FCC RADIO TEST REPORT

Applicant's company	**D-Link Corporation**
Applicant Address	No.289, Sinhu 3rd Rd., Neihu District, Taipei City 114, Taiwan, R.O.C.
FCC ID	**KA2IR895LA1**

Product Name	AC5300 Ultra Wi-Fi Router
Brand Name	D-Link
Model No.	DIR-895L
Test Rule Part(s)	47 CFR FCC Part 15 Subpart C § 15.247
Test Freq. Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Received Date	May 15, 2015
Final Test Date	May 21, 2015
Submission Type	Original Equipment

Statement

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

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

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

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.10-2009**, **47 CFR FCC Part 15 Subpart C**, **KDB 558074 D01 v03r02**, **KDB 662911 D01 v02r01**, **KDB644545 D01 v01r02**.

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

Note: Using 1.5m table as an alternative was permitted by the FCC per TCBC conference call of Dec. 2, 2014.

TAF
Testing Laboratory
1190

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History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR551992AA	Rev. 01	Initial issue of report	May 26, 2015

1. VERIFICATION OF COMPLIANCE

Product Name	:	AC5300 Ultra Wi-Fi Router
Brand Name	:	D-Link
Model No.	:	DIR-895L
Applicant	:	D-Link Corporation
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 15, 2015 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**	**Under Limit**
4.1	15.207	AC Power Line Conducted Emissions	Complies	10.17 dB
4.2	15.247(b)(3)	Maximum Conducted Output Power	Complies	0.03 dB
4.3	15.247(e)	Power Spectral Density	Complies	0.54 dB
4.4	15.247(a)(2)	6dB Spectrum Bandwidth	Complies	-
4.5	15.247(d)	Radiated Emissions	Complies	0.02 dB
4.6	15.247(d)	Band Edge Emissions	Complies	0.09 dB
4.7	15.203	Antenna Requirements	Complies	-

3. GENERAL INFORMATION

3.1. Product Details

Items	Description
Product Type	For 2.4GHz Band: IEEE 802.11b/g/n/ac: WLAN (4TX, 4RX) For 5GHz Band: IEEE 802.11a/n/ac: WLAN (4TX, 4RX)
Radio Type	Intentional Transceiver
Power Type	From power adapter
Modulation	IEEE 802.11b: DSSS IEEE 802.11a/g: 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, 1024QAM)
Data Rate (Mbps)	IEEE 802.11b: DSSS (1/ 2/ 5.5/11) IEEE 802.11a/g: OFDM (6/9/12/18/24/36/48/54) IEEE 802.11n/ac: see the below table
Frequency Range	2400 ~ 2483.5MHz / 5725 ~ 5850MHz
Channel Number	For 2.4GHz Band: 11 for 20MHz bandwidth ; 7 for 40MHz bandwidth For 5GHz Band: 5 for 20MHz bandwidth ; 2 for 40MHz bandwidth 1 for 80MHz bandwidth
Channel Band Width (99%)	For non-beamforming mode For 2.4GHz Band: IEEE 802.11b: 10.56 MHz IEEE 802.11g: 15.36 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 17.40 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 37.00 MHz For 5GHz Band: IEEE 802.11a: 15.72 MHz IEEE 802.11ac MCS0/Nss1 (VHT20): 17.37 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 36.61 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 75.83 MHz

	For beamforming mode For 2.4GHz Band: IEEE 802.11 ac MCS0/Nss1 (VHT20): 17.71 MHz IEEE 802.11 ac MCS0/Nss1 (VHT40): 36.76 MHz For 5GHz Band: IEEE 802.11ac MCS0/Nss1 (VHT20): 18.14 MHz IEEE 802.11ac MCS0/Nss1 (VHT40): 36.90 MHz IEEE 802.11ac MCS0/Nss1 (VHT80): 76.12 MHz
Maximum Conducted Output Power	For non-beamforming mode For 2.4GHz Band: IEEE 802.11b: 29.97 dBm IEEE 802.11g: 29.97 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 29.90 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 26.69 dBm For 5GHz Band: IEEE 802.11a: 29.46 dBm IEEE 802.11ac MCS0/Nss1 (VHT20): 29.06 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 29.87 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 29.83 dBm For beamforming mode For 2.4GHz Band: IEEE 802.11 ac MCS0/Nss1 (VHT20): 28.57 dBm IEEE 802.11 ac MCS0/Nss1 (VHT40): 25.07 dBm For 5GHz Band: IEEE 802.11ac MCS0/Nss1 (VHT20): 27.65 dBm IEEE 802.11ac MCS0/Nss1 (VHT40): 27.76 dBm IEEE 802.11ac MCS0/Nss1 (VHT80): 27.69 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Items	Description	
Beamforming Function	☒ With beamforming	☐ Without beamforming

Note: The product has beamforming function for 801.11n/ac in 2.4GHz and 5GHz.

Antenna and Band width

Antenna		Four (TX)		
Band width Mode		20 MHz	40 MHz	80 MHz
2.4G	IEEE 802.11b	V	X	X
	IEEE 802.11g	V	X	X
	IEEE 802.11n	V	V	X
	IEEE 802.11ac	V	V	X
5G	IEEE 802.11a	V	X	X
	IEEE 802.11n	V	V	X
	IEEE 802.11ac	V	V	V

IEEE 802.11n/ac Spec.

Protocol		Number of Transmit Chains (NTX)	Data Rate / MCS
2.4G	802.11n (HT20)	4	MCS0-31
	802.11n (HT40)	4	MCS0-31
	802.11ac (VHT20)	4	MCS0-11/Nss1-4
	802.11ac (VHT40)	4	MCS0-11/Nss1-4
5G	802.11n (HT20)	4	MCS0-31
	802.11n (HT40)	4	MCS0-31
	802.11ac (VHT20)	4	MCS0-11/Nss1-4
	802.11ac (VHT40)	4	MCS0-11/Nss1-4
	802.11ac (VHT80)	4	MCS0-11/Nss1-4

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

Note 2: IEEE Std. 802.11ac modulation consists of VHT20, VHT40, VHT80 and VHT160 (VHT: Very High Throughput). Then EUT supports VHT20, VHT40 in 2.4GHz and supports VHT20, VHT40, VHT80 in 5GHz.

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

3.2. Accessories

Power	Brand	Model	Rating
Adapter	APD	DA-60N12	Input:100-240V~1.5A 50-60Hz Output:12V-5A
Others			
Power cable*1, non-shielded 1.3m			

3.3. Table for Filed Antenna

Ant.	Brand Holder	P/N	Antenna Type	Connector	Antenn Gain (dBi)			Cable Loss (dBi)			True Gain (dBi)		
					2.4G	5G B1	5G B4	2.4G	5G B1	5G B4	2.4G	5G B1	5G B4
1	HL TECHNOLOGY GROUP LIMITED	290-20187	Dipole Antenna	SMA Plug Reverse	1.8	2.8	2.8	0.5	1.1	0.7	1.3	1.7	2.1
2	HL TECHNOLOGY GROUP LIMITED	290-20188	Dipole Antenna	SMA Plug Reverse	1.8	2.8	2.8	0.5	1.1	0.7	1.3	1.7	2.1
3	HL TECHNOLOGY GROUP LIMITED	290-20188	Dipole Antenna	SMA Plug Reverse	1.8	2.8	2.8	0.5	1.1	0.7	1.3	1.7	2.1
4	HL TECHNOLOGY GROUP LIMITED	290-20188	Dipole Antenna	SMA Plug Reverse	1.8	2.8	2.8	0.5	1.1	0.7	1.3	1.7	2.1
5	HL TECHNOLOGY GROUP LIMITED	290-20187	Dipole Antenna	SMA Plug Reverse	1.8	2.8	2.8	0.5	1.1	0.7	1.3	1.7	2.1
6	HL TECHNOLOGY GROUP LIMITED	290-20188	Dipole Antenna	SMA Plug Reverse	1.8	2.8	2.8	0.5	1.1	0.7	1.3	1.7	2.1
7	HL TECHNOLOGY GROUP LIMITED	290-20188	Dipole Antenna	SMA Plug Reverse	1.8	2.8	2.8	0.5	1.1	0.7	1.3	1.7	2.1
8	HL TECHNOLOGY GROUP LIMITED	290-20188	Dipole Antenna	SMA Plug Reverse	1.8	2.8	2.8	0.5	1.1	0.7	1.3	1.7	2.1

Note: The EUT has eight antennas.

<For 2.4GHz Band>

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

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

<For 5GHz Band 1>

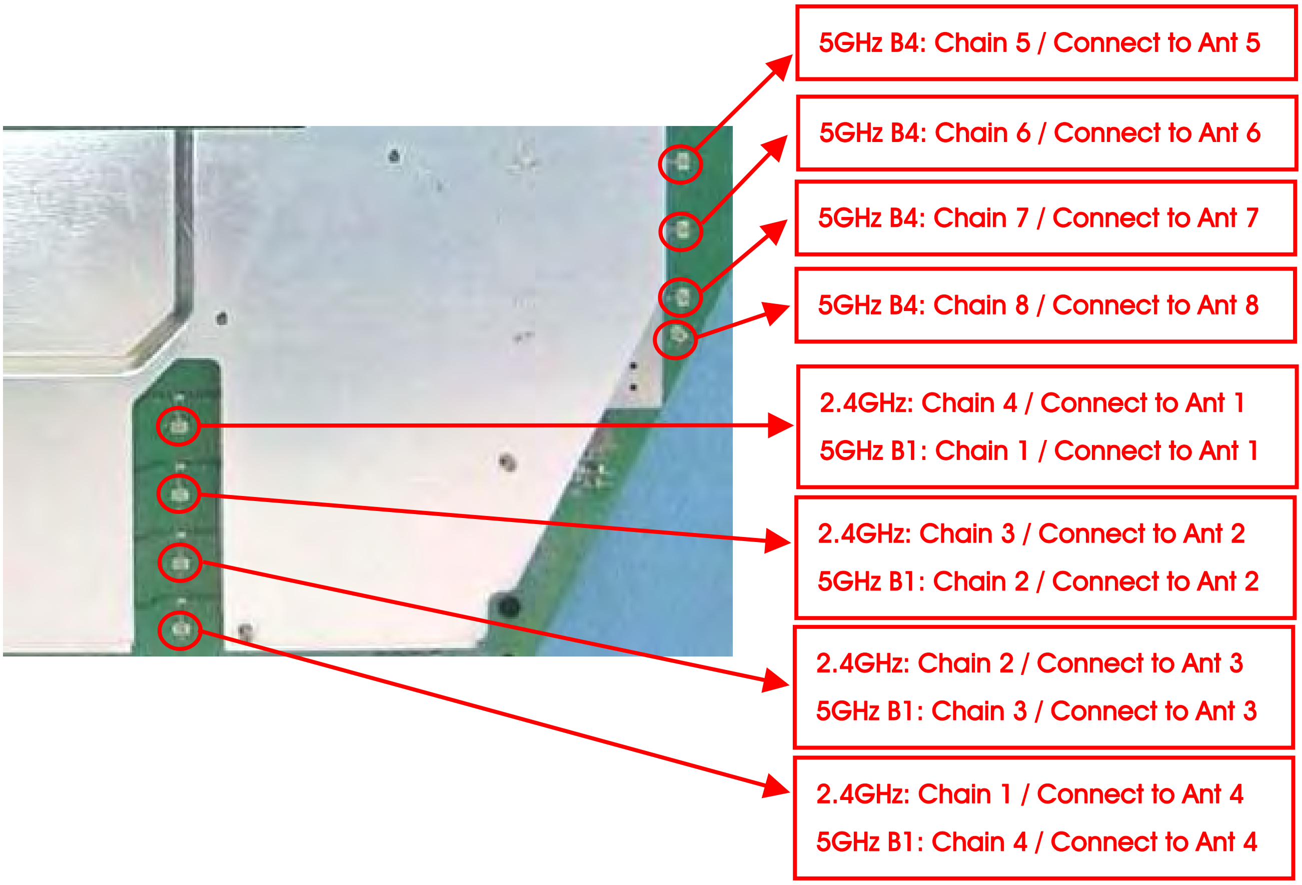
For IEEE 802.11a/n/ac mode (4TX/4RX):

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

<For 5GHz Band 4>

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

Chain 5, Chain 6, Chain 7 and Chain 8 could transmit/receive simultaneously.


5GHz B4: Chain 5 / Connect to Ant 5
5GHz B4: Chain 6 / Connect to Ant 6
5GHz B4: Chain 7 / Connect to Ant 7
5GHz B4: Chain 8 / Connect to Ant 8
2.4GHz: Chain 4 / Connect to Ant 1
5GHz B1: Chain 1 / Connect to Ant 1
2.4GHz: Chain 3 / Connect to Ant 2
5GHz B1: Chain 2 / Connect to Ant 2
2.4GHz: Chain 2 / Connect to Ant 3
5GHz B1: Chain 3 / Connect to Ant 3
2.4GHz: Chain 1 / Connect to Ant 4
5GHz B1: Chain 4 / Connect to Ant 4

3.4. Table for Carrier Frequencies

For 2.4GHz Band:

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	-	-

For 5GHz Band:

There are three bandwidth systems.

For 20MHz bandwidth systems, use Channel 149, 153, 157, 161, 165.

For 40MHz bandwidth systems, use Channel 151, 159.

For 80MHz bandwidth systems, use Channel 155.

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
5725~5850 MHz Band 4	149	5745 MHz	157	5785 MHz
	151	5755 MHz	159	5795 MHz
	153	5765 MHz	161	5805 MHz
	155	5775 MHz	165	5825 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 2.4GHz Band:

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

Radiated Emissions Below 1GHz	Normal Link	-	-	-
Radiated Emissions Above 1GHz	**For non-beamforming mode**			
	11b/CCK	1 Mbps	1/6/11	1+2+3+4
	11g/BPSK	6 Mbps	1/6/11	1+2+3+4
	11ac VHT20	MCS0/Nss1	1/6/11	1+2+3+4
	11ac VHT40	MCS0/Nss1	3/6/9	1+2+3+4
	For beamforming mode			
	11ac VHT20	MCS0/Nss1	1/6/11	1+2+3+4
	11ac VHT40	MCS0/Nss1	3/6/9	1+2+3+4
Band Edge Emissions	**For non-beamforming mode**			
	11b/CCK	1 Mbps	1/6/11	1+2+3+4
	11g/BPSK	6 Mbps	1/6/11	1+2+3+4
	11ac VHT20	MCS0/Nss1	1/6/11	1+2+3+4
	11ac VHT40	MCS0/Nss1	3/6/9	1+2+3+4
	For beamforming mode			
	11ac VHT20	MCS0/Nss1	1/6/11	1+2+3+4
	11ac VHT40	MCS0/Nss1	3/6/9	1+2+3+4

For 5GHz Band:

Test Items	Mode	Data Rate	Channel	Chain
AC Power Line Conducted Emissions	Normal Link	-	-	-
Maximum Conducted Output Power	**For non-beamforming mode**			
	11a/BPSK	6 Mbps	149/157/165	1+2+3+4
	11ac VHT20	MCS0/Nss1	149/157/165	1+2+3+4
	11ac VHT40	MCS0/Nss1	151/159	1+2+3+4
	11ac VHT80	MCS0/Nss1	155	1+2+3+4
	For beamforming mode			
	11ac VHT20	MCS0/Nss1	149/157/165	1+2+3+4
	11ac VHT40	MCS0/Nss1	151/159	1+2+3+4
	11ac VHT80	MCS0/Nss1	155	1+2+3+4
Power Spectral Density	**For non-beamforming mode**			
	11a/BPSK	6 Mbps	149/157/165	1+2+3+4
	11ac VHT20	MCS0/Nss1	149/157/165	1+2+3+4
	11ac VHT40	MCS0/Nss1	151/159	1+2+3+4
	11ac VHT80	MCS0/Nss1	155	1+2+3+4
	For beamforming mode			
	11ac VHT20	MCS0/Nss1	149/157/165	1+2+3+4
	11ac VHT40	MCS0/Nss1	151/159	1+2+3+4
	11ac VHT80	MCS0/Nss1	155	1+2+3+4
6dB Spectrum Bandwidth	**For non-beamforming mode**			
	11a/BPSK	6 Mbps	149/157/165	1+2+3+4
	11ac VHT20	MCS0/Nss1	149/157/165	1+2+3+4
	11ac VHT40	MCS0/Nss1	151/159	1+2+3+4
	11ac VHT80	MCS0/Nss1	155	1+2+3+4
	For beamforming mode			
	11ac VHT20	MCS0/Nss1	149/157/165	1+2+3+4
	11ac VHT40	MCS0/Nss1	151/159	1+2+3+4
	11ac VHT80	MCS0/Nss1	155	1+2+3+4

Radiated Emissions Below 1GHz	Normal Link	-	-	-
Radiated Emissions Above 1GHz	**For non-beamforming mode**			
	11a/BPSK	6 Mbps	149/157/165	1+2+3+4
	11ac VHT20	MCS0/Nss1	149/157/165	1+2+3+4
	11ac VHT40	MCS0/Nss1	151/159	1+2+3+4
	11ac VHT80	MCS0/Nss1	155	1+2+3+4
	For beamforming mode			
	11ac VHT20	MCS0/Nss1	149/157/165	1+2+3+4
	11ac VHT40	MCS0/Nss1	151/159	1+2+3+4
	11ac VHT80	MCS0/Nss1	155	1+2+3+4
Band Edge Emissions	**For non-beamforming mode**			
	11a/BPSK	6 Mbps	149/157/165	1+2+3+4
	11ac VHT20	MCS0/Nss1	149/157/165	1+2+3+4
	11ac VHT40	MCS0/Nss1	151/159	1+2+3+4
	11ac VHT80	MCS0/Nss1	155	1+2+3+4
	For beamforming mode			
	11ac VHT20	MCS0/Nss1	149/157/165	1+2+3+4
	11ac VHT40	MCS0/Nss1	151/159	1+2+3+4
	11ac VHT80	MCS0/Nss1	155	1+2+3+4

Note 1: VHT20/VHT40 covers HT20/HT40, due to same modulation.

Note 2: There are two modes of EUT, one is beamforming mode, and the other is non-beamforming mode for 802.11n/ac, Beamforming mode and non-beamforming mode has been test and record in this test report.

Note 3: All the specification of test configurations and test modes were based on customer's request

The following test modes were performed for all tests:

For Conducted Emission test:

Mode 1. Normal Link

For Radiated Emission below 1GHz test:

Mode 1. Normal Link - Place EUT in X axis

Mode 2. Normal Link - Place EUT in Y axis

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

For Radiated Emission above 1GHz test:

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. So the measurement will follow this same test configuration.

Mode 1. CTX - Place EUT in X axis

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

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

3.6. Table for Testing Locations

Test Site Location				
Address:	No.8, Lane 724, Bo-ai St., Jhubei City, Hsinchu County 302, Taiwan, R.O.C.			
TEL:	886-3-656-9065			
FAX:	886-3-656-9085			
Test Site No.	Site Category	Location	FCC Reg. No.	IC File No.
03CH01-CB	SAC	Hsin Chu	262045	IC 4086D
CO02-CB	Conduction	Hsin Chu	262045	IC 4086D
TH01-CB	OVEN Room	Hsin Chu	-	-

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

3.7. Table for Supporting Units

For Below 1GHz

For Test Site No: 03CH01-CB

Support Unit	Brand	Model	FCC ID
Notebook*5	DELL	E4300	DoC
Flash disk	Silicon Power	I-Series	DoC
Flash disk3.0	Silicon Power	B06	DoC

For Above 1GHz

For Test Site No: 03CH01-CB (For non-beamforming mode)

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E4300	DoC

For Test Site No: 03CH01-CB (For beamforming mode)

Support Unit	Brand	Model	FCC ID
Notebook*2	DELL	E4300	DoC
RX Device	Broadcom	Bcm4366	DoC

For Test Site No: CO01-CB

Support Unit	Brand	Model	FCC ID
Notebook*5	DELL	E6430	DoC
Flash disk3.0	Transcend	JetFlash-700	DoC
Flash disk	Transcend	604108 8255	DoC

For Test Site No: TH01-CB

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E4300	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 non-beamforming mode:

For 2.4GHz Band

Test Software Version	Mtool 2.0.2.7					
Mode	Test Frequency (MHz)					
	NCB: 20MHz			NCB: 40MHz		
	2412 MHz	2437 MHz	2462 MHz	2422 MHz	2437 MHz	2452 MHz
802.11b	97	97	97	-	-	-
802.11g	87	98	90	-	-	-
802.11ac MCS0/Nss1 VHT20	87	98	87	-	-	-
802.11ac MCS0/Nss1 VHT40	-	-	-	73	85	63

For 5GHz Band

Test Software Version	Mtool 2.0.2.7					
Mode	Test Frequency (MHz)					
	NCB: 20MHz			NCB: 40MHz		NCB: 80MHz
	5745 MHz	5785 MHz	5825 MHz	5755 MHz	5795 MHz	5775 MHz
802.11a	90	96	98	-	-	-
802.11ac MCS0/Nss1 VHT20	93	94	93	-	-	-
802.11ac MCS0/Nss1 VHT40	-	-	-	97	97	-
802.11ac MCS0/Nss1 VHT80	-	-	-	-	-	97

For beamforming mode:

For 2.4GHz Band

Test Software Version	Mtool 2.0.2.7					
Mode	Test Frequency (MHz)					
	NCB: 20MHz			NCB: 40MHz		
	2412 MHz	2437 MHz	2462 MHz	2422 MHz	2437 MHz	2452 MHz
802.11ac MCS0/Nss1 VHT20	83	93	78	-	-	-
802.11ac MCS0/Nss1 VHT40	-	-	-	66	78	62

For 5GHz Band

Test Software Version	Mtool 2.0.2.7					
Mode	Test Frequency (MHz)					
	NCB: 20MHz			NCB: 40MHz		NCB: 80MHz
	5745 MHz	5785 MHz	5825 MHz	5755 MHz	5795 MHz	5775 MHz
802.11ac MCS0/Nss1 VHT20	87	88	90	-	-	-
802.11ac MCS0/Nss1 VHT40	-	-	-	88	89	-
802.11ac MCS0/Nss1 VHT80	-	-	-	-	-	88

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 DOS.
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 non-beamforming mode:

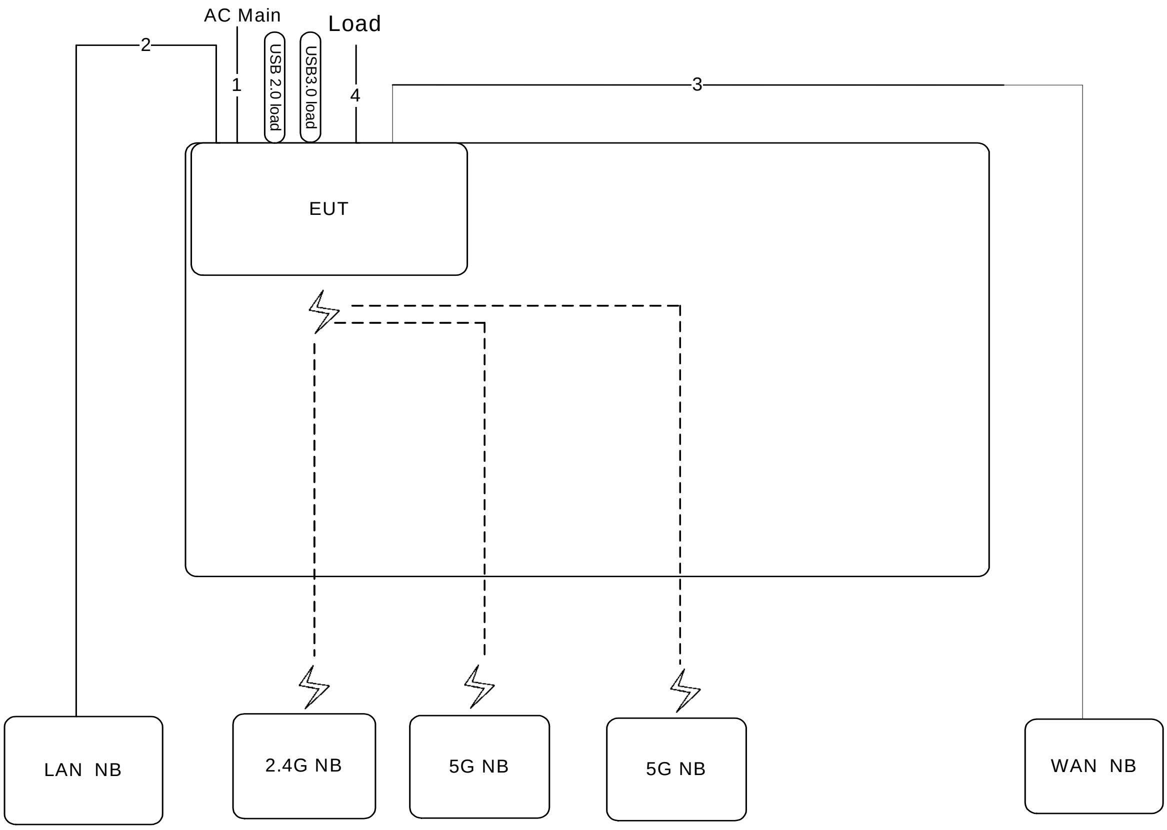
Band	Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
2.4G	802.11b	1.000	1.000	100.00	0.00	0.01
	802.11g	2.020	2.060	98.06	0.09	0.01
	802.11ac MCS0/Nss1 VHT20	1.900	1.940	97.94	0.09	0.53
	802.11ac MCS0/Nss1 VHT40	0.890	0.930	95.70	0.19	1.12
5G	802.11a	2.030	2.070	98.07	0.08	0.01
	802.11ac MCS0/Nss1 VHT20	1.924	1.944	98.97	0.04	0.01
	802.11ac MCS0/Nss1 VHT40	0.915	0.969	94.43	0.25	1.09
	802.11ac MCS0/Nss1 VHT80	0.431	0.483	89.23	0.49	2.32

For beamforming mode:

Band	Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
2.4G	802.11ac MCS0/Nss1 VHT20	4.640	5.000	92.80	0.32	0.22
	802.11ac MCS0/Nss1 VHT40	4.460	4.760	93.70	0.28	0.22
5G	802.11ac MCS0/Nss1 VHT20	4.640	4.740	97.89	0.09	0.22
	802.11ac MCS0/Nss1 VHT40	4.440	4.560	97.37	0.12	0.23
	802.11ac MCS0/Nss1 VHT80	5.080	5.200	97.69	0.10	0.20

3.11. Test Configurations

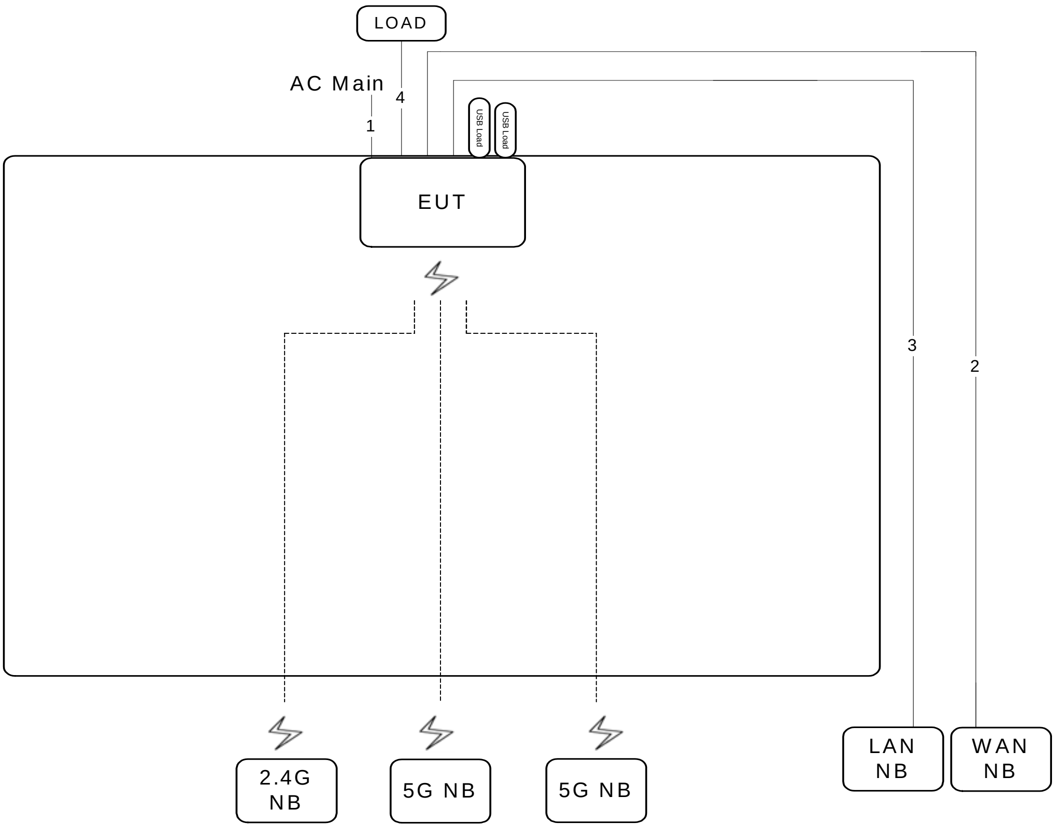
3.11.1. AC Power Line Conduction Emissions Test Configuration



Item	Connection	Shielded	Length	Remark
1	Power cable	No	3.1m	-
2	RJ-45 cable	No	10m	-
3	RJ-45 cable	No	10m	-
4	RJ-45 cable *3	No	3m	Load

3.11.2. Radiation Emissions Test Configuration

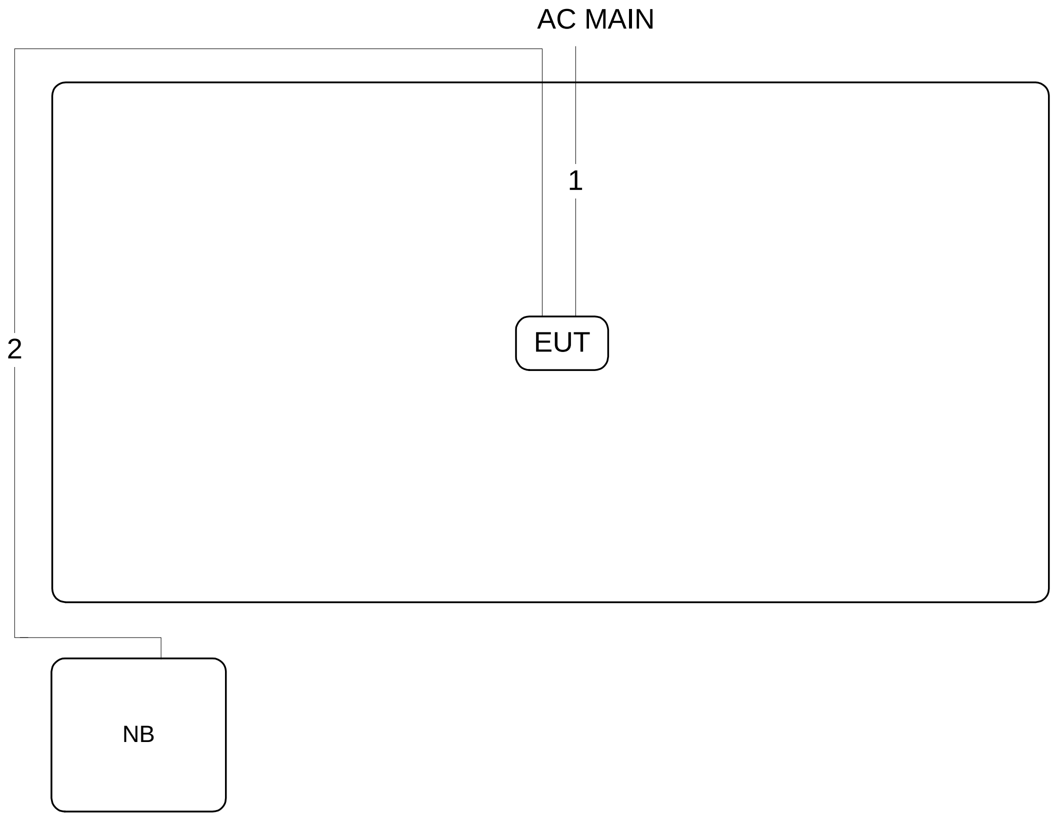
Test Configuration: 30MHz~1GHz



Item	Connection	Shielded	Length	Remark
1	Power cable	No	3.1m	-
2	RJ-45 cable	No	10m	-
3	RJ-45 cable	No	10m	-
4	RJ-45 cable *3	No	3m	Load

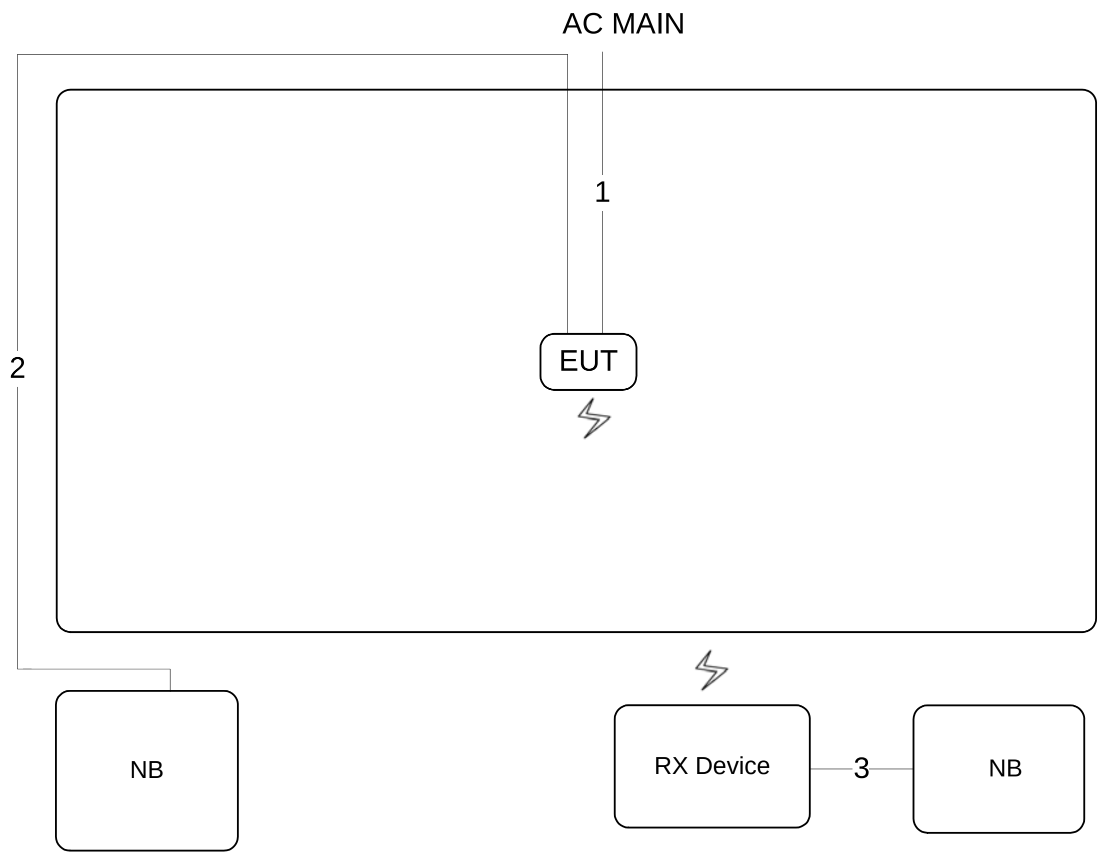
Test Configuration: above 1GHz

For non-beamforming mode



Item	Connection	Shielded	Length
1	Power cable	No	3.1m
2	RJ-45 cable	No	10m

For beamforming mode:



Item	Connection	Shielded	Length
1	Power cable	No	3.1m
2	RJ-45 cable	No	10m
3	RJ-45 cable	No	1.5m

4. EST RESULT

4.1. AC Power Line Conducted Emissions Measurement

4.1.1. Limit

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

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

4.1.2. Measuring Instruments and Setting

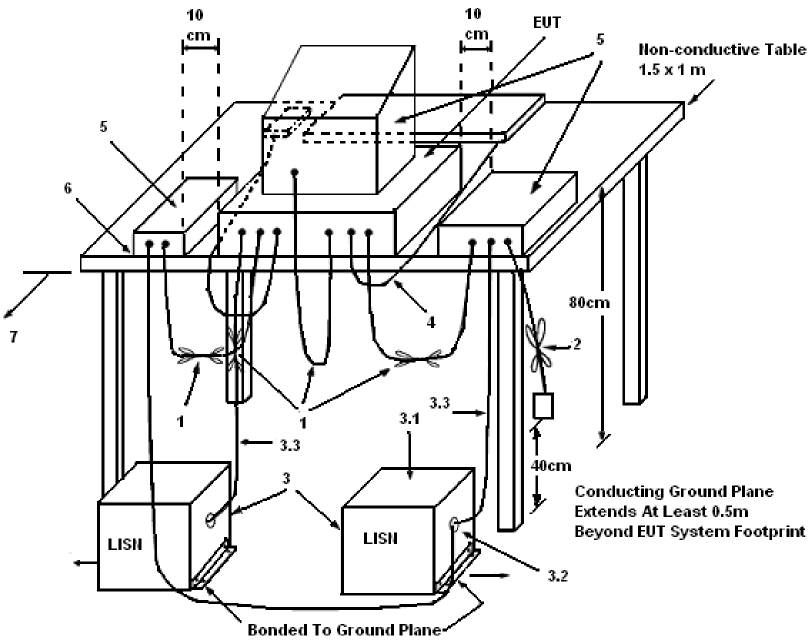
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

4.1.3. Test Procedures

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

4.1.4. Test Setup Layout



LEGEND:

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

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

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

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

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

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

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

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

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

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

4.1.5. Test Deviation

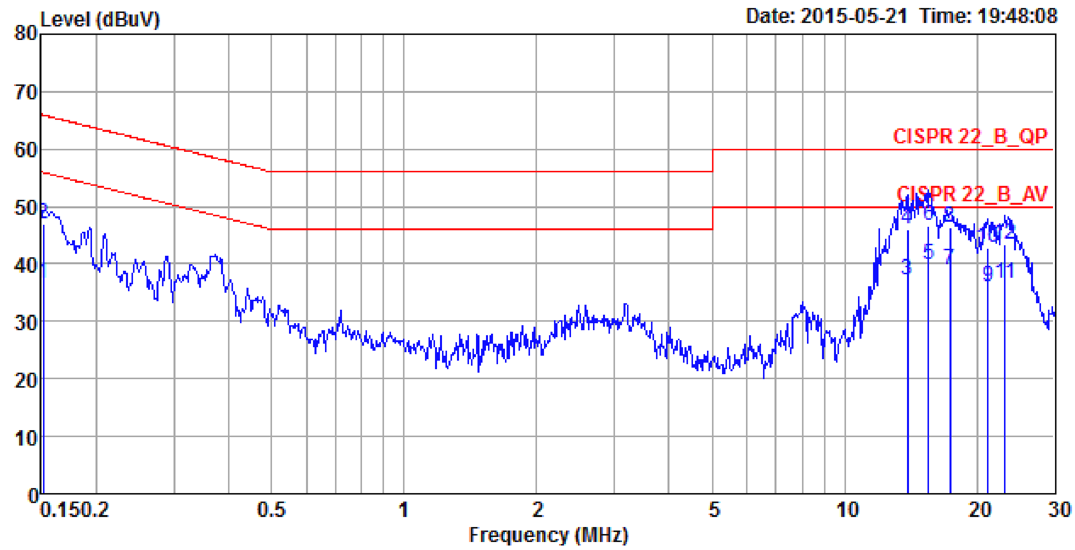
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

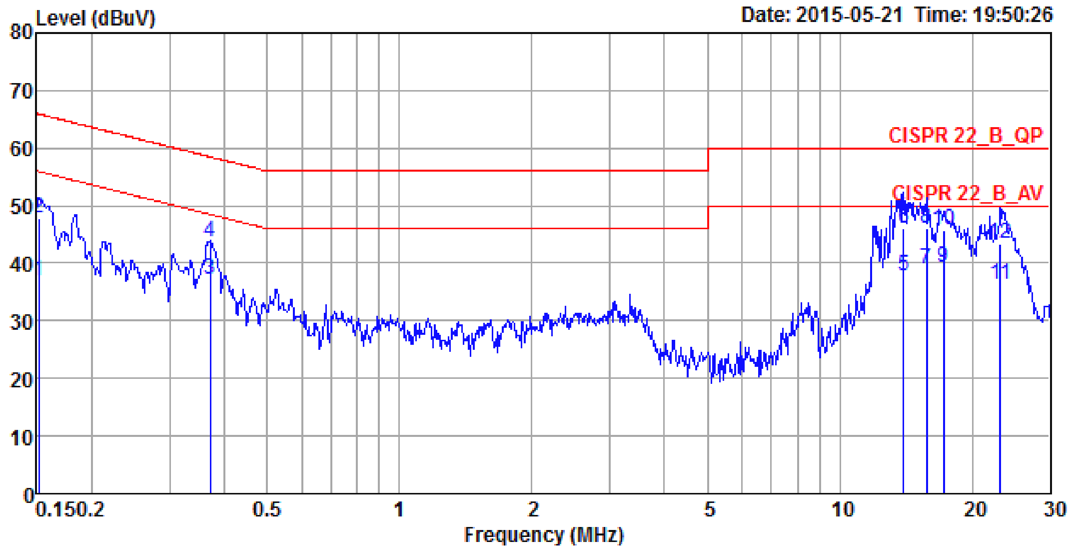
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	22°C	Humidity	54%
Test Engineer	Da Deng	Phase	Line
Configuration	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1516	36.74	-19.17	55.91	26.57	10.00	0.17	LINE	Average
2	0.1516	46.84	-19.07	65.91	36.67	10.00	0.17	LINE	QP
3	13.9146	37.32	-12.68	50.00	26.60	10.30	0.42	LINE	Average
4	13.9146	45.96	-14.04	60.00	35.24	10.30	0.42	LINE	QP
5	15.5523	39.83	-10.17	50.00	29.06	10.33	0.44	LINE	Average
6	15.5523	46.70	-13.30	60.00	35.93	10.33	0.44	LINE	QP
7	17.3826	38.93	-11.07	50.00	28.12	10.36	0.45	LINE	Average
8	17.3826	46.23	-13.77	60.00	35.42	10.36	0.45	LINE	QP
9	21.1472	35.89	-14.11	50.00	24.99	10.41	0.49	LINE	Average
10	21.1472	42.90	-17.10	60.00	32.00	10.41	0.49	LINE	QP
11	23.1404	36.67	-13.33	50.00	25.72	10.44	0.51	LINE	Average
12	23.1404	43.49	-16.51	60.00	32.54	10.44	0.51	LINE	QP

Temperature	22°C	Humidity	54%
Test Engineer	Da Deng	Phase	Neutral
Configuration	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1516	36.79	-19.12	55.91	26.62	10.00	0.17	NEUTRAL	Average
2	0.1516	47.87	-18.04	65.91	37.70	10.00	0.17	NEUTRAL	QP
3	0.3712	37.12	-11.35	48.47	26.91	10.01	0.20	NEUTRAL	Average
4	0.3712	43.74	-14.73	58.47	33.53	10.01	0.20	NEUTRAL	QP
5	13.9886	37.85	-12.15	50.00	27.13	10.30	0.42	NEUTRAL	Average
6	13.9886	45.96	-14.04	60.00	35.24	10.30	0.42	NEUTRAL	QP
7	15.7179	38.94	-11.06	50.00	28.17	10.33	0.44	NEUTRAL	Average
8	15.7179	46.20	-13.80	60.00	35.43	10.33	0.44	NEUTRAL	QP
9	17.1994	39.26	-10.74	50.00	28.46	10.35	0.45	NEUTRAL	Average
10	17.1994	45.74	-14.26	60.00	34.94	10.35	0.45	NEUTRAL	QP
11	23.1404	36.24	-13.76	50.00	25.29	10.44	0.51	NEUTRAL	Average
12	23.1404	43.51	-16.49	60.00	32.56	10.44	0.51	NEUTRAL	QP

Note:

Level = Read Level + LISN Factor + Cable Loss

4.2. Maximum Conducted Output Power Measurement

4.2.1. Limit

For systems using digital modulation in the 2400-2483.5MHz, the limit for output power is 30dBm. The limited has to be reduced by the amount in dB that the gain of the antenna exceed 6dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi. Systems operating in the 5725-5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter output power.

