100	VERTICAL
2	15780.50	51.84	74.00	-22.16	40.37	7.93	38.48	34.94	Peak	184	100	VERTICAL

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11a CH 60 / Chain 1
Test Date	Apr. 15, 2014		

Horizontal

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	Remark	deg	cm
1	10601.84	46.85	54.00	-7.15	36.86	6.60	38.38	34.99	Average	243	100 HORIZONTAL
2	10602.84	57.11	74.00	-16.89	47.12	6.60	38.38	34.99	Peak	243	100 HORIZONTAL
3	15895.56	52.89	74.00	-21.11	41.57	7.97	38.38	35.03	Peak	296	100 HORIZONTAL
4	15904.54	39.99	54.00	-14.01	28.67	7.98	38.37	35.03	Average	296	100 HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	Remark	deg	cm
1	10600.32	67.87	74.00	-6.13	57.89	6.60	38.38	35.00	Peak	325	100 VERTICAL
2	10601.44	53.11	54.00	-0.89	43.12	6.60	38.38	34.99	Average	325	100 VERTICAL
3	15895.00	39.69	54.00	-14.31	28.37	7.97	38.38	35.03	Average	343	100 VERTICAL
4	15902.74	52.19	74.00	-21.81	40.87	7.98	38.37	35.03	Peak	343	100 VERTICAL

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11a CH 64 / Chain 1
Test Date	Apr. 15, 2014		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	10639.76	39.81	54.00	-14.19	29.82	6.59	38.37	34.97	Average	74	100	HORIZONTAL
2	10640.64	52.00	74.00	-22.00	42.01	6.59	38.37	34.97	Peak	74	100	HORIZONTAL
3	15960.48	39.88	54.00	-14.12	28.65	8.00	38.33	35.10	Average	241	100	HORIZONTAL
4	15961.44	52.09	74.00	-21.91	40.86	8.00	38.33	35.10	Peak	241	100	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	10638.44	61.45	74.00	-12.55	51.46	6.59	38.37	34.97	Peak	34	102	VERTICAL
2	10642.40	45.82	54.00	-8.18	35.83	6.59	38.37	34.97	Average	34	102	VERTICAL
3	15956.46	52.62	74.00	-21.38	41.39	8.00	38.33	35.10	Peak	142	102	VERTICAL
4	15959.86	39.93	54.00	-14.07	28.70	8.00	38.33	35.10	Average	142	102	VERTICAL

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11a CH 100 / Chain 1
Test Date	Apr. 15, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna 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	10996.64	43.86	54.00	-10.14	33.81	6.46	38.30	34.71	Average	44	100	HORIZONTAL
2	11000.42	57.84	74.00	-16.16	47.79	6.46	38.30	34.71	Peak	44	100	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna 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	10999.86	50.59	54.00	-3.41	40.54	6.46	38.30	34.71	Average	324	100	VERTICAL
2	11000.46	65.58	74.00	-8.42	55.53	6.46	38.30	34.71	Peak	324	100	VERTICAL

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11a CH 116 / Chain 1
Test Date	Apr. 15, 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	11160.30	60.29	74.00	-13.71	50.12	6.56	38.30	34.69	Peak	44	100	HORIZONTAL
2	11162.48	46.09	54.00	-7.91	35.92	6.56	38.30	34.69	Average	44	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	11157.28	53.64	54.00	-0.36	43.48	6.55	38.30	34.69	Average	330	100	VERTICAL
2	11158.72	68.35	74.00	-5.65	58.18	6.56	38.30	34.69	Peak	330	100	VERTICAL

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11a CH 140 / Chain 1
Test Date	Apr. 15, 2014		

Horizontal

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp		T/Pos	A/Pos	
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	Remark	deg	cm	Pol/Phase
1	11396.36	54.29	74.00	-19.71	43.97	6.69	38.30	34.67	Peak	43	100	HORIZONTAL
2	11399.32	41.36	54.00	-12.64	31.04	6.69	38.30	34.67	Average	43	100	HORIZONTAL

Vertical

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp		T/Pos	A/Pos	
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	Remark	deg	cm	Pol/Phase
1	11398.48	64.26	74.00	-9.74	53.94	6.69	38.30	34.67	Peak	324	100	VERTICAL
2	11401.64	48.70	54.00	-5.30	38.38	6.69	38.30	34.67	Average	324	100	VERTICAL

