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FCC RADIO TEST REPORT

Applicant's company	**Ubee Interactive Corp.**
Applicant Address	10F-1, No.5, Taiyuan 1st St. Jhubei, Hsinchu, 302, Taiwan
FCC ID	**XCNDVW32C**
Manufacturer's company	**Ubee Interactive Corp.**
Manufacturer Address	10F-1, No.5, Taiyuan 1st St. Jhubei, Hsinchu, 302, Taiwan

Product Name	Wireless eMTA
Brand Name	Ubee
Model No.	DVW32C
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5250 ~ 5350MHz / 5470 ~ 5725MHz
Received Date	Sep. 19, 2014
Final Test Date	Jul. 01, 2015
Submission Type	Class II Change

Statement

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

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

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

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

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

Testing Laboratory
1190

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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR4O0315-01	Rev. 01	Initial issue of report	Oct. 19, 2015

1. VERIFICATION OF COMPLIANCE

Product Name	:	Wireless eMTA
Brand Name	:	Ubee
Model No.	:	DVW32C
Applicant	:	Ubee Interactive Corp.
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 Sep. 19, 2014 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

Sam Chen

SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart E				
Part	**Rule Section**	**Description of Test**	**Result**	**Under Limit**
4.1	15.407(a)	26dB Spectrum Bandwidth and 99% Occupied Bandwidth	Complies	-
4.2	15.407(a)	Maximum Conducted Output Power	Complies	0.02 dB
4.3	15.407(a)	Power Spectral Density	Complies	0.02 dB
4.4	15.407(b)	Radiated Emissions	Complies	0.08 dB
4.5	15.407(b)	Band Edge Emissions	Complies	0.02 dB
4.6	15.407(g)	Frequency Stability	Complies	-
4.7	15.203	Antenna Requirements	Complies	-

3. GENERAL INFORMATION

3.1. Product Details

IEEE 802.11n/ac

Items	Description
Product Type	WLAN (3TX, 3RX)
Radio Type	Intentional Transceiver
Power Type	From battery 7.4V or Internal power supply
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	5250 ~ 5350MHz / 5470 ~ 5725MHz
Channel Number	15 for 20MHz bandwidth ; 7 for 40MHz bandwidth 3 for 80MHz bandwidth
Channel Band Width (99%)	Band 2: For Non-Beamforming Mode 802.11ac MCS0/Nss1 (VHT20): 17.92 MHz ; 802.11ac MCS0/Nss1 (VHT40): 36.48 MHz ; 802.11ac MCS0/Nss1 (VHT80): 76.16 MHz For Beamforming Mode 802.11ac MCS0/Nss1 (VHT20): 17.92 MHz ; 802.11ac MCS0/Nss1 (VHT40): 36.48 MHz ; 802.11ac MCS0/Nss1 (VHT80): 76.16 MHz Band 3: For Non-Beamforming Mode 802.11ac MCS0/Nss1 (VHT20): 18.08 MHz ; 802.11ac MCS0/Nss1 (VHT40): 36.48 MHz ; 802.11ac MCS0/Nss1 (VHT80): 76.80 MHz For Beamforming Mode 802.11ac MCS0/Nss1 (VHT20): 17.92 MHz ; 802.11ac MCS0/Nss1 (VHT40): 36.48 MHz ; 802.11ac MCS0/Nss1 (VHT80): 76.60 MHz

Maximum Conducted Output Power	Band 2: For Non-Beamforming Mode 802.11ac MCS0/Nss1 (VHT20): 22.24 dBm ; 802.11ac MCS0/Nss1 (VHT40): 22.82 dBm ; 802.11ac MCS0/Nss1 (VHT80): 22.09 dBm For Beamforming Mode 802.11ac MCS0/Nss1 (VHT20): 21.81 dBm ; 802.11ac MCS0/Nss1 (VHT40): 21.91 dBm ; 802.11ac MCS0/Nss1 (VHT80): 21.86 dBm Band 3: For Non-Beamforming Mode 802.11ac MCS0/Nss1 (VHT20): 21.60 dBm ; 802.11ac MCS0/Nss1 (VHT40): 23.86 dBm ; 802.11ac MCS0/Nss1 (VHT80): 23.93 dBm For Beamforming Mode 802.11ac MCS0/Nss1 (VHT20): 21.30 dBm ; 802.11ac MCS0/Nss1 (VHT40): 21.30 dBm ; 802.11ac MCS0/Nss1 (VHT80): 21.24 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

IEEE 802.11a

Items	Description
Product Type	WLAN (3TX, 3RX)
Radio Type	Intentional Transceiver
Power Type	From battery 7.4V or Internal power supply
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	5250 ~ 5350MHz / 5470 ~ 5725MHz
Channel Number	15
Channel Band Width (99%)	Band 2: 16.80 MHz ; Band 3: 16.80 MHz
Maximum Conducted Output Power	Band 2: 22.16 dBm ; Band 3: 21.60 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Items	Description	
Communication Mode	☒ IP Based (Load Based)	☐ Frame Based
TPC Function	☒ With TPC	☐ Without TPC
Weather Band (5600~5650MHz)	☒ With 5600~5650MHz	☐ Without 5600~5650MHz
Beamforming Function	☒ With beamforming for 802.11n/ac in 2.4GHz/5GHz.	☐ Without beamforming
Operating Mode	☐ Outdoor access point	
	☒ Indoor access point	
	☐ Fixed point-to-point access points	
	☐ Mobile and portable client devices	

Antenna and Band width

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

IEEE 11n/ac Spec.

Protocol	Number of Transmit Ant.s (NTX)	Data Rate / MCS
802.11n (HT20)	3	MCS 0-23
802.11n (HT40)	3	MCS 0-23
802.11ac (VHT20)	3	MCS 0-9/Nss1-3
802.11ac (VHT40)	3	MCS 0-9/Nss1-3
802.11ac (VHT80)	3	MCS 0-9/Nss1-3
Note 1: IEEE Std. 802.11n modulation consists of HT20 and HT40 (HT: High Throughput). Then EUT support HT20 and HT40. Note 2: IEEE Std. 802.11ac modulation consists of VHT20, VHT40, VHT80 and VHT160 (VHT: Very High Throughput). Then EUT support VHT20, VHT40 and VHT80. Note 3: Modulation modes consist of below configuration: HT20/HT40: IEEE 802.11n, VHT20/VHT40/VHT80: IEEE 802.11ac		

3.2. Accessories

Name	Brand	Model	Rating
Rechargeable Li-Ion Battery	SMP	SMPCM10	7.4V, 2.55Ahr 18 87Wh
Others			
AC Power Cable*1, Non-shielded, 1.5m RJ-45 Cable*1, Non-shielded, 1.5m RJ-11 Cable*1, Non-shielded, 1.5m			

3.3. Table for Filed Antenna

Set	Ant.	Brand Holder	P/N	Antenna Type	Connector
1	1	TONGDA COMMUNICATION CO., LTD	T-543-8201046-1	PCB Antenna	I-PEX
	2	TONGDA COMMUNICATION CO., LTD	T-543-8201046-2	PCB Antenna	I-PEX
	3	TONGDA COMMUNICATION CO., LTD	T-543-8201046-3	PCB Antenna	I-PEX
2	1	WHA YU INDUSTRIAL CO., LTD.	C107-511155-A	PCB Antenna	I-PEX
	2	WHA YU INDUSTRIAL CO., LTD.	C107-511156-A	PCB Antenna	I-PEX
	3	WHA YU INDUSTRIAL CO., LTD.	C107-511157-A	PCB Antenna	I-PEX

Antenna Gain (dBi)						
Frequency	Ant. 1		Ant. 2		Ant. 3	
	Set 1	Set 2	Set 1	Set 2	Set 1	Set 2
2400MHz	4.815	5.0	5.424	5.5	4.567	4.6
2450MHz	4.509	4.6	4.242	4.3	3.718	3.8
2500MHz	4.978	5.0	4.860	5.0	4.771	4.9

Band	Ant. 1		Ant. 2		Ant. 3	
	Set 1	Set 2	Set 1	Set 2	Set 1	Set 2
Band1	4.518	4.7	4.228	4.4	2.785	2.8
Band2	3.546	3.8	3.342	3.5	2.326	2.5
Band3	3.812	4.1	4.386	4.5	2.843	3.0
Band4	4.301	4.5	5.217	5.4	3.469	3.6

Note 1: The EUT has two sets of antennas and there are three antennas for each set.

Note 2: Because TONGDA antennas and WHAYU antennas are the same type antennas; only the higher gain antennas "WHAYU antennas" was tested and recorded in the report.

For 2.4GHz function (3TX/3RX):

For IEEE 802.11b/g/n/ac mode:

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

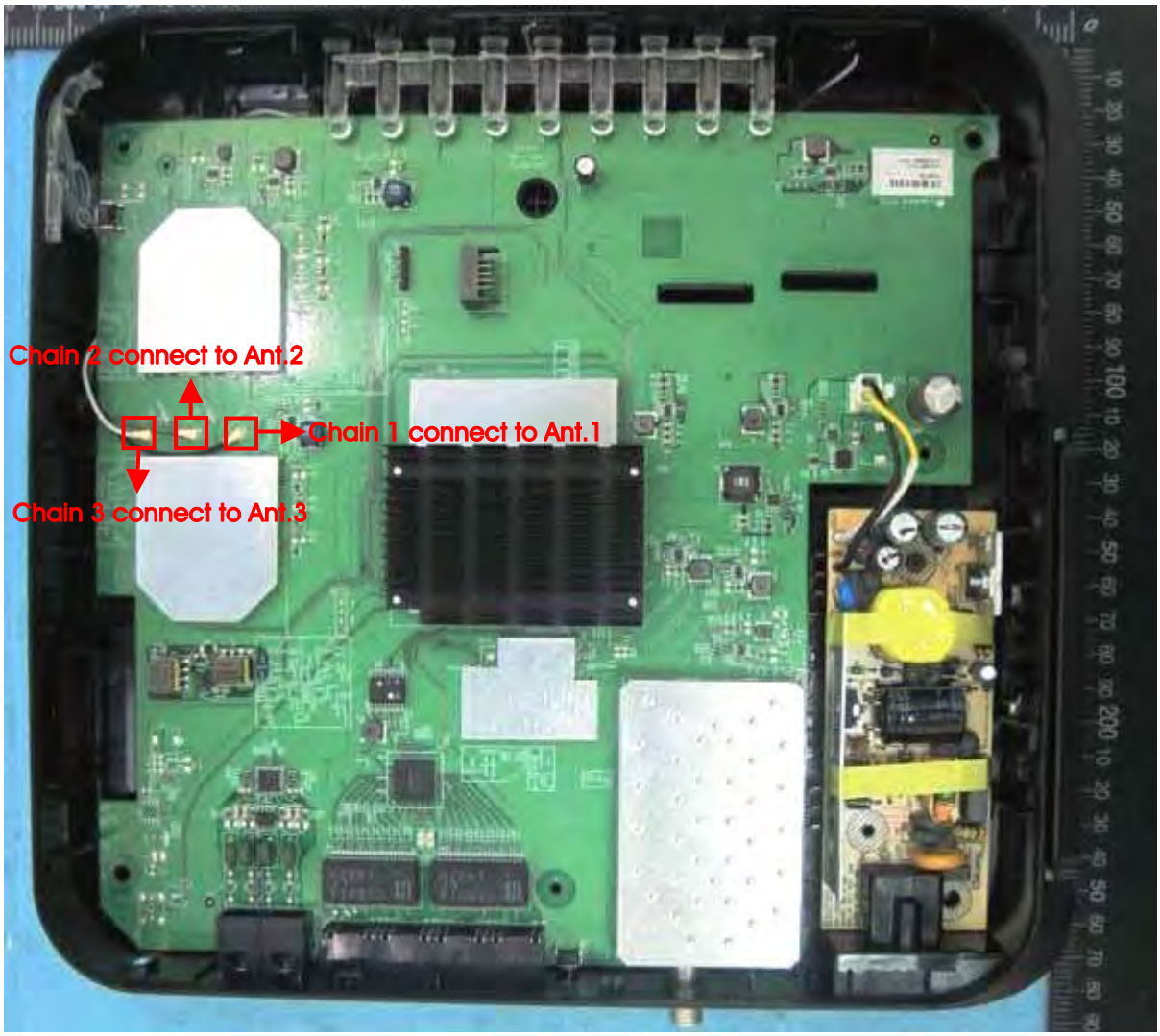
Ant. 1, Ant. 2 and Ant. 3 could transmit/receive simultaneously.

For 5Hz function (3TX/3RX):

For IEEE 802.11a/n/ac mode:

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

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


Chain 2 connect to Ant.2
Chain 1 connect to Ant.1
Chain 3 connect to Ant.3

3.4. Table for Carrier Frequencies

There are three bandwidth systems.

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

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

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

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
5250~5350 MHz Band 2	52	5260 MHz	60	5300 MHz
	54	5270 MHz	62	5310 MHz
	56	5280 MHz	64	5320 MHz
	58	5290 MHz	-	-
5470~5725 MHz Band 3	100	5500 MHz	120	5600 MHz
	102	5510 MHz	122	5610 MHz
	104	5520 MHz	124	5620 MHz
	106	5530 MHz	126	5630 MHz
	108	5540 MHz	128	5640 MHz
	110	5550 MHz	132	5660 MHz
	112	5560 MHz	134	5670 MHz
	116	5580 MHz	136	5680 MHz
	118	5590 MHz	140	5700 MHz

3.5. Table for Test Modes

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

Test Items	Mode		Data Rate	Channel	Chain
Max. Conducted Output Power	11ac VHT20	Band 2-3	MCS0/Nss1	52/60/64/100/116/140	1+2+3
	11ac VHT40	Band 2-3	MCS0/Nss1	54/62/102/110/134	1+2+3
	11ac VHT80	Band 2-3	MCS0/Nss1	58/106/122	1+2+3
	11a/BPSK	Band 2-3	6Mbps	52/60/64/100/116/140	1+2+3
Power Spectral Density	11ac VHT20	Band 2-3	MCS0/Nss1	52/60/64/100/116/140	1+2+3
	11ac VHT40	Band 2-3	MCS0/Nss1	54/62/102/110/134	1+2+3
	11ac VHT80	Band 2-3	MCS0/Nss1	58/106/122	1+2+3
	11a/BPSK	Band 2-3	6Mbps	52/60/64/100/116/140	1+2+3
26dB Spectrum Bandwidth 99% Occupied Bandwidth Measurement	11ac VHT20	Band 2-3	MCS0/Nss1	52/60/64/100/116/140	1+2+3
	11ac VHT40	Band 2-3	MCS0/Nss1	54/62/102/110/134	1+2+3
	11ac VHT80	Band 2-3	MCS0/Nss1	58/106/122	1+2+3
	11a/BPSK	Band 2-3	6Mbps	52/60/64/100/116/140	1+2+3
Radiated Emission Above 1GHz	11ac VHT20	Band 2-3	MCS0/Nss1	52/60/64/100/116/140	1+2+3
	11ac VHT40	Band 2-3	MCS0/Nss1	54/62/102/110/134	1+2+3
	11ac VHT80	Band 2-3	MCS0/Nss1	58/106/122	1+2+3
	11a/BPSK	Band 2-3	6Mbps	52/60/64/100/116/140	1+2+3

Band Edge Emission	11ac VHT20	Band 2-3	MCS0/Nss1	52/60/64/100/116/140	1+2+3
	11ac VHT40	Band 2-3	MCS0/Nss1	54/62/102/110/134	1+2+3
	11ac VHT80	Band 2-3	MCS0/Nss1	58/106/122	1+2+3
	11a/BPSK	Band 2-3	6Mbps	52/60/64/100/116/140	1+2+3
Frequency Stability	Un-modulation		-	60/100	1+2+3

Note1: VHT20/VHT40 covers HT20/HT40, due to same modulation.

Note2: There are two modes of EUT, one is beamforming mode, and the other is non-beamforming mode for 802.11n/ac.All test results were recorded in the report.

The following test modes were performed for all tests:

For Radiated Emission test (Above 1G):

Mode 1. CTX

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

The EUT could be applied with 2.4GHz WLAN function and 5GHz WLAN function; therefore Co-location Maximum Permissible Exposure (Please refer to FA4O0315-01) test is added for simultaneously transmit between 2.4GHz WLAN function and 5GHz WLAN function.

3.6. Table for Testing Locations

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

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

3.7. Table for Class II Change

This product is an extension of original one reported under Sporton project number: FR4O0315AB.

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

Modifications	Performance Checking
Add 5 GHz Band 2 and Band 3 (5250~5350 MHz, 5470~5725 MHz) for this device.	1. 26dB Spectrum Bandwidth and 99% Occupied Bandwidth 2. Maximum Conducted Output Power 3. Power Spectral Density 4. Radiated Emissions (Above 1GHz) 5. Band Edge Emissions 6. Frequency Stability Measurement

3.8. Table for Supporting Units

For Test Site No: 03CH01-CB

For Non-Beamforming Mode:

Support Unit	Brand	Model	FCC ID
NB	DELL	E6430	DoC

For Beamforming Mode:

Support Unit	Brand	Model	FCC ID
NB*2	DELL	E6430	DoC
WLAN ac Dongle	Netgear	A6200	PY312200200

For Test Site No: TH01-CB

Support Unit	Brand	Model	FCC ID
NB	DELL	E6430	DoC

3.9. Table for Parameters of Test Software Setting

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

For Non-Beamforming mode:

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT20

Test Software Version	Mtool: 2.0.1.0					
Frequency	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
MCS0/Nss1 VHT20	64	63	62	60	60	60

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT40

Test Software Version	Mtool: 2.0.1.0				
Frequency	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz
MCS0/Nss1 VHT40	65	64	68	68	68

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT80

Test Software Version		Mtool: 2.0.1.0	
Frequency	5290 MHz	5530 MHz	5610 MHz
MCS0/Nss1 VHT80	63	68	72

Power Parameters of IEEE 802.11a

Test Software Version	Mtool: 2.0.1.0					
Frequency	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
802.11a	63	62	61	60	60	60

For Beamforming mode:

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT20

Test Software Version	Mtool: 2.0.1.0					
Frequency	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
MCS0/Nss1 VHT20	62	61	61	59	59	59

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT40

Test Software Version	Mtool: 2.0.1.0				
Frequency	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz
MCS0/Nss1 VHT40	61	60	58	58	57

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT80

Test Software Version	Mtool: 2.0.1.0		
Frequency	5290 MHz	5530 MHz	5610 MHz
MCS0/Nss1 VHT80	62	59	60

3.10. EUT Operation during Test

For non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

For Conducted Mode:

The EUT was programmed to be in continuously transmitting mode.

For Radiated Mode:

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

The program was executed as follows:

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

3.11. Duty Cycle

For non-beamforming mode:

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11ac MCS0/Nss1 VHT20	1.920	1.950	98.46%	0.07	0.01
802.11ac MCS0/Nss1 VHT40	0.940	0.970	96.91%	0.14	1.06
802.11ac MCS0/Nss1 VHT80	0.460	0.480	95.83%	0.18	2.17
802.11a	2.060	2.090	98.63%	0.06	0.01

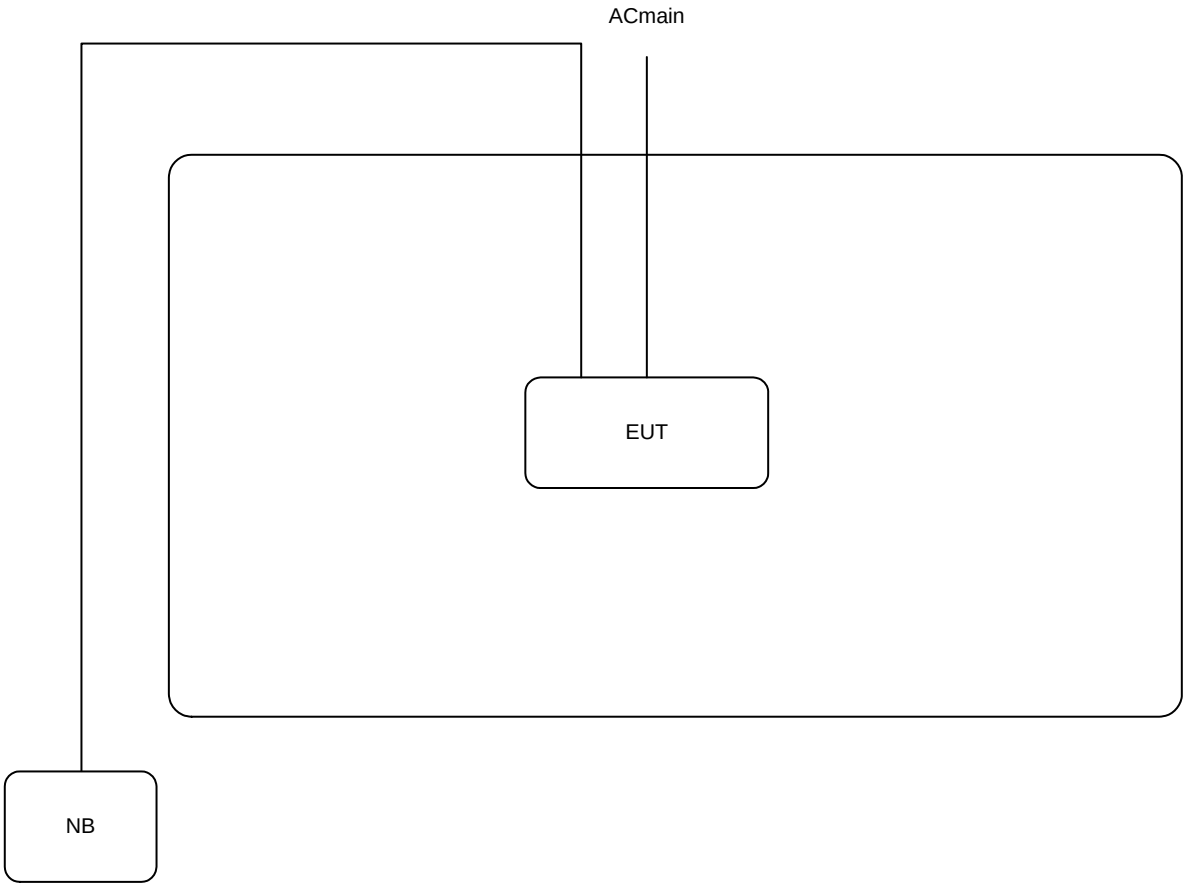
For beamforming mode:

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11ac MCS0/Nss1 VHT20	3.840	3.940	97.46%	0.11	0.26
802.11ac MCS0/Nss1 VHT40	4.560	4.640	98.28%	0.08	0.01
802.11ac MCS0/Nss1 VHT80	5.070	5.300	95.66%	0.19	0.20

3.12. Test Configurations

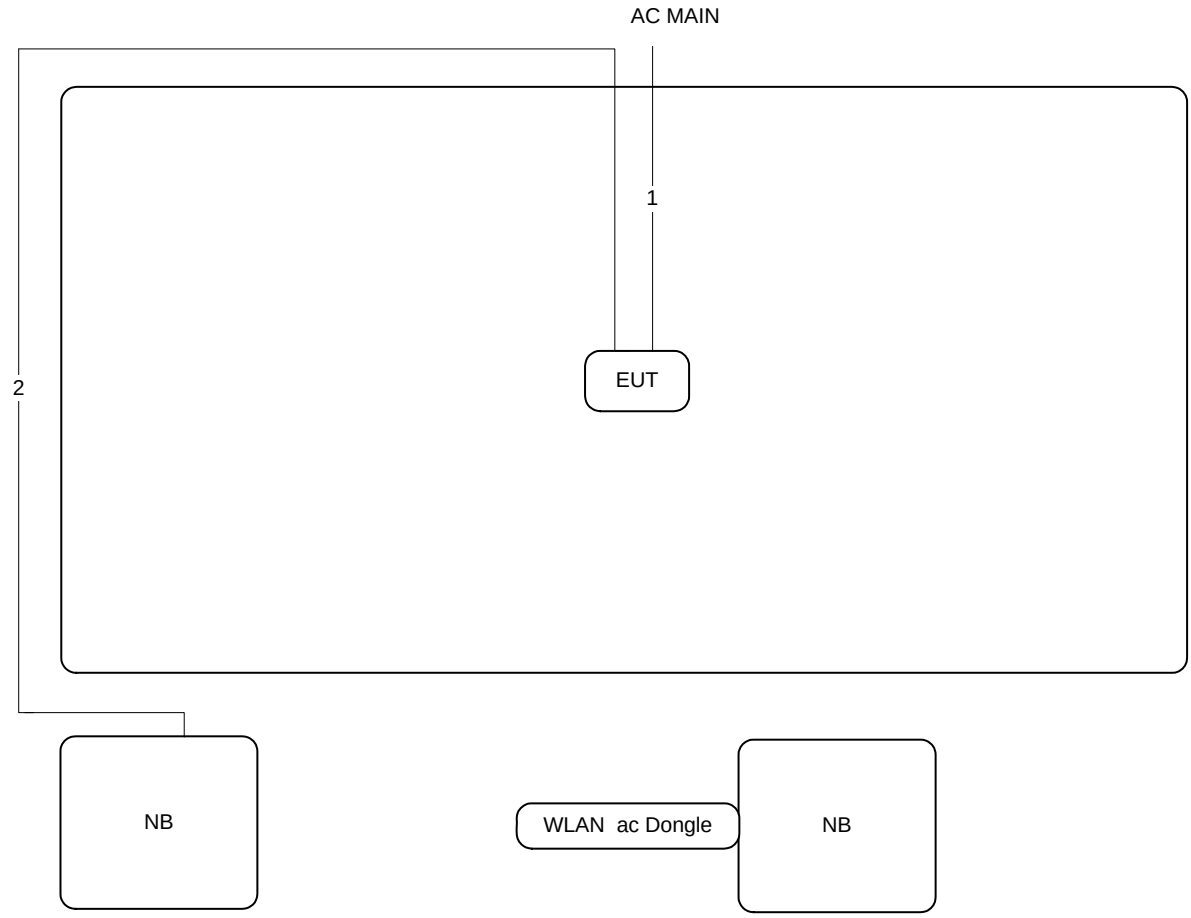
3.12.1. Radiation Emissions Test Configuration

For Non-Beamforming mode:



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

For Beamforming mode:



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

4. TEST RESULT

4.1. 26dB Bandwidth and 99% Occupied Bandwidth Measurement

4.1.1. Limit

No restriction limits.