4.2.2. Measuring Instruments and Setting

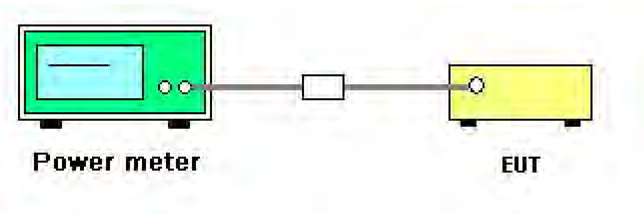
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Detector	Average

4.2.3. Test Procedures

1. Test procedures refer KDB 558074 D01 v03r02 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°C	Humidity	45%
Test Engineer	Magic Lai	Test Date	May 20, 2015

For non-beamforming mode

For 2.4GHz Band

Mode	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
802.11b	2412 MHz	24.22	23.84	23.78	23.95	29.97	30.00	Complies
	2437 MHz	24.02	23.72	23.84	24.08	29.94	30.00	Complies
	2462 MHz	24.07	23.87	23.74	24.01	29.94	30.00	Complies
802.11g	2412 MHz	21.45	21.25	21.28	21.53	27.40	30.00	Complies
	2437 MHz	24.12	23.72	23.84	24.12	29.97	30.00	Complies
	2462 MHz	22.22	21.92	22.02	22.25	28.13	30.00	Complies
802.11ac MCS0/Nss1 VHT20	2412 MHz	21.25	21.17	20.98	21.19	27.17	30.00	Complies
	2437 MHz	24.07	23.75	23.65	24.02	29.90	30.00	Complies
	2462 MHz	21.25	21.08	21.02	21.27	27.18	30.00	Complies
802.11ac MCS0/Nss1 VHT40	2422 MHz	17.95	17.53	17.58	17.87	23.76	30.00	Complies
	2437 MHz	20.89	20.48	20.57	20.72	26.69	30.00	Complies
	2452 MHz	15.61	15.23	15.22	15.53	21.42	30.00	Complies

For 5GHz Band

Mode	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Chain 5	Chain 6	Chain 7	Chain 8	Total		
802.11a	5745 MHz	22.22	22.29	22.58	22.00	28.30	30.00	Complies
	5785 MHz	23.24	23.33	23.25	23.60	29.38	30.00	Complies
	5825 MHz	23.38	23.04	23.64	23.68	29.46	30.00	Complies
802.11ac MCS0/Nss1 VHT20	5745 MHz	23.05	22.99	23.20	22.90	29.06	30.00	Complies
	5785 MHz	22.72	22.89	22.73	22.92	28.84	30.00	Complies
	5825 MHz	22.22	22.15	22.69	22.47	28.41	30.00	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	23.87	23.79	23.92	23.80	29.87	30.00	Complies
	5795 MHz	23.40	23.54	23.50	23.84	29.59	30.00	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	23.86	23.64	23.91	23.81	29.83	30.00	Complies

Temperature	25°C	Humidity	45%
Test Engineer	Magic Lai	Test Date	May 20, 2015

For beamforming mode

For 2.4GHz Band

Mode	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
802.11ac MCS0/Nss1 VHT20	2412 MHz	20.46	19.96	20.01	20.27	26.20	28.68	Complies
	2437 MHz	22.74	22.47	22.33	22.63	28.57	28.68	Complies
	2462 MHz	19.39	18.98	19.08	19.02	25.14	28.68	Complies
802.11ac MCS0/Nss1 VHT40	2422 MHz	16.23	15.68	15.75	16.04	21.95	28.68	Complies
	2437 MHz	19.35	18.84	18.94	19.05	25.07	28.68	Complies
	2452 MHz	15.23	14.85	14.98	15.24	21.10	28.68	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$ =7.32dBi >6dBi, so the limit 30-(7.32-6)=28.68dBm

For 5GHz Band

Mode	Frequency	Conducted Power (dBm)					Max. Limit (dBm)	Result
		Chain 5	Chain 6	Chain 7	Chain 8	Total		
802.11ac MCS0/Nss1 VHT20	5745 MHz	21.58	21.38	21.70	21.46	27.55	27.88	Complies
	5785 MHz	21.53	21.56	21.61	21.75	27.63	27.88	Complies
	5825 MHz	21.56	21.43	21.72	21.79	27.65	27.88	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	21.58	21.67	21.91	21.79	27.76	27.88	Complies
	5795 MHz	21.38	21.63	21.62	21.88	27.65	27.88	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	21.56	21.55	21.81	21.75	27.69	27.88	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$ =8.12dBi >6dBi, so the limit 30-(8.12-6)=27.88dBm

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

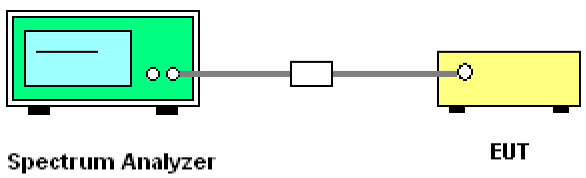
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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 KDB 558074 D01 v03r02 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°C	Humidity	45%
Test Engineer	Magic Lai		

For non-beamforming mode

For 2.4GHz Band

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	-7.46	-7.90	-7.61	-8.13	-1.75	6.68	Complies
	2437 MHz	-7.57	-7.73	-7.64	-7.99	-1.71	6.68	Complies
	2462 MHz	-7.58	-7.99	-7.70	-7.65	-1.71	6.68	Complies
802.11g	2412 MHz	-2.62	-2.50	-1.04	-2.21	3.97	6.68	Complies
	2437 MHz	-0.27	0.74	0.60	-0.77	6.14	6.68	Complies
	2462 MHz	-1.16	-1.78	-2.59	-2.39	4.08	6.68	Complies
802.11ac MCS0/Nss1 VHT20	2412 MHz	-3.49	-2.96	-3.91	-3.18	2.65	6.68	Complies
	2437 MHz	-0.74	-1.17	-0.56	-0.13	5.39	6.68	Complies
	2462 MHz	-3.50	-3.00	-3.50	-3.22	2.72	6.68	Complies
802.11ac MCS0/Nss1 VHT40	2422 MHz	-10.11	-9.04	-9.44	-8.94	-3.34	6.68	Complies
	2437 MHz	-7.29	-7.97	-6.01	-7.16	-1.03	6.68	Complies
	2452 MHz	-13.19	-12.58	-12.75	-13.27	-6.92	6.68	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$ =7.32dBi >6dBi, so the limit 8-(7.32-6)=6.68dBm/3kHz

For 5GHz Band

Mode	Frequency	Power Density (dBm/3kHz)					Power Density Limit (dBm/3kHz)	Result
		Chain 5	Chain 6	Chain 7	Chain 8	Total		
802.11a	5745 MHz	-2.99	-3.06	-3.31	-2.34	3.11	5.88	Complies
	5785 MHz	-1.62	-1.53	-1.35	-1.47	4.53	5.88	Complies
	5825 MHz	-0.79	-2.08	-0.73	-1.31	4.83	5.88	Complies
802.11ac MCS0/Nss1 VHT20	5745 MHz	-2.37	-2.91	-2.73	-1.68	3.62	5.88	Complies
	5785 MHz	-2.69	-1.97	-1.76	-2.55	3.80	5.88	Complies
	5825 MHz	-2.87	-2.01	-2.45	-2.99	3.46	5.88	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	-4.54	-4.11	-4.84	-4.64	1.50	5.88	Complies
	5795 MHz	-4.71	-4.55	-4.44	-3.40	1.78	5.88	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	-7.61	-6.62	-7.11	-7.47	-1.16	5.88	Complies

Note: $DirectionalGain = 10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =8.12dBi >6dBi, so the limit 8-(8.12-6)=5.88dBm/3kHz

Temperature	25°C	Humidity	45%
Test Engineer	Magic Lai		

For beamforming mode

For 2.4GHz Band

Mode	Frequency	Power Density (dBm/3kHz)					Power Density Limit (dBm/3kHz)	Result
		Chain 1	Chain 2	Chain 3	Chain 4	Total		
802.11ac MCS0/Nss1 VHT20	2412 MHz	-4.18	-3.11	-4.17	-3.75	2.24	6.68	Complies
	2437 MHz	-2.05	-0.79	-2.32	-2.32	4.20	6.68	Complies
	2462 MHz	-5.71	-5.50	-5.79	-5.29	0.45	6.68	Complies
802.11ac MCS0/Nss1 VHT40	2422 MHz	-11.89	-12.60	-12.81	-12.42	-6.40	6.68	Complies
	2437 MHz	-9.79	-9.13	-9.88	-9.36	-3.51	6.68	Complies
	2452 MHz	-13.48	-12.90	-12.38	-13.50	-7.02	6.68	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$ =7.32dBi >6dBi, so the limit 8-(7.32-6)=6.68dBm/3kHz

For 5GHz Band

Mode	Frequency	Power Density (dBm/3kHz)					Power Density Limit (dBm/3kHz)	Result
		Chain 5	Chain 6	Chain 7	Chain 8	Total		
802.11ac MCS0/Nss1 VHT20	5745 MHz	-4.21	-4.04	-3.01	-2.67	2.59	5.88	Complies
	5785 MHz	-3.05	-4.18	-3.49	-4.15	2.33	5.88	Complies
	5825 MHz	-3.27	-2.91	-3.70	-3.09	2.79	5.88	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	-5.76	-6.44	-5.86	-5.96	0.02	5.88	Complies
	5795 MHz	-5.87	-6.16	-6.52	-6.07	-0.13	5.88	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	-8.44	-8.74	-8.97	-9.20	-2.81	5.88	Complies

Note: $DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$ =8.12dBi >6dBi, so the limit 8-(8.12-6)=5.88dBm/3kHz

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

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

For non-beamforming mode

For 2.4GHz Band

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

Date: 21.MAY.2015 02:02:01

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

Date: 21.MAY.2015 02:03:12

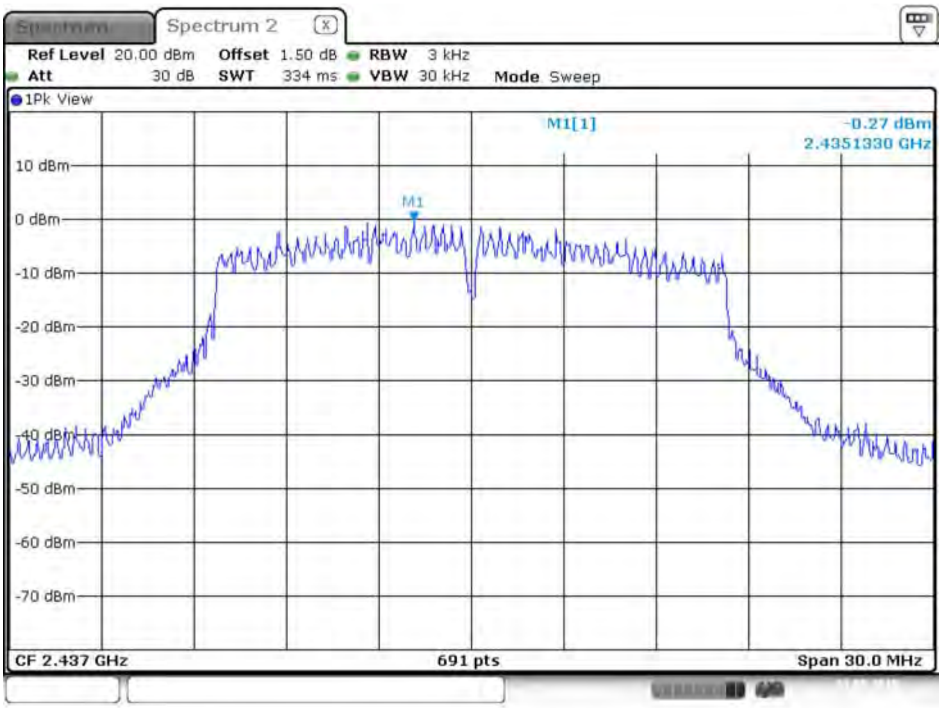
Power Density Plot on Configuration IEEE 802.11b / 2462 MHz / Chain 3

Date: 21.MAY.2015 02:04:43

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

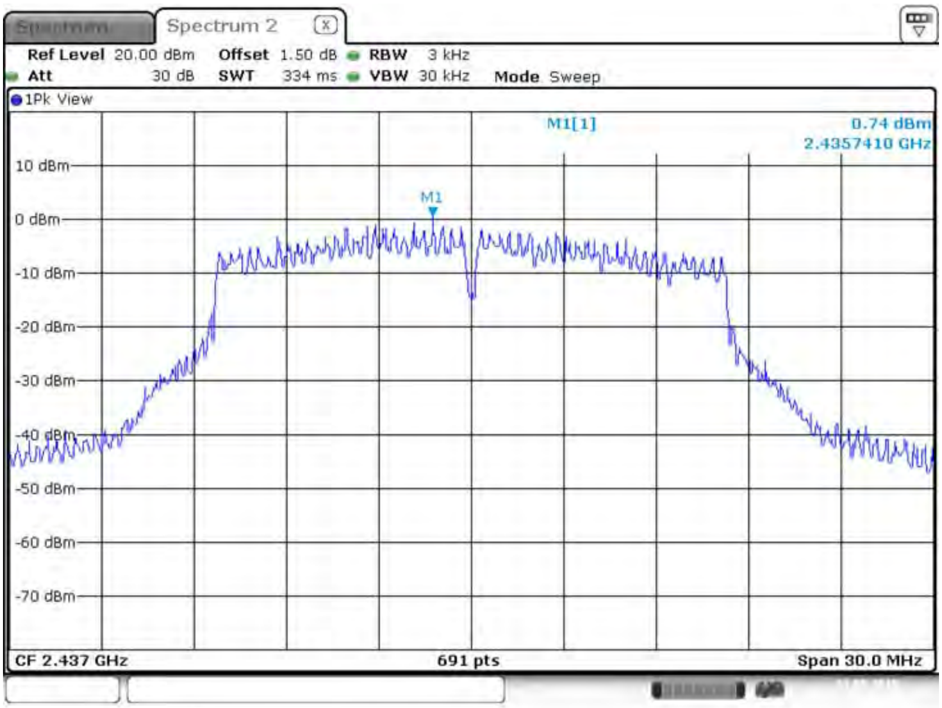
Date: 21.MAY.2015 02:06:21

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



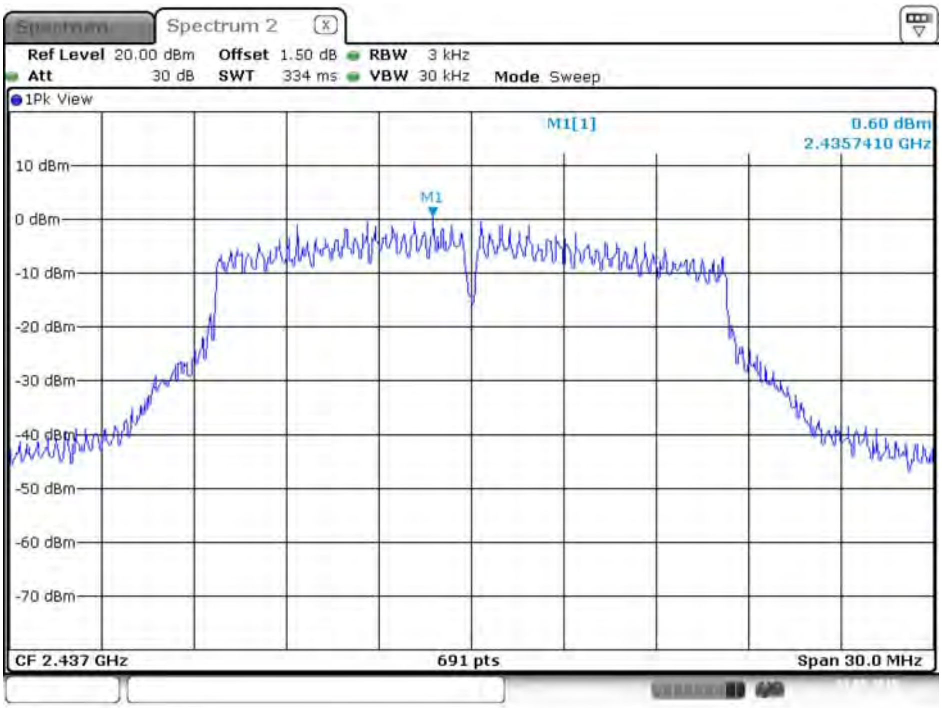
Date: 21.MAY.2015 02:08:51

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



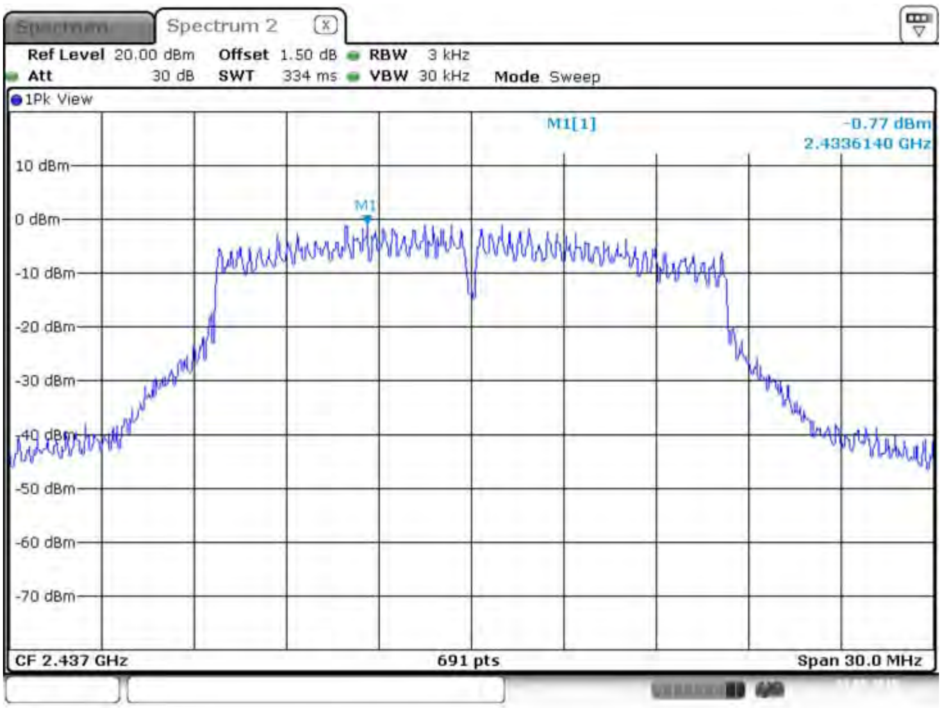
Date: 21.MAY.2015 02:09:33

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



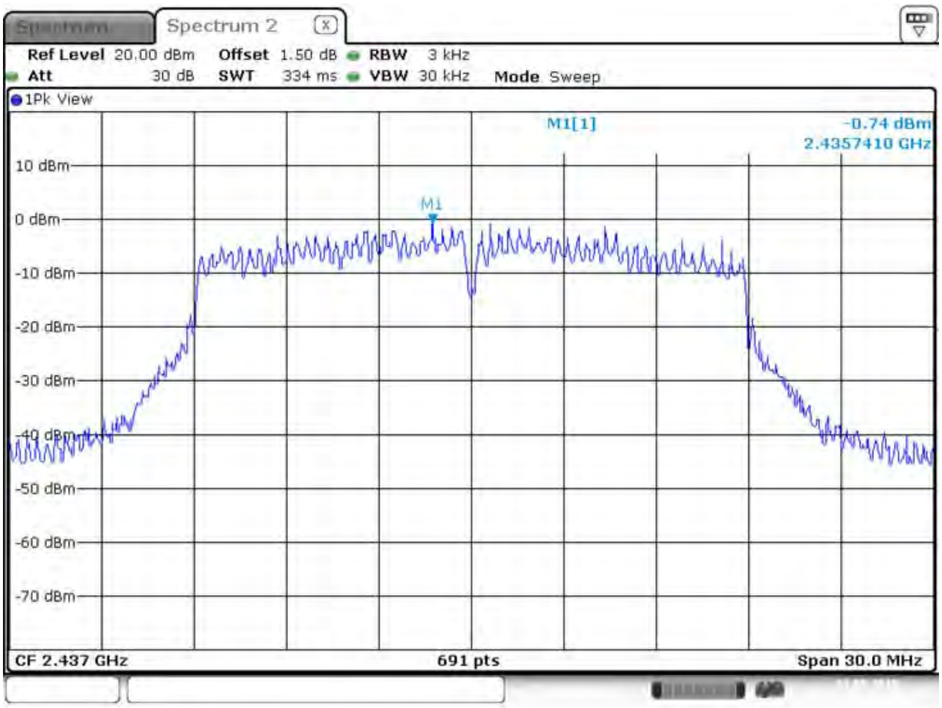
Date: 21.MAY.2015 02:10:05

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



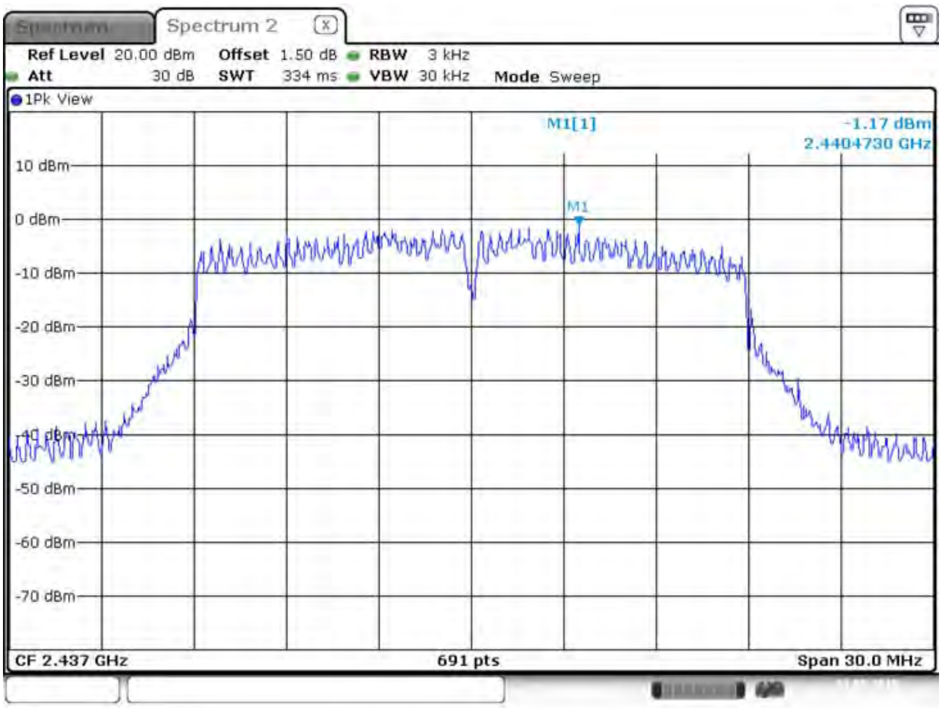
Date: 21.MAY.2015 02:10:36

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



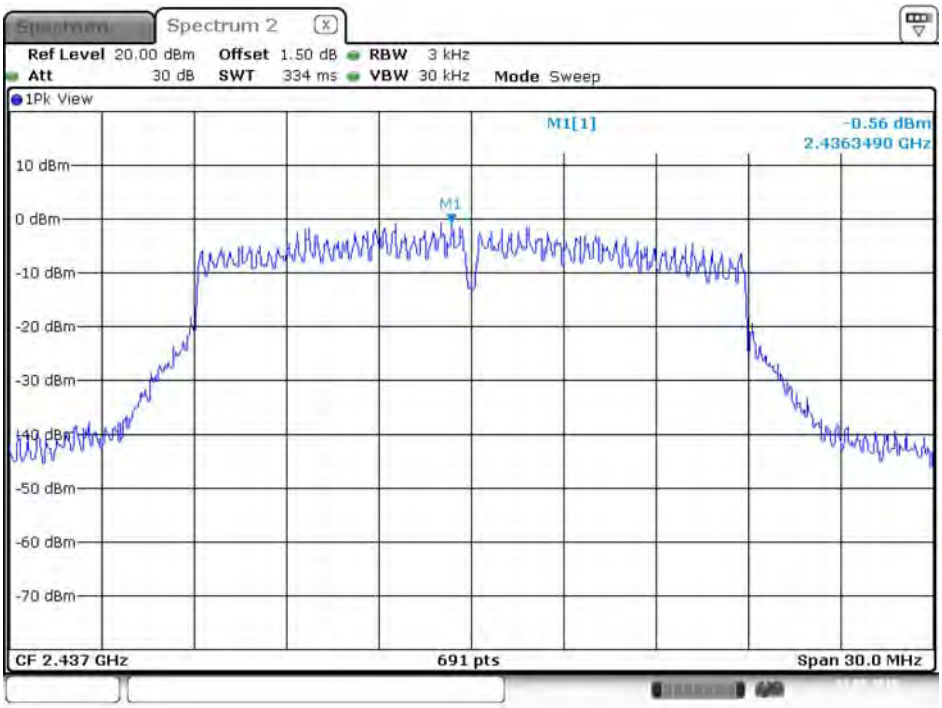
Date: 21.MAY.2015 02:17:19

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



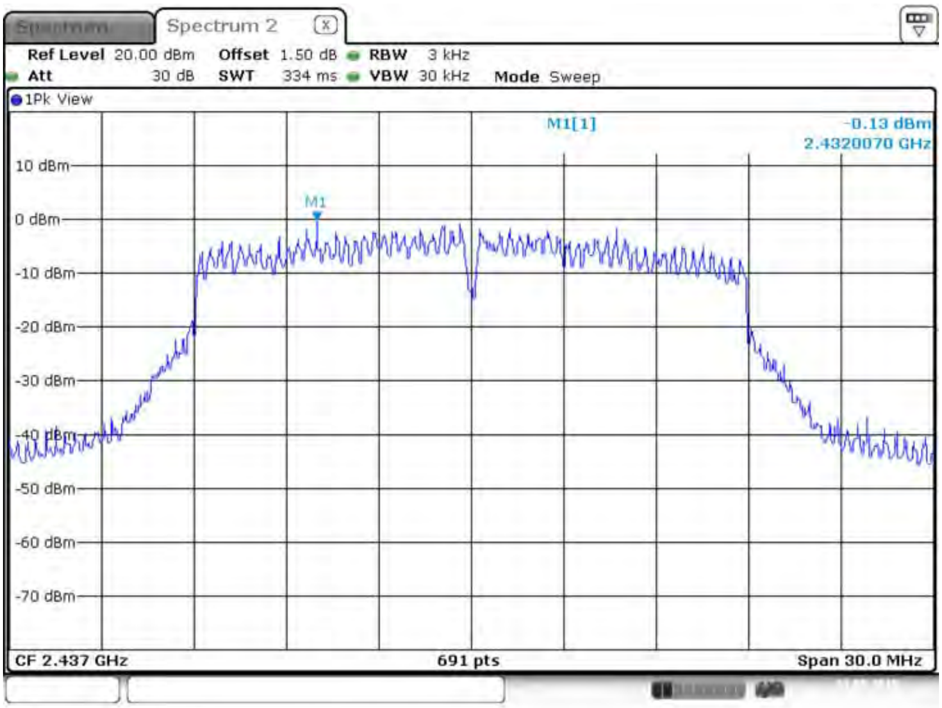
Date: 21.MAY.2015 02:17:45

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



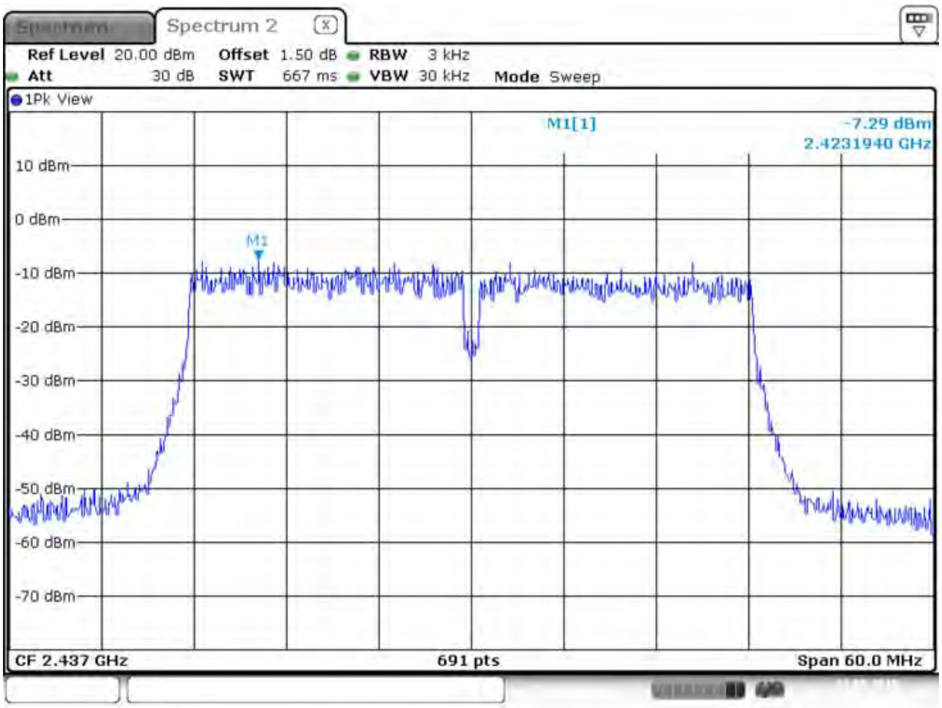
Date: 21.MAY.2015 02:18:09

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



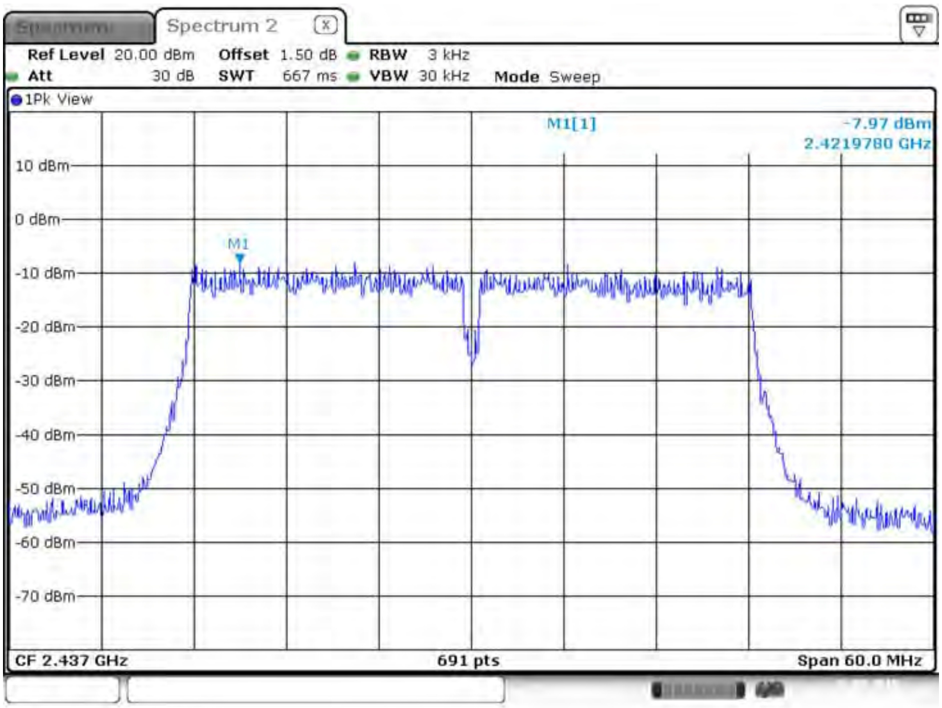
Date: 21.MAY.2015 02:18:32

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



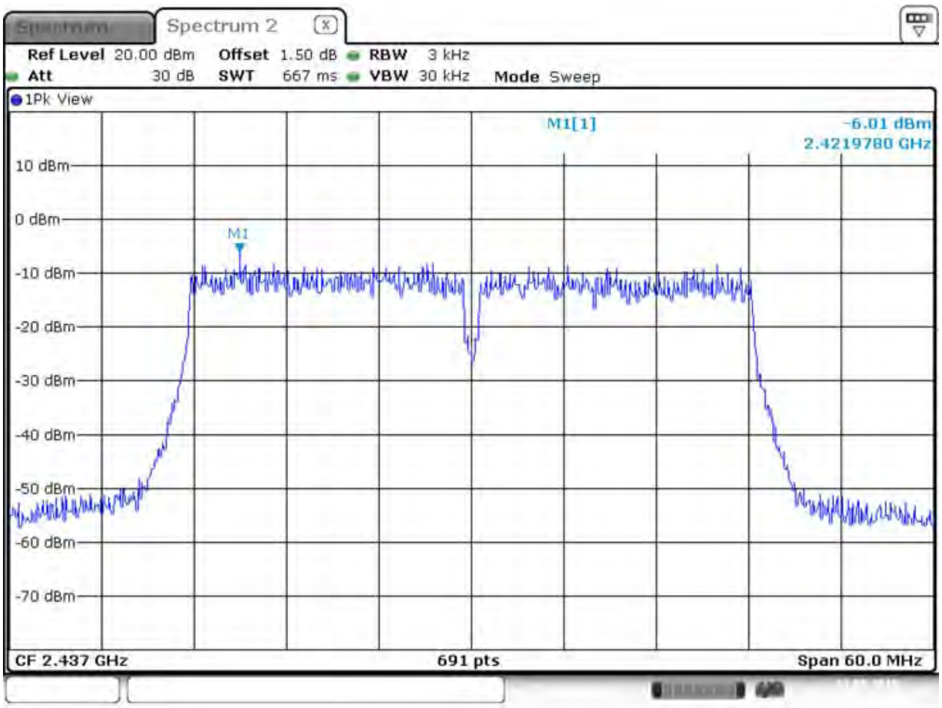
Date: 21.MAY.2015 02:22:36

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



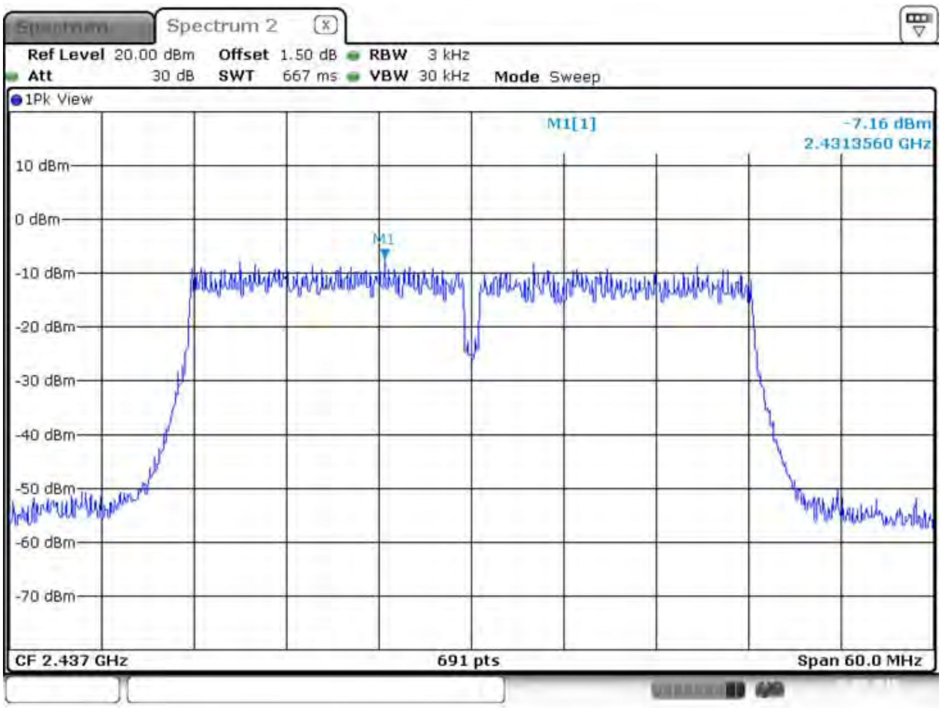
Date: 21.MAY.2015 02:22:53

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



Date: 21.MAY.2015 02:23:12

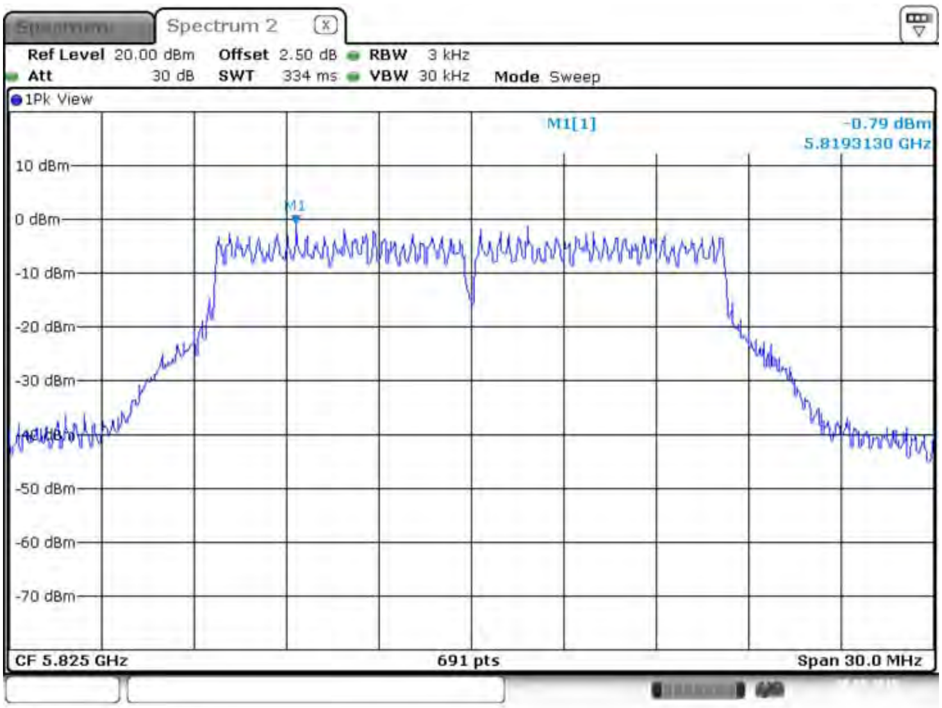
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 4



