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FCC RADIO TEST REPORT

Applicant's company	**Ubiquiti Networks, Inc.**
Applicant Address	2580 Orchard Parkway San Jose, CA 95131
FCC ID	**SWX-UAPACHD**
Manufacturer's company	**Ubiquiti Networks, Inc.**
Manufacturer Address	2580 Orchard Parkway San Jose, CA 95131

Product Name	UniFi Access Point
Brand Name	UBIQUITI
Model No.	UAP-AC-SHD, UAP-AC-HD
Test Rule Part(s)	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz
Received Date	Jun. 17, 2016
Final Test Date	Nov. 04, 2016
Submission Type	Original Equipment

Statement

Test result included is only for the IEEE 802.11b/g, IEEE 802.11n and IEEE 802.11ac 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 C**, **KDB558074 D01 v03r05**, **KDB 662911 D01 v02r01**, **KDB644545 D01 v01r02.**

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

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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR661623-02AA	Rev. 01	Initial issue of report	Nov. 09, 2016
FR661623-02AA	Rev. 02	Adding a Model Name: UAP-AC-SHD	Nov. 14, 2016

1. VERIFICATION OF COMPLIANCE

Product Name	:	UniFi Access Point
Brand Name	:	UBIQUITI
Model No.	:	UAP-AC-SHD, UAP-AC-HD
Applicant	:	Ubiquiti Networks, Inc.
Test Rule Part(s)	:	47 CFR FCC Part 15 Subpart C § 15.247

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Jun. 17, 2016 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 C			
Part	**Rule Section**	**Description of Test**	**Result**
4.1	15.207	AC Power Line Conducted Emissions	Complies
4.2	15.247(b)(3)	Maximum Conducted Output Power	Complies
4.3	15.247(e)	Power Spectral Density	Complies
4.4	15.247(a)(2)	6dB Spectrum Bandwidth	Complies
4.5	15.247(d)	Radiated Emissions	Complies
4.6	15.247(d)	Band Edge Emissions	Complies
4.7	15.203	Antenna Requirements	Complies

3. GENERAL INFORMATION

3.1. Product Details

Items	Description
Product Type	WLAN (4TX, 4RX)
Radio Type	Intentional Transceiver
Power Type	From PoE
Modulation	IEEE 802.11b: DSSS IEEE 802.11g: OFDM IEEE 802.11n/ac: see the below table
Data Modulation	IEEE 802.11b: DSSS (BPSK / QPSK / CCK) IEEE 802.11g/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) IEEE 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)
Data Rate (Mbps)	IEEE 802.11b: DSSS (1/ 2/ 5.5/11) IEEE 802.11g: OFDM (6/9/12/18/24/36/48/54) IEEE 802.11n/ac: see the below table
Frequency Range	2400 ~ 2483.5MHz
Channel Number	11 for 20MHz bandwidth ; 7 for 40MHz bandwidth
Channel Bandwidth (99%)	**For Non-Beamforming Mode** IEEE 802.11b: 11.20 MHz IEEE 802.11g: 16.67 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 17.89 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 35.89 MHz **For Beamforming Mode** IEEE 802.11ac MCS0/Nss1 (VHT20): 17.97 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.05 MHz
Maximum Conducted Output Power	**For Non-Beamforming Mode** IEEE 802.11b: 18.67 dBm IEEE 802.11g: 23.77 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 24.29 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 22.84 dBm **For Beamforming Mode** IEEE 802.11ac MCS0/Nss1 (VHT20): 23.12 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 23.18 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Items	Description	
Beamforming Function	☒ With beamforming	☐ Without beamforming

Note: The EUT has beamforming function for 802.11n/ac.

Antenna and Bandwidth

Antenna	Four (TX)	
Bandwidth Mode	20 MHz	40 MHz
IEEE 802.11b	V	X
IEEE 802.11g	V	X
IEEE 802.11n	V	V
IEEE 802.11ac	V	V

IEEE 802.11n/ac Spec.

Protocol	Number of Transmit Chains (NTX)	Data Rate / MCS
802.11n (HT20)	4	MCS0-31
802.11n (HT40)	4	MCS0-31
802.11ac (VHT20)	4	MCS 0-9/Nss1-4
802.11ac (VHT40)	4	MCS 0-9/Nss1-4

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

Note 2: IEEE Std. 802.11ac modulation consists of VHT20, VHT40, VHT80 and VHT160 (VHT: Very High Throughput). Then EUT supports VHT20, VHT40.

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

3.2. Accessories

Support Unit	Brand	Model	Rating
PoE	UBIQUITI	GP-H480-050G	Input: 100-240V~50/60Hz, MAX 0.75A(0.75A) Output: 48V, 0.5A(0.5A)
Others			
Power cable*1, Non-shielded, 0.6m			

3.3. Table for Filed Antenna

For 2.4GHz WLAN function

Ant.	Brand	Model Name	Antenna Type	Connector	TX/RX Gain (dBi)
1	-	-	PIFA Antenna	N/A	3
2	-	-	PIFA Antenna	N/A	3

For 5GHz WLAN function

Ant.	Brand	Model Name	Antenna Type	Connector	TX/RX Gain (dBi)
3	-	-	PIFA Antenna	N/A	4
4	-	-	PIFA Antenna	N/A	4

For Bluetooth function

Ant.	Brand	Model Name	Antenna Type	Connector	TX/RX Gain (dBi)
5	-	-	PIFA Antenna	N/A	1

For RX function

Ant.	Brand	Model Name	Antenna Type	Connector	RX Gain (dBi)	
					2.4GHz	5GHz
6	-	-	PIFA Antenna	N/A	1	2

Note: The EUT has six antennas.

For 2.4GHz WLAN function

IEEE 802.11b/g/n/ac mode (4TX/4RX):

Chain 1 and Chain 2 connect to Ant. 1.

Chain 3 and Chain 4 connect to Ant. 2.

Chain 1, Chain 2, Chain 3 and Chain 4 can be used as transmitting/receiving antenna.

Chain 1, Chain 2, Chain 3 and Chain 4 could transmit/receive simultaneously.

For 5GHz WLAN function

IEEE 802.11a/n/ac mode (4TX/4RX): The module has four chains.

Chain 1 and Chain 2 connect to Ant. 3.

Chain 3 and Chain 4 connect to Ant. 4.

Chain 1, Chain 2, Chain 3 and Chain 4 can be used as transmitting/receiving antenna.

Chain 1, Chain 2, Chain 3 and Chain 4 could transmit/receive simultaneously.

For Bluetooth function: The module has one chain only.

Chain 1 connects to Ant. 5.

Chain 1 can be used as transmitting/receiving antenna.

Chain 1 could transmit/receive simultaneously.

For RX function: The module has one chain only.

Chain 1 connects to Ant. 6.

Only Chain 1 can be used as receiving antenna.

3.4. Table for Carrier Frequencies

There are two bandwidth systems.

For 20MHz bandwidth systems, use Channel 1~Channel 11.

For 40MHz bandwidth systems, use Channel 3~Channel 9.

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
2400~2483.5MHz	1	2412 MHz	7	2442 MHz
	2	2417 MHz	8	2447 MHz
	3	2422 MHz	9	2452 MHz
	4	2427 MHz	10	2457 MHz
	5	2432 MHz	11	2462 MHz
	6	2437 MHz	-	-

3.5. Table for Test Modes

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

Test Items	Mode	Data Rate	Channel	Chain
AC Power Line Conducted Emissions	CTX	-	-	-
Maximum Conducted Output Power	**For Non-Beamforming Mode**			
	11b/CCK	1 Mbps	1/6/11	1+2+3+4
	11g/BPSK	6 Mbps	1/6/11	1+2+3+4
	11ac VHT20	MCS0/Nss1	1/6/11	1+2+3+4
	11ac VHT40	MCS0/Nss1	3/6/9	1+2+3+4
	For Beamforming Mode			
	11ac VHT20	MCS0/Nss1	1/6/11	1+2+3+4
	11ac VHT40	MCS0/Nss1	3/6/9	1+2+3+4
Power Spectral Density	**For Non-Beamforming Mode**			
	11b/CCK	1 Mbps	1/6/11	1+2+3+4
	11g/BPSK	6 Mbps	1/6/11	1+2+3+4
	11ac VHT20	MCS0/Nss1	1/6/11	1+2+3+4
	11ac VHT40	MCS0/Nss1	3/6/9	1+2+3+4
	For Beamforming Mode			
	11ac VHT20	MCS0/Nss1	1/6/11	1+2+3+4
	11ac VHT40	MCS0/Nss1	3/6/9	1+2+3+4
6dB Spectrum Bandwidth	**For Non-Beamforming Mode**			
	11b/CCK	1 Mbps	1/6/11	1+2+3+4
	11g/BPSK	6 Mbps	1/6/11	1+2+3+4
	11ac VHT20	MCS0/Nss1	1/6/11	1+2+3+4
	11ac VHT40	MCS0/Nss1	3/6/9	1+2+3+4
	For Beamforming Mode			
	11ac VHT20	MCS0/Nss1	1/6/11	1+2+3+4
	11ac VHT40	MCS0/Nss1	3/6/9	1+2+3+4

Radiated Emissions Below 1GHz	CTX	-	-	-
Radiated Emissions Above 1GHz	**For Non-Beamforming Mode**			
	11b/CCK	1 Mbps	1/6/11	1+2+3+4
	11g/BPSK	6 Mbps	1/6/11	1+2+3+4
	11ac VHT20	MCS0/Nss1	1/6/11	1+2+3+4
	11ac VHT40	MCS0/Nss1	3/6/9	1+2+3+4
	For Beamforming Mode			
	11ac VHT20	MCS0/Nss1	1/6/11	1+2+3+4
	11ac VHT40	MCS0/Nss1	3/6/9	1+2+3+4
Band Edge Emissions	**For Non-Beamforming Mode**			
	11b/CCK	1 Mbps	1/6/11	1+2+3+4
	11g/BPSK	6 Mbps	1/6/11	1+2+3+4
	11ac VHT20	MCS0/Nss1	1/6/11	1+2+3+4
	11ac VHT40	MCS0/Nss1	3/6/9	1+2+3+4
	For Beamforming Mode			
	11ac VHT20	MCS0/Nss1	1/6/11	1+2+3+4
	11ac VHT40	MCS0/Nss1	3/6/9	1+2+3+4

Note 1: VHT20/VHT40 covers HT20/HT40, due to same modulation. The power setting for 802.11n HT20 and HT40 are the same or lower than 802.11ac VHT20 and VHT40.

Note 2: 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.

Note 3: The EUT supports P to M and P to P operating mode. After evaluating, the P to M is the worst operating mode. And it was tested and recorded in the report.

The following test modes were performed for all tests:

For Conducted Emission test:

Mode 1. CTX - 2.4GHz

Mode 2. CTX - 5GHz

Mode 3. CTX - Bluetooth

Mode 1 generated the worst test result, so it was recorded in this report.

For Radiated Emission test (Below 1GHz):

Mode 1. CTX - 5GHz at Z-axis

Mode 2. CTX - 5GHz at Y-axis

Mode 2 has been evaluated to be the worst case among Mode 1～2, thus measurement for Mode 3 ～ 4 will follow this same test mode.

Mode 3. CTX - 2.4GHz at Y-axis

Mode 4. CTX - Bluetooth at Y-axis

Mode 2 generated the worst test result, so it was recorded in this report.

For Radiated Emission test (Above 1GHz):

The EUT can be placed in Y-axis and Z-axis. After evaluating, The worst case was found at Y-axis, so it's recorded in this report.

Mode 1. CTX at Y-axis

For Co-location MPE Test:

The EUT could be applied with 2.4GHz WLAN function, 5GHz WLAN function and Bluetooth function; therefore Co-location Maximum Permissible Exposure (Please refer to FA661623-02) tests are added for simultaneously transmit between 2.4GHz WLAN function, 5GHz WLAN function and Bluetooth function.

3.6. Table for Testing Locations

Test Site Location				
Address:	No.8, Lane 724, Bo-ai St., Jhubei City, Hsinchu County 302, Taiwan, R.O.C.			
TEL:	886-3-656-9065			
FAX:	886-3-656-9085			
Test Site No.	**Site Category**	**Location**	**FCC Designation No.**	**IC File No.**
03CH01-CB	SAC	Hsin Chu	TW0006	IC 4086D
CO02CB	Conduction	Hsin Chu	TW0006	IC 4086D
TH01-CB	OVEN Room	Hsin Chu	-	-

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

3.7. Table for Multiple Listing

The model names as below

Brand Name	Model Name	2.4GHz/5GHz WLAN function	2.4GHz/5GHz RX function	Bluetooth function
UBIQUITI	UAP-AC-SHD	O	O	O
	UAP-AC-HD	O	X	X

Note: The Model UAP-AC-SHD was selected to test and recorded in the report.

3.8. Table for Supporting Units

For Test Site No: CO02-CB

Support Unit	Brand	Model	FCC ID
NB	DELL	E6430	DoC

For Test Site No: 03CH01-CB

For Non-Beamforming Mode

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	DoC

For Beamforming Mode

Support Unit	Brand	Model	FCC ID
NB*2	DELL	E4300	DoC
RX Device	UBIQUITI	UAP-AC-HD	SWX-UAPACHD

For Test Site No: TH01-CB

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	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

Test Software Version	QCA v3.0.197.0					
Mode	Test Frequency (MHz)					
	NCB: 20MHz			NCB: 40MHz		
	2412 MHz	2437 MHz	2462 MHz	2422 MHz	2437 MHz	2452 MHz
802.11b	11.5	11.5	11.5	-	-	-
802.11g	16	16	16.5	-	-	-
802.11ac MCS0/Nss1 VHT20	16	17	16	-	-	-
802.11ac MCS0/Nss1 VHT40	-	-	-	14.5	15.5	15.1

For Beamforming Mode

Test Software Version	QCA v3.0.197.0					
Mode	Test Frequency (MHz)					
	NCB: 20MHz			NCB: 40MHz		
	2412 MHz	2437 MHz	2462 MHz	2422 MHz	2437 MHz	2452 MHz
802.11ac MCS0/Nss1 VHT20	20.5	22.5	21.5	-	-	-
802.11ac MCS0/Nss1 VHT40	-	-	-	19	22	19.5

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 7 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 Telnet.
3. Executed "Lantest.exe " to link with the remote workstation to receive and transmit packet by RX Device and transmit duty cycle no less 98%

3.11. Duty Cycle

For Non-Beamforming Mode

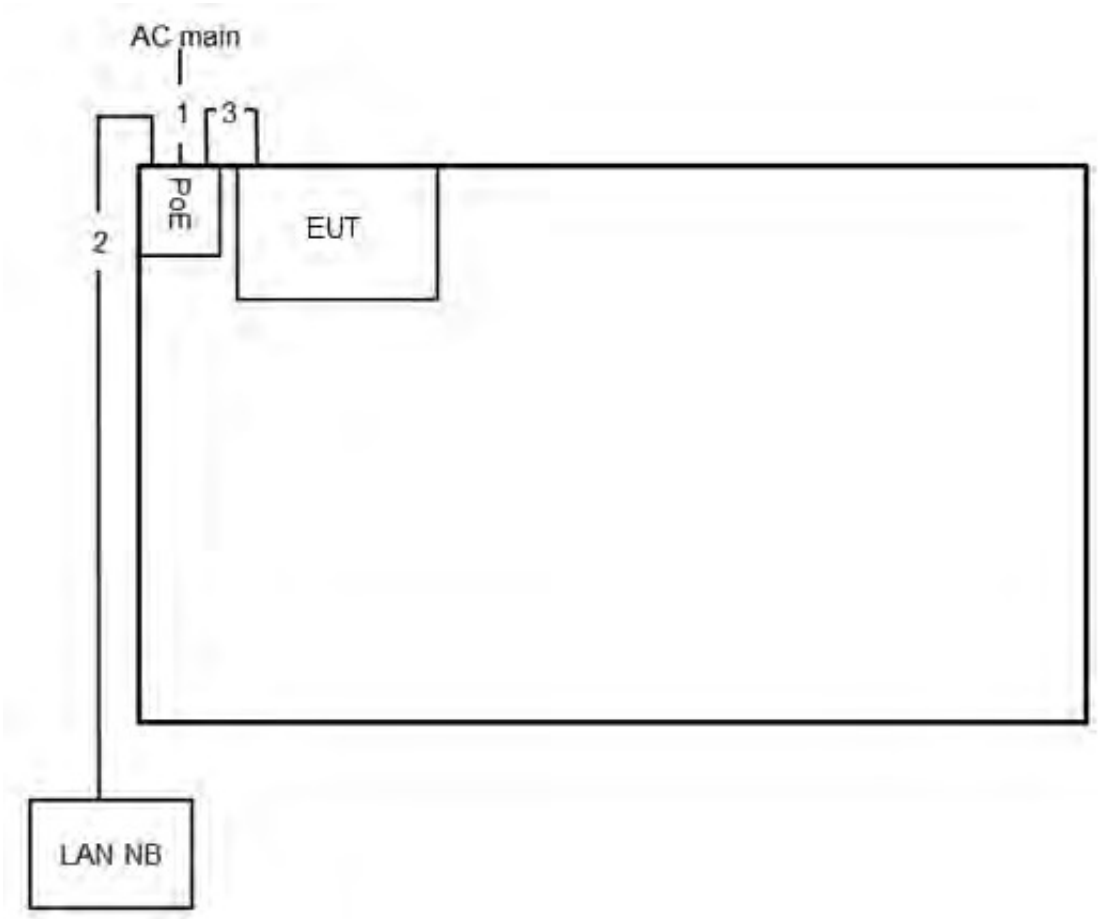
Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11b	1.000	1.000	100.00%	0.00	0.01
802.11g	2.038	2.146	94.97%	0.22	0.49
802.11ac MCS0/Nss1 VHT20	4.996	5.084	98.27%	0.08	0.01
802.11ac MCS0/Nss1 VHT40	2.380	2.490	95.58%	0.20	0.42

For Beamforming Mode

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11ac MCS0/Nss1 VHT20	1.750	1.920	91.15%	0.40	0.57
802.11ac MCS0/Nss1 VHT40	1.649	1.840	89.62%	0.48	0.61

3.12. Test Configurations

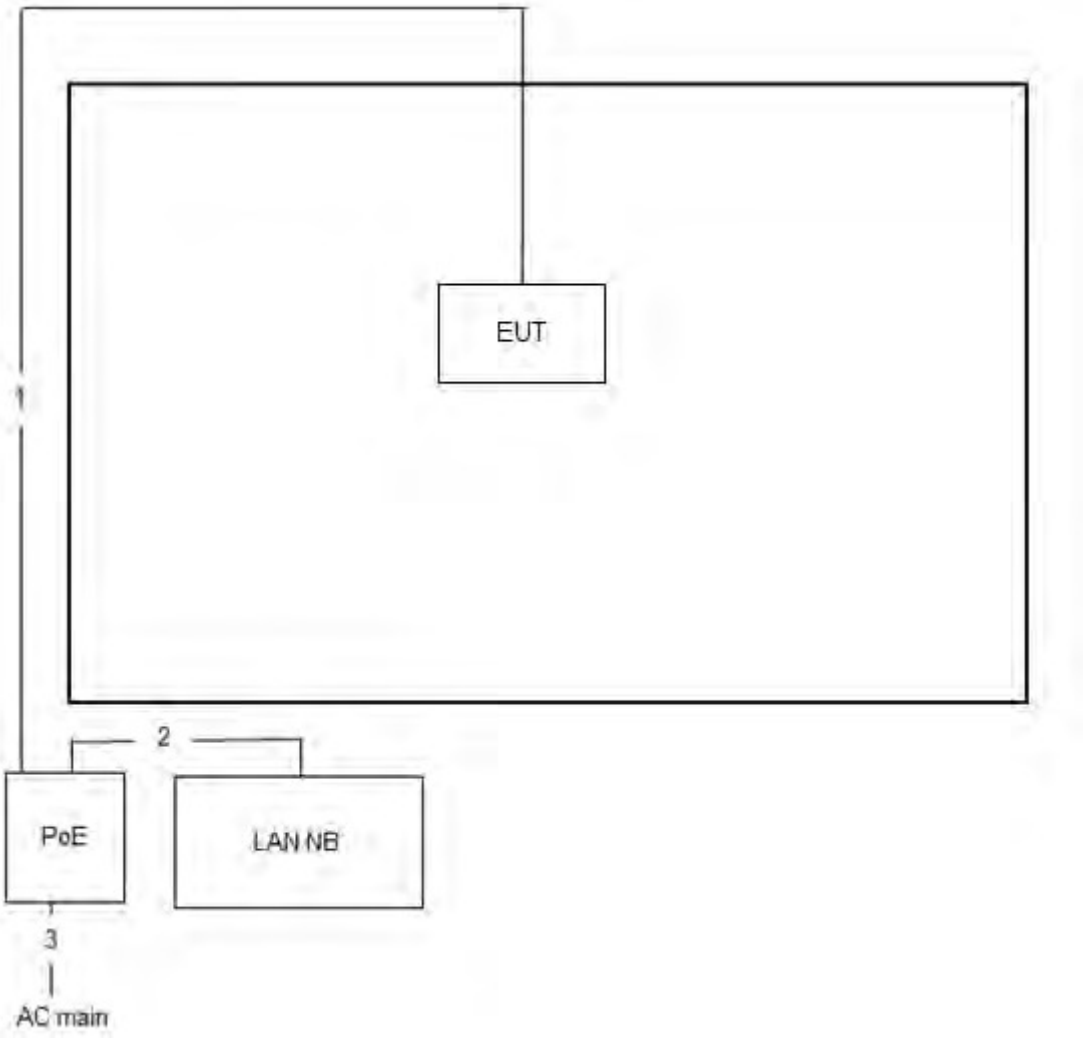
3.12.1. AC Power Line Conduction Emissions Test Configuration



Item	Connection	Shielded	Length
1	Power cable	No	0.6m
2	RJ-45 cable	No	10m
3	RJ-45 cable	No	1m

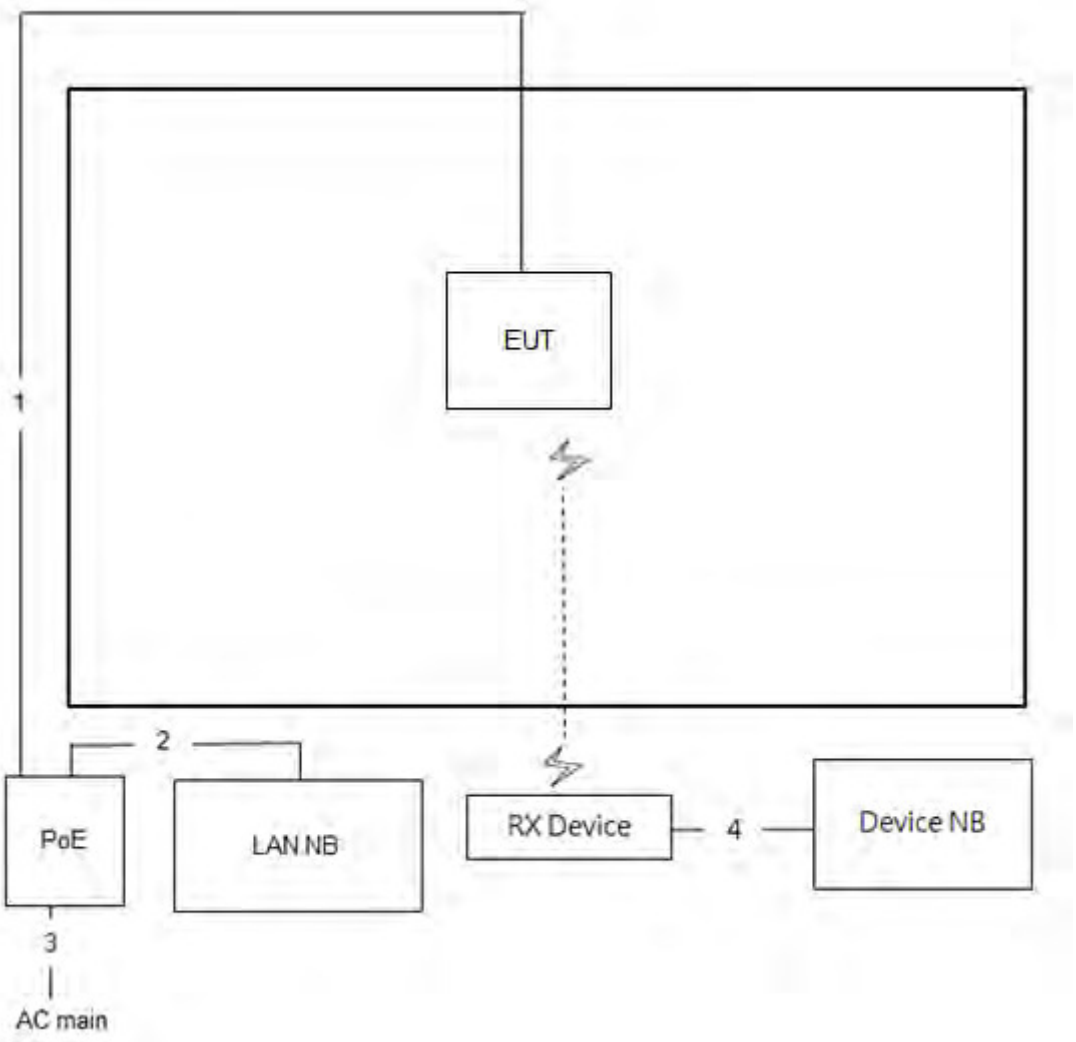
3.12.2. Radiation Emissions Test Configuration

For Non-Beamforming Mode



Item	Connection	Shielded	Length
1	RJ-45 cable	No	10m
2	RJ-45 cable	No	1.5m
3	Power cable	No	0.6m

For Beamforming Mode



Item	Connection	Shielded	Length
1	RJ-45 cable	No	10m
2	RJ-45 cable	No	1.5m
3	Power cable	No	0.6m
4	RJ-45 cable	No	1.5m

4. TEST RESULT

4.1. AC Power Line Conducted Emissions Measurement

4.1.1. Limit

For this product which is designed to be connected to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

Frequency (MHz)	QP Limit (dBuV)	AV Limit (dBuV)
0.15~0.5	66~56	56~46
0.5~5	56	46
5~30	60	50

4.1.2. Measuring Instruments and Setting

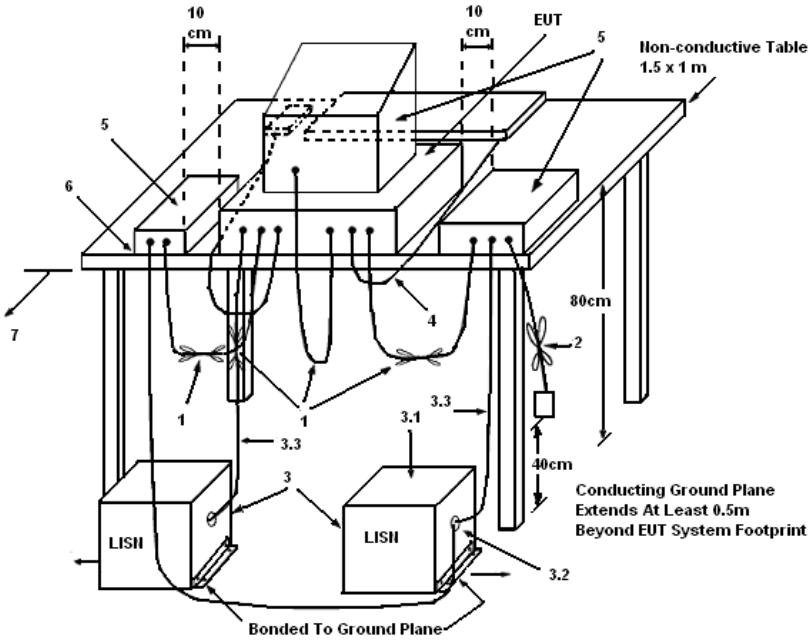
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

4.1.3. Test Procedures

1. Configure the EUT according to ANSI C63.10. The EUT or host of EUT has to be placed 0.4 meter far from the conducting wall of the shielding room and at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT or host of EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connected to the other LISNs. The LISN should provide 50uH/50ohms coupling impedance.
4. The frequency range from 150 kHz to 30 MHz was searched.
5. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
6. The measurement has to be done between each power line and ground at the power terminal.

4.1.4. Test Setup Layout



LEGEND:

(1) Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.

(2) I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

(3) EUT connected to one LISN. Unused LISN measuring port connectors shall be terminated in 50 Ω. LISN can be placed on top of, or immediately beneath, reference ground plane.

(3.1) All other equipment powered from additional LISN(s).

(3.2) Multiple outlet strip can be used for multiple power cords of non-EUT equipment.

(3.3) LISN at least 80 cm from nearest part of EUT chassis.

(4) Cables of hand-operated devices, such as keyboards, mice, etc., shall be placed as for normal use.

(5) Non-EUT components of EUT system being tested.

(6) Rear of EUT, including peripherals, shall all be aligned and flush with rear of tabletop.

(7) Rear of tabletop shall be 40 cm removed from a vertical conducting plane that is bonded to the ground plane.

