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

FCC RADIO TEST REPORT

Applicant's company	**Tembo Systems, Inc.**
Applicant Address	2933 Bunker Hill lane, Suite 100, Santa Clara, CA 95054 U.S.A
FCC ID	**2AGMRTRM9992G**
Manufacturer's company	**Tembo Systems, Inc.**
Manufacturer Address	2933 Bunker Hill lane, Suite 100, Santa Clara, CA 95054 U.S.A

Product Name	802.11bgn WiFi Radio Module
Model No.	TRM9992G
Test Rule Part(s)	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz
Received Date	May 30, 2016
Final Test Date	Aug. 19, 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.

Table of Contents

History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR650411-04	Rev. 01	Initial issue of report	Sep. 13, 2016

1. VERIFICATION OF COMPLIANCE

Product Name	:	802.11bgn WiFi Radio Module
Model No.	:	TRM9992G
Applicant	:	Tembo Systems, 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 May 30, 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

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

Note: **For Directional antenna:**

The EUT is a limited module which only limited to the host (model: AP1004NRe series).

The EUT was installed to the host (model: AP1004NRe series) to perform all the tests.

For OMNI antenna:

The EUT is a limited module which only limited to the host (model: AP1004WRe series).

The EUT was installed to the host (model: AP1004WRe series) to perform all the tests.

3. GENERAL INFORMATION

3.1. Product Details

Items	Description
Product Type	**For Directional antenna:** WLAN (2TX, 2RX) **For OMNI antenna:** WLAN (4TX, 4RX)
Radio Type	Intentional Transceiver
Power Type	From host system
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 802.11a/g/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 Directional antenna:** **<For Non-Beamforming Mode>** IEEE 802.11b: 11.55 MHz IEEE 802.11g: 16.50 MHz IEEE 802.11ac MCS0Nss1 (VHT20): 17.71 MHz IEEE 802.11ac MCS0Nss1 (VHT40): 35.75 MHz **<For Beamforming Mode>** IEEE 802.11ac MCS0Nss1 (VHT20): 17.63 MHz IEEE 802.11ac MCS0Nss1 (VHT40): 36.18 MHz **For OMNI antenna:** **<For Non-Beamforming Mode>** IEEE 802.11b: 13.98 MHz IEEE 802.11g: 16.24 MHz IEEE 802.11ac MCS0Nss1 (VHT20): 17.02 MHz IEEE 802.11ac MCS0Nss1 (VHT40): 36.61 MHz **<For Beamforming Mode>** IEEE 802.11ac MCS0Nss1 (VHT20): 20.06 MHz IEEE 802.11ac MCS0Nss1 (VHT40): 38.35 MHz

Maximum Conducted Output Power	**For Directional antenna:** **<For Non-Beamforming Mode>** IEEE 802.11b: 22.65 dBm IEEE 802.11g: 22.89 dBm IEEE 802.11ac MCS0Nss1 (VHT20): 22.65 dBm IEEE 802.11ac MCS0Nss1 (VHT40): 20.66 dBm **<For Beamforming Mode>** IEEE 802.11ac MCS0Nss1 (VHT20): 22.70 dBm IEEE 802.11ac MCS0Nss1 (VHT40): 21.13 dBm **For OMNI antenna:** **<For Non-Beamforming Mode>** IEEE 802.11b: 27.19 dBm IEEE 802.11g: 27.08 dBm IEEE 802.11ac MCS0Nss1 (VHT20): 27.47 dBm IEEE 802.11ac MCS0Nss1 (VHT40): 21.07 dBm **<For Beamforming Mode>** IEEE 802.11ac MCS0Nss1 (VHT20): 24.67 dBm IEEE 802.11ac MCS0Nss1 (VHT40): 19.71 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Items	Description	
Beamforming Function	☒ With beamforming for 802. 11n/ac.	☐ Without beamforming

Antenna and Bandwidth

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

IEEE 802.11n/ac Spec.

Protocol	Number of Transmit Chains (NTX)	Data Rate / MCS
802.11n (HT20)	2, 4	MCS0-15, MCS0-31
802.11n (HT40)	2, 4	MCS0-15, MCS0-31
802.11ac (VHT20)	2, 4	MCS 0-9/Nss1-2, MCS 0-9/Nss1-4
802.11ac (VHT40)	2, 4	MCS 0-9/Nss1-2, 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 and VHT40.

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

3.2. Accessories

N/A

3.3. Table for Filed Antenna

Ant.	Brand Holder	Model Name	Antenna Type	Connector	Gain (dBi)	TX Function	Host System Model
1	Tembo Systems Inc.	PCA-000008-XXX-X	Directional Antenna	I-PEX	Note	2TX/2RX	AP1004NRe series
2	Tembo Systems Inc.	PCA-000006-000-X/ PCB-000015-XXX-X	OMNI Antenna	I-PEX	Note	4TX/4RX	AP1004WRe series

Note:

Ant.	Tested Antenna Gain (dBi)	Cable loss (dB)	Tested net antenna gain (dBi)	Certified Net Antenna Gain (dBi)	Array Gain (dBi)
1	13.5	1.2	12.3	13	0

Ant.	Gain (dBi)	Cable loss	True Gain (dBi)	Array Gain (dBi)
2	6.44	0.9	5.54	3

Note: The EUT has two antenna.

For IEEE 802.11b/g/n/ac mode (2TX/2RX):

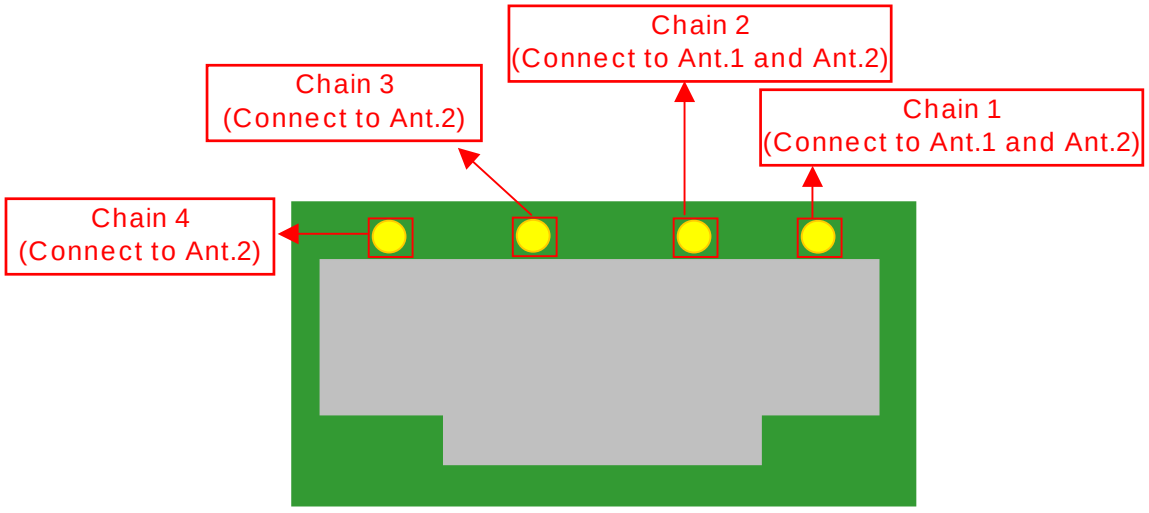
Chain 1 and Chain 2 can be used as transmitting/receiving antenna.\

Chain 1 and Chain 2 could transmit/receive simultaneously.

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

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.



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.

For Directional antenna:

Test Items	Mode	Data Rate	Channel	Chain
AC Power Line Conducted Emissions	Normal Link	-	-	-
Maximum Conducted Output Power Power Spectral Density 6dB Spectrum Bandwidth	**<For Non-Beamforming Mode>**			
	11b/CCK	1 Mbps	1/6/11	1+2
	11g/BPSK	6 Mbps	1/6/11	1+2
	11ac VHT20	MCS0Nss1	1/6/11	1+2
	11ac VHT40	MCS0Nss1	3/6/9	1+2
	<For Beamforming Mode>			
	11ac VHT20	MCS0Nss1	1/6/11	1+2
	11ac VHT40	MCS0Nss1	3/6/9	1+2
Radiated Emissions Below 1GHz	Normal Link	-	-	-
Radiated Emissions Above 1GHz Band Edge Emissions	**<For Non-Beamforming Mode>**			
	11b/CCK	1 Mbps	1/6/11	1+2
	11g/BPSK	6 Mbps	1/6/11	1+2
	11ac VHT20	MCS0Nss1	1/6/11	1+2
	11ac VHT40	MCS0Nss1	3/6/9	1+2
	<For Beamforming Mode>			
	11ac VHT20	MCS0Nss1	1/6/11	1+2
	11ac VHT40	MCS0Nss1	3/6/9	1+2

For OMNI antenna:

Test Items	Mode	Data Rate	Channel	Chain
AC Power Line Conducted Emissions	Normal Link	-	-	-
Maximum Conducted Output Power Power Spectral Density 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	MCS0Nss1	1/6/11	1+2+3+4
	11ac VHT40	MCS0Nss1	3/6/9	1+2+3+4
	<For Beamforming Mode>			
	11ac VHT20	MCS0Nss1	1/6/11	1+2+3+4
	11ac VHT40	MCS0Nss1	3/6/9	1+2+3+4
Radiated Emissions Below 1GHz	Normal Link	-	-	-
Radiated Emissions Above 1GHz 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	MCS0Nss1	1/6/11	1+2+3+4
	11ac VHT40	MCS0Nss1	3/6/9	1+2+3+4
	<For Beamforming Mode>			
	11ac VHT20	MCS0Nss1	1/6/11	1+2+3+4
	11ac VHT40	MCS0Nss1	3/6/9	1+2+3+4

The following test modes were performed for all tests:

Conducted Emissions	
Test Mode	**Description**
1	AP Mode with Ant.1
2	Repeater Mode with Ant.1
3	AP Mode with Ant.2
4	Repeater Mode with Ant.2
Mode 4 generated the worst test result, so it was recorded in this report.	

Radiated Emissions (Below 1GHz)	
Test Mode	**Description**
1	EUT Y axis - AP Mode with Ant.1
2	EUT X axis - AP Mode with Ant.1
Mode 1 has been evaluated to be the worst case between Mode 1~2, thus measurement for Mode 3 will follow this same test mode.	
3	EUT Y axis - Repeater Mode with Ant.1
4	EUT Y axis - AP Mode with Ant.2
5	EUT X axis - AP Mode with Ant.2
Mode 4 has been evaluated to be the worst case between Mode 4~5, thus measurement for Mode 6 will follow this same test mode.	
6	EUT Y axis - Repeater Mode with Ant.2
Mode 6 generated the worst test result, so it was recorded in this report.	

Radiated Emissions (Above 1GHz)	
Test Mode	**Description**
The EUT was performed at X axis and Y axis position for Radiated emission above 1GHz test, and the worst case was found at X axis for Directional antenna and Y axis for Omni antenna. So the measurement will follow this same test configuration.	
1	EUT X axis + Ant.1
2	EUT Y axis + Ant.2

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.

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 this report.

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
CO01-CB	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 Supporting Units

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

Support Unit	Brand	Model	FCC ID
NB*4	DELL	E4300	DoC
Host system	N/A	AP1004WRe series	DoC
AP Router	Planex	GW-AP54SGX	KA220030603014-1
PoE*2	ZyXEL	PoE12-HP	N/A

For Test Site No: 03CH01-CB (Above 1GHz) /<For Non-Beamforming Mode>

For Directional antenna:

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	DoC
PoE*2	ZyXEL	PoE12-HP	N/A
Host system	N/A	AP1004NRe series	DoC

For OMNI antenna:

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	DoC
PoE*2	ZyXEL	PoE12-HP	N/A
Host system	N/A	AP1004WRe series	DoC

For Test Site No: 03CH01-CB (Above 1GHz) /<For Non-Beamforming Mode>

For Directional antenna:

Support Unit	Brand	Model	FCC ID
NB*2	DELL	E4300	DoC
PoE*2	ZyXEL	PoE12-HP	N/A
Host system	N/A	AP1004NRe series	DoC
RX Device	N/A	AP1004WRe series AP1004NRe series	DoC

For OMNI antenna:

Support Unit	Brand	Model	FCC ID
NB*2	DELL	E4300	DoC
PoE*2	ZyXEL	PoE12-HP	N/A
Host system	N/A	AP1004WRe series	DoC
RX Device	N/A	AP1004WRe series AP1004NRe series	DoC

For Test Site No: CO01-CB

Support Unit	Brand	Model	FCC ID
NB*3	DELL	E6430	DoC
AP Router	Planex	GW-AP54SGX	KA220030603014-1
PoE*2	ZyXEL	PoE12-HP	N/A
Host system	N/A	AP1004WRe series	DoC

For Test Site No: TH01-CB

For Directional antenna:

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	DoC
PoE*2	ZyXEL	PoE12-HP	N/A
Host system	N/A	AP1004NRe series	DoC

For OMNI antenna:

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	DoC
PoE*2	ZyXEL	PoE12-HP	N/A
Host system	N/A	AP1004WRe series	DoC

3.8. 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 Directional antenna / Non-Beamforming Mode

Test Software Version	QCARCT					
Mode	Test Frequency (MHz)					
	NCB: 20MHz			NCB: 40MHz		
	2412 MHz	2437 MHz	2462 MHz	2422 MHz	2437 MHz	2452 MHz
802.11b	19	19	19	-	-	-
802.11g	16.5	20	16.5	-	-	-
802.11ac MCS0Nss1 VHT20	15.5	20	16	-	-	-
802.11ac MCS0Nss1 VHT40	-	-	-	12.5	17	15

For Directional antenna / Beamforming Mode

Test Software Version	QCARCT					
Mode	Test Frequency (MHz)					
	NCB: 20MHz			NCB: 40MHz		
	2412 MHz	2437 MHz	2462 MHz	2422 MHz	2437 MHz	2452 MHz
802.11ac MCS0Nss1 VHT20	19	26	20	-	-	-
802.11ac MCS0Nss1 VHT40	-	-	-	15	20	18

For Omni antenna / Non-Beamforming Mode

Test Software Version	QCARCT					
Mode	Test Frequency (MHz)					
	NCB: 20MHz			NCB: 40MHz		
	2412 MHz	2437 MHz	2462 MHz	2422 MHz	2437 MHz	2452 MHz
802.11b	19	19.5	21	-	-	-
802.11g	15	22	18.5	-	-	-
802.11ac MCS0Nss1 VHT20	14.5	22	16.5	-	-	-
802.11ac MCS0Nss1 VHT40	-	-	-	11	15.5	15

For Omni antenna / Beamforming Mode

Test Software Version	QCARCT					
Mode	Test Frequency (MHz)					
	NCB: 20MHz			NCB: 40MHz		
	2412 MHz	2437 MHz	2462 MHz	2422 MHz	2437 MHz	2452 MHz
802.11ac MCS0Nss1 VHT20	20	26	23	-	-	-
802.11ac MCS0Nss1 VHT40	-	-	-	16	20	20

3.9. EUT Operation during Test

For non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

For Conducted Mode:

The EUT was programmed to be in continuously transmitting mode.

For Radiated Mode:

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

The program was executed as follows:

1. During the test, the EUT operation to normal function.
2. Executed command fixed test channel under 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%

3.10. Duty Cycle

For Directional antenna / Non-Beamforming Mode:

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11b	100.000	100.000	100.00%	0.00	0.01
802.11g	2.060	2.130	96.71%	0.15	0.49
802.11ac MCS0Nss1 VHT20	5.020	5.100	98.43%	0.07	0.01
802.11ac MCS0Nss1 VHT40	2.370	2.510	94.42%	0.25	0.42

For Directional antenna / Beamforming Mode:

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11ac MCS0Nss1 VHT20	1.760	1.935	90.96%	0.41	0.57
802.11ac MCS0Nss1 VHT40	1.663	1.857	89.53%	0.48	0.60

For Omni antenna / Non-Beamforming Mode:

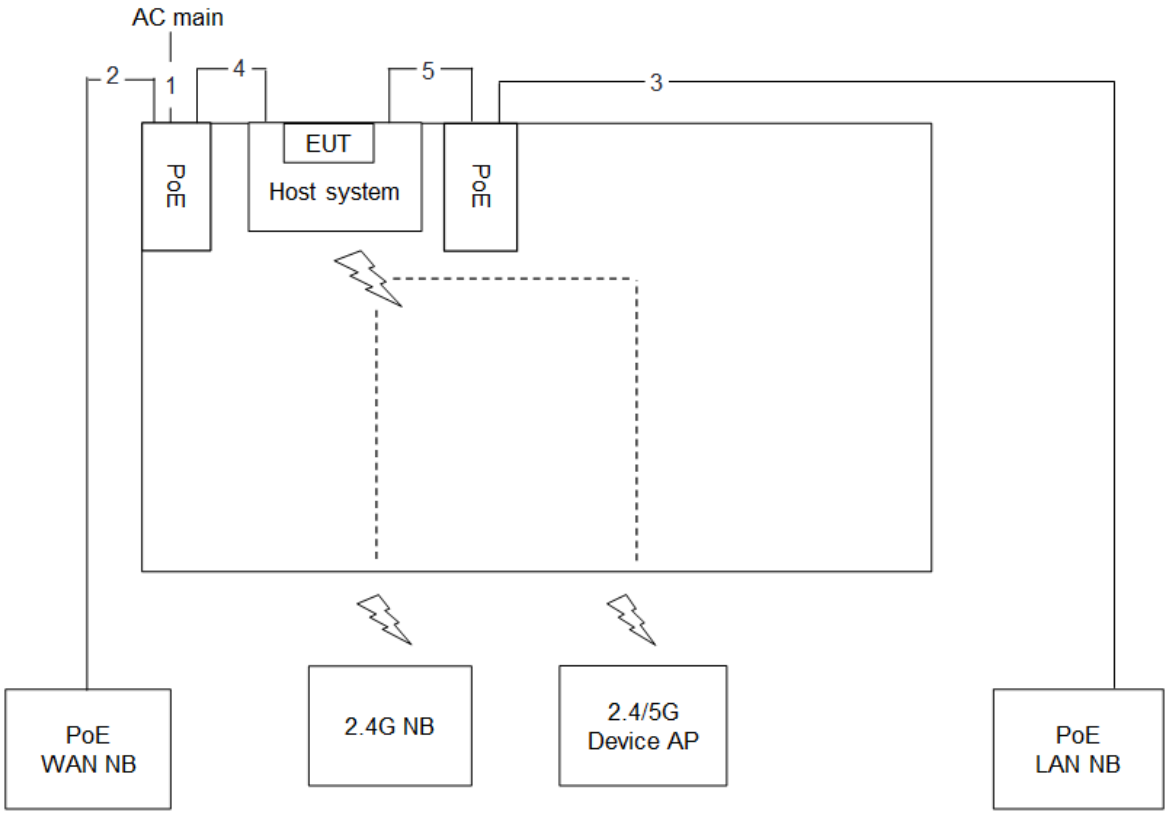
Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11b	100.000	100.000	100.00%	0.00	0.01
802.11g	2.043	2.139	95.51%	0.20	0.49
802.11ac MCS0Nss1 VHT20	4.951	5.080	97.46%	0.11	0.20
802.11ac MCS0Nss1 VHT40	4.967	5.064	98.08%	0.08	0.01

For Omni antenna / Beamforming Mode:

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11ac MCS0Nss1 VHT20	1.685	1.875	89.88%	0.46	0.59
802.11ac MCS0Nss1 VHT40	1.563	1.755	89.04%	0.50	0.64

3.11. Test Configurations

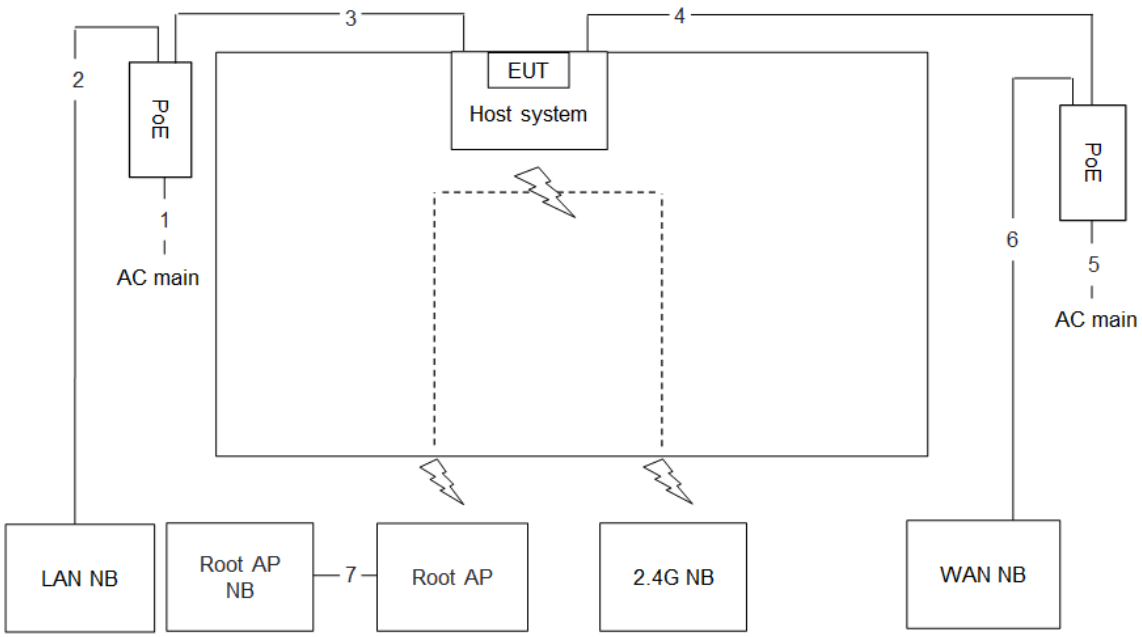
3.11.1. AC Power Line Conduction Emissions Test Configuration



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

3.11.2. Radiation Emissions Test Configuration

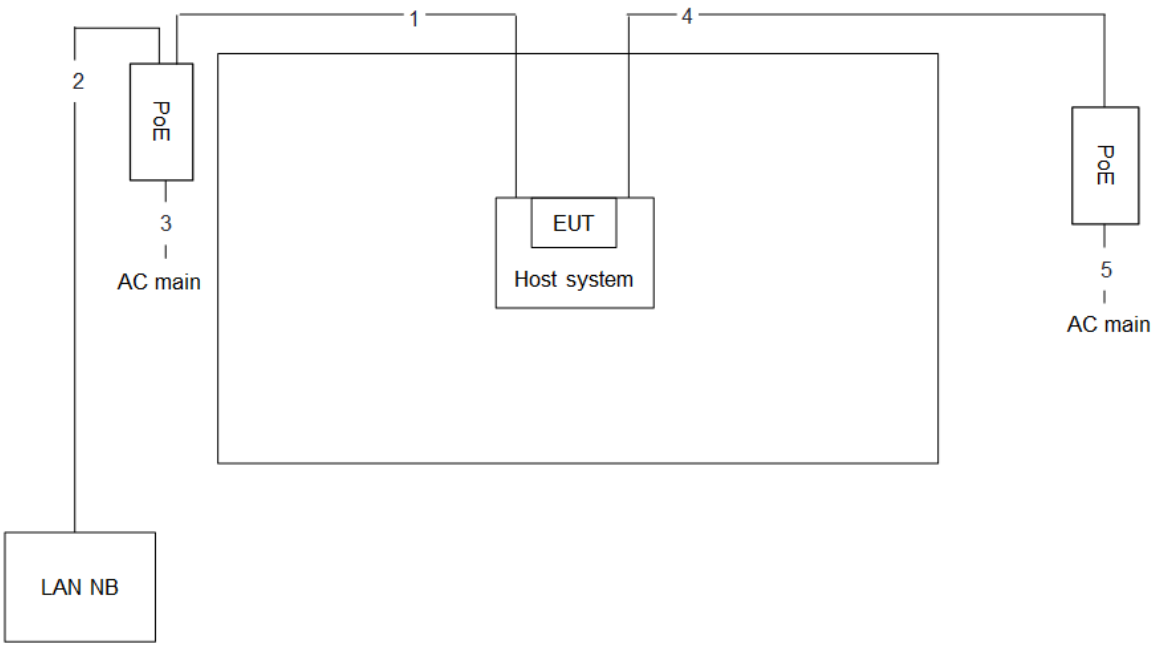
Test Configuration: 30MHz~1GHz



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

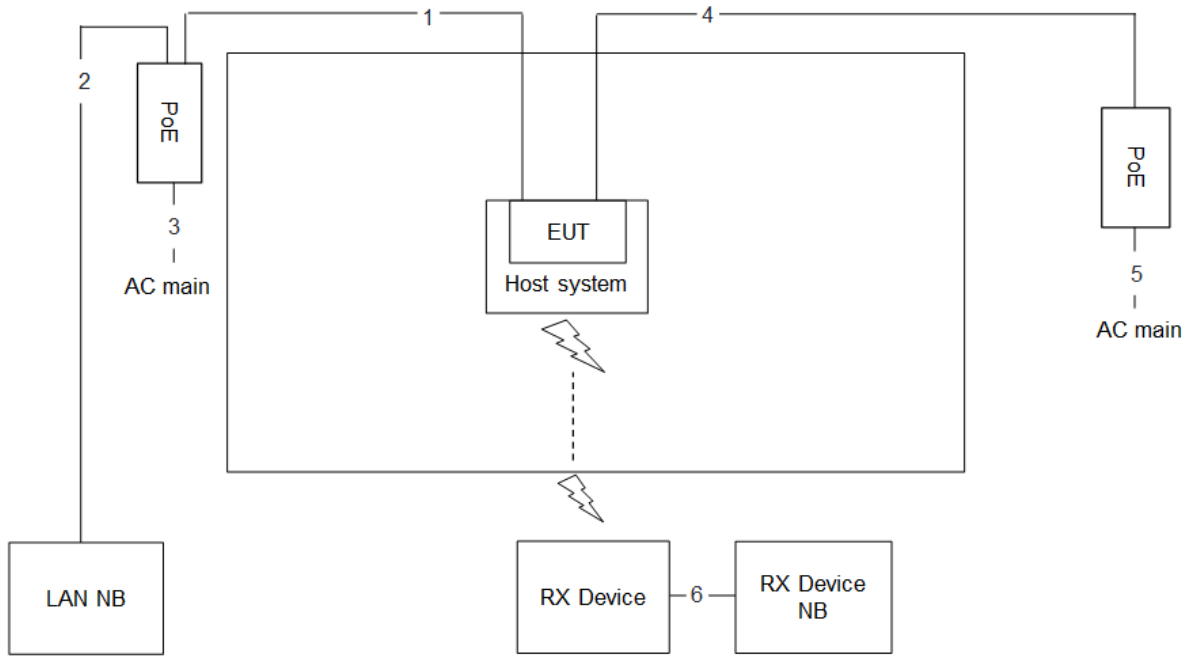
Test Configuration: above 1GHz

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	1.5m
4	RJ-45 cable	No	10m
5	Power cable	No	1.5m

For Beamforming Mode:



Item	Connection	Shielded	Length
1	RJ-45 cable	No	10m
2	RJ-45 cable	No	1.5m
3	Power cable	No	1.5m
4	RJ-45 cable	No	10m
5	Power cable	No	1.5m
6	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

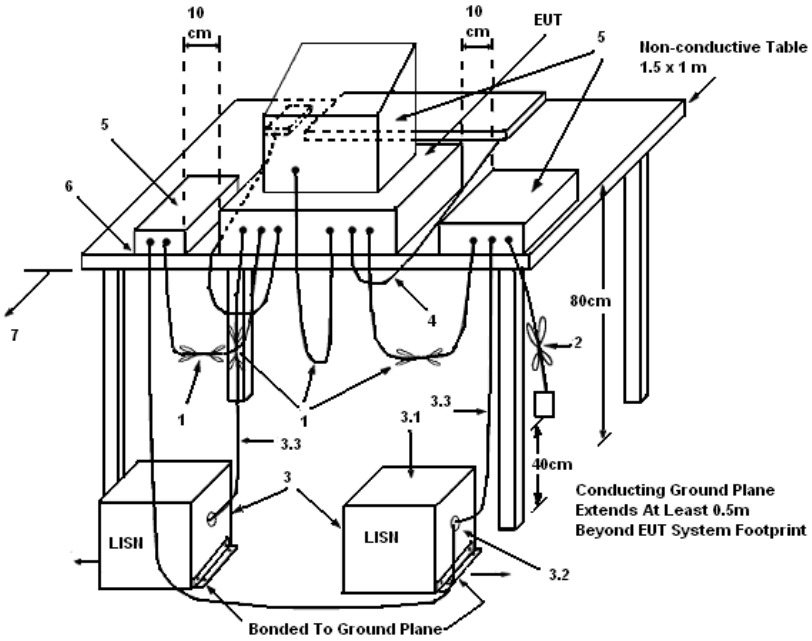
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

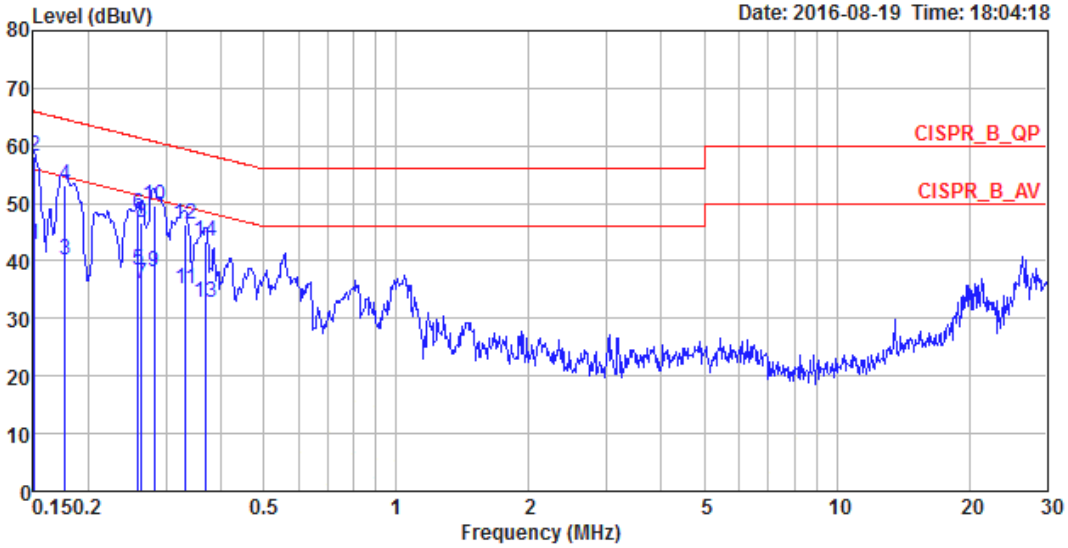
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

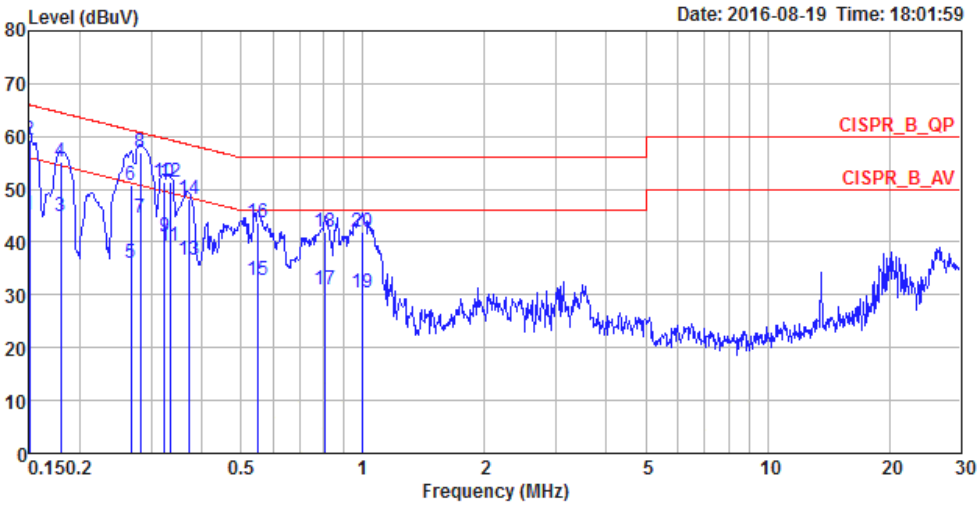
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	23℃	Humidity	60%
Test Engineer	Kane Liu	Phase	Line
Configuration	Normal Link / Mode 4		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1508	42.89	-13.07	55.96	32.71	10.02	0.16	LINE	Average
2	0.1508	58.27	-7.69	65.96	48.09	10.02	0.16	LINE	QP
3	0.1768	40.06	-14.58	54.64	29.96	9.92	0.18	LINE	Average
4	0.1768	53.21	-11.43	64.64	43.11	9.92	0.18	LINE	QP
5	0.2589	38.39	-13.08	51.47	28.35	9.92	0.12	LINE	Average
6	0.2589	47.99	-13.48	61.47	37.95	9.92	0.12	LINE	QP
7	0.2644	35.93	-15.36	51.29	25.89	9.92	0.12	LINE	Average
8	0.2644	46.65	-14.64	61.29	36.61	9.92	0.12	LINE	QP
9	0.2818	38.22	-12.54	50.76	28.20	9.92	0.10	LINE	Average
10	0.2818	49.67	-11.09	60.76	39.65	9.92	0.10	LINE	QP
11	0.3321	35.21	-14.19	49.40	25.23	9.92	0.06	LINE	Average
12	0.3321	46.30	-13.10	59.40	36.32	9.92	0.06	LINE	QP
13	0.3692	32.76	-15.76	48.52	22.81	9.92	0.03	LINE	Average
14	0.3692	43.26	-15.26	58.52	33.31	9.92	0.03	LINE	QP

Temperature	23℃	Humidity	60%
Test Engineer	Kane Liu	Phase	Neutral
Configuration	Normal Link / Mode 4		



	Freq	Level	Limit	Line	Level	Factor	Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1500	45.20	-10.80	56.00	35.02	10.02	0.16	NEUTRAL	Average
2	0.1500	59.42	-6.58	66.00	49.24	10.02	0.16	NEUTRAL	QP
3	0.1796	44.83	-9.67	54.50	34.73	9.92	0.18	NEUTRAL	Average
4	0.1796	55.09	-9.41	64.50	44.99	9.92	0.18	NEUTRAL	QP
5	0.2672	36.02	-15.18	51.20	25.99	9.92	0.11	NEUTRAL	Average
6	0.2672	50.89	-10.31	61.20	40.86	9.92	0.11	NEUTRAL	QP
7	0.2818	44.44	-6.32	50.76	34.42	9.92	0.10	NEUTRAL	Average
8	0.2818	57.06	-3.70	60.76	47.04	9.92	0.10	NEUTRAL	QP
9	0.3234	41.07	-8.55	49.62	31.09	9.92	0.06	NEUTRAL	Average
10	0.3234	51.25	-8.37	59.62	41.27	9.92	0.06	NEUTRAL	QP
11	0.3338	39.28	-10.07	49.35	29.30	9.92	0.06	NEUTRAL	Average
12	0.3338	51.41	-7.94	59.35	41.43	9.92	0.06	NEUTRAL	QP
13	0.3712	36.62	-11.85	48.47	26.67	9.92	0.03	NEUTRAL	Average
14	0.3712	48.10	-10.37	58.47	38.15	9.92	0.03	NEUTRAL	QP
15	0.5523	32.63	-13.37	46.00	22.43	9.93	0.27	NEUTRAL	Average
16	0.5523	43.70	-12.30	56.00	33.50	9.93	0.27	NEUTRAL	QP
17	0.8088	31.09	-14.91	46.00	20.59	9.93	0.57	NEUTRAL	Average
18	0.8088	41.83	-14.17	56.00	31.33	9.93	0.57	NEUTRAL	QP
19	0.9944	30.38	-15.62	46.00	19.71	9.94	0.73	NEUTRAL	Average
20	0.9944	41.90	-14.10	56.00	31.23	9.94	0.73	NEUTRAL	QP

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

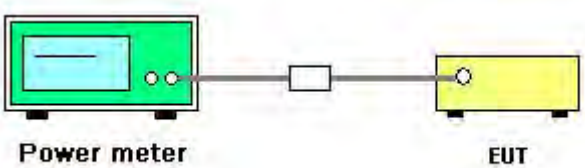
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

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	25℃	Humidity	60%
Test Engineer	Akina Chiu	Test Date	Jul. 23, 2016 ~ Jul. 27, 2016

For Directional antenna / Non-Beamforming Mode:

Mode	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
802.11b	2412 MHz	19.71	19.54	22.64	23.00	**Complies**
	2437 MHz	19.86	19.41	22.65	23.00	**Complies**
	2462 MHz	19.54	19.66	22.61	23.00	**Complies**
802.11g	2412 MHz	16.41	16.43	19.43	23.00	**Complies**
	2437 MHz	19.9	19.85	22.89	23.00	**Complies**
	2462 MHz	16.53	16.27	19.41	23.00	**Complies**
802.11ac	2412 MHz	15.37	14.9	18.15	23.00	**Complies**
MCS0Nss1	2437 MHz	19.74	19.53	22.65	23.00	**Complies**
VHT20	2462 MHz	15.56	15.66	18.62	23.00	**Complies**
802.11 ac	2422 MHz	13.46	13.26	16.37	23.00	**Complies**
MCS0Nss1	2437 MHz	17.78	17.52	20.66	23.00	**Complies**
VHT40	2452 MHz	15.68	15.55	18.63	23.00	**Complies**

Note: Antenna gain=13 dBi, so limit=30-(13-6)=23 dBm.

For Directional antenna / Beamforming Mode:

Mode	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
802.11ac	2412 MHz	15.57	14.84	18.23	23.00	**Complies**
MCS0Nss1	2437 MHz	19.62	19.75	22.70	23.00	**Complies**
VHT20	2462 MHz	16.98	16.92	19.96	23.00	**Complies**
802.11 ac	2422 MHz	13.46	13.23	16.36	23.00	**Complies**
MCS0Nss1	2437 MHz	18.2	18.04	21.13	23.00	**Complies**
VHT40	2452 MHz	16.03	15.49	18.78	23.00	**Complies**

Note: Directional gain=13 dBi, so limit=30-(13-6)=23 dBm.

For Omni antenna / 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	18.78	18.15	19.22	18.85	24.79	30.00	**Complies**
	2437 MHz	19.26	17.80	19.49	19.29	25.03	30.00	**Complies**
	2462 MHz	20.46	19.28	22.16	22.13	27.19	30.00	**Complies**
802.11g	2412 MHz	13.81	13.37	13.89	13.96	19.78	30.00	**Complies**
	2437 MHz	20.56	22.01	20.48	21.02	27.08	30.00	**Complies**
	2462 MHz	16.79	17.29	17.37	17.44	23.25	30.00	**Complies**
802.11ac MCS0Nss1 VHT20	2412 MHz	13.11	12.62	13.35	13.47	19.17	30.00	**Complies**
	2437 MHz	22.19	21.94	20.42	21.03	27.47	30.00	**Complies**
	2462 MHz	15.01	14.56	15.19	15.40	21.07	30.00	**Complies**
802.11 ac MCS0Nss1 VHT40	2422 MHz	10.71	10.24	10.97	10.89	16.73	30.00	**Complies**
	2437 MHz	14.93	14.73	15.17	15.34	21.07	30.00	**Complies**
	2452 MHz	14.46	14.21	14.66	14.72	20.54	30.00	**Complies**

For Omni antenna / Beamforming Mode:

Mode	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
802.11ac MCS0Nss1 VHT20	2412 MHz	12.69	12.34	13.24	12.32	18.68	30.00	**Complies**
	2437 MHz	18.46	18.22	19.24	18.62	24.67	30.00	**Complies**
	2462 MHz	16.08	15.77	16.64	16.12	22.18	30.00	**Complies**
802.11 ac MCS0Nss1 VHT40	2422 MHz	9.63	9.04	10.03	9.85	15.67	30.00	**Complies**
	2437 MHz	13.23	13.37	14.26	13.83	19.71	30.00	**Complies**
	2452 MHz	13.02	13.41	14.18	13.92	19.68	30.00	**Complies**

Note: Directional gain =8.54 dBi, so limit=30-(8.54-6)=27.46 dBm.

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

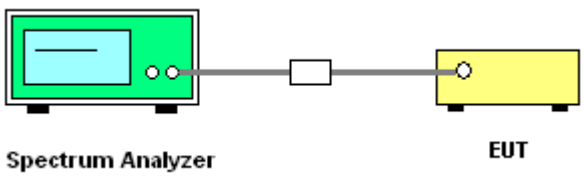
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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	25℃	Humidity	60%
Test Engineer	Akina Chiu		

For Directional antenna / Non-Beamforming Mode:

Mode	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Total		
802.11b	2412 MHz	-12.56	-13.01	-9.77	1.00	**Complies**
	2437 MHz	-12.74	-13.20	-9.95	1.00	**Complies**
	2462 MHz	-12.59	-12.64	-9.60	1.00	**Complies**
802.11g	2412 MHz	-10.88	-11.67	-8.25	1.00	**Complies**
	2437 MHz	-8.36	-8.28	-5.31	1.00	**Complies**
	2462 MHz	-11.92	-11.60	-8.75	1.00	**Complies**
802.11ac MCS0Nss1 VHT20	2412 MHz	-13.02	-12.78	-9.89	1.00	**Complies**
	2437 MHz	-8.51	-8.70	-5.59	1.00	**Complies**
	2462 MHz	-12.08	-11.48	-8.76	1.00	**Complies**
802.11ac MCS0Nss1 VHT40	2422 MHz	-15.13	-17.07	-12.98	1.00	**Complies**
	2437 MHz	-11.30	-12.44	-8.82	1.00	**Complies**
	2452 MHz	-13.60	-15.17	-11.30	1.00	**Complies**

Note: Directional gain =13 dBi, so limit=8-(13-6)=1 dBm/3kHz.

For Directional antenna / Beamforming Mode:

Mode	Frequency	Power Density (dBm/3kHz)			Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Total		
802.11ac MCS0Nss1 VHT20	2412 MHz	-12.10	-11.47	-8.76	1.00	**Complies**
	2437 MHz	-8.40	-8.09	-5.23	1.00	**Complies**
	2462 MHz	-10.62	-9.80	-7.18	1.00	**Complies**
802.11ac MCS0Nss1 VHT40	2422 MHz	-14.63	-15.11	-11.85	1.00	**Complies**
	2437 MHz	-10.59	-10.79	-7.68	1.00	**Complies**
	2452 MHz	-13.15	-13.00	-10.06	1.00	**Complies**

Note: Directional gain =13 dBi, so limit=8-(13-6)=1 dBm/3kHz.

For Omni antenna / 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	-12.64	-12.74	-12.62	-12.65	-6.64	5.46	**Complies**
	2437 MHz	-14.11	-12.83	-12.04	-12.21	-6.70	5.46	**Complies**
	2462 MHz	-12.12	-11.20	-10.42	-10.42	-4.96	5.46	**Complies**
802.11g	2412 MHz	-12.29	-12.41	-12.45	-12.94	-6.49	5.46	**Complies**
	2437 MHz	-6.13	-7.06	-5.65	-6.06	-0.17	5.46	**Complies**
	2462 MHz	-10.18	-10.21	-7.85	-10.35	-3.49	5.46	**Complies**
802.11ac MCS0Nss1 VHT20	2412 MHz	-13.09	-14.21	-11.66	-14.13	-7.12	5.46	**Complies**
	2437 MHz	-6.77	-6.77	-6.31	-6.21	-0.49	5.46	**Complies**
	2462 MHz	-11.23	-12.06	-8.29	-11.03	-4.38	5.46	**Complies**
802.11ac MCS0Nss1 VHT40	2422 MHz	-19.12	-18.86	-15.59	-18.91	-11.82	5.46	**Complies**
	2437 MHz	-14.55	-14.62	-14.10	-13.56	-8.17	5.46	**Complies**
	2452 MHz	-14.48	-14.25	-14.46	-14.43	-8.38	5.46	**Complies**

Note: Directional gain =8.54 dBi, so limit=8-(8.54-6)=5.46 dBm.

For Omni antenna / 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 MCS0Nss1 VHT20	2412 MHz	-12.34	-12.16	-12.16	-11.58	-6.03	5.46	**Complies**
	2437 MHz	-7.35	-6.67	-5.56	-5.75	-0.25	5.46	**Complies**
	2462 MHz	-10.24	-8.96	-9.10	-8.96	-3.26	5.46	**Complies**
802.11ac MCS0Nss1 VHT40	2422 MHz	-17.52	-17.44	-17.60	-16.89	-11.33	5.46	**Complies**
	2437 MHz	-15.52	-14.45	-15.24	-13.99	-8.74	5.46	**Complies**
	2452 MHz	-15.52	-15.38	-12.96	-13.33	-8.12	5.46	**Complies**

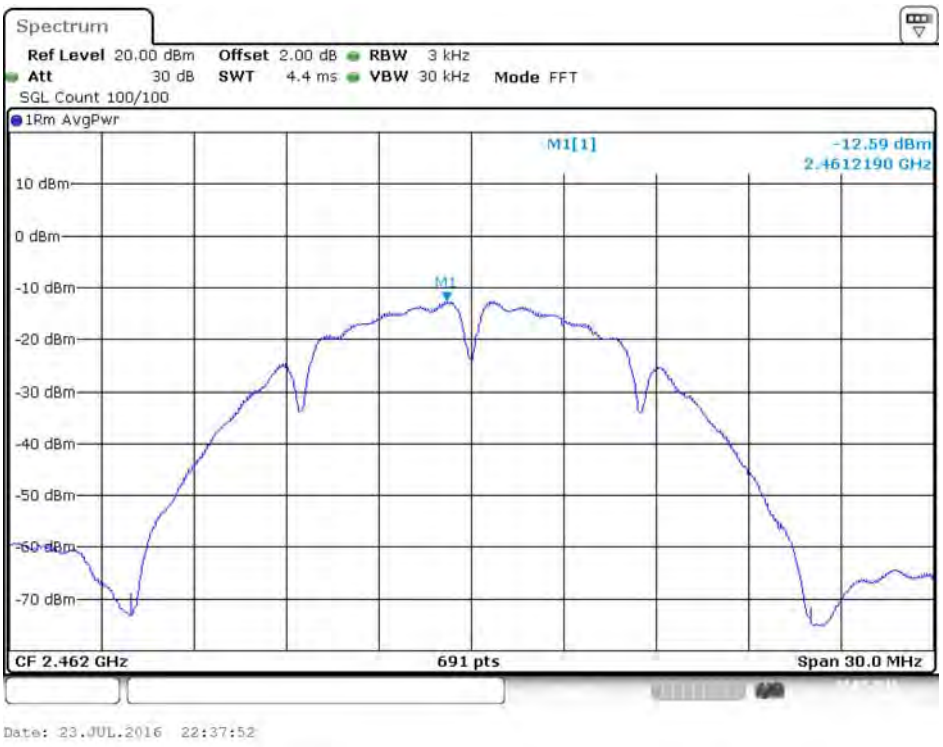
Note: Directional gain =8.54 dBi, so limit=8-(8.54-6)=5.46 dBm.

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

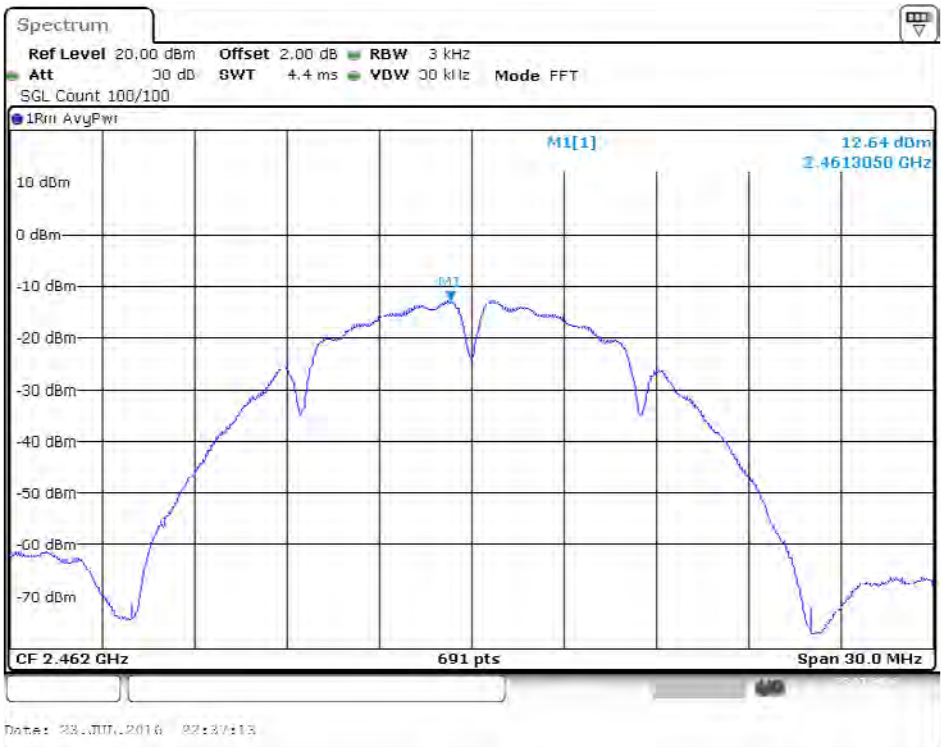
For plots, only the channel with worse result was shown.