Date: 21.MAY.2015 02:23:31

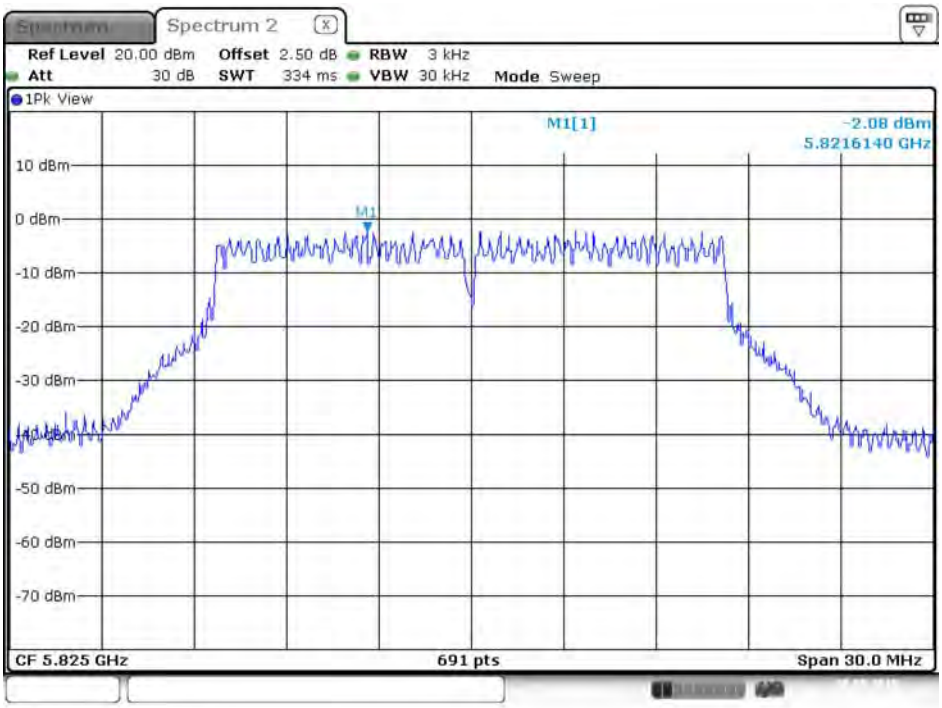
For 5GHz Band

Power Density Plot on Configuration IEEE 802.11a / 5825 MHz / Chain 5



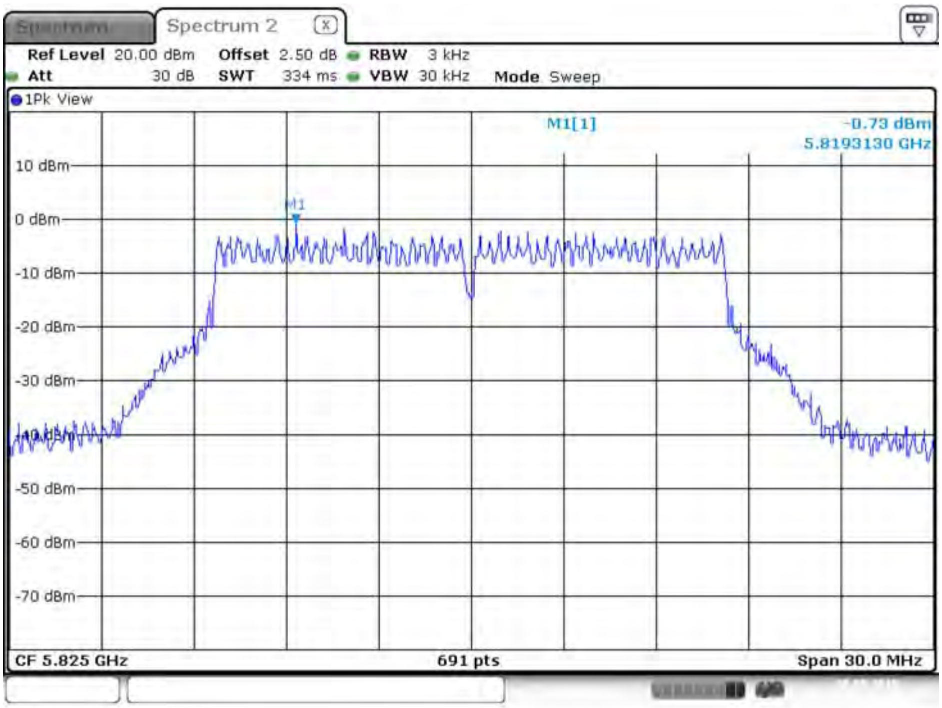
Date: 20.MAY.2015 23:55:09

Power Density Plot on Configuration IEEE 802.11a / 5825 MHz / Chain 6



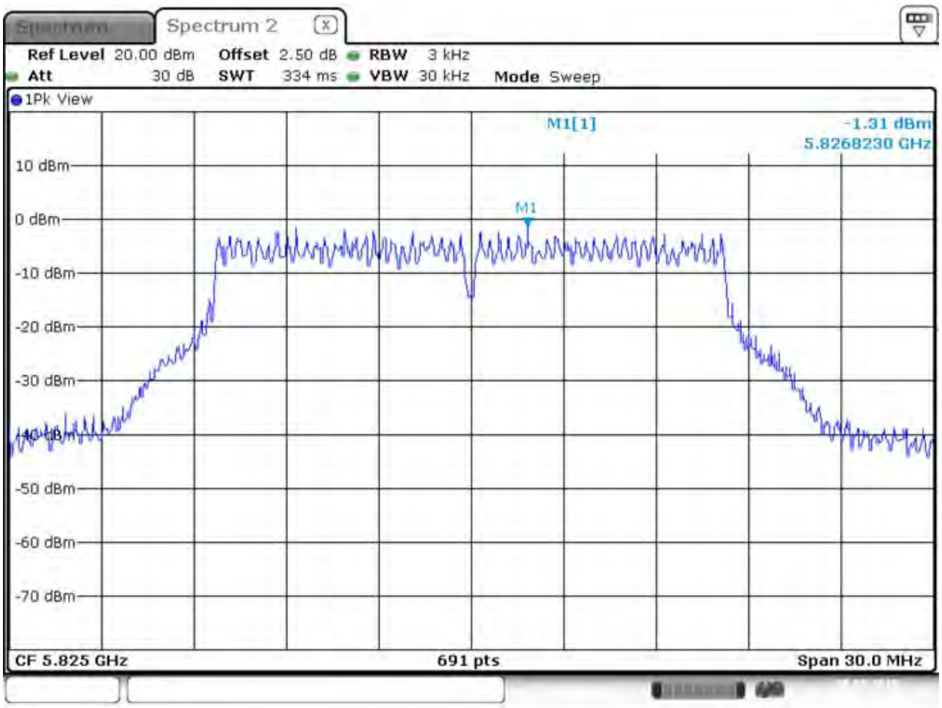
Date: 20.MAY.2015 23:55:29

Power Density Plot on Configuration IEEE 802.11a / 5825 MHz / Chain 7



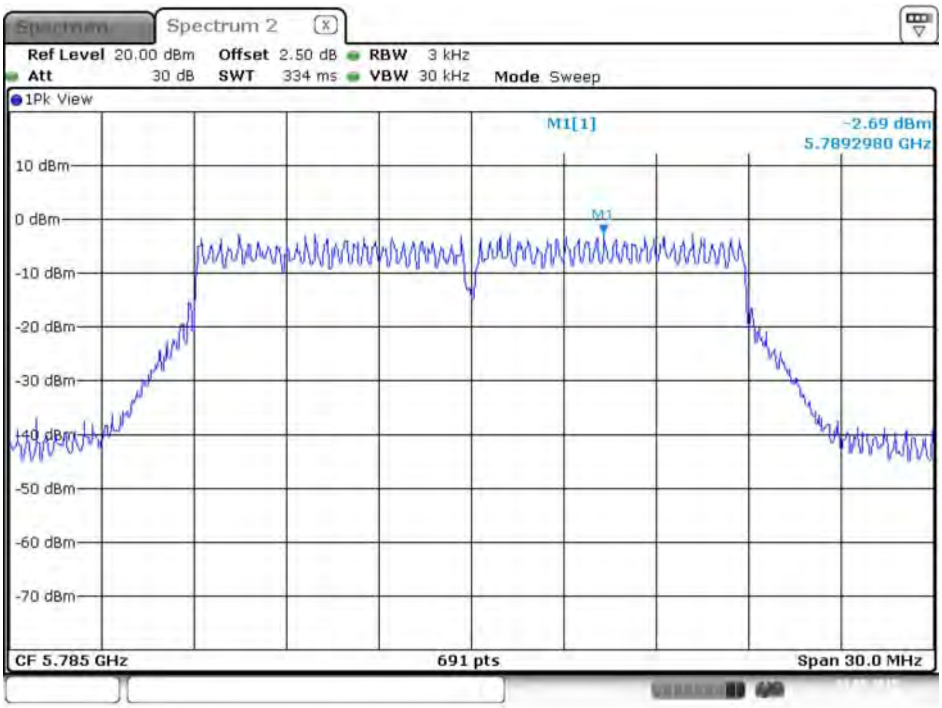
Date: 20.MAY.2015 23:55:48

Power Density Plot on Configuration IEEE 802.11a / 5825 MHz / Chain 8



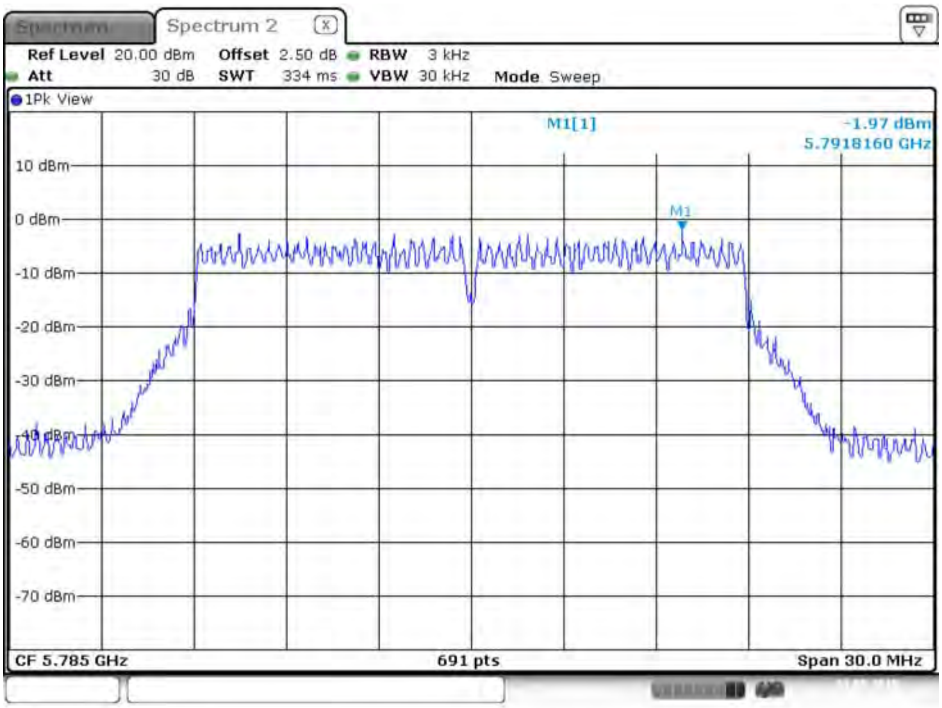
Date: 20.MAY.2015 23:56:13

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5785 MHz / Chain 5



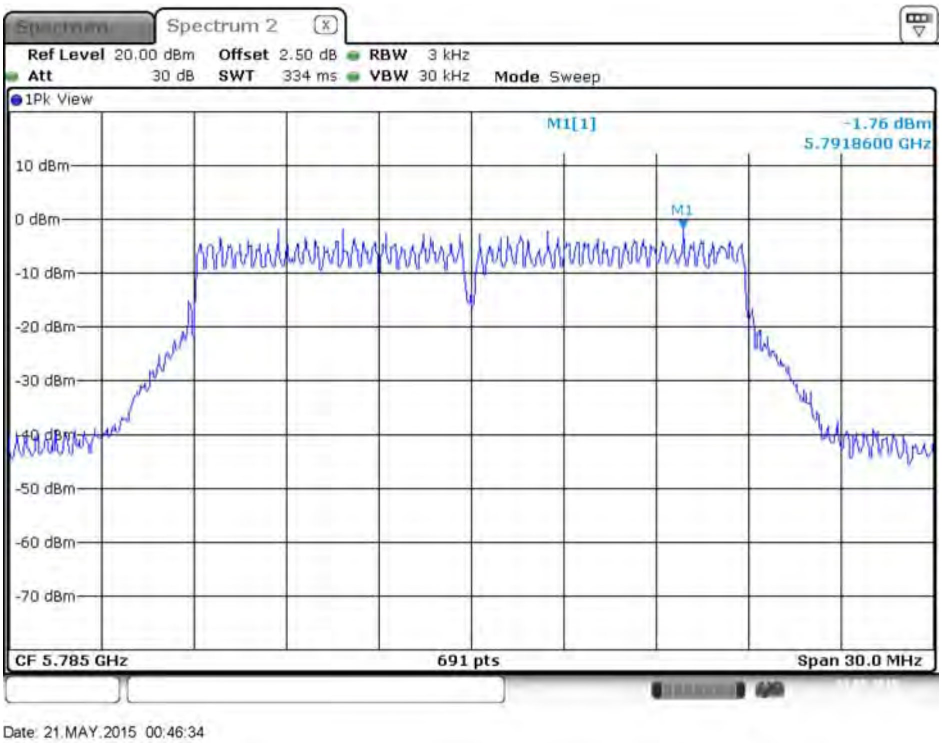
Date: 21.MAY.2015 00:45:56

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5785 MHz / Chain 6

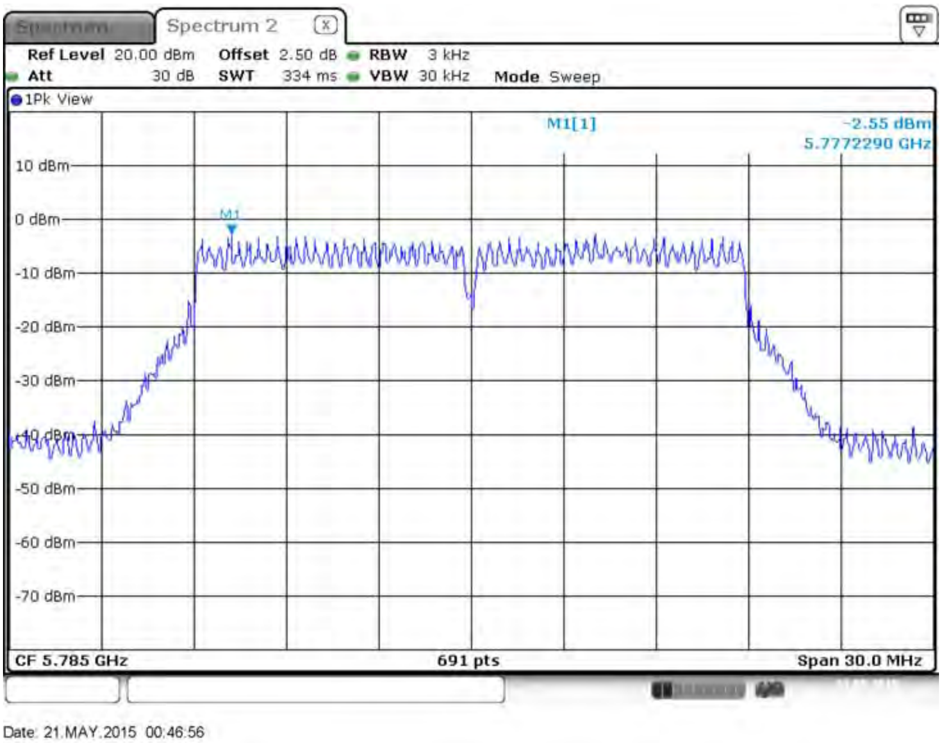


Date: 21.MAY.2015 00:46:16

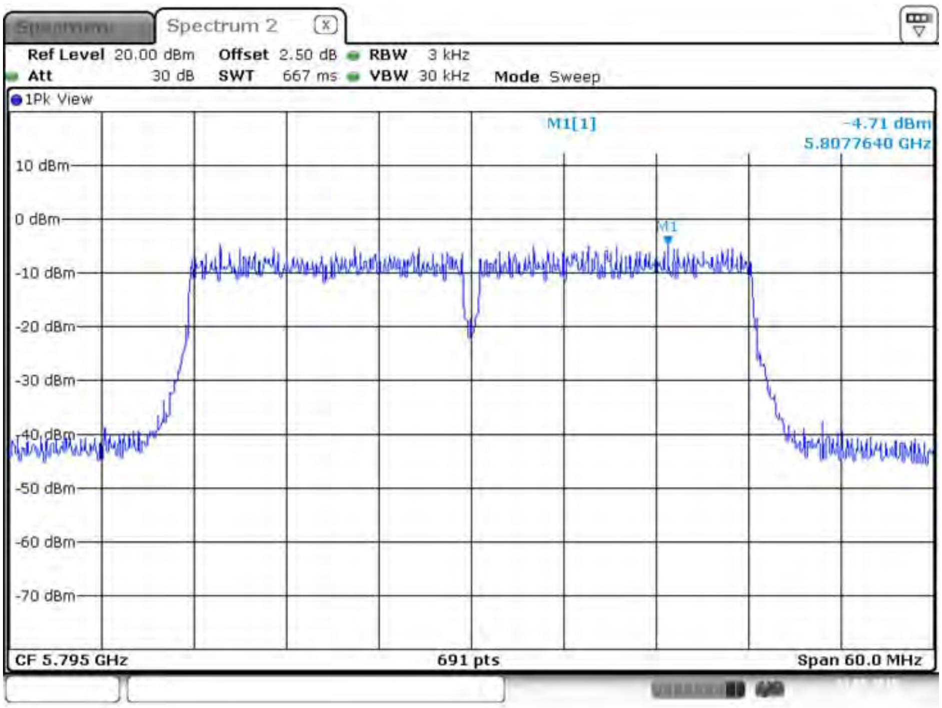
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5785 MHz / Chain 7



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5785 MHz / Chain 8

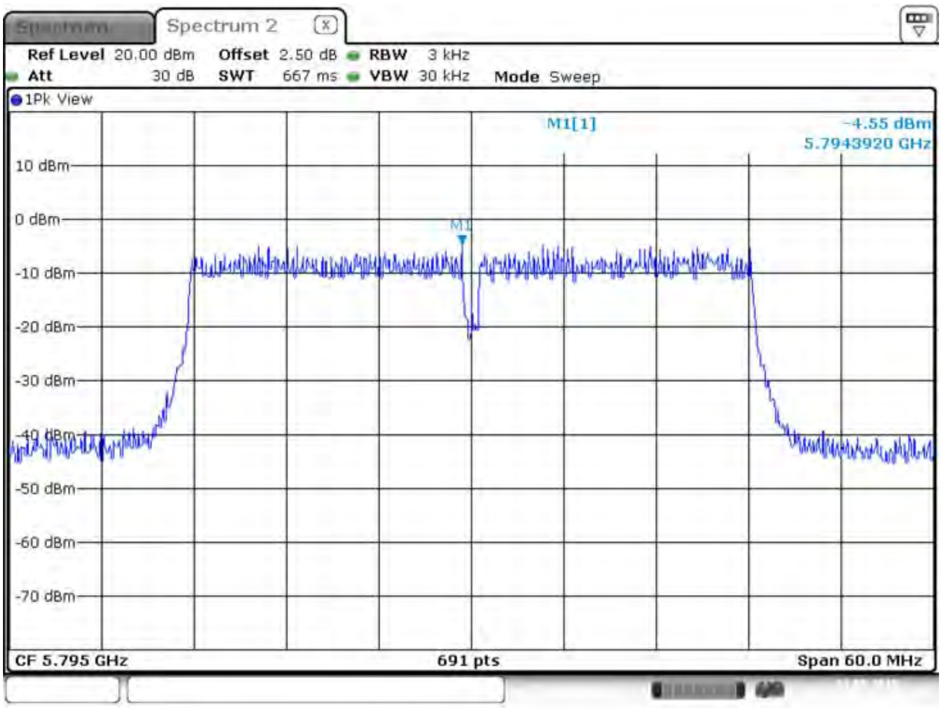


Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 5795 MHz / Chain 5



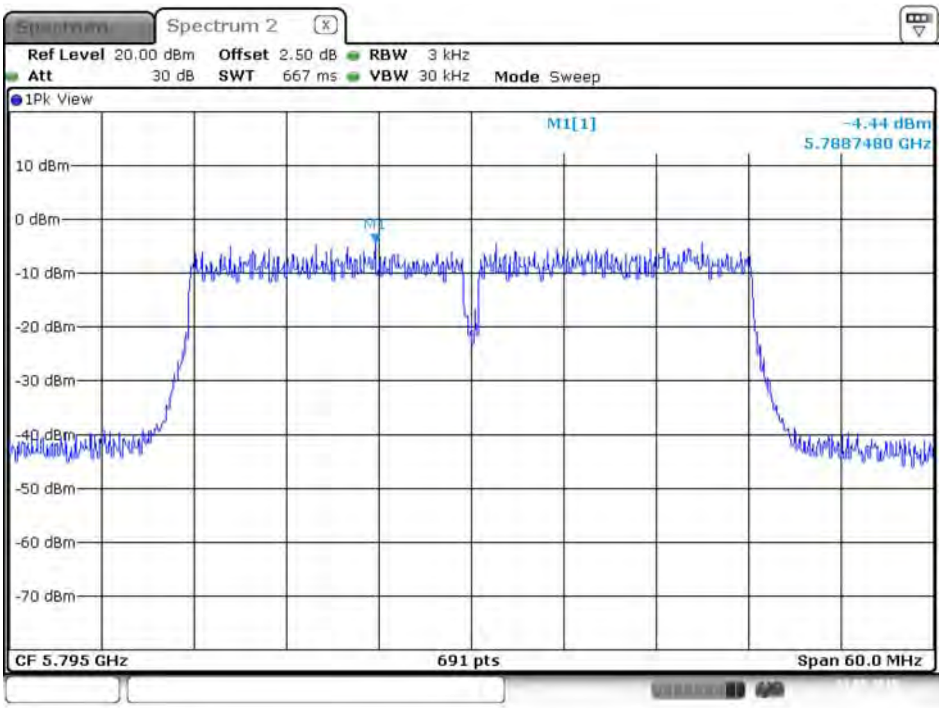
Date: 21.MAY.2015 00:51:10

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 5795 MHz / Chain 6



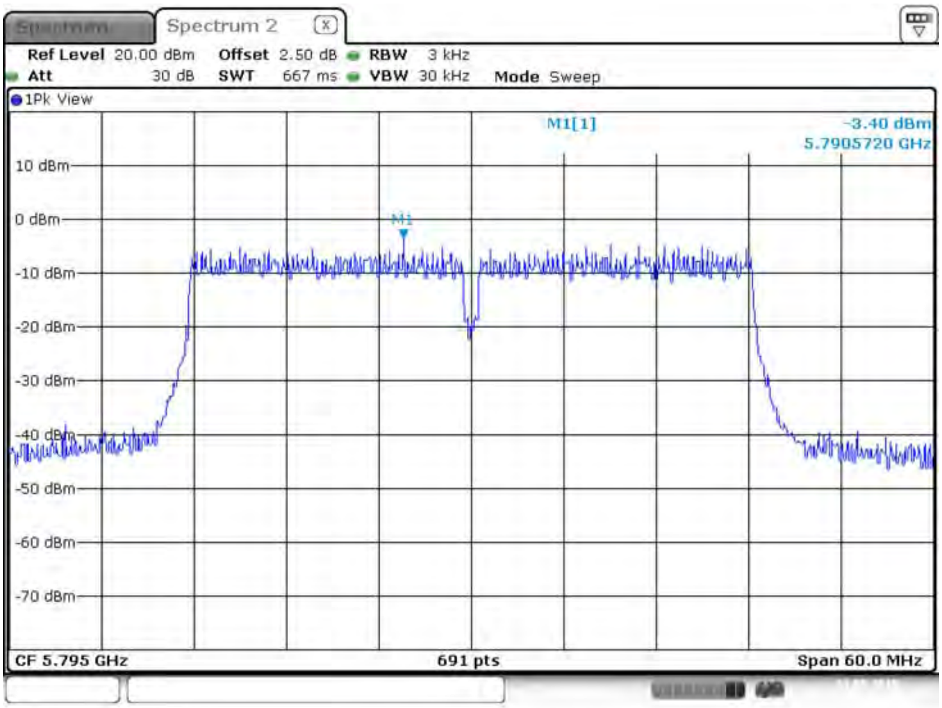
Date: 21.MAY.2015 00:51:28

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 5795 MHz / Chain 7



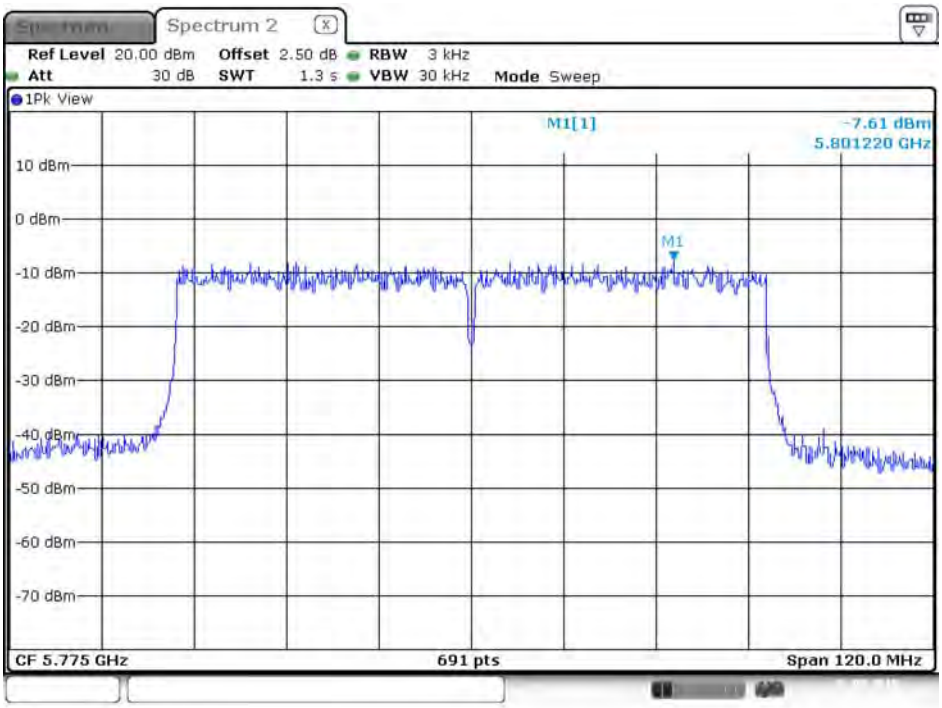
Date: 21.MAY.2015 00:51:54

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 5795 MHz / Chain 8



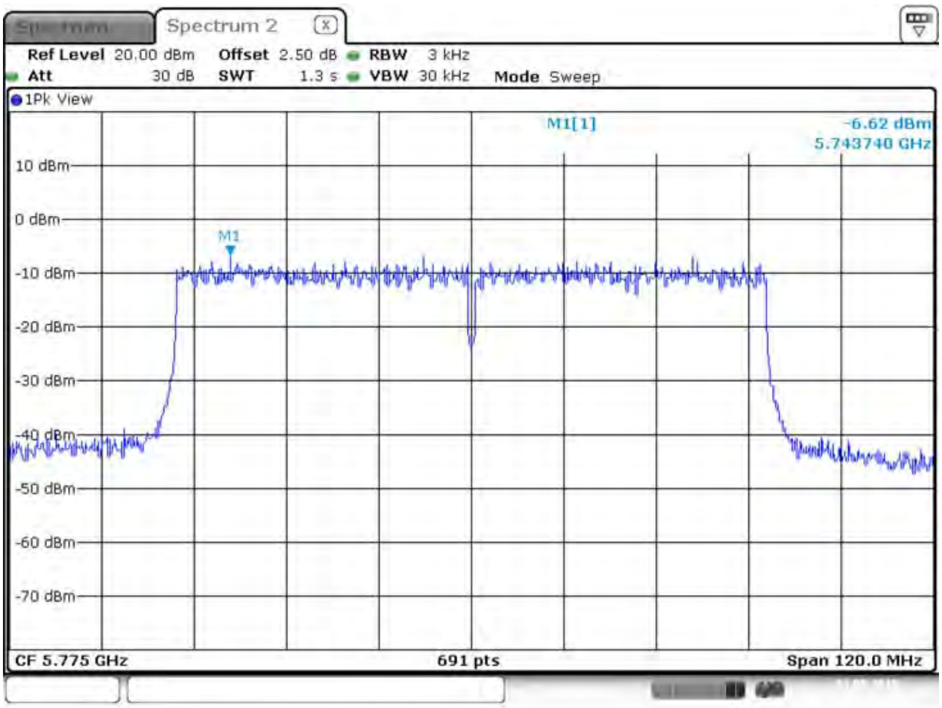
Date: 21.MAY.2015 00:52:14

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / 5775 MHz / Chain 5



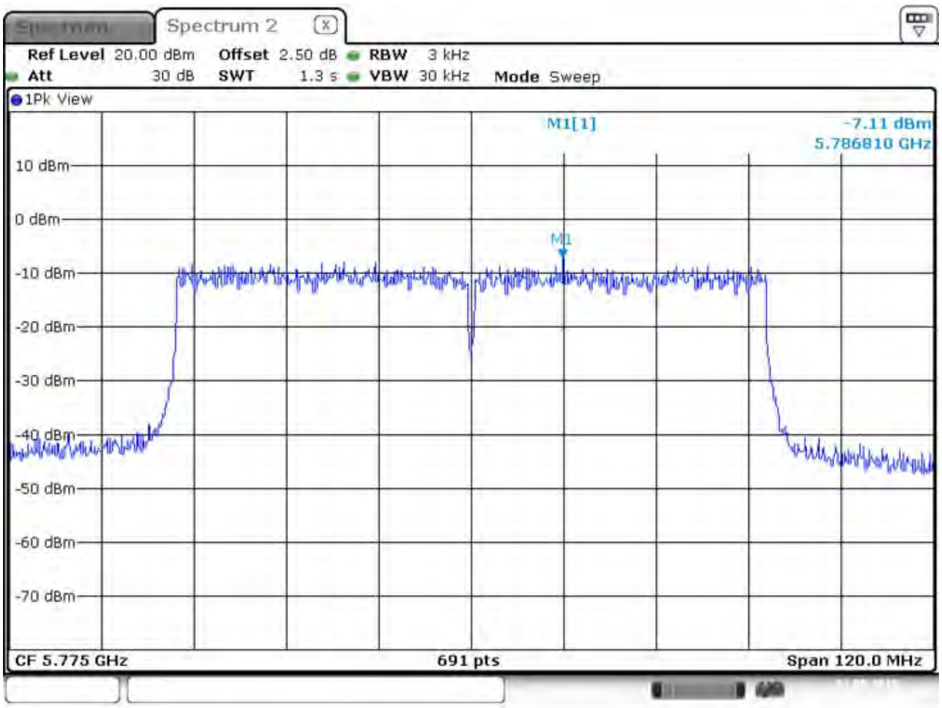
Date: 21.MAY.2015 00:53:09

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / 5775 MHz / Chain 6



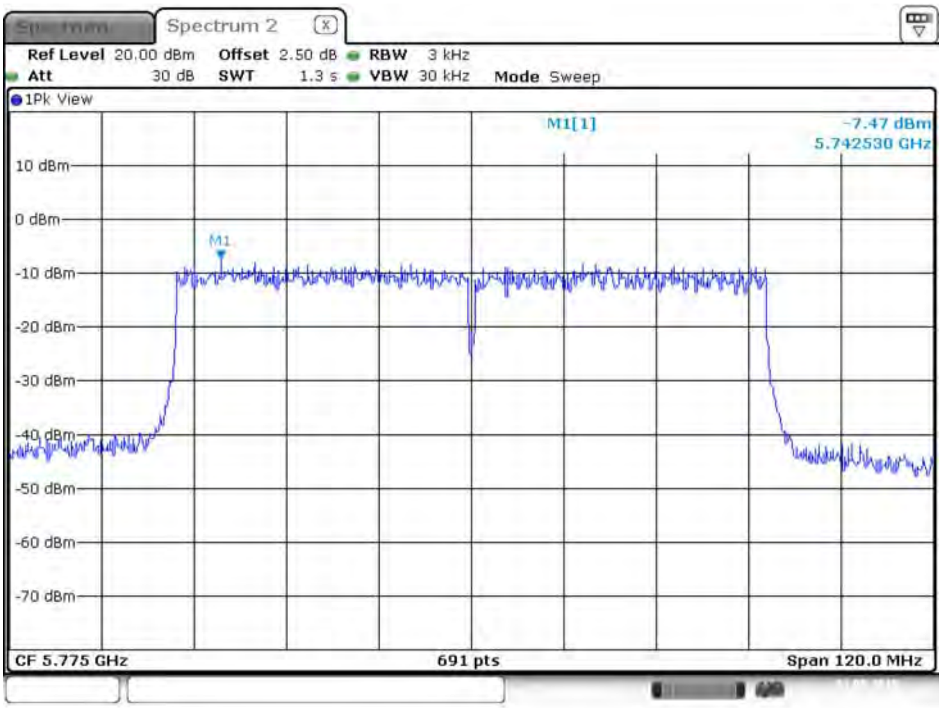
Date: 21.MAY.2015 00:53:50

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / 5775 MHz / Chain 7



Date: 21.MAY.2015 00:54:23

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / 5775 MHz / Chain 8

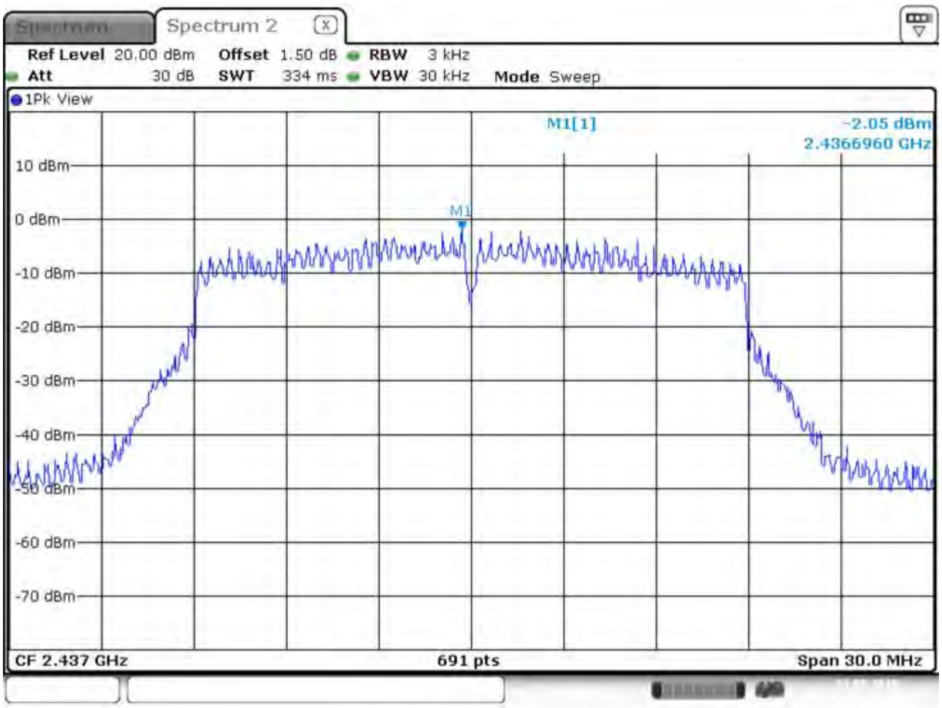


Date: 21.MAY.2015 00:54:58

For beamforming mode

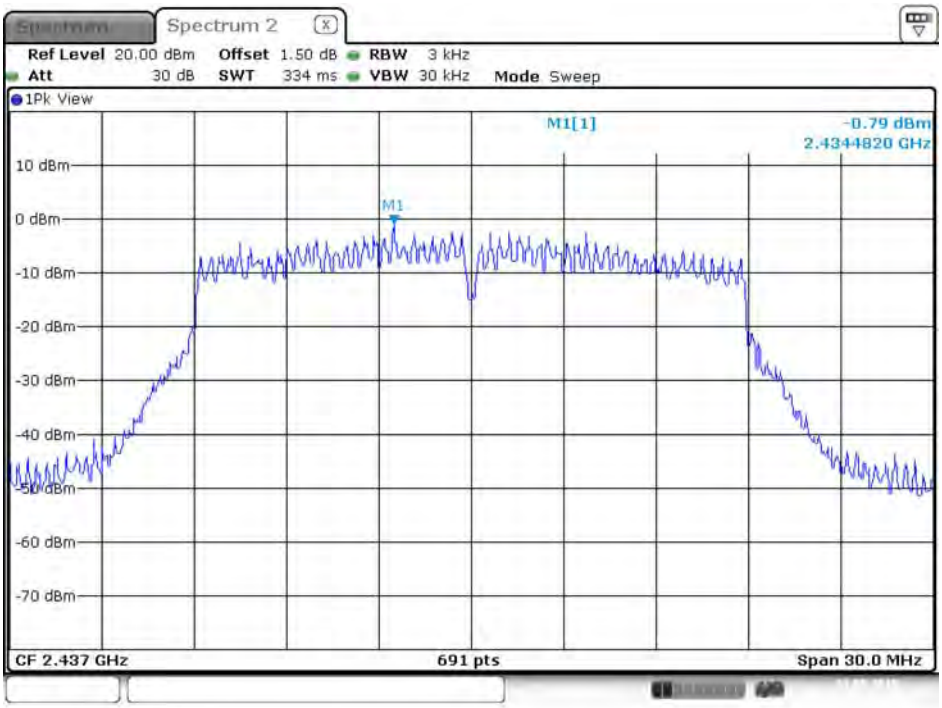
For 2.4GHz Band

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



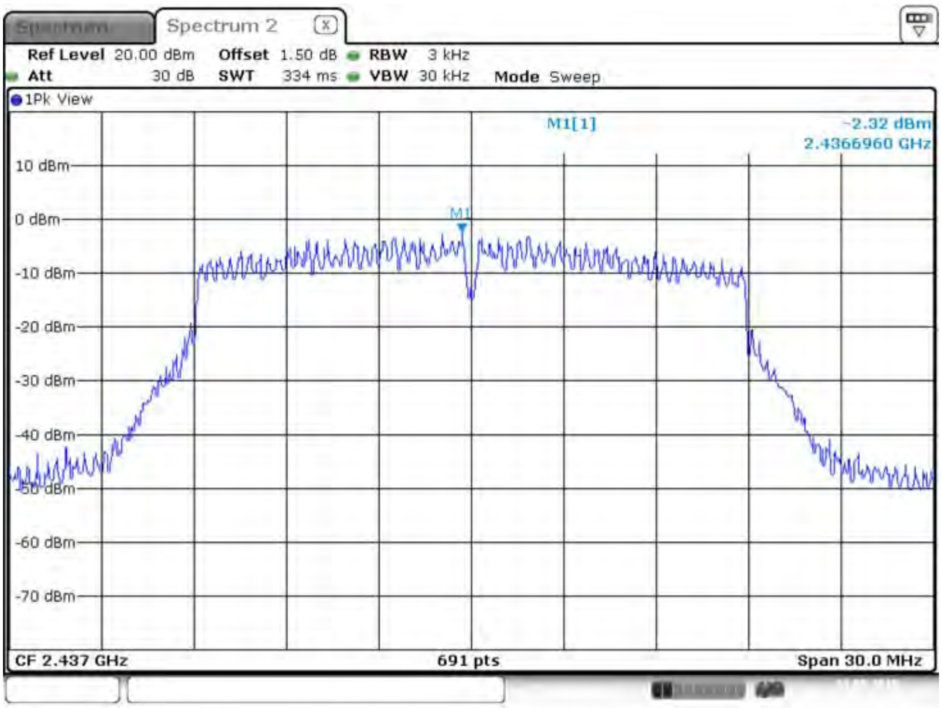
Date: 21.MAY.2015 02:34:39

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



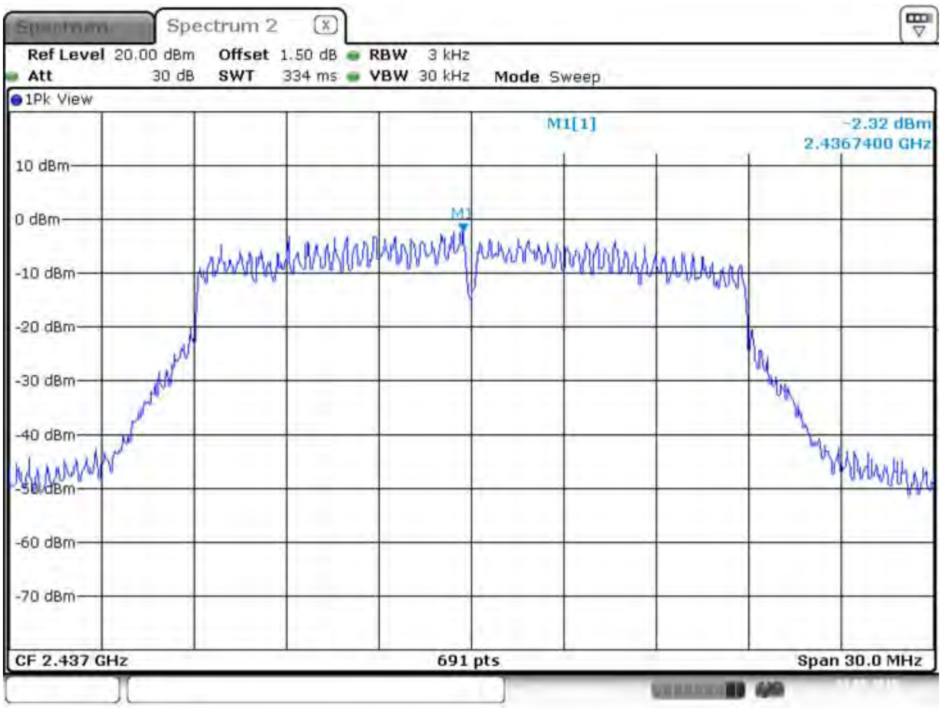
Date: 21.MAY.2015 02:35:01

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



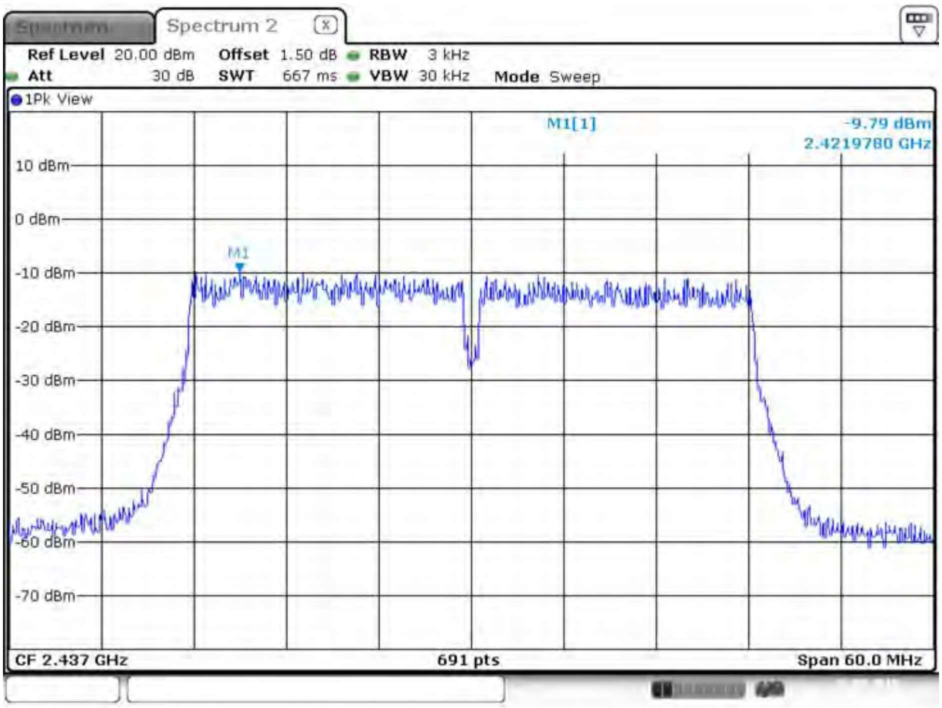
Date: 21.MAY.2015 02:35:22

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



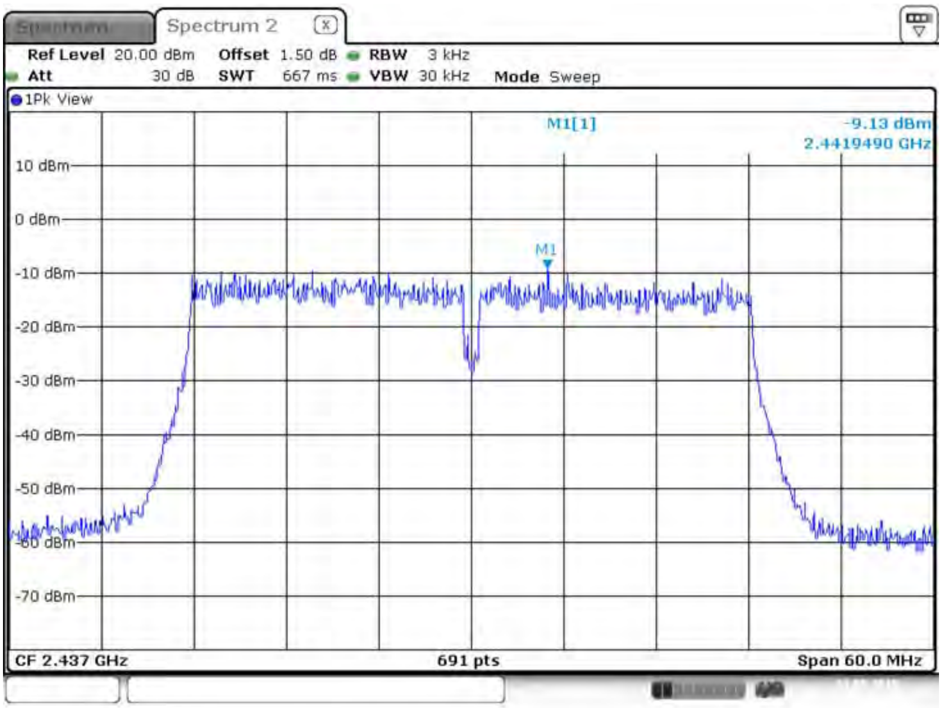
Date: 21.MAY.2015 02:35:40

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



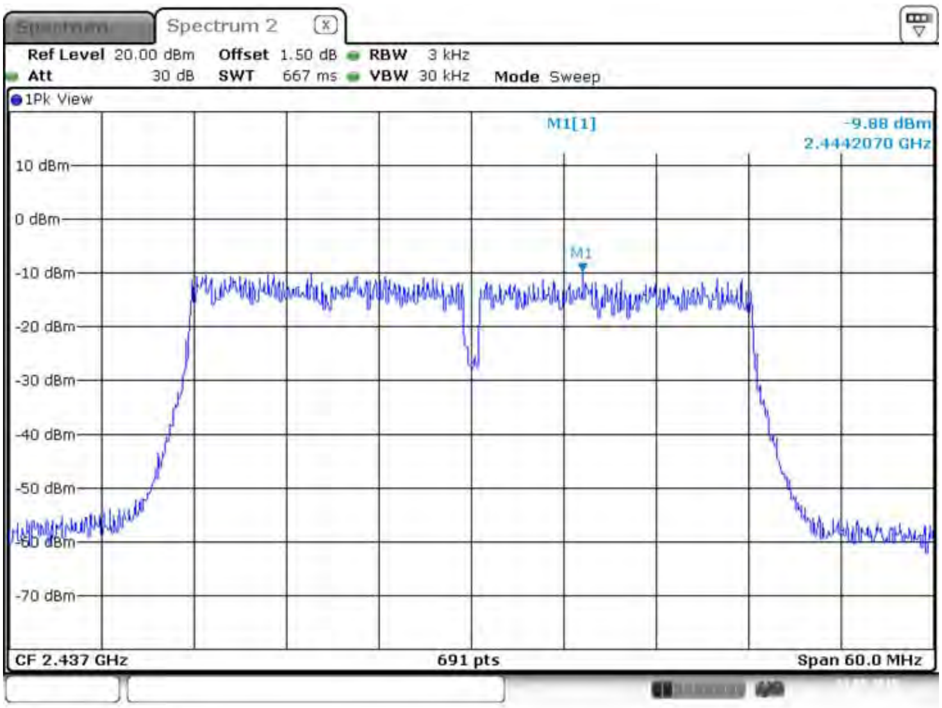
Date: 21.MAY.2015 02:40:29

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



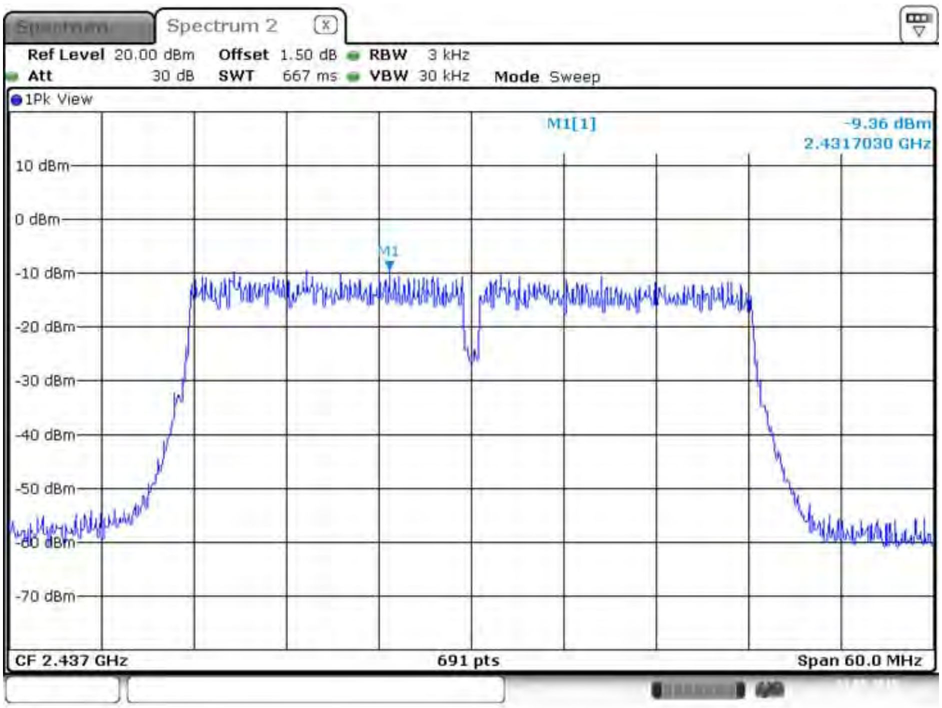
Date: 21.MAY.2015 02:40:59

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



Date: 21.MAY.2015 02:41:16

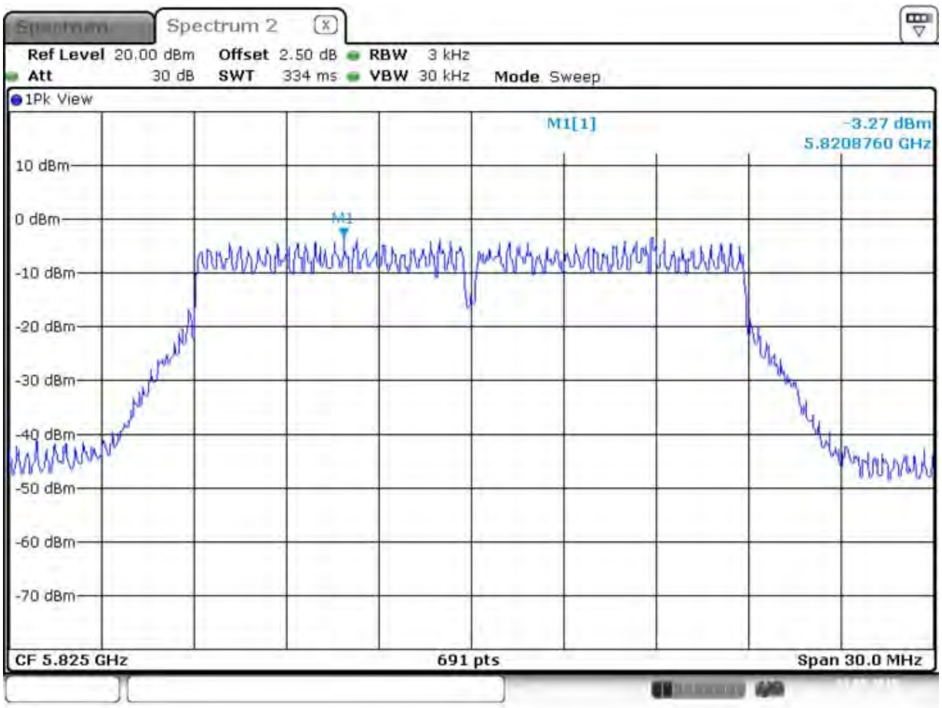
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 4