4.1.5. Test Deviation

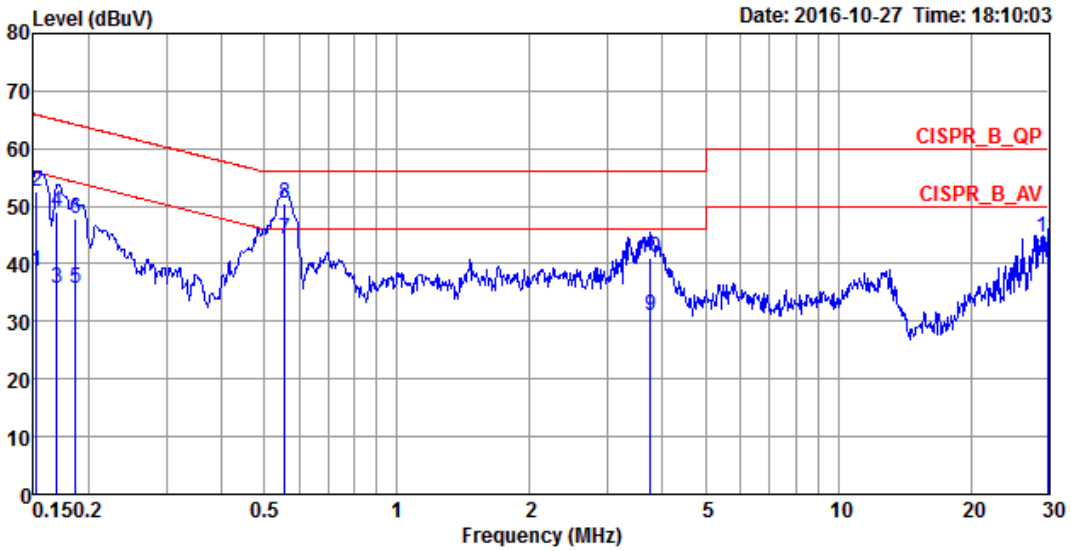
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

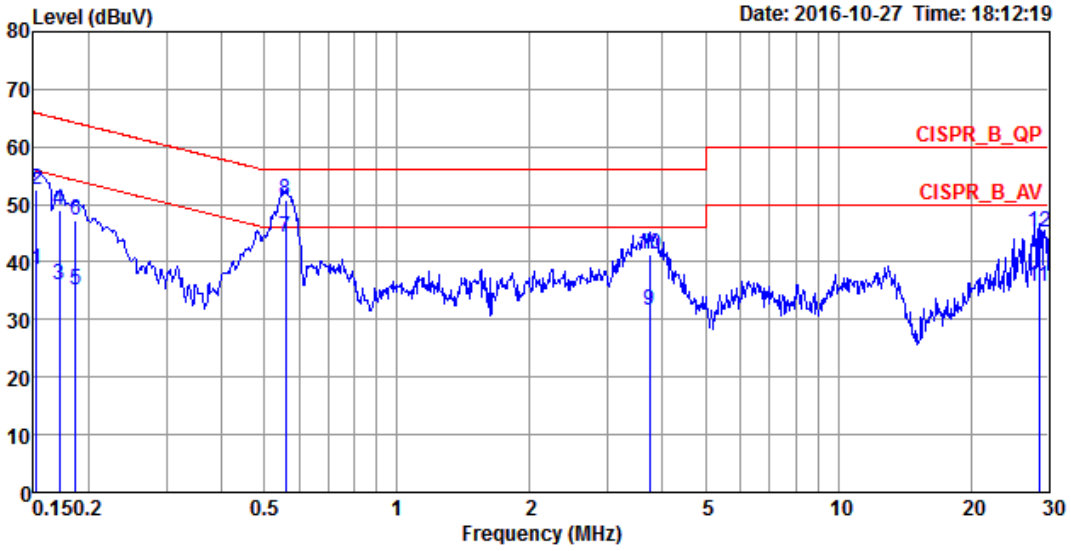
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	22°C	Humidity	52%
Test Engineer	Ryo Fan/Edison Lin	Phase	Line
Configuration	CTX	Test Mode	Mode 1



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1524	38.78	-17.09	55.87	28.66	9.96	0.16	Average	LINE
2	0.1524	52.53	-13.34	65.87	42.41	9.96	0.16	QP	LINE
3	0.1694	35.72	-19.27	54.99	25.60	9.96	0.16	Average	LINE
4	0.1694	48.87	-16.12	64.99	38.75	9.96	0.16	QP	LINE
5	0.1864	35.63	-18.57	54.20	25.50	9.95	0.18	Average	LINE
6	0.1864	47.71	-16.49	64.20	37.58	9.95	0.18	QP	LINE
7	0.5552	44.20	-1.80	46.00	33.98	10.02	0.20	Average	LINE
8	0.5552	50.62	-5.38	56.00	40.40	10.02	0.20	QP	LINE
9	3.7594	30.93	-15.07	46.00	20.50	10.11	0.32	Average	LINE
10	3.7594	41.05	-14.95	56.00	30.62	10.11	0.32	QP	LINE
11	29.8956	40.92	-9.08	50.00	29.97	10.35	0.60	Average	LINE
12	29.8956	44.47	-15.53	60.00	33.52	10.35	0.60	QP	LINE

Temperature	22°C	Humidity	52%
Test Engineer	Ryo Fan/Edison Lin	Phase	Neutral
Configuration	CTX	Test Mode	Mode 1



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1524	38.56	-17.31	55.87	28.44	9.96	0.16	Average	NEUTRAL
2	0.1524	52.64	-13.23	65.87	42.52	9.96	0.16	QP	NEUTRAL
3	0.1712	36.10	-18.80	54.90	25.98	9.96	0.16	Average	NEUTRAL
4	0.1712	49.01	-15.89	64.90	38.89	9.96	0.16	QP	NEUTRAL
5	0.1864	35.27	-18.93	54.20	25.13	9.96	0.18	Average	NEUTRAL
6	0.1864	47.19	-17.01	64.20	37.05	9.96	0.18	QP	NEUTRAL
7	0.5581	44.23	-1.77	46.00	34.06	9.97	0.20	Average	NEUTRAL
8	0.5581	50.78	-5.22	56.00	40.61	9.97	0.20	QP	NEUTRAL
9	3.7395	31.64	-14.36	46.00	21.30	10.02	0.32	Average	NEUTRAL
10	3.7395	41.40	-14.60	56.00	31.06	10.02	0.32	QP	NEUTRAL
11	28.5122	35.76	-14.24	50.00	24.85	10.34	0.57	Average	NEUTRAL
12	28.5122	45.14	-14.86	60.00	34.23	10.34	0.57	QP	NEUTRAL

Note:

Level = Read Level + LISN Factor + Cable Loss

4.2. Maximum Conducted Output Power Measurement

4.2.1. Limit

The limit for output power is 30dBm.

4.2.2. Measuring Instruments and Setting

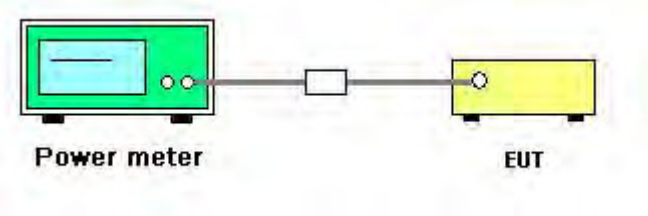
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Detector	Average

4.2.3. Test Procedures

1. Test procedures refer KDB558074 D01 v03r05 section 9.2.3.2 Measurement using a power meter (PM).
2. Multiple antenna system was performed in accordance with KDB 662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
3. This procedure provides an alternative for determining the RMS output power using a broadband RF average power meter with a thermocouple detector.

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

Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang	Test Date	Jul. 30, 2016~Aug. 14, 2016

For Non-Beamforming Mode

Mode	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
802.11b	2412 MHz	12.47	12.18	12.57	12.96	18.57	30.00	Complies
	2437 MHz	12.63	12.21	12.64	13.08	18.67	30.00	Complies
	2462 MHz	12.55	12.35	12.22	12.67	18.47	30.00	Complies
802.11g	2412 MHz	17.55	17.54	17.51	17.65	23.58	30.00	Complies
	2437 MHz	17.57	17.69	17.77	17.94	23.77	30.00	Complies
	2462 MHz	16.85	16.81	16.84	17.26	22.96	30.00	Complies
802.11ac MCS0/Nss1 VHT20	2412 MHz	17.21	17.25	17.35	17.37	23.32	30.00	Complies
	2437 MHz	18.24	18.13	18.17	18.51	24.29	30.00	Complies
	2462 MHz	17.19	17.04	17.13	17.61	23.27	30.00	Complies
802.11ac MCS0/Nss1 VHT40	2422 MHz	15.62	15.81	15.73	16.02	21.82	30.00	Complies
	2437 MHz	16.82	16.68	16.65	17.11	22.84	30.00	Complies
	2452 MHz	15.18	15.18	15.28	15.61	21.34	30.00	Complies

For Beamforming Mode

Mode	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
802.11ac MCS0/Nss1 VHT20	2412 MHz	14.75	14.97	14.90	15.16	20.97	26.98	Complies
	2437 MHz	16.74	16.68	17.27	17.62	23.12	26.98	Complies
	2462 MHz	15.42	14.84	15.10	16.42	21.51	26.98	Complies
802.11ac MCS0/Nss1 VHT40	2422 MHz	13.61	13.31	14.02	14.89	20.02	26.98	Complies
	2437 MHz	16.92	17.01	16.85	17.78	23.18	26.98	Complies
	2452 MHz	13.03	13.39	13.93	13.67	19.54	26.98	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.02dBi>6dBi, so Limit=30-(9.02-6)=26.98dBm.

4.3. Power Spectral Density Measurement

4.3.1. Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

4.3.2. Measuring Instruments and Setting

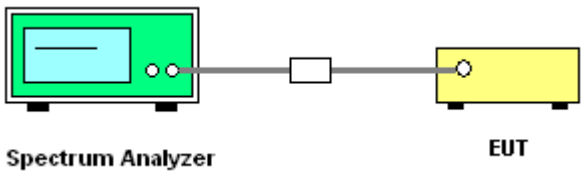
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Set the span to 1.5 times the DTS channel bandwidth.
RBW	3 kHz ≤ RBW ≤ 100kHz
VBW	≥ 3 x RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto couple

4.3.3. Test Procedures

1. Test was performed in accordance with KDB558074 D01 v03r05 for Performing Compliance Measurements on Digital Transmission Systems (DTS) - section 10.2 Method PKPSD (peak PSD) and KDB 662911 D01 v02r01 section In-Band Power Spectral Density (PSD) Measurements option (b) Measure and sum spectral maximal across the outputs.
2. Use this procedure when the maximum conducted output power in the fundamental emission is used to demonstrate compliance. The EUT must be configured to transmit continuously at full power over the measurement duration.
3. Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW (use of a greater number of measurement points than this minimum requirement is recommended).
4. Use the peak marker function to determine the maximum level in any 3 kHz band segment within the fundamental EBW.
5. The resulting PSD level must be ≤ 8 dBm.

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

Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang		

For Non-Beamforming Mode

Mode	Frequency	Power Density (dBm/3kHz)					Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
802.11b	2412 MHz	-22.35	-22.41	-22.29	-22.37	-16.33	4.98	Complies
	2437 MHz	-22.08	-22.06	-22.07	-22.06	-16.05	4.98	Complies
	2462 MHz	-16.86	-16.82	-16.80	-16.90	-10.82	4.98	Complies
802.11g	2412 MHz	-12.31	-13.31	-13.38	-13.74	-7.13	4.98	Complies
	2437 MHz	-13.16	-14.60	-13.97	-13.54	-7.76	4.98	Complies
	2462 MHz	-14.01	-14.47	-14.05	-14.26	-8.17	4.98	Complies
802.11ac MCS0/Nss1 VHT20	2412 MHz	-14.14	-14.59	-13.80	-14.86	-8.31	4.98	Complies
	2437 MHz	-13.60	-12.60	-13.57	-13.43	-7.26	4.98	Complies
	2462 MHz	-13.96	-13.46	-13.61	-12.59	-7.35	4.98	Complies
802.11ac MCS0/Nss1 VHT40	2422 MHz	-17.48	-18.12	-17.23	-18.40	-11.76	4.98	Complies
	2437 MHz	-16.32	-14.70	-15.59	-15.02	-9.34	4.98	Complies
	2452 MHz	-18.14	-16.86	-16.50	-17.92	-11.28	4.98	Complies

Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.02dBi>6dBi, so Limit=8-(9.02-6)=4.98dBm/3kHz.

For Beamforming Mode

Mode	Frequency	Power Density (dBm/3kHz)					Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
802.11ac MCS0/Nss1 VHT20	2412 MHz	-10.55	-10.78	-10.59	-10.06	-4.47	4.98	Complies
	2437 MHz	-8.96	-8.07	-8.37	-12.97	-3.20	4.98	Complies
	2462 MHz	-10.27	-10.02	-10.29	-9.61	-4.02	4.98	Complies
802.11ac MCS0/Nss1 VHT40	2422 MHz	-14.41	-13.74	-14.33	-14.77	-8.28	4.98	Complies
	2437 MHz	-10.42	-11.26	-10.24	-11.60	-4.82	4.98	Complies
	2452 MHz	-13.87	-13.71	-12.84	-15.22	-7.81	4.98	Complies

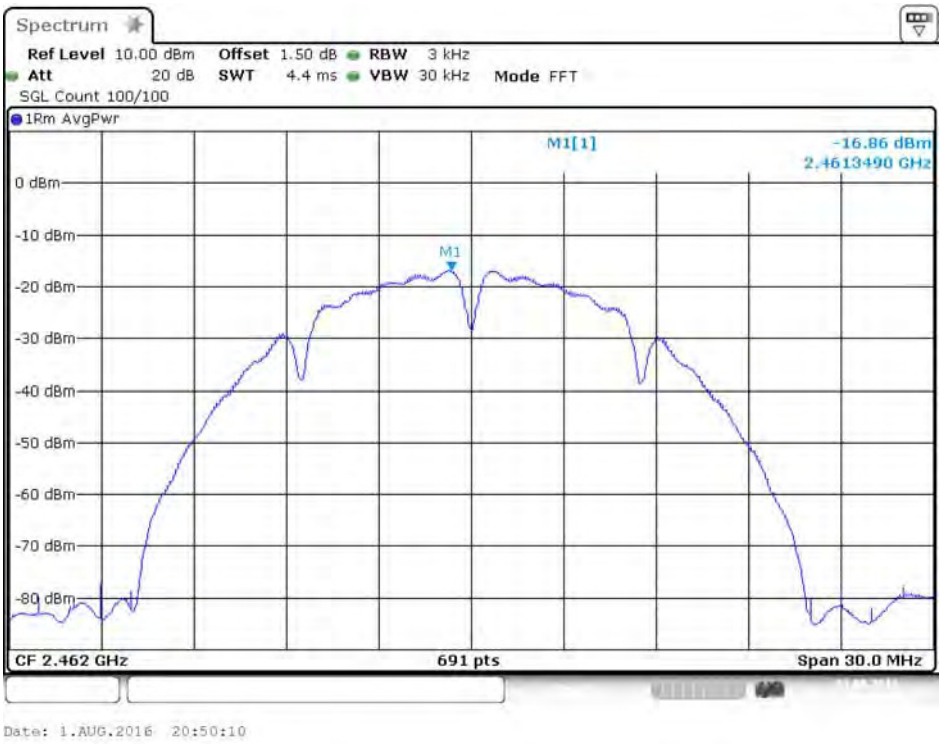
Note: $Directional\,Gain = 10\log\left[\frac{\sum_{j=1}^{Nss}\left\{\sum_{K=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.02dBi>6dBi, so Limit=8-(9.02-6)=4.98dBm/3kHz.

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

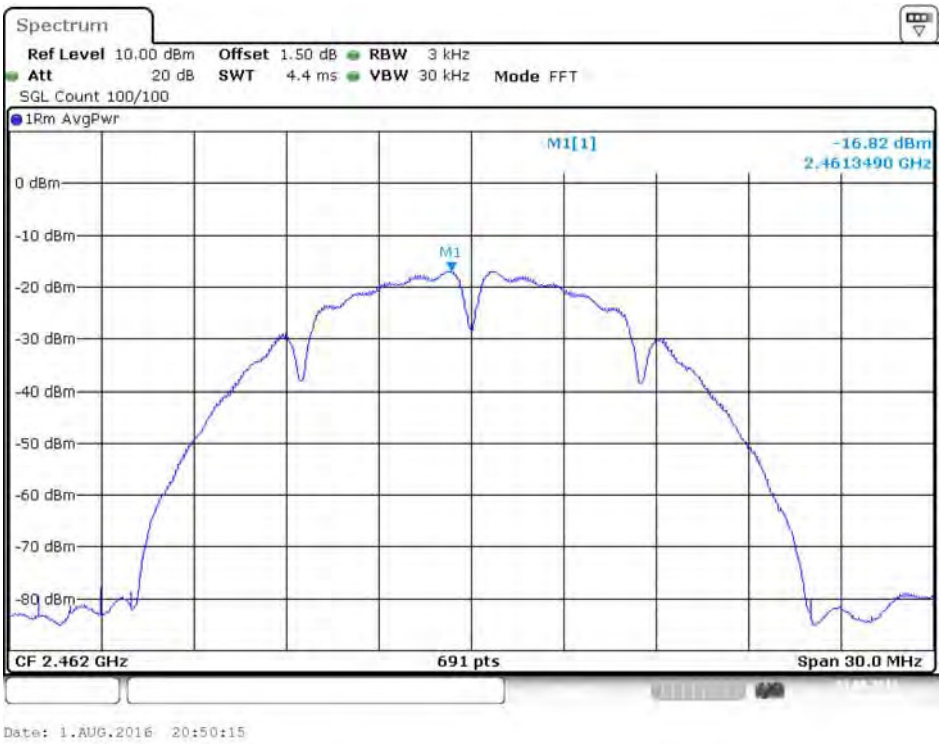
For plots, only the channel with worse result was shown.

For Non-Beamforming Mode

Power Density Plot on Configuration IEEE 802.11b / 2462 MHz / Chain 1

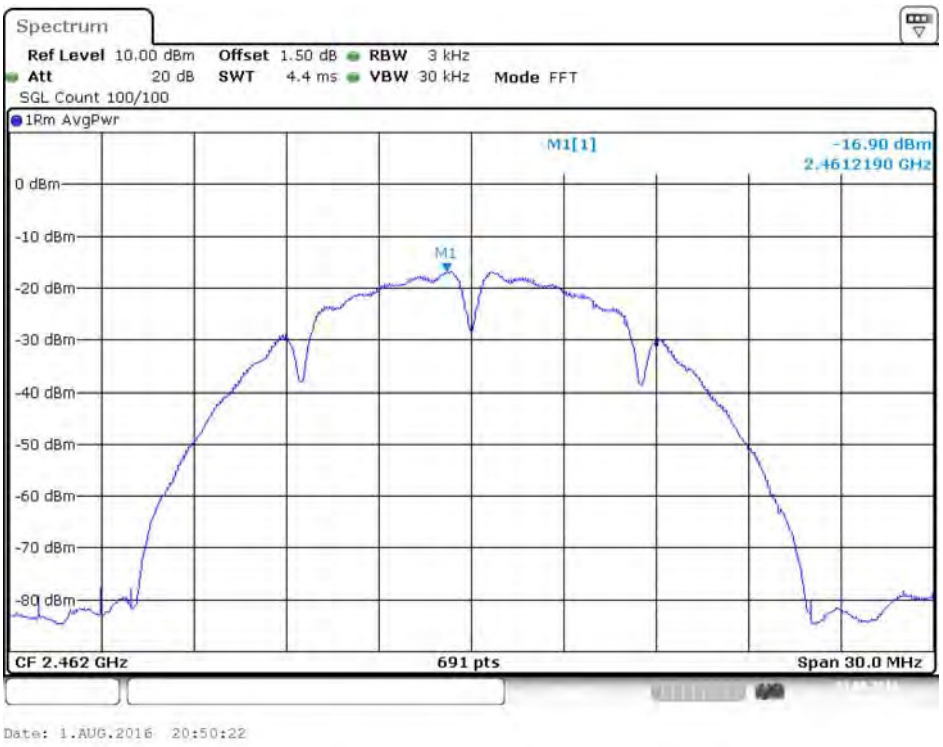


Power Density Plot on Configuration IEEE 802.11b / 2462 MHz / Chain 2

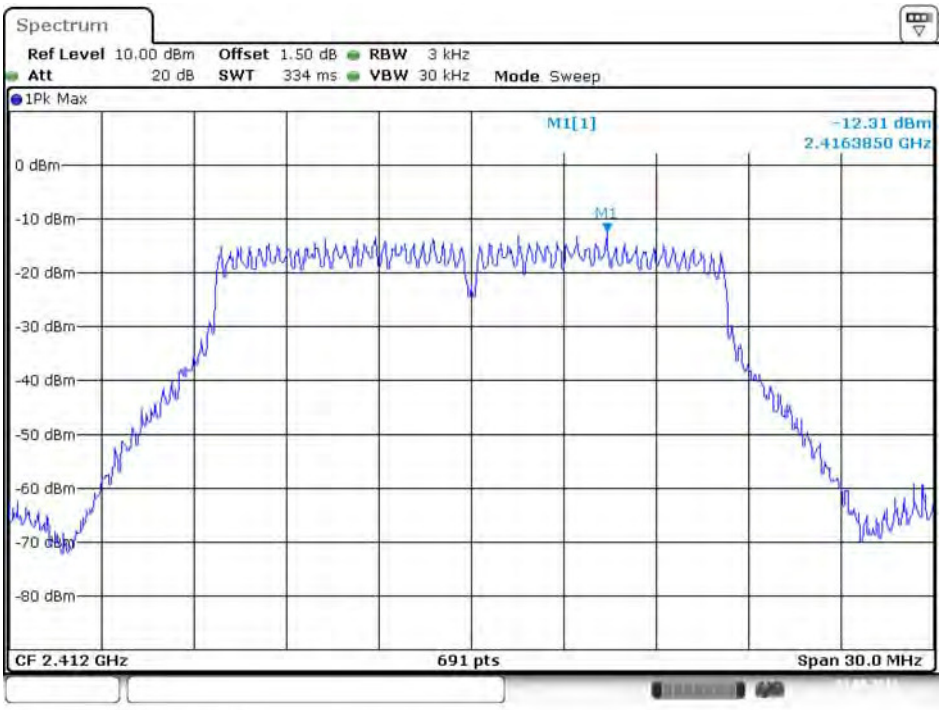


Power Density Plot on Configuration IEEE 802.11b / 2462 MHz / Chain 3

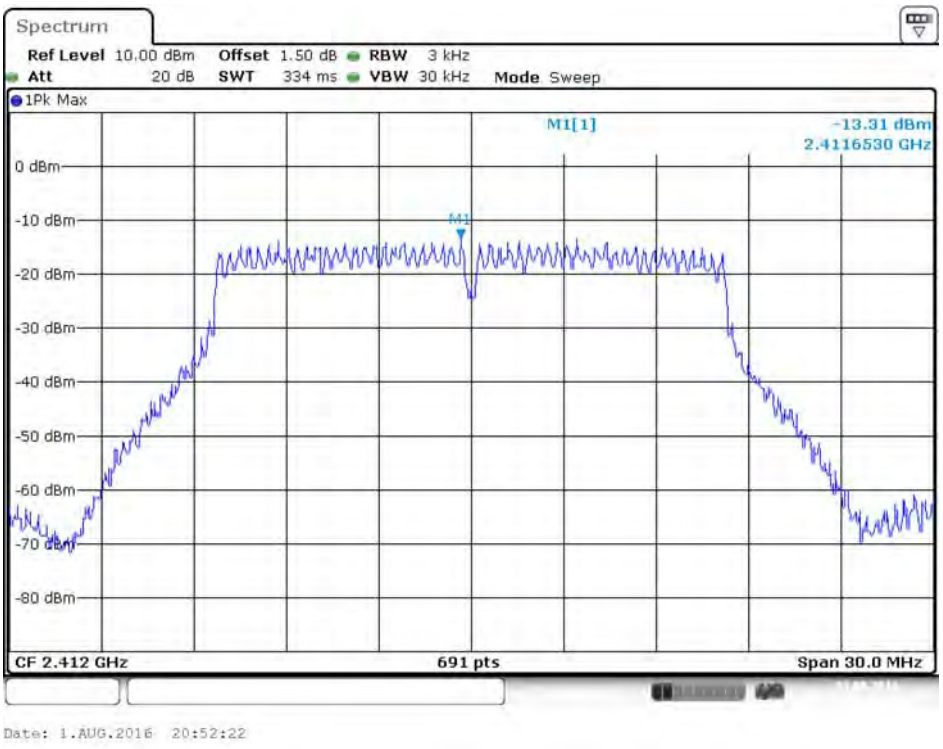
Power Density Plot on Configuration IEEE 802.11b / 2462 MHz / Chain 4



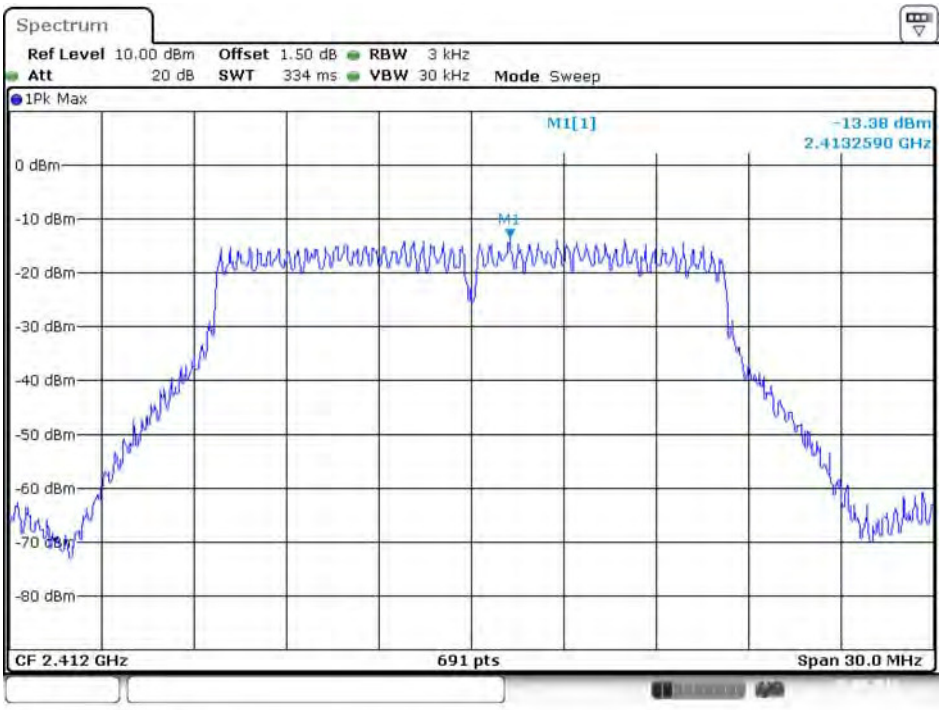
Power Density Plot on Configuration IEEE 802.11g / 2412 MHz / Chain 1



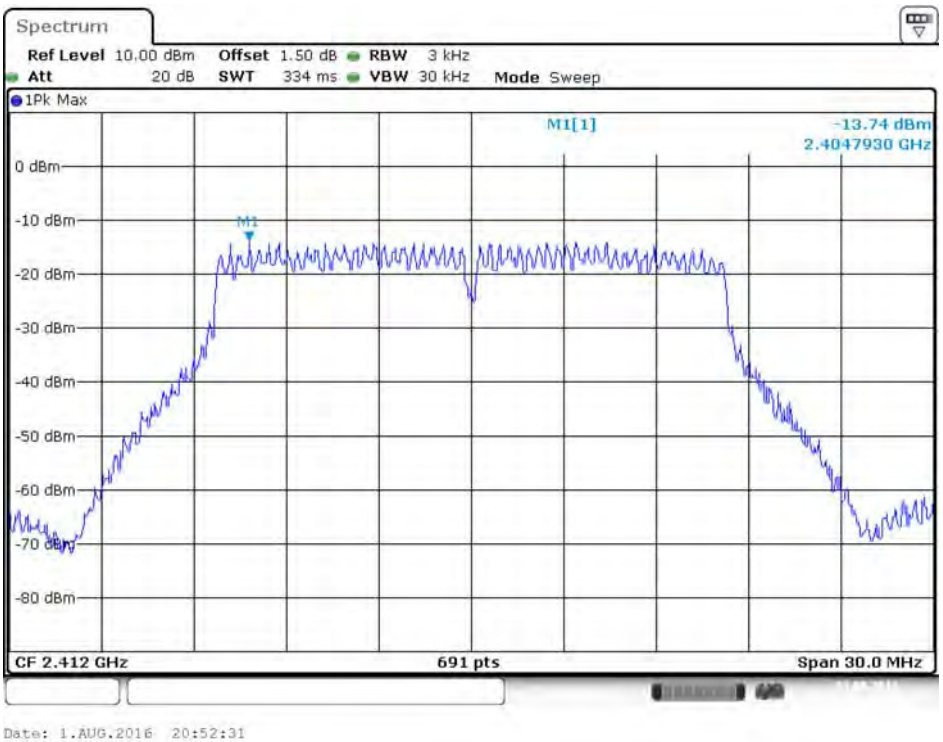
Power Density Plot on Configuration IEEE 802.11g / 2412 MHz / Chain 2



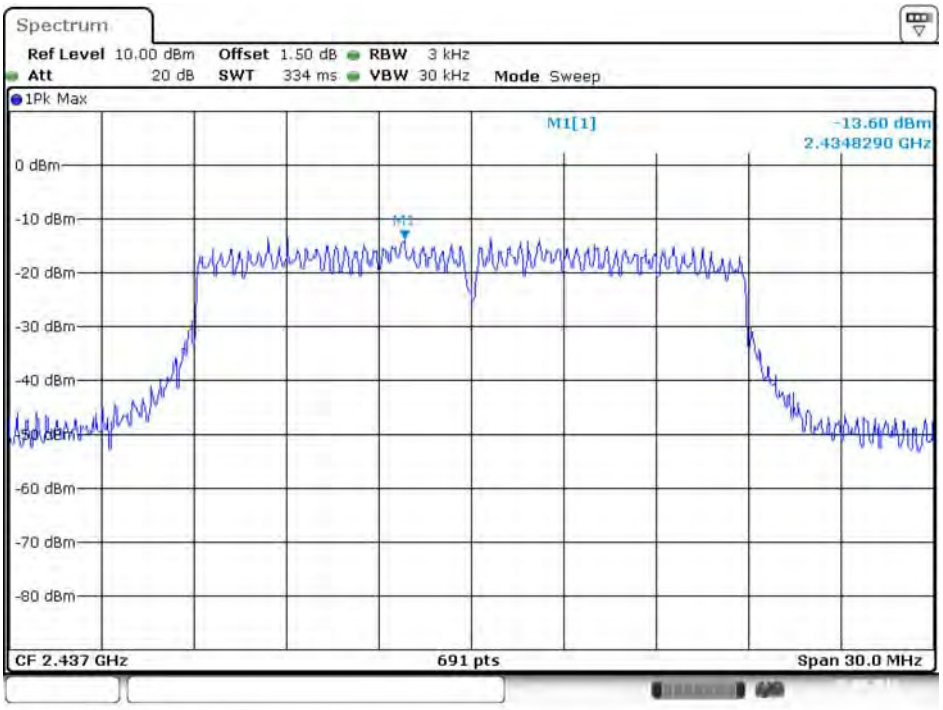
Power Density Plot on Configuration IEEE 802.11g / 2412 MHz / Chain 3



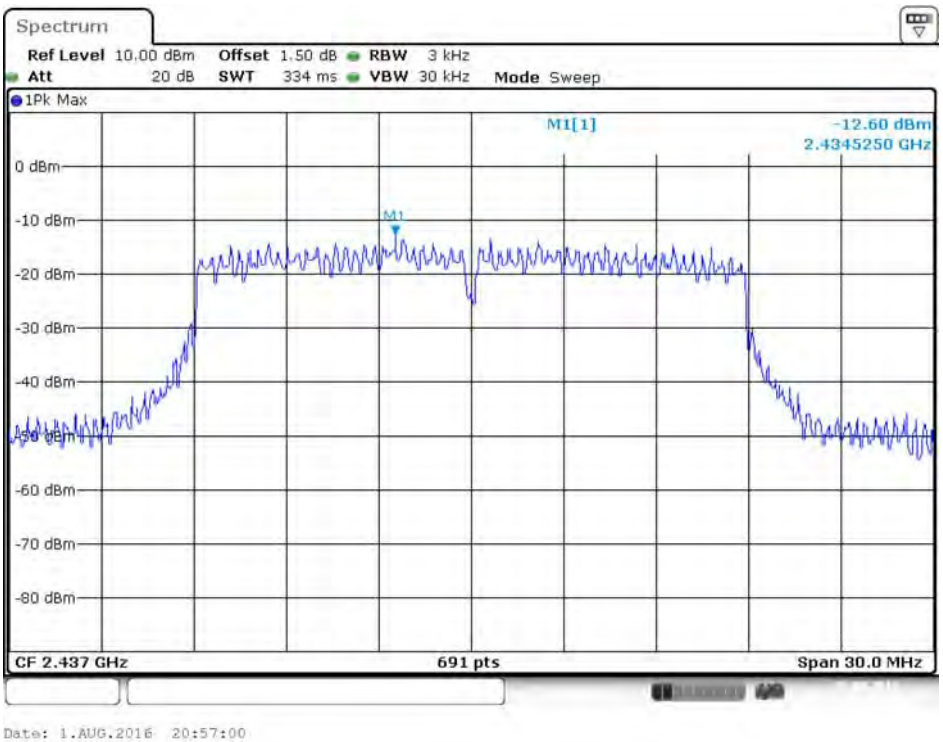
Power Density Plot on Configuration IEEE 802.11g / 2412 MHz / Chain 4



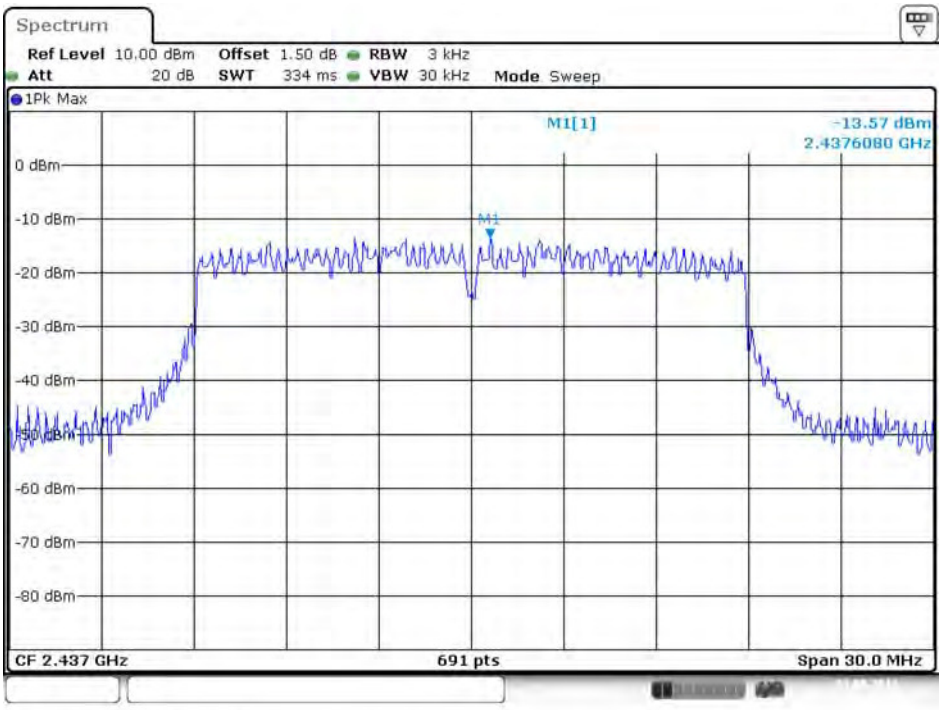
Power Density Plot on Configuration 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 1