For Directional antenna / Non-Beamforming Mode:

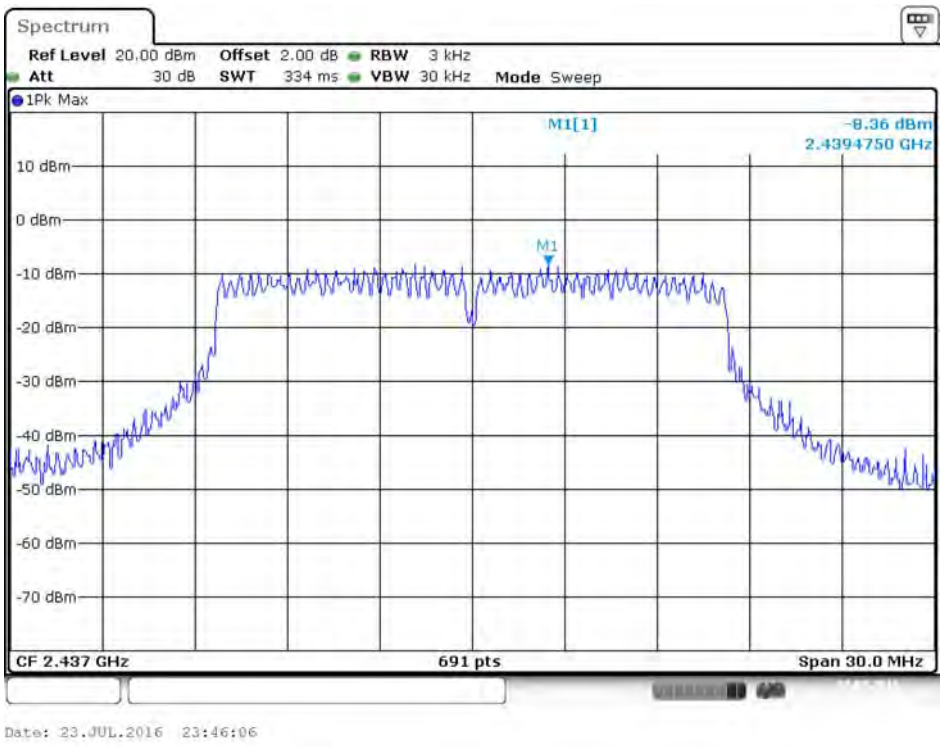
Power Density Plot on Configuration IEEE 802.11b / 2462 MHz / Chain 1



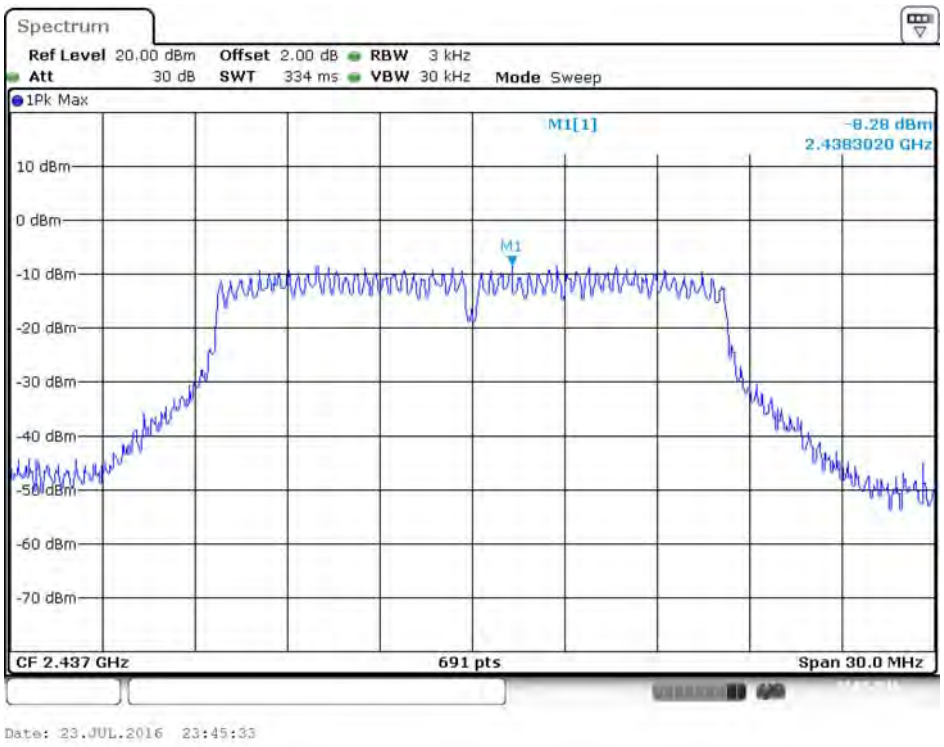
Power Density Plot on Configuration IEEE 802.11b / 2462 MHz / Chain 2



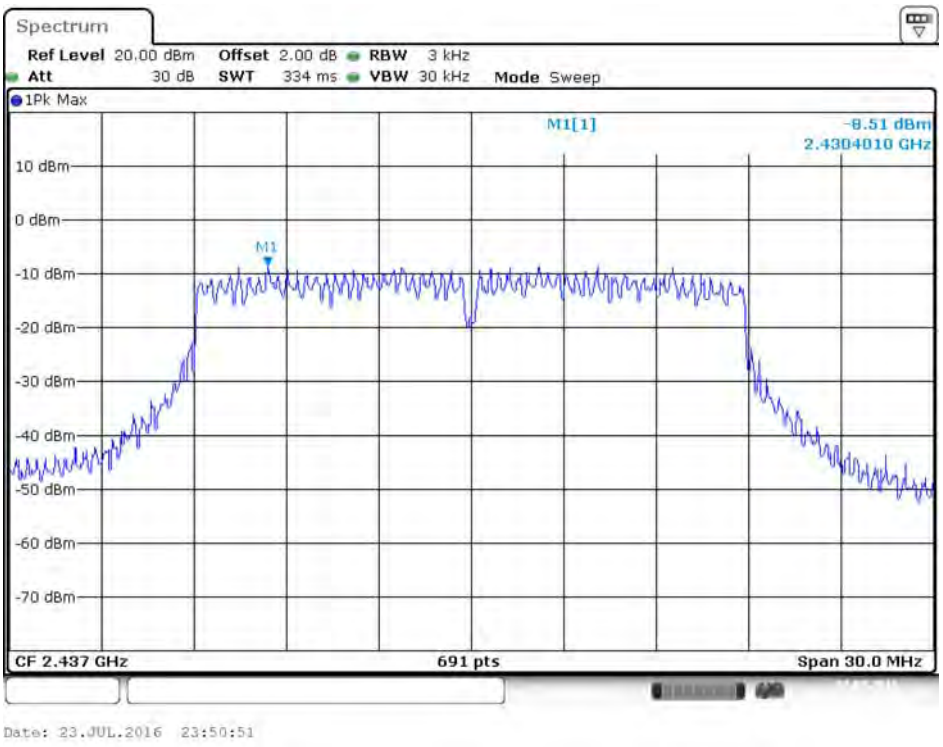
Power Density Plot on Configuration IEEE 802.11g / 2437 MHz / Chain 1



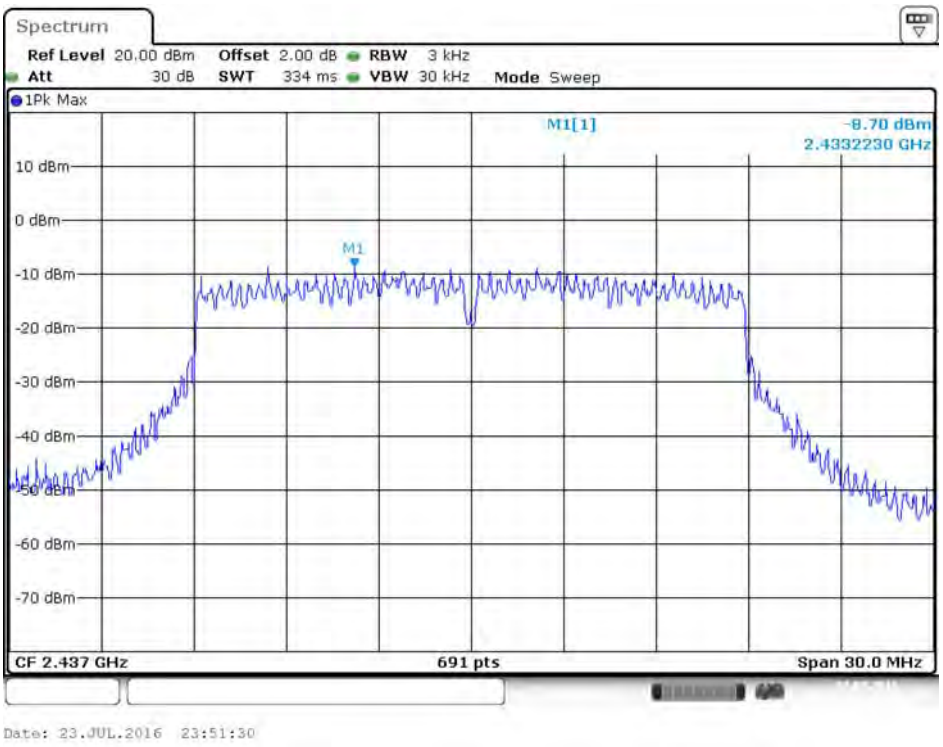
Power Density Plot on Configuration IEEE 802.11g / 2437 MHz / Chain 2



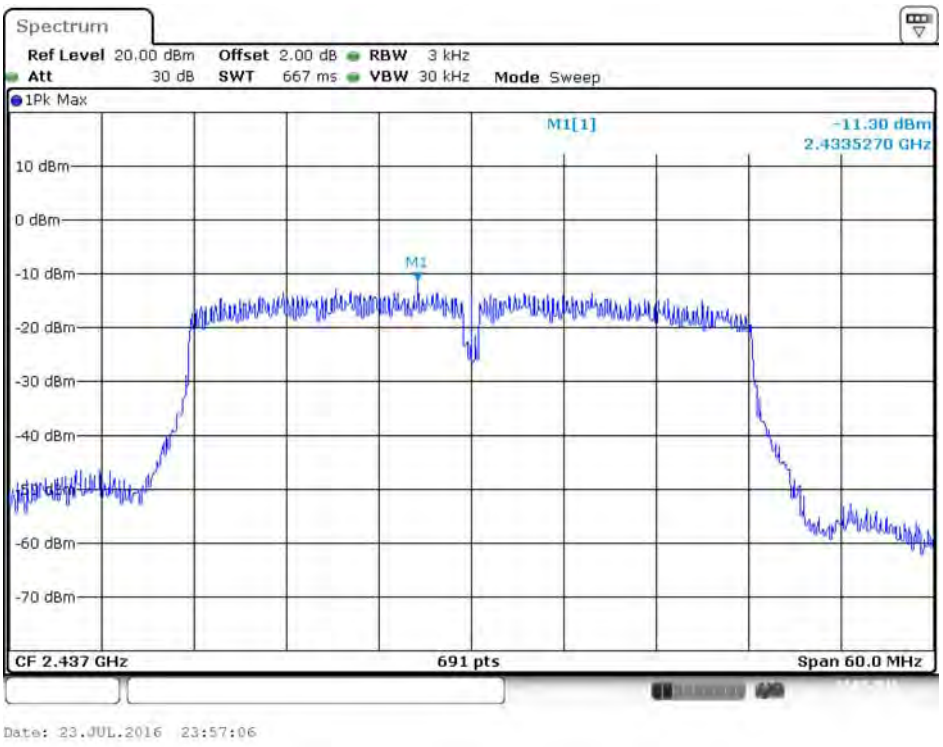
Power Density Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / 2437 MHz / Chain 1



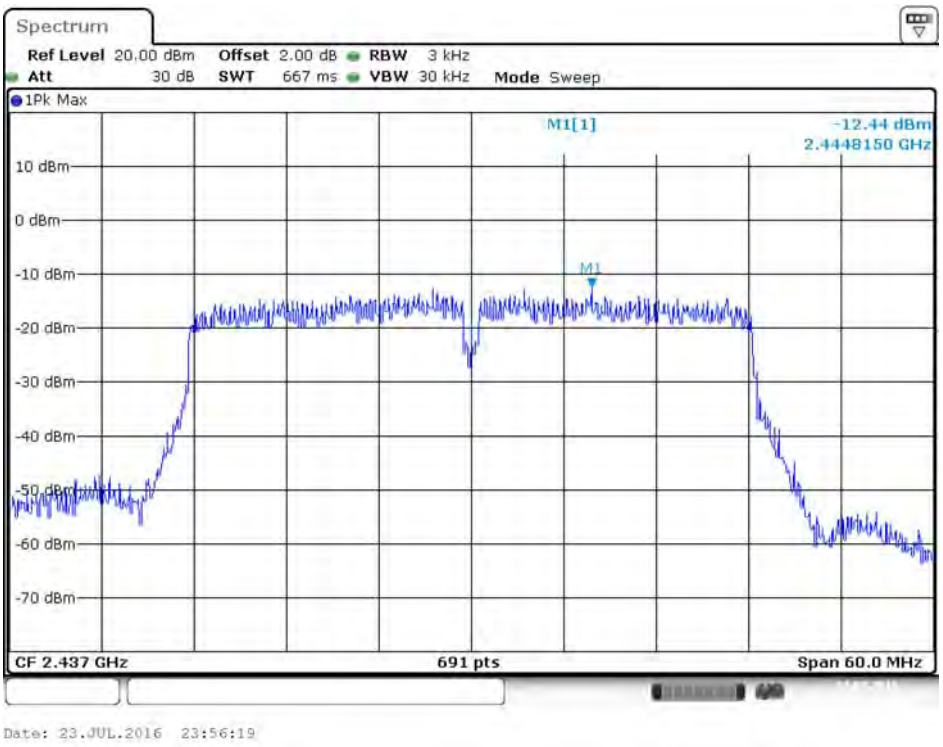
Power Density Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / 2437 MHz / Chain 2



Power Density Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / 2437 MHz / Chain 1

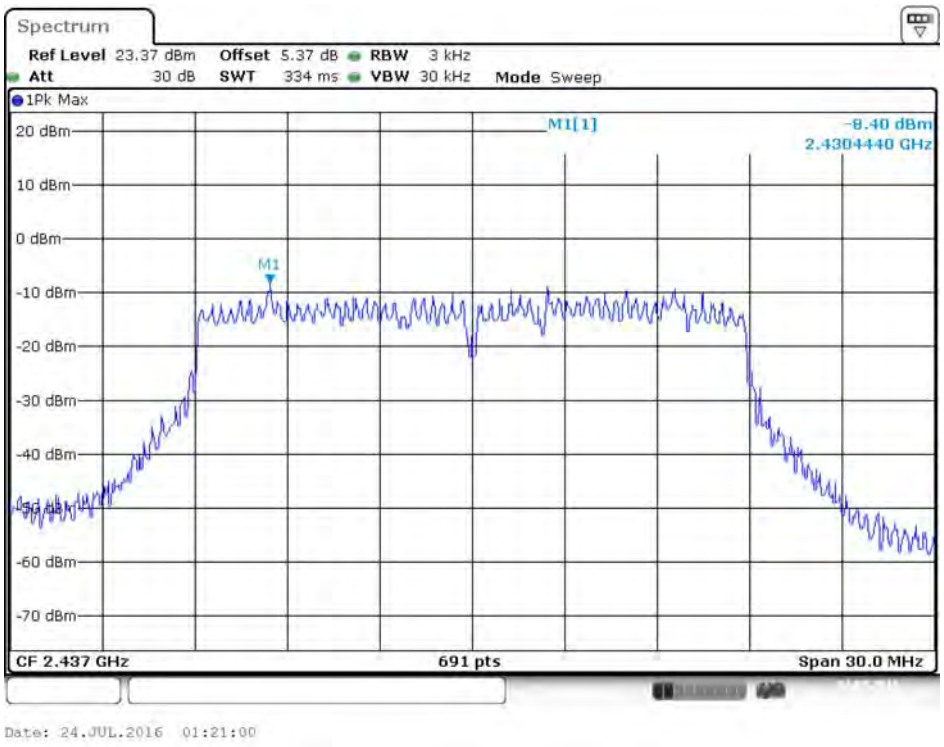


Power Density Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / 2437 MHz / Chain 2

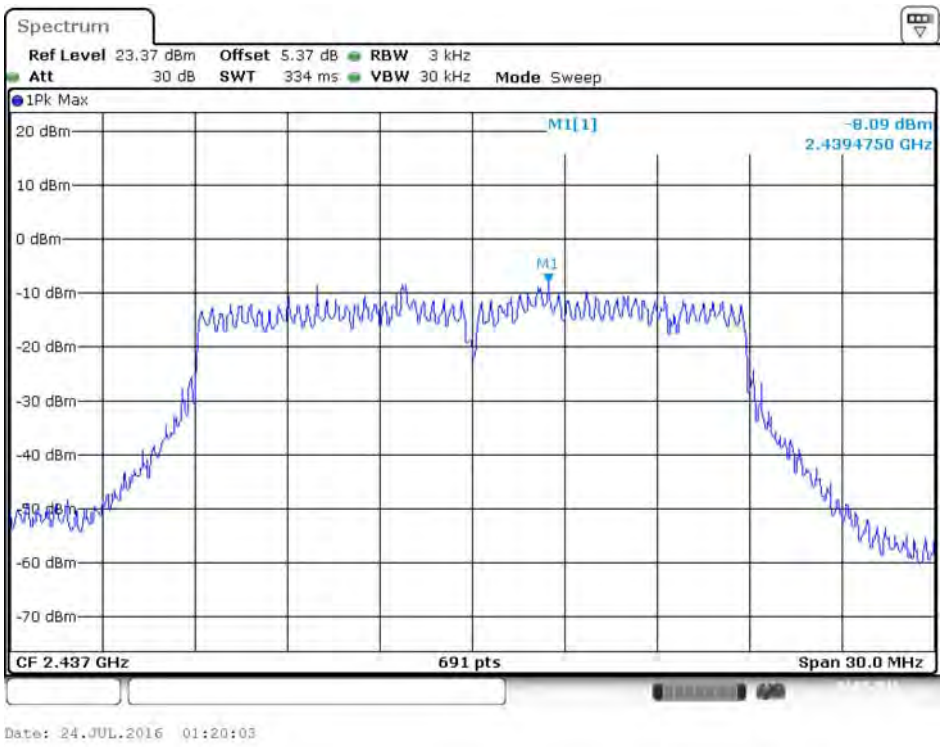


For Directional antenna / Beamforming Mode:

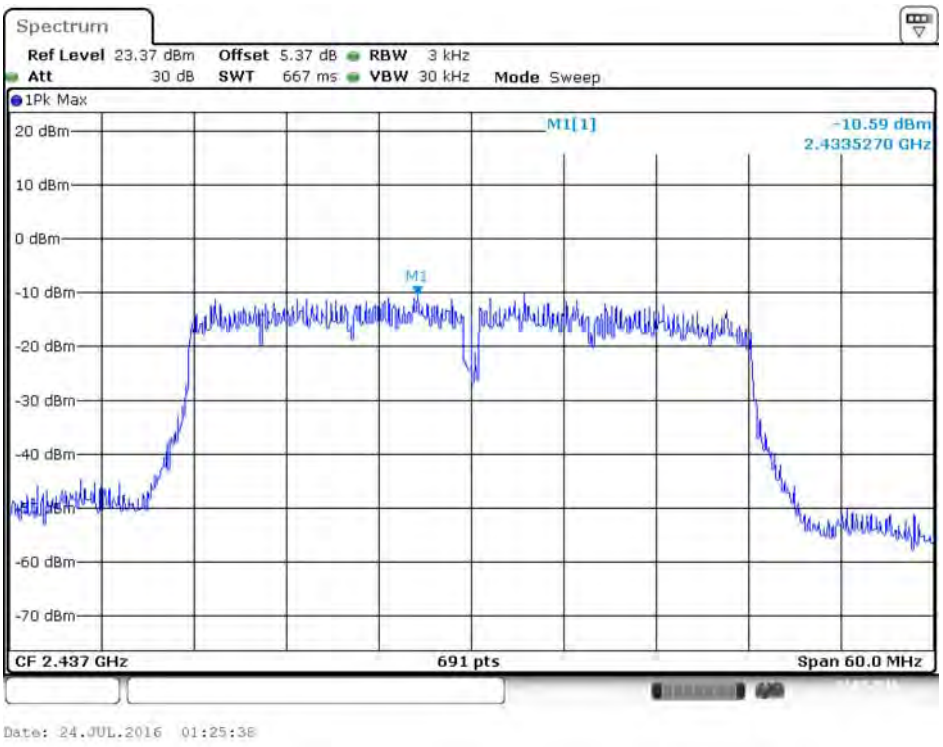
Power Density Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / 2437 MHz / Chain 1



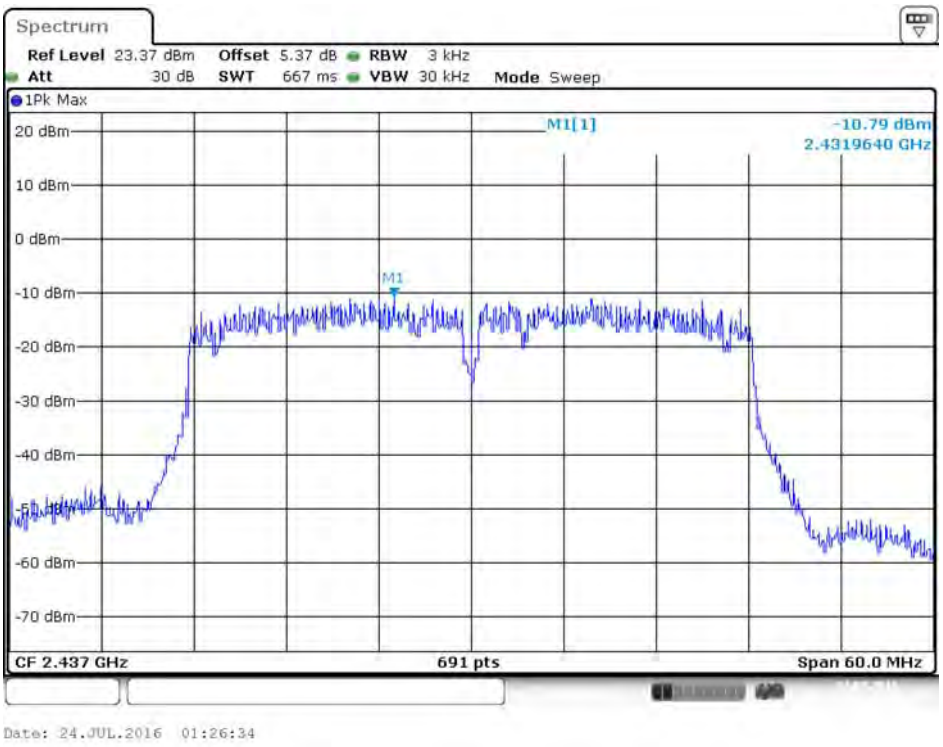
Power Density Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / 2437 MHz / Chain 2



Power Density Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / 2422 MHz / Chain 1



Power Density Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / 2422 MHz / Chain 2



For Omni antenna / Non-Beamforming Mode:

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

Date: 25.JUL.2016 11:39:27

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

Date: 25.JUL.2016 11:39:34

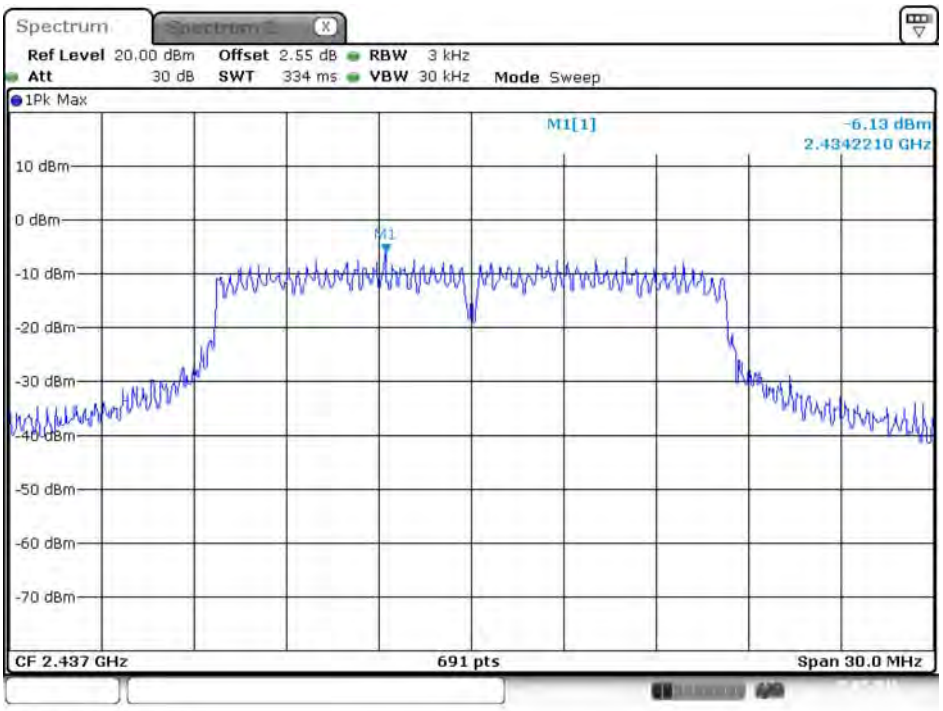
Power Density Plot on Configuration IEEE 802.11b / 2462 MHz / Chain 3

Date: 25.JUL.2016 11:39:43

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

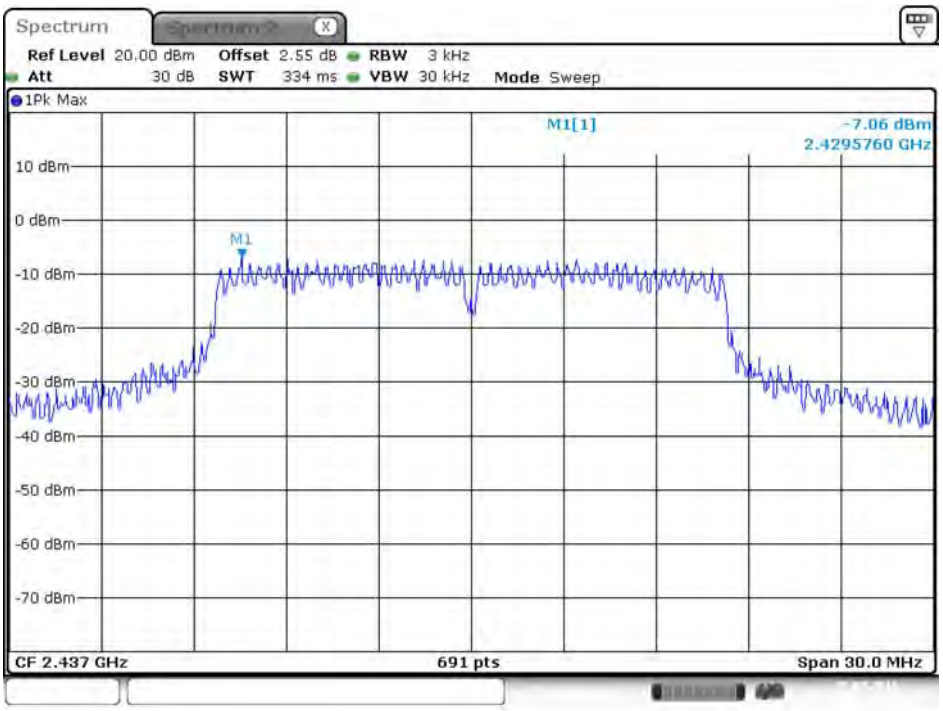
Date: 25.JUL.2016 11:39:48

Power Density Plot on Configuration IEEE 802.11g / 2437 MHz / Chain 1



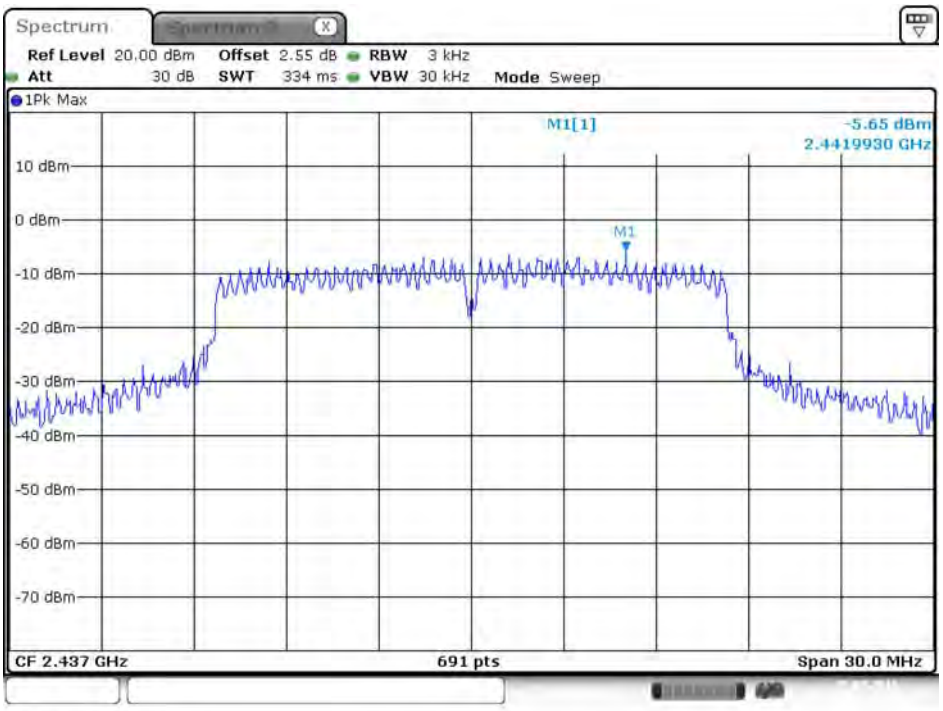
Date: 25.JUL.2016 11:55:57

Power Density Plot on Configuration IEEE 802.11g / 2437 MHz / Chain 2



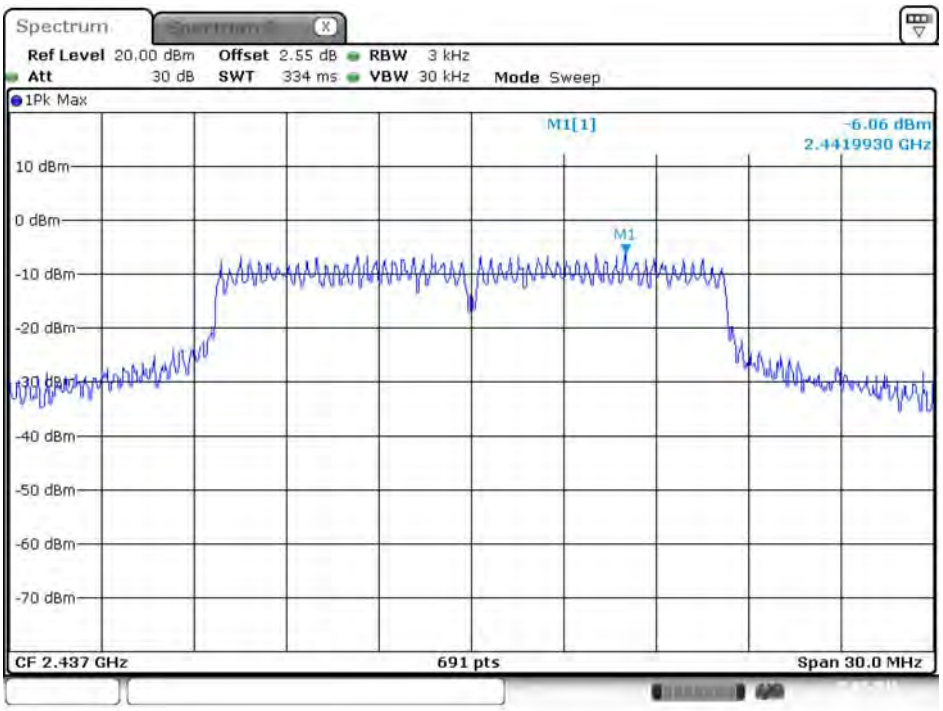
Date: 25.JUL.2016 11:56:06

Power Density Plot on Configuration IEEE 802.11g / 2437 MHz / Chain 3



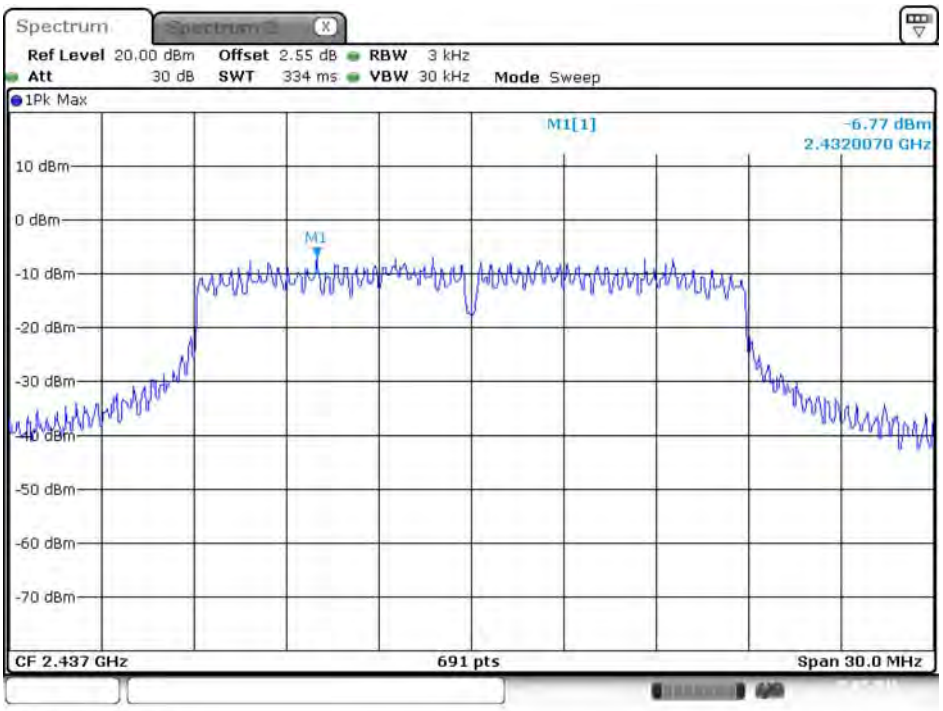
Date: 25.JUL.2016 11:56:16

Power Density Plot on Configuration IEEE 802.11g / 2437 MHz / Chain 4

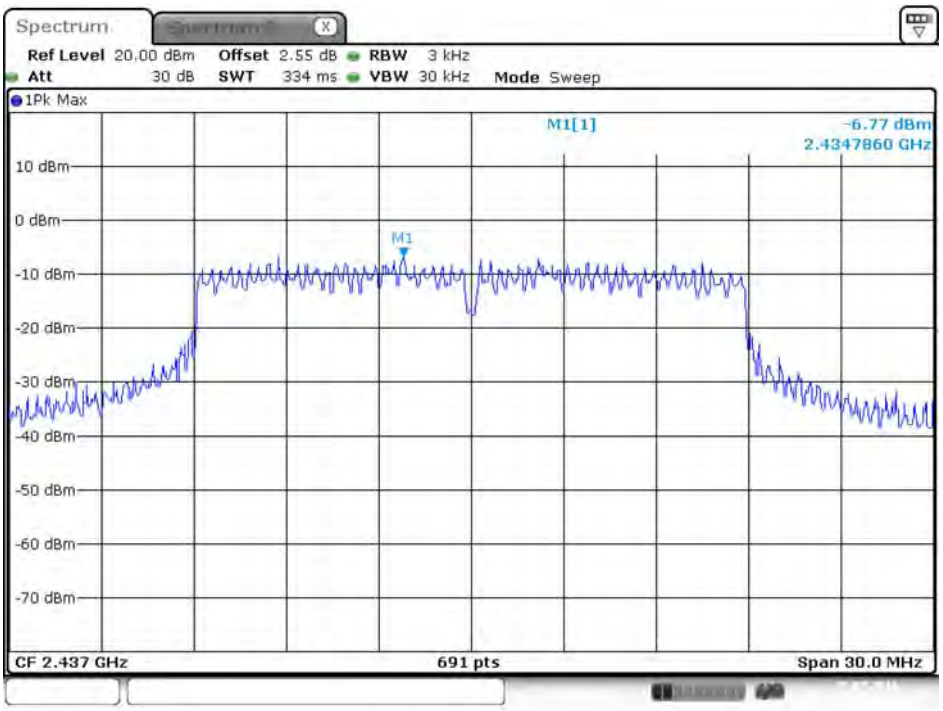


Date: 25.JUL.2016 11:56:25

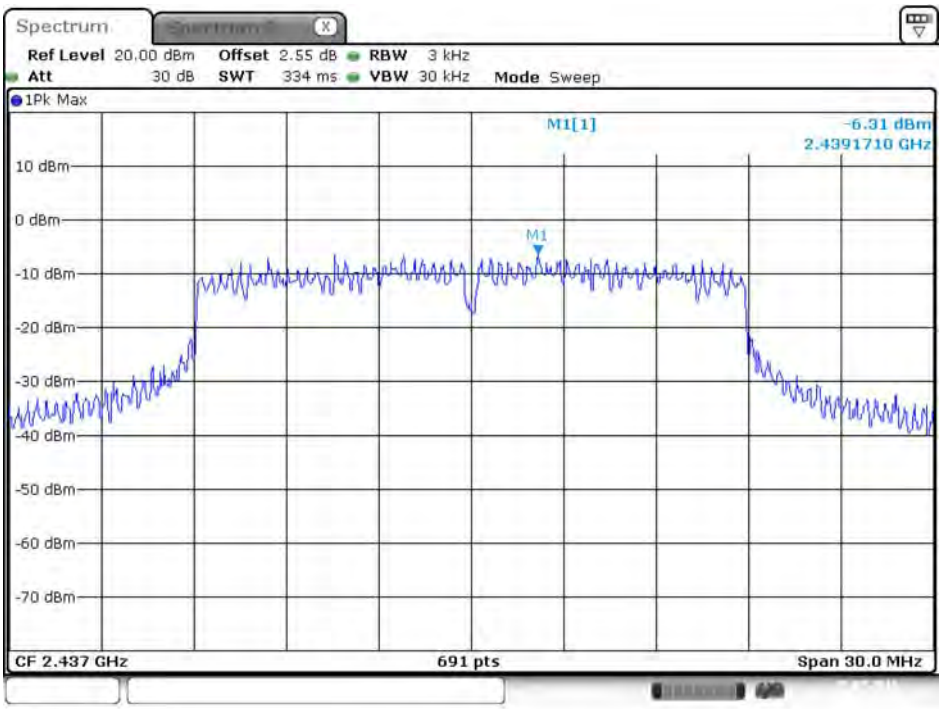
Power Density Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / 2437 MHz / Chain 1



Power Density Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / 2437 MHz / Chain 2

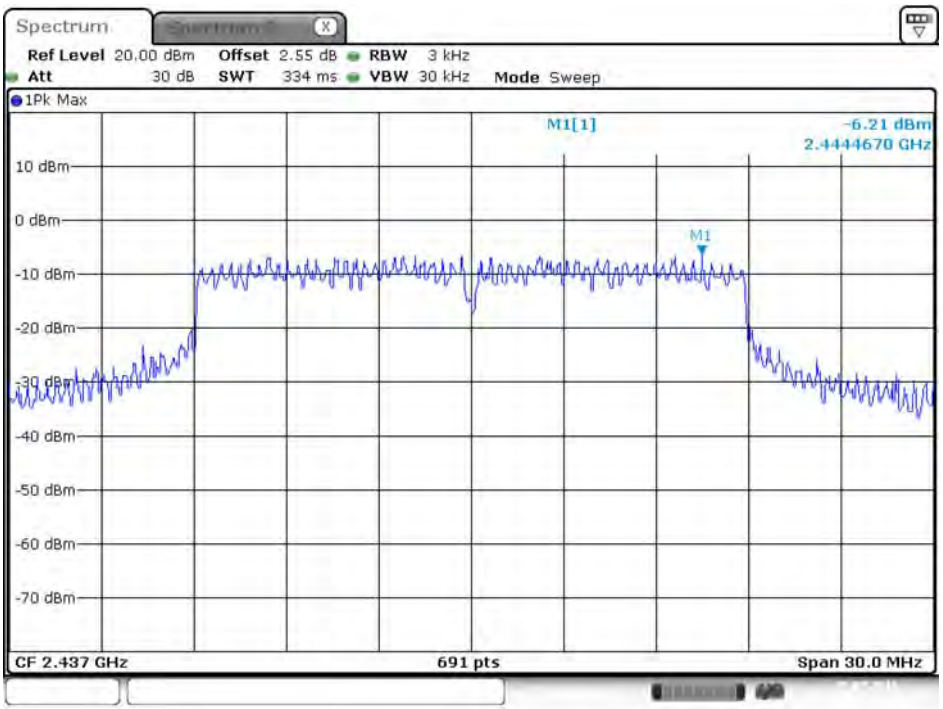


Power Density Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / 2437 MHz / Chain 3



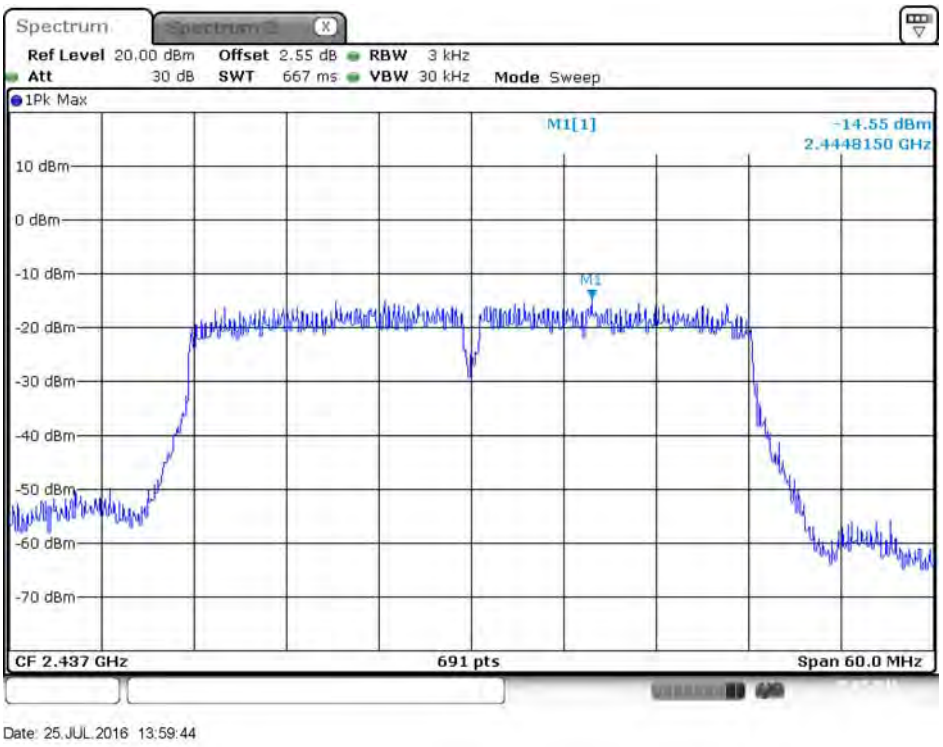
Date: 25.JUL.2016 12:02:59

Power Density Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / 2437 MHz / Chain 4

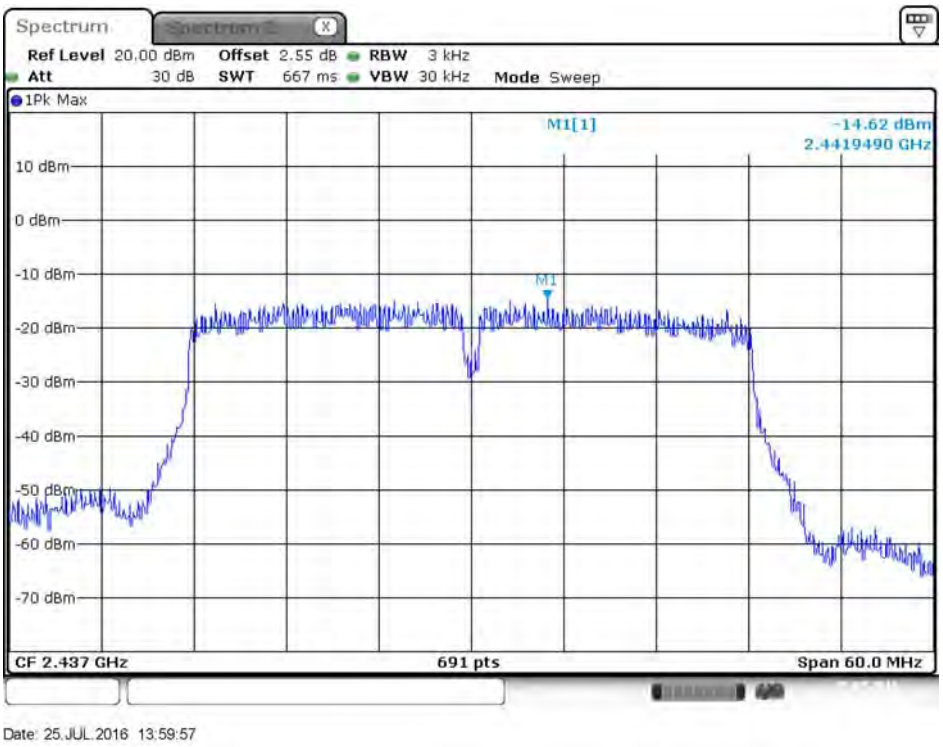


Date: 25.JUL.2016 12:03:14

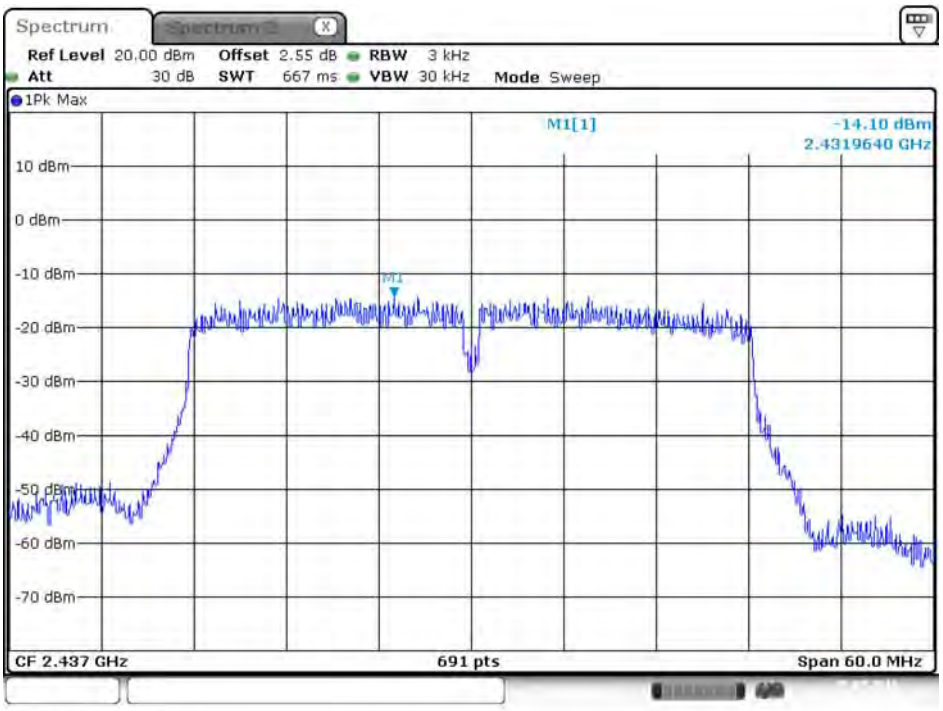
Power Density Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / 2437 MHz / Chain 1



Power Density Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / 2437 MHz / Chain 2

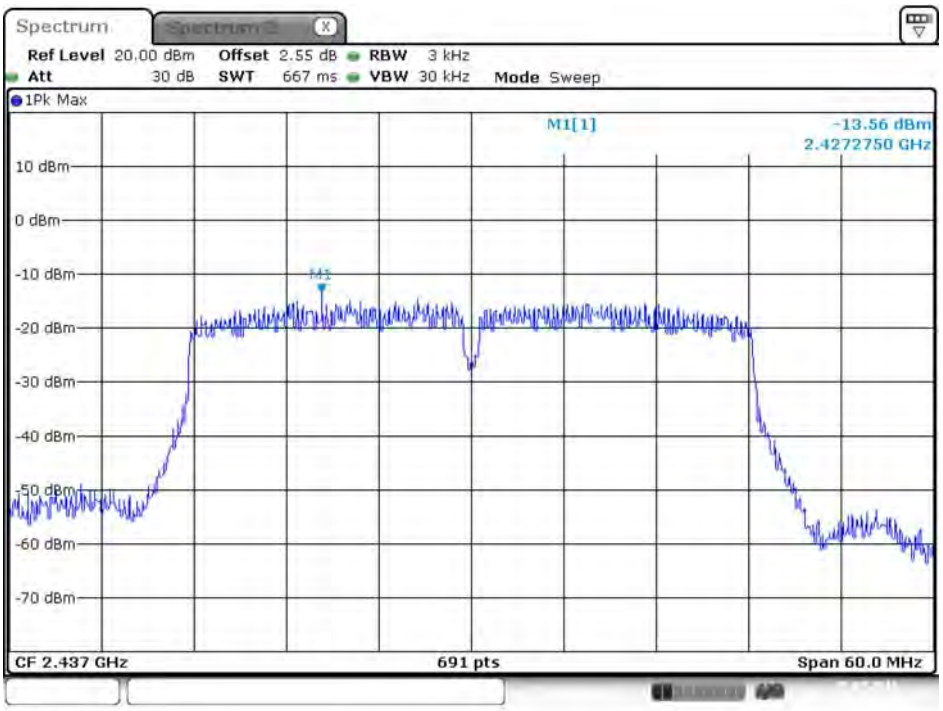


Power Density Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / 2437 MHz / Chain 3



Date: 25.JUL.2016 14:00:09

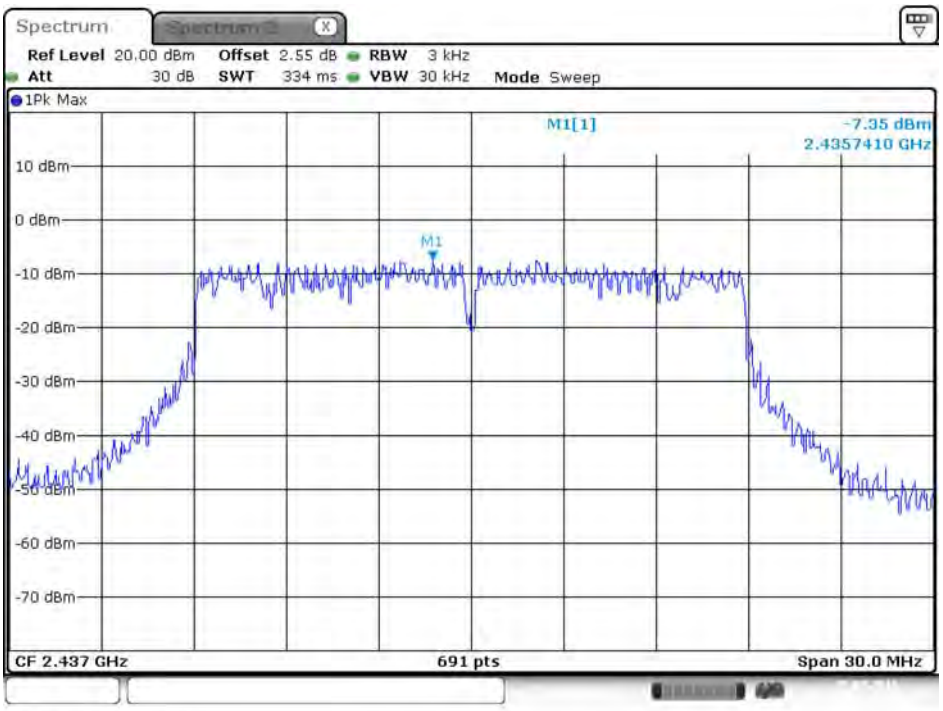
Power Density Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / 2437 MHz / Chain 4



Date: 25.JUL.2016 14:00:36

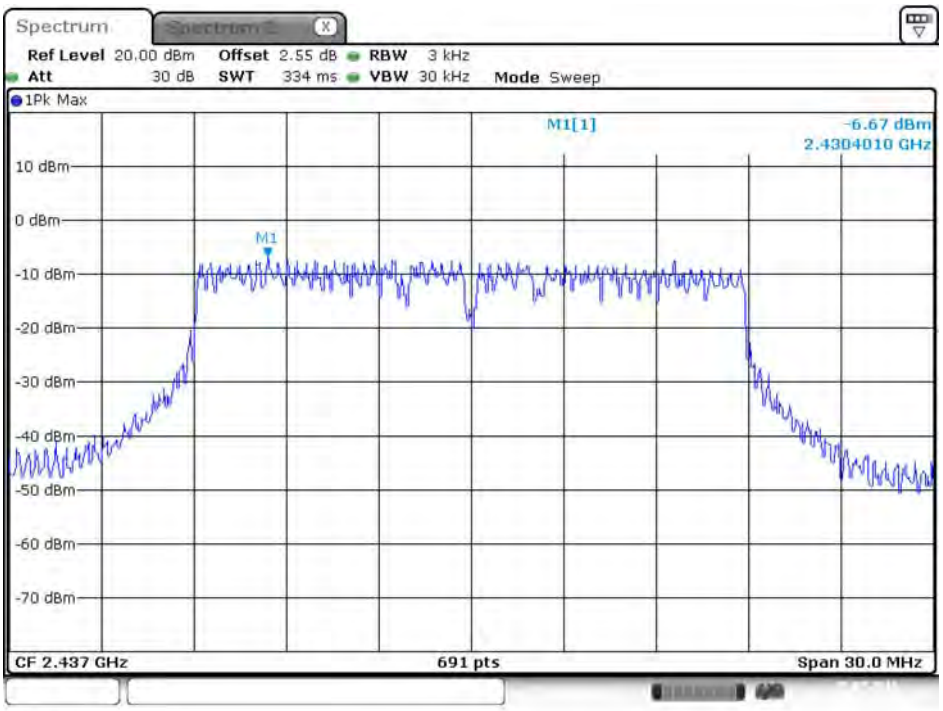
For Omni antenna / Beamforming Mode:

Power Density Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / 2437 MHz / Chain 1