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 spectrum analyzer.

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

4.1.3. Test Procedures

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

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

4.1.4. Test Setup Layout

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

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

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 26dB Bandwidth and 99% Occupied Bandwidth

For Non-Beamforming mode:

Temperature	26°C	Humidity	63%
Test Engineer	Serway Li, Roki Liu	Configurations	IEEE 802.11ac

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2 + Ant. 3

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
52	5260 MHz	20.16	17.92
60	5300 MHz	20.48	17.92
64	5320 MHz	20.16	17.92
100	5500 MHz	20.16	17.92
116	5580 MHz	20.16	17.92
140	5700 MHz	20.32	18.08

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2 + Ant. 3

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
54	5270 MHz	39.04	36.48
62	5310 MHz	39.36	36.16
102	5510 MHz	38.72	36.48
110	5550 MHz	38.72	36.16
134	5670 MHz	38.72	36.48

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 1 + Ant. 2 + Ant. 3

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
58	5290 MHz	81.28	76.16
106	5530 MHz	81.92	76.80
122	5610 MHz	82.00	76.80

Temperature	26°C	Humidity	63%
Test Engineer	Serway Li, Roki Liu	Configurations	IEEE 802.11a

Configuration IEEE 802.11a / Ant. 1 + Ant. 2 + Ant. 3

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
52	5260 MHz	20.00	16.80
60	5300 MHz	19.84	16.80
64	5320 MHz	19.68	16.80
100	5500 MHz	19.68	16.80
116	5580 MHz	20.00	16.80
140	5700 MHz	19.84	16.64

For Beamforming mode:

Temperature	26°C	Humidity	63%
Test Engineer	Serway Li, Roki Liu	Configurations	IEEE 802.11ac

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2 + Ant. 3

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
52	5260 MHz	20.48	17.92
60	5300 MHz	20.48	17.92
64	5320 MHz	20.48	17.92
100	5500 MHz	20.48	17.92
116	5580 MHz	20.48	17.92
140	5700 MHz	20.64	17.92

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2 + Ant. 3

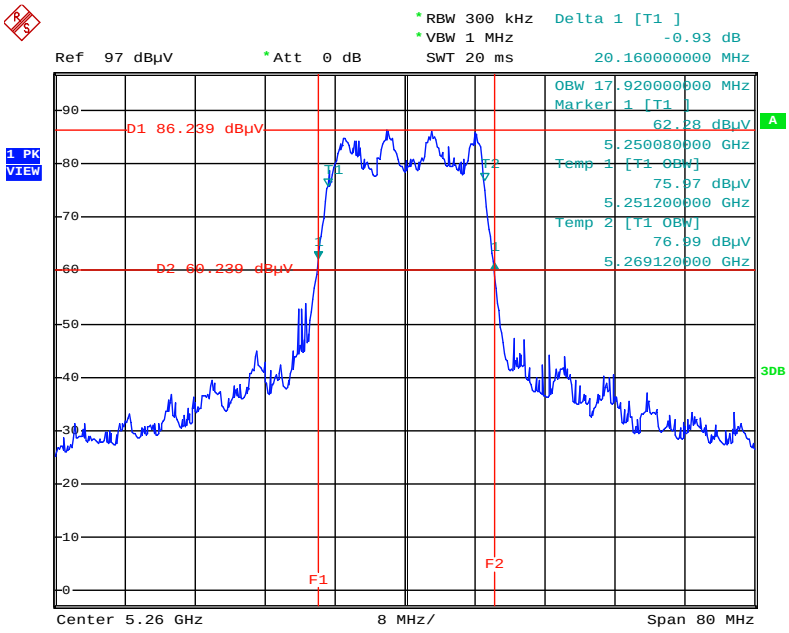
Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
54	5270 MHz	39.04	36.48
62	5310 MHz	39.04	36.48
102	5510 MHz	39.04	36.48
110	5550 MHz	39.36	36.48
134	5670 MHz	39.04	36.48

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 1 + Ant. 2 + Ant. 3

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
58	5290 MHz	81.92	76.16
106	5530 MHz	81.92	76.80
122	5610 MHz	82.80	76.00

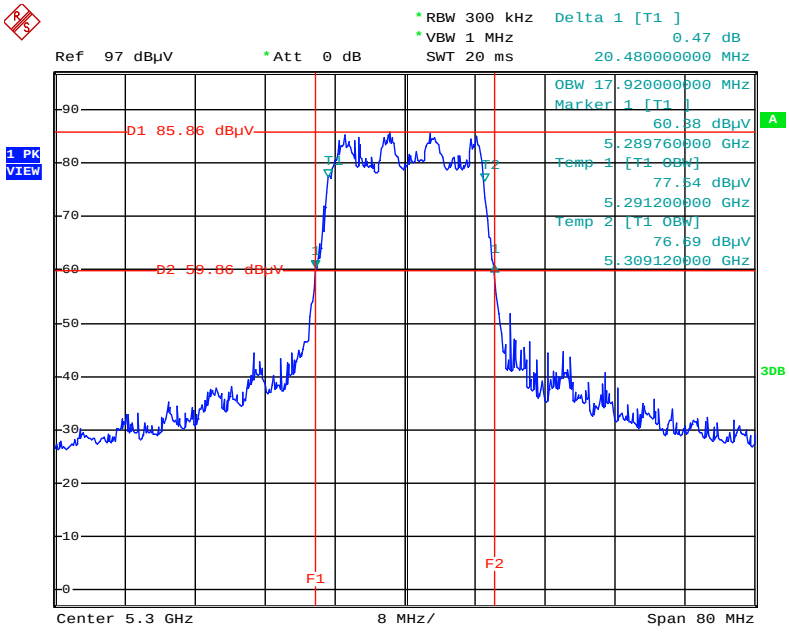
For Non-Beamforming mode:

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2 + Ant. 3 / 5260 MHz



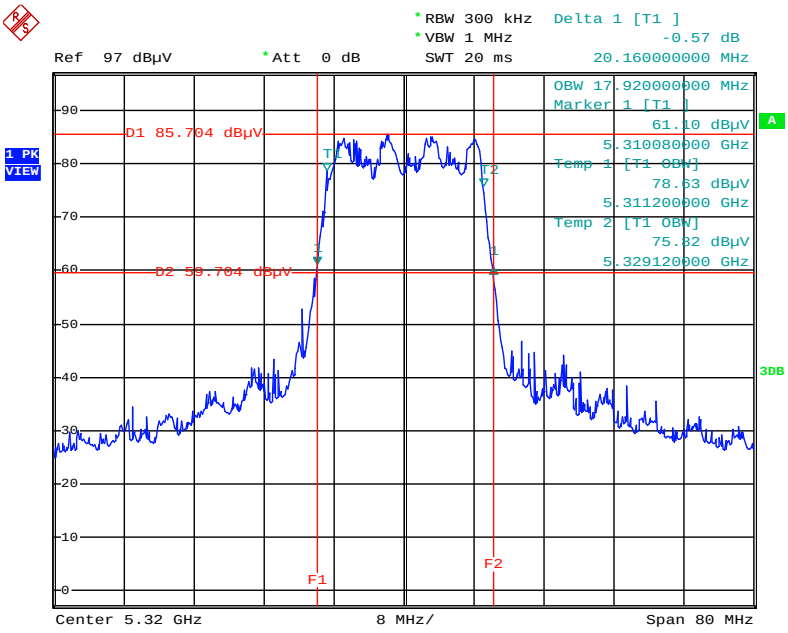
Date: 22.OCT.2014 15:14:21

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2 + Ant. 3 / 5300 MHz



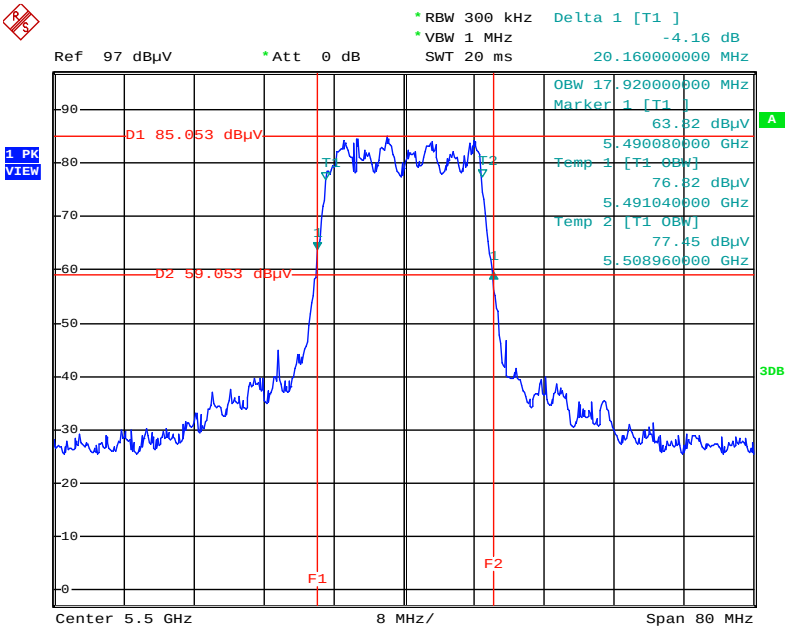
Date: 22.OCT.2014 15:15:51

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2 + Ant. 3 / 5320 MHz



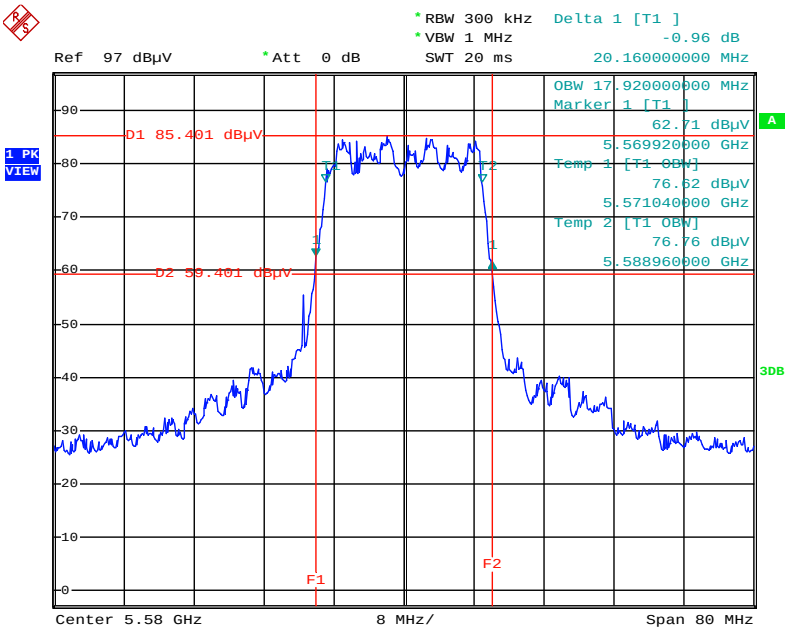
Date: 22.OCT.2014 15:17:16

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2 + Ant. 3 / 5500 MHz



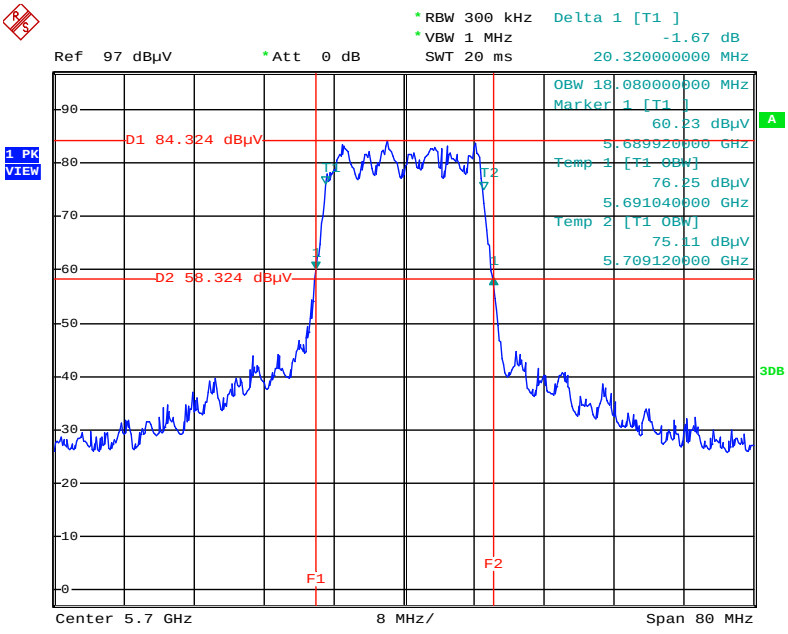
Date: 22.OCT.2014 15:18:51

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2 + Ant. 3 / 5580 MHz



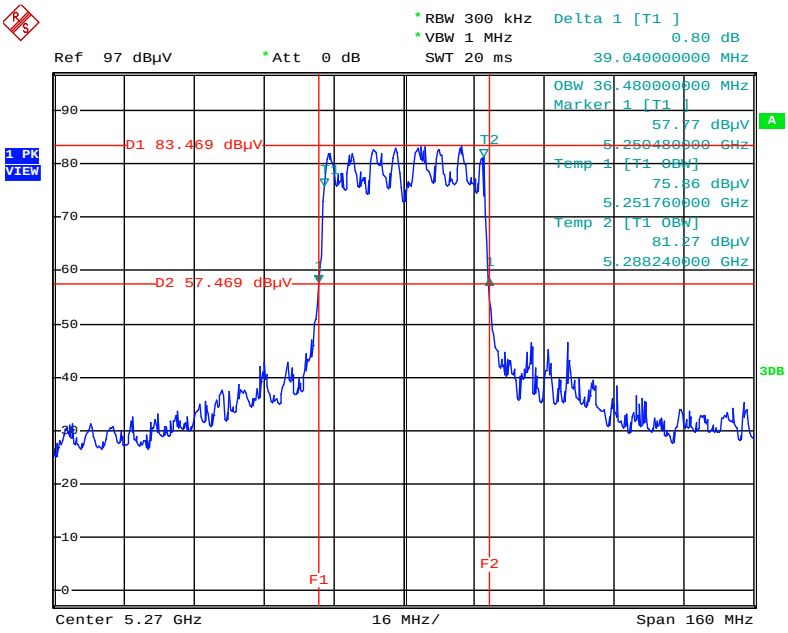
Date: 22.OCT.2014 15:20:16

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2 + Ant. 3 / 5700 MHz



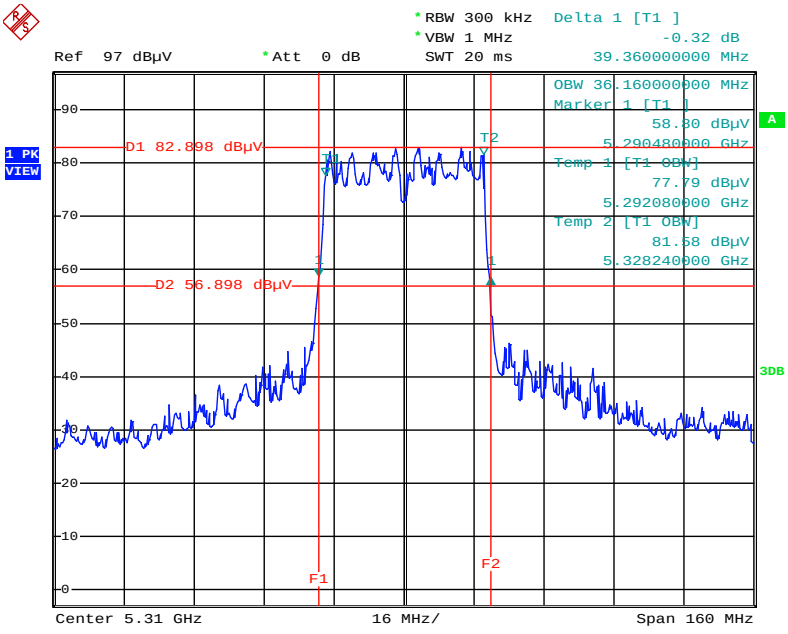
Date: 22.OCT.2014 15:21:48

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2 + Ant. 3 / 5270 MHz



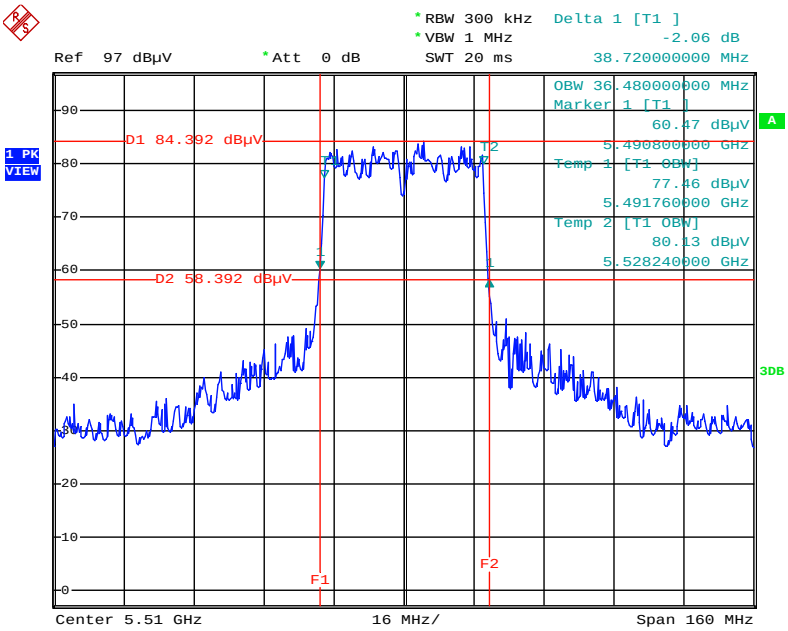
Date: 22.OCT.2014 15:28:31

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2 + Ant. 3 / 5310 MHz



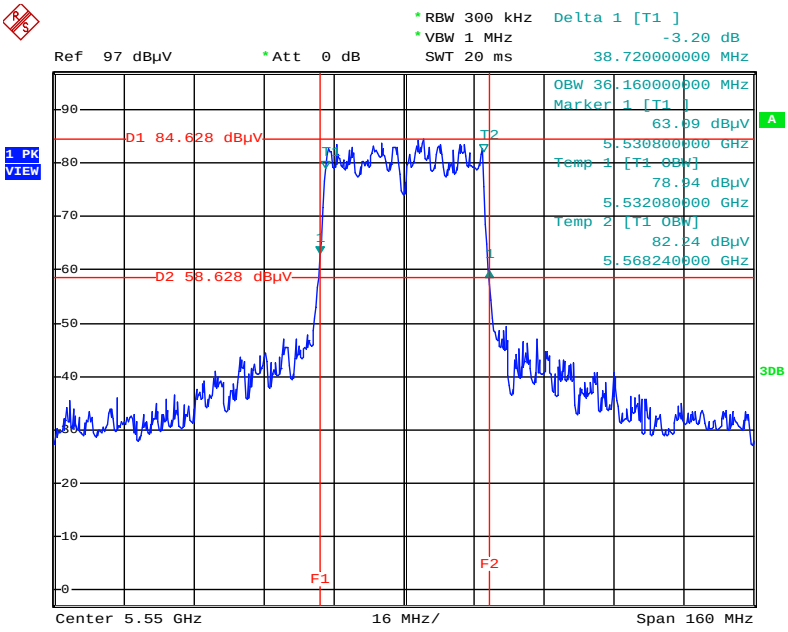
Date: 22.OCT.2014 15:30:29

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2 + Ant. 3 / 5510 MHz



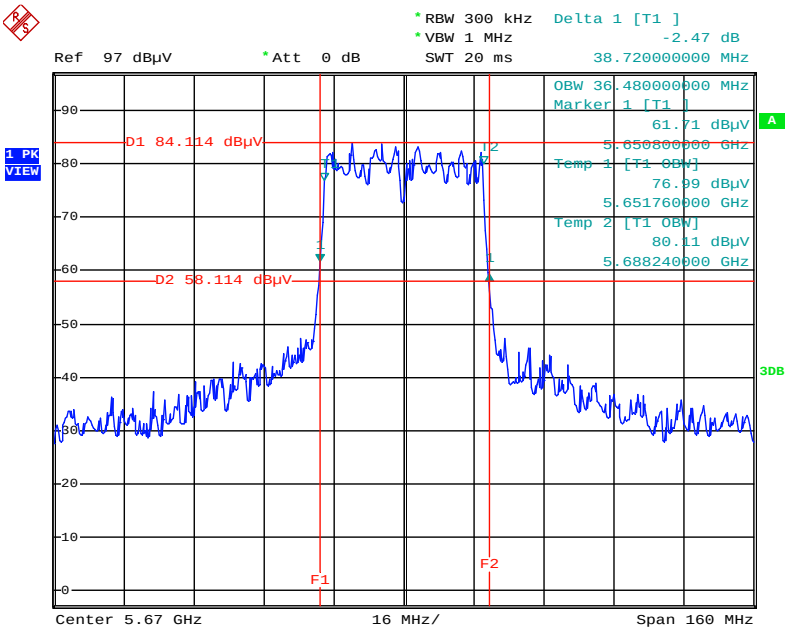
Date: 22.OCT.2014 15:32:29

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2 + Ant. 3 / 5550 MHz



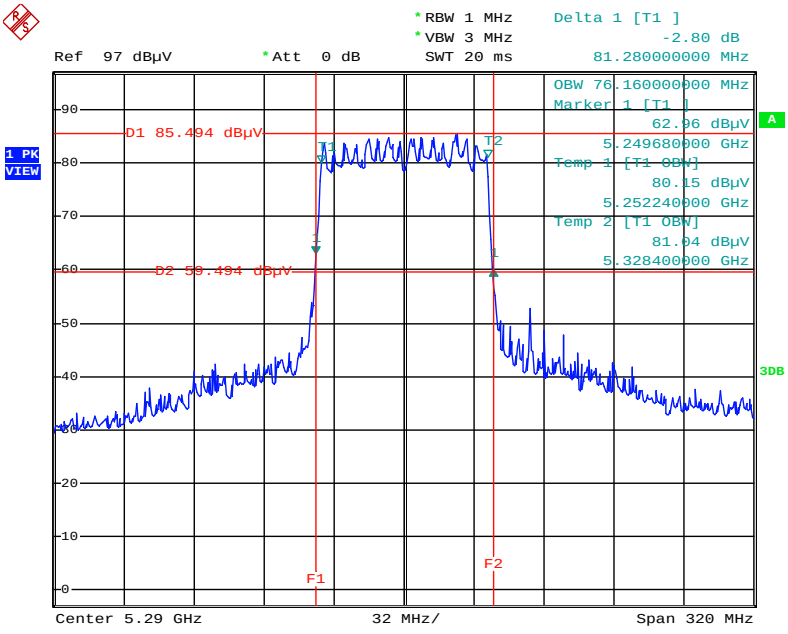
Date: 22.OCT.2014 15:34:39

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2 + Ant. 3 / 5670 MHz



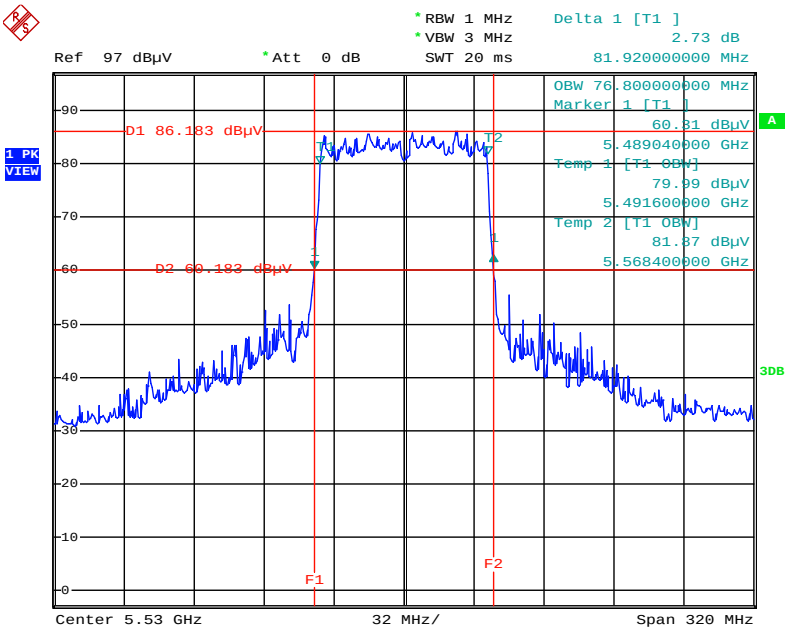
Date: 22.OCT.2014 15:36:36

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 1 + Ant. 2 + Ant. 3 / 5290 MHz



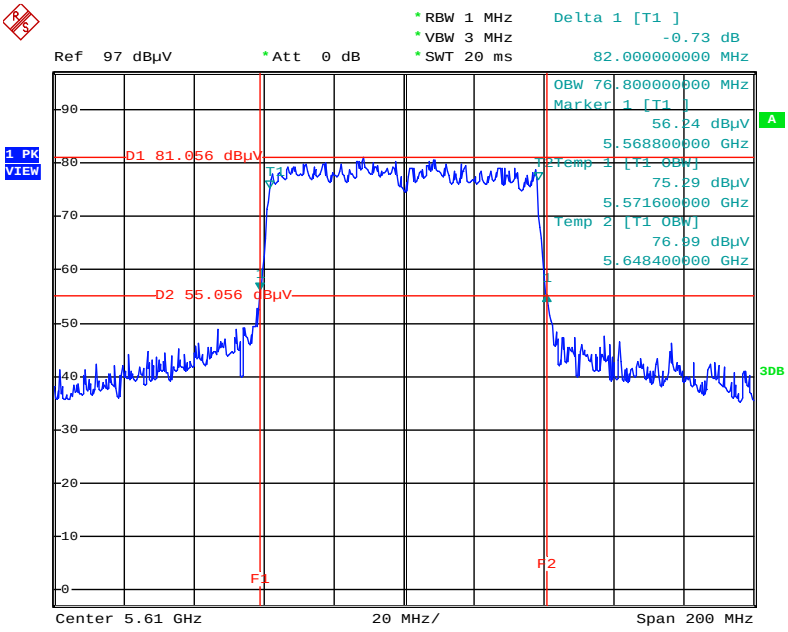
Date: 22.OCT.2014 15:41:16

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 1 + Ant. 2 + Ant. 3 / 5530 MHz



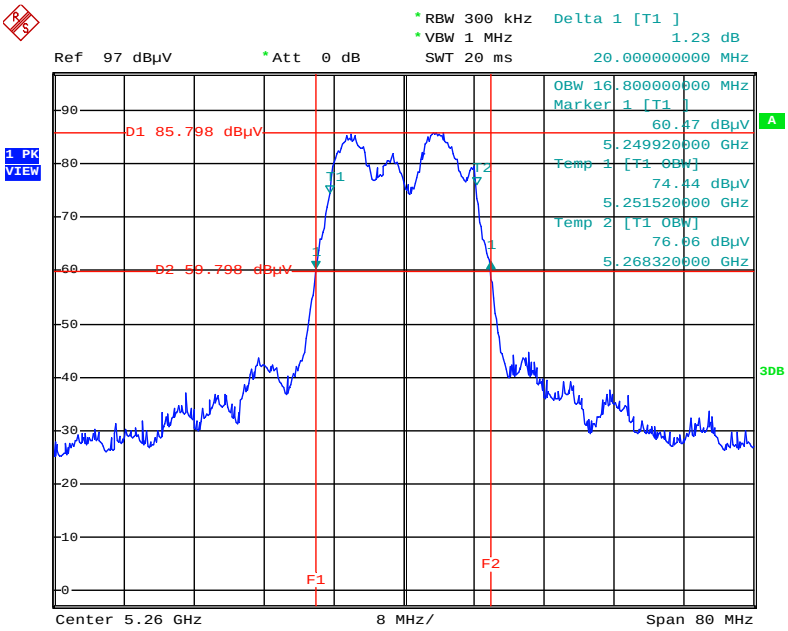
Date: 22.OCT.2014 15:43:44

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 1 + Ant. 2 + Ant. 3 / 5610 MHz



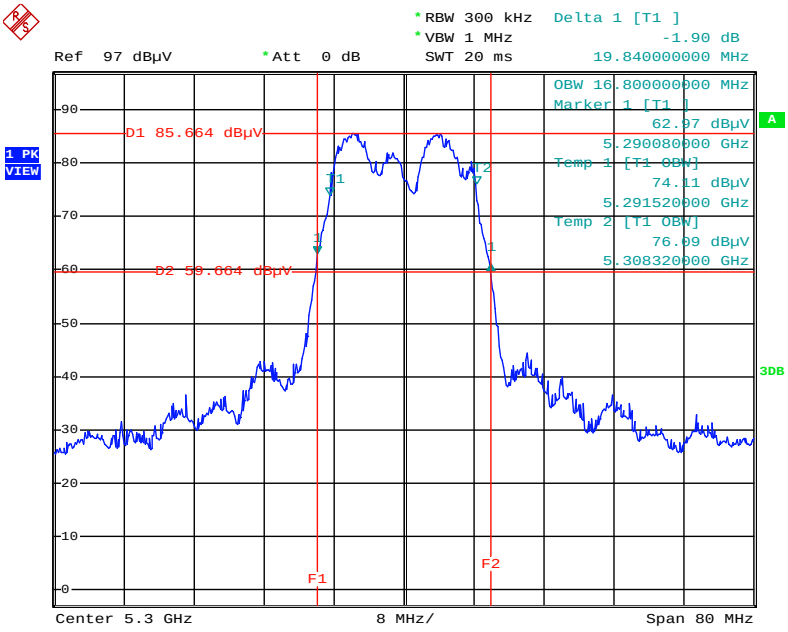
Date: 1.JUL.2015 11:49:05

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant. 1 + Ant. 2 + Ant. 3 / 5260 MHz



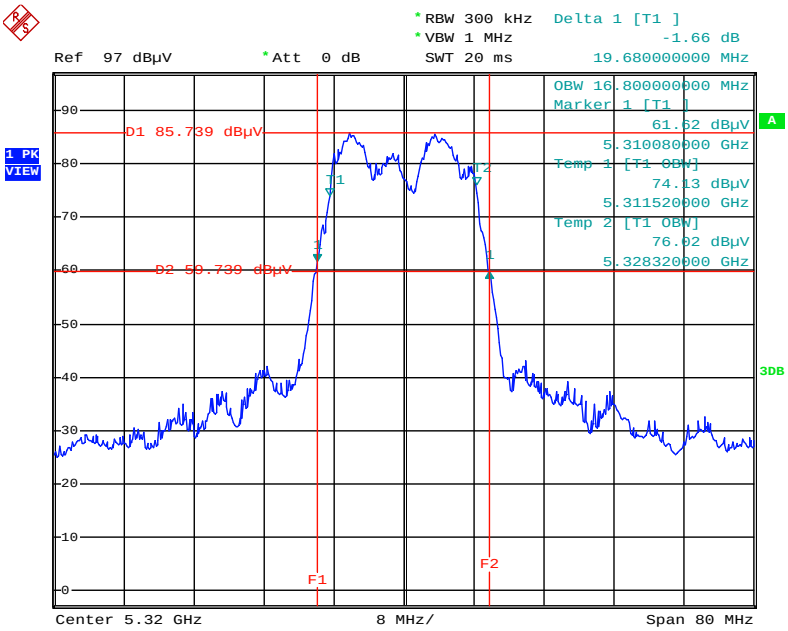
Date: 22.OCT.2014 14:57:25

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant. 1 + Ant. 2 + Ant. 3 / 5300 MHz



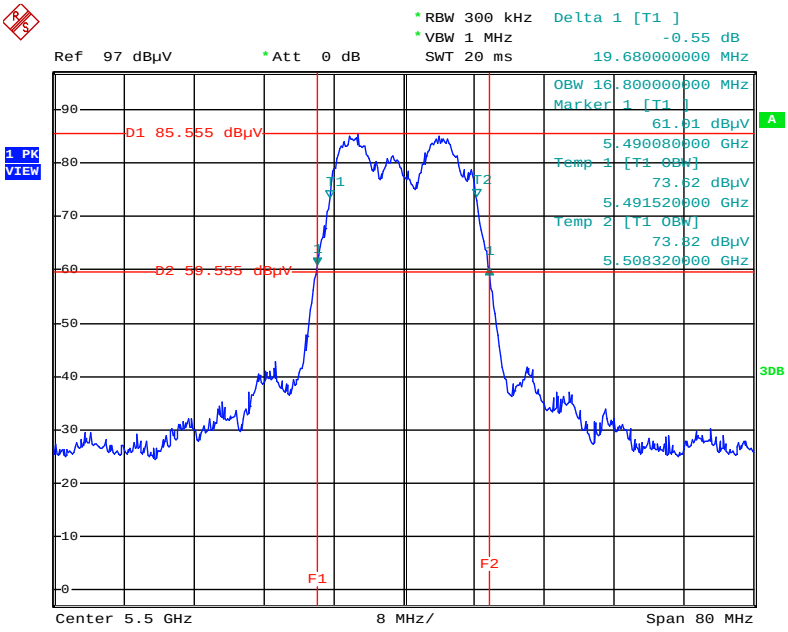
Date: 22.OCT.2014 14:58:54

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant. 1 + Ant. 2 + Ant. 3 / 5320 MHz



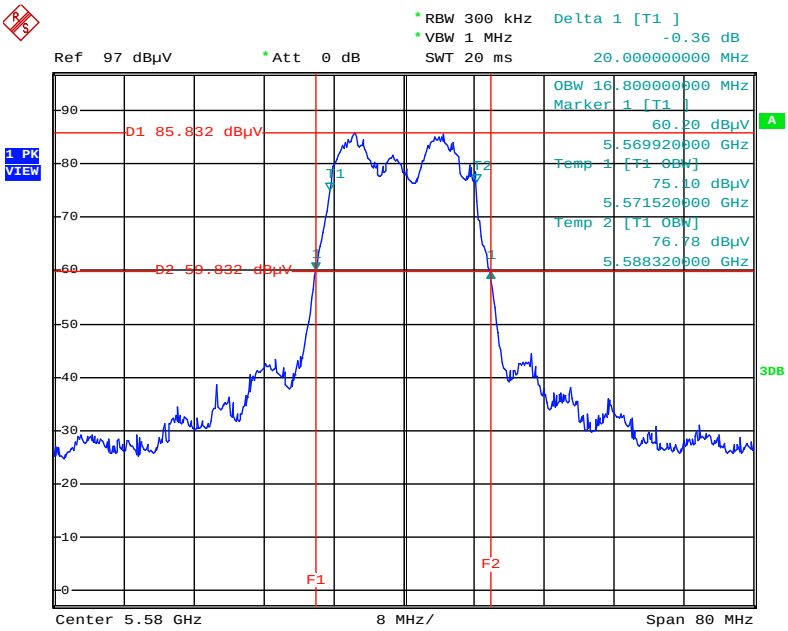
Date: 22.OCT.2014 15:01:05

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant. 1 + Ant. 2 + Ant. 3 / 5500 MHz



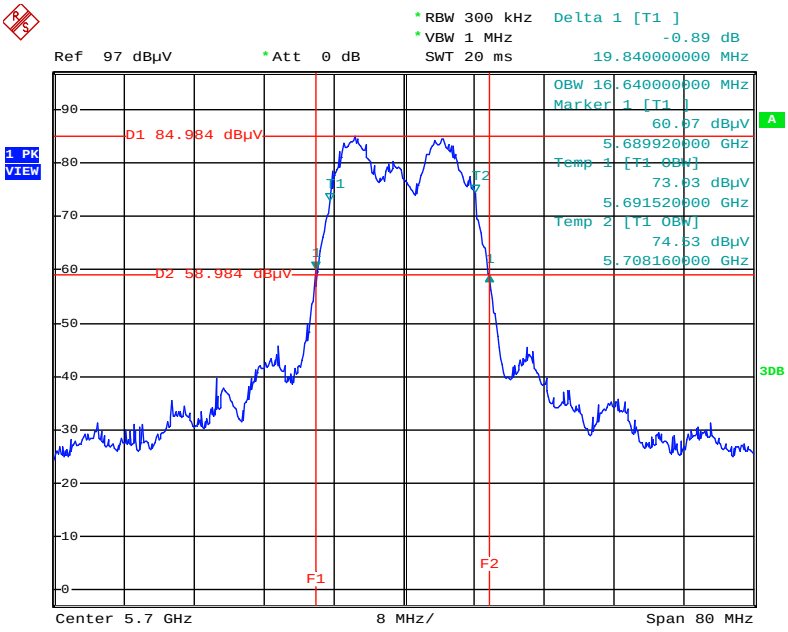
Date: 22.OCT.2014 15:03:06

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant. 1 + Ant. 2 + Ant. 3 / 5580 MHz



Date: 22.OCT.2014 15:04:56

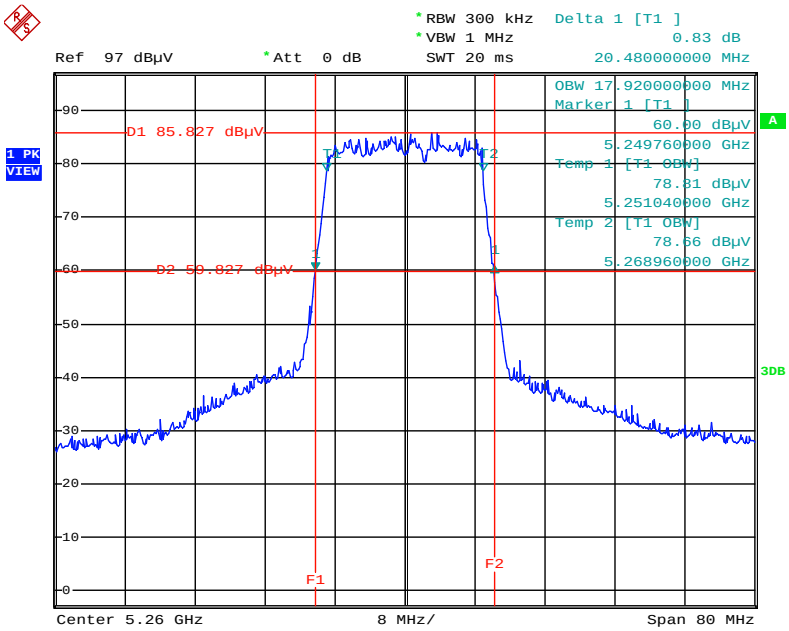
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Ant. 1 + Ant. 2 + Ant. 3 / 5700 MHz



Date: 22.OCT.2014 15:06:33

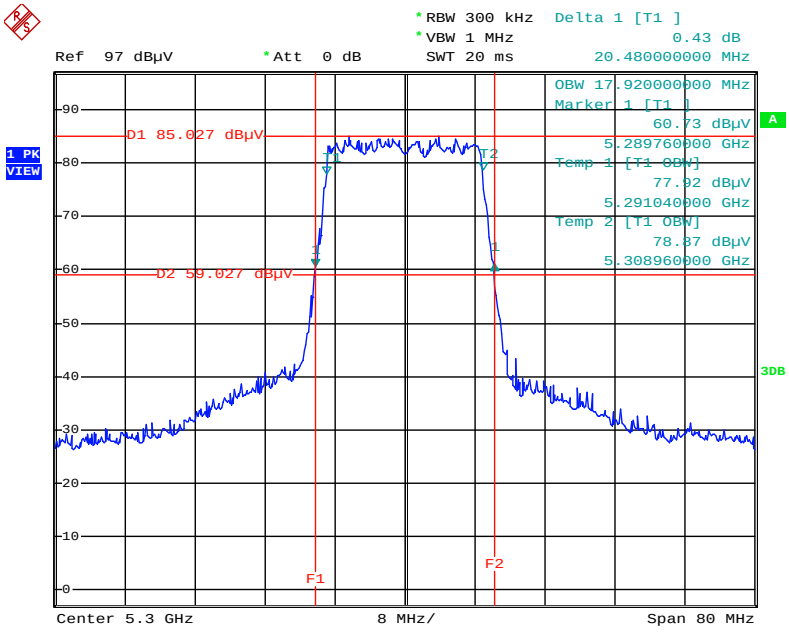
For Beamforming mode:

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2 + Ant. 3 / 5260 MHz



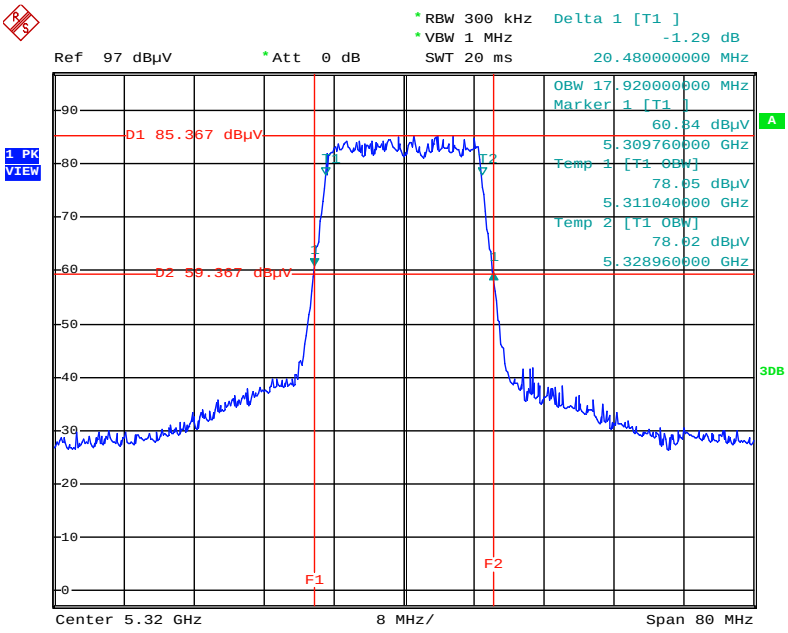
Date: 22.OCT.2014 15:55:38

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2 + Ant. 3 / 5300 MHz



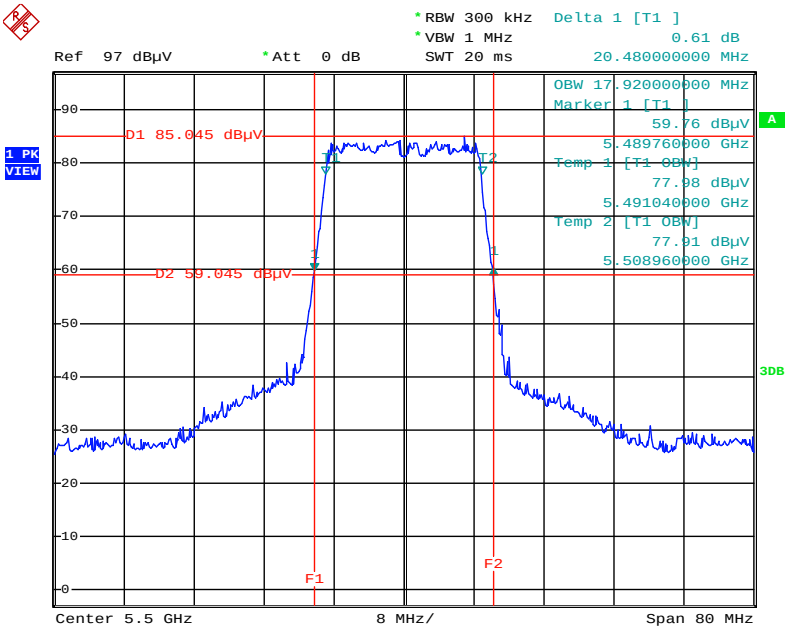
Date: 22.OCT.2014 15:57:20

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2 + Ant. 3 / 5320 MHz



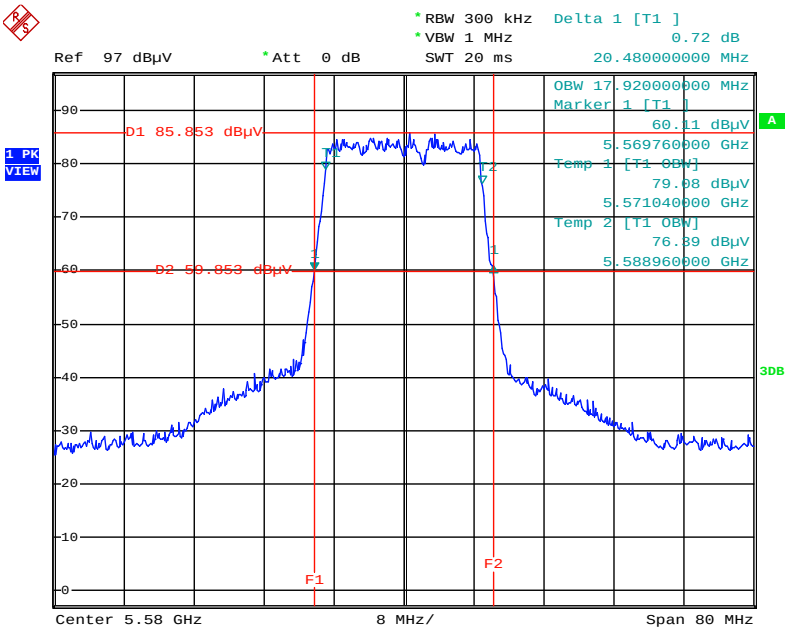
Date: 22.OCT.2014 15:58:42

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2 + Ant. 3 / 5500 MHz



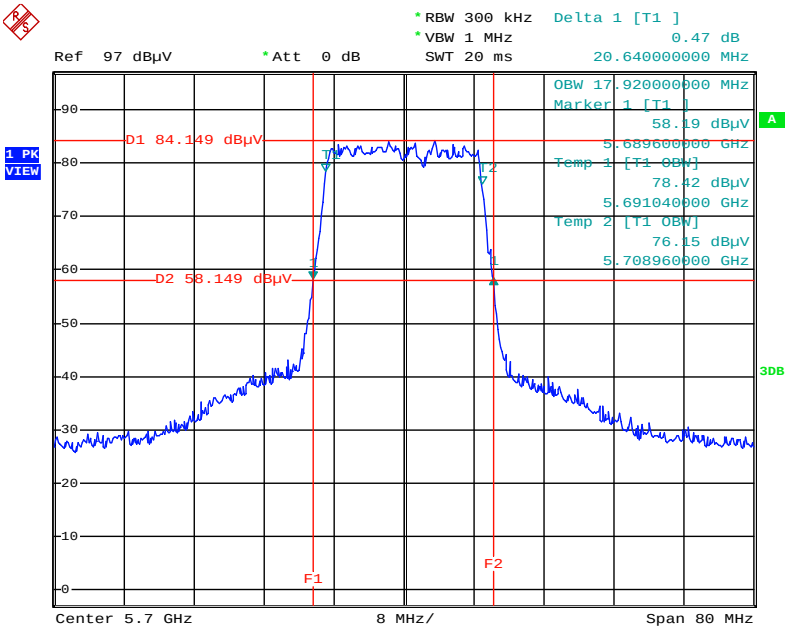
Date: 22.OCT.2014 16:00:20

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2 + Ant. 3 / 5580 MHz



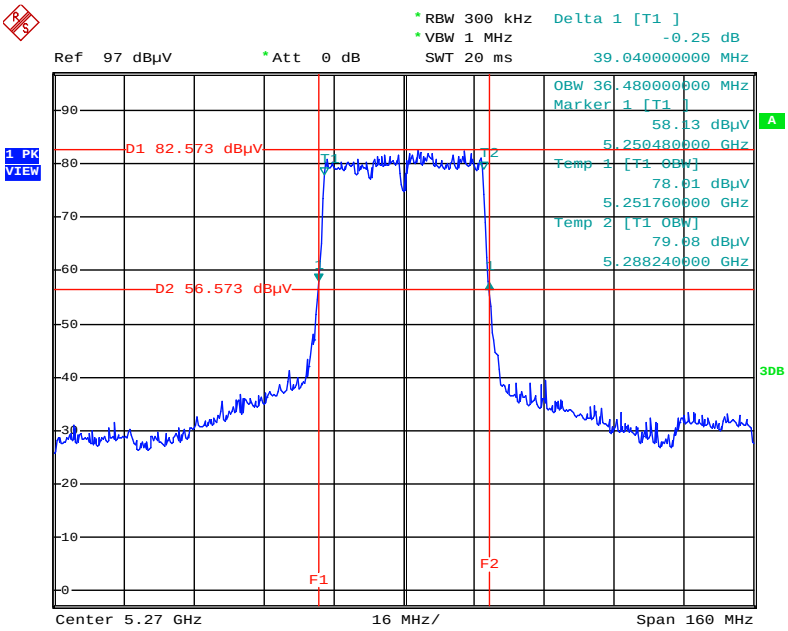
Date: 22.OCT.2014 16:02:24

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2 + Ant. 3 / 5700 MHz



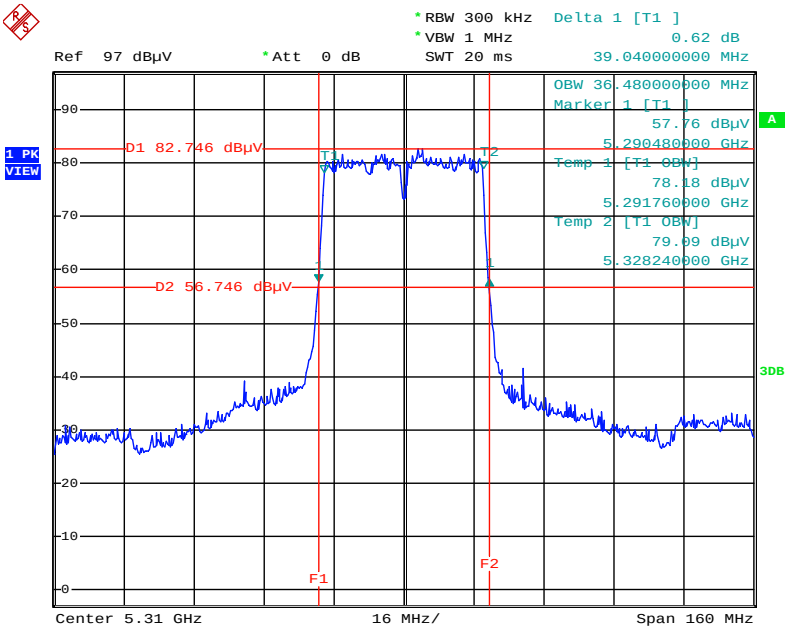
Date: 22.OCT.2014 16:03:54

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2 + Ant. 3 / 5270 MHz



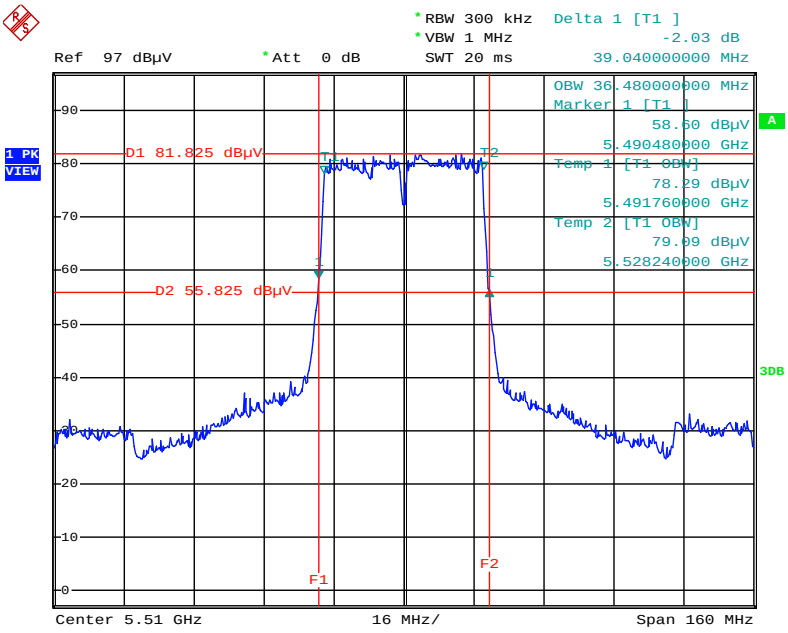
Date: 22.OCT.2014 16:11:59

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2 + Ant. 3 / 5310 MHz



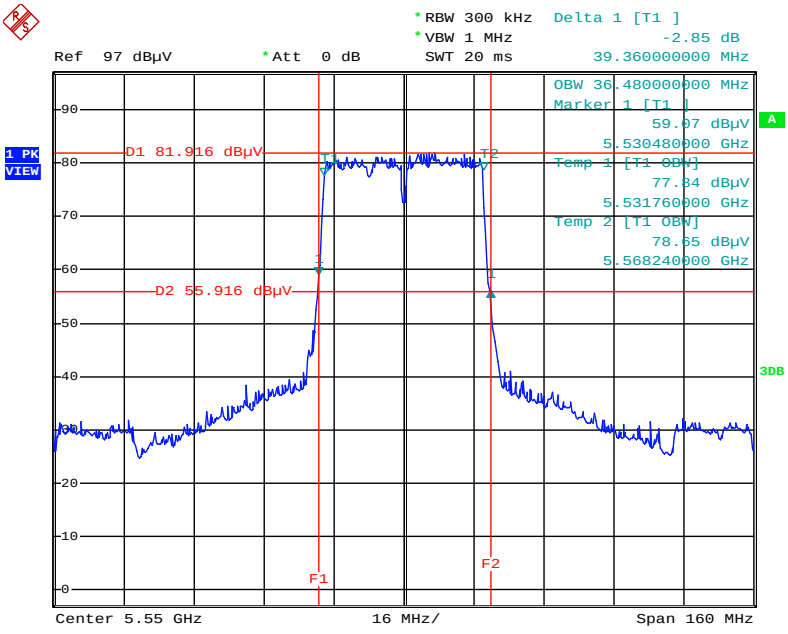
Date: 22.OCT.2014 16:13:41

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2 + Ant. 3 / 5510 MHz



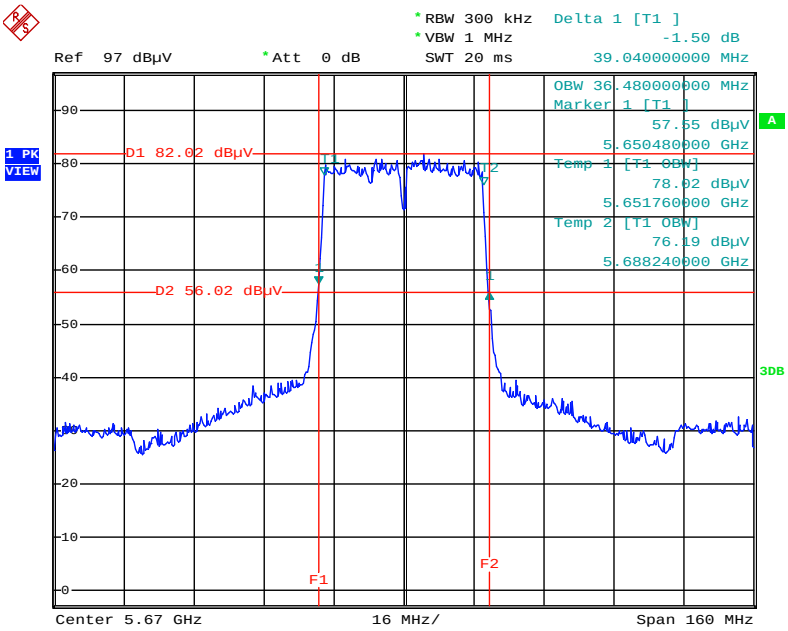
Date: 22.OCT.2014 16:15:29

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2 + Ant. 3 / 5550 MHz



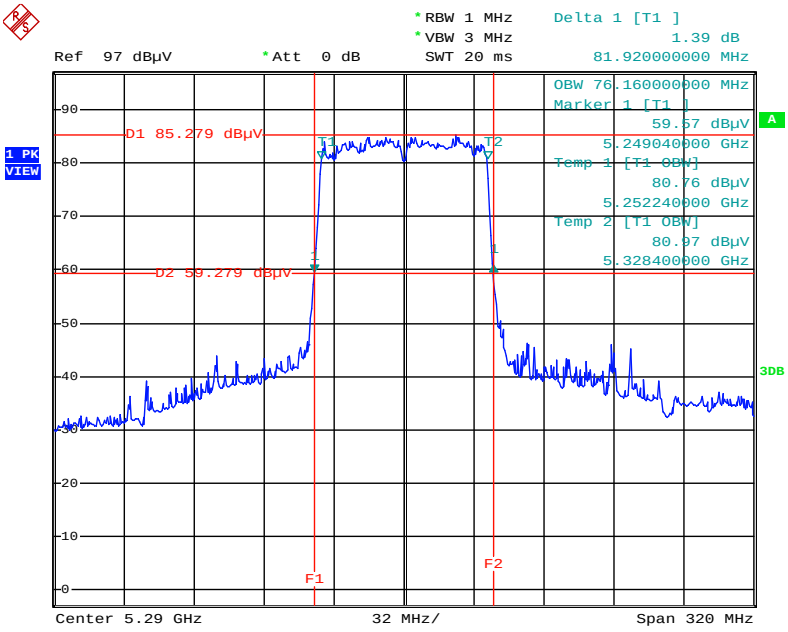
Date: 22.OCT.2014 16:17:14

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2 + Ant. 3 / 5670 MHz



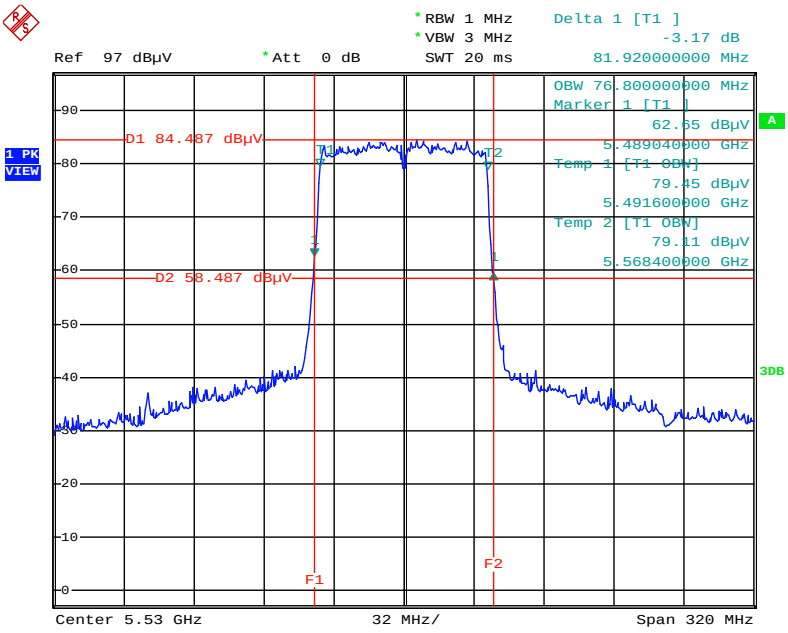
Date: 22.OCT.2014 16:20:12

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 1 + Ant. 2 + Ant. 3 / 5290 MHz



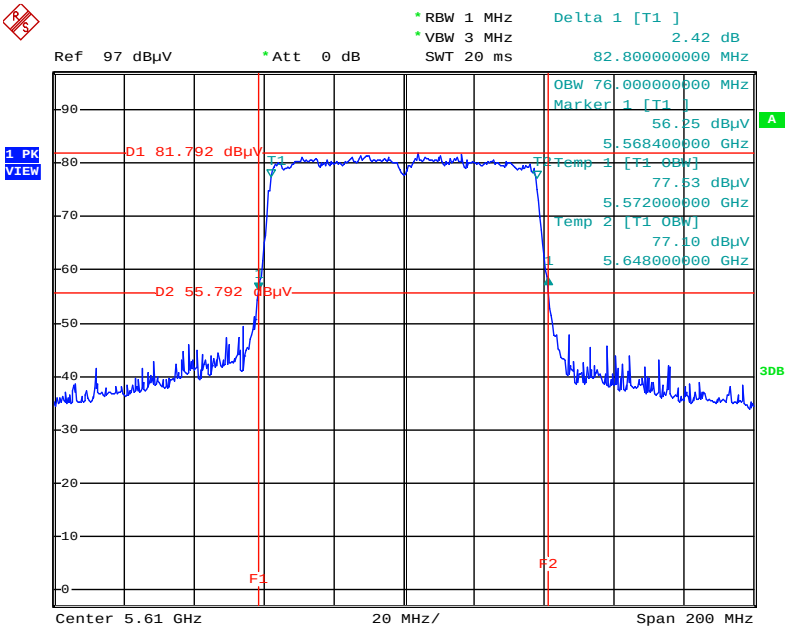
Date: 22.OCT.2014 16:25:19

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 1 + Ant. 2 + Ant. 3 / 5530 MHz



Date: 22.OCT.2014 16:27:16

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 1 + Ant. 2 + Ant. 3 / 5610 MHz



Date: 1.JUL.2015 12:21:04

4.2. Maximum Conducted Output Power Measurement

4.2.1. Limit

Frequency Band		Limit
☒	5.25-5.35 GHz	The maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW (24dBm) or 11 dBm 10 log B, where B is the 26 dB emission bandwidth in megahertz. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.
☒	5.470-5.725 GHz	

4.2.2. Measuring Instruments and Setting

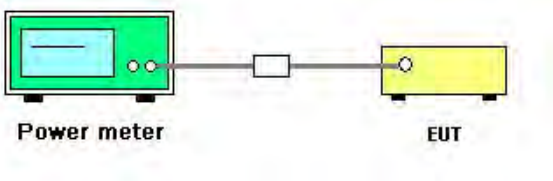
Please refer to section 5 of equipments list in this report The following table is the setting of the power meter.

Power Meter Parameter	Setting
Detector	AVERAGE

4.2.3. Test Procedures

1. The transmitter output (antenna port) was connected to the power meter.
2. Test was performed in accordance with KDB789033 D02 v01 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (E) Maximum conducted output power =>3. Measurement using a Power Meter (PM) =>b) Method PM-G (Measurement using a gated RF average power meter).
3. Multiple antenna systems was performed in accordance with KDB662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. When measuring maximum conducted output power with multiple antenna systems,add every result of the values by mathematic formula.

4.2.4. 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 Maximum Conducted Output Power

For Non-Beamforming mode:

Temperature	26°C	Humidity	63%
Test Engineer	Serway Li, Roki Liu	Configurations	IEEE 802.11ac
Test Date	Oct. 22, 2014, Jun. 30, 2015		

Configuration IEEE 802.11ac MCS0/Nss1 VHT20

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Ant. 1	Ant. 2	Ant. 3	Total		
52	5260 MHz	17.57	16.93	17.66	22.17	24.00	Complies
60	5300 MHz	17.54	17.05	17.78	22.24	24.00	Complies
64	5320 MHz	17.25	16.96	17.77	22.11	24.00	Complies
100	5500 MHz	16.78	16.89	16.74	21.58	24.00	Complies
116	5580 MHz	16.85	16.88	16.77	21.60	24.00	Complies
140	5700 MHz	16.74	16.71	16.92	21.56	24.00	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT40

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Ant. 1	Ant. 2	Ant. 3	Total		
54	5270 MHz	18.07	17.68	18.38	22.82	24.00	Complies
62	5310 MHz	18.14	17.54	18.35	22.79	24.00	Complies
102	5510 MHz	18.94	19.28	18.93	23.82	24.00	Complies
110	5550 MHz	18.88	19.28	18.94	23.81	24.00	Complies
134	5670 MHz	18.92	19.23	19.11	23.86	24.00	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT80

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Ant. 1	Ant. 2	Ant. 3	Total		
58	5290 MHz	17.05	16.94	17.91	22.09	24.00	Complies
106	5530 MHz	18.22	18.81	18.65	23.34	24.00	Complies
122	5610 MHz	18.72	19.23	19.48	23.93	24.00	Complies

Temperature	26°C	Humidity	63%
Test Engineer	Serway Li, Roki Liu	Configurations	IEEE 802.11a
Test Date	Oct. 22, 2014, Jun. 30, 2015		

Configuration IEEE 802.11a

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Ant. 1	Ant. 2	Ant. 3	Total		
52	5260 MHz	17.45	16.92	17.76	22.16	24.00	Complies
60	5300 MHz	17.18	16.89	17.64	22.02	24.00	Complies
64	5320 MHz	17.12	16.92	17.61	22.00	24.00	Complies
100	5500 MHz	16.71	16.94	16.76	21.58	24.00	Complies
116	5580 MHz	16.68	16.91	16.88	21.60	24.00	Complies
140	5700 MHz	16.73	16.75	16.83	21.54	24.00	Complies

For Beamforming mode:

Temperature	26°C	Humidity	63%
Test Engineer	Serway Li, Roki Liu	Configurations	IEEE 802.11ac
Test Date	Oct. 22, 2014, Jul. 01, 2015		

Configuration IEEE 802.11ac MCS0/Nss1 VHT20

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Ant. 1	Ant. 2	Ant. 3	Total		
52	5260 MHz	16.91	16.65	17.45	21.79	21.93	Complies
60	5300 MHz	16.89	16.73	17.39	21.78	21.93	Complies
64	5320 MHz	16.99	16.65	17.43	21.81	21.93	Complies
100	5500 MHz	16.45	16.76	16.32	21.29	21.32	Complies
116	5580 MHz	16.43	16.71	16.45	21.30	21.32	Complies
140	5700 MHz	16.41	16.54	16.53	21.26	21.32	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.07dBi >6dBi,So Band2 Limit =24-(8.07-6)=21.93dBm

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.68dBi >6dBi,So Band3 Limit =24-(8.68-6)=21.32dBm

Configuration IEEE 802.11ac MCS0/Nss1 VHT40

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Ant. 1	Ant. 2	Ant. 3	Total		
54	5270 MHz	17.23	16.62	17.51	21.91	21.93	Complies
62	5310 MHz	17.21	16.82	17.32	21.89	21.93	Complies
102	5510 MHz	16.69	16.72	15.97	21.24	21.32	Complies
110	5550 MHz	16.68	16.81	16.05	21.30	21.32	Complies
134	5670 MHz	16.56	16.69	16.25	21.28	21.32	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.07dBi >6dBi,So Band2 Limit =24-(8.07-6)=21.93dBm

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.68dBi >6dBi,So Band3 Limit =24-(8.68-6)=21.32dBm

Configuration IEEE 802.11ac MCS0/Nss1 VHT80

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Ant. 1	Ant. 2	Ant. 3	Total		
58	5290 MHz	16.77	16.83	17.62	21.86	21.93	Complies
106	5530 MHz	16.26	16.64	16.51	21.24	21.32	Complies
122	5610 MHz	16.08	16.48	16.66	21.18	21.32	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.07dBi >6dBi,So Band2 Limit =24-(8.07-6)=21.93dBm

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.68dBi >6dBi,So Band3 Limit =24-(8.68-6)=21.32dBm

4.3. Power Spectral Density Measurement

4.3.1. Limit

The following table is power spectral density limits and decrease power density limit rule refer to section 4.2.1.

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

4.3.2. Measuring Instruments and Setting

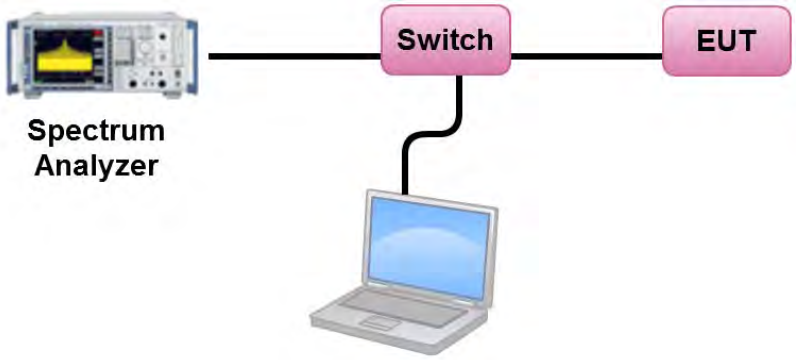
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Encompass the entire emissions bandwidth (EBW) of the signal
RBW	1000 kHz
VBW	3000 kHz
Detector	RMS
Trace	AVERAGE
Sweep Time	Auto
Trace Average	100 times

4.3.3. Test Procedures

1. The transmitter output (antenna port) was connected RF switch to the spectrum analyzer.
2. Test was performed in accordance with KDB789033 D02 v01 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (F) Maximum Power Spectral Density (PSD).
3. Multiple antenna systems was performed in accordance KDB662911 D01 v02r01 in-Band Power Spectral Density (PSD) Measurements (a) Measure and sum the spectra across the outputs.
4. When measuring first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3 and so on up to the Nth output to obtain the value for the first frequency bin of the summed spectrum. The summed spectrum value for each of the other frequency bins is computed in the same way.