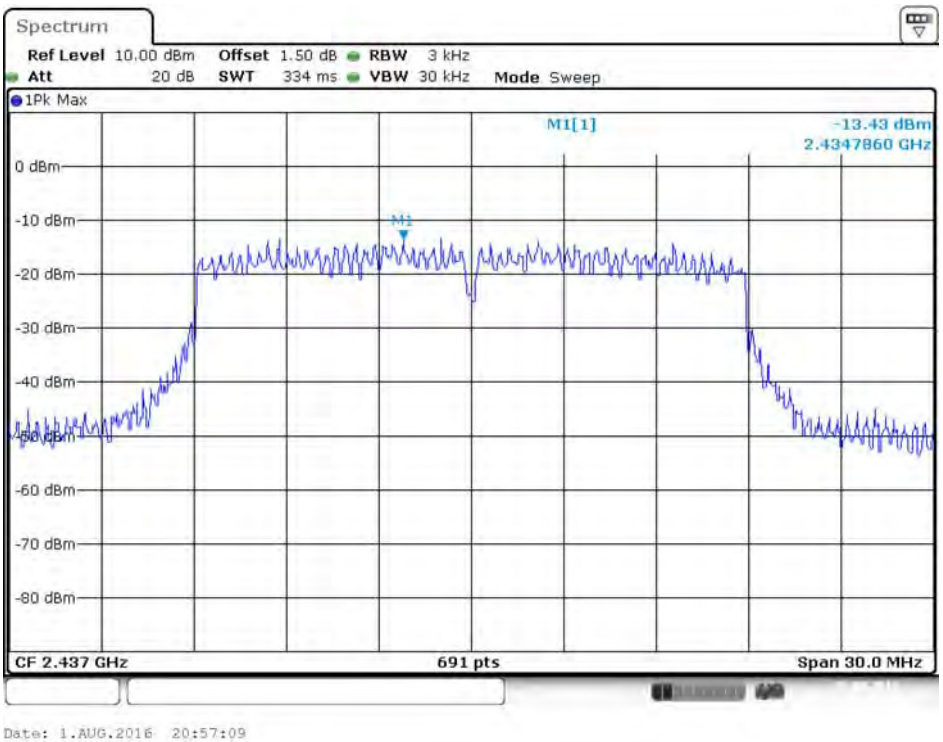
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 2



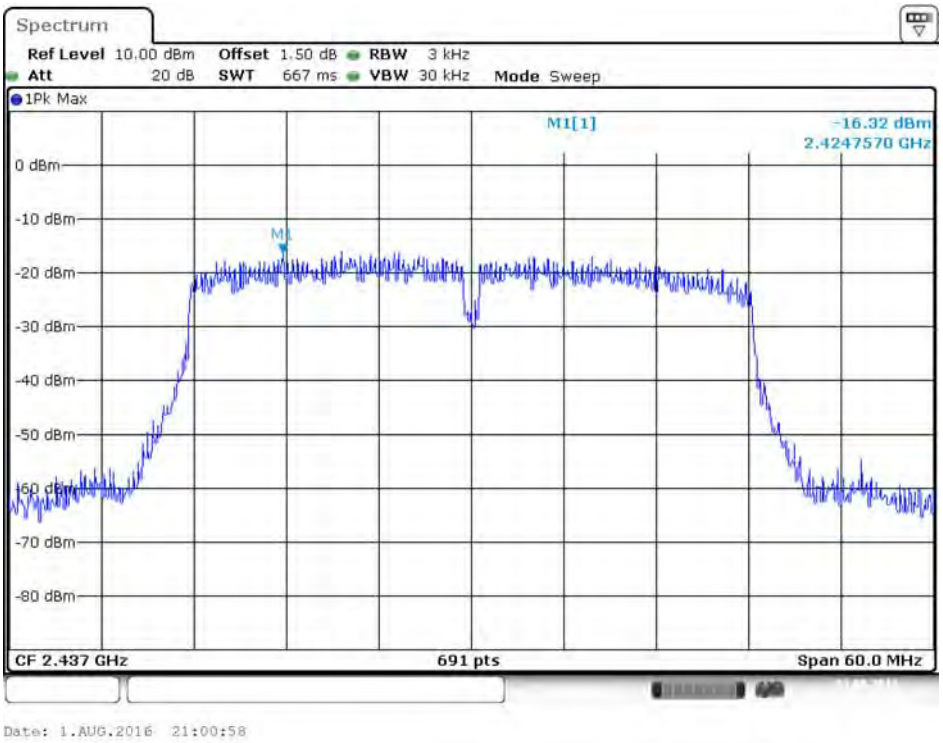
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 3



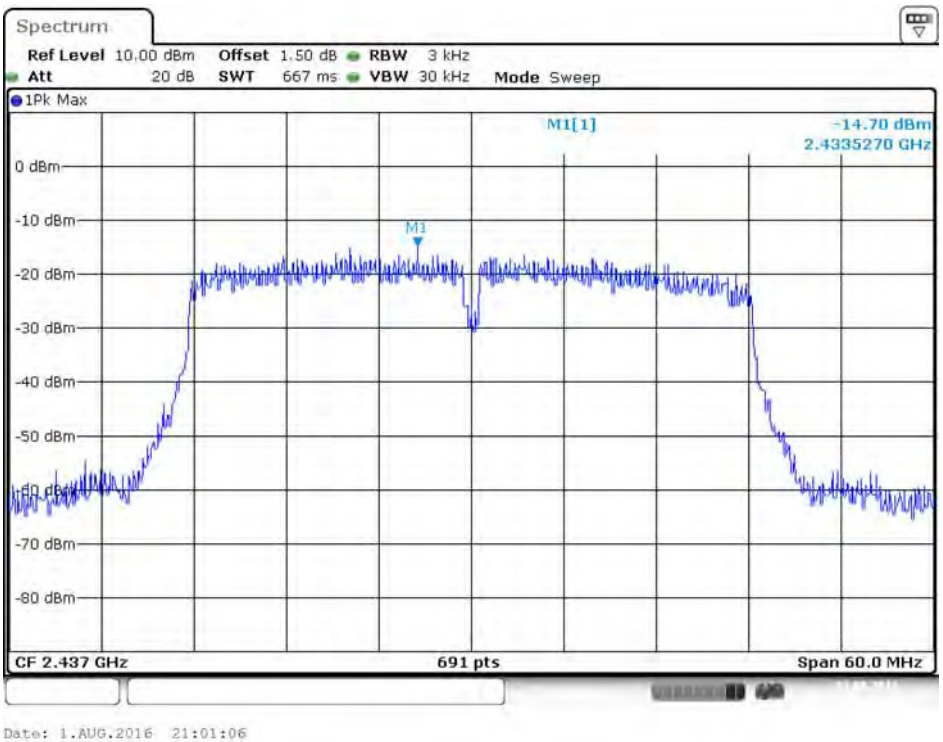
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 4



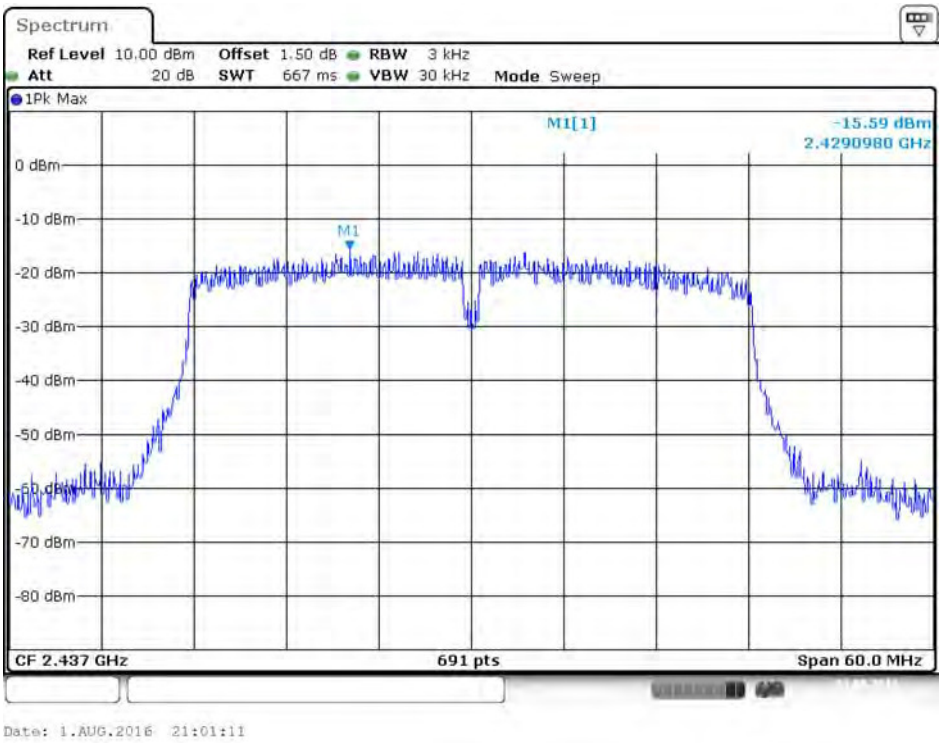
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 1



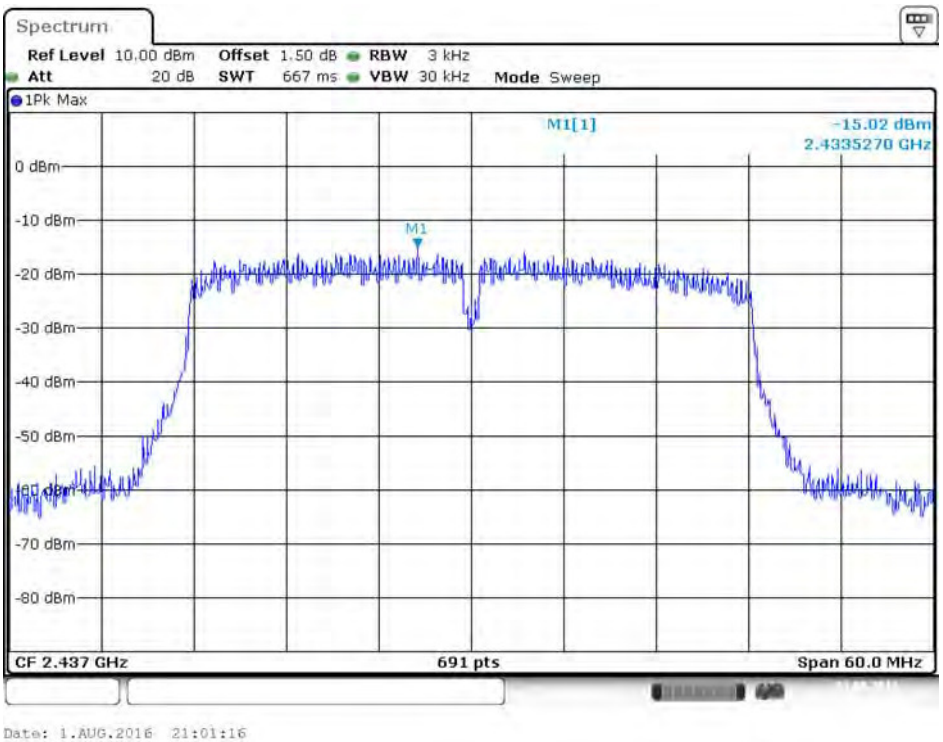
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 2



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40/ 2437 MHz / Chain 3

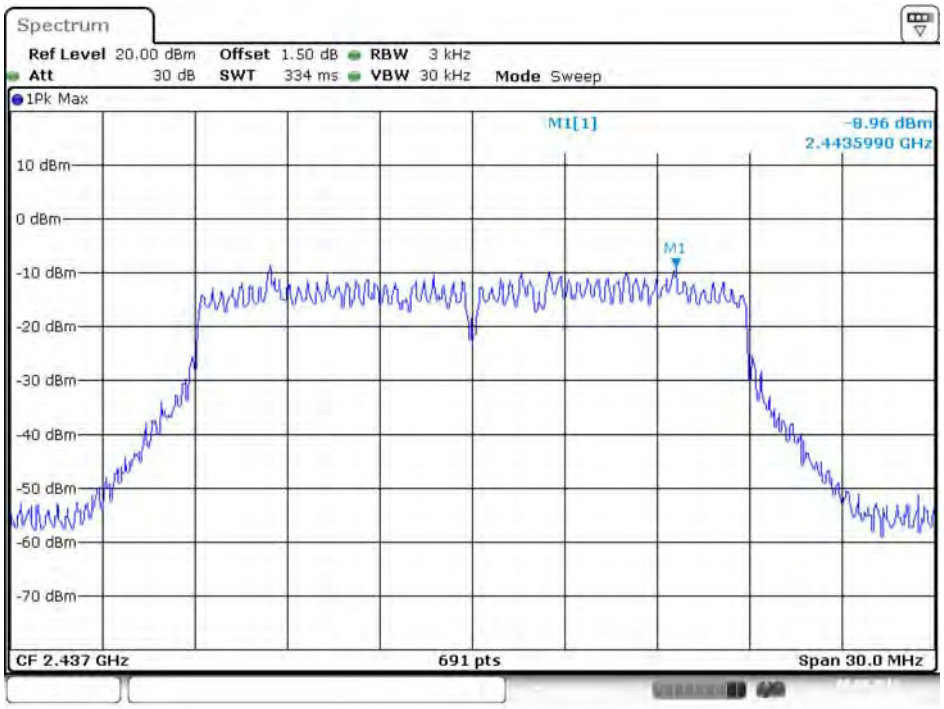


Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 4



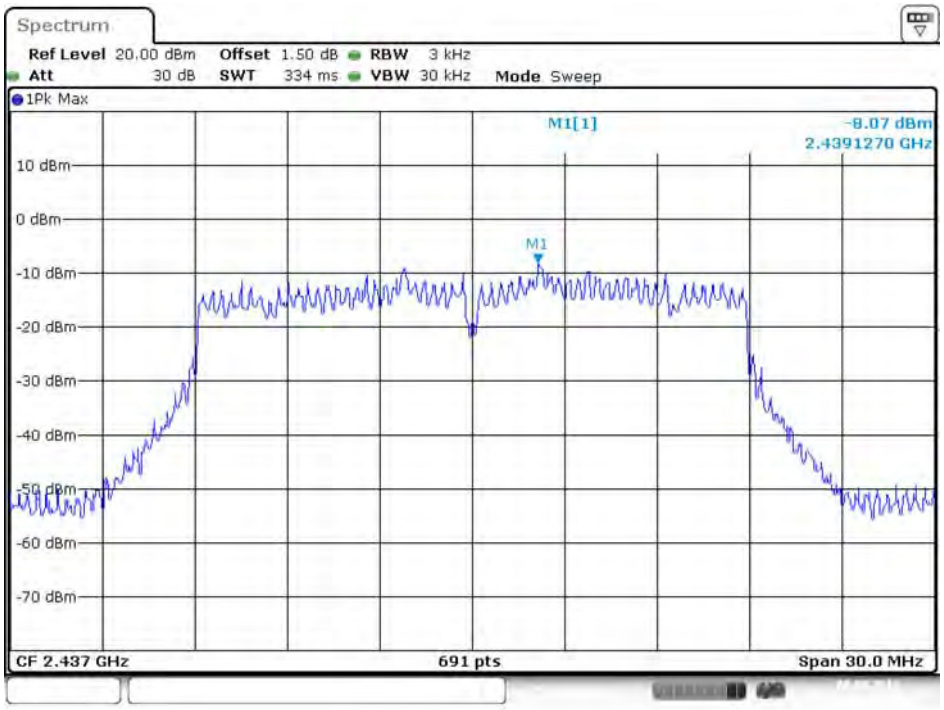
For Beamforming Mode

Power Density Plot on Configuration 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 1



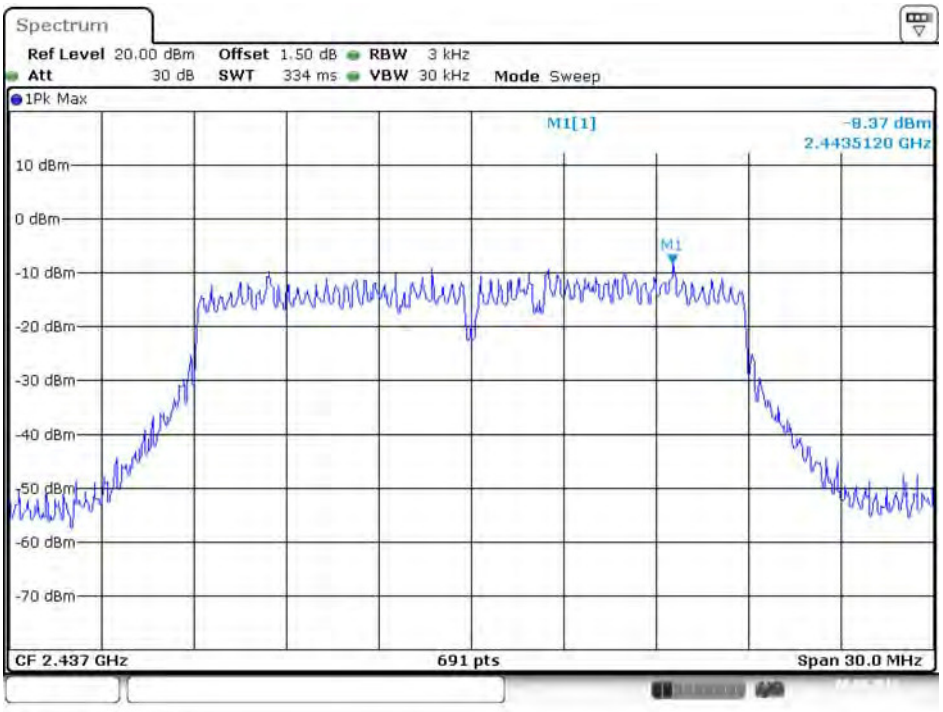
Date: 8.AUG.2016 14:33:31

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 2



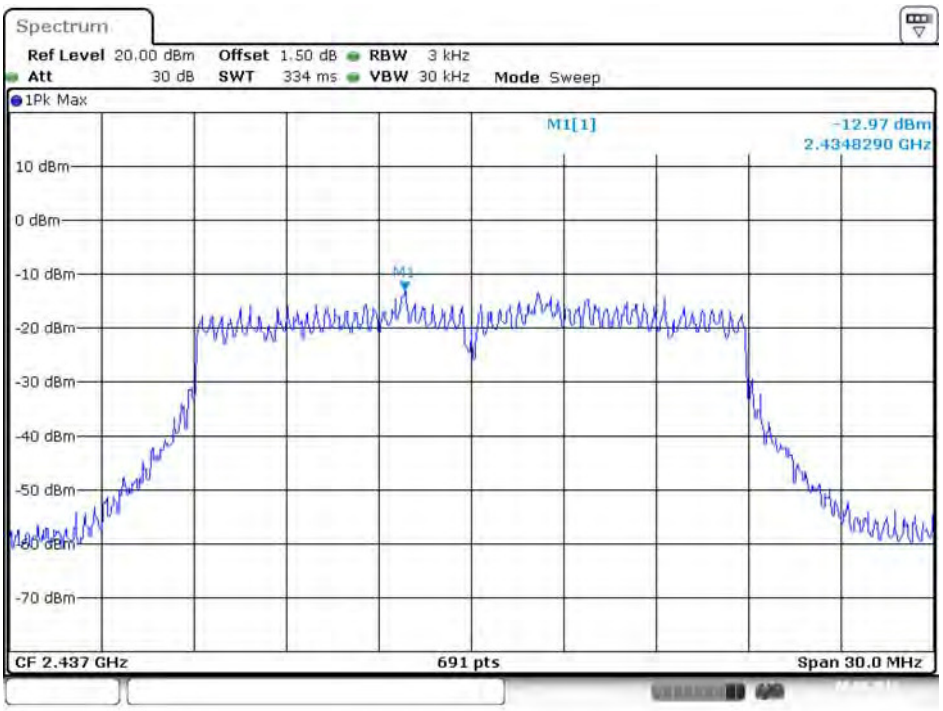
Date: 8.AUG.2016 14:33:04

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 3



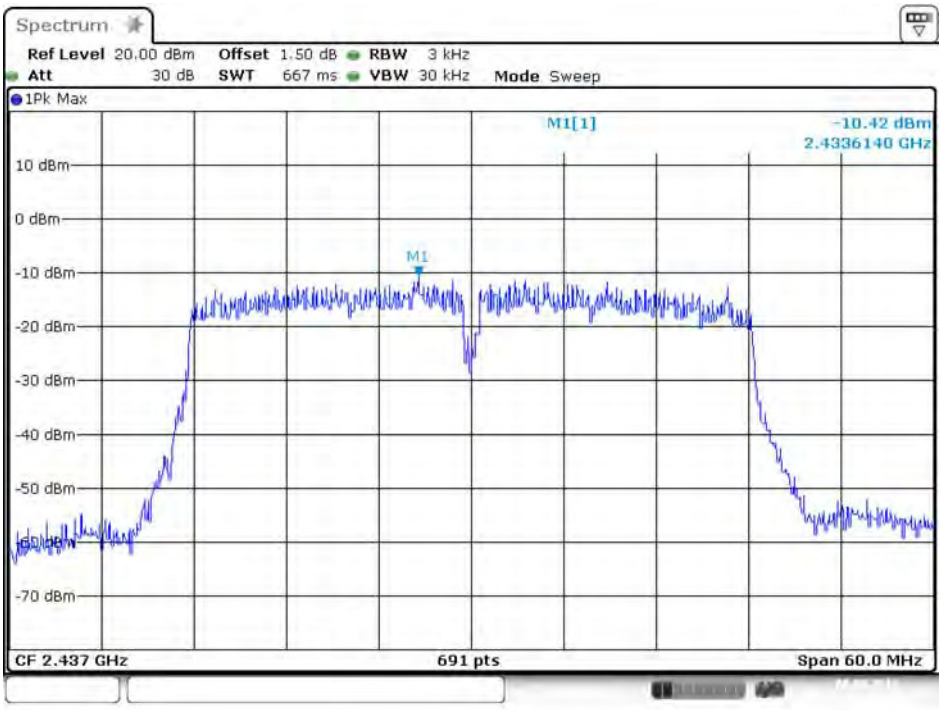
Date: 8.AUG.2016 14:32:38

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 4



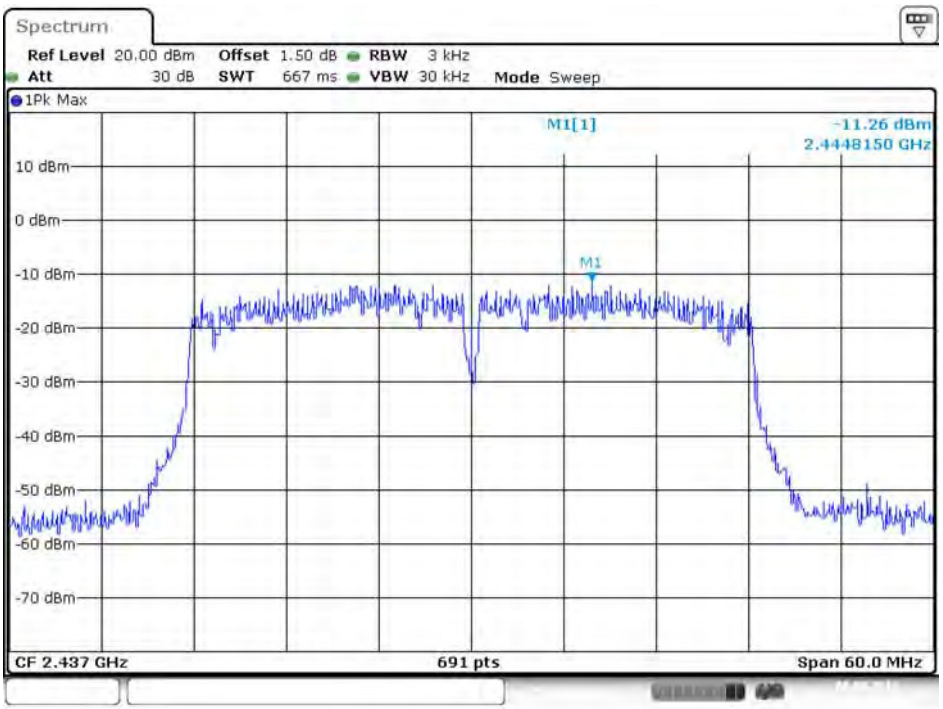
Date: 8.AUG.2016 14:32:07

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 1



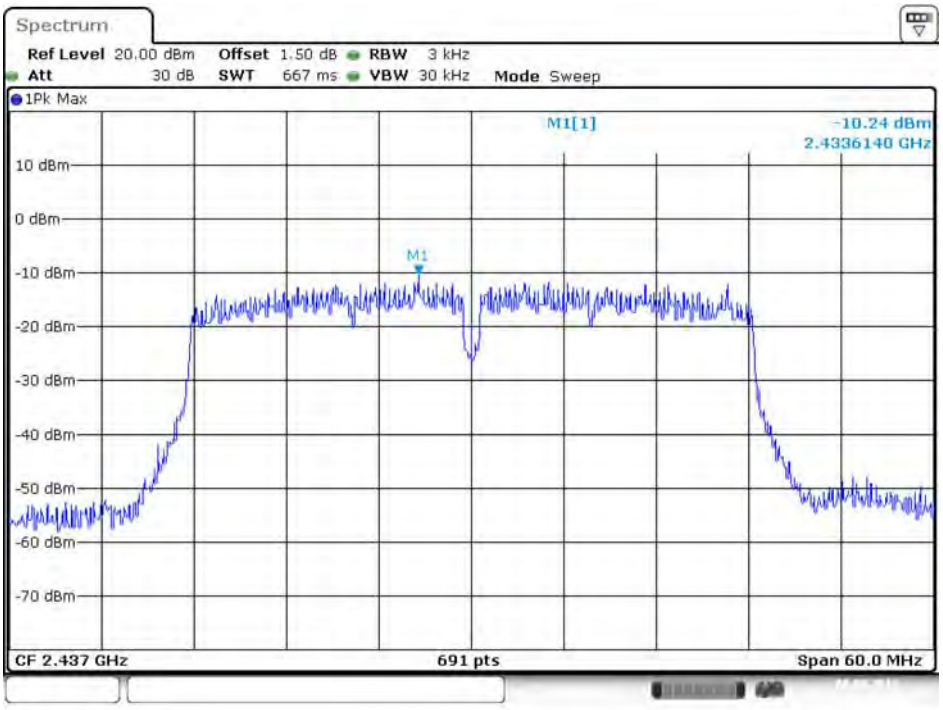
Date: 8.AUG.2016 14:40:07

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 2



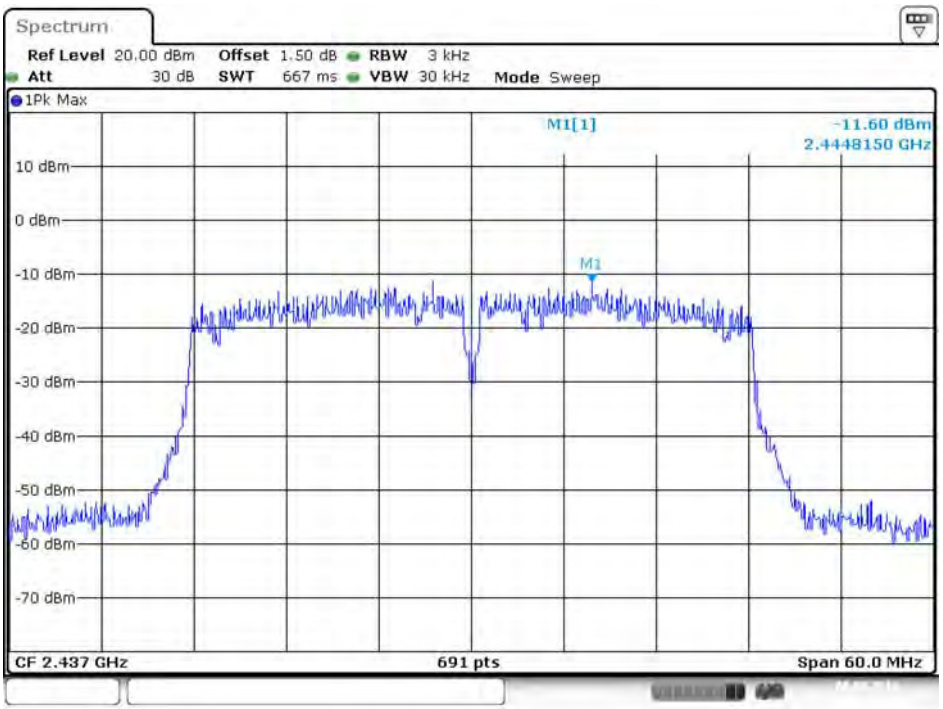
Date: 8.AUG.2016 14:40:35

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40/ 2437 MHz / Chain 3



Date: 8.AUG.2016 14:41:07

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 4



Date: 8.AUG.2016 14:41:43

4.4. 6dB Spectrum Bandwidth Measurement

4.4.1. Limit

For digital modulation systems, the minimum 6dB bandwidth shall be at least 500 kHz.

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.

6dB Spectrum Bandwidth	
Spectrum Parameters	**Setting**
Attenuation	Auto
Span Frequency	> 6dB Bandwidth
RBW	100kHz
VBW	≥ 3 x 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

4.4.3. Test Procedures

For Radiated 6dB Bandwidth Measurement:

1. The transmitter was radiated to the spectrum analyzer in peak hold mode.
2. Test was performed in accordance with KDB558074 D01 v03r05 for Performing Compliance Measurements on Digital Transmission Systems (DTS) - section 8.0 DTS bandwidth=> 8.1 Option 1.
3. Multiple antenna system was performed in accordance with KDB 662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. Measured the spectrum width with power higher than 6dB below carrier.

