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

FCC RADIO TEST REPORT

Applicant's company	**Broadcom Corporation**
Applicant Address	190 Mathilda Place Sunnyvale CA 94086 U.S.A.
FCC ID	**QDS-BRCM1090**
Manufacturer's company	**Broadcom Corporation**
Manufacturer Address	190 Mathilda Place Sunnyvale CA 94086 U.S.A.

Product Name	Broadcom 802.11a/b/g/n/ac WLAN + Bluetooth PCI-E/SDIO NGFF 2230 Card
Brand Name	Broadcom
Model No.	BCM94371ZAE
Part No.	BCM94371ZAE, BCM94371Z
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5150 ~ 5350MHz / 5470 ~ 5725MHz / 5725 ~ 5850 MHz
Received Date	Jul. 31, 2014
Final Test Date	Jan. 07, 2016
Submission Type	Original Equipment
Operating Mode	Client (without radar detection function)

Statement

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

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

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

The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in **ANSI C63.10-2013**, **47 CFR FCC Part 15 Subpart E, KDB789033 D02 v01r01, KDB662911 D01 v02r01**

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

Testing Laboratory
1190

Table of Contents

History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR473142-07AB	Rev. 01	Initial issue of report	Jan. 12, 2016

1. VERIFICATION OF COMPLIANCE

Product Name	:	Broadcom 802.11a/b/g/n/ac WLAN + Bluetooth PCI-E/SDIO NGFF 2230 Card
Brand Name	:	Broadcom
Model No.	:	BCM94371ZAE
Part No.	:	BCM94371ZAE, BCM94371Z
Applicant	:	Broadcom Corporation
Test Rule Part(s)	:	47 CFR FCC Part 15 Subpart E § 15.407

Sporton International as requested by the applicant to evaluate the EMC performance of the product sample received on Jul. 31, 2014 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.

Sam Chen

SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart E				
Part	**Rule Section**	**Description of Test**	**Result**	**Under Limit**
4.1	15.207	AC Power Line Conducted Emissions	Complies	12.12 dB
4.2	15.407(a)	26dB Spectrum Bandwidth and 99% Occupied Bandwidth	Complies	-
4.3	15.407(e)	6dB Spectrum Bandwidth and 99% Occupied Bandwidth	Complies	-
4.4	15.407(a)	Maximum Conducted Output Power	Complies	0.02 dB
4.5	15.407(a)	Power Spectral Density	Complies	0.02 dB
4.6	15.407(b)	Radiated Emissions	Complies	2.38 dB
4.7	15.407(b)	Band Edge Emissions	Complies	0.01 dB
4.8	15.407(g)	Frequency Stability	Complies	-
4.9	15.203	Antenna Requirements	Complies	-

3. GENERAL INFORMATION

3.1. Product Details

IEEE 802.11n/ac

Items	Description
Product Type	WLAN (2TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	From host system
Modulation	see the below table for IEEE 802.11n/ac
Data Modulation	For 802.11n: OFDM (BPSK / QPSK / 16QAM / 64QAM) For 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)
Data Rate (Mbps)	see the below table for IEEE 802.11n/ac
Frequency Range	5150 ~ 5350MHz / 5470 ~ 5725MHz / 5725 ~ 5850 MHz
Channel Number	25 for 20MHz bandwidth ; 12 for 40MHz bandwidth 6 for 80MHz bandwidth
Channel Band Width (99%)	For non-beamforming function: Band 1: 802.11ac MCS0/Nss1 (VHT20): 19.20 MHz ; 802.11ac MCS0/Nss1 (VHT40): 38.08 MHz ; 802.11ac MCS0/Nss1 (VHT80): 76.16 MHz Band 2: 802.11ac MCS0/Nss1 (VHT20): 19.84 MHz ; 802.11ac MCS0/Nss1 (VHT40): 41.92 MHz ; 802.11ac MCS0/Nss1 (VHT80): 76.16 MHz Band 3: 802.11ac MCS0/Nss1 (VHT20): 19.04 MHz ; 802.11ac MCS0/Nss1 (VHT40): 51.20 MHz ; 802.11ac MCS0/Nss1 (VHT80): 78.08 MHz Band 4: 802.11ac MCS0/Nss1 (VHT20): 18.16 MHz ; 802.11ac MCS0/Nss1 (VHT40): 36.48 MHz ; 802.11ac MCS0/Nss1 (VHT80): 76.16 MHz

	For beamforming function: Band 1: 802.11ac MCS0/Nss1 (VHT20): 18.56 MHz ; 802.11ac MCS0/Nss1 (VHT40): 36.48 MHz ; 802.11ac MCS0/Nss1 (VHT80): 76.80 MHz Band 2: 802.11ac MCS0/Nss1 (VHT20): 18.88 MHz ; 802.11ac MCS0/Nss1 (VHT40): 36.80 MHz ; 802.11ac MCS0/Nss1 (VHT80): 76.16 MHz Band 3: 802.11ac MCS0/Nss1 (VHT20): 18.72 MHz ; 802.11ac MCS0/Nss1 (VHT40): 36.80 MHz ; 802.11ac MCS0/Nss1 (VHT80): 76.80 MHz Band 4: 802.11ac MCS0/Nss1 (VHT20): 18.40 MHz ; 802.11ac MCS0/Nss1 (VHT40): 36.48 MHz ; 802.11ac MCS0/Nss1 (VHT80): 75.84 MHz For STBC function: Band 1: 802.11n MCS0 (HT20): 19.84 MHz

Maximum Conducted Output Power	For non-beamforming function: Band 1: 802.11ac MCS0/Nss1 (VHT20): 21.57 dBm ; 802.11ac MCS0/Nss1 (VHT40): 21.64 dBm ; 802.11ac MCS0/Nss1 (VHT80): 17.35 dBm Band 2: 802.11ac MCS0/Nss1 (VHT20): 21.49 dBm ; 802.11ac MCS0/Nss1 (VHT40): 21.51 dBm ; 802.11ac MCS0/Nss1 (VHT80): 17.80 dBm Band 3: 802.11ac MCS0/Nss1 (VHT20): 21.16 dBm ; 802.11ac MCS0/Nss1 (VHT40): 21.57 dBm ; 802.11ac MCS0/Nss1 (VHT80): 21.10 dBm Band 4: 802.11ac MCS0/Nss1 (VHT20): 21.73 dBm ; 802.11ac MCS0/Nss1 (VHT40): 19.81 dBm ; 802.11ac MCS0/Nss1 (VHT80): 16.39 dBm For beamforming function: Band 1: 802.11ac MCS0/Nss1 (VHT20): 21.10 dBm ; 802.11ac MCS0/Nss1 (VHT40): 20.98 dBm ; 802.11ac MCS0/Nss1 (VHT80): 17.19 dBm Band 2: 802.11ac MCS0/Nss1 (VHT20): 21.12 dBm ; 802.11ac MCS0/Nss1 (VHT40): 21.05 dBm ; 802.11ac MCS0/Nss1 (VHT80): 17.80 dBm Band 3: 802.11ac MCS0/Nss1 (VHT20): 20.69 dBm ; 802.11ac MCS0/Nss1 (VHT40): 20.71 dBm ; 802.11ac MCS0/Nss1 (VHT80): 20.46 dBm Band 4: 802.11ac MCS0/Nss1 (VHT20): 21.73 dBm ; 802.11ac MCS0/Nss1 (VHT40): 19.67 dBm ; 802.11ac MCS0/Nss1 (VHT80): 14.49 dBm For STBC function: Band 1: 802.11n MCS0 (HT20): 21.73 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

IEEE 802.11a

Items	Description
Product Type	WLAN (2TX, 2RX)
Radio Type	Intentional Transceiver
Power Type	From host system
Modulation	OFDM for IEEE 802.11a
Data Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	OFDM (6/9/12/18/24/36/48/54)
Frequency Range	5150 ~ 5350MHz / 5470 ~ 5725MHz / 5725 ~ 5850 MHz
Channel Number	25
Channel Band Width (99%)	Band 1: 18.56 MHz ; Band 2: 18.40 MHz ; Band 3: 18.56 MHz ; Band 4: 17.36 MHz
Maximum Conducted Output Power	Band 1: 21.59 dBm ; Band 2: 21.54 dBm ; Band 3: 21.18 dBm ; Band 4: 21.61 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Items	Description	
Communication Mode	☒ IP Based (Load Based)	☐ Frame Based
TPC Function	☒ With TPC	☐ Without TPC
Weather Band (5600~5650MHz)	☒ With 5600~5650MHz	☐ Without 5600~5650MHz
Beamforming Function	☒ With beamforming	☐ Without beamforming
STBC Function	☒ With STBC	☐ Without STBC

Note: 1. The EUT has beamforming function for 802.11n/ac in 5GHz band 1~4.

2. The EUT has STBC function for 802.11n/ac in 5GHz band 1~4.

3. The MIMO transmission mode is correlated.

Antenna and Band width

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

IEEE 11n/ac Spec.

Protocol	Number of Transmit Chains (NTX)	Data Rate / MCS
802.11n (HT20)	2	MCS 0-15
802.11n (HT40)	2	MCS 0-15
802.11ac (VHT20)	2	MCS 0-9/Nss1-2
802.11ac (VHT40)	2	MCS 0-9/Nss1-2
802.11ac (VHT80)	2	MCS 0-9/Nss1-2
Note 1: IEEE Std. 802.11n modulation consists of HT20 and HT40 (HT: High Throughput). Then EUT support HT20 and HT40. Note 2: IEEE Std. 802.11ac modulation consists of VHT20, VHT40, VHT80 and VHT160 (VHT: Very High Throughput). Then EUT support VHT20, VHT40 and VHT80. Note 3: Modulation modes consist of below configuration: HT20/HT40: IEEE 802.11n, VHT20/VHT40/VHT80: IEEE 802.11ac		

3.2. Accessories

N/A

3.3. Table for Filed Antenna

Set	Ant.	Brand	Part No.	Antenna Type	Connector	Gain (dBi)				
						2.4G/ BT	5G B1	5G B2	5G B3	5G B4
1	1	MAG.LAYERS	PCA-4077-25GC1-A1-RT	WLAN/BT antenna	I-PEX A13	3.33	5.85	5.85	6.21	6.21
	2	MAG.LAYERS	PCA-4077-25GC1-A1-RT	WLAN/BT antenna	I-PEX A13	3.33	5.85	5.85	6.21	6.21

Note: The EUT has one set of antenna, and each set contains two antennas.

Chain 1: Connect to Ant. 1, Chain 2: Connect to Ant. 2.

For 2.4 GHz WLAN function (2TX/2RX):

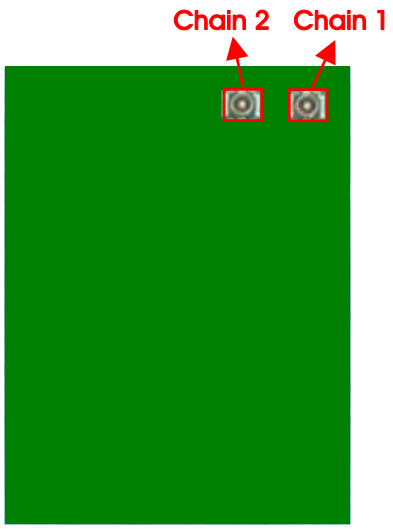
Chain 1 and Chain 2 could transmit/receive simultaneously.

For Bluetooth function (1TX/1RX):

Only Chain 1 could transmit/receive simultaneously.

For 5 GHz WLAN function (2TX/2RX):

Chain 1 and Chain 2 could transmit/receive simultaneously.



3.4. Table for Carrier Frequencies

There are three bandwidth systems.

For 20MHz bandwidth systems, use Channel 36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 144, 149, 153, 157, 161, 165.

For 40MHz bandwidth systems, use Channel 38, 46, 54, 62, 102, 110, 118, 126, 134, 142, 151, 159.

For 80MHz bandwidth systems, use Channel 42, 58, 106, 122, 138, 155.

Frequency Band	Channel No.	Frequency	Channel No.	Frequency
5150~5250 MHz Band 1	36	5180 MHz	44	5220 MHz
	38	5190 MHz	46	5230 MHz
	40	5200 MHz	48	5240 MHz
	42	5210 MHz	-	-
5250~5350 MHz Band 2	52	5260 MHz	60	5300 MHz
	54	5270 MHz	62	5310 MHz
	56	5280 MHz	64	5320 MHz
	58	5290 MHz	-	-
5470~5725 MHz Band 3	100	5500 MHz	124	5620 MHz
	102	5510 MHz	126	5630 MHz
	104	5520 MHz	128	5640 MHz
	106	5530 MHz	132	5660 MHz
	108	5540 MHz	134	5670 MHz
	110	5550 MHz	136	5680 MHz
	112	5560 MHz	138	5690 MHz
	116	5580 MHz	140	5700 MHz
	118	5590 MHz	142	5710 MHz
	120	5600 MHz	144	5720 MHz
	122	5610 MHz	-	-
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 non-beamforming function and beamforming function:

Test Items	Mode		Data Rate	Channel	Chain
AC Power Conducted Emission	Normal Link		-	-	-
Max. Conducted Output Power	11ac VHT20	Band 1~4	MCS0/Nss1	36/40/48/52/60/64/100/116/140/144/149/157/165	1+2
	11ac VHT40	Band 1~4	MCS0/Nss1	38/46/54/62/102/110/134/142/151/159	1+2
	11ac VHT80	Band 1~4	MCS0/Nss1	42/58/106/138/155	1+2
	11a/BPSK	Band 1~4	6Mbps	36/40/48/52/60/64/100/116/140/144/149/157/165	1+2
Power Spectral Density	11ac VHT20	Band 1~4	MCS0/Nss1	36/40/48/52/60/64/100/116/140/144/149/157/165	1+2
	11ac VHT40	Band 1~4	MCS0/Nss1	38/46/54/62/102/110/134/142/151/159	1+2
	11ac VHT80	Band 1~4	MCS0/Nss1	42/58/106/138/155	1+2
	11a/BPSK	Band 1~4	6Mbps	36/40/48/52/60/64/100/116/140/144/149/157/165	1+2
26dB&6dB Spectrum Bandwidth 99% Occupied Bandwidth Measurement	11ac VHT20	Band 1~4	MCS0/Nss1	36/40/48/52/60/64/100/116/140/144/149/157/165	1+2
	11ac VHT40	Band 1~4	MCS0/Nss1	38/46/54/62/102/110/134/142/151/159	1+2
	11ac VHT80	Band 1~4	MCS0/Nss1	42/58/106/138/155	1+2
	11a/BPSK	Band 1~4	6Mbps	36/40/48/52/60/64/100/116/140/144/149/157/165	1+2
Radiated Emission Below 1GHz	Normal Link		-	-	-

Radiated Emission Above 1GHz	11ac VHT20	Band 1~4	MCS0/Nss1	36/40/48/52/60/64/100 /116/140/144/149/157/ 165	1+2
	11ac VHT40	Band 1~4	MCS0/Nss1	38/46/54/62/102/110/ 134/142/151/159	1+2
	11ac VHT80	Band 1~4	MCS0/Nss1	42/58/106/138/155	1+2
	11a/BPSK	Band 1~4	6Mbps	36/40/48/52/60/64/100 /116/140/144/149/157/ 165	1+2
Band Edge Emission	11ac VHT20	Band 1~4	MCS0/Nss1	36/40/48/52/60/64/100 /140/149/157/165	1+2
	11ac VHT40	Band 1~4	MCS0/Nss1	38/46/54/62/102/110/ 134/151/159	1+2
	11ac VHT80	Band 1~4	MCS0/Nss1	42/58/106/155	1+2
	11a/BPSK	Band 1~4	6Mbps	36/40/48/52/60/64/100 /140/149/157/165	1+2
Frequency Stability	Un-modulation		-	40/60/100	1+2

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

2. Non-beamforming function and beamforming function for 802.11n/ac in 5GHz band 1~4, two functions test results were recorded in the report.

For STBC function:

Test Items	Mode		Data Rate	Channel	Chain
AC Power Conducted Emission	Normal Link		-	-	-
Max. Conducted Output Power	11n HT20	Band 1	MCS0	36/40/48	1+2
Power Spectral Density	11n HT20	Band 1	MCS0	36/40/48	1+2
26dB&6dB Spectrum Bandwidth 99% Occupied Bandwidth Measurement	11n HT20	Band 1	MCS0	36/40/48	1+2
Radiated Emission Below 1GHz	Normal Link		-	-	-
Radiated Emission Above 1GHz	11n HT20	Band 1	MCS0	36/40/48	1+2
Band Edge Emission	11n HT20	Band 1	MCS0	36/40/48	1+2

Note: For STBC function: only the 802.11n in 20MHz bandwidth system of 5GHz band 1 was performed for all the tests and recorded in this report, and it was base on customer's request.

The following test modes were performed for all tests:

For AC Power Line Conducted Emissions test:

Mode 1. EUT 1 + 2.4GHz WLAN function + Bluetooth function

Mode 2. EUT 1 + 5GHz WLAN function + Bluetooth function

Mode 3. EUT 2 + 2.4GHz WLAN function

Mode 4. EUT 2 + 5GHz WLAN function

Mode 5. EUT 2 + Bluetooth function

Mode 5 is the worst case, so it was selected to record in this test report.

For Radiated Emissions 9kHz~1GHz test:

Mode 1. Place EUT 1 in X axis + 2.4GHz WLAN function + Bluetooth function

Mode 2. Place EUT 1 in Y axis + 2.4GHz WLAN function + Bluetooth function

Mode 3. Place EUT 1 in Z axis + 2.4GHz WLAN function + Bluetooth function

Mode 4. Place EUT 1 in X axis + 5GHz WLAN function + Bluetooth function

Mode 5. Place EUT 1 in Y axis + 5GHz WLAN function + Bluetooth function

Mode 6. Place EUT 1 in Z axis + 5GHz WLAN function + Bluetooth function

Mode 7. Place EUT 2 in X axis + 2.4GHz WLAN function

Mode 8. Place EUT 2 in Y axis + 2.4GHz WLAN function

Mode 9. Place EUT 2 in Z axis + 2.4GHz WLAN function

Mode 10. Place EUT 2 in X axis + 5GHz WLAN function

Mode 11. Place EUT 2 in Y axis + 5GHz WLAN function

Mode 12. Place EUT 2 in Z axis + 5GHz WLAN function

Mode 9 has been evaluated to be the worst case among Mode 7~9, thus measurement for Mode 13 will follow this same test mode.

Mode 13. Place EUT 2 in Z axis + Bluetooth function

Mode 9 is the worst case, so it was selected to record in this test report.

For Radiated Emissions above 1GHz test:

Radiated Emissions above 1GHz test was perform at its 3-axis (X-axis, Y-axis and Z-axis). Z-axis was the worst case, so it's recorded in this test report.

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 FA473142-07AA) and Radiated Emission Co-location (please refer to Appendix B) tests are added for simultaneously transmit between 2.4GHz WLAN function and 5GHz WLAN function.

Mode 1. EUT 1 + 2.4GHz WLAN function + Bluetooth function

Mode 2. EUT 1 + 5GHz WLAN function + Bluetooth function

3.6. Table for Testing Locations

Test Site Location					
Address:	No.8, Lane 724, Bo-ai St., Jhubei City, Hsinchu County 302, Taiwan, R.O.C.				
TEL:	886-3-656-9065				
FAX:	886-3-656-9085				
Test Site No.	**Site Category**	**Location**	**FCC Reg. No.**	**IC File No.**	**VCCI Reg. No**
03CH01-CB	SAC	Hsin Chu	262045	IC 4086D	-
CO01-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 Multiple Listing

The EUT has three part numbers which are identical to each other in all aspects except for the following table:

EUT	Model No.	Part No.	Description
EUT 1	BCM94371ZAE	BCM94371Z	M.2 E Key connector which support PCIe/USB interface.
EUT 2		BCM94371Z	M.2 E Key connector which support SDIO/UART/PCIe/USB interface.
EUT 3		BCM94371ZAE	M.2 A key + E Key connector which support PCIe/USB interface.

From the above models, part number: EUT 1 and EUT 2 were selected as representative models for AC Power Line Conducted Emissions and Radiated Emissions <below 1GHz> tests and EUT 1 was selected as representative model for other tests.

3.8. Table for Supporting Units

For Test Site No: CO01-CB

Support Unit	Brand	Model	FCC ID
NB	DELL	E6430	DoC
Fixture*2	Broadcom	BCM9MC2EC_1	N/A
Mouse	Logitech	M-U0026	N/A
Earphone	SHYARO CHI	MIC-04	N/A
NB	DELL	E4300	N/A
Broadcom 802.11a/b/g/n/ac WLAN + Bluetooth PCI-E NGFF 2230 Card (Device)	Broadcom	BCM94371ZAE	QDS-BRCM1090

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

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	DoC
Wireless ac AP	Netgear	R6300V2	PY313200227
Fixture	Broadcom	BCM9MC2EC_1	N/A
Mouse	Logitech	M-U0026	DoC
Earphone	SHYARO CHI	MIC-04	N/A
Adapter	Moso	MSA-C2000IC5	N/A

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

For non-beamforming function and STBC function:

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	RSE-TG233
Test fixture	Broadcom	BCM9NGFF2EC_1	N/A

For beamforming function:

Support Unit	Brand	Model	FCC ID
NB	DELL	E4300	RSE-TG233
Test fixture	Broadcom	BCM9NGFF2EC_1	N/A
Wireless AP	Netgear	R7000	PY313200233

For Test Site No: TH01-CB

Support Unit	Brand	Model	FCC ID
NB	DELL	E6430	DoC
Test fixture	Broadcom	BCM9NGFF2EC_1	N/A

3.9. Table for Parameters of Test Software Setting

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

For non-beamforming function:

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT20

Test Software Version	Manual Tool version: 2.0.2.1						
Frequency	5180 MHz	5200 MHz	5240 MHz	5260 MHz	5300 MHz	5320 MHz	5500 MHz
MCS0/Nss1 VHT20	68	78	78	79	79	70	70
Frequency	5580 MHz	5700 MHz	5720MHz	5745 MHz	5785 MHz	5825 MHz	
MCS0/Nss1 VHT20	79	68	76	67	80	71	

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT40

Test Software Version	Manual Tool version: 2.0.2.1						
Frequency	5190 MHz	5230 MHz	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz
MCS0/Nss1 VHT40	58	80	80	62	55	80	71
Frequency	5710 MHz	5755 MHz	5795 MHz				
MCS0/Nss1 VHT40	80	51	68				

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT80

Test Software Version	Manual Tool version: 2.0.2.1				
Frequency	5210 MHz	5290 MHz	5530 MHz	5690 MHz	5775 MHz
MCS0/Nss1 VHT80	62	63	58	80	56

Power Parameters of IEEE 802.11a

Test Software Version	Manual Tool version: 2.0.2.1						
Frequency	5180 MHz	5200 MHz	5240 MHz	5260 MHz	5300 MHz	5320 MHz	5500 MHz
MCS0/Nss1 VHT20	68	78	78	78	78	70	70
Frequency	5580 MHz	5700 MHz	5720MHz	5745 MHz	5785 MHz	5825 MHz	
MCS0/Nss1 VHT20	79	70	79	67	80	73	

For beamforming function:

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT20

Test Software Version	Manual Tool version: 2.0.2.1						
Frequency	5180 MHz	5200 MHz	5240 MHz	5260 MHz	5300 MHz	5320 MHz	5500 MHz
MCS0/Nss1 VHT20	70	75	75	76	76	69	72
Frequency	5580 MHz	5700 MHz	5720MHz	5745 MHz	5785 MHz	5825 MHz	
MCS0/Nss1 VHT20	76	68	76	67	80	70	

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT40

Test Software Version	Manual Tool version: 2.0.2.1						
Frequency	5190 MHz	5230 MHz	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz
MCS0/Nss1 VHT40	57	73	73	62	61	75	71
Frequency	5710 MHz	5755 MHz	5795 MHz				
MCS0/Nss1 VHT40	74	51	67				

Power Parameters of IEEE 802.11ac MCS0/Nss1 VHT80

Test Software Version	Manual Tool version: 2.0.2.1				
Frequency	5210 MHz	5290 MHz	5530 MHz	5690 MHz	5775 MHz
MCS0/Nss1 VHT80	61	63	61	77	48

For STBC function:

Power Parameters of IEEE 802.11n MCS0 HT20

Test Software Version	Manual Tool version: 2.0.2.1		
Frequency	5180 MHz	5200 MHz	5240 MHz
MCS0 HT20	71	100	100

3.10. EUT Operation during Test

For non-beamforming function and STBC function:

The EUT was programmed to be in continuously transmitting mode.

For beamforming function:

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 Wireless AP and transmit duty cycle no less 98%

3.11. Duty Cycle

For non-beamforming function:

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11ac MCS0/Nss1 VHT20	1.92	1.94	98.97	0.05	0.01
802.11ac MCS0/Nss1 VHT40	0.95	0.97	97.94	0.09	1.05
802.11ac MCS0/Nss1 VHT80	0.47	0.49	95.10	0.22	2.15
802.11a	2.07	2.16	95.83	0.18	0.48

For beamforming function:

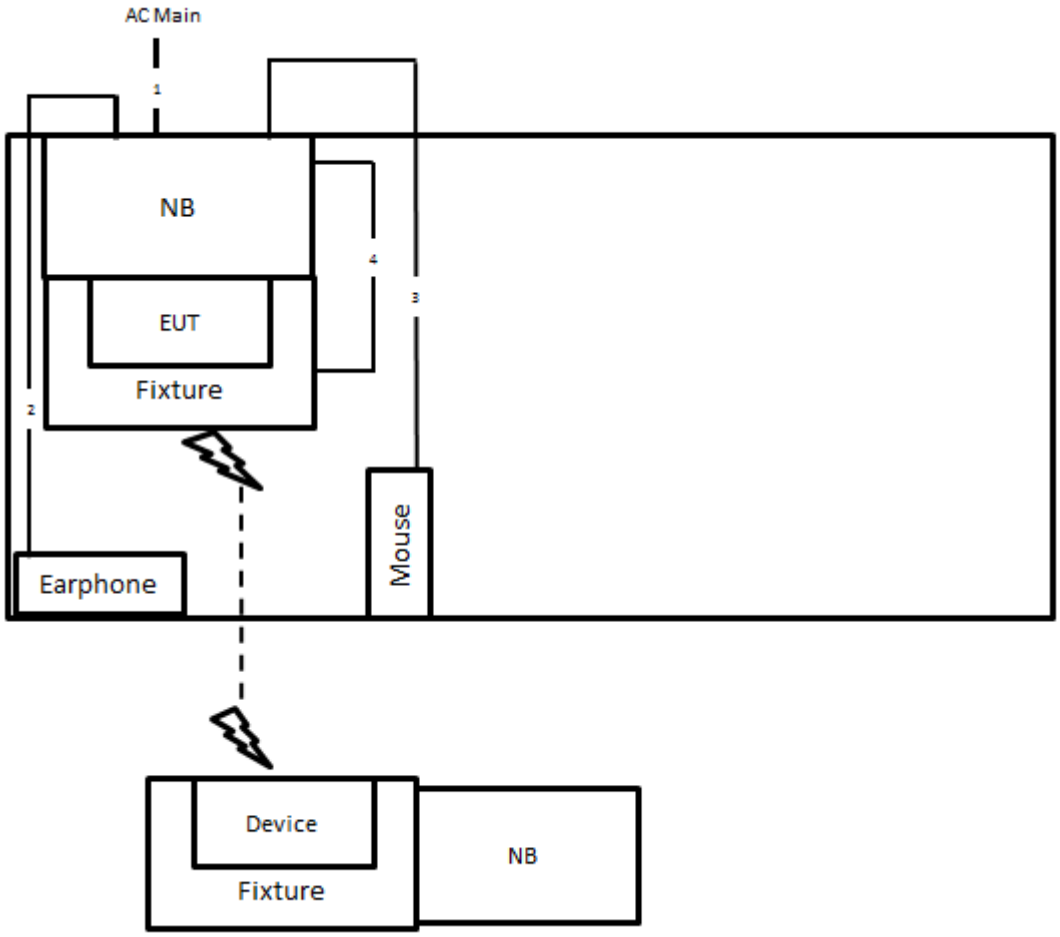
Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11ac MCS0/Nss1 VHT20	3.82	3.94	96.95	0.13	0.26
802.11ac MCS0/Nss1 VHT40	9.29	10.34	89.85	0.47	0.11
802.11ac MCS0/Nss1 VHT80	4.25	5.15	82.52	0.83	0.24

For STBC function:

Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
802.11n MCS0 HT20	1.91	1.96	97.09	0.13	0.52

3.12. Test Configurations

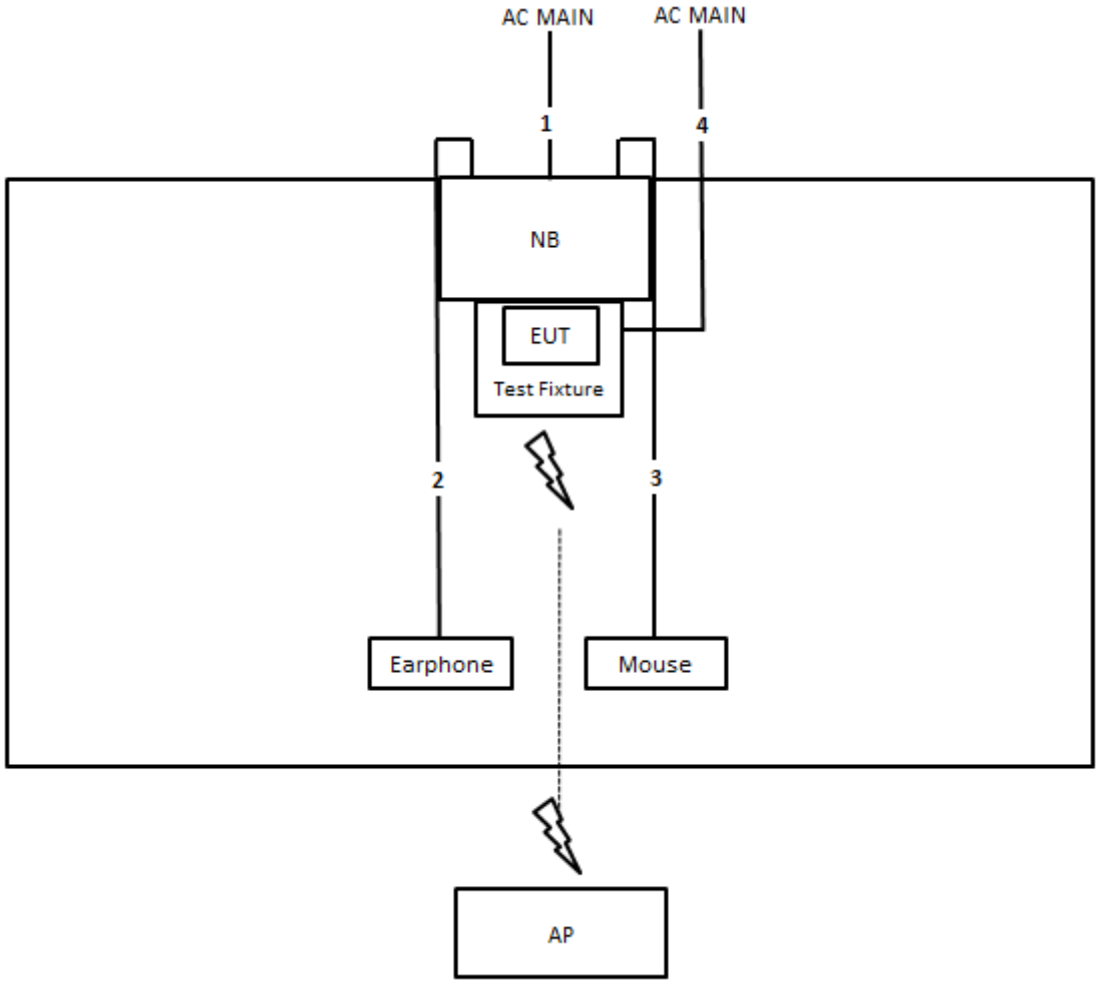
3.12.1. AC Power Line Conduction Emissions Test Configuration



Item	Connection	Shielded	Length
1	Power cable	No	2.6m
2	Audio cable	No	1.1m
3	USB cable	Yes	1.8m
4	USB cable	Yes	1.2m

3.12.2. Radiation Emissions Test Configuration

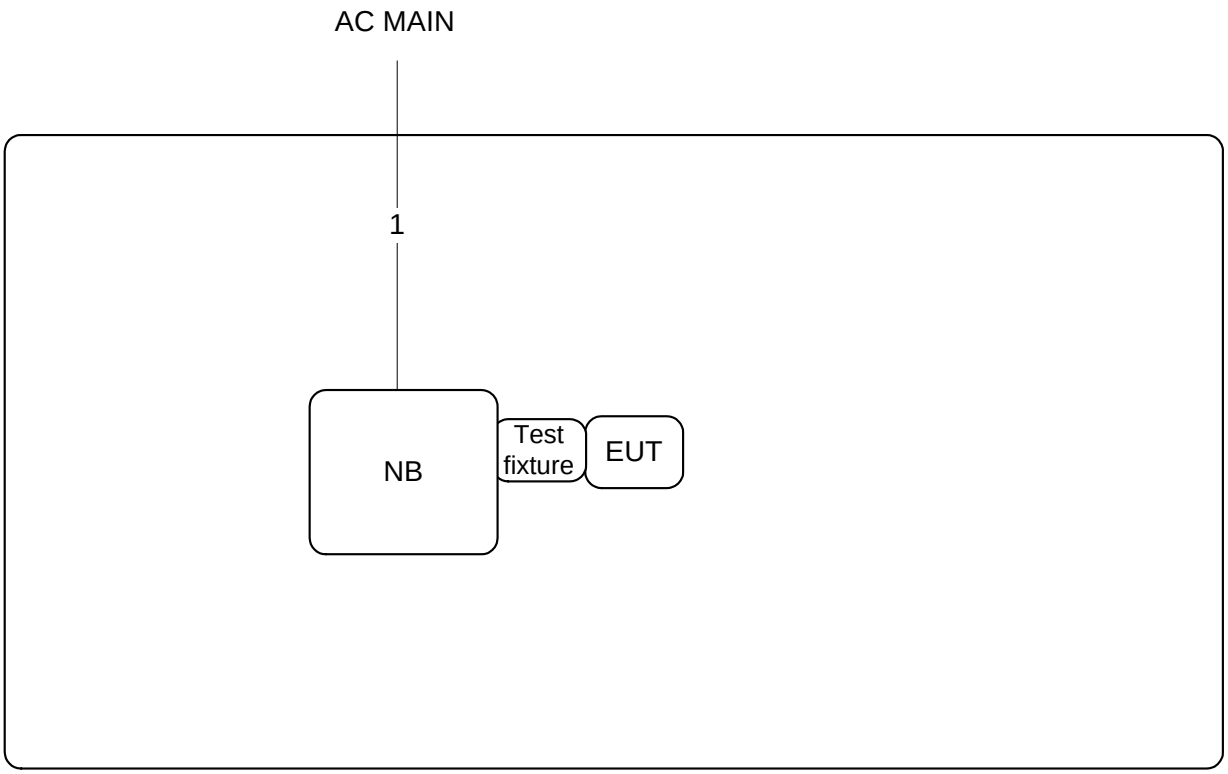
Test Configuration: 30MHz~1GHz



Item	Connection	Shielded	Length
1	Power cable	No	2.6m
2	Audio Cable	No	1.1m
3	USB Cable	Yes	1.8m
4	Power cable	No	1.8m

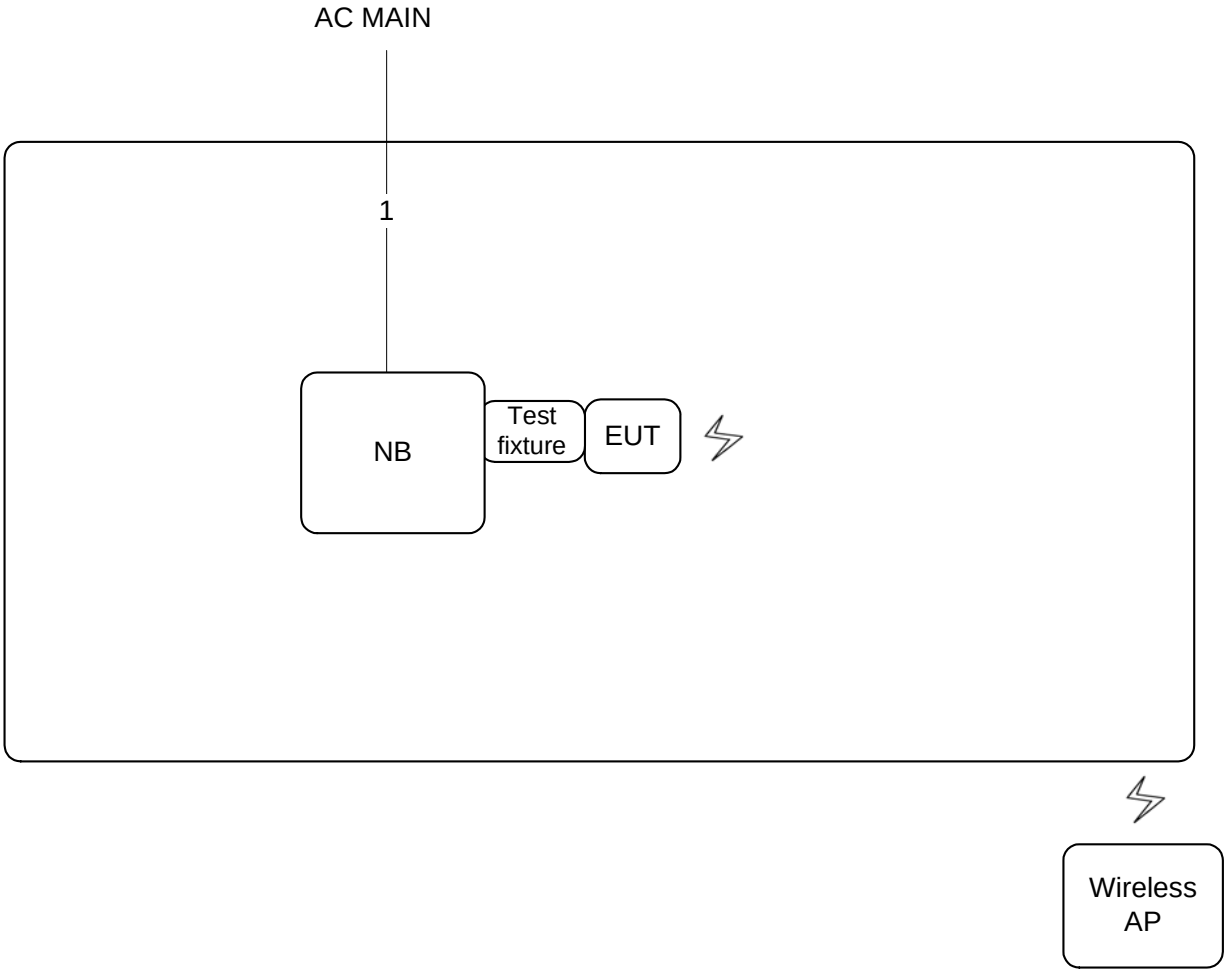
Test Configuration: above 1GHz

For non-beamforming function and STBC function:



Item	Connection	Shielded	Length
1	Power cable	No	1.8m

For beamforming function:



Item	Connection	Shielded	Length
1	Power cable	No	1.8m

4. TEST RESULT

4.1. AC Power Line Conducted Emissions Measurement

4.1.1. Limit

For this product that is designed to connect 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

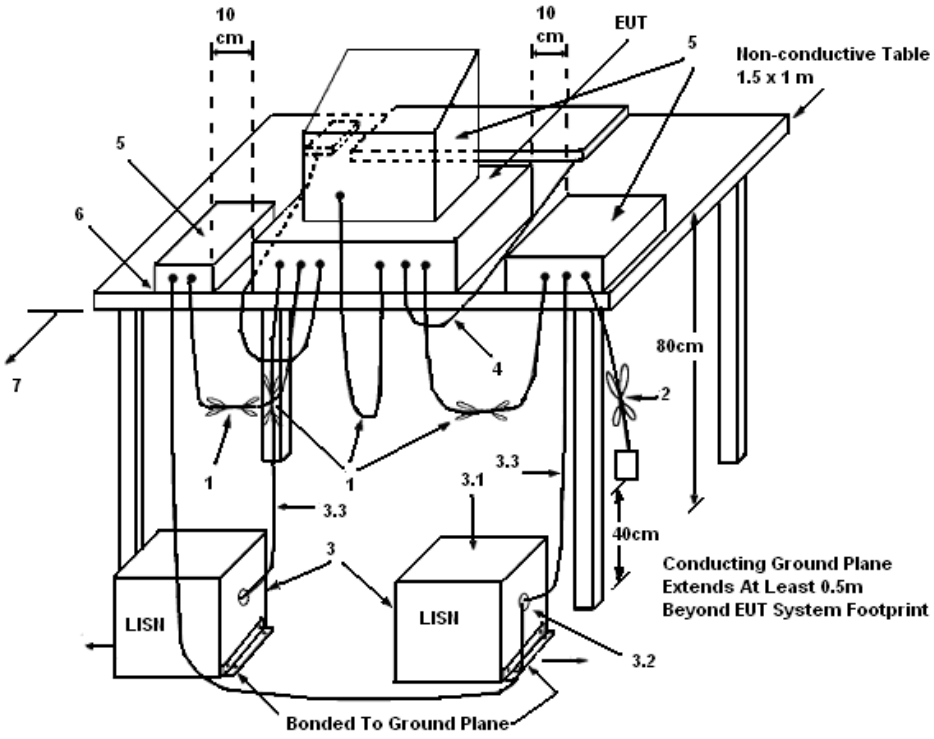
Please refer to section 5 of equipments list in this report. The following table is the setting of the receiver.