Date: 21.MAY.2015 02:41:32

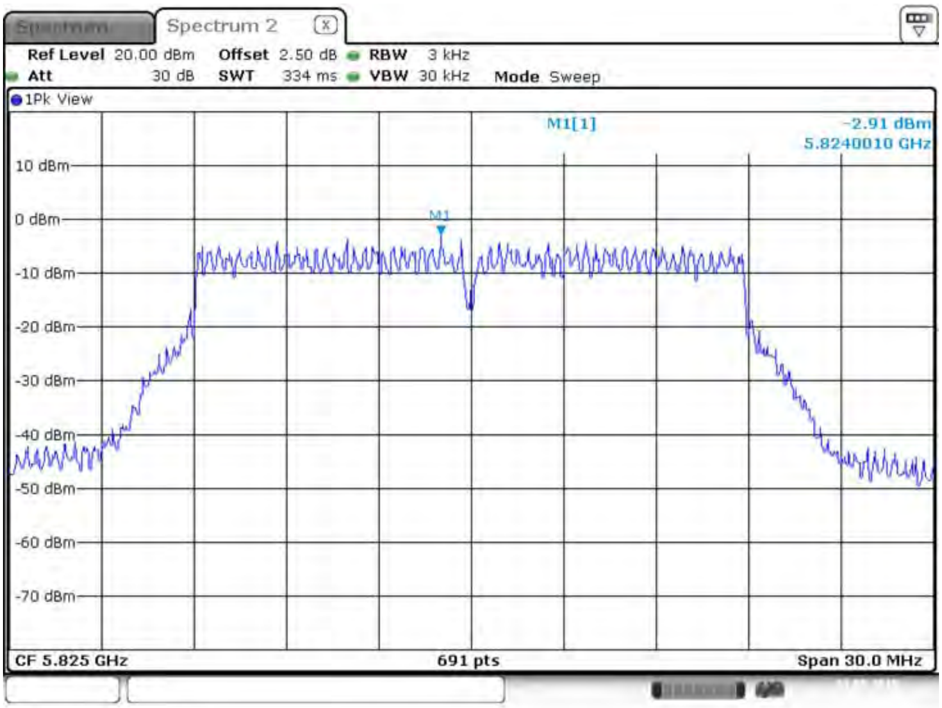
For 5GHz Band

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5825 MHz / Chain 5



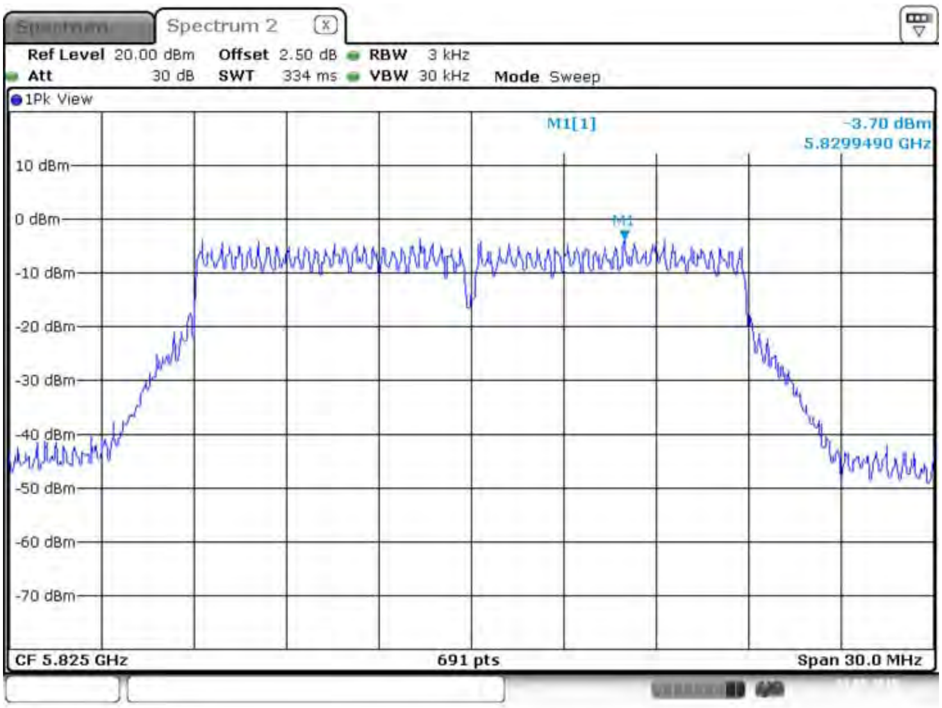
Date: 21.MAY.2015 01:39:14

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5825 MHz / Chain 6



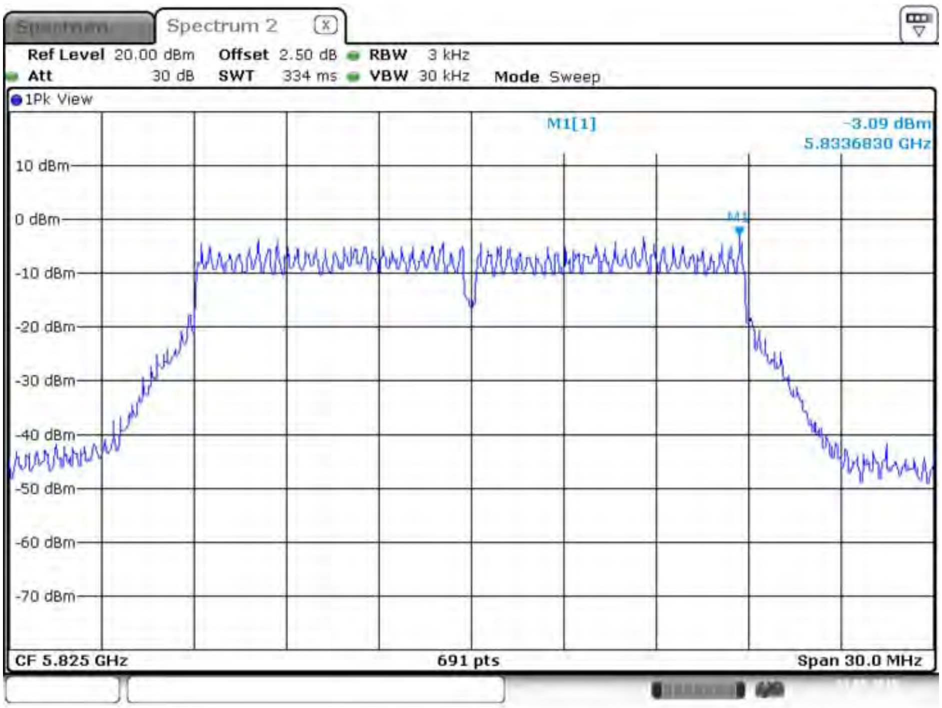
Date: 21.MAY.2015 01:42:07

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5825 MHz / Chain 7



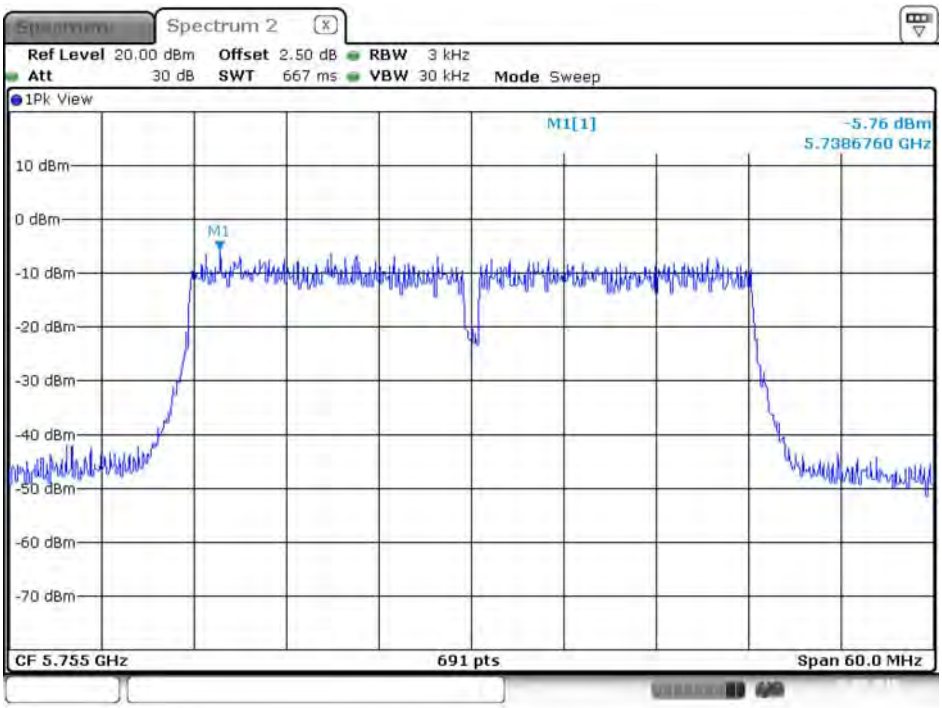
Date: 21.MAY.2015 01:42:23

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5825 MHz / Chain 8



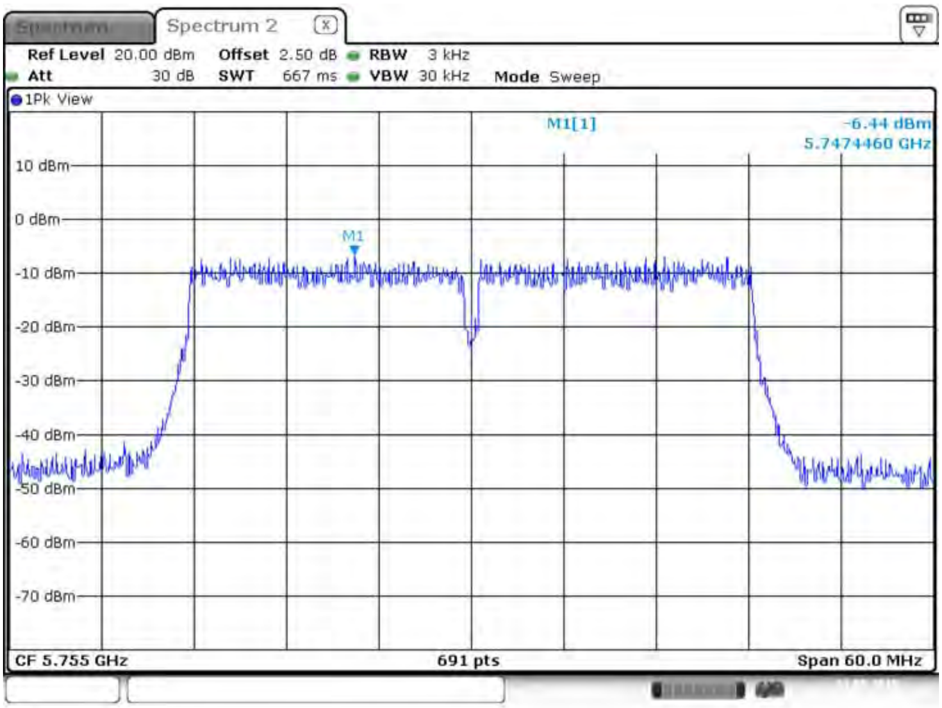
Date: 21.MAY.2015 01:42:41

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 5755 MHz / Chain 5



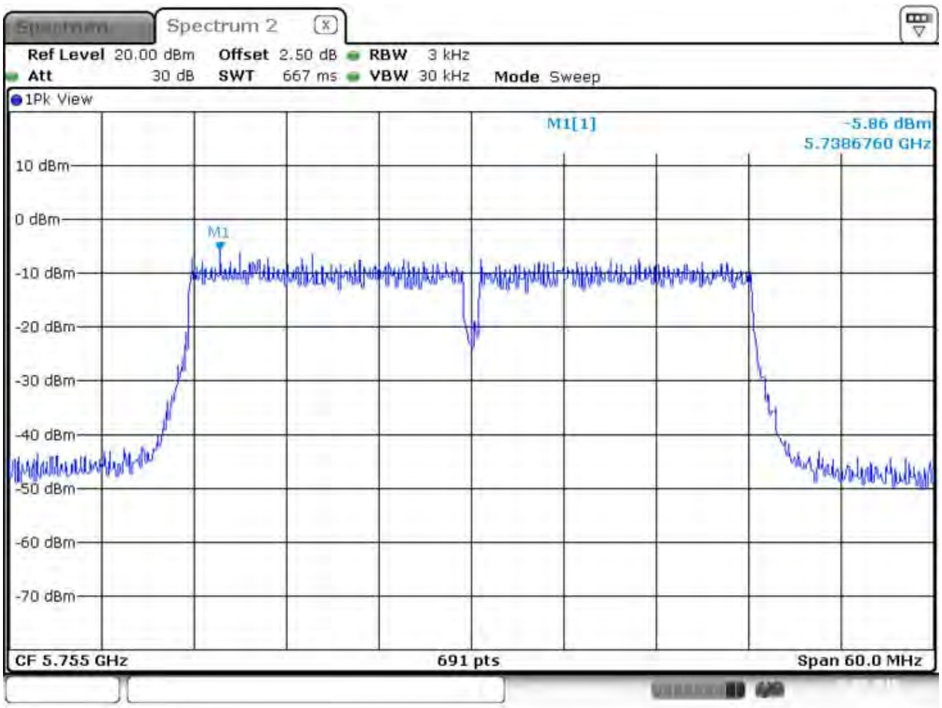
Date: 21.MAY.2015 01:31:46

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 5755 MHz / Chain 6



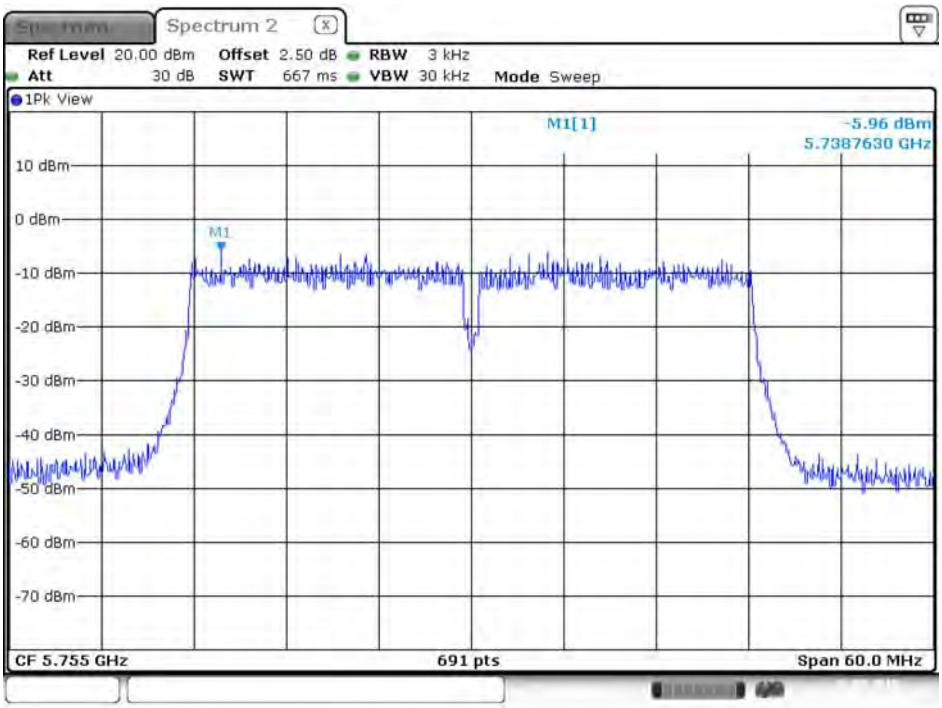
Date: 21.MAY.2015 01:32:09

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 5755 MHz / Chain 7



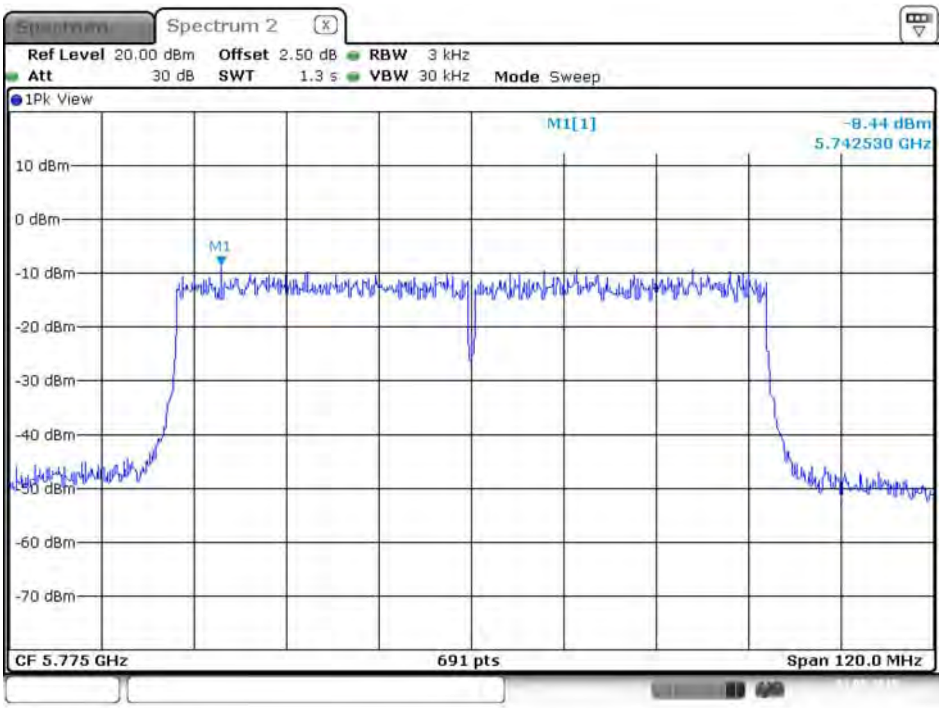
Date: 21.MAY.2015 01:32:31

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 5755 MHz / Chain 8



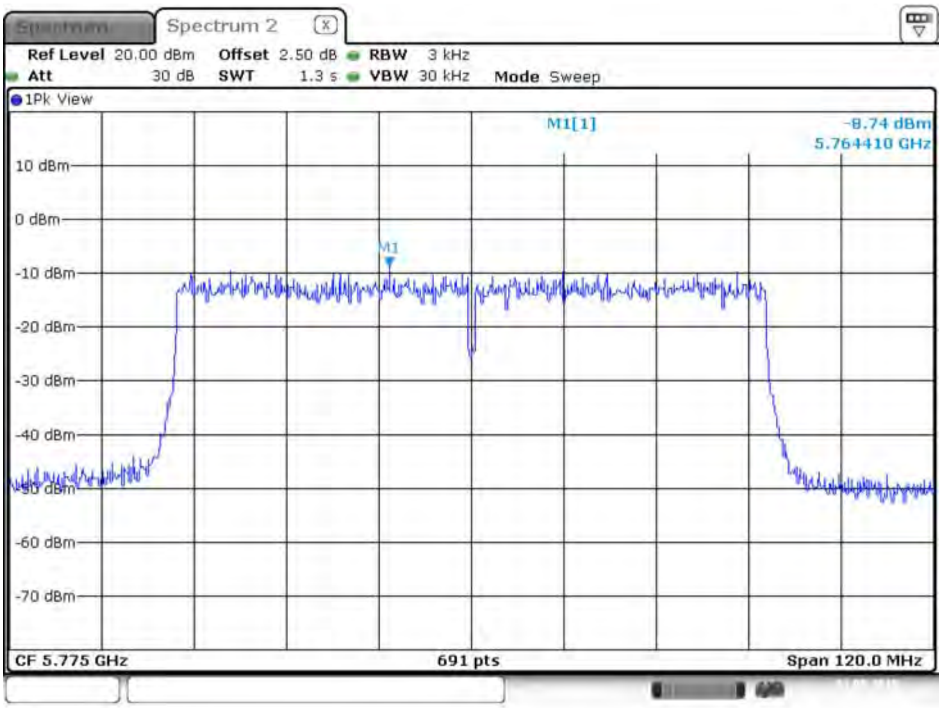
Date: 21.MAY.2015 01:32:47

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / 5775 MHz / Chain 5



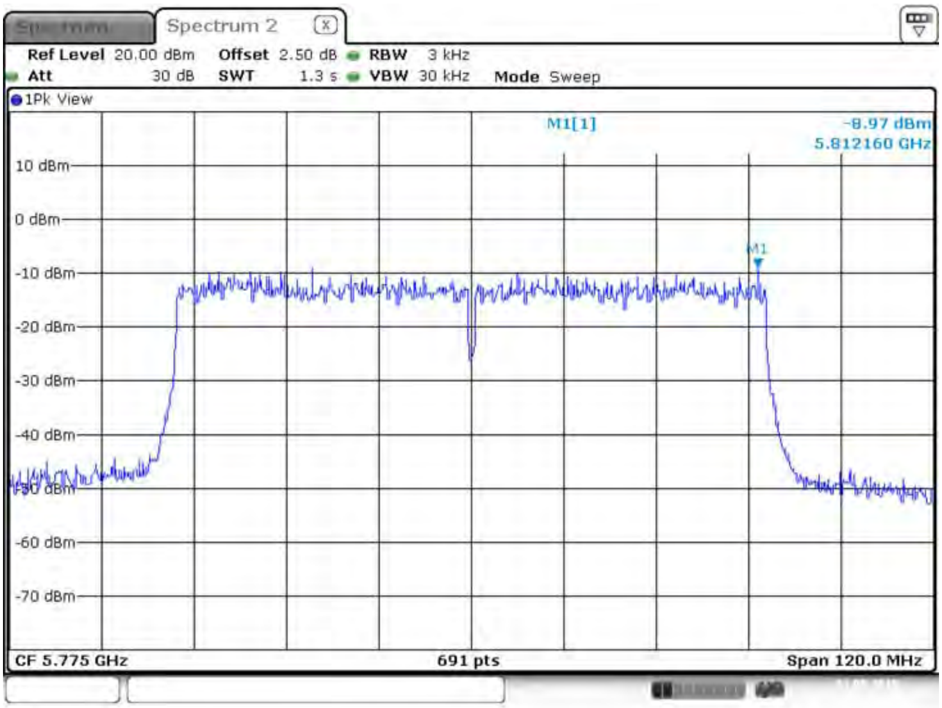
Date: 21.MAY.2015 01:28:01

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / 5775 MHz / Chain 6



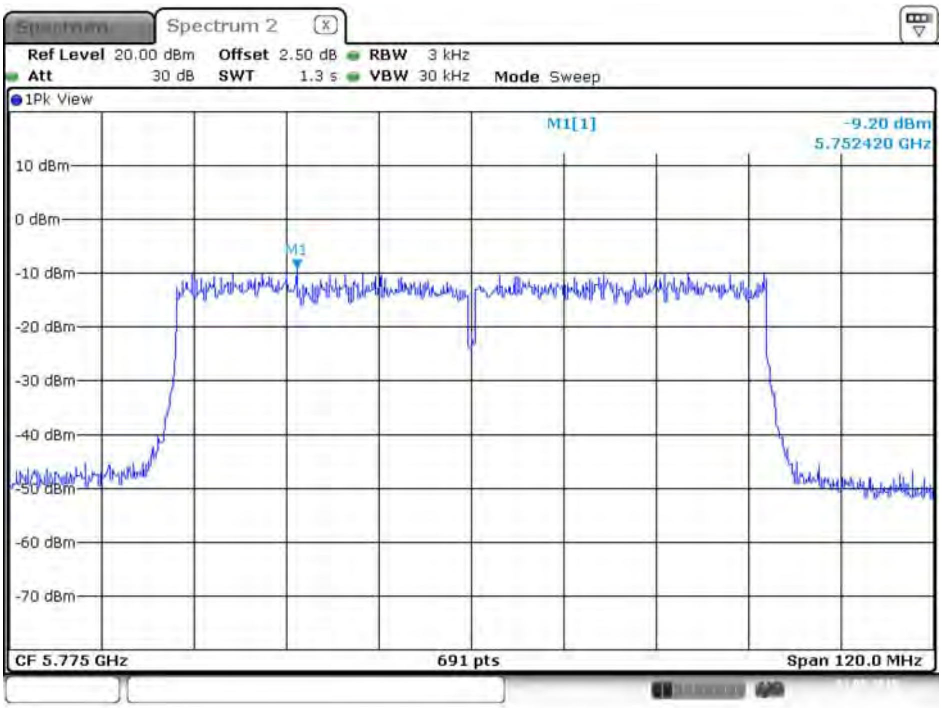
Date: 21.MAY.2015 01:29:04

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / 5775 MHz / Chain 7



Date: 21.MAY.2015 01:29:36

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / 5775 MHz / Chain 8



Date: 21.MAY.2015 01:30:09

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 KDB 558074 D01 v03r02 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°C	Humidity	45%
Test Engineer	Magic Lai		

For non-beamforming mode

For 2.4GHz Band

Mode	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11b	2412 MHz	8.00	10.56	500	Complies
	2437 MHz	7.04	10.56	500	Complies
	2462 MHz	7.04	10.56	500	Complies
802.11g	2412 MHz	3.60	15.36	500	Complies
	2437 MHz	11.36	14.76	500	Complies
	2462 MHz	4.80	14.64	500	Complies
802.11ac MCS0/Nss1 VHT20	2412 MHz	15.36	17.40	500	Complies
	2437 MHz	8.00	17.28	500	Complies
	2462 MHz	15.92	17.40	500	Complies
802.11ac MCS0/Nss1 VHT40	2422 MHz	35.20	37.00	500	Complies
	2437 MHz	30.24	37.00	500	Complies
	2452 MHz	32.64	37.00	500	Complies

For 5GHz Band

Mode	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11a	5745 MHz	10.78	15.20	500	Complies
	5785 MHz	10.72	15.72	500	Complies
	5825 MHz	10.72	14.93	500	Complies
802.11ac MCS0/Nss1 VHT20	5745 MHz	15.36	17.37	500	Complies
	5785 MHz	15.42	17.27	500	Complies
	5825 MHz	15.42	17.19	500	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	35.71	36.61	500	Complies
	5795 MHz	34.78	36.32	500	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	75.07	75.83	500	Complies

Temperature	25°C	Humidity	45%
Test Engineer	Magic Lai		

For beamforming mode

For 2.4GHz Band

Mode	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11ac MCS0/Nss1 VHT20	2412 MHz	12.57	17.62	500	Complies
	2437 MHz	12.57	17.62	500	Complies
	2462 MHz	12.57	17.71	500	Complies
802.11ac MCS0/Nss1 VHT40	2422 MHz	35.71	36.61	500	Complies
	2437 MHz	35.71	36.76	500	Complies
	2452 MHz	36.29	36.76	500	Complies

For 5GHz Band

Mode	Frequency	6dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)	Min. Limit (kHz)	Test Result
802.11ac MCS0/Nss1 VHT20	5745 MHz	17.56	18.14	500	Complies
	5785 MHz	17.50	17.97	500	Complies
	5825 MHz	17.50	18.06	500	Complies
802.11ac MCS0/Nss1 VHT40	5755 MHz	36.40	36.90	500	Complies
	5795 MHz	35.94	36.90	500	Complies
802.11ac MCS0/Nss1 VHT80	5775 MHz	75.65	76.12	500	Complies

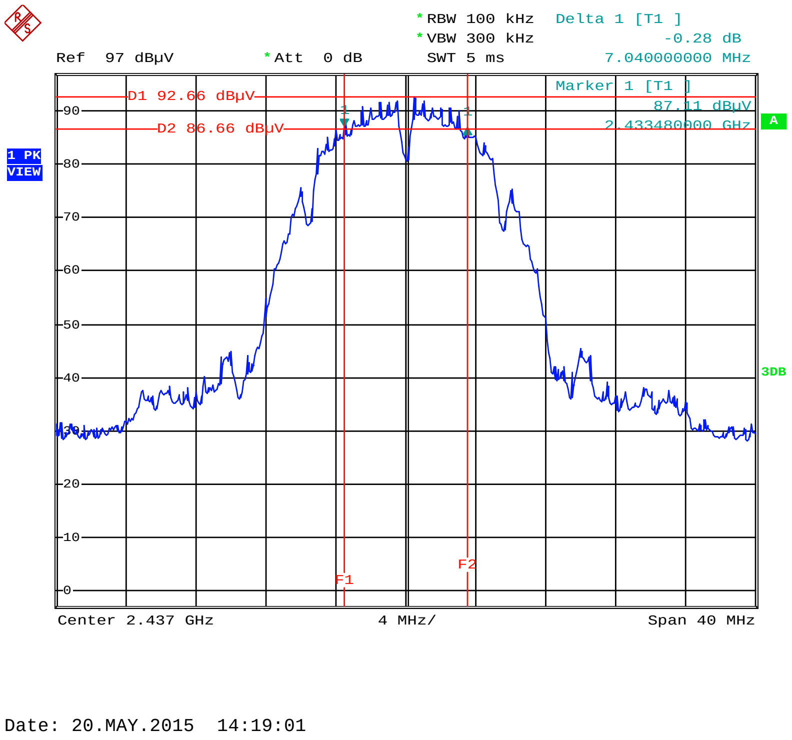
Note: All the test values were listed in the report.

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

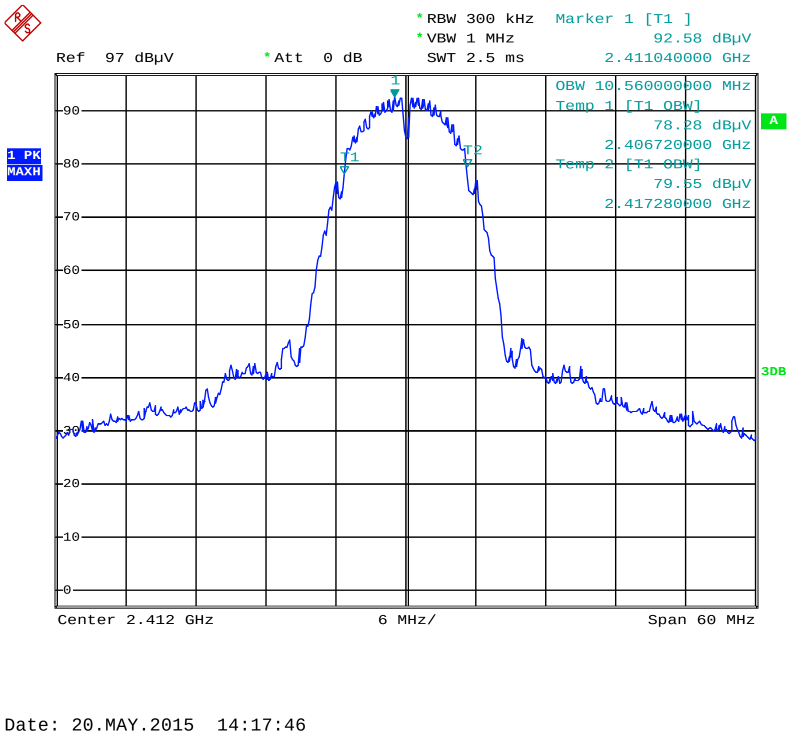
For non-beamforming mode

For 2.4GHz Band

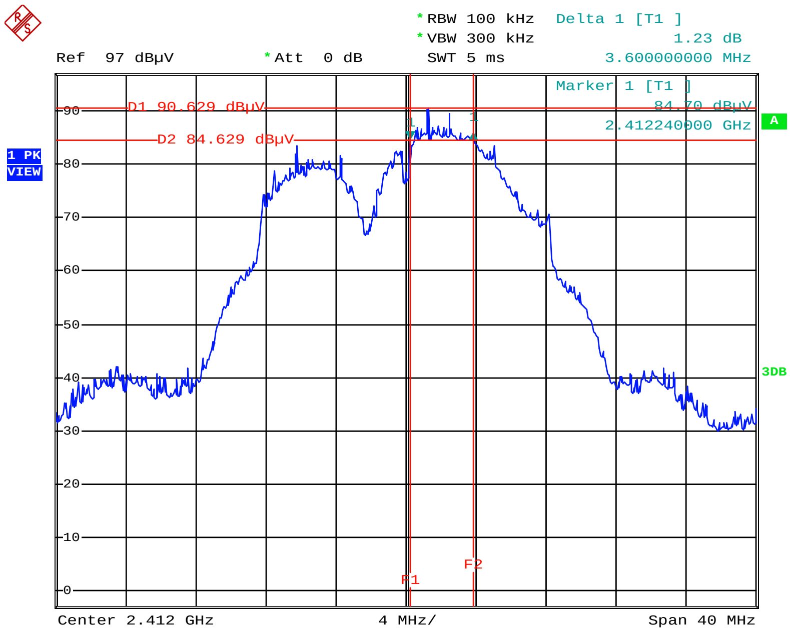
6 dB Bandwidth Plot on Configuration IEEE 802.11b / 2437 MHz / Chain 1 + Chain 2 + Chain 3 + Chain 4



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

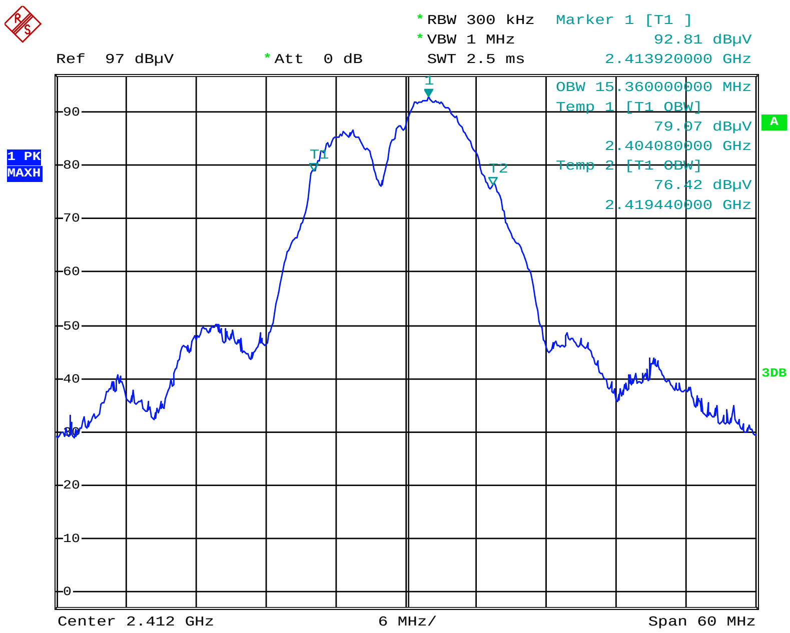


6 dB Bandwidth Plot on Configuration IEEE 802.11g / 2412 MHz / Chain 1 + Chain 2 + Chain 3 + Chain 4



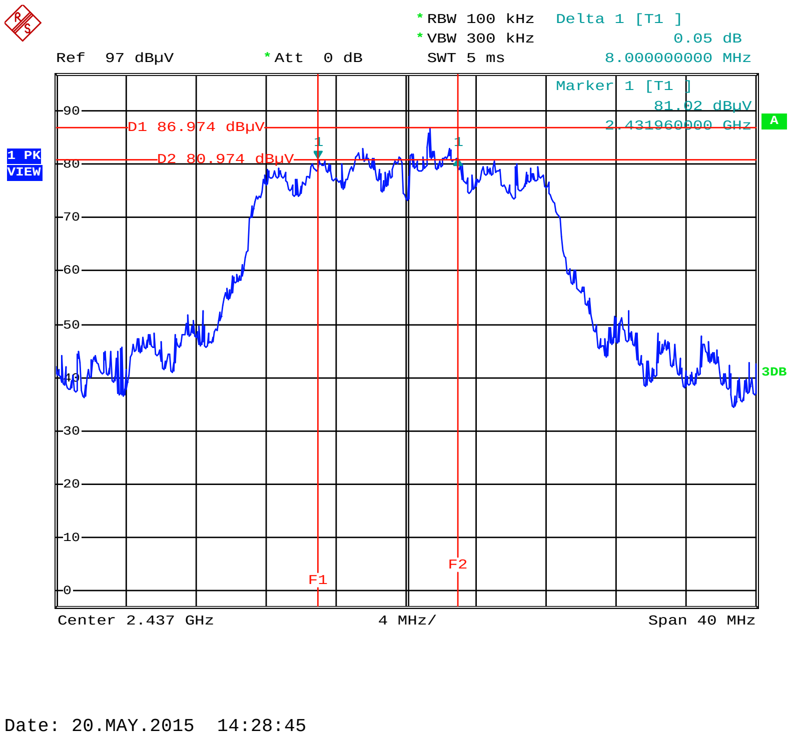
Date: 20.MAY.2015 14:21:38

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

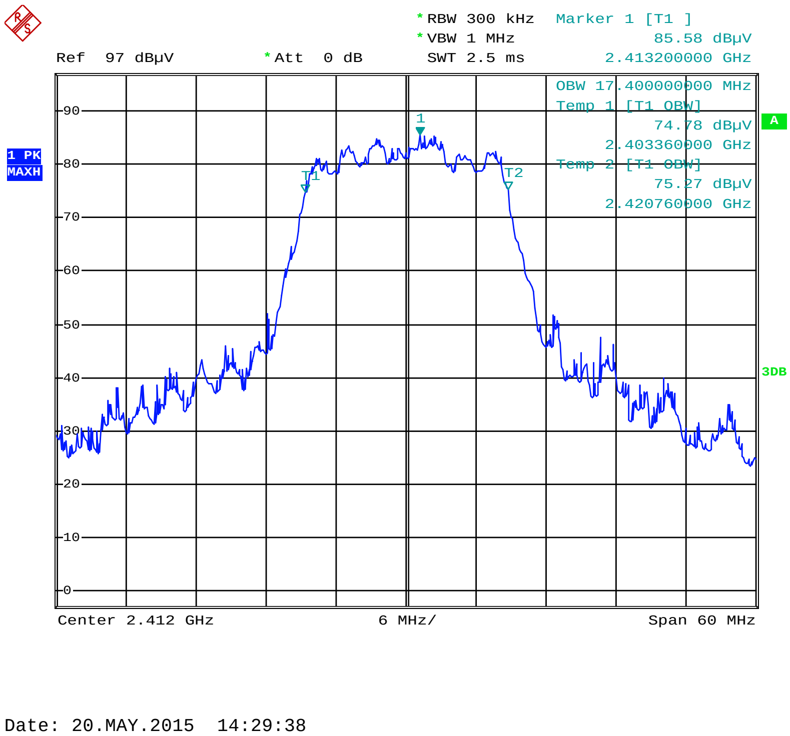


Date: 20.MAY.2015 14:22:14

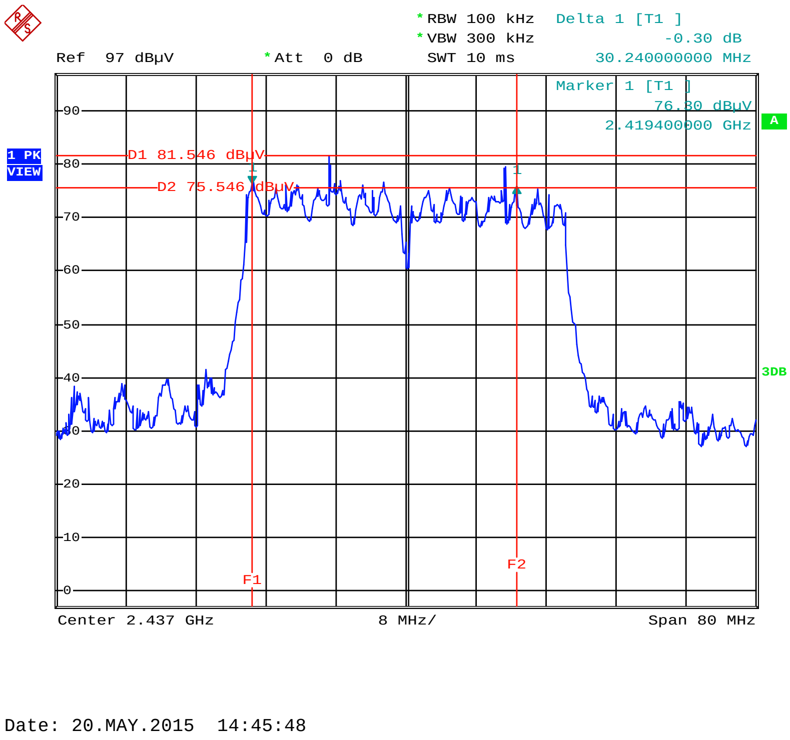
6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2437 MHz / Chain 1 + Chain 2 + Chain 3 + Chain 4



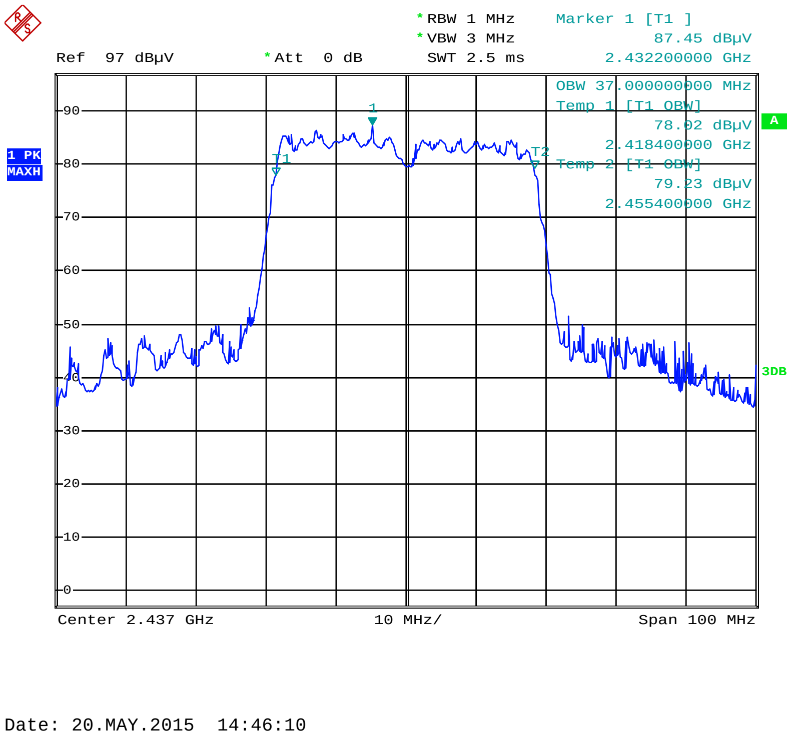
99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2412 MHz / Chain 1 + Chain 2 + Chain 3 + Chain 4



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

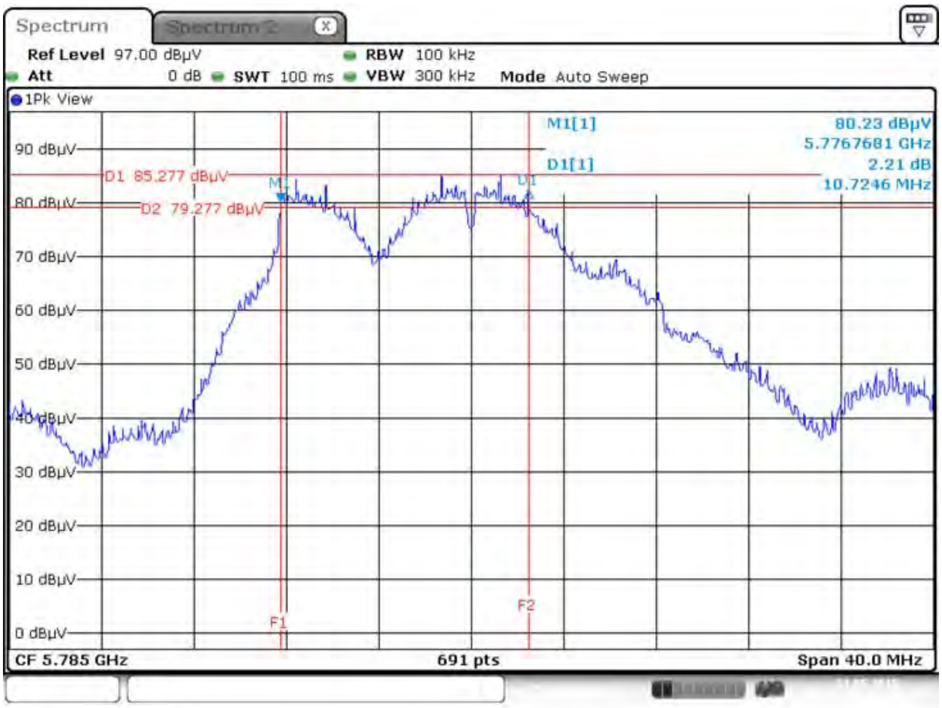


99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 2437 MHz / Chain 1 + Chain 2 + Chain 3 + Chain 4



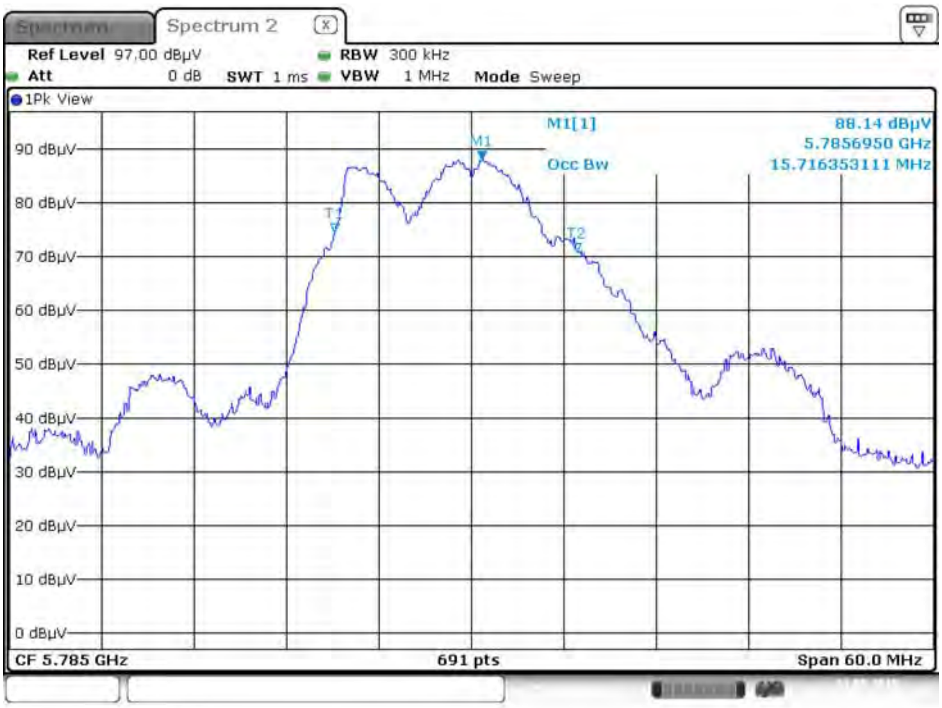
For 5GHz Band

6 dB Bandwidth Plot on Configuration IEEE 802.11a / 5785 MHz / Chain 5 + Chain 6 + Chain 7 + Chain 8



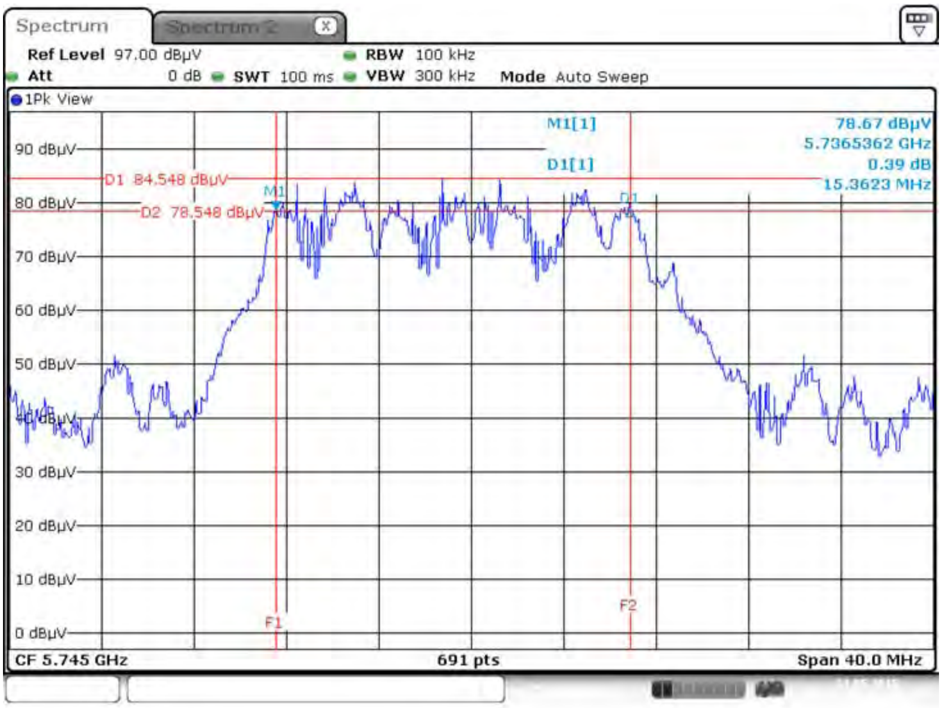
Date: 21.MAY.2015 01:13:00

99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / 5785 MHz / Chain 5 + Chain 6 + Chain 7 + Chain 8



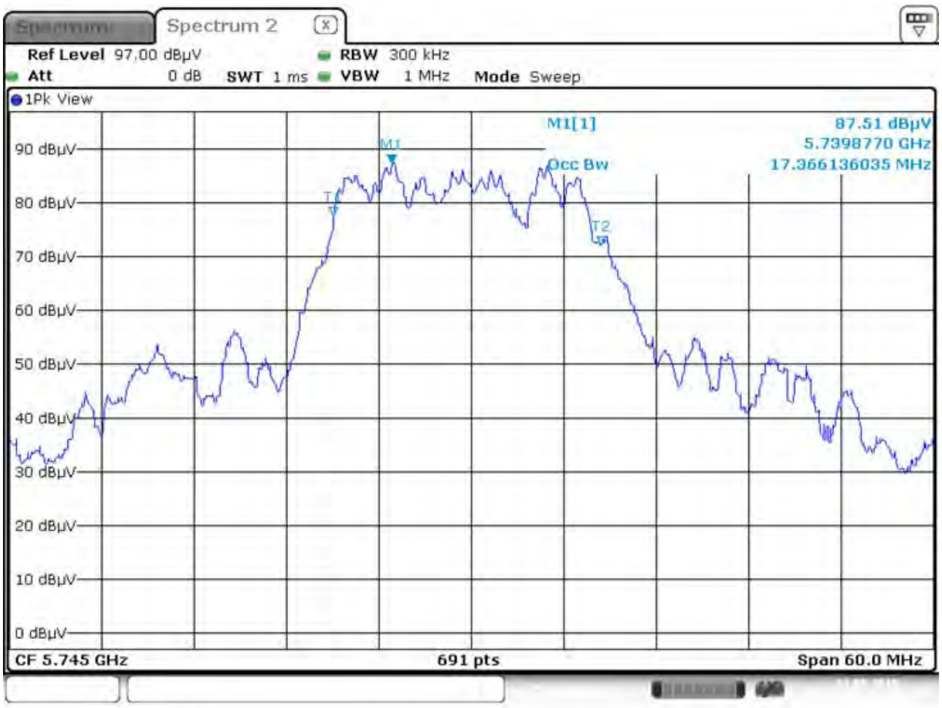
Date: 21.MAY.2015 01:12:32

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5745 MHz / Chain 5 + Chain 6 + Chain 7 + Chain 8