4.4.4. Test Setup Layout

For Radiated 6dB Bandwidth Measurement:

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

4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.4.7. Test Result of 6dB Spectrum Bandwidth

Temperature	22°C	Humidity	54%
Test Engineer	Gino Huang		

For Non-Beamforming Mode

Mode	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11b	2412 MHz	4.23	11.20	500	Complies
	2437 MHz	4.23	11.20	500	Complies
	2462 MHz	4.52	10.16	500	Complies
802.11g	2412 MHz	15.71	16.67	500	Complies
	2437 MHz	16.29	16.41	500	Complies
	2462 MHz	16.29	16.67	500	Complies
802.11ac MCS0/Nss1 VHT20	2412 MHz	17.62	17.80	500	Complies
	2437 MHz	17.57	17.89	500	Complies
	2462 MHz	17.57	17.71	500	Complies
802.11ac MCS0/Nss1 VHT40	2422 MHz	29.45	35.46	500	Complies
	2437 MHz	30.73	35.89	500	Complies
	2452 MHz	30.03	35.46	500	Complies

For Beamforming Mode

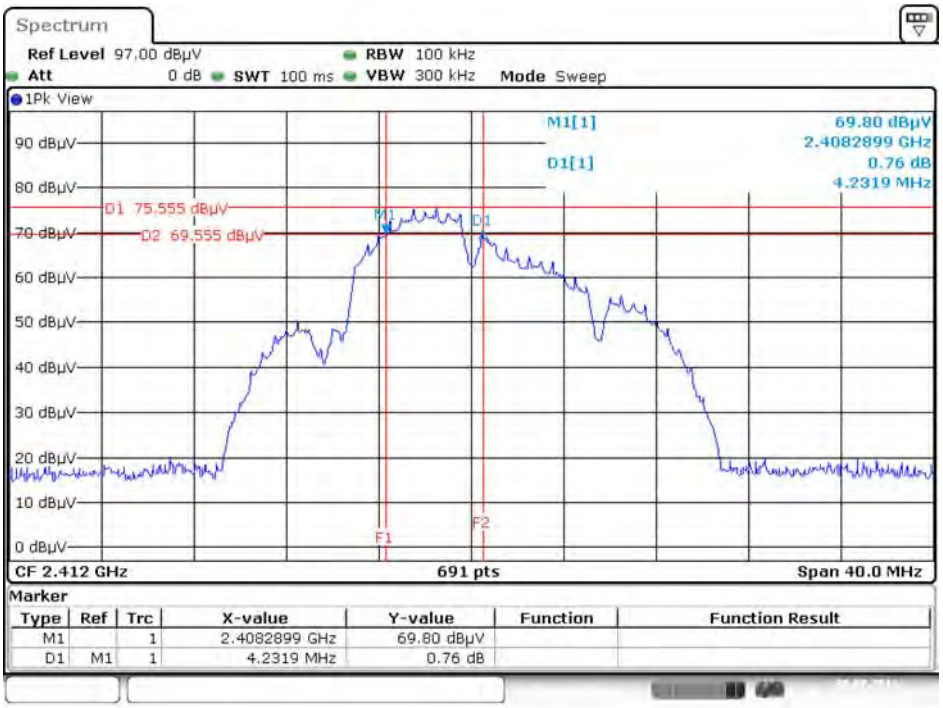
Mode	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11ac MCS0/Nss1 VHT20	2412 MHz	17.74	17.89	500	Complies
	2437 MHz	17.68	17.89	500	Complies
	2462 MHz	17.80	17.97	500	Complies
802.11ac MCS0/Nss1 VHT40	2422 MHz	36.06	36.76	500	Complies
	2437 MHz	35.48	36.61	500	Complies
	2452 MHz	35.48	37.05	500	Complies

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

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

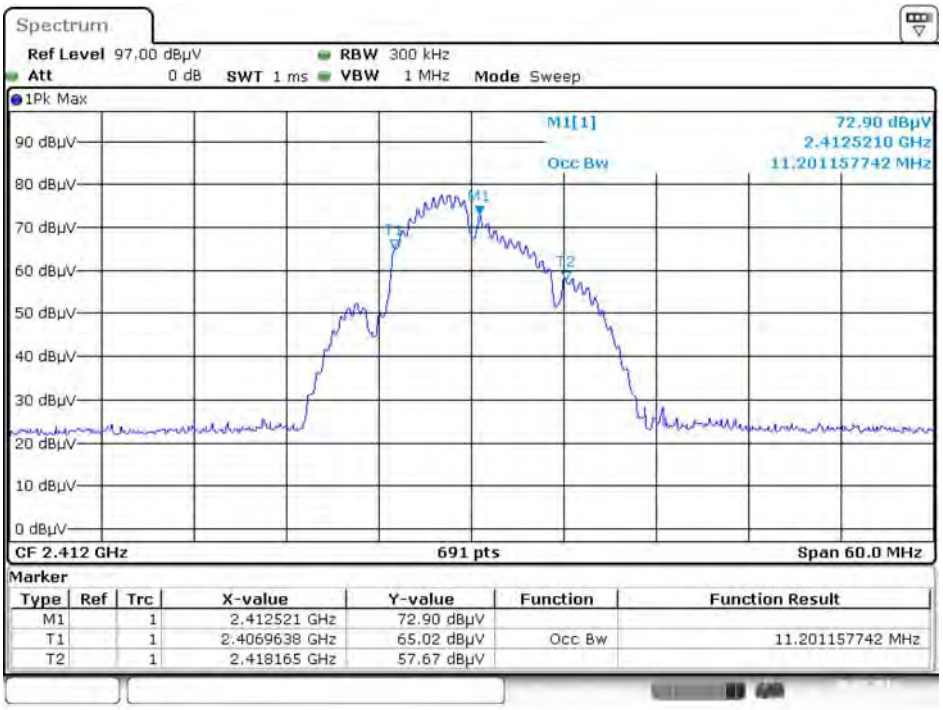
For Non-Beamforming Mode

6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2412 MHz / Chain 1+ Chain 2 + Chain 3 + Chain 4



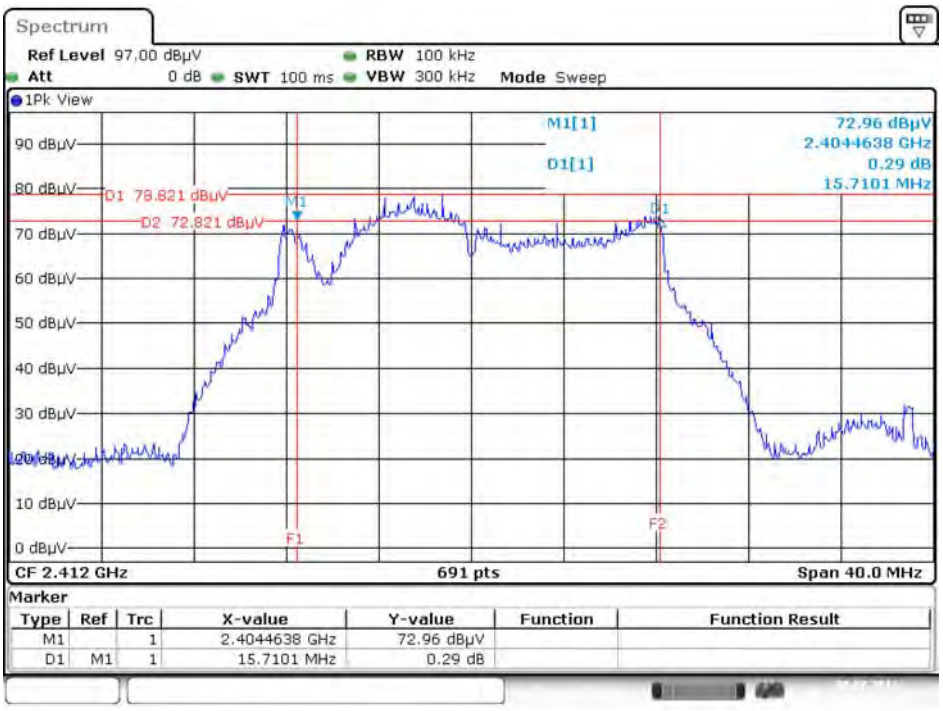
Date: 30.JUL.2016 16:34:31

99% Occupied Bandwidth Plot on Configuration IEEE 802.11b / 2412 MHz / Chain 1+ Chain 2 + Chain 3 + Chain 4



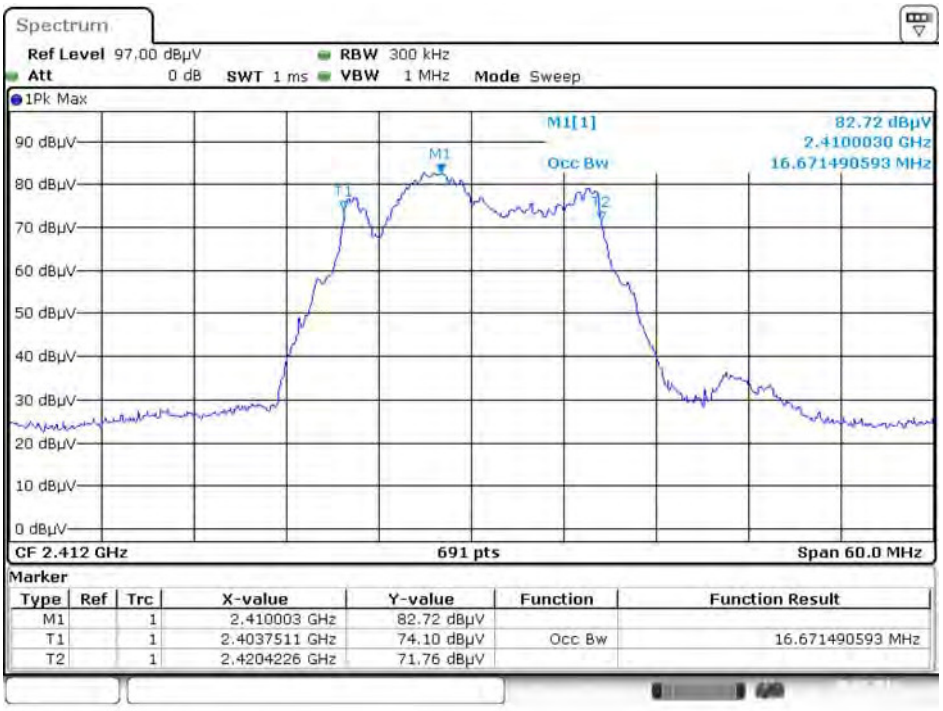
Date: 30.JUL.2016 15:54:54

6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2412 MHz / Chain 1+ Chain 2 + Chain 3 + Chain 4



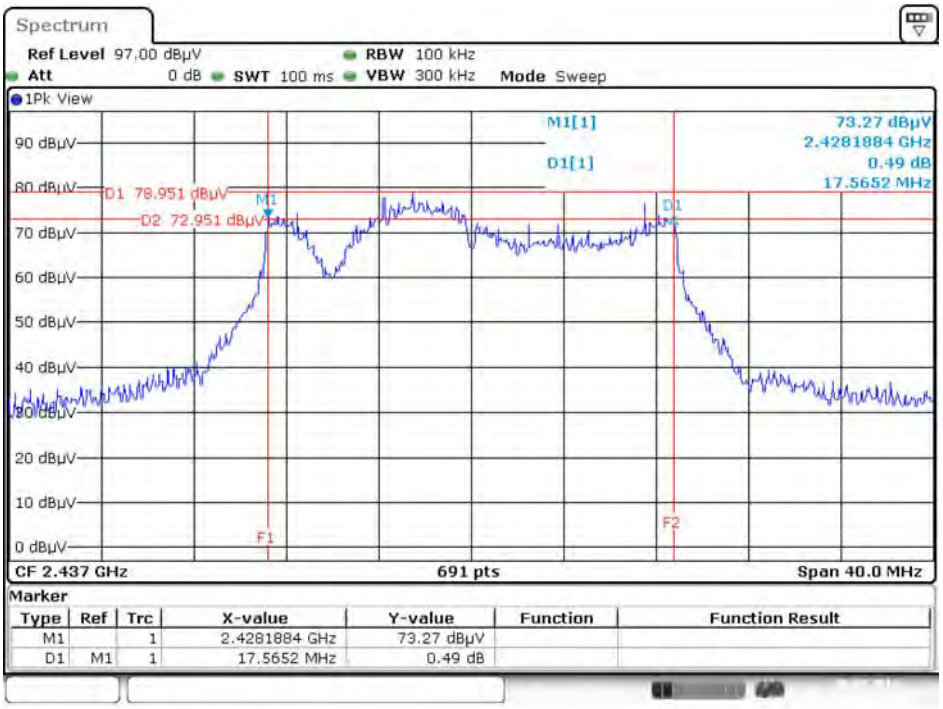
Date: 30.JUL.2016 16:52:13

99% Occupied Bandwidth Plot on Configuration IEEE 802.11g / 2412 MHz / Chain 1+ Chain 2 + Chain 3 + Chain 4

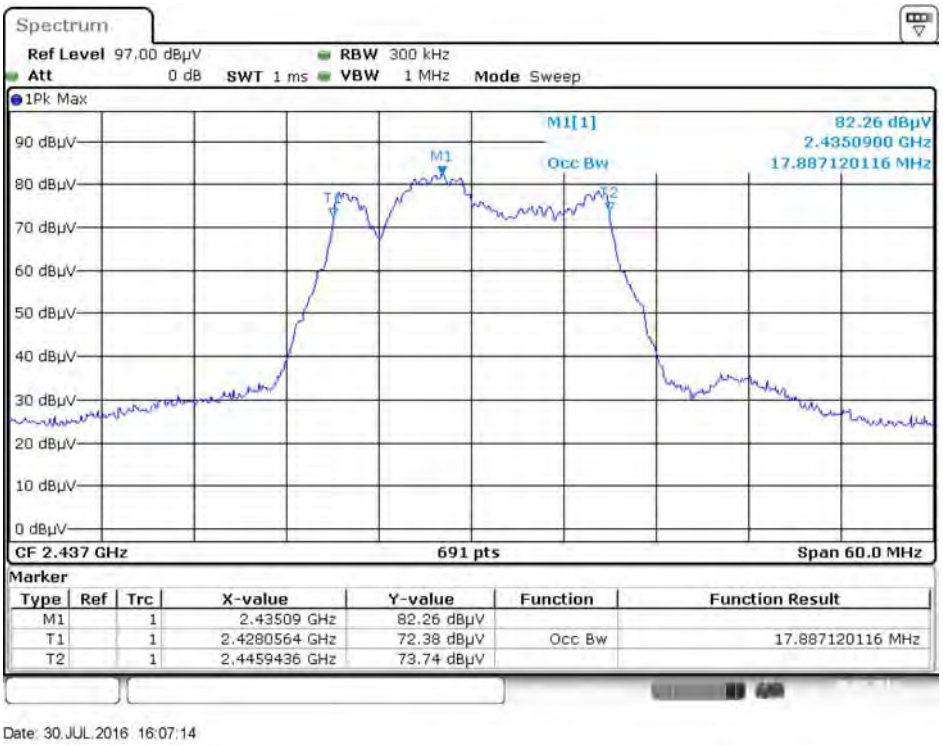


Date: 30.JUL.2016 15:59:23

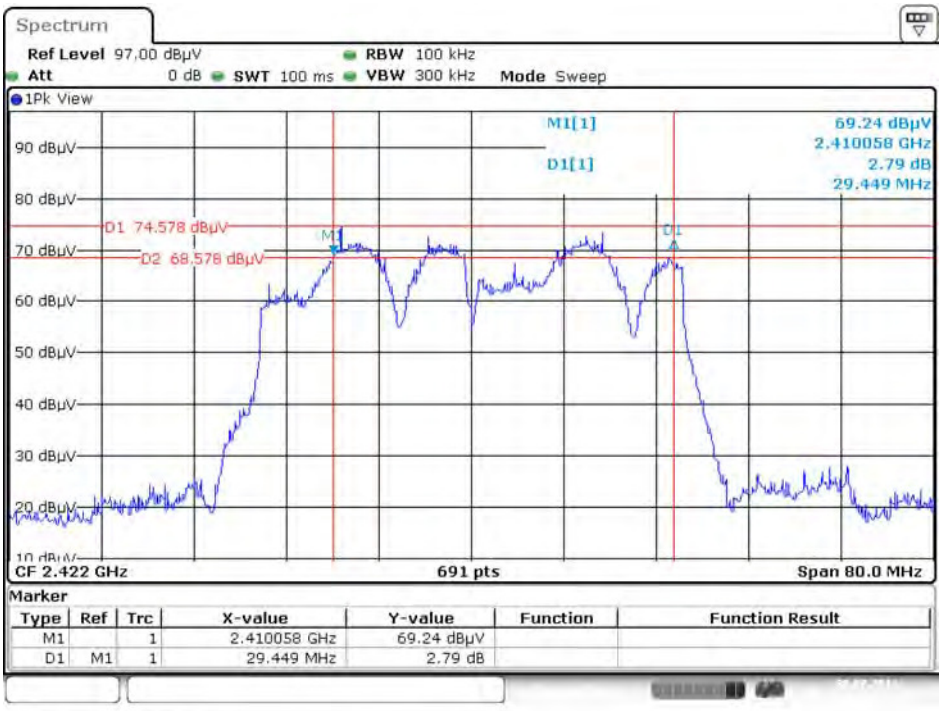
6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 1+ Chain 2 + Chain 3 + Chain 4



99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 1+ Chain 2 + Chain 3 + Chain 4

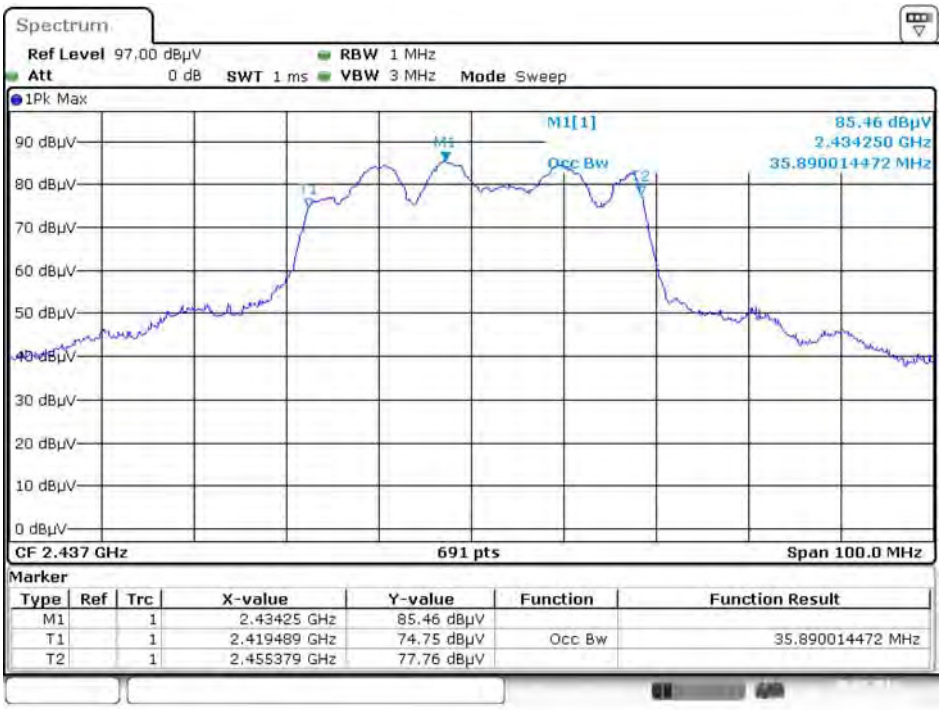


6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2422 MHz / Chain 1+ Chain 2 + Chain 3 + Chain 4



Date: 30.JUL.2016 17:02:21

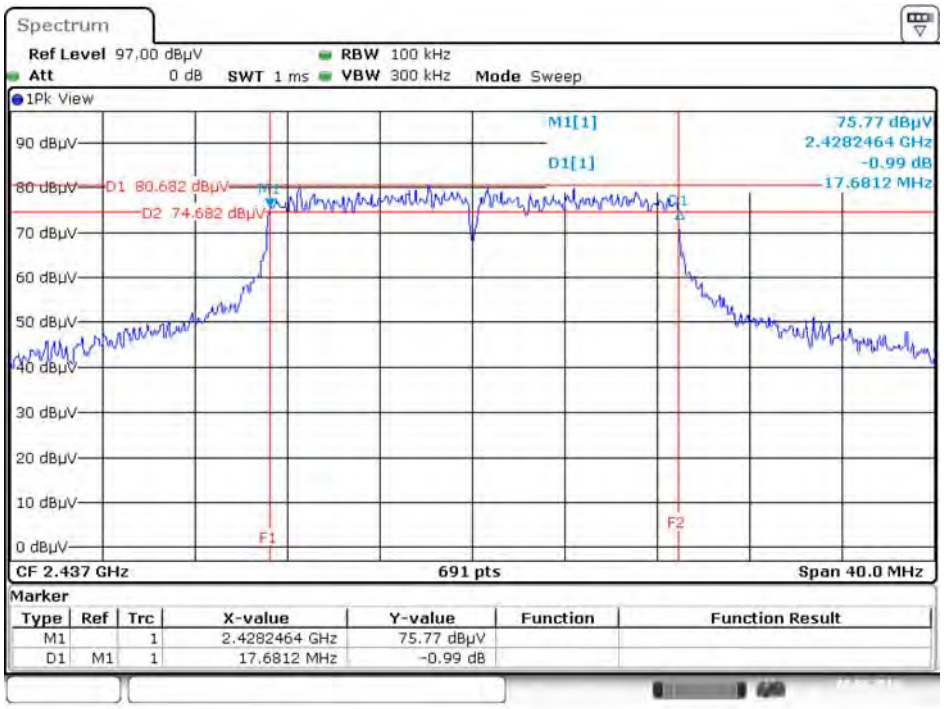
99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 1+ Chain 2 + Chain 3 + Chain 4



Date: 30.JUL.2016 16:11:30

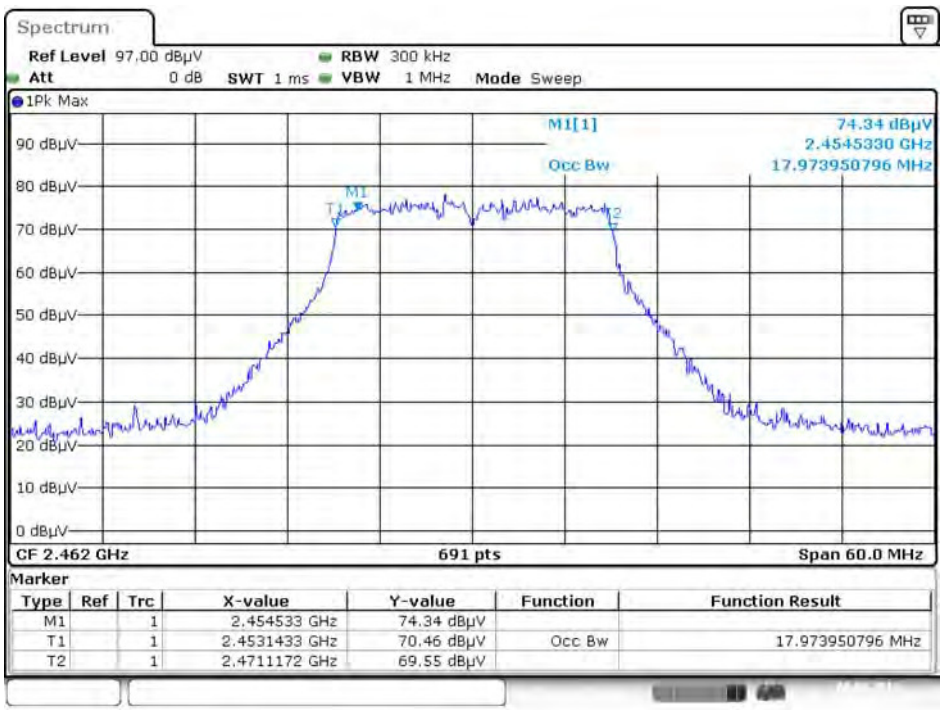
For Beamforming Mode

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20/ 2437 MHz / Chain 1+ Chain 2 + Chain 3 + Chain 4



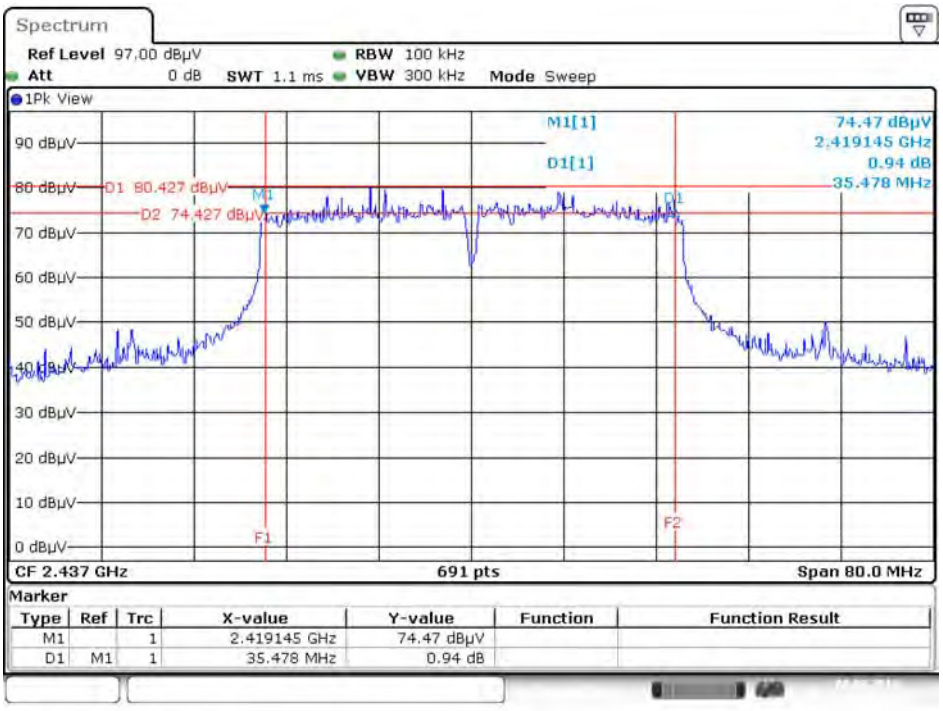
Date: 8.AUG.2016 15:04:33

99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2462 MHz / Chain 1+ Chain 2 + Chain 3 + Chain 4



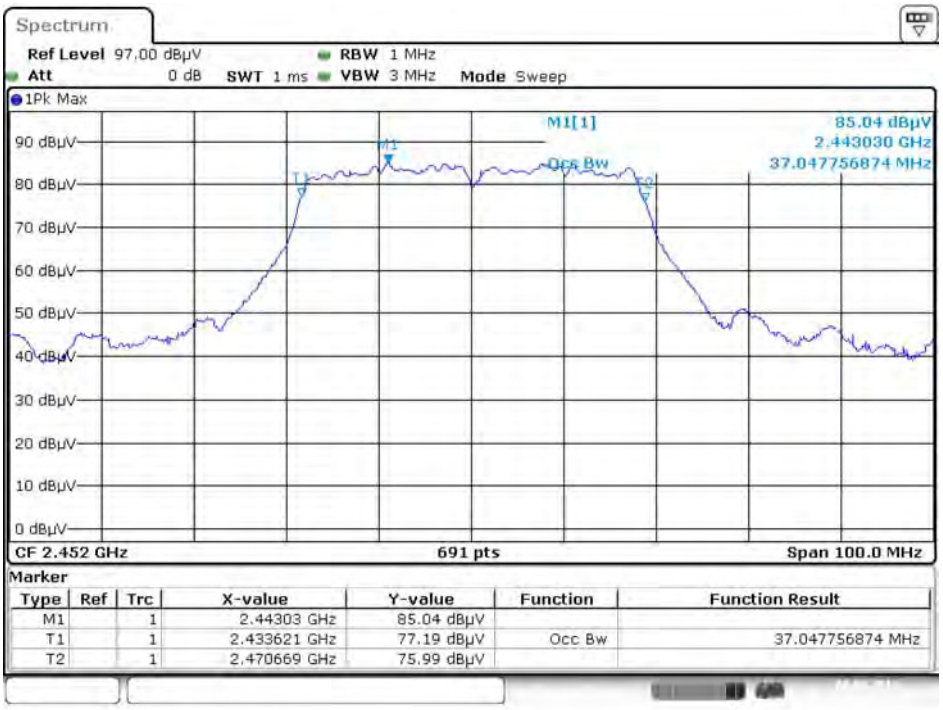
Date: 8.AUG.2016 14:59:58

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 1+ Chain 2 + Chain 3 + Chain 4



Date: 8.AUG.2016 15:06:26

99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2452 MHz / Chain 1+ Chain 2 + Chain 3 + Chain 4



Date: 8.AUG.2016 14:52:34

4.5. Radiated Emissions Measurement

4.5.1. Limit

30dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

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

4.5.2. Measuring Instruments and Setting

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

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, 1MHz / 1/T for Average
RBW / VBW (Emission in non-restricted band)	100kHz / 300kHz for peak

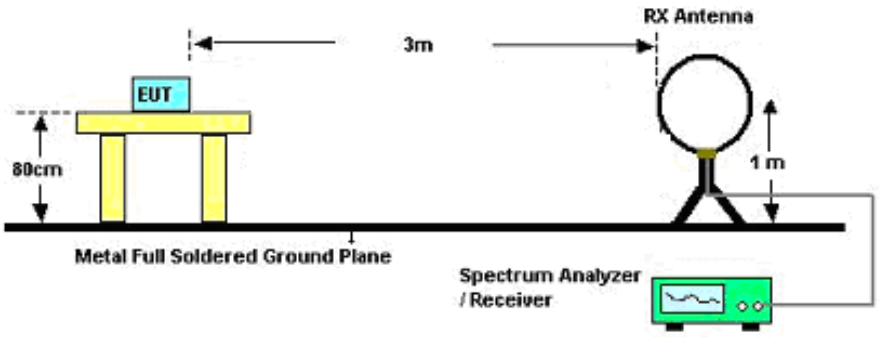
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1GHz / RBW 120kHz for QP

4.5.3. Test Procedures

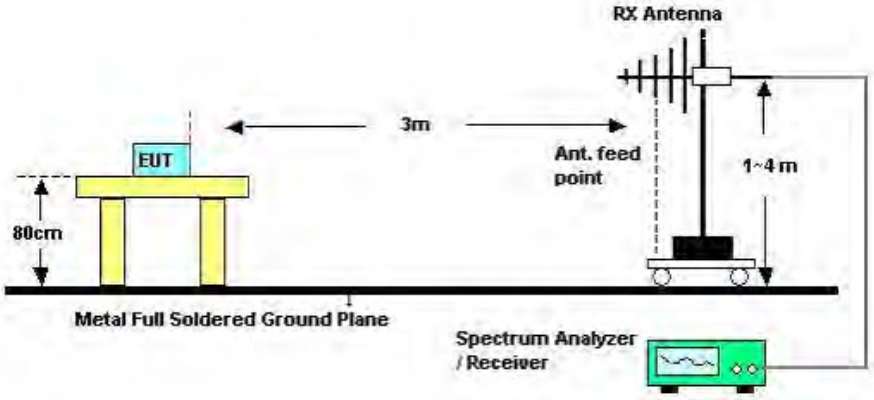
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 1m & 3m far away from the turntable.
2. Power on the EUT and all the supporting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

4.5.4. Test Setup Layout

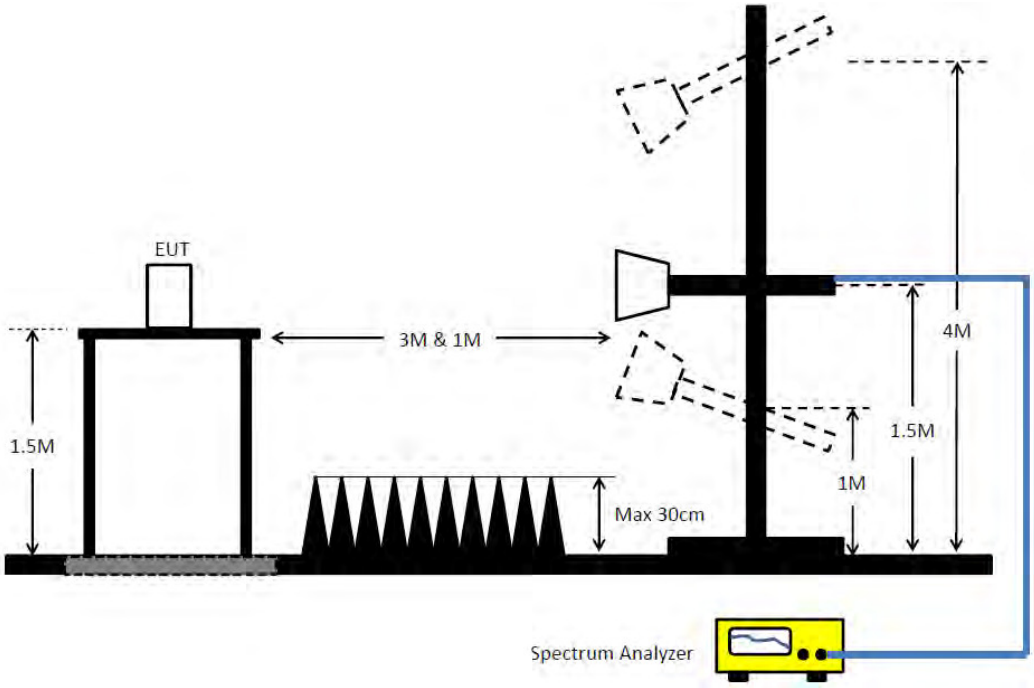
For Radiated Emissions: 9kHz ~30MHz



For Radiated Emissions: 30MHz~1GHz



For Radiated Emissions: Above 1GHz



4.5.5. Test Deviation

There is no deviation with the original standard.

4.5.6. EUT Operation during Test

For Non-Beamforming Mode:

The EUT was programmed to be in continuously transmitting mode.

For Beamforming Mode:

The EUT was programmed to be in beamforming transmitting mode.