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

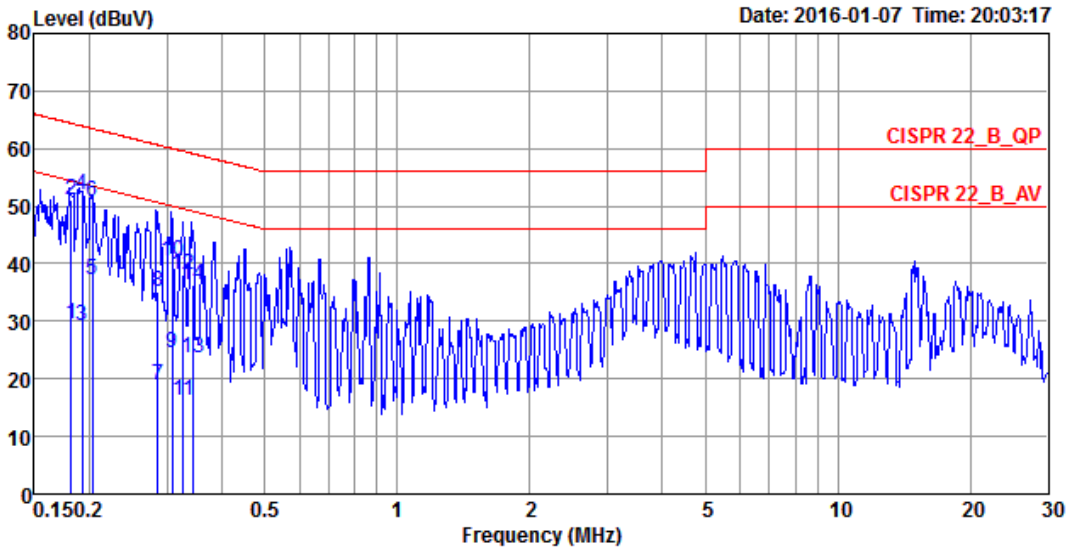
There is no deviation with the original standard.

4.1.6. EUT Operation during Test

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

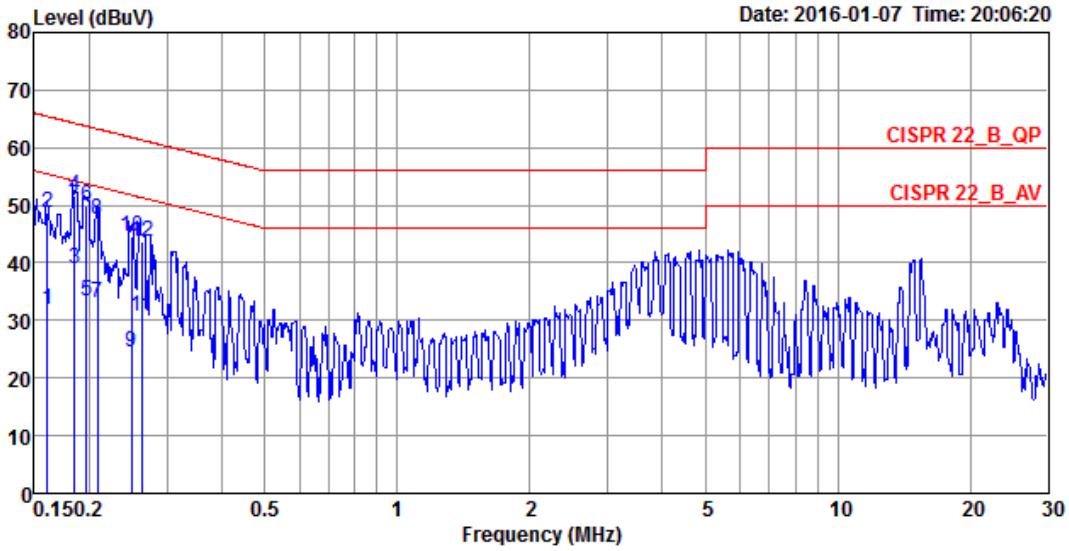
4.1.7. Results of AC Power Line Conducted Emissions Measurement

Temperature	25°C	Humidity	62%
Test Engineer	Kane Liu	Phase	Line
Configuration	Normal Link	Test Mode	Mode 5



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1815	29.48	-24.94	54.42	19.53	9.93	0.02	LINE	Average
2	0.1815	50.94	-13.48	64.42	40.99	9.93	0.02	LINE	QP
3	0.1924	29.14	-24.79	53.93	19.19	9.93	0.02	LINE	Average
4	0.1924	51.81	-12.12	63.93	41.86	9.93	0.02	LINE	QP
5	0.2029	37.31	-16.18	53.49	27.36	9.93	0.02	LINE	Average
6	0.2029	50.65	-12.84	63.49	40.70	9.93	0.02	LINE	QP
7	0.2863	18.97	-31.66	50.63	9.00	9.93	0.04	LINE	Average
8	0.2863	35.00	-25.63	60.63	25.03	9.93	0.04	LINE	QP
9	0.3083	24.54	-25.48	50.02	14.57	9.93	0.04	LINE	Average
10	0.3083	40.39	-19.63	60.02	30.42	9.93	0.04	LINE	QP
11	0.3268	16.17	-33.36	49.53	6.20	9.93	0.04	LINE	Average
12	0.3268	38.13	-21.40	59.53	28.16	9.93	0.04	LINE	QP
13	0.3428	23.59	-25.54	49.13	13.62	9.93	0.04	LINE	Average
14	0.3428	36.30	-22.83	59.13	26.33	9.93	0.04	LINE	QP

Temperature	25°C	Humidity	62%
Test Engineer	Kane Liu	Phase	Neutral
Configuration	Normal Link	Test Mode	Mode 5



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.1607	31.76	-23.67	55.43	21.96	9.78	0.02	NEUTRAL	Average
2	0.1607	48.74	-16.69	65.43	38.94	9.78	0.02	NEUTRAL	QP
3	0.1854	38.93	-15.31	54.24	29.12	9.79	0.02	NEUTRAL	Average
4	0.1854	51.52	-12.72	64.24	41.71	9.79	0.02	NEUTRAL	QP
5	0.1965	33.34	-20.42	53.76	23.53	9.79	0.02	NEUTRAL	Average
6	0.1965	49.79	-13.97	63.76	39.98	9.79	0.02	NEUTRAL	QP
7	0.2083	33.19	-20.08	53.27	23.38	9.79	0.02	NEUTRAL	Average
8	0.2083	47.39	-15.88	63.27	37.58	9.79	0.02	NEUTRAL	QP
9	0.2495	24.40	-27.38	51.78	14.58	9.79	0.03	NEUTRAL	Average
10	0.2495	44.48	-17.30	61.78	34.66	9.79	0.03	NEUTRAL	QP
11	0.2630	30.57	-20.77	51.34	20.75	9.79	0.03	NEUTRAL	Average
12	0.2630	43.56	-17.78	61.34	33.74	9.79	0.03	NEUTRAL	QP

Note:

Level = Read Level + LISN Factor + Cable Loss.

4.2. 26dB Bandwidth and 99% Occupied Bandwidth Measurement

4.2.1. Limit

No restriction limits.

4.2.2. Measuring Instruments and Setting

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

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

4.2.3. Test Procedures

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

4.2.4. Test Setup Layout

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

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 26dB Bandwidth and 99% Occupied Bandwidth

Temperature	20°C	Humidity	52%
Test Engineer	Robert Chang	Configurations	IEEE 802.11ac
Test Function	Non-beamforming function		

Configuration IEEE 802.11ac MCS0/Nss1 VHT20

Channel	Frequency	26dB Bandwidth (MHz)		99% Occupied Bandwidth (MHz)	
		Chain 1	Chain 2	Chain 1	Chain 2
36	5180 MHz	22.08	21.60	18.40	18.24
40	5200 MHz	29.76	21.60	18.88	18.40
48	5240 MHz	29.44	21.76	19.20	18.56
52	5260 MHz	36.16	21.60	19.20	18.40
60	5300 MHz	41.12	21.76	19.84	18.40
64	5320 MHz	21.92	22.08	18.40	18.24
100	5500 MHz	21.92	21.60	18.40	18.24
116	5580 MHz	32.16	21.92	18.72	18.40
140	5700 MHz	21.92	21.92	18.24	18.08
144	5720 MHz	41.44	28.00	19.04	18.40

Configuration IEEE 802.11ac MCS0/Nss1 VHT40

Channel	Frequency	26dB Bandwidth (MHz)		99% Occupied Bandwidth (MHz)	
		Chain 1	Chain 2	Chain 1	Chain 2
38	5190 MHz	40.00	39.68	36.48	36.48
46	5230 MHz	90.56	39.36	38.08	36.48
54	5270 MHz	82.56	39.36	41.92	36.48
62	5310 MHz	40.32	39.68	36.48	36.48
102	5510 MHz	39.68	39.36	36.48	36.48
110	5550 MHz	88.64	68.80	40.96	36.48
134	5670 MHz	39.68	39.68	36.48	36.48
142	5710 MHz	92.16	69.12	51.20	36.80

Configuration IEEE 802.11ac MCS0/Nss1 VHT80

Channel	Frequency	26dB Bandwidth (MHz)		99% Occupied Bandwidth (MHz)	
		Chain 1	Chain 2	Chain 1	Chain 2
42	5210 MHz	81.92	81.92	76.16	76.16
58	5290 MHz	81.92	82.56	76.16	76.16
106	5530 MHz	82.56	81.92	76.80	76.80
138	5690 MHz	178.56	83.84	78.08	76.80

Temperature	20°C	Humidity	52%
Test Engineer	Robert Chang	Configurations	IEEE 802.11a
Test Function	Non-beamforming function		

Configuration IEEE 802.11a

Channel	Frequency	26dB Bandwidth (MHz)		99% Occupied Bandwidth (MHz)	
		Chain 1	Chain 2	Chain 1	Chain 2
36	5180 MHz	21.76	21.60	17.28	17.28
40	5200 MHz	28.00	22.88	18.24	17.44
48	5240 MHz	31.52	22.72	18.56	17.44
52	5260 MHz	30.40	21.44	18.40	17.44
60	5300 MHz	32.48	21.44	18.24	17.44
64	5320 MHz	21.60	21.28	17.28	17.28
100	5500 MHz	21.76	21.60	17.44	17.28
116	5580 MHz	30.24	21.44	18.08	17.44
140	5700 MHz	21.60	21.76	17.44	17.28
144	5720 MHz	34.72	26.88	18.56	17.92

Temperature	20°C	Humidity	52%
Test Engineer	Robert Chang	Configurations	IEEE 802.11ac
Test Function	Beamforming function		

Configuration IEEE 802.11ac MCS0/Nss1 VHT20

Channel	Frequency	26dB Bandwidth (MHz)		99% Occupied Bandwidth (MHz)	
		Chain 1	Chain 2	Chain 1	Chain 2
36	5180 MHz	22.08	21.76	18.40	18.08
40	5200 MHz	27.36	27.04	18.56	18.40
48	5240 MHz	25.76	21.60	18.40	18.24
52	5260 MHz	27.84	21.92	18.88	18.40
60	5300 MHz	27.36	21.60	18.72	18.24
64	5320 MHz	22.24	21.76	18.40	18.24
100	5500 MHz	22.08	21.44	18.56	18.08
116	5580 MHz	22.08	26.72	18.40	18.40
140	5700 MHz	22.08	21.60	18.24	18.24
144	5720 MHz	21.92	21.76	18.72	18.24

Configuration IEEE 802.11ac MCS0/Nss1 VHT40

Channel	Frequency	26dB Bandwidth (MHz)		99% Occupied Bandwidth (MHz)	
		Chain 1	Chain 2	Chain 1	Chain 2
38	5190 MHz	39.68	39.36	36.48	36.48
46	5230 MHz	40.00	39.68	36.48	36.48
54	5270 MHz	48.96	45.12	36.80	36.48
62	5310 MHz	40.00	39.36	36.48	36.48
102	5510 MHz	39.68	39.36	36.48	36.48
110	5550 MHz	71.04	53.44	36.80	36.48
134	5670 MHz	40.00	39.68	36.48	36.48
142	5710 MHz	65.92	48.32	36.80	36.48

Configuration IEEE 802.11ac MCS0/Nss1 VHT80

Channel	Frequency	26dB Bandwidth (MHz)		99% Occupied Bandwidth (MHz)	
		Chain 1	Chain 2	Chain 1	Chain 2
42	5210 MHz	82.56	81.92	76.80	76.16
58	5290 MHz	82.56	82.56	76.16	76.16
106	5530 MHz	82.56	82.56	76.80	76.80
138	5690 MHz	116.48	110.72	76.80	76.80

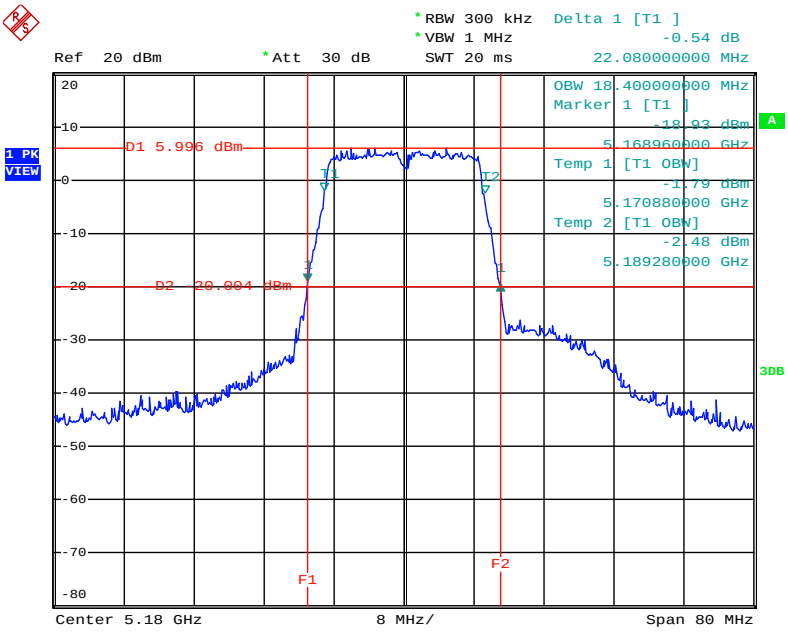
Temperature	20°C	Humidity	52%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n
Test Function	STBC function		

Configuration IEEE 802.11n MCS0 HT20

Channel	Frequency	26dB Bandwidth (MHz)		99% Occupied Bandwidth (MHz)	
		Chain 1	Chain 2	Chain 1	Chain 2
36	5180 MHz	21.92	21.92	18.40	18.08
40	5200 MHz	33.28	21.92	19.04	18.40
48	5240 MHz	34.56	21.76	19.84	18.24

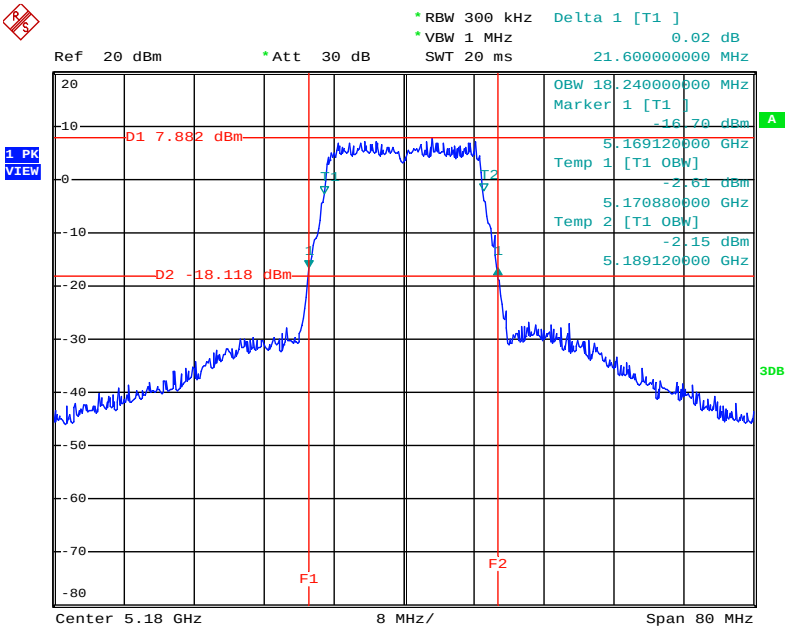
For non-beamforming function:

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5180 MHz



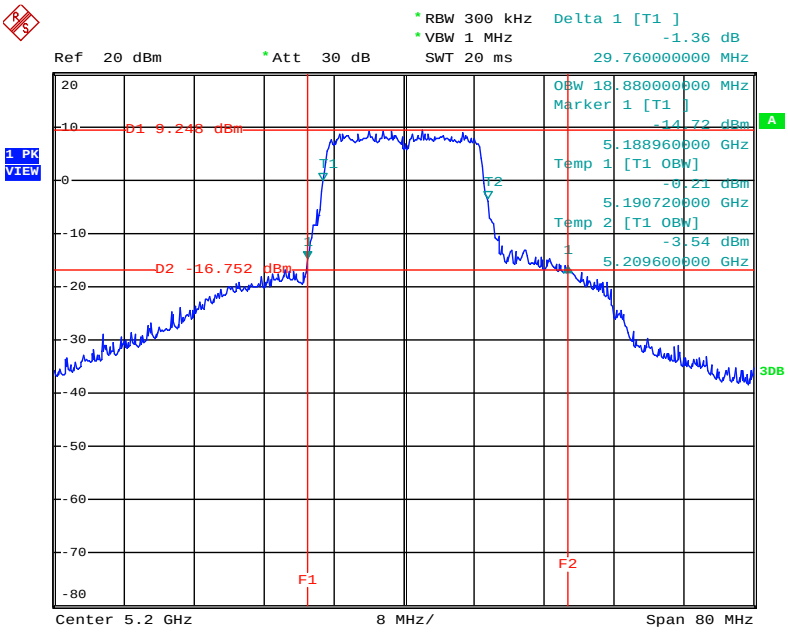
Date: 16.SEP.2014 17:50:56

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 2 / 5180 MHz



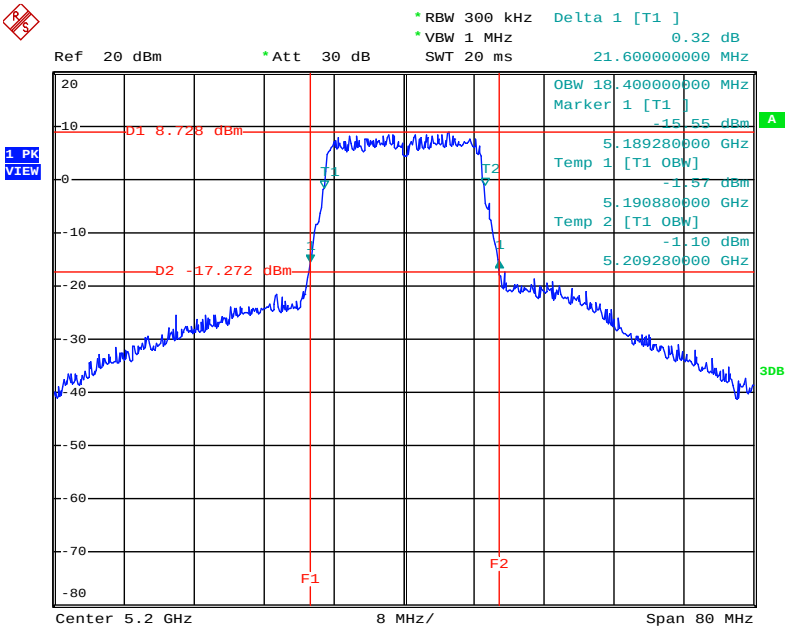
Date: 16.SEP.2014 17:50:20

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5200 MHz



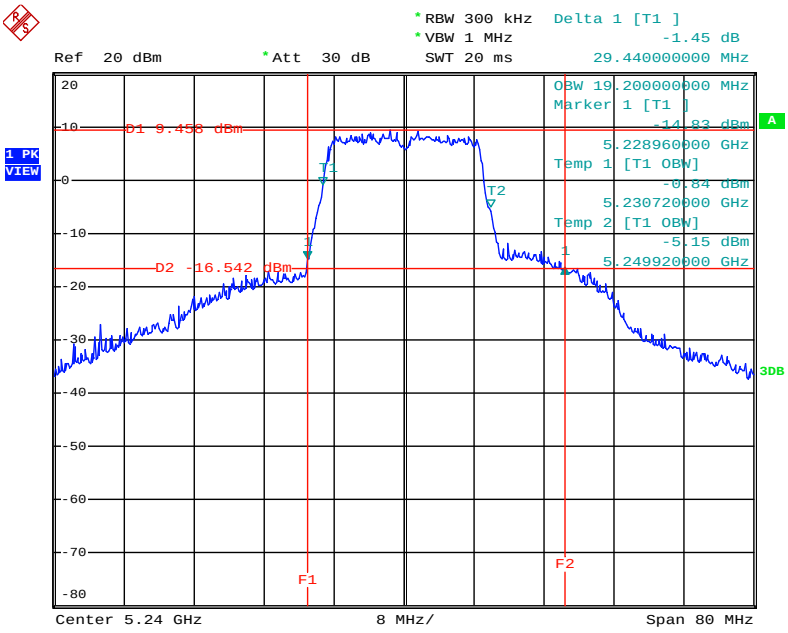
Date: 16.SEP.2014 17:51:26

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 2 / 5200 MHz



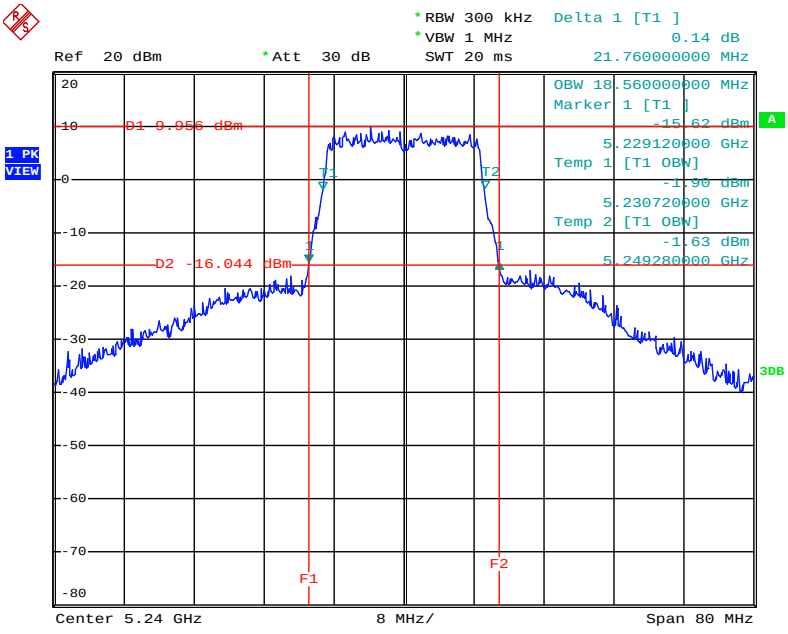
Date: 16.SEP.2014 17:51:59

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5240 MHz



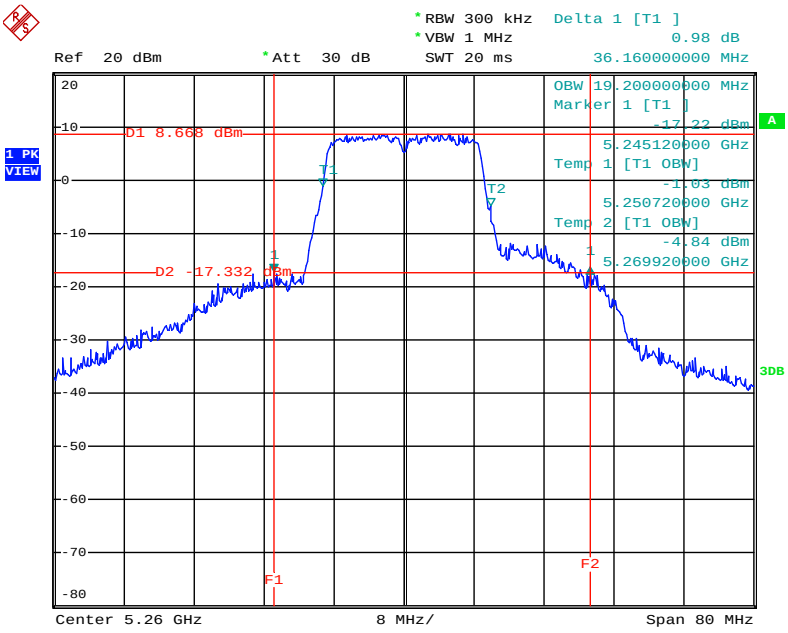
Date: 16.SEP.2014 17:53:04

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 2 / 5240 MHz



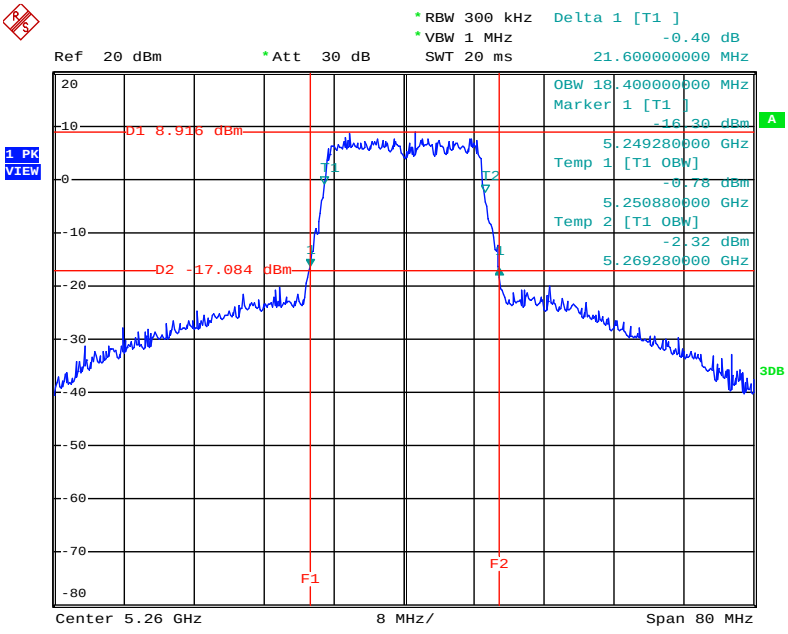
Date: 16.SEP.2014 17:52:32

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5260 MHz



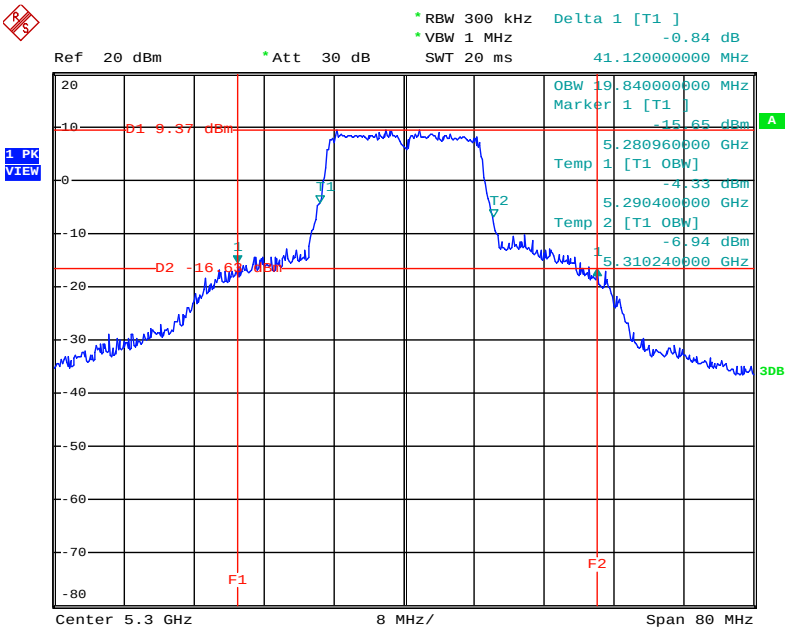
Date: 16.SEP.2014 17:53:40

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 2 / 5260 MHz



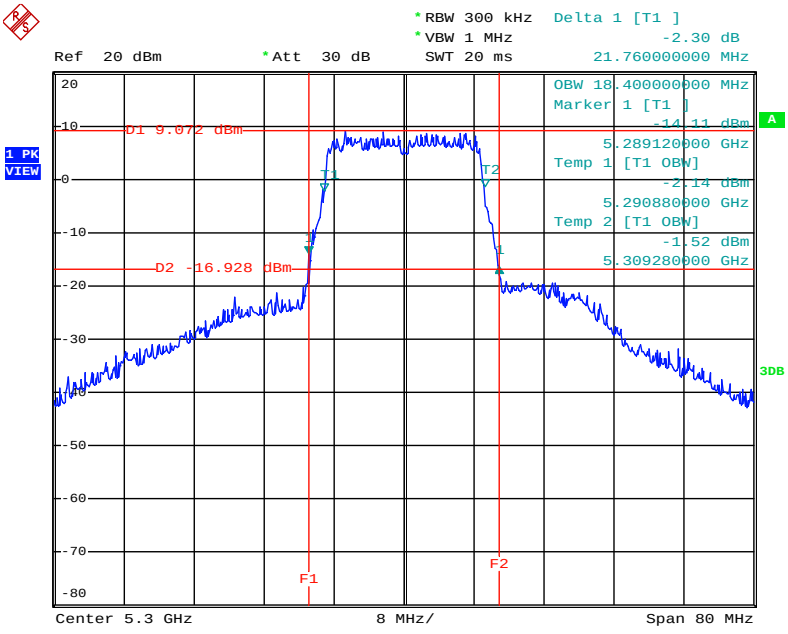
Date: 16.SEP.2014 17:54:27

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5300 MHz



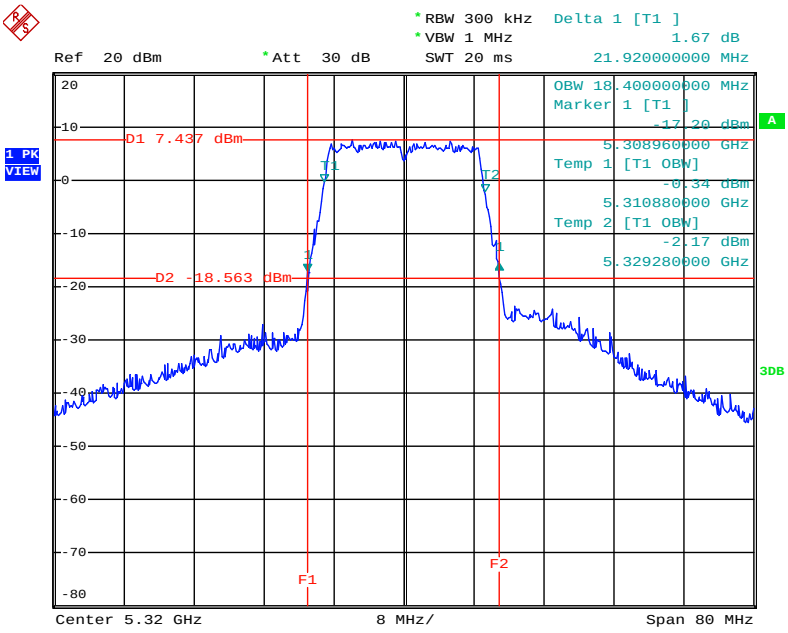
Date: 16.SEP.2014 17:55:35

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 2 / 5300 MHz



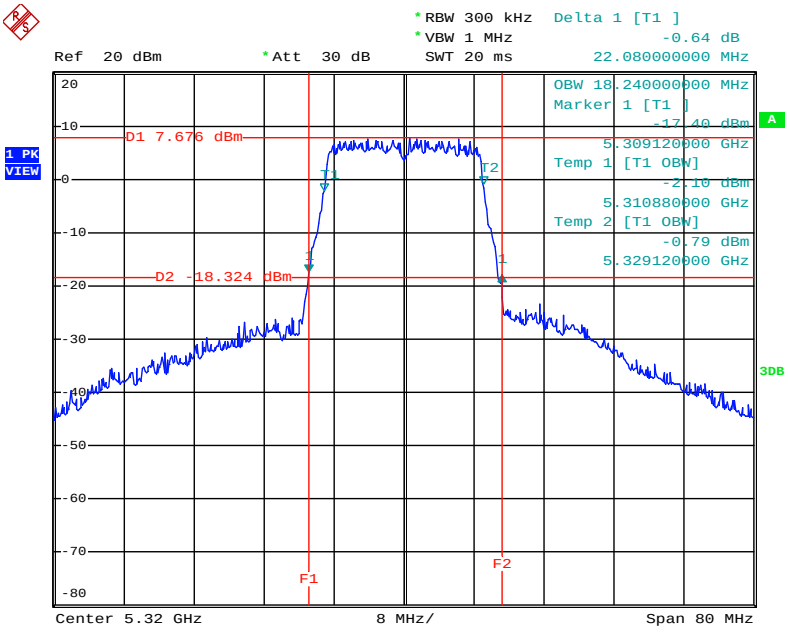
Date: 16.SEP.2014 17:55:05

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5320 MHz



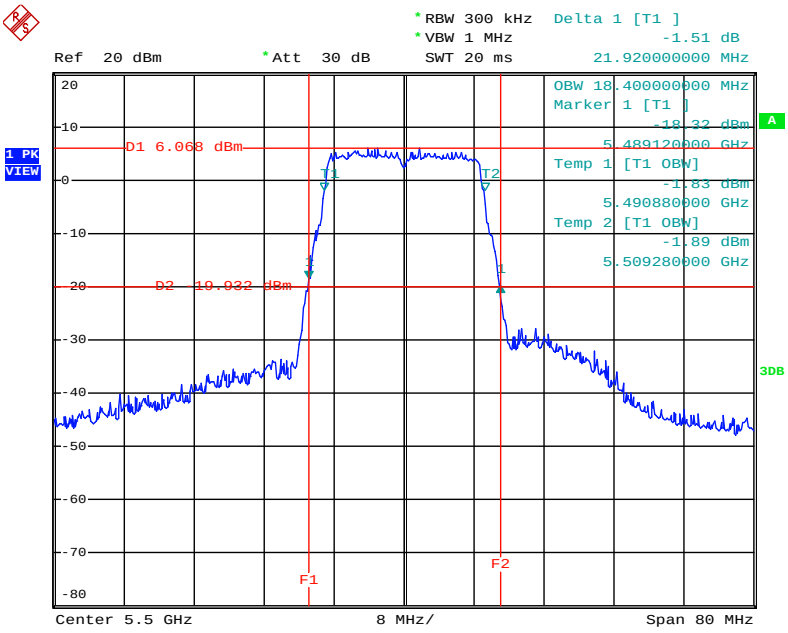
Date: 16.SEP.2014 17:56:09

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 2 / 5320 MHz



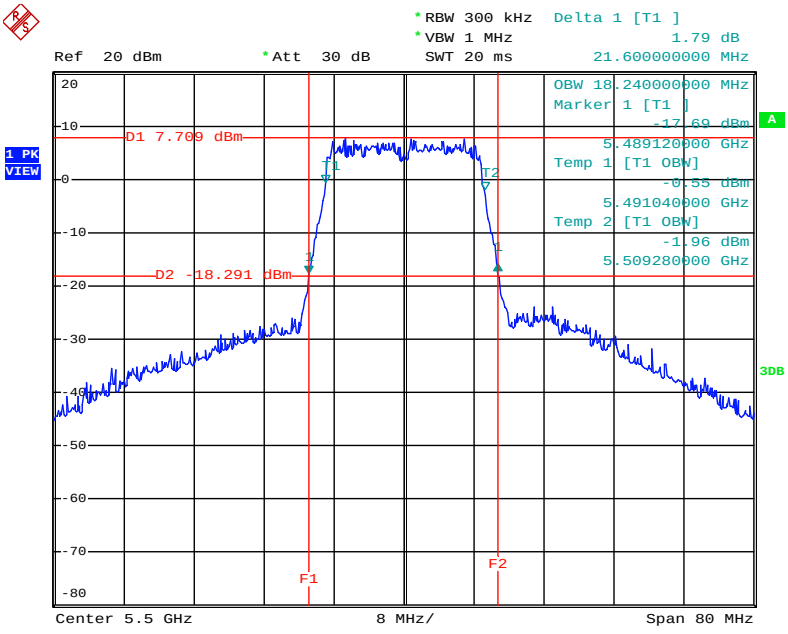
Date: 16.SEP.2014 17:56:49

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5500 MHz



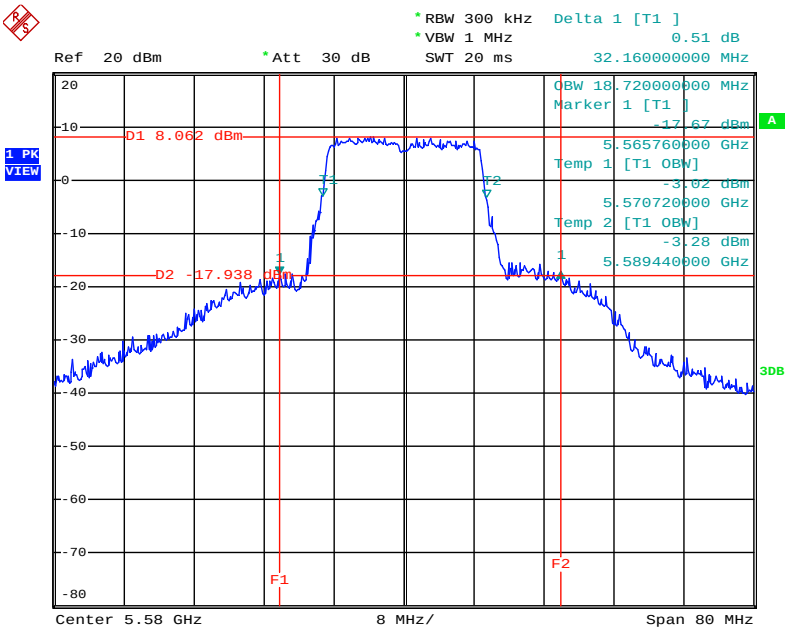
Date: 16.SEP.2014 17:48:58

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 2 / 5500 MHz



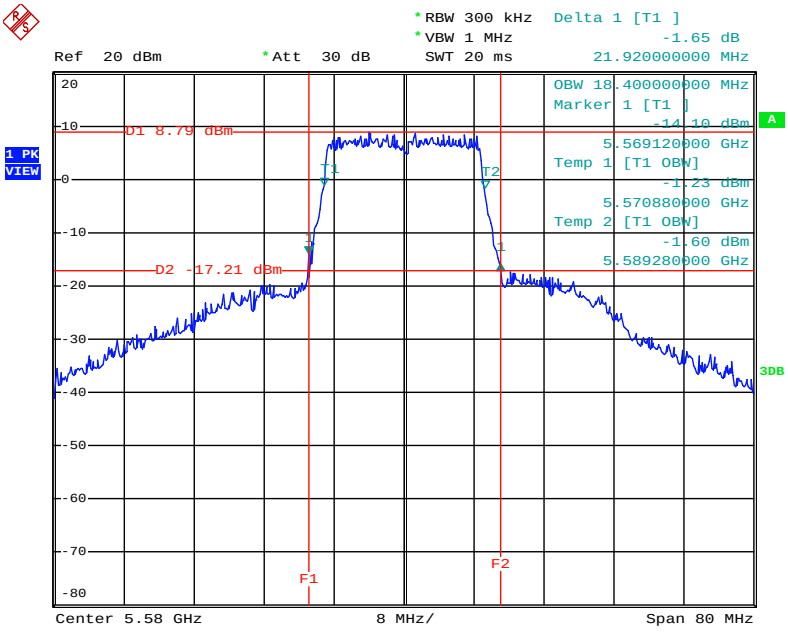
Date: 16.SEP.2014 17:49:33

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5580 MHz



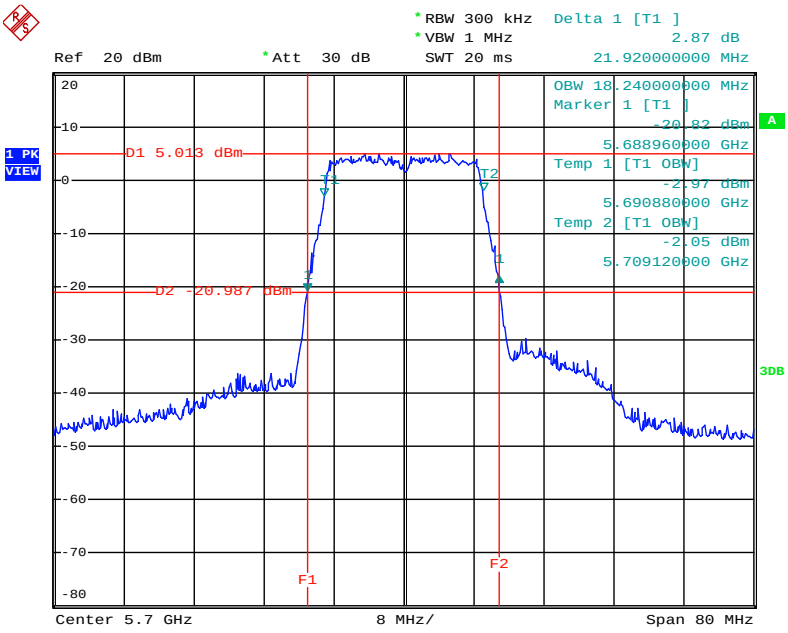
Date: 16.SEP.2014 17:48:16

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 2 / 5580 MHz



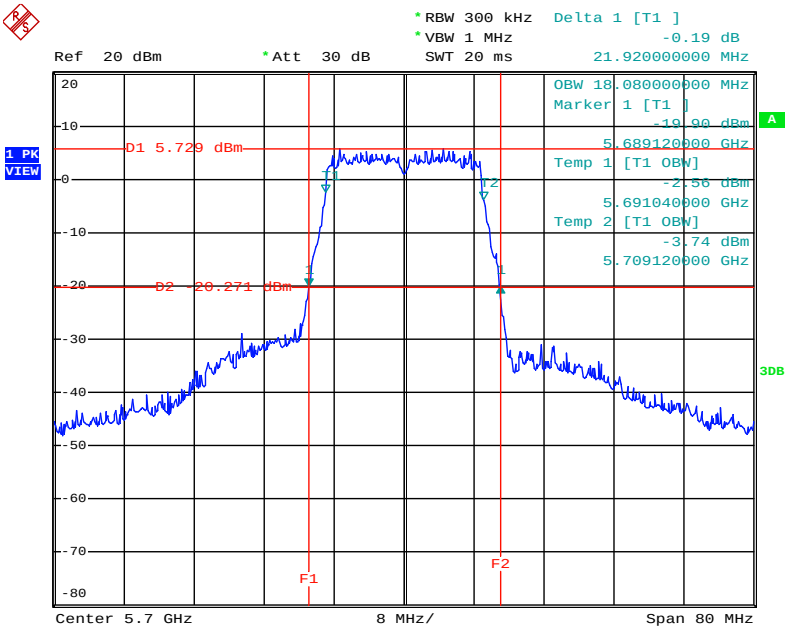
Date: 16.SEP.2014 17:47:40

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5700 MHz



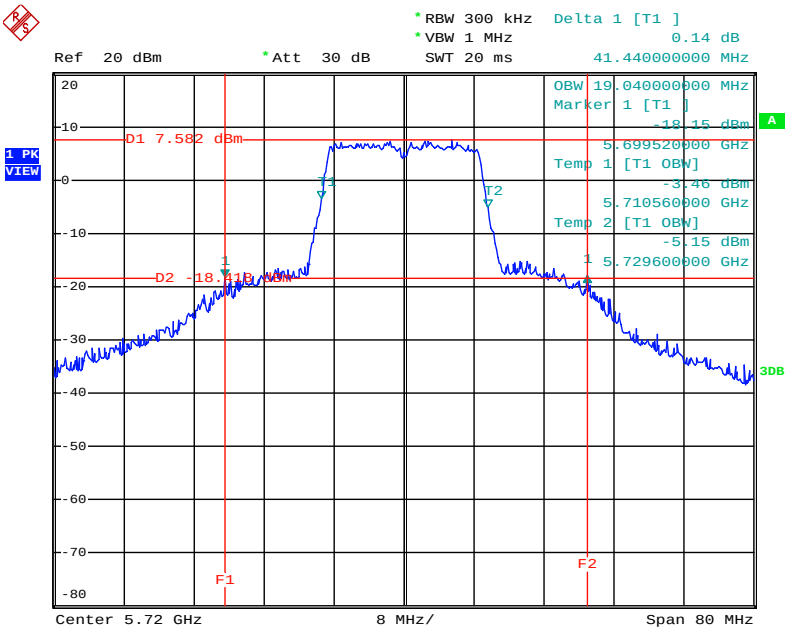
Date: 16.SEP.2014 17:46:14

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 2 / 5700 MHz



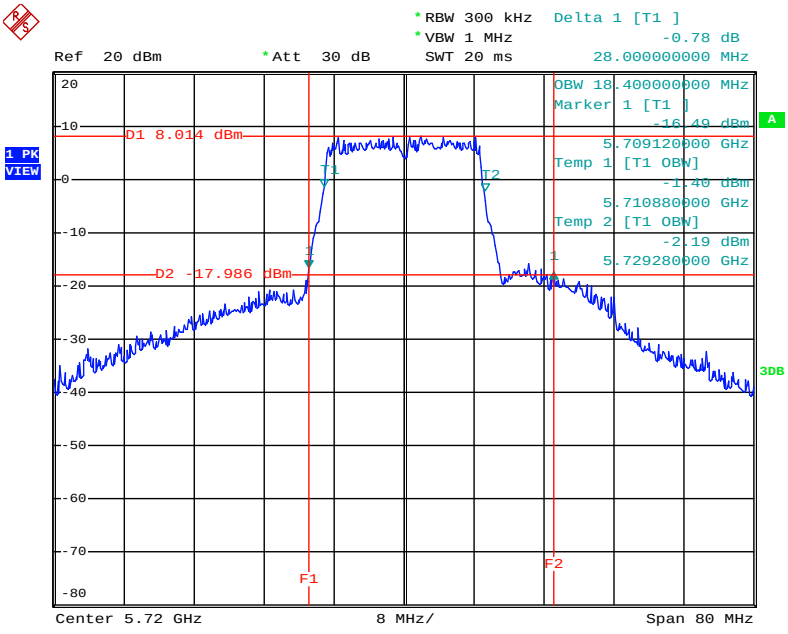
Date: 16.SEP.2014 17:46:57

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5720 MHz



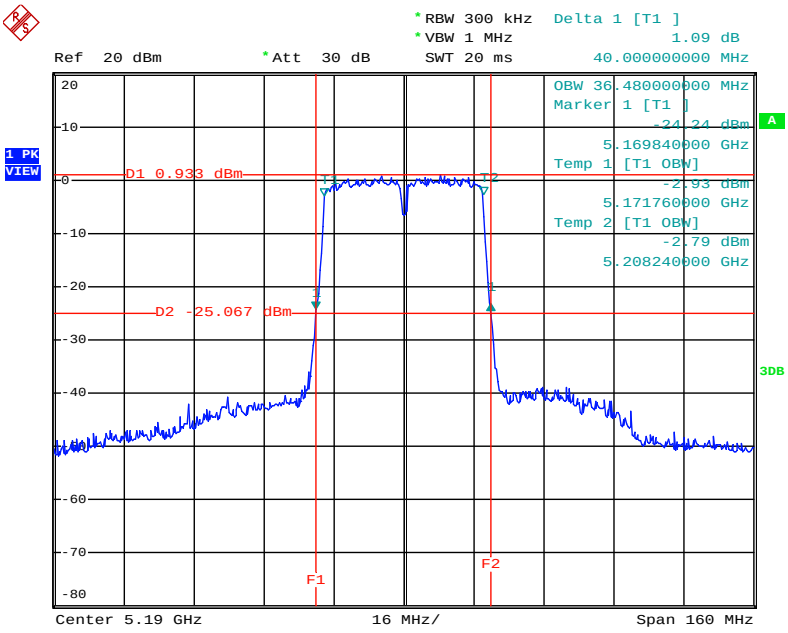
Date: 16.SEP.2014 17:45:27

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 2 / 5720 MHz



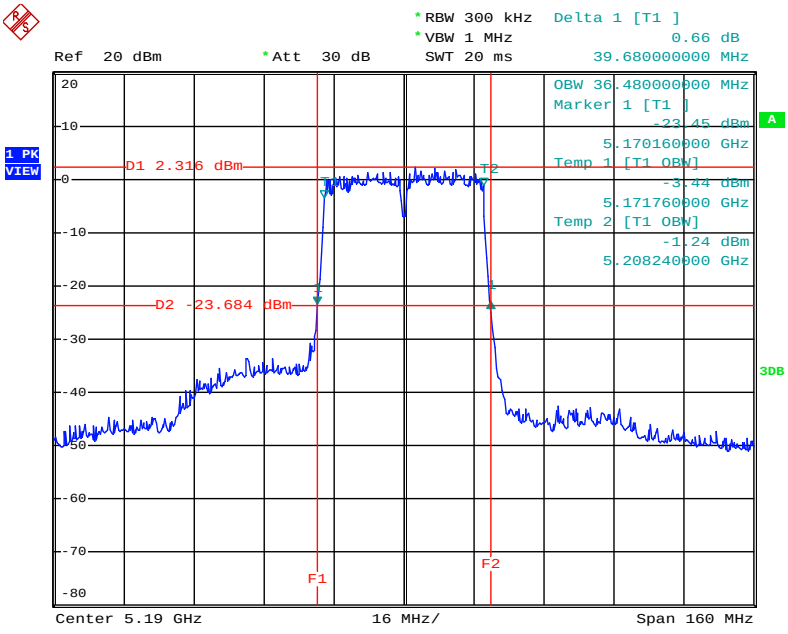
Date: 16.SEP.2014 17:44:40

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5190 MHz



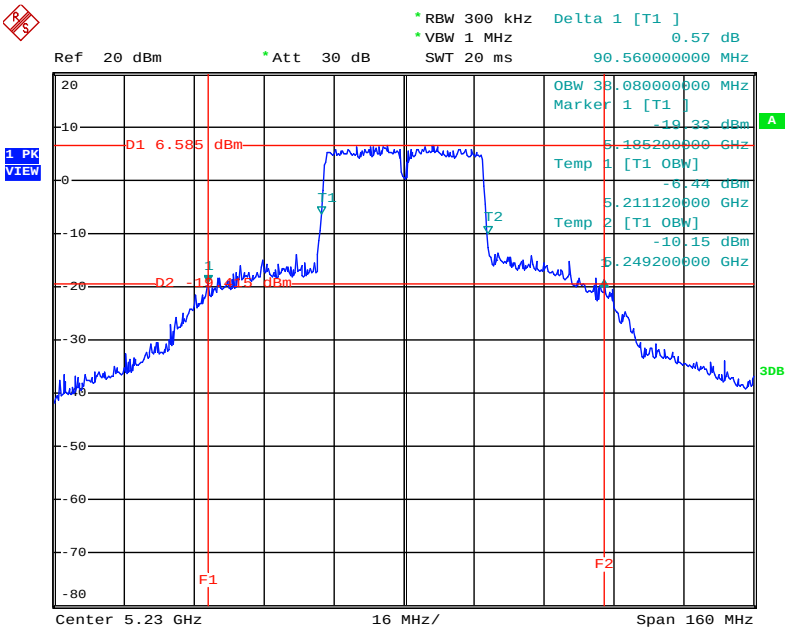
Date: 16.SEP.2014 17:58:30

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 2 / 5190 MHz



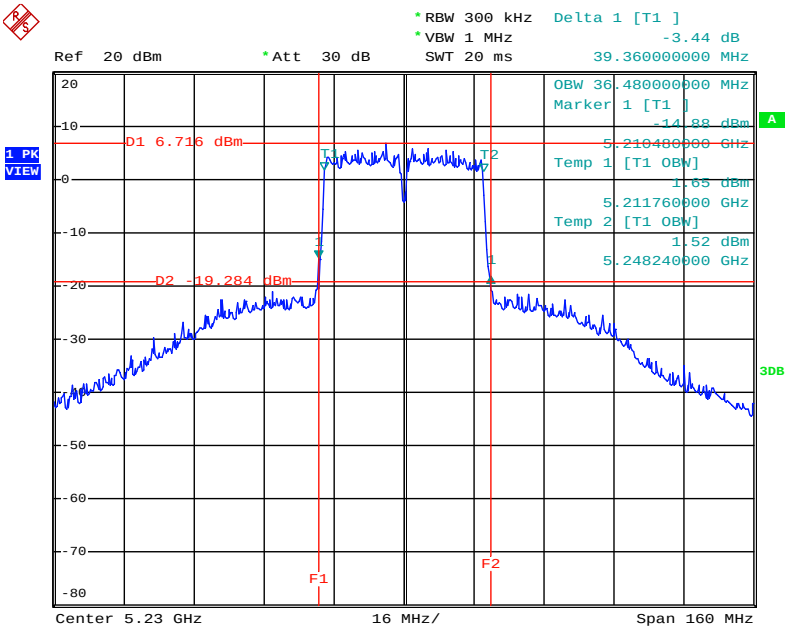
Date: 16.SEP.2014 17:57:52

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5230 MHz



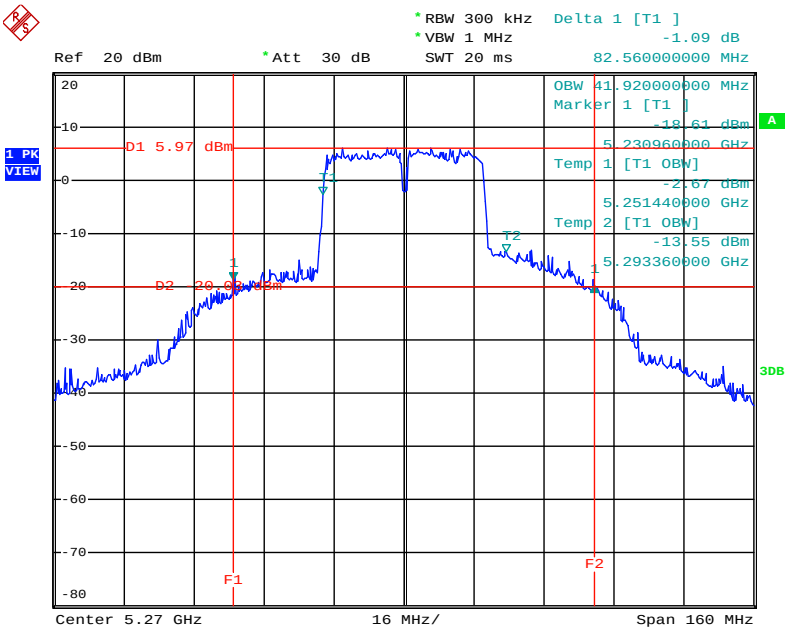
Date: 16.SEP.2014 17:59:09

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 2 / 5230 MHz



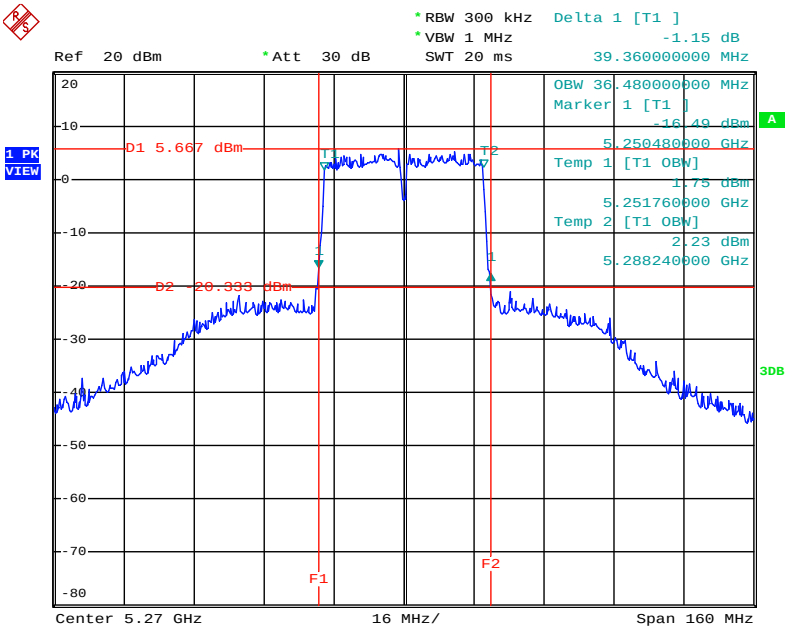
Date: 16.SEP.2014 17:59:45

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5270 MHz



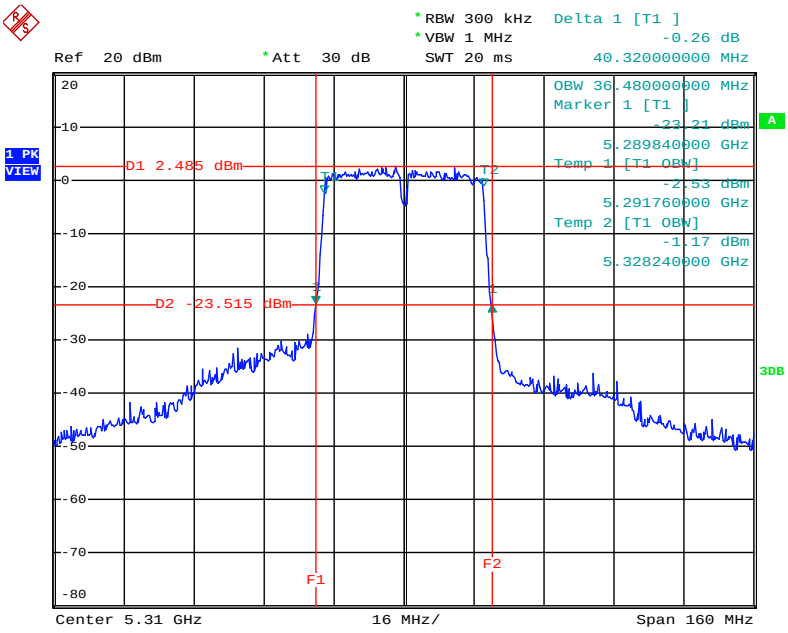
Date: 16.SEP.2014 18:01:34

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 2 / 5270 MHz



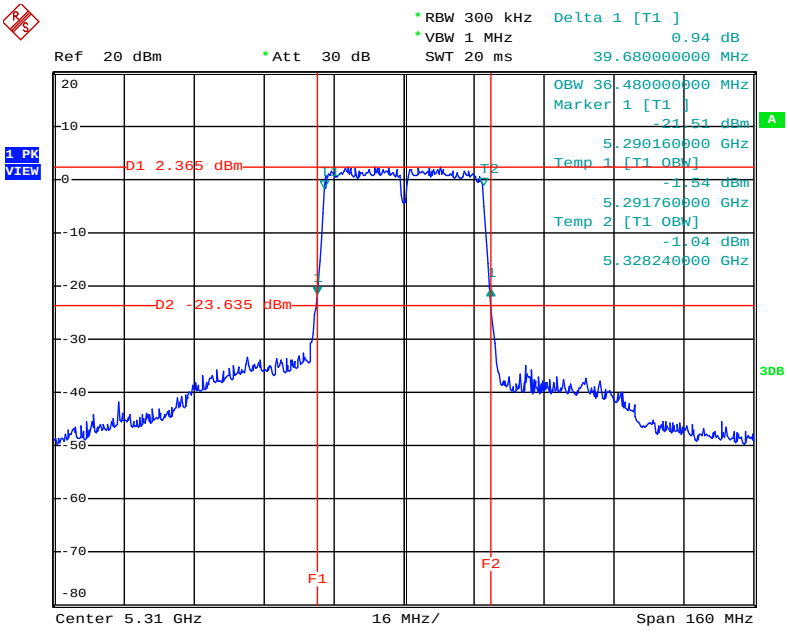
Date: 16.SEP.2014 18:00:15

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5310 MHz



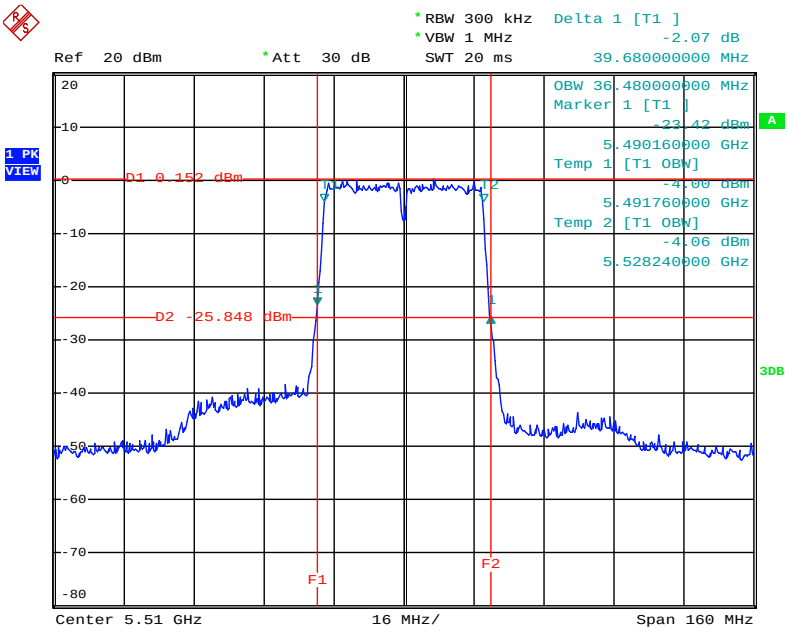
Date: 16.SEP.2014 18:03:25

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 2 / 5310 MHz



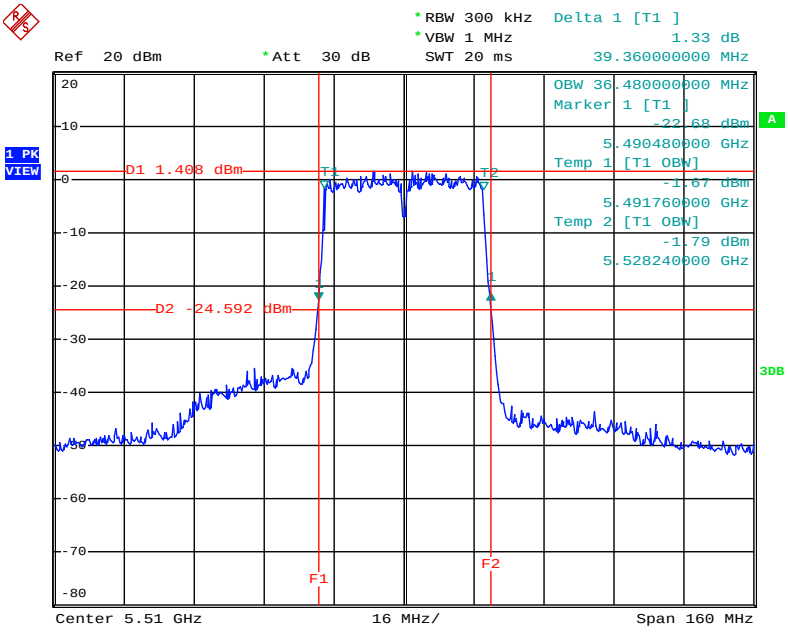
Date: 16.SEP.2014 18:02:12

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5510 MHz



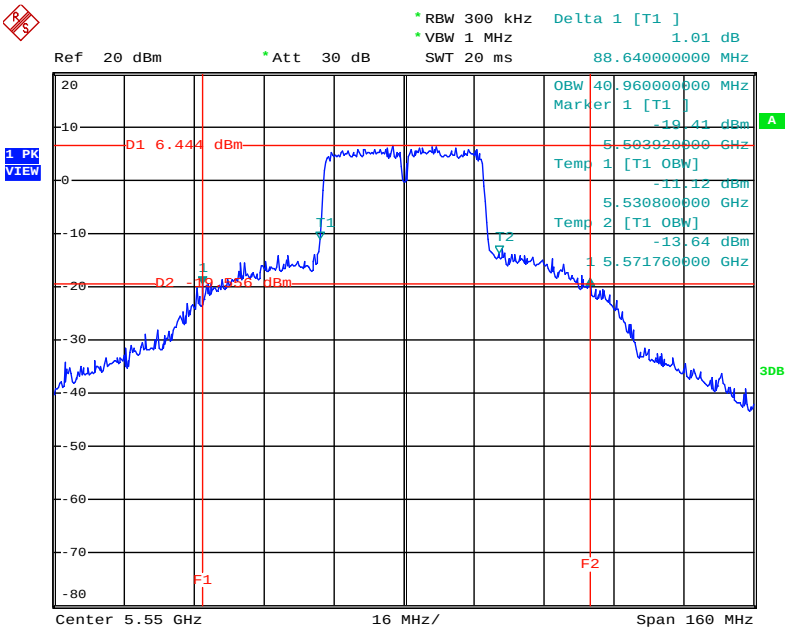
Date: 16.SEP.2014 18:04:20

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 2 / 5510 MHz



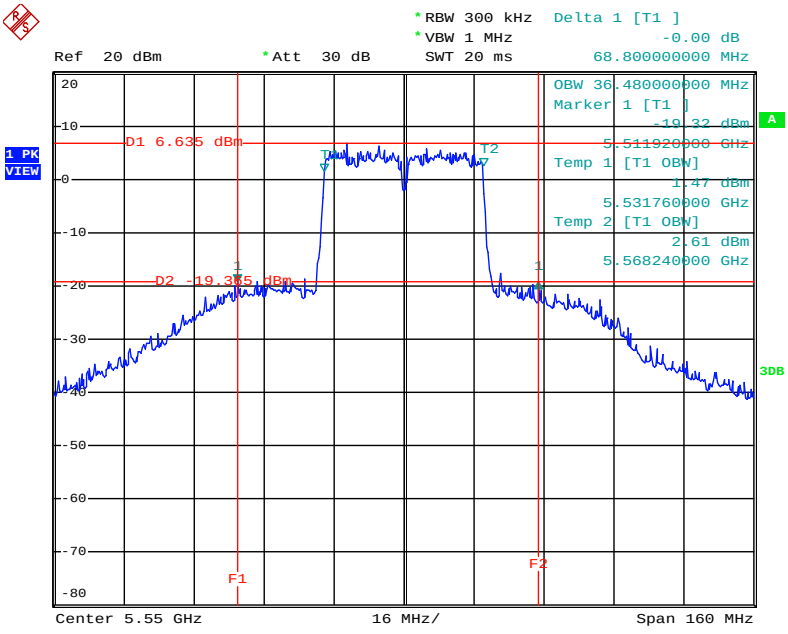
Date: 16.SEP.2014 18:05:06

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5550 MHz



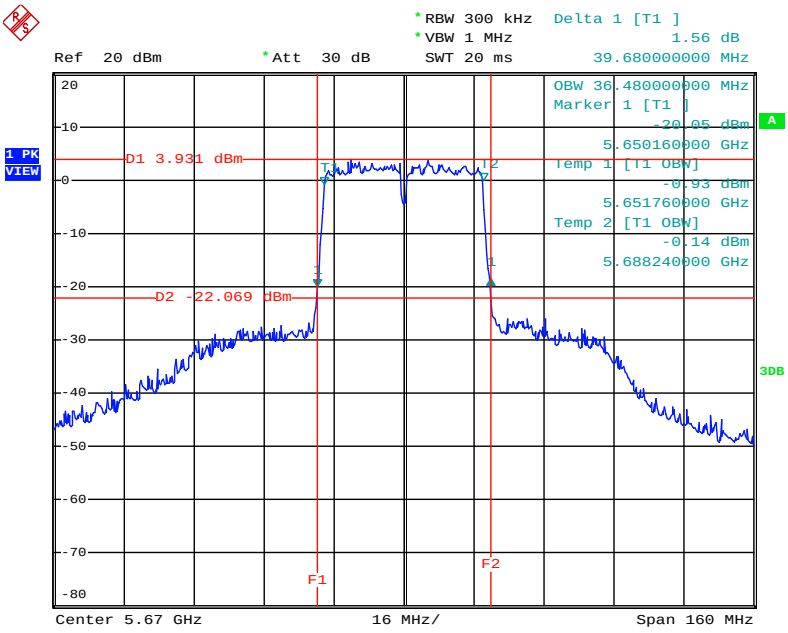
Date: 16.SEP.2014 18:06:20

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 2 / 5550 MHz



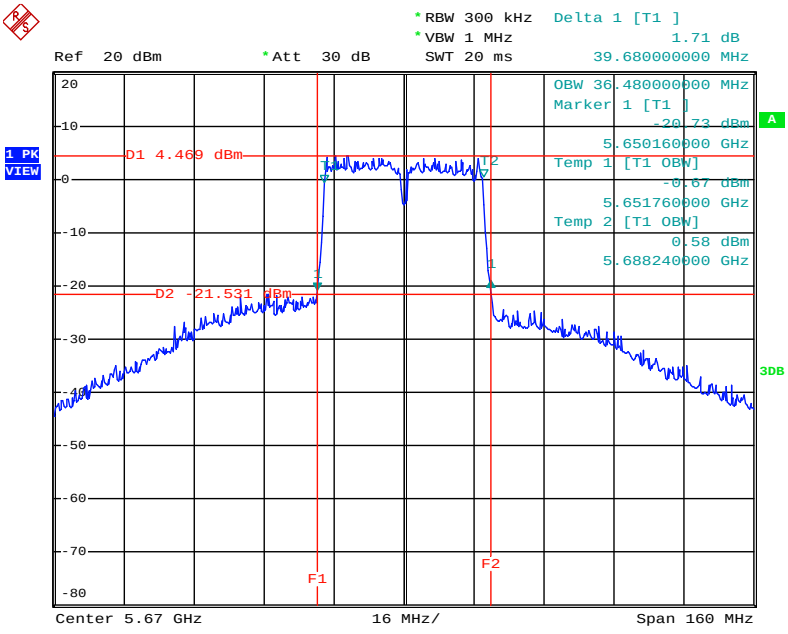
Date: 16.SEP.2014 18:05:46