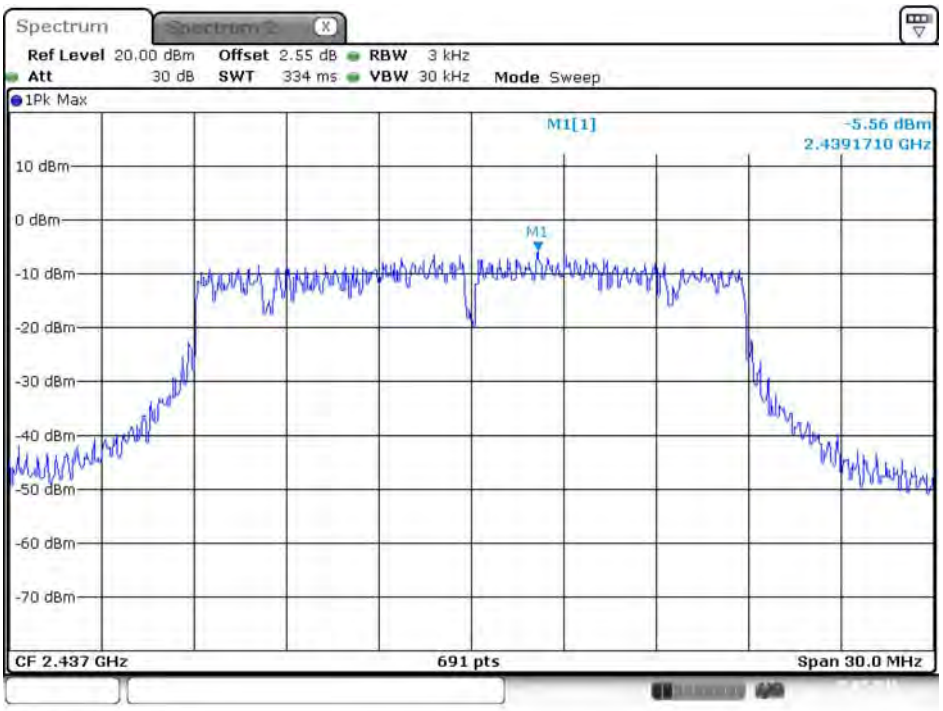
Date: 25.JUL.2016 14:28:57

Power Density Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / 2437 MHz / Chain 2



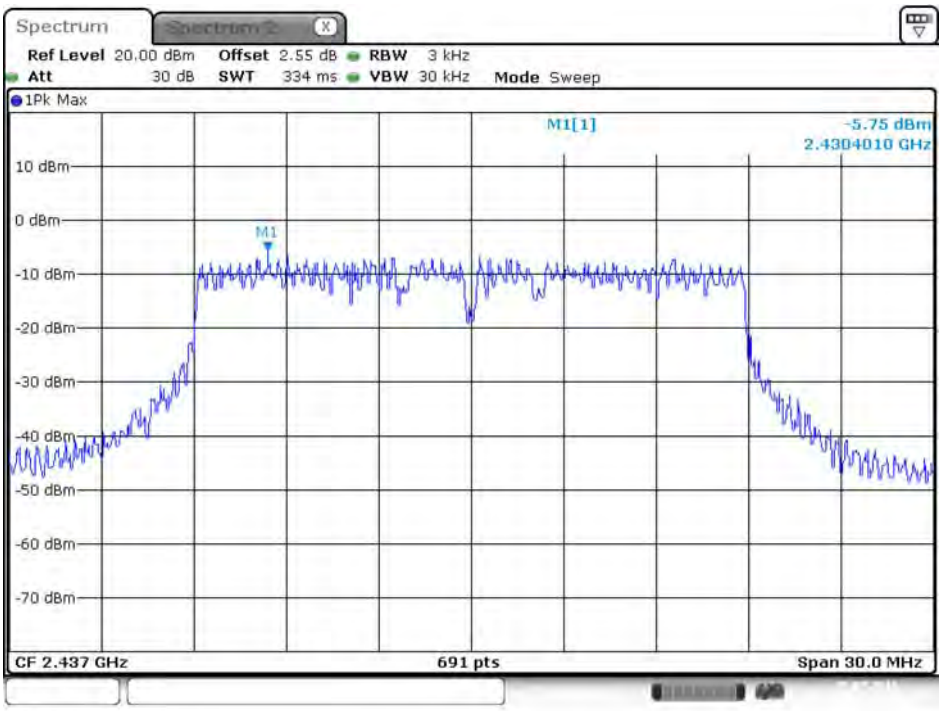
Date: 25.JUL.2016 14:29:08

Power Density Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / 2437 MHz / Chain 3



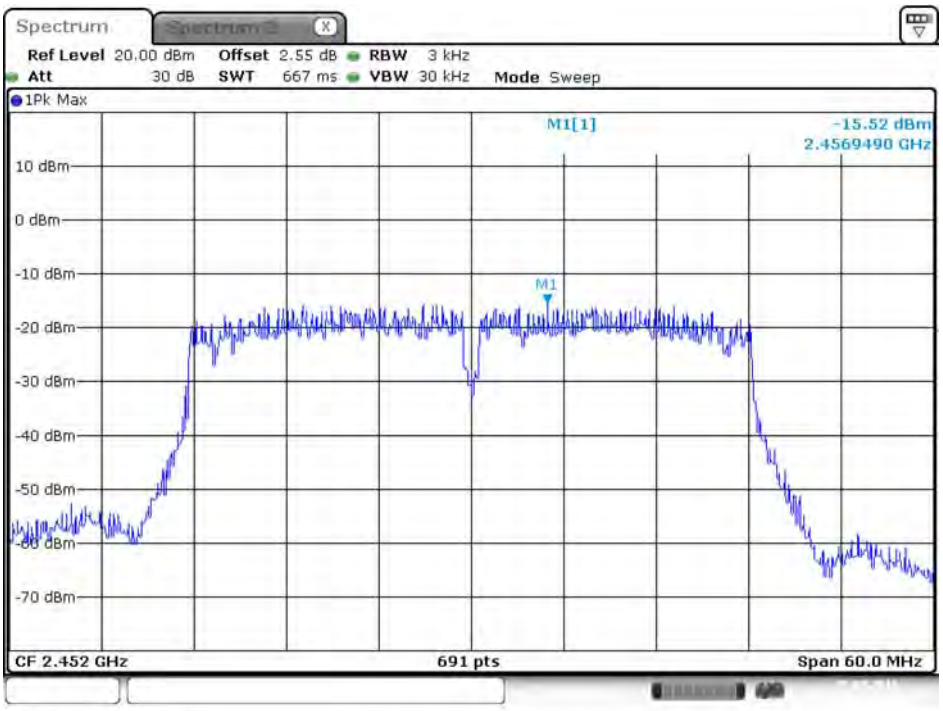
Date: 25.JUL.2016 14:29:20

Power Density Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / 2437 MHz / Chain 4



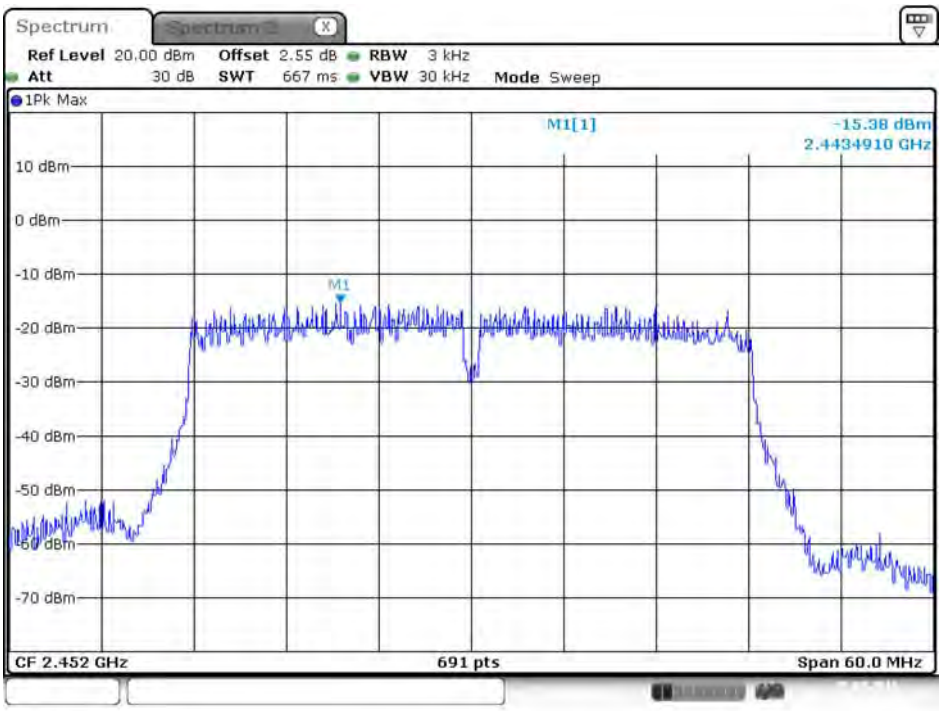
Date: 25.JUL.2016 14:29:30

Power Density Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / 2452 MHz / Chain 1



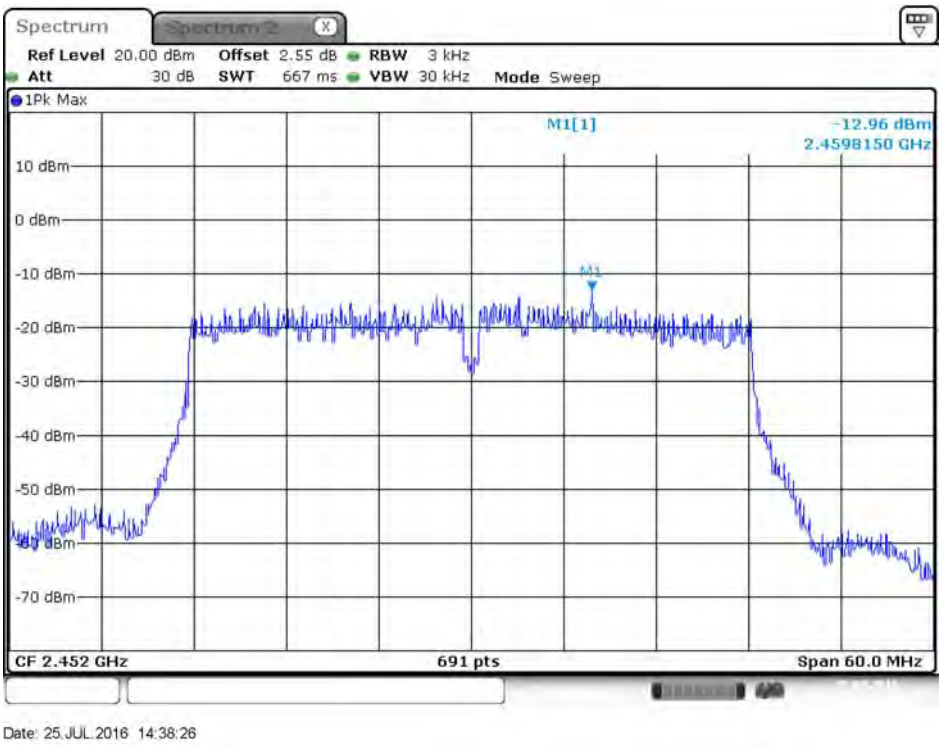
Date: 25.JUL.2016 14:38:12

Power Density Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / 2452 MHz / Chain 2

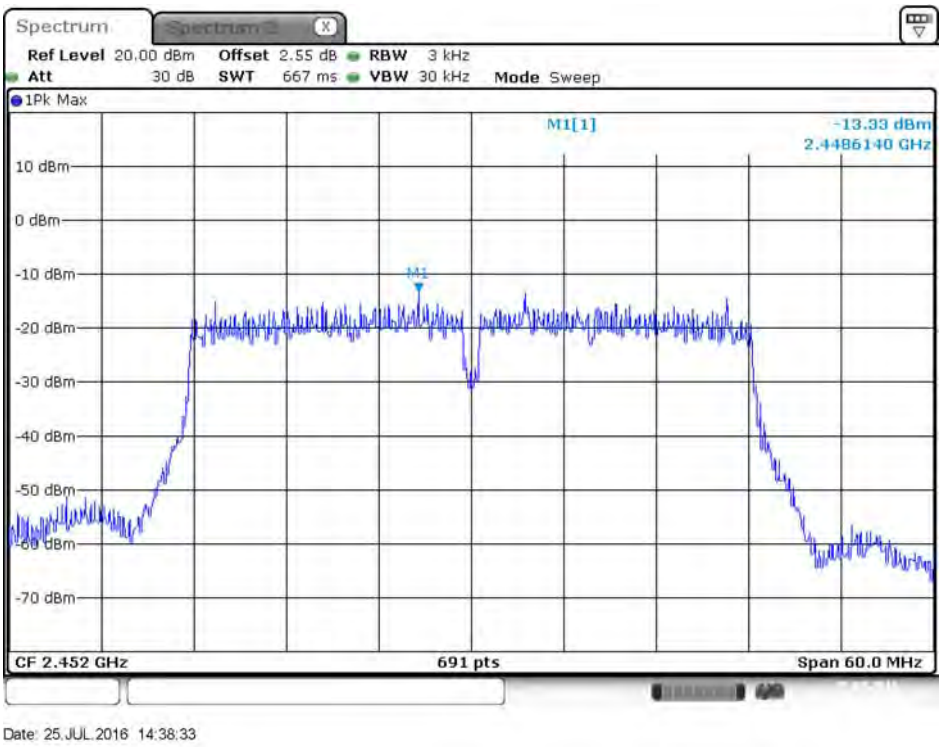


Date: 25.JUL.2016 14:38:18

Power Density Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / 2452 MHz / Chain 3



Power Density Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / 2452 MHz / Chain 4



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	25℃	Humidity	60%
Test Engineer	Akina Chiu		

For Directional antenna / Non-Beamforming Mode:

Mode	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11b	2412 MHz	6.55	10.33	500	**Complies**
	2437 MHz	6.03	11.55	500	**Complies**
	2462 MHz	6.09	10.25	500	**Complies**
802.11g	2412 MHz	15.77	16.50	500	**Complies**
	2437 MHz	12.00	16.50	500	**Complies**
	2462 MHz	15.77	16.50	500	**Complies**
802.11ac MCS0Nss1 VHT20	2412 MHz	8.46	17.71	500	**Complies**
	2437 MHz	12.93	17.63	500	**Complies**
	2462 MHz	16.99	17.71	500	**Complies**
802.11ac MCS0Nss1 VHT40	2422 MHz	33.86	35.75	500	**Complies**
	2437 MHz	33.97	35.60	500	**Complies**
	2452 MHz	32.58	35.75	500	**Complies**

For Directional antenna / Beamforming Mode:

Mode	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11ac MCS0Nss1 VHT20	2412 MHz	11.59	17.54	500	**Complies**
	2437 MHz	17.10	17.63	500	**Complies**
	2462 MHz	17.10	17.63	500	**Complies**
802.11ac MCS0Nss1 VHT40	2422 MHz	35.01	36.03	500	**Complies**
	2437 MHz	35.01	36.18	500	**Complies**
	2452 MHz	33.86	36.18	500	**Complies**

For Omni antenna / Non-Beamforming Mode:

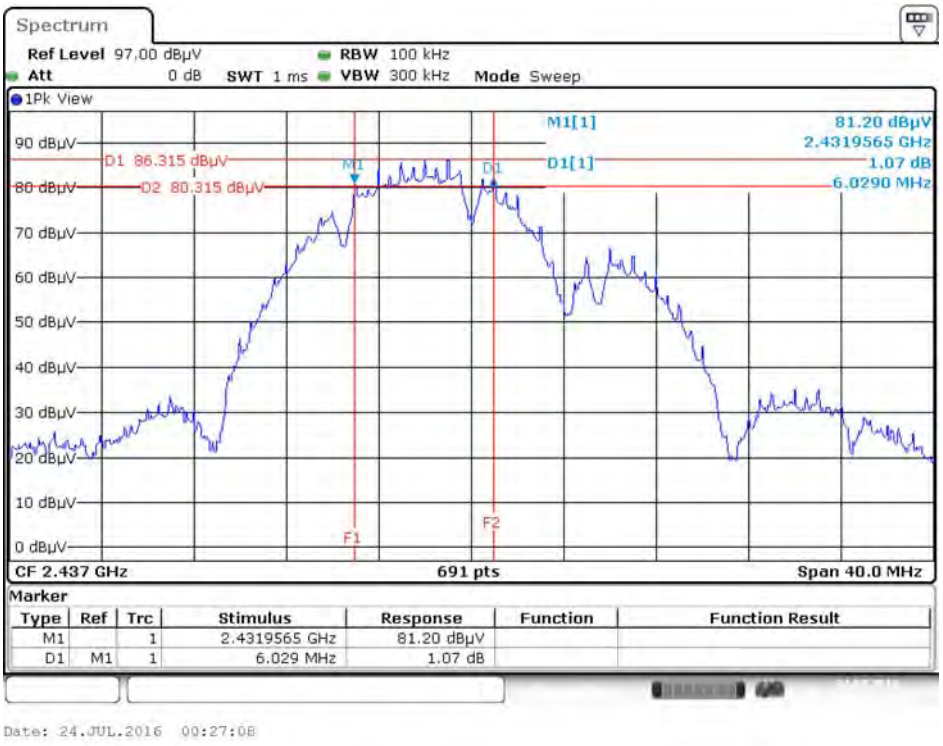
Mode	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11b	2412 MHz	4.52	13.81	500	**Complies**
	2437 MHz	3.59	12.59	500	**Complies**
	2462 MHz	9.04	13.98	500	**Complies**
802.11g	2412 MHz	10.09	15.98	500	**Complies**
	2437 MHz	12.58	16.24	500	**Complies**
	2462 MHz	13.86	16.15	500	**Complies**
802.11ac MCS0Nss1 VHT20	2412 MHz	12.58	16.76	500	**Complies**
	2437 MHz	14.61	16.93	500	**Complies**
	2462 MHz	13.16	17.02	500	**Complies**
802.11ac MCS0Nss1 VHT40	2422 MHz	32.70	36.47	500	**Complies**
	2437 MHz	35.71	36.61	500	**Complies**
	2452 MHz	35.71	36.61	500	**Complies**

For Omni antenna / Beamforming Mode:

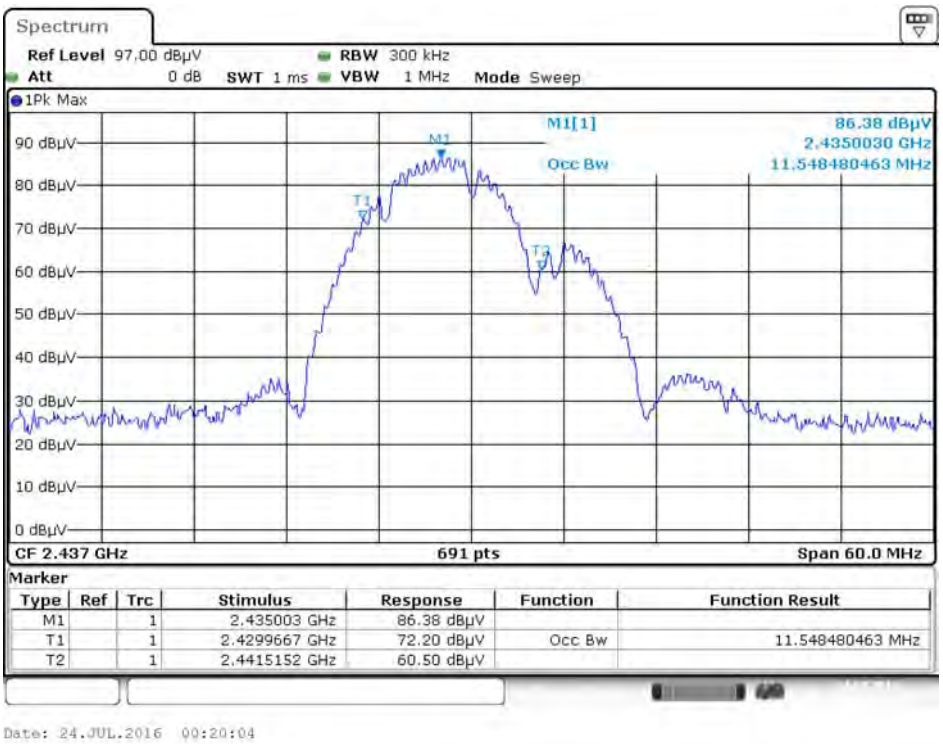
Mode	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11ac MCS0Nss1 VHT20	2412 MHz	16.06	18.06	500	**Complies**
	2437 MHz	15.94	20.06	500	**Complies**
	2462 MHz	12.17	18.58	500	**Complies**
802.11ac MCS0Nss1 VHT40	2422 MHz	35.13	37.05	500	**Complies**
	2437 MHz	36.41	37.77	500	**Complies**
	2452 MHz	36.41	38.35	500	**Complies**

For Directional antenna / Non-Beamforming Mode:

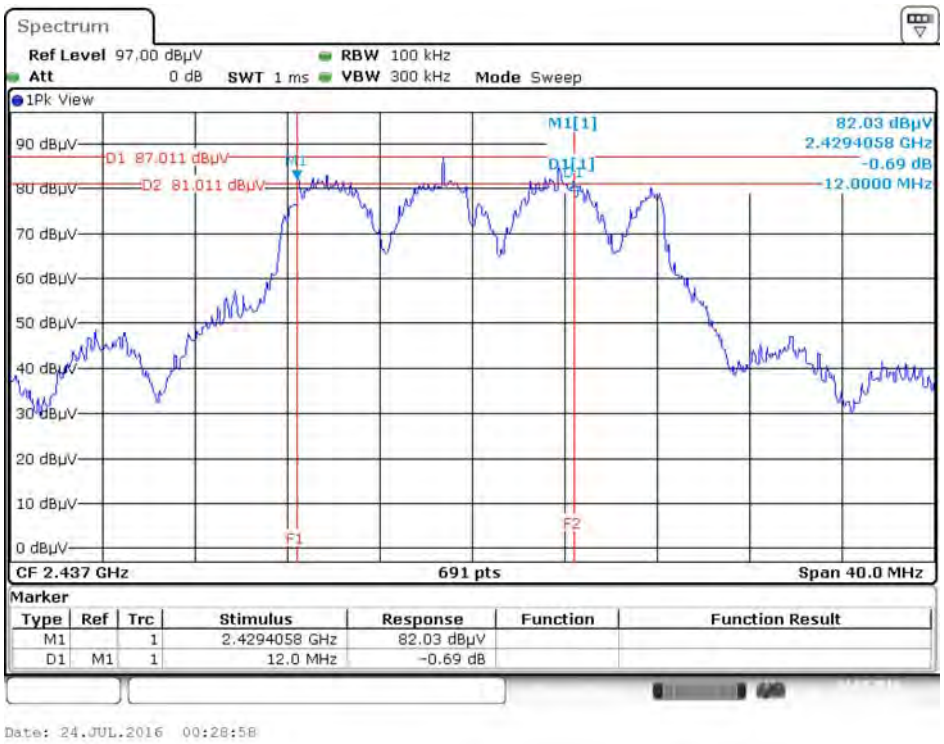
6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2437 MHz / Chain 1 + Chain 2



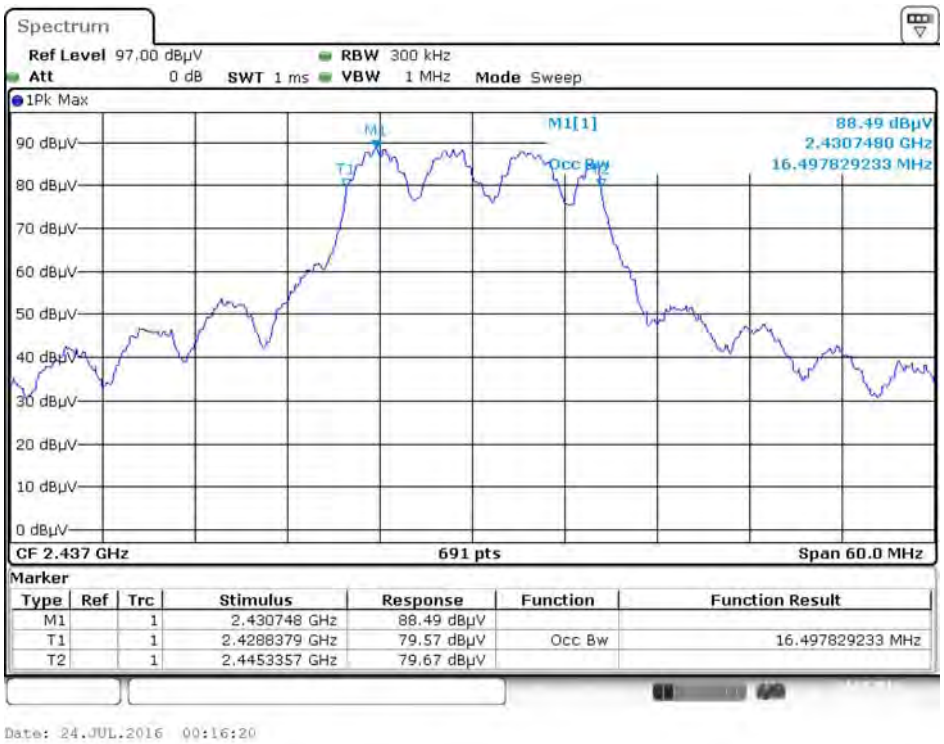
99% Occupied Bandwidth Plot on Configuration IEEE 802.11b / 2437 MHz / Chain 1 + Chain 2



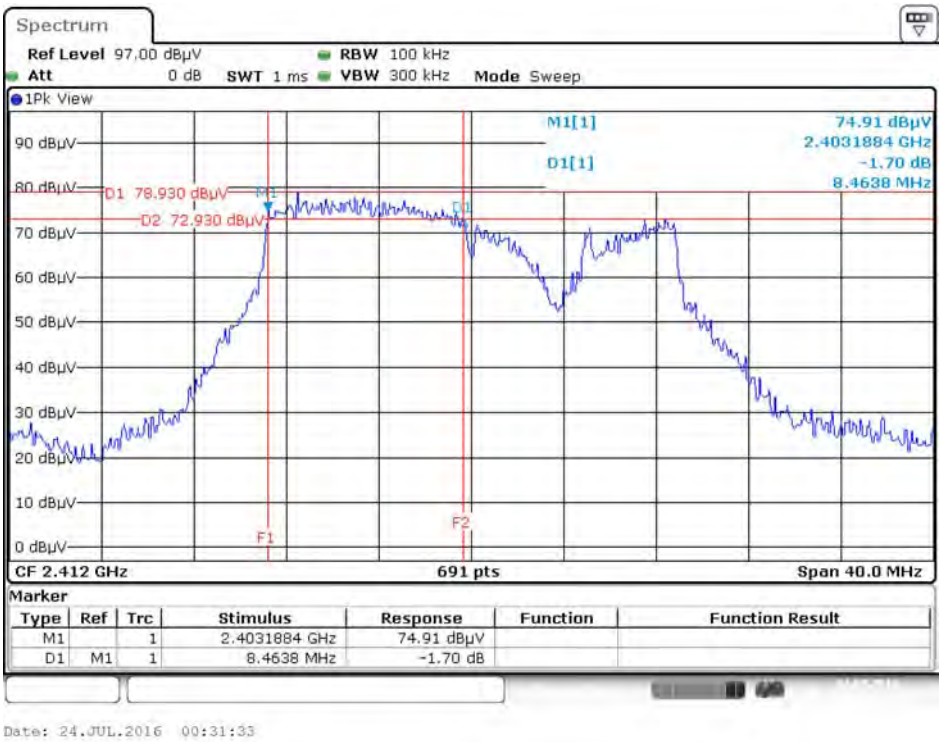
6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2437 MHz / Chain 1 + Chain 2



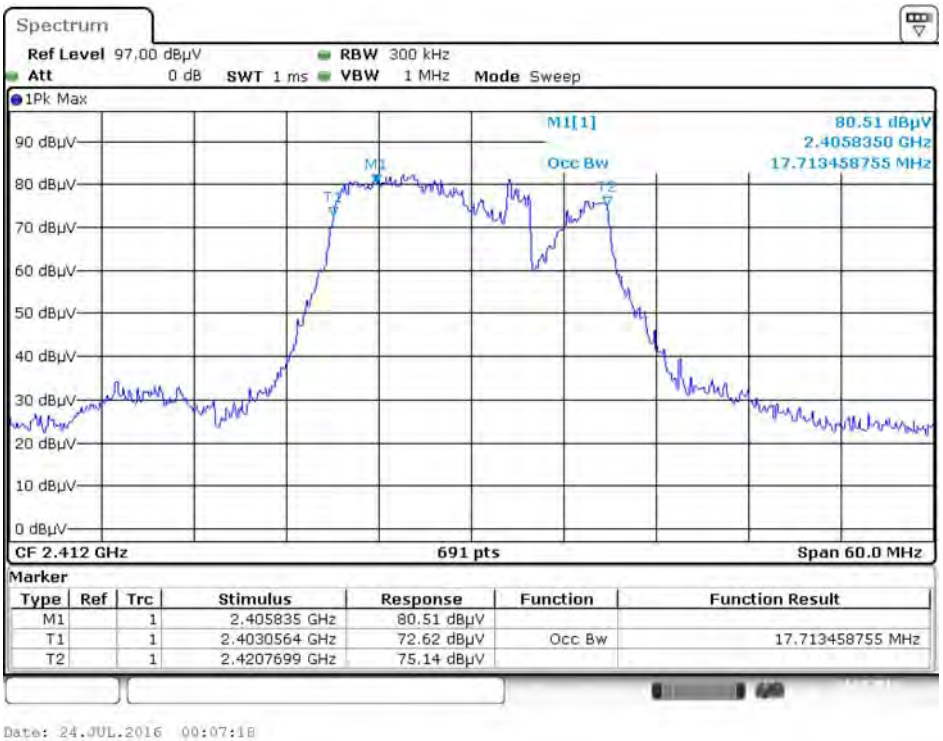
99% Occupied Bandwidth Plot on Configuration IEEE 802.11g / 2437 MHz / Chain 1 + Chain 2



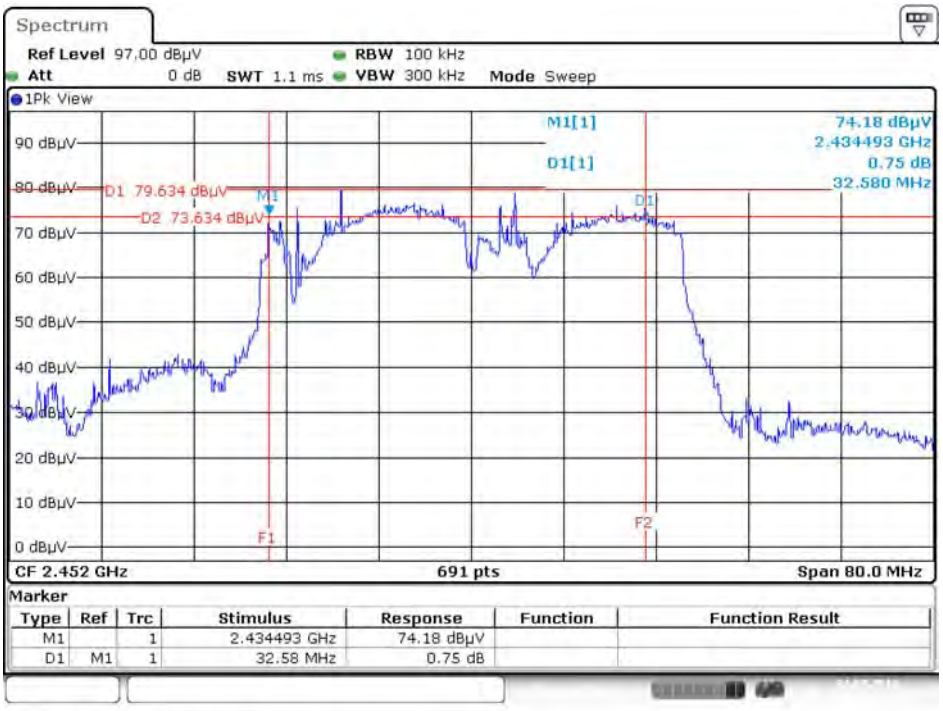
6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / 2412 MHz / Chain 1 + Chain 2



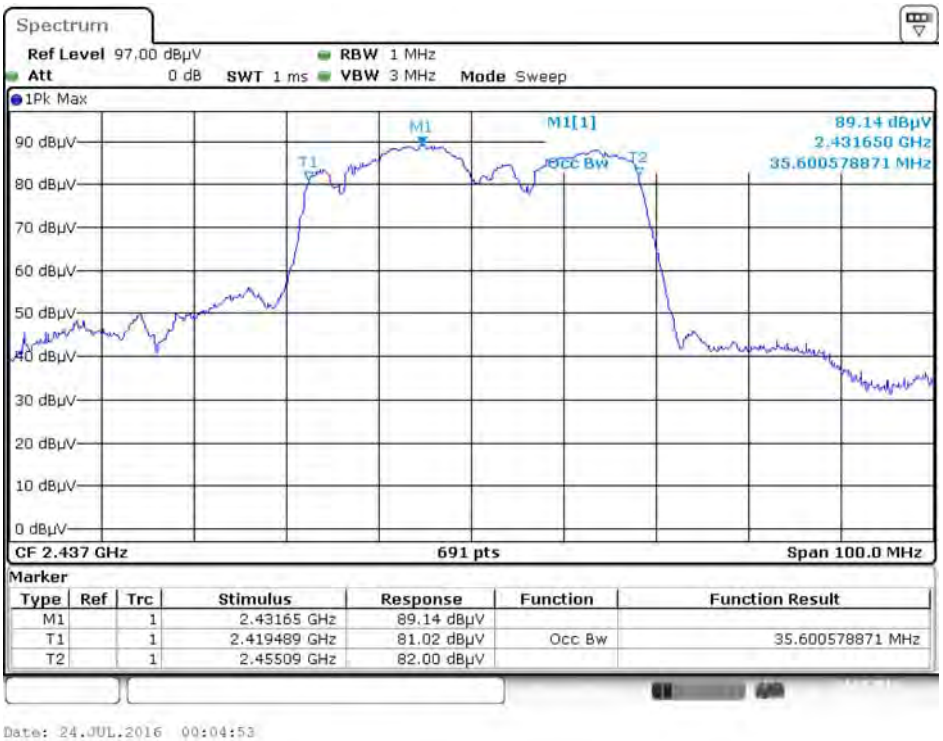
99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / 2412 MHz / Chain 1 + Chain 2



6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / 2452 MHz / Chain 1 + Chain 2

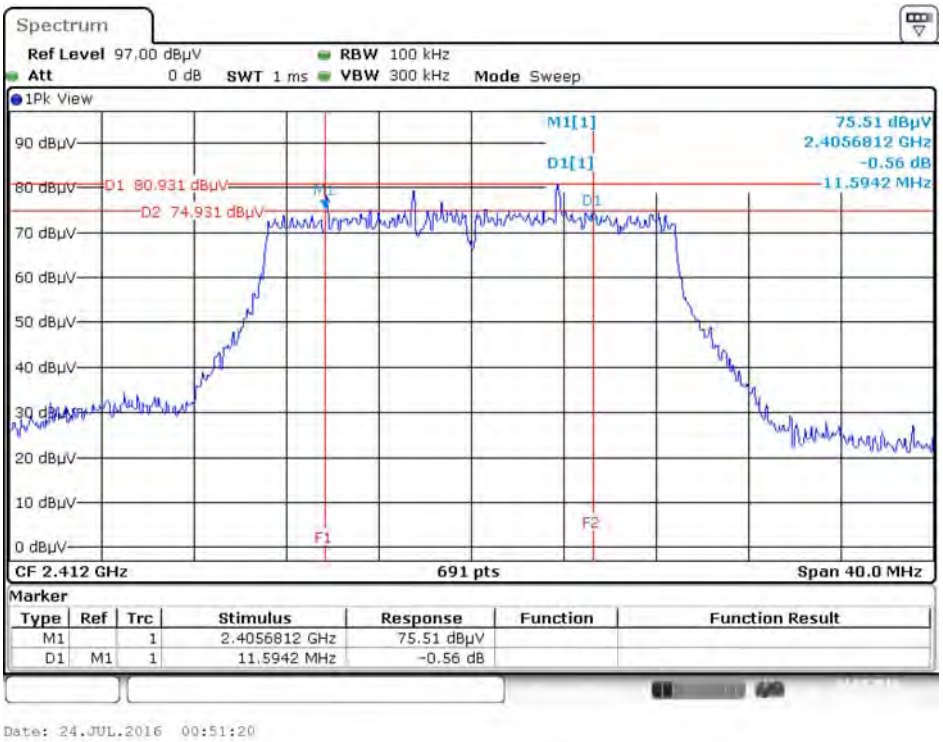


99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / 2437 MHz / Chain 1 + Chain 2

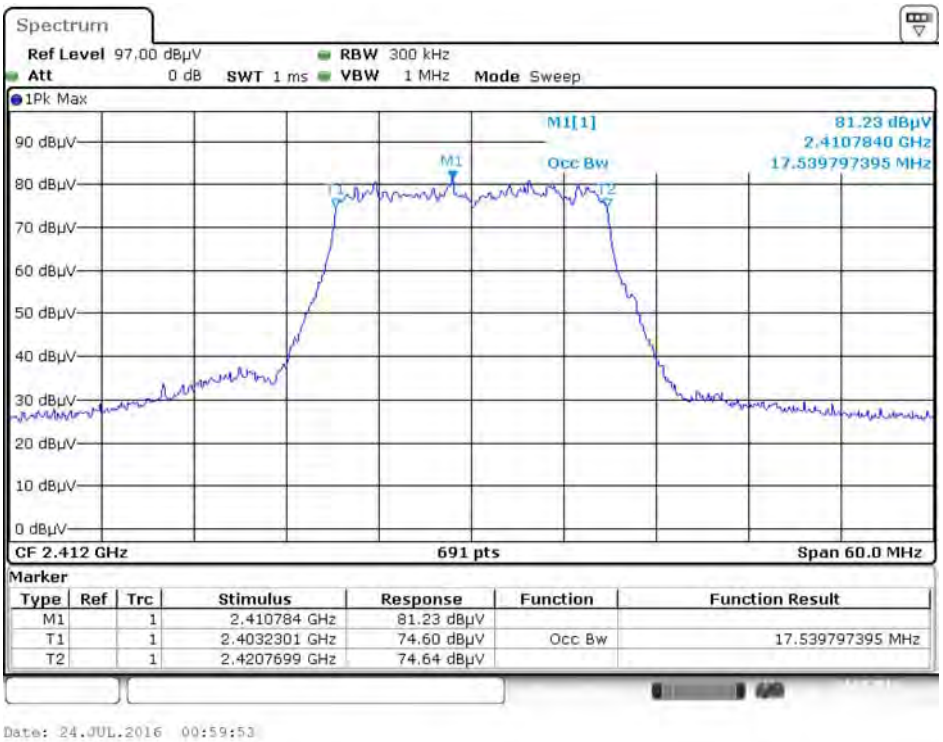


For Directional antenna / Beamforming Mode:

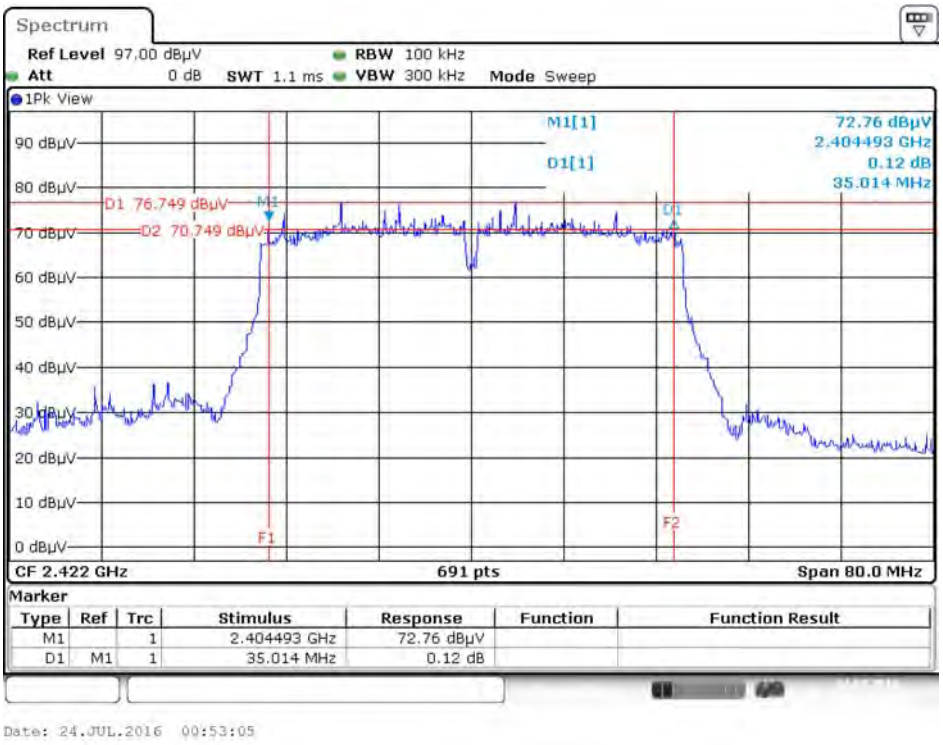
6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / 2412 MHz / Chain 1 + Chain 2



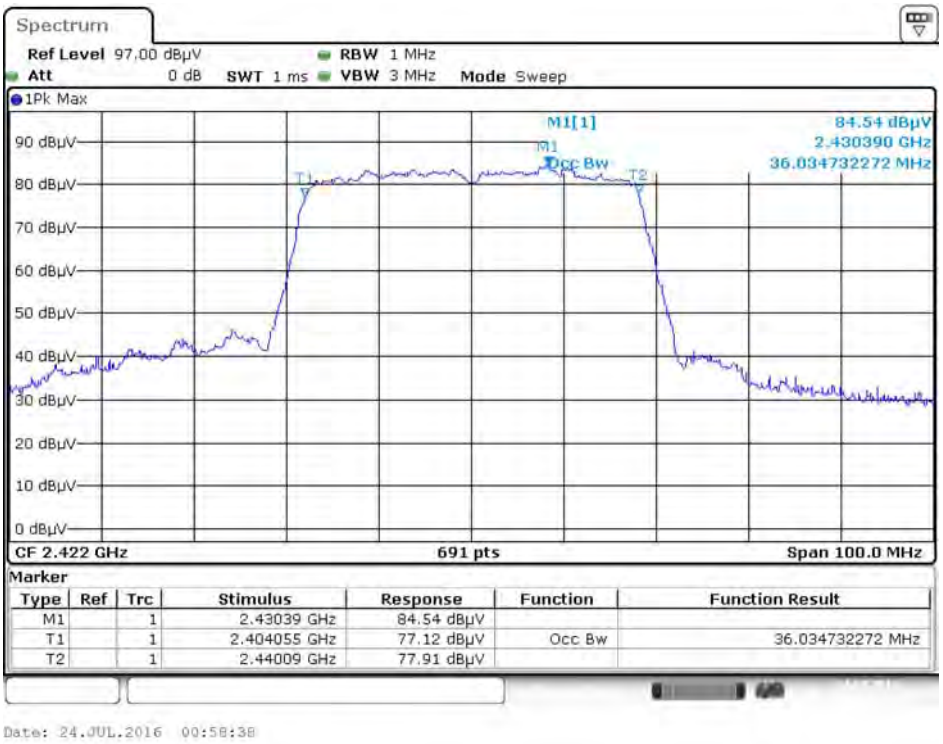
99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / 2412 MHz / Chain 1 + Chain 2



6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / 2422 MHz / Chain 1 + Chain 2

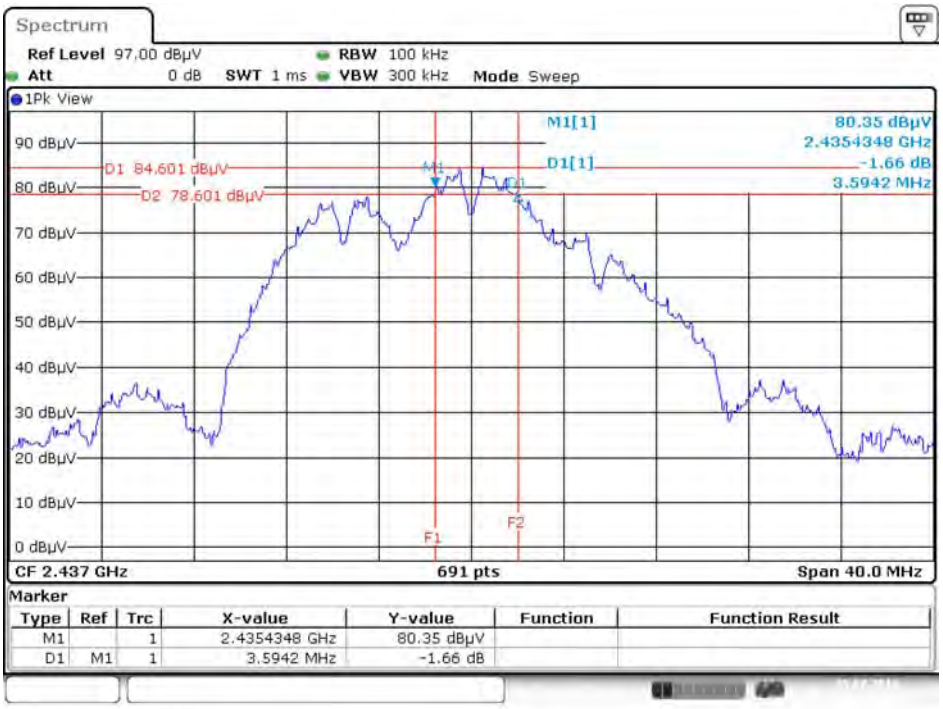


99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / 2422 MHz / Chain 1 + Chain 2



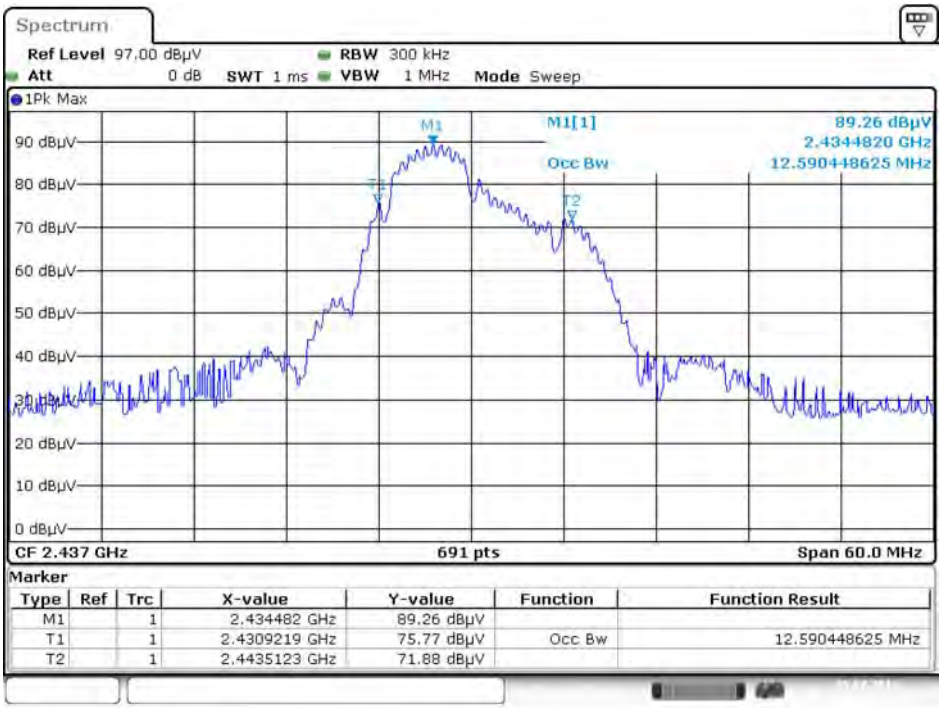
For Omni antenna / Non-Beamforming Mode:

6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2437 MHz / Chain 1 + Chain 2 + Chain 3 + Chain 4



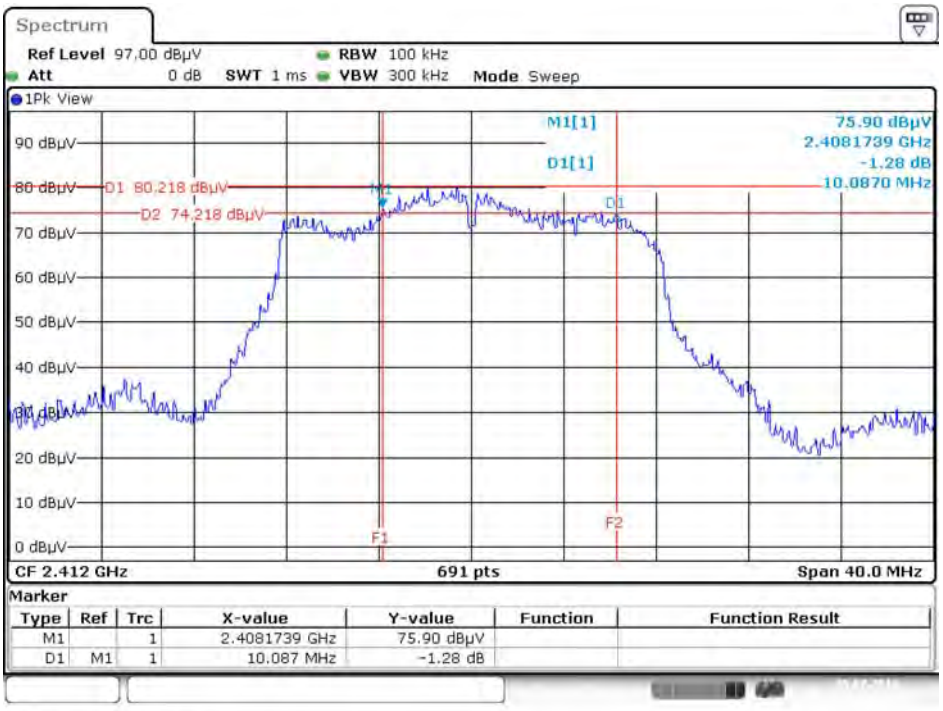
Date: 25.JUL.2016 14:52:02

99% Occupied Bandwidth Plot on Configuration IEEE 802.11b / 2437 MHz / Chain 1 + Chain 2 + Chain 3 + Chain 4