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11a CH 144 / Chain 1
Test Date	Apr. 15, 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	11439.90	46.12	54.00	-7.88	35.78	6.71	38.30	34.67	Average	66	162	HORIZONTAL
2	11443.02	60.32	74.00	-13.68	49.98	6.71	38.30	34.67	Peak	66	162	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	11439.94	53.83	54.00	-0.17	43.49	6.71	38.30	34.67	Average	324	100	VERTICAL
2	11440.44	68.42	74.00	-5.58	58.08	6.71	38.30	34.67	Peak	324	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.

4.5. Band Edge Emissions Measurement

4.5.1. 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. 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 the spectrum analyzer.

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

Mode	On Time(ms)	On+Off Time(ms)	Duty Cycle(%)	1/T Minimum VBW (kHz)
802.11a	2.075	2.100	98.81%	0.01
802.11ac VHT20	1.940	1.965	98.73%	0.01
802.11ac VHT40	0.960	0.985	97.46%	1.04
802.11ac VHT80	0.460	0.485	94.85%	2.17

4.5.3. Test Procedures

1. The test procedure is the same as section 4.4.3, only the frequency range investigated is limited to 100MHz around bandedges.

4.5.4. Test Setup Layout

This test setup layout is the same as that shown in section 4.4.4.

4.5.5. Test Deviation

There is no deviation with the original standard.

4.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.5.7. Test Result of Band Edge and Fundamental Emissions

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 20MHz CH 36, 40, 48 / Chain 1
Test Date	Apr. 15, 2014		

Channel 36

	Freq	Level	Limit	Over	Read	CableAntenna	Preampl		T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	Remark	deg	cm
1	5146.80	67.54	74.00	-6.46	64.59	4.34	33.14	34.53	Peak	340	100 VERTICAL
2	5150.00	53.50	54.00	-0.50	50.55	4.34	33.14	34.53	Average	340	100 VERTICAL
3	5181.20	101.27			98.25	4.36	33.19	34.53	Average	340	100 VERTICAL
4	5184.40	112.04			109.02	4.36	33.19	34.53	Peak	340	100 VERTICAL

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

Channel 40

	Freq	Level	Limit	Over	Read	CableAntenna	Preampl		T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	Remark	deg	cm
1	5147.60	66.53	74.00	-7.47	63.58	4.34	33.14	34.53	Peak	340	109 VERTICAL
2	5150.00	53.46	54.00	-0.54	50.51	4.34	33.14	34.53	Average	340	109 VERTICAL
3	5202.00	104.38			101.32	4.37	33.22	34.53	Average	340	109 VERTICAL
4	5206.40	115.77			112.71	4.37	33.22	34.53	Peak	340	109 VERTICAL

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

Channel 48

	Freq	Level	Limit	Over	Read	CableAntenna	Preampl		T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	Remark	deg	cm
1	5145.20	60.39	74.00	-13.61	57.44	4.34	33.14	34.53	Peak	326	108 VERTICAL
2	5150.00	46.21	54.00	-7.79	43.26	4.34	33.14	34.53	Average	326	108 VERTICAL
3	5238.80	104.95			101.82	4.39	33.27	34.53	Average	326	108 VERTICAL
4	5241.20	116.48			113.35	4.39	33.27	34.53	Peak	326	108 VERTICAL
5	5351.80	44.94	54.00	-9.06	41.54	4.47	33.46	34.53	Average	326	108 VERTICAL
6	5352.40	57.96	74.00	-16.04	54.56	4.47	33.46	34.53	Peak	326	108 VERTICAL

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

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 20MHz CH 52, 60, 64 / Chain 1
Test Date	Apr. 15, 2014		

Channel 52

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	dB	deg	cm
1	5142.80	57.62	74.00	-16.38	54.67	4.34	33.14	34.53	Peak	326	108 VERTICAL
2	5148.80	44.66	54.00	-9.34	41.71	4.34	33.14	34.53	Average	326	108 VERTICAL
3	5254.00	105.24			102.07	4.40	33.30	34.53	Average	326	108 VERTICAL
4	5258.20	116.49			113.32	4.40	33.30	34.53	Peak	326	108 VERTICAL
5	5350.00	46.29	54.00	-7.71	42.89	4.47	33.46	34.53	Average	326	108 VERTICAL
6	5361.40	61.81	74.00	-12.19	58.37	4.48	33.49	34.53	Peak	326	108 VERTICAL