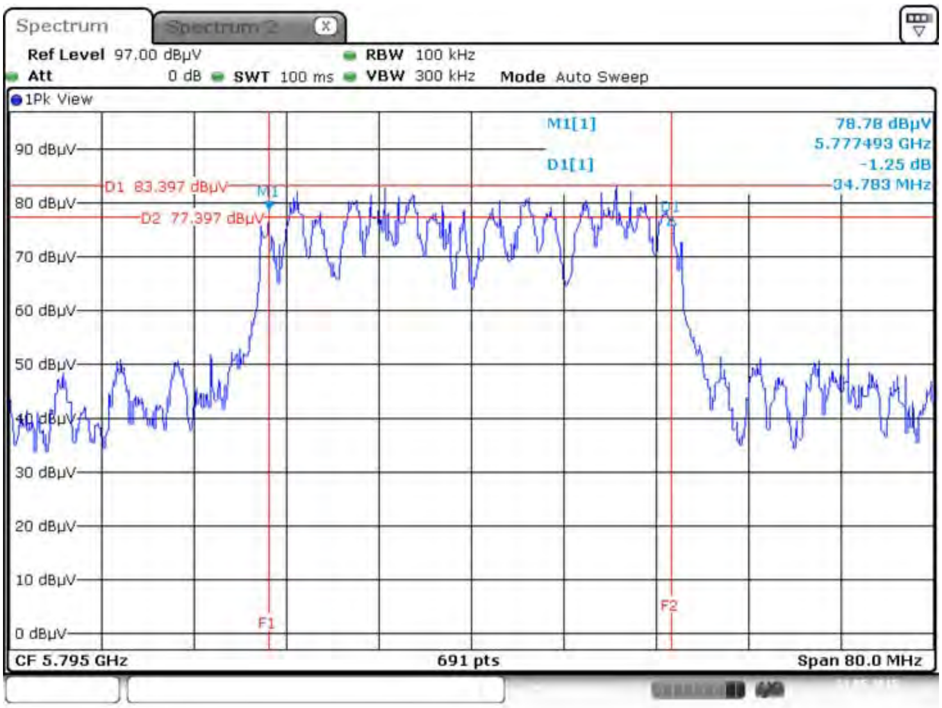
Date: 21.MAY.2015 01:08:16

99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5745 MHz / Chain 5 + Chain 6 + Chain 7 + Chain 8



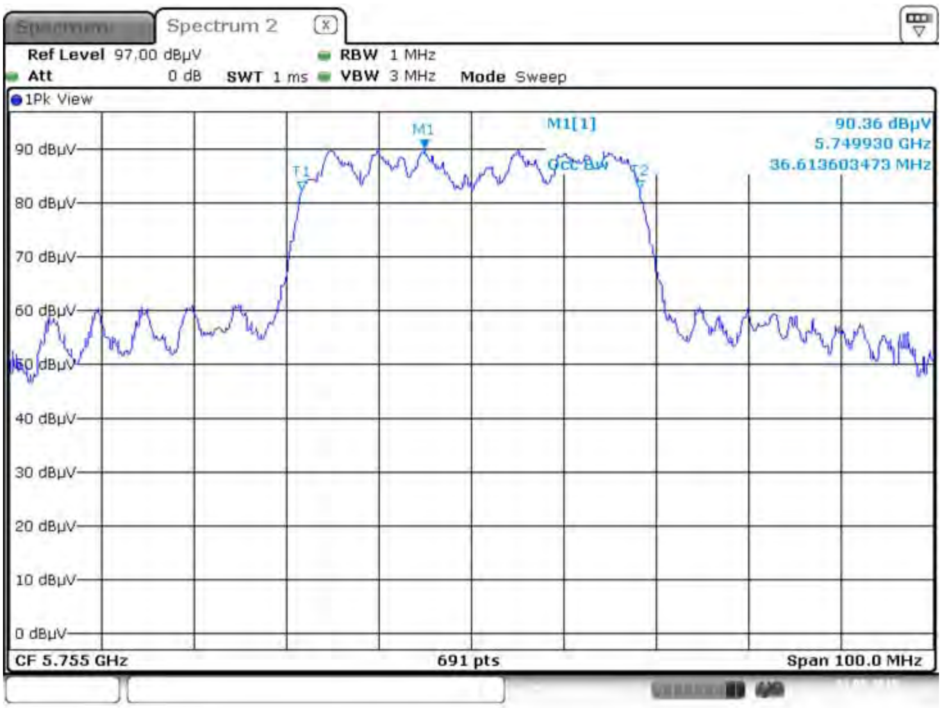
Date: 21.MAY.2015 01:07:49

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 5795MHz / Chain 5 + Chain 6 + Chain 7 + Chain 8



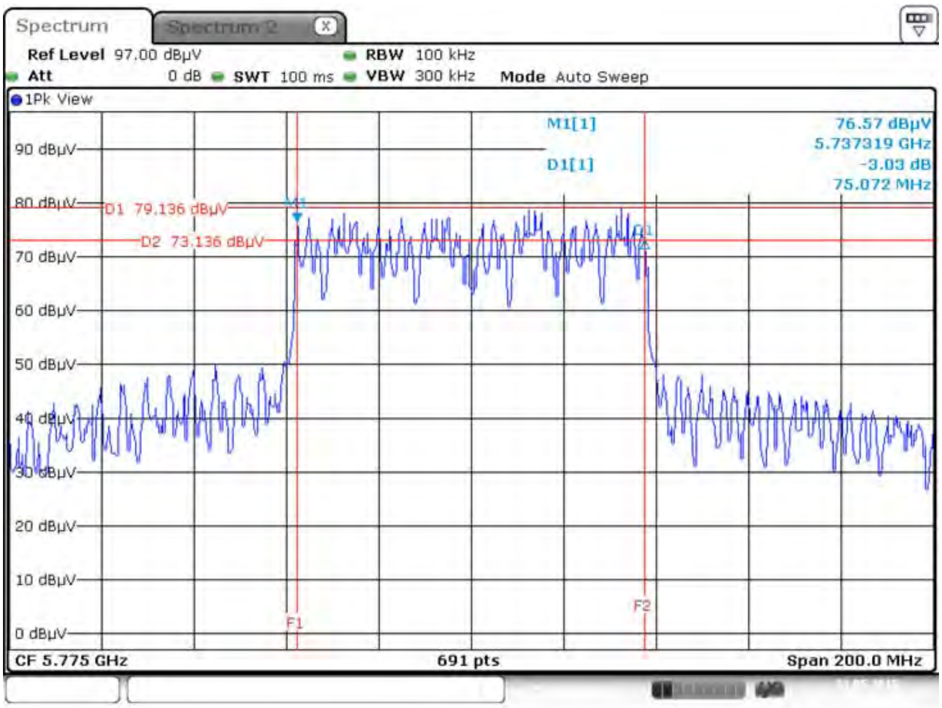
Date: 21.MAY.2015 01:05:56

99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 5755MHz / Chain 5 + Chain 6 + Chain 7 + Chain 8



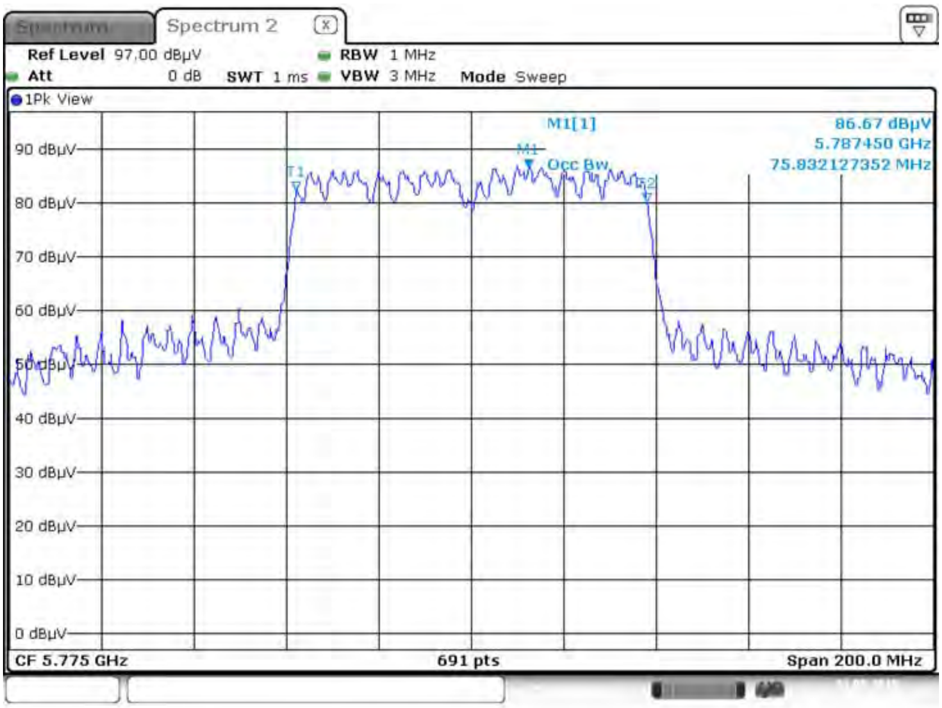
Date: 21.MAY.2015 01:04:19

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / 5775 MHz / Chain 5 + Chain 6 + Chain 7 + Chain 8



Date: 21.MAY.2015 01:00:51

99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / 5775 MHz / Chain 5 + Chain 6 + Chain 7 + Chain 8

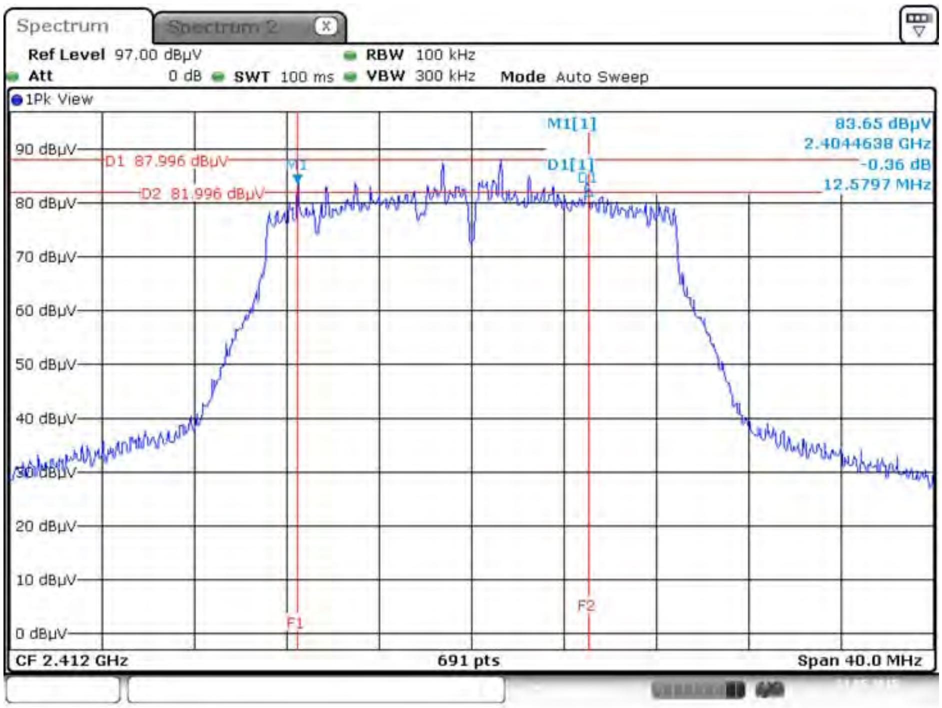


Date: 21.MAY.2015 01:02:31

For beamforming mode

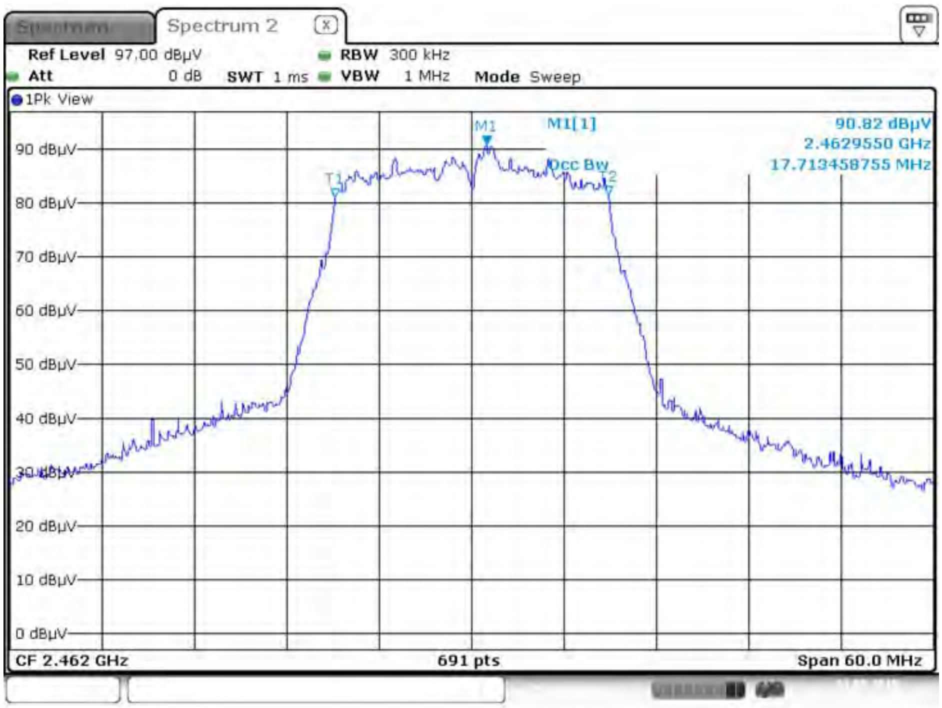
For 2.4GHz Band

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 2412 MHz / Chain 1 + Chain 2 + Chain 3 + Chain 4



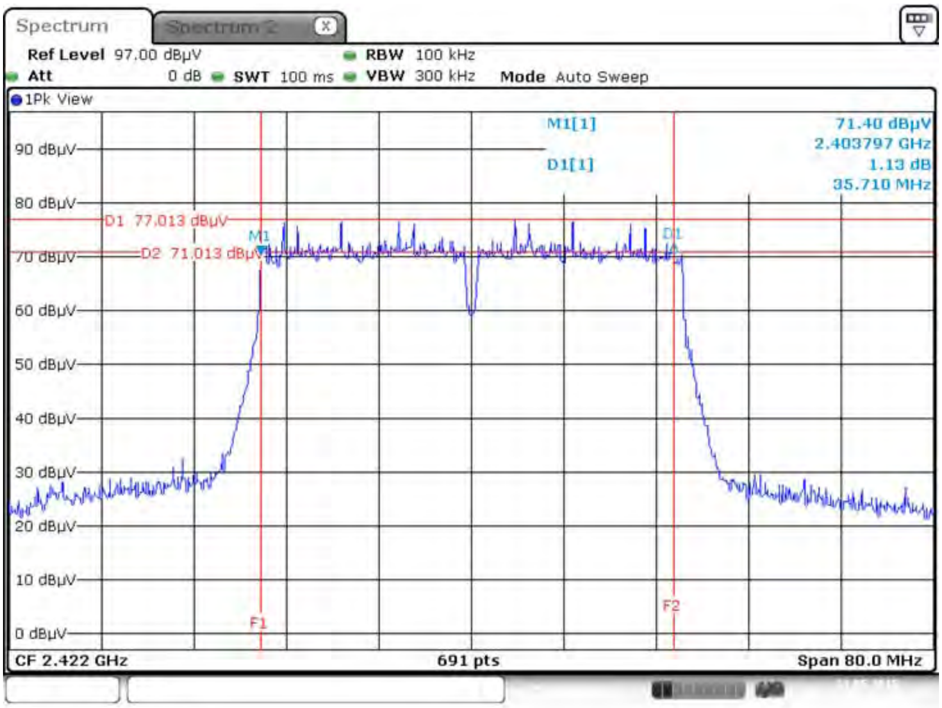
Date: 21.MAY.2015 02:57:04

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



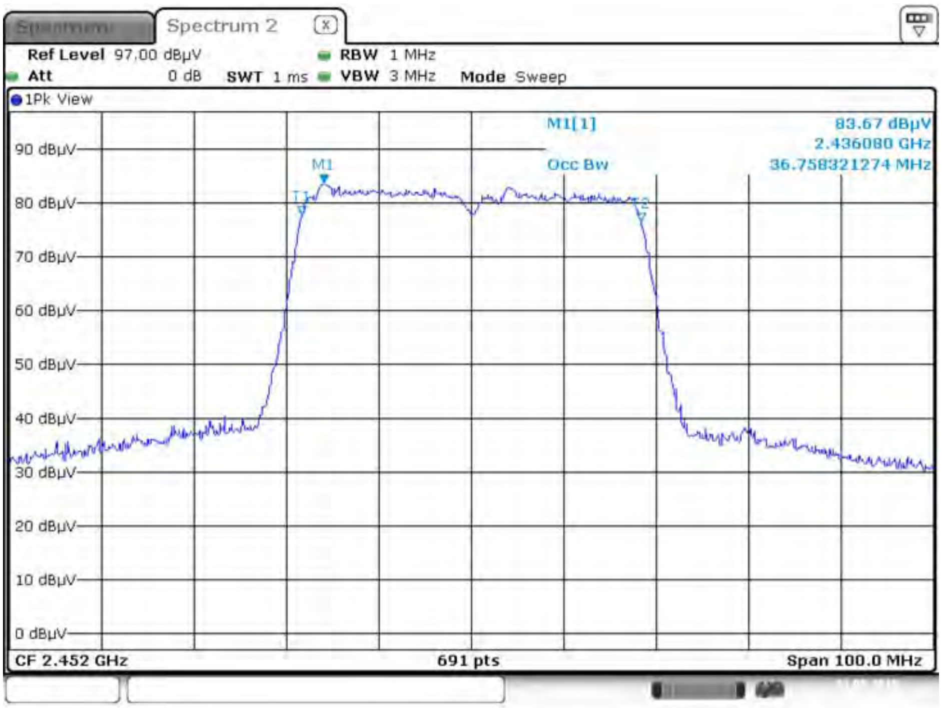
Date: 21.MAY.2015 02:58:27

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



Date: 21.MAY.2015 02:52:07

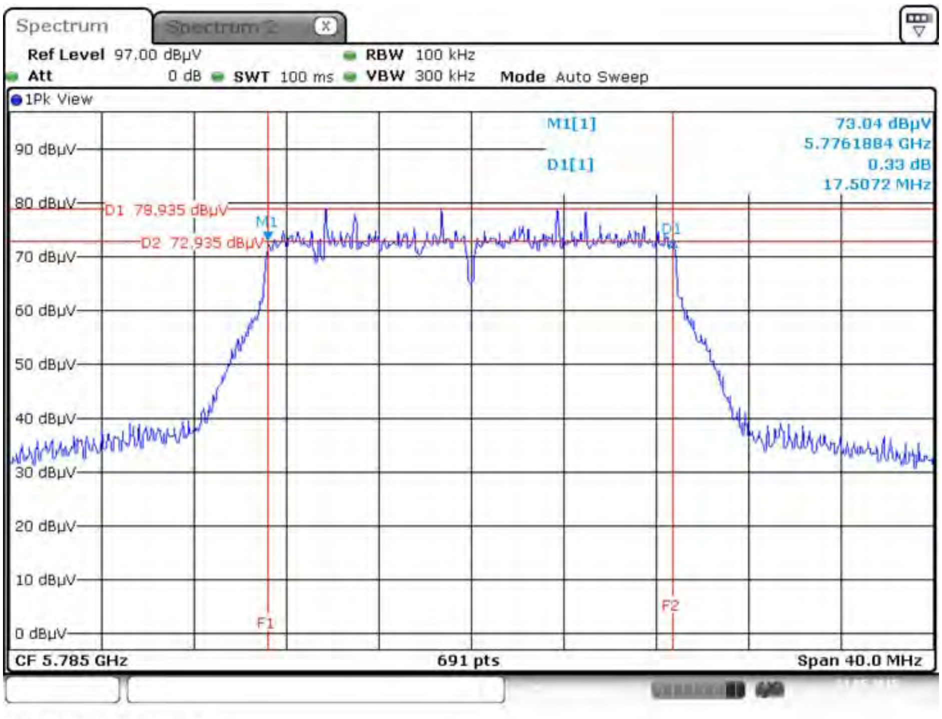
99% Occupied Bandwidth Plot on Configuration 802.11ac MCS0/Nss1 VHT40 / 2452 MHz / Chain 1 + Chain 2 + Chain 3 + Chain 4



Date: 21.MAY.2015 02:48:07

For 5GHz Band

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5785 MHz / Chain 5 + Chain 6 + Chain 7 + Chain 8

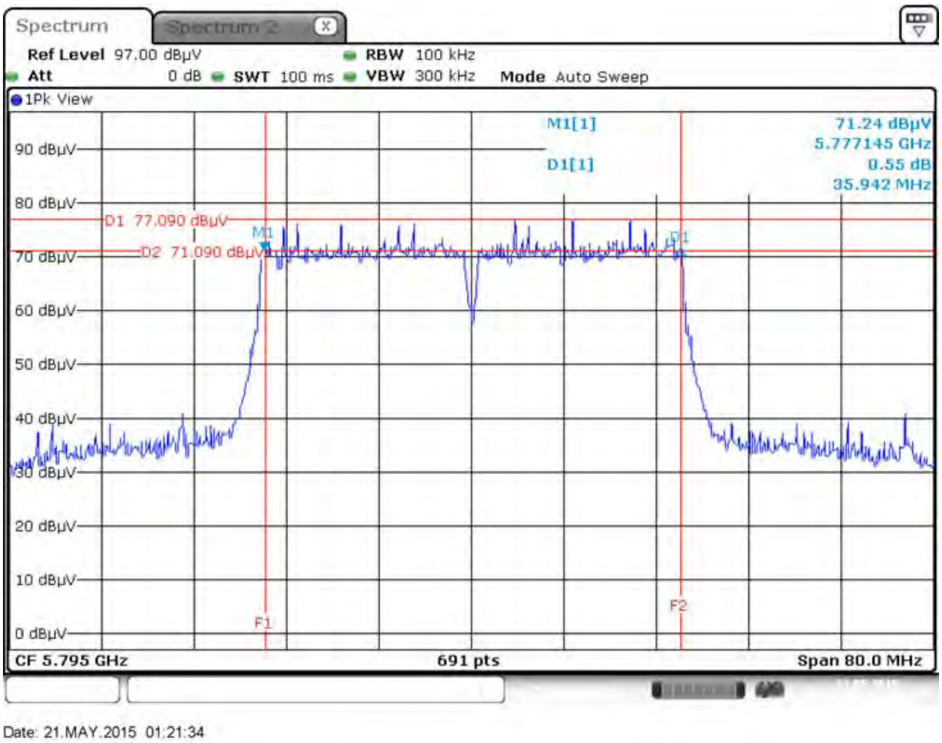


Date: 21.MAY.2015 01:17:27

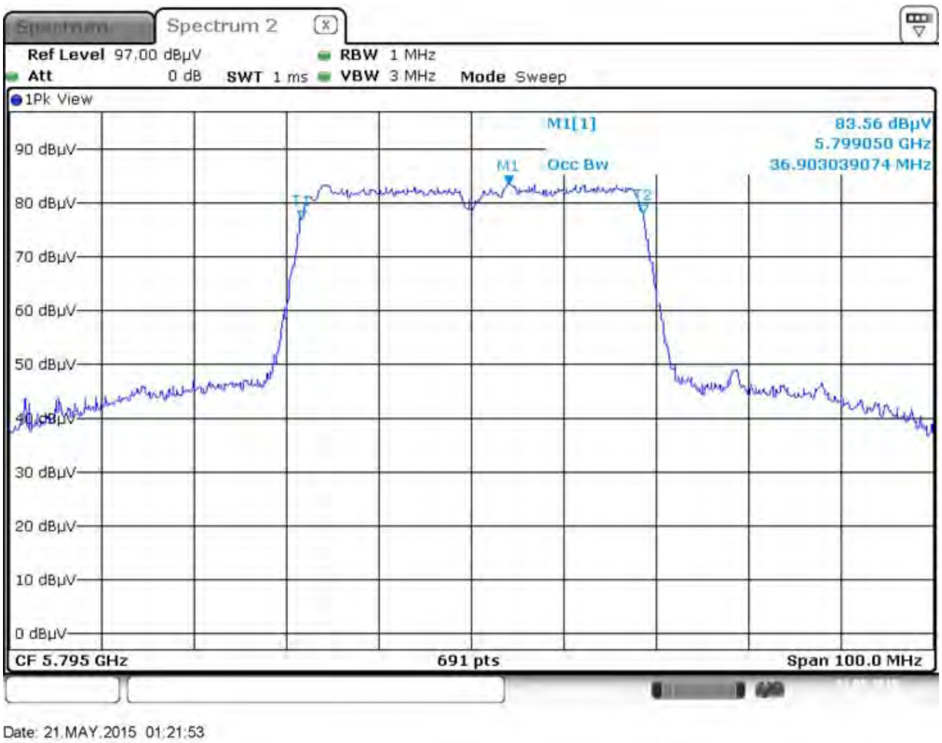
99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / 5745 MHz / Chain 5 + Chain 6 + Chain 7 + Chain 8

Date: 21.MAY.2015 01:16:21

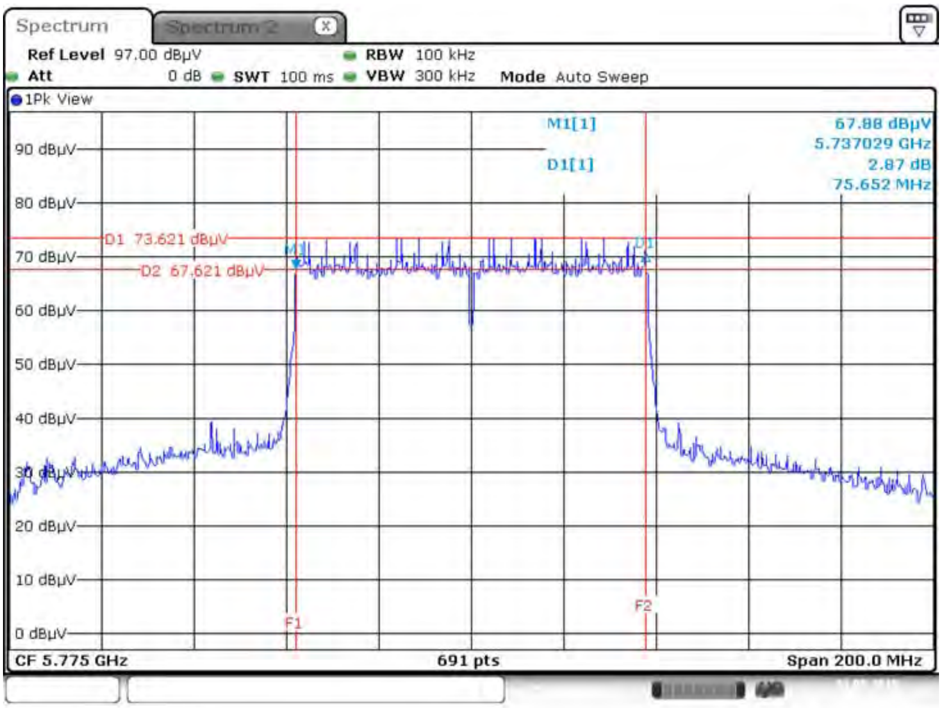
6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 5795MHz / Chain 5 + Chain 6 + Chain 7 + Chain 8



99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / 5795MHz / Chain 5 + Chain 6 + Chain 7 + Chain 8

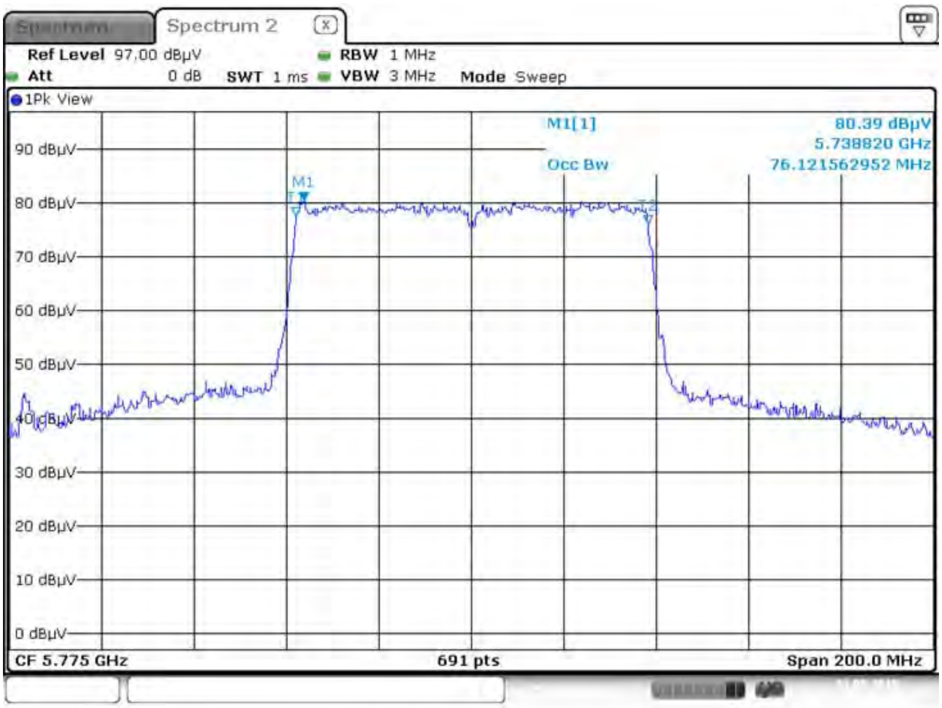


6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / 5775 MHz / Chain 5 + Chain 6 + Chain 7 + Chain 8



Date: 21.MAY.2015 01:23:22

99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / 5775 MHz / Chain 5 + Chain 6 + Chain 7 + Chain 8



Date: 21.MAY.2015 01:22:53

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

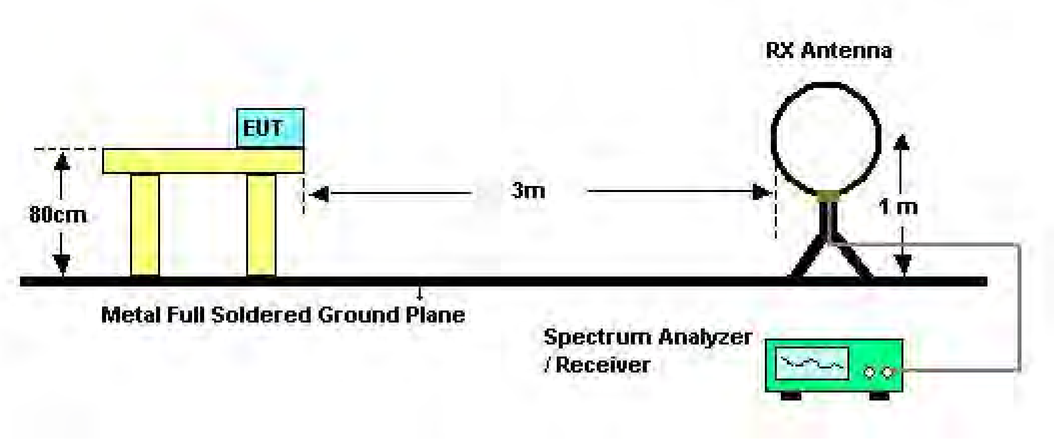
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1GHz / RBW 120kHz for QP

4.5.3. Test Procedures

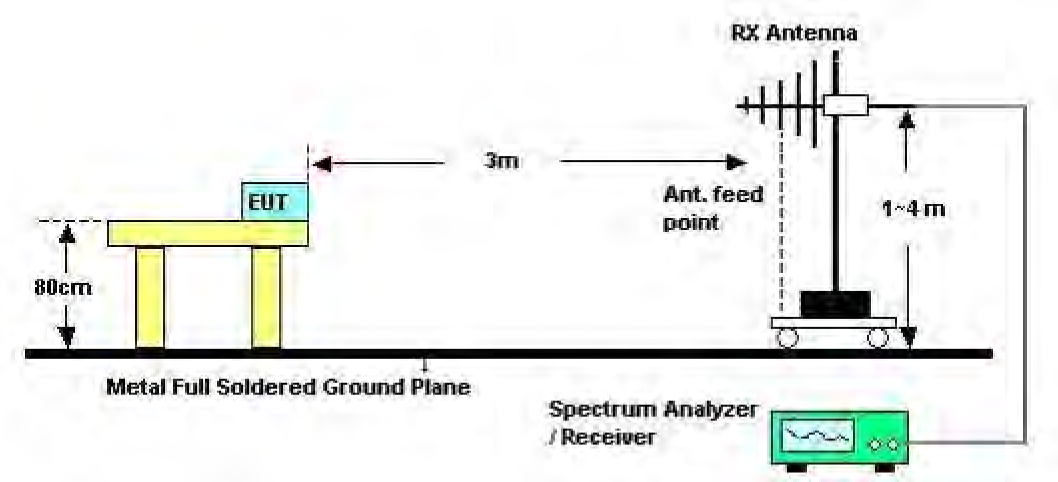
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 1m & 3m far away from the turntable.
2. Power on the EUT and all the supporting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

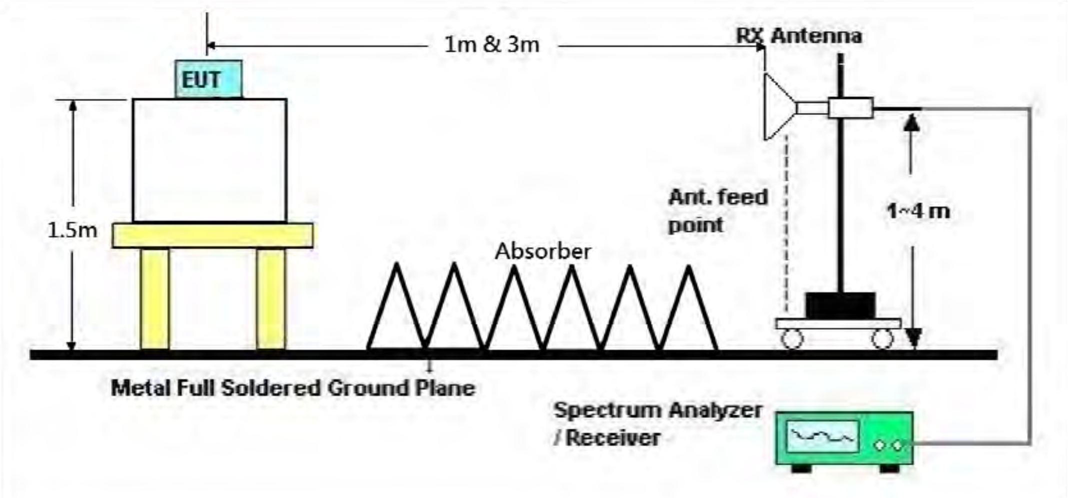
For Radiated Emissions: 9kHz ~30MHz



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	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	Normal Link
Test Date	May 20, 2015		

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.

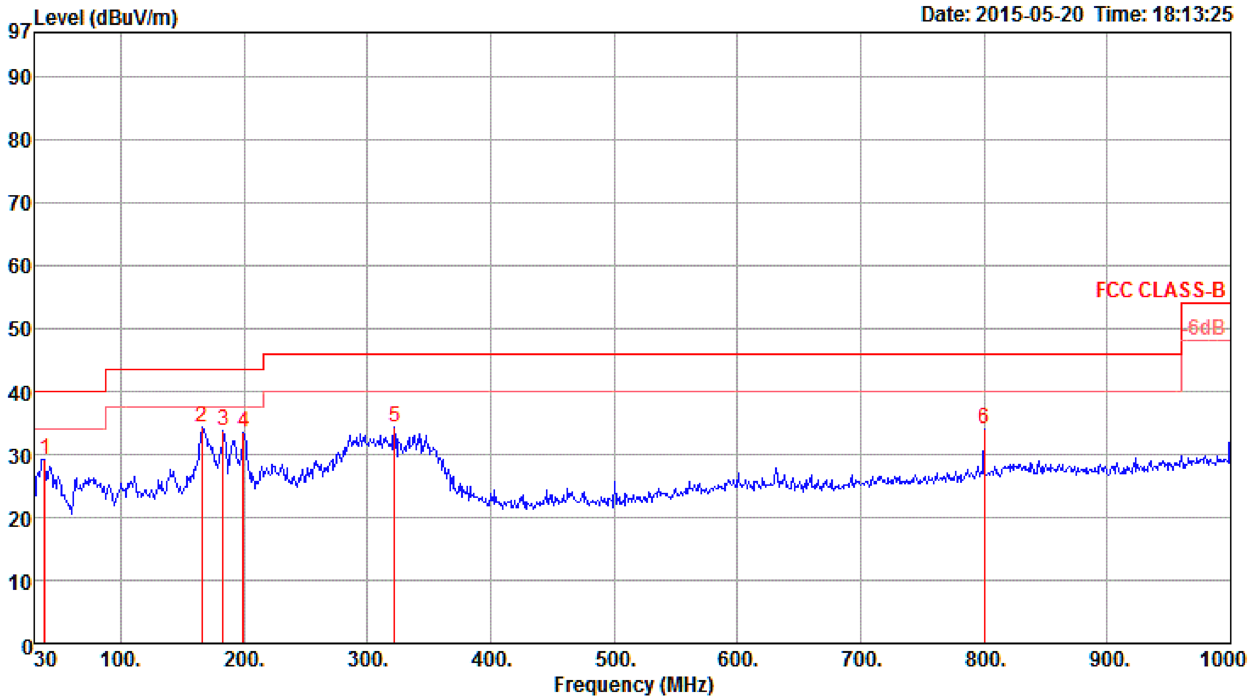
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

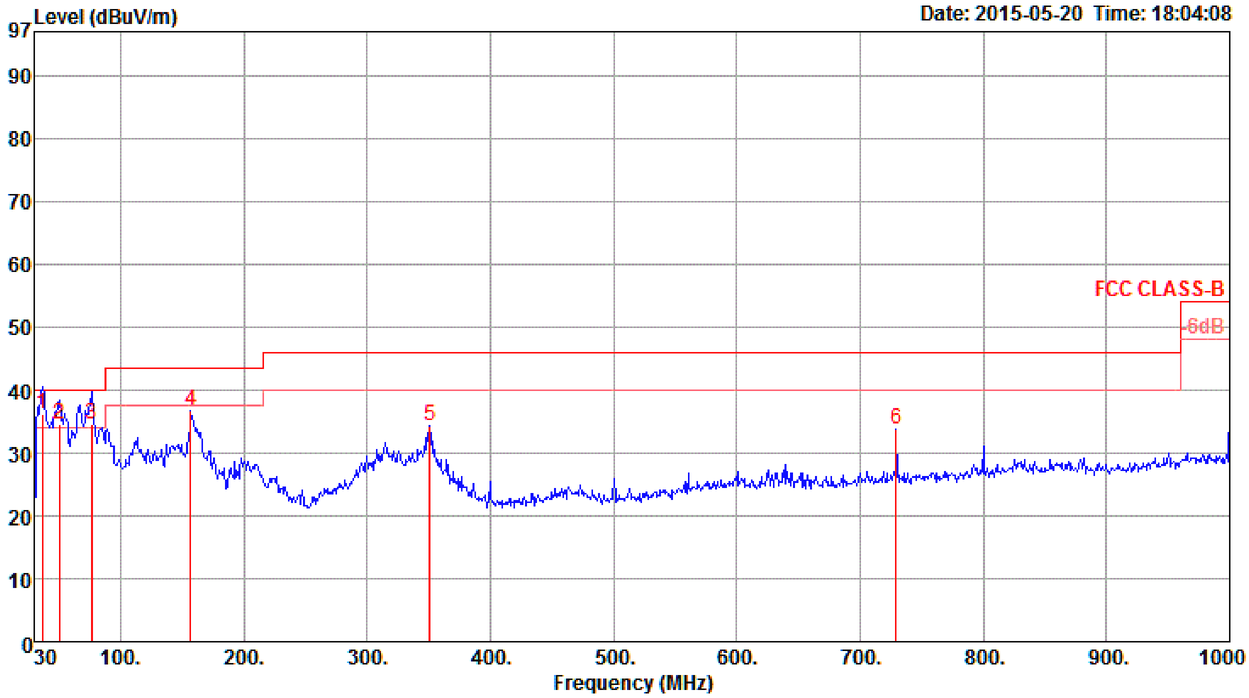
Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	Normal Link

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	38.73	29.30	40.00	-10.70	42.30	0.59	14.40	27.99	0	400	Peak	HORIZONTAL
2	165.80	34.33	43.50	-9.17	50.15	1.07	10.52	27.41	0	400	Peak	HORIZONTAL
3	183.26	33.78	43.50	-9.72	49.93	1.15	10.07	27.37	0	400	Peak	HORIZONTAL
4	199.75	33.42	43.50	-10.08	49.10	1.17	10.40	27.25	0	400	Peak	HORIZONTAL
5	321.97	34.31	46.00	-11.69	45.12	1.46	14.65	26.92	0	400	Peak	HORIZONTAL
6	800.18	34.03	46.00	-11.97	37.43	2.29	21.20	26.89	0	400	Peak	HORIZONTAL

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	36.79	36.10	40.00	-3.90	47.90	0.60	15.60	28.00	349	110	QP	VERTICAL
2	50.26	34.71	40.00	-5.29	53.20	0.63	8.80	27.92	219	100	QP	VERTICAL
3	76.56	34.49	40.00	-5.51	54.33	0.76	7.31	27.91	213	104	QP	VERTICAL
4	157.07	36.73	43.50	-6.77	52.26	1.06	10.85	27.44	0	400	Peak	VERTICAL
5	351.07	34.43	46.00	-11.57	44.37	1.53	15.62	27.09	0	400	Peak	VERTICAL
6	729.37	33.77	46.00	-12.23	38.39	2.17	20.31	27.10	0	400	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 non-beamforming mode

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11b CH 1 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 17, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4823.99	54.46	74.00	-19.54	47.87	6.11	33.56	33.08	103	194	Peak	HORIZONTAL
2	4824.00	48.92	54.00	-5.08	42.33	6.11	33.56	33.08	103	194	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4824.03	43.11	54.00	-10.89	36.52	6.11	33.56	33.08	23	159	Average	VERTICAL
2	4824.04	50.66	74.00	-23.34	44.07	6.11	33.56	33.08	23	159	Peak	VERTICAL

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11b CH 6 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 17, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4874.04	50.53	54.00	-3.47	43.87	6.08	33.66	33.08	244	205	Average	HORIZONTAL
2	4874.05	54.43	74.00	-19.57	47.77	6.08	33.66	33.08	244	205	Peak	HORIZONTAL
3	7311.16	39.02	54.00	-14.98	27.57	8.28	36.64	33.47	220	200	Average	HORIZONTAL
4	7311.16	52.46	74.00	-21.54	41.01	8.28	36.64	33.47	220	200	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4874.05	46.90	54.00	-7.10	40.24	6.08	33.66	33.08	316	260	Average	VERTICAL
2	4874.06	52.41	74.00	-21.59	45.75	6.08	33.66	33.08	316	260	Peak	VERTICAL
3	7310.42	39.99	54.00	-14.01	28.54	8.28	36.64	33.47	148	217	Average	VERTICAL
4	7310.42	50.28	74.00	-23.72	38.83	8.28	36.64	33.47	148	217	Peak	VERTICAL

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11b CH 11 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 17, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4923.98	53.98	74.00	-20.02	47.23	6.05	33.76	33.06	89	212	Peak	HORIZONTAL
2	4924.03	49.05	54.00	-4.95	42.30	6.05	33.76	33.06	89	212	Average	HORIZONTAL
3	7386.06	43.88	54.00	-10.12	32.18	8.34	36.85	33.49	23	208	Average	HORIZONTAL
4	7386.06	53.52	74.00	-20.48	41.82	8.34	36.85	33.49	23	208	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4924.00	47.44	54.00	-6.56	40.69	6.05	33.76	33.06	323	180	Average	VERTICAL
2	4924.08	52.49	74.00	-21.51	45.74	6.05	33.76	33.06	323	180	Peak	VERTICAL
3	7385.99	40.38	54.00	-13.62	28.68	8.34	36.85	33.49	327	152	Average	VERTICAL
4	7386.16	54.09	74.00	-19.91	42.39	8.34	36.85	33.49	327	152	Peak	VERTICAL

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11g CH 1 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 17, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4824.80	52.01	74.00	-21.99	45.42	6.11	33.56	33.08	106	200	Peak	HORIZONTAL
2	4825.60	37.10	54.00	-16.90	30.51	6.11	33.56	33.08	106	200	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4823.98	53.09	74.00	-20.91	46.50	6.11	33.56	33.08	325	153	Peak	VERTICAL
2	4824.00	35.77	54.00	-18.23	29.18	6.11	33.56	33.08	325	153	Average	VERTICAL

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11g CH 6 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 17, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4873.96	52.35	74.00	-21.65	45.69	6.08	33.66	33.08	106	200	Peak	HORIZONTAL
2	4874.72	38.08	54.00	-15.92	31.42	6.08	33.66	33.08	106	200	Average	HORIZONTAL
3	7310.82	53.85	74.00	-20.15	42.40	8.28	36.64	33.47	27	200	Peak	HORIZONTAL
4	7311.15	42.18	54.00	-11.82	30.73	8.28	36.64	33.47	27	200	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4867.92	55.20	74.00	-18.80	48.54	6.08	33.66	33.08	321	180	Peak	VERTICAL
2	4869.32	38.41	54.00	-15.59	31.75	6.08	33.66	33.08	321	180	Average	VERTICAL
3	7310.96	52.69	74.00	-21.31	41.24	8.28	36.64	33.47	332	221	Peak	VERTICAL
4	7310.98	40.01	54.00	-13.99	28.56	8.28	36.64	33.47	332	221	Average	VERTICAL