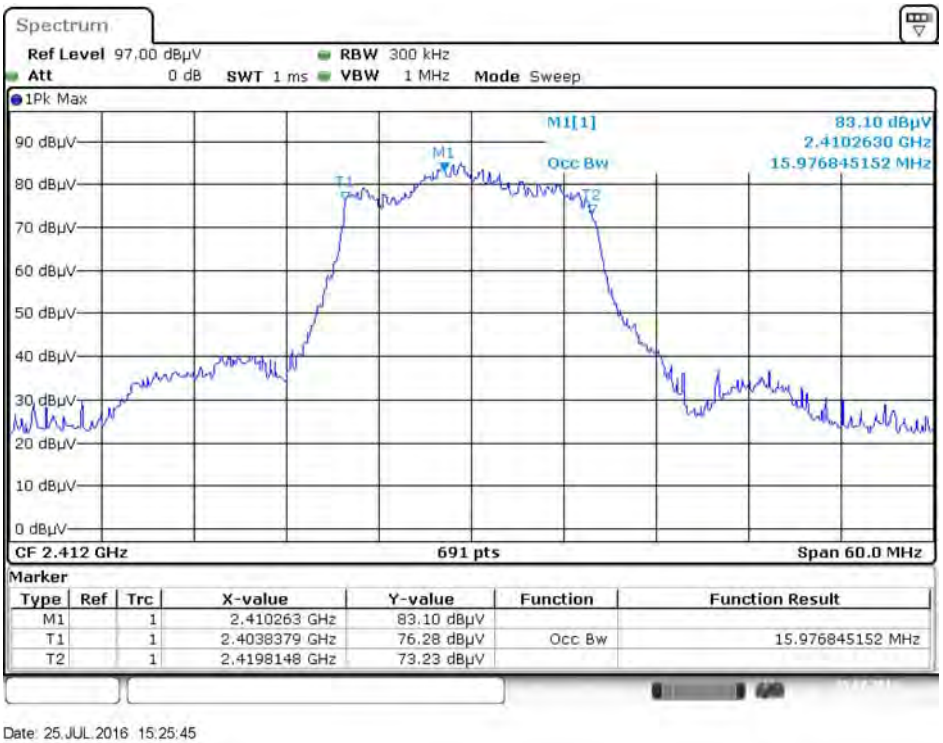


Date: 25.JUL.2016 15:22:51

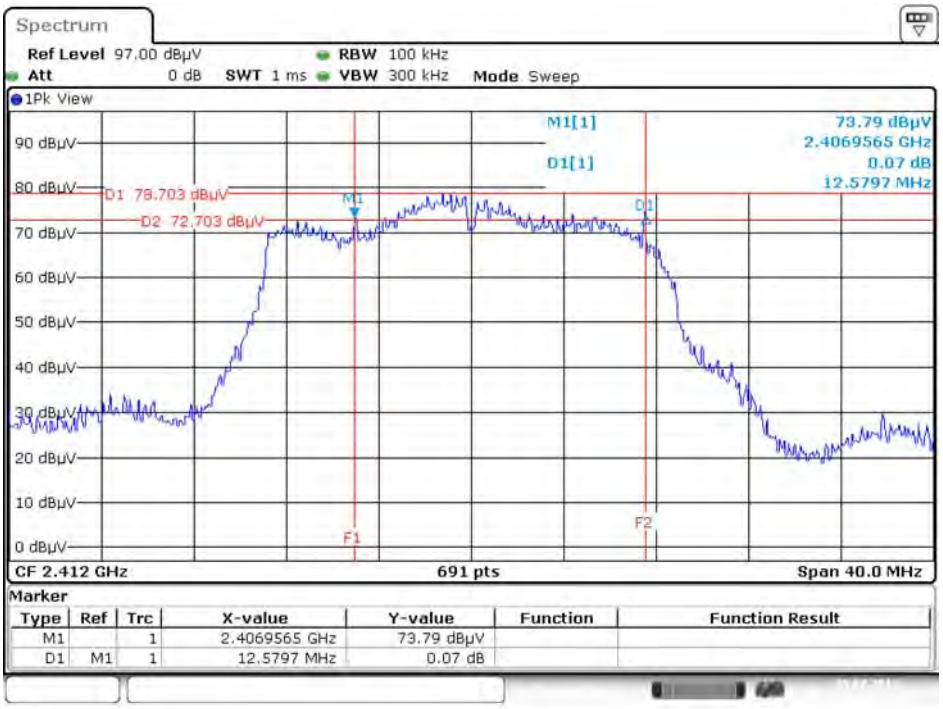
6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2412 MHz / Chain 1 + Chain 2 + Chain 3 + Chain 4



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



6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / 2412 MHz / Chain 1 + Chain 2 + Chain 3 + Chain 4

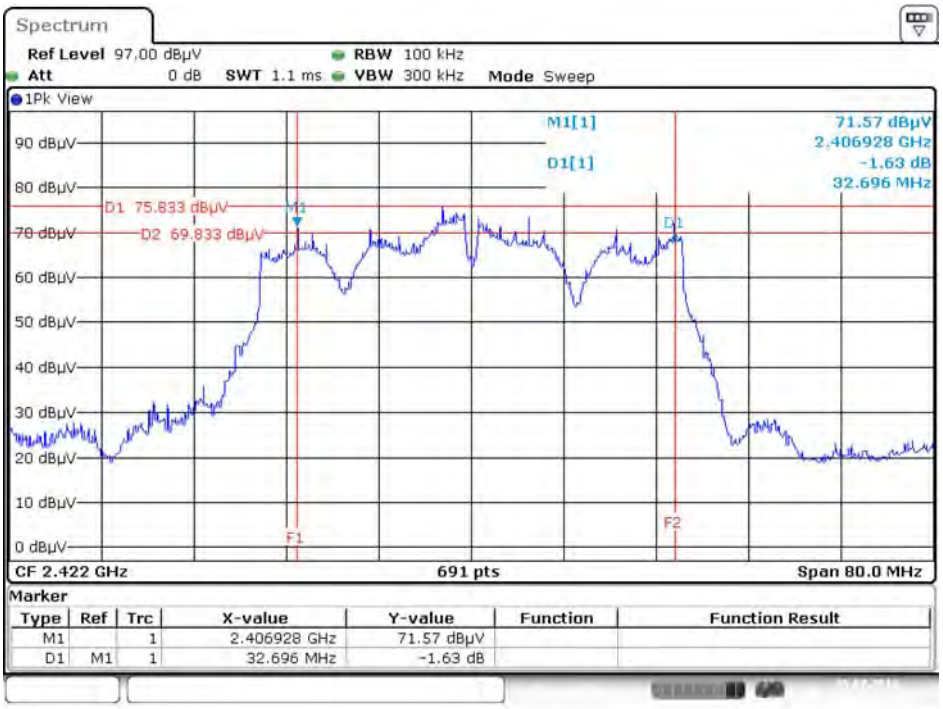


Date: 25.JUL.2016 15:02:34

99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / 2412 MHz / Chain 1 + Chain 2 + Chain 3 + Chain 4

Date: 25.JUL.2016 15:32:19

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / 2422 MHz / Chain 1 + Chain 2 + Chain 3 + Chain 4



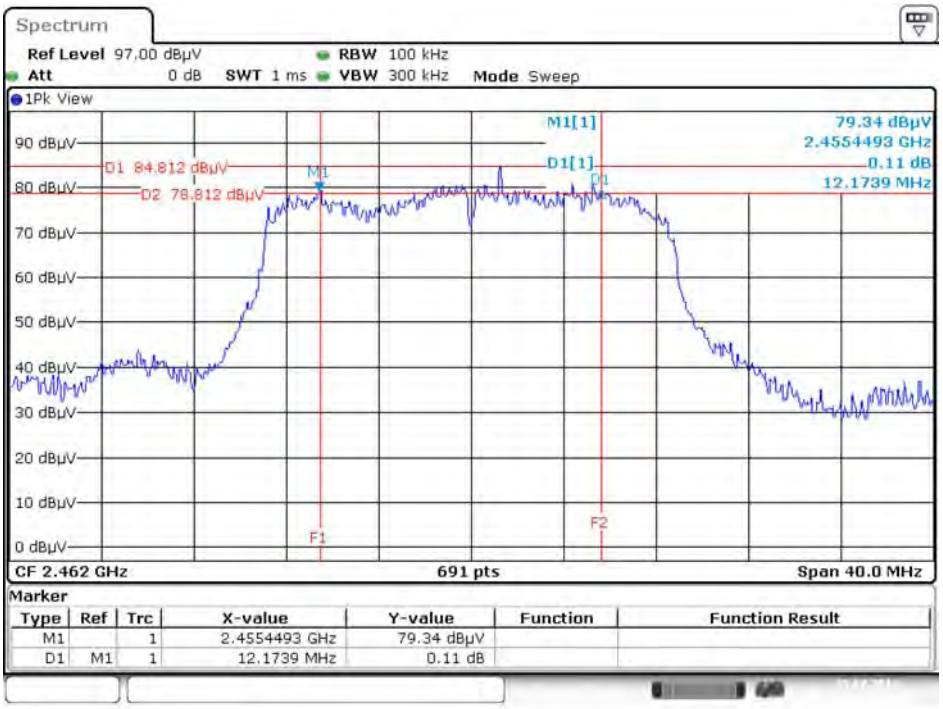
Date: 25.JUL.2016 15:03:59

99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / 2422 MHz / Chain 1 + Chain 2 + Chain 3 + Chain 4

Date: 25.JUL.2016 15:37:54

For Directional antenna / Beamforming Mode:

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / 2462 MHz / Chain 1 + Chain 2 + Chain 3 + Chain 4

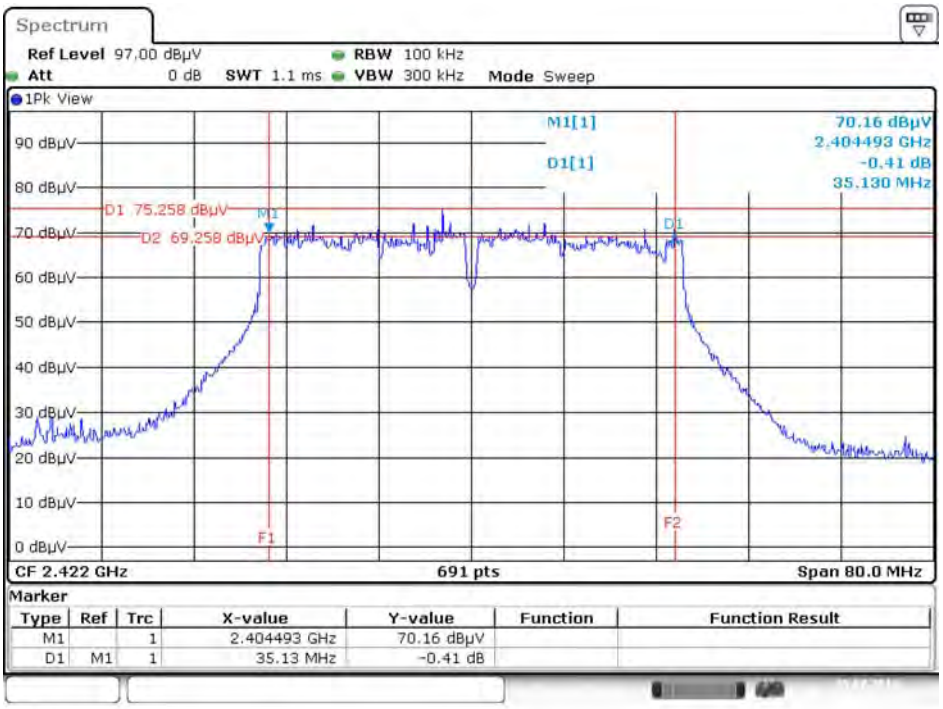


Date: 25.JUL.2016 15:07:37

99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / 2412 MHz / Chain 1 + Chain 2 + Chain 3 + Chain 4

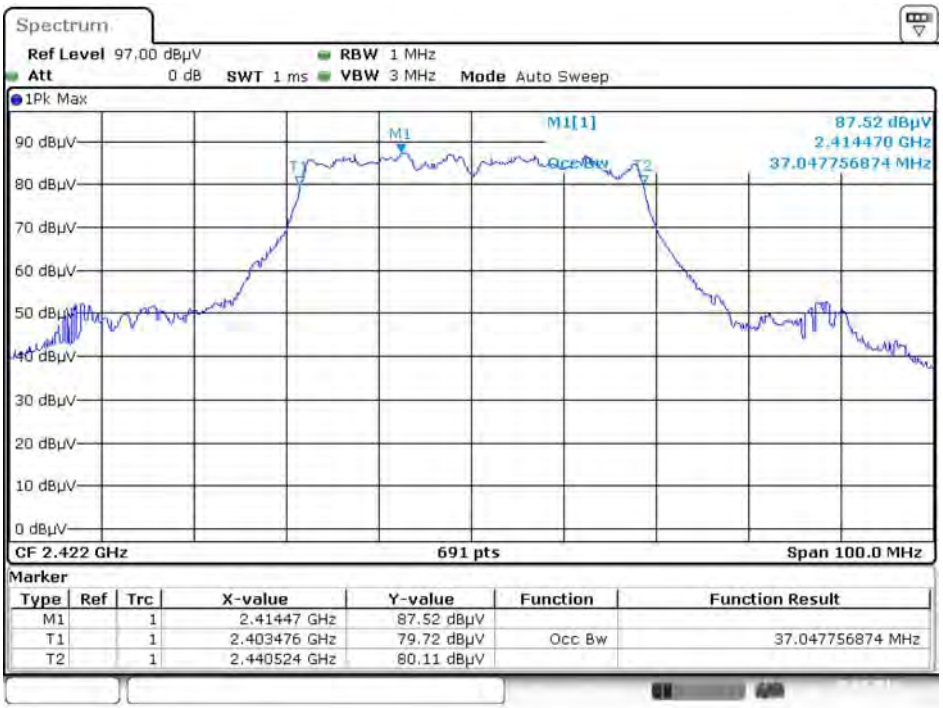
Date: 25.JUL.2016 15:43:31

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / 2422 MHz / Chain 1 + Chain 2 + Chain 3 + Chain 4



Date: 25.JUL.2016 15:09:16

99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / 2422 MHz / Chain 1 + Chain 2 + Chain 3 + Chain 4



Date: 25.JUL.2016 15:39:34

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

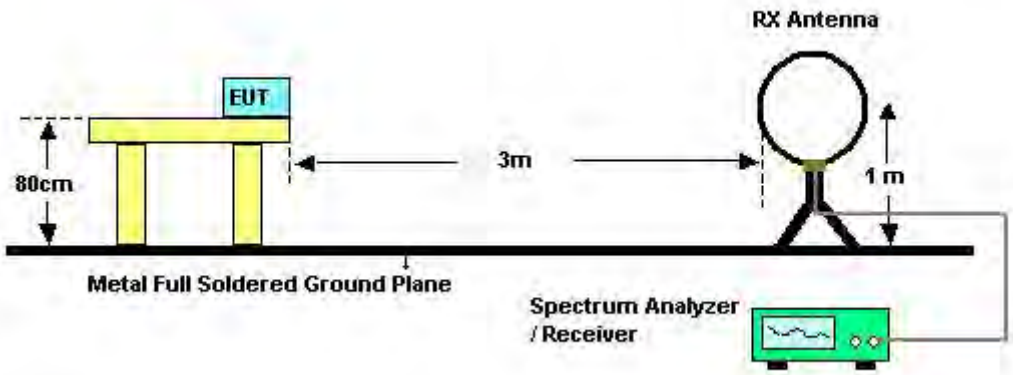
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1GHz / RBW 120kHz for QP

4.5.3. Test Procedures

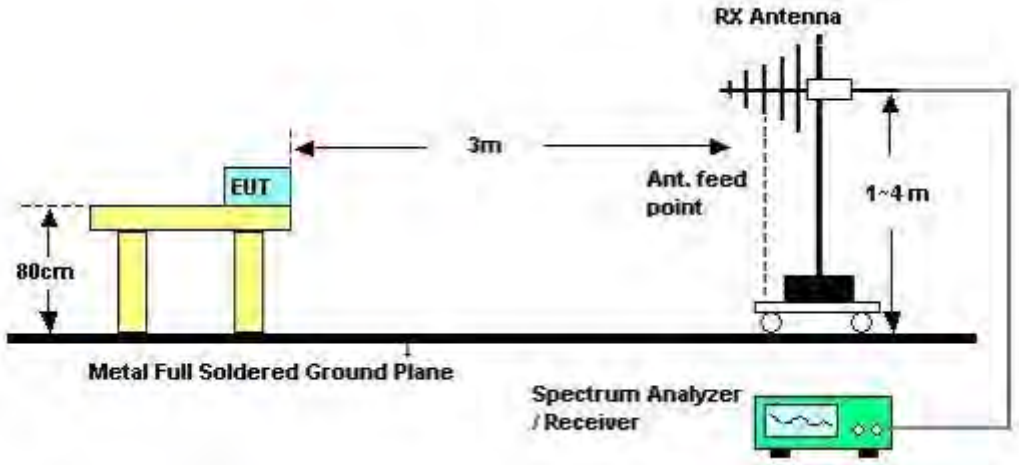
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 1m & 3m far away from the turntable.
2. Power on the EUT and all the supporting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

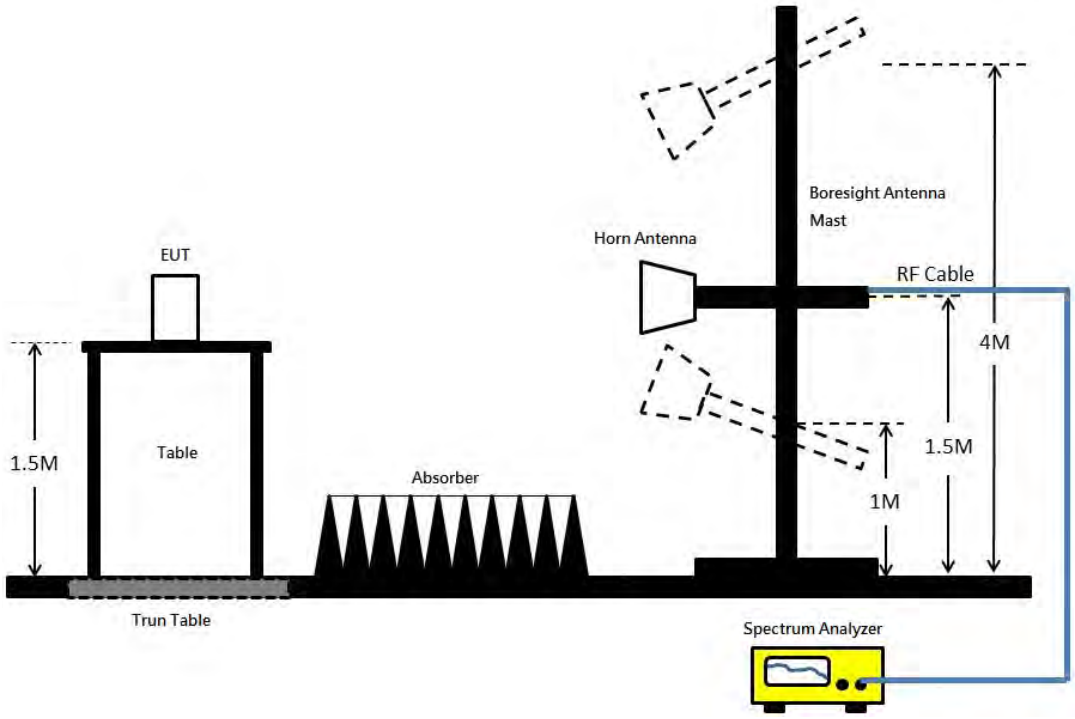
For Radiated Emissions: 9kHz ~30MHz



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℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	Normal Link / Mode 6
Test Date	Jul. 22, 2016		

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.

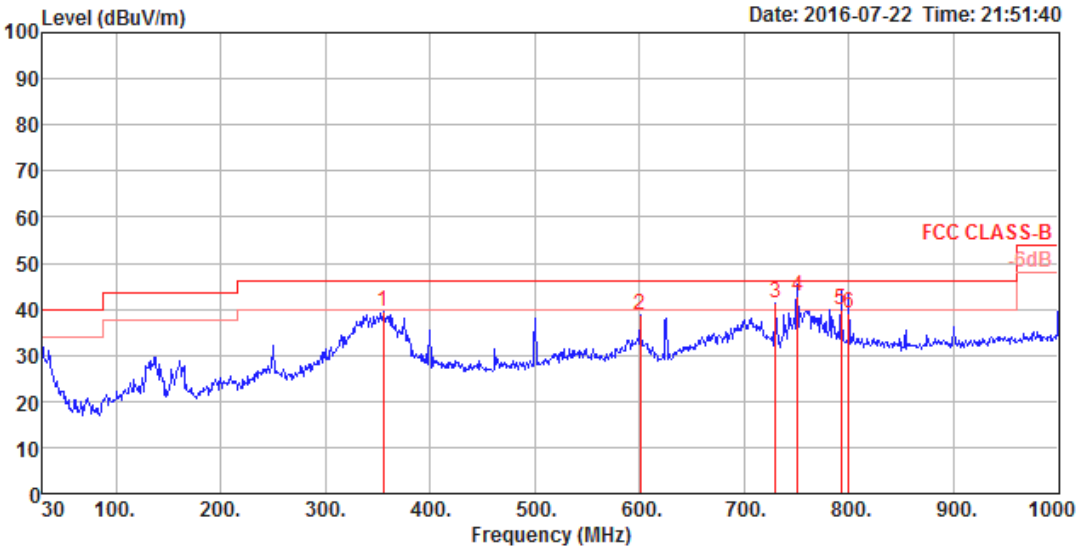
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

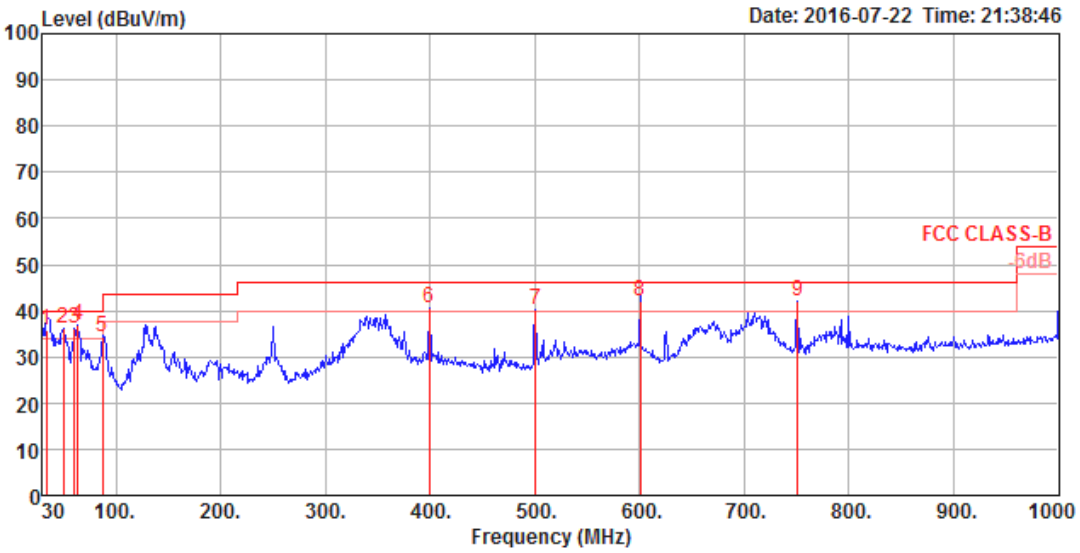
Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	Normal Link / Mode 6

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	354.95	39.66	46.00	-6.34	48.81	1.62	21.54	32.31	125	93	Peak	HORIZONTAL
2	600.36	38.67	46.00	-7.33	43.56	2.12	25.40	32.41	150	314	Peak	HORIZONTAL
3	730.34	41.16	46.00	-4.84	44.95	2.33	26.20	32.32	100	174	Peak	HORIZONTAL
4	750.71	42.97	46.00	-3.03	46.50	2.37	26.40	32.30	150	352	QP	HORIZONTAL
5	792.42	39.95	46.00	-6.05	42.99	2.45	26.76	32.25	125	7	QP	HORIZONTAL
6	800.18	39.02	46.00	-6.98	42.00	2.46	26.80	32.24	125	1	QP	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	33.88	35.88	40.00	-4.12	44.00	0.51	23.77	32.40	100	359	QP	VERTICAL
2	49.40	36.34	40.00	-3.66	52.95	0.61	15.19	32.41	100	271	Peak	VERTICAL
3	60.07	36.30	40.00	-3.70	54.31	0.69	13.70	32.40	150	71	Peak	VERTICAL
4	63.95	36.92	40.00	-3.08	55.25	0.70	13.37	32.40	200	12	Peak	VERTICAL
5	87.23	34.23	40.00	-5.77	50.83	0.81	14.98	32.39	150	172	Peak	VERTICAL
6	399.57	40.59	46.00	-5.41	48.52	1.73	22.67	32.33	125	155	Peak	VERTICAL
7	500.45	40.34	46.00	-5.66	46.72	1.94	24.03	32.35	150	360	Peak	VERTICAL
8	600.36	42.21	46.00	-3.79	47.10	2.12	25.40	32.41	100	175	QP	VERTICAL
9	750.71	41.94	46.00	-4.06	45.47	2.37	26.40	32.30	100	266	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.

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

For Directional antenna / Non-Beamforming Mode:

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11b CH 1 / Chain 1 + Chain 2
Test Date	May 31, 2016 ~ Jul. 26, 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	41.39	54.00	-12.61	35.51	7.58	32.82	34.52	160	115	Average	HORIZONTAL
2	4824.04	50.47	74.00	-23.53	44.59	7.58	32.82	34.52	160	115	Peak	HORIZONTAL
3	12058.14	47.03	54.00	-6.97	33.51	9.58	38.71	34.77	257	147	Average	HORIZONTAL
4	12060.60	59.08	74.00	-14.92	45.56	9.58	38.71	34.77	257	147	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	4823.86	50.02	74.00	-23.98	44.14	7.58	32.82	34.52	288	162	Peak	VERTICAL
2	4823.99	40.39	54.00	-13.61	34.51	7.58	32.82	34.52	288	162	Average	VERTICAL
3	12060.68	49.16	54.00	-4.84	35.64	9.58	38.71	34.77	264	104	Average	VERTICAL
4	12061.40	58.28	74.00	-15.72	44.76	9.58	38.71	34.77	264	104	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11b CH 6 / Chain 1 + Chain 2
Test Date	May 31, 2016 ~ Jul. 26, 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	4873.67	49.36	74.00	-24.64	43.36	7.60	32.91	34.51	286	245	Peak	HORIZONTAL
2	4873.92	37.11	54.00	-16.89	31.11	7.60	32.91	34.51	286	245	Average	HORIZONTAL
3	12183.90	49.42	54.00	-4.58	35.69	9.67	38.77	34.71	263	150	Average	HORIZONTAL
4	12184.10	58.16	74.00	-15.84	44.43	9.67	38.77	34.71	263	150	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	4873.94	50.55	74.00	-23.45	44.55	7.60	32.91	34.51	257	184	Peak	VERTICAL
2	4873.96	41.13	54.00	-12.87	35.13	7.60	32.91	34.51	257	184	Average	VERTICAL
3	12184.00	58.41	74.00	-15.59	44.68	9.67	38.77	34.71	272	112	Peak	VERTICAL
4	12185.90	49.18	54.00	-4.82	35.45	9.67	38.77	34.71	272	112	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11b CH 11 / Chain 1 + Chain 2
Test Date	May 31, 2016 ~ Jul. 26, 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	4923.94	45.43	54.00	-8.57	39.31	7.62	32.99	34.49	253	187	Average	HORIZONTAL
2	4923.95	51.89	74.00	-22.11	45.77	7.62	32.99	34.49	253	187	Peak	HORIZONTAL
3	12310.68	49.37	54.00	-4.63	35.43	9.77	38.83	34.66	262	105	Average	HORIZONTAL
4	12310.92	59.20	74.00	-14.80	45.26	9.77	38.83	34.66	262	105	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	4923.84	52.28	74.00	-21.72	46.16	7.62	32.99	34.49	253	189	Peak	VERTICAL
2	4923.96	45.21	54.00	-8.79	39.09	7.62	32.99	34.49	253	189	Average	VERTICAL
3	12308.90	49.39	54.00	-4.61	35.45	9.77	38.83	34.66	257	110	Average	VERTICAL
4	12310.82	60.05	74.00	-13.95	46.11	9.77	38.83	34.66	257	110	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11g CH 1 / Chain 1 + Chain 2
Test Date	May 31, 2016 ~ Jul. 26, 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	4823.06	33.55	54.00	-20.45	27.24	7.04	34.17	34.90	188	233	Average	HORIZONTAL
2	4823.49	46.92	74.00	-27.08	40.61	7.04	34.17	34.90	188	233	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	4823.06	34.55	54.00	-19.45	28.24	7.04	34.17	34.90	188	233	Average	VERTICAL
2	4823.49	47.92	74.00	-26.08	41.61	7.04	34.17	34.90	188	233	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11g CH 6 / Chain 1 + Chain 2
Test Date	May 31, 2016 ~ Jul. 26, 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	4873.45	48.78	74.00	-25.22	42.16	7.18	34.34	34.90	218	109	Peak	HORIZONTAL
2	4873.95	35.03	54.00	-18.97	28.41	7.18	34.34	34.90	218	109	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	4873.05	49.38	74.00	-24.62	42.76	7.18	34.34	34.90	134	109	Peak	VERTICAL
2	4873.28	35.23	54.00	-18.77	28.61	7.18	34.34	34.90	134	109	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11g CH 11 / Chain 1 + Chain 2
Test Date	May 31, 2016 ~ Jul. 26, 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	4924.06	34.50	54.00	-19.50	27.59	7.31	34.50	34.90	134	109	Average	HORIZONTAL
2	4924.18	47.42	74.00	-26.58	40.51	7.31	34.50	34.90	134	109	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	4924.10	47.70	74.00	-26.30	40.79	7.31	34.50	34.90	121	12	Peak	VERTICAL
2	4924.30	34.20	54.00	-19.80	27.29	7.31	34.50	34.90	121	12	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0Nss1 VHT20 CH 1 / Chain 1 + Chain 2
Test Date	May 31, 2016 ~ Jul. 26, 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	4829.88	34.46	54.00	-19.54	28.07	7.08	34.21	34.90	118	201	Average	HORIZONTAL
2	4831.92	47.48	74.00	-26.52	41.09	7.08	34.21	34.90	118	201	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	4826.92	48.00	74.00	-26.00	41.61	7.08	34.21	34.90	121	236	Peak	VERTICAL
2	4829.84	34.52	54.00	-19.48	28.13	7.08	34.21	34.90	121	236	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0Nss1 VHT20 CH 6 / Chain 1 + Chain 2
Test Date	May 31, 2016 ~ Jul. 26, 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	4873.50	48.65	74.00	-25.35	42.03	7.18	34.34	34.90	176	56	Peak	HORIZONTAL
2	4874.92	35.17	54.00	-18.83	28.55	7.18	34.34	34.90	176	56	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	4873.23	48.49	74.00	-25.51	41.87	7.18	34.34	34.90	214	123	Peak	VERTICAL
2	4874.62	34.80	54.00	-19.20	28.18	7.18	34.34	34.90	214	123	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0Nss1 VHT20 CH 11 / Chain 1 + Chain 2
Test Date	May 31, 2016 ~ Jul. 26, 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	4923.65	35.33	54.00	-18.67	28.42	7.31	34.50	34.90	121	80	Average	HORIZONTAL
2	4924.28	48.57	74.00	-25.43	41.66	7.31	34.50	34.90	121	80	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	4923.41	49.18	74.00	-24.82	42.34	7.28	34.46	34.90	118	266	Peak	VERTICAL
2	4923.75	35.34	54.00	-18.66	28.43	7.31	34.50	34.90	118	266	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0Nss1 VHT40 CH 3 / Chain 1 + Chain 2
Test Date	May 31, 2016 ~ Jul. 26, 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	4843.49	34.46	54.00	-19.54	28.00	7.11	34.25	34.90	173	172	Average	HORIZONTAL
2	4843.94	48.54	74.00	-25.46	42.08	7.11	34.25	34.90	173	172	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	4843.60	48.14	74.00	-25.86	41.68	7.11	34.25	34.90	160	198	Peak	VERTICAL
2	4843.98	34.60	54.00	-19.40	28.14	7.11	34.25	34.90	160	198	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0Nss1 VHT40 CH 6 / Chain 1 + Chain 2
Test Date	May 31, 2016 ~ Jul. 26, 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	4874.79	35.36	54.00	-18.64	28.74	7.18	34.34	34.90	114	232	Average	HORIZONTAL
2	4874.79	48.11	74.00	-25.89	41.49	7.18	34.34	34.90	114	232	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	4874.78	48.66	74.00	-25.34	42.04	7.18	34.34	34.90	238	142	Peak	VERTICAL
2	4874.96	35.43	54.00	-18.57	28.81	7.18	34.34	34.90	238	142	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0Nss1 VHT40 CH 9 / Chain 1 + Chain 2
Test Date	May 31, 2016 ~ Jul. 26, 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	4903.24	35.06	54.00	-18.94	28.30	7.24	34.42	34.90	190	290	Average	HORIZONTAL
2	4904.63	48.14	74.00	-25.86	41.38	7.24	34.42	34.90	190	290	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	4903.66	35.03	54.00	-18.97	28.27	7.24	34.42	34.90	147	131	Average	VERTICAL
2	4904.10	48.07	74.00	-25.93	41.31	7.24	34.42	34.90	147	131		VERTICAL

For Directional antenna / Beamforming Mode:

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0Nss1 VHT20 CH 1 / Chain 1 + Chain 2
Test Date	May 31, 2016 ~ Jul. 26, 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	4821.60	46.41	74.00	-27.59	40.93	5.30	33.11	32.93	177	118	Peak	HORIZONTAL
2	4821.66	33.45	54.00	-20.55	27.97	5.30	33.11	32.93	177	118	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	4823.72	47.20	74.00	-26.80	41.72	5.30	33.11	32.93	183	165	Peak	VERTICAL
2	4825.36	34.00	54.00	-20.00	28.49	5.30	33.14	32.93	183	165	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0Nss1 VHT20 CH 6 / Chain 1 + Chain 2
Test Date	May 31, 2016 ~ Jul. 26, 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	4848.44	47.05	74.00	-26.95	41.51	5.30	33.17	32.93	184	197	Peak	HORIZONTAL
2	4851.23	32.96	54.00	-21.04	27.42	5.30	33.17	32.93	184	197	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	4849.14	46.99	74.00	-27.01	41.45	5.30	33.17	32.93	172	235	Peak	VERTICAL
2	4850.18	34.42	54.00	-19.58	28.88	5.30	33.17	32.93	172	235	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0Nss1 VHT20 CH 11 / Chain 1 + Chain 2
Test Date	May 31, 2016 ~ Jul. 26, 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	4922.33	46.12	74.00	-27.88	40.42	5.30	33.32	32.92	199	97	Peak	HORIZONTAL
2	4922.39	32.77	54.00	-21.23	27.07	5.30	33.32	32.92	199	97	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	4922.10	32.84	54.00	-21.16	27.14	5.30	33.32	32.92	180	46	Average	VERTICAL
2	4924.14	46.28	74.00	-27.72	40.55	5.30	33.35	32.92	180	46	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0Nss1 VHT40 CH 3 / Chain 1 + Chain 2
Test Date	May 31, 2016 ~ Jul. 26, 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	4842.80	33.08	54.00	-20.92	27.54	5.30	33.17	32.93	198	146	Average	HORIZONTAL
2	4844.91	47.32	74.00	-26.68	41.78	5.30	33.17	32.93	198	146	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	4842.40	33.48	54.00	-20.52	27.94	5.30	33.17	32.93	185	185	Average	VERTICAL
2	4843.90	46.59	74.00	-27.41	41.05	5.30	33.17	32.93	185	185	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0Nss1 VHT40 CH 6 / Chain 1 + Chain 2
Test Date	May 31, 2016 ~ Jul. 26, 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	4872.74	46.84	74.00	-27.16	41.24	5.30	33.23	32.93	192	51	Peak	HORIZONTAL
2	4872.83	33.09	54.00	-20.91	27.49	5.30	33.23	32.93	192	51	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	4873.71	33.72	54.00	-20.28	28.12	5.30	33.23	32.93	181	112	Average	VERTICAL
2	4875.17	46.34	74.00	-27.66	40.74	5.30	33.23	32.93	181	112	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0Nss1 VHT40 CH 9 / Chain 1 + Chain 2
Test Date	May 31, 2016 ~ Jul. 26, 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	4904.75	46.42	74.00	-27.58	40.75	5.30	33.29	32.92	197	217	Peak	HORIZONTAL
2	4906.48	33.02	54.00	-20.98	27.35	5.30	33.29	32.92	197	217	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	4904.58	33.21	54.00	-20.79	27.54	5.30	33.29	32.92	186	143	Average	VERTICAL
2	4905.00	46.36	74.00	-27.64	40.69	5.30	33.29	32.92	186	143	Peak	VERTICAL

For Omni antenna / Non-Beamforming Mode:

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11b CH 1 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 31, 2016 ~ Jul. 26, 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	4823.96	57.36	74.00	-16.64	50.35	7.48	32.58	33.05	205	327	Peak	HORIZONTAL
2	4823.98	53.82	54.00	-0.18	46.81	7.48	32.58	33.05	205	327	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	4823.96	47.35	54.00	-6.65	40.34	7.48	32.58	33.05	145	160	Average	VERTICAL
2	4823.99	52.68	74.00	-21.32	45.67	7.48	32.58	33.05	145	160	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11b CH 6 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 31, 2016 ~ Jul. 26, 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	4873.94	52.94	54.00	-1.06	45.73	7.56	32.68	33.03	240	325	Average	HORIZONTAL
2	4874.05	56.76	74.00	-17.24	49.55	7.56	32.68	33.03	240	325	Peak	HORIZONTAL
3	7309.58	41.77	54.00	-12.23	28.85	9.18	37.24	33.50	234	147	Average	HORIZONTAL
4	7310.40	55.03	74.00	-18.97	42.11	9.18	37.24	33.50	234	147	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	4873.97	51.51	54.00	-2.49	44.30	7.56	32.68	33.03	233	336	Average	VERTICAL
2	4873.99	55.96	74.00	-18.04	48.75	7.56	32.68	33.03	233	336	Peak	VERTICAL
3	7311.56	55.64	74.00	-18.36	42.72	9.18	37.24	33.50	100	6	Peak	VERTICAL
4	7311.66	44.05	54.00	-9.95	31.13	9.18	37.24	33.50	100	6	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11b CH 11 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 31, 2016 ~ Jul. 26, 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	4923.99	47.34	54.00	-6.66	39.91	7.65	32.78	33.00	148	298	Average	HORIZONTAL
2	4924.10	53.49	74.00	-20.51	46.06	7.65	32.78	33.00	148	298	Peak	HORIZONTAL
3	7387.02	46.20	54.00	-7.80	33.30	9.10	37.35	33.55	148	288	Average	HORIZONTAL
4	7387.40	55.60	74.00	-18.40	42.70	9.10	37.35	33.55	148	288	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	4918.65	50.49	74.00	-23.51	43.11	7.63	32.75	33.00	148	298	Peak	VERTICAL
2	4919.73	44.34	54.00	-9.66	36.96	7.63	32.75	33.00	148	298	Average	VERTICAL
3	7386.25	52.60	74.00	-21.40	39.70	9.10	37.35	33.55	148	288	Peak	VERTICAL
4	7388.47	43.20	54.00	-10.80	30.30	9.10	37.35	33.55	148	288	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11g CH 1 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 31, 2016 ~ Jul. 26, 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	4844.93	36.91	54.00	-17.09	27.17	10.29	33.17	33.72	182	167	Average	HORIZONTAL
2	4848.42	49.98	74.00	-24.02	40.23	10.29	33.17	33.71	182	167	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	4846.13	50.18	74.00	-23.82	40.43	10.29	33.17	33.71	174	68	Peak	VERTICAL
2	4850.15	36.71	54.00	-17.29	26.96	10.29	33.17	33.71	174	68	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11g CH 6 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 31, 2016 ~ Jul. 26, 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	4876.24	36.66	54.00	-17.34	26.86	10.28	33.23	33.71	164	172	Average	HORIZONTAL
2	4878.71	50.26	74.00	-23.74	40.45	10.28	33.23	33.70	164	172	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	4869.06	36.34	54.00	-17.66	26.54	10.28	33.23	33.71	155	247	Average	VERTICAL
2	4869.26	50.44	74.00	-23.56	40.64	10.28	33.23	33.71	155	247	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11g CH 11 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 31, 2016 ~ Jul. 26, 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	4923.07	36.52	54.00	-17.48	26.60	10.28	33.32	33.68	128	54	Average	HORIZONTAL
2	4928.09	49.34	74.00	-24.66	39.39	10.28	33.35	33.68	128	54	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	4924.24	36.48	54.00	-17.52	26.53	10.28	33.35	33.68	135	130	Average	VERTICAL
2	4924.59	49.72	74.00	-24.28	39.77	10.28	33.35	33.68	135	130	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0Nss1 VHT20 CH 1 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 31, 2016 ~ Jul. 26, 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	4826.52	50.56	74.00	-23.44	40.86	10.29	33.14	33.73	122	193	Peak	HORIZONTAL
2	4828.06	37.32	54.00	-16.68	27.62	10.29	33.14	33.73	122	193	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	4825.30	50.72	74.00	-23.28	41.02	10.29	33.14	33.73	117	130	Peak	VERTICAL
2	4827.86	37.35	54.00	-16.65	27.65	10.29	33.14	33.73	117	130	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0Nss1 VHT20 CH 6 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 31, 2016 ~ Jul. 26, 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	4894.16	49.40	74.00	-24.60	39.55	10.28	33.26	33.69	173	314	Peak	HORIZONTAL
2	4901.50	36.32	54.00	-17.68	26.44	10.28	33.29	33.69	173	314	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	4894.19	49.85	74.00	-24.15	40.00	10.28	33.26	33.69	184	216	Peak	VERTICAL
2	4901.95	36.51	54.00	-17.49	26.63	10.28	33.29	33.69	184	216	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0Nss1 VHT20 CH 11 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 31, 2016 ~ Jul. 26, 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	4920.99	49.62	74.00	-24.38	39.70	10.28	33.32	33.68	177	226	Peak	HORIZONTAL
2	4923.92	36.64	54.00	-17.36	26.69	10.28	33.35	33.68	177	226	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	4919.83	50.38	74.00	-23.62	40.46	10.28	33.32	33.68	185	145	Peak	VERTICAL
2	4927.54	36.51	54.00	-17.49	26.56	10.28	33.35	33.68	185	145	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0Nss1 VHT40 CH 3 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 31, 2016 ~ Jul. 26, 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	4841.23	50.18	74.00	-23.82	40.44	10.29	33.17	33.72	193	169	Peak	HORIZONTAL
2	4847.91	37.65	54.00	-16.35	27.90	10.29	33.17	33.71	193	169	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	4844.03	36.94	54.00	-17.06	27.20	10.29	33.17	33.72	179	255	Average	VERTICAL
2	4845.94	50.24	74.00	-23.76	40.49	10.29	33.17	33.71	179	255	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0Nss1 VHT40 CH 6 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 31, 2016 ~ Jul. 26, 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	4869.29	50.73	74.00	-23.27	40.93	10.28	33.23	33.71	182	271	Peak	HORIZONTAL
2	4877.96	36.41	54.00	-17.59	26.60	10.28	33.23	33.70	182	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	4869.10	49.69	74.00	-24.31	39.89	10.28	33.23	33.71	179	167	Peak	VERTICAL
2	4873.95	36.50	54.00	-17.50	26.70	10.28	33.23	33.71	179	167	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0Nss1 VHT40 CH 9 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 31, 2016 ~ Jul. 26, 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	4899.16	36.68	54.00	-17.32	26.80	10.28	33.29	33.69	178	156	Average	HORIZONTAL
2	4904.56	50.42	74.00	-23.58	40.54	10.28	33.29	33.69	178	156	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	4899.00	36.20	54.00	-17.80	26.32	10.28	33.29	33.69	168	323	Average	VERTICAL
2	4900.62	49.86	74.00	-24.14	39.98	10.28	33.29	33.69	168	323	Peak	VERTICAL

For Omni antenna / Beamforming Mode:

Temperature	22℃	**Humidity**	54%
Test Engineer	Gino Huang	**Configurations**	IEEE 802.11ac MCS0Nss1 VHT20 CH 1 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 31, 2016 ~ Jul. 26, 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	4823.81	48.03	74.00	-25.97	41.17	10.29	33.11	36.54	102	149	Peak	HORIZONTAL
2	4823.93	34.54	54.00	-19.46	27.68	10.29	33.11	36.54	102	149	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	4823.74	34.97	54.00	-19.03	28.11	10.29	33.11	36.54	106	132	Average	VERTICAL
2	4824.60	47.40	74.00	-26.60	40.54	10.29	33.11	36.54	106	132	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0Nss1 VHT20 CH 6 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 31, 2016 ~ Jul. 26, 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	4874.31	47.51	74.00	-26.49	40.53	10.28	33.23	36.53	101	185	Peak	HORIZONTAL
2	4874.46	33.74	54.00	-20.26	26.76	10.28	33.23	36.53	101	185	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	4873.47	46.68	74.00	-27.32	39.70	10.28	33.23	36.53	102	167	Peak	VERTICAL
2	4874.96	33.85	54.00	-20.15	26.87	10.28	33.23	36.53	102	167	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0Nss1 VHT20 CH 11 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 31, 2016 ~ Jul. 26, 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	4924.18	35.38	54.00	-18.62	28.66	6.29	33.35	32.92	213	105	Average	HORIZONTAL
2	4924.32	47.84	74.00	-26.16	41.12	6.29	33.35	32.92	213	105	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	4922.08	34.83	54.00	-19.17	28.14	6.29	33.32	32.92	180	268	Average	VERTICAL
2	4923.09	48.63	74.00	-25.37	41.94	6.29	33.32	32.92	180	268	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0Nss1 VHT40 CH 3 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 31, 2016 ~ Jul. 26, 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	4843.29	47.93	74.00	-26.07	41.01	10.29	33.17	36.54	103	360	Peak	HORIZONTAL
2	4843.34	34.54	54.00	-19.46	27.62	10.29	33.17	36.54	103	360	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	4844.10	34.71	54.00	-19.29	27.79	10.29	33.17	36.54	101	343	Average	VERTICAL
2	4844.19	47.80	74.00	-26.20	40.88	10.29	33.17	36.54	101	343	Peak	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0Nss1 VHT40 CH 6 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 31, 2016 ~ Jul. 26, 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	4873.16	47.93	74.00	-26.07	40.95	10.28	33.23	36.53	102	360	Peak	HORIZONTAL
2	4874.94	34.23	54.00	-19.77	27.25	10.28	33.23	36.53	102	360	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	4874.28	47.28	74.00	-26.72	40.30	10.28	33.23	36.53	103	348	Peak	VERTICAL
2	4874.32	34.26	54.00	-19.74	27.28	10.28	33.23	36.53	103	348	Average	VERTICAL

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0Nss1 VHT40 CH 9 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 31, 2016 ~ Jul. 26, 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	4903.22	47.26	74.00	-26.74	40.22	10.28	33.29	36.53	105	329	Peak	HORIZONTAL
2	4904.64	34.47	54.00	-19.53	27.43	10.28	33.29	36.53	105	329	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	4904.83	34.55	54.00	-19.45	27.51	10.28	33.29	36.53	107	342	Average	VERTICAL
2	4904.98	47.62	74.00	-26.38	40.58	10.28	33.29	36.53	107	342	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:

1. The test procedure is the same as section 4.5.3.

For Radiated Out of Band Emission Measurement:

1. 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:

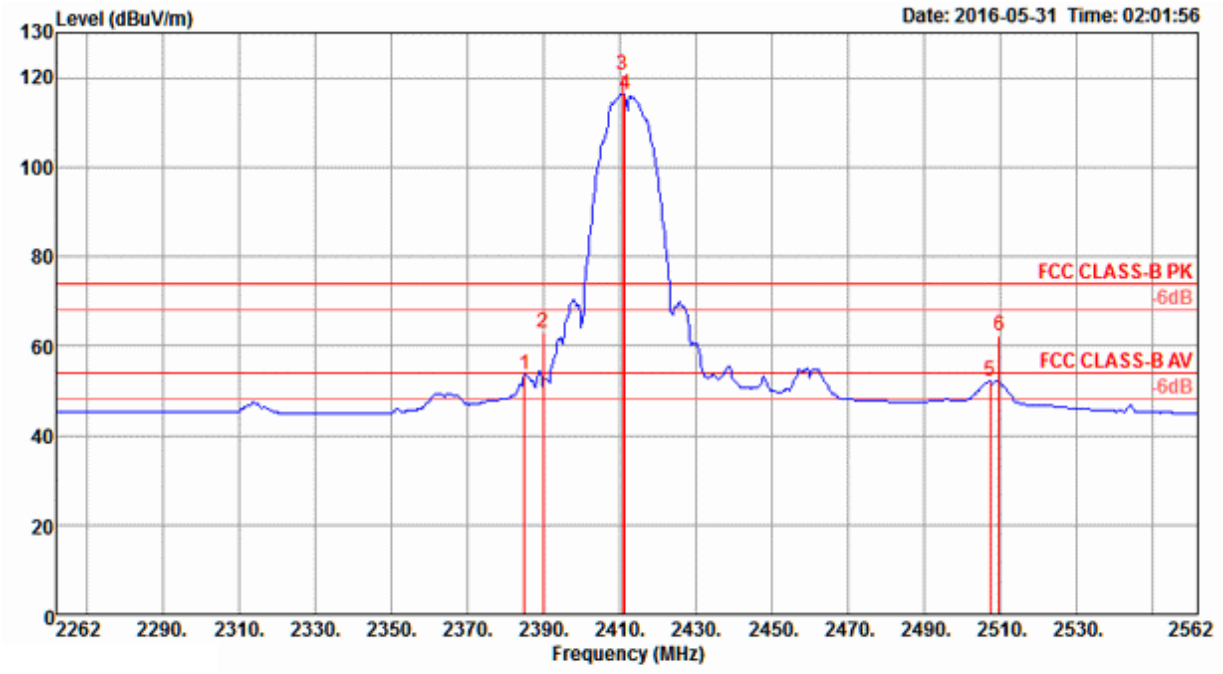
The EUT was programmed to be in beamforming transmitting mode.