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

Channel 60

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	dB	deg	cm
1	5298.80	100.85			97.56	4.44	33.38	34.53	Average	55	100 VERTICAL
2	5304.40	112.49			109.20	4.44	33.38	34.53	Peak	55	100 VERTICAL
3	5350.00	53.61	54.00	-0.39	50.21	4.47	33.46	34.53	Average	55	100 VERTICAL
4	5352.80	69.91	74.00	-4.09	66.51	4.47	33.46	34.53	Peak	55	100 VERTICAL

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

Channel 64

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	dB	deg	cm
1	5318.40	98.87			95.54	4.45	33.41	34.53	Average	37	103 VERTICAL
2	5325.20	109.05			105.72	4.45	33.41	34.53	Peak	37	103 VERTICAL
3	5350.00	53.47	54.00	-0.53	50.07	4.47	33.46	34.53	Average	37	103 VERTICAL
4	5350.80	68.92	74.00	-5.08	65.52	4.47	33.46	34.53	Peak	37	103 VERTICAL

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

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 20MHz CH 100, 140, 144 / Chain 1
Test Date	Apr. 15, 2014		

Channel 100

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	dB	deg	cm
1	5459.20	64.64	74.00	-9.36	61.01	4.54	33.62	34.53	Peak	341	103 VERTICAL
2	5460.00	50.65	54.00	-3.35	47.02	4.54	33.62	34.53	Average	341	103 VERTICAL
3	5468.80	70.11	74.00	-3.89	66.44	4.55	33.65	34.53	Peak	341	103 VERTICAL
4	5470.00	53.48	54.00	-0.52	49.81	4.55	33.65	34.53	Average	341	103 VERTICAL
5	5493.60	102.24			98.54	4.56	33.67	34.53	Average	341	103 VERTICAL
6	5494.00	113.70			110.00	4.56	33.67	34.53	Peak	341	103 VERTICAL

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

Channel 140

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	dB	deg	cm
1	5693.60	111.15			106.75	4.70	34.27	34.57	Peak	325	100 VERTICAL
2	5694.00	100.31			95.91	4.70	34.27	34.57	Average	325	100 VERTICAL
3	5725.00	69.88	74.00	-4.12	65.37	4.72	34.37	34.58	Peak	325	100 VERTICAL
4	5725.00	53.87	54.00	-0.13	49.36	4.72	34.37	34.58	Average	325	100 VERTICAL

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

Channel 144

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	dB	deg	cm
1	5713.00	104.08			99.63	4.71	34.32	34.58	Average	3	100 VERTICAL
2	5724.00	114.93			110.42	4.72	34.37	34.58	Peak	3	100 VERTICAL
3	5833.00	44.78	54.00	-9.22	39.91	4.79	34.68	34.60	Average	3	100 VERTICAL
4	5842.00	57.69	74.00	-16.31	52.76	4.80	34.73	34.60	Peak	3	100 VERTICAL

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

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 40MHz CH 38, 46 / Chain 1
Test Date	Apr. 15, 2014		

Channel 38

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	Remark	deg	cm
1	5145.60	68.60	74.00	-5.40	65.65	4.34	33.14	34.53	Peak	341	110 VERTICAL
2	5150.00	53.42	54.00	-0.58	50.47	4.34	33.14	34.53	Average	341	110 VERTICAL
3	5193.20	93.81			90.75	4.37	33.22	34.53	Average	341	110 VERTICAL
4	5196.40	105.60			102.54	4.37	33.22	34.53	Peak	341	110 VERTICAL

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

Channel 46

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	Remark	deg	cm
1	5149.00	67.26	74.00	-6.74	64.31	4.34	33.14	34.53	Peak	324	109 VERTICAL
2	5150.00	53.40	54.00	-0.60	50.45	4.34	33.14	34.53	Average	324	109 VERTICAL
3	5225.00	99.57			96.44	4.39	33.27	34.53	Average	324	109 VERTICAL
4	5237.00	111.12			107.99	4.39	33.27	34.53	Peak	324	109 VERTICAL