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11g CH 11 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 17, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4923.80	49.17	74.00	-24.83	42.42	6.05	33.76	33.06	95	202	Peak	HORIZONTAL
2	4926.04	36.62	54.00	-17.38	29.87	6.05	33.76	33.06	95	202	Average	HORIZONTAL
3	7386.00	43.59	54.00	-10.41	31.89	8.34	36.85	33.49	21	203	Average	HORIZONTAL
4	7386.16	54.32	74.00	-19.68	42.62	8.34	36.85	33.49	21	203	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4919.44	36.53	54.00	-17.47	29.78	6.05	33.76	33.06	321	171	Average	VERTICAL
2	4919.44	48.76	74.00	-25.24	42.01	6.05	33.76	33.06	321	171	Peak	VERTICAL
3	7386.16	40.49	54.00	-13.51	28.79	8.34	36.85	33.49	301	153	Average	VERTICAL
4	7386.80	52.78	74.00	-21.22	41.08	8.34	36.85	33.49	301	153	Peak	VERTICAL

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 1 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 17, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4823.74	47.31	74.00	-26.69	40.72	6.11	33.56	33.08	340	215	Peak	HORIZONTAL
2	4824.14	34.67	54.00	-19.33	28.08	6.11	33.56	33.08	340	215	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4823.90	49.84	74.00	-24.16	43.25	6.11	33.56	33.08	330	169	Peak	VERTICAL
2	4825.36	35.96	54.00	-18.04	29.37	6.11	33.56	33.08	330	169	Average	VERTICAL

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 6 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 17, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4873.84	50.50	74.00	-23.50	43.84	6.08	33.66	33.08	244	190	Peak	HORIZONTAL
2	4874.08	36.80	54.00	-17.20	30.14	6.08	33.66	33.08	244	190	Average	HORIZONTAL
3	7310.97	42.40	54.00	-11.60	30.95	8.28	36.64	33.47	22	204	Average	HORIZONTAL
4	7310.97	54.06	74.00	-19.94	42.61	8.28	36.64	33.47	22	204	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4873.20	38.32	54.00	-15.68	31.66	6.08	33.66	33.08	321	210	Average	VERTICAL
2	4873.20	53.92	74.00	-20.08	47.26	6.08	33.66	33.08	321	210	Peak	VERTICAL
3	7310.97	52.39	74.00	-21.61	40.94	8.28	36.64	33.47	25	154	Peak	VERTICAL
4	7311.03	39.98	54.00	-14.02	28.53	8.28	36.64	33.47	25	154	Average	VERTICAL

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 11 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 17, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4923.80	46.95	74.00	-27.05	40.20	6.05	33.76	33.06	126	228	Peak	HORIZONTAL
2	4924.20	35.00	54.00	-19.00	28.25	6.05	33.76	33.06	126	228	Average	HORIZONTAL
3	7385.90	54.79	74.00	-19.21	43.09	8.34	36.85	33.49	28	211	Peak	HORIZONTAL
4	7386.06	43.28	54.00	-10.72	31.58	8.34	36.85	33.49	28	211	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4922.80	36.00	54.00	-18.00	29.25	6.05	33.76	33.06	329	188	Average	VERTICAL
2	4923.08	48.73	74.00	-25.27	41.98	6.05	33.76	33.06	329	188	Peak	VERTICAL
3	7385.90	39.74	54.00	-14.26	28.04	8.34	36.85	33.49	284	155	Average	VERTICAL
4	7386.16	53.32	74.00	-20.68	41.62	8.34	36.85	33.49	284	155	Peak	VERTICAL

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 3 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 17, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4843.52	46.63	74.00	-27.37	40.02	6.10	33.59	33.08	281	159	Peak	HORIZONTAL
2	4844.48	33.87	54.00	-20.13	27.26	6.10	33.59	33.08	281	159	Average	HORIZONTAL
3	7265.98	52.37	74.00	-21.63	41.02	8.26	36.56	33.47	19	216	Peak	HORIZONTAL
4	7266.00	41.15	54.00	-12.85	29.80	8.26	36.56	33.47	19	216	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4843.89	45.90	74.00	-28.10	39.29	6.10	33.59	33.08	305	158	Peak	VERTICAL
2	4844.01	33.38	54.00	-20.62	26.77	6.10	33.59	33.08	305	158	Average	VERTICAL
3	7265.89	38.53	54.00	-15.47	27.18	8.26	36.56	33.47	28	168	Average	VERTICAL
4	7265.97	50.95	74.00	-23.05	39.60	8.26	36.56	33.47	28	168	Peak	VERTICAL

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 6 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 17, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4873.88	34.01	54.00	-19.99	27.35	6.08	33.66	33.08	36	170	Average	HORIZONTAL
2	4874.16	47.02	74.00	-26.98	40.36	6.08	33.66	33.08	36	170	Peak	HORIZONTAL
3	7310.96	51.49	74.00	-22.51	40.04	8.28	36.64	33.47	82	206	Peak	HORIZONTAL
4	7311.00	39.52	54.00	-14.48	28.07	8.28	36.64	33.47	82	206	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4873.96	46.00	74.00	-28.00	39.34	6.08	33.66	33.08	218	154	Peak	VERTICAL
2	4874.04	33.52	54.00	-20.48	26.86	6.08	33.66	33.08	218	154	Average	VERTICAL
3	7310.72	52.85	74.00	-21.15	41.40	8.28	36.64	33.47	14	154	Peak	VERTICAL
4	7310.92	39.59	54.00	-14.41	28.14	8.28	36.64	33.47	97	154	Average	VERTICAL

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 9 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 17, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4903.97	46.39	74.00	-27.61	39.66	6.07	33.73	33.07	322	197	Peak	HORIZONTAL
2	4903.98	33.79	54.00	-20.21	27.06	6.07	33.73	33.07	322	197	Average	HORIZONTAL
3	7355.88	54.13	74.00	-19.87	42.52	8.32	36.77	33.48	27	189	Peak	HORIZONTAL
4	7356.00	43.26	54.00	-10.74	31.65	8.32	36.77	33.48	27	189	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4903.80	45.98	74.00	-28.02	39.25	6.07	33.73	33.07	275	154	Peak	VERTICAL
2	4904.24	33.74	54.00	-20.26	27.01	6.07	33.73	33.07	275	154	Average	VERTICAL
3	7356.00	39.59	54.00	-14.41	27.98	8.32	36.77	33.48	50	154	Average	VERTICAL
4	7356.44	51.85	74.00	-22.15	40.24	8.32	36.77	33.48	50	154	Peak	VERTICAL

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11a CH 149 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 17, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11486.32	52.81	54.00	-1.19	36.08	10.71	39.39	33.37	348	141	Average	HORIZONTAL
2	11488.80	65.86	74.00	-8.14	49.13	10.71	39.39	33.37	348	141	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11484.72	53.71	54.00	-0.29	36.98	10.71	39.39	33.37	164	174	Average	VERTICAL
2	11485.12	67.18	74.00	-6.82	50.45	10.71	39.39	33.37	164	174	Peak	VERTICAL

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11a CH 157 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 17, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11566.08	53.31	54.00	-0.69	36.50	10.75	39.44	33.38	349	148	Average	HORIZONTAL
2	11567.92	66.43	74.00	-7.57	49.62	10.75	39.44	33.38	349	148	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11561.52	67.53	74.00	-6.47	50.73	10.75	39.43	33.38	165	120	Peak	VERTICAL
2	11562.08	53.84	54.00	-0.16	37.04	10.75	39.43	33.38	165	120	Average	VERTICAL

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11a CH 165 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 17, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11646.24	53.41	54.00	-0.59	36.54	10.79	39.48	33.40	357	146	Average	HORIZONTAL
2	11648.96	67.19	74.00	-6.81	50.31	10.81	39.48	33.41	357	146	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11642.48	53.88	54.00	-0.12	37.01	10.79	39.48	33.40	165	125	Average	VERTICAL
2	11642.72	67.87	74.00	-6.13	51.00	10.79	39.48	33.40	165	125	Peak	VERTICAL

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 17, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11487.28	67.43	74.00	-6.57	50.70	10.71	39.39	33.37	348	148	Peak	HORIZONTAL
2	11492.40	53.11	54.00	-0.89	36.38	10.71	39.39	33.37	348	148	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11491.20	68.03	74.00	-5.97	51.30	10.71	39.39	33.37	165	138	Peak	VERTICAL
2	11491.52	53.80	54.00	-0.20	37.07	10.71	39.39	33.37	165	138	Average	VERTICAL

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 17, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11572.64	53.70	54.00	-0.30	36.89	10.76	39.44	33.39	351	140	Average	HORIZONTAL
2	11572.64	66.03	74.00	-7.97	49.22	10.76	39.44	33.39	351	140	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11571.28	68.25	74.00	-5.75	51.44	10.76	39.44	33.39	167	145	Peak	VERTICAL
2	11571.60	53.95	54.00	-0.05	37.14	10.76	39.44	33.39	167	145	Average	VERTICAL

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 17, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11646.56	65.05	74.00	-8.95	48.17	10.81	39.48	33.41	353	144	Peak	HORIZONTAL
2	11647.44	52.35	54.00	-1.65	35.47	10.81	39.48	33.41	353	144	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11651.44	67.71	54.00	13.71	50.82	10.81	39.49	33.41	164	144	Average	VERTICAL
2	11651.52	53.88	54.00	-0.12	36.99	10.81	39.49	33.41	164	144	Average	VERTICAL

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 17, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11502.72	53.14	54.00	-0.86	36.39	10.72	39.40	33.37	348	146	Average	HORIZONTAL
2	11506.48	65.64	74.00	-8.36	48.89	10.72	39.40	33.37	348	146	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11506.80	53.78	54.00	-0.22	37.03	10.72	39.40	33.37	167	170	Average	VERTICAL
2	11506.88	66.92	74.00	-7.08	50.17	10.72	39.40	33.37	167	170	Peak	VERTICAL

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 17, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11586.32	65.63	74.00	-8.37	48.81	10.76	39.45	33.39	351	152	Peak	HORIZONTAL
2	11592.24	52.74	54.00	-1.26	35.92	10.76	39.45	33.39	351	152	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11591.20	66.79	74.00	-7.21	49.97	10.76	39.45	33.39	163	149	Peak	VERTICAL
2	11591.68	53.98	54.00	-0.02	37.16	10.76	39.45	33.39	163	149	Average	VERTICAL

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 17, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11547.12	63.30	74.00	-10.70	46.51	10.75	39.42	33.38	350	172	Peak	HORIZONTAL
2	11547.44	50.37	54.00	-3.63	33.58	10.75	39.42	33.38	350	172	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11546.96	52.66	54.00	-1.34	35.87	10.75	39.42	33.38	167	154	Average	VERTICAL
2	11566.56	64.97	74.00	-9.03	48.16	10.75	39.44	33.38	167	154	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.

For beamforming mode

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 1 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 17, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4821.04	34.53	54.00	-19.47	27.94	6.11	33.56	33.08	149	100	Average	HORIZONTAL
2	4827.08	47.83	74.00	-26.17	41.24	6.11	33.56	33.08	149	100	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4828.16	34.72	54.00	-19.28	28.13	6.11	33.56	33.08	107	100	Average	VERTICAL
2	4828.82	47.30	74.00	-26.70	40.71	6.11	33.56	33.08	107	100	Peak	VERTICAL

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 6 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 17, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4866.00	48.53	74.00	-25.47	41.91	6.08	33.62	33.08	32	101	Peak	HORIZONTAL
2	4875.90	36.79	54.00	-17.21	30.13	6.08	33.66	33.08	32	101	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4865.70	36.54	54.00	-17.46	29.92	6.08	33.62	33.08	121	100	Average	VERTICAL
2	4869.00	47.94	74.00	-26.06	41.28	6.08	33.66	33.08	121	100	Peak	VERTICAL

Temperature	25℃	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 11 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 17, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4914.20	35.11	54.00	-18.89	28.38	6.07	33.73	33.07	232	101	Average	HORIZONTAL
2	4948.70	48.07	74.00	-25.93	41.29	6.04	33.80	33.06	232	101	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4912.70	48.04	74.00	-25.96	41.31	6.07	33.73	33.07	128	101	Peak	VERTICAL
2	4912.80	35.14	54.00	-18.86	28.41	6.07	33.73	33.07	128	101	Average	VERTICAL

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 3 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 17, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4846.92	48.38	74.00	-25.62	41.77	6.10	33.59	33.08	174	100	Peak	HORIZONTAL
2	4848.76	34.47	54.00	-19.53	27.86	6.10	33.59	33.08	174	100	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4847.48	47.92	74.00	-26.08	41.31	6.10	33.59	33.08	241	100	Peak	VERTICAL
2	4848.08	34.67	54.00	-19.33	28.06	6.10	33.59	33.08	241	100	Average	VERTICAL

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 6 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 17, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4869.04	47.79	74.00	-26.21	41.13	6.08	33.66	33.08	166	100	Peak	HORIZONTAL
2	4869.26	34.71	54.00	-19.29	28.05	6.08	33.66	33.08	166	100	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4875.52	47.63	74.00	-26.37	40.97	6.08	33.66	33.08	131	100	Peak	VERTICAL
2	4878.50	34.87	54.00	-19.13	28.21	6.08	33.66	33.08	131	100	Average	VERTICAL

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 9 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 17, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4902.44	34.77	54.00	-19.23	28.04	6.07	33.73	33.07	54	100	Average	HORIZONTAL
2	4903.09	48.22	74.00	-25.78	41.49	6.07	33.73	33.07	54	100	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	4901.44	34.51	54.00	-19.49	27.82	6.07	33.69	33.07	202	100	Average	VERTICAL
2	4907.50	48.69	74.00	-25.31	41.96	6.07	33.73	33.07	202	100	Peak	VERTICAL

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 18, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11488.00	68.37	74.00	-5.63	51.64	10.71	39.39	33.37	62	141	Peak	HORIZONTAL
2	11489.60	53.80	54.00	-0.20	37.07	10.71	39.39	33.37	62	141	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11496.10	67.27	74.00	-6.73	50.53	10.72	39.39	33.37	173	222	Peak	VERTICAL
2	11496.70	53.86	54.00	-0.14	37.12	10.72	39.39	33.37	173	222	Average	VERTICAL

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 18, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11572.70	68.78	74.00	-5.22	51.97	10.76	39.44	33.39	7	145	Peak	HORIZONTAL
2	11574.10	53.76	54.00	-0.24	36.95	10.76	39.44	33.39	7	145	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11575.80	66.46	74.00	-7.54	49.65	10.76	39.44	33.39	186	141	Peak	VERTICAL
2	11576.30	53.02	54.00	-0.98	36.21	10.76	39.44	33.39	186	141	Average	VERTICAL

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 18, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11650.60	52.90	54.00	-1.10	36.01	10.81	39.49	33.41	338	144	Average	HORIZONTAL
2	11652.16	66.07	74.00	-7.93	49.18	10.81	39.49	33.41	338	144	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11646.60	53.78	54.00	-0.22	36.90	10.81	39.48	33.41	180	139	Average	VERTICAL
2	11651.50	67.25	74.00	-6.75	50.36	10.81	39.49	33.41	180	139	Peak	VERTICAL

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 151 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 18, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11497.40	67.46	74.00	-6.54	50.72	10.72	39.39	33.37	18	144	Peak	HORIZONTAL
2	11499.00	53.80	54.00	-0.20	37.05	10.72	39.40	33.37	18	144	Average	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11485.60	66.47	74.00	-7.53	49.74	10.71	39.39	33.37	187	150	Peak	VERTICAL
2	11507.00	53.69	54.00	-0.31	36.94	10.72	39.40	33.37	187	150	Average	VERTICAL

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 159 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 18, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11587.40	53.74	54.00	-0.26	36.92	10.76	39.45	33.39	341	151	Average	HORIZONTAL
2	11590.00	68.67	74.00	-5.33	51.85	10.76	39.45	33.39	341	151	Peak	HORIZONTAL

Vertical

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	11591.60	67.28	74.00	-6.72	50.46	10.76	39.45	33.39	188	151	Peak	VERTICAL
2	11592.00	53.84	54.00	-0.16	37.02	10.76	39.45	33.39	188	151	Average	VERTICAL

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT80 CH 155 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 19, 2015		

Horizontal

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	11536.86	67.52	74.00	-6.48	54.23	9.35	40.12	36.18	153	360	Peak	HORIZONTAL
2	11549.68	53.38	54.00	-0.62	40.13	9.34	40.08	36.17	153	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	11551.68	66.00	74.00	-8.00	52.76	9.34	40.07	36.17	155	180	Peak	VERTICAL
2	11551.94	53.79	54.00	-0.21	40.55	9.34	40.07	36.17	155	180	Average	VERTICAL

Note:

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

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

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

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 KDB 558074 D01 v03r02 for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 section 10.1 Unwanted Emissions into Non-Restricted Frequency Bands Measurement Procedure

4.6.4. Test Setup Layout

For Radiated band edges Measurement:

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

For Radiated Out of Band Emission Measurement:

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

4.6.5. Test Deviation

There is no deviation with the original standard.

4.6.6. EUT Operation during Test

For non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

The EUT was programmed to be in beamforming transmitting mode.

4.6.7. Test Result of Band Edge and Fundamental Emissions

For non-beamforming mode

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11b CH 1, 6, 11 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 17, 2015		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2390.00	52.03	54.00	-1.97	19.13	4.41	28.49	0.00	262	100	Average	HORIZONTAL
2	2390.00	63.90	74.00	-10.10	31.00	4.41	28.49	0.00	262	100	Peak	HORIZONTAL
3	2411.00	123.62			90.68	4.41	28.53	0.00	262	100	Peak	HORIZONTAL
4	2411.20	119.60			86.66	4.41	28.53	0.00	262	100	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	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2388.80	59.67	74.00	-14.33	26.81	4.37	28.49	0.00	261	101	Peak	HORIZONTAL
2	2390.00	46.87	54.00	-7.13	13.97	4.41	28.49	0.00	261	101	Average	HORIZONTAL
3	2437.80	118.24			85.20	4.44	28.60	0.00	261	101	Average	HORIZONTAL
4	2438.20	122.37			89.33	4.44	28.60	0.00	261	101	Peak	HORIZONTAL
5	2483.50	47.25	54.00	-6.75	14.07	4.51	28.67	0.00	261	101	Average	HORIZONTAL
6	2485.90	58.88	74.00	-15.12	25.70	4.51	28.67	0.00	261	101	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	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2463.00	123.41			90.30	4.48	28.63	0.00	261	112	Peak	HORIZONTAL
2	2463.20	119.34			86.23	4.48	28.63	0.00	261	112	Average	HORIZONTAL
3	2483.50	53.80	54.00	-0.20	20.62	4.51	28.67	0.00	261	112	Average	HORIZONTAL
4	2483.50	64.49	74.00	-9.51	31.31	4.51	28.67	0.00	261	112	Peak	HORIZONTAL

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

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11g CH 1, 6, 11 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 17, 2015		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2389.60	71.73	74.00	-2.27	38.87	4.37	28.49	0.00	267	101	Peak	HORIZONTAL
2	2390.00	53.81	54.00	-0.19	20.91	4.41	28.49	0.00	267	101	Average	HORIZONTAL
3	2410.40	112.52			79.58	4.41	28.53	0.00	267	101	Average	HORIZONTAL
4	2410.80	122.80			89.86	4.41	28.53	0.00	267	101	Peak	HORIZONTAL

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

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2379.60	61.44	74.00	-12.56	28.61	4.37	28.46	0.00	261	170	Peak	HORIZONTAL
2	2390.00	47.25	54.00	-6.75	14.35	4.41	28.49	0.00	261	170	Average	HORIZONTAL
3	2432.60	125.90			92.90	4.44	28.56	0.00	261	170	Peak	HORIZONTAL
4	2433.40	115.11			82.11	4.44	28.56	0.00	261	170	Average	HORIZONTAL
5	2483.50	48.09	54.00	-5.91	14.91	4.51	28.67	0.00	261	170	Average	HORIZONTAL
6	2492.70	61.88	74.00	-12.12	28.63	4.55	28.70	0.00	261	170	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	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2459.20	113.93			80.82	4.48	28.63	0.00	263	150	Average	HORIZONTAL
2	2460.40	124.76			91.65	4.48	28.63	0.00	263	150	Peak	HORIZONTAL
3	2483.50	53.84	54.00	-0.16	20.66	4.51	28.67	0.00	263	150	Average	HORIZONTAL
4	2484.40	71.69	74.00	-2.31	38.51	4.51	28.67	0.00	263	150	Peak	HORIZONTAL

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

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 1, 6, 11 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test date	May 17, 2015		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2386.80	70.38	74.00	-3.62	37.52	4.37	28.49	0.00	282	132	Peak	HORIZONTAL
2	2390.00	53.70	54.00	-0.30	20.80	4.41	28.49	0.00	282	132	Average	HORIZONTAL
3	2411.20	113.17			80.23	4.41	28.53	0.00	282	132	Average	HORIZONTAL
4	2411.60	122.54			89.60	4.41	28.53	0.00	282	132	Peak	HORIZONTAL

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

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2388.40	60.51	74.00	-13.49	27.65	4.37	28.49	0.00	276	141	Peak	HORIZONTAL
2	2390.00	48.35	54.00	-5.65	15.45	4.41	28.49	0.00	276	141	Average	HORIZONTAL
3	2436.20	116.23			83.23	4.44	28.56	0.00	276	141	Average	HORIZONTAL
4	2436.20	125.78			92.78	4.44	28.56	0.00	276	141	Peak	HORIZONTAL
5	2483.50	49.28	54.00	-4.72	16.10	4.51	28.67	0.00	276	141	Average	HORIZONTAL
6	2483.50	63.16	74.00	-10.84	29.98	4.51	28.67	0.00	276	141	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	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2461.20	112.34			79.23	4.48	28.63	0.00	262	101	Average	HORIZONTAL
2	2461.20	121.98			88.87	4.48	28.63	0.00	262	101	Peak	HORIZONTAL
3	2486.80	53.91	54.00	-0.09	20.73	4.51	28.67	0.00	262	101	Average	HORIZONTAL
4	2487.20	72.54	74.00	-1.46	39.36	4.51	28.67	0.00	262	101	Peak	HORIZONTAL

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

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 3, 6, 9 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test date	May 17, 2015		

Channel 3

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2386.80	53.60	54.00	-0.40	20.74	4.37	28.49	0.00	269	100	Average	HORIZONTAL
2	2386.80	67.42	74.00	-6.58	34.56	4.37	28.49	0.00	269	100	Peak	HORIZONTAL
3	2411.60	114.47			81.53	4.41	28.53	0.00	269	100	Peak	HORIZONTAL
4	2416.40	104.65			71.68	4.44	28.53	0.00	269	100	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	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2386.20	68.37	74.00	-5.63	35.51	4.37	28.49	0.00	283	101	Peak	HORIZONTAL
2	2386.60	53.91	54.00	-0.09	21.05	4.37	28.49	0.00	283	101	Average	HORIZONTAL
3	2421.40	107.97			74.97	4.44	28.56	0.00	283	101	Average	HORIZONTAL
4	2421.40	118.10			85.10	4.44	28.56	0.00	283	101	Peak	HORIZONTAL
5	2486.60	52.37	54.00	-1.63	19.19	4.51	28.67	0.00	283	101	Average	HORIZONTAL
6	2487.00	68.25	74.00	-5.75	35.07	4.51	28.67	0.00	283	101	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	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2436.40	102.66			69.66	4.44	28.56	0.00	279	146	Average	HORIZONTAL
2	2448.80	112.64			79.56	4.48	28.60	0.00	279	146	Peak	HORIZONTAL
3	2486.00	66.84	74.00	-7.16	33.66	4.51	28.67	0.00	279	146	Peak	HORIZONTAL
4	2486.40	53.67	54.00	-0.33	20.49	4.51	28.67	0.00	279	146	Average	HORIZONTAL

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 beamforming mode

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 1, 6, 11 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test Date	May 17, 2015		

Channel 1

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2387.00	68.82	74.00	-5.18	35.96	4.37	28.49	0.00	266	164	Peak	HORIZONTAL
2	2390.00	53.72	54.00	-0.28	20.82	4.41	28.49	0.00	266	164	Average	HORIZONTAL
3	2413.40	112.44			79.50	4.41	28.53	0.00	266	164	Average	HORIZONTAL
4	2413.60	121.67			88.73	4.41	28.53	0.00	266	164	Peak	HORIZONTAL

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

Channel 6

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2386.20	61.66	74.00	-12.34	28.80	4.37	28.49	0.00	270	170	Peak	HORIZONTAL
2	2389.80	48.79	54.00	-5.21	15.89	4.41	28.49	0.00	270	170	Average	HORIZONTAL
3	2433.80	127.63			94.63	4.44	28.56	0.00	270	170	Peak	HORIZONTAL
4	2435.40	117.66			84.66	4.44	28.56	0.00	270	170	Average	HORIZONTAL
5	2483.50	49.98	54.00	-4.02	16.80	4.51	28.67	0.00	270	170	Average	HORIZONTAL
6	2489.00	62.86	74.00	-11.14	29.65	4.51	28.70	0.00	270	170	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	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2463.00	121.06			87.95	4.48	28.63	0.00	288	167	Peak	HORIZONTAL
2	2464.20	111.89			78.78	4.48	28.63	0.00	288	167	Average	HORIZONTAL
3	2483.50	67.73	74.00	-6.27	34.55	4.51	28.67	0.00	288	167	Peak	HORIZONTAL
4	2483.80	53.86	54.00	-0.14	20.68	4.51	28.67	0.00	288	167	Average	HORIZONTAL

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

Temperature	25°C	Humidity	60%
Test Engineer	Akina Chiu	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 3, 6, 9 / Chain 1 + Chain 2 + Chain 3 + Chain 4
Test date	May 17, 2015		

Channel 3

	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2389.20	66.15	74.00	-7.85	33.29	4.37	28.49	0.00	279	164	Peak	HORIZONTAL
2	2390.00	53.68	54.00	-0.32	20.78	4.41	28.49	0.00	279	164	Average	HORIZONTAL
3	2414.40	114.64			81.70	4.41	28.53	0.00	279	164	Peak	HORIZONTAL
4	2416.40	105.40			72.43	4.44	28.53	0.00	279	164	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	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2389.40	64.72	74.00	-9.28	31.86	4.37	28.49	0.00	284	153	Peak	HORIZONTAL
2	2390.00	53.09	54.00	-0.91	20.19	4.41	28.49	0.00	284	153	Average	HORIZONTAL
3	2423.80	119.40			86.40	4.44	28.56	0.00	284	153	Peak	HORIZONTAL
4	2442.60	109.29			76.21	4.48	28.60	0.00	284	153	Average	HORIZONTAL
5	2483.50	53.78	54.00	-0.22	20.60	4.51	28.67	0.00	284	153	Average	HORIZONTAL
6	2484.20	66.76	74.00	-7.24	33.58	4.51	28.67	0.00	284	153	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	T/Pos	A/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	deg	cm		
1	2435.60	105.22			72.22	4.44	28.56	0.00	273	163	Average	HORIZONTAL
2	2449.60	114.70			81.62	4.48	28.60	0.00	273	163	Peak	HORIZONTAL
3	2483.50	53.78	54.00	-0.22	20.60	4.51	28.67	0.00	273	163	Average	HORIZONTAL
4	2484.40	65.52	74.00	-8.48	32.34	4.51	28.67	0.00	273	163	Peak	HORIZONTAL

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

Note:

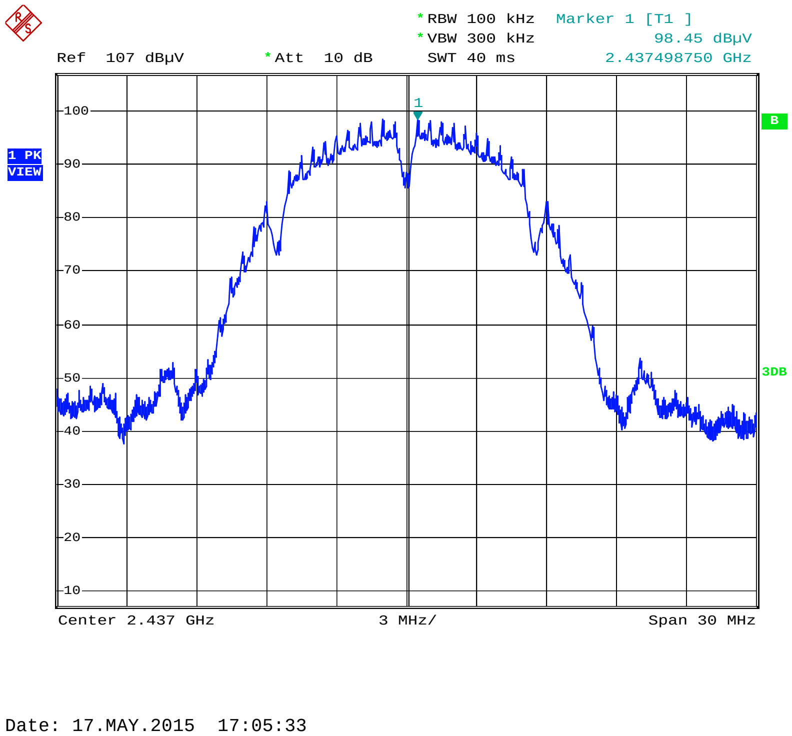
Emission level (dBuV/m) = 20 log Emission level (uV/m).

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

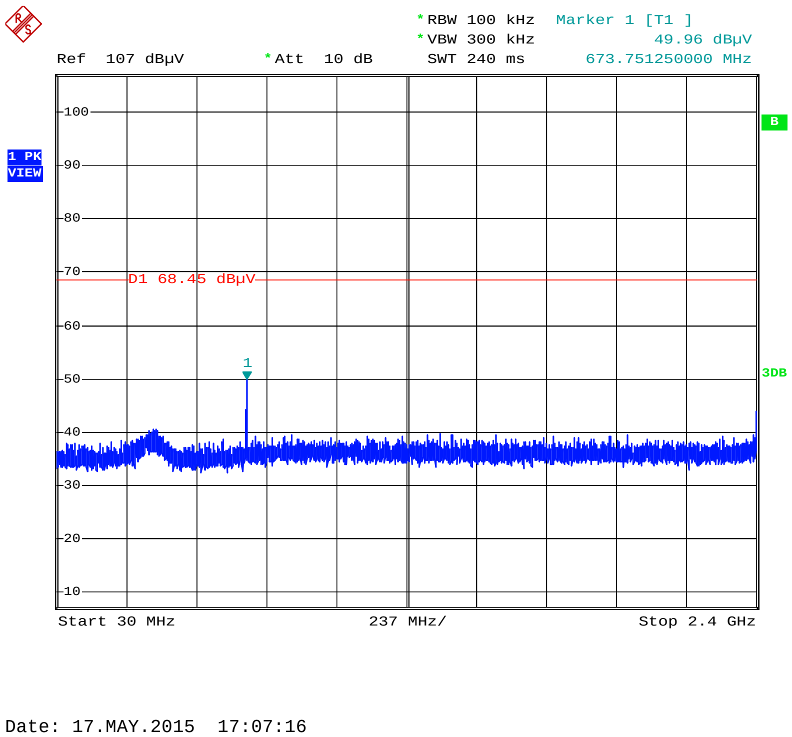
For Emission not in Restricted Band

For non-beamforming mode

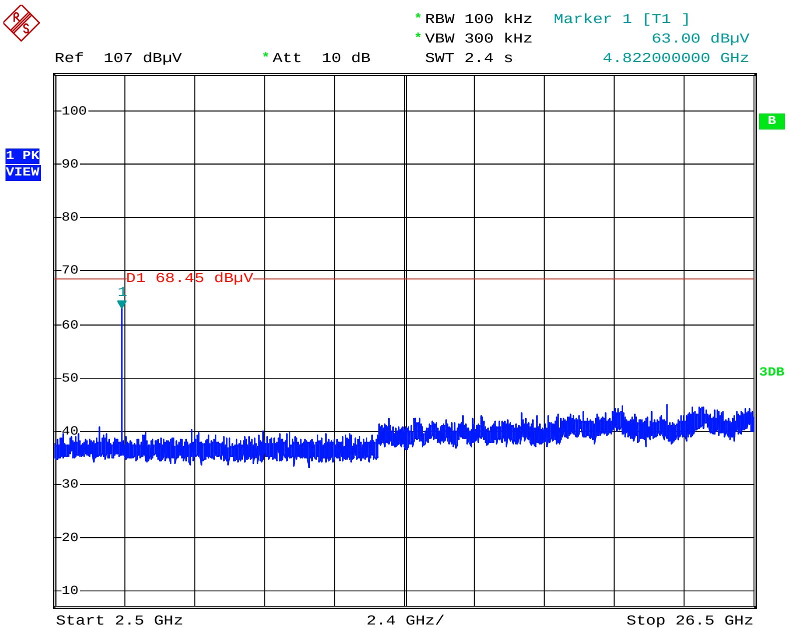
Plot on Configuration IEEE 802.11b / Reference Level



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



Plot on Configuration IEEE 802.11b / CH 1 / 2500MHz~26500MHz (down 30dBc)



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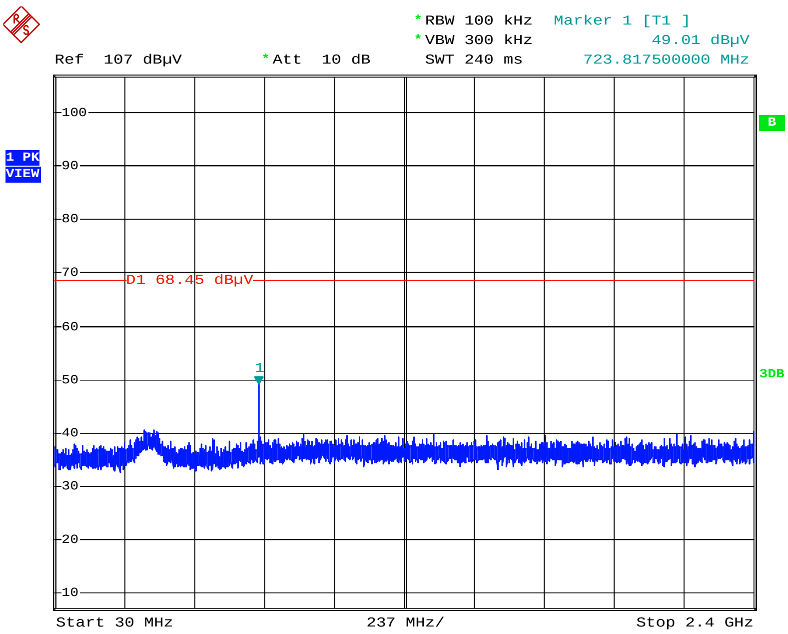
Plot on Configuration IEEE 802.11b / CH 11 / 30MHz~2400MHz (down 30dBc)



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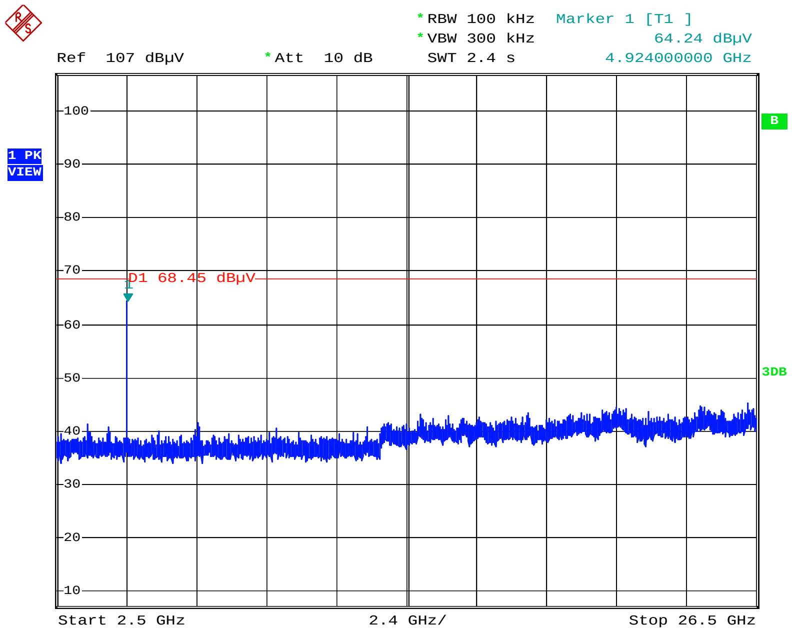
Plot on Configuration IEEE 802.11b / CH 11 / 2500MHz~26500MHz (down 30dBc)



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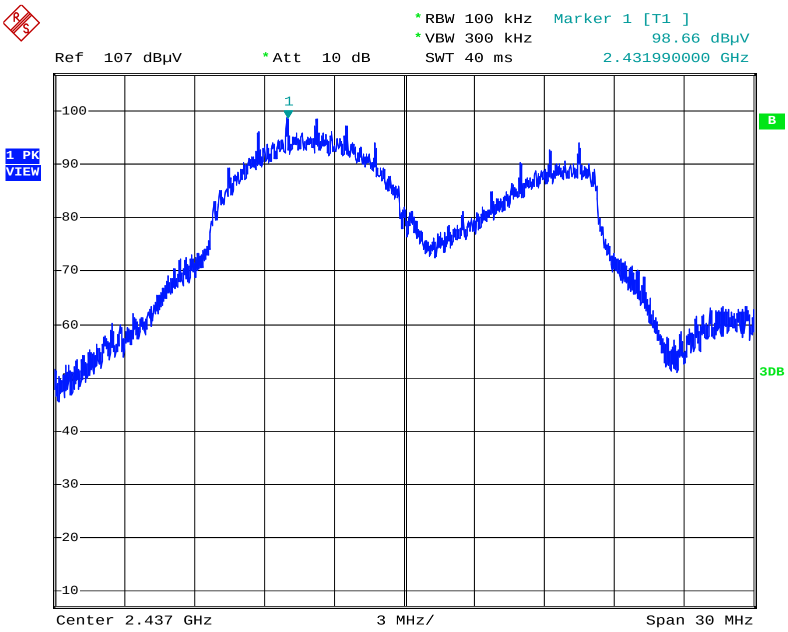
Plot on Configuration IEEE 802.11g / Reference Level



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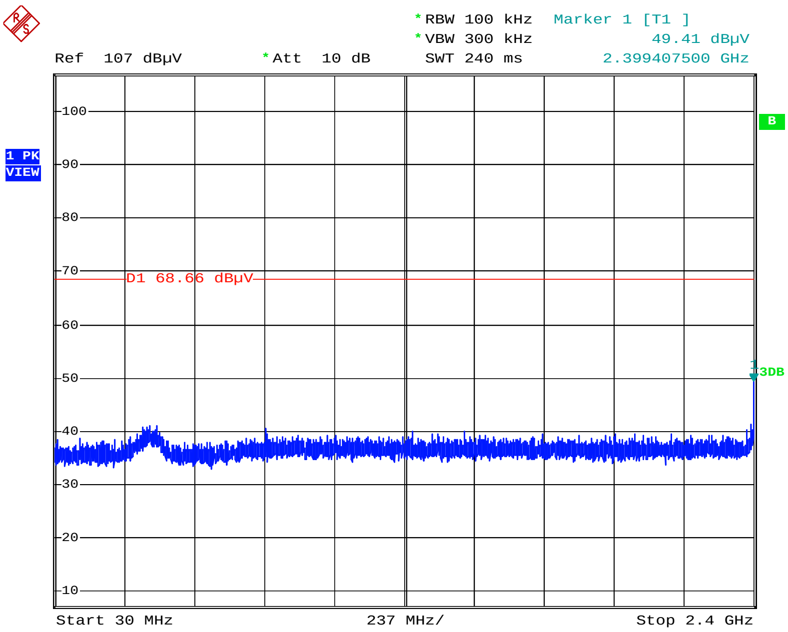
Plot on Configuration IEEE 802.11g / CH 1 / 30MHz~2400MHz (down 30dBc)



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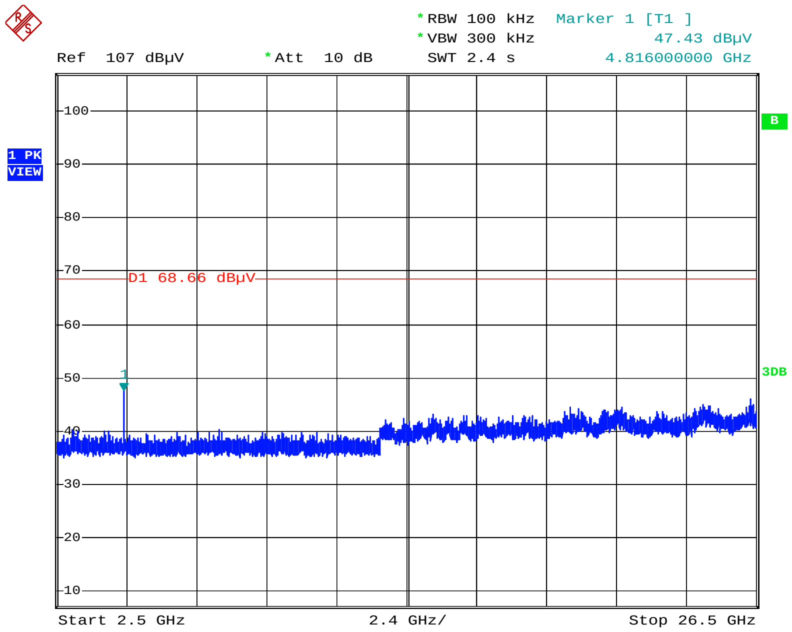
Plot on Configuration IEEE 802.11g / CH 1 / 2500MHz~26500MHz (down 30dBc)



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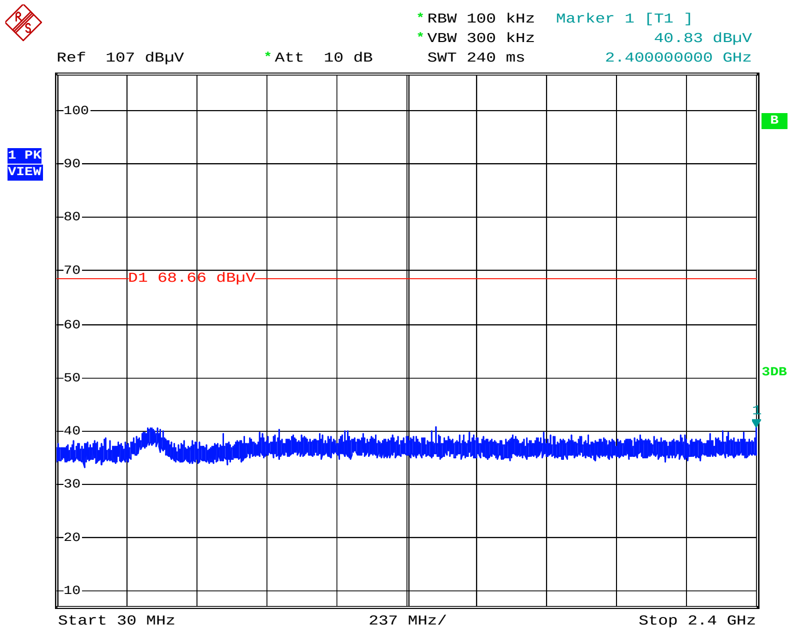
Plot on Configuration IEEE 802.11g / CH 11 / 30MHz~2400MHz (down 30dBc)



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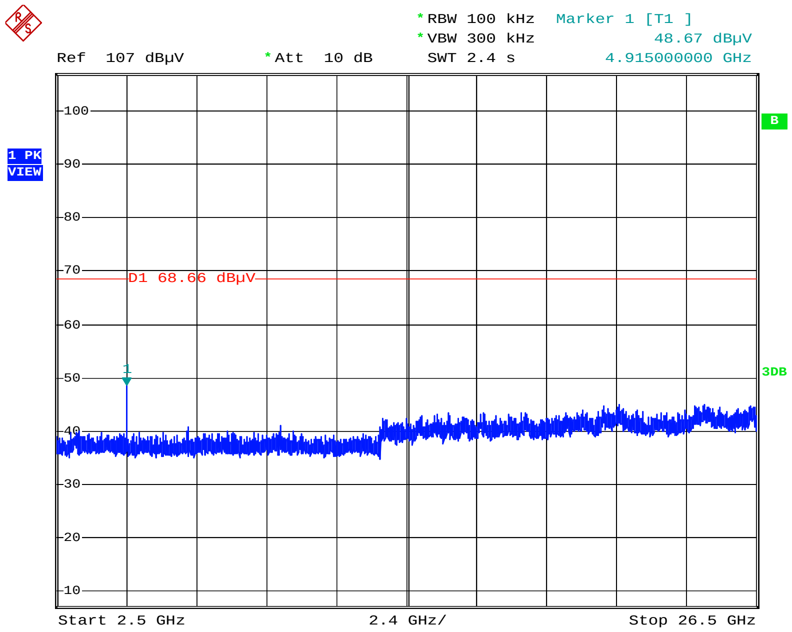
Plot on Configuration IEEE 802.11g / CH 11 / 2500MHz~26500MHz (down 30dBc)