4.6.7. Test Result of Band Edge and Fundamental Emissions

For Directional antenna / Non-Beamforming Mode:

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11b CH 1, 6, 11 / Chain 1 + Chain 2

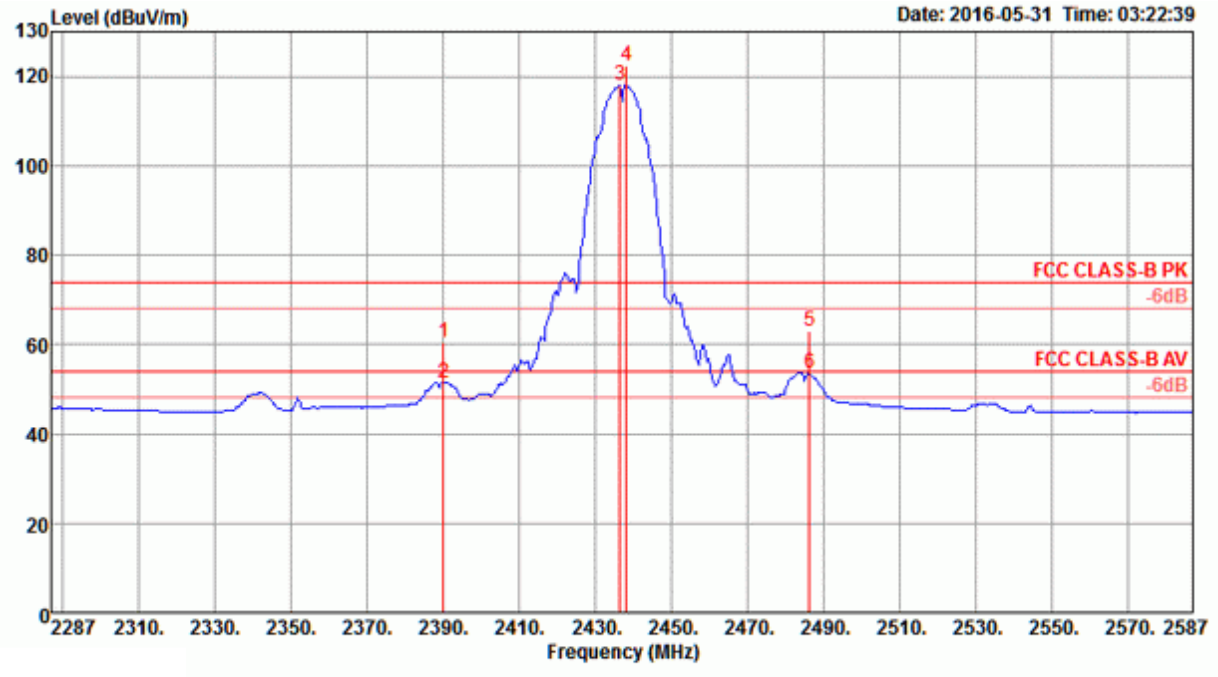
Channel 1



	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	2385.00	53.54	54.00	-0.46	20.99	4.53	28.02	0.00	180	360	Average	VERTICAL
2	2390.00	63.12	74.00	-10.88	30.57	4.53	28.02	0.00	180	360	Peak	VERTICAL
3	2410.80	120.46			87.90	4.56	28.00	0.00	180	360	Peak	VERTICAL
4	2411.40	116.41			83.85	4.57	27.99	0.00	180	360	Average	VERTICAL
5	2507.40	52.26	54.00	-1.74	19.63	4.71	27.92	0.00	180	360	Average	VERTICAL
6	2509.80	62.26	74.00	-11.74	29.63	4.71	27.92	0.00	180	360	Peak	VERTICAL

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

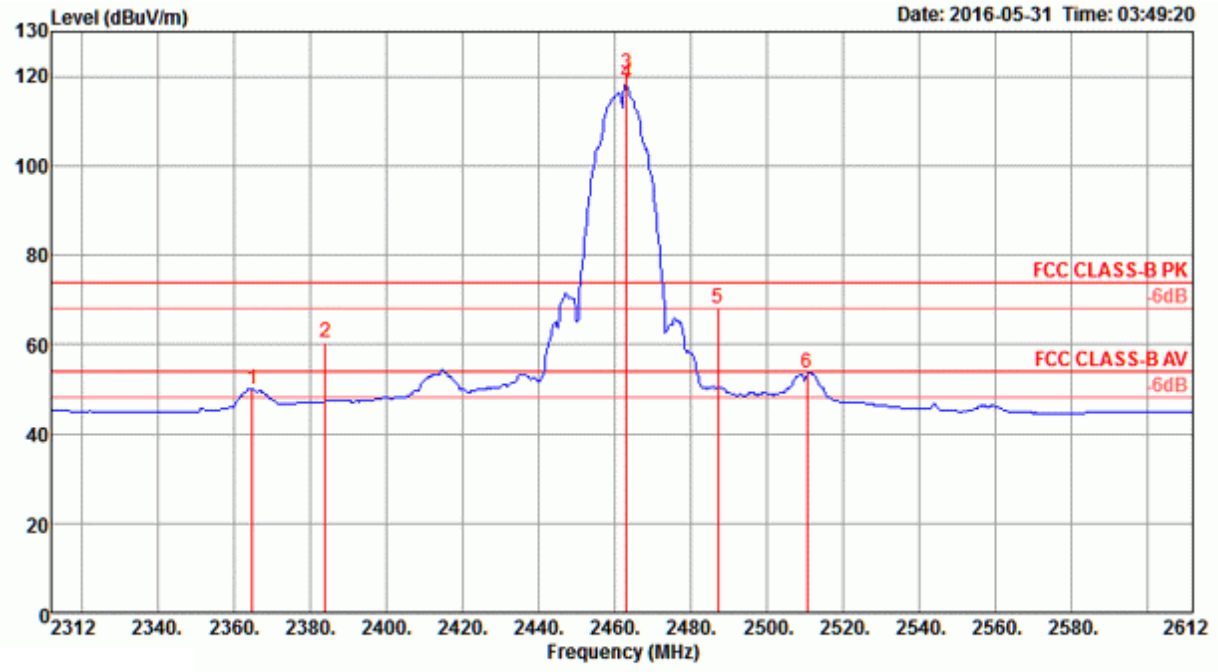
Channel 6



	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	2390.00	60.65	74.00	-13.35	28.10	4.53	28.02	0.00	199	0	Peak	HORIZONTAL
2	2390.00	51.56	54.00	-2.44	19.01	4.53	28.02	0.00	199	0	Average	HORIZONTAL
3	2436.40	117.97			85.40	4.60	27.97	0.00	199	0	Average	HORIZONTAL
4	2438.20	122.36			89.79	4.60	27.97	0.00	199	0	Peak	HORIZONTAL
5	2486.20	62.86	74.00	-11.14	30.26	4.68	27.92	0.00	199	0	Peak	HORIZONTAL
6	2486.20	53.68	54.00	-0.32	21.08	4.68	27.92	0.00	199	0	Average	HORIZONTAL

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

Channel 11

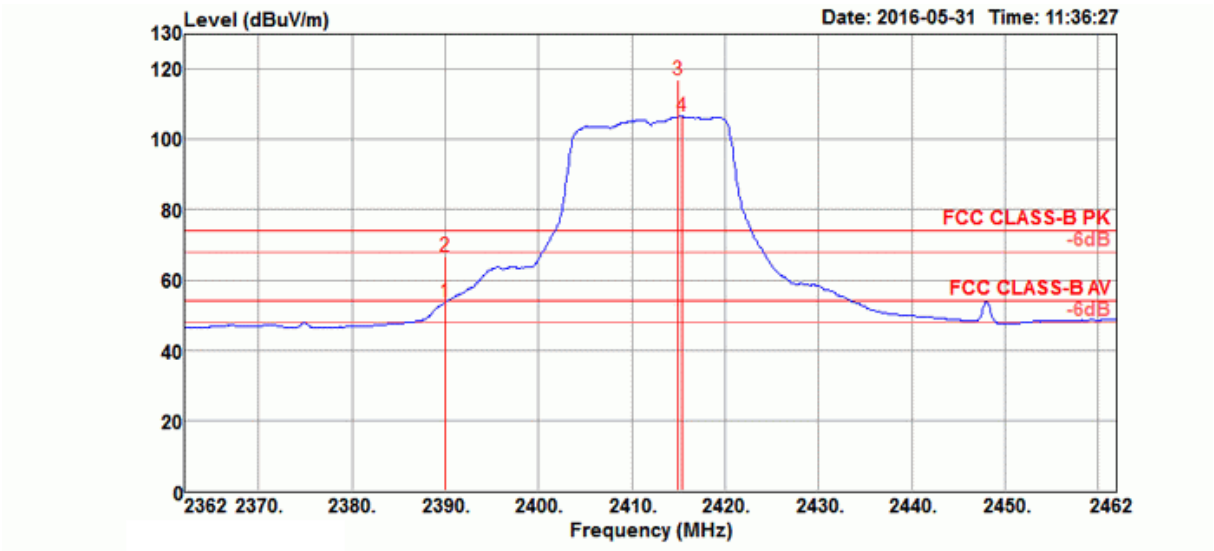


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2364.80	50.09	54.00	-3.91	17.54	4.50	28.05	0.00	200	0	Average	VERTICAL
2	2384.00	60.34	74.00	-13.66	27.79	4.53	28.02	0.00	200	0	Peak	VERTICAL
3	2463.20	120.55			87.97	4.64	27.94	0.00	200	0	Peak	VERTICAL
4	2463.20	118.26			85.68	4.64	27.94	0.00	200	0	Average	VERTICAL
5	2487.20	68.18	74.00	-5.82	35.58	4.68	27.92	0.00	200	0	Peak	VERTICAL
6	2510.60	53.62	54.00	-0.38	20.99	4.71	27.92	0.00	200	0	Average	VERTICAL

Item 3, 4 are the fundamental frequency at 2462 MHz.

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11g CH 1, 6, 11 / Chain 1 + Chain 2

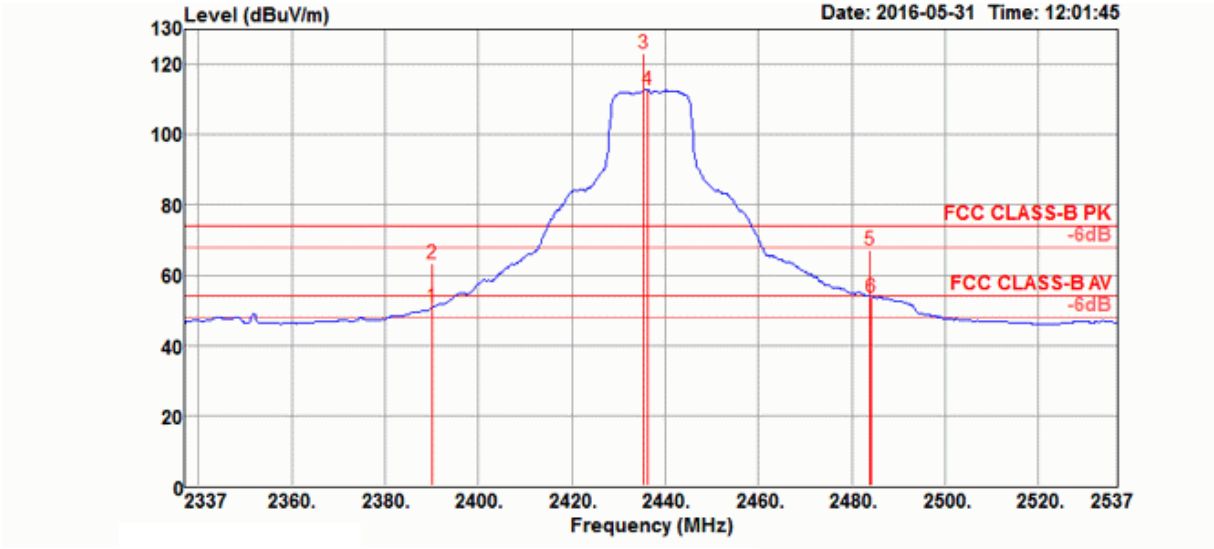
Channel 1



	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	2390.00	53.65	54.00	-0.35	20.54	4.54	28.57	0.00	187	182	Average	HORIZONTAL
2	2390.00	66.77	74.00	-7.23	33.66	4.54	28.57	0.00	187	182	Peak	HORIZONTAL
3	2415.00	117.00			83.80	4.57	28.63	0.00	187	182	Peak	HORIZONTAL
4	2415.40	106.71			73.51	4.57	28.63	0.00	187	182	Average	HORIZONTAL

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

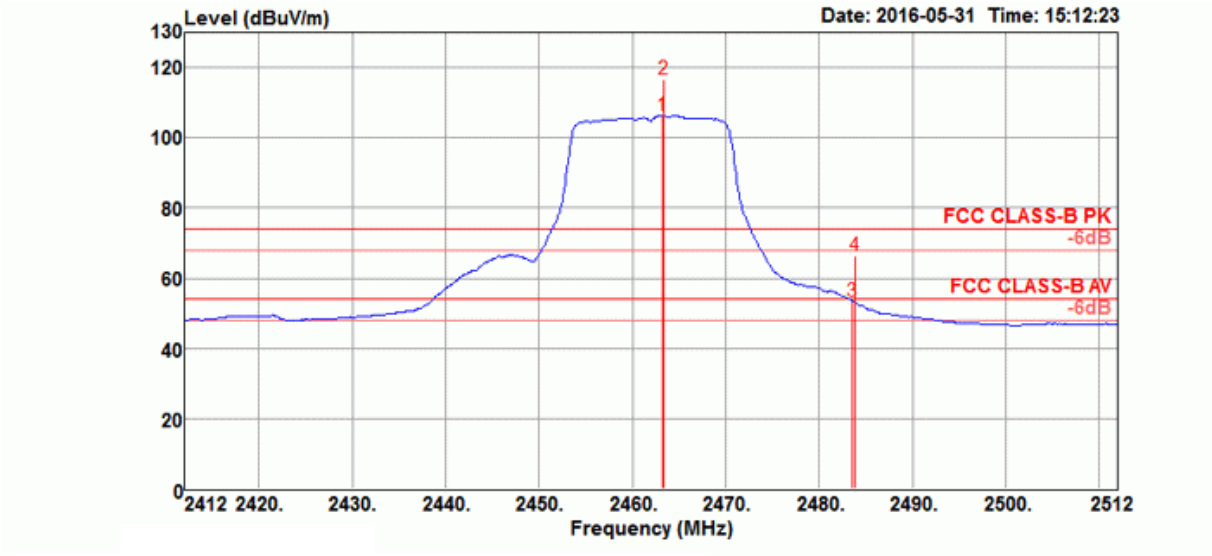
Channel 6



	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	51.03	54.00	-2.97	17.92	4.54	28.57	0.00	171	183	Average	HORIZONTAL
2	2390.00	63.18	74.00	-10.82	30.07	4.54	28.57	0.00	171	183	Peak	HORIZONTAL
3	2435.40	123.15			89.89	4.59	28.67	0.00	171	183	Peak	HORIZONTAL
4	2436.20	112.87			79.61	4.59	28.67	0.00	171	183	Average	HORIZONTAL
5	2483.80	67.26	74.00	-6.74	33.86	4.63	28.77	0.00	171	183	Peak	HORIZONTAL
6	2484.20	53.87	54.00	-0.13	20.47	4.63	28.77	0.00	171	183	Average	HORIZONTAL

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

Channel 11

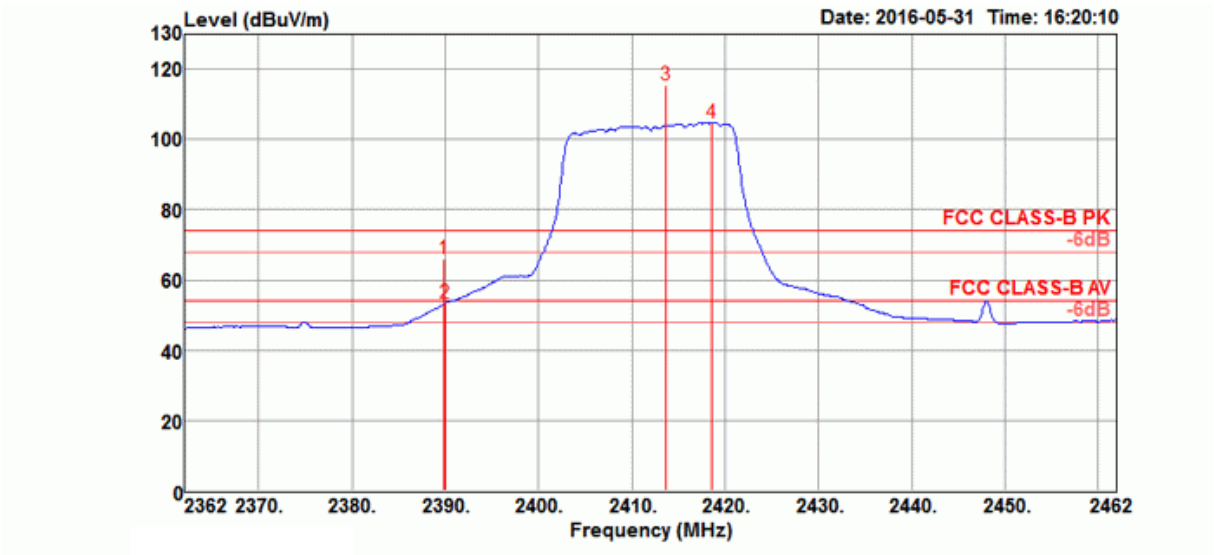


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2463.20	106.16			72.82	4.61	28.73	0.00	178	185	Average	HORIZONTAL
2	2463.40	116.44			83.10	4.61	28.73	0.00	178	185	Peak	HORIZONTAL
3	2483.50	53.41	54.00	-0.59	20.01	4.63	28.77	0.00	178	185	Average	HORIZONTAL
4	2483.80	66.23	74.00	-7.77	32.83	4.63	28.77	0.00	178	185	Peak	HORIZONTAL

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

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0Nss1 VHT20 CH 1, 6, 11 / Chain 1 + Chain 2

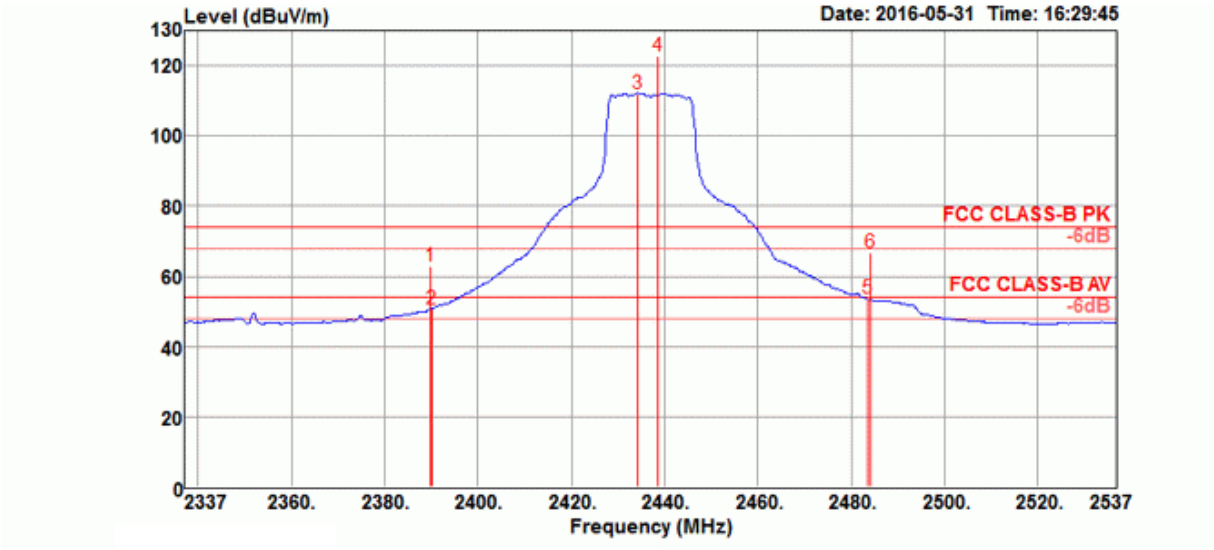
Channel 1



	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	2389.80	65.86	74.00	-8.14	32.75	4.54	28.57	0.00	188	180	Peak	HORIZONTAL
2	2390.00	53.47	54.00	-0.53	20.36	4.54	28.57	0.00	188	180	Average	HORIZONTAL
3	2413.60	115.56			82.36	4.57	28.63	0.00	188	180	Peak	HORIZONTAL
4	2418.60	104.64			71.42	4.58	28.64	0.00	188	180	Average	HORIZONTAL

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

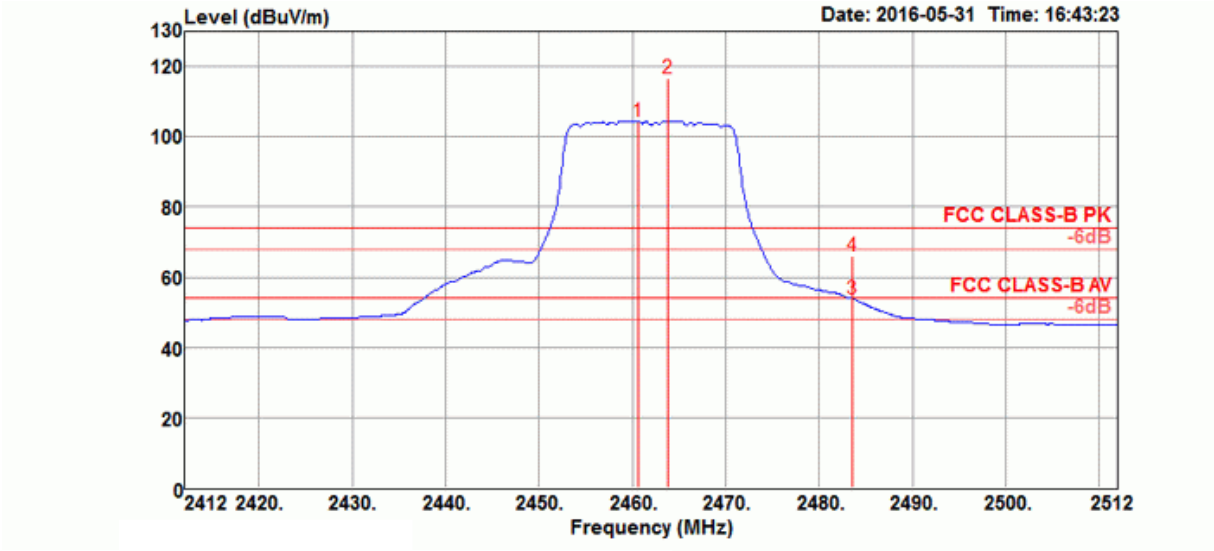
Channel 6



	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	2389.80	63.02	74.00	-10.98	29.91	4.54	28.57	0.00	204	181	Peak	HORIZONTAL
2	2390.00	50.73	54.00	-3.27	17.62	4.54	28.57	0.00	204	181	Average	HORIZONTAL
3	2434.20	112.18			78.92	4.59	28.67	0.00	204	181	Average	HORIZONTAL
4	2438.60	122.77			89.51	4.59	28.67	0.00	204	181	Peak	HORIZONTAL
5	2483.50	53.56	54.00	-0.44	20.16	4.63	28.77	0.00	204	181	Average	HORIZONTAL
6	2484.20	66.88	74.00	-7.12	33.48	4.63	28.77	0.00	204	181	Peak	HORIZONTAL

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

Channel 11

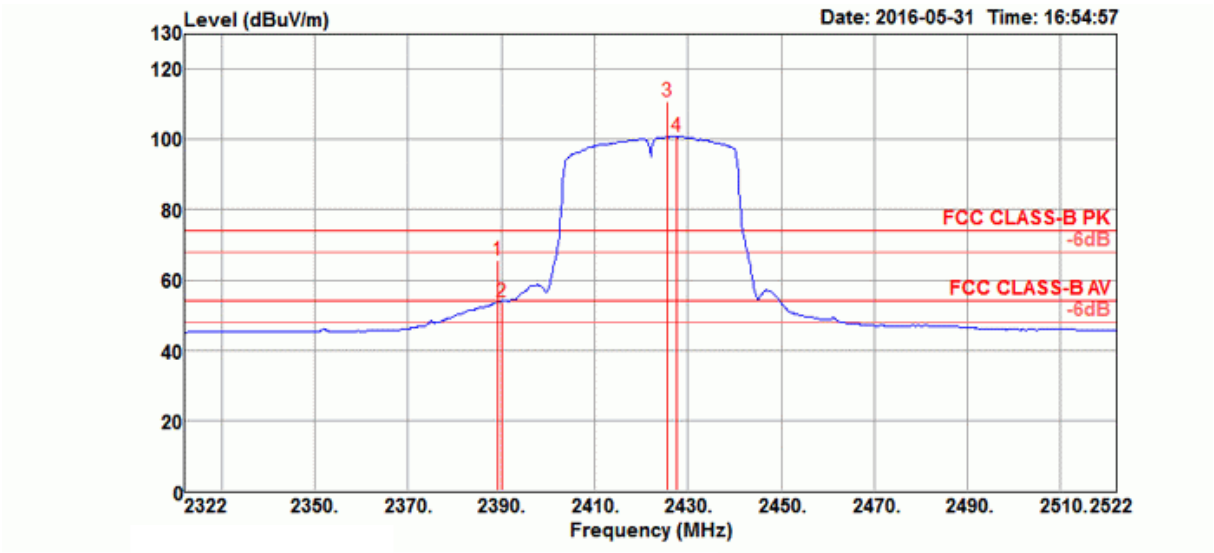


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2460.60	104.47			71.13	4.61	28.73	0.00	195	182	Average	HORIZONTAL
2	2463.80	116.63			83.29	4.61	28.73	0.00	195	182	Peak	HORIZONTAL
3	2483.50	53.76	54.00	-0.24	20.36	4.63	28.77	0.00	195	182	Average	HORIZONTAL
4	2483.50	65.84	74.00	-8.16	32.44	4.63	28.77	0.00	195	182	Peak	HORIZONTAL

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

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0Nss1 VHT40 CH 3, 6, 9 / Chain 1 + Chain 2

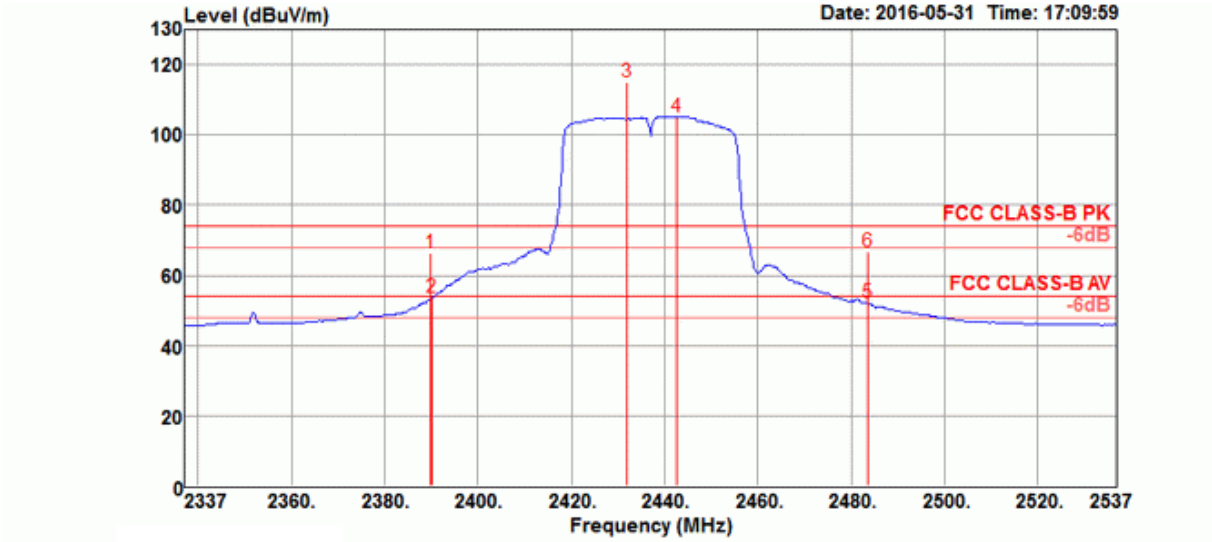
Channel 3



	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	2389.20	65.41	74.00	-8.59	32.30	4.54	28.57	0.00	192	181	Peak	HORIZONTAL
2	2390.00	53.85	54.00	-0.15	20.74	4.54	28.57	0.00	192	181	Average	HORIZONTAL
3	2425.60	110.82			77.58	4.58	28.66	0.00	192	181	Peak	HORIZONTAL
4	2427.60	100.90			67.66	4.58	28.66	0.00	192	181	Average	HORIZONTAL

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

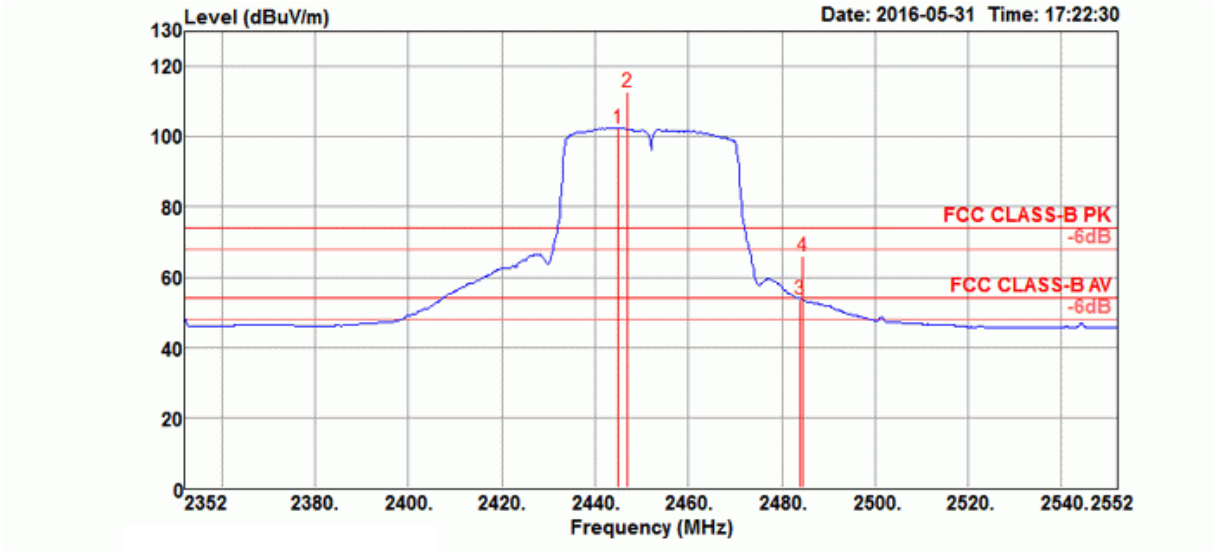
Channel 6



	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	2389.80	66.20	74.00	-7.80	33.09	4.54	28.57	0.00	176	180	Peak	HORIZONTAL
2	2390.00	53.55	54.00	-0.45	20.44	4.54	28.57	0.00	176	180	Average	HORIZONTAL
3	2431.80	115.18			81.94	4.58	28.66	0.00	176	180	Peak	HORIZONTAL
4	2442.60	105.15			71.86	4.60	28.69	0.00	176	180	Average	HORIZONTAL
5	2483.50	52.00	54.00	-2.00	18.60	4.63	28.77	0.00	176	180	Average	HORIZONTAL
6	2483.50	66.70	74.00	-7.30	33.30	4.63	28.77	0.00	176	180	Peak	HORIZONTAL

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

Channel 9



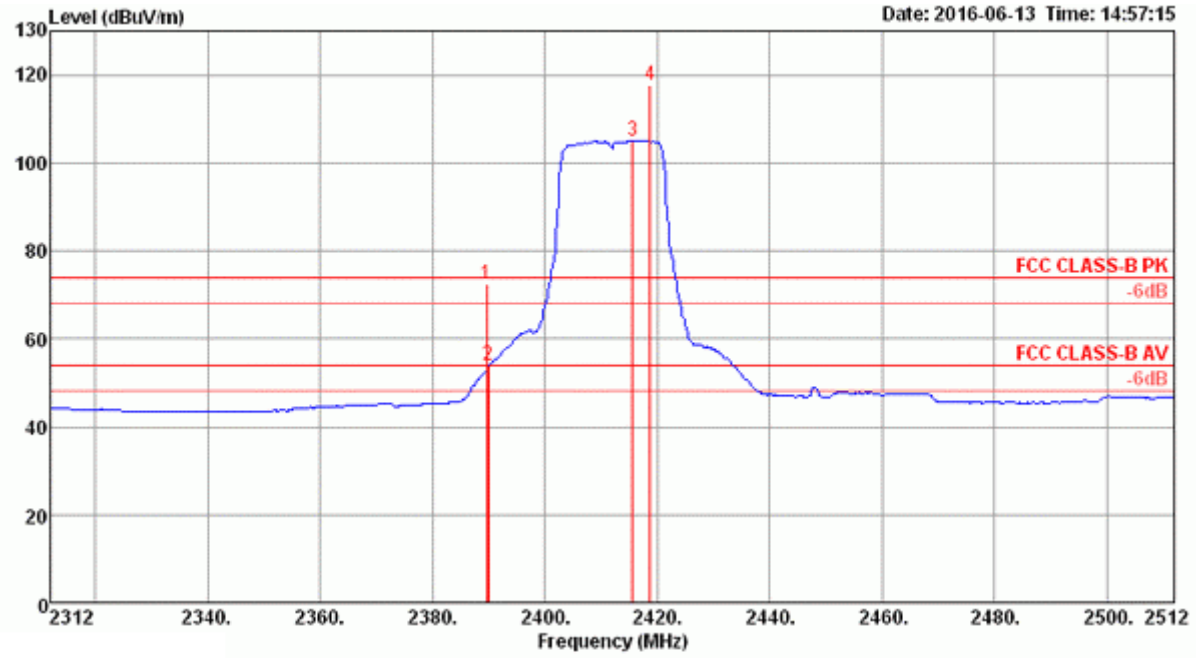
	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2444.80	102.43			69.14	4.60	28.69	0.00	195	178	Average	HORIZONTAL
2	2446.80	112.57			79.27	4.60	28.70	0.00	195	178	Peak	HORIZONTAL
3	2484.00	53.85	54.00	-0.15	20.45	4.63	28.77	0.00	195	178	Average	HORIZONTAL
4	2484.40	66.00	74.00	-8.00	32.60	4.63	28.77	0.00	195	178	Peak	HORIZONTAL

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

For Directional antenna / Beamforming Mode:

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0Nss1 VHT20 CH 1, 6, 11 / Chain 1 + Chain 2

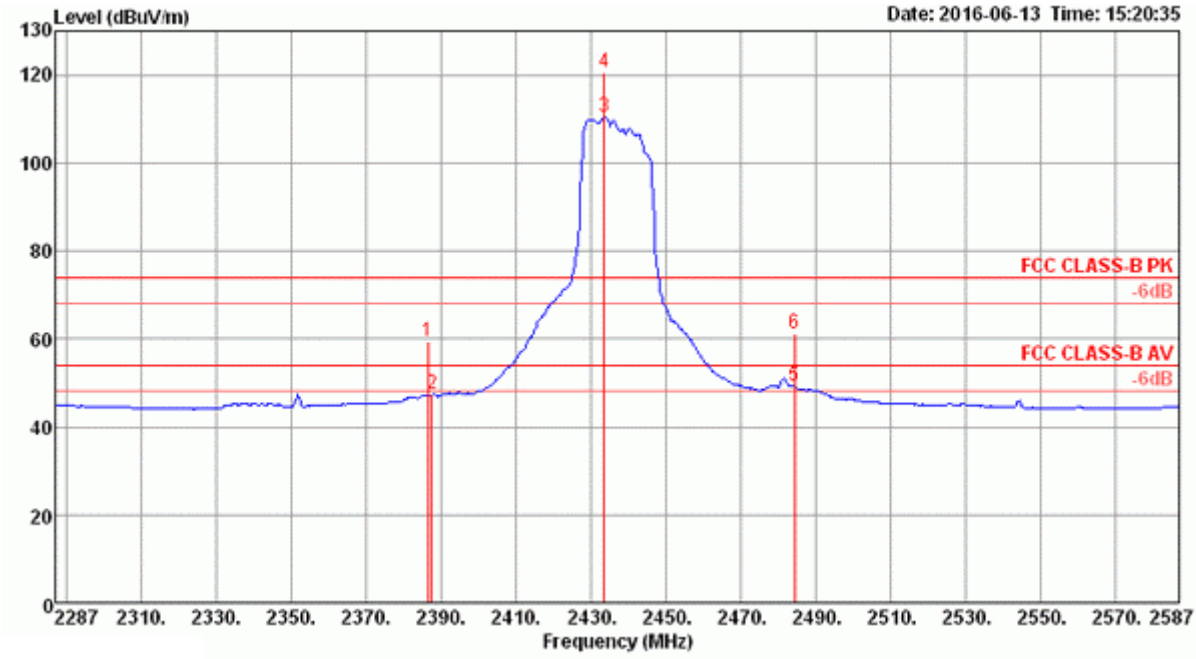
Channel 1



	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	2389.60	72.25	74.00	-1.75	40.34	3.60	28.31	0.00	179	4	Peak	VERTICAL
2	2390.00	53.82	54.00	-0.18	21.91	3.60	28.31	0.00	179	4	Average	VERTICAL
3	2415.60	105.09			73.11	3.62	28.36	0.00	179	4	Average	VERTICAL
4	2418.80	117.54			85.54	3.63	28.37	0.00	179	4	Peak	VERTICAL

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

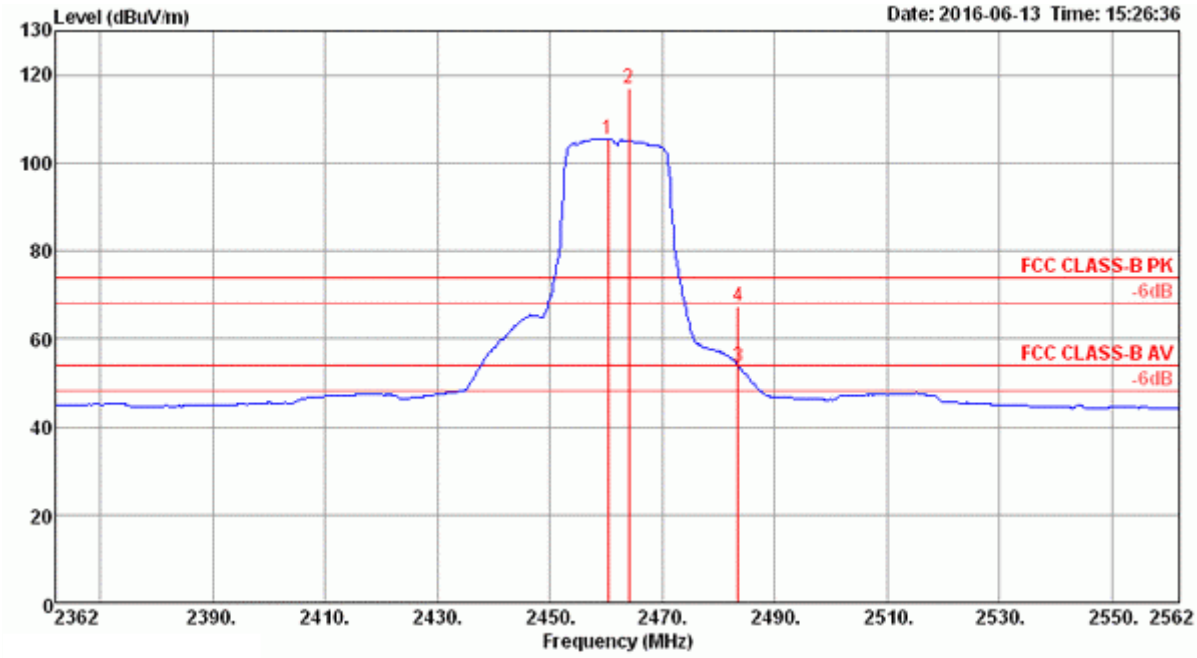
Channel 6



	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	2386.40	59.24	74.00	-14.76	27.33	3.60	28.31	0.00	189	0	Peak	HORIZONTAL
2	2387.60	47.40	54.00	-6.60	15.49	3.60	28.31	0.00	189	0	Average	HORIZONTAL
3	2433.40	110.37			78.34	3.64	28.39	0.00	189	0	Average	HORIZONTAL
4	2433.40	120.47			88.44	3.64	28.39	0.00	189	0	Peak	HORIZONTAL
5	2484.40	49.37	54.00	-4.63	17.21	3.68	28.48	0.00	189	0	Average	HORIZONTAL
6	2484.40	61.27	74.00	-12.73	29.11	3.68	28.48	0.00	189	0	Peak	HORIZONTAL

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

Channel 11

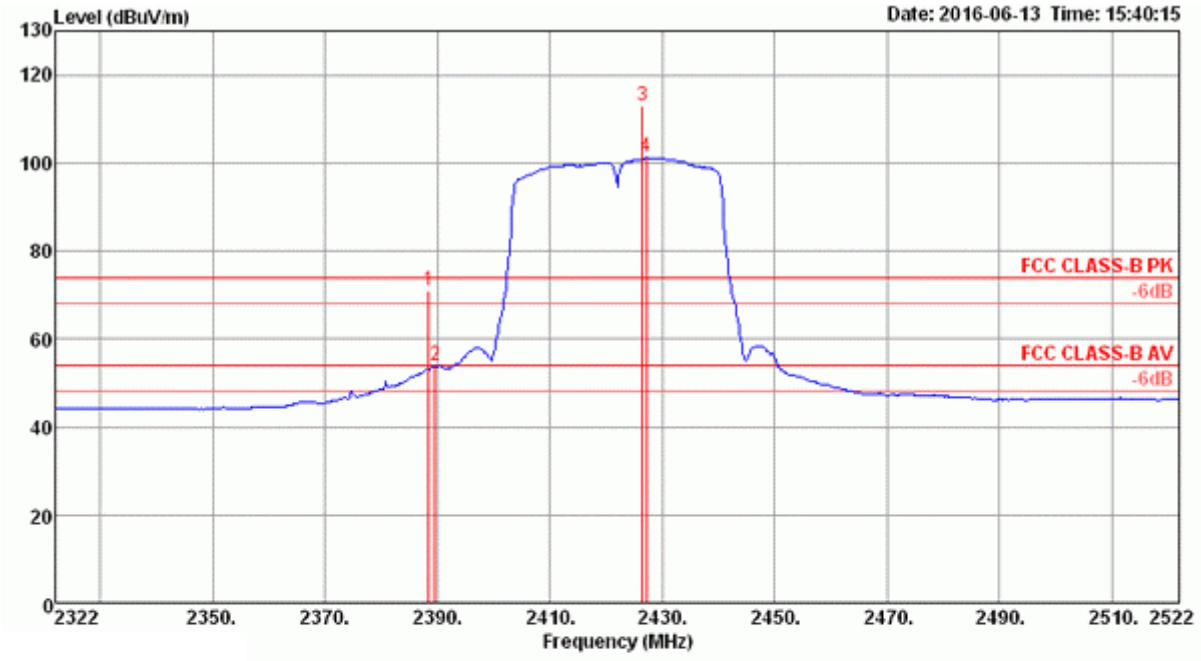


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2460.40	105.54			73.45	3.66	28.43	0.00	189	0	Average	VERTICAL
2	2464.00	117.11			85.01	3.66	28.44	0.00	189	0	Peak	VERTICAL
3	2483.50	53.72	54.00	-0.28	21.56	3.68	28.48	0.00	189	0	Average	VERTICAL
4	2483.50	67.43	74.00	-6.57	35.27	3.68	28.48	0.00	189	0	Peak	VERTICAL

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

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0Nss1 VHT40 CH 3, 6, 9 / Chain 1 + Chain 2

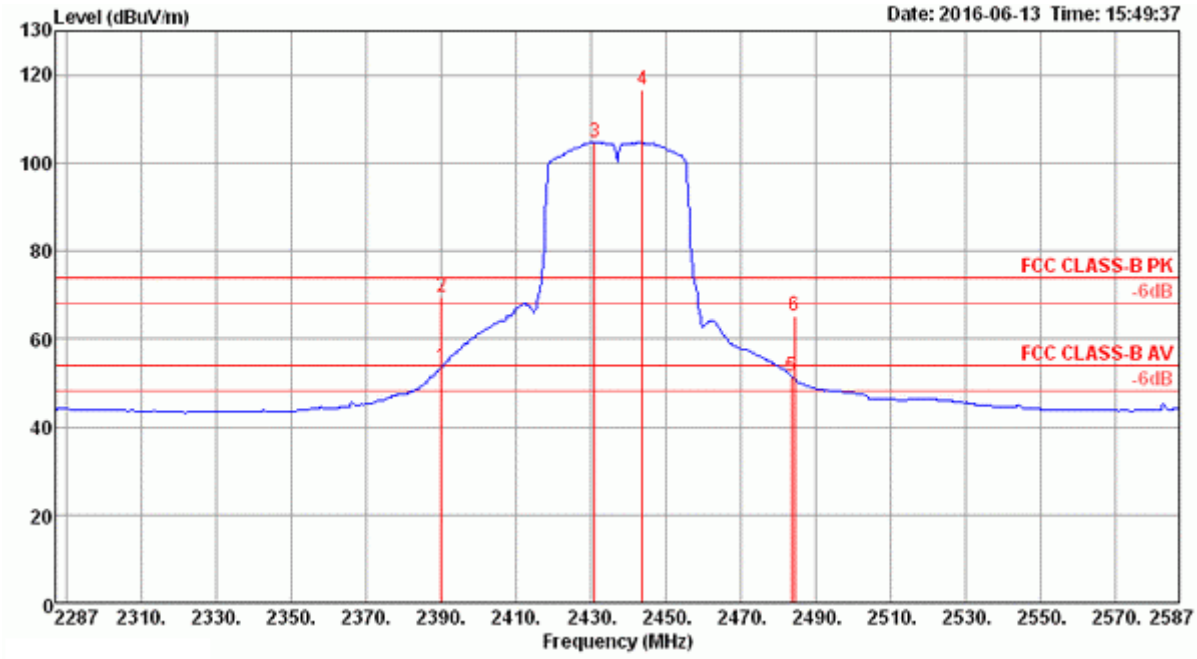
Channel 3



	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	2388.40	71.12	74.00	-2.88	39.21	3.60	28.31	0.00	193	7	Peak	VERTICAL
2	2389.60	53.83	54.00	-0.17	21.92	3.60	28.31	0.00	193	7	Average	VERTICAL
3	2426.40	112.82			80.81	3.63	28.38	0.00	193	7	Peak	VERTICAL
4	2427.20	101.33			69.32	3.63	28.38	0.00	193	7	Average	VERTICAL

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

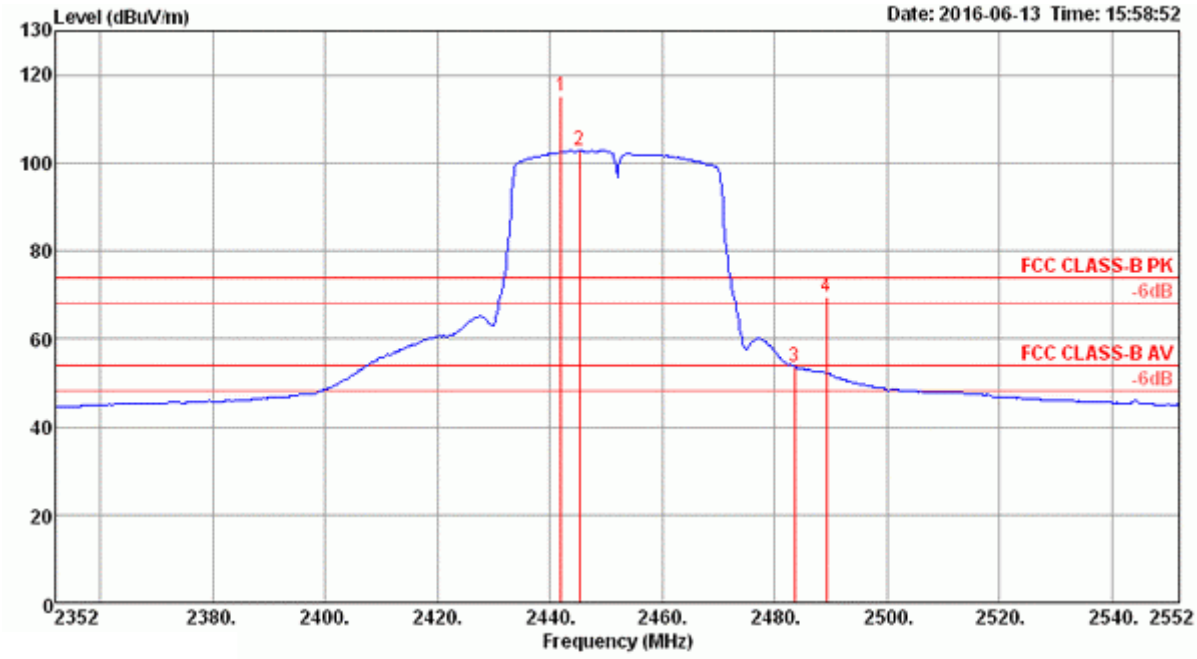
Channel 6



	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	53.68	54.00	-0.32	21.77	3.60	28.31	0.00	194	0	Average	VERTICAL
2	2390.00	69.53	74.00	-4.47	37.62	3.60	28.31	0.00	194	0	Peak	VERTICAL
3	2431.00	104.69			72.68	3.63	28.38	0.00	194	0	Average	VERTICAL
4	2443.60	116.48			84.43	3.64	28.41	0.00	194	0	Peak	VERTICAL
5	2483.50	51.35	54.00	-2.65	19.19	3.68	28.48	0.00	194	0	Average	VERTICAL
6	2484.40	65.26	74.00	-8.74	33.10	3.68	28.48	0.00	194	0	Peak	VERTICAL

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

Channel 9



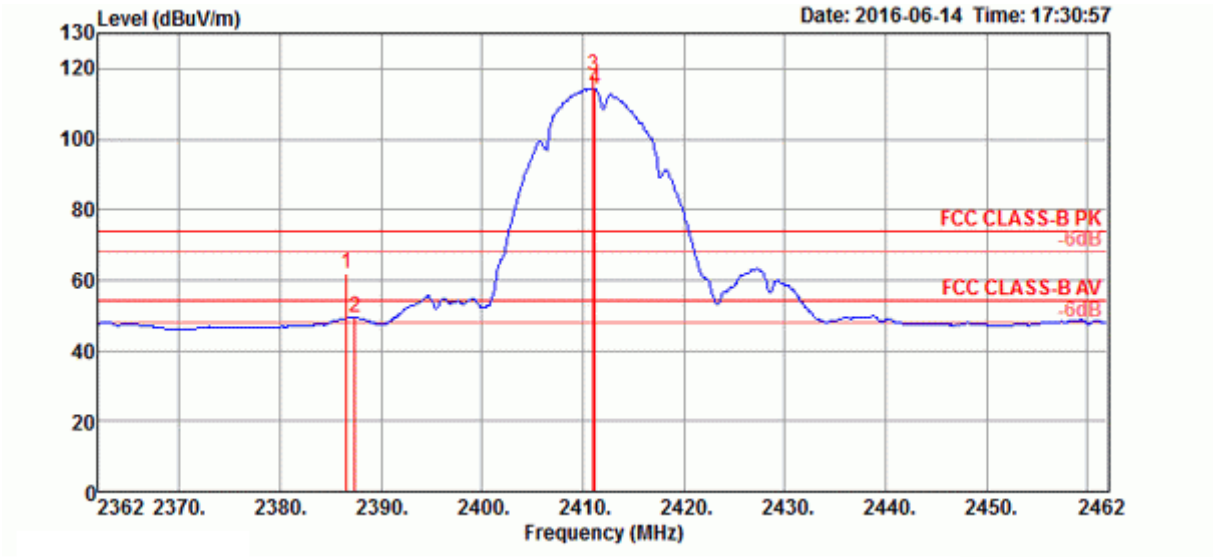
	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2442.00	115.33			83.28	3.64	28.41	0.00	195	3	Peak	VERTICAL
2	2445.20	102.77			70.72	3.64	28.41	0.00	195	3	Average	VERTICAL
3	2483.50	53.75	54.00	-0.25	21.59	3.68	28.48	0.00	195	3	Average	VERTICAL
4	2489.20	69.48	74.00	-4.52	37.31	3.68	28.49	0.00	195	3	Peak	VERTICAL

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

For Omni antenna / Non-Beamforming Mode:

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11b CH 1, 6, 11 / Chain 1 + Chain 2 + Chain 3 + Chain 4

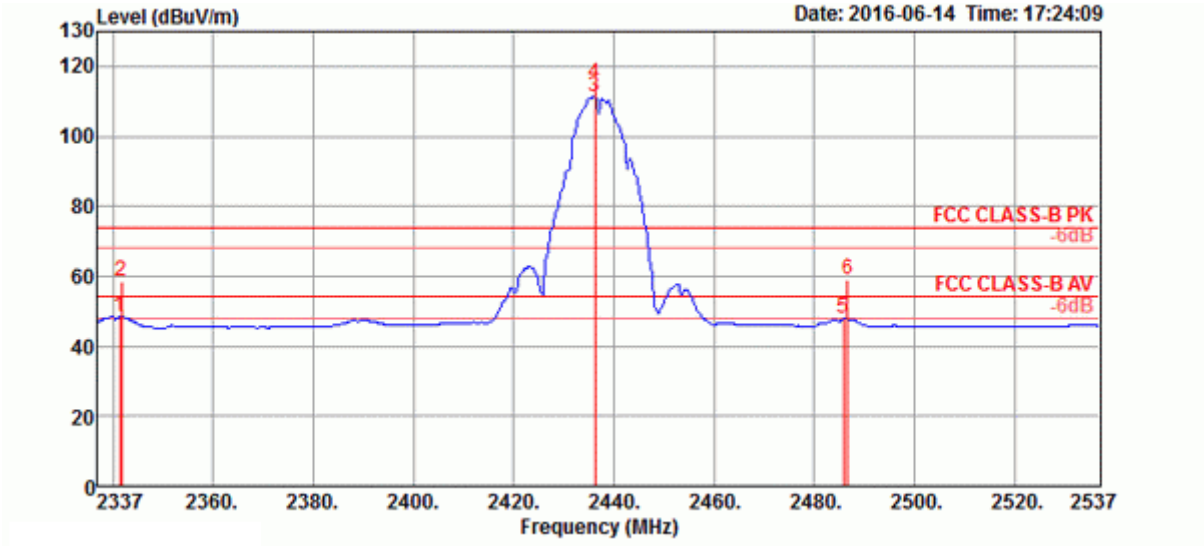
Channel 1



	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	2386.60	61.67	74.00	-12.33	28.57	5.20	27.90	0.00	245	204	Peak	HORIZONTAL
2	2387.40	49.25	54.00	-4.75	16.15	5.20	27.90	0.00	245	204	Average	HORIZONTAL
3	2411.00	118.12			85.01	5.23	27.88	0.00	245	204	Peak	HORIZONTAL
4	2411.20	114.22			81.10	5.24	27.88	0.00	245	204	Average	HORIZONTAL