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

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 40MHz CH 54, 62 / Chain 1
Test Date	Apr. 15, 2014		

Channel 54

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss 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	61.01	74.00	-12.99	58.06	4.34	33.14	34.53	Peak	338	108 VERTICAL
2	5150.00	44.93	54.00	-9.07	41.98	4.34	33.14	34.53	Average	338	108 VERTICAL
3	5274.00	112.35			109.13	4.42	33.33	34.53	Peak	338	108 VERTICAL
4	5275.00	99.70			96.48	4.42	33.33	34.53	Average	338	108 VERTICAL
5	5350.00	53.49	54.00	-0.51	50.09	4.47	33.46	34.53	Average	338	108 VERTICAL
6	5351.00	69.03	74.00	-4.97	65.63	4.47	33.46	34.53	Peak	338	108 VERTICAL

Item 3, 4 are the fundamental frequency at 5270 MHz.

Channel 62

	Freq	Level	Limit Line	Over Limit	Read Level	CableAntenna Loss 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	107.07			103.74	4.45	33.41	34.53	Peak	43	115 VERTICAL
2	5316.00	94.27			90.94	4.45	33.41	34.53	Average	43	115 VERTICAL
3	5354.00	53.61	54.00	-0.39	50.21	4.47	33.46	34.53	Average	43	115 VERTICAL
4	5356.40	71.09	74.00	-2.91	67.69	4.47	33.46	34.53	Peak	43	115 VERTICAL

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

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 40MHz CH 102, 110 / Chain 1
Test Date	Apr. 15, 2014		

Channel 102

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	dB	deg	cm
1	5458.00	63.33	74.00	-10.67	59.70	4.54	33.62	34.53	Peak	355	102 VERTICAL
2	5460.00	48.39	54.00	-5.61	44.76	4.54	33.62	34.53	Average	355	102 VERTICAL
3	5469.20	68.63	74.00	-5.37	64.96	4.55	33.65	34.53	Peak	355	102 VERTICAL
4	5470.00	53.19	54.00	-0.81	49.52	4.55	33.65	34.53	Average	355	102 VERTICAL
5	5496.00	94.35			90.65	4.56	33.67	34.53	Average	355	102 VERTICAL
6	5498.80	106.34			102.60	4.57	33.70	34.53	Peak	355	102 VERTICAL

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

Channel 110

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	dB	deg	cm
1	5452.00	66.36	74.00	-7.64	62.73	4.54	33.62	34.53	Peak	324	100 VERTICAL
2	5453.60	51.80	54.00	-2.20	48.17	4.54	33.62	34.53	Average	324	100 VERTICAL
3	5469.60	73.40	74.00	-0.60	69.73	4.55	33.65	34.53	Peak	324	100 VERTICAL
4	5470.00	53.23	54.00	-0.77	49.56	4.55	33.65	34.53	Average	324	100 VERTICAL
5	5544.00	114.72			110.87	4.59	33.80	34.54	Peak	324	100 VERTICAL
6	5554.80	101.62			97.70	4.60	33.86	34.54	Average	324	100 VERTICAL

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

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 40MHz CH 134, 142 / Chain 1
Test Date	Apr. 15, 2014		

Channel 134

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	dB	deg	cm
1	5663.60	97.89			93.61	4.67	34.17	34.56	Average	324	100 VERTICAL
2	5679.60	110.27			105.94	4.68	34.22	34.57	Peak	324	100 VERTICAL
3	5725.00	68.57	74.00	-5.43	64.06	4.72	34.37	34.58	Peak	324	100 VERTICAL
4	5725.00	53.86	54.00	-0.14	49.35	4.72	34.37	34.58	Average	324	100 VERTICAL

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

Channel 142

	Freq	Level	Limit	Over	Read	CableAntenna	Preamp		T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	dB	deg	cm
1	5701.00	100.88			96.42	4.71	34.32	34.57	Average	2	110 VERTICAL
2	5701.60	114.34			109.88	4.71	34.32	34.57	Peak	2	110 VERTICAL
3	5825.00	48.16	54.00	-5.84	43.29	4.79	34.68	34.60	Average	2	110 VERTICAL
4	5827.40	64.12	74.00	-9.88	59.25	4.79	34.68	34.60	Peak	2	110 VERTICAL