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

Temperature	22°C	Humidity	54%
Test Engineer	Brian Sun	Configurations	CTX
Test Date	Nov. 04, 2016	Test Mode	Mode 2

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

Note:

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

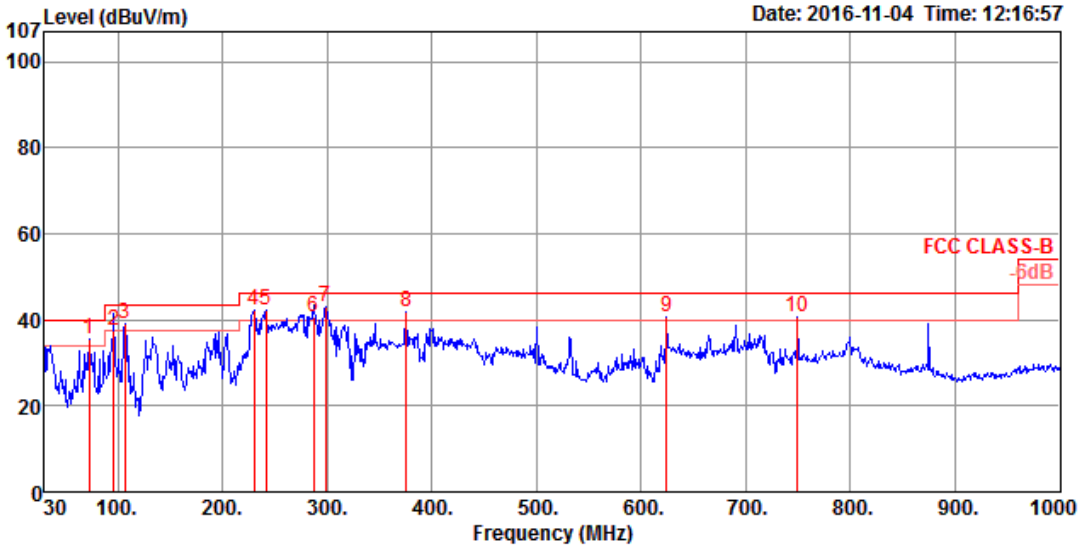
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

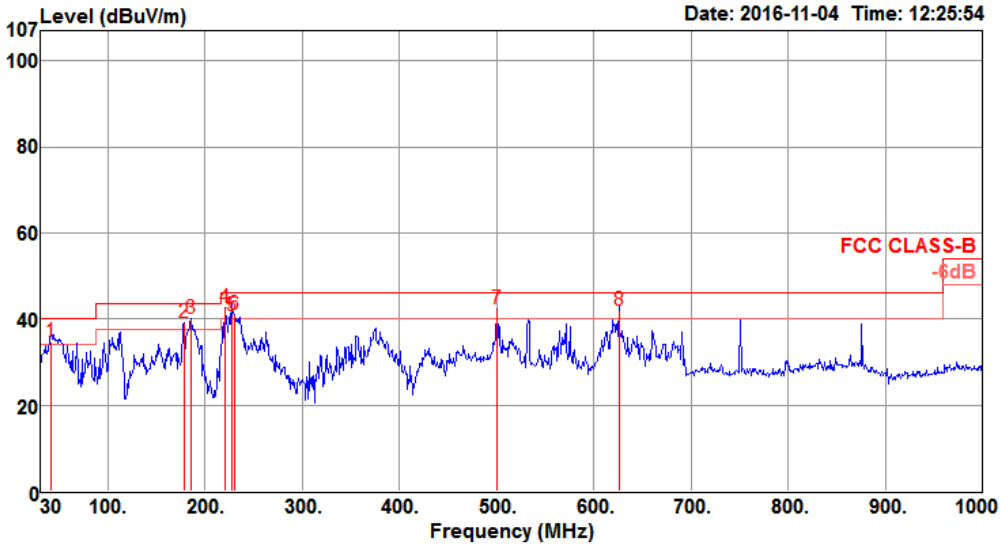
Temperature	22°C	Humidity	54%
Test Engineer	Brian Sun	Configurations	CTX
Test Mode	Mode 2		

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 @	72.68	35.36	40.00	-4.64	53.74	0.75	12.71	31.84	200	258	Peak	HORIZONTAL
2	95.96	37.48	43.50	-6.02	52.16	0.87	16.30	31.85	200	322	QP	HORIZONTAL
3 @	106.63	39.01	43.50	-4.49	52.19	0.87	17.81	31.86	200	331	Peak	HORIZONTAL
4 @	229.82	42.40	46.00	-3.60	56.17	1.21	17.00	31.98	125	74	Peak	HORIZONTAL
5 @	241.46	42.40	46.00	-3.60	55.00	1.23	18.12	31.95	150	235	Peak	HORIZONTAL
6 @	287.05	40.49	46.00	-5.51	51.82	1.34	19.37	32.04	125	236	QP	HORIZONTAL
7 @	298.69	42.95	46.00	-3.05	54.03	1.37	19.56	32.01	125	260	Peak	HORIZONTAL
8 @	375.32	41.75	46.00	-4.25	50.64	1.50	21.73	32.12	100	98	Peak	HORIZONTAL
9 @	624.61	40.74	46.00	-5.26	46.06	1.97	25.16	32.45	125	125	Peak	HORIZONTAL
10 @	749.74	40.68	46.00	-5.32	45.07	2.19	26.00	32.58	150	241	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	41.64	34.86	40.00	-5.14	47.26	0.56	18.71	31.67	100	229	QP	VERTICAL
2	178.41	39.19	43.50	-4.31	54.53	1.06	15.54	31.94	100	132	Peak	VERTICAL
3	185.20	40.17	43.50	-3.33	55.60	1.08	15.45	31.96	100	147	Peak	VERTICAL
4	220.12	42.51	46.00	-3.49	56.98	1.18	16.30	31.95	200	310	Peak	VERTICAL
5	226.91	40.75	46.00	-5.25	54.74	1.20	16.78	31.97	200	270	QP	VERTICAL
6	229.82	41.04	46.00	-4.96	54.81	1.21	17.00	31.98	200	181	Peak	VERTICAL
7	500.45	42.30	46.00	-3.70	49.13	1.76	23.73	32.32	100	144	Peak	VERTICAL
8	625.58	41.99	46.00	-4.01	47.31	1.97	25.16	32.45	100	40	QP	VERTICAL

Note:

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

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

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

4.5.9. Results for Radiated Emissions (1GHz~10th Harmonic)

For Non-Beamforming Mode

Temperature	22°C	Humidity	54%
Test Engineer	Nick Peng	Configurations	IEEE 802.11b CH 1 / Chain 1+Chain 2+Chain 3+Chain 4
Test Date	Aug. 12, 2016		

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	4823.93	49.69	54.00	-4.31	42.34	8.00	31.09	31.74	308	216	Average	HORIZONTAL
2	4823.97	54.62	74.00	-19.38	47.27	8.00	31.09	31.74	308	216	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	4823.91	56.82	74.00	-17.18	49.47	8.00	31.09	31.74	310	202	Peak	VERTICAL
2	4823.97	53.67	54.00	-0.33	46.32	8.00	31.09	31.74	310	202	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Brian Sun	Configurations	IEEE 802.11b CH 6 / Chain 1+Chain 2+Chain 3+Chain 4
Test Date	Oct. 18, 2016		

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	4866.84	46.19	74.00	-27.81	39.65	6.27	33.20	32.93	184	146	Peak	HORIZONTAL
2	4874.00	34.17	54.00	-19.83	27.59	6.28	33.23	32.93	184	146	Average	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	4867.04	47.29	74.00	-26.71	40.71	6.28	33.23	32.93	249	72	Peak	VERTICAL
2	4874.00	33.86	54.00	-20.14	27.28	6.28	33.23	32.93	249	72	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Nick Peng	Configurations	IEEE 802.11b CH 11 / Chain 1+Chain 2+Chain 3+Chain 4
Test Date	Aug. 12, 2016		

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	4923.96	52.24	54.00	-1.76	44.61	8.11	31.22	31.70	330	244	Average	HORIZONTAL
2	4923.98	56.10	74.00	-17.90	48.47	8.11	31.22	31.70	330	244	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	4923.93	53.91	54.00	-0.09	46.28	8.11	31.22	31.70	299	201	Average	VERTICAL
2	4923.96	57.44	74.00	-16.56	49.81	8.11	31.22	31.70	299	201	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Nick Peng	Configurations	IEEE 802.11g CH 1 / Chain 1+Chain 2+Chain 3+Chain 4
Test Date	Aug. 13, 2016		

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	4824.00	51.07	54.00	-2.93	44.63	6.26	33.11	32.93	244	236	Average	HORIZONTAL
2	4830.41	63.12	74.00	-10.88	56.64	6.27	33.14	32.93	244	236	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	4824.40	52.36	54.00	-1.64	45.92	6.26	33.11	32.93	233	227	Average	VERTICAL
2	4825.44	64.62	74.00	-9.38	58.14	6.27	33.14	32.93	233	227	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Brian Sun	Configurations	IEEE 802.11g CH 6 / Chain 1+Chain 2+Chain 3+Chain 4
Test Date	Oct. 19, 2016		

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	4874.20	34.53	54.00	-19.47	27.95	6.28	33.23	32.93	212	51	Average	HORIZONTAL
2	4875.20	47.34	74.00	-26.66	40.76	6.28	33.23	32.93	212	51	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	4874.28	35.23	54.00	-18.77	28.65	6.28	33.23	32.93	201	276	Average	VERTICAL
2	4874.72	47.96	74.00	-26.04	41.38	6.28	33.23	32.93	201	276	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Nick Peng	Configurations	IEEE 802.11g CH 11 / Chain 1+Chain 2+Chain 3+Chain 4
Test Date	Aug. 13, 2016		

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	4924.32	52.55	54.00	-1.45	45.83	6.29	33.35	32.92	272	242	Average	HORIZONTAL
2	4925.36	65.41	74.00	-8.59	58.69	6.29	33.35	32.92	272	242	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	4920.31	66.74	74.00	-7.26	60.05	6.29	33.32	32.92	306	223	Peak	VERTICAL
2	4922.08	52.99	54.00	-1.01	46.30	6.29	33.32	32.92	306	223	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Nick Peng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 1 / Chain 1+Chain 2+Chain 3+Chain 4
Test Date	Aug. 13, 2016		

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	4822.16	63.97	74.00	-10.03	57.53	6.26	33.11	32.93	258	230	Peak	HORIZONTAL
2	4824.00	50.61	54.00	-3.39	44.17	6.26	33.11	32.93	258	230	Average	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	4821.92	66.67	74.00	-7.33	60.23	6.26	33.11	32.93	319	221	Peak	VERTICAL
2	4823.84	51.67	54.00	-2.33	45.23	6.26	33.11	32.93	319	221	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Brian Sun	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 6 / Chain 1+Chain 2+Chain 3+Chain 4
Test Date	Oct. 19, 2016		

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	4874.27	34.75	54.00	-19.25	28.17	6.28	33.23	32.93	189	27	Average	HORIZONTAL
2	4874.90	47.58	74.00	-26.42	41.00	6.28	33.23	32.93	189	27	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	4872.22	34.89	54.00	-19.11	28.31	6.28	33.23	32.93	203	357	Average	VERTICAL
2	4872.29	47.25	74.00	-26.75	40.67	6.28	33.23	32.93	203	357	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Nick Peng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 11 / Chain 1+Chain 2+Chain 3+Chain 4
Test Date	Aug. 13, 2016		

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	4915.91	68.01	74.00	-5.99	61.32	6.29	33.32	32.92	273	249	Peak	HORIZONTAL
2	4923.92	52.26	54.00	-1.74	45.54	6.29	33.35	32.92	273	249	Average	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	4922.00	69.50	74.00	-4.50	62.81	6.29	33.32	32.92	261	216	Peak	VERTICAL
2	4924.00	52.66	54.00	-1.34	45.94	6.29	33.35	32.92	261	216	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Nick Peng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 3 / Chain 1+Chain 2+Chain 3+Chain 4
Test Date	Aug. 13, 2016		

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	4844.00	61.11	74.00	-12.89	53.70	8.03	31.12	31.74	302	216	Peak	HORIZONTAL
2	4844.08	48.02	54.00	-5.98	40.61	8.03	31.12	31.74	302	216	Average	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	4843.20	58.73	74.00	-15.27	51.32	8.03	31.12	31.74	202	208	Peak	VERTICAL
2	4843.80	45.92	54.00	-8.08	38.51	8.03	31.12	31.74	202	208	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Brian Sun	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 6 / Chain 1+Chain 2+Chain 3+Chain 4
Test Date	Oct. 19, 2016		

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	4874.05	46.69	74.00	-27.31	40.11	6.28	33.23	32.93	294	271	Peak	HORIZONTAL
2	4874.82	34.03	54.00	-19.97	27.45	6.28	33.23	32.93	294	271	Average	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	4872.78	47.55	74.00	-26.45	40.97	6.28	33.23	32.93	300	332	Peak	VERTICAL
2	4873.95	34.18	54.00	-19.82	27.60	6.28	33.23	32.93	300	332	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Nick Peng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 9 / Chain 1+Chain 2+Chain 3+Chain 4
Test Date	Aug. 13, 2016		

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	4906.40	58.64	74.00	-15.36	51.06	8.09	31.19	31.70	292	239	Peak	HORIZONTAL
2	4908.00	45.94	54.00	-8.06	38.36	8.09	31.19	31.70	292	239	Average	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	4901.00	61.02	74.00	-12.98	53.44	8.09	31.19	31.70	302	204	Peak	VERTICAL
2	4904.00	48.20	54.00	-5.80	40.62	8.09	31.19	31.70	302	204	Average	VERTICAL

For Beamforming Mode

Temperature	22°C	Humidity	54%
Test Engineer	Nick Peng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 1 / Chain 1+Chain 2+Chain 3+Chain 4
Test Date	Aug. 06, 2016		

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	4815.24	39.97	54.00	-14.03	33.66	7.04	34.17	34.90	153	310	Average	HORIZONTAL
2	4832.00	47.26	74.00	-26.74	40.87	7.08	34.21	34.90	153	310	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	4814.92	40.16	54.00	-13.84	33.85	7.04	34.17	34.90	156	214	Average	VERTICAL
2	4816.92	48.00	74.00	-26.00	41.69	7.04	34.17	34.90	156	214	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Brian Sun	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 6 / Chain 1+Chain 2+Chain 3+Chain 4
Test Date	Oct. 21, 2016		

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	4865.60	47.72	74.00	-26.28	41.18	6.27	33.20	32.93	116	86	Peak	HORIZONTAL
2	4874.00	39.53	54.00	-14.47	32.95	6.28	33.23	32.93	116	86	Average	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	4865.08	35.20	54.00	-18.80	28.66	6.27	33.20	32.93	155	206	Average	VERTICAL
2	4876.92	47.61	74.00	-26.39	41.03	6.28	33.23	32.93	155	206	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Nick Peng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 11 / Chain 1+Chain 2+Chain 3+Chain 4
Test Date	Aug. 06, 2016		

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	4926.72	39.42	54.00	-14.58	32.51	7.31	34.50	34.90	153	187	Average	HORIZONTAL
2	4929.68	48.86	74.00	-25.14	41.95	7.31	34.50	34.90	153	187	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	4915.52	42.00	54.00	-12.00	35.16	7.28	34.46	34.90	156	214	Average	VERTICAL
2	4926.68	48.83	74.00	-25.17	41.92	7.31	34.50	34.90	156	214	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Nick Peng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 3 / Chain 1+Chain 2+Chain 3+Chain 4
Test Date	Aug. 06, 2016		

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	4842.00	39.32	54.00	-14.68	32.86	7.11	34.25	34.90	154	224	Average	HORIZONTAL
2	4846.40	46.99	74.00	-27.01	40.53	7.11	34.25	34.90	154	224	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	4845.28	42.03	54.00	-11.97	35.57	7.11	34.25	34.90	156	90	Average	VERTICAL
2	4849.72	47.26	74.00	-26.74	40.80	7.11	34.25	34.90	156	90	Peak	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Brian Sun	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 6 / Chain 1+Chain 2+Chain 3+Chain 4
Test Date	Oct. 21, 2016		

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	4854.80	36.82	54.00	-17.18	30.28	6.27	33.20	32.93	142	277	Average	HORIZONTAL
2	4871.04	47.45	74.00	-26.55	40.87	6.28	33.23	32.93	142	277	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	4856.16	47.48	74.00	-26.52	40.94	6.27	33.20	32.93	149	88	Peak	VERTICAL
2	4893.68	37.00	54.00	-17.00	30.38	6.28	33.26	32.92	149	88	Average	VERTICAL

Temperature	22°C	Humidity	54%
Test Engineer	Nick Peng	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 9 / Chain 1+Chain 2+Chain 3+Chain 4
Test Date	Aug. 06, 2016		

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	4908.24	35.85	54.00	-18.15	29.09	7.24	34.42	34.90	162	222	Average	HORIZONTAL
2	4910.40	48.54	74.00	-25.46	41.70	7.28	34.46	34.90	162	222	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	4895.12	39.15	54.00	-14.85	32.46	7.21	34.38	34.90	146	136	Average	VERTICAL
2	4907.04	57.62	74.00	-16.38	50.86	7.24	34.42	34.90	146	136	Peak	VERTICAL

Note:

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

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

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

4.6. Emissions Measurement

4.6.1. Limit

30dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

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

4.6.2. Measuring Instruments and Setting

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

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	100 MHz
RBW / VBW (Emission in restricted band)	1MHz / 3MHz for Peak, 1MHz / 1/T for Average
RBW / VBW (30dBc in any 100 kHz bandwidth emission)	100 kHz / 300 kHz for Peak

4.6.3. Test Procedures

For Radiated band edges Measurement:

The test procedure is the same as section 4.5.3.

For Radiated Out of Band Emission Measurement:

Test was performed in accordance with KDB558074 D01 v03r05 for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 11.0 Unwanted Emissions into Non-Restricted Frequency Bands Measurement Procedure

4.6.4. Test Setup Layout

For Radiated band edges Measurement:

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

For Radiated Out of Band Emission Measurement:

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

4.6.5. Test Deviation

There is no deviation with the original standard.

4.6.6. EUT Operation during Test

For Non-Beamforming Mode:

The EUT was programmed to be in continuously transmitting mode.

For Beamforming Mode:

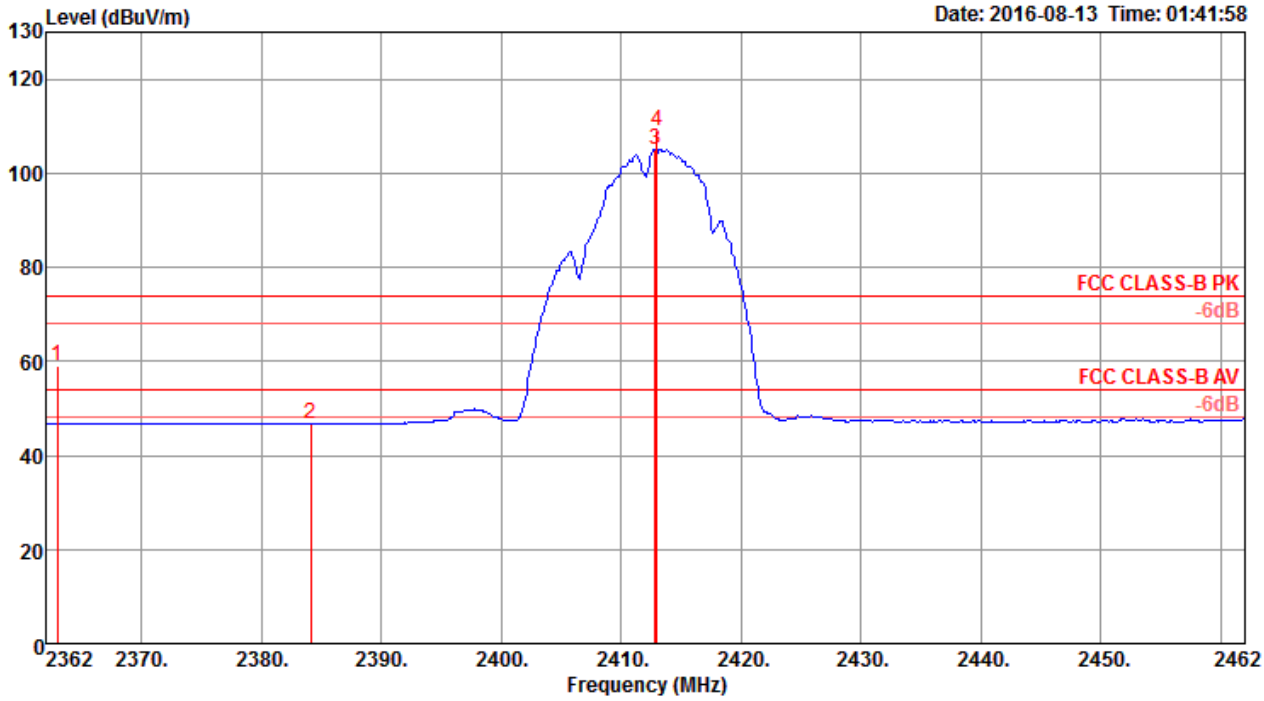
The EUT was programmed to be in beamforming transmitting mode.

4.6.7. Test Result of Band Edge and Fundamental Emissions

For Non-Beamforming Mode

Temperature	22°C	Humidity	54%
Test Engineer	Nick Peng/Brian Sun	Configurations	IEEE 802.11b CH 1, 6, 11 / Chain 1+Chain 2+Chain 3+Chain 4

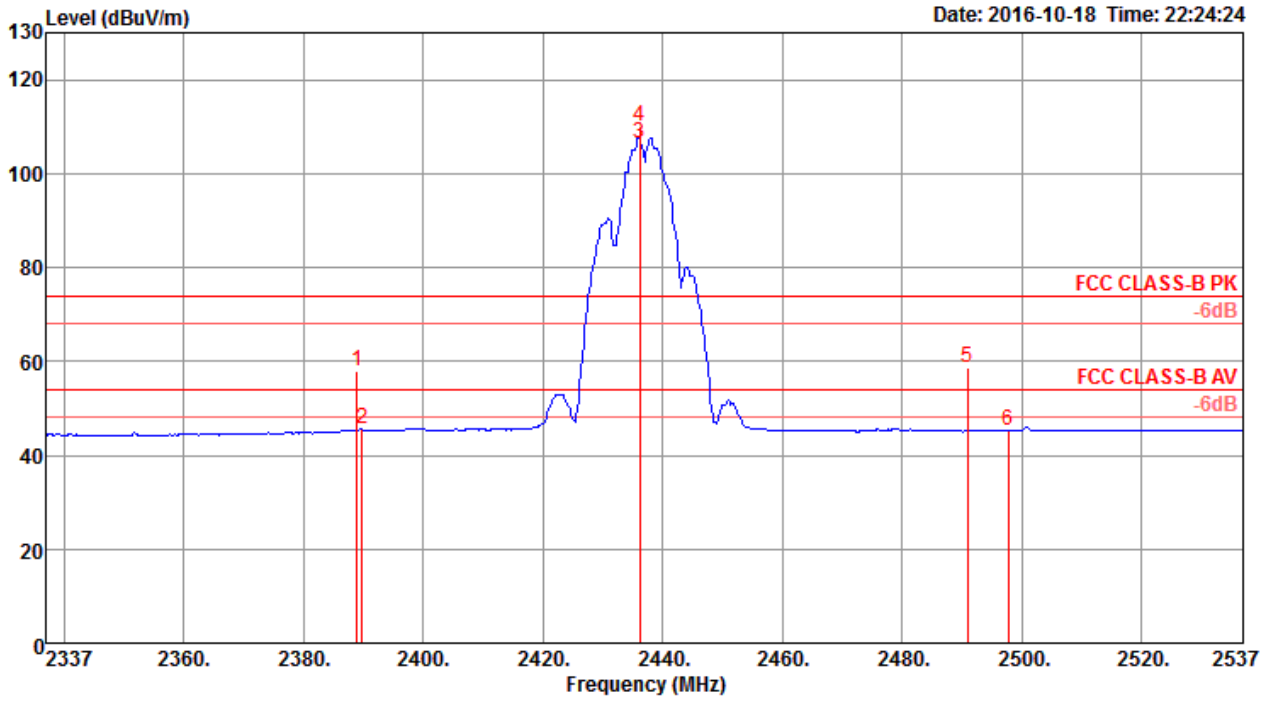
Channel 1



	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	2362.96	59.08	74.00	-14.92	27.22	3.58	28.28	0.00	292	183	Peak	VERTICAL
2	2384.12	46.85	54.00	-7.15	14.94	3.60	28.31	0.00	292	183	Average	VERTICAL
3	2412.80	104.93			72.95	3.62	28.36	0.00	292	183	Average	VERTICAL
4	2412.96	108.89			76.91	3.62	28.36	0.00	292	183	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 2412 MHz.

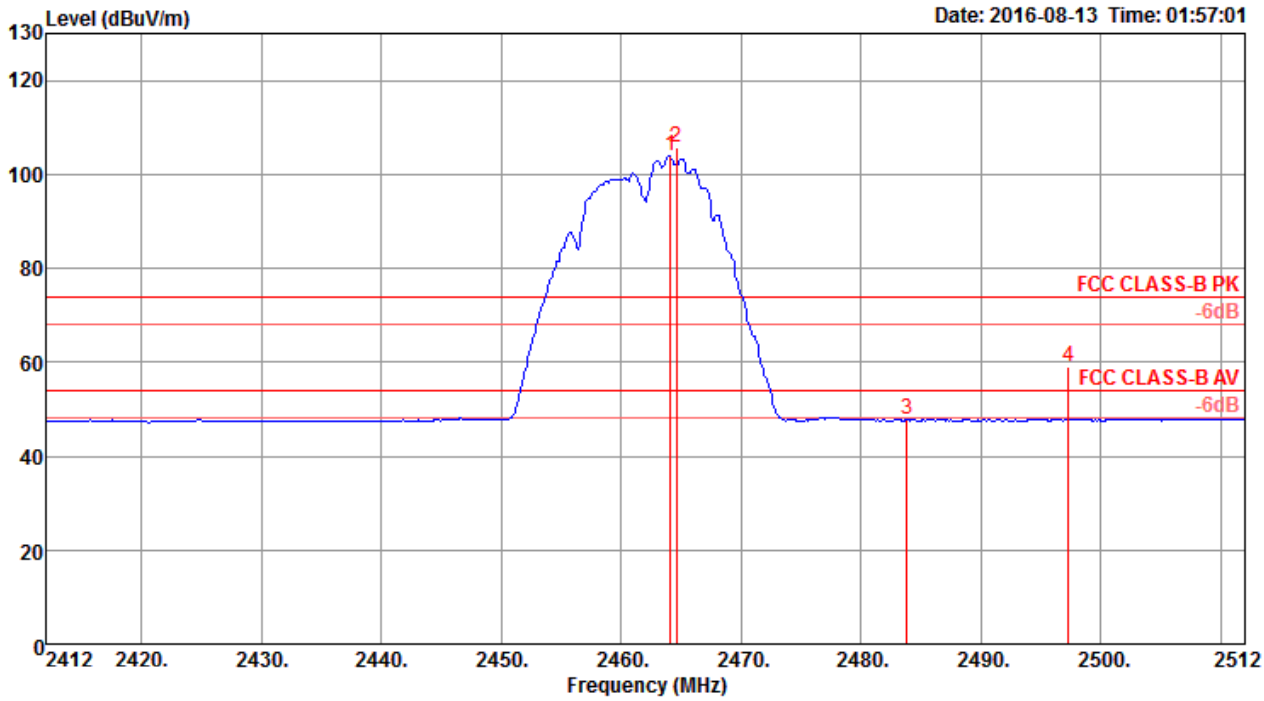
Channel 6



	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	2389.00	57.90	74.00	-16.10	25.99	3.60	28.31	0.00	261	349	Peak	HORIZONTAL
2	2389.80	45.54	54.00	-8.46	13.63	3.60	28.31	0.00	261	349	Average	HORIZONTAL
3	2436.20	106.49			74.46	3.64	28.39	0.00	261	349	Average	HORIZONTAL
4	2436.20	110.11			78.08	3.64	28.39	0.00	261	349	Peak	HORIZONTAL
5	2491.00	58.70	74.00	-15.30	26.53	3.68	28.49	0.00	261	349	Peak	HORIZONTAL
6	2497.80	45.30	54.00	-8.70	13.11	3.69	28.50	0.00	261	349	Average	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 11

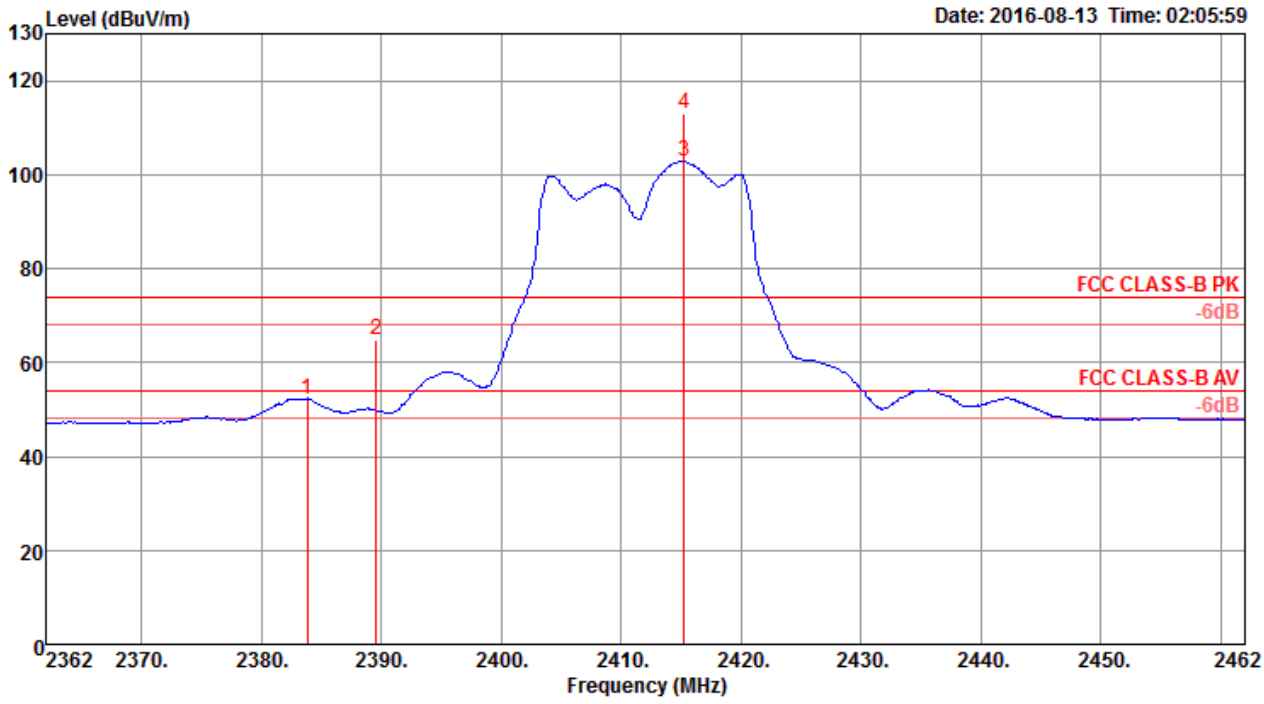


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2464.08	103.83			71.73	3.66	28.44	0.00	224	164	Average	HORIZONTAL
2	2464.56	105.72			73.62	3.66	28.44	0.00	224	164	Peak	HORIZONTAL
3	2483.80	47.91	54.00	-6.09	15.75	3.68	28.48	0.00	224	164	Average	HORIZONTAL
4	2497.26	59.09	74.00	-14.91	26.90	3.69	28.50	0.00	224	164	Peak	HORIZONTAL

Item 1, 2 are the fundamental frequency at 2462 MHz.