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

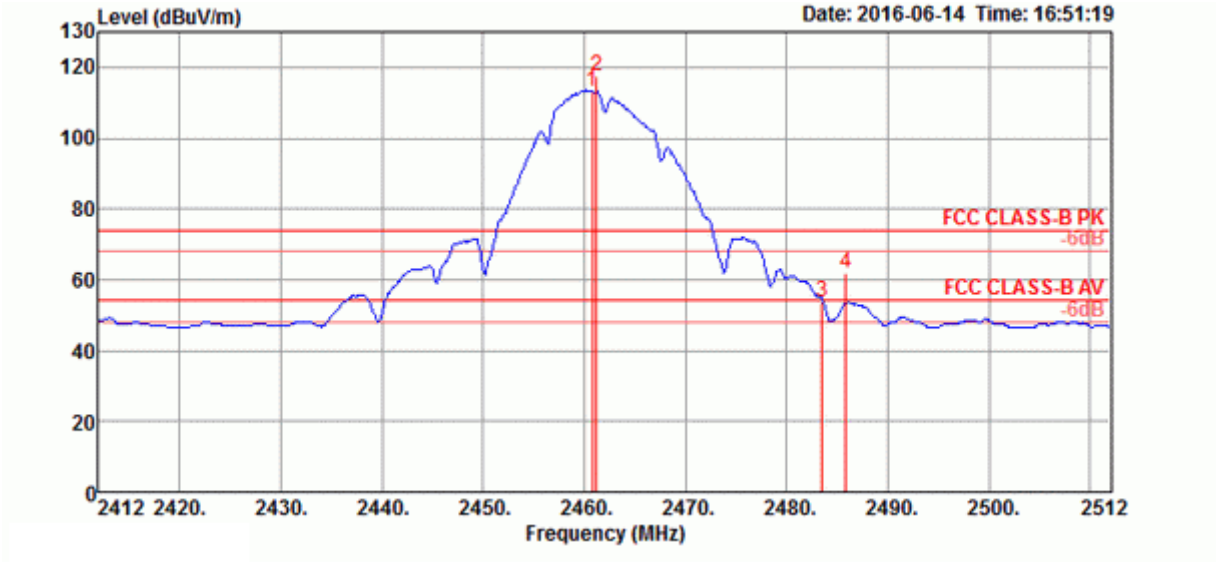
Channel 6



	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	2341.40	48.57	54.00	-5.43	15.48	5.14	27.95	0.00	154	175	Average	VERTICAL
2	2341.80	58.38	74.00	-15.62	25.29	5.14	27.95	0.00	154	175	Peak	VERTICAL
3	2436.20	111.45			78.32	5.27	27.86	0.00	154	175	Average	VERTICAL
4	2436.20	115.32			82.19	5.27	27.86	0.00	154	175	Peak	VERTICAL
5	2485.80	47.91	54.00	-6.09	14.76	5.34	27.81	0.00	154	175	Average	VERTICAL
6	2486.60	58.78	74.00	-15.22	25.63	5.34	27.81	0.00	154	175	Peak	VERTICAL

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

Channel 11

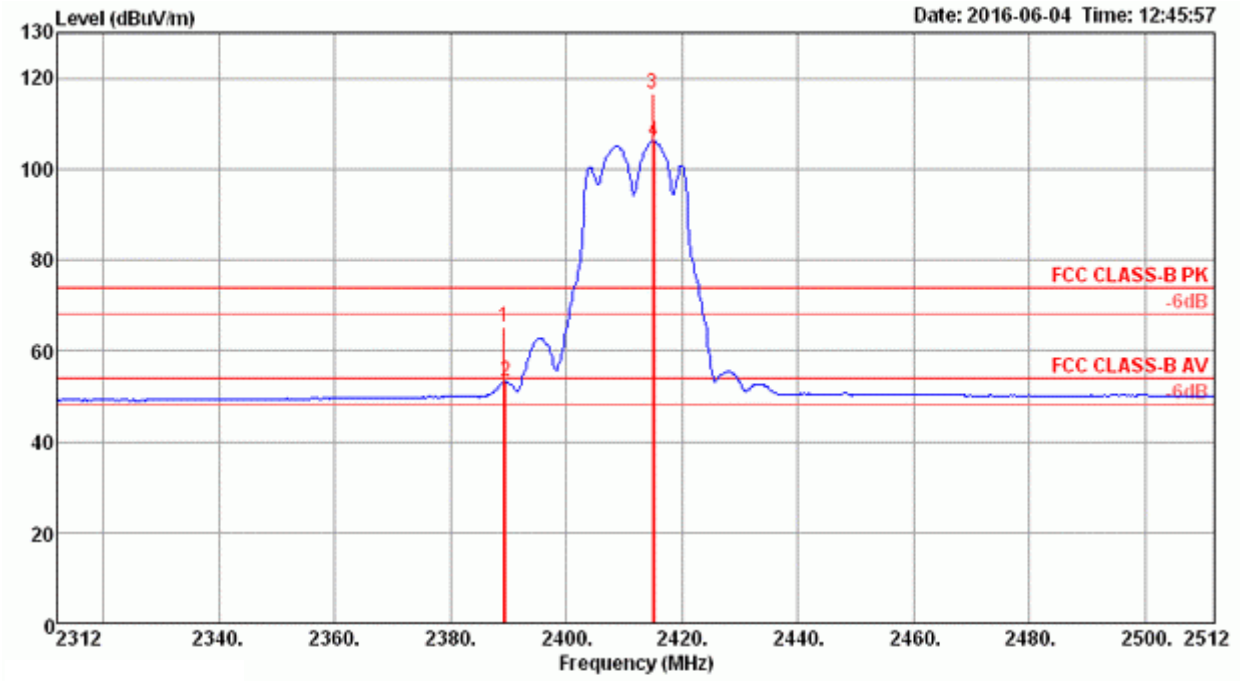


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2460.80	113.36			80.22	5.31	27.83	0.00	292	205	Average	HORIZONTAL
2	2461.20	117.39			84.25	5.31	27.83	0.00	292	205	Peak	HORIZONTAL
3	2483.50	53.84	54.00	-0.16	20.69	5.34	27.81	0.00	292	205	Average	HORIZONTAL
4	2485.80	61.70	74.00	-12.30	28.55	5.34	27.81	0.00	292	205	Peak	HORIZONTAL

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

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11g CH 1, 6, 11 / Chain 1 + Chain 2 + Chain 3 + Chain 4

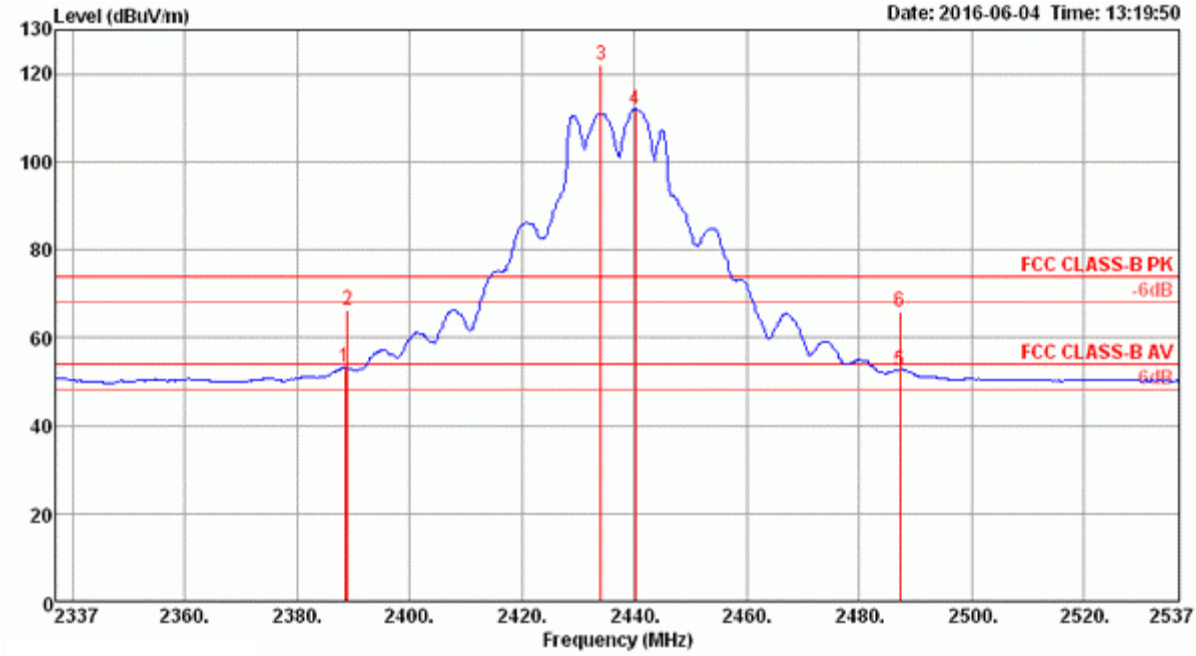
Channel 1



	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	2389.24	65.28	74.00	-8.72	31.32	5.65	28.31	0.00	194	1	Peak	VERTICAL
2	2389.56	53.11	54.00	-0.89	19.15	5.65	28.31	0.00	194	1	Average	VERTICAL
3	2414.89	116.62			82.57	5.69	28.36	0.00	194	1	Peak	VERTICAL
4	2415.21	106.09			72.04	5.69	28.36	0.00	194	1	Average	VERTICAL

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

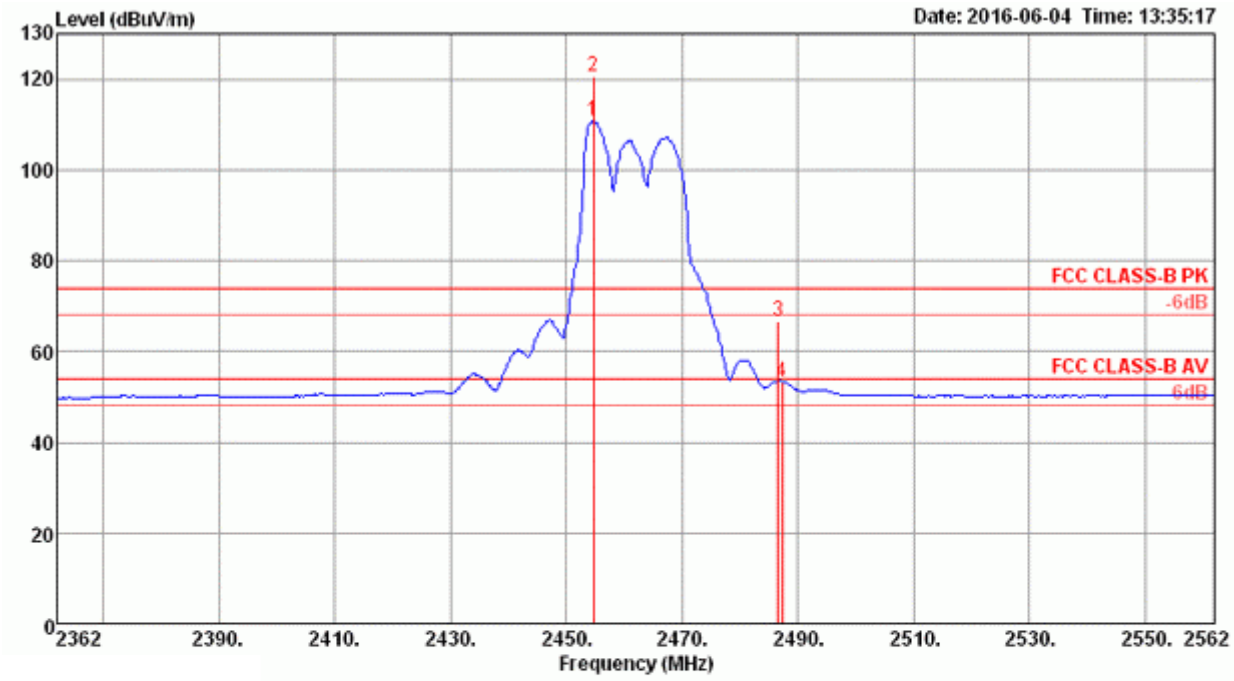
Channel 6



	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	2388.60	53.26	54.00	-0.74	19.30	5.65	28.31	0.00	170	6	Average	VERTICAL
2	2388.92	66.16	74.00	-7.84	32.20	5.65	28.31	0.00	170	6	Peak	VERTICAL
3	2434.12	122.15			88.03	5.73	28.39	0.00	170	6	Peak	VERTICAL
4	2440.21	112.03			77.88	5.74	28.41	0.00	170	6	Average	VERTICAL
5	2487.32	52.66	54.00	-1.34	18.38	5.80	28.48	0.00	170	6	Average	VERTICAL
6	2487.32	65.79	74.00	-8.21	31.51	5.80	28.48	0.00	170	6	Peak	VERTICAL

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

Channel 11

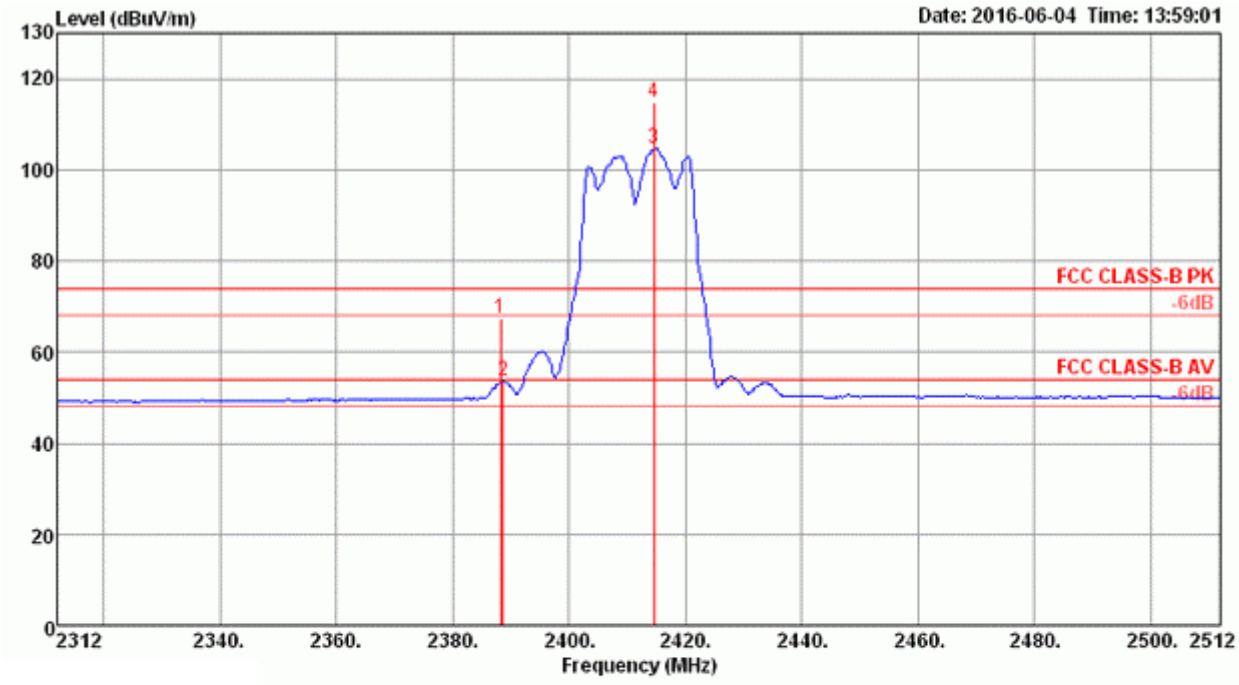


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2454.63	110.78			76.59	5.76	28.43	0.00	156	352	Average	VERTICAL
2	2454.63	120.64			86.45	5.76	28.43	0.00	156	352	Peak	VERTICAL
3	2486.68	66.57	74.00	-7.43	32.29	5.80	28.48	0.00	156	352	Peak	VERTICAL
4	2487.32	53.31	54.00	-0.69	19.03	5.80	28.48	0.00	156	352	Average	VERTICAL

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

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0Nss1 VHT20 CH 1, 6, 11 / Chain 1 + Chain 2 + Chain 3 + Chain 4

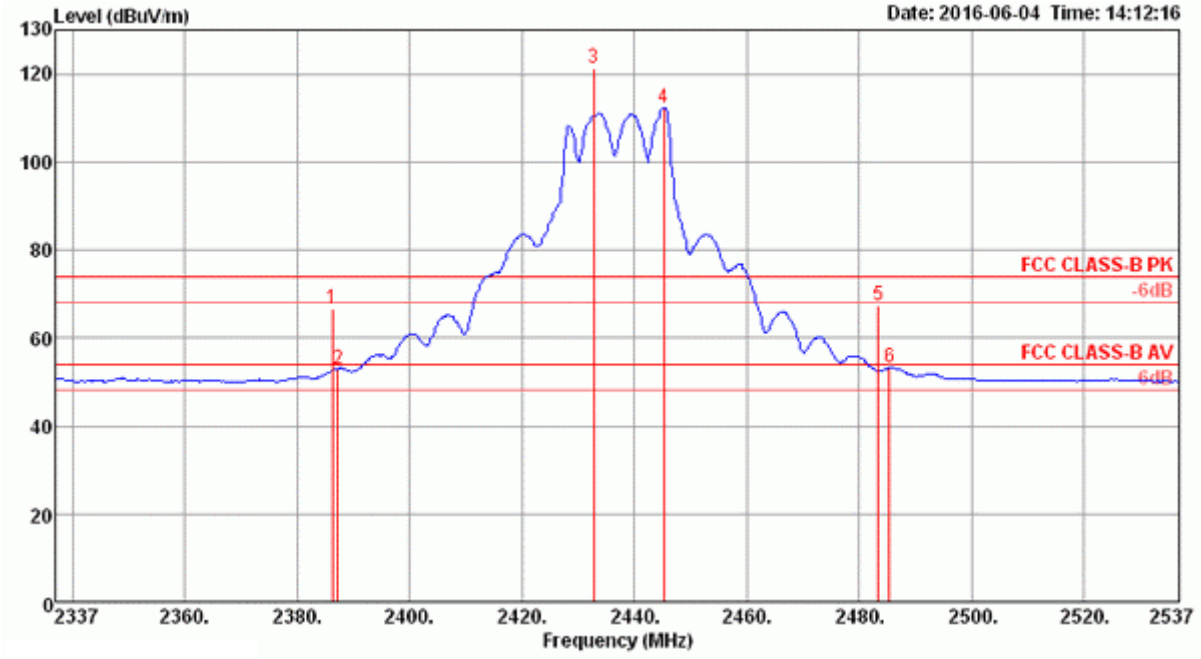
Channel 1



	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	2388.28	67.45	74.00	-6.55	33.49	5.65	28.31	0.00	230	0	Peak	VERTICAL
2	2388.60	53.49	54.00	-0.51	19.53	5.65	28.31	0.00	230	0	Average	VERTICAL
3	2414.56	104.52			70.47	5.69	28.36	0.00	230	0	Average	VERTICAL
4	2414.56	114.71			80.66	5.69	28.36	0.00	230	0	Peak	VERTICAL

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

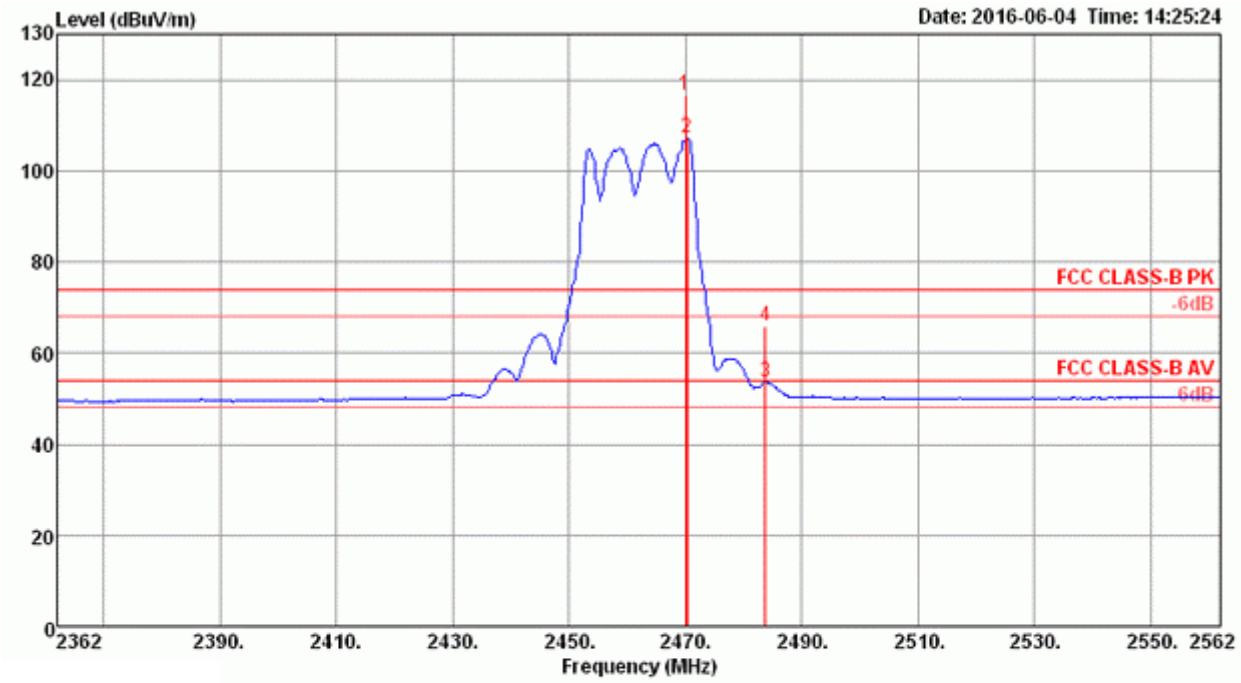
Channel 6



	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	2386.36	66.57	74.00	-7.43	32.61	5.65	28.31	0.00	230	9	Peak	VERTICAL
2	2387.32	52.85	54.00	-1.15	18.89	5.65	28.31	0.00	230	9	Average	VERTICAL
3	2432.83	121.34			87.22	5.73	28.39	0.00	230	9	Peak	VERTICAL
4	2445.33	112.28			78.13	5.74	28.41	0.00	230	9	Average	VERTICAL
5	2483.50	67.20	74.00	-6.80	32.92	5.80	28.48	0.00	230	9	Peak	VERTICAL
6	2485.40	53.22	54.00	-0.78	18.94	5.80	28.48	0.00	230	9	Average	VERTICAL

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

Channel 11

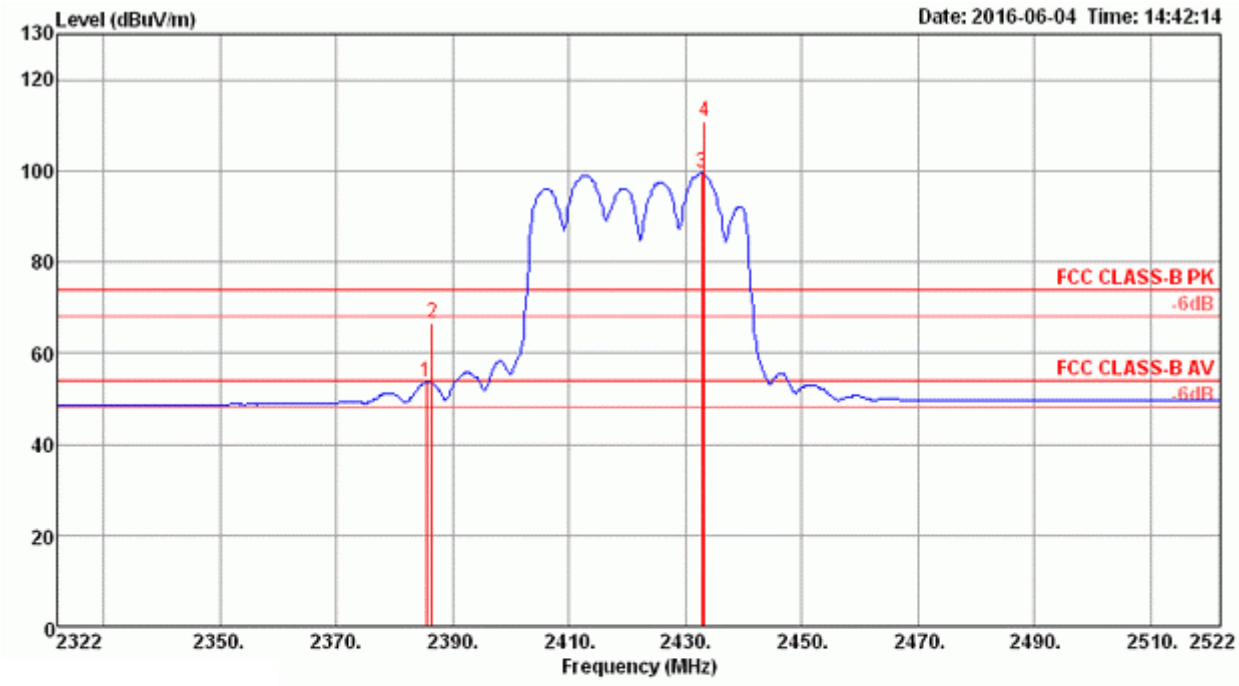


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2470.01	116.53			82.30	5.78	28.45	0.00	211	7	Peak	VERTICAL
2	2470.33	107.01			72.78	5.78	28.45	0.00	211	7	Average	VERTICAL
3	2483.80	53.58	54.00	-0.42	19.30	5.80	28.48	0.00	211	7	Average	VERTICAL
4	2483.80	65.87	74.00	-8.13	31.59	5.80	28.48	0.00	211	7	Peak	VERTICAL

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

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0Nss1 VHT40 CH 3, 6, 9 / Chain 1 + Chain 2 + Chain 3 + Chain 4

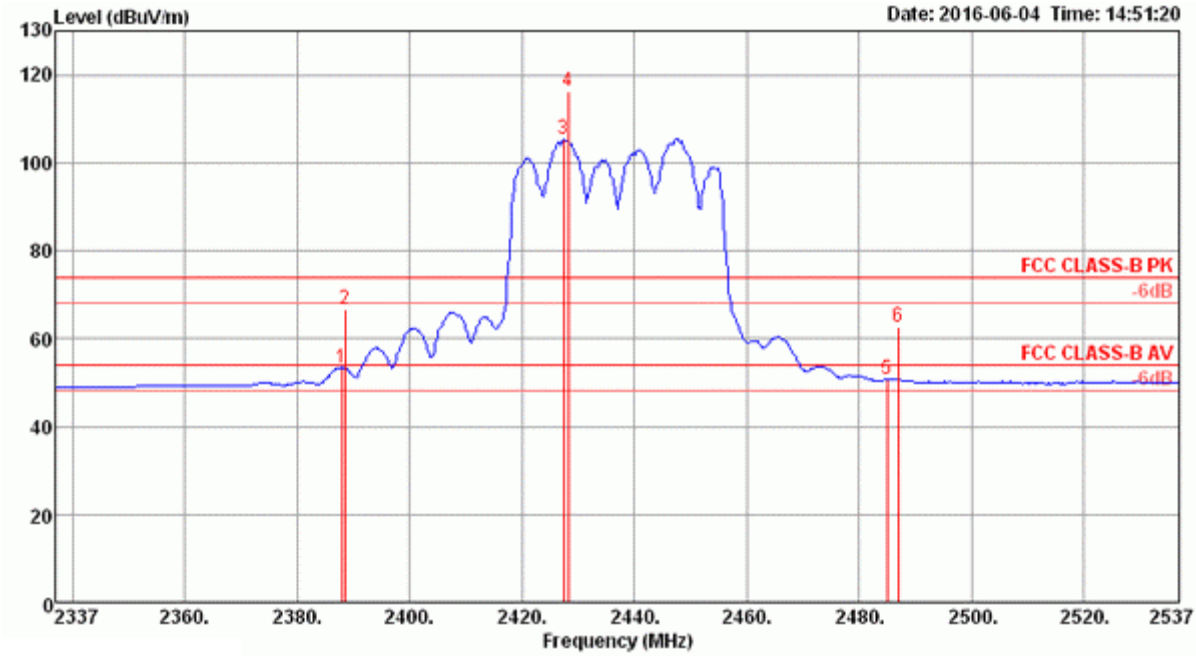
Channel 3



	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	2385.46	53.49	54.00	-0.51	19.53	5.65	28.31	0.00	179	361	Average	VERTICAL
2	2386.42	66.55	74.00	-7.45	32.59	5.65	28.31	0.00	179	361	Peak	VERTICAL
3	2432.90	99.47			65.35	5.73	28.39	0.00	179	361	Average	VERTICAL
4	2433.22	110.88			76.76	5.73	28.39	0.00	179	361	Peak	VERTICAL

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

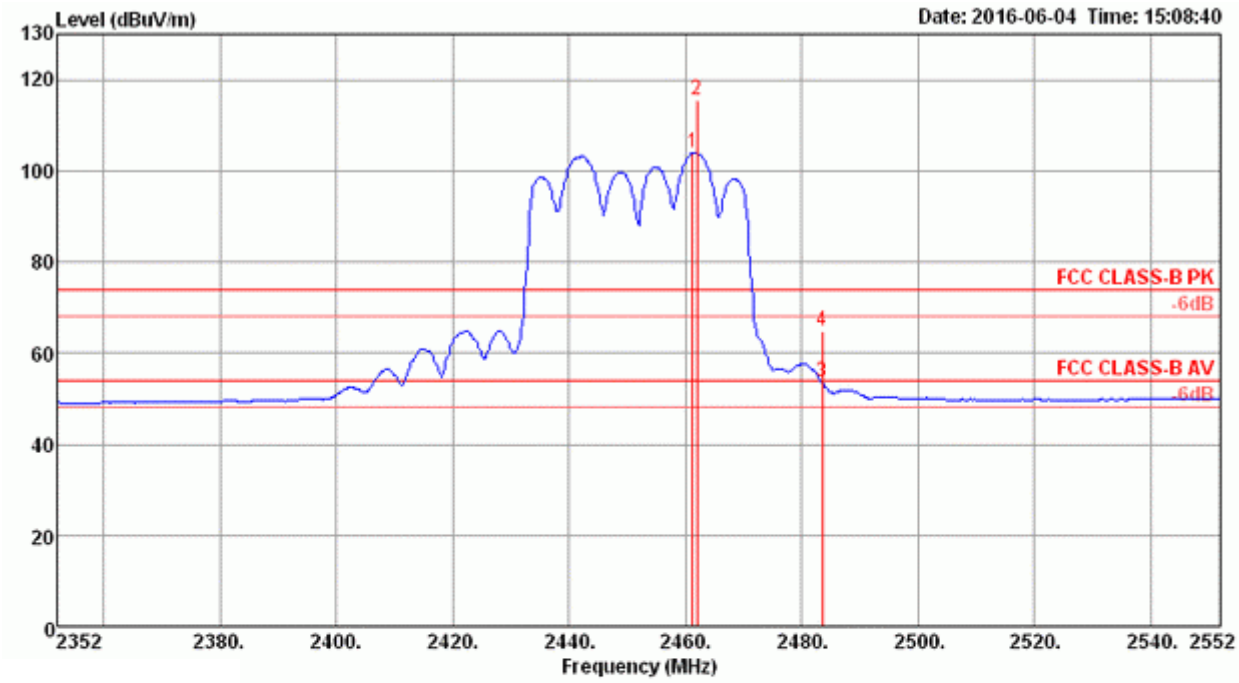
Channel 6



	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	2387.96	53.41	54.00	-0.59	19.45	5.65	28.31	0.00	192	360	Average	VERTICAL
2	2388.60	66.70	74.00	-7.30	32.74	5.65	28.31	0.00	192	360	Peak	VERTICAL
3	2427.39	105.46			71.37	5.71	28.38	0.00	192	360	Average	VERTICAL
4	2428.35	116.13			82.04	5.71	28.38	0.00	192	360	Peak	VERTICAL
5	2485.08	50.78	54.00	-3.22	16.50	5.80	28.48	0.00	192	360	Average	VERTICAL
6	2487.00	62.60	74.00	-11.40	28.32	5.80	28.48	0.00	192	360	Peak	VERTICAL

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

Channel 9



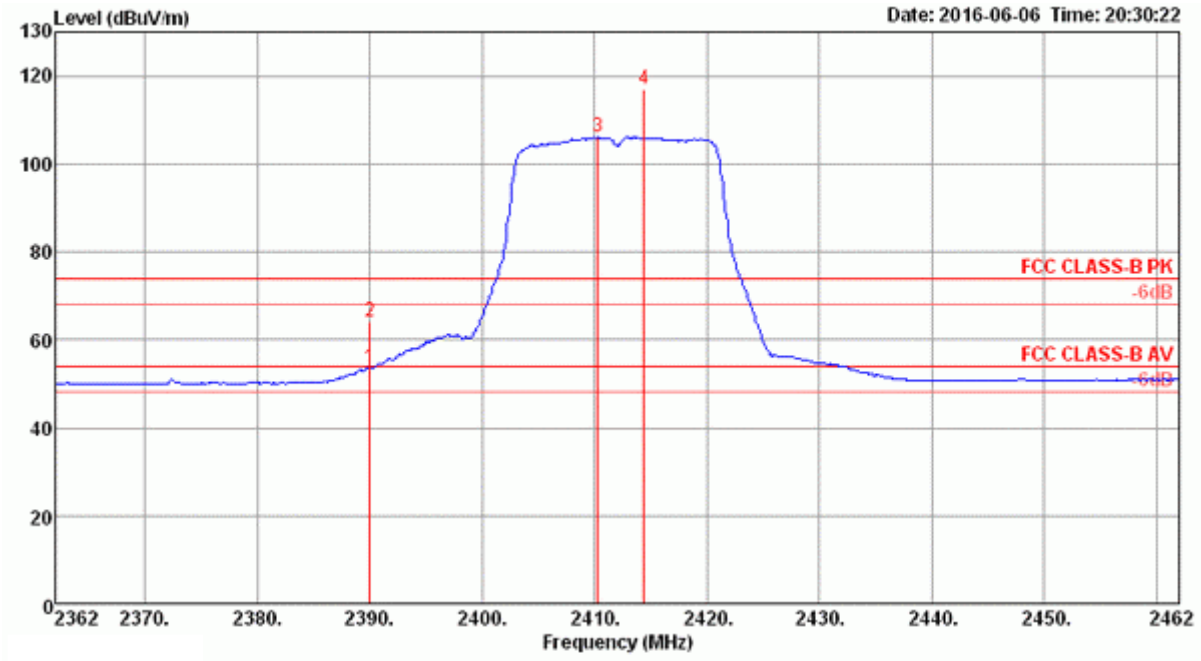
	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2461.30	104.00			69.79	5.77	28.44	0.00	194	7	Average	VERTICAL
2	2461.94	115.50			81.29	5.77	28.44	0.00	194	7	Peak	VERTICAL
3	2483.50	53.69	54.00	-0.31	19.41	5.80	28.48	0.00	194	7	Average	VERTICAL
4	2483.50	64.82	74.00	-9.18	30.54	5.80	28.48	0.00	194	7	Peak	VERTICAL

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

For Omni antenna / Beamforming Mode:

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0Nss1 VHT20 CH 1, 6, 11 / Chain 1 + Chain 2 + Chain 3 + Chain 4

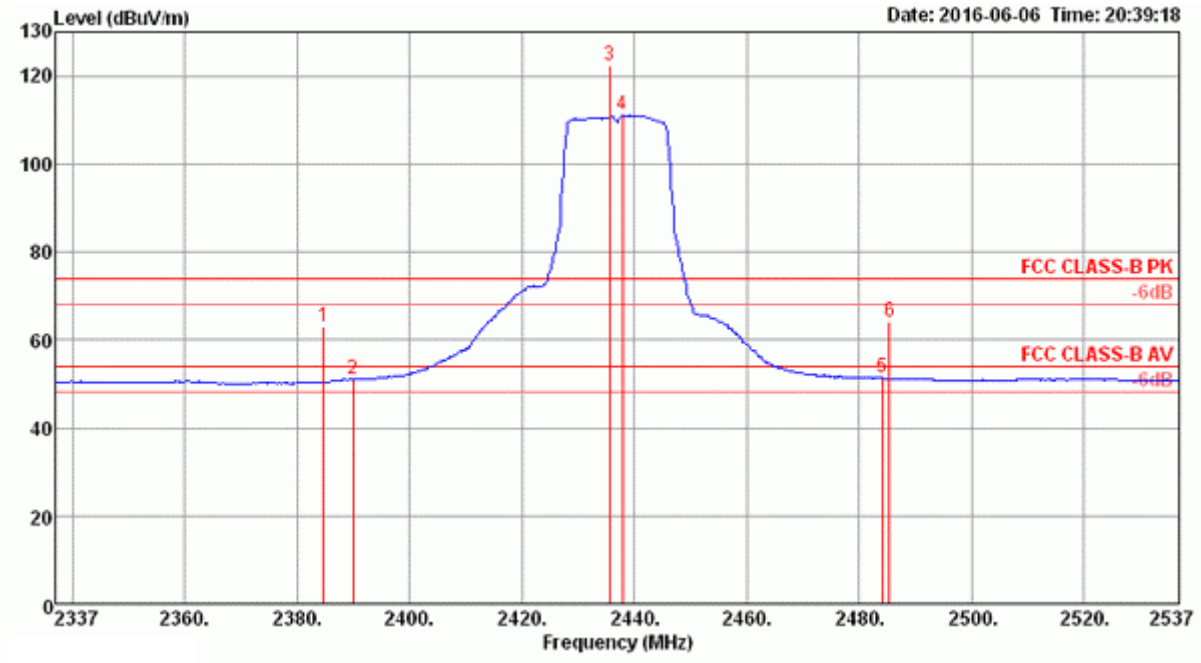
Channel 1



	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	2390.00	53.56	54.00	-0.44	18.99	6.26	28.31	0.00	138	360	Average	VERTICAL
2	2390.00	64.09	74.00	-9.91	29.52	6.26	28.31	0.00	138	360	Peak	VERTICAL
3	2410.24	106.01			71.36	6.30	28.35	0.00	138	360	Average	VERTICAL
4	2414.40	117.05			82.37	6.32	28.36	0.00	138	360	Peak	VERTICAL

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

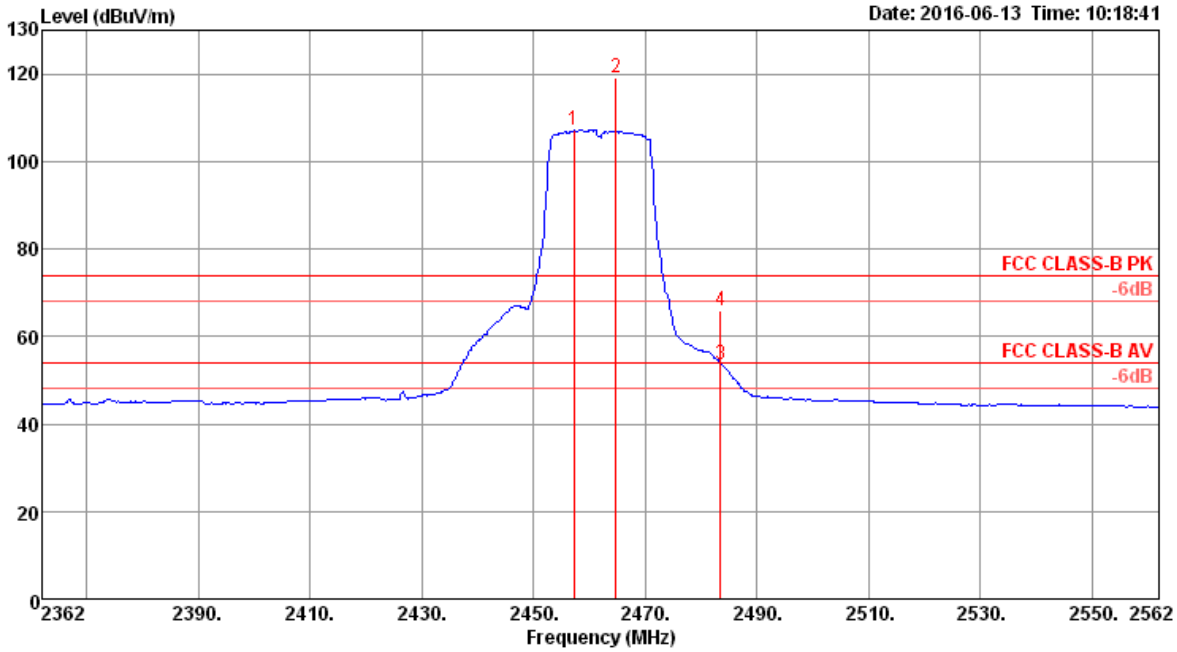
Channel 6



	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	2384.76	63.18	74.00	-10.82	28.61	6.26	28.31	0.00	152	360	Peak	VERTICAL
2	2390.00	50.97	54.00	-3.03	16.40	6.26	28.31	0.00	152	360	Average	VERTICAL
3	2435.72	122.43			87.69	6.35	28.39	0.00	152	360	Peak	VERTICAL
4	2437.96	111.01			76.27	6.35	28.39	0.00	152	360	Average	VERTICAL
5	2484.12	51.33	54.00	-2.67	16.41	6.44	28.48	0.00	152	360	Average	VERTICAL
6	2485.40	64.06	74.00	-9.94	29.14	6.44	28.48	0.00	152	360	Peak	VERTICAL

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

Channel 11

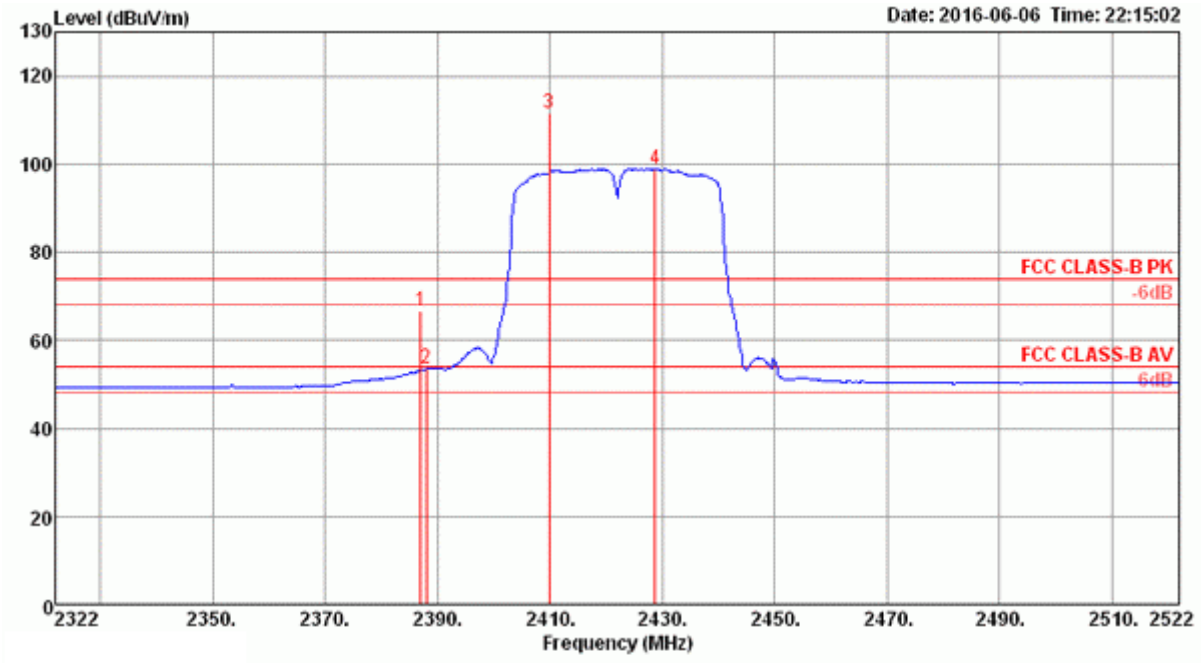


	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	2457.20	107.20			75.11	3.66	28.43	0.00	143	360	Average	VERTICAL
2	2464.80	119.00			86.90	3.66	28.44	0.00	143	360	Peak	VERTICAL
3	2483.50	53.75	54.00	-0.25	21.59	3.68	28.48	0.00	143	360	Average	VERTICAL
4	2483.50	66.01	74.00	-7.99	33.85	3.68	28.48	0.00	143	360	Peak	VERTICAL

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

Temperature	22℃	Humidity	54%
Test Engineer	Gino Huang	Configurations	IEEE 802.11ac MCS0Nss1 VHT40 CH 3, 6, 9 / Chain 1 + Chain 2 + Chain 3 + Chain 4

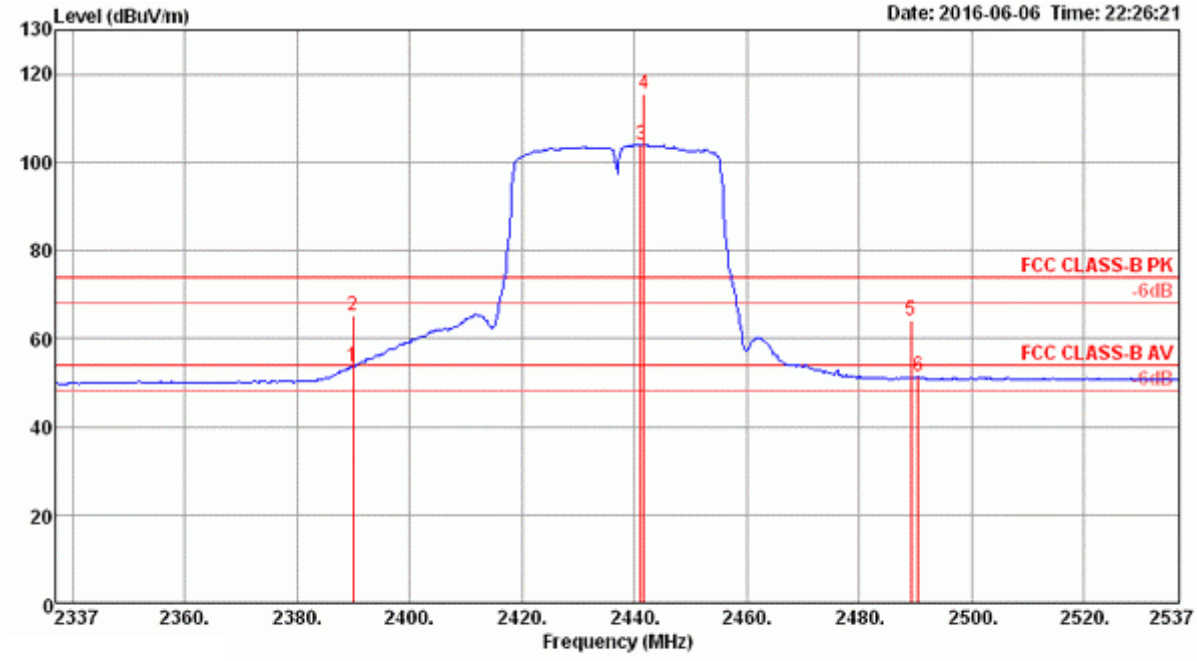
Channel 3



	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	2387.06	66.56	74.00	-7.44	31.99	6.26	28.31	0.00	136	360	Peak	VERTICAL
2	2388.03	53.75	54.00	-0.25	19.18	6.26	28.31	0.00	136	360	Average	VERTICAL
3	2409.82	111.59			76.94	6.30	28.35	0.00	136	360	Peak	VERTICAL
4	2428.73	98.95			64.23	6.34	28.38	0.00	136	360	Average	VERTICAL

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

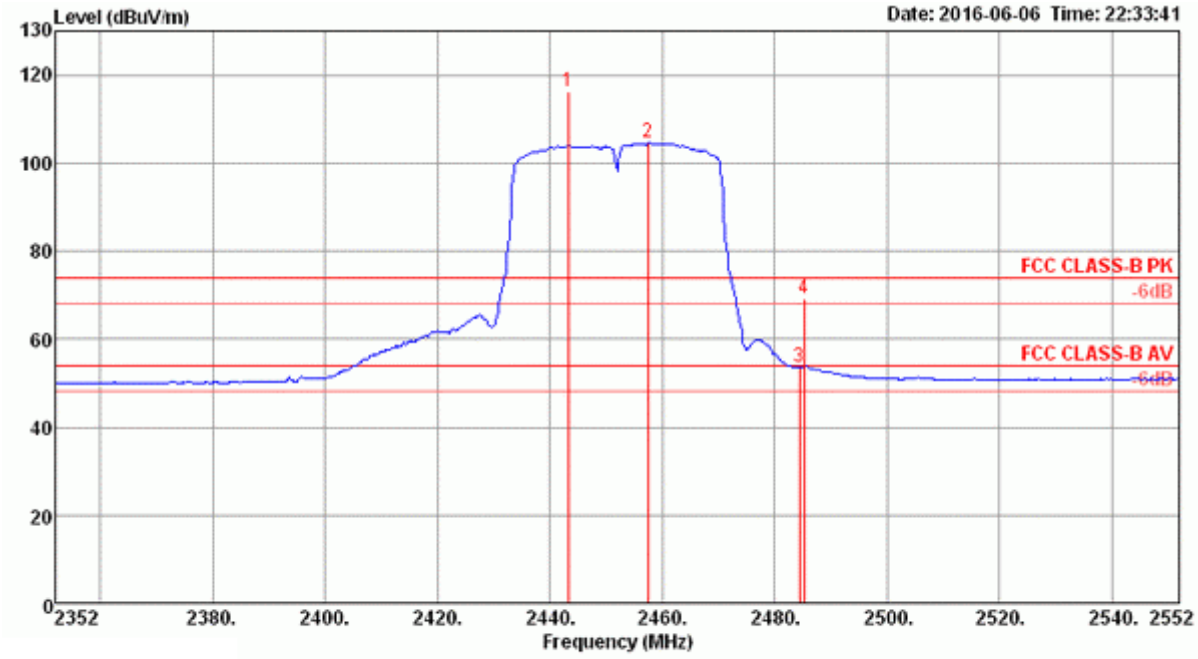
Channel 6



	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	53.47	54.00	-0.53	18.90	6.26	28.31	0.00	150	358	Average	VERTICAL
2	2390.00	65.06	74.00	-8.94	30.49	6.26	28.31	0.00	150	358	Peak	VERTICAL
3	2441.17	104.05			69.28	6.36	28.41	0.00	150	358	Average	VERTICAL
4	2441.81	115.47			80.70	6.36	28.41	0.00	150	358	Peak	VERTICAL
5	2489.24	64.09	74.00	-9.91	29.15	6.45	28.49	0.00	150	358	Peak	VERTICAL
6	2490.53	51.25	54.00	-2.75	16.31	6.45	28.49	0.00	150	358	Average	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	2443.35	116.07			81.30	6.36	28.41	0.00	148	0	Peak	VERTICAL
2	2457.45	104.51			69.69	6.39	28.43	0.00	148	0	Average	VERTICAL
3	2484.37	53.75	54.00	-0.25	18.83	6.44	28.48	0.00	148	0	Average	VERTICAL
4	2485.33	69.05	74.00	-4.95	34.13	6.44	28.48	0.00	148	0	Peak	VERTICAL

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

Note:

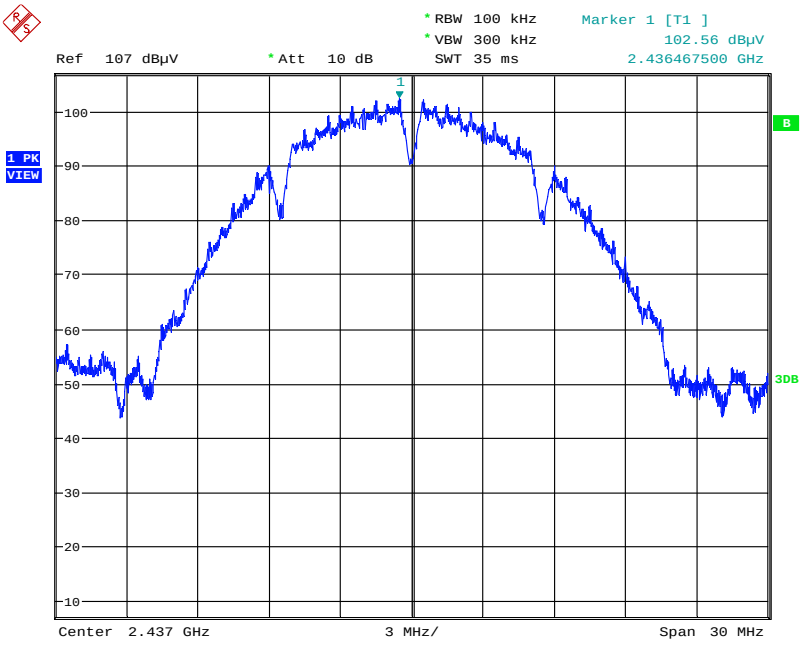
Emission level (dBuV/m) = 20 log Emission level (uV/m).