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

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 80MHz CH 42, 58 / Chain 1
Test Date	Apr. 08, 2014 & Apr. 15, 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	5134.40	53.91	54.00	-0.09	13.81	6.12	33.98	0.00	Average	102	50	VERTICAL
2	5145.80	68.29	74.00	-5.71	28.15	6.13	34.01	0.00	Peak	102	50	VERTICAL
3	5199.80	103.05			62.78	6.16	34.11	0.00	Peak	102	50	VERTICAL
4	5201.60	89.64			49.37	6.16	34.11	0.00	Average	102	50	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	5150.00	58.97	74.00	-15.03	56.02	4.34	33.14	34.53	Peak	48	104	VERTICAL
2	5150.00	45.56	54.00	-8.44	42.61	4.34	33.14	34.53	Average	48	104	VERTICAL
3	5276.00	90.42			87.17	4.43	33.35	34.53	Average	48	104	VERTICAL
4	5278.00	103.33			100.08	4.43	33.35	34.53	Peak	48	104	VERTICAL
5	5378.00	53.83	54.00	-0.17	50.36	4.49	33.51	34.53	Average	48	104	VERTICAL
6	5385.00	70.49	74.00	-3.51	67.02	4.49	33.51	34.53	Peak	48	104	VERTICAL

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

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 80MHz CH 106, 122, 138 / Chain 1
Test Date	Apr. 08, 2014 & Apr. 15, 2014		

Channel 106

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	5436.00	68.67	74.00	-5.33	65.08	4.53	33.59	34.53	Peak	323	100	VERTICAL
2	5453.00	53.32	54.00	-0.68	49.69	4.54	33.62	34.53	Average	323	100	VERTICAL
3	5470.00	65.62	74.00	-8.38	61.95	4.55	33.65	34.53	Peak	323	100	VERTICAL
4	5470.00	52.58	54.00	-1.42	48.91	4.55	33.65	34.53	Average	323	100	VERTICAL
5	5541.00	104.09			100.24	4.59	33.80	34.54	Peak	323	100	VERTICAL
6	5543.00	91.29			87.44	4.59	33.80	34.54	Average	323	100	VERTICAL
7	5726.00	58.39	74.00	-15.61	53.88	4.72	34.37	34.58	Peak	323	100	VERTICAL
8	5726.00	43.39	54.00	-10.61	38.88	4.72	34.37	34.58	Average	323	100	VERTICAL

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

Channel 122

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	5592.87	94.29			53.12	6.39	34.78	0.00	Average	100	0	HORIZONTAL
2	5595.63	107.90			66.73	6.39	34.78	0.00	Peak	100	0	HORIZONTAL
3	5727.50	53.67	54.00	-0.33	12.33	6.45	34.89	0.00	Average	100	0	HORIZONTAL
4	5730.46	68.68	74.00	-5.32	27.34	6.45	34.89	0.00	Peak	100	0	HORIZONTAL

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

Channel 138

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	5681.00	89.28			84.95	4.68	34.22	34.57	Average	327	100	HORIZONTAL
2	5682.00	102.61			98.28	4.68	34.22	34.57	Peak	327	100	HORIZONTAL
3	5826.00	67.86	74.00	-6.14	62.99	4.79	34.68	34.60	Peak	327	100	HORIZONTAL
4	5828.00	53.50	54.00	-0.50	48.63	4.79	34.68	34.60	Average	327	100	HORIZONTAL

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

Note:

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

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

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11a CH 36, 40, 48 / Chain 1
Test Date	Apr. 08, 2014 & Apr. 15, 2014		

Channel 36

	Freq	Level	Limit	Over	Read	CableAntenna	Preampl		T/Pos	A/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	deg	cm
			dBuV/m	dB	dBuV	dB	dB/m	dB			Pol/Phase
1	5148.60	72.80	74.00	-1.20	35.32	4.34	33.14	0.00	Peak	76	110 VERTICAL
2	5150.00	53.96	54.00	-0.04	16.48	4.34	33.14	0.00	Average	76	110 VERTICAL
3	5176.40	113.24			75.69	4.36	33.19	0.00	Peak	76	110 VERTICAL
4	5186.20	102.20			64.65	4.36	33.19	0.00	Average	76	110 VERTICAL