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5670 MHz



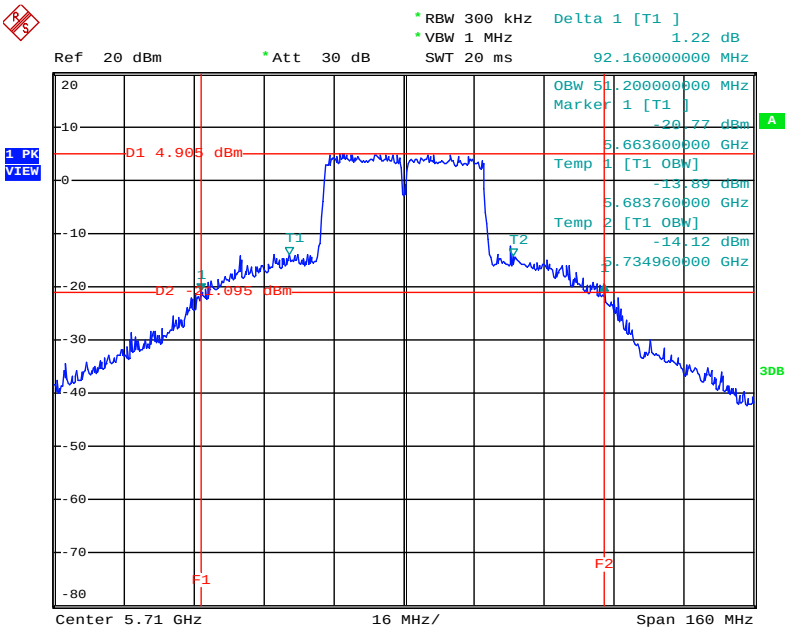
Date: 16.SEP.2014 18:07:14

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 2 / 5670 MHz



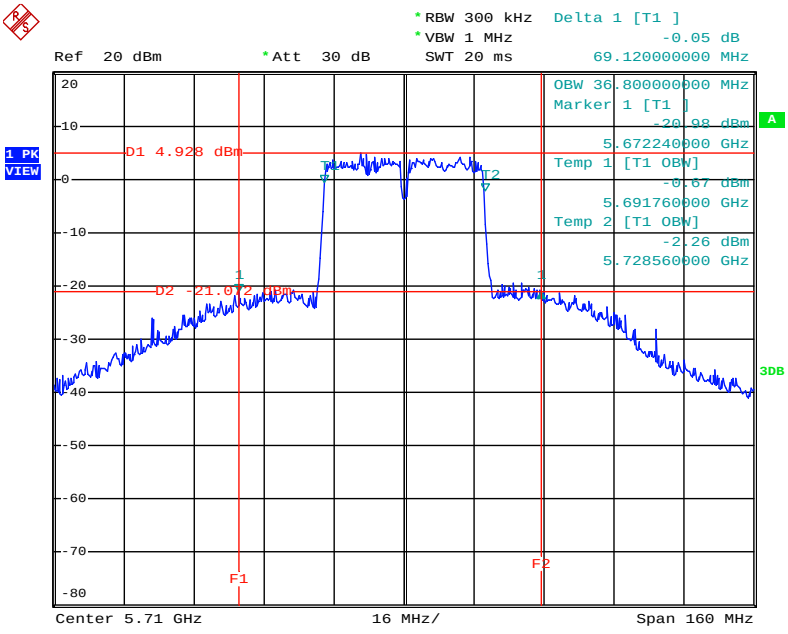
Date: 16.SEP.2014 18:07:51

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5710 MHz



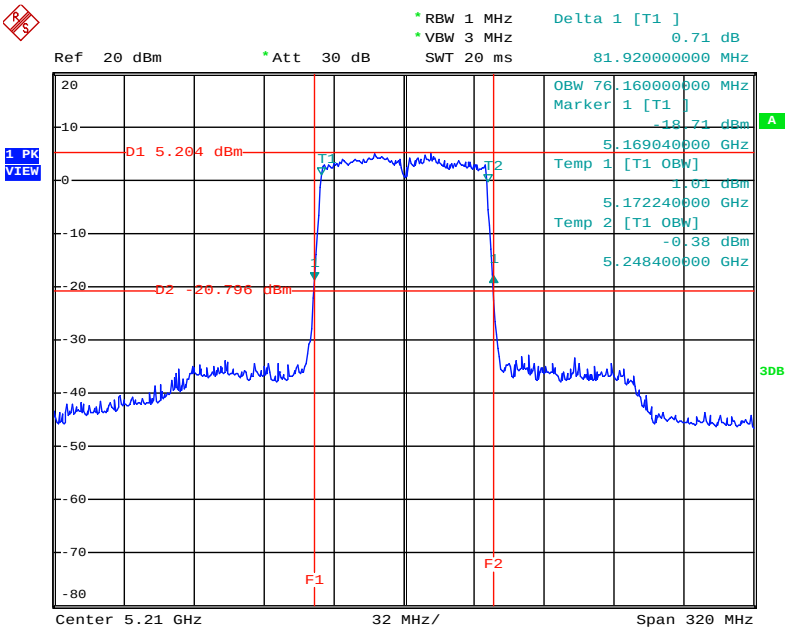
Date: 16.SEP.2014 18:11:05

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 2 / 5710 MHz



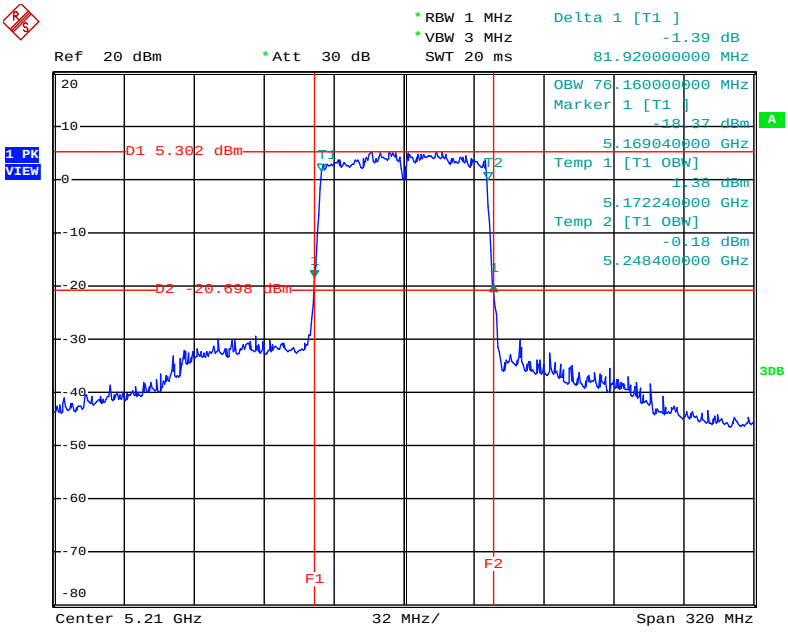
Date: 16.SEP.2014 18:10:38

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 / 5210 MHz



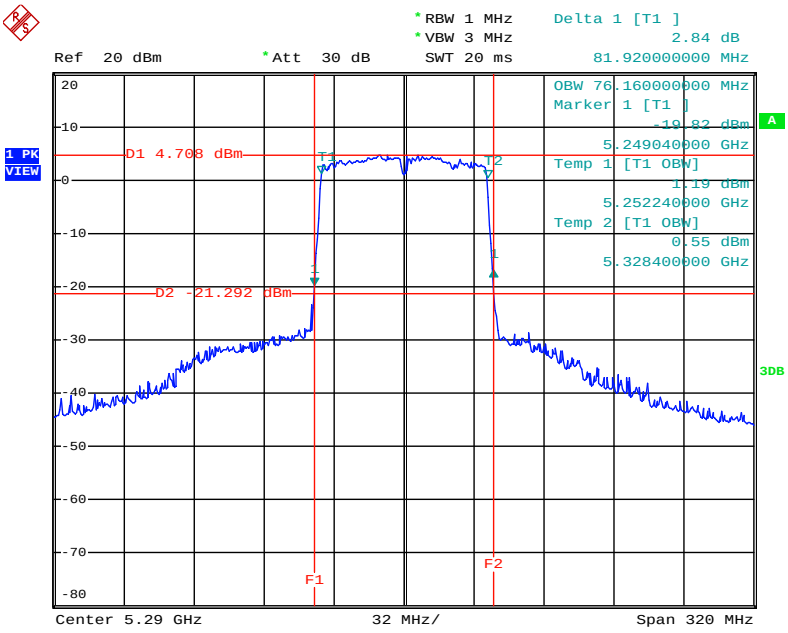
Date: 16.SEP.2014 18:12:08

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 2 / 5210 MHz



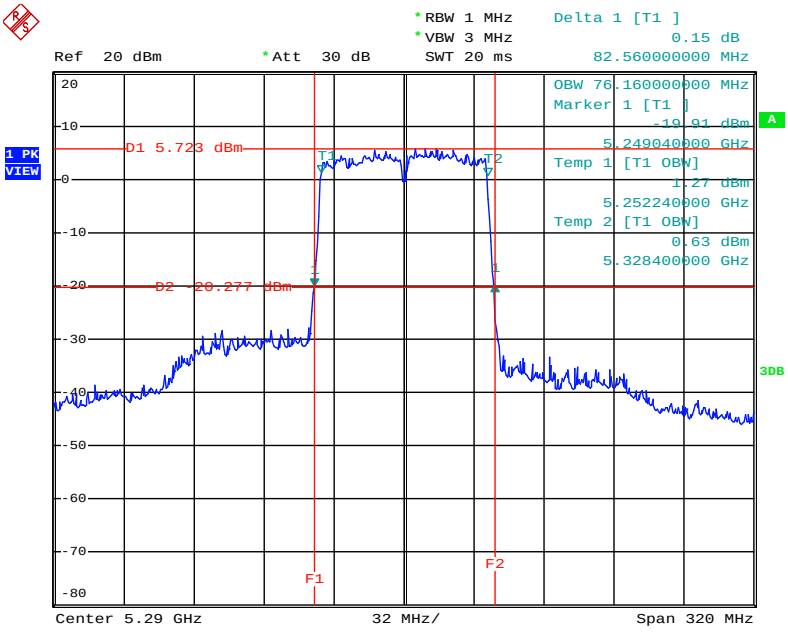
Date: 16.SEP.2014 18:12:37

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 / 5290 MHz



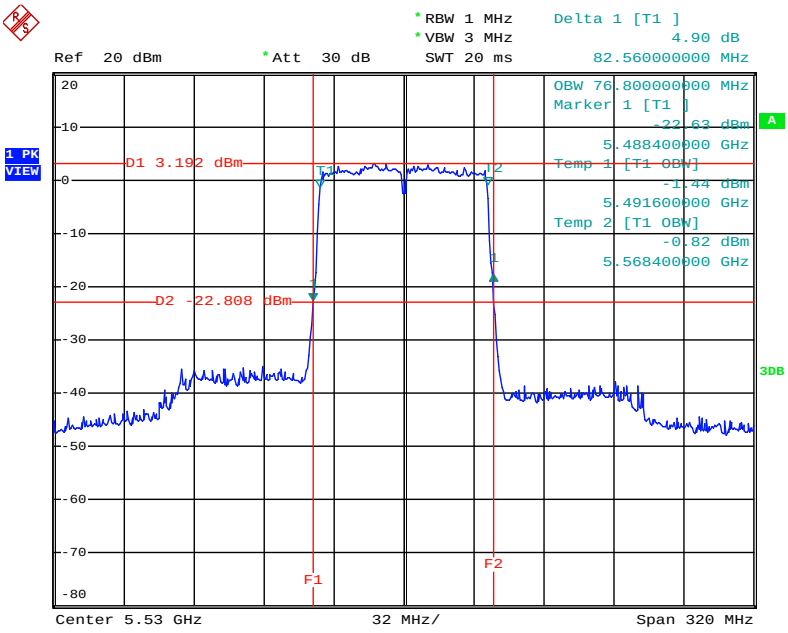
Date: 16.SEP.2014 18:14:05

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 2 / 5290 MHz



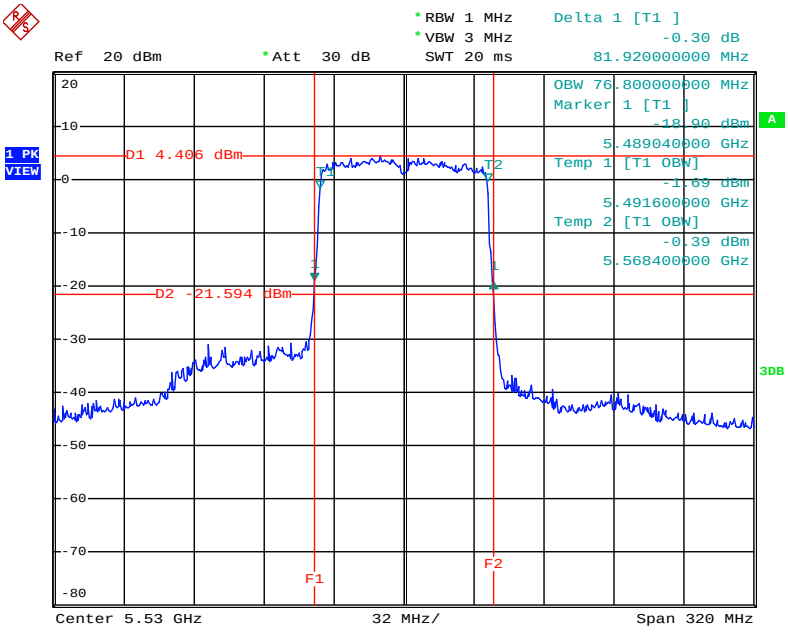
Date: 16.SEP.2014 18:13:27

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 / 5530 MHz



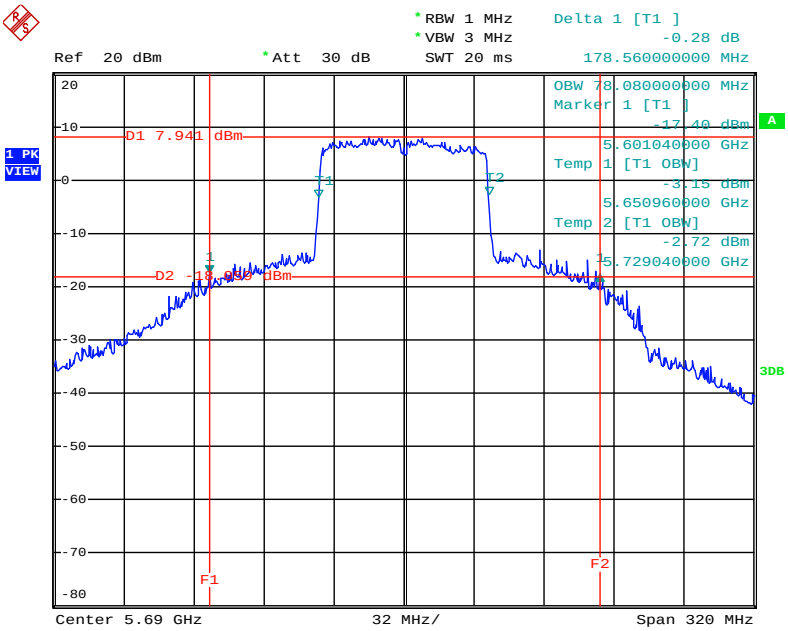
Date: 16.SEP.2014 18:14:46

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 2 / 5530 MHz



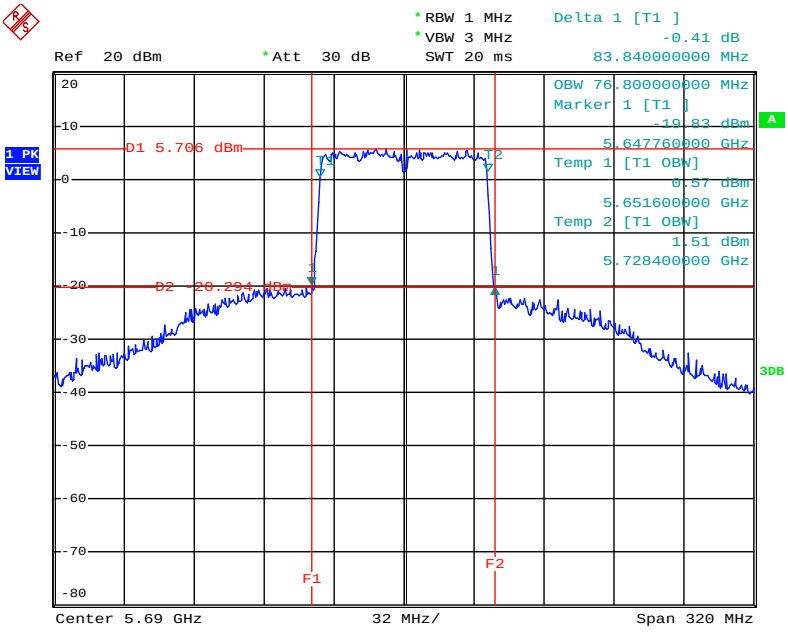
Date: 16.SEP.2014 18:15:27

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 / 5690 MHz



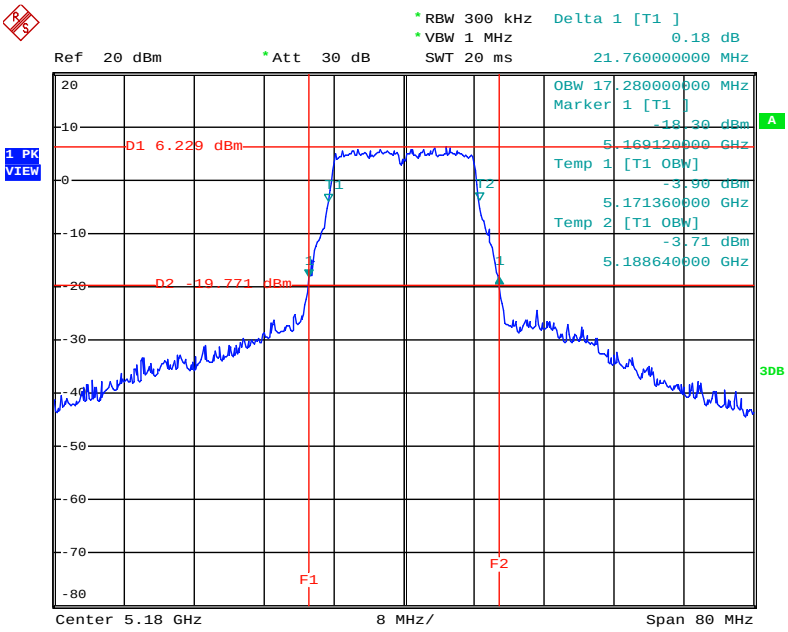
Date: 16.SEP.2014 18:19:53

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 2 / 5690 MHz



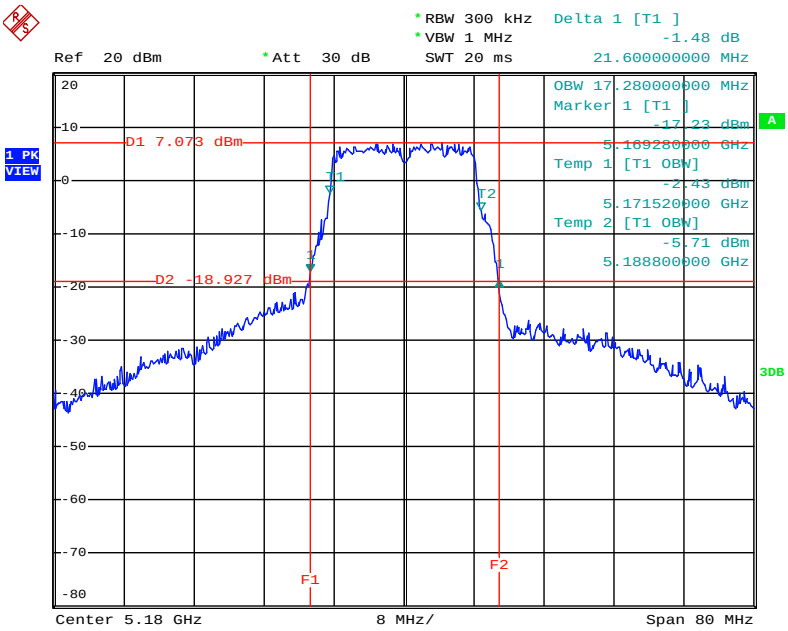
Date: 16.SEP.2014 18:19:12

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5180 MHz



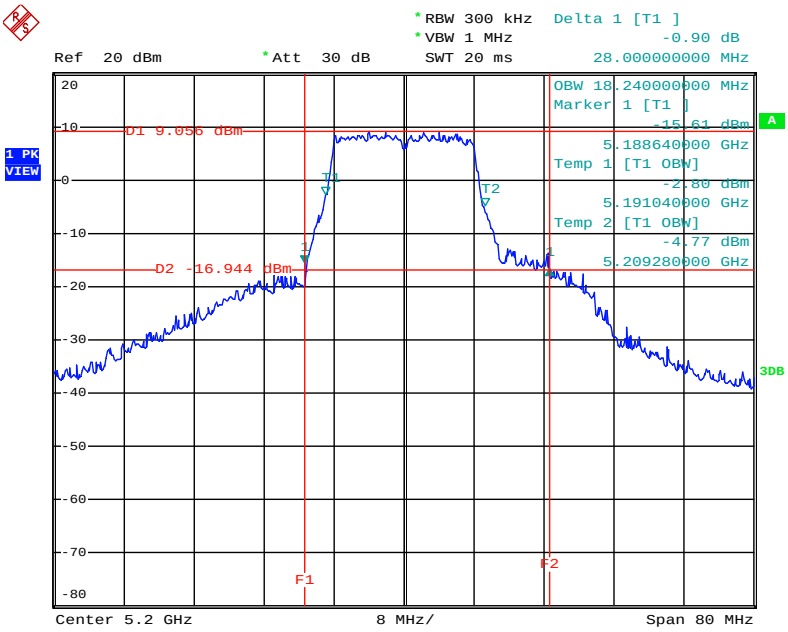
Date: 16.SEP.2014 17:07:12

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 2 / 5180 MHz



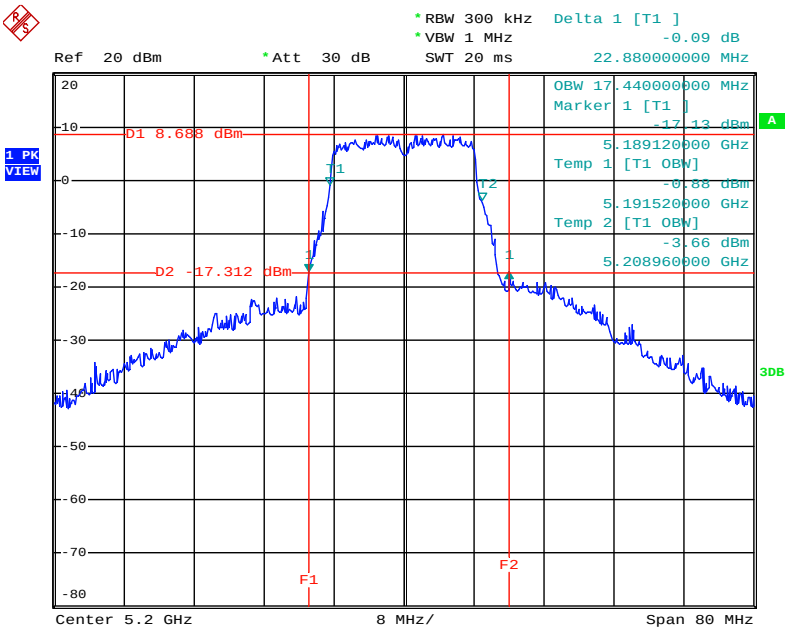
Date: 16.SEP.2014 17:06:39

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5200 MHz



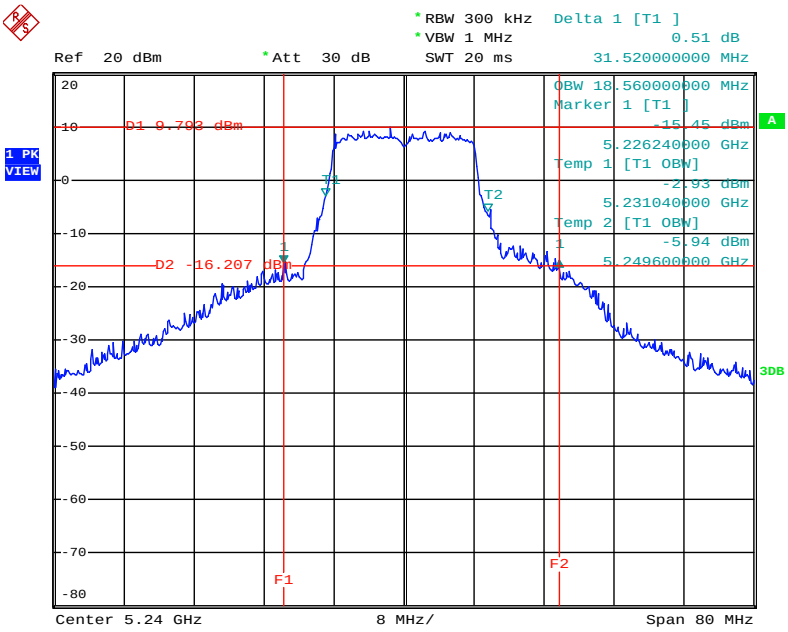
Date: 16.SEP.2014 17:07:53

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 2 / 5200 MHz



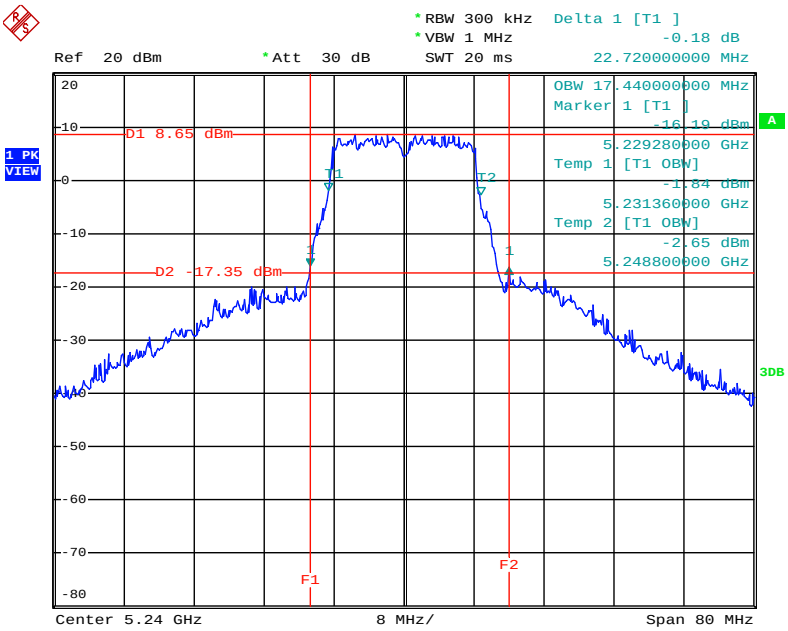
Date: 16.SEP.2014 17:08:23

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5240 MHz



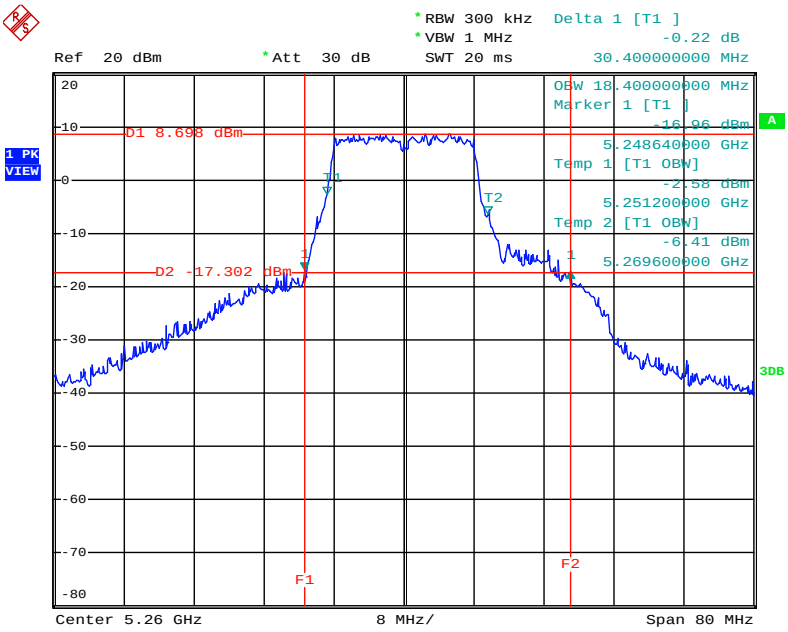
Date: 16.SEP.2014 17:09:34

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 2 / 5240 MHz



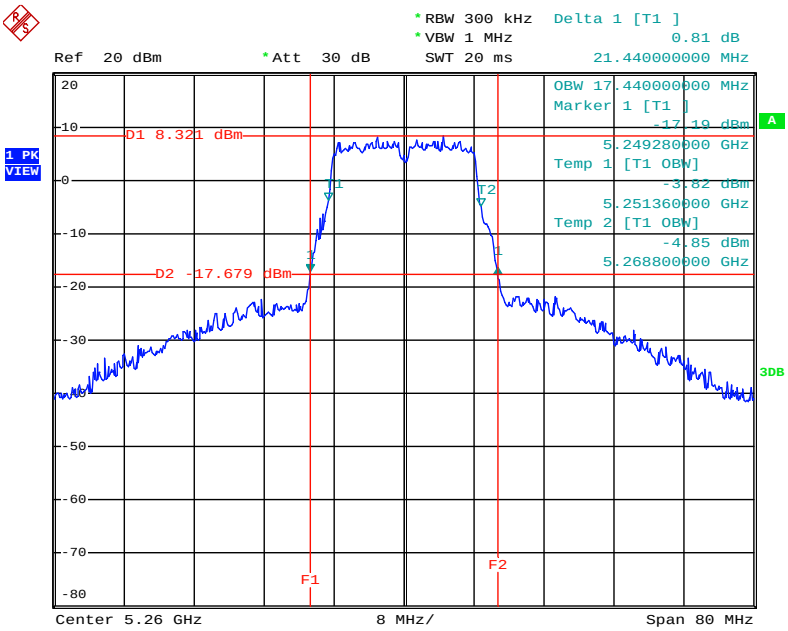
Date: 16.SEP.2014 17:08:57

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5260 MHz



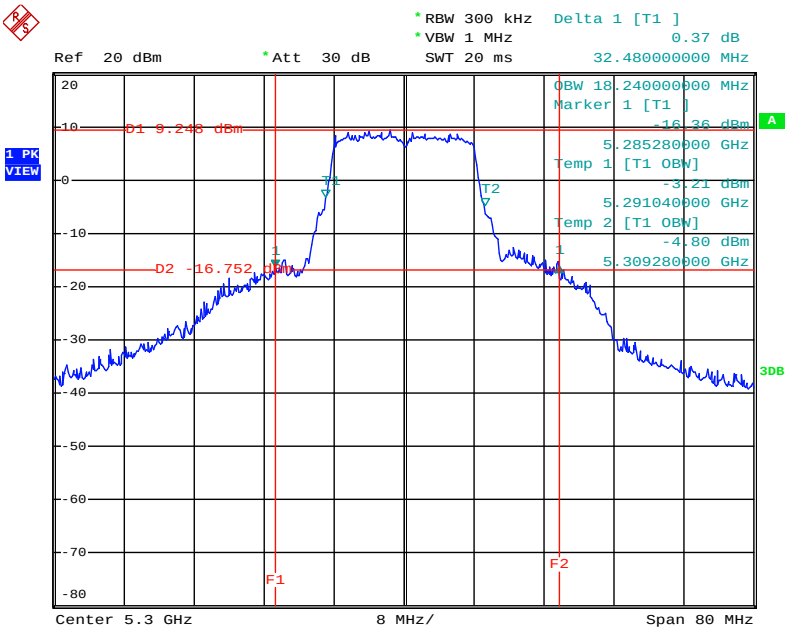
Date: 16.SEP.2014 17:10:12

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 2 / 5260 MHz



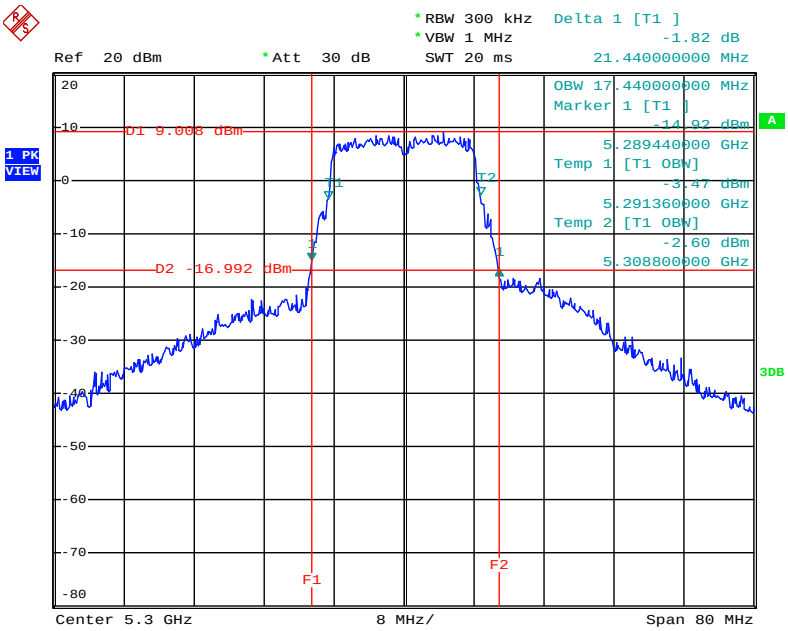
Date: 16.SEP.2014 17:10:45

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5300 MHz



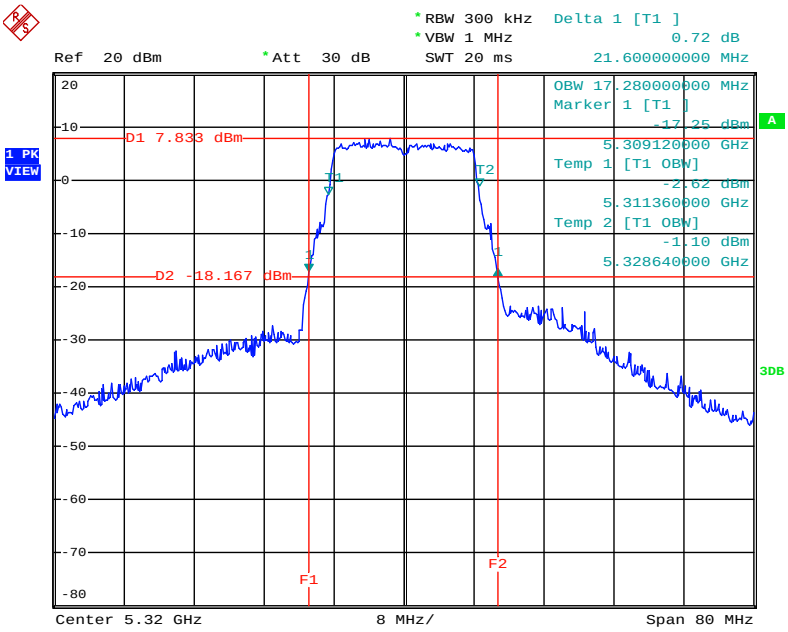
Date: 16.SEP.2014 17:11:50

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 2 / 5300 MHz



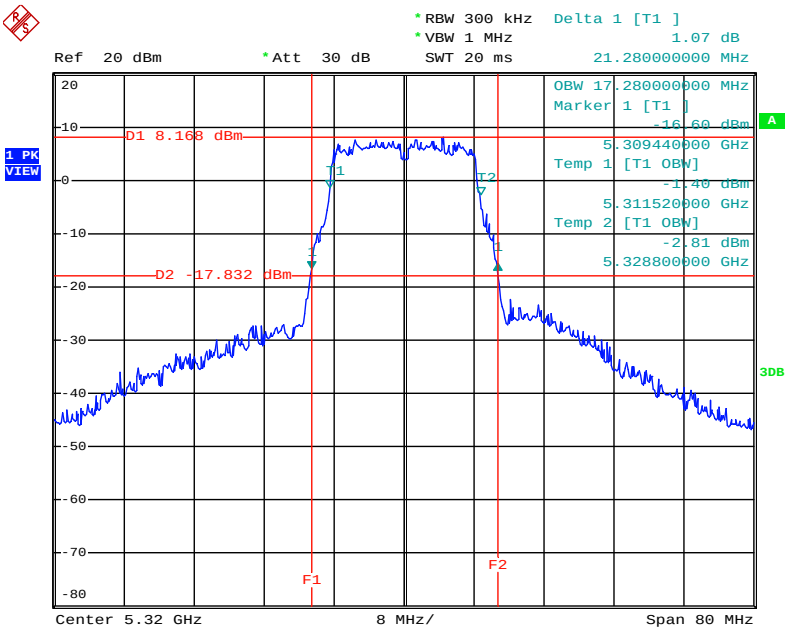
Date: 16.SEP.2014 17:11:16

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5320 MHz



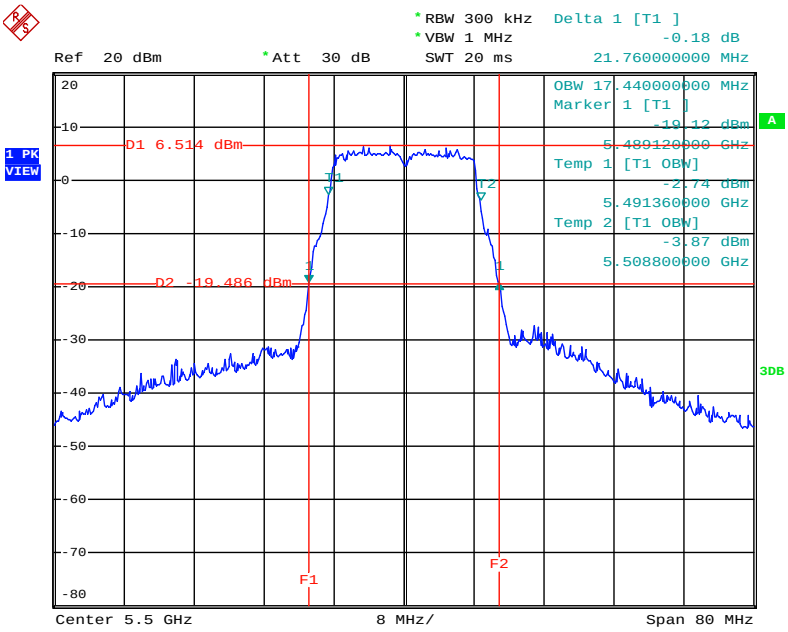
Date: 16.SEP.2014 17:12:32

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 2 / 5320 MHz



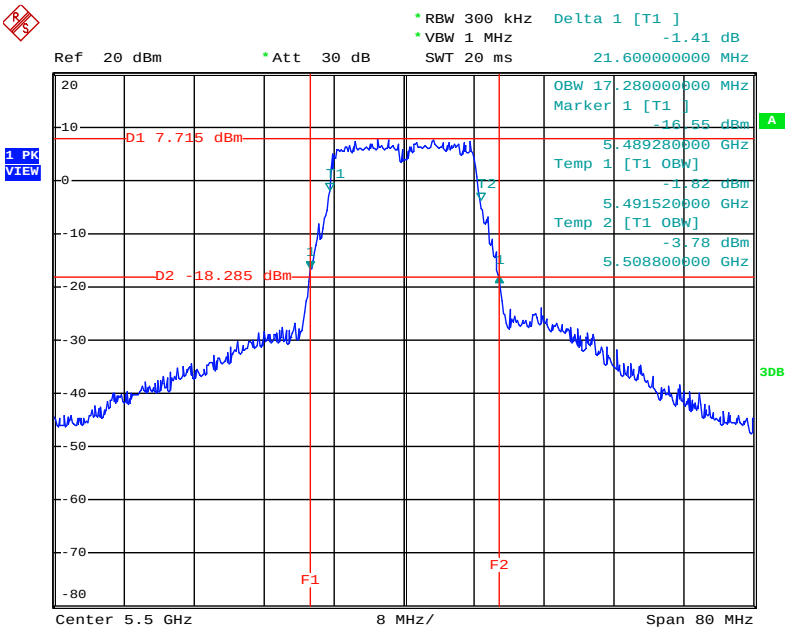
Date: 16.SEP.2014 17:13:09

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5500 MHz



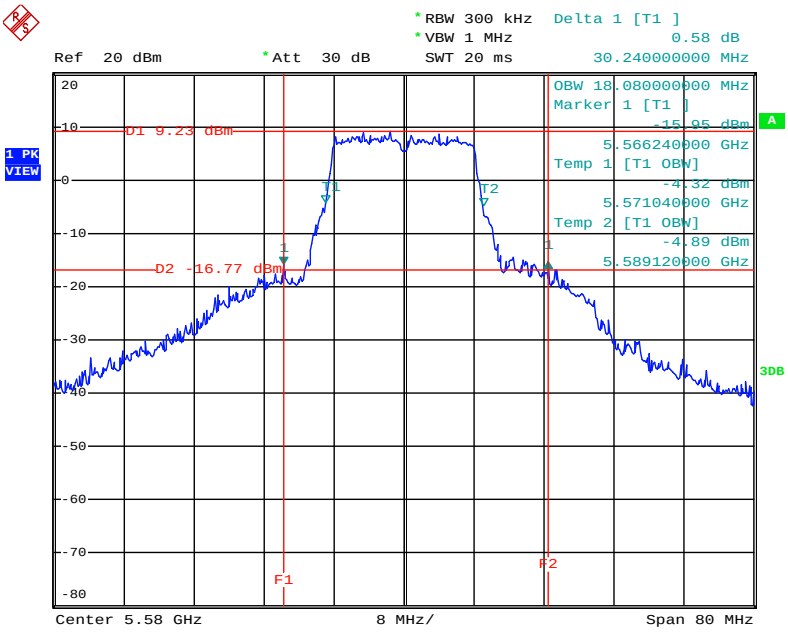
Date: 16.SEP.2014 17:15:22

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 2 / 5500 MHz



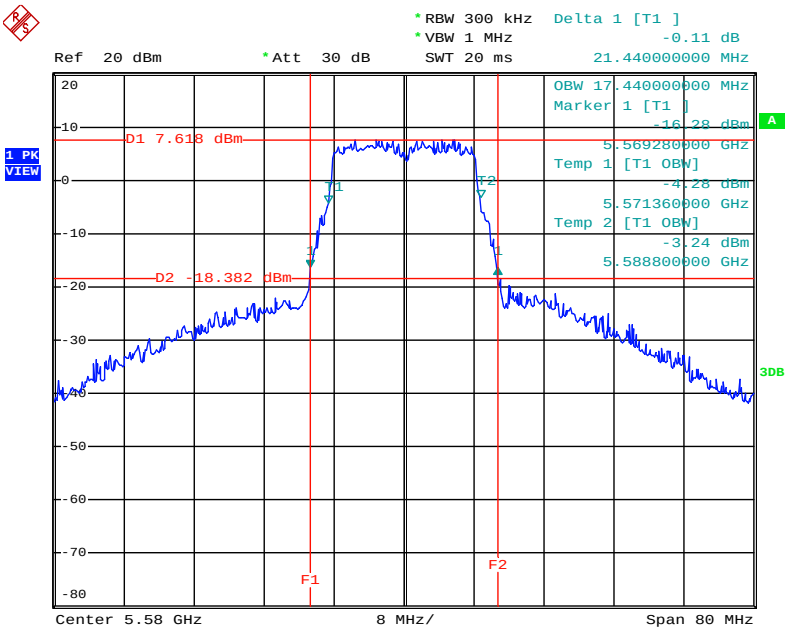
Date: 16.SEP.2014 17:13:51

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5580 MHz



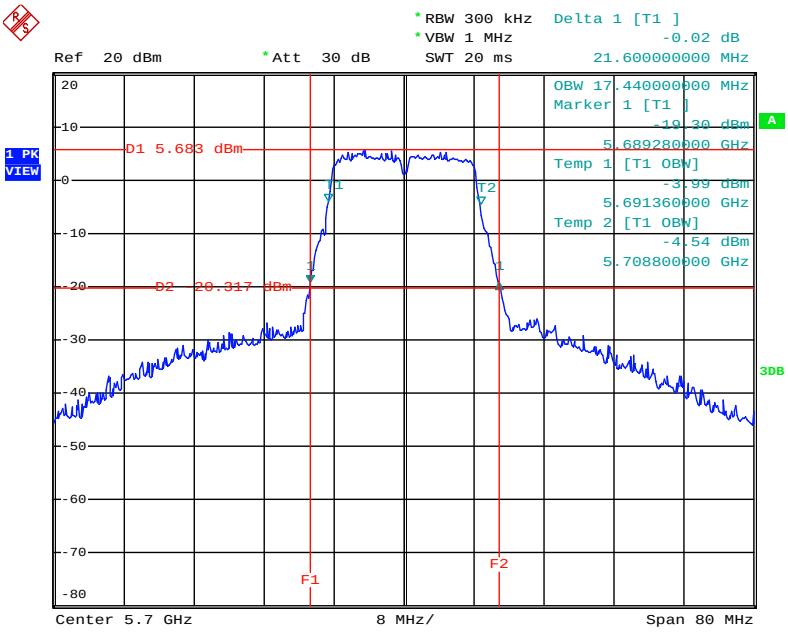
Date: 16.SEP.2014 17:16:50

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 2 / 5580 MHz



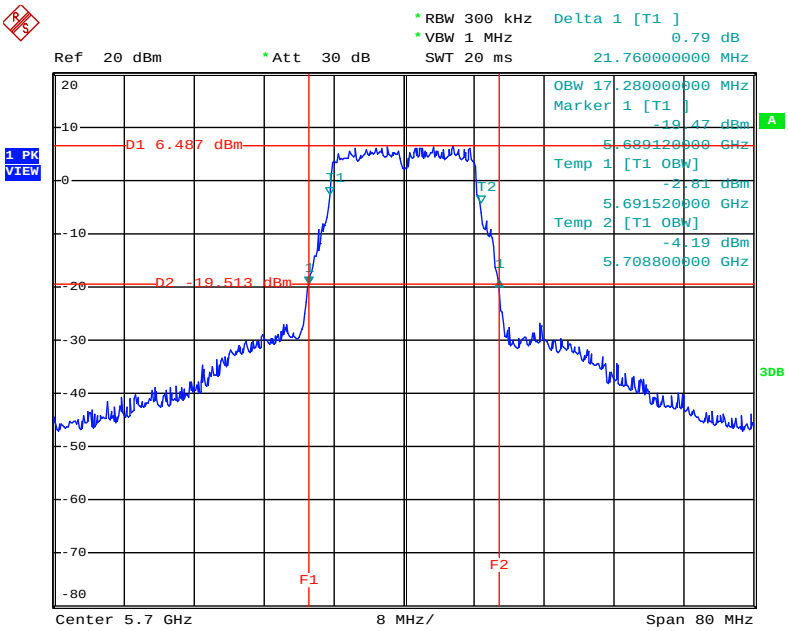
Date: 16.SEP.2014 17:17:37

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5700 MHz



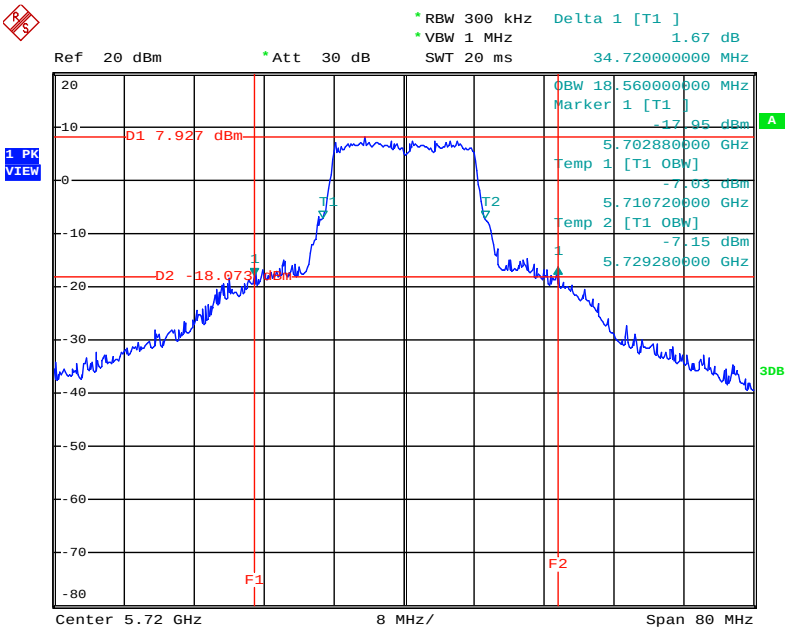
Date: 16.SEP.2014 17:22:56

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5700 MHz



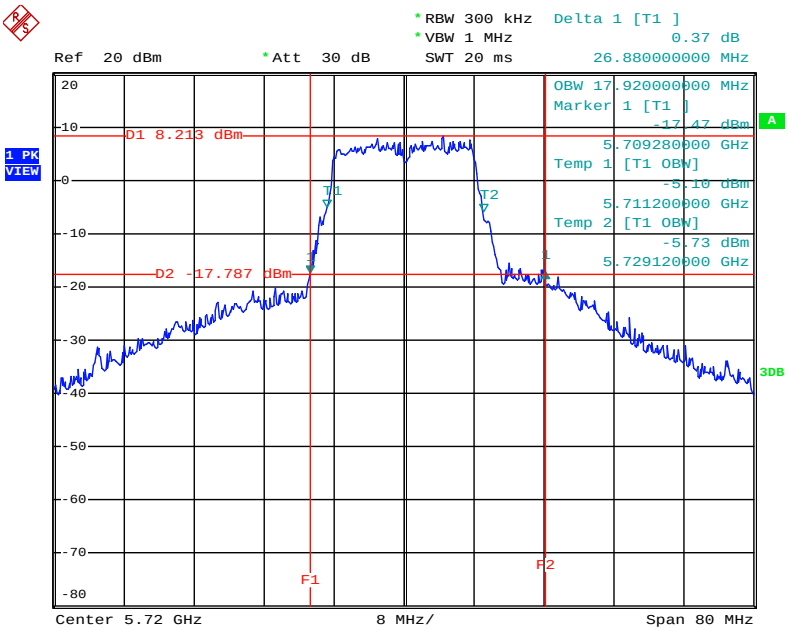
Date: 16.SEP.2014 17:20:50

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5720 MHz



Date: 16.SEP.2014 17:29:27

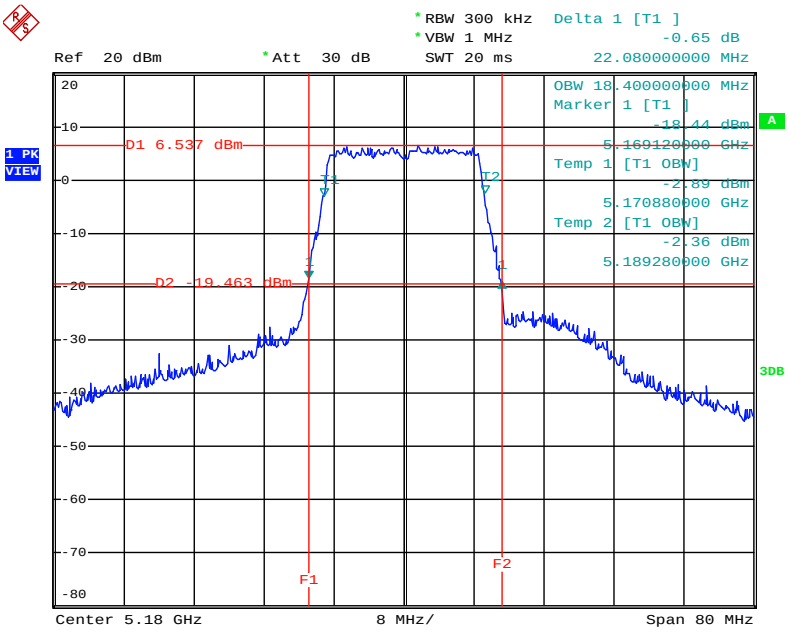
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5720 MHz



Date: 16.SEP.2014 17:30:13

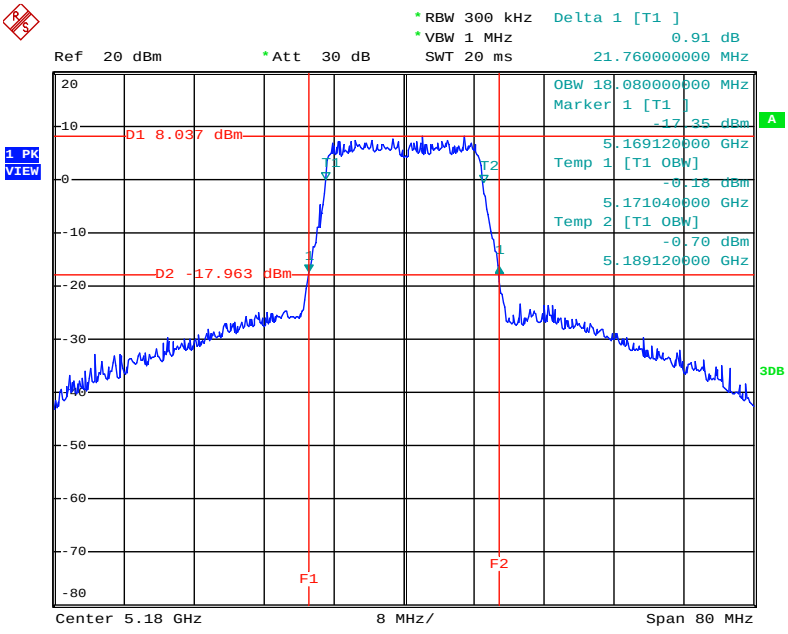
For beamforming function:

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5180 MHz



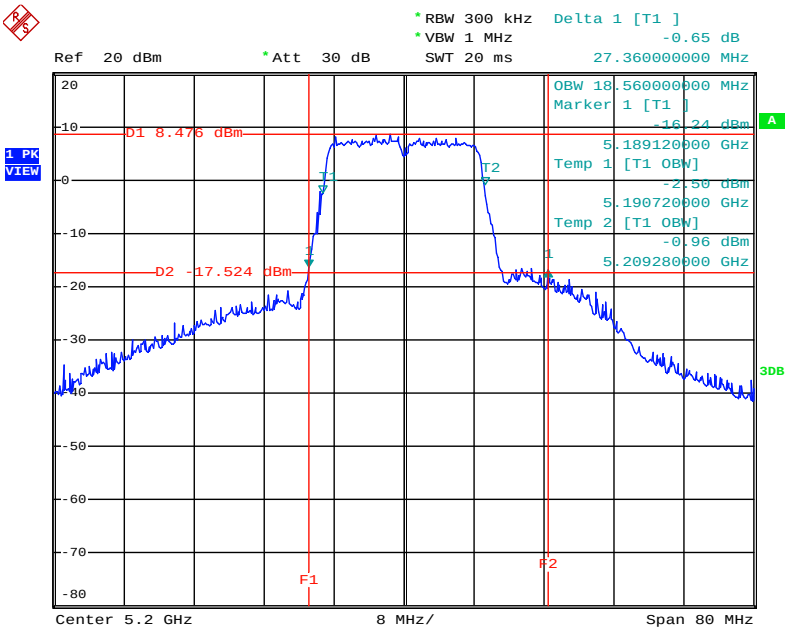
Date: 16.SEP.2014 18:43:56

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 2 / 5180 MHz



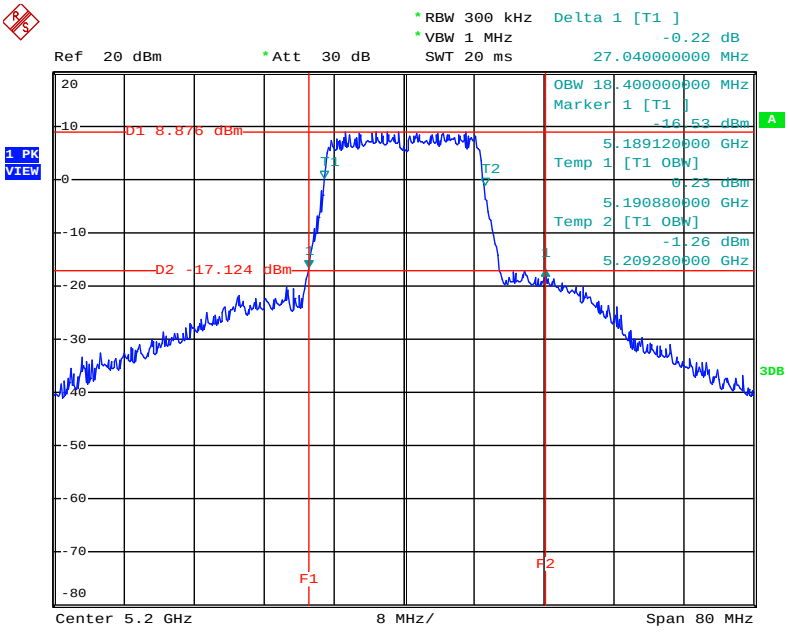
Date: 16.SEP.2014 18:44:37

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5200 MHz



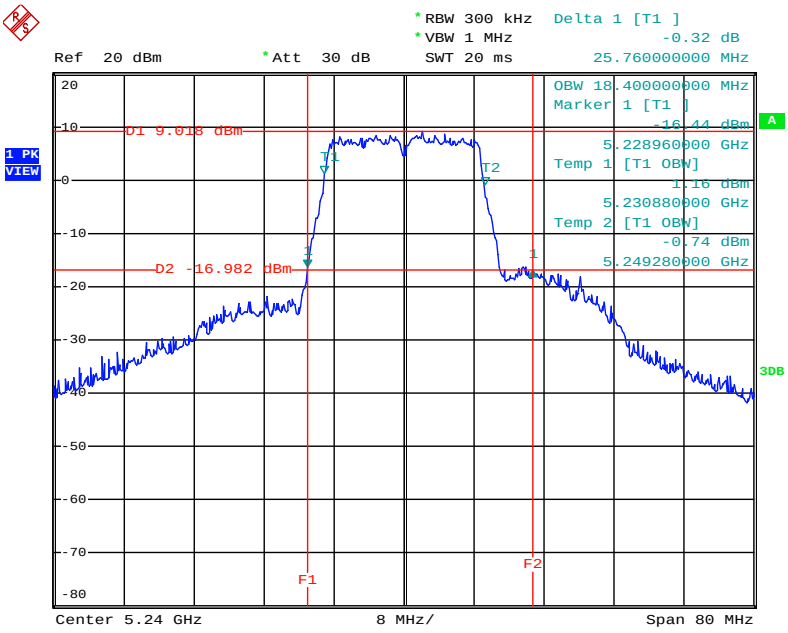
Date: 16.SEP.2014 18:45:47

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 2 / 5200 MHz



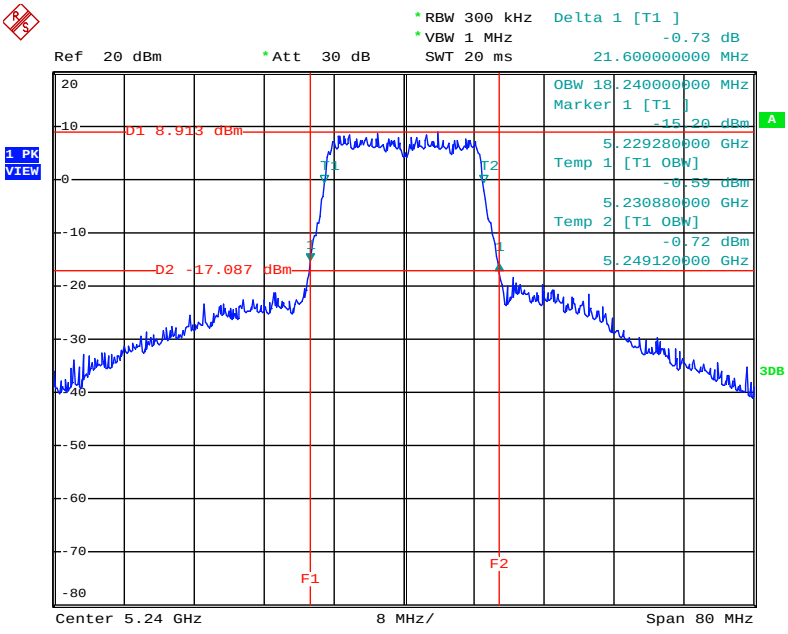
Date: 16.SEP.2014 18:45:11

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5240 MHz



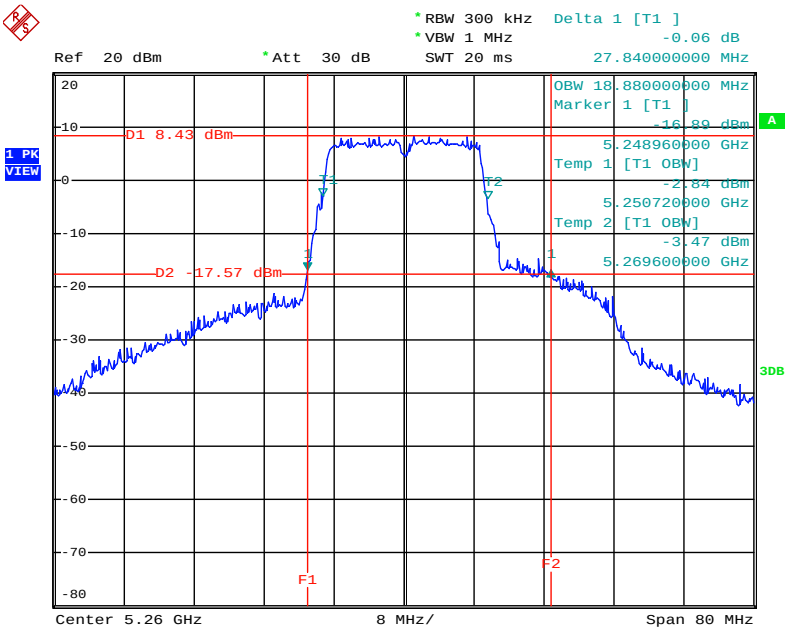
Date: 16.SEP.2014 18:46:19

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 2 / 5240 MHz



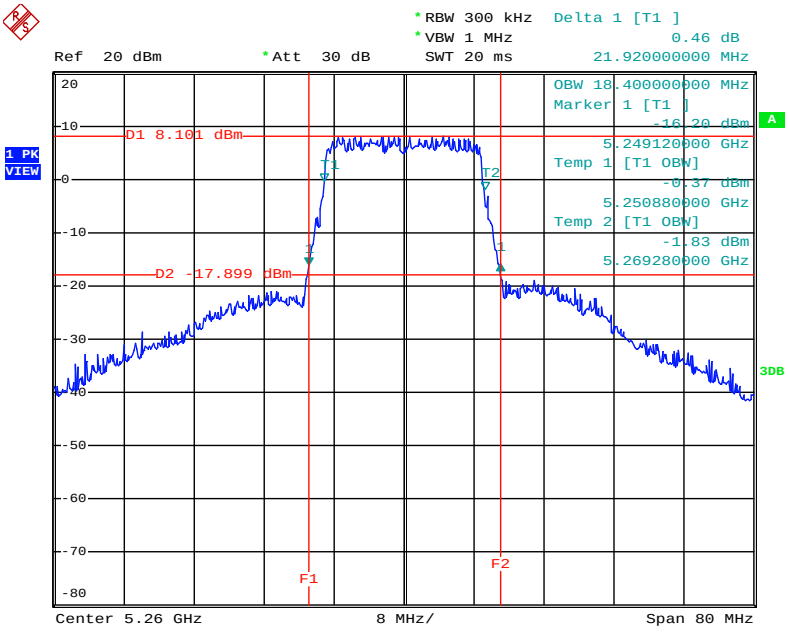
Date: 16.SEP.2014 18:46:51

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5260 MHz



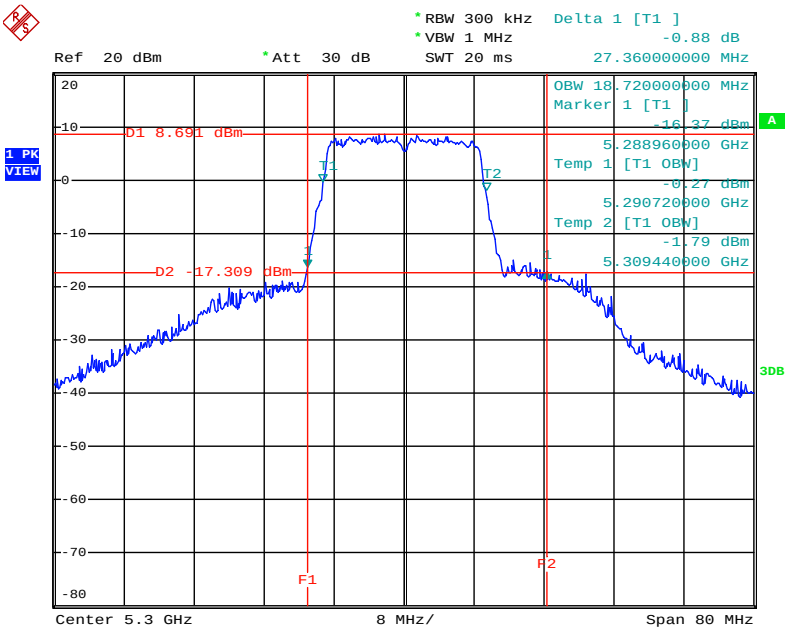
Date: 16.SEP.2014 18:47:57

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 2 / 5260 MHz



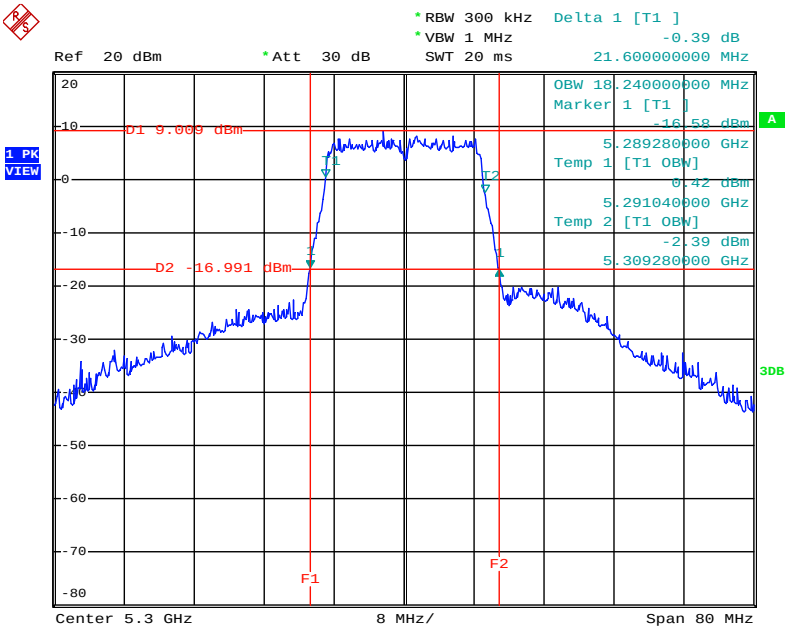
Date: 16.SEP.2014 18:47:25

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5300 MHz



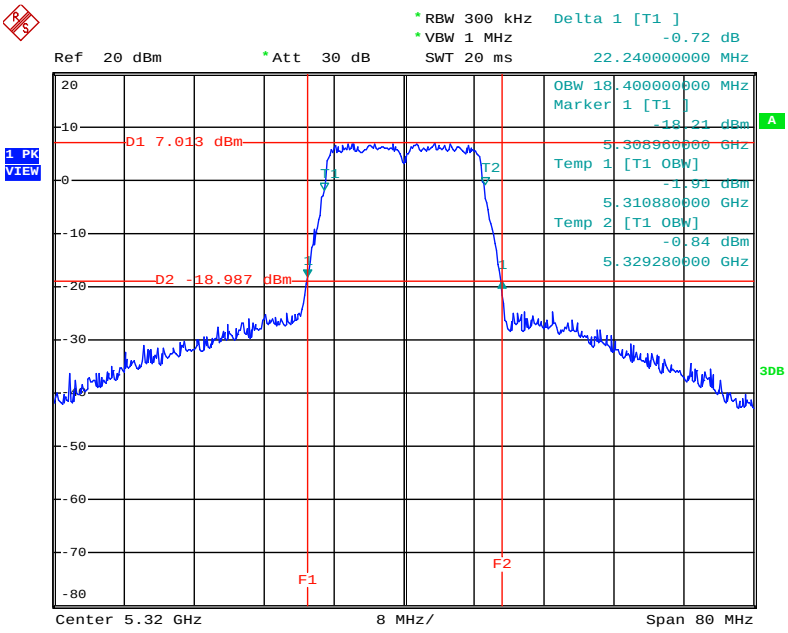
Date: 16.SEP.2014 18:48:29

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 2 / 5300 MHz



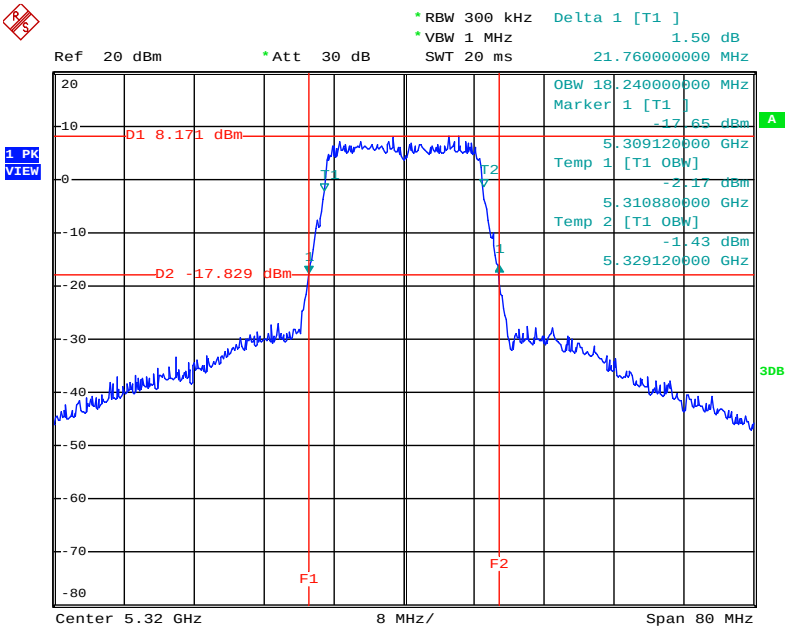
Date: 16.SEP.2014 18:49:02

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5320 MHz



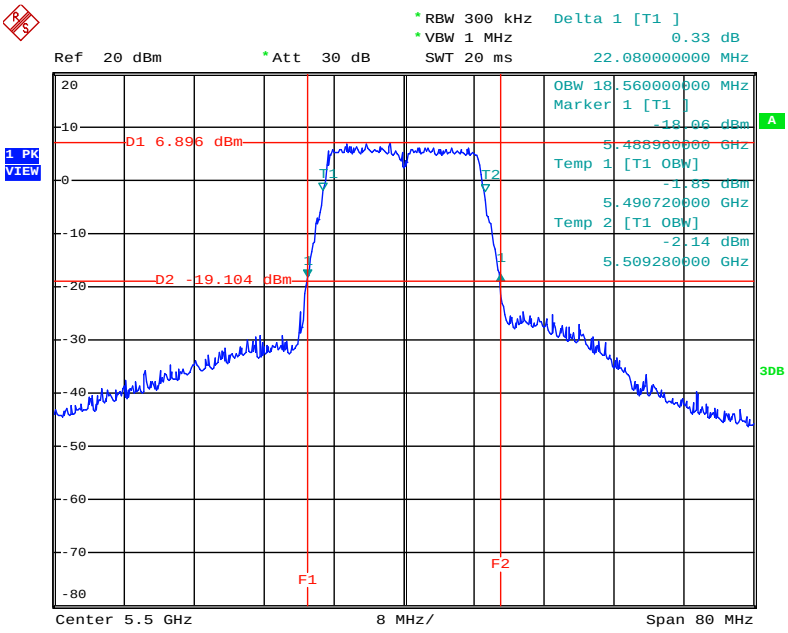
Date: 16.SEP.2014 18:50:11

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 2 / 5320 MHz



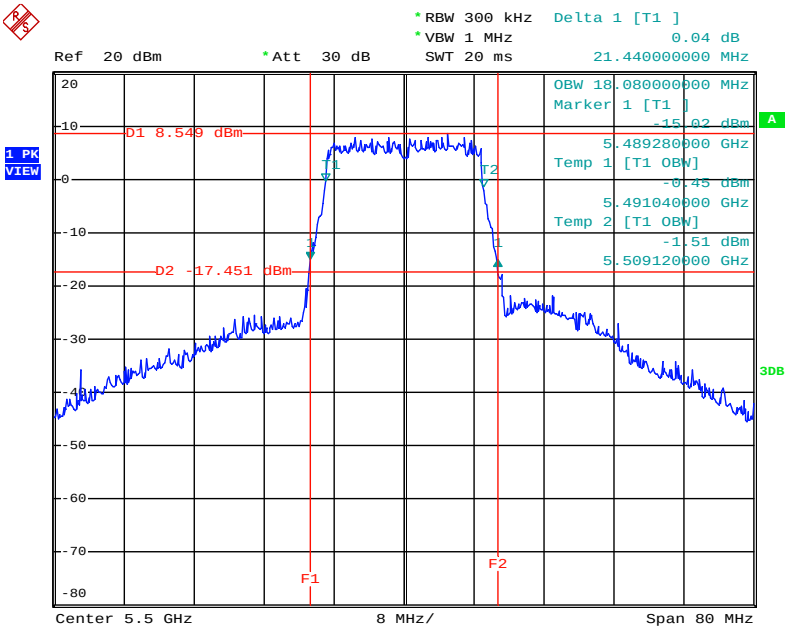
Date: 16.SEP.2014 18:49:38

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5500 MHz



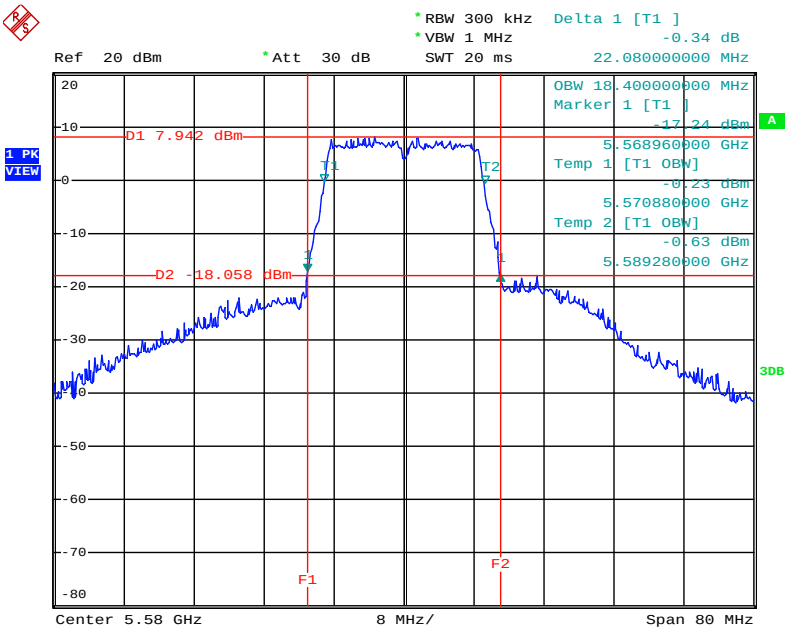
Date: 16.SEP.2014 18:50:54

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 2 / 5500 MHz



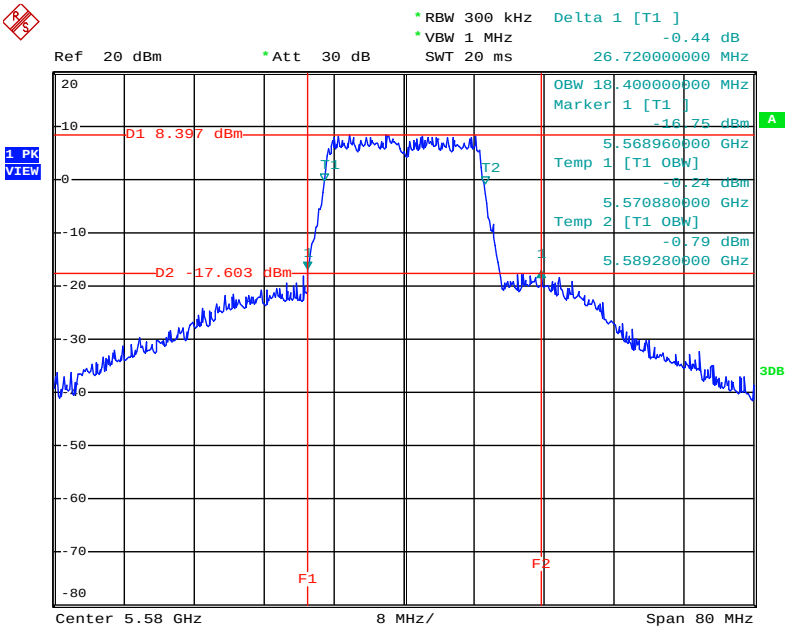
Date: 16.SEP.2014 18:51:27

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5580 MHz



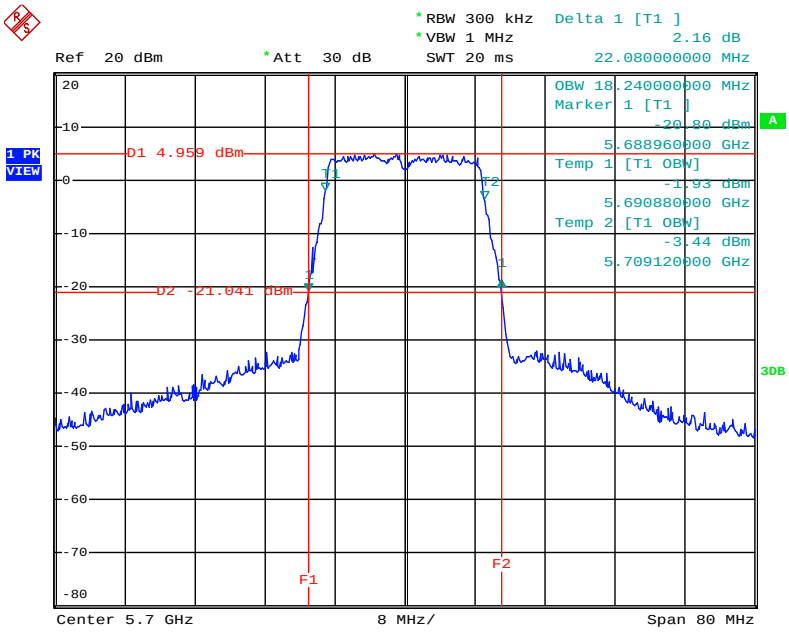
Date: 16.SEP.2014 18:52:39

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 2 / 5580 MHz



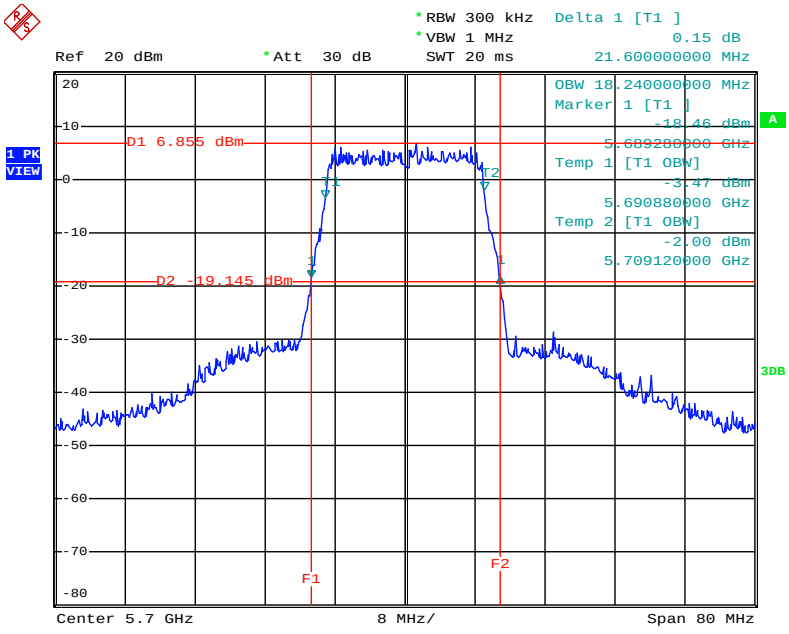
Date: 16.SEP.2014 18:52:03

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5700 MHz



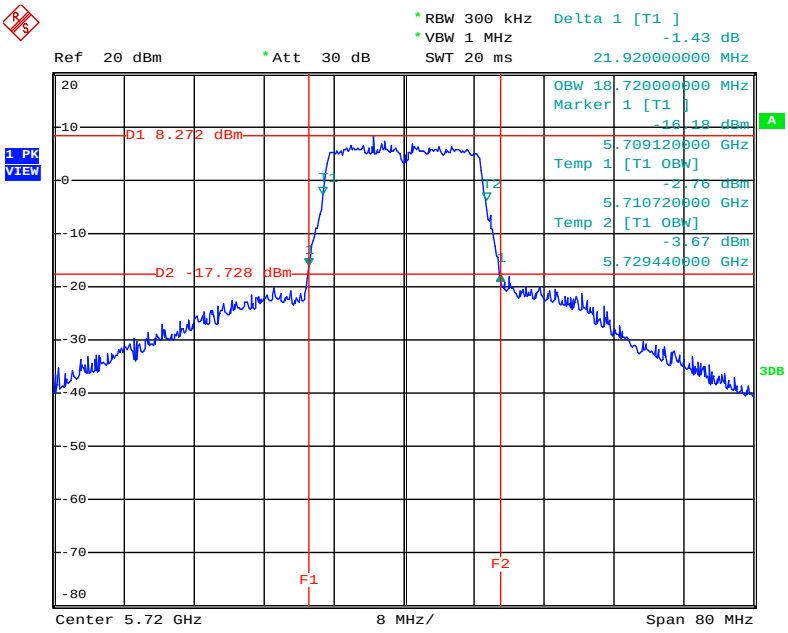
Date: 16.SEP.2014 18:53:16

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 2 / 5700 MHz



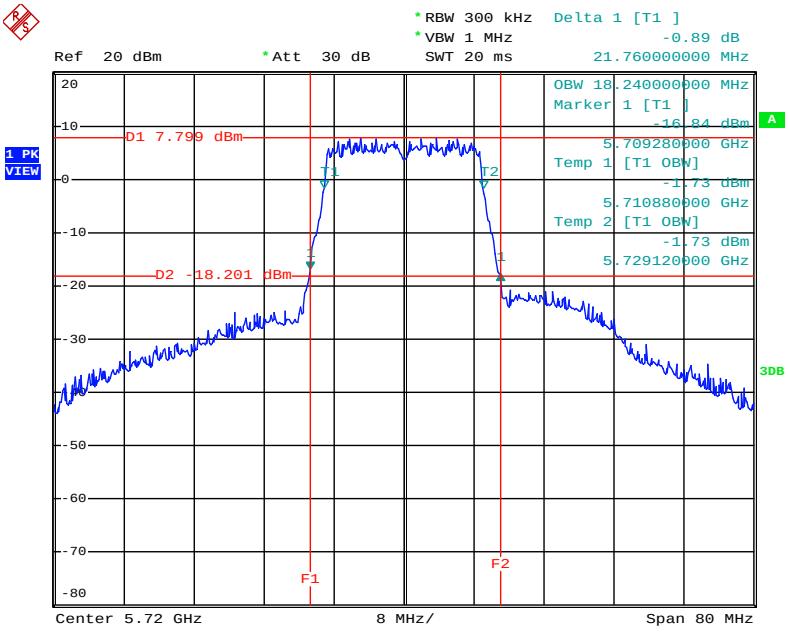
Date: 16.SEP.2014 18:53:49

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5720 MHz



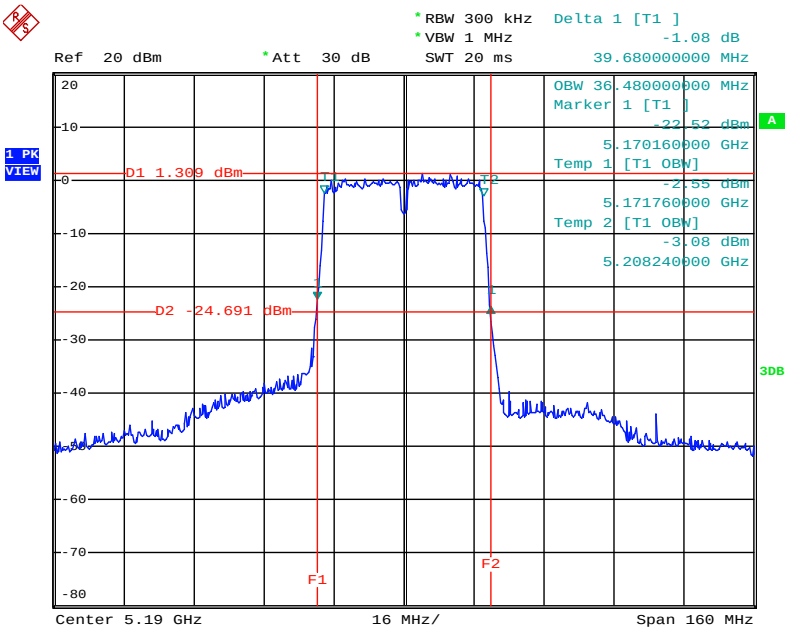
Date: 16.SEP.2014 18:55:11

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 2 / 5720 MHz



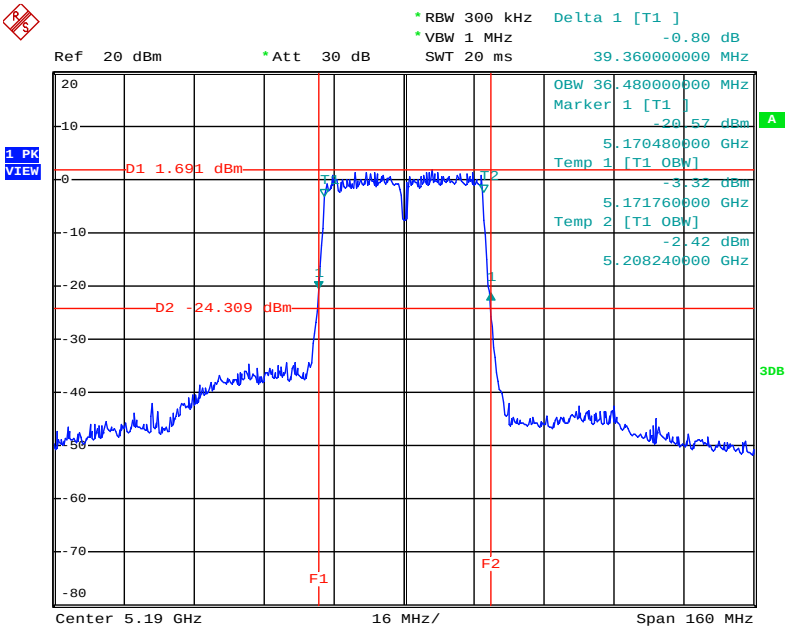
Date: 16.SEP.2014 18:54:38

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5190 MHz



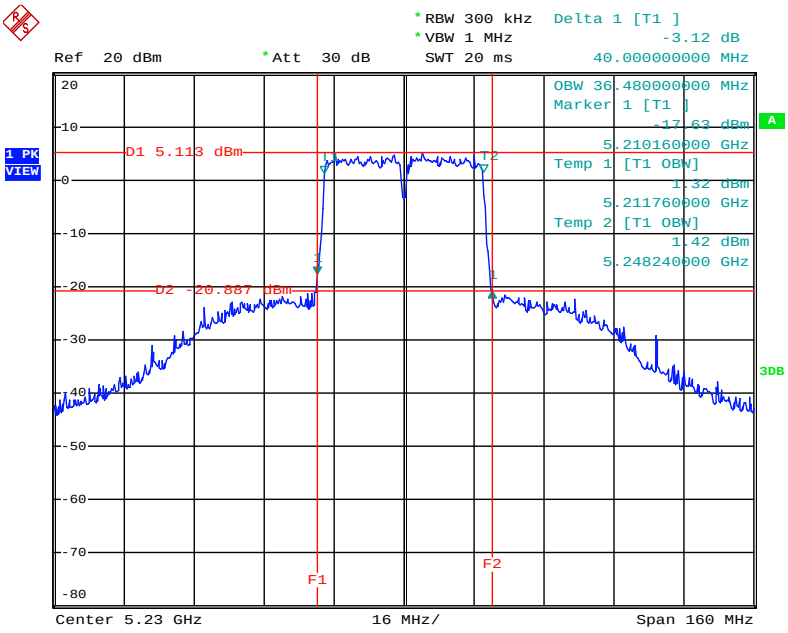
Date: 16.SEP.2014 18:55:59

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 2 / 5190 MHz



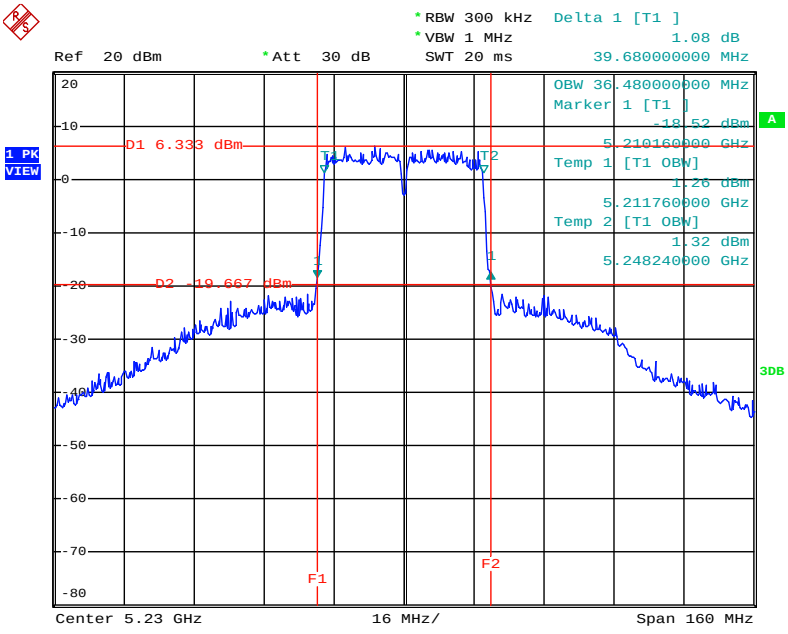
Date: 16.SEP.2014 18:56:57

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5230 MHz



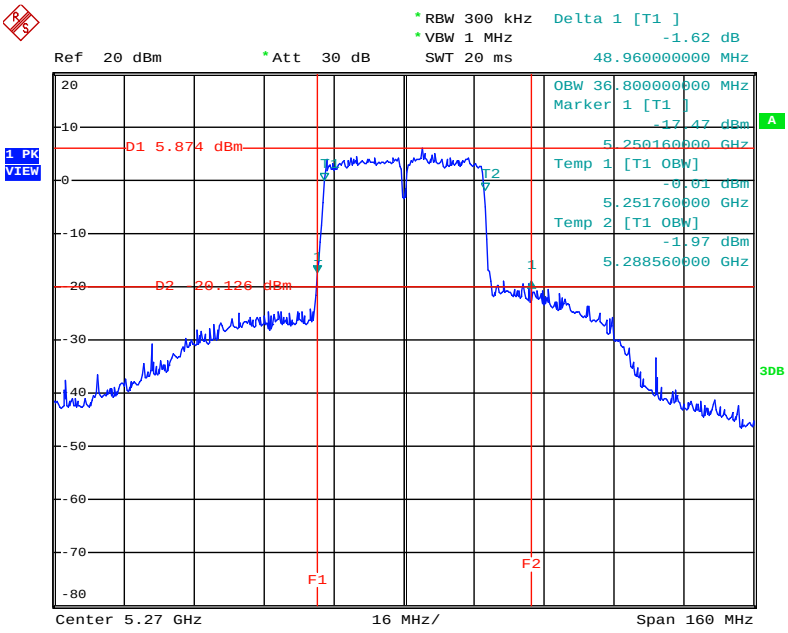
Date: 16.SEP.2014 18:58:16

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 2 / 5230 MHz



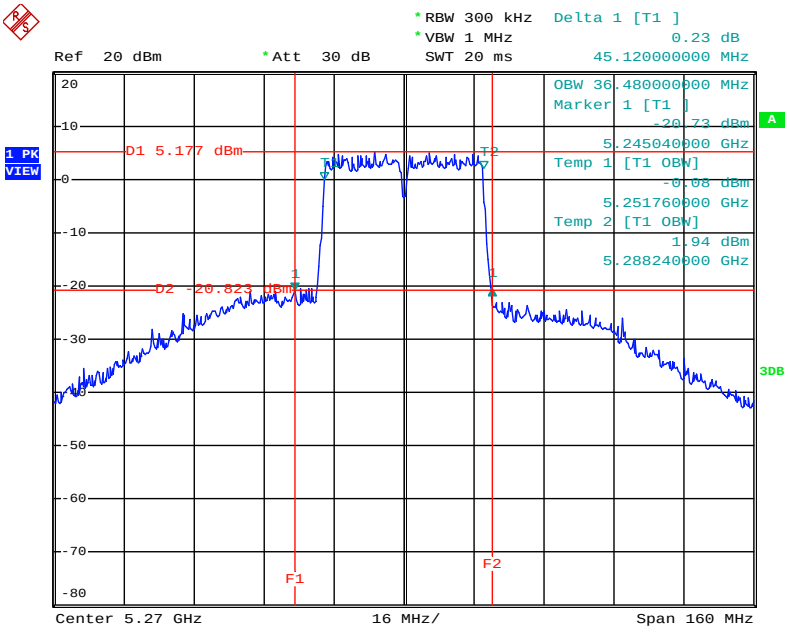
Date: 16.SEP.2014 18:57:40

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5270 MHz



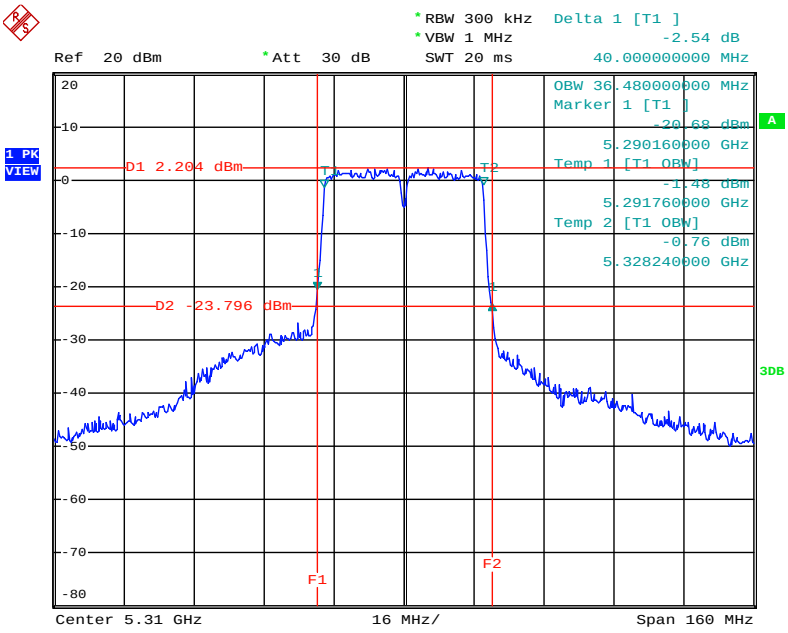
Date: 16.SEP.2014 18:58:46

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 2 / 5270 MHz



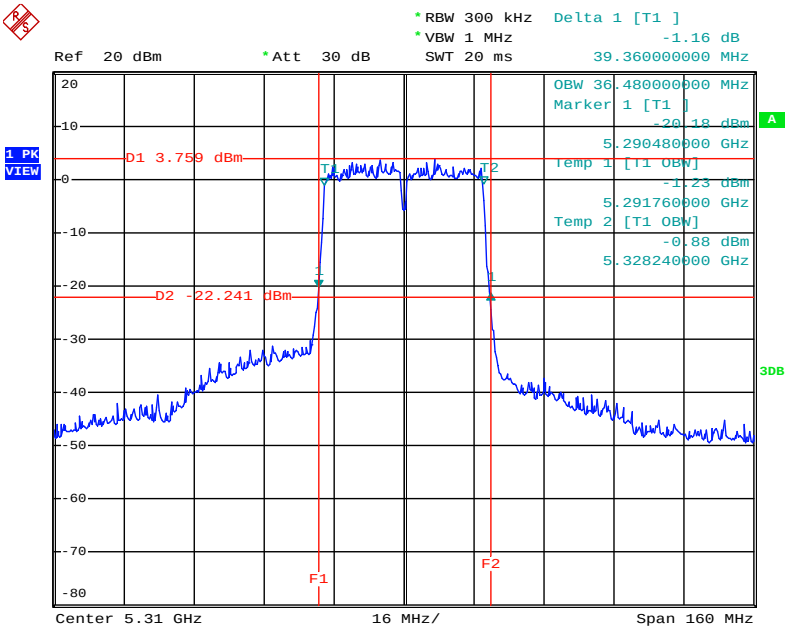
Date: 16.SEP.2014 18:59:38

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5310 MHz



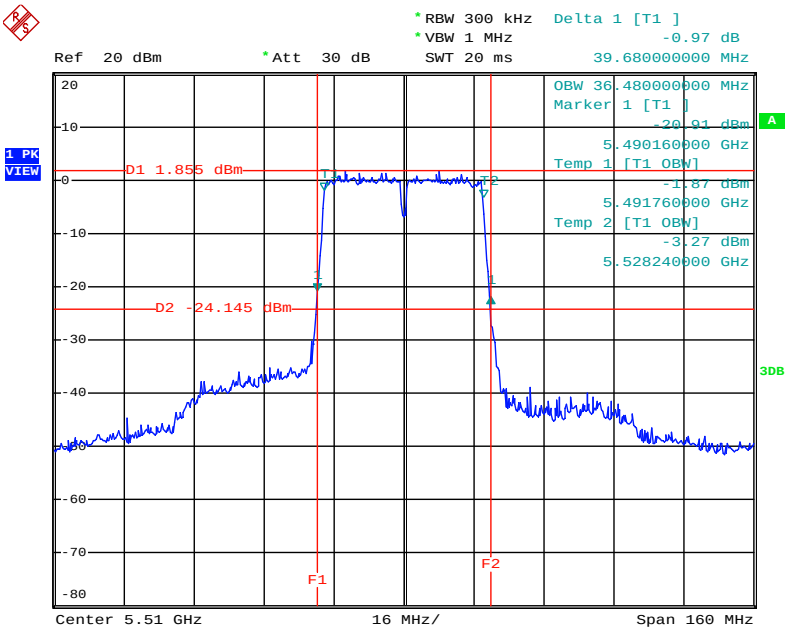
Date: 16.SEP.2014 19:01:14

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 2 / 5310 MHz



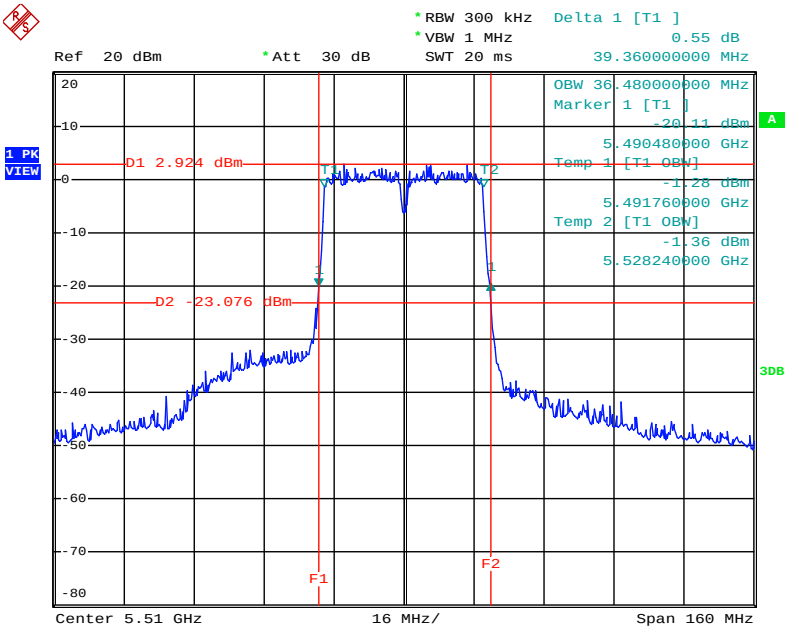
Date: 16.SEP.2014 19:00:19

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5510 MHz



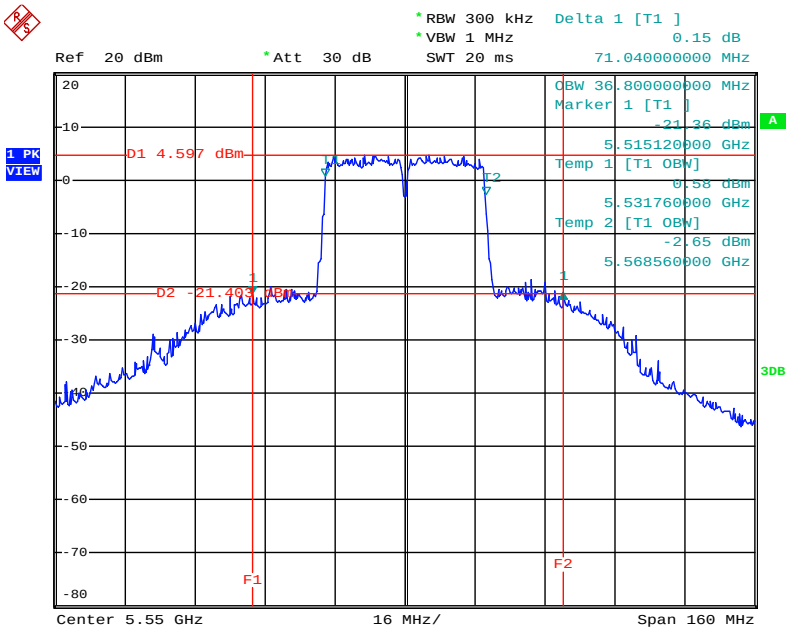
Date: 16.SEP.2014 19:01:53

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 2 / 5510 MHz



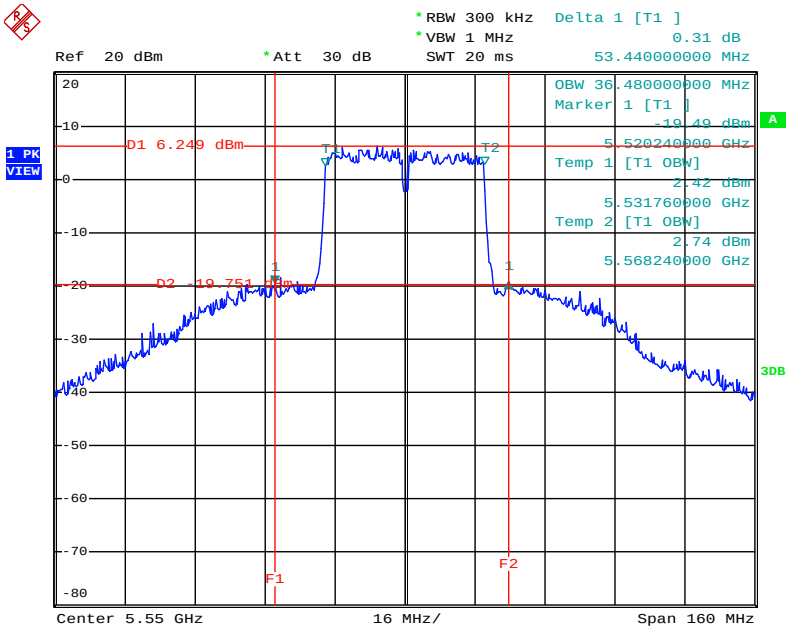
Date: 16.SEP.2014 19:02:26

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5550 MHz



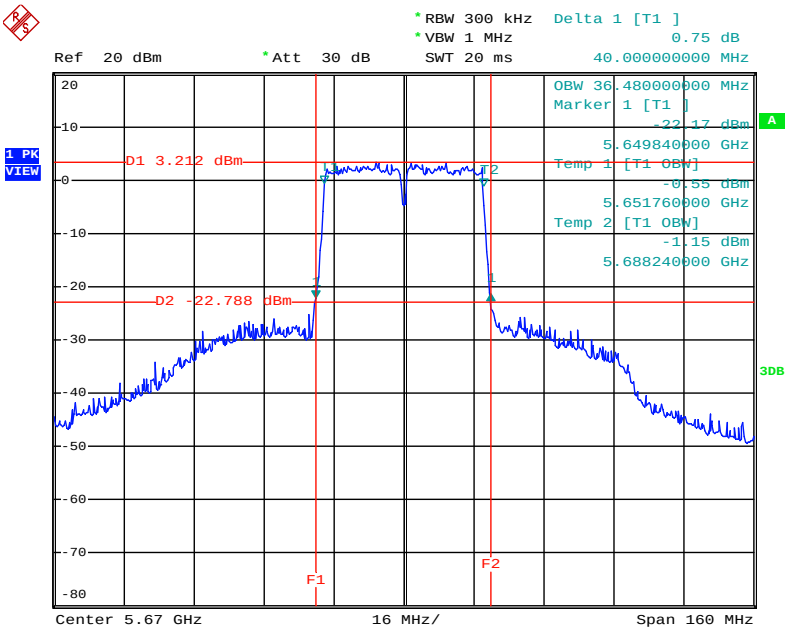
Date: 16.SEP.2014 19:03:45

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 2 / 5550 MHz



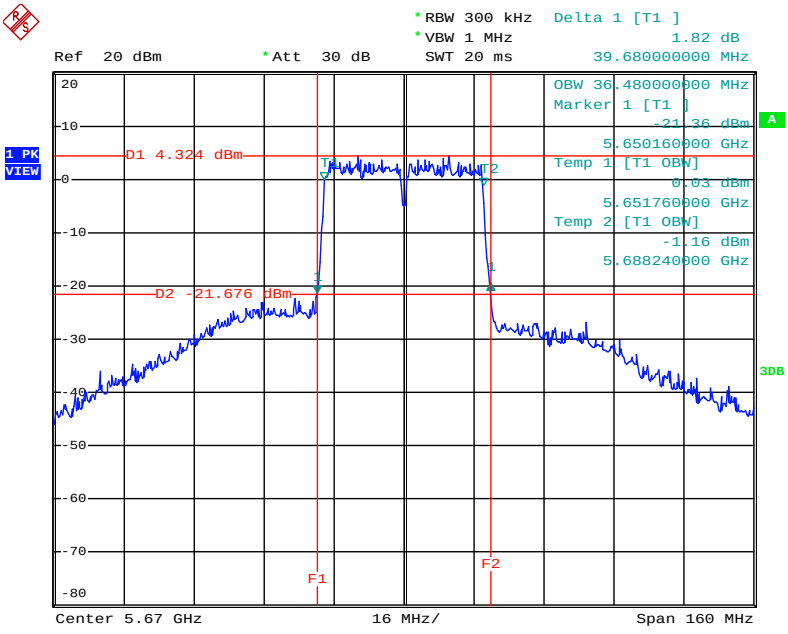
Date: 16.SEP.2014 19:03:12

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5670 MHz



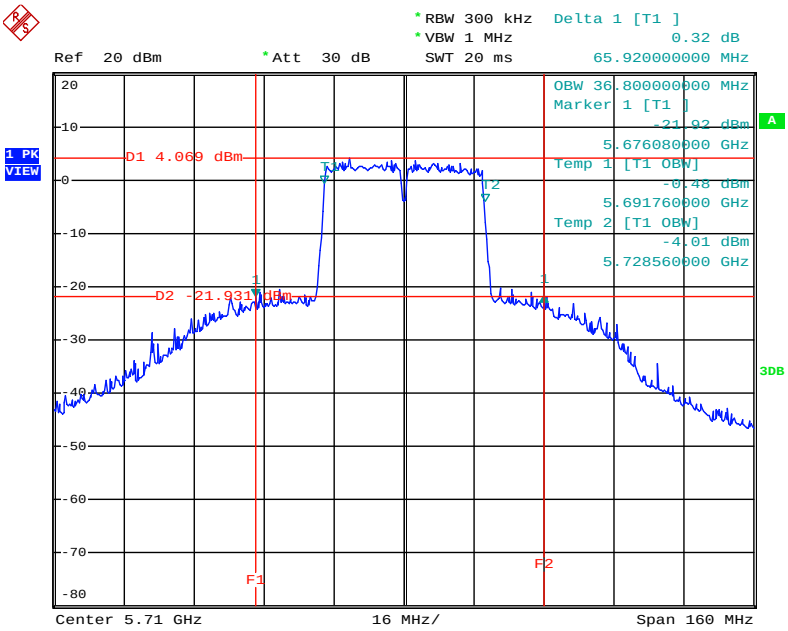
Date: 16.SEP.2014 19:04:21

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 2 / 5670 MHz



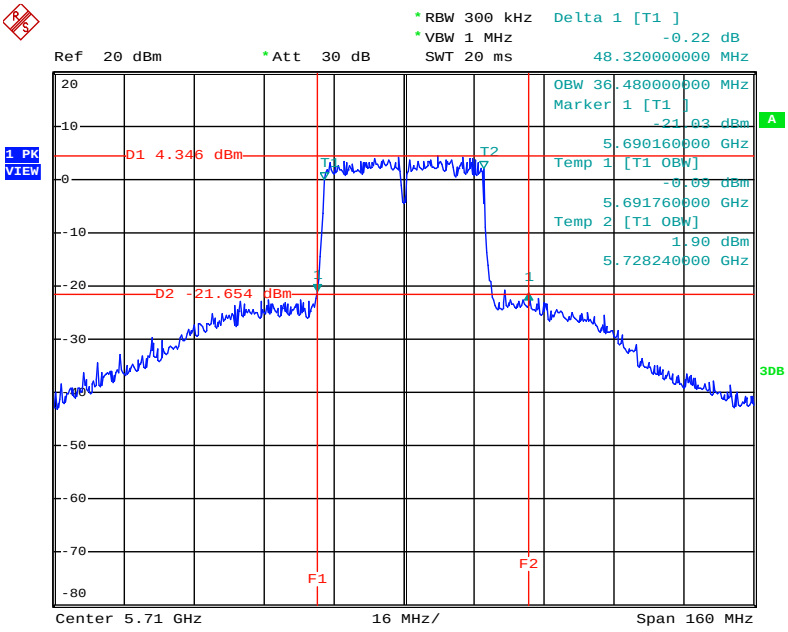
Date: 16.SEP.2014 19:04:53

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5710 MHz



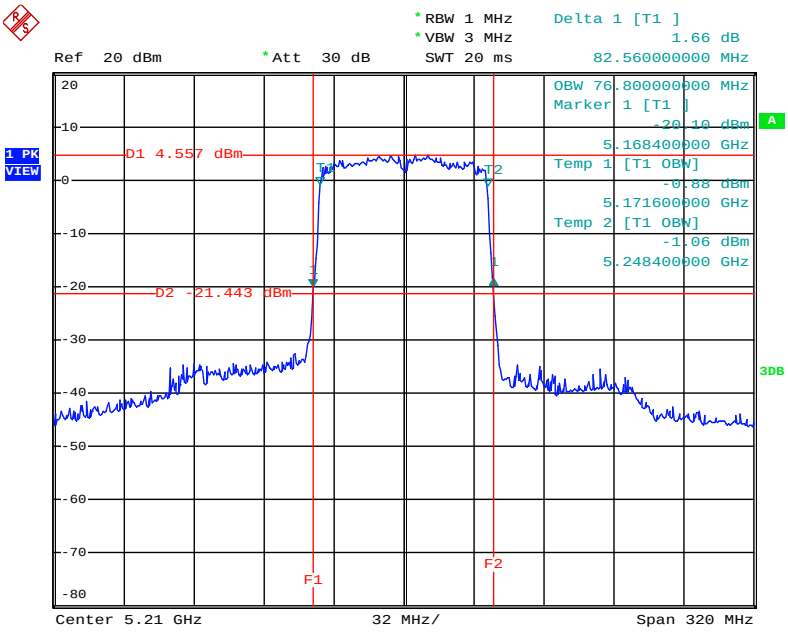
Date: 16.SEP.2014 19:06:17

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 2 / 5710 MHz



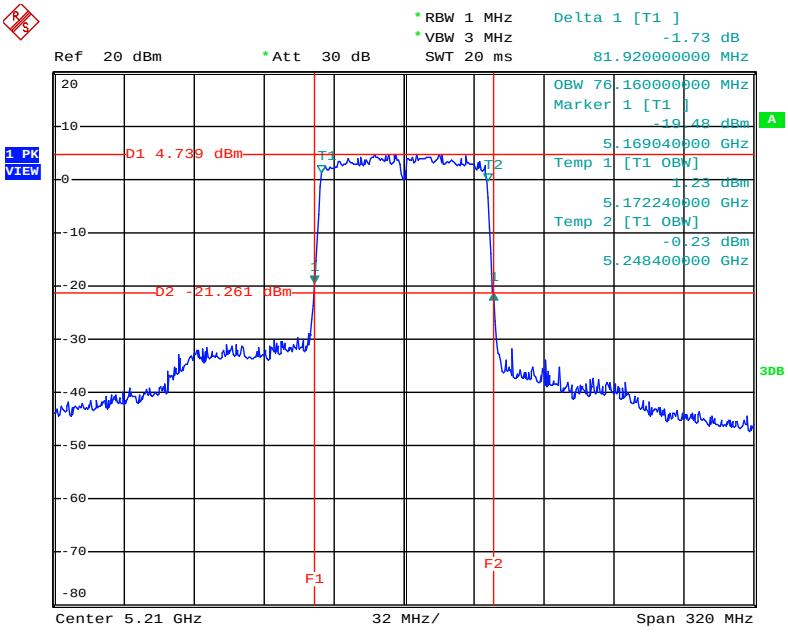
Date: 16.SEP.2014 19:05:32

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 / 5210 MHz



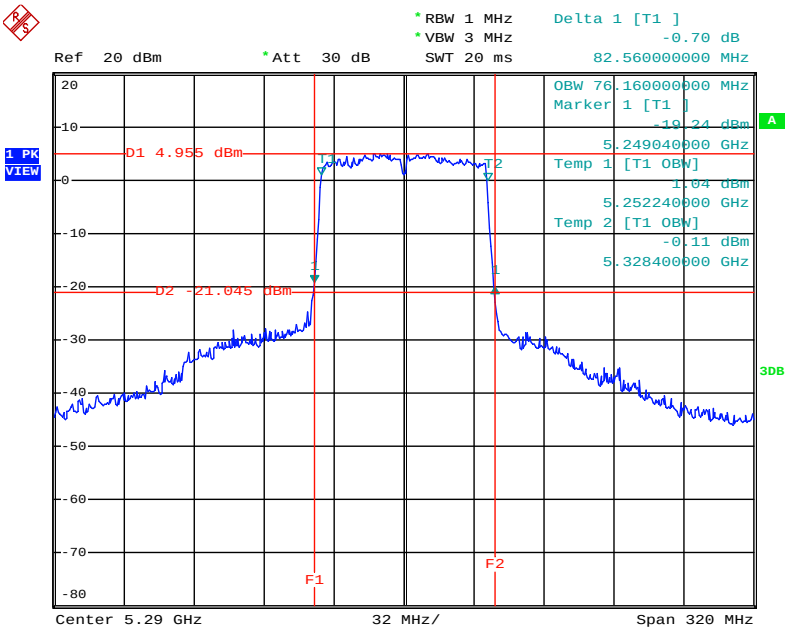
Date: 16.SEP.2014 19:07:06

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 2 / 5210 MHz



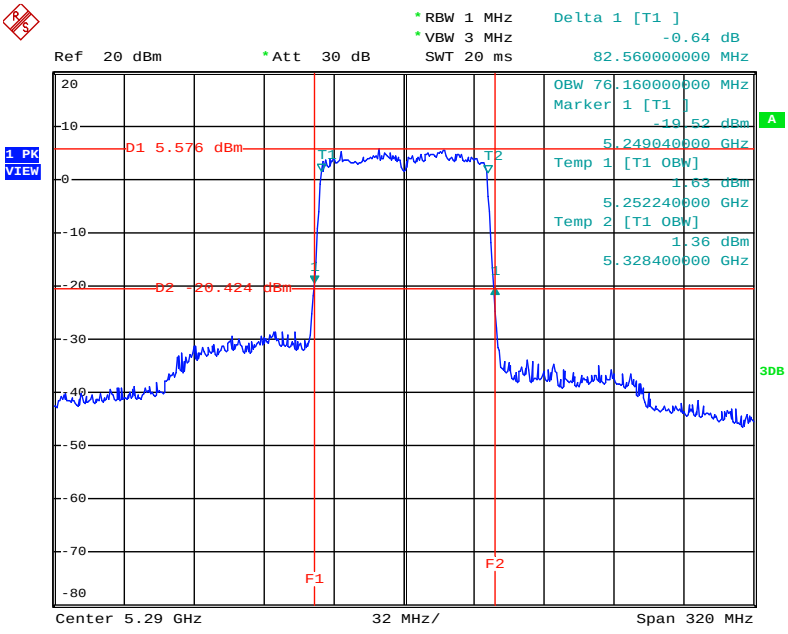
Date: 16.SEP.2014 19:07:41

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 / 5290 MHz



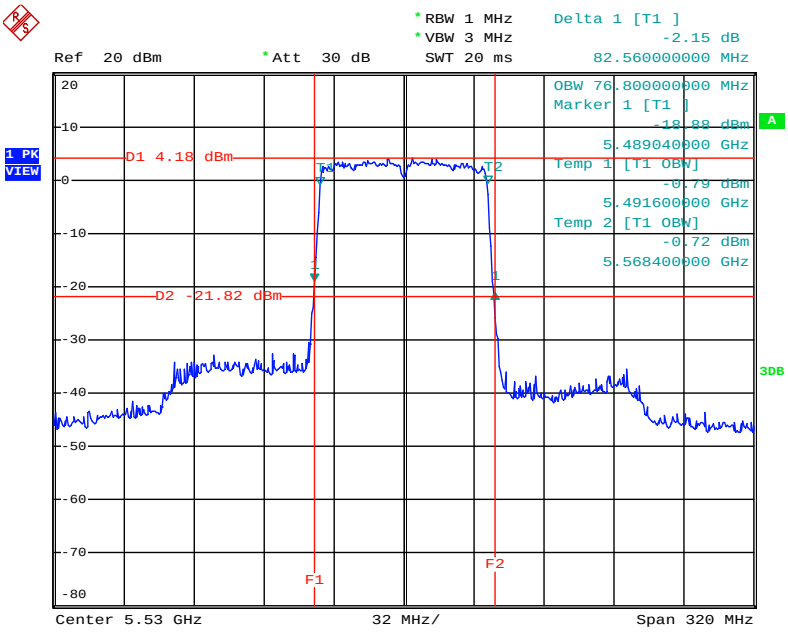
Date: 16.SEP.2014 19:08:58

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 2 / 5290 MHz



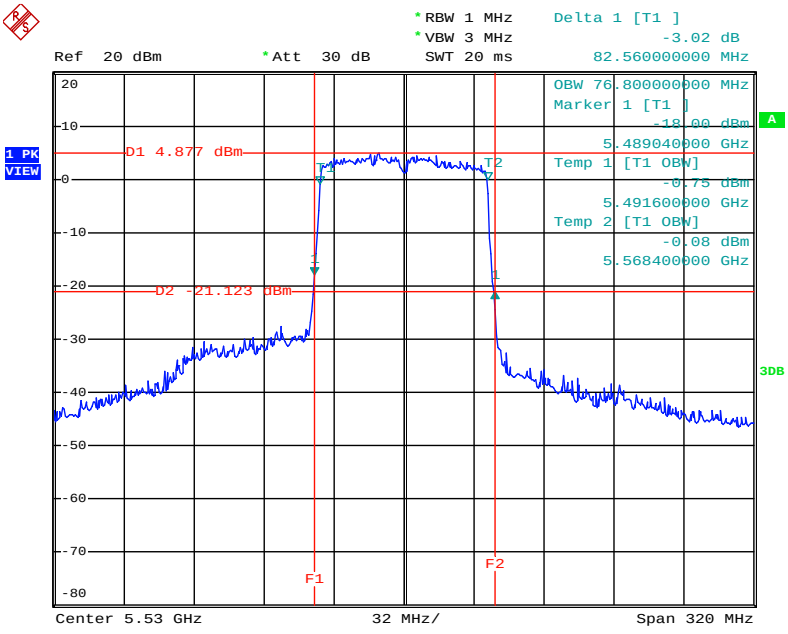
Date: 16.SEP.2014 19:08:22

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 / 5530 MHz



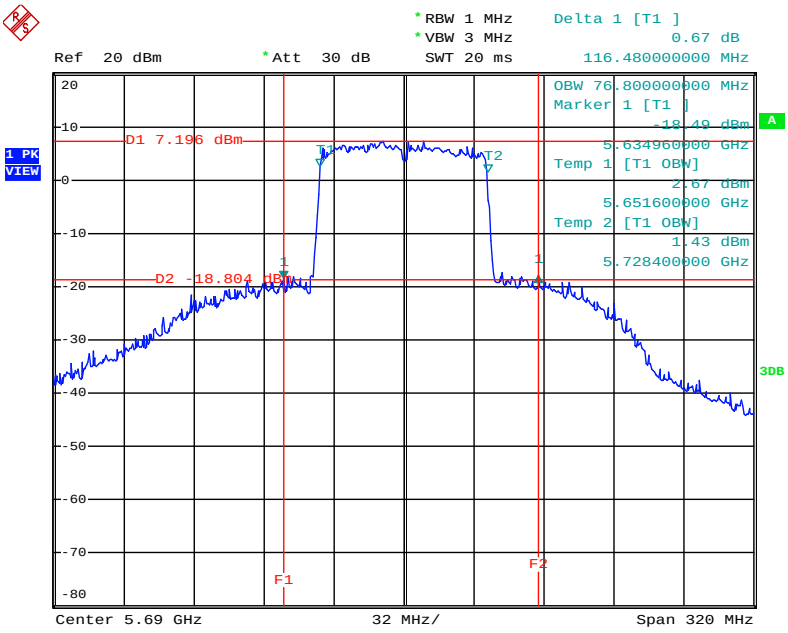
Date: 16.SEP.2014 19:09:43

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 2 / 5530 MHz



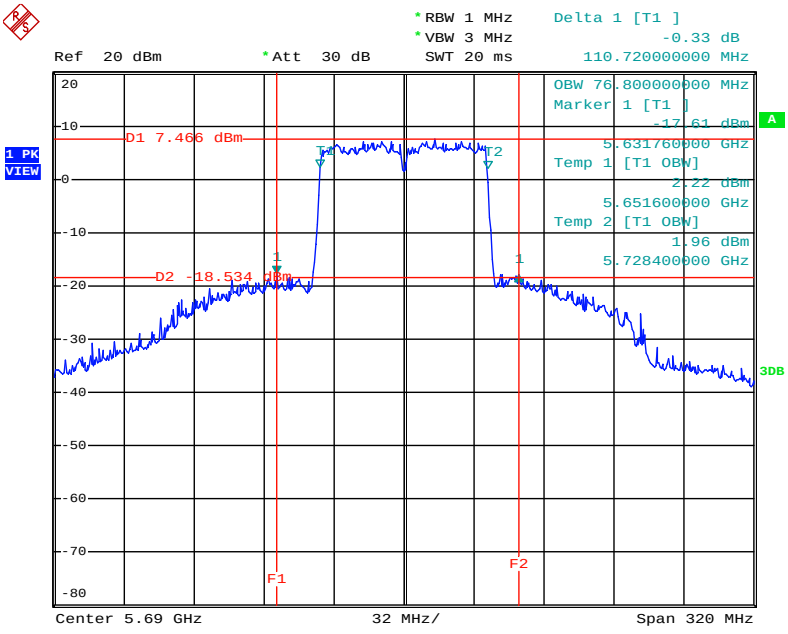
Date: 16.SEP.2014 19:10:11

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 / 5690 MHz



Date: 16.SEP.2014 19:12:08