4.3.4. 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 Power Spectral Density

For Non-Beamforming mode:

Temperature	26°C	Humidity	63%
Test Engineer	Serway Li, Roki Liu	Configurations	IEEE 802.11ac
Test Date	Oct. 22, 2014, Jun. 30, 2015		

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2 + Ant. 3

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
52	5260 MHz	8.82	8.93	Complies
60	5300 MHz	8.87	8.93	Complies
64	5320 MHz	8.87	8.93	Complies
100	5500 MHz	8.25	8.32	Complies
116	5580 MHz	8.21	8.32	Complies
140	5700 MHz	8.24	8.32	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.07dBi >6dBi,So Band2 Limit =11-(8.07-6)=8.93dBm/MHz

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.68dBi >6dBi,So Band3 Limit =11-(8.68-6)=8.32dBm/MHz

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2 + Ant. 3

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
54	5270 MHz	6.49	8.93	Complies
62	5310 MHz	6.57	8.93	Complies
102	5510 MHz	7.52	8.32	Complies
110	5550 MHz	7.60	8.32	Complies
134	5670 MHz	7.59	8.32	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.07dBi >6dBi,So Band2 Limit =11-(8.07-6)=8.93dBm/MHz

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.68dBi >6dBi,So Band3 Limit =11-(8.68-6)=8.32dBm/MHz

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 1 + Ant. 2 + Ant. 3

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
58	5290 MHz	2.81	8.93	Complies
106	5530 MHz	3.94	8.32	Complies
122	5610 MHz	4.53	8.32	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.07dBi >6dBi,So Band2 Limit =11-(8.07-6)=8.93dBm/MHz

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.68dBi >6dBi,So Band3 Limit =11-(8.68-6)=8.32dBm/MHz

Temperature	26°C	Humidity	63%
Test Engineer	Serway Li, Roki Liu	Configurations	IEEE 802.11a
Test Date	Oct. 22, 2014, Jun. 30, 2015		

Configuration IEEE 802.11a / Ant. 1 + Ant. 2 + Ant. 3

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
52	5260 MHz	8.82	8.93	Complies
60	5300 MHz	8.70	8.93	Complies
64	5320 MHz	8.82	8.93	Complies
100	5500 MHz	8.29	8.32	Complies
116	5580 MHz	8.29	8.32	Complies
140	5700 MHz	8.30	8.32	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.07dBi >6dBi,So Band2 Limit =11-(8.07-6)=8.93dBm/MHz

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.68dBi >6dBi,So Band3 Limit =11-(8.68-6)=8.32dBm/MHz

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

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

For Beamforming mode:

Temperature	26°C	Humidity	63%
Test Engineer	Serway Li, Roki Liu	Configurations	IEEE 802.11ac
Test Date	Oct. 22, 2014, Jul. 01, 2015		

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2 + Ant. 3

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
52	5260 MHz	8.58	8.93	Complies
60	5300 MHz	8.39	8.93	Complies
64	5320 MHz	8.40	8.93	Complies
100	5500 MHz	7.99	8.32	Complies
116	5580 MHz	7.92	8.32	Complies
140	5700 MHz	7.85	8.32	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.07dBi >6dBi,So Band2 Limit =11-(8.07-6)=8.93dBm/MHz

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.68dBi >6dBi,So Band3 Limit =11-(8.68-6)=8.32dBm/MHz

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2 + Ant. 3

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
54	5270 MHz	5.61	8.93	Complies
62	5310 MHz	5.69	8.93	Complies
102	5510 MHz	5.04	8.32	Complies
110	5550 MHz	4.91	8.32	Complies
134	5670 MHz	4.80	8.32	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.07dBi >6dBi,So Band2 Limit =11-(8.07-6)=8.93dBm/MHz

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.68dBi >6dBi,So Band3 Limit =11-(8.68-6)=8.32dBm/MHz

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 1 + Ant. 2 + Ant. 3

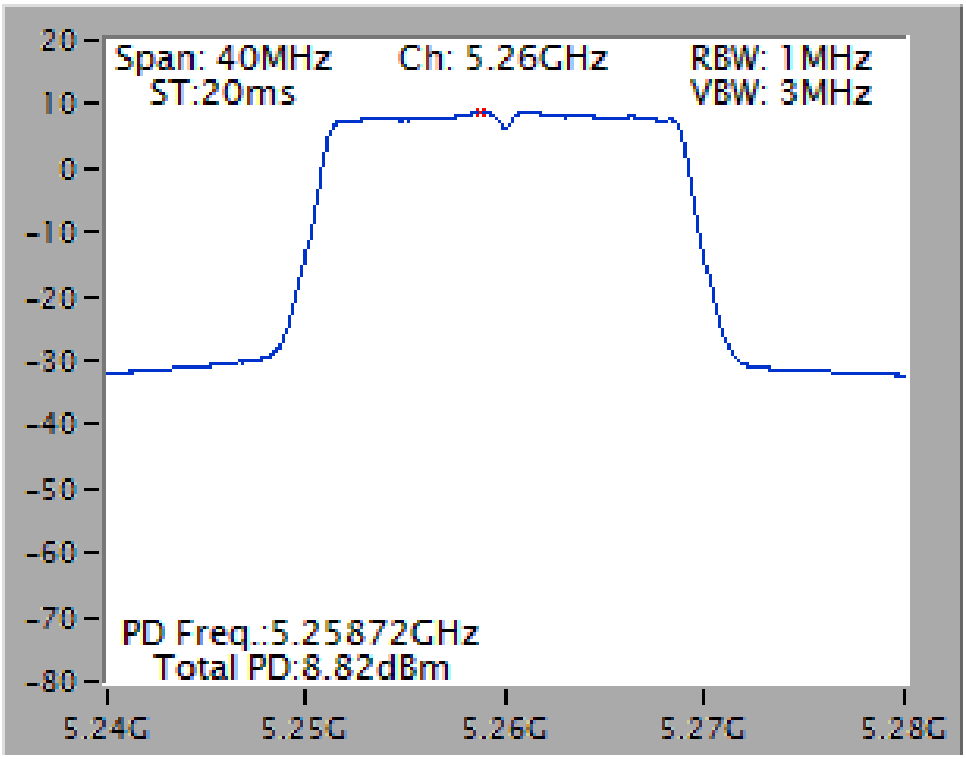
Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
58	5290 MHz	2.33	8.93	Complies
106	5530 MHz	2.15	8.32	Complies
122	5610 MHz	2.05	8.32	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.07dBi >6dBi,So Band2 Limit =11-(8.07-6)=8.93dBm/MHz

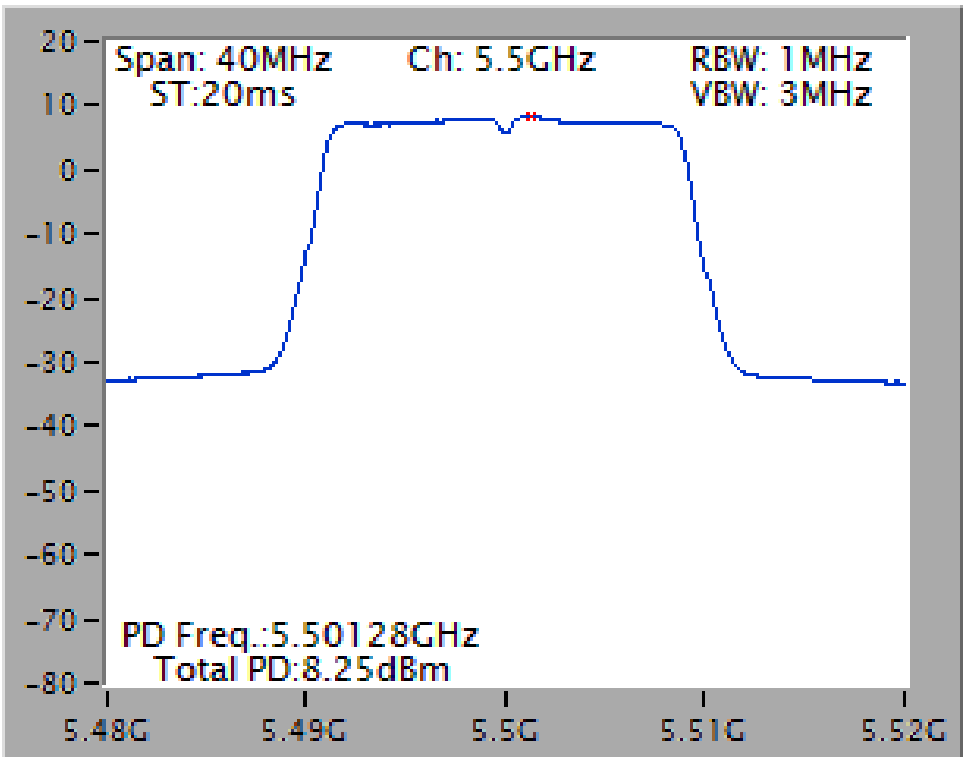
Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.68dBi >6dBi,So Band3 Limit =11-(8.68-6)=8.32dBm/MHz

For Non-Beamforming mode:

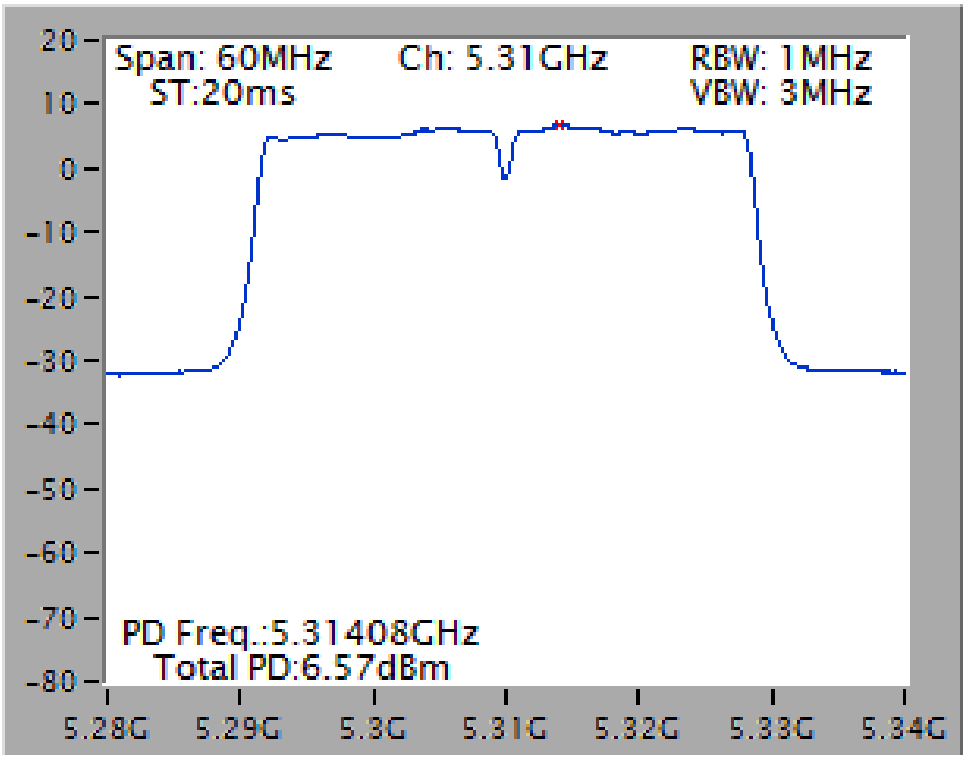
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2 + Ant. 3 / 5260 MHz



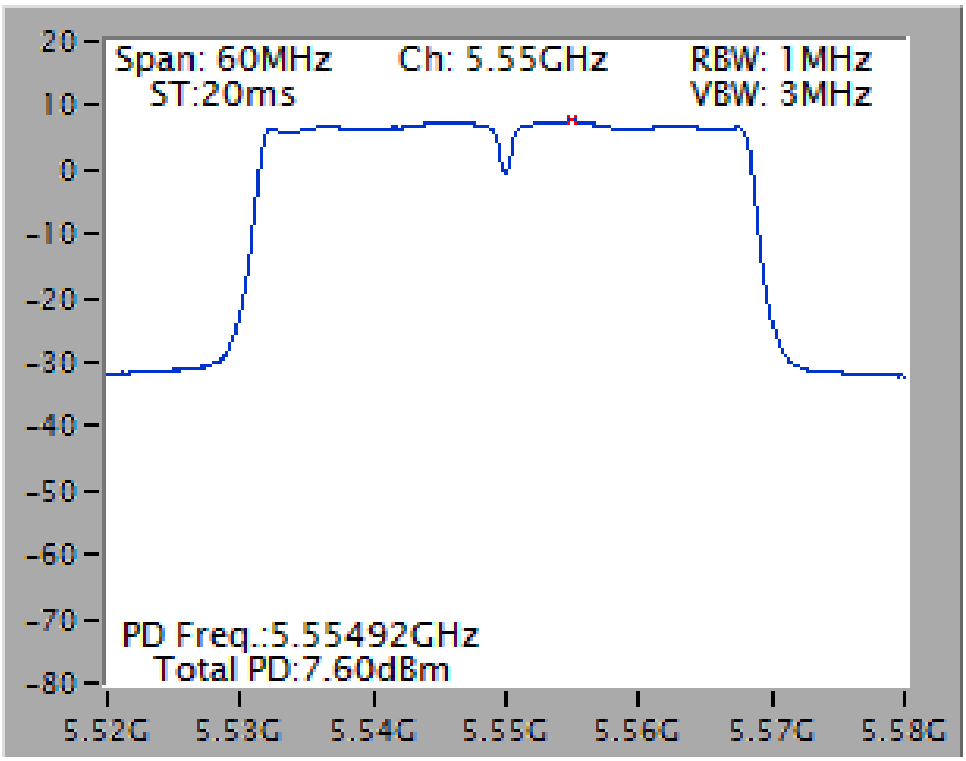
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2 + Ant. 3 / 5500 MHz



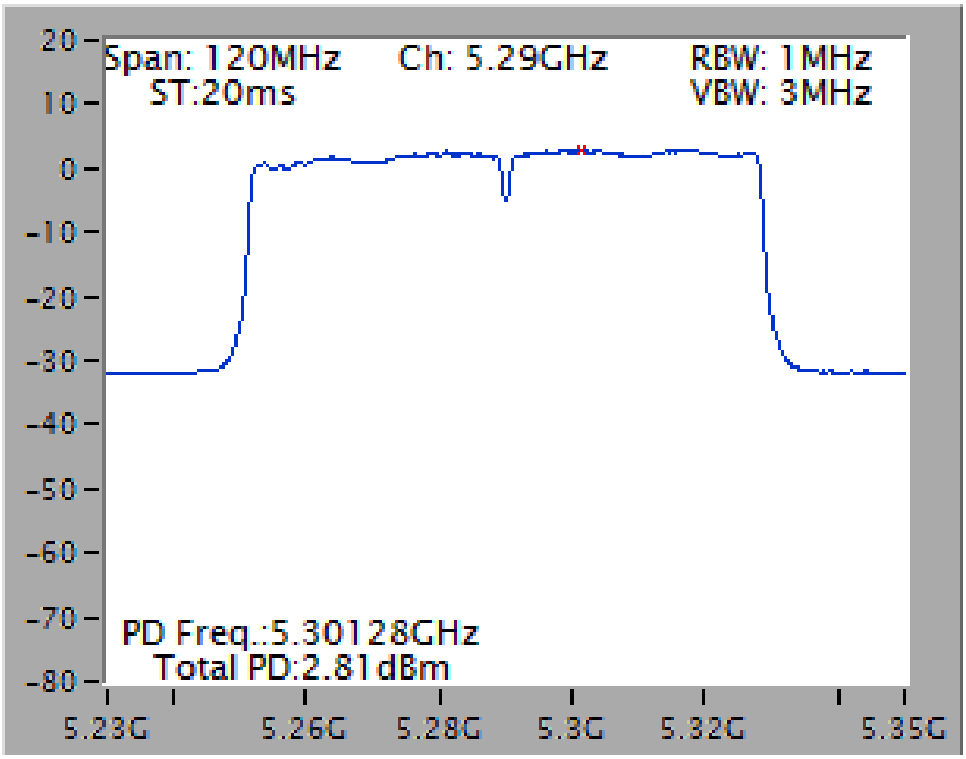
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2 + Ant. 3 / 5310 MHz



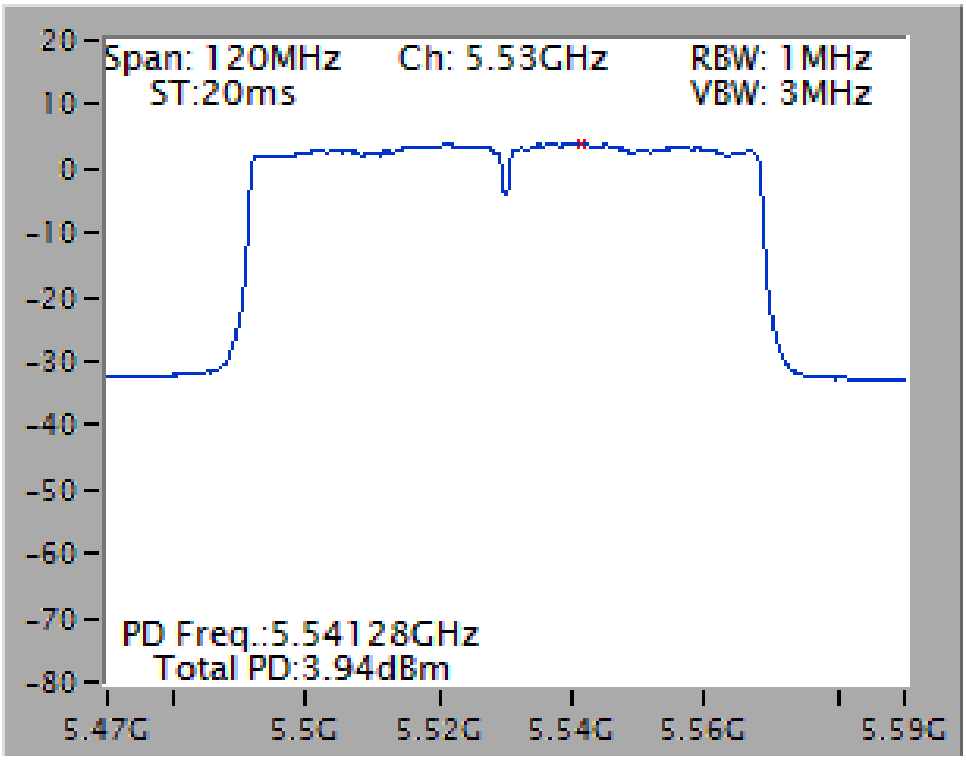
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2 + Ant. 3 / 5550 MHz



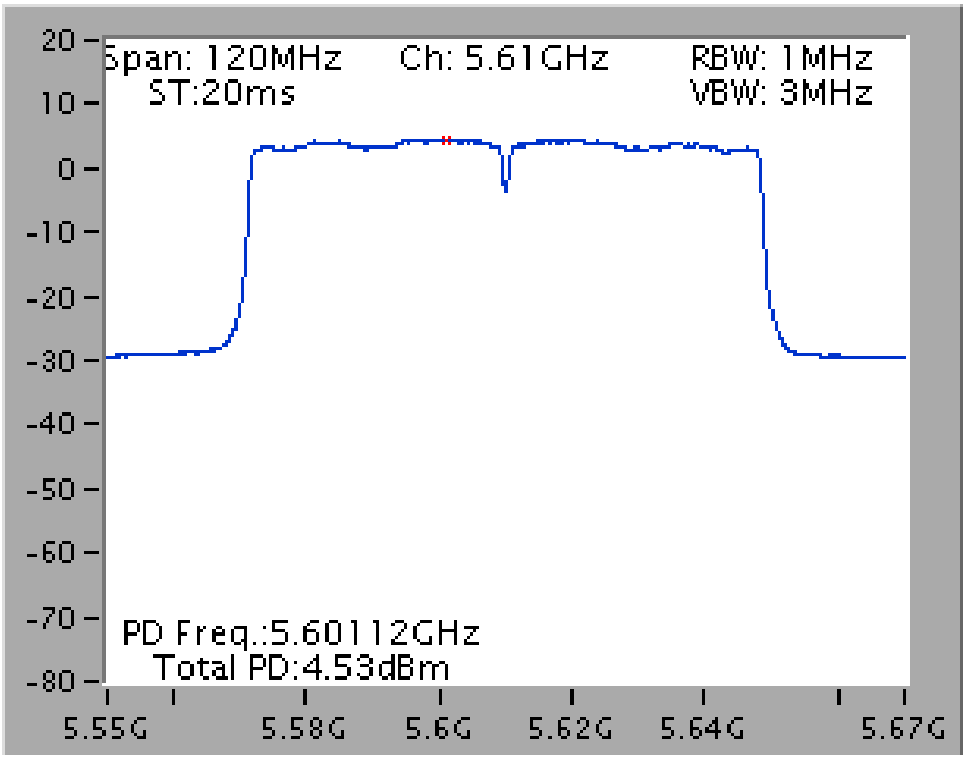
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 1 + Ant. 2 + Ant. 3 / 5290 MHz



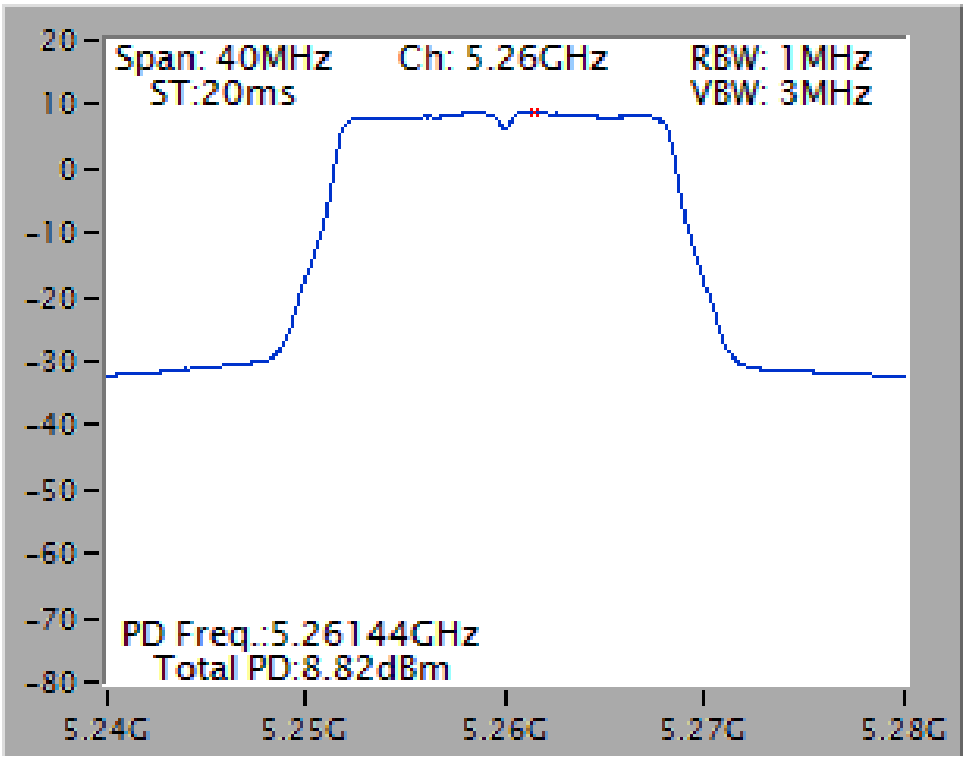
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 1 + Ant. 2 + Ant. 3 / 5530 MHz