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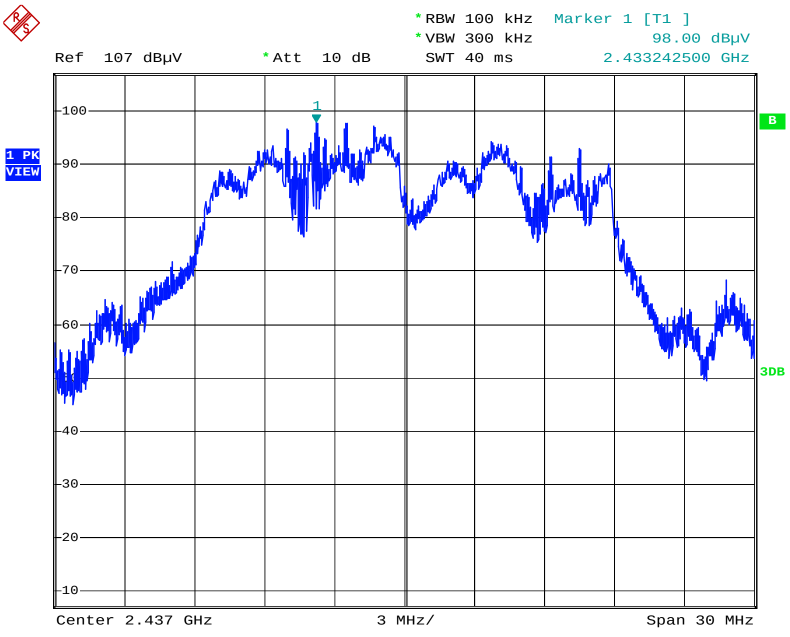
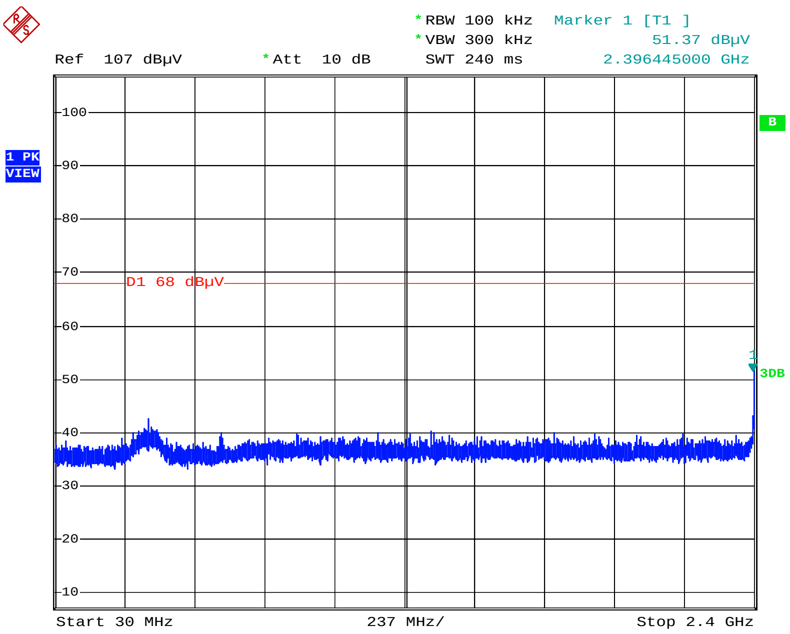
Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Reference Level



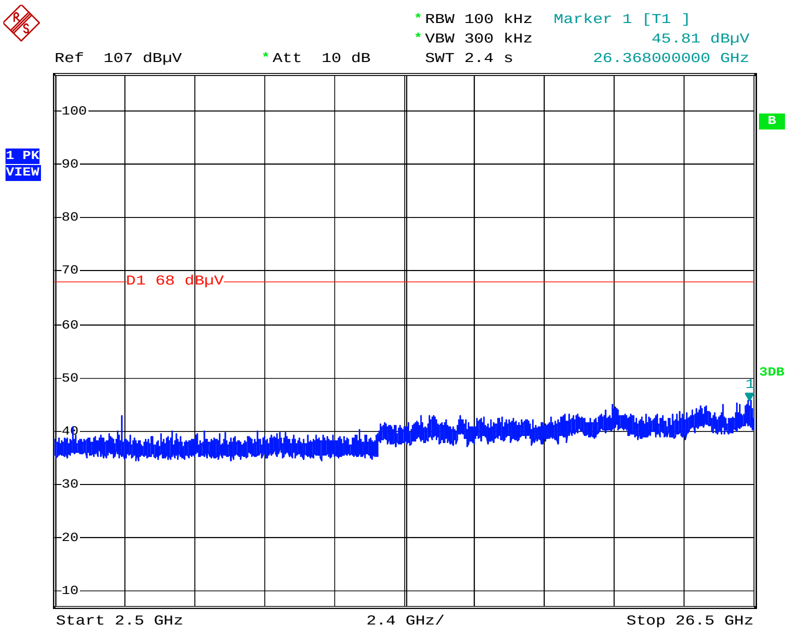
Date: 17.MAY.2015 17:19:50

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



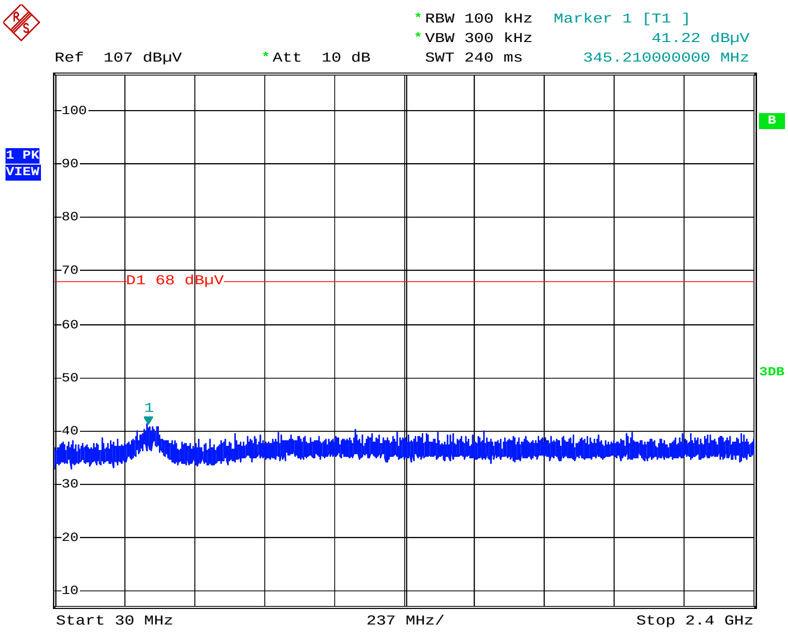
Date: 17.MAY.2015 17:21:39

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 1 / 2500MHz~26500MHz (down 30dBc)



Date: 17.MAY.2015 17:23:32

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



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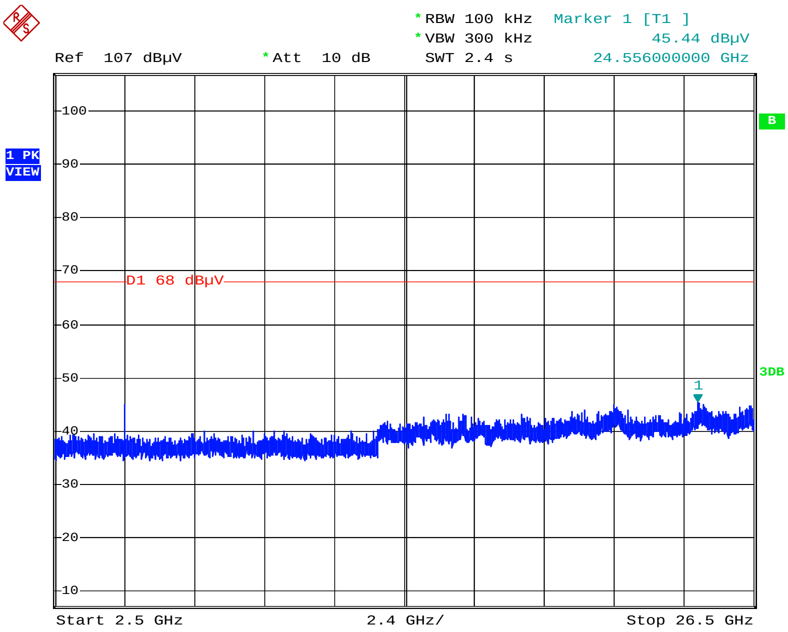
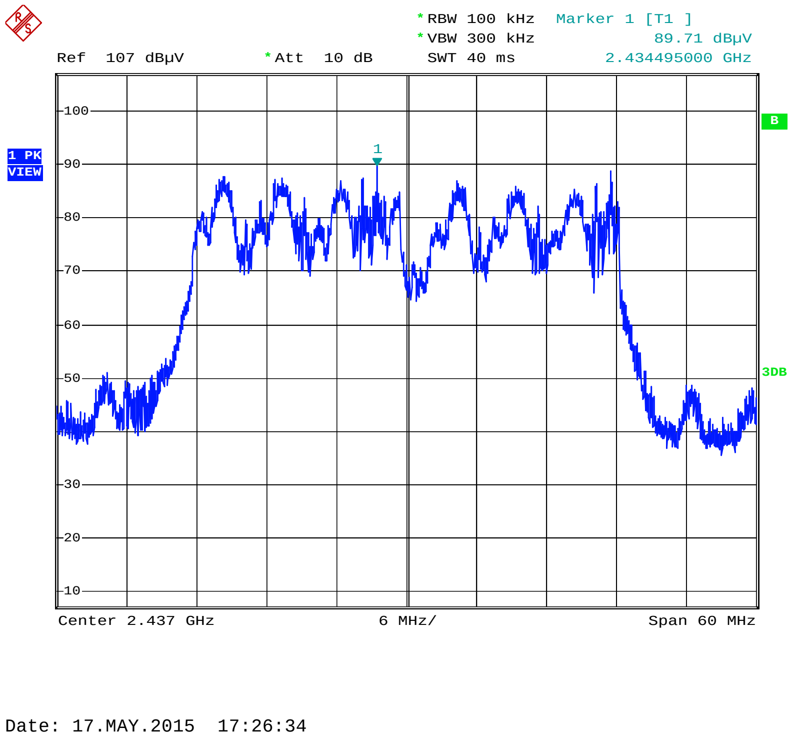
Plot on Configuration IEEE 802.11acMCS0/Nss1 VHT20 / CH 11 / 2500MHz~26500MHz (down 30dBc)

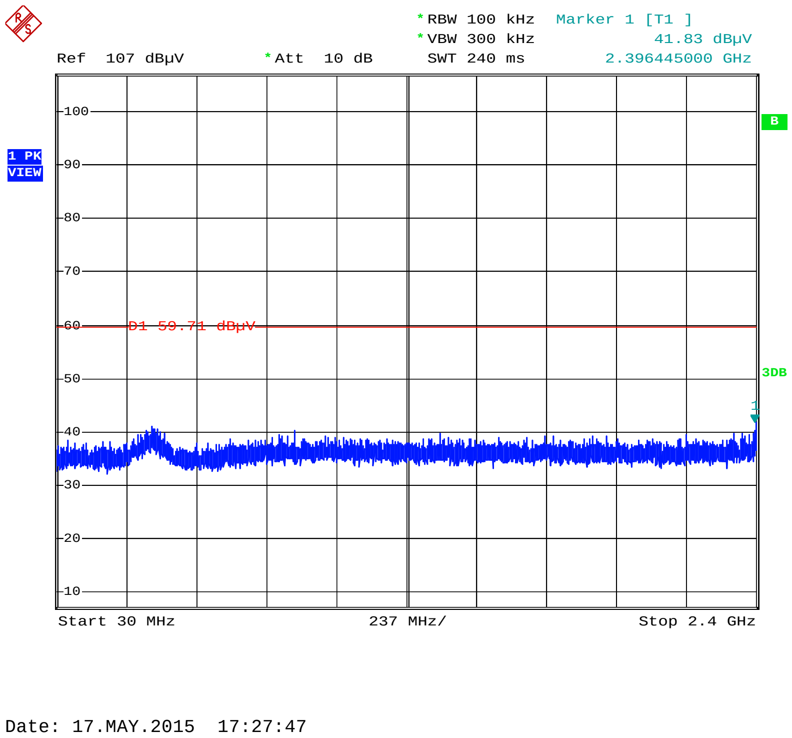


Date: 17.MAY.2015 17:25:10

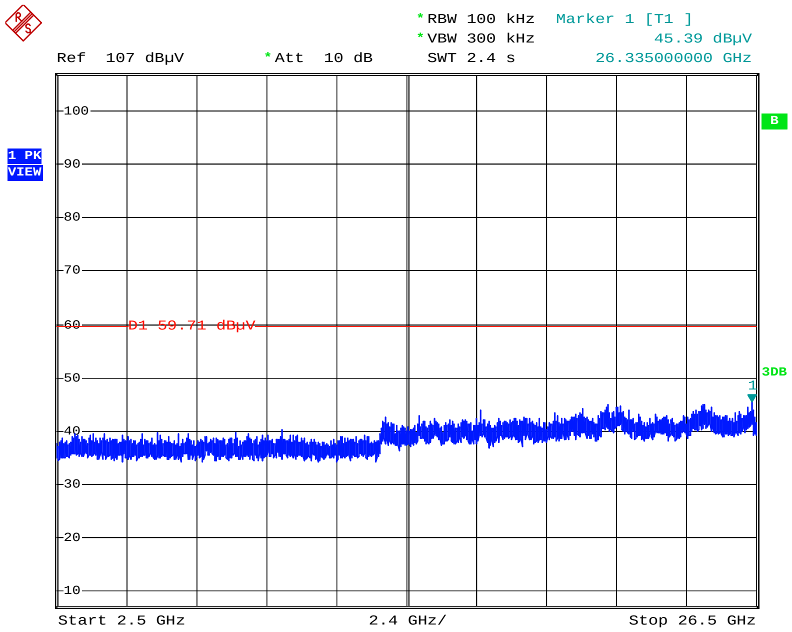
Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Reference Level



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



Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 3 / 2500MHz~26500MHz (down 30dBc)



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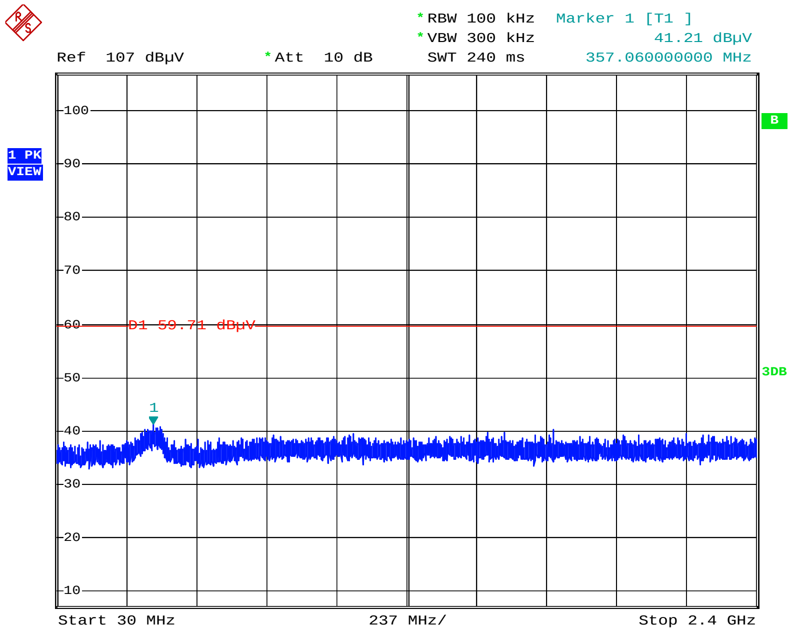
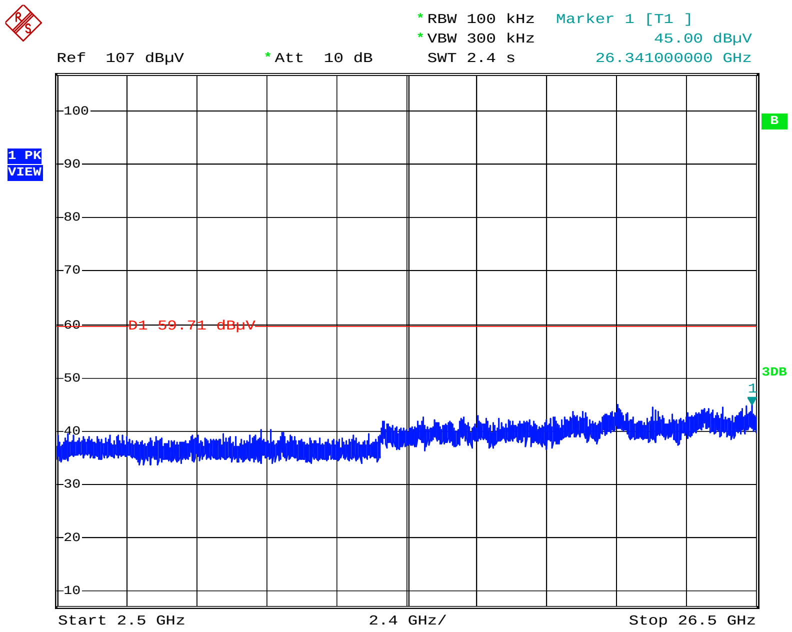
Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 9 / 30MHz~2400MHz (down 30dBc)



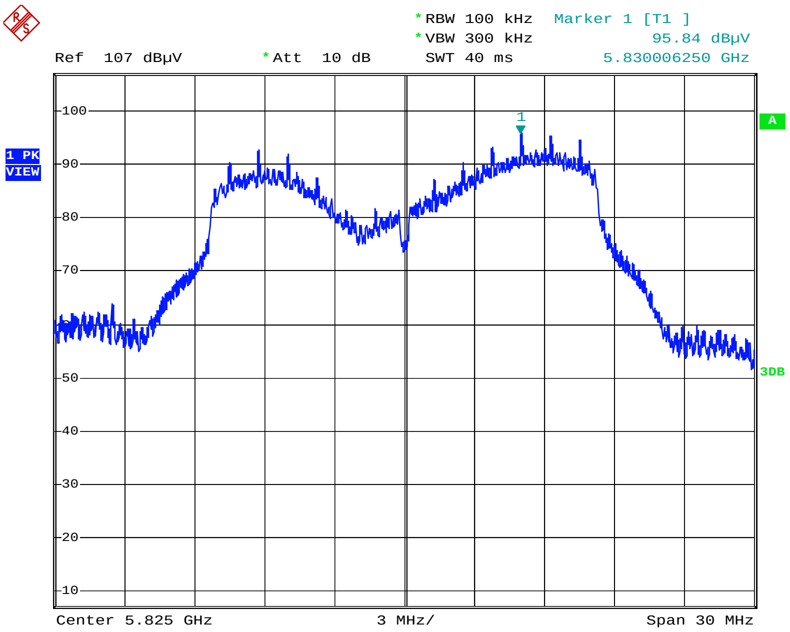
Date: 17.MAY.2015 17:30:15

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 9 / 2500MHz~26500MHz (down 30dBc)



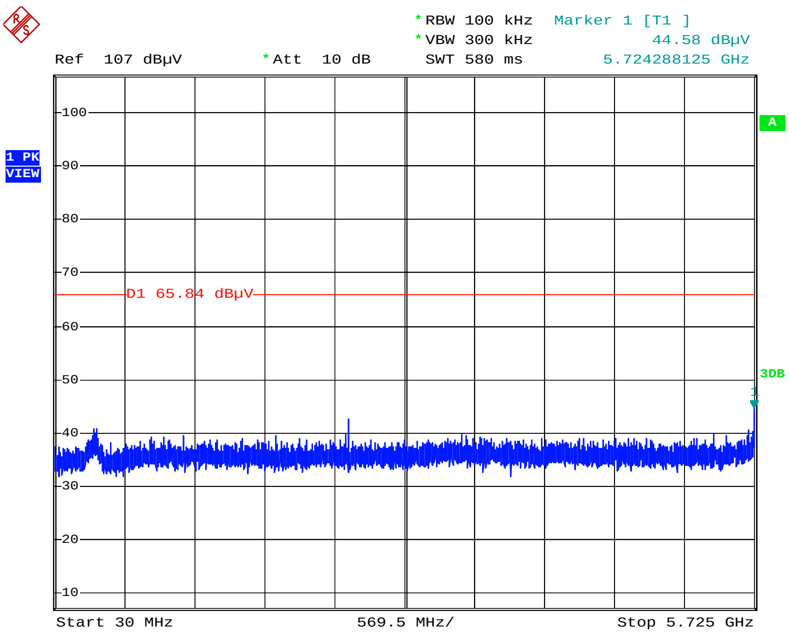
Date: 17.MAY.2015 17:29:43

Plot on Configuration IEEE 802.11a / Reference Level



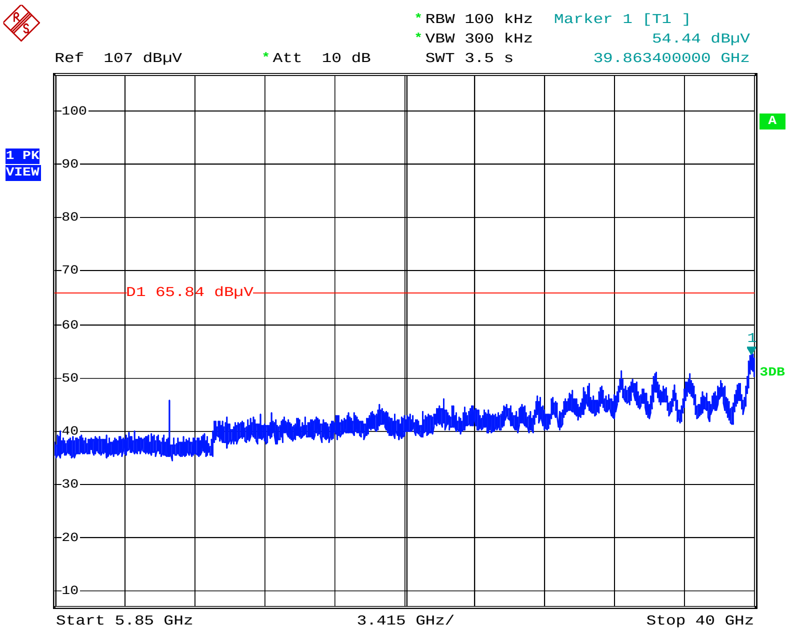
Date: 17.MAY.2015 06:07:45

Plot on Configuration IEEE 802.11a / CH 149 / 30MHz~5725MHz (down 30dBc)



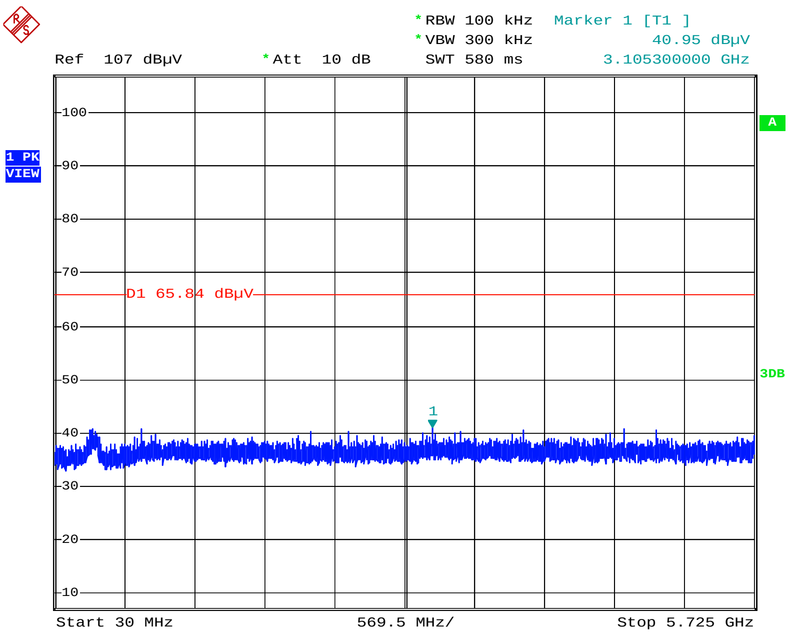
Date: 17.MAY.2015 06:11:03

Plot on Configuration IEEE 802.11a / CH 149 / 5850MHz~40000MHz (down 30dBc)



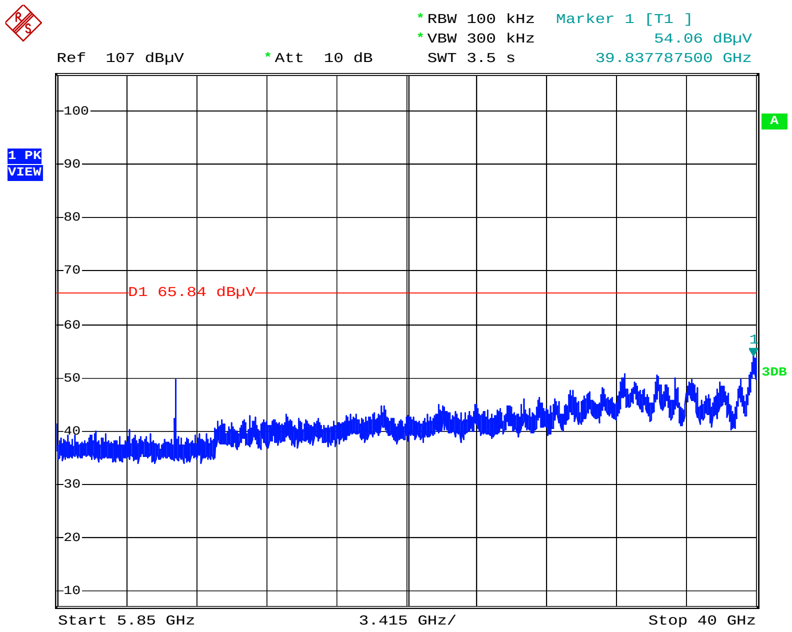
Date: 17.MAY.2015 06:11:41

Plot on Configuration IEEE 802.11a / CH 165 / 30MHz~5725MHz (down 30dBc)



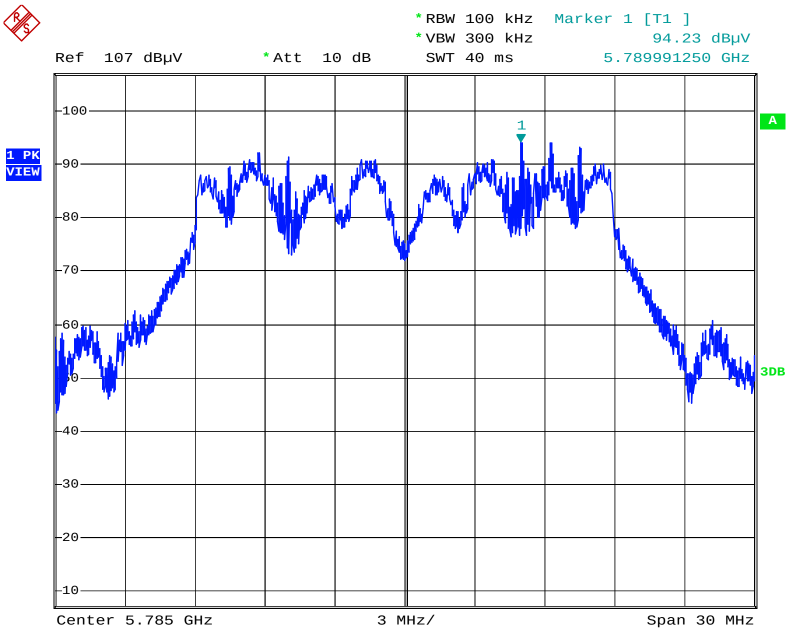
Date: 17.MAY.2015 06:08:44

Plot on Configuration IEEE 802.11a / CH 165 / 5850MHz~40000MHz (down 30dBc)



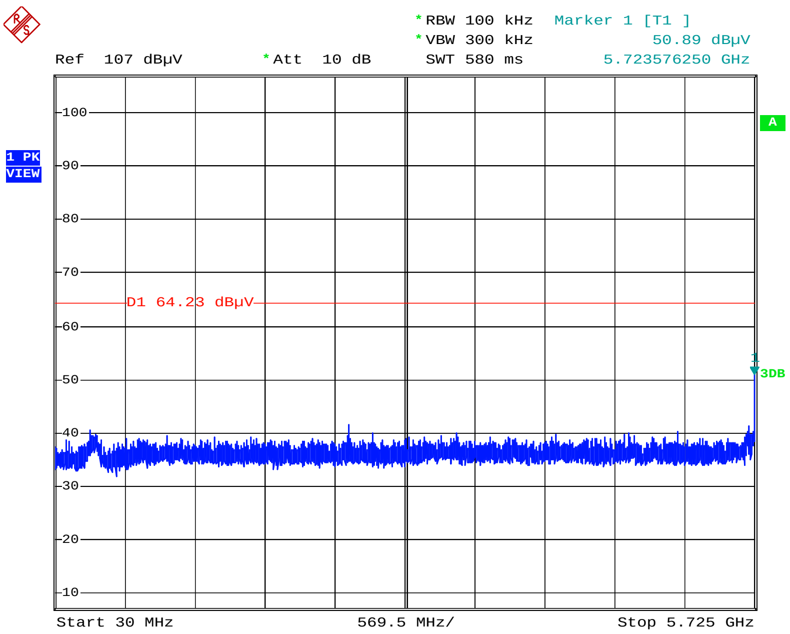
Date: 17.MAY.2015 06:09:14

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



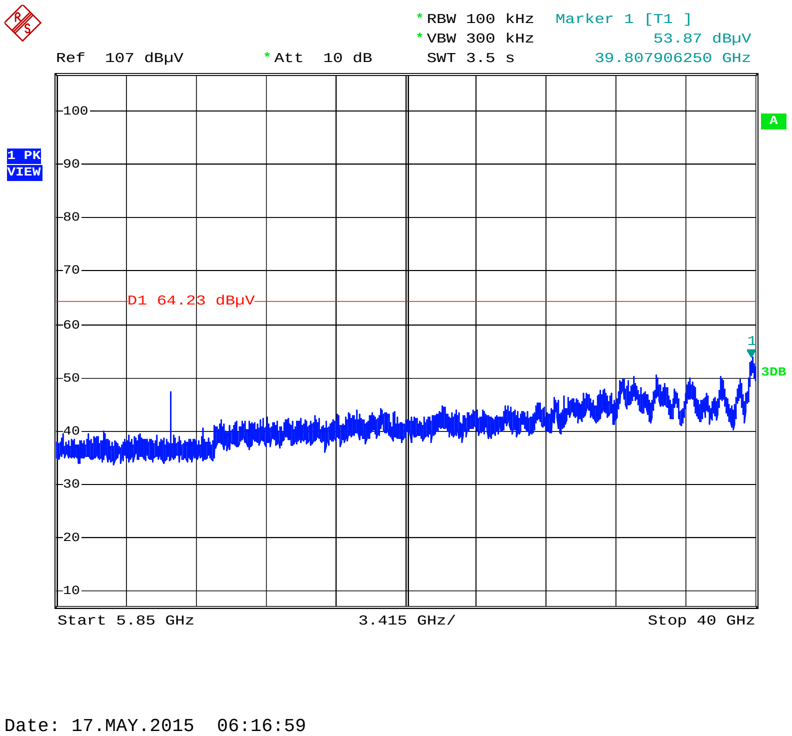
Date: 17.MAY.2015 06:14:54

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 149 / 30MHz~5725MHz (down 30dBc)

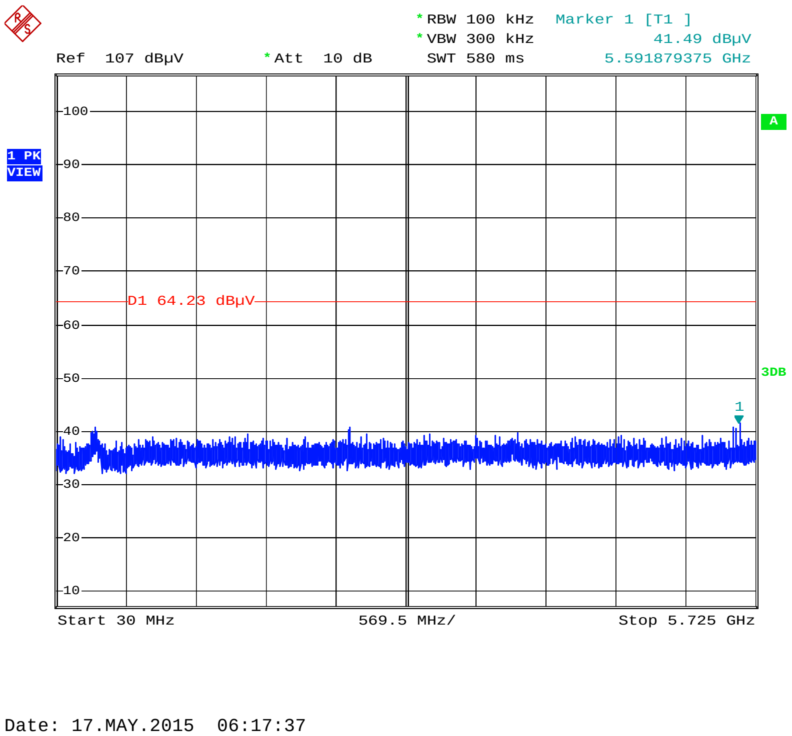


Date: 17.MAY.2015 06:16:31

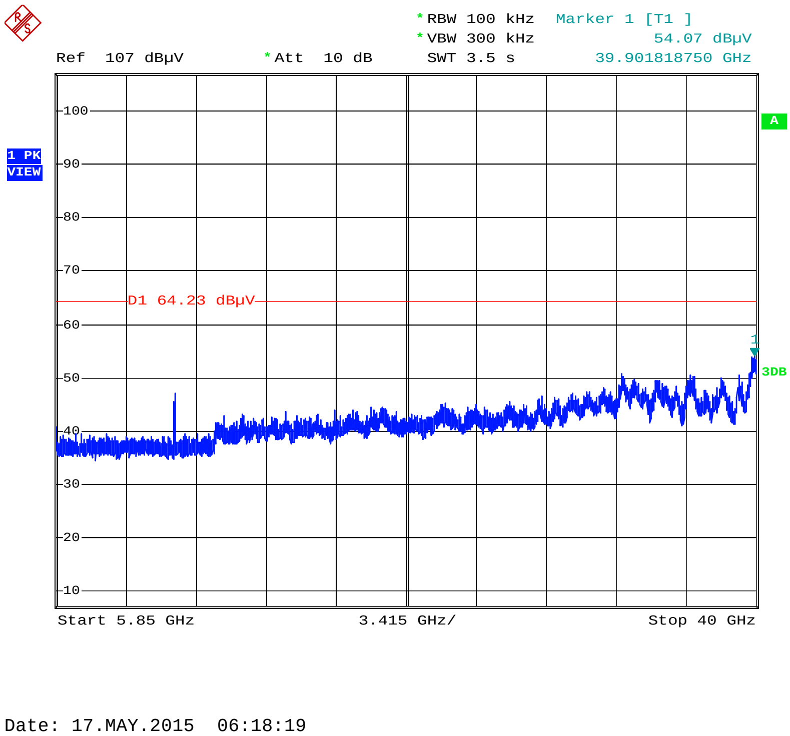
Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 149 / 5850MHz~40000MHz (down 30dBc)



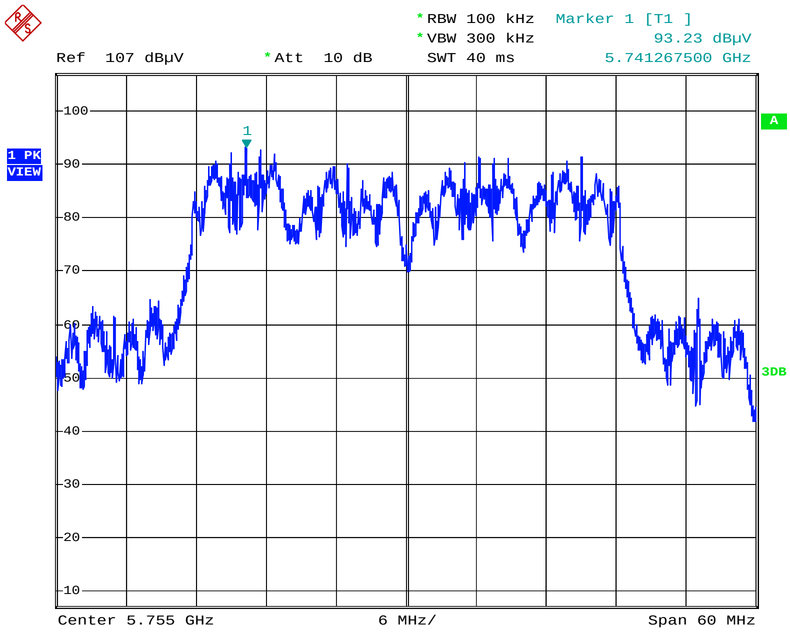
Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 165 / 30MHz~5725MHz (down 30dBc)



Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 165 / 5850MHz~40000MHz (down 30dBc)

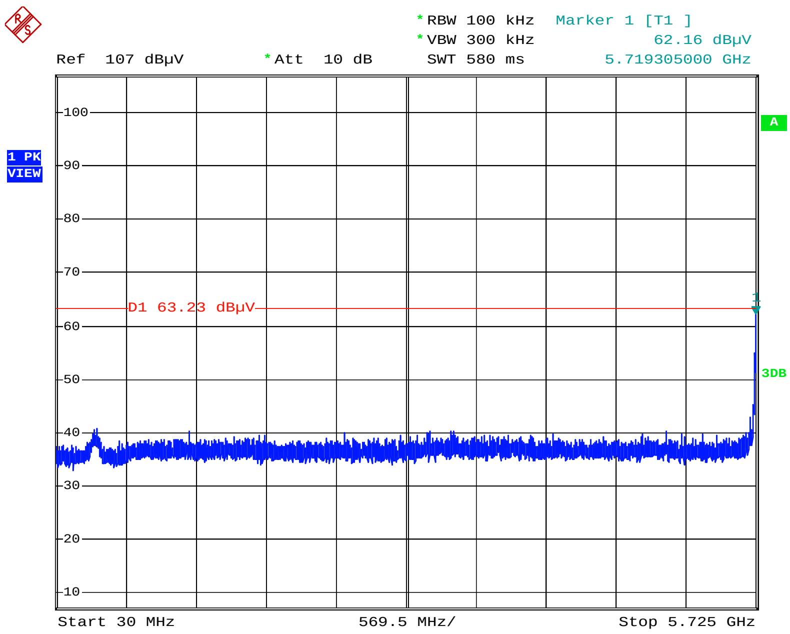


Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Reference Level



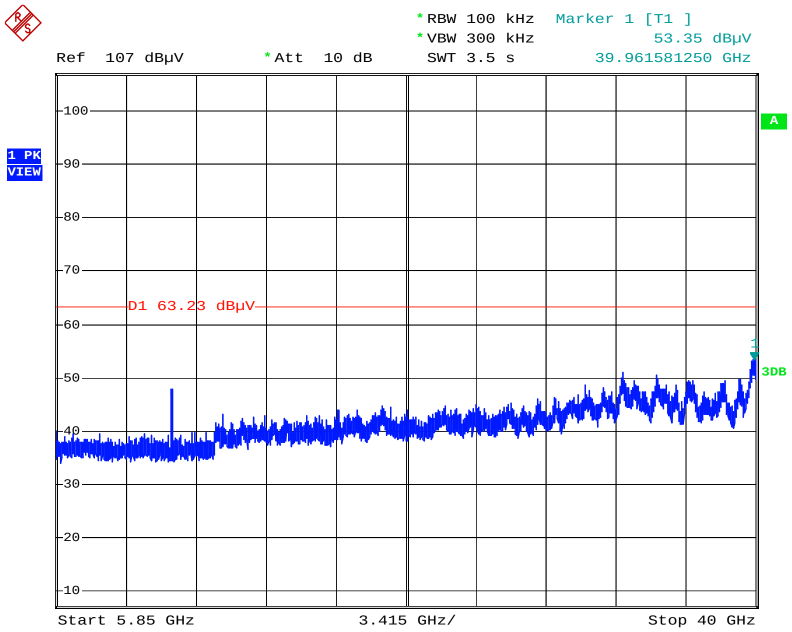
Date: 17.MAY.2015 06:20:46

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 151 / 30MHz~5725MHz (down 30dBc)



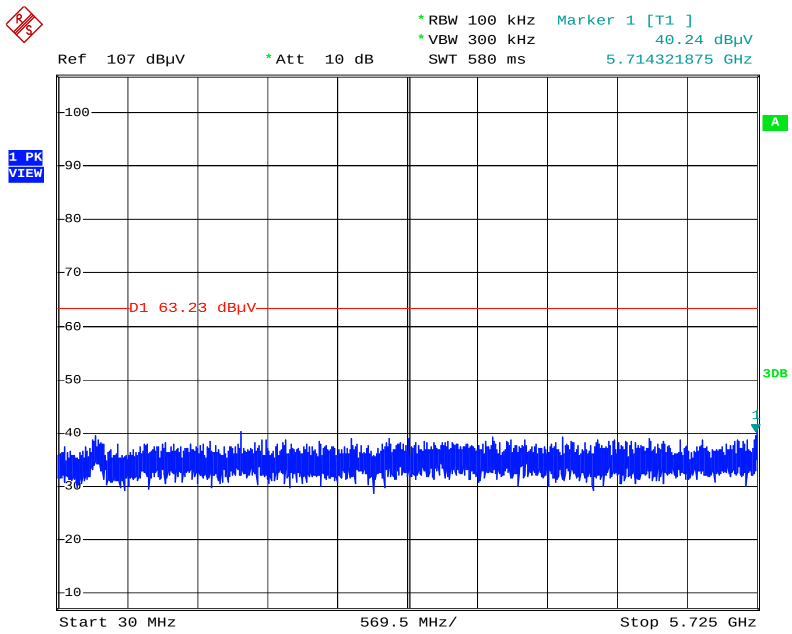
Date: 17.MAY.2015 06:22:22

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 151 / 5850MHz~40000MHz (down 30dBc)



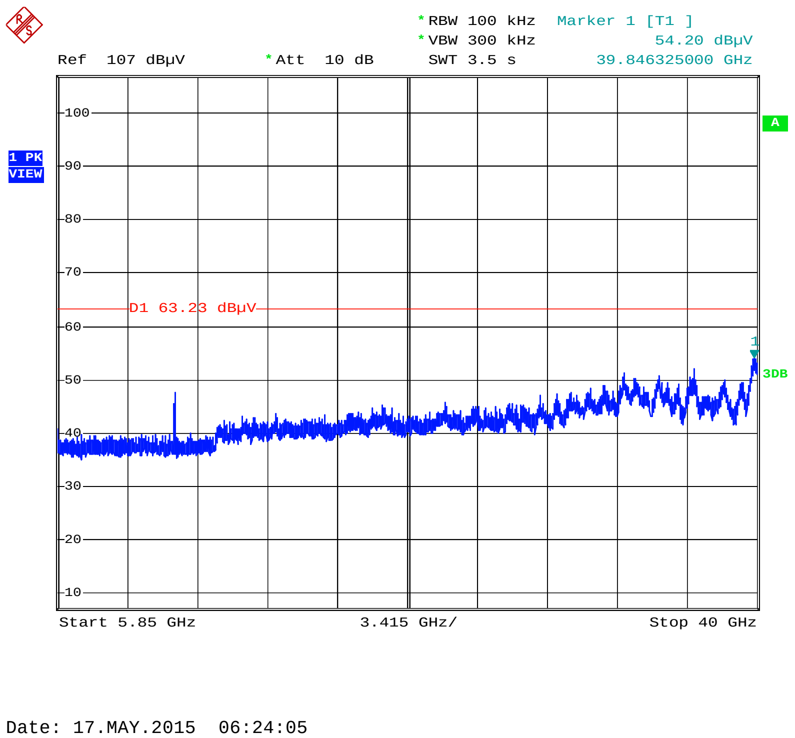
Date: 17.MAY.2015 06:22:46

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 159 / 30MHz~5725MHz (down 30dBc)

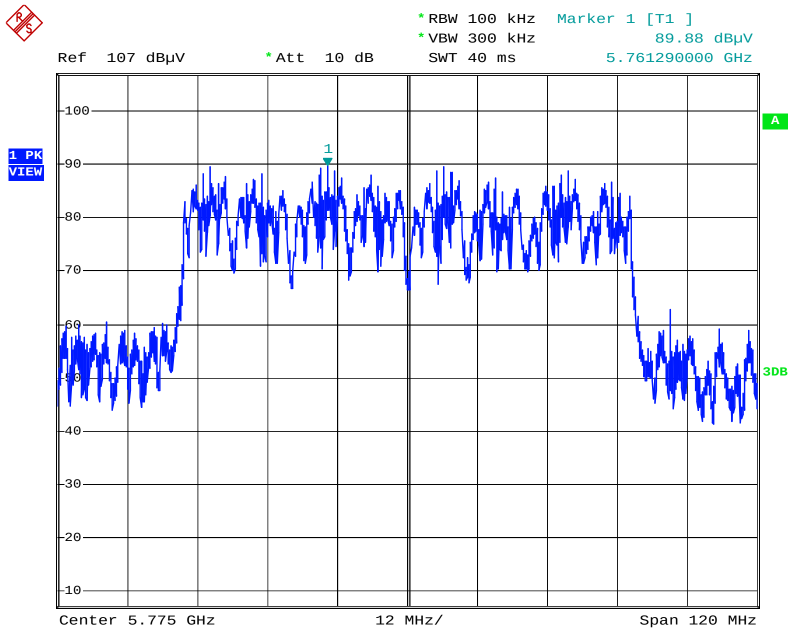


Date: 17.MAY.2015 06:23:13

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 159 / 5850MHz~40000MHz (down 30dBc)

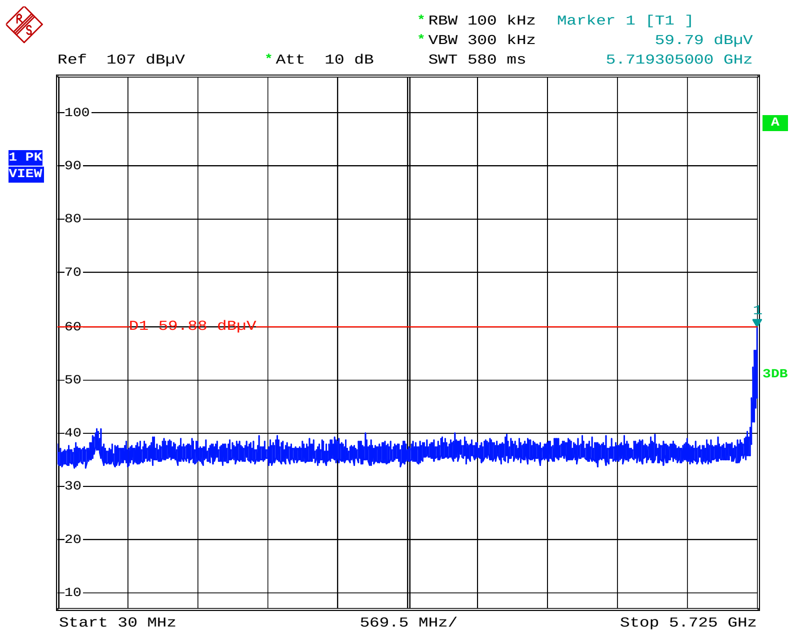


Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Reference Level



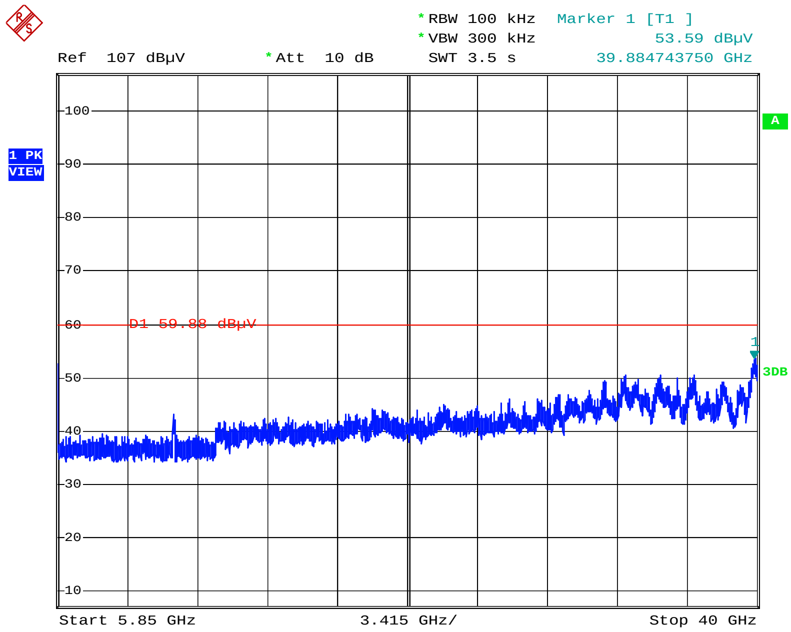
Date: 17.MAY.2015 06:32:37

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / CH 155 / 30MHz~5725MHz (down 30dBc)