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

For Emission not in Restricted Band

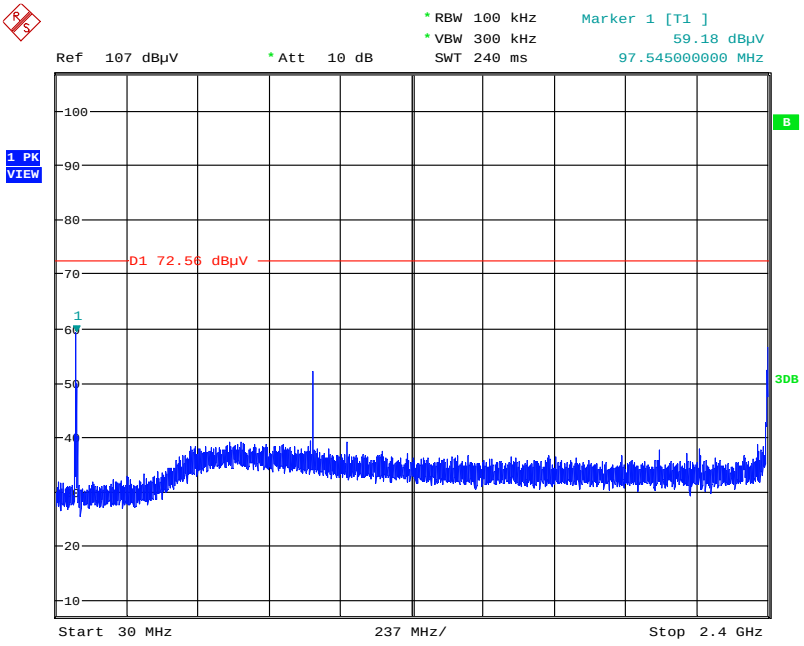
For Directional antenna / Non-Beamforming Mode:

Plot on Configuration IEEE 802.11b / Reference Level



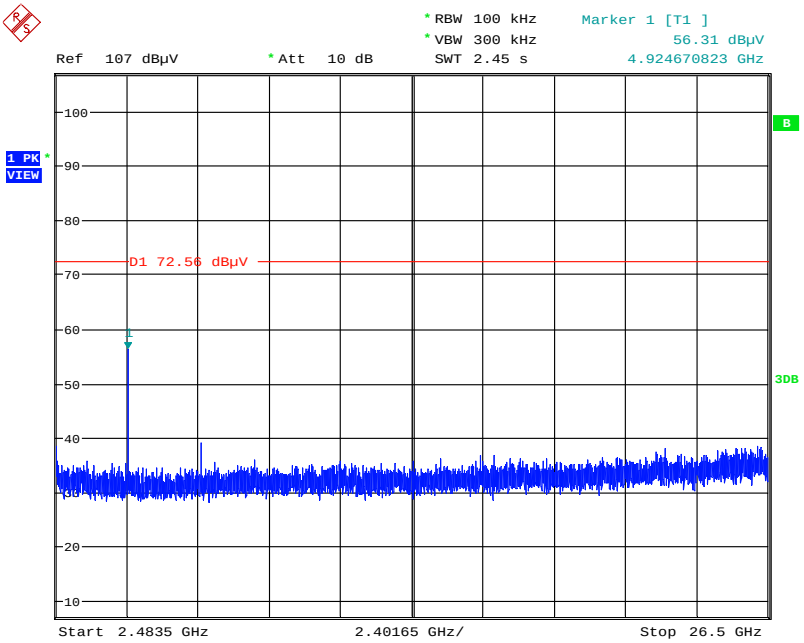
Date: 1.JUN.2016 00:43:48

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



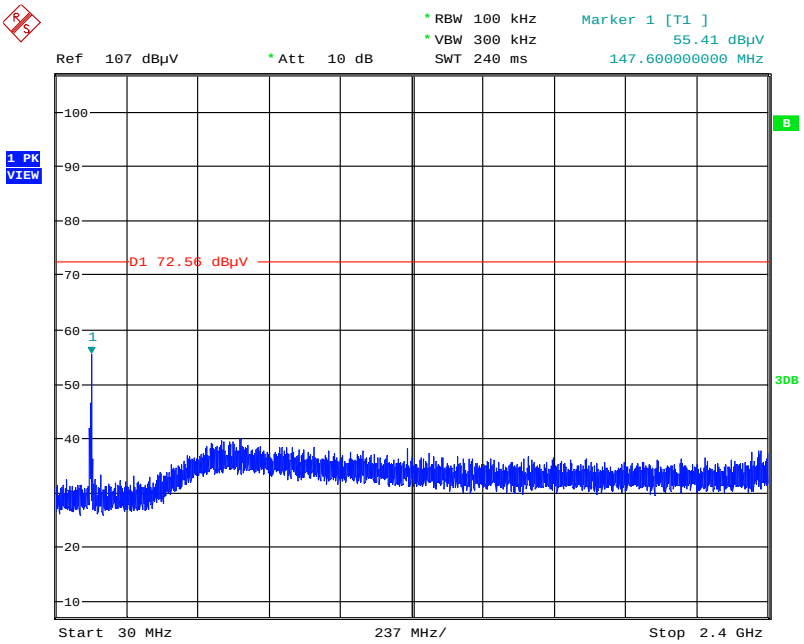
Date: 1.JUN.2016 00:45:03

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



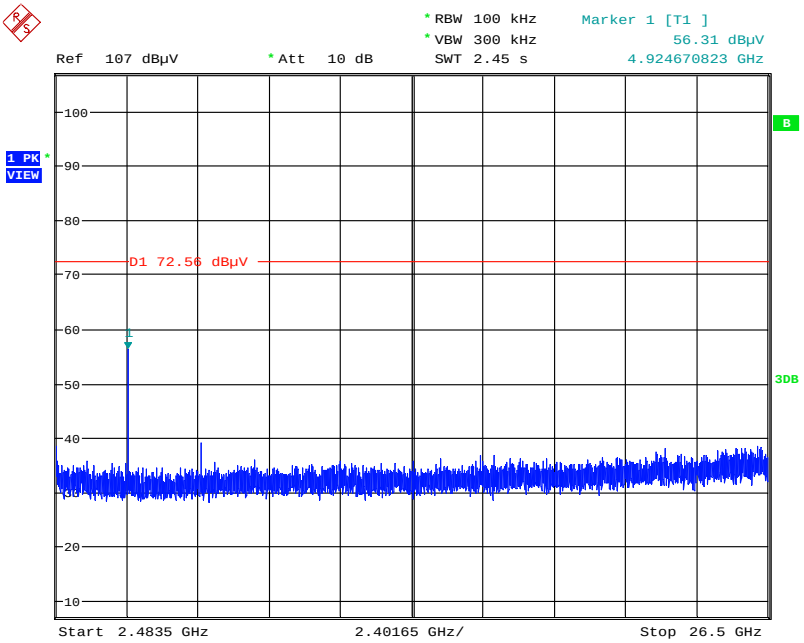
Date: 1.JUN.2016 00:52:52

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



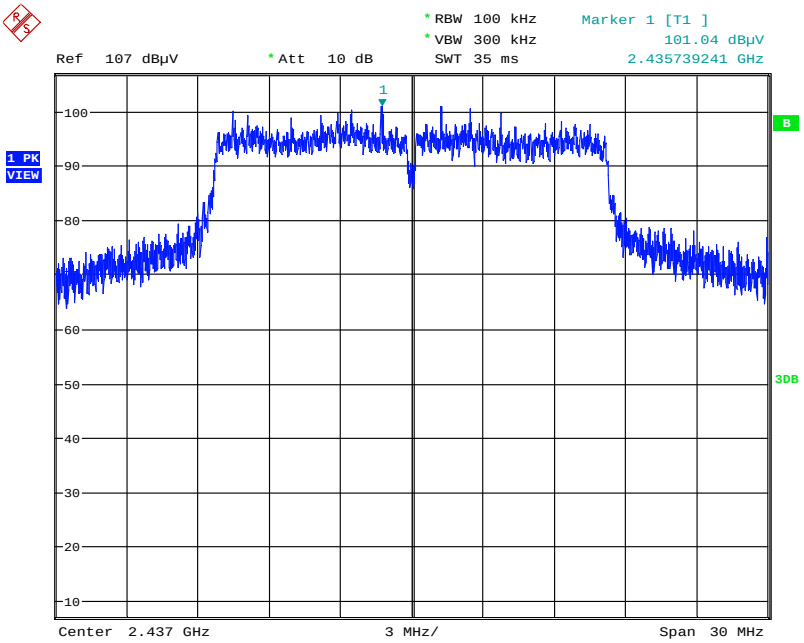
Date: 1.JUN.2016 00:54:23

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



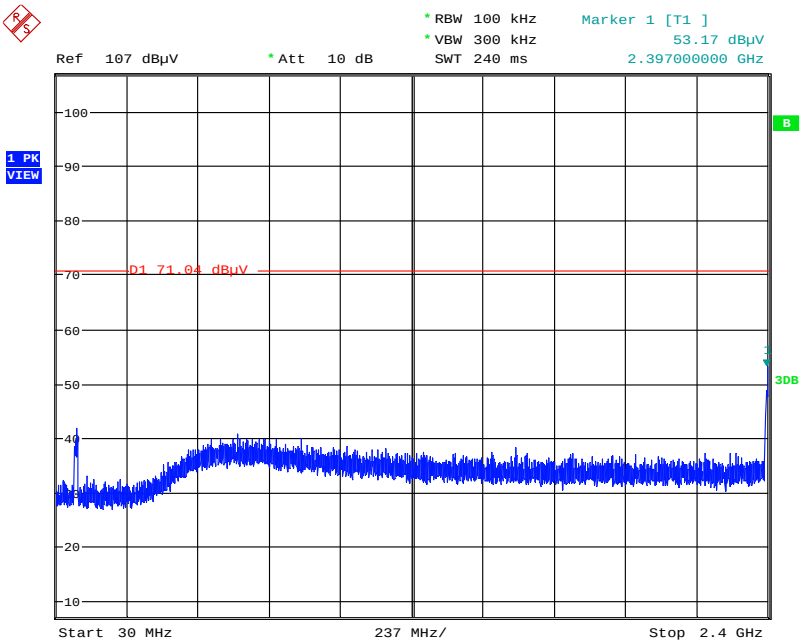
Date: 1.JUN.2016 00:52:52

Plot on Configuration IEEE 802.11g / Reference Level



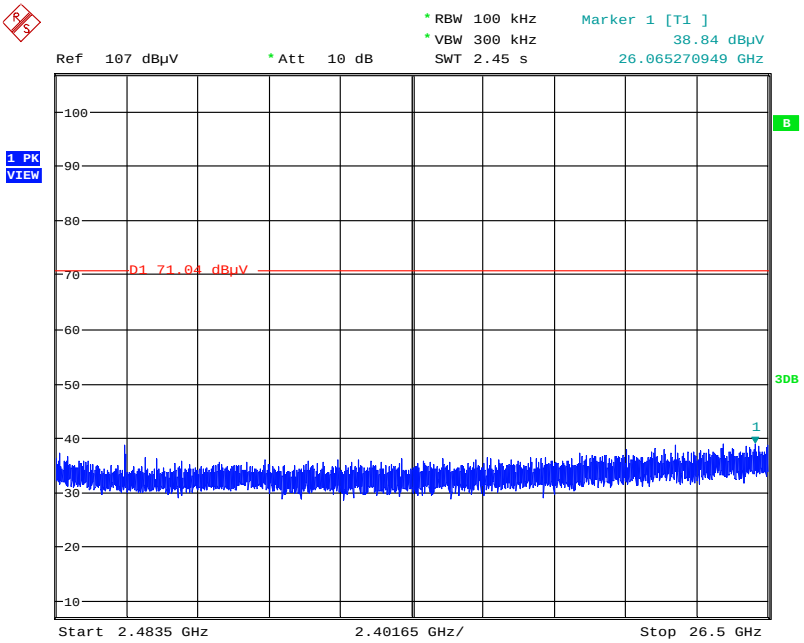
Date: 1.JUN.2016 01:01:17

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



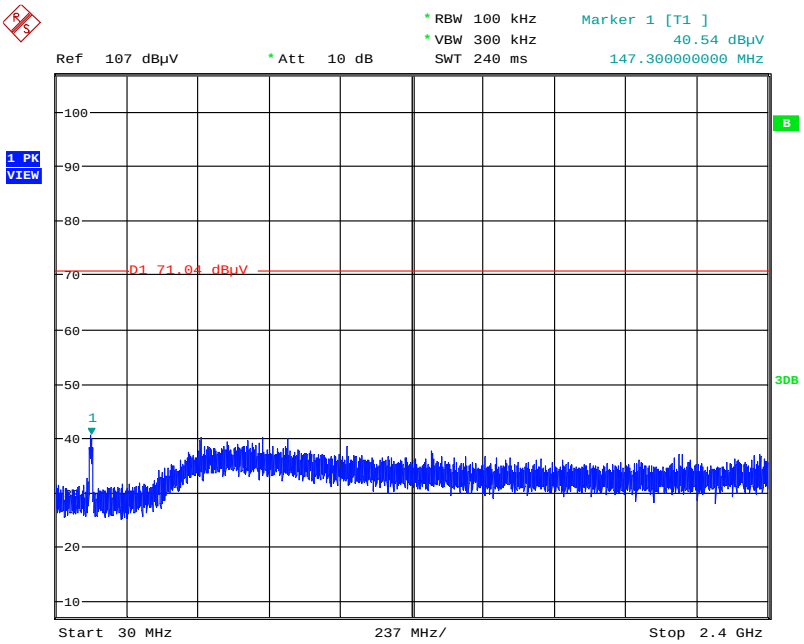
Date: 1.JUN.2016 01:50:23

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



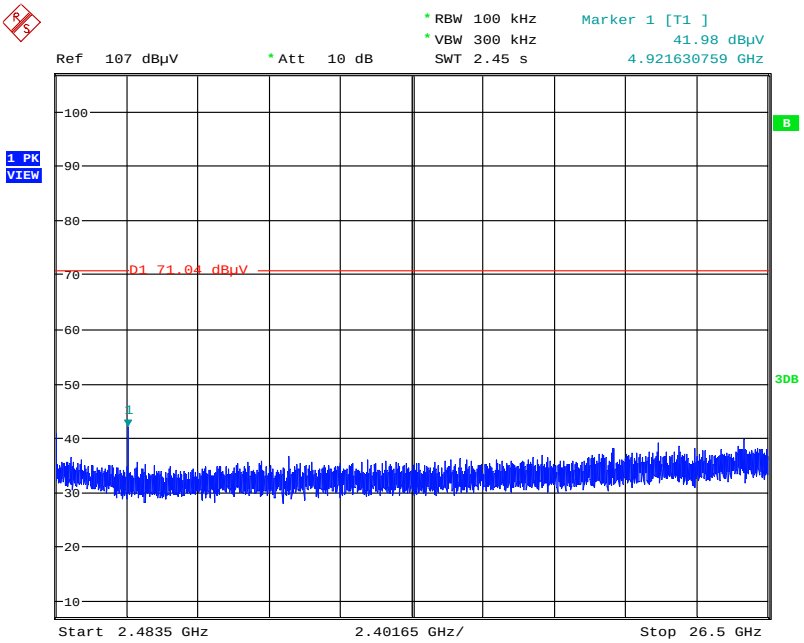
Date: 1.JUN.2016 01:51:51

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



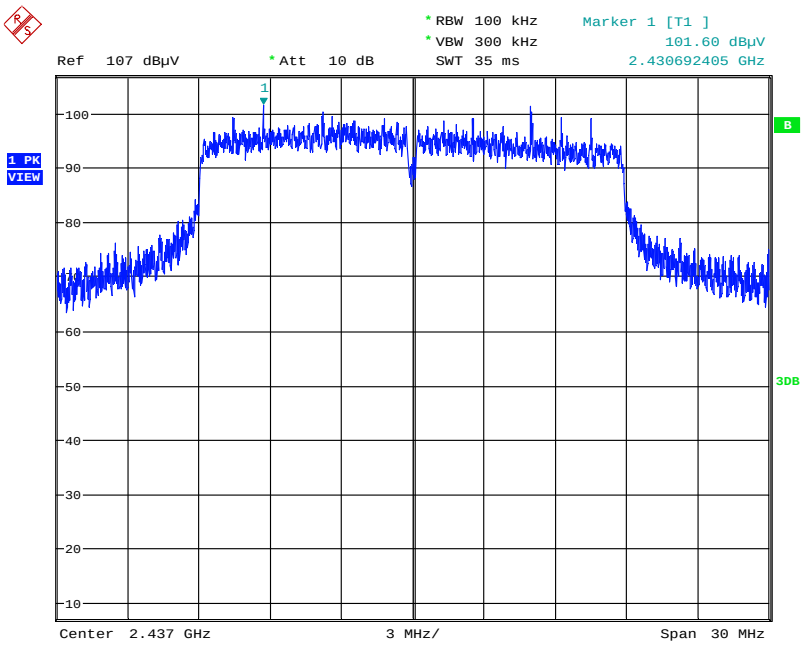
Date: 1.JUN.2016 01:53:44

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



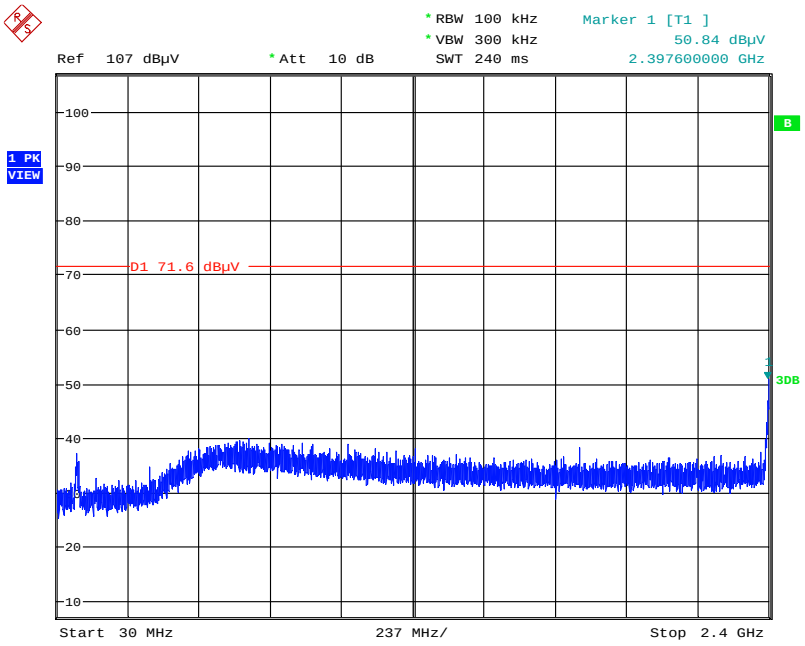
Date: 1.JUN.2016 01:53:13

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / Reference Level



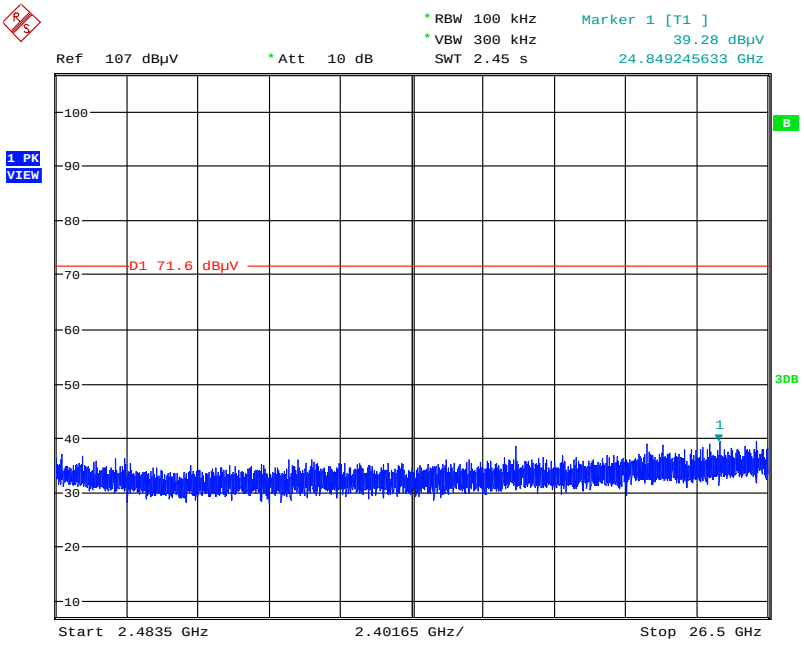
Date: 1.JUN.2016 01:55:25

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / CH 1 / 30MHz~2400MHz (down 30dBc)



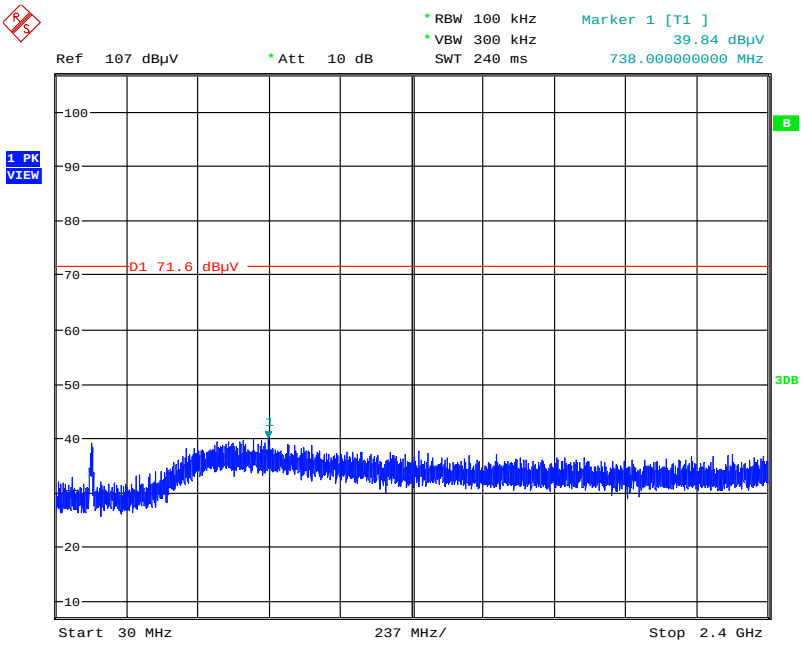
Date: 1.JUN.2016 01:56:42

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / CH 1 / 2483.5MHz~26500MHz (down 30dBc)



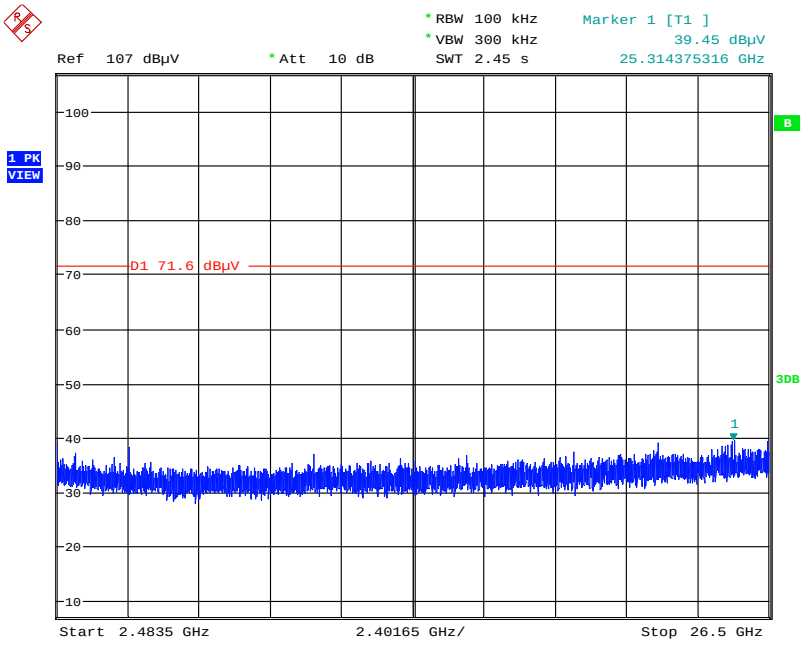
Date: 1.JUN.2016 01:57:19

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / CH 11 / 30MHz~2400MHz (down 30dBc)



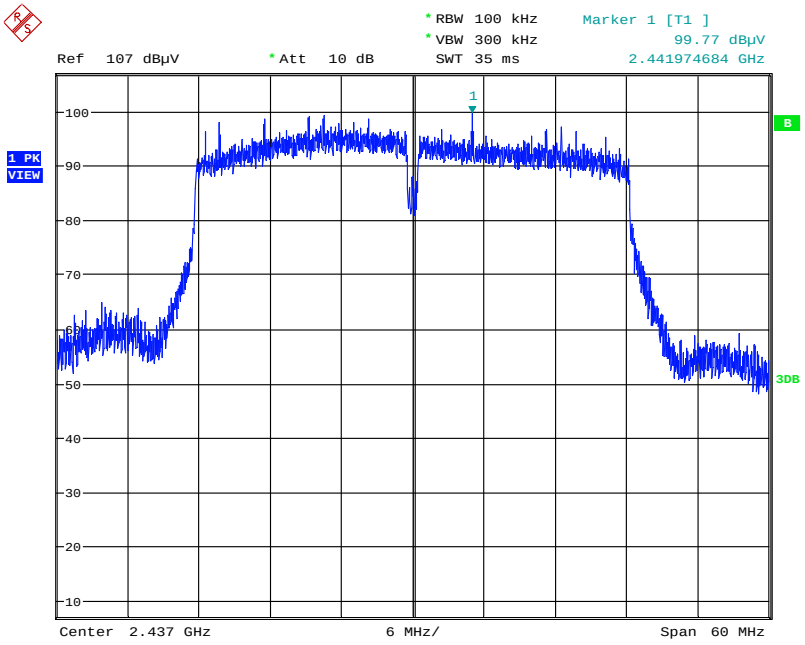
Date: 1.JUN.2016 01:59:11

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / CH 11 / 2483.5MHz~26500MHz (down 30dBc)



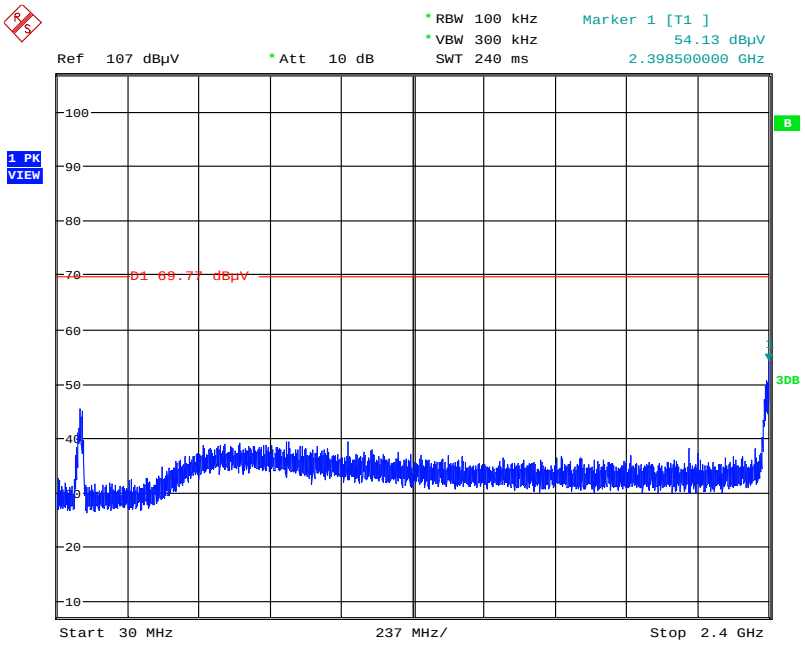
Date: 1.JUN.2016 01:58:01

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / Reference Level



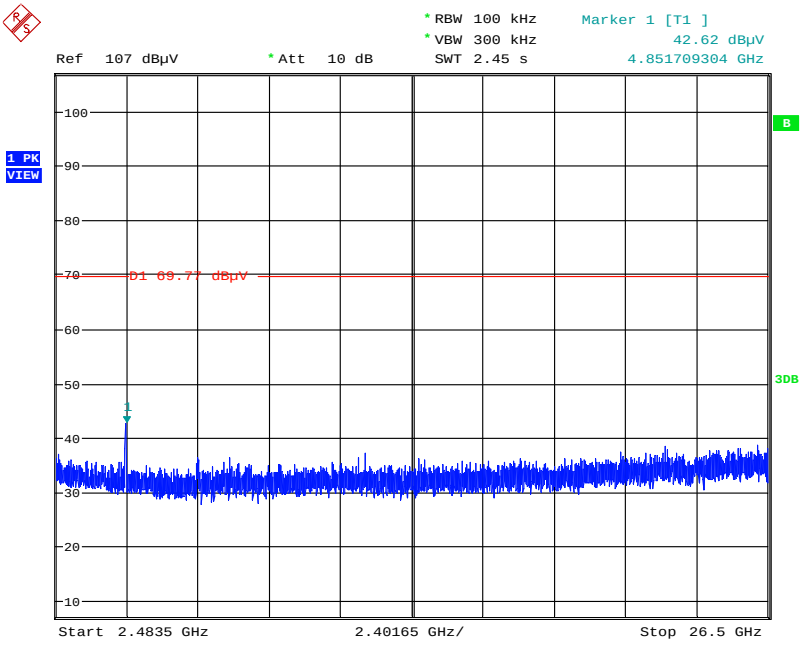
Date: 1.JUN.2016 02:01:12

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / CH 3 / 30MHz~2400MHz (down 30dBc)



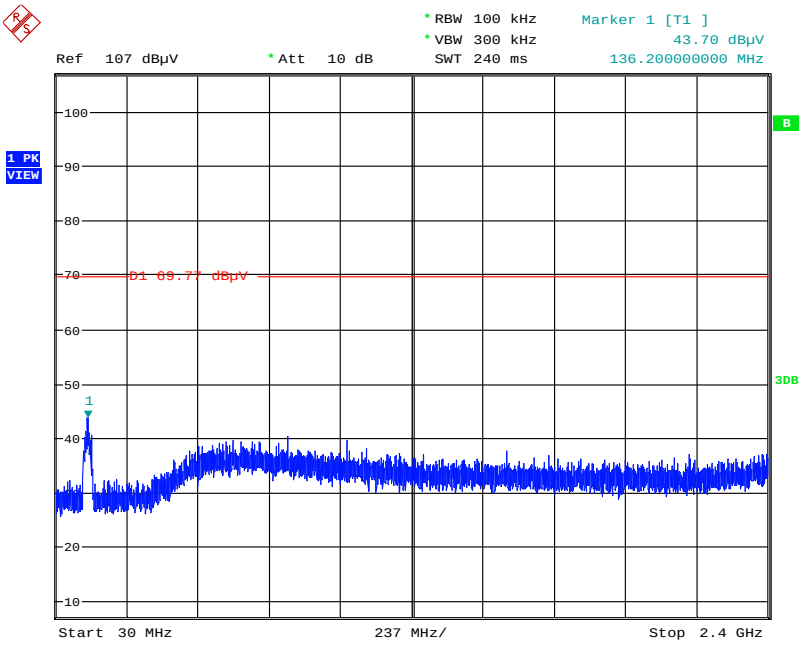
Date: 1.JUN.2016 02:02:19

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / CH 3 / 2483.5MHz~26500MHz (down 30dBc)



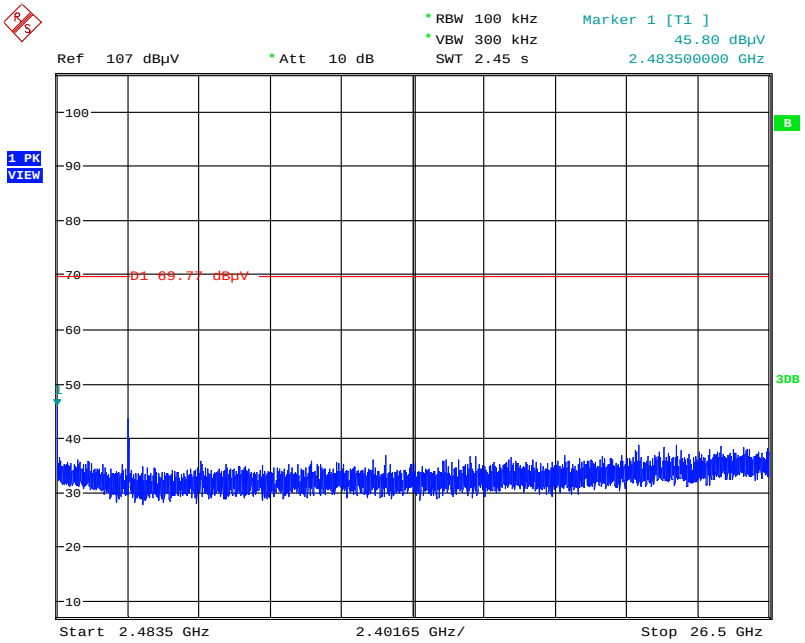
Date: 1.JUN.2016 02:02:39

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / CH 9 / 30MHz~2400MHz (down 30dBc)



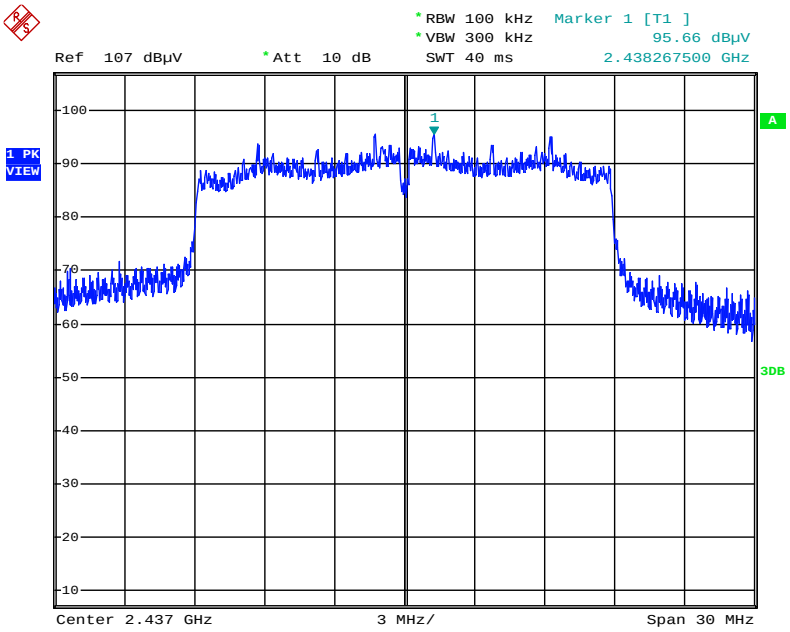
Date: 1.JUN.2016 02:03:17

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / CH 9 / 2483.5MHz~26500MHz (down 30dBc)



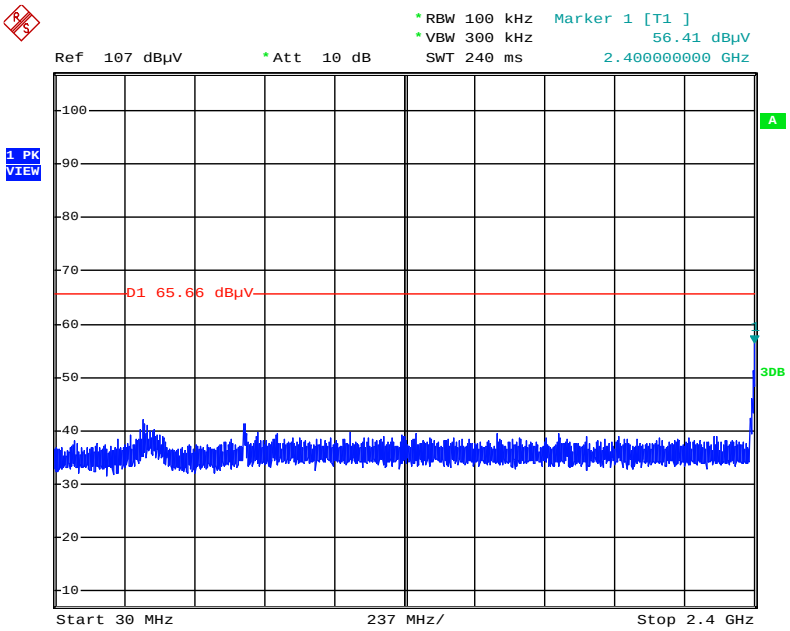
For Directional antenna / Beamforming Mode:

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / Reference Level



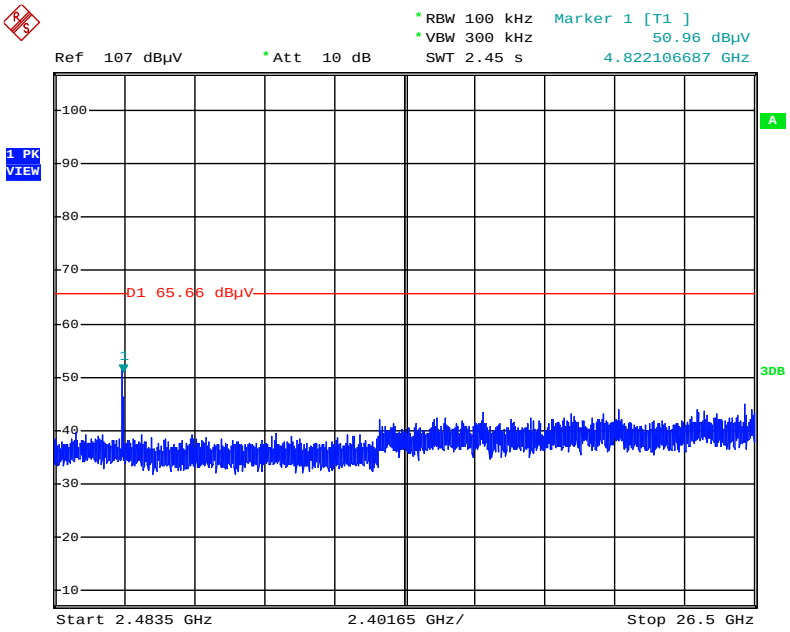
Date: 14.JUN.2016 02:34:54

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / CH 1 / 30MHz~2400MHz (down 30dBc)



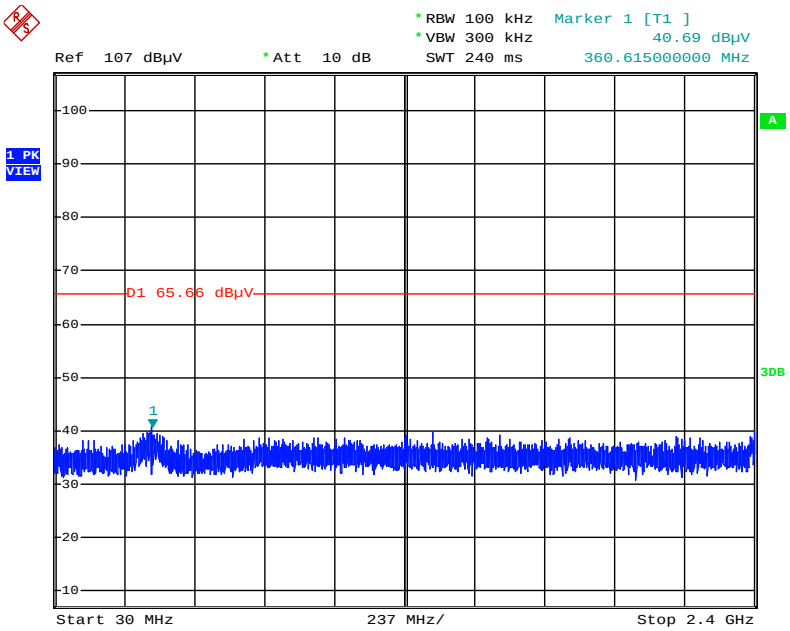
Date: 14.JUN.2016 02:35:51

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / CH 1 / 2483.5MHz~26500MHz (down 30dBc)



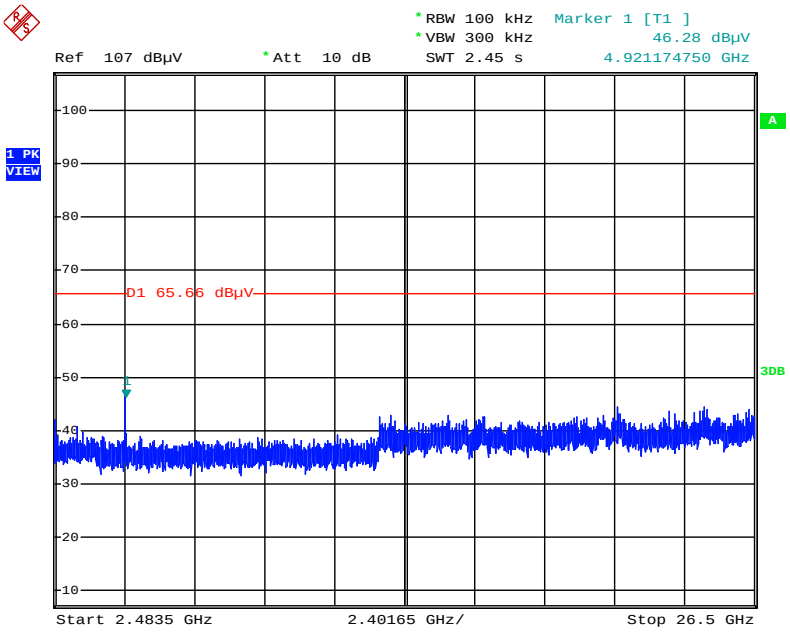
Date: 14.JUN.2016 02:37:02

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / CH 11 / 30MHz~2400MHz (down 30dBc)



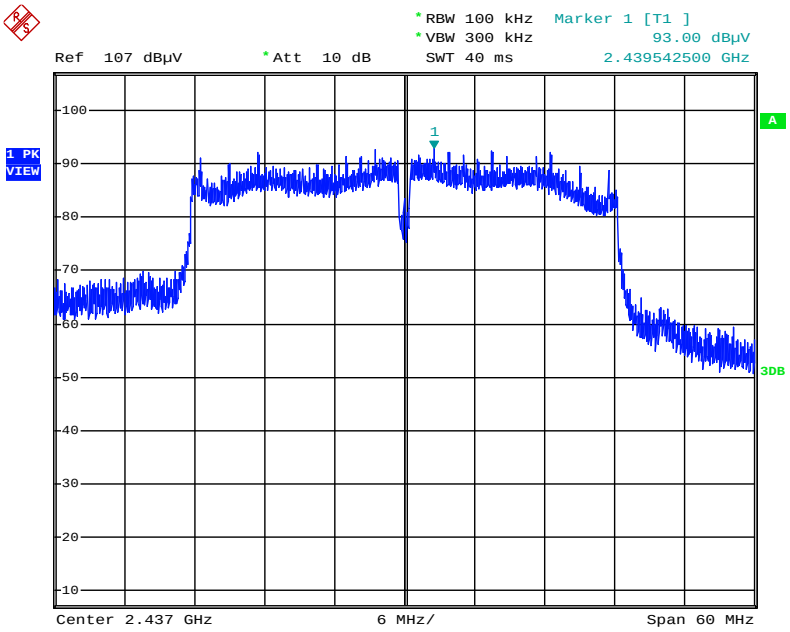
Date: 14.JUN.2016 02:38:27

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / CH 11 / 2483.5MHz~26500MHz (down 30dBc)



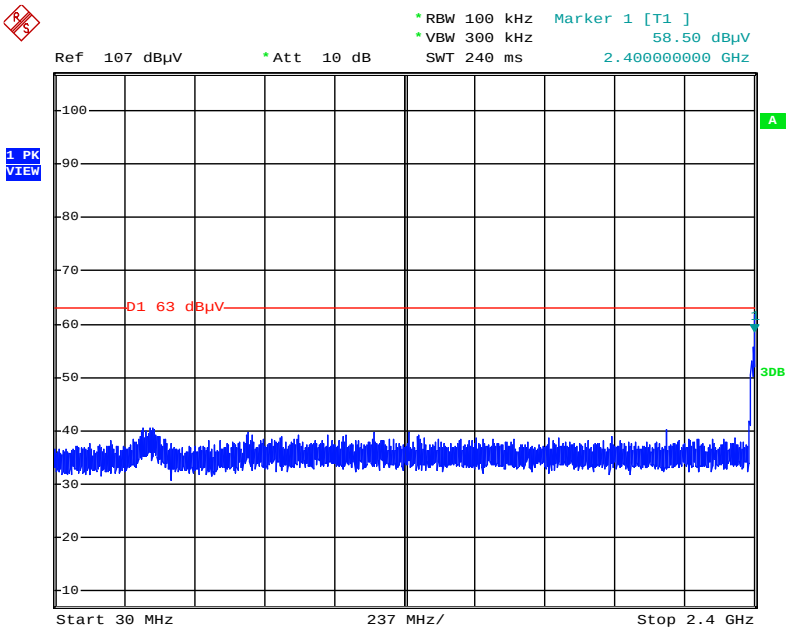
Date: 14.JUN.2016 02:37:56

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / Reference Level



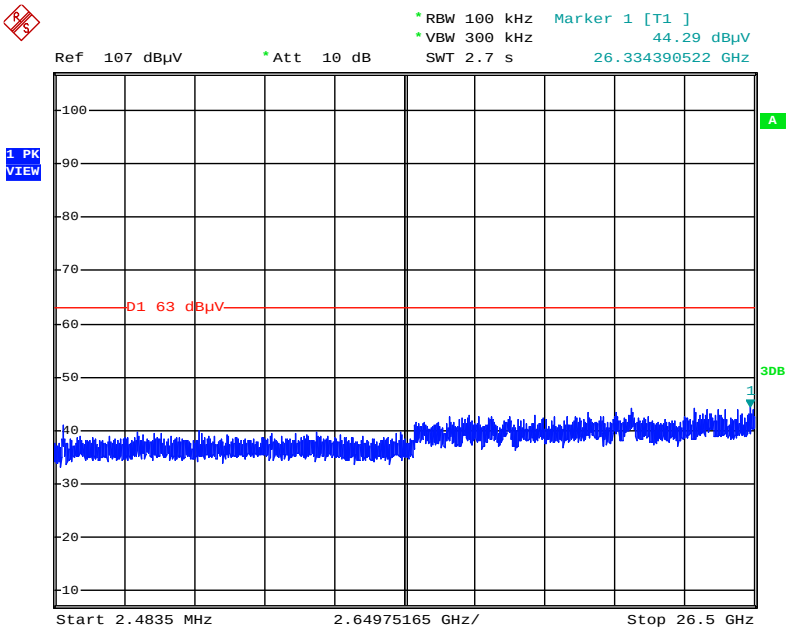
Date: 14.JUN.2016 01:55:21

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / CH 3 / 30MHz~2400MHz (down 30dBc)



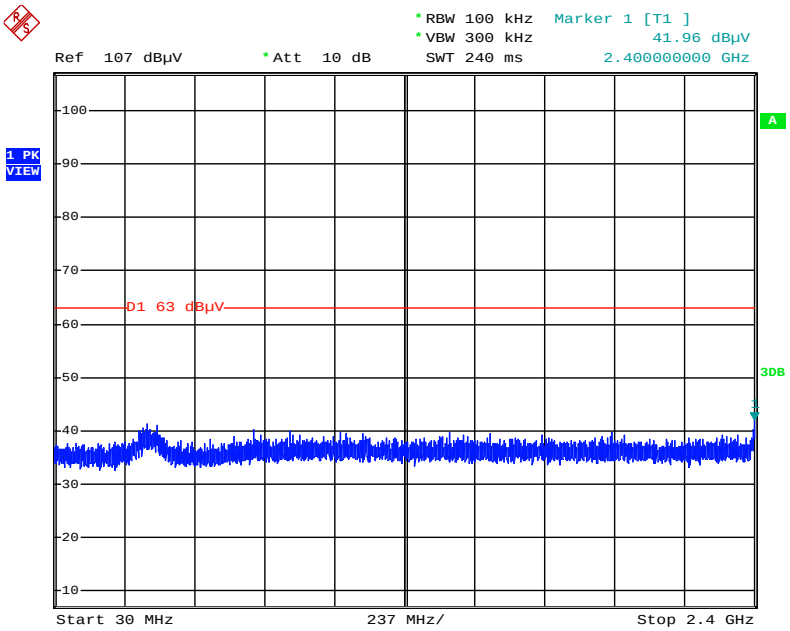
Date: 14.JUN.2016 02:22:32

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / CH 3 / 2483.5MHz~26500MHz (down 30dBc)



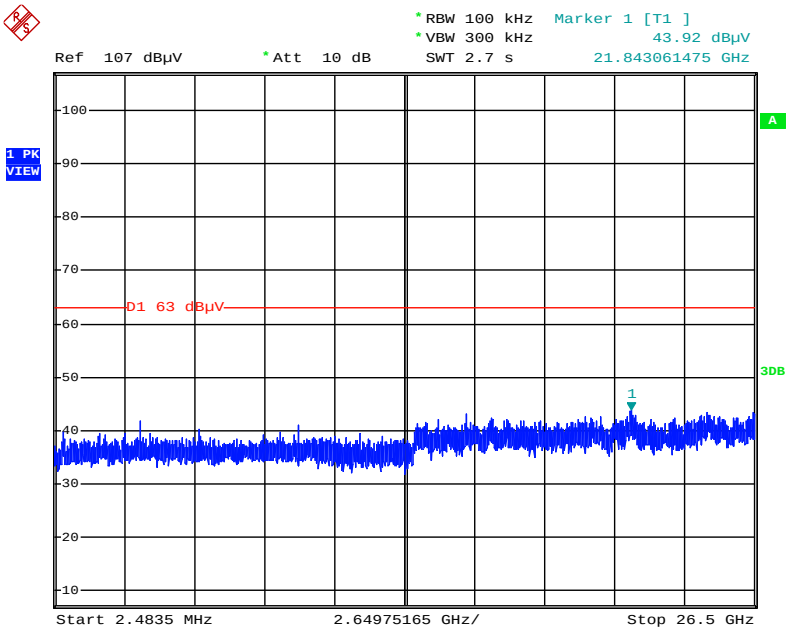
Date: 14.JUN.2016 02:28:32

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / CH 9 / 30MHz~2400MHz (down 30dBc)



Date: 14.JUN.2016 02:31:58

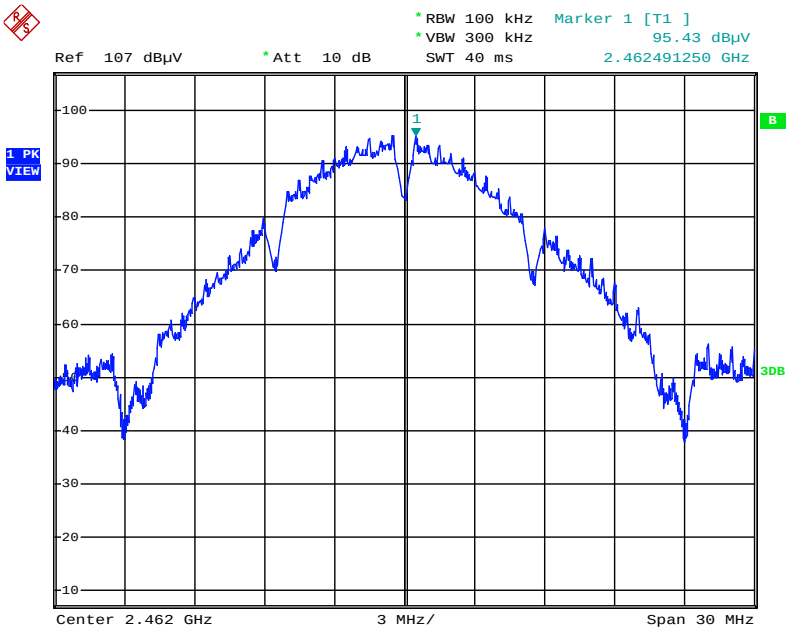
Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / CH 9 / 2483.5MHz~26500MHz (down 30dBc)