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

Channel 40

	Freq	Level	Limit	Over	Read	CableAntenna	Preampl		T/Pos	A/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	deg	cm
			dBuV/m	dB	dBuV	dB	dB/m	dB			Pol/Phase
1	5147.20	65.04	74.00	-8.96	62.09	4.34	33.14	34.53	Peak	233	115 VERTICAL
2	5150.00	52.14	54.00	-1.86	49.19	4.34	33.14	34.53	Average	233	115 VERTICAL
3	5198.00	112.58			109.52	4.37	33.22	34.53	Peak	233	115 VERTICAL
4	5198.80	102.19			99.13	4.37	33.22	34.53	Average	233	115 VERTICAL

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

Channel 48

	Freq	Level	Limit	Over	Read	CableAntenna	Preampl		T/Pos	A/Pos	
	MHz	dBuV/m	Line	Limit	Level	Loss	Factor	Factor	Remark	deg	cm
			dBuV/m	dB	dBuV	dB	dB/m	dB			Pol/Phase
1	5136.20	56.01	74.00	-17.99	53.10	4.33	33.11	34.53	Peak	232	102 VERTICAL
2	5150.00	42.36	54.00	-11.64	39.41	4.34	33.14	34.53	Average	232	102 VERTICAL
3	5235.20	112.59			109.46	4.39	33.27	34.53	Peak	232	102 VERTICAL
4	5236.40	101.89			98.76	4.39	33.27	34.53	Average	232	102 VERTICAL
5	5350.00	44.14	54.00	-9.86	40.74	4.47	33.46	34.53	Average	232	102 VERTICAL
6	5351.80	57.41	74.00	-16.59	54.01	4.47	33.46	34.53	Peak	232	102 VERTICAL

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

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11a CH 52, 60, 64 / Chain1
Test Date	Apr. 15, 2014		

Channel 52

	Freq	Level	Limit	Over	Read	CableAntenna	Preampl	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	deg	cm	
1	5252.80	113.54			110.37	4.40	33.30	34.53	231	102	VERTICAL
2	5254.80	102.61			99.44	4.40	33.30	34.53	231	102	VERTICAL
3	5350.40	44.37	54.00	-9.63	40.97	4.47	33.46	34.53	231	102	VERTICAL
4	5355.20	58.32	74.00	-15.68	54.92	4.47	33.46	34.53	231	102	VERTICAL

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

Channel 60

	Freq	Level	Limit	Over	Read	CableAntenna	Preampl	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	deg	cm	
1	5305.20	112.61			109.32	4.44	33.38	34.53	230	103	VERTICAL
2	5306.40	102.14			98.85	4.44	33.38	34.53	230	103	VERTICAL
3	5350.00	52.76	54.00	-1.24	49.36	4.47	33.46	34.53	230	103	VERTICAL
4	5354.80	68.43	74.00	-5.57	65.03	4.47	33.46	34.53	230	103	VERTICAL

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

Channel 64

	Freq	Level	Limit	Over	Read	CableAntenna	Preampl	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	Loss	Factor	Factor	deg	cm	
1	5317.20	98.43			95.10	4.45	33.41	34.53	231	100	VERTICAL
2	5319.20	109.09			105.76	4.45	33.41	34.53	231	100	VERTICAL
3	5350.00	53.35	54.00	-0.65	49.95	4.47	33.46	34.53	231	100	VERTICAL
4	5350.80	69.00	74.00	-5.00	65.60	4.47	33.46	34.53	231	100	VERTICAL

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

Temperature	21°C	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11a CH 100, 140, 144 / Chain 1
Test Date	Apr. 15, 2014		

Channel 100

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	5460.00	63.21	74.00	-10.79	59.58	4.54	33.62	34.53	Peak	146	100	VERTICAL
2	5460.00	49.54	54.00	-4.46	45.91	4.54	33.62	34.53	Average	146	100	VERTICAL
3	5470.00	68.82	74.00	-5.18	65.15	4.55	33.65	34.53	Peak	146	100	VERTICAL
4	5470.00	53.77	54.00	-0.23	50.10	4.55	33.65	34.53	Average	146	100	VERTICAL
5	5498.00	112.23			108.49	4.57	33.70	34.53	Peak	146	100	VERTICAL
6	5501.60	101.54			97.80	4.57	33.70	34.53	Average	146	100	VERTICAL