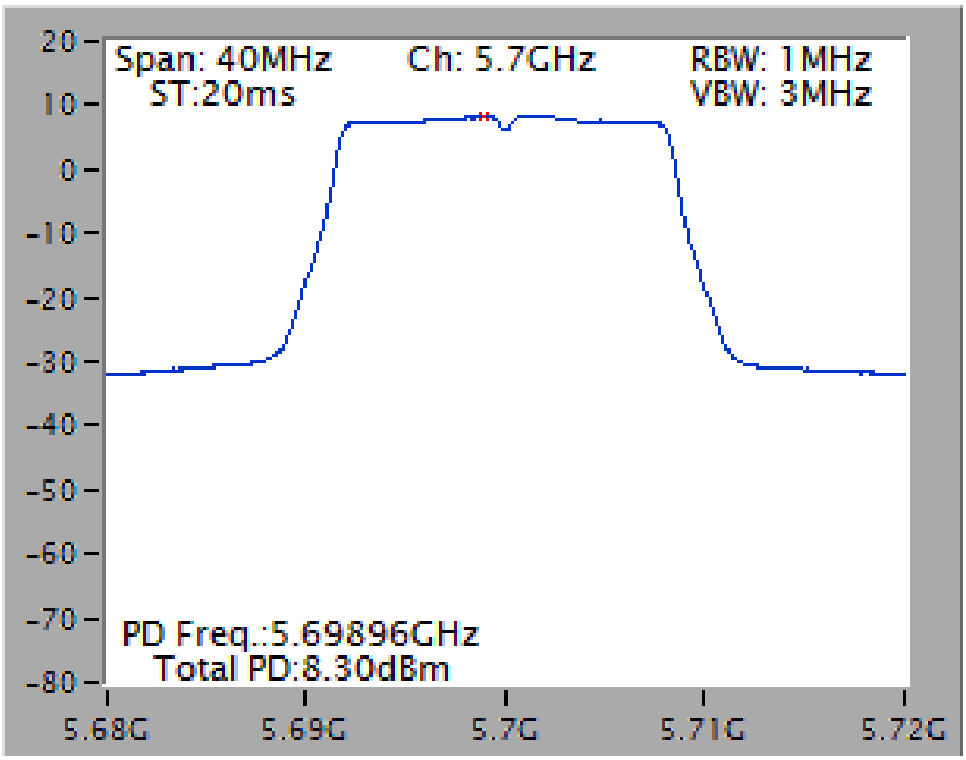
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 1 + Ant. 2 + Ant. 3 / 5610 MHz



Power Density Plot on Configuration IEEE 802.11a / Ant. 1 + Ant. 2 + Ant. 3 / 5260 MHz

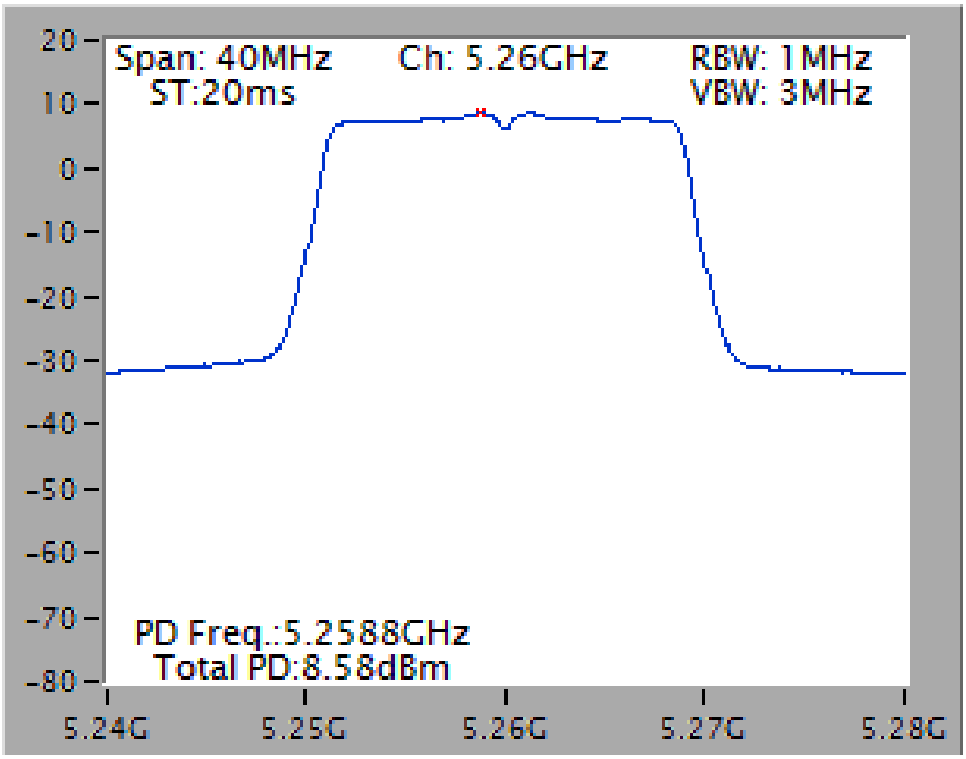


Power Density Plot on Configuration IEEE 802.11a / Ant. 1 + Ant. 2 + Ant. 3 / 5700 MHz

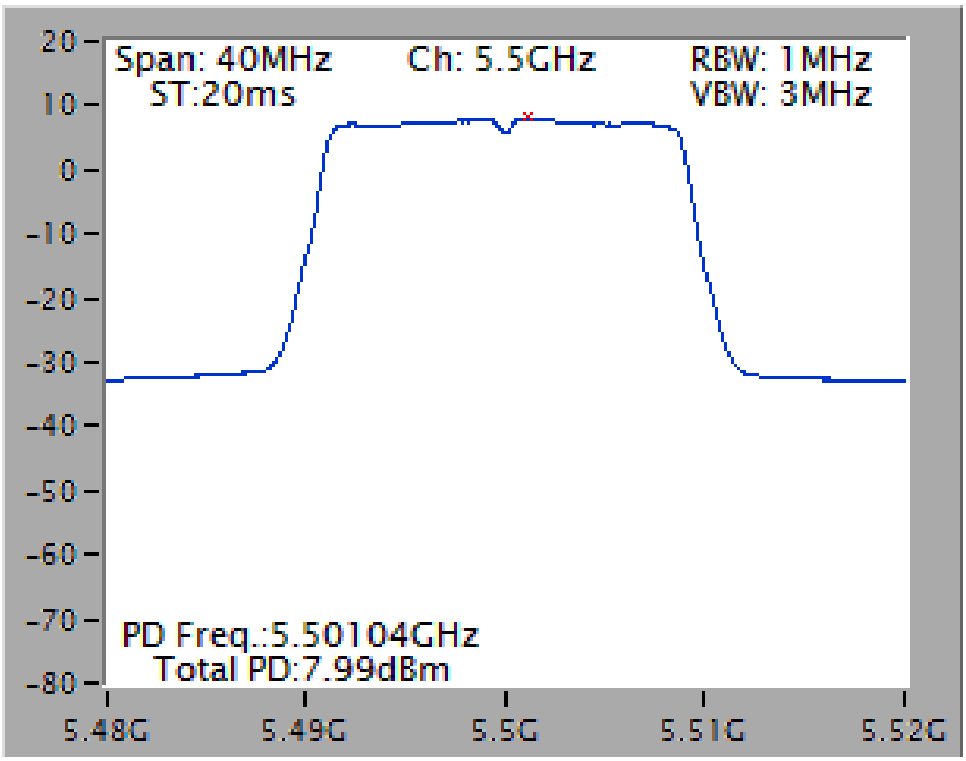


For Beamforming mode:

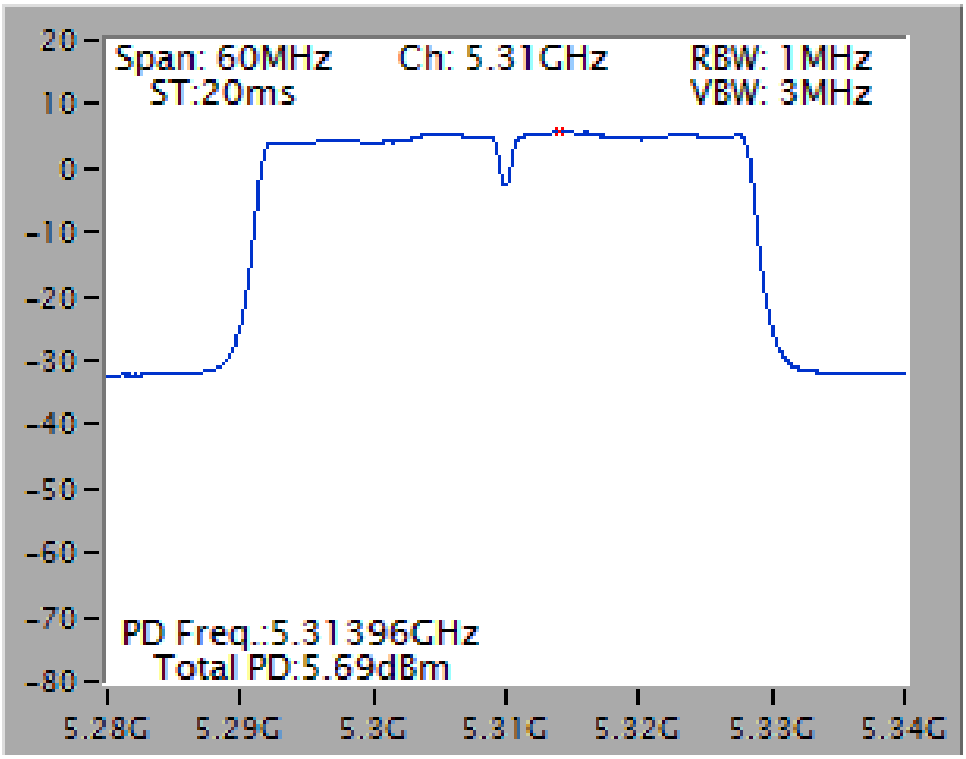
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2 + Ant. 3 / 5260 MHz



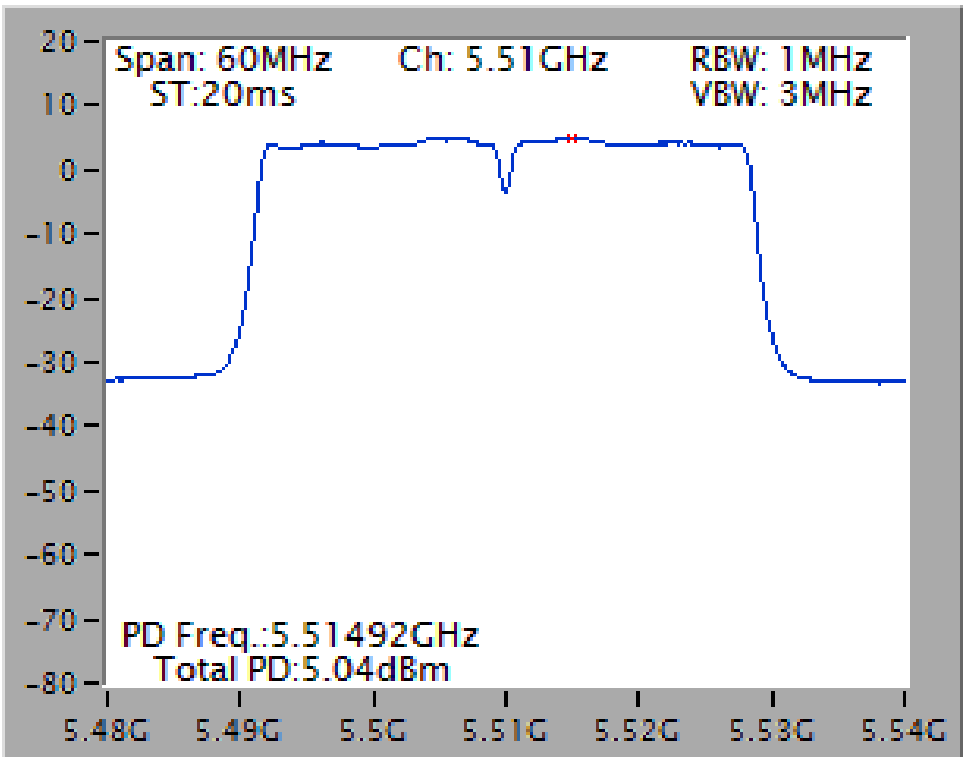
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Ant. 1 + Ant. 2 + Ant. 3 / 5500 MHz



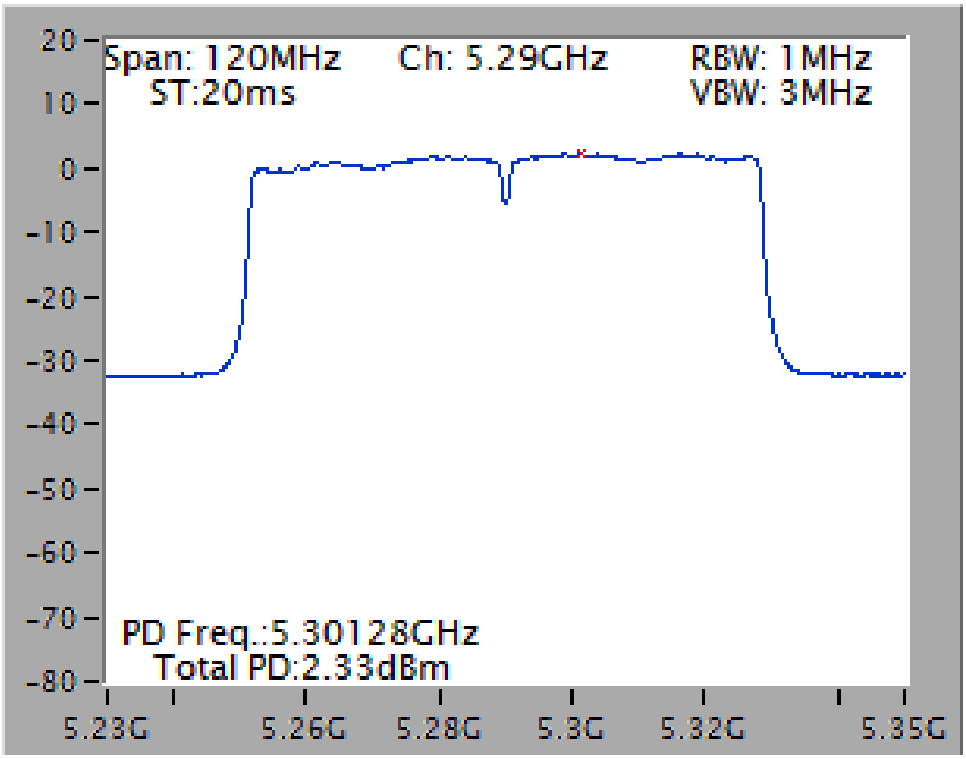
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2 + Ant. 3 / 5310 MHz



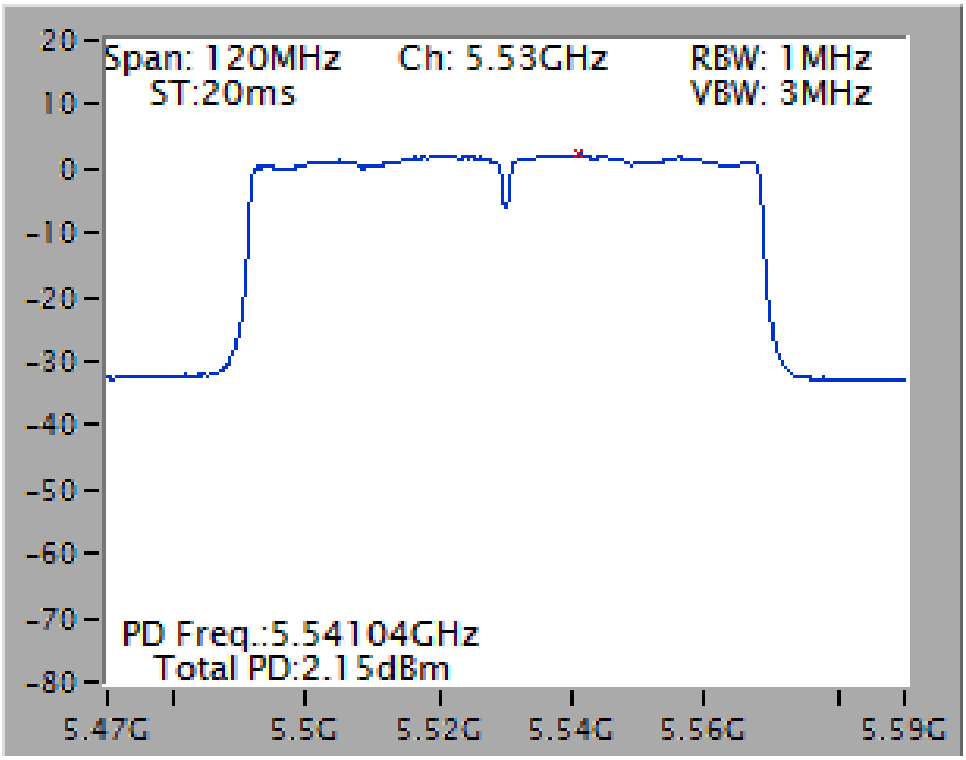
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Ant. 1 + Ant. 2 + Ant. 3 / 5510 MHz



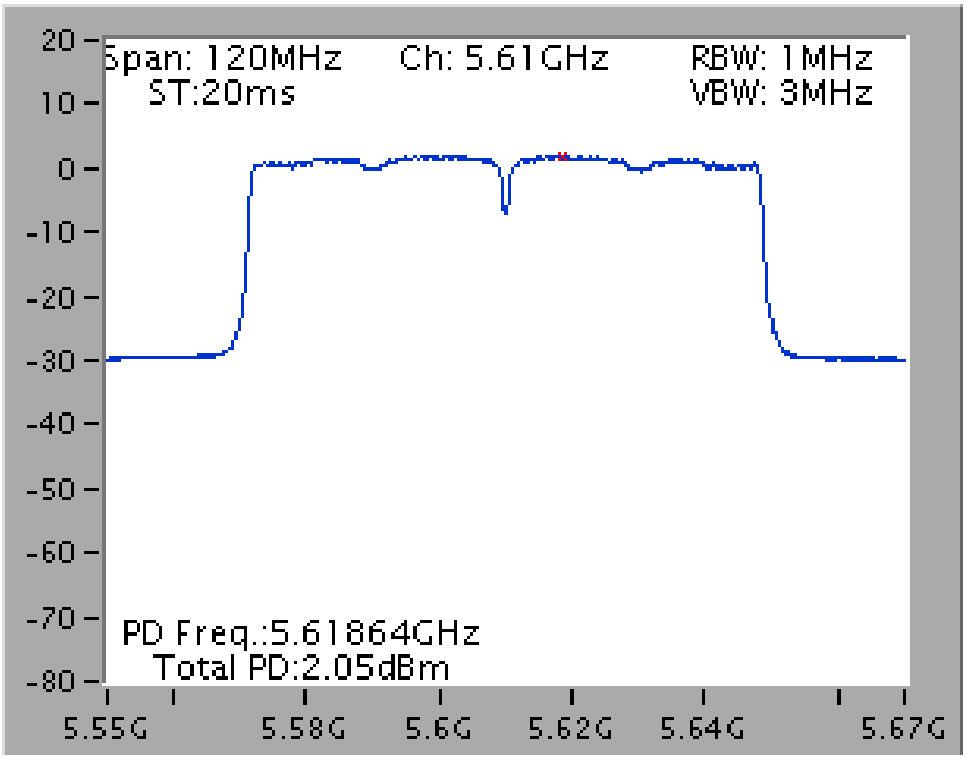
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 1 + Ant. 2 + Ant. 3 / 5290 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 1 + Ant. 2 + Ant. 3 / 5530 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Ant. 1 + Ant. 2 + Ant. 3 / 5610 MHz



4.4. Radiated Emissions Measurement

4.4.1. Limit

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

For transmitters operating in the 5.470-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

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

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

4.4.2. 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.

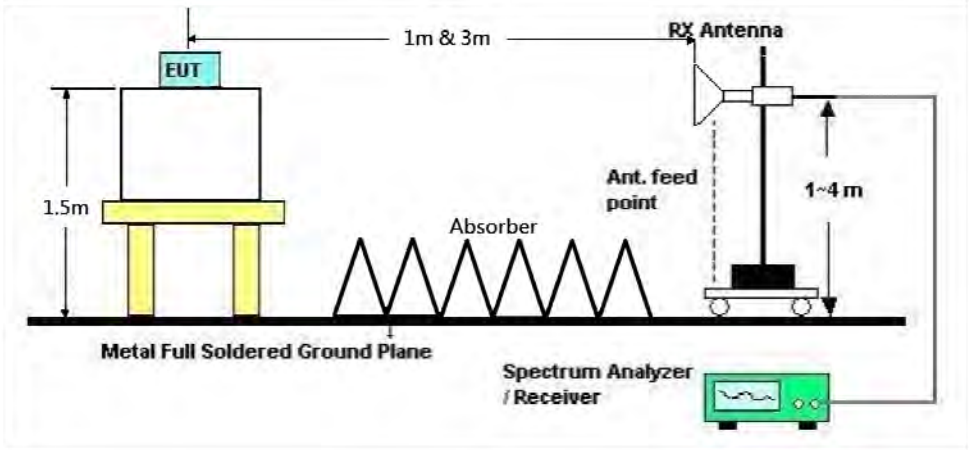
Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	40 GHz
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, 1MHz / 1/T for Average
RBW / VBW (Emission in non-restricted band)	1MHz / 3MHz for peak

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

4.4.3. Test Procedures

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

4.4.4. Test Setup Layout



4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

For Non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

The EUT was programmed to be in beamforming transmitting mode.