Date: 14.JUN.2016 02:30:52

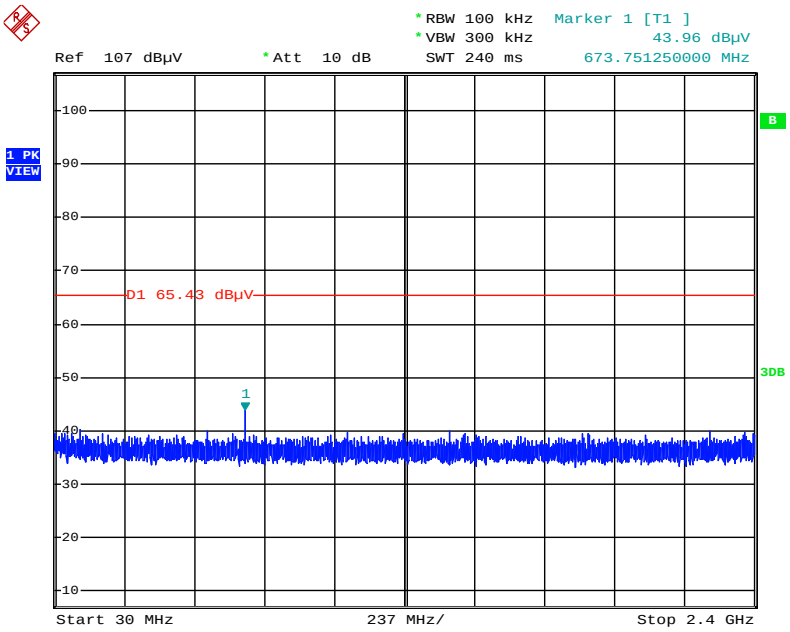
For Omni antenna / Non-Beamforming Mode:

Plot on Configuration IEEE 802.11b / Reference Level



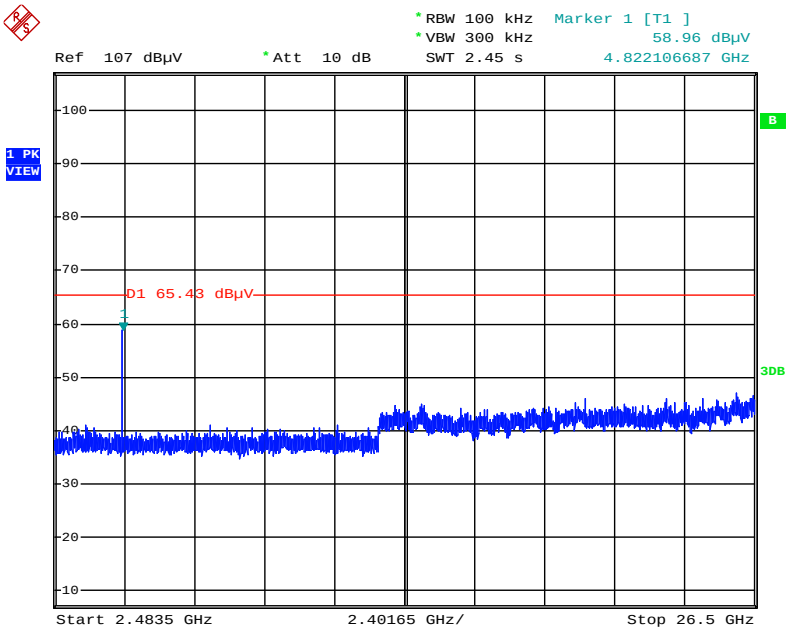
Date: 14.JUN.2016 18:49:03

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



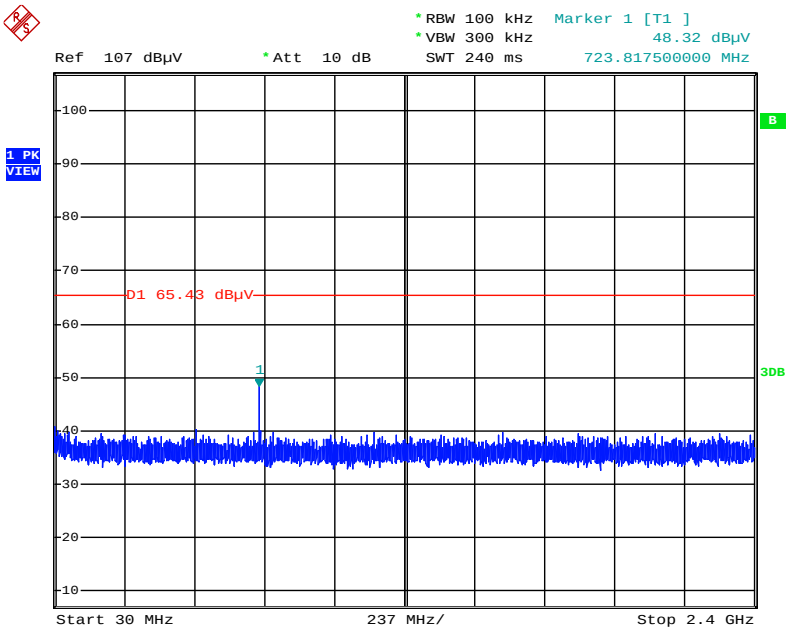
Date: 14.JUN.2016 18:52:46

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



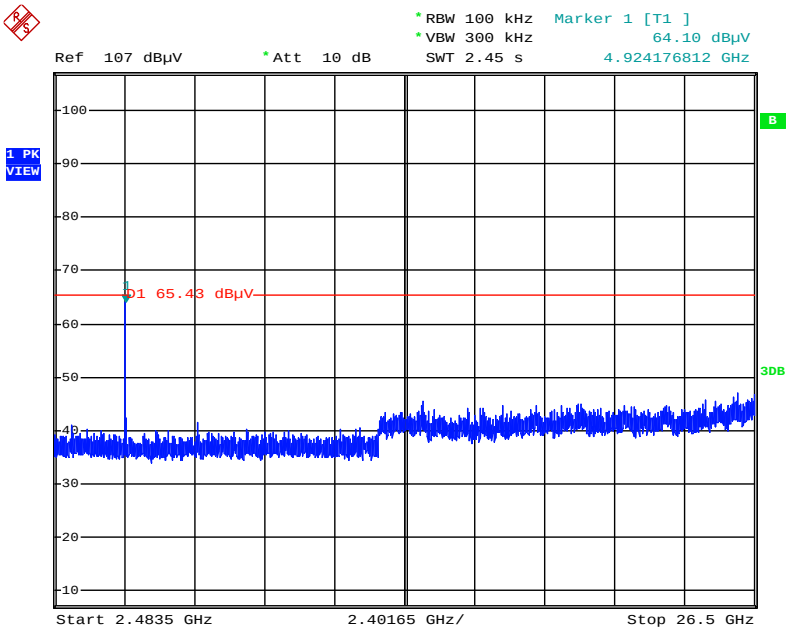
Date: 14.JUN.2016 18:53:49

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



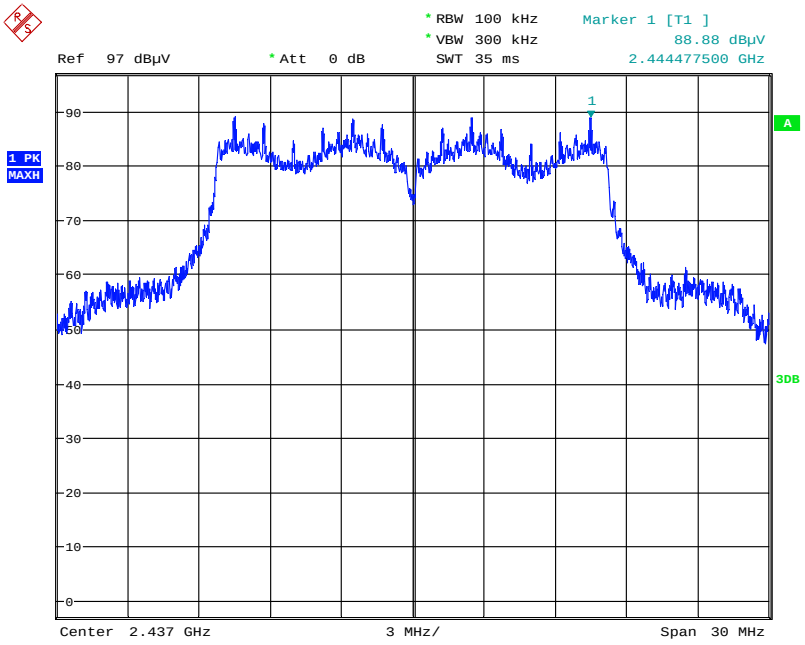
Date: 14.JUN.2016 18:57:01

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



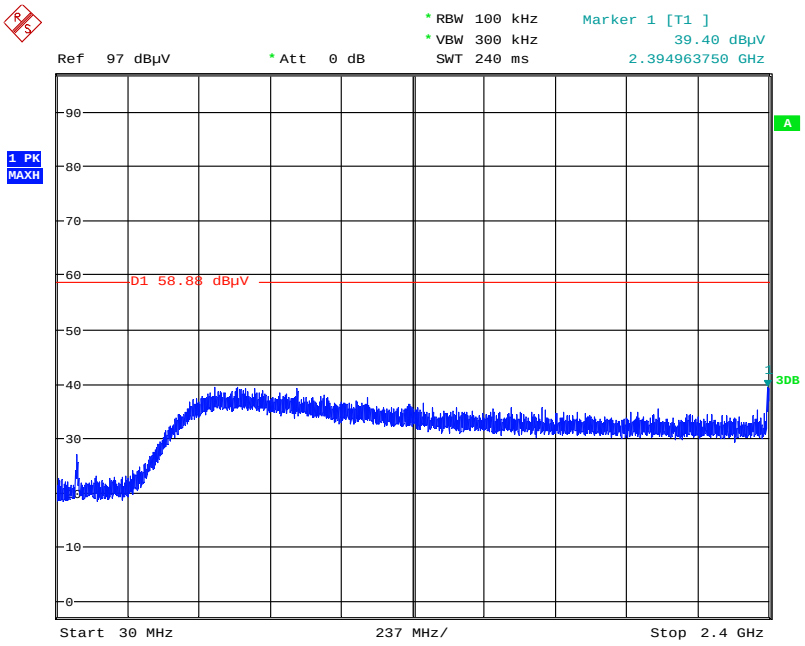
Date: 14.JUN.2016 18:51:38

Plot on Configuration IEEE 802.11g / Reference Level



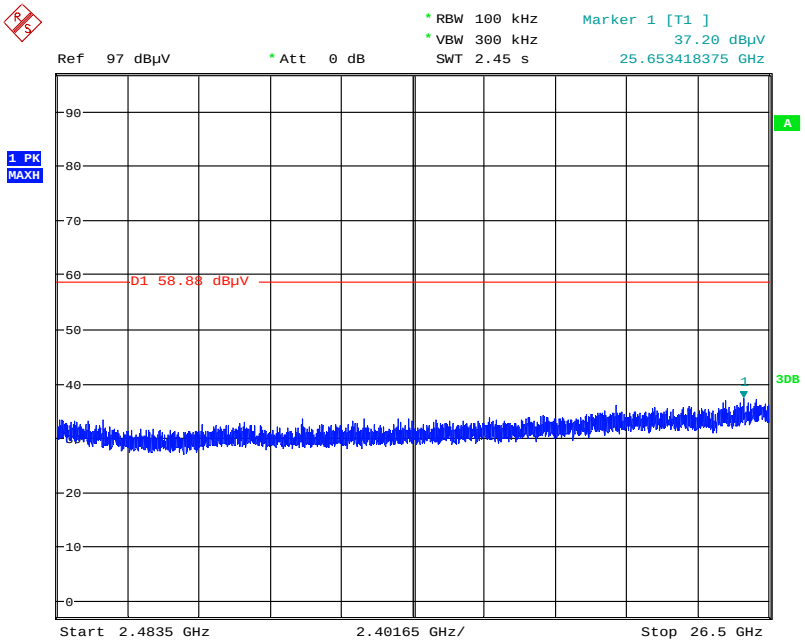
Date: 4.JUN.2016 20:24:11

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



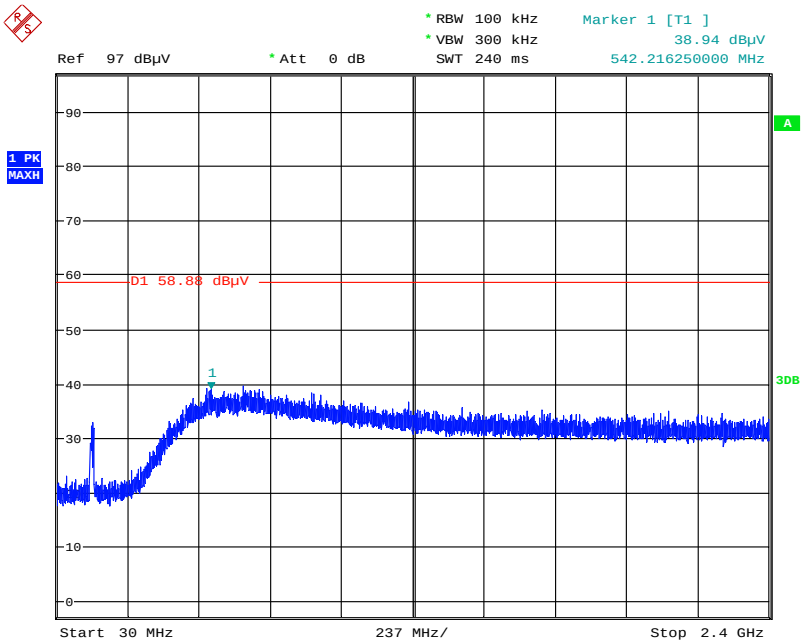
Date: 4.JUN.2016 20:26:07

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



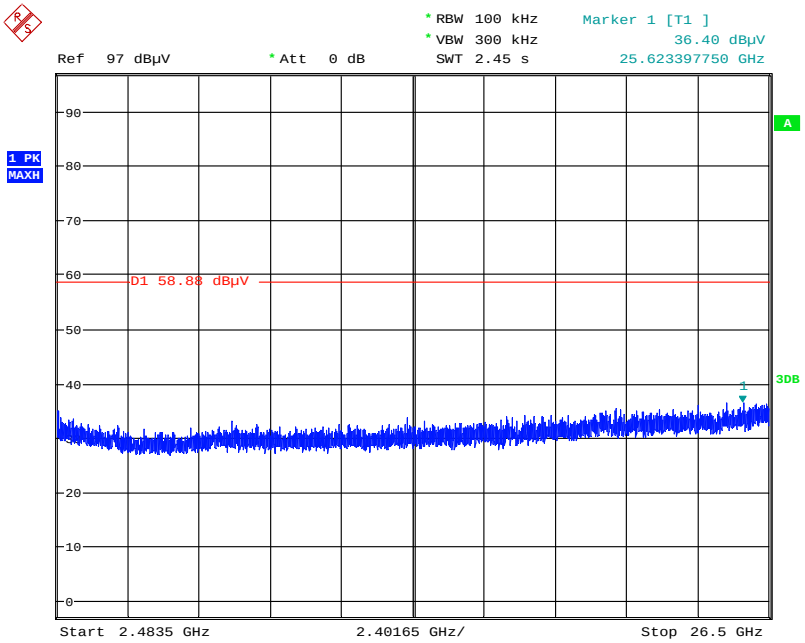
Date: 4.JUN.2016 20:26:54

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



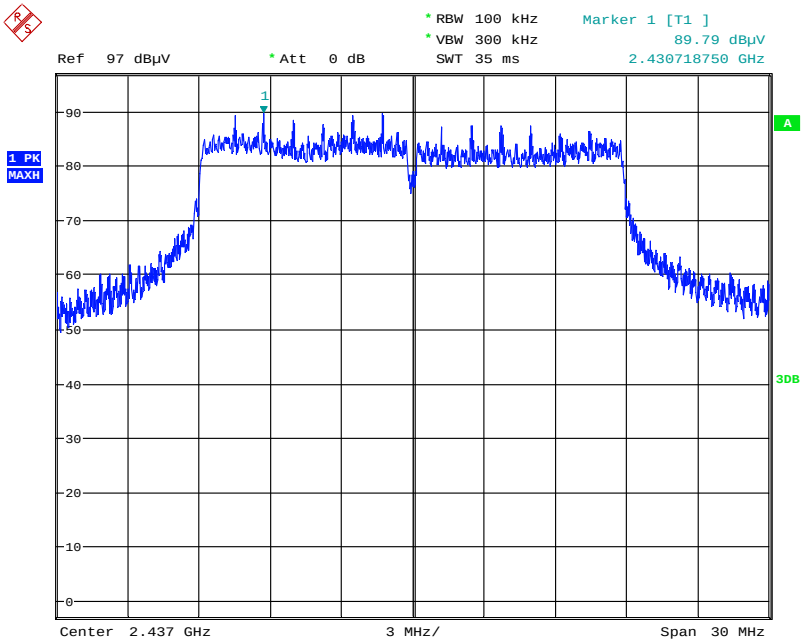
Date: 4.JUN.2016 20:28:22

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



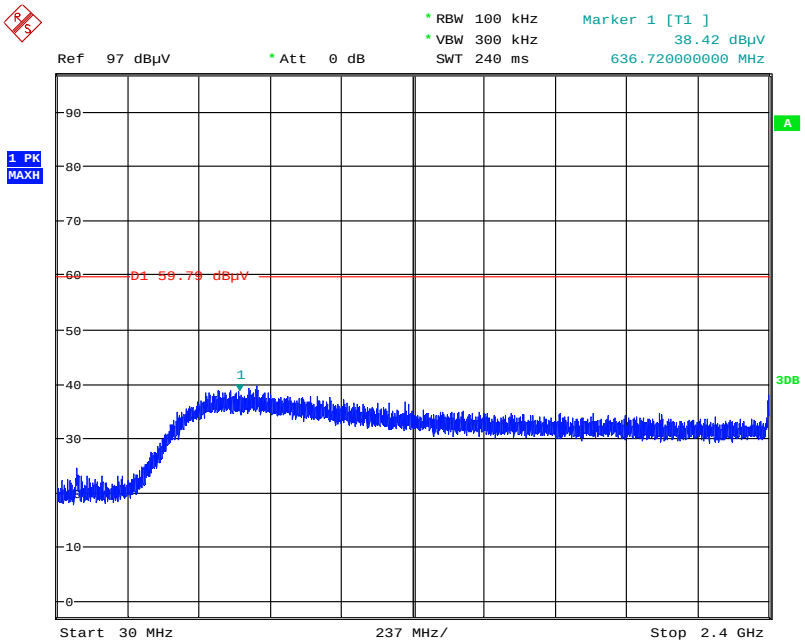
Date: 4.JUN.2016 20:28:51

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / Reference Level



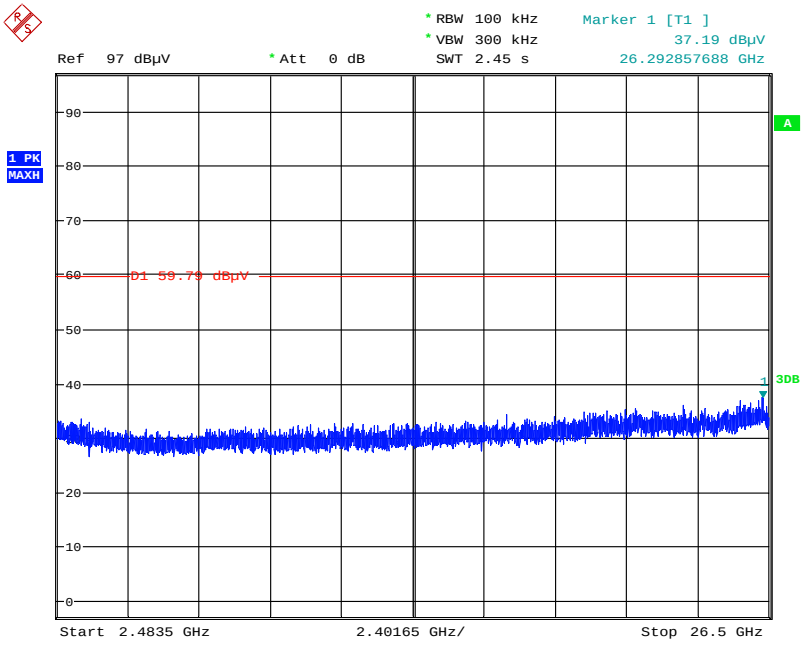
Date: 4.JUN.2016 20:31:05

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / CH 1 / 30MHz~2400MHz (down 30dBc)



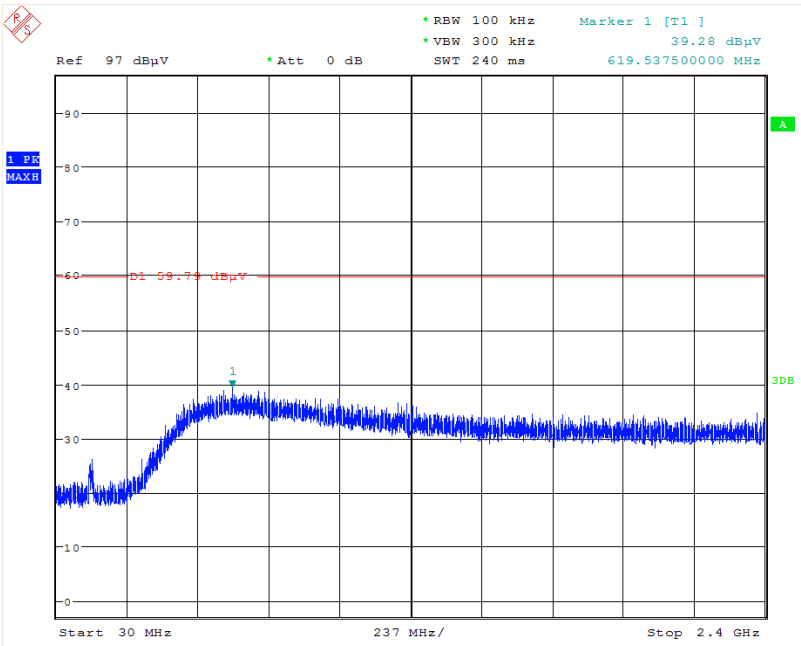
Date: 4.JUN.2016 20:32:39

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / CH 1 / 2483.5MHz~26500MHz (down 30dBc)



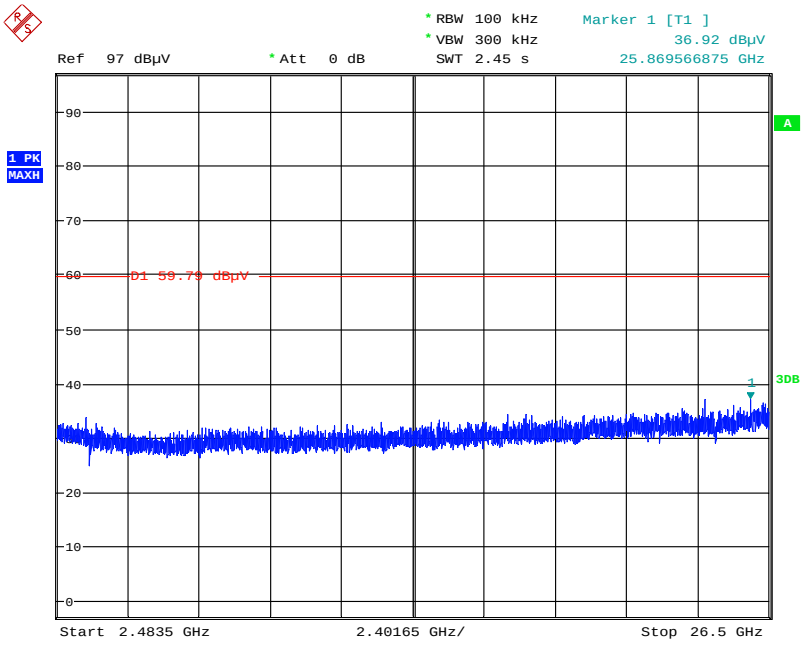
Date: 4.JUN.2016 20:33:24

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / CH 11 / 30MHz~2400MHz (down 30dBc)



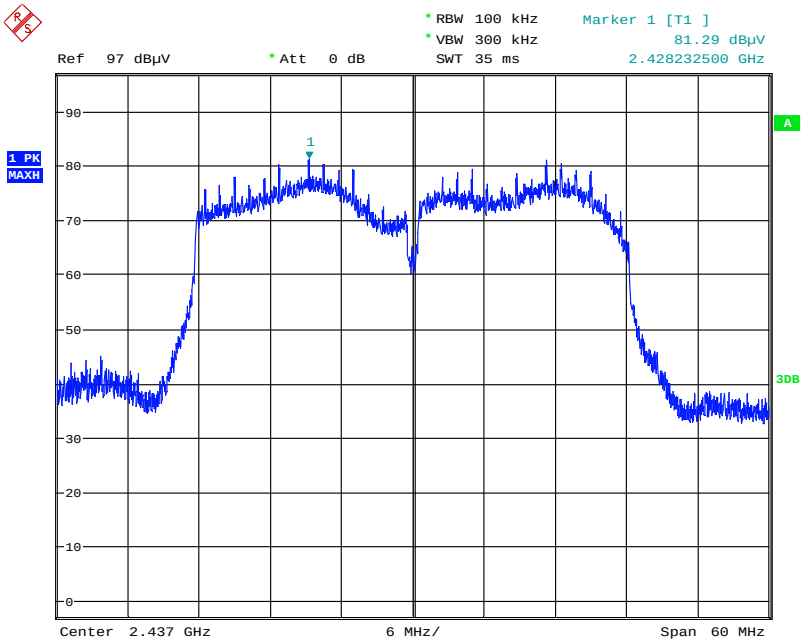
Date: 4.JUN.2016 20:34:19

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / CH 11 / 2483.5MHz~26500MHz (down 30dBc)



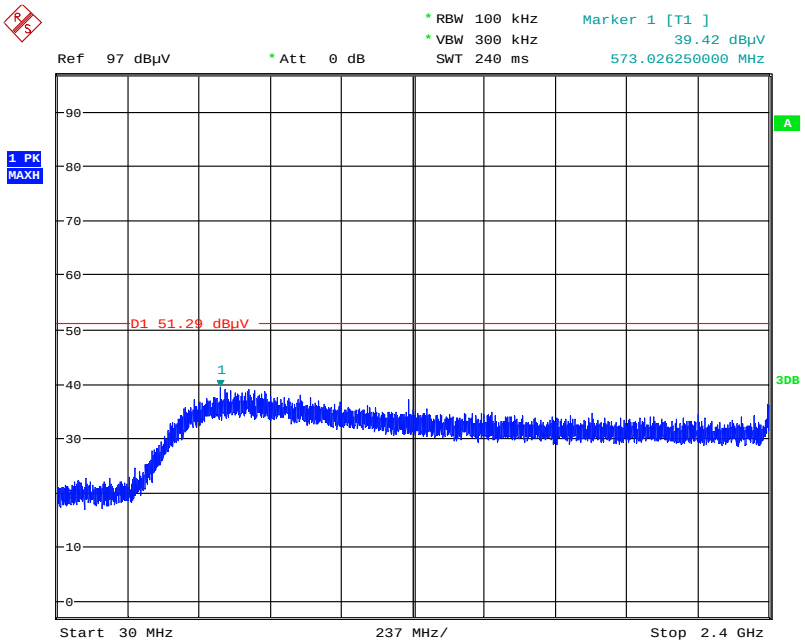
Date: 4.JUN.2016 20:34:53

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / Reference Level



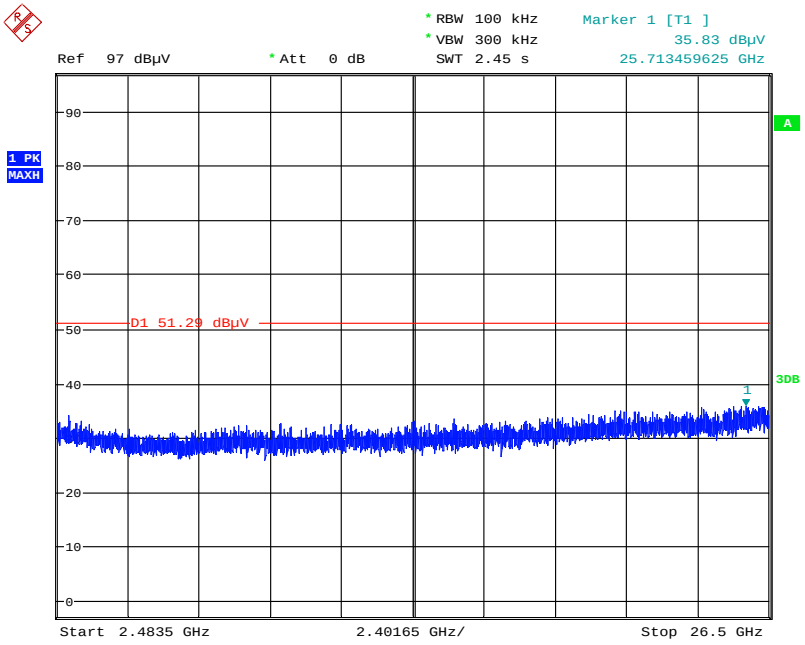
Date: 4.JUN.2016 20:37:11

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / CH 3 / 30MHz~2400MHz (down 30dBc)



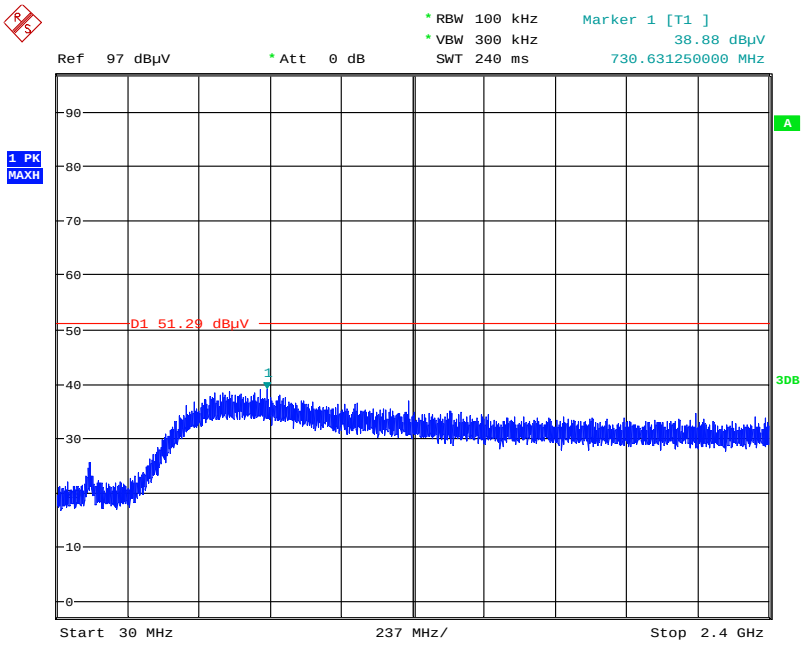
Date: 4.JUN.2016 20:39:34

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / CH 3 / 2483.5MHz~26500MHz (down 30dBc)



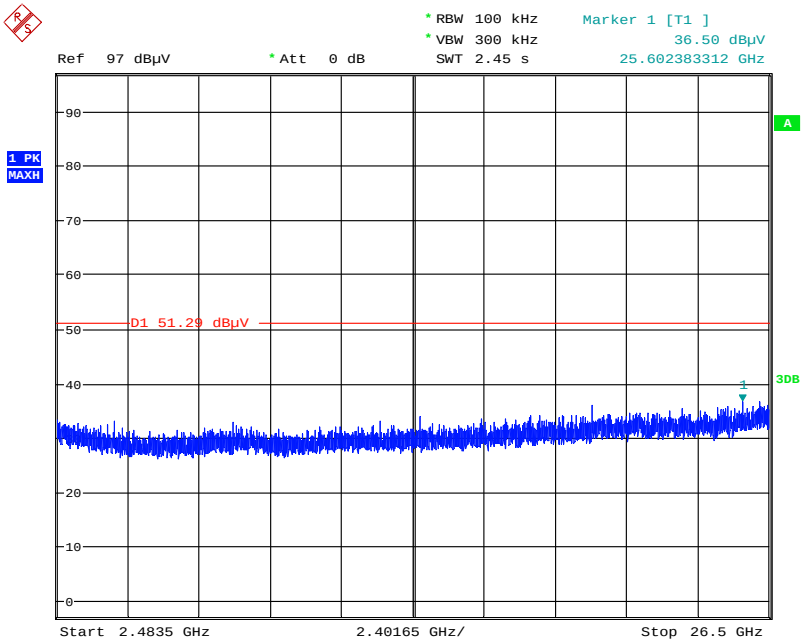
Date: 4.JUN.2016 20:40:06

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / CH 9 / 30MHz~2400MHz (down 30dBc)



Date: 4.JUN.2016 20:40:44

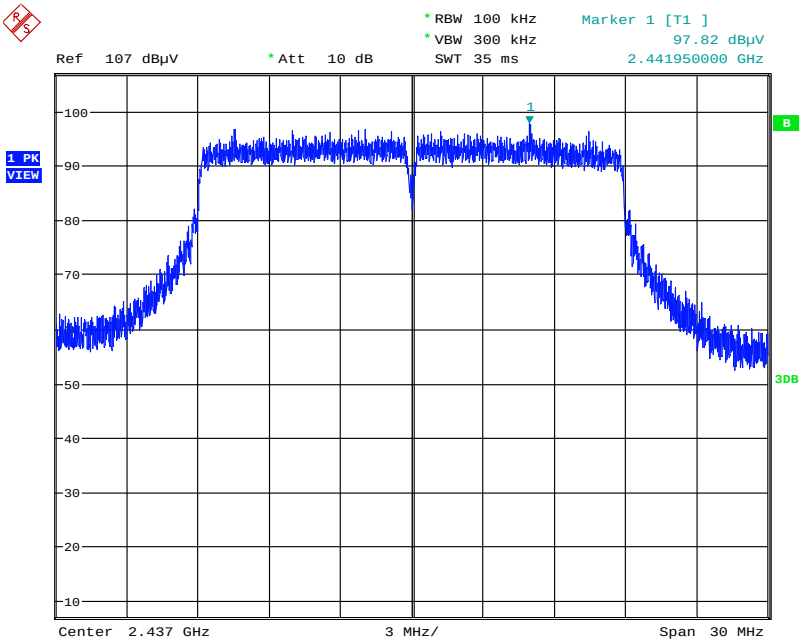
Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / CH 9 / 2483.5MHz~26500MHz (down 30dBc)



Date: 4.JUN.2016 20:41:11

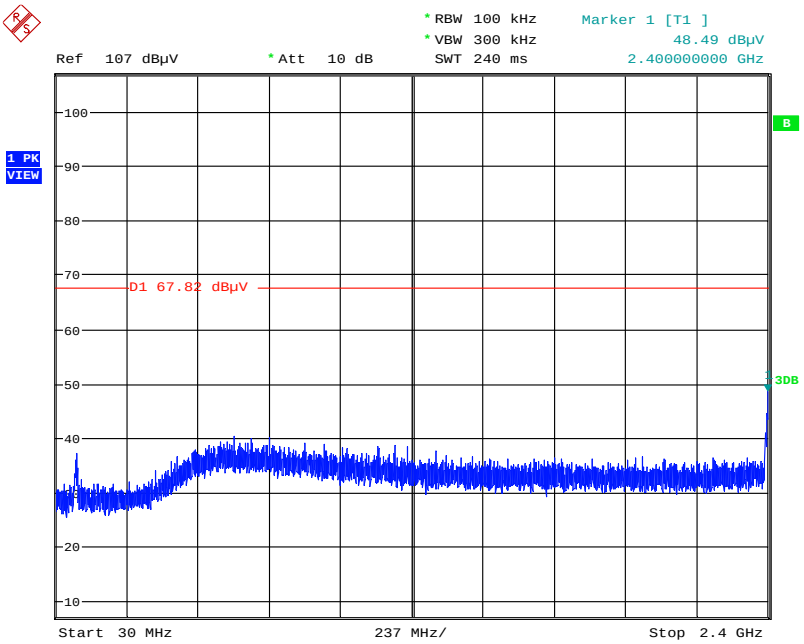
For Omni antenna / Beamforming Mode:

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / Reference Level



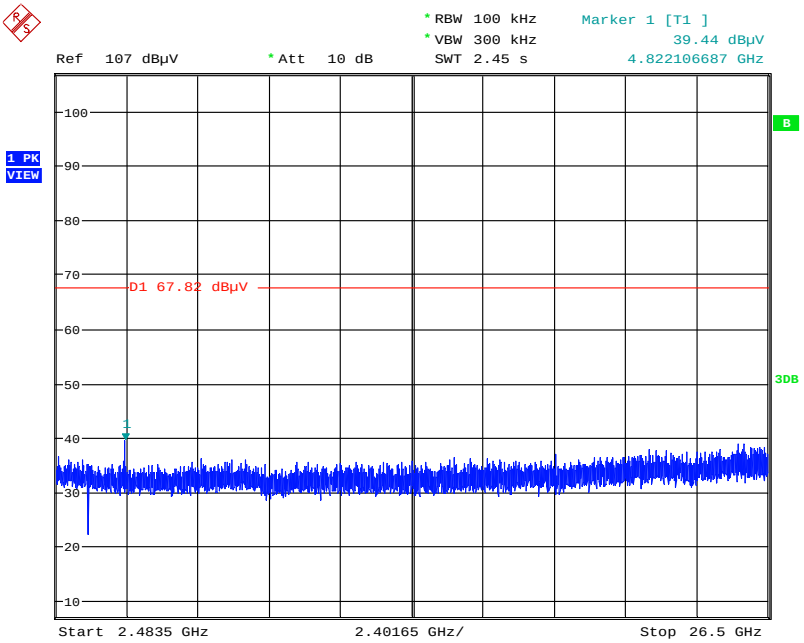
Date: 7.JUN.2016 00:09:13

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / CH 1 / 30MHz~2400MHz (down 30dBc)



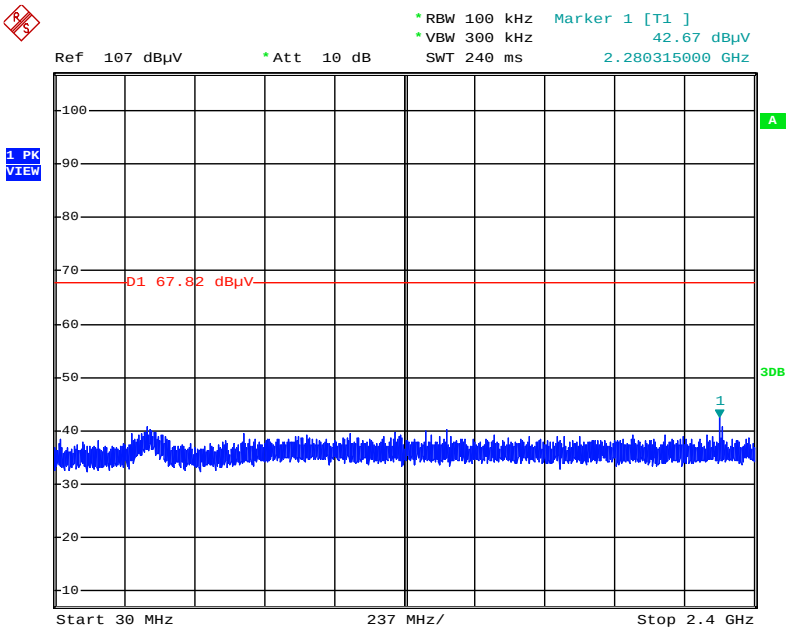
Date: 7.JUN.2016 00:11:49

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / CH 1 / 2483.5MHz~26500MHz (down 30dBc)



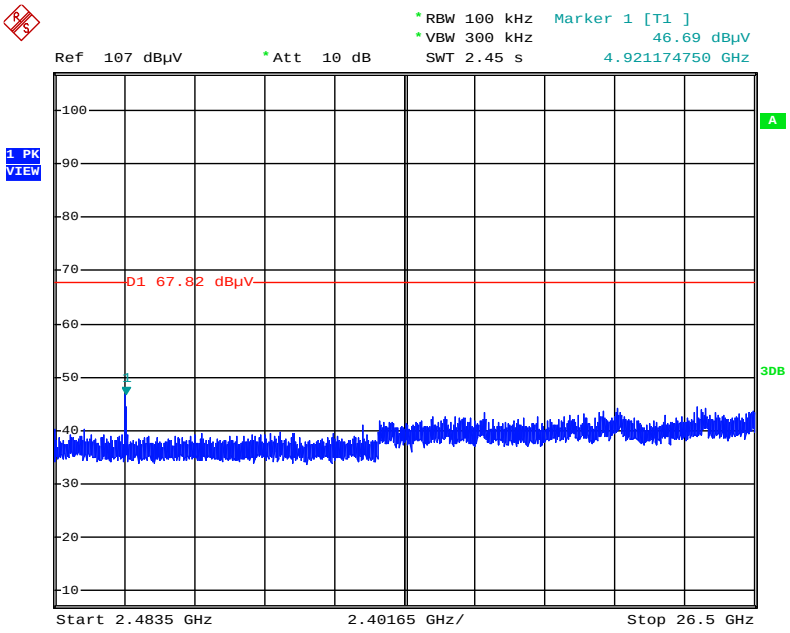
Date: 7.JUN.2016 00:12:51

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / CH 11 / 30MHz~2400MHz (down 30dBc)



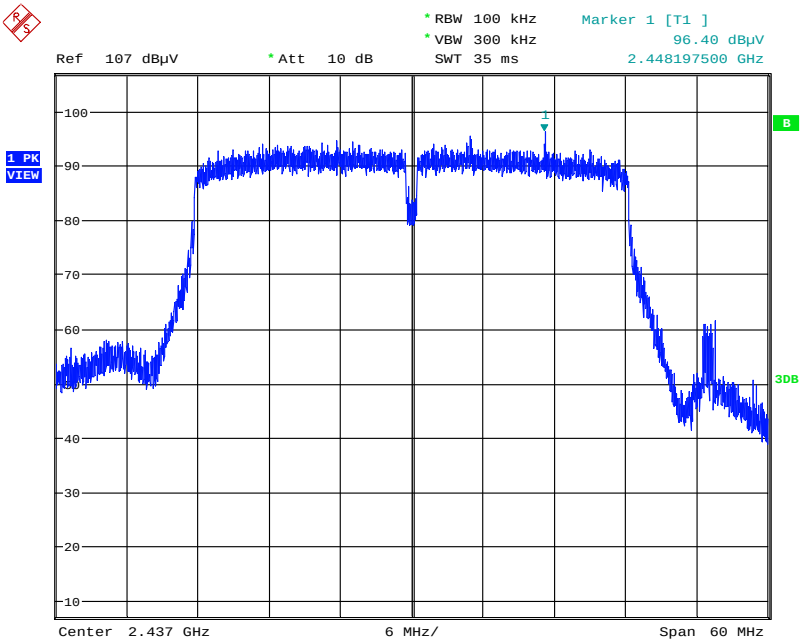
Date: 13.JUN.2016 10:44:34

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT20 / CH 11 / 2483.5MHz~26500MHz (down 30dBc)



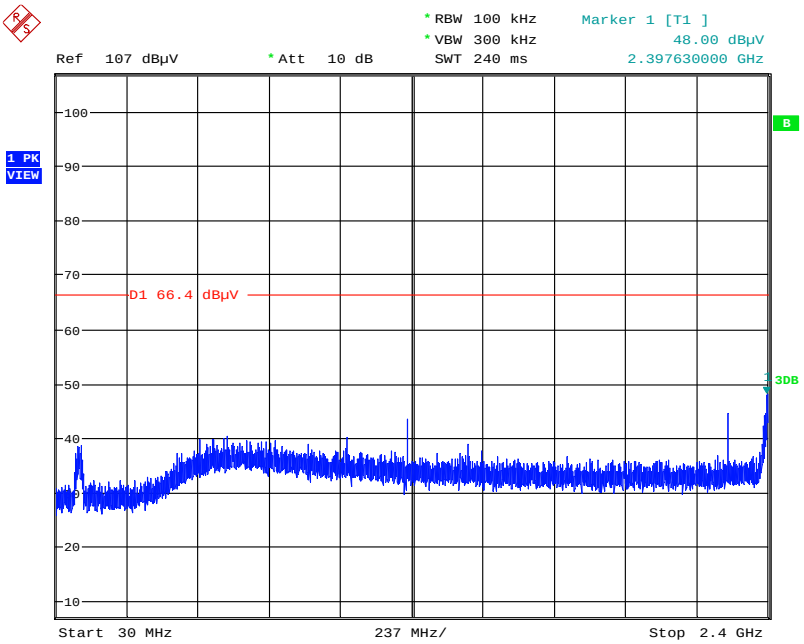
Date: 13.JUN.2016 10:43:44

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / Reference Level



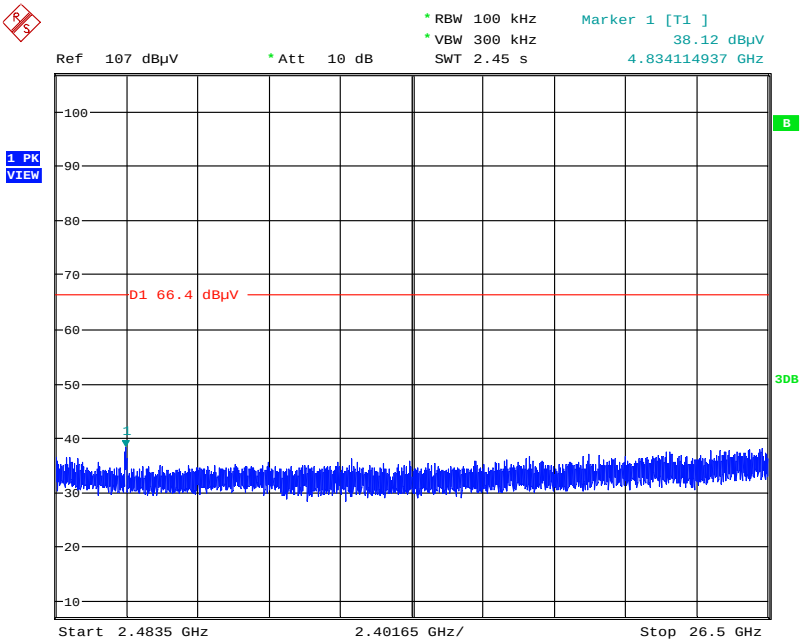
Date: 7.JUN.2016 00:16:35

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / CH 3 / 30MHz~2400MHz (down 30dBc)



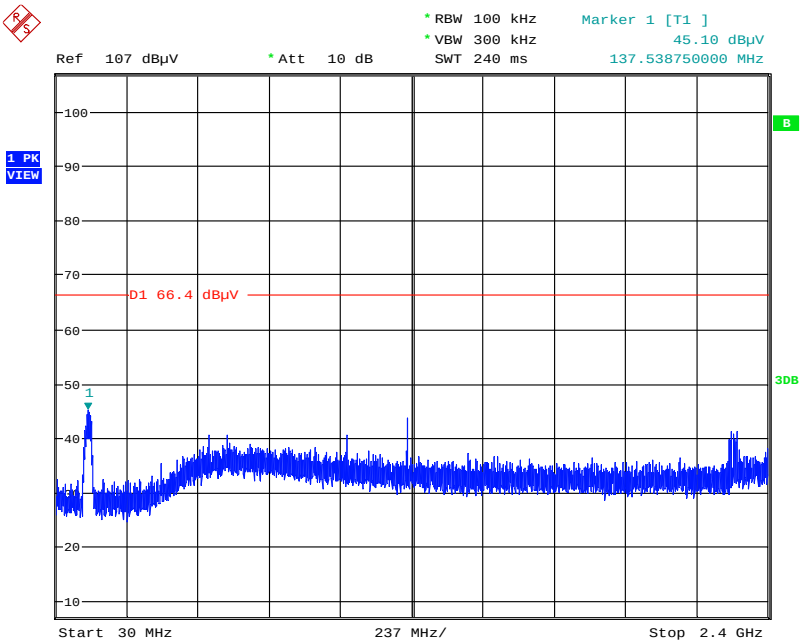
Date: 7.JUN.2016 00:18:44

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / CH 3 / 2483.5MHz~26500MHz (down 30dBc)



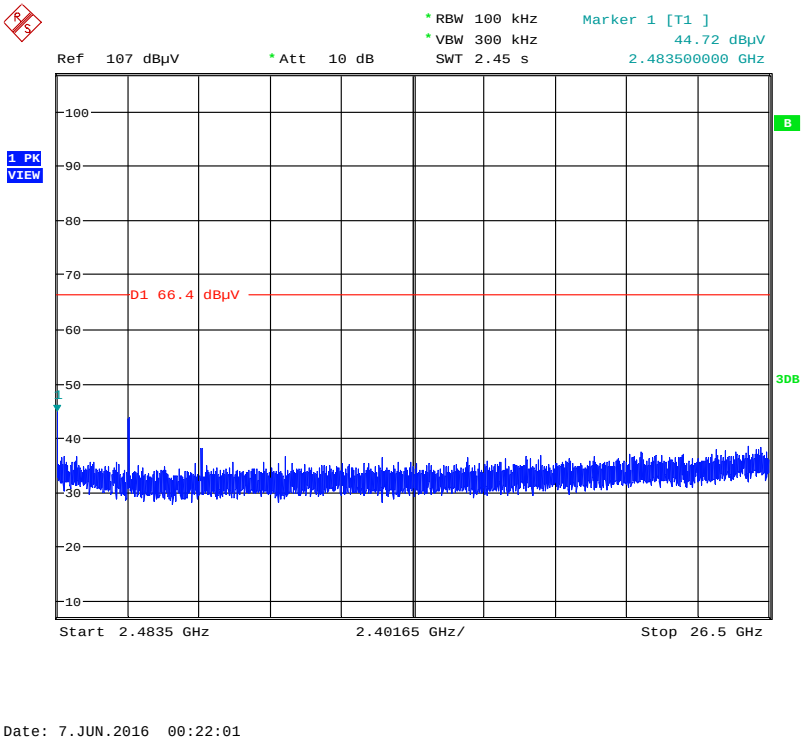
Date: 7.JUN.2016 00:19:07

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / CH 9 / 30MHz~2400MHz (down 30dBc)



Date: 7.JUN.2016 00:22:26

Plot on Configuration IEEE 802.11ac MCS0Nss1 VHT40 / CH 9 / 2483.5MHz~26500MHz (down 30dBc)



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
EMI Receiver	Agilent	N9038A	My52260123	9kHz ~ 8.45GHz	Jan. 27, 2016	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Dec. 08, 2015	Conduction (CO01-CB)
LISN	Schwarzbeck	NSLK 8127	8127647	9kHz ~ 30MHz	Dec. 23, 2015	Conduction (CO01-CB)
COND Cable	Woken	Cable	01	150kHz ~ 30MHz	May 24, 2016	Conduction (CO01-CB)
Software	Audix	E3	6.120210n	-	N.C.R.	Conduction (CO01-CB)
BILOG ANTENNA	TESEQ	CBL6112D	37880	20MHz ~ 2GHz	Sep. 03, 2015	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9kHz - 30 MHz	Mar. 16, 2016*	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Oct. 22, 2015	Radiation (03CH01-CB)
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170507	15GHz ~ 40GHz	Mar. 01, 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)
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	Nov. 02, 2015	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)
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%