Temperature	22°C	Humidity	54%
Test Engineer	Nick Peng/Brian Sun	Configurations	IEEE 802.11g CH 1, 6, 11 / Chain 1+Chain 2+Chain 3+Chain 4

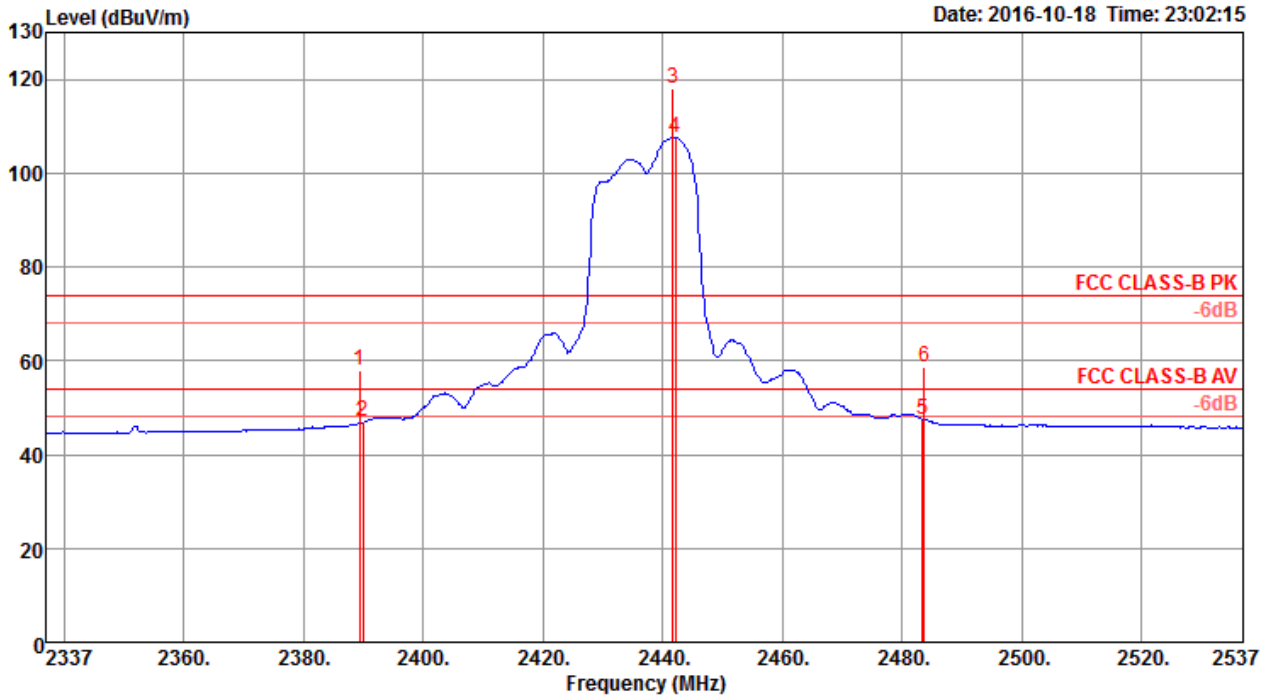
Channel 1



	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	2383.80	52.12	54.00	-1.88	20.21	3.60	28.31	0.00	248	188	Average	HORIZONTAL
2	2389.56	64.92	74.00	-9.08	33.01	3.60	28.31	0.00	248	188	Peak	HORIZONTAL
3	2415.21	102.87			70.89	3.62	28.36	0.00	248	188	Average	HORIZONTAL
4	2415.21	112.98			81.00	3.62	28.36	0.00	248	188	Peak	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2412 MHz.

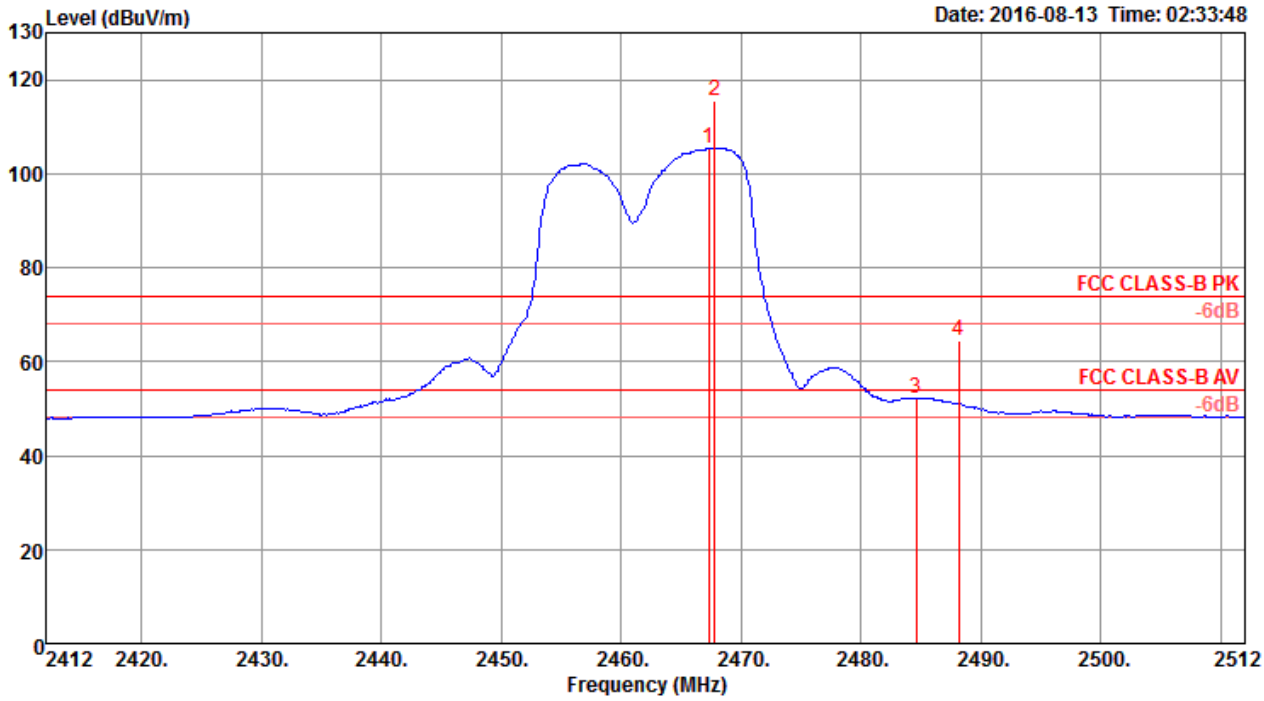
Channel 6



	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	2389.40	57.93	74.00	-16.07	26.02	3.60	28.31	0.00	149	360	Peak	VERTICAL
2	2390.00	46.96	54.00	-7.04	15.05	3.60	28.31	0.00	149	360	Average	VERTICAL
3	2441.80	118.00			85.95	3.64	28.41	0.00	149	360	Peak	VERTICAL
4	2442.20	107.57			75.52	3.64	28.41	0.00	149	360	Average	VERTICAL
5	2483.50	47.55	54.00	-6.45	15.39	3.68	28.48	0.00	149	360	Average	VERTICAL
6	2483.80	58.84	74.00	-15.16	26.68	3.68	28.48	0.00	149	360	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 11

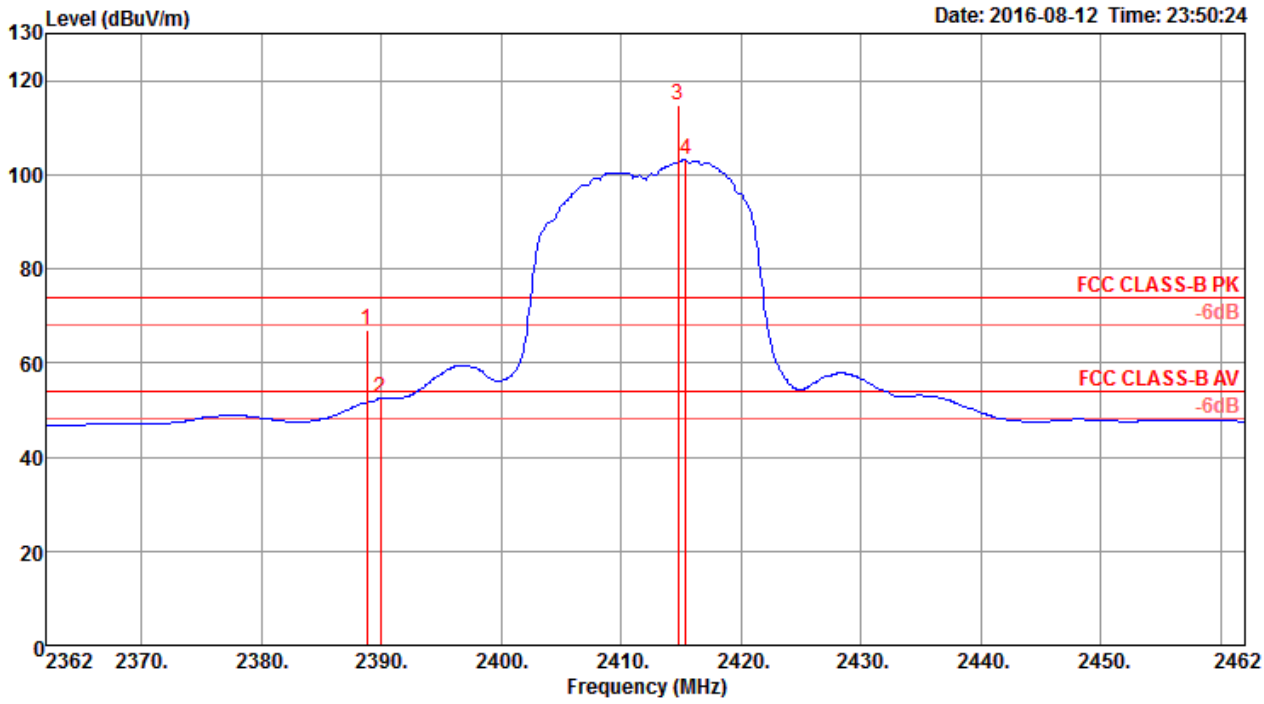


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2467.29	105.38			73.28	3.66	28.44	0.00	125	177	Average	VERTICAL
2	2467.77	115.38			83.26	3.67	28.45	0.00	125	177	Peak	VERTICAL
3	2484.60	52.13	54.00	-1.87	19.97	3.68	28.48	0.00	125	177	Average	VERTICAL
4	2488.12	64.32	74.00	-9.68	32.16	3.68	28.48	0.00	125	177	Peak	VERTICAL

Item 1, 2 are the fundamental frequency at 2462 MHz.

Temperature	22°C	Humidity	54%
Test Engineer	Nick Peng/Brian Sun	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 1, 6, 11 / Chain 1+Chain 2+Chain 3+Chain 4

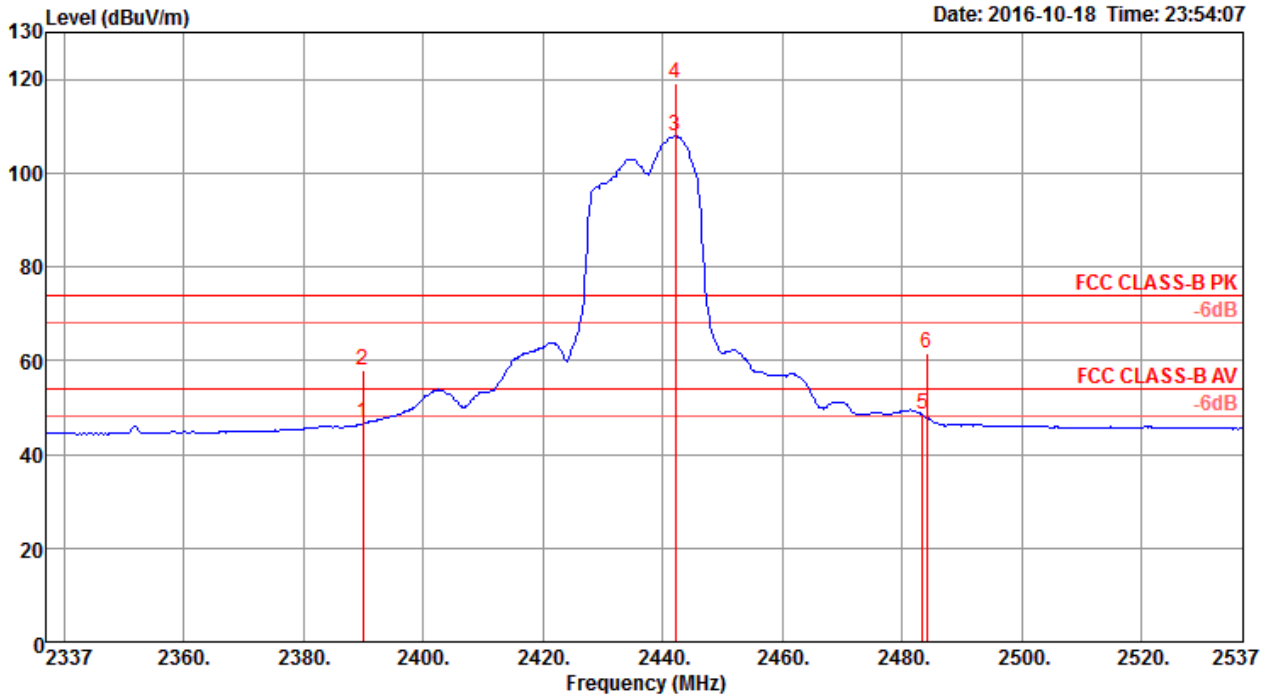
Channel 1



	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	2388.76	66.86	74.00	-7.14	34.95	3.60	28.31	0.00	113	142	Peak	HORIZONTAL
2	2389.89	52.37	54.00	-1.63	20.46	3.60	28.31	0.00	113	142	Average	HORIZONTAL
3	2414.72	114.70			82.72	3.62	28.36	0.00	113	142	Peak	HORIZONTAL
4	2415.37	103.12			71.14	3.62	28.36	0.00	113	142	Average	HORIZONTAL

Item 3, 4 are the fundamental frequency at 2412 MHz.

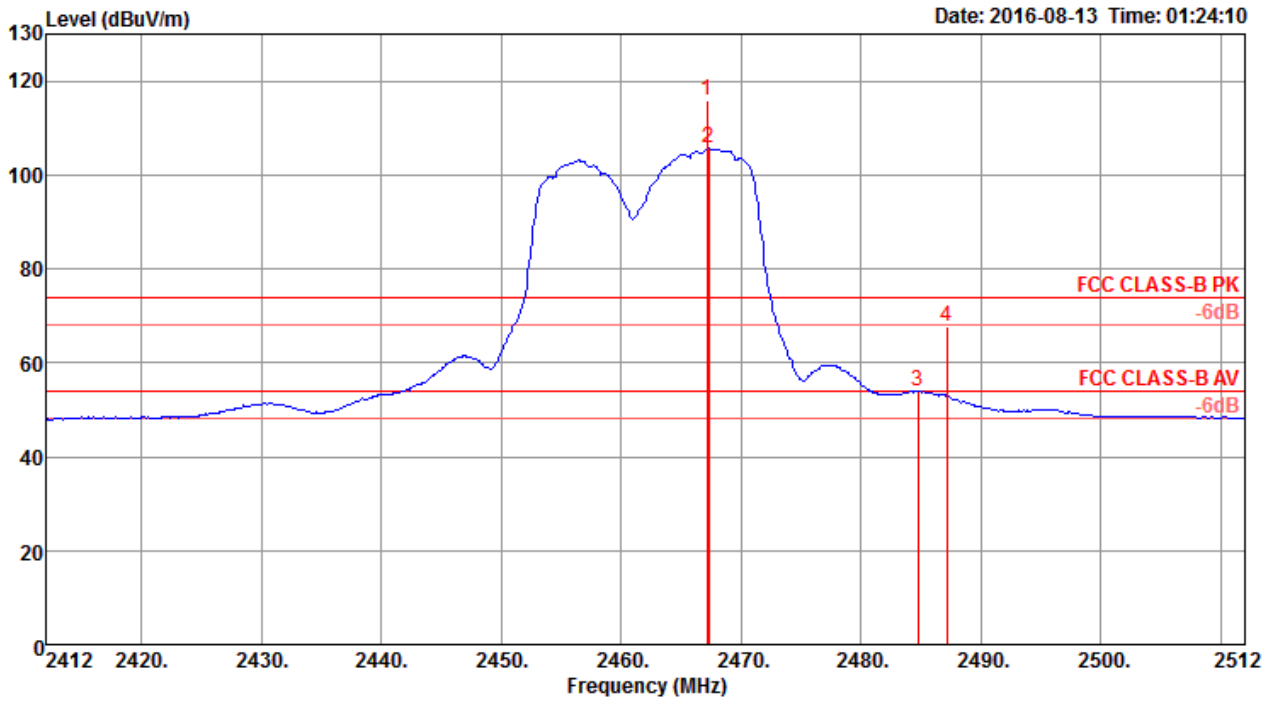
Channel 6



	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	2390.00	46.54	54.00	-7.46	14.63	3.60	28.31	0.00	151	359	Average	VERTICAL
2	2390.00	57.84	74.00	-16.16	25.93	3.60	28.31	0.00	151	359	Peak	VERTICAL
3	2442.20	107.96			75.91	3.64	28.41	0.00	151	359	Average	VERTICAL
4	2442.20	119.00			86.95	3.64	28.41	0.00	151	359	Peak	VERTICAL
5	2483.50	48.50	54.00	-5.50	16.34	3.68	28.48	0.00	151	359	Average	VERTICAL
6	2484.20	61.50	74.00	-12.50	29.34	3.68	28.48	0.00	151	359	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 11

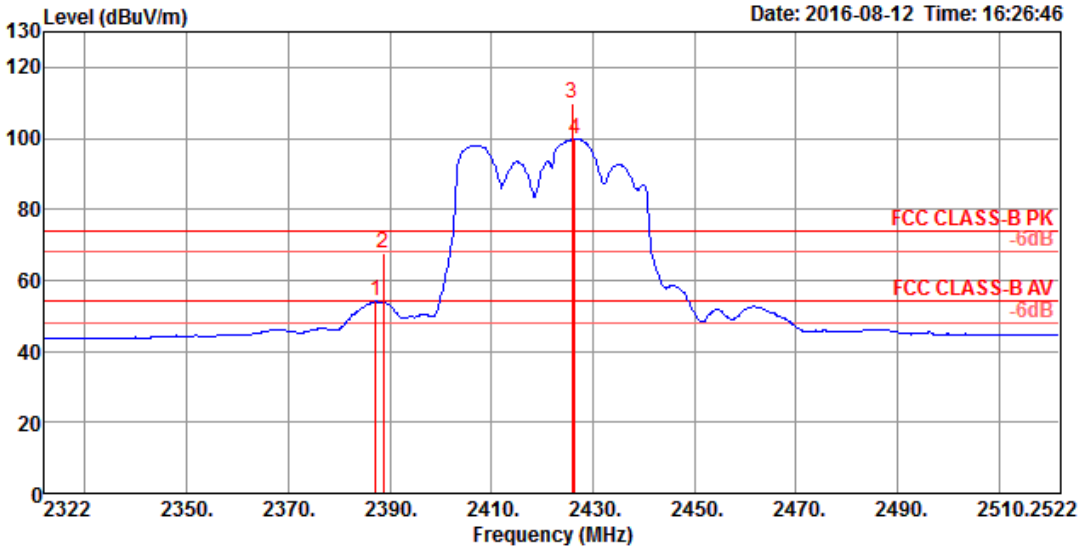


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2467.13	115.71			83.61	3.66	28.44	0.00	127	179	Peak	VERTICAL
2	2467.29	105.58			73.48	3.66	28.44	0.00	127	179	Average	VERTICAL
3	2484.76	53.96	54.00	-0.04	21.80	3.68	28.48	0.00	127	179	Average	VERTICAL
4	2487.16	67.56	74.00	-6.44	35.40	3.68	28.48	0.00	127	179	Peak	VERTICAL

Item 1, 2 are the fundamental frequency at 2462 MHz.

Temperature	22°C	Humidity	54%
Test Engineer	Nick Peng/Brian Sun	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 3, 6, 9 / Chain 1+Chain 2+Chain 3+Chain 4

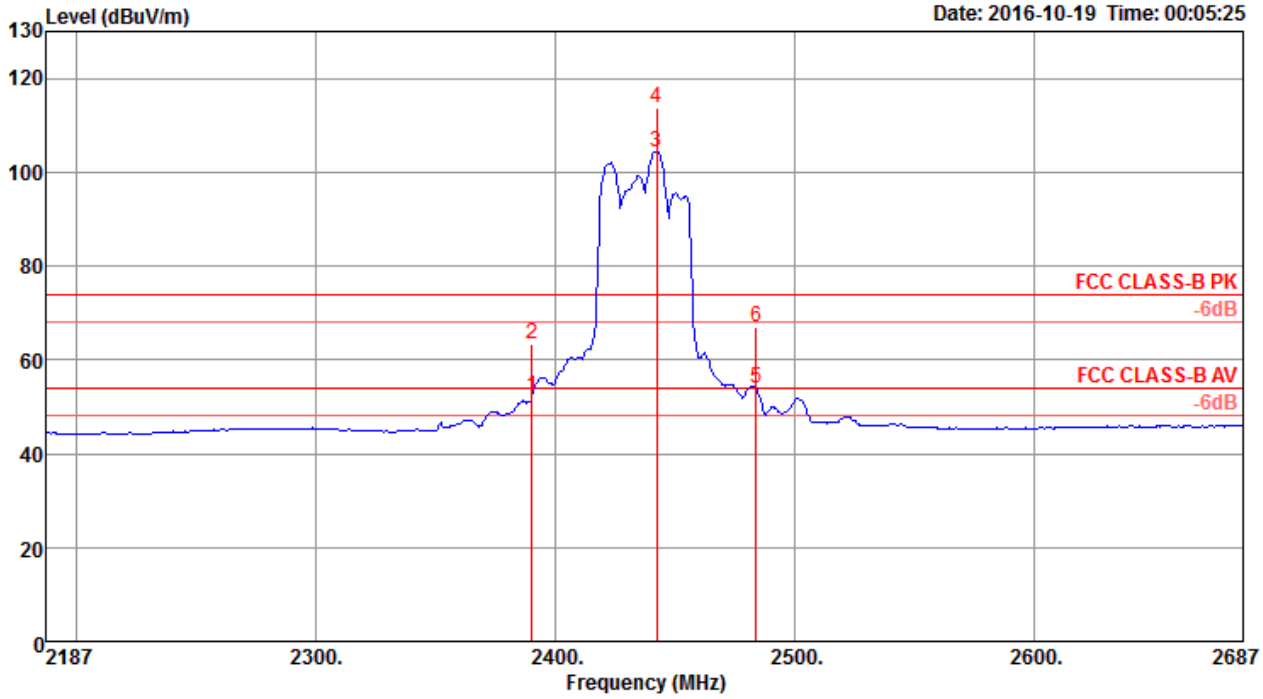
Channel 3



	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	2387.20	53.99	54.00	-0.01	22.73	4.03	27.23	0.00	236	171	Average	VERTICAL
2	2388.80	67.42	74.00	-6.58	36.16	4.03	27.23	0.00	236	171	Peak	VERTICAL
3 0	2426.00	109.79			78.40	4.06	27.33	0.00	236	171	Peak	VERTICAL
4 0	2426.40	99.77			68.38	4.06	27.33	0.00	236	171	Average	VERTICAL

Item 3, 4 are the fundamental frequency at 2422 MHz.

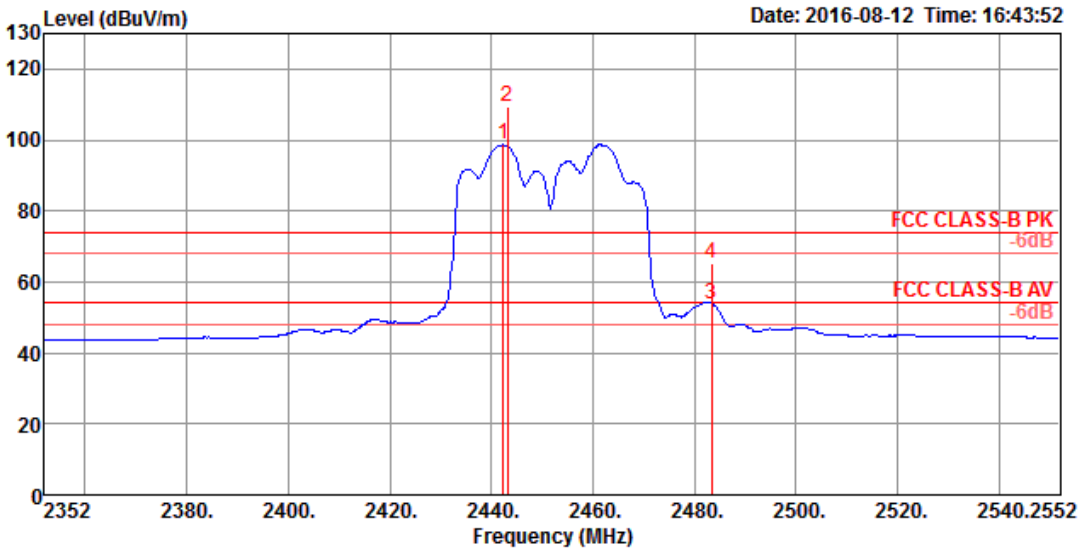
Channel 6



	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	2390.00	52.09	54.00	-1.91	20.18	3.60	28.31	0.00	156	360	Average	VERTICAL
2	2390.00	63.21	74.00	-10.79	31.30	3.60	28.31	0.00	156	360	Peak	VERTICAL
3	2442.00	104.46			72.41	3.64	28.41	0.00	156	360	Average	VERTICAL
4	2442.00	113.81			81.76	3.64	28.41	0.00	156	360	Peak	VERTICAL
5	2483.50	53.92	54.00	-0.08	21.76	3.68	28.48	0.00	156	360	Average	VERTICAL
6	2483.50	67.08	74.00	-6.92	34.92	3.68	28.48	0.00	156	360	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 9



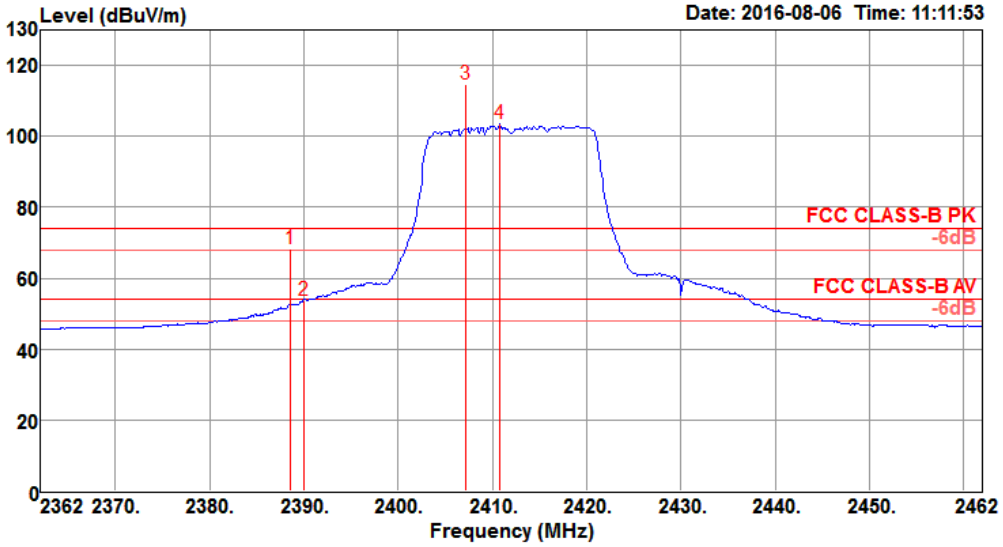
		Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
		MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	0	2442.40	98.65			67.22	4.07	27.36	0.00	179	183	Average	HORIZONTAL
2	0	2443.20	109.44			78.01	4.07	27.36	0.00	179	183	Peak	HORIZONTAL
3		2483.50	53.77	54.00	-0.23	22.20	4.10	27.47	0.00	179	183	Average	HORIZONTAL
4		2483.50	65.22	74.00	-8.78	33.65	4.10	27.47	0.00	179	183	Peak	HORIZONTAL

Item 1, 2 are the fundamental frequency at 2452 MHz.

For Beamforming Mode

Temperature	22℃	Humidity	54%
Test Engineer	Nick Peng/Brian Sun	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 1, 6, 11 / Chain 1+Chain 2+Chain 3+Chain 4

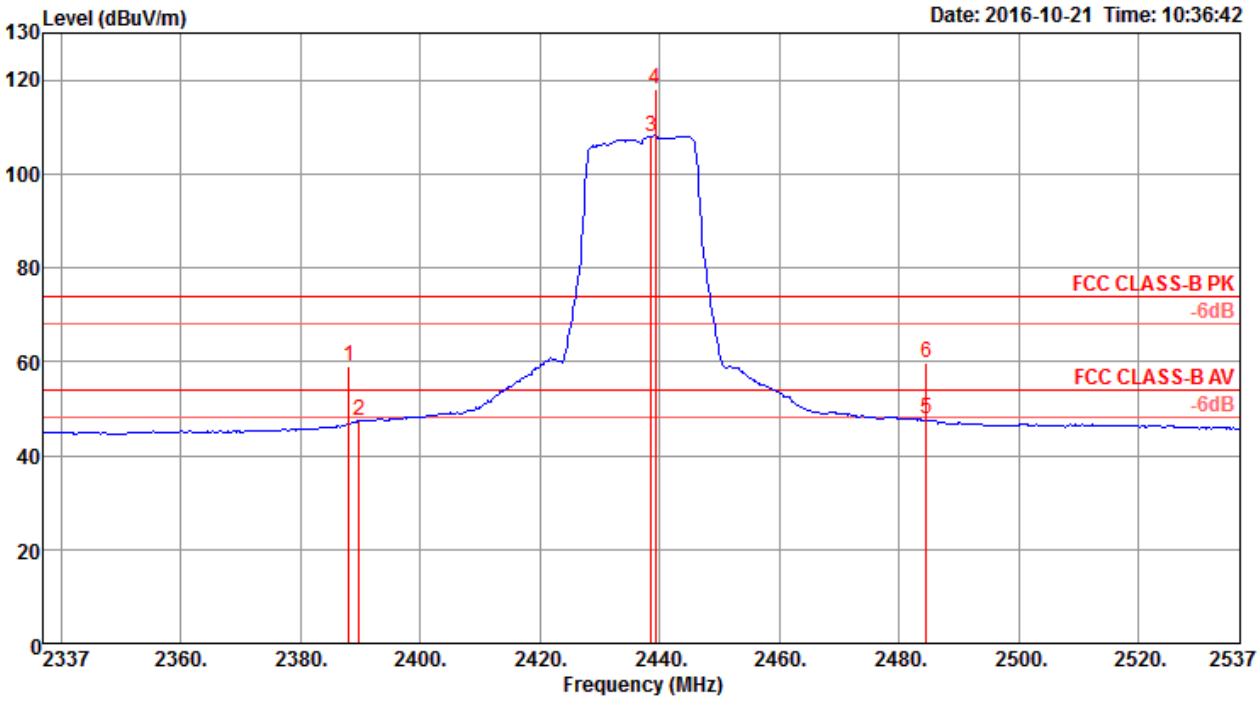
Channel 1



	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	2388.60	68.29	74.00	-5.71	35.18	4.54	28.57	0.00	230	175	Peak	VERTICAL
2	2390.00	53.89	54.00	-0.11	20.78	4.54	28.57	0.00	230	175	Average	VERTICAL
3	2407.20	114.85			81.67	4.57	28.61	0.00	230	175	Peak	VERTICAL
4	2410.80	103.67			70.49	4.57	28.61	0.00	230	175	Average	VERTICAL

Item 3, 4 are the fundamental frequency at 2412 MHz.