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

For Non-Beamforming mode:

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 52 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 18, 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	15760.17	54.41	74.00	-19.59	42.91	7.93	38.49	34.92	Peak	236	150	HORIZONTAL
2	15785.07	41.23	54.00	-12.77	29.76	7.94	38.47	34.94	Average	236	150	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	15774.14	41.03	54.00	-12.97	29.54	7.93	38.48	34.92	Average	7	150	VERTICAL
2	15782.97	54.07	74.00	-19.93	42.60	7.94	38.47	34.94	Peak	7	150	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 60 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 18, 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	10586.61	38.39	54.00	-15.61	28.40	6.61	38.38	35.00	Average	349	150	HORIZONTAL
2	10619.75	51.19	74.00	-22.81	41.20	6.60	38.38	34.99	Peak	349	150	HORIZONTAL
3	15892.26	54.81	74.00	-19.19	43.49	7.97	38.38	35.03	Peak	213	150	HORIZONTAL
4	15903.11	41.37	54.00	-12.63	30.05	7.98	38.37	35.03	Average	213	150	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	10590.67	38.32	54.00	-15.68	28.33	6.61	38.38	35.00	Average	32	150	VERTICAL
2	10608.32	51.64	74.00	-22.36	41.65	6.60	38.38	34.99	Peak	32	150	VERTICAL
3	15897.68	53.81	74.00	-20.19	42.49	7.97	38.38	35.03	Peak	44	150	VERTICAL
4	15916.28	41.18	54.00	-12.82	29.88	7.98	38.37	35.05	Average	50	150	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 64 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 18, 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	10616.92	38.35	54.00	-15.65	28.36	6.60	38.38	34.99	Average	294	150	HORIZONTAL
2	10632.18	51.85	74.00	-22.15	41.86	6.59	38.37	34.97	Peak	294	150	HORIZONTAL
3	15967.96	41.46	54.00	-12.54	30.23	8.00	38.33	35.10	Average	253	150	HORIZONTAL
4	15979.83	54.24	74.00	-19.76	43.03	8.00	38.31	35.10	Peak	253	150	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	10631.75	51.49	74.00	-22.51	41.50	6.59	38.37	34.97	Peak	68	150	VERTICAL
2	10639.86	38.56	54.00	-15.44	28.57	6.59	38.37	34.97	Average	68	150	VERTICAL
3	15950.81	54.66	74.00	-19.34	43.41	7.99	38.34	35.08	Peak	143	150	VERTICAL
4	15965.28	41.17	54.00	-12.83	29.94	8.00	38.33	35.10	Average	143	150	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 100 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 18, 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	10997.25	44.42	54.00	-9.58	34.37	6.46	38.30	34.71	Average	227	150	HORIZONTAL
2	11018.02	51.75	74.00	-22.25	41.69	6.47	38.30	34.71	Peak	227	150	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	11000.00	44.32	54.00	-9.68	34.27	6.46	38.30	34.71	Average	87	169	VERTICAL
2	11004.85	57.27	74.00	-16.73	47.21	6.47	38.30	34.71	Peak	87	169	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 116 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 18, 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	11161.95	63.13	74.00	-10.87	52.96	6.56	38.30	34.69	Peak	157	150	HORIZONTAL
2	11162.39	50.86	54.00	-3.14	40.69	6.56	38.30	34.69	Average	157	150	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	11159.93	66.36	74.00	-7.64	56.19	6.56	38.30	34.69	Peak	65	190	VERTICAL
2	11159.93	52.60	54.00	-1.40	42.43	6.56	38.30	34.69	Average	65	190	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 140 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 18, 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	11394.43	52.71	74.00	-21.29	42.40	6.68	38.30	34.67	Peak	343	150	HORIZONTAL
2	11400.94	42.77	54.00	-11.23	32.45	6.69	38.30	34.67	Average	343	150	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	11397.61	59.54	74.00	-14.46	49.22	6.69	38.30	34.67	Peak	82	150	VERTICAL
2	11402.24	45.56	54.00	-8.44	35.24	6.69	38.30	34.67	Average	82	150	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 54 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 18, 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	10526.11	52.75	74.00	-21.25	42.76	6.63	38.40	35.04	Peak	323	155	HORIZONTAL
2	10546.08	38.96	54.00	-15.04	28.99	6.62	38.39	35.04	Average	323	155	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	10546.58	52.12	74.00	-21.88	42.15	6.62	38.39	35.04	Peak	280	155	VERTICAL
2	10550.93	38.74	54.00	-15.26	28.75	6.62	38.39	35.02	Average	280	155	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 62 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 18, 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	10615.51	38.50	54.00	-15.50	28.51	6.60	38.38	34.99	Average	68	150	HORIZONTAL
2	10642.21	51.73	74.00	-22.27	41.74	6.59	38.37	34.97	Peak	68	150	HORIZONTAL
3	15911.69	54.92	74.00	-19.08	43.62	7.98	38.37	35.05	Peak	90	150	HORIZONTAL
4	15945.92	41.78	54.00	-12.22	30.53	7.99	38.34	35.08	Average	90	150	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	10624.49	38.65	54.00	-15.35	28.66	6.60	38.38	34.99	Average	256	150	VERTICAL
2	10634.62	52.71	74.00	-21.29	42.72	6.59	38.37	34.97	Peak	256	150	VERTICAL
3	15923.05	54.65	74.00	-19.35	43.35	7.99	38.36	35.05	Peak	341	150	VERTICAL
4	15949.17	41.47	54.00	-12.53	30.22	7.99	38.34	35.08	Average	341	8995	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 102 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 18, 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	11017.90	52.57	74.00	-21.43	42.51	6.47	38.30	34.71	Peak	89	173	HORIZONTAL
2	11022.32	39.39	54.00	-14.61	29.32	6.48	38.30	34.71	Average	61	173	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	11025.07	40.63	54.00	-13.37	30.56	6.48	38.30	34.71	Average	61	163	VERTICAL
2	11025.64	53.55	74.00	-20.45	43.48	6.48	38.30	34.71	Peak	61	163	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 110 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 18, 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	11097.18	45.35	54.00	-8.65	35.23	6.52	38.30	34.70	Average	152	223	HORIZONTAL
2	11102.75	57.11	74.00	-16.89	46.99	6.52	38.30	34.70	Peak	152	223	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	11099.42	46.84	54.00	-7.16	36.72	6.52	38.30	34.70	Average	87	231	VERTICAL
2	11104.49	60.47	74.00	-13.53	50.35	6.52	38.30	34.70	Peak	87	231	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 134 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 18, 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	11339.78	53.75	74.00	-20.25	43.48	6.65	38.30	34.68	Peak	344	150	HORIZONTAL
2	11345.07	43.69	54.00	-10.31	33.40	6.66	38.30	34.67	Average	344	172	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	11349.62	48.08	54.00	-5.92	37.79	6.66	38.30	34.67	Average	83	232	VERTICAL
2	11349.77	61.00	74.00	-13.00	50.71	6.66	38.30	34.67	Peak	83	232	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 58 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 18, 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	15858.86	54.92	74.00	-19.08	43.56	7.96	38.41	35.01	Peak	68	218	HORIZONTAL
2	15863.78	41.82	54.00	-12.18	30.46	7.96	38.41	35.01	Average	68	218	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	15850.46	41.88	54.00	-12.12	30.50	7.96	38.41	34.99	Average	24	177	VERTICAL
2	15883.31	54.83	74.00	-19.17	43.49	7.97	38.40	35.03	Peak	25	177	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 106 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 18, 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	11038.08	39.26	54.00	-14.74	29.18	6.48	38.30	34.70	Average	252	201	HORIZONTAL
2	11050.74	52.55	74.00	-21.45	42.46	6.49	38.30	34.70	Peak	252	201	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	11042.56	54.13	74.00	-19.87	44.04	6.49	38.30	34.70	Peak	322	170	VERTICAL
2	11070.42	41.91	54.00	-12.09	31.81	6.50	38.30	34.70	Average	322	170	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 122 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Jun. 30, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11212.47	46.91	54.00	-7.09	32.69	9.10	40.32	35.20	100	133	Average	HORIZONTAL
2	11233.08	59.42	74.00	-14.58	45.19	9.12	40.31	35.20	100	133	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11205.41	61.71	74.00	-12.29	47.47	9.10	40.32	35.18	100	264	Peak	VERTICAL
2	11210.74	49.22	54.00	-4.78	34.98	9.10	40.32	35.18	100	264	Average	VERTICAL

Note:

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

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

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

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11a CH 52 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 18, 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	15789.04	53.62	74.00	-20.38	42.15	7.94	38.47	34.94	Peak	156	153	HORIZONTAL
2	15794.04	41.27	54.00	-12.73	29.80	7.94	38.47	34.94	Average	156	153	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	15787.67	40.79	54.00	-13.21	29.32	7.94	38.47	34.94	Average	149	8995	VERTICAL
2	15801.49	54.44	74.00	-19.56	42.98	7.95	38.45	34.94	Peak	149	150	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11a CH 60 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 18, 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	10589.87	51.70	74.00	-22.30	41.71	6.61	38.38	35.00	Peak	85	166	HORIZONTAL
2	10597.68	38.42	54.00	-15.58	28.44	6.60	38.38	35.00	Average	85	172	HORIZONTAL
3	15897.90	41.26	54.00	-12.74	29.94	7.97	38.38	35.03	Average	127	185	HORIZONTAL
4	15922.43	54.24	74.00	-19.76	42.94	7.99	38.36	35.05	Peak	121	185	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	10601.59	38.51	54.00	-15.49	28.52	6.60	38.38	34.99	Average	138	166	VERTICAL
2	10606.44	51.54	74.00	-22.46	41.55	6.60	38.38	34.99	Peak	152	166	VERTICAL
3	15889.72	40.97	54.00	-13.03	29.65	7.97	38.38	35.03	Average	144	176	VERTICAL
4	15896.45	55.46	74.00	-18.54	44.14	7.97	38.38	35.03	Peak	142	176	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11a CH 64 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 18, 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	10631.39	38.49	54.00	-15.51	28.50	6.59	38.37	34.97	Average	134	154	HORIZONTAL
2	10647.16	52.03	74.00	-21.97	42.04	6.59	38.37	34.97	Peak	138	154	HORIZONTAL
3	15942.63	41.48	54.00	-12.52	30.23	7.99	38.34	35.08	Average	69	158	HORIZONTAL
4	15971.50	54.17	74.00	-19.83	42.96	8.00	38.31	35.10	Peak	124	158	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	10646.08	51.99	74.00	-22.01	42.00	6.59	38.37	34.97	Peak	10	148	VERTICAL
2	10646.66	38.46	54.00	-15.54	28.47	6.59	38.37	34.97	Average	7	148	VERTICAL
3	15956.02	55.04	74.00	-18.96	43.81	8.00	38.33	35.10	Peak	67	148	VERTICAL
4	15978.02	41.12	54.00	-12.88	29.91	8.00	38.31	35.10	Average	67	148	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11a CH 100 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 18, 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	11000.87	43.57	54.00	-10.43	33.52	6.46	38.30	34.71	Average	197	149	HORIZONTAL
2	11001.38	53.65	74.00	-20.35	43.60	6.46	38.30	34.71	Peak	197	148	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	10998.70	59.72	74.00	-14.28	49.67	6.46	38.30	34.71	Peak	70	177	VERTICAL
2	10999.35	45.26	54.00	-8.74	35.21	6.46	38.30	34.71	Average	70	177	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11a CH 116 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 18, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11159.88	49.48	54.00	-4.52	34.75	10.60	39.13	35.00	216	148	Average	HORIZONTAL
2	11160.30	63.55	74.00	-10.45	48.82	10.60	39.13	35.00	216	148	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11160.42	68.22	74.00	-5.78	53.49	10.60	39.13	35.00	249	166	Peak	VERTICAL
2	11161.02	53.08	54.00	-0.92	38.35	10.60	39.13	35.00	249	166	Average	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11a CH 140 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 18, 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	11401.30	47.82	54.00	-6.18	37.50	6.69	38.30	34.67	Average	314	150	HORIZONTAL
2	11403.26	56.08	74.00	-17.92	45.76	6.69	38.30	34.67	Peak	314	150	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	11400.51	63.83	74.00	-10.17	53.51	6.69	38.30	34.67	Peak	84	191	VERTICAL
2	11400.80	50.69	54.00	-3.31	40.37	6.69	38.30	34.67	Average	84	191	VERTICAL

Note:

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

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

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

For Beamforming mode:

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 52 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 19, 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	15775.29	52.51	74.00	-21.49	41.02	7.93	38.48	34.92	Peak	231	100	HORIZONTAL
2	15776.54	38.64	54.00	-15.36	27.15	7.93	38.48	34.92	Average	231	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	15776.22	38.61	54.00	-15.39	27.12	7.93	38.48	34.92	Average	26	100	VERTICAL
2	15784.86	52.59	74.00	-21.41	41.12	7.94	38.47	34.94	Peak	26	100	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 60 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 19, 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	10598.16	38.48	54.00	-15.52	28.50	6.60	38.38	35.00	Average	238	100	HORIZONTAL
2	10599.02	53.05	74.00	-20.95	43.07	6.60	38.38	35.00	Peak	238	100	HORIZONTAL
3	15899.26	38.99	54.00	-15.01	27.67	7.97	38.38	35.03	Average	16	100	HORIZONTAL
4	15901.01	53.20	74.00	-20.80	41.88	7.98	38.37	35.03	Peak	16	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	10597.56	52.44	74.00	-21.56	42.46	6.60	38.38	35.00	Peak	273	100	VERTICAL
2	10598.19	38.82	54.00	-15.18	28.84	6.60	38.38	35.00	Average	273	100	VERTICAL
3	15902.84	53.12	74.00	-20.88	41.80	7.98	38.37	35.03	Peak	182	140	VERTICAL
4	15903.73	38.79	54.00	-15.21	27.47	7.98	38.37	35.03	Average	182	140	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 64 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 19, 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	10636.38	52.28	74.00	-21.72	42.29	6.59	38.37	34.97	Peak	187	100	HORIZONTAL
2	10641.51	38.53	54.00	-15.47	28.54	6.59	38.37	34.97	Average	187	100	HORIZONTAL
3	15958.33	39.16	54.00	-14.84	27.93	8.00	38.33	35.10	Average	45	100	HORIZONTAL
4	15958.62	53.62	74.00	-20.38	42.39	8.00	38.33	35.10	Peak	45	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	10638.04	53.67	74.00	-20.33	43.68	6.59	38.37	34.97	Peak	276	119	VERTICAL
2	10639.49	39.16	54.00	-14.84	29.17	6.59	38.37	34.97	Average	276	119	VERTICAL
3	15956.01	39.05	54.00	-14.95	27.82	8.00	38.33	35.10	Average	285	100	VERTICAL
4	15964.29	52.77	74.00	-21.23	41.54	8.00	38.33	35.10	Peak	285	100	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 100 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 20, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10997.16	46.08	54.00	-7.92	32.45	8.93	39.50	34.80	Average	173	183	HORIZONTAL
2	10999.04	59.53	74.00	-14.47	45.90	8.93	39.50	34.80	Peak	173	183	HORIZONTAL
3	16490.72	58.93	74.00	-15.07	44.76	11.20	38.17	35.20	Peak	150	250	HORIZONTAL
4	16494.52	45.80	54.00	-8.20	31.60	11.20	38.20	35.20	Average	150	250	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10997.52	60.70	74.00	-13.30	47.07	8.93	39.50	34.80	Peak	190	61	VERTICAL
2	10999.88	47.68	54.00	-6.32	34.05	8.93	39.50	34.80	Average	190	61	VERTICAL
3	16504.80	45.28	54.00	-8.72	31.05	11.21	38.20	35.18	Average	150	6	VERTICAL
4	16509.88	57.06	74.00	-16.94	42.77	11.21	38.26	35.18	Peak	150	6	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 116 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 20, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11163.44	64.31	74.00	-9.69	50.67	9.04	39.50	34.90	Peak	120	41	HORIZONTAL
2	11163.76	52.02	54.00	-1.98	38.38	9.04	39.50	34.90	Average	120	41	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11169.04	53.92	54.00	-0.08	40.28	9.04	39.50	34.90	Average	100	251	VERTICAL
2	11170.08	68.04	74.00	-5.96	54.40	9.04	39.50	34.90	Peak	100	251	VERTICAL

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 140 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 20, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11396.52	57.91	74.00	-16.09	44.26	9.19	39.50	35.04	Peak	139	181	HORIZONTAL
2	11402.64	44.57	54.00	-9.43	30.92	9.19	39.50	35.04	Average	139	181	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11402.64	63.79	74.00	-10.21	50.14	9.19	39.50	35.04	Peak	160	80	VERTICAL
2	11405.04	49.24	54.00	-4.76	35.59	9.19	39.50	35.04	Average	160	80	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 54 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 20, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10517.60	53.73	74.00	-20.27	40.38	8.57	39.98	35.20	Peak	100	150	HORIZONTAL
2	10539.40	41.81	54.00	-12.19	28.43	8.59	39.97	35.18	Average	100	150	HORIZONTAL
3	15827.40	44.39	54.00	-9.61	31.43	10.80	37.69	35.53	Average	100	240	HORIZONTAL
4	15856.20	56.48	74.00	-17.52	43.56	10.81	37.64	35.53	Peak	100	240	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10542.40	54.44	74.00	-19.56	41.06	8.59	39.97	35.18	Peak	100	256	VERTICAL
2	10577.60	42.05	54.00	-11.95	28.65	8.61	39.93	35.14	Average	100	256	VERTICAL
3	15826.00	44.52	54.00	-9.48	31.56	10.80	37.69	35.53	Average	100	220	VERTICAL
4	15849.60	56.60	74.00	-17.40	43.68	10.81	37.64	35.53	Peak	100	220	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 62 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 20, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10594.60	55.08	74.00	-18.92	41.69	8.62	39.91	35.14	Peak	100	225	HORIZONTAL
2	10616.40	41.71	54.00	-12.29	28.30	8.65	39.88	35.12	Average	100	225	HORIZONTAL
3	15936.00	57.77	74.00	-16.23	44.96	10.81	37.51	35.51	Peak	100	170	HORIZONTAL
4	15966.40	44.65	54.00	-9.35	31.89	10.82	37.45	35.51	Average	100	170	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10587.20	41.86	54.00	-12.14	28.47	8.62	39.91	35.14	Average	100	286	VERTICAL
2	10644.40	54.35	74.00	-19.65	40.92	8.66	39.86	35.09	Peak	100	286	VERTICAL
3	15961.40	56.86	74.00	-17.14	44.07	10.82	37.48	35.51	Peak	100	219	VERTICAL
4	15963.00	44.61	54.00	-9.39	31.82	10.82	37.48	35.51	Average	100	219	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 102 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 20, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11036.40	55.20	74.00	-18.80	41.58	8.95	39.50	34.83	Peak	100	250	HORIZONTAL
2	11042.20	41.64	54.00	-12.36	28.01	8.96	39.50	34.83	Average	100	250	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11025.40	41.74	54.00	-12.26	28.10	8.95	39.50	34.81	Average	100	168	VERTICAL
2	11036.80	54.16	74.00	-19.84	40.54	8.95	39.50	34.83	Peak	100	168	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 110 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 20, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11078.60	50.64	54.00	-3.36	37.00	8.98	39.50	34.84	Average	224	51	HORIZONTAL
2	11105.00	63.63	74.00	-10.37	50.00	8.99	39.50	34.86	Peak	224	51	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11098.00	51.69	54.00	-2.31	38.06	8.99	39.50	34.86	Average	177	76	VERTICAL
2	11100.00	67.51	74.00	-6.49	53.88	8.99	39.50	34.86	Peak	177	76	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 134 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 20, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11338.80	58.22	74.00	-15.78	44.57	9.14	39.50	34.99	Peak	242	26	HORIZONTAL
2	11340.40	46.05	54.00	-7.95	32.40	9.14	39.50	34.99	Average	242	26	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11317.60	46.38	54.00	-7.62	32.74	9.13	39.50	34.99	Average	170	52	VERTICAL
2	11350.80	59.34	74.00	-14.66	45.70	9.15	39.50	35.01	Peak	170	52	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 58 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 20, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10551.36	41.52	54.00	-12.48	28.13	8.60	39.95	35.16	Average	100	264	HORIZONTAL
2	10594.24	55.32	74.00	-18.68	41.93	8.62	39.91	35.14	Peak	100	264	HORIZONTAL
3	15903.28	44.88	54.00	-9.12	32.03	10.81	37.56	35.52	Average	100	150	HORIZONTAL
4	15908.88	57.81	74.00	-16.19	44.96	10.81	37.56	35.52	Peak	100	150	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10550.08	41.87	54.00	-12.13	28.50	8.60	39.95	35.18	Average	100	53	VERTICAL
2	10559.20	55.09	74.00	-18.91	41.70	8.60	39.95	35.16	Peak	100	53	VERTICAL
3	15895.76	57.62	74.00	-16.38	44.77	10.81	37.56	35.52	Peak	100	257	VERTICAL
4	15907.12	44.73	54.00	-9.27	31.88	10.81	37.56	35.52	Average	100	257	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 106 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 20, 2014		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11069.28	55.36	74.00	-18.64	41.73	8.97	39.50	34.84	Peak	100	248	HORIZONTAL
2	11098.72	42.17	54.00	-11.83	28.54	8.99	39.50	34.86	Average	100	248	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11068.00	55.41	74.00	-18.59	41.78	8.97	39.50	34.84	Peak	100	154	VERTICAL
2	11095.20	42.09	54.00	-11.91	28.46	8.99	39.50	34.86	Average	100	154	VERTICAL

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 122 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Jul. 01, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg		
1	11218.63	47.03	54.00	-6.97	31.28	40.08	10.87	35.20	153	310	HORIZONTAL	Average
2	11219.90	61.00	74.00	-13.00	45.25	40.08	10.87	35.20	153	310	HORIZONTAL	Peak

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg		
1	11219.44	47.77	54.00	-6.23	32.02	40.08	10.87	35.20	146	44	VERTICAL	Average
2	11219.49	60.37	74.00	-13.63	44.62	40.08	10.87	35.20	146	44	VERTICAL	Peak

Note:

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

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

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

4.5. Band Edge Emissions Measurement

4.5.1. Limit

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

For transmitters operating in the 5.470-5.725 GHz band: all emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.

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

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

4.5.2. Measuring Instruments and Setting

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

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

4.5.3. 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

For Non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

The EUT was programmed to be in beamforming transmitting mode.

4.5.7. Test Result of Band Edge and Fundamental Emissions

For Non-Beamforming mode:

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 52, 60, 64 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 18, 2014		

Channel 52

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5260.80	105.81			100.11	6.34	34.27	34.91	228	207	Average	VERTICAL
2	5260.80	115.78			110.08	6.34	34.27	34.91	228	207	Peak	VERTICAL
3	5421.20	53.69	54.00	-0.31	47.60	6.53	34.48	34.92	228	207	Average	VERTICAL
4	5421.20	64.17	74.00	-9.83	58.08	6.53	34.48	34.92	228	207	Peak	VERTICAL

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

Channel 60

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5300.80	103.98			98.17	6.40	34.32	34.91	231	210	Average	VERTICAL
2	5301.60	114.07			108.26	6.40	34.32	34.91	231	210	Peak	VERTICAL
3	5380.40	63.68	74.00	-10.32	57.66	6.50	34.44	34.92	231	210	Peak	VERTICAL
4	5381.60	53.67	54.00	-0.33	47.65	6.50	34.44	34.92	231	210	Average	VERTICAL

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

Channel 64

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5318.40	113.00			107.17	6.40	34.34	34.91	194	162	Peak	VERTICAL
2	5319.60	102.51			96.68	6.40	34.34	34.91	194	162	Average	VERTICAL
3	5399.60	53.80	54.00	-0.20	47.73	6.53	34.46	34.92	194	162	Average	VERTICAL
4	5399.60	64.99	74.00	-9.01	58.92	6.53	34.46	34.92	194	162	Peak	VERTICAL

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

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 100, 116, 140 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 18, 2014		

Channel 100

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5420.80	53.98	54.00	-0.02	47.89	6.53	34.48	34.92	231	188	Average	VERTICAL
2	5420.80	64.56	74.00	-9.44	58.47	6.53	34.48	34.92	231	188	Peak	VERTICAL
3	5470.00	52.74	54.00	-1.26	46.51	6.60	34.55	34.92	231	188	Average	VERTICAL
4	5470.00	70.69	74.00	-3.31	64.46	6.60	34.55	34.92	231	188	Peak	VERTICAL
5	5501.20	107.25			100.92	6.65	34.60	34.92	231	188	Average	VERTICAL
6	5501.20	117.51			111.18	6.65	34.60	34.92	231	188	Peak	VERTICAL

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

Channel 116

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5420.80	53.70	54.00	-0.30	47.61	6.53	34.48	34.92	248	193	Average	VERTICAL
2	5420.80	64.07	74.00	-9.93	57.98	6.53	34.48	34.92	248	193	Peak	VERTICAL
3	5466.00	61.94	68.20	-6.26	55.71	6.60	34.55	34.92	248	193	Peak	VERTICAL
4	5581.60	111.28			104.86	6.72	34.63	34.93	248	193	Average	VERTICAL
5	5581.60	121.54			115.12	6.72	34.63	34.93	248	193	Peak	VERTICAL
6	5741.80	66.80	68.20	-1.40	60.18	6.86	34.70	34.94	248	193	Peak	VERTICAL

Item 4, 5 are the fundamental frequency at 5580 MHz.