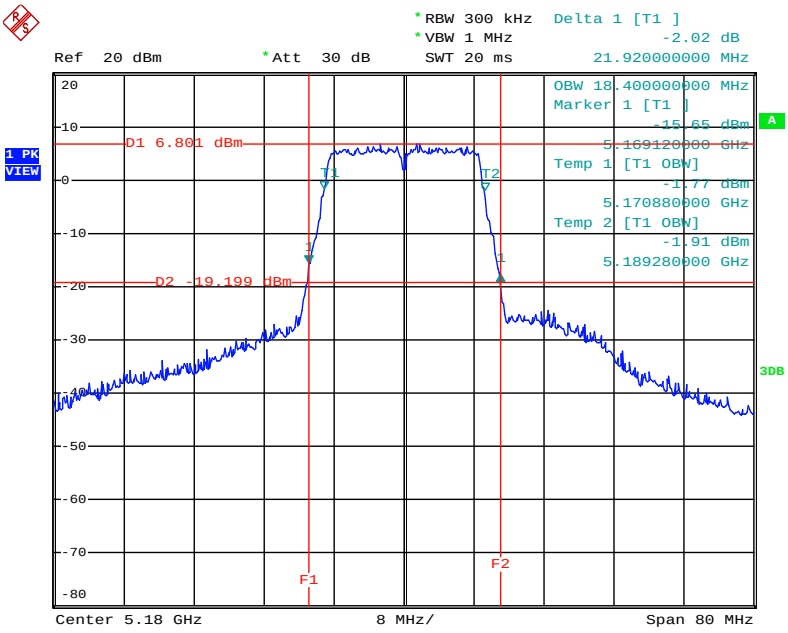
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 2 / 5690 MHz



Date: 16.SEP.2014 19:11:03

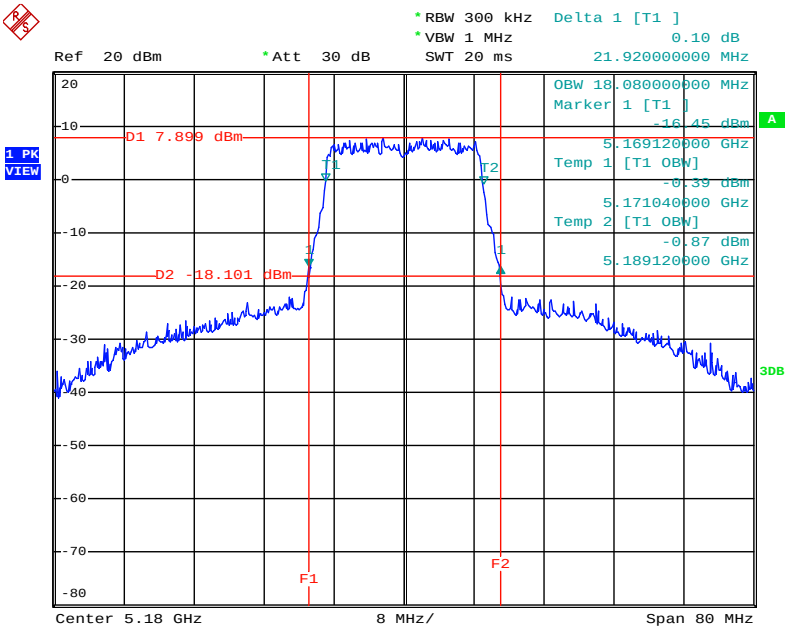
For STBC function:

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 / 5180 MHz



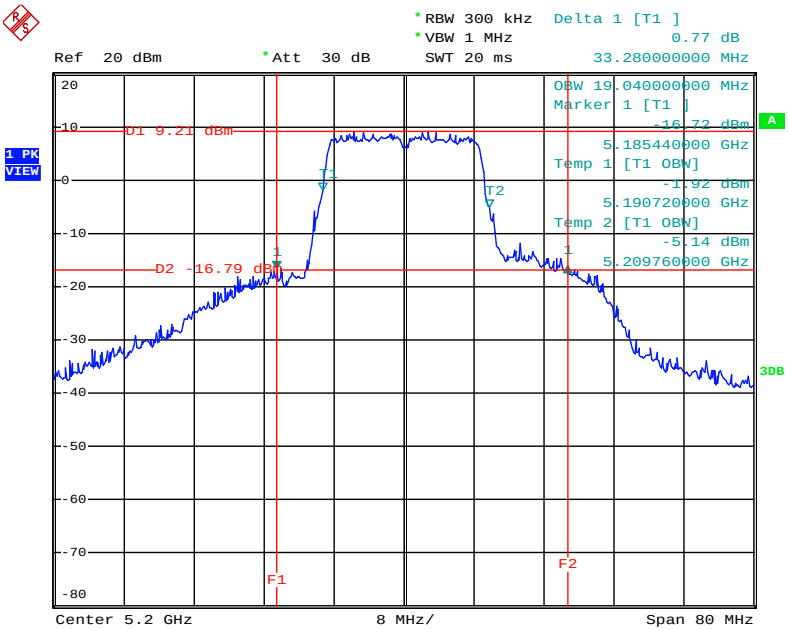
Date: 16.SEP.2014 19:15:00

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 2 / 5180 MHz



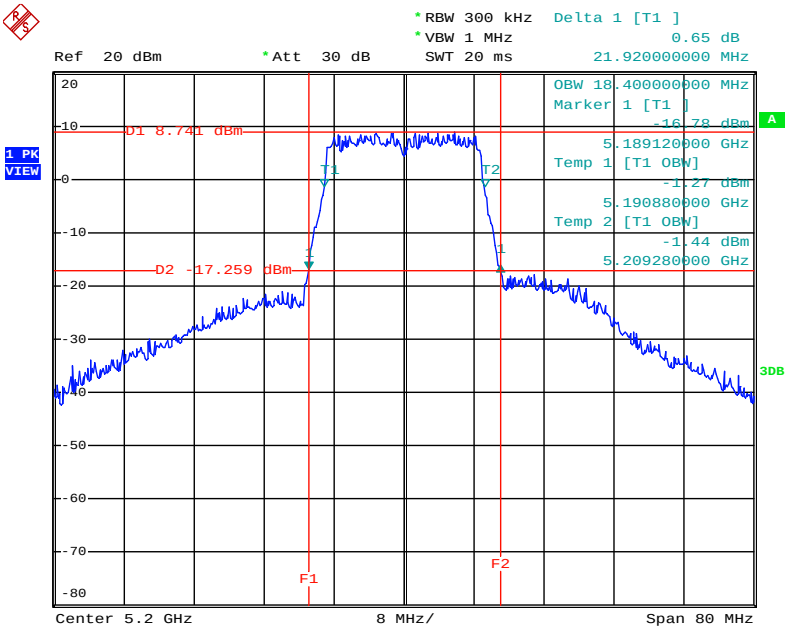
Date: 16.SEP.2014 19:15:35

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 / 5200 MHz



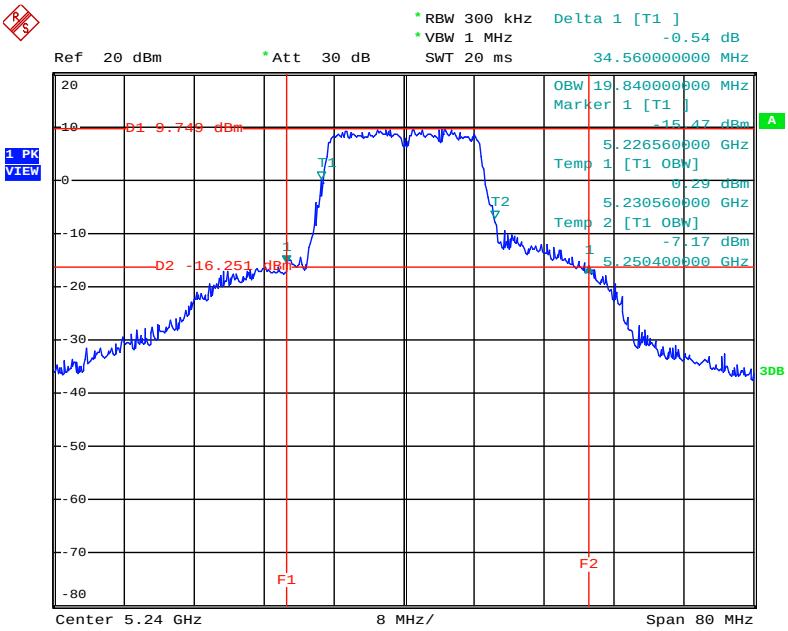
Date: 16.SEP.2014 19:16:38

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 2 / 5200 MHz



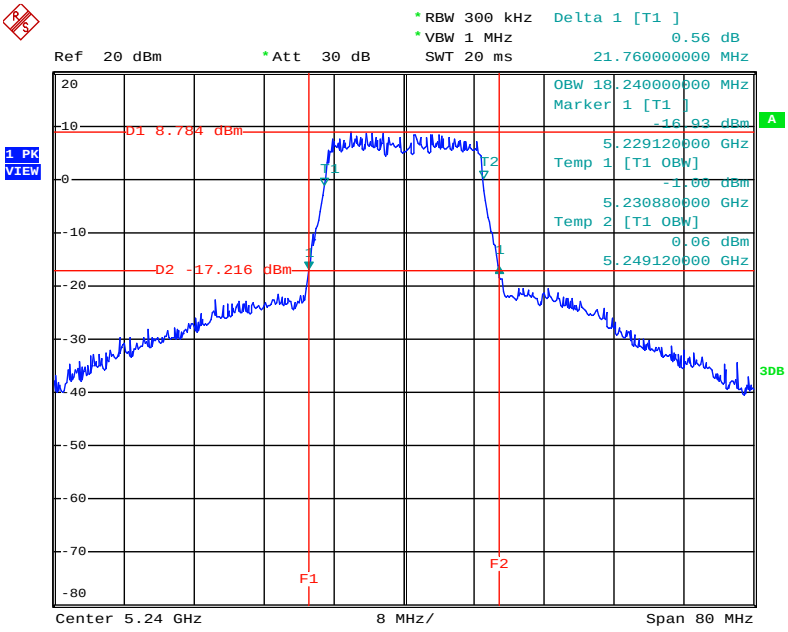
Date: 16.SEP.2014 19:16:06

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 / 5240 MHz



Date: 16.SEP.2014 19:17:11

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 2 / 5240 MHz



Date: 16.SEP.2014 19:17:54

4.3. 6dB Spectrum Bandwidth and 99% Occupied Bandwidth Measurement

4.3.1. Limit

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

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 spectrum analyzer.

Spectrum Parameters	Setting
Attenuation	Auto
Span Frequency	> 6dB Bandwidth
RBW	approximately 1% of the emission bandwidth
VBW	VBW > RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto

4.3.3. Test Procedures

1. The transmitter was conducted to the spectrum analyzer in peak hold mode.
2. Test was performed in accordance with KDB789033 D02 General UNII Test Procedures New Rules v01 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (C) Emission Bandwidth.
3. Multiple antenna system was performed in accordance with KDB662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. Measurement perform conducted of each port.
5. Measured the spectrum width with power higher than 6dB below carrier.

4.3.4. Test Setup Layout

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

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 6dB Spectrum Bandwidth and 99% Occupied Bandwidth

Temperature	20°C	Humidity	52%
Test Engineer	Robert Chang	Configurations	IEEE 802.11ac
Test Function	Non-beamforming function		

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 (Straddle Channel)

Channel	Frequency	6dB Bandwidth (MHz)		Min. Limit (kHz)	Test Result
		Chain 1	Chain 2		
144	5720 MHz	3.86	3.86	500	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT20

Channel	Frequency	6dB Bandwidth (MHz)		99% Occupied Bandwidth (MHz)		Min. Limit (kHz)	Test Result
		Chain 1	Chain 2	Chain 1	Chain 2		
149	5745 MHz	17.52	17.60	17.84	17.84	500	Complies
157	5785 MHz	17.52	17.52	18.16	18.08	500	Complies
165	5825 MHz	17.60	17.60	17.84	17.76	500	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 (Straddle Channel)

Channel	Frequency	6dB Bandwidth (MHz)		Min. Limit (kHz)	Test Result
		Chain 1	Chain 2		
142	5710 MHz	3.29	3.29	500	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT40

Channel	Frequency	6dB Bandwidth (MHz)		99% Occupied Bandwidth (MHz)		Min. Limit (kHz)	Test Result
		Chain 1	Chain 2	Chain 1	Chain 2		
151	5755 MHz	36.32	36.32	36.32	36.16	500	Complies
159	5795 MHz	35.36	36.00	36.32	36.48	500	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 (Straddle Channel)

Channel	Frequency	6dB Bandwidth (MHz)		Min. Limit (kHz)	Test Result
		Chain 1	Chain 2		
138	5690 MHz	3.44	3.44	500	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT80

Channel	Frequency	6dB Bandwidth (MHz)		99% Occupied Bandwidth (MHz)		Min. Limit (kHz)	Test Result
		Chain 1	Chain 2	Chain 1	Chain 2		
155	5775 MHz	73.92	76.48	75.84	76.16	500	Complies

Temperature	20°C	Humidity	52%
Test Engineer	Robert Chang	Configurations	IEEE 802.11a
Test Function	Non-beamforming function		

Configuration IEEE 802.11a (Straddle Channel)

Channel	Frequency	6dB Bandwidth (MHz)		Min. Limit (kHz)	Test Result
		Chain 1	Chain 2		
144	5720 MHz	3.22	3.22	500	Complies

Configuration IEEE 802.11a

Channel	Frequency	6dB Bandwidth (MHz)		99% Occupied Bandwidth (MHz)		Min. Limit (kHz)	Test Result
		Chain 1	Chain 2	Chain 1	Chain 2		
149	5745 MHz	16.40	16.32	16.64	16.64	500	Complies
157	5785 MHz	16.32	16.32	17.36	17.12	500	Complies
165	5825 MHz	16.32	16.32	16.72	16.72	500	Complies

Temperature	20°C	Humidity	52%
Test Engineer	Robert Chang	Configurations	IEEE 802.11ac
Test Function	Beamforming function		

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 (Straddle Channel)

Channel	Frequency	6dB Bandwidth (MHz)		Min. Limit (kHz)	Test Result
		Chain 1	Chain 2		
144	5720 MHz	3.86	3.86	500	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT20

Channel	Frequency	6dB Bandwidth (MHz)		99% Occupied Bandwidth (MHz)		Min. Limit (kHz)	Test Result
		Chain 1	Chain 2	Chain 1	Chain 2		
149	5745 MHz	17.52	17.60	17.84	17.84	500	Complies
157	5785 MHz	17.60	17.60	18.40	18.00	500	Complies
165	5825 MHz	17.52	17.52	17.84	17.76	500	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 (Straddle Channel)

Channel	Frequency	6dB Bandwidth (MHz)		Min. Limit (kHz)	Test Result
		Chain 1	Chain 2		
142	5710 MHz	3.29	3.29	500	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT40

Channel	Frequency	6dB Bandwidth (MHz)		99% Occupied Bandwidth (MHz)		Min. Limit (kHz)	Test Result
		Chain 1	Chain 2	Chain 1	Chain 2		
151	5755 MHz	36.32	36.48	36.32	36.32	500	Complies
159	5795 MHz	36.32	36.32	36.48	36.32	500	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 (Straddle Channel)

Channel	Frequency	6dB Bandwidth (MHz)		Min. Limit (kHz)	Test Result
		Chain 1	Chain 2		
138	5690 MHz	3.44	3.44	500	Complies

Configuration IEEE 802.11ac MCS0/Nss1 VHT80

Channel	Frequency	6dB Bandwidth (MHz)		99% Occupied Bandwidth (MHz)		Min. Limit (kHz)	Test Result
		Chain 1	Chain 2	Chain 1	Chain 2		
155	5775 MHz	75.52	74.56	75.52	75.84	500	Complies

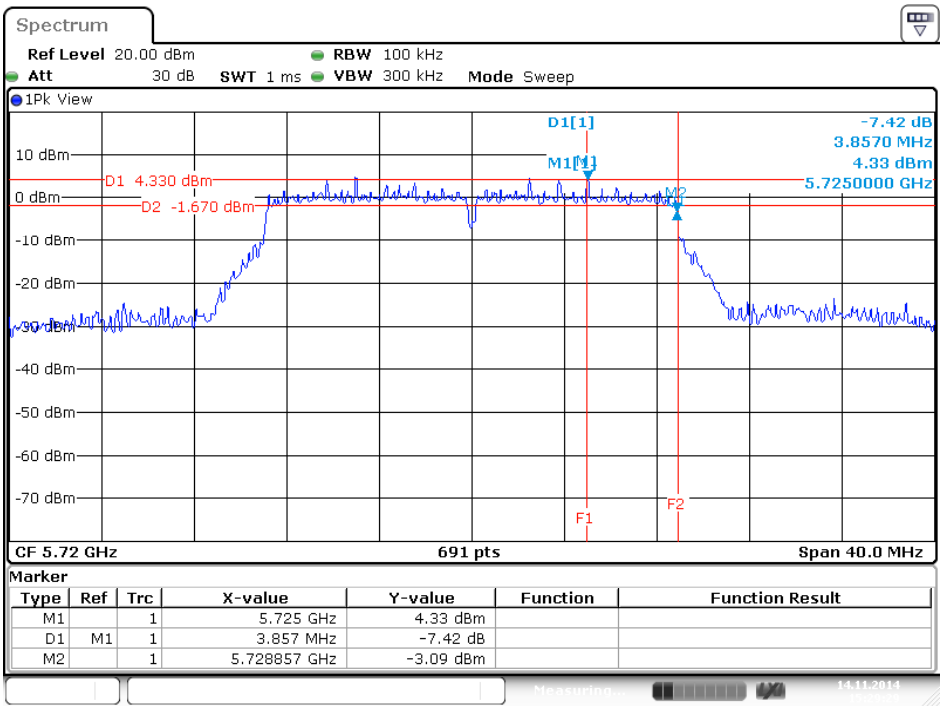
Note: All the test values were listed in the report.