Date: 17.MAY.2015 06:34:04

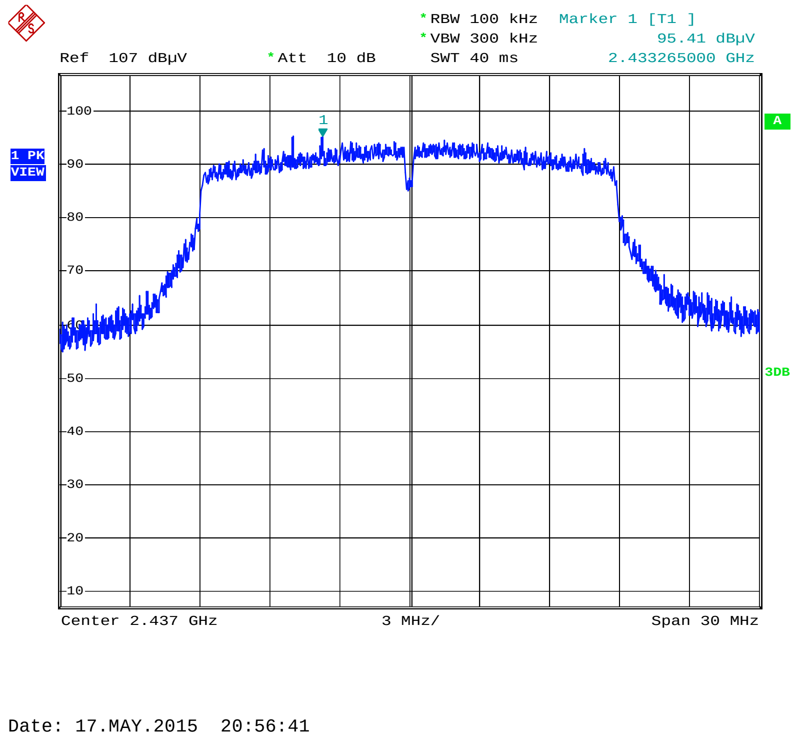
Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / CH 155 / 5850MHz~40000MHz (down 30dBc)



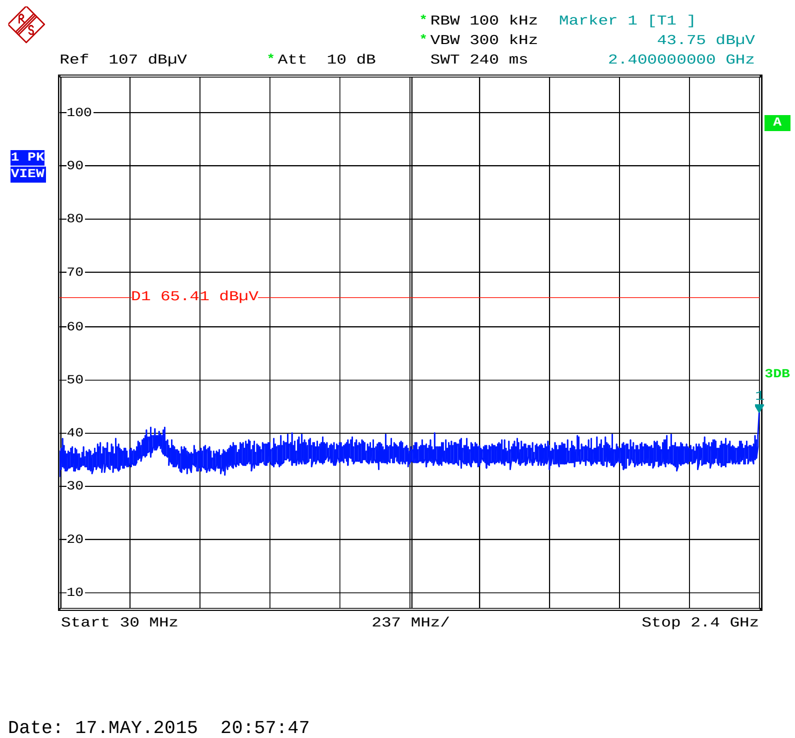
Date: 17.MAY.2015 06:34:27

For beamforming mode

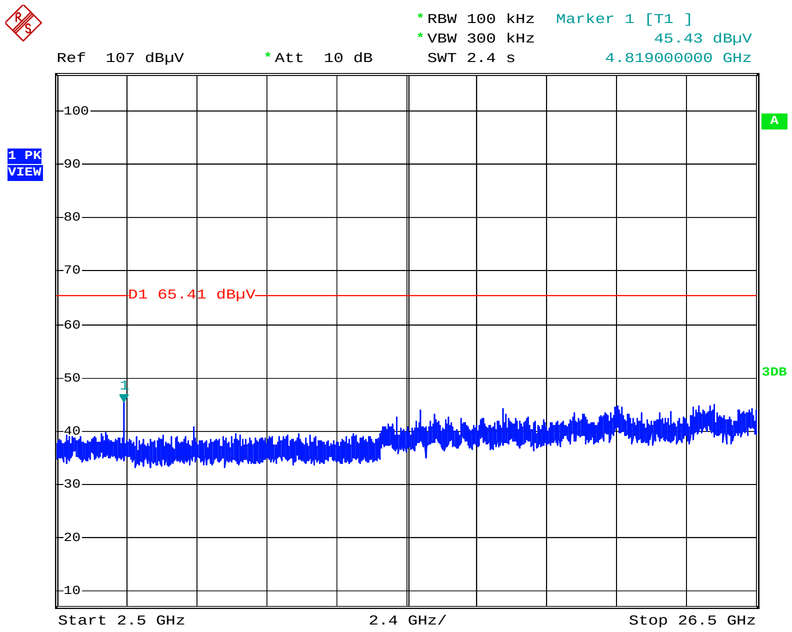
Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Reference Level



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

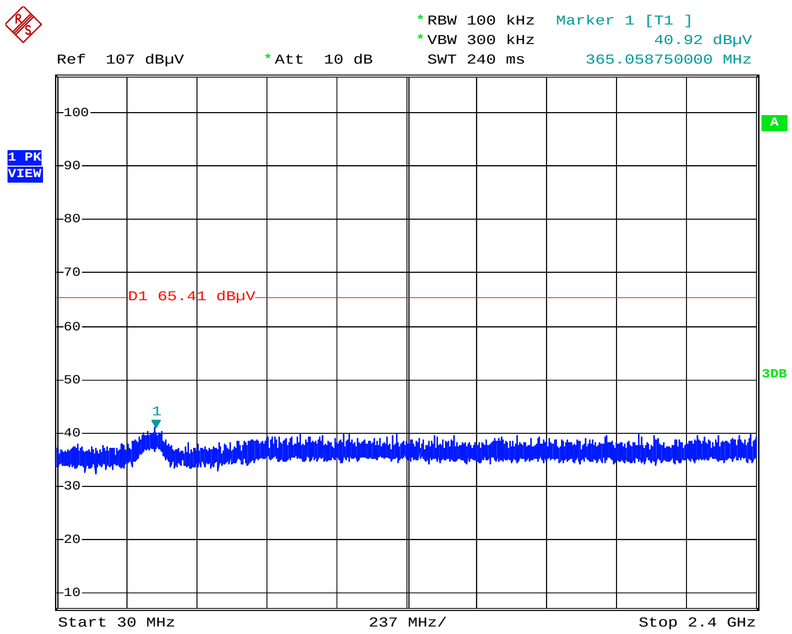


Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 1 / 2500MHz~26500MHz (down 30dBc)



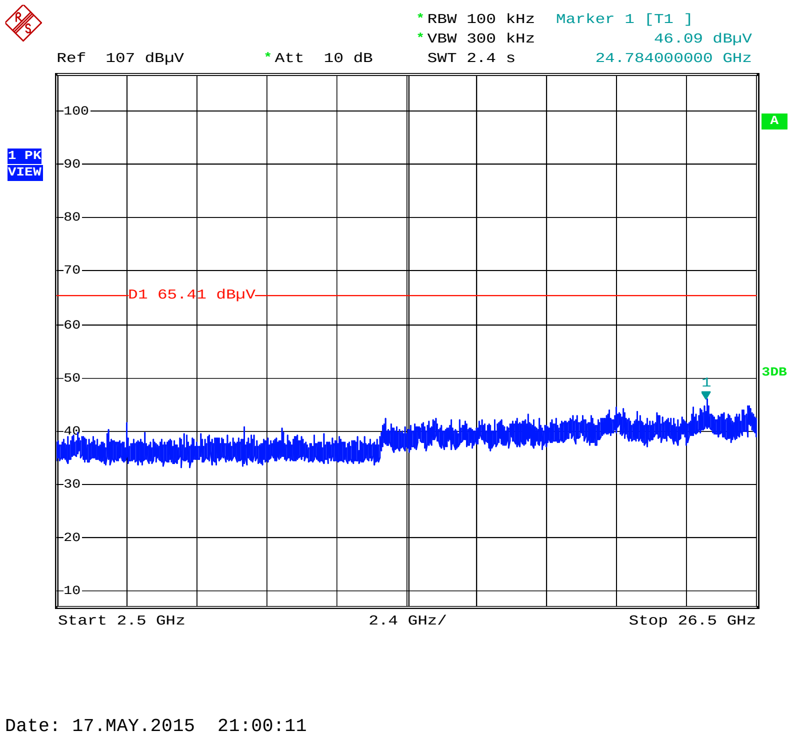
Date: 17.MAY.2015 21:00:50

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

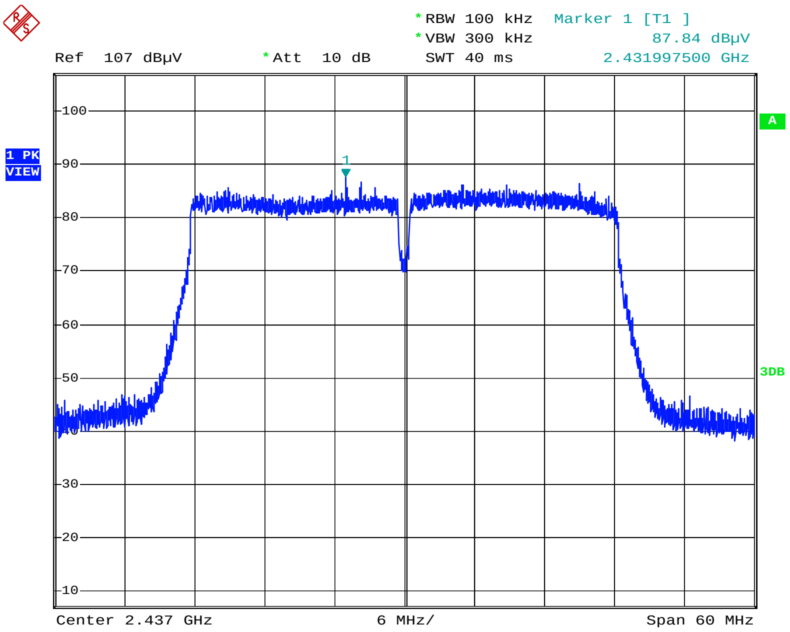


Date: 17.MAY.2015 20:59:39

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 11 / 2500MHz~26500MHz (down 30dBc)

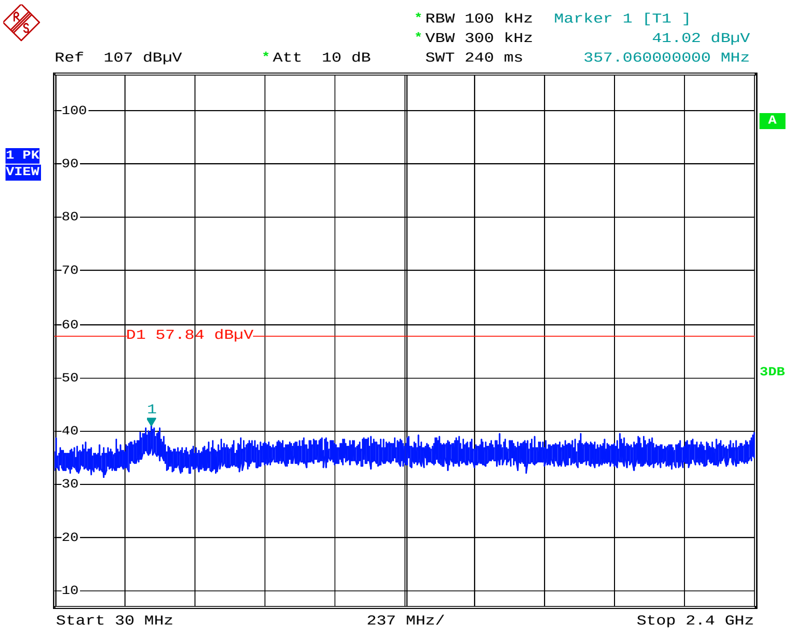


Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Reference Level



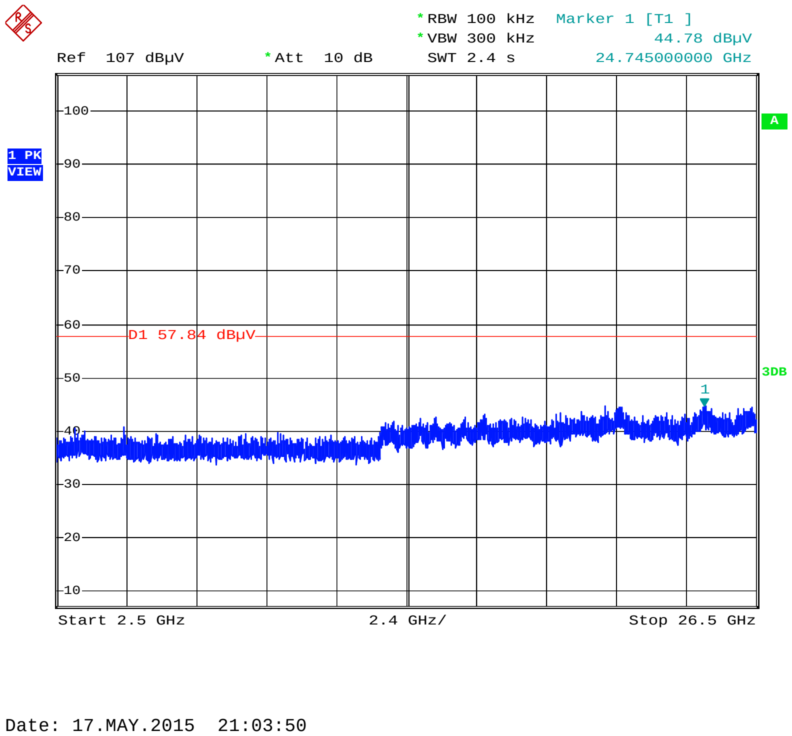
Date: 17.MAY.2015 21:02:03

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

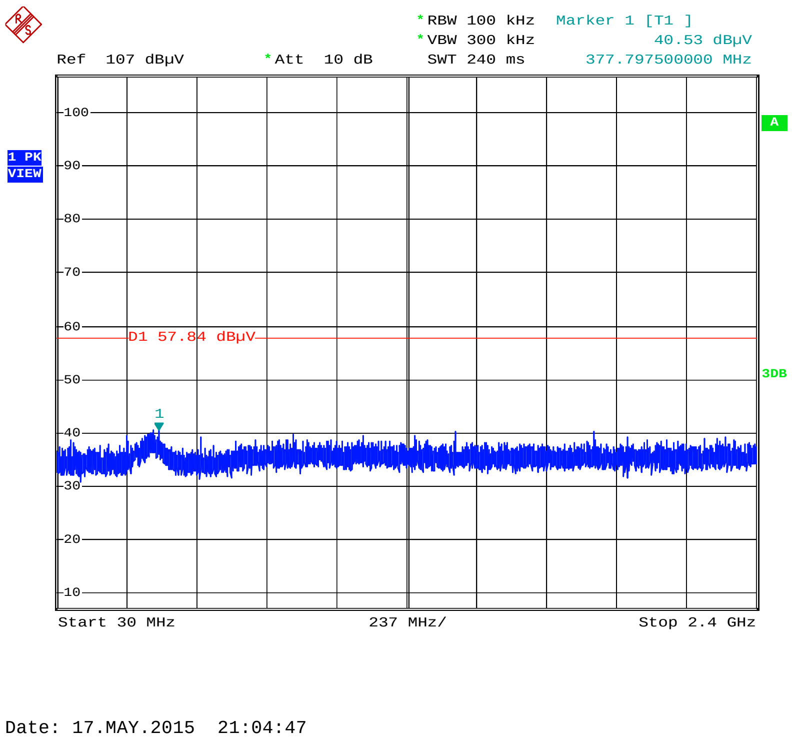


Date: 17.MAY.2015 21:03:22

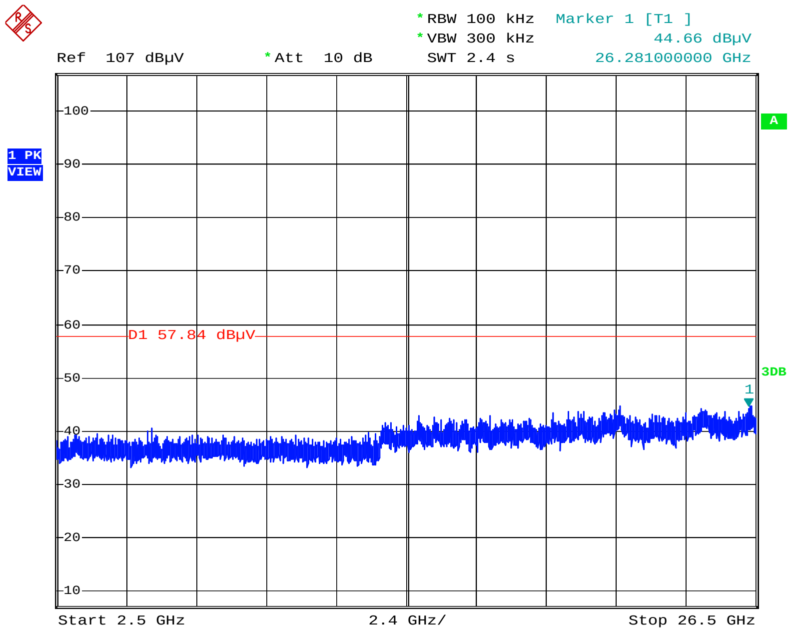
Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 3 / 2500MHz~26500MHz (down 30dBc)



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

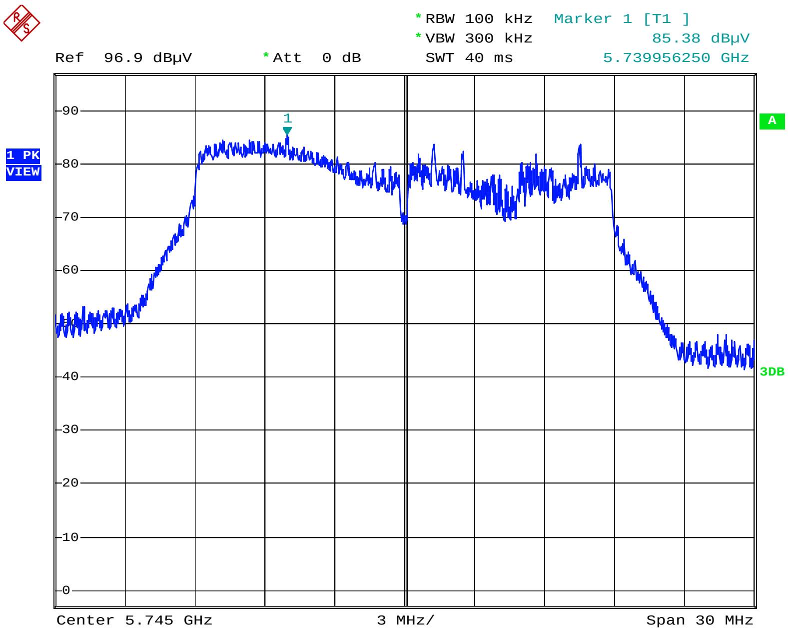


Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 9 / 2500MHz~26500MHz (down 30dBc)



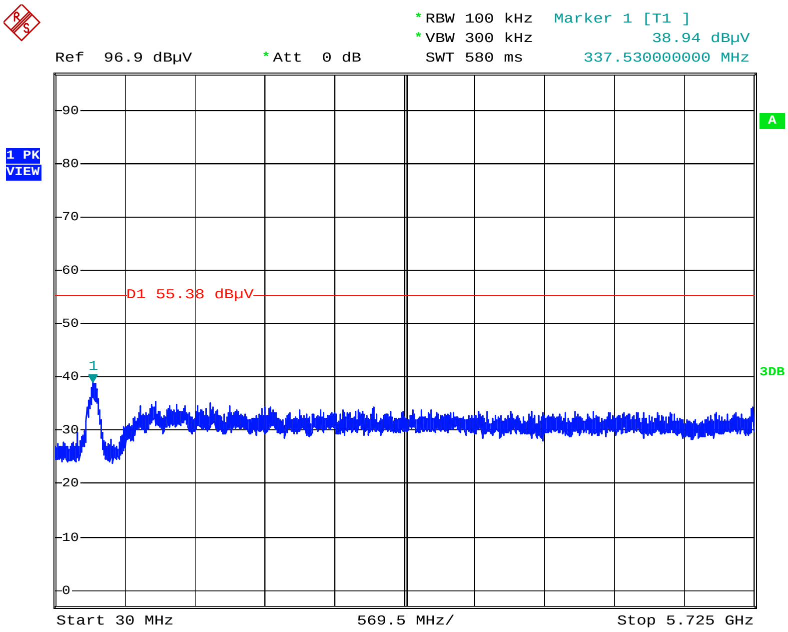
Date: 17.MAY.2015 21:05:11

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



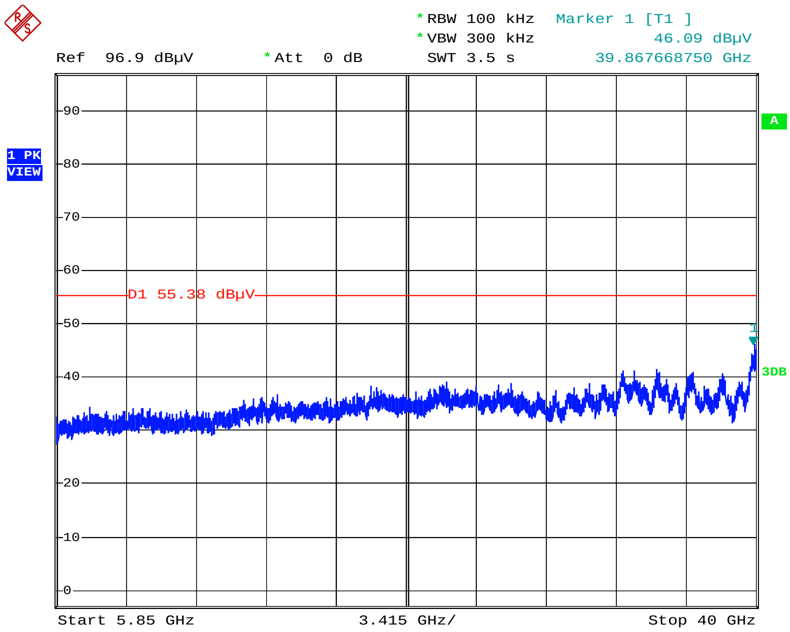
Date: 18.MAY.2015 16:18:02

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 149 / 30MHz~5725MHz (down 30dBc)



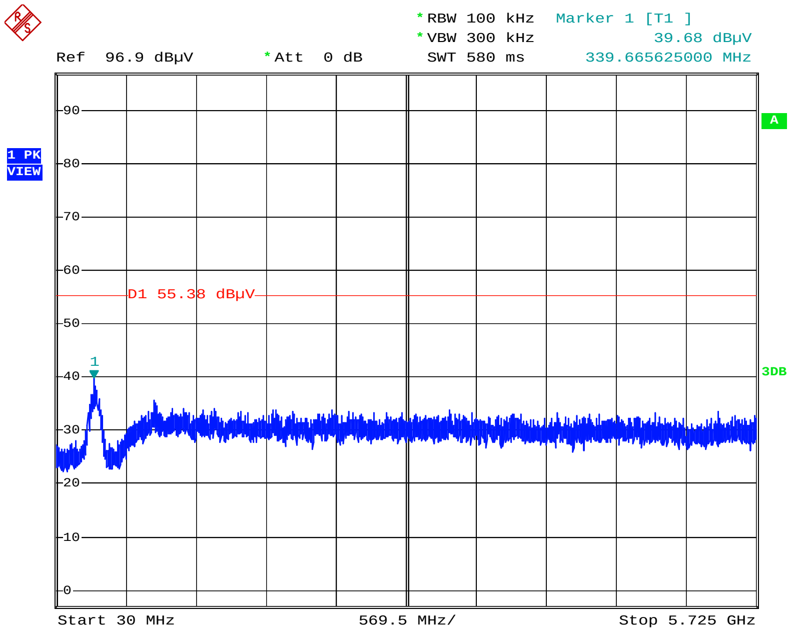
Date: 18.MAY.2015 16:23:40

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 149 / 5850MHz~40000MHz (down 30dBc)



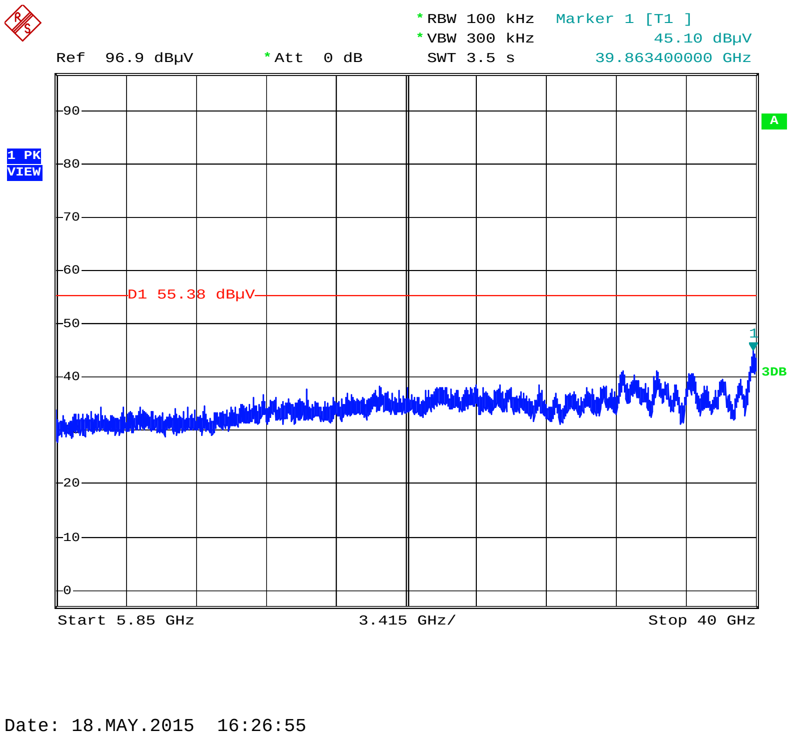
Date: 18.MAY.2015 16:24:39

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 165 / 30MHz~5725MHz (down 30dBc)

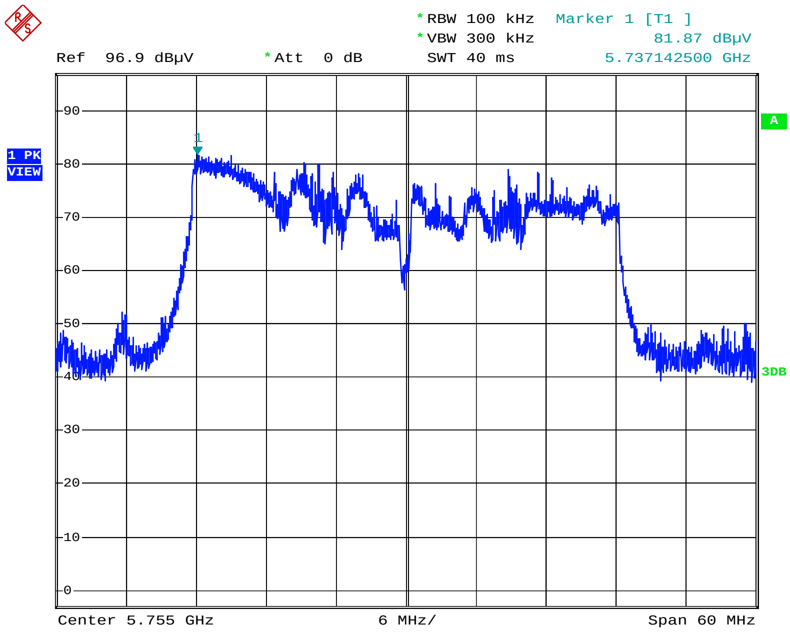


Date: 18.MAY.2015 16:27:23

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / CH 165 / 5850MHz~40000MHz (down 30dBc)

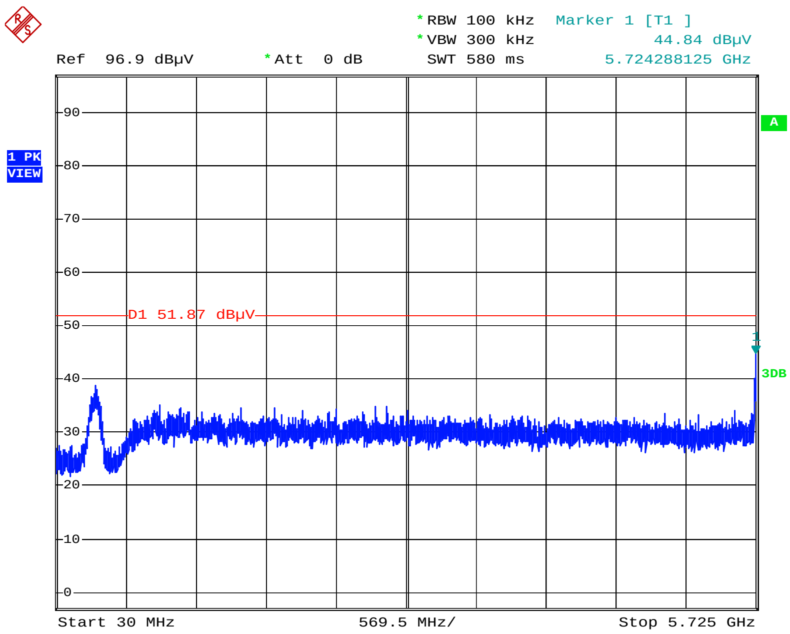


Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Reference Level



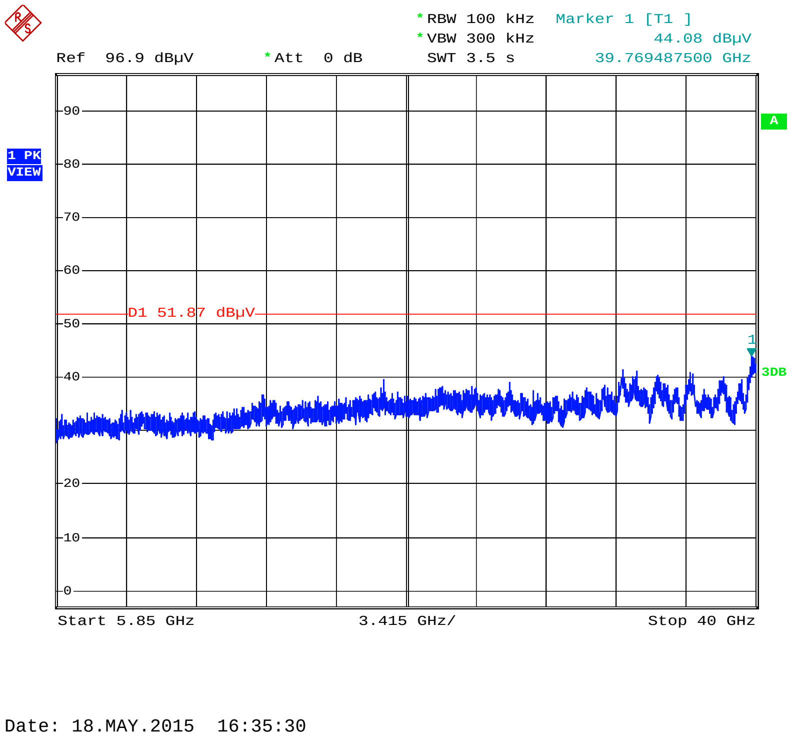
Date: 18.MAY.2015 16:33:56

Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 151 / 30MHz~5725MHz (down 30dBc)

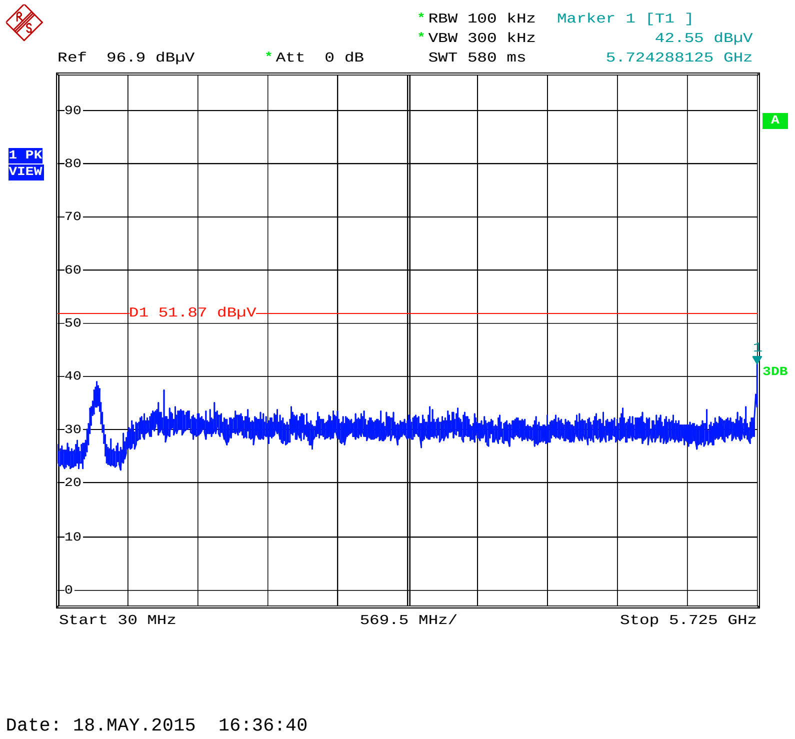


Date: 18.MAY.2015 16:34:47

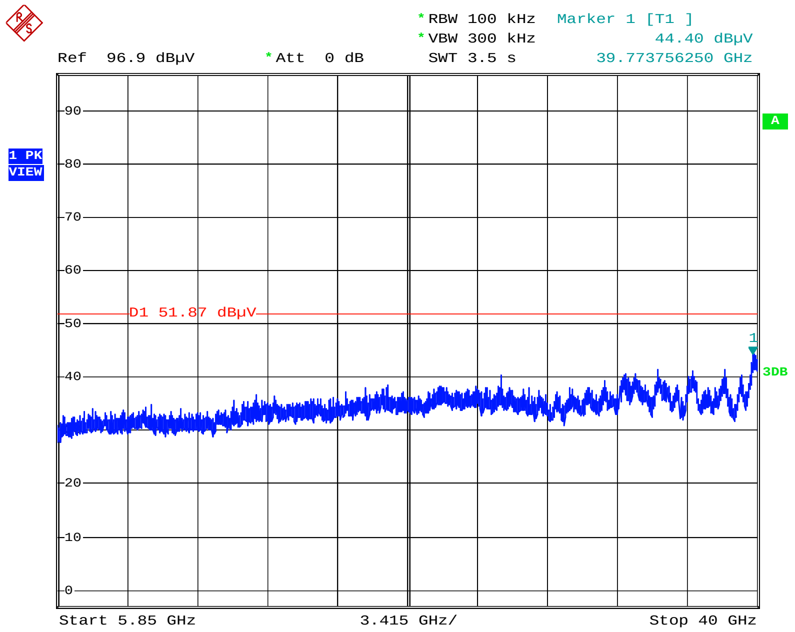
Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 151 / 5850MHz~40000MHz (down 30dBc)



Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 159 / 30MHz~5725MHz (down 30dBc)

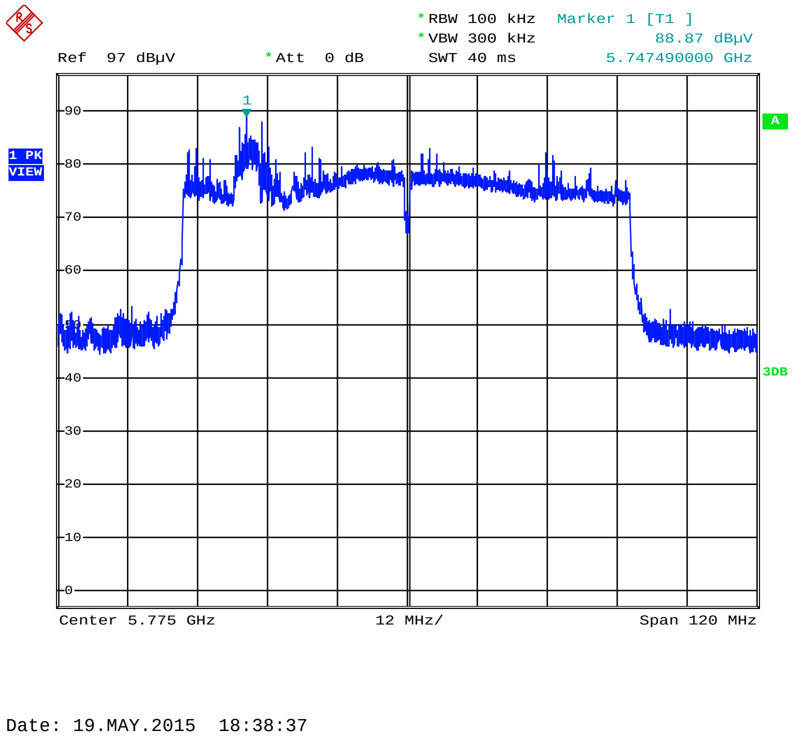


Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / CH 159 / 5850MHz~40000MHz (down 30dBc)

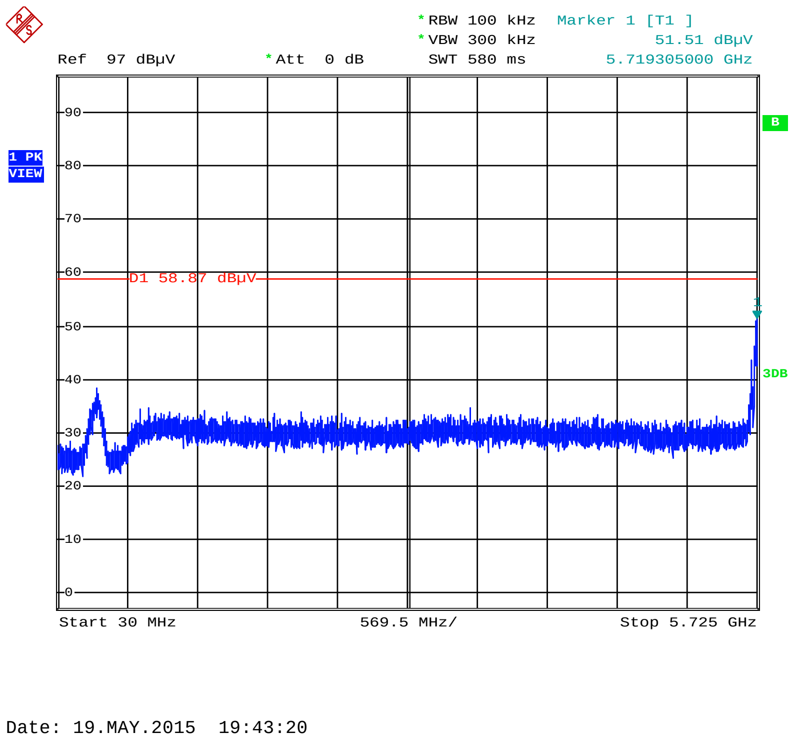


Date: 18.MAY.2015 16:37:29

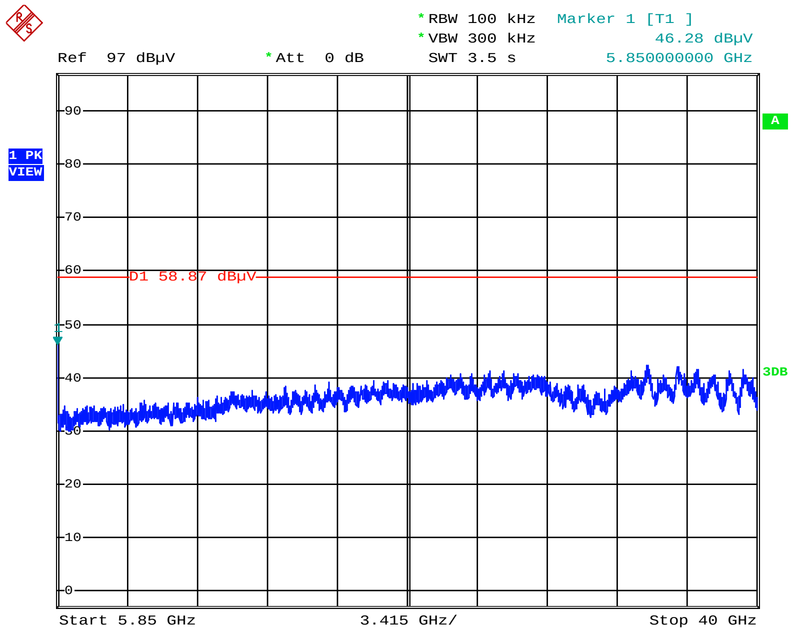
Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Reference Level



Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / CH 155 / 30MHz~5725MHz (down 30dBc)



Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / CH 155 / 5850MHz~40000MHz (down 30dBc)



Date: 19.MAY.2015 18:42:21

4.7. Antenna Requirements

4.7.1. Limit

Except for special regulations, the Low-power Radio-frequency Devices must not be equipped with any jacket for installing an antenna with extension cable. An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that the user can replace a broken antenna, but the use of a standard antenna jack or electrical connector is prohibited. Further, this requirement does not apply to intentional radiators that must be professionally installed.

4.7.2. Antenna Connector Construction

Please refer to section 3.3 in this test report; antenna connector complied with the requirements.

5. LIST OF MEASURING EQUIPMENTS

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
LISN	Schwarzbeck	NSLK 8127	8127650	9kHz ~ 30MHz	Nov. 17, 2014	Conduction (CO02-CB)
LISN	Schwarzbeck	NSLK 8127	8127478	9kHz ~ 30MHz	Nov. 17, 2014	Conduction (CO02-CB)
MXE EMI Receiver	Agilent	N9038A	MY52260140	9kHz ~ 30MHz	Jan. 13, 2015	Conduction (CO02-CB)
COND Cable	Woken	Cable	01	0.15MHz ~ 30MHz	Dec. 01, 2014	Conduction (CO02-CB)
Software	Audix	E3	5.410e	-	N.C.R.	Conduction (CO02-CB)
Pulse Limiter	Schwarzbeck	VTSD 9561F	9561-F073	9kHz ~ 30MHz	Sep. 26, 2014	Conduction (CO02-CB)
BILOG ANTENNA	Schaffner	CBL6112D	22021	20MHz ~ 2GHz	May 06, 2015	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz ~ 18GHz	Oct. 28, 2014	Radiation (03CH01-CB)
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Aug. 22, 2014	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Feb. 24, 2015	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Jan. 12, 2015	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26GHz ~ 40GHz	Nov. 25, 2014	Radiation (03CH01-CB)
Spectrum Analyzer	R&S	FSP40	100056	9kHz ~ 40GHz	Nov. 06, 2014	Radiation (03CH01-CB)
EMI Test Receiver	Agilent	N9038A	MY52260123	9kHz ~ 8GHz	Jan. 21, 2015	Radiation (03CH01-CB)
Turn Table	INN CO	CO 2000	N/A	0 ~ 360 degree	N.C.R.	Radiation (03CH01-CB)
Antenna Mast	INN CO	CO 2000	N/A	1 m ~ 4 m	N.C.R.	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz ~ 1 GHz	Nov. 15, 2014	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-1	N/A	1 GHz ~ 40 GHz	Nov. 15, 2014	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-40G-2	N/A	1 GHz ~ 40 GHz	Nov. 15, 2014	Radiation (03CH01-CB)
Thermometer	HTC-1	HTC-1	TP-1	-50°C~70°C	Mar. 11, 2015	Radiation (03CH01-CB)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz ~ 30 MHz	Jul. 28, 2014	Radiation (03CH01-CB)
Spectrum analyzer	R&S	FSV40	100979	9kHz~40GHz	Dec. 12, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-7	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-8	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-9	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
RF Cable-high	Woken	RG402	High Cable-10	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Remark
RF Cable-high	Woken	RG402	High Cable-6	1 GHz – 26.5 GHz	Nov. 15, 2014	Conducted (TH01-CB)
Power Sensor	Agilent	U2021XA	MY53410001	50MHz~18GHz	Nov. 03, 2014	Conducted (TH01-CB)
Thermometer	HTC-1	HTC-1	TP-8	-50°C~70°C	Mar. 05, 2015	Conducted (TH01-CB)

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

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

6. MEASUREMENT UNCERTAINTY

Test Items	Uncertainty	Remark
Conducted Emission (150kHz ~ 30MHz)	2.4 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%