Channel 140

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	5699.42	115.21			110.81	4.70	34.27	34.57	Peak	64	225	VERTICAL
2	5699.42	105.53			101.13	4.70	34.27	34.57	Average	64	225	VERTICAL
3	5725.00	68.06	68.20	-0.14	63.55	4.72	34.37	34.58	Peak	64	225	VERTICAL

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

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 54, 62 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 18, 2014		

Channel 54

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	5265.95	111.24	74.00			4.42	33.33	34.53	Peak	59	198	VERTICAL
2	5265.95	102.35	54.00			4.42	33.33	34.53	Average	59	198	VERTICAL
3	5351.16	53.89	54.00	-0.11	50.49	4.47	33.46	34.53	Average	59	198	VERTICAL
4	5356.37	63.37	74.00	-10.63	59.97	4.47	33.46	34.53	Peak	59	198	VERTICAL

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

Channel 62

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	5314.63	111.22			107.89	4.45	33.41	34.53	Peak	29	185	VERTICAL
2	5315.21	101.93			98.60	4.45	33.41	34.53	Average	29	185	VERTICAL
3	5350.00	53.80	54.00	-0.20	50.40	4.47	33.46	34.53	Average	29	185	VERTICAL
4	5350.58	68.03	74.00	-5.97	64.63	4.47	33.46	34.53	Peak	29	185	VERTICAL
5	5455.95	62.84	74.00	-11.16	59.21	4.54	33.62	34.53	Peak	29	185	VERTICAL
6	5460.00	52.75	54.00	-1.25	49.12	4.54	33.62	34.53	Average	29	185	VERTICAL

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

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 102, 110, 134 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 18, 2014		

Channel 102

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	Cm	
1	5440.90	51.02	54.00	-2.98	47.43	4.53	33.59	34.53	Average	60	191	VERTICAL
2	5460.00	66.82	74.00	-7.18	63.19	4.54	33.62	34.53	Peak	60	191	VERTICAL
3	5466.53	71.77	74.00	-2.23	68.10	4.55	33.65	34.53	Peak	60	191	VERTICAL
4	5470.00	53.86	54.00	-0.14	50.19	4.55	33.65	34.53	Average	60	191	VERTICAL
5	5505.95	103.80			100.06	4.57	33.70	34.53	Average	60	191	VERTICAL
6	5506.53	113.03			109.29	4.57	33.70	34.53	Peak	60	191	VERTICAL

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

Channel 110

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	Cm	
1	5455.95	67.84	74.00	-6.16	64.21	4.54	33.62	34.53	Peak	57	192	VERTICAL
2	5455.95	53.87	54.00	-0.13	50.24	4.54	33.62	34.53	Average	57	192	VERTICAL
3	5466.53	66.68	68.20	-1.52	63.01	4.55	33.65	34.53	Peak	57	192	VERTICAL
4	5545.95	105.86			102.01	4.59	33.80	34.54	Average	57	192	VERTICAL
5	5546.53	115.88			112.03	4.59	33.80	34.54	Peak	57	192	VERTICAL

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

Channel 134

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	Cm	
1	5665.37	114.49			110.21	4.67	34.17	34.56	Peak	62	162	VERTICAL
2	5665.37	104.68			100.40	4.67	34.17	34.56	Average	62	162	VERTICAL
3	5725.58	70.36	74.00	-3.64	65.85	4.72	34.37	34.58	Peak	62	162	VERTICAL
4	5736.00	53.92	54.00	-0.08	49.35	4.73	34.42	34.58	Average	62	162	VERTICAL

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

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 58, 106, 122 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 18, 2014, Jun. 30, 2015		

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	5123.95	56.20	74.00	-17.80	53.29	4.33	33.11	34.53	Peak	66	196	VERTICAL
2	5150.00	44.25	54.00	-9.75	41.30	4.34	33.14	34.53	Average	66	196	VERTICAL
3	5295.79	98.21			94.92	4.44	33.38	34.53	Average	66	196	VERTICAL
4	5296.51	107.99			104.70	4.44	33.38	34.53	Peak	66	196	VERTICAL
5	5350.72	53.87	54.00	-0.13	50.47	4.47	33.46	34.53	Average	66	196	VERTICAL
6	5353.62	66.43	74.00	-7.57	63.03	4.47	33.46	34.53	Peak	66	196	VERTICAL

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

Channel 106

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	5451.32	70.86	74.00	-3.14	67.23	4.54	33.62	34.53	Peak	57	192	VERTICAL
2	5455.66	52.56	54.00	-1.44	48.93	4.54	33.62	34.53	Average	57	192	VERTICAL
3	5466.38	71.08	74.00	-2.92	67.41	4.55	33.65	34.53	Peak	57	192	VERTICAL
4	5466.38	53.99	54.00	-0.01	50.32	4.55	33.65	34.53	Average	57	192	VERTICAL
5	5536.51	107.70			103.85	4.59	33.80	34.54	Peak	57	192	VERTICAL
6	5540.85	98.37			94.52	4.59	33.80	34.54	Average	57	192	VERTICAL
7	5726.45	57.94	74.00	-16.06	53.43	4.72	34.37	34.58	Peak	57	192	VERTICAL
8	5726.45	46.61	54.00	-7.39	42.10	4.72	34.37	34.58	Average	57	192	VERTICAL

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

Channel 122

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	5458.55	49.94	54.00	-4.06	45.77	5.99	31.76	33.58	186	52	Average	VERTICAL
2	5460.00	61.80	74.00	-12.20	57.63	5.99	31.76	33.58	186	52	Peak	VERTICAL
3	5468.55	50.51	54.00	-3.49	46.32	5.99	31.78	33.58	186	52	Average	VERTICAL
4	5470.00	61.90	74.00	-12.10	57.71	5.99	31.78	33.58	186	52	Peak	VERTICAL
5 0	5620.85	100.48			96.07	6.06	31.94	33.59	186	52	Average	VERTICAL
6 0	5620.85	110.39			105.98	6.06	31.94	33.59	186	52	Peak	VERTICAL
7	5726.45	53.28	54.00	-0.72	48.70	6.10	32.08	33.60	186	52	Average	VERTICAL
8	5726.45	65.76	74.00	-8.24	61.18	6.10	32.08	33.60	186	52	Peak	VERTICAL

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

Note:

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

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

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11a CH 52, 60, 64 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 17, 2014		

Channel 52

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5146.00	44.80	54.00	-9.20	39.39	6.21	34.11	34.91	191	169	Average	VERTICAL
2	5147.60	56.47	74.00	-17.53	51.06	6.21	34.11	34.91	191	169	Peak	VERTICAL
3	5259.20	106.11			100.41	6.34	34.27	34.91	191	169	Average	VERTICAL
4	5259.20	116.21			110.51	6.34	34.27	34.91	191	169	Peak	VERTICAL
5	5418.80	64.49	74.00	-9.51	58.40	6.53	34.48	34.92	191	169	Peak	VERTICAL
6	5420.00	53.93	54.00	-0.07	47.84	6.53	34.48	34.92	191	169	Average	VERTICAL

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

Channel 60

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5299.20	104.06			98.25	6.40	34.32	34.91	188	161	Average	VERTICAL
2	5299.20	114.11			108.30	6.40	34.32	34.91	188	161	Peak	VERTICAL
3	5378.00	64.83	74.00	-9.17	58.81	6.50	34.44	34.92	188	161	Peak	VERTICAL
4	5378.80	53.86	54.00	-0.14	47.84	6.50	34.44	34.92	188	161	Average	VERTICAL

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

Channel 64

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5318.40	103.84			98.01	6.40	34.34	34.91	185	157	Average	VERTICAL
2	5318.80	114.00			108.17	6.40	34.34	34.91	185	157	Peak	VERTICAL
3	5398.80	64.81	74.00	-9.19	58.74	6.53	34.46	34.92	185	157	Peak	VERTICAL
4	5399.20	53.95	54.00	-0.05	47.88	6.53	34.46	34.92	185	157	Average	VERTICAL

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

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11a CH 100, 116, 140 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 17, 2014		

Channel 100

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5426.00	53.95	54.00	-0.05	47.83	6.56	34.48	34.92	241	195	Average	VERTICAL
2	5426.00	64.86	74.00	-9.14	58.74	6.56	34.48	34.92	241	195	Peak	VERTICAL
3	5466.00	49.49	54.00	-4.51	43.26	6.60	34.55	34.92	241	195	Average	VERTICAL
4	5466.80	63.00	74.00	-11.00	56.77	6.60	34.55	34.92	241	195	Peak	VERTICAL
5	5495.60	117.68			111.39	6.63	34.58	34.92	241	195	Peak	VERTICAL
6	5496.40	107.22			100.93	6.63	34.58	34.92	241	195	Average	VERTICAL

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

Channel 116

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5423.20	52.32	54.00	-1.68	46.23	6.53	34.48	34.92	230	155	Average	VERTICAL
2	5423.20	63.40	74.00	-10.60	57.31	6.53	34.48	34.92	230	155	Peak	VERTICAL
3	5463.20	60.37	68.20	-7.83	54.14	6.60	34.55	34.92	230	155	Peak	VERTICAL
4	5580.80	110.22			103.80	6.72	34.63	34.93	230	155	Average	VERTICAL
5	5580.80	120.32			113.90	6.72	34.63	34.93	230	155	Peak	VERTICAL
6	5742.60	65.88	68.20	-2.32	59.26	6.86	34.70	34.94	230	155	Peak	VERTICAL

Item 4, 5 are the fundamental frequency at 5580 MHz.

Channel 140

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	5700.40	105.79			99.24	6.81	34.68	34.94	194	160	Average	VERTICAL
2	5701.20	116.43			109.88	6.81	34.68	34.94	194	160	Peak	VERTICAL
3	5730.60	68.06	68.20	-0.14	61.45	6.86	34.69	34.94	194	160	Peak	VERTICAL

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

Note:

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

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

For Beamforming mode:

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 52, 60, 64 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 19, 2014		

Channel 52

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	Cm	
1	5100.64	55.40	74.00	-18.60	52.56	4.31	33.06	34.53	Peak	248	180	VERTICAL
2	5100.64	43.79	54.00	-10.21	40.95	4.31	33.06	34.53	Average	248	180	VERTICAL
3	5258.72	116.47			113.25	4.42	33.33	34.53	Peak	248	180	VERTICAL
4	5261.28	106.58			103.36	4.42	33.33	34.53	Average	248	180	VERTICAL
5	5413.46	53.72	54.00	-0.28	50.16	4.52	33.57	34.53	Average	248	180	VERTICAL
6	5423.08	64.30	74.00	-9.70	60.74	4.52	33.57	34.53	Peak	248	180	VERTICAL

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

Channel 60

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	Cm	
1	5298.72	105.02			101.73	4.44	33.38	34.53	Average	214	162	VERTICAL
2	5301.28	115.23			111.94	4.44	33.38	34.53	Peak	214	162	VERTICAL
3	5381.15	53.88	54.00	-0.12	50.41	4.49	33.51	34.53	Average	214	162	VERTICAL
4	5381.41	64.45	74.00	-9.55	60.98	4.49	33.51	34.53	Peak	214	162	VERTICAL

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

Channel 64

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	Cm	
1	5318.40	104.99			101.66	4.45	33.41	34.53	Average	253	198	VERTICAL
2	5318.72	115.55			112.22	4.45	33.41	34.53	Peak	253	198	VERTICAL
3	5398.14	53.78	54.00	-0.22	50.27	4.50	33.54	34.53	Average	253	198	VERTICAL
4	5399.04	64.28	74.00	-9.72	60.77	4.50	33.54	34.53	Peak	253	198	VERTICAL

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

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 100, 116, 140 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 19, 2014		

Channel 100

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	Cm	
1	5420.26	64.74	74.00	-9.26	61.18	4.52	33.57	34.53	Peak	248	184	VERTICAL
2	5420.58	53.76	54.00	-0.24	50.20	4.52	33.57	34.53	Average	248	184	VERTICAL
3	5470.00	70.11	74.00	-3.89	66.44	4.55	33.65	34.53	Peak	248	184	VERTICAL
4	5470.00	52.23	54.00	-1.77	48.56	4.55	33.65	34.53	Average	248	184	VERTICAL
5	5498.72	118.02			114.28	4.57	33.70	34.53	Peak	248	184	VERTICAL
6	5500.96	107.66			103.92	4.57	33.70	34.53	Average	248	184	VERTICAL

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

Channel 116

	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	5411.92	62.96	74.00	-11.04	59.40	4.52	33.57	34.53	Peak	242	185	VERTICAL
2	5413.21	52.20	54.00	-1.80	48.64	4.52	33.57	34.53	Average	242	185	VERTICAL
3	5468.08	59.41	68.20	-8.79	55.74	4.55	33.65	34.53	Peak	242	185	VERTICAL
4	5572.95	111.61			107.62	4.62	33.91	34.54	Average	242	185	VERTICAL
5	5575.51	122.01			118.02	4.62	33.91	34.54	Peak	242	185	VERTICAL
6	5741.67	67.09	68.20	-1.11	62.52	4.73	34.42	34.58	Peak	242	185	VERTICAL

Item 4, 5 are the fundamental frequency at 5580 MHz.

Channel 140

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	Cm	
1	5701.60	105.90			101.44	4.71	34.32	34.57	Average	253	186	VERTICAL
2	5707.05	117.38			112.93	4.71	34.32	34.58	Peak	253	186	VERTICAL
3	5725.32	68.11	68.20	-0.09	63.60	4.72	34.37	34.58	Peak	253	186	VERTICAL

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

Temperature	26℃	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 54, 62 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 19, 2014		

Channel 54

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	5108.33	56.85	74.00	-17.15	53.97	4.32	33.09	34.53	Peak	237	204	VERTICAL
2	5127.56	43.70	54.00	-10.30	40.79	4.33	33.11	34.53	Average	237	204	VERTICAL
3	5275.13	103.74			100.52	4.42	33.33	34.53	Average	237	204	VERTICAL
4	5275.77	115.29			112.04	4.43	33.35	34.53	Peak	237	204	VERTICAL
5	5354.49	64.51	74.00	-9.49	61.11	4.47	33.46	34.53	Peak	237	204	VERTICAL
6	5354.49	53.80	54.00	-0.20	50.40	4.47	33.46	34.53	Average	237	204	VERTICAL

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

Channel 62

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	5304.55	114.16			110.87	4.44	33.38	34.53	Peak	231	219	VERTICAL
2	5305.19	103.57			100.28	4.44	33.38	34.53	Average	231	219	VERTICAL
3	5351.60	70.53	74.00	-3.47	67.13	4.47	33.46	34.53	Peak	231	219	VERTICAL
4	5385.58	53.93	54.00	-0.07	50.46	4.49	33.51	34.53	Average	231	219	VERTICAL

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

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 102, 110, 134 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 19, 2014		

Channel 102

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	5425.39	50.49	54.00	-3.51	46.93	4.52	33.57	34.53	Average	252	226	VERTICAL
2	5460.00	69.64	74.00	-4.36	66.01	4.54	33.62	34.53	Peak	252	226	VERTICAL
3	5468.72	51.20	54.00	-2.80	47.53	4.55	33.65	34.53	Average	252	226	VERTICAL
4	5469.36	73.91	74.00	-0.09	70.24	4.55	33.65	34.53	Peak	252	226	VERTICAL
5	5505.83	114.69			110.95	4.57	33.70	34.53	Peak	252	226	VERTICAL
6	5506.15	102.84			99.10	4.57	33.70	34.53	Average	252	226	VERTICAL

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

Channel 110

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	5452.31	53.60	54.00	-0.40	49.97	4.54	33.62	34.53	Average	252	164	VERTICAL
2	5454.87	66.68	74.00	-7.32	63.05	4.54	33.62	34.53	Peak	252	164	VERTICAL
3	5467.44	67.82	68.20	-0.38	64.15	4.55	33.65	34.53	Peak	252	164	VERTICAL
4	5554.49	107.29			103.37	4.60	33.86	34.54	Average	252	164	VERTICAL
5	5556.41	119.29			115.37	4.60	33.86	34.54	Peak	252	164	VERTICAL
6	5725.64	64.08	68.20	-4.12	59.57	4.72	34.37	34.58	Peak	252	164	VERTICAL

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

Channel 134

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	cm	
1	5665.51	103.54			99.26	4.67	34.17	34.56	Average	253	164	VERTICAL
2	5676.41	115.82			111.48	4.68	34.22	34.56	Peak	253	164	VERTICAL
3	5726.60	69.03	74.00	-4.97	64.52	4.72	34.37	34.58	Peak	253	164	VERTICAL
4	5745.51	53.97	54.00	-0.03	49.40	4.73	34.42	34.58	Average	253	164	VERTICAL

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

Temperature	26°C	Humidity	68%
Test Engineer	Lucas Huang	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 58, 106, 122 / Ant. 1 + Ant. 2 + Ant. 3
Test Date	Oct. 19, 2014, Jul. 01, 2015		

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	5278.46	99.16			95.91	4.43	33.35	34.53	Average	245	194	VERTICAL
2	5304.74	109.84			106.55	4.44	33.38	34.53	Peak	245	194	VERTICAL
3	5350.00	53.63	54.00	-0.37	50.23	4.47	33.46	34.53	Average	245	194	VERTICAL
4	5350.64	68.17	74.00	-5.83	64.77	4.47	33.46	34.53	Peak	245	194	VERTICAL

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

Channel 106

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	T/Pos	A/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		deg	Cm	
1	5453.59	52.15	54.00	-1.85	48.52	4.54	33.62	34.53	Average	242	182	VERTICAL
2	5454.87	69.96	74.00	-4.04	66.33	4.54	33.62	34.53	Peak	242	182	VERTICAL
3	5464.87	71.65	74.00	-2.35	67.98	4.55	33.65	34.53	Peak	242	182	VERTICAL
4	5468.72	53.96	54.00	-0.04	50.29	4.55	33.65	34.53	Average	242	182	VERTICAL
5	5531.92	99.00			95.15	4.59	33.80	34.54	Average	242	182	VERTICAL
6	5535.13	110.59			106.74	4.59	33.80	34.54	Peak	242	182	VERTICAL

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

Channel 122

	Freq	Level	Limit Line	Over Limit	Read Level	Antenna Factor	Cable Loss	Preamp Factor	A/Pos	T/Pos	Pol/Phase	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	deg		
1	5455.66	63.71	74.00	-10.29	57.25	31.76	7.62	32.92	144	68	VERTICAL	Peak
2	5460.00	51.11	54.00	-2.89	44.65	31.76	7.62	32.92	144	68	VERTICAL	Average
3	5464.93	64.21	74.00	-9.79	57.72	31.78	7.63	32.92	144	68	VERTICAL	Peak
4	5470.00	51.26	54.00	-2.74	44.77	31.78	7.63	32.92	144	68	VERTICAL	Average
5	5573.10	113.45			106.82	31.88	7.70	32.95	144	68	VERTICAL	Peak
6	5617.24	100.69			93.99	31.94	7.73	32.97	144	68	VERTICAL	Average
7	5725.00	66.05	74.00	-7.95	59.18	32.08	7.79	33.00	144	68	VERTICAL	Peak
8	5725.00	53.46	54.00	-0.54	46.59	32.08	7.79	33.00	144	68	VERTICAL	Average

Item 5, 6 are the fundamental frequency at 5610 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. Frequency Stability Measurement

4.6.1. Limit

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

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

4.6.2. Measuring Instruments and Setting

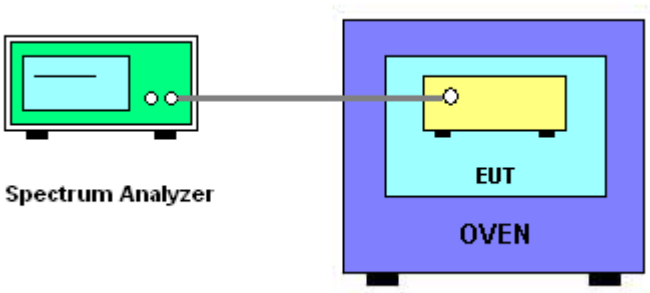
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.6.3. Test Procedures

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

4.6.4. Test Setup Layout



4.6.5. Test Deviation

There is no deviation with the original standard.

4.6.6. EUT Operation during Test

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

4.6.7. Test Result of Frequency Stability

Temperature	26°C	Humidity	63%
Test Engineer	Serway Li	Test Date	Oct. 22, 2014

Voltage vs. Frequency Stability

Voltage	Measurement Frequency (MHz)	
(V)	5260 MHz	5580 MHz
126.50	5259.9620	5579.9620
110.00	5259.9622	5579.9622
93.50	5259.9622	5579.9622
Max. Deviation (MHz)	0.038000	0.038000
Max. Deviation (ppm)	7.22	6.81

Temperature vs. Frequency Stability

Temperature	Measurement Frequency (MHz)	
(°C)	5260 MHz	5580 MHz
0	5259.9620	5579.9620
10	5259.9620	5579.9620
20	5259.9622	5579.9622
30	5259.9628	5579.9628
40	5259.9634	5579.9634
Max. Deviation (MHz)	0.038000	0.038000
Max. Deviation (ppm)	7.2243	6.81

4.7. Antenna Requirements

4.7.1. 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.

4.7.2. 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
Horn Antenna	EMCO	3115	00075790	750MHz~18GHz	Nov. 01, 2013	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Oct. 28, 2014	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Aug. 22, 2014	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Dec. 16, 2013	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 12, 2015	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	--	26GHz ~ 40GHz	Feb. 17, 2014	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26GHz ~ 40GHz	Nov. 25, 2014	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSP40	100019	9kHz~40GHz	Dec. 02, 2013	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Nov. 06, 2014	Radiation (03CH01-CB)
Turn Table	INN CO	CO 2000	N/A	0 ~ 360 degree	N.C.R.	Radiation (03CH01-CB)
Antenna Mast	INN CO	CO 2000	N/A	1 m - 4 m	N.C.R.	Radiation (03CH01-CB)
RF Cable-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)
RF Cable-high	Woken	High Cable-40G-1	N/A	1 GHz ~ 40 GHz	Nov. 15, 2014	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-2	N/A	1 GHz ~ 40 GHz	Nov. 15, 2014	Radiation (03CH01-CB)
Signal analyzer	R&S	FSV40	100979	9kHz~40GHz	Nov. 29, 2013	Conducted (TH01-CB)
Spectrum analyzer	R&S	FSP40	100979	9kHz~40GHz	Dec. 12, 2014	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 03, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-7	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-7	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-8	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-8	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-9	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-9	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-10	-	1 GHz – 26.5 GHz	Nov. 17, 2013	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
Power Sensor	Anritsu	MA2411B	1126203	300MHz~40GHz	Oct. 06, 2014	Conducted (TH01-CB)
Power Meter	Anritsu	ML2495A	1210004	300MHz~40GHz	Oct. 06, 2014	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 03, 2014	Conducted (TH01-CB)

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

N.C.R means Non-Calibration required.

6. MEASUREMENT UNCERTAINTY

Test Items	Uncertainty	Remark
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.7 dB	Confidence levels of 95%