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

Channel 140

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	5697.20	98.59			94.19	4.70	34.27	34.57	Average	160	100	VERTICAL
2	5698.00	109.76			105.36	4.70	34.27	34.57	Peak	160	100	VERTICAL
3	5725.80	67.30	68.20	-0.90	62.79	4.72	34.37	34.58	Peak	160	100	VERTICAL

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

Channel 144

	Freq	Level	Limit	Over	Read	Cable	Antenna	Preamp	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	5724.00	114.07			109.56	4.72	34.37	34.58	Peak	162	108	VERTICAL
2	5725.00	104.02			99.51	4.72	34.37	34.58	Average	162	108	VERTICAL
3	5837.00	58.20	74.00	-15.80	53.27	4.80	34.73	34.60	Peak	162	108	VERTICAL
4	5843.00	44.96	54.00	-9.04	40.03	4.80	34.73	34.60	Average	162	108	VERTICAL

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

Note:

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

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

4.6. Antenna Requirements

4.6.1. 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.

4.6.2. 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	2888	20MHz ~ 2GHz	Jan. 15, 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	SCHWARZBEAK	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	CO2000	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. 04, 2013	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

Uncertainty of Radiated Emission Measurement (30MHz ~ 1,000MHz)

Contribution	Uncertainty of x_i			$u(x_i)$
	Value	Unit	Probability Distribution k	
Receiver reading	± 0.173	dB	K=1	0.086
Cable loss	± 0.174	dB	K=2	0.087
Antenna gain	± 0.169	dB	K=2	0.084
Site imperfection	± 0.433	dB	Triangular	0.214
Pre-amplifier gain	± 0.366	dB	K=2	0.183
Transmitter antenna	± 1.200	dB	Rectangular	0.600
Signal generator	± 0.461	dB	Rectangular	0.231
Mismatch	± 0.080	dB	U-shape	0.040
Spectrum analyzer	± 0.500	dB	Rectangular	0.250
Combined standard uncertainty $U_c(y)$				1.778
Measuring uncertainty for a level of confidence of 95% $U=2U_c(y)$				3.555

Uncertainty of Radiated Emission Measurement (1GHz ~ 18GHz)

Contribution	Uncertainty of x_i			$u(x_i)$
	Value	Unit	Probability Distribution k	
Receiver reading	± 0.191	dB	K=1	0.095
Cable loss	± 0.169	dB	K=2	0.084
Antenna gain	± 0.191	dB	K=2	0.096
Site imperfection	± 0.582	dB	Triangular	0.291
Pre-amplifier gain	± 0.304	dB	K=2	0.152
Transmitter antenna	± 1.200	dB	Rectangular	0.600
Signal generator	± 0.461	dB	Rectangular	0.231
Mismatch	± 0.080	dB	U-shape	0.040
Spectrum analyzer	± 0.500	dB	Rectangular	0.250
Combined standard uncertainty $U_c(y)$				1.839
Measuring uncertainty for a level of confidence of 95% $U=2U_c(y)$				3.678

Uncertainty of Radiated Emission Measurement (18GHz ~ 40GHz)

Contribution	Uncertainty of x_i			$u(x_i)$
	Value	Unit	Probability Distribution k	
Receiver reading	± 0.186	dB	K=1	0.093
Cable loss	± 0.167	dB	K=2	0.083
Antenna gain	± 0.190	dB	K=2	0.095
Site imperfection	± 0.488	dB	Triangular	0.244
Pre-amplifier gain	± 0.269	dB	K=2	0.134
Transmitter antenna	± 1.200	dB	Rectangular	0.600
Signal generator	± 0.461	dB	Rectangular	0.231
Mismatch	± 0.080	dB	U-shape	0.040
Spectrum analyzer	± 0.500	dB	Rectangular	0.250
Combined standard uncertainty $U_c(y)$				1.771
Measuring uncertainty for a level of confidence of 95% $U=2U_c(y)$				3.541