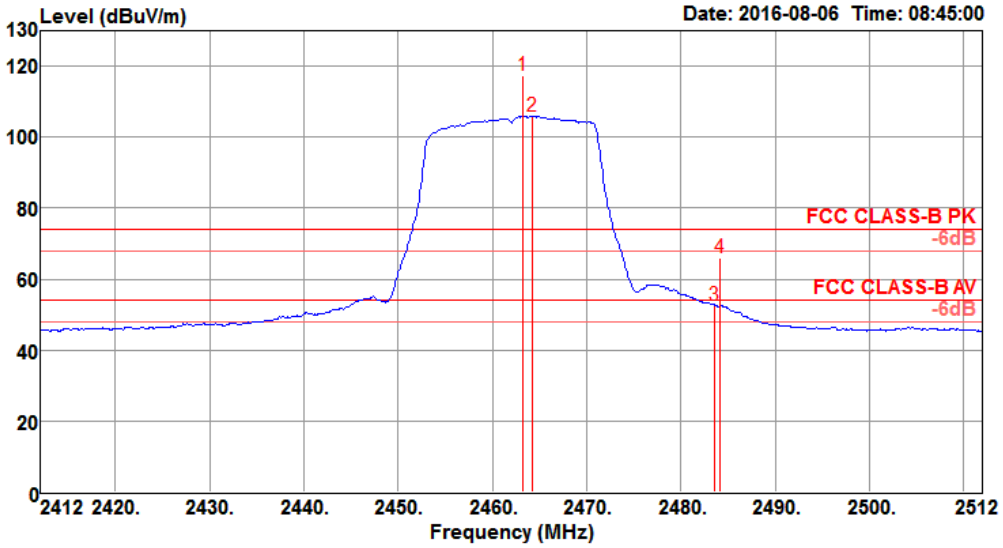
Channel 6



	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	2388.20	59.11	74.00	-14.89	27.20	3.60	28.31	0.00	151	24	Peak	VERTICAL
2	2389.80	47.28	54.00	-6.72	15.37	3.60	28.31	0.00	151	24	Average	VERTICAL
3	2438.60	107.96			75.93	3.64	28.39	0.00	151	24	Average	VERTICAL
4	2439.40	118.09			86.04	3.64	28.41	0.00	151	24	Peak	VERTICAL
5	2484.60	47.76	54.00	-6.24	15.60	3.68	28.48	0.00	151	24	Average	VERTICAL
6	2484.60	59.77	74.00	-14.23	27.61	3.68	28.48	0.00	151	24	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 11

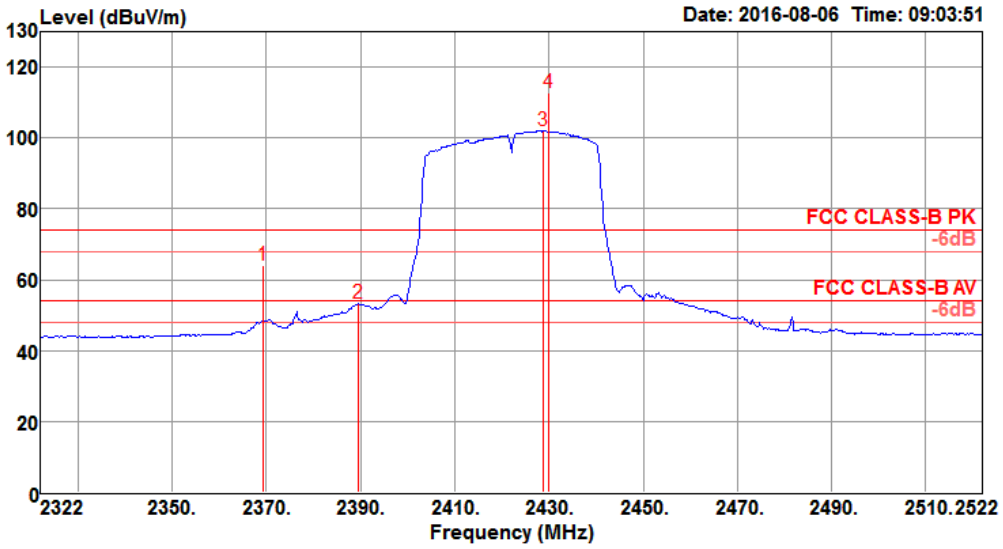


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2463.20	117.24			83.90	4.61	28.73	0.00	202	178	Peak	VERTICAL
2	2464.20	105.95			72.61	4.61	28.73	0.00	202	178	Average	VERTICAL
3	2483.50	52.69	54.00	-1.31	19.29	4.63	28.77	0.00	202	178	Average	VERTICAL
4	2484.20	66.16	74.00	-7.84	32.76	4.63	28.77	0.00	202	178	Peak	VERTICAL

Item 1, 2 are the fundamental frequency at 2462 MHz.

Temperature	22°C	Humidity	54%
Test Engineer	Nick Peng/Brian Sun	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 3, 6, 9 / Chain 1+Chain 2+Chain 3+Chain 4

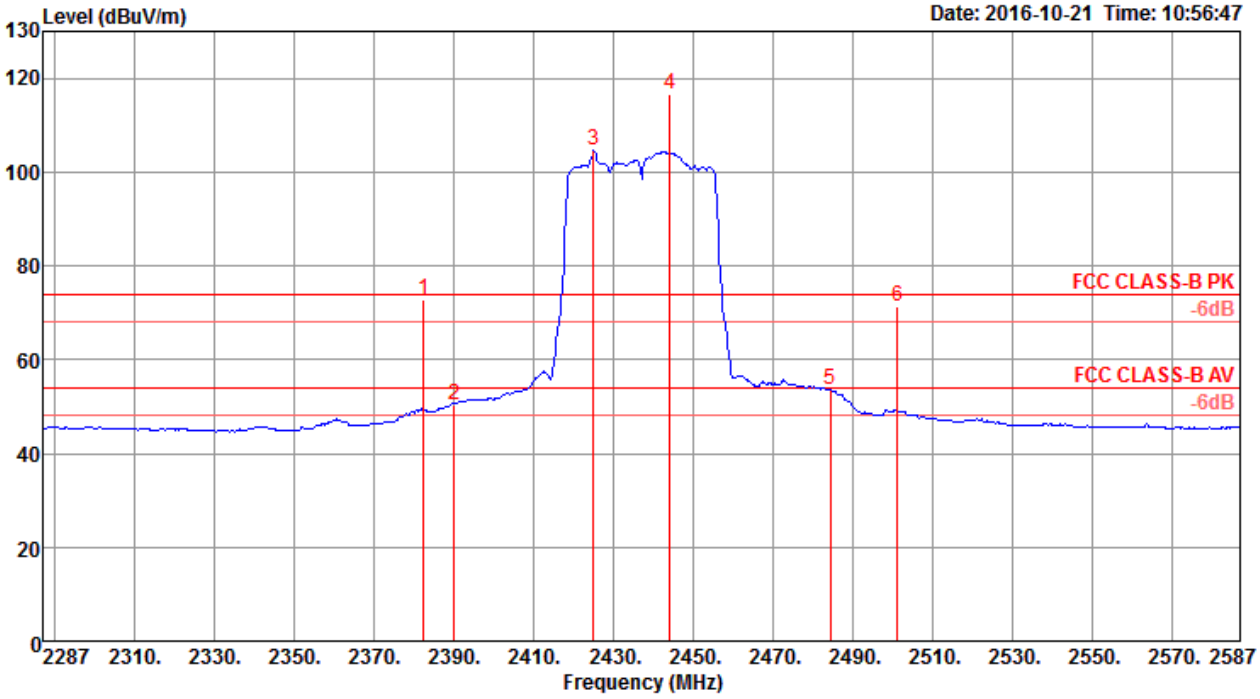
Channel 3



	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	2369.20	64.25	74.00	-9.75	31.20	4.52	28.53	0.00	226	176	Peak	VERTICAL
2	2389.60	53.26	54.00	-0.74	20.15	4.54	28.57	0.00	226	176	Average	VERTICAL
3	2428.80	102.11			68.87	4.58	28.66	0.00	226	176	Average	VERTICAL
4	2430.00	112.59			79.35	4.58	28.66	0.00	226	176	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 2422 MHz.

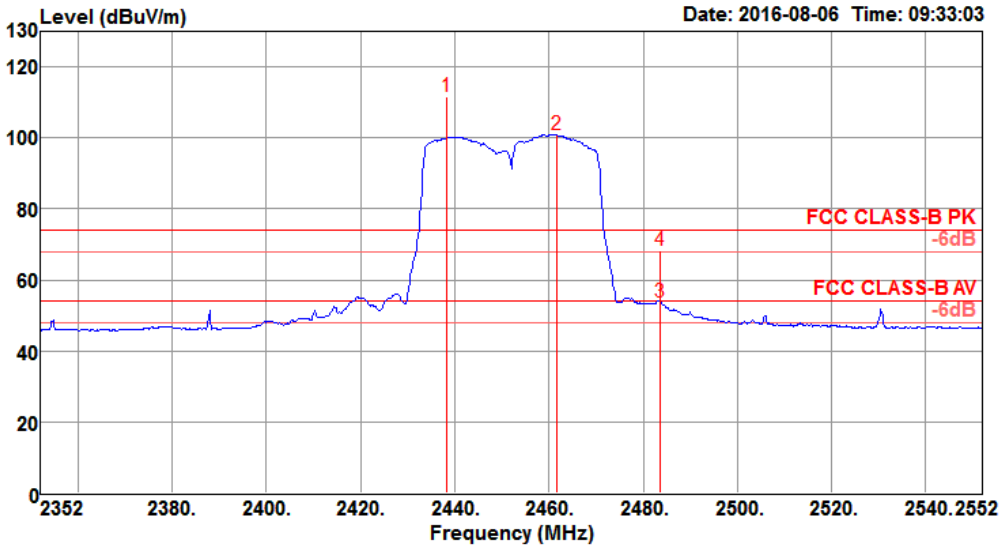
Channel 6



	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	2382.40	72.93	74.00	-1.07	41.04	3.59	28.30	0.00	151	13	Peak	VERTICAL
2	2390.00	50.49	54.00	-3.51	18.58	3.60	28.31	0.00	151	13	Average	VERTICAL
3	2425.00	104.66			72.66	3.63	28.37	0.00	151	13	Average	VERTICAL
4	2444.20	116.71			84.66	3.64	28.41	0.00	151	13	Peak	VERTICAL
5	2484.40	53.53	54.00	-0.47	21.37	3.68	28.48	0.00	151	13	Average	VERTICAL
6	2501.20	71.24	74.00	-2.76	39.05	3.69	28.50	0.00	151	13	Peak	VERTICAL

Item 3, 4 are the fundamental frequency at 2437 MHz.

Channel 9



	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	2438.40	111.68			78.42	4.59	28.67	0.00	215	181	Peak	VERTICAL
2	2461.60	100.94			67.60	4.61	28.73	0.00	215	181	Average	VERTICAL
3	2483.50	53.72	54.00	-0.28	20.32	4.63	28.77	0.00	215	181	Average	VERTICAL
4	2483.50	68.39	74.00	-5.61	34.99	4.63	28.77	0.00	215	181	Peak	VERTICAL

Item 1, 2 are the fundamental frequency at 2452 MHz.

Note:

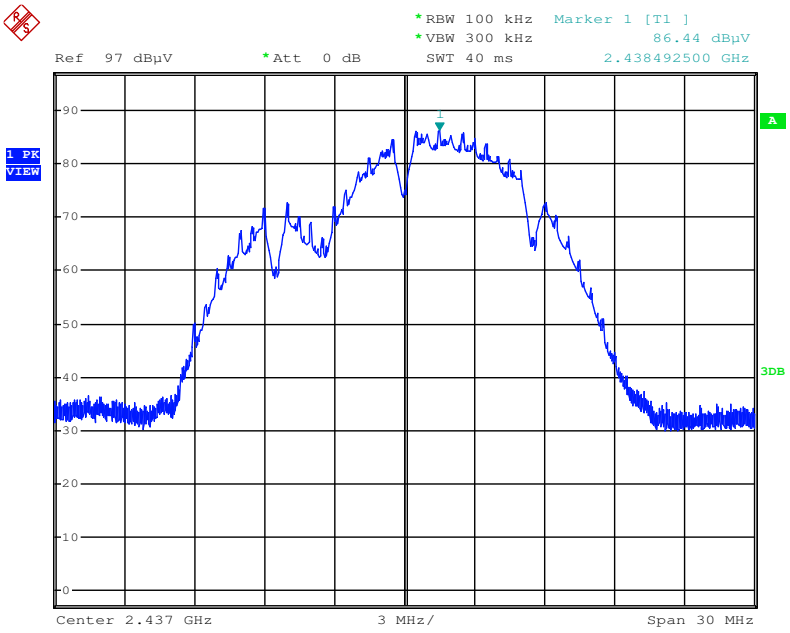
Emission level (dBuV/m) = 20 log Emission level (uV/m).

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

For Emission not in Restricted Band

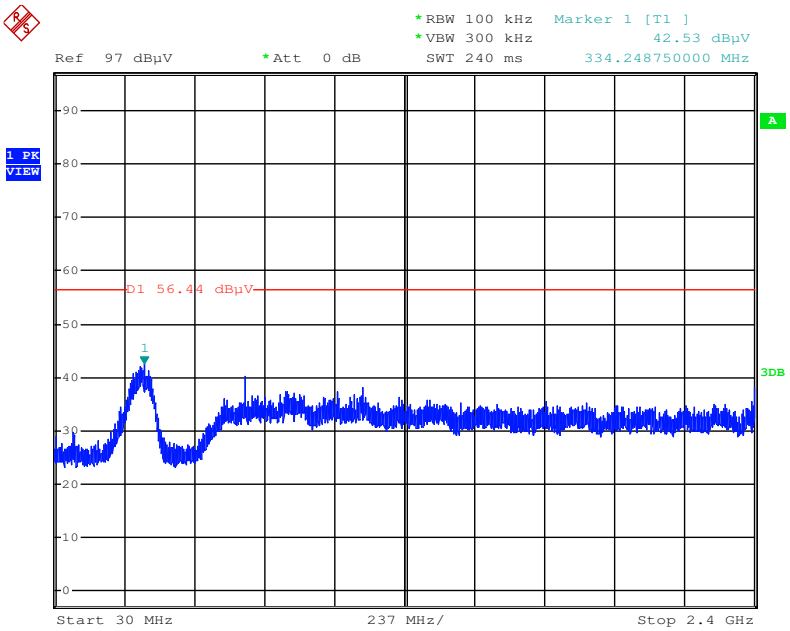
For Non-Beamforming Mode

Plot on Configuration IEEE 802.11b / Reference Level



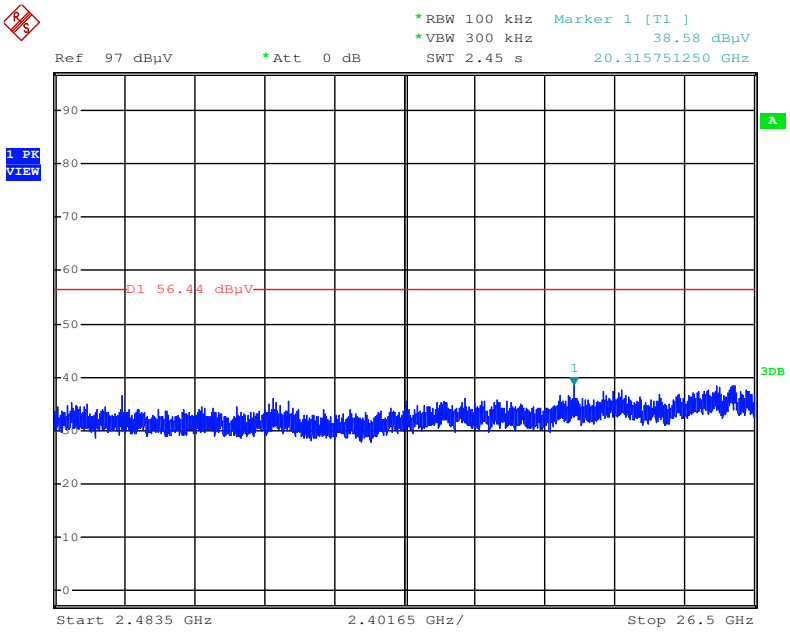
Date: 13.AUG.2016 11:03:40

Plot on Configuration IEEE 802.11b / CH 1 / 30MHz~2400MHz (down 30dBc)



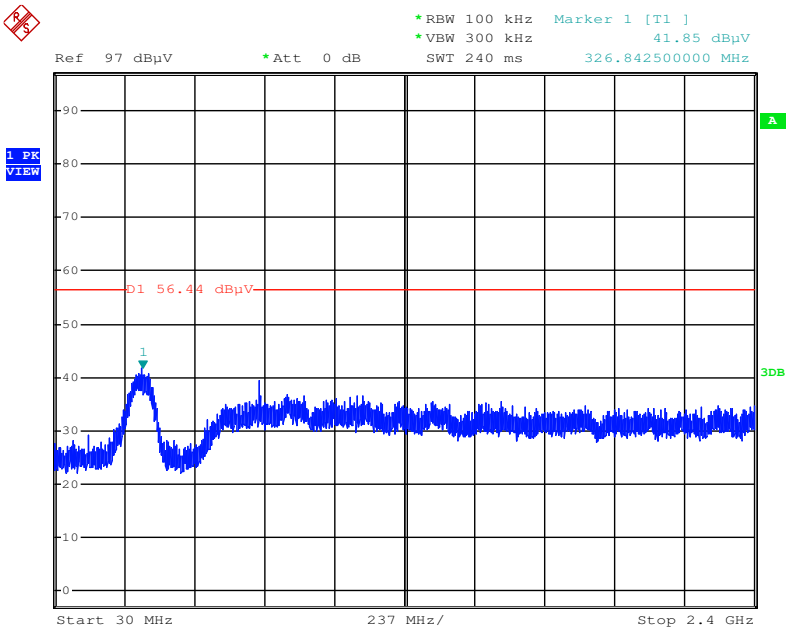
Date: 13.AUG.2016 11:08:31

Plot on Configuration IEEE 802.11b / CH 1 / 2483.5MHz~26500MHz (down 30dBc)



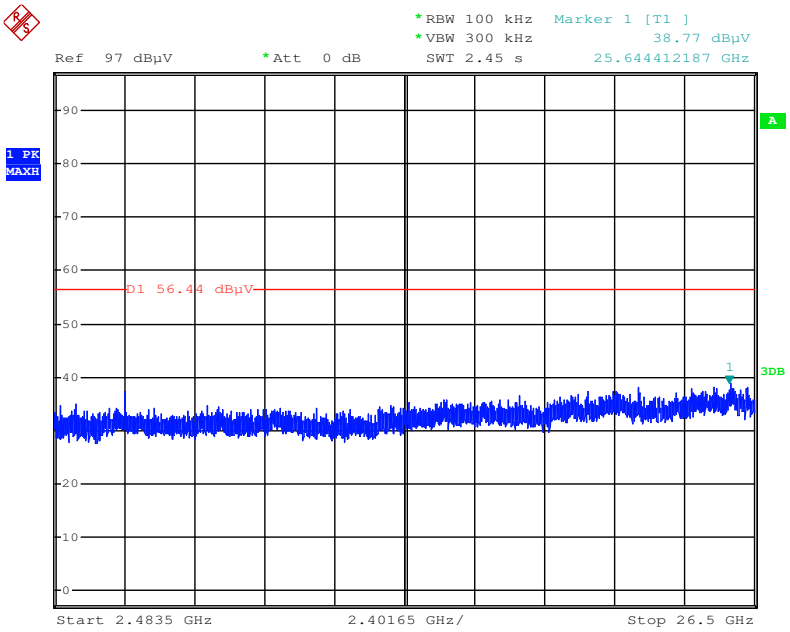
Date: 13.AUG.2016 11:09:13

Plot on Configuration IEEE 802.11b / CH 11 / 30MHz~2400MHz (down 30dBc)



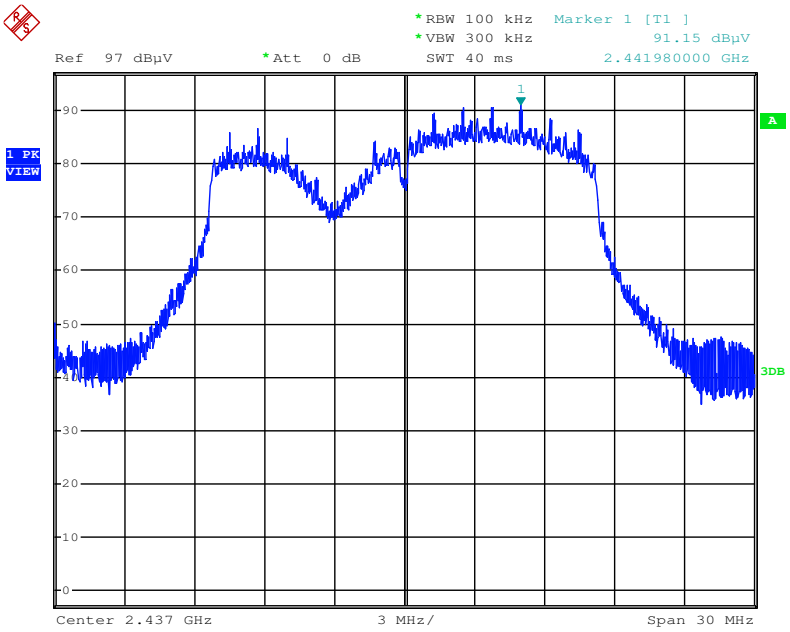
Date: 13.AUG.2016 11:10:00

Plot on Configuration IEEE 802.11b / CH 11 / 2483.5MHz~26500MHz (down 30dBc)



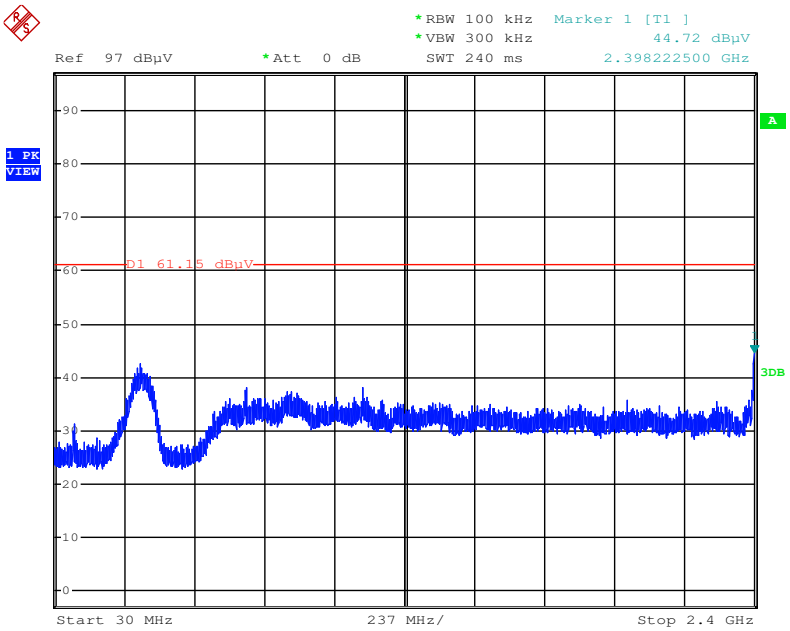
Date: 13.AUG.2016 11:10:34

Plot on Configuration IEEE 802.11g / Reference Level



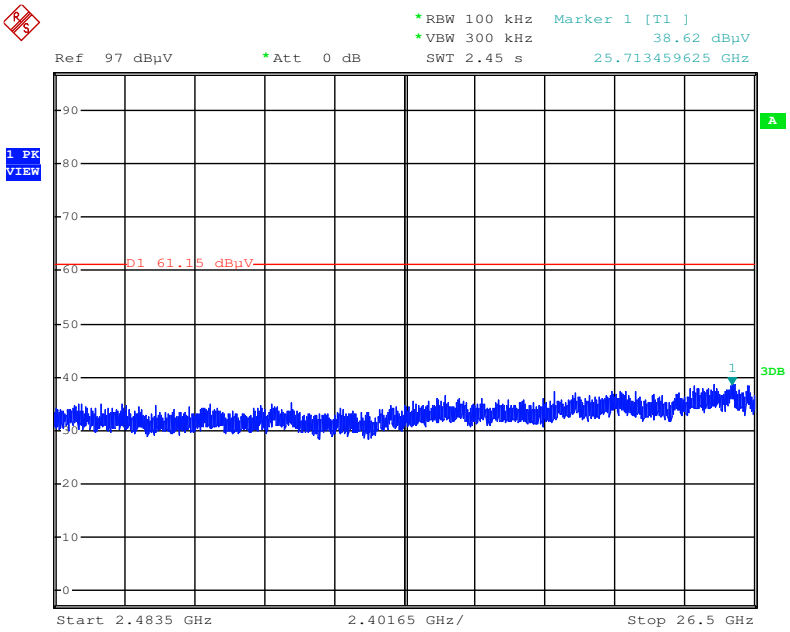
Date: 13.AUG.2016 11:11:48

Plot on Configuration IEEE 802.11g / CH 1 / 30MHz~2400MHz (down 30dBc)



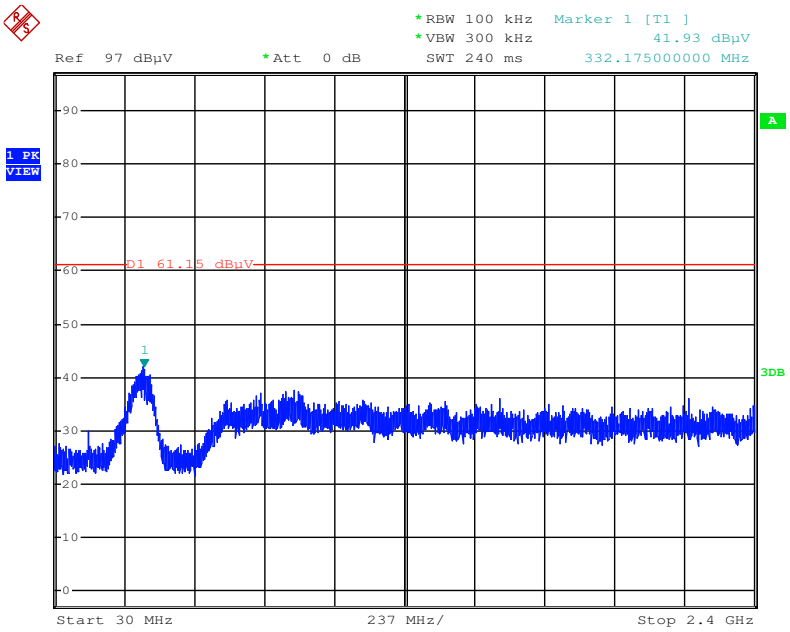
Date: 13.AUG.2016 11:17:10

Plot on Configuration IEEE 802.11g / CH 1 / 2483.5MHz~26500MHz (down 30dBc)



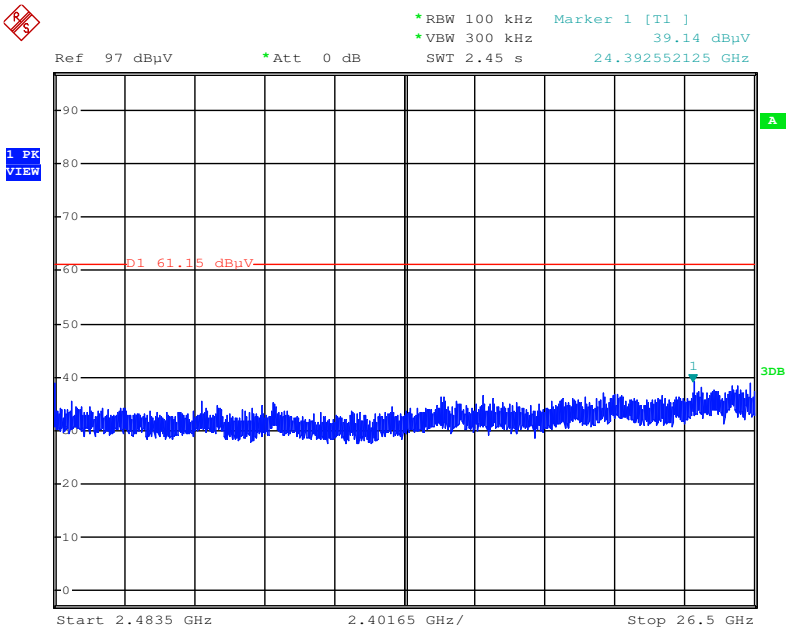
Date: 13.AUG.2016 11:14:26

Plot on Configuration IEEE 802.11g / CH 11 / 30MHz~2400MHz (down 30dBc)



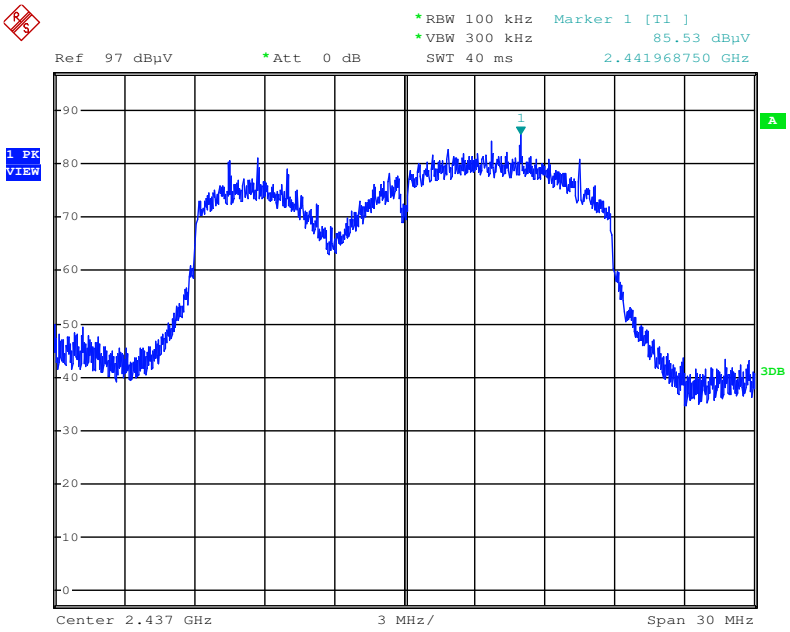
Date: 13.AUG.2016 11:18:22

Plot on Configuration IEEE 802.11g / CH 11 / 2483.5MHz~26500MHz (down 30dBc)



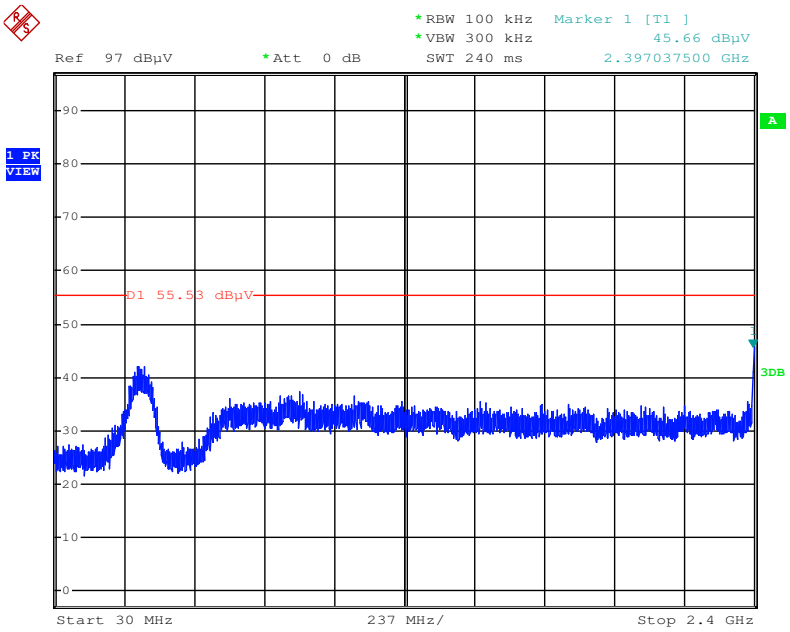
Date: 13.AUG.2016 11:18:47

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Reference Level



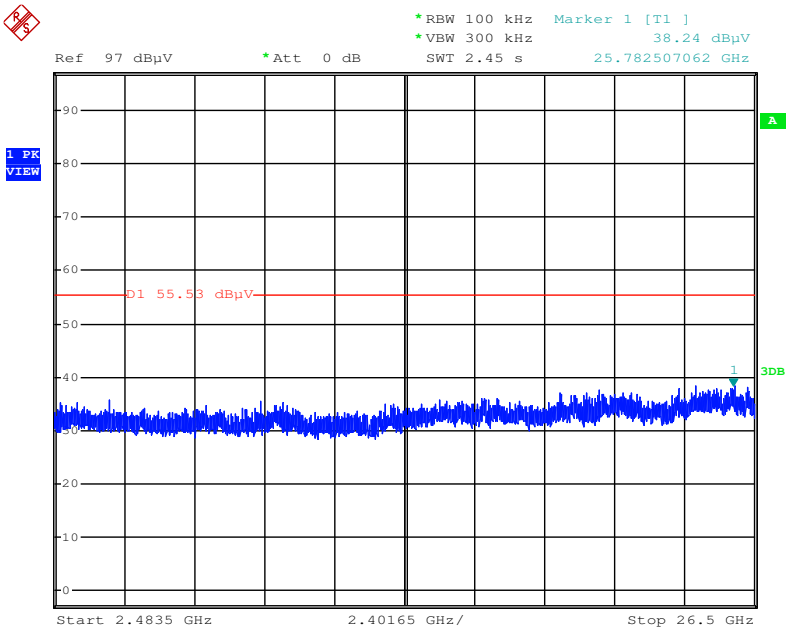
Date: 13.AUG.2016 11:21:12

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 1 / 30MHz~2400MHz (down 30dBc)