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

For non-beamforming function:

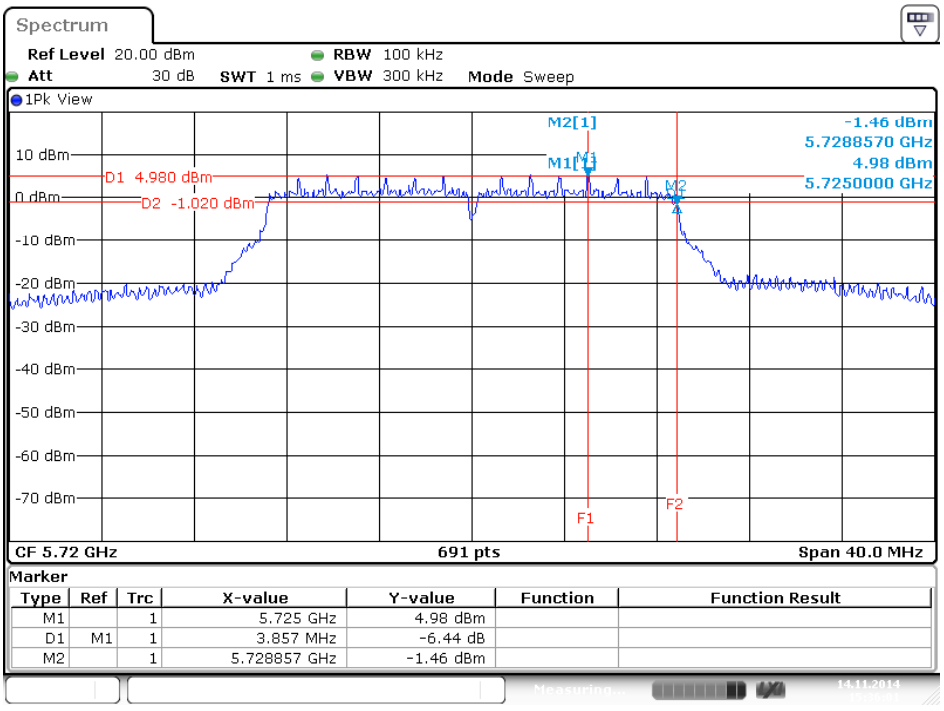
(straddle channel)

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5720 MHz



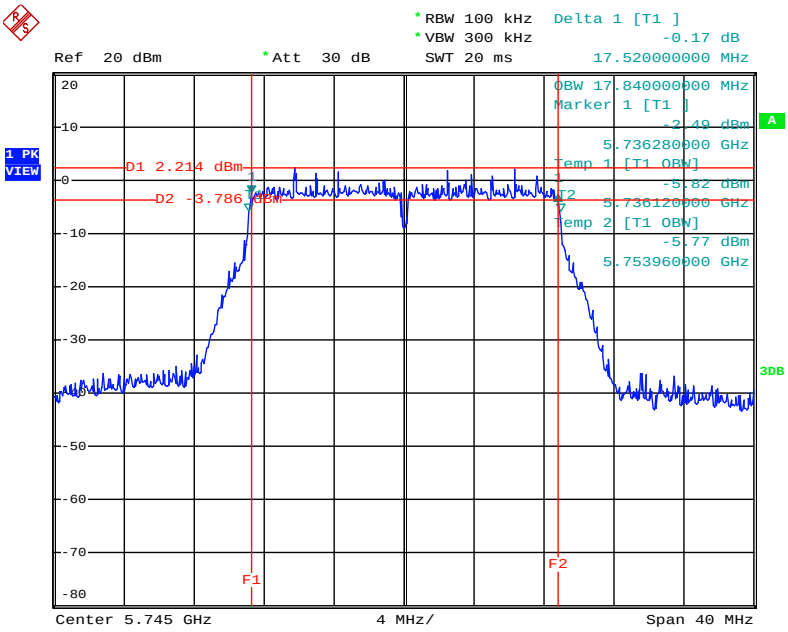
Date: 14.NOV.2014 15:29:28

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 2 / 5720 MHz



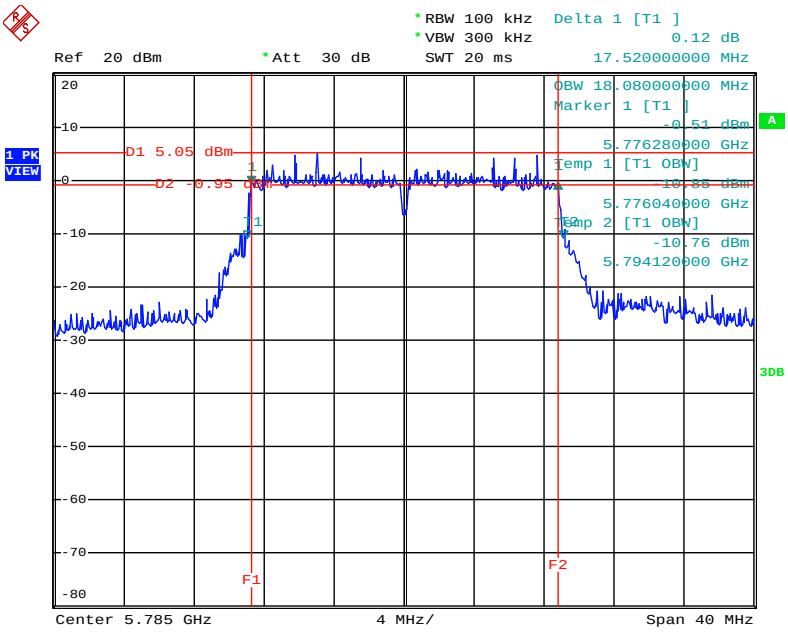
Date: 14.NOV.2014 15:36:01

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5745 MHz



Date: 16.SEP.2014 16:59:07

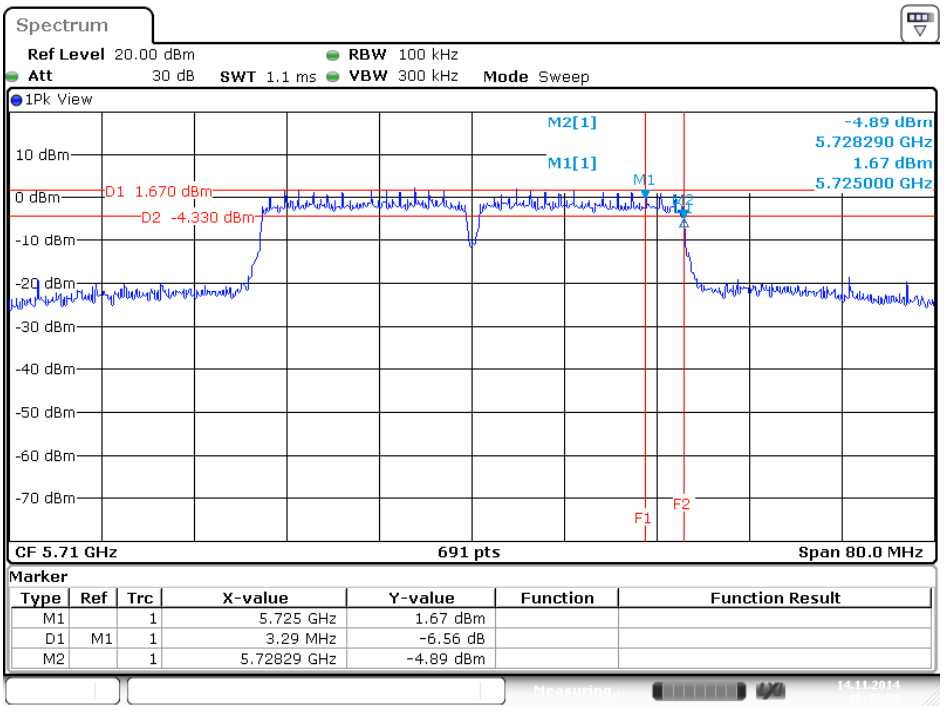
6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 2 / 5785 MHz



Date: 16.SEP.2014 16:57:38

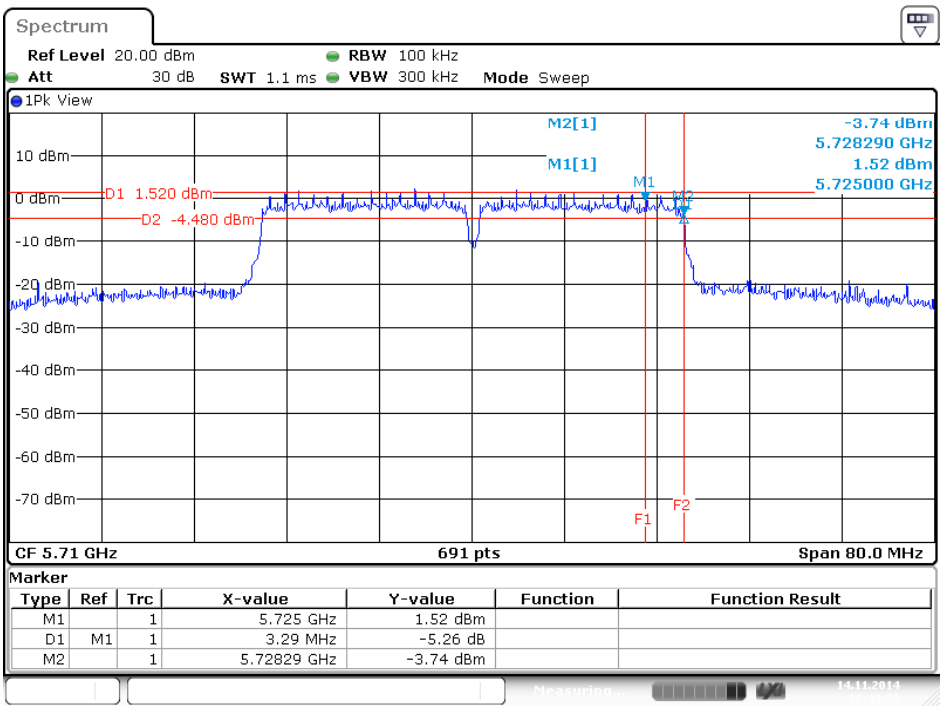
(straddle channel)

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5710 MHz



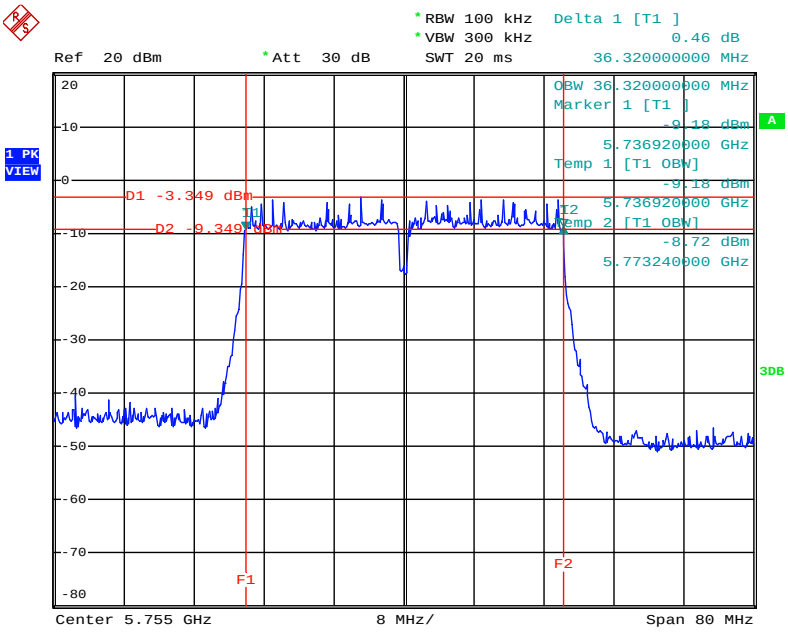
Date: 14.NOV.2014 16:47:50

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 2 / 5710 MHz



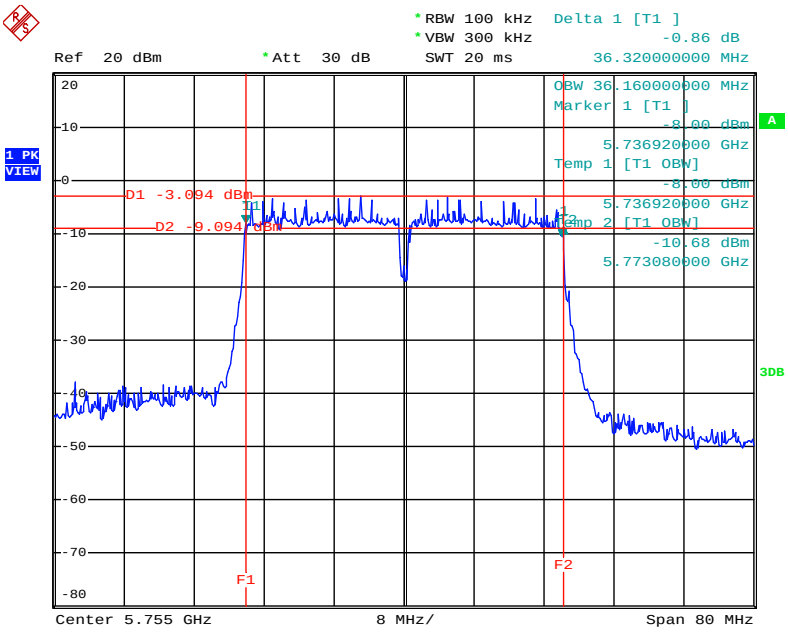
Date: 14.NOV.2014 16:43:22

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5755 MHz



Date: 16.SEP.2014 16:59:58

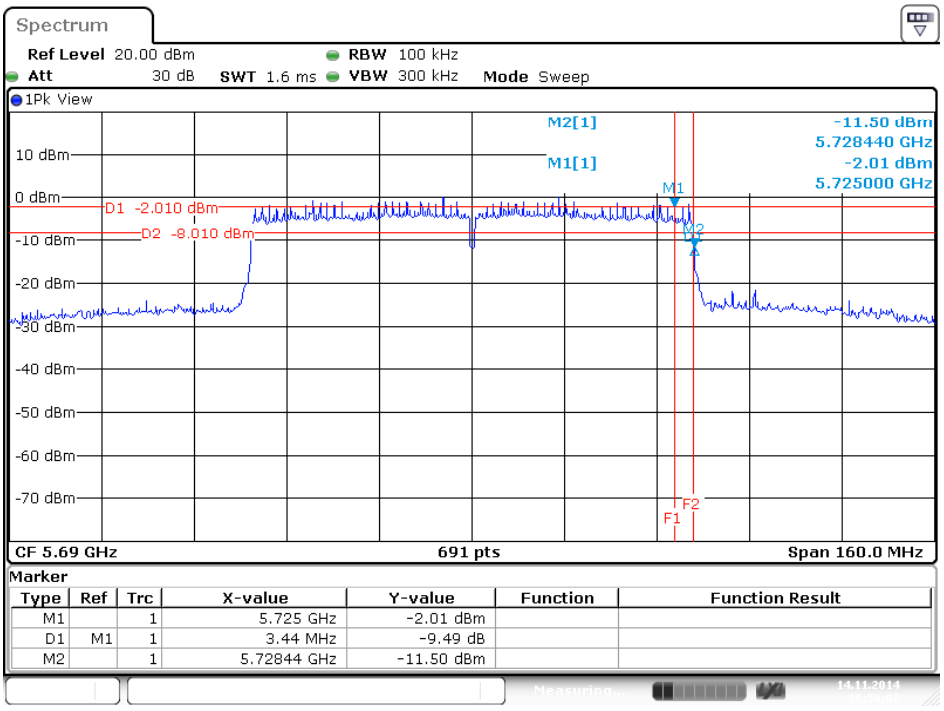
6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 2 / 5755 MHz



Date: 16.SEP.2014 17:00:39

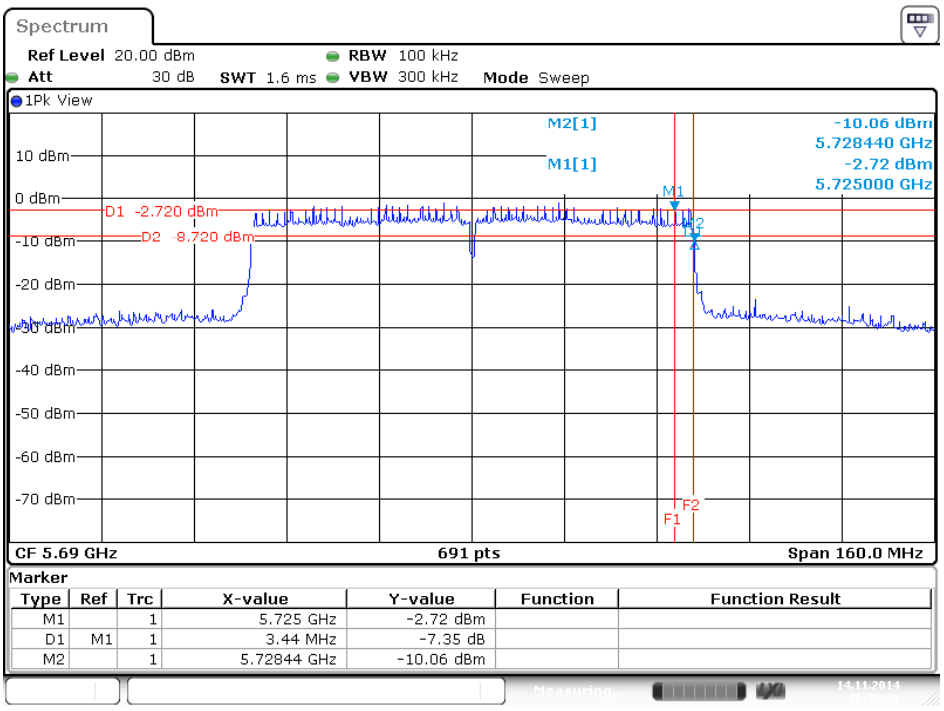
(straddle channel)

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 / 5690MHz



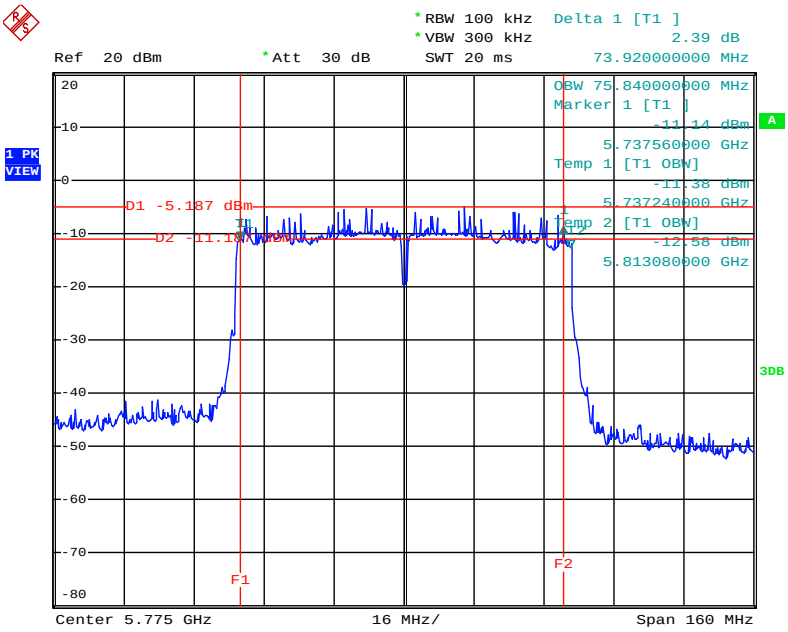
Date: 14.NOV.2014 16:56:02

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 2 / 5690 MHz



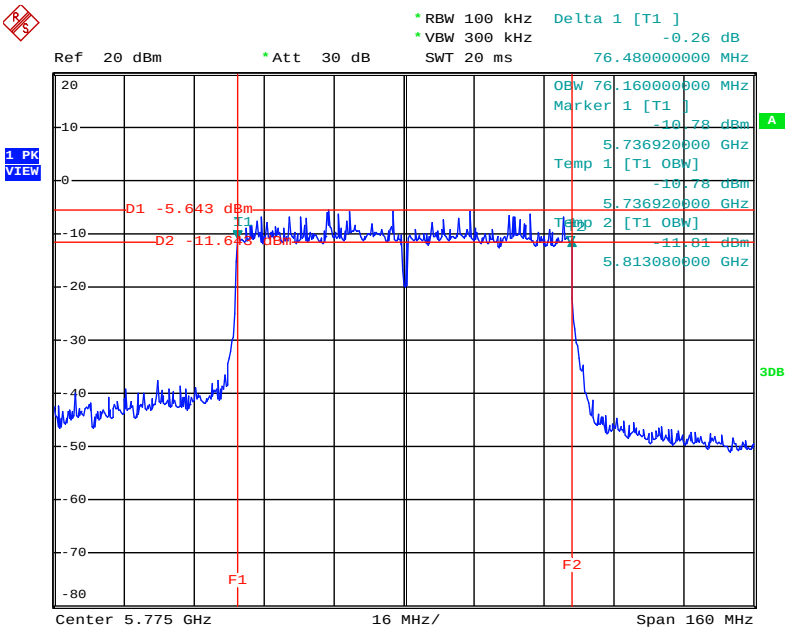
Date: 14.NOV.2014 16:59:31

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 / 5775 MHz



Date: 16.SEP.2014 17:02:49

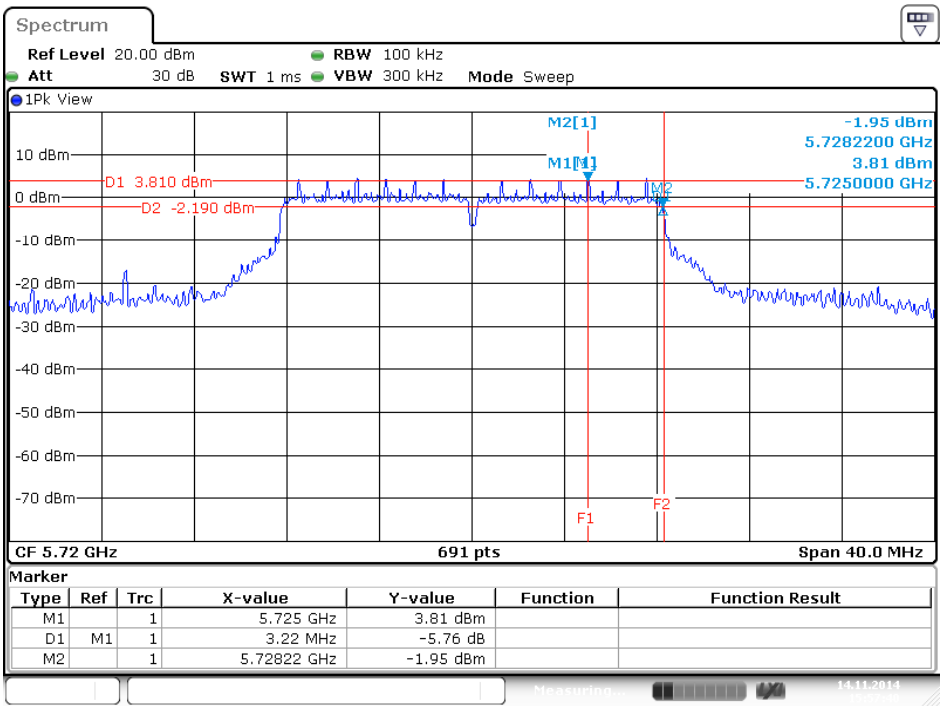
6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 2 / 5775 MHz



Date: 16.SEP.2014 17:03:25

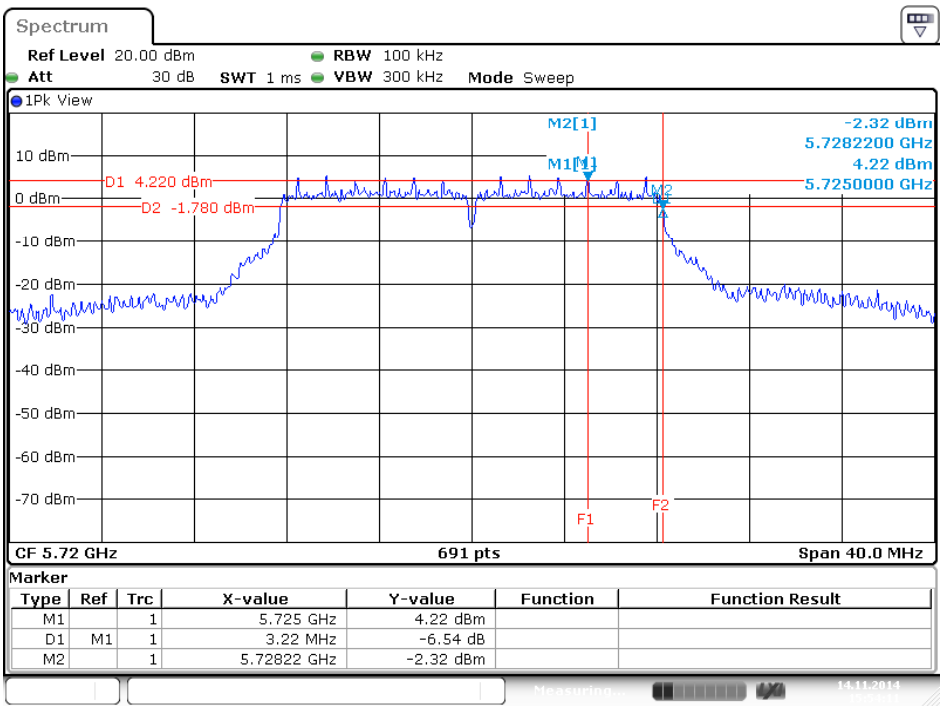
(straddle channel)

6 dB Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5720 MHz



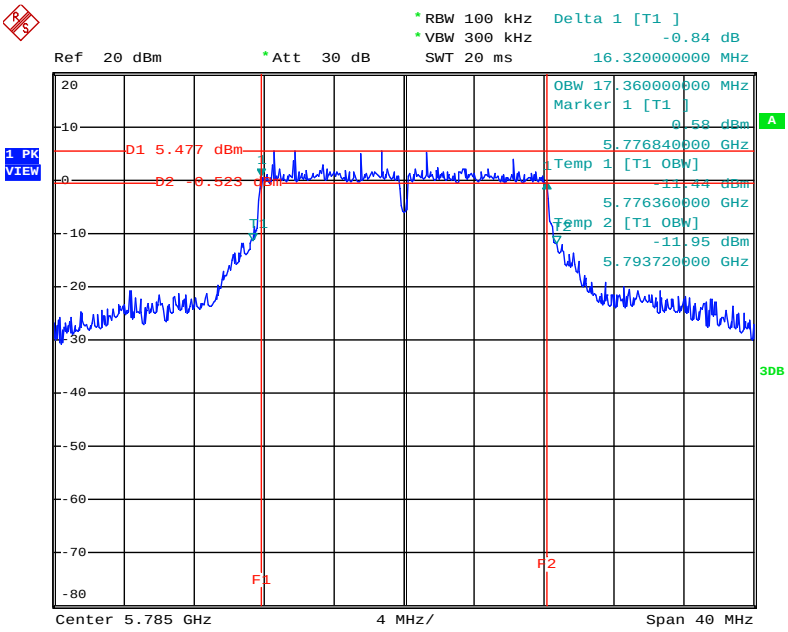
Date: 14.NOV.2014 15:57:40

6 dB Bandwidth Plot on Configuration IEEE 802.11a / Chain 2 / 5720 MHz



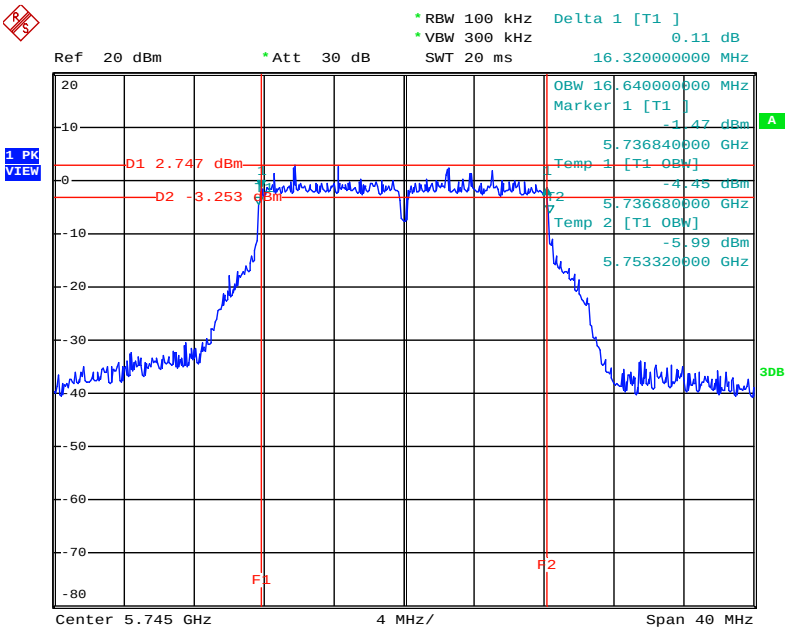
Date: 14.NOV.2014 15:54:11

6 dB Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5785 MHz



Date: 16.SEP.2014 16:52:22

6 dB Bandwidth Plot on Configuration IEEE 802.11a / Chain 2 / 5745 MHz

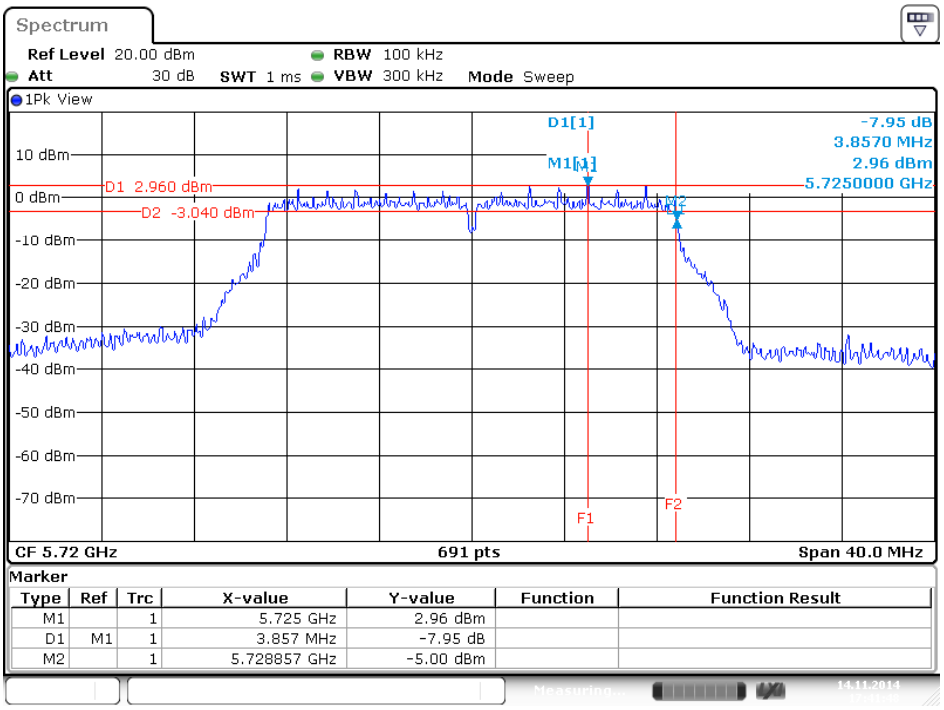


Date: 16.SEP.2014 16:50:34

For beamforming function:

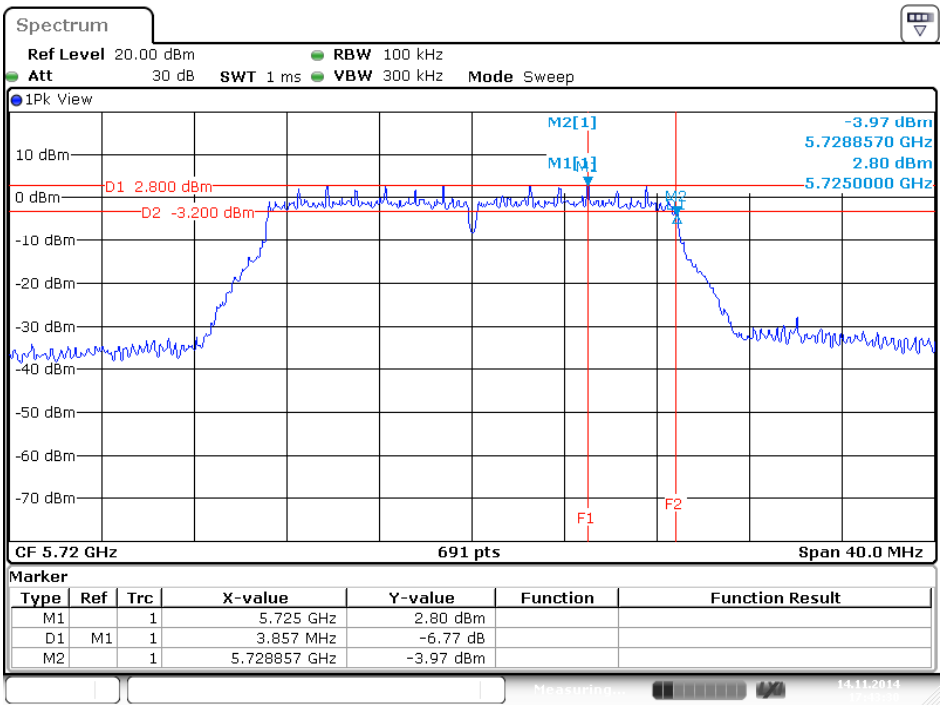
(straddle channel)

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5720 MHz



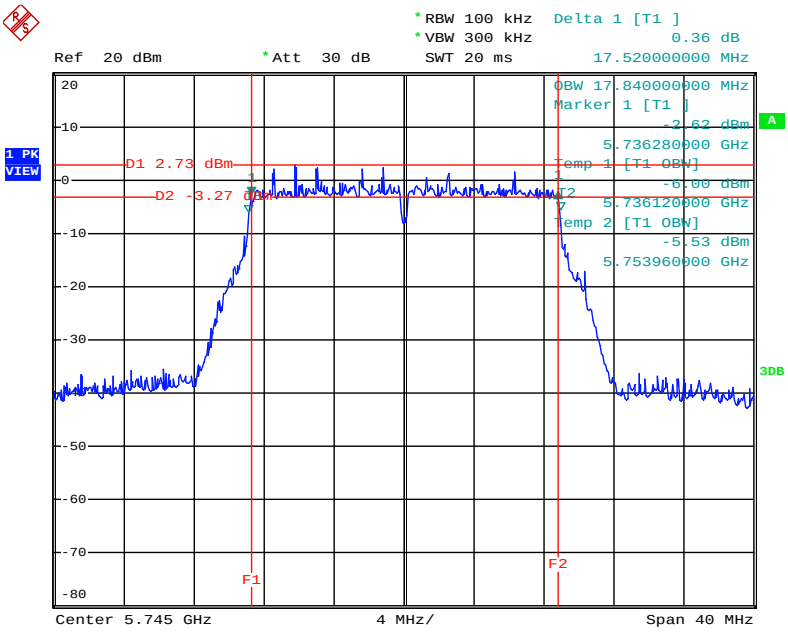
Date: 14.NOV.2014 17:41:48

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 2 / 5720 MHz



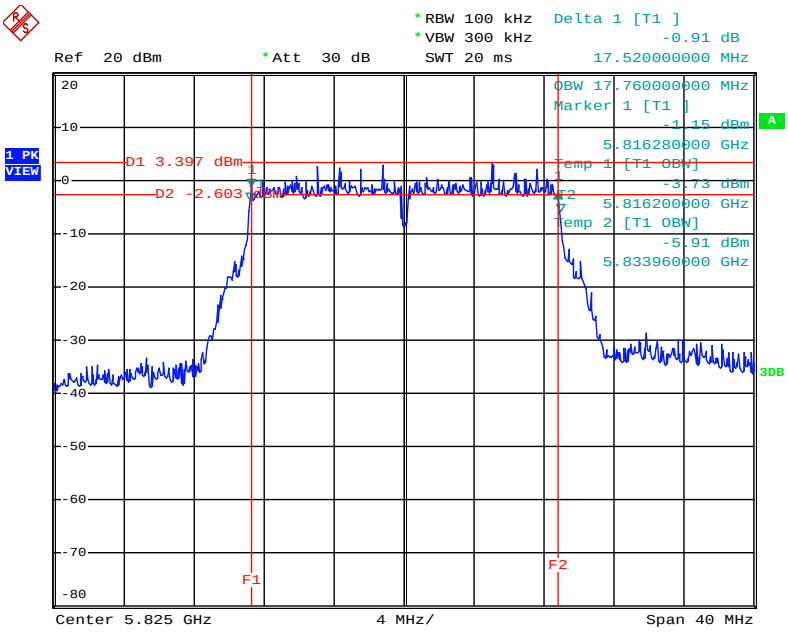
Date: 14.NOV.2014 17:43:31

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5745 MHz



Date: 16.SEP.2014 18:24:01

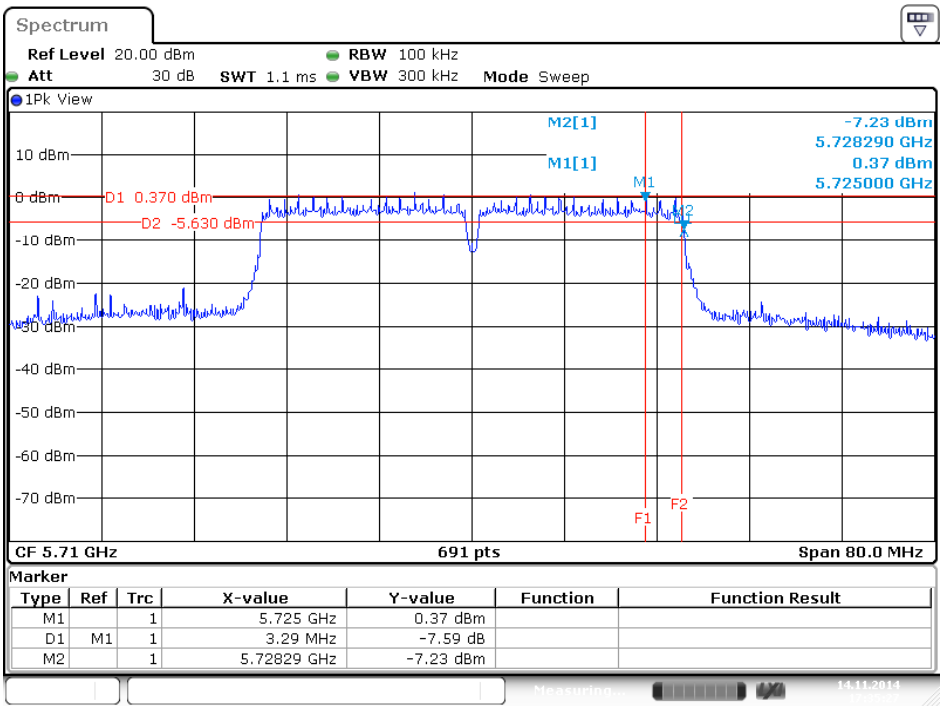
6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 2 / 5825 MHz



Date: 16.SEP.2014 18:27:15

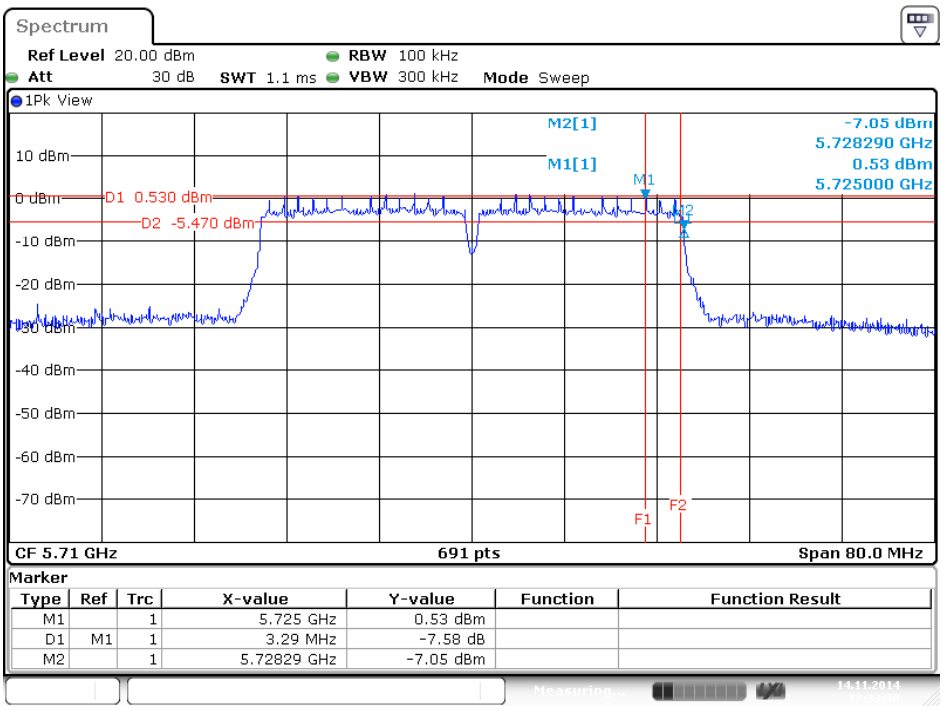
(straddle channel)