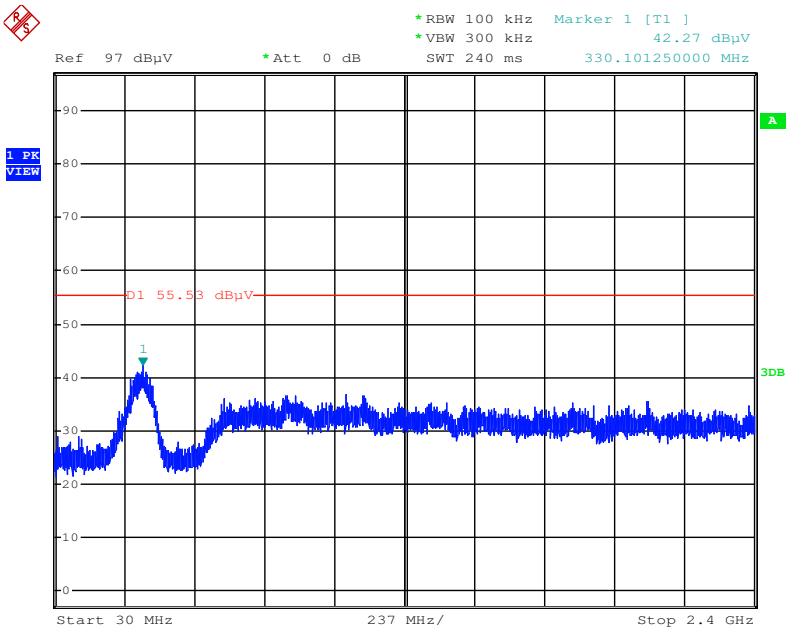
Date: 13.AUG.2016 11:22:22

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 1 / 2483.5MHz~26500MHz (down 30dBc)



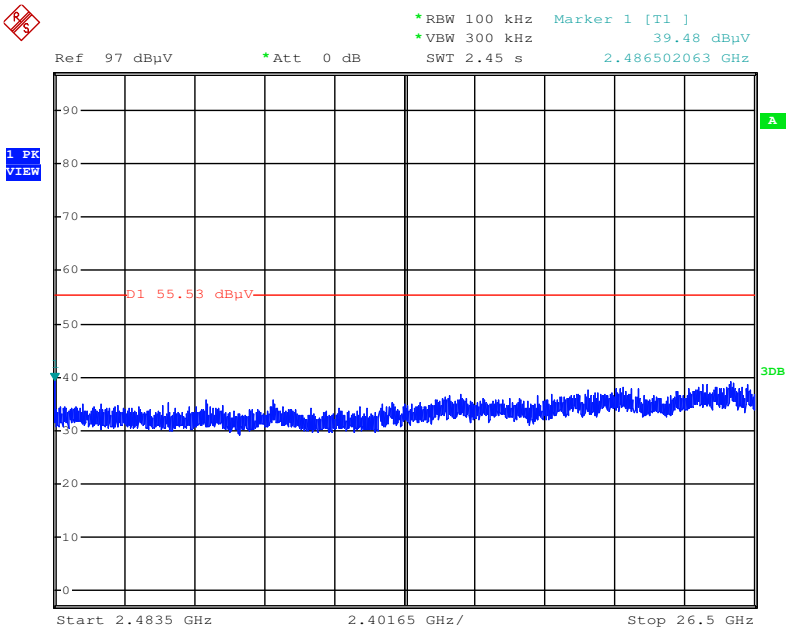
Date: 13.AUG.2016 11:23:45

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 11 / 30MHz~2400MHz (down 30dBc)



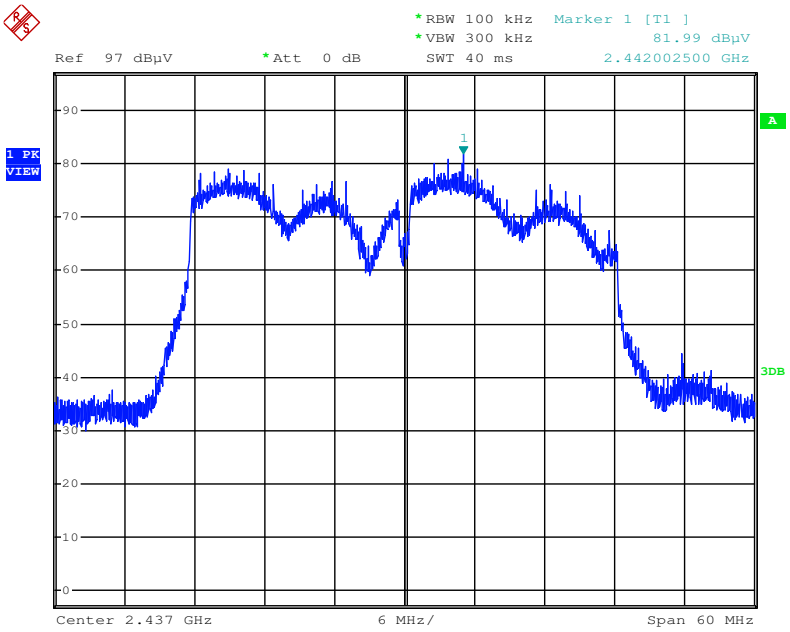
Date: 13.AUG.2016 11:24:44

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 11 / 2483.5MHz~26500MHz (down 30dBc)



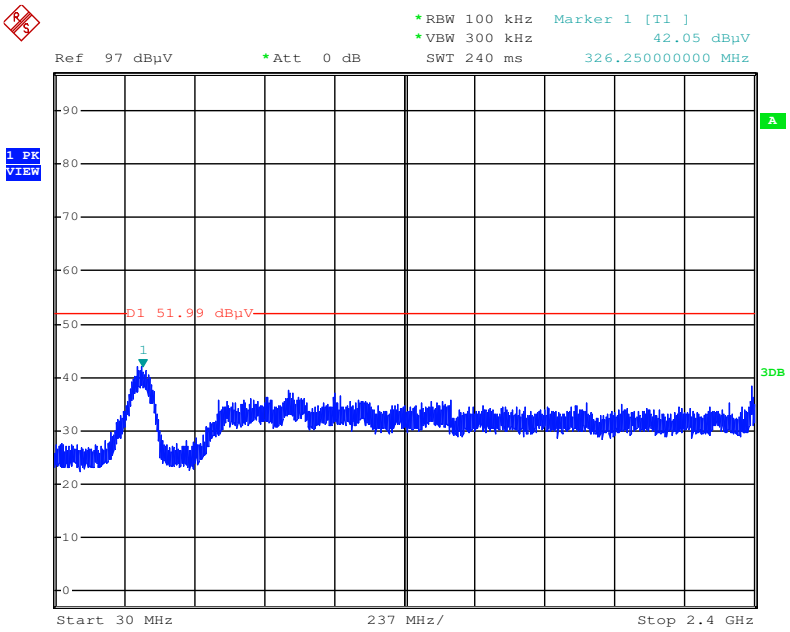
Date: 13.AUG.2016 11:25:52

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Reference Level



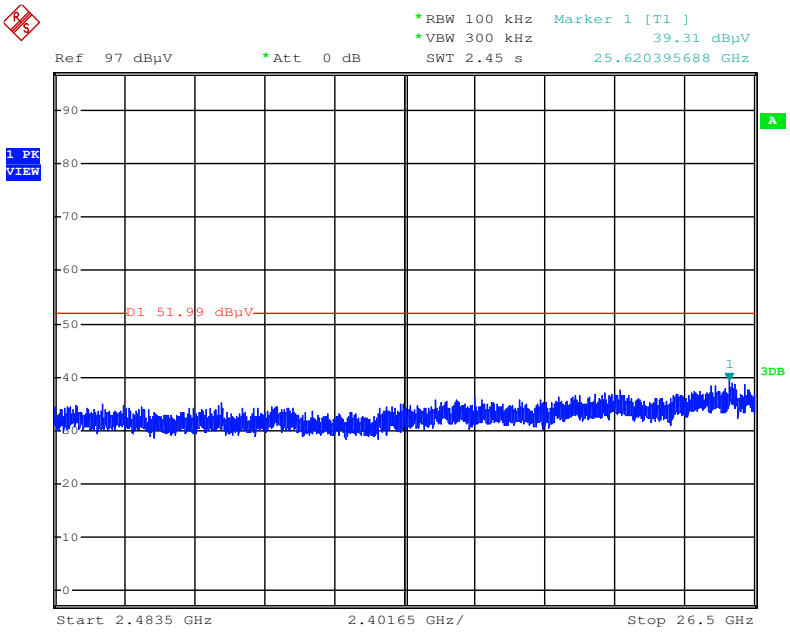
Date: 13.AUG.2016 11:27:03

Plot on Configuration I IEEE 802.11ac MCS0/Nss1 VHT40 / CH 3 / 30MHz~2400MHz (down 30dBc)



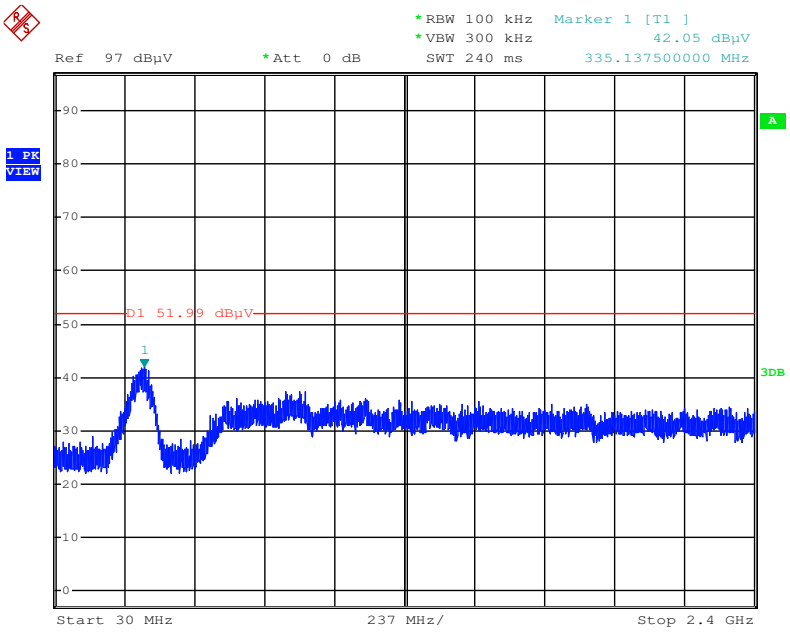
Date: 13.AUG.2016 11:28:04

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 3 / 2483.5MHz~26500MHz (down 30dBc)



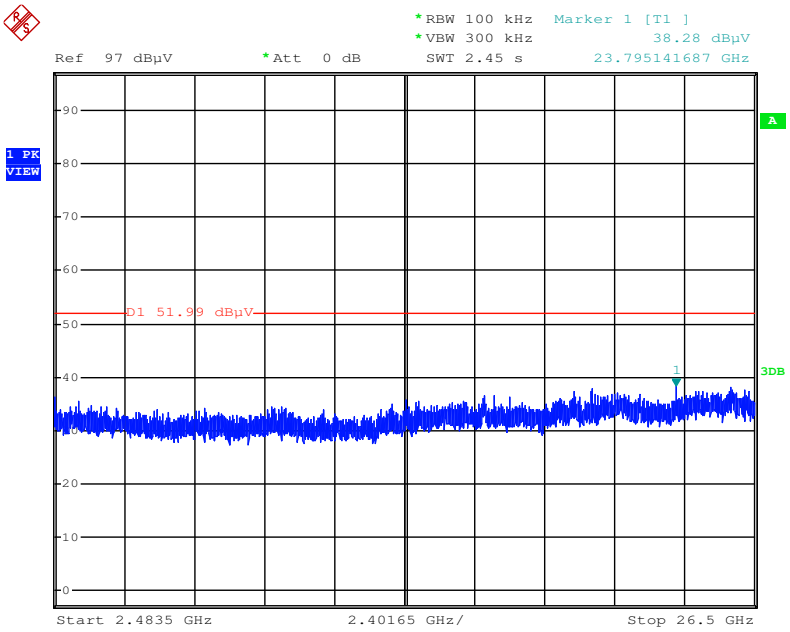
Date: 13.AUG.2016 11:28:48

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 9 / 30MHz~2400MHz (down 30dBc)



Date: 13.AUG.2016 11:30:05

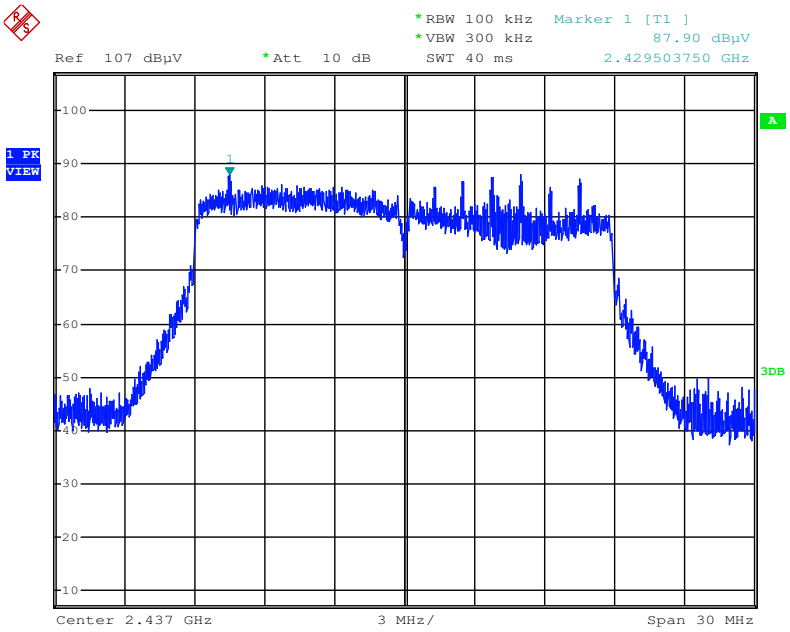
Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 9 / 2483.5MHz~26500MHz (down 30dBc)



Date: 13.AUG.2016 11:30:38

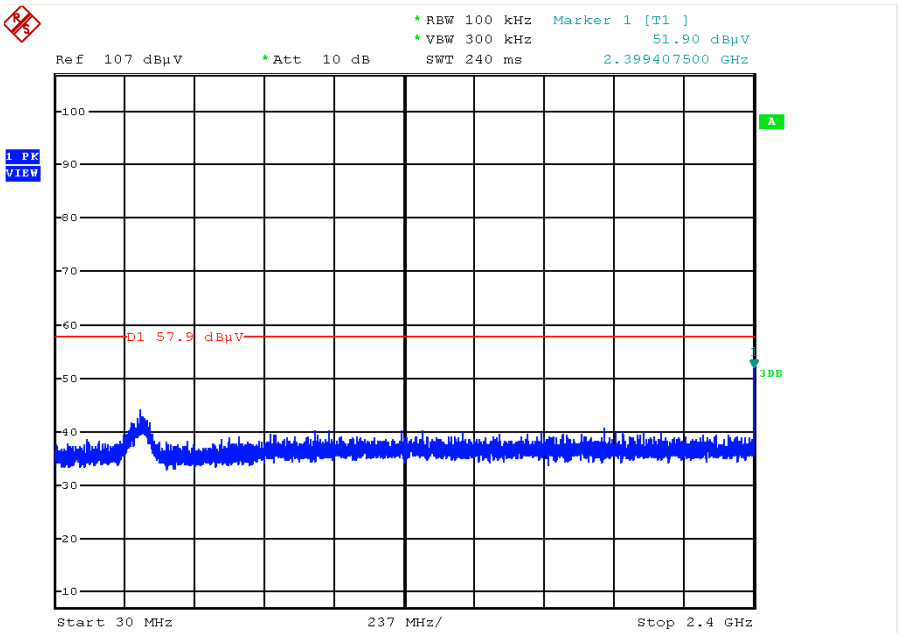
For Beamforming Mode

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Reference Level



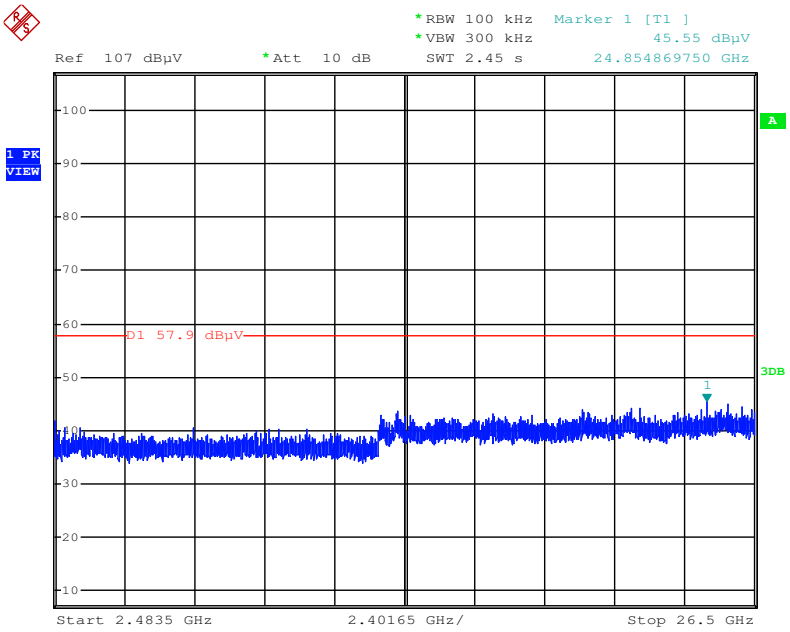
Date: 6.AUG.2016 10:56:08

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 1 / 30MHz~2400MHz (down 30dBc)



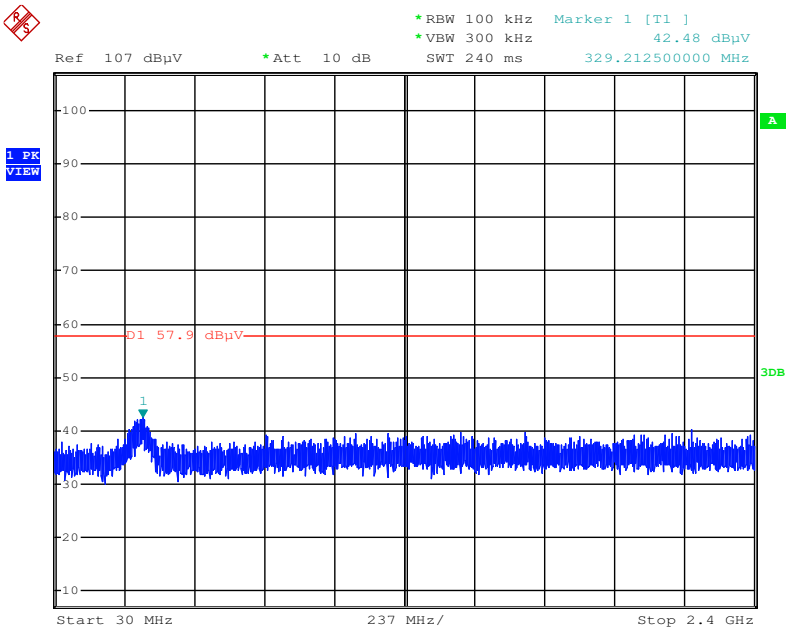
Date: 6.AUG.2016 10:57:23

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 1 / 2483.5MHz~26500MHz (down 30dBc)



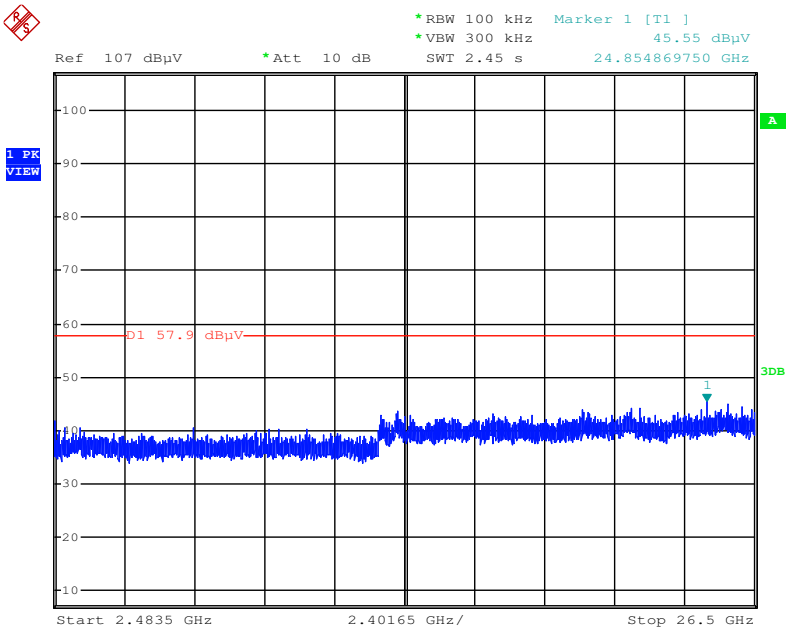
Date: 6.AUG.2016 10:57:52

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 11 / 30MHz~2400MHz (down 30dBc)



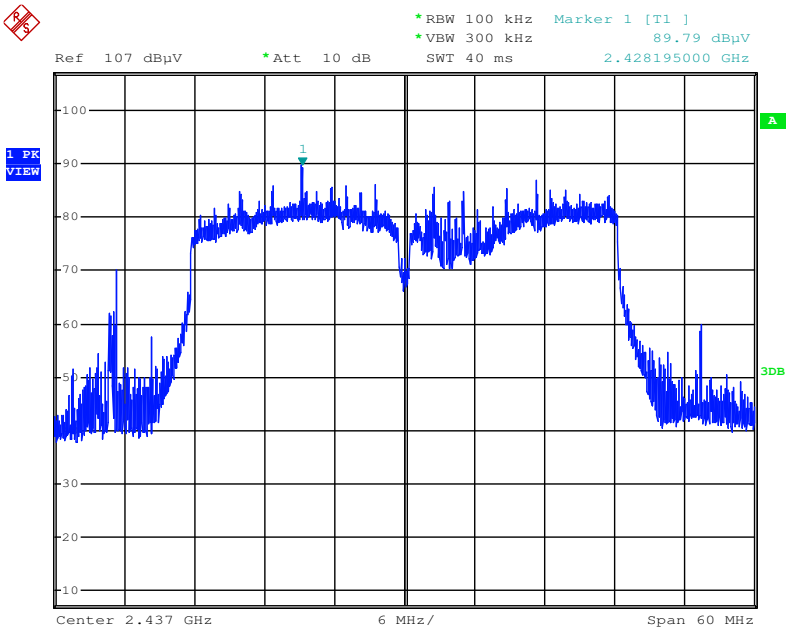
Date: 6.AUG.2016 10:58:59

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 11 / 2483.5MHz~26500MHz (down 30dBc)



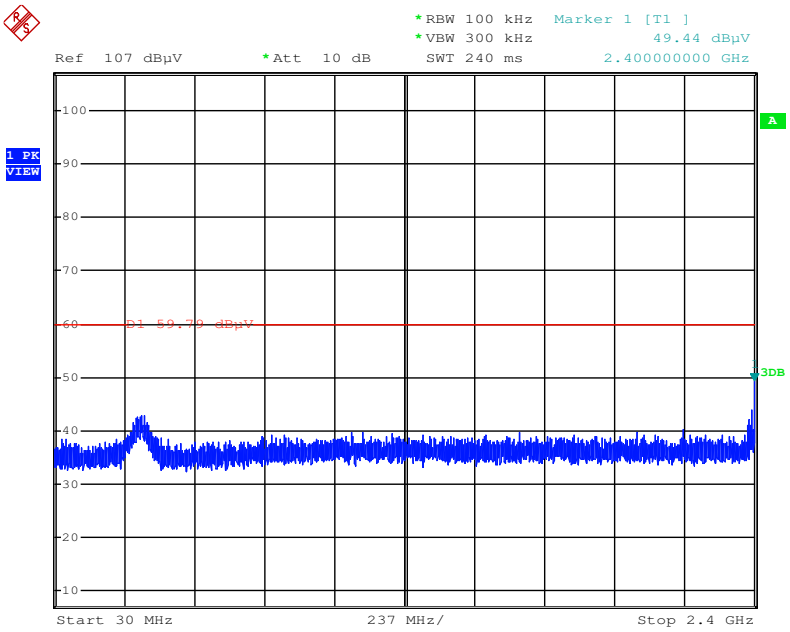
Date: 6.AUG.2016 10:58:42

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Reference Level



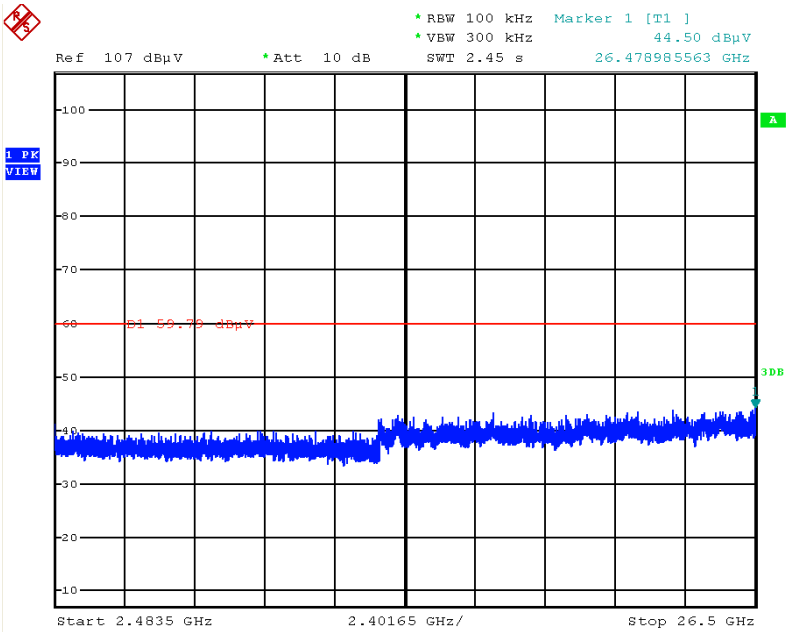
Date: 6.AUG.2016 11:00:13

Plot on Configuration I IEEE 802.11ac MCS0/Nss1 VHT40 / CH 3 / 30MHz~2400MHz (down 30dBc)



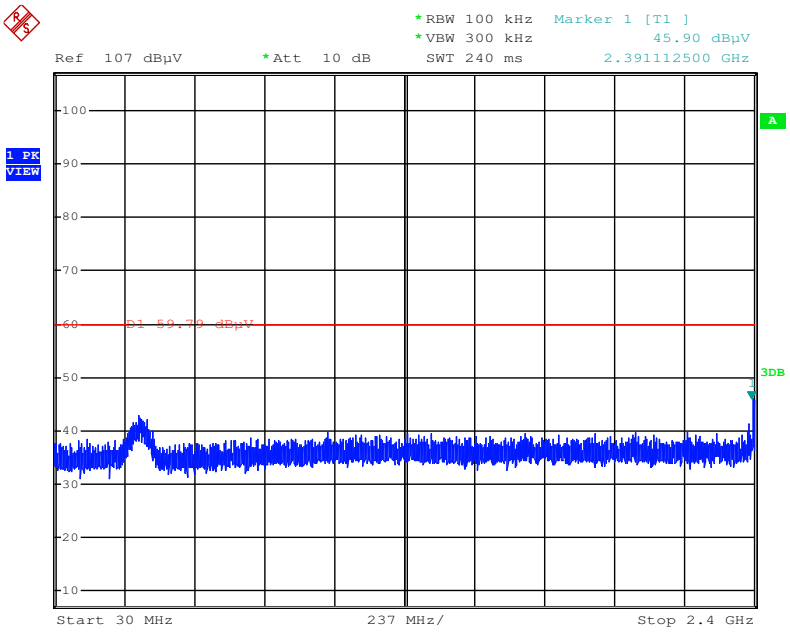
Date: 6.AUG.2016 11:01:08

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 3 / 2483.5MHz~26500MHz (down 30dBc)



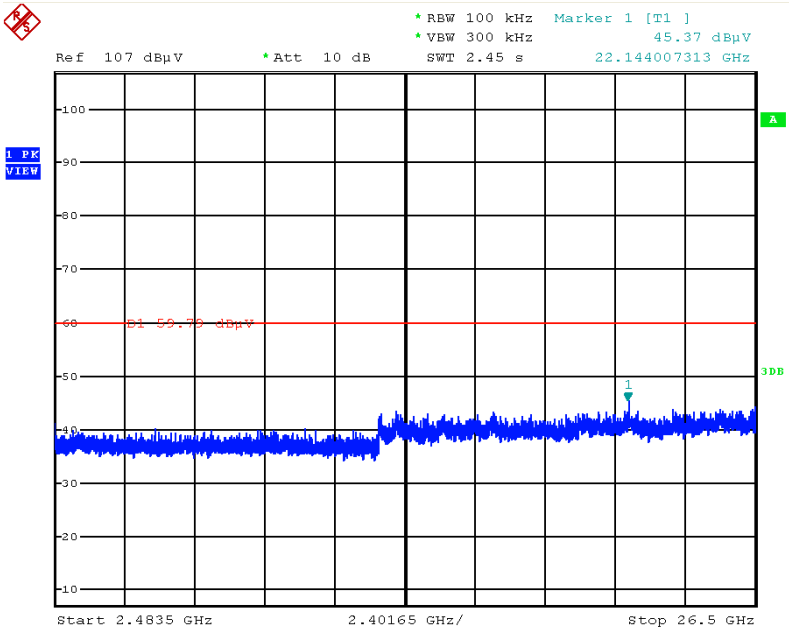
Date: 6.AUG.2016 11:02:00

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 9 / 30MHz~2400MHz (down 30dBc)



Date: 6.AUG.2016 11:02:29

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 9 / 2483.5MHz~26500MHz (down 30dBc)



Date: 6.AUG.2016 11:02:09

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
LISN	Schwarzbeck	NSLK 8127	8127650	9kHz ~ 30MHz	Nov. 16, 2015	Conduction (CO02-CB)
LISN	Schwarzbeck	NSLK 8127	8127478	9kHz ~ 30MHz	Nov. 13, 2015	Conduction (CO02-CB)
EMI Receiver	Agilent	N9038A	MY52260140	9kHz ~ 8.4GHz	Jan. 18, 2016	Conduction (CO02-CB)
COND Cable	Woken	Cable	01	0.15MHz ~ 30MHz	Dec. 01, 2015	Conduction (CO02-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	Conduction (CO02-CB)
Pulse Limiter	Schwarzbeck	VTSD 9561F	9561-F073	9kHz ~ 30MHz	Sep. 29, 2016	Conduction (CO02-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 16, 2016*	Radiation (03CH01-CB)
BILOG ANTENNA	TESEQ	CBL6112D	37880	20MHz ~ 2GHz	Aug. 30, 2016	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Oct. 22, 2015	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Jul. 25, 2016	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Mar. 15, 2016	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 18, 2016	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Oct. 27, 2015	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP-40	100019	9kHz ~ 40GHz	Apr. 21, 2016	Radiation (03CH01-CB)
EMI Test	R&S	ESCS	100355	9kHz ~ 2.75GHz	May 16, 2016	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz ~ 1 GHz	Oct. 24, 2016	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-16	N/A	1 GHz ~ 18 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-17	N/A	1 GHz ~ 18 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-1	N/A	18GHz ~ 40 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-2	N/A	18GHz ~ 40 GHz	Nov. 02, 2015	Radiation (03CH01-CB)
Test Software	Audix	E3	6.2009-l0-7	N/A	N/A	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 09, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-7	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
RF Cable-high	Woken	RG402	High Cable-8	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-9	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz – 26.5 GHz	Nov. 02, 2015	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 02, 2015	Conducted (TH01-CB)

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

"*" Calibration Interval of instruments listed above is two years.

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

6. MEASUREMENT UNCERTAINTY

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	3.2 dB	Confidence levels of 95%
Radiated Emission (30MHz ~ 1,000MHz)	3.6 dB	Confidence levels of 95%
Radiated Emission (1GHz ~ 18GHz)	3.7 dB	Confidence levels of 95%
Radiated Emission (18GHz ~ 40GHz)	3.5 dB	Confidence levels of 95%
Conducted Emission	1.7 dB	Confidence levels of 95%