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5710 MHz



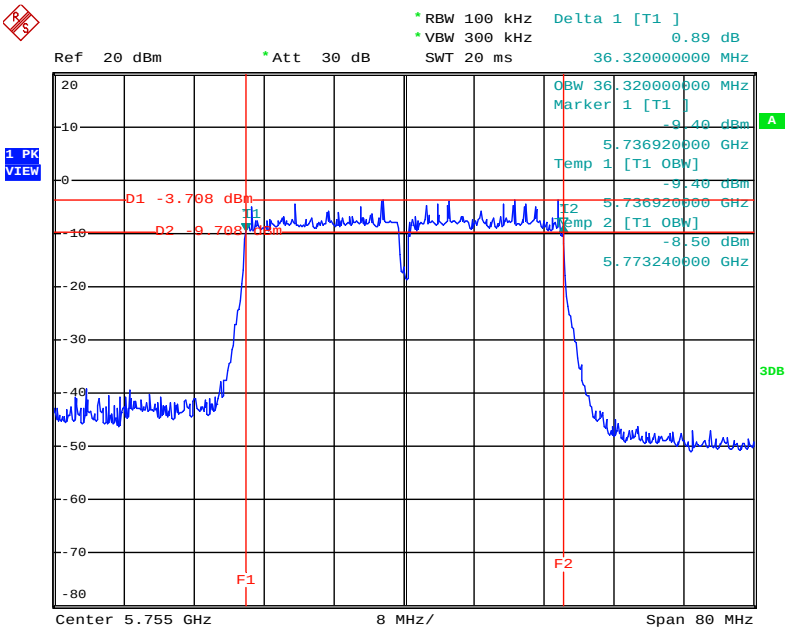
Date: 14.NOV.2014 17:35:27

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 2 / 5710 MHz



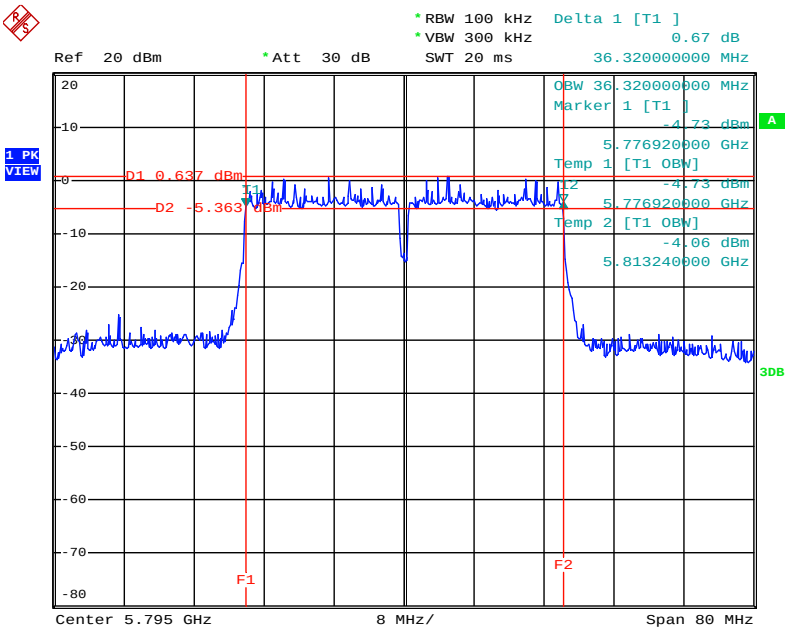
Date: 14.NOV.2014 17:33:30

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5755 MHz



Date: 16.SEP.2014 18:28:44

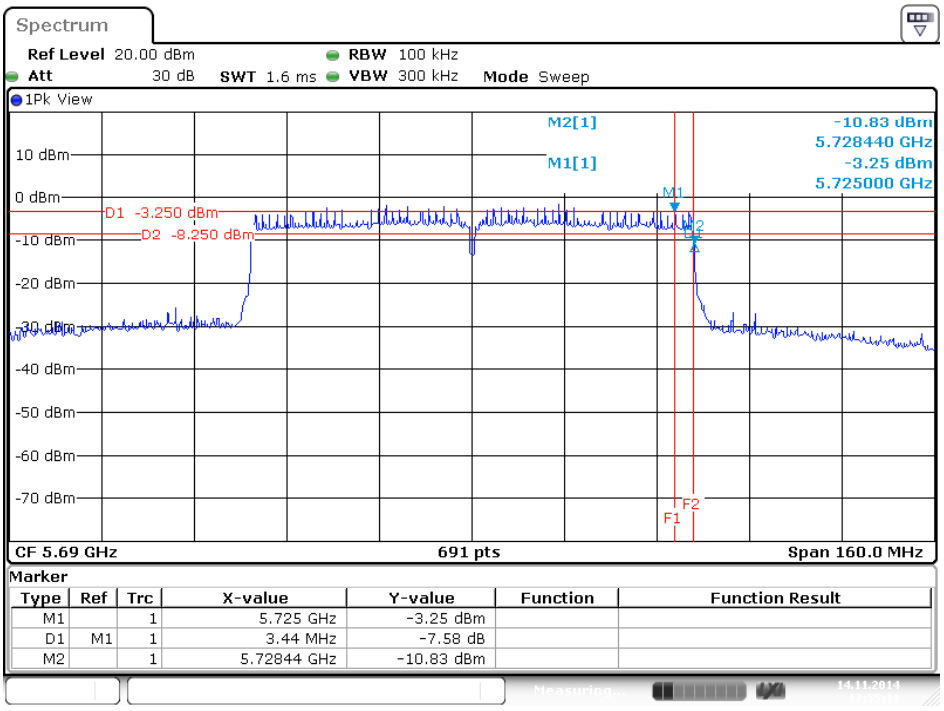
6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 2 / 5795 MHz



Date: 16.SEP.2014 18:29:59

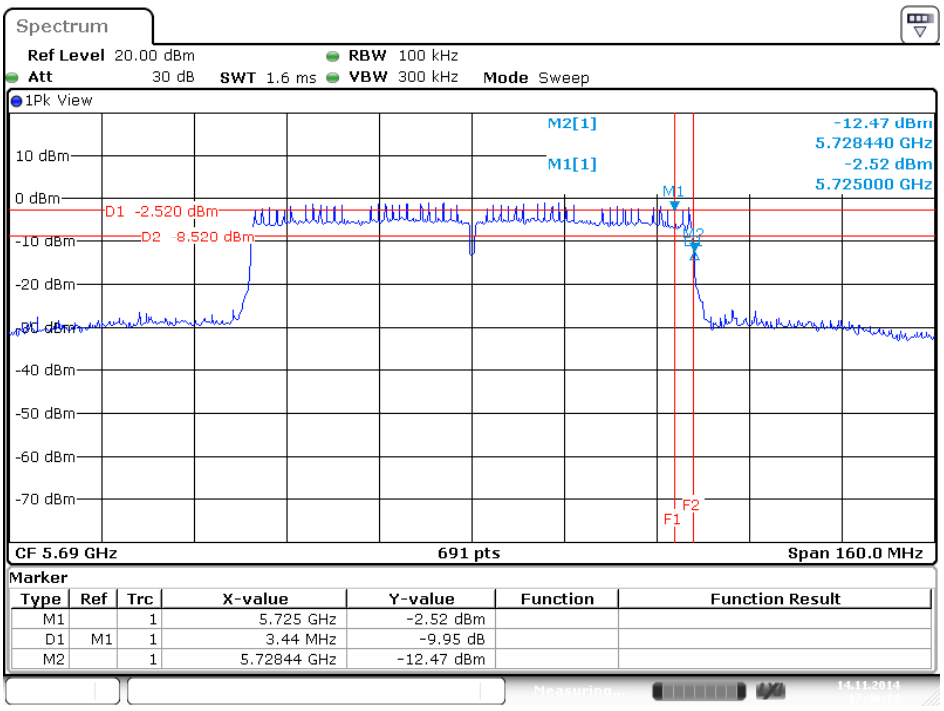
(straddle channel)

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 / 5690 MHz



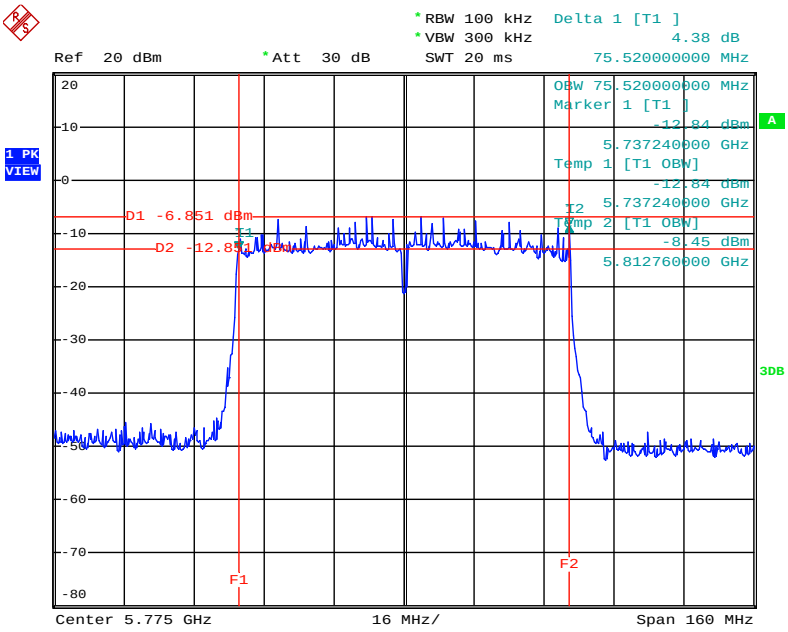
Date: 14.NOV.2014 17:55:11

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 2 / 5690 MHz



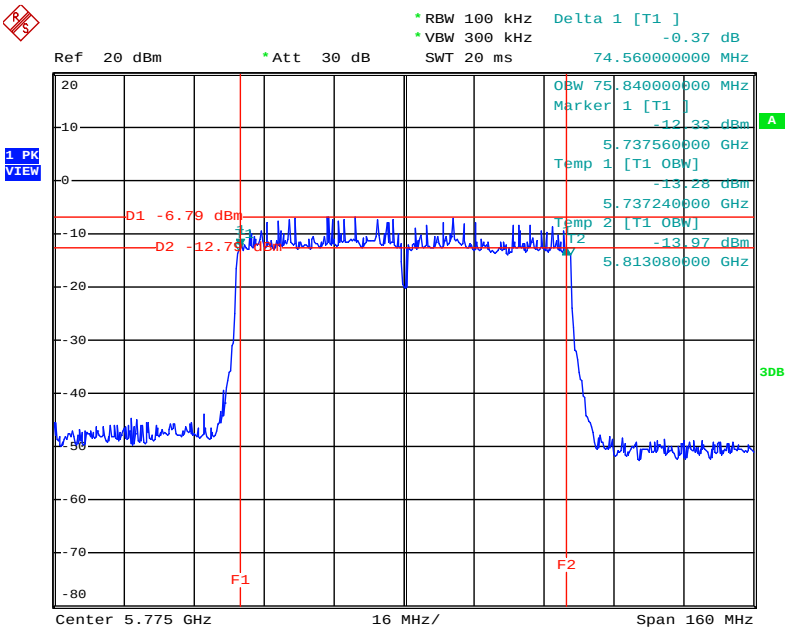
Date: 14.NOV.2014 17:46:14

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 / 5775 MHz



Date: 16.SEP.2014 18:31:31

6 dB Bandwidth Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 2 / 5775 MHz



Date: 16.SEP.2014 18:30:54

4.4. Maximum Conducted Output Power Measurement

4.4.1. Limit

For the band 5.15~5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW (24dBm) provided the maximum antenna gain does not exceed 6 dBi. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

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

For the band 5.725~5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W (30dBm). If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

4.4.2. Measuring Instruments and Setting

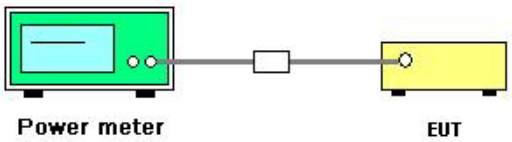
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Detector	AVERAGE

4.4.3. Test Procedures

1. The transmitter output (antenna port) was connected to the power meter.
2. Test was performed in accordance with KDB789033 D02 v01r01 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (E) Maximum conducted output power =>3. Measurement using a Power Meter (PM) =>b) Method PM-G (Measurement using a gated RF average power meter).
3. Multiple antenna systems was performed in accordance with KDB662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. When measuring maximum conducted output power with multiple antenna systems,add every result of the values by mathematic formula.

4.4.4. Test Setup Layout



4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.4.7. Test Result of Maximum Conducted Output Power

Temperature	20°C	Humidity	52%
Test Engineer	Robert Chang	Configurations	IEEE 802.11ac
Test Date	Sep. 10, 2014	Test Function	Non-beamforming function

Configuration IEEE 802.11ac MCS0/Nss1 VHT20

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
36	5180 MHz	16.56	16.25	19.42	24.00	Complies
40	5200 MHz	18.95	18.14	21.57	24.00	Complies
48	5240 MHz	18.81	18.17	21.51	24.00	Complies
52	5260 MHz	18.84	18.08	21.49	24.00	Complies
60	5300 MHz	18.87	18.04	21.49	24.00	Complies
64	5320 MHz	16.91	16.88	19.91	24.00	Complies
100	5500 MHz	16.41	16.35	19.39	23.79	Complies
116	5580 MHz	18.37	17.92	21.16	23.79	Complies
140	5700 MHz	16.16	15.42	18.82	23.79	Complies
144	5720 MHz	18.41	17.78	21.12	22.80	Complies
149	5745 MHz	16.07	15.91	19.00	29.79	Complies
157	5785 MHz	18.75	18.68	21.73	29.79	Complies
165	5825 MHz	16.98	16.63	19.82	29.79	Complies

Note: CH100~140 antenna gain=6.21dBi >6dBi, so limit=24 – (6.21 – 6)=23.79dBm.

CH144 antenna gain=6.21dBi >6dBi, and limit=24dBm or 11+10*log(15.88) – (6.21 – 6)

=22.80dBm<24dBm, so limit=22.80dBm.

CH149~165 antenna gain=6.21dBi >6dBi, so limit=30 – (6.21 – 6)=29.79dBm.

Straddle channel complies with output power limit of Band 3 & Band4										
CH	26dB BW (MHz)	99% OBW (MHz)	26dB BW F1 (MHz)	99% OBW T1 (MHz)	UNII B3 BW (MHz)	UNII B4 BW (MHz)	Total Conducted Output Power (dBm)	UNII B3 Limit (dBm)	UNII B4 Limit (dBm)	Result
144	28.00	18.40	5709.12	5710.88	15.88	12.12	21.12	22.80	29.79	Complies

Note: UNII B3 antenna gain=6.21dBi >6dBi, and limit=24dBm or 11+10*log(15.88) – (6.21 – 6)

=22.80dBm<24dBm, so limit=22.80dBm.

UNII B4 antenna gain=6.21dBi >6dBi, so limit=30 – (6.21 – 6)=29.79dBm.

Configuration IEEE 802.11ac MCS0/Nss1 VHT40

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
38	5190 MHz	14.14	13.85	17.01	24.00	Complies
46	5230 MHz	19.34	17.78	21.64	24.00	Complies
54	5270 MHz	19.28	17.54	21.51	24.00	Complies
62	5310 MHz	15.31	15.18	18.26	24.00	Complies
102	5510 MHz	13.25	13.23	16.25	23.79	Complies
110	5550 MHz	19.12	17.57	21.42	23.79	Complies
134	5670 MHz	16.85	16.32	19.60	23.79	Complies
142	5710 MHz	19.25	17.74	21.57	23.79	Complies
151	5755 MHz	12.88	12.59	15.75	29.79	Complies
159	5795 MHz	16.96	16.63	19.81	29.79	Complies

Note: UNII B3 antenna gain=6.21dBi >6dBi, so limit=24 – (6.21 – 6)=23.79dBm.

UNII B4 antenna gain=6.21dBi >6dBi, so limit=30 – (6.21 – 6)=29.79dBm.

Straddle channel complies with output power limit of Band 3 & Band4										
CH	26dB BW (MHz)	99% OBW (MHz)	26dB BW F1 (MHz)	99% OBW T1 (MHz)	UNII B3 BW (MHz)	UNII B4 BW (MHz)	Total Conducted Output Power (dBm)	UNII B3 Limit (dBm)	UNII B4 Limit (dBm)	Result
142	69.12	36.80	5672.24	5691.76	52.76	16.36	21.57	23.79	29.79	Complies

Note: UNII B3 antenna gain=6.21dBi >6dBi, so limit=24 – (6.21 – 6)=23.79dBm.

UNII B4 antenna gain=6.21dBi >6dBi, so limit=30 – (6.21 – 6)=29.79dBm.

Configuration IEEE 802.11ac MCS0/Nss1 VHT80

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
42	5210 MHz	14.37	14.31	17.35	24.00	Complies
58	5290 MHz	14.95	14.63	17.80	24.00	Complies
106	5530 MHz	13.21	13.18	16.21	23.79	Complies
138	5690 MHz	18.52	17.61	21.10	23.79	Complies
155	5775 MHz	13.54	13.22	16.39	29.79	Complies

Note: UNII B3 antenna gain=6.21dBi >6dBi, so limit=24 – (6.21 – 6)=23.79dBm.

UNII B4 antenna gain=6.21dBi >6dBi, so limit=30 – (6.21 – 6)=29.79dBm.

Straddle channel complies with output power limit of Band 3 & Band4										
CH	26dB BW (MHz)	99% OBW (MHz)	26dB BW F1 (MHz)	99% OBW T1 (MHz)	UNII B3 BW (MHz)	UNII B4 BW (MHz)	Total Conducted Output Power (dBm)	UNII B3 Limit (dBm)	UNII B4 Limit (dBm)	Result
138	83.84	76.80	5647.76	5651.60	77.24	6.60	21.10	23.79	29.79	Complies

Note: UNII B3 antenna gain=6.21dBi >6dBi, so limit=24 – (6.21 – 6)=23.79dBm.

UNII B4 antenna gain=6.21dBi >6dBi, so limit=30 – (6.21 – 6)=29.79dBm.

Temperature	20°C	Humidity	52%
Test Engineer	Robert Chang	Configurations	IEEE 802.11a
Test Date	Sep. 10, 2014	Test Function	Non-beamforming function

Configuration IEEE 802.11a

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
36	5180 MHz	16.72	16.45	19.60	24.00	Complies
40	5200 MHz	18.83	18.31	21.59	24.00	Complies
48	5240 MHz	18.82	18.02	21.45	24.00	Complies
52	5260 MHz	18.97	18.03	21.54	24.00	Complies
60	5300 MHz	18.87	18.15	21.54	24.00	Complies
64	5320 MHz	17.05	17.04	20.06	24.00	Complies
100	5500 MHz	16.63	16.57	19.61	23.79	Complies
116	5580 MHz	18.67	17.51	21.14	23.79	Complies
140	5700 MHz	16.45	16.13	19.30	23.79	Complies
144	5720 MHz	18.52	17.78	21.18	22.75	Complies
149	5745 MHz	16.14	16.13	19.15	29.79	Complies
157	5785 MHz	18.72	18.47	21.61	29.79	Complies
165	5825 MHz	17.51	17.12	20.33	29.79	Complies

Note: CH100~140 antenna gain=6.21dBi >6dBi, so limit=24 – (6.21 – 6)=23.79dBm.

CH144 antenna gain=6.21dBi >6dBi, and limit=24dBm or 11+10*log(15.72) – (6.21 – 6)

=22.75dBm<24dBm, so limit=22.75dBm.

CH149~165 antenna gain=6.21dBi >6dBi, so limit=30 – (6.21 – 6)=29.79dBm.

Straddle channel complies with output power limit of Band 3 & Band4										
CH	26dB BW (MHz)	99% OBW (MHz)	26dB BW F1 (MHz)	99% OBW T1 (MHz)	UNII B3 BW (MHz)	UNII B4 BW (MHz)	Total Conducted Output Power (dBm)	UNII B3 Limit (dBm)	UNII B4 Limit (dBm)	Result
144	26.88	17.92	5709.28	5711.20	15.72	11.16	21.18	22.75	29.79	Complies

Note: UNII B3 antenna gain=6.21dBi >6dBi, and limit=24dBm or 11+10*log(15.88) – (6.21 – 6)

=22.80dBm<24dBm, so limit=22.80dBm.

UNII B4 antenna gain=6.21dBi >6dBi, so limit=30 – (6.21 – 6)=29.79dBm.

Temperature	20°C	Humidity	52%
Test Engineer	Robert Chang	Configurations	IEEE 802.11ac
Test Date	Sep. 10, 2014	Test Function	Beamforming function

Configuration IEEE 802.11ac MCS0/Nss1 VHT20

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
36	5180 MHz	17.12	17.21	20.18	21.14	Complies
40	5200 MHz	18.12	17.91	21.03	21.14	Complies
48	5240 MHz	18.17	18.01	21.10	21.14	Complies
52	5260 MHz	18.34	17.87	21.12	21.14	Complies
60	5300 MHz	18.33	17.49	20.94	21.14	Complies
64	5320 MHz	16.67	16.78	19.74	21.14	Complies
100	5500 MHz	17.01	16.95	19.99	20.78	Complies
116	5580 MHz	17.66	17.69	20.69	20.78	Complies
140	5700 MHz	16.16	15.42	18.82	20.78	Complies
144	5720 MHz	16.84	16.44	19.65	19.74	Complies
149	5745 MHz	16.07	15.91	19.00	26.78	Complies
157	5785 MHz	18.75	18.68	21.73	26.78	Complies
165	5825 MHz	16.70	16.46	19.59	26.78	Complies

Note: Directional gain= $10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$

CH36~64 directional gain=8.86dBi>6dBi, so limit=24 – (8.86 – 6)=21.14dBm.

CH100~140 directional gain=9.22dBi>6dBi, so limit=24 – (9.22 – 6)=20.78dBm.

CH144 directional gain=9.22dBi>6dBi and limit=24dBm or 11+10*log(15.72) – (9.22 – 6)
=19.73dBm<24dBm, so limit=19.74dBm.

CH149~165 directional gain=9.22dBi>6dBi, so limit=30 – (9.22 – 6)=26.78dBm.

Straddle channel complies with output power limit of Band 3 & Band4										
CH	26dB BW (MHz)	99% OBW (MHz)	26dB BW F1 (MHz)	99% OBW T1 (MHz)	UNII B3 BW (MHz)	UNII B4 BW (MHz)	Total Conducted Output Power (dBm)	UNII B3 Limit (dBm)	UNII B4 Limit (dBm)	Result
144	21.76	18.24	5709.28	5710.88	15.72	6.04	19.65	19.74	26.78	Complies

Note: Directional gain= $10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$

UNII B3 directional gain=9.22dBi>6dBi and limit=24dBm or 11+10*log(15.72) – (9.22 – 6)
=19.73dBm<24dBm, so limit=19.74dBm.

UNII B4 directional gain=9.22dBi>6dBi, so limit=30 – (9.22 – 6)=26.78dBm.

Configuration IEEE 802.11ac MCS0/Nss1 VHT40

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
38	5190 MHz	13.96	13.75	16.87	21.14	Complies
46	5230 MHz	17.81	18.13	20.98	21.14	Complies
54	5270 MHz	17.97	18.11	21.05	21.14	Complies
62	5310 MHz	15.31	15.18	18.26	21.14	Complies
102	5510 MHz	14.52	14.69	17.62	20.78	Complies
110	5550 MHz	17.59	17.80	20.71	20.78	Complies
134	5670 MHz	16.85	16.32	19.60	20.78	Complies
142	5710 MHz	17.66	17.21	20.45	20.78	Complies
151	5755 MHz	12.88	12.59	15.75	26.78	Complies
159	5795 MHz	16.77	16.55	19.67	26.78	Complies

Note: Directional gain= $10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$

UNII B1 directional gain=8.86dBi>6dBi, so limit=24 – (8.86 – 6)=21.14dBm.

UNII B2 directional gain=8.86dBi>6dBi, so limit=24 – (8.86 – 6)=21.14dBm.

UNII B3 directional gain=9.22dBi>6dBi, so limit=24 – (9.22 – 6)=20.78dBm.

UNII B4 directional gain=9.22dBi>6dBi, so limit=30 – (9.22 – 6)=26.78dBm.

Straddle channel complies with output power limit of Band 3 & Band4										
CH	26dB BW (MHz)	99% OBW (MHz)	26dB BW F1 (MHz)	99% OBW T1 (MHz)	UNII B3 BW (MHz)	UNII B4 BW (MHz)	Total Conducted Output Power (dBm)	UNII B3 Limit (dBm)	UNII B4 Limit (dBm)	Result
142	48.32	36.48	5690.16	5691.76	34.84	13.48	20.45	20.78	26.78	Complies

Note: Directional gain= $10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$

UNII B3 directional gain=9.22dBi>6dBi, so limit=24 – (9.22 – 6)=20.78dBm.

UNII B4 directional gain=9.22dBi>6dBi, so limit=30 – (9.22 – 6)=26.78dBm.

Configuration IEEE 802.11ac MCS0/Nss1 VHT80

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
42	5210 MHz	14.12	14.23	17.19	21.14	Complies
58	5290 MHz	14.95	14.63	17.80	21.14	Complies
106	5530 MHz	13.88	14.09	17.00	20.78	Complies
138	5690 MHz	17.66	17.23	20.46	20.78	Complies
155	5775 MHz	11.52	11.43	14.49	26.78	Complies

Note: Directional gain= $10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$

UNII B1 directional gain=8.86dBi>6dBi, so limit=24 – (8.86 – 6)=21.14dBm.

UNII B2 directional gain=8.86dBi>6dBi, so limit=24 – (8.86 – 6)=21.14dBm.

UNII B3 directional gain=9.22dBi>6dBi, so limit=24 – (9.22 – 6)=20.78dBm.

UNII B4 directional gain=9.22dBi>6dBi, so limit=30 – (9.22 – 6)=26.78dBm.

Straddle channel complies with output power limit of Band 3 & Band4										
CH	26dB BW (MHz)	99% OBW (MHz)	26dB BW F1 (MHz)	99% OBW T1 (MHz)	UNII B3 BW (MHz)	UNII B4 BW (MHz)	Total Conducted Output Power (dBm)	UNII B3 Limit (dBm)	UNII B4 Limit (dBm)	Result
138	110.72	76.8	5631.76	5651.60	93.24	17.48	20.46	20.78	26.78	Complies

Note: Directional gain= $10 \cdot \log \left[\frac{\sum_{j=1}^{N_{SS}} \left\{ \sum_{k=1}^{N_{ANT}} g_{j,k} \right\}^2}{N_{ANT}} \right]$

UNII B3 directional gain=9.22dBi>6dBi, so limit=24 – (9.22 – 6)=20.78dBm.

UNII B4 directional gain=9.22dBi>6dBi, so limit=30 – (9.22 – 6)=26.78dBm.

Temperature	20°C	Humidity	52%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n
Test Date	Sep. 02, 2014	Test Function	STBC function

Configuration IEEE 802.11n MCS0 HT20

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
36	5180 MHz	17.28	17.11	20.21	24.00	Complies
40	5200 MHz	19.07	18.33	21.73	24.00	Complies
48	5240 MHz	19.24	17.58	21.50	24.00	Complies

Temperature	20°C	Humidity	52%
Test Engineer	Robert Chang	Configurations	IEEE 802.11ac
Test Date	Sep. 10, 2014	Test Function	Power table for SAR only

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Power table for SAR only

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
36	5180 MHz	14.06	13.72	16.90	24.00	Complies
40	5200 MHz	14.04	13.71	16.89	24.00	Complies
44	5220 MHz	14.11	13.78	16.96	24.00	Complies
48	5240 MHz	14.02	13.85	16.95	24.00	Complies
52	5260 MHz	13.96	13.91	16.95	24.00	Complies
56	5280 MHz	14.02	13.81	16.93	24.00	Complies
60	5300 MHz	13.89	13.86	16.89	24.00	Complies
64	5320 MHz	14.01	13.82	16.93	24.00	Complies
100	5500 MHz	13.39	13.21	16.31	23.79	Complies
104	5520 MHz	13.28	13.19	16.25	23.79	Complies
108	5540 MHz	13.36	13.32	16.35	23.79	Complies
112	5560 MHz	13.32	13.28	16.31	23.79	Complies
116	5580 MHz	13.35	13.34	16.36	23.79	Complies
120	5600 MHz	13.31	13.26	16.30	23.79	Complies
124	5620 MHz	13.44	13.42	16.44	23.79	Complies
128	5640 MHz	13.41	13.17	16.30	23.79	Complies
132	5660 MHz	13.48	13.34	16.42	23.79	Complies
136	5680 MHz	13.44	13.24	16.35	23.79	Complies
140	5700 MHz	13.65	13.16	16.42	23.79	Complies
144	5720 MHz	13.59	13.03	16.33	22.80	Complies
149	5745 MHz	14.02	13.85	16.95	29.79	Complies
153	5765 MHz	14.04	13.87	16.97	29.79	Complies
157	5785 MHz	14.07	13.71	16.90	29.79	Complies
161	5805 MHz	14.03	13.78	16.92	29.79	Complies
165	5825 MHz	13.94	13.81	16.89	29.79	Complies

Note: CH100~140 antenna gain=6.21dBi >6dBi, so limit=24 – (6.21 – 6)=23.79dBm.

CH144 antenna gain=6.21dBi >6dBi, and limit=24dBm or 11+10*log(15.88) – (6.21 – 6)

=22.80dBm<24dBm, so limit=22.80dBm.

CH149~165 antenna gain=6.21dBi >6dBi, so limit=30 – (6.21 – 6)=29.79dBm.

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Power table for SAR only

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
38	5190 MHz	13.89	13.86	16.89	24.00	Complies
46	5230 MHz	13.98	13.82	16.91	24.00	Complies
54	5270 MHz	13.89	13.74	16.83	24.00	Complies
62	5310 MHz	13.85	13.94	16.91	24.00	Complies
102	5510 MHz	13.25	13.23	16.25	23.79	Complies
110	5550 MHz	13.32	13.15	16.25	23.79	Complies
118	5590 MHz	13.38	13.31	16.36	23.79	Complies
126	5630 MHz	13.33	13.25	16.30	23.79	Complies
134	5670 MHz	13.41	13.22	16.33	23.79	Complies
142	5710 MHz	13.37	13.21	16.30	23.79	Complies
151	5755 MHz	12.88	12.59	15.75	29.79	Complies
159	5795 MHz	14.02	13.85	16.95	29.79	Complies

Note: UNII B3 antenna gain=6.21dBi >6dBi, so limit=24 – (6.21 – 6)=23.79dBm.

UNII B4 antenna gain=6.21dBi >6dBi, so limit=30 – (6.21 – 6)=29.79dBm.

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Power table for SAR only

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
42	5210 MHz	14.04	13.82	16.94	24.00	Complies
58	5290 MHz	13.99	13.87	16.94	24.00	Complies
106	5530 MHz	13.48	13.32	16.41	23.79	Complies
122	5610 MHz	13.45	13.23	16.35	23.79	Complies
138	5690 MHz	13.55	13.06	16.32	23.79	Complies
155	5775 MHz	13.54	13.22	16.39	29.79	Complies

Note: UNII B3 antenna gain=6.21dBi >6dBi, so limit=24 – (6.21 – 6)=23.79dBm.

UNII B4 antenna gain=6.21dBi >6dBi, so limit=30 – (6.21 – 6)=29.79dBm.

Temperature	20°C	Humidity	52%
Test Engineer	Robert Chang	Configurations	IEEE 802.11a
Test Date	Sep. 10, 2014	Test Function	Power table for SAR only

Configuration IEEE 802.11a / Power table for SAR only

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
36	5180 MHz	13.95	13.81	16.89	24.00	Complies
40	5200 MHz	13.91	13.89	16.91	24.00	Complies
44	5220 MHz	13.73	13.71	16.73	24.00	Complies
48	5240 MHz	13.94	13.83	16.90	24.00	Complies
52	5260 MHz	13.89	13.83	16.87	24.00	Complies
56	5280 MHz	14.01	13.74	16.89	24.00	Complies
60	5300 MHz	13.97	13.82	16.91	24.00	Complies
64	5320 MHz	13.83	13.79	16.82	24.00	Complies
100	5500 MHz	13.13	13.08	16.12	23.79	Complies
104	5520 MHz	13.15	13.05	16.11	23.79	Complies
108	5540 MHz	13.11	13.04	16.09	23.79	Complies
112	5560 MHz	13.12	13.07	16.11	23.79	Complies
116	5580 MHz	13.25	13.21	16.24	23.79	Complies
120	5600 MHz	13.09	13.07	16.09	23.79	Complies
124	5620 MHz	13.12	13.08	16.11	23.79	Complies
128	5640 MHz	13.15	13.08	16.13	23.79	Complies
132	5660 MHz	13.17	13.02	16.11	23.79	Complies
136	5680 MHz	13.16	13.08	16.13	23.79	Complies
140	5700 MHz	13.36	13.02	16.20	23.79	Complies
144	5720 MHz	13.17	13.04	16.12	22.80	Complies
149	5745 MHz	13.92	13.82	16.88	29.79	Complies
153	5765 MHz	13.94	13.81	16.89	29.79	Complies
157	5785 MHz	14.04	13.78	16.92	29.79	Complies
161	5805 MHz	13.85	13.73	16.80	29.79	Complies
165	5825 MHz	14.02	13.76	16.90	29.79	Complies

4.5. Power Spectral Density Measurement

4.5.1. Limit

The power spectral density is defined as the highest level of power in dBm per MHz generated by the transmitter within the power envelope. The following table is power spectral density limits and decrease power density limit rule refer to section 4.4.1.

Frequency Range	Power Spectral Density limit
5.15~5.25 GHz	11 dBm/MHz
5.25-5.35 GHz	11 dBm/MHz
5.470-5.725 GHz	11 dBm/MHz
5.725~5.85 GHz	30 dBm/500kHz

4.5.2. Measuring Instruments and Setting

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

For 5.15-5.35 GHz / 5.470-5.725 GHz

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

For 5.725~5.85 GHz

Spectrum Parameter	Setting
Attenuation	Auto
Span Frequency	Set the span to 1.5 times the DTS channel bandwidth.
RBW	RBW ≥ 1/T
VBW	VBW ≥ 3 RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto couple
Note: If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (< 500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.	

4.5.3. Test Procedures

For 5.15-5.35 GHz / 5.470-5.725 GHz

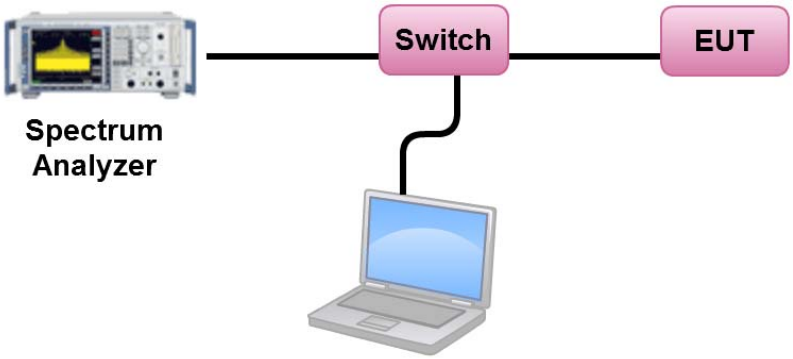
1. The transmitter output (antenna port) was connected RF switch to the spectrum analyzer.
2. Test was performed in accordance with KDB789033 D02 v01r01 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (F) Maximum Power Spectral Density (PSD).
3. Multiple antenna systems was performed in accordance KDB662911 D01 v02r01 in-Band Power Spectral Density (PSD) Measurements (a) Measure and sum the spectra across the outputs.
4. When measuring first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3 and so on up to the Nth output to obtain the value for the first frequency bin of the summed spectrum. The summed spectrum value for each of the other frequency bins is computed in the same way.

For 5.725~5.85 GHz

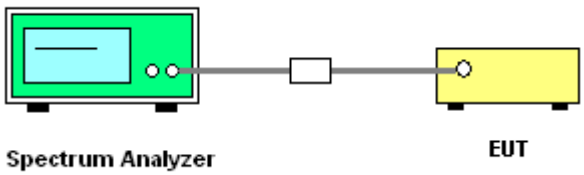
1. Test procedures refer KDB662911 D01 v02r01 section In-Band Power Spectral Density (PSD) Measurements option (b) Measure and sum spectral maximal across the outputs.
2. Use this procedure when the maximum conducted output power in the fundamental emission is used to demonstrate compliance. The EUT 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 measured result of PSD level must add 10log(500kHz/RBW) and the final result should ≤ 30 dBm.

4.5.4. Test Setup Layout

For 5.15-5.35 GHz / 5.470-5.725 GHz



For 5.725~5.85 GHz



4.5.5. Test Deviation

There is no deviation with the original standard.

4.5.6. EUT Operation during Test

The EUT was programmed to be in continuously transmitting mode.

4.5.7. Test Result of Power Spectral Density

Temperature	20°C	Humidity	52%
Test Engineer	Robert Chang	Configurations	IEEE 802.11ac
Test Function	Non-beamforming function		

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	5.75	8.14	Complies
40	5200 MHz	7.90	8.14	Complies
48	5240 MHz	7.85	8.14	Complies
52	5260 MHz	7.87	8.14	Complies
60	5300 MHz	7.92	8.14	Complies
64	5320 MHz	6.43	8.14	Complies
100	5500 MHz	5.80	7.78	Complies
116	5580 MHz	7.54	7.78	Complies
140	5700 MHz	5.36	7.78	Complies
144	5720 MHz	7.63	7.78	Complies

Note: Directional gain= $10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$

For UNII B1, directional gain=8.86dBi>6dBi, so limit=11 – (8.86 – 6)=8.14dBm/MHz.

For UNII B2, directional gain=8.86dBi>6dBi, so limit=11 – (8.86 – 6)=8.14dBm/MHz.

For UNII B3, directional gain=9.22dBi>6dBi, so limit=11 – (9.22 – 6)=7.78dBm/MHz.

Channel	Frequency	Power Density (dBm/3kHz)			BWCF factor	Total Power Density	Power Density Limit	Result
		Chain 1	Chain 2	Total	3kHz to 500kHz	dBm/500kHz		
149	5745 MHz	-11.82	-11.84	-8.82	22.22	13.40	26.78	Complies
157	5785 MHz	-8.82	-9.08	-5.94	22.22	16.28	26.78	Complies
165	5825 MHz	-9.84	-10.66	-7.22	22.22	15.00	26.78	Complies

Note: Directional gain= $10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.22dBi>6dBi, so limit=30 – (9.22 – 6)=26.78dBm/500kHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	0.97	8.14	Complies
46	5230 MHz	5.34	8.14	Complies
54	5270 MHz	5.54	8.14	Complies
62	5310 MHz	2.06	8.14	Complies
102	5510 MHz	0.15	7.78	Complies
110	5550 MHz	5.66	7.78	Complies
134	5670 MHz	3.59	7.78	Complies
142	5710 MHz	5.82	7.78	Complies

Note: Directional gain= $10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$

For UNII B1, directional gain=8.86dBi>6dBi, so limit=11 – (8.86 – 6)=8.14dBm/MHz.

For UNII B2, directional gain=8.86dBi>6dBi, so limit=11 – (8.86 – 6)=8.14dBm/MHz.

For UNII B3, directional gain=9.22dBi>6dBi, so limit=11 – (9.22 – 6)=7.78dBm/MHz.

Channel	Frequency	Power Density (dBm/3kHz)			BWCF factor	Total Power Density	Power Density Limit	Result
		Chain 1	Chain 2	Total	3kHz to 500kHz	dBm/500kHz		
151	5755 MHz	-18.18	-18.44	-15.30	22.22	6.92	26.78	Complies
159	5795 MHz	-14.27	-13.69	-10.96	22.22	11.26	26.78	Complies

Note: Directional gain= $10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.22dBi>6dBi, so limit=30 – (9.22 – 6)=26.78dBm/500kHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
42	5210 MHz	-1.53	8.14	Complies
58	5290 MHz	-1.05	8.14	Complies
106	5530 MHz	-2.47	7.78	Complies
138	5690 MHz	2.17	7.78	Complies

Note: Directional gain= $10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$

For UNII B1, directional gain=8.86dBi>6dBi, so limit=11 – (8.86 – 6)=8.14dBm/MHz.

For UNII B2, directional gain=8.86dBi>6dBi, so limit=11 – (8.86 – 6)=8.14dBm/MHz.

For UNII B3, directional gain=9.22dBi>6dBi, so limit=11 – (9.22 – 6)=7.78dBm/MHz.

Channel	Frequency	Power Density (dBm/3kHz)			BWCF factor	Total Power Density	Power Density Limit	Result
		Chain 1	Chain 2	Total	3kHz to 500kHz	dBm/500kHz		
155	5775 MHz	-19.98	-19.88	-16.92	22.22	5.30	26.78	Complies

Note: Directional gain= $10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.22dBi>6dBi, so limit=30 – (9.22 – 6)=26.78dBm/500kHz.

Temperature	20°C	Humidity	52%
Test Engineer	Robert Chang	Configurations	IEEE 802.11a
Test Function	Non-beamforming function		

Configuration IEEE 802.11a / Chain 1 + Chain 2

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	6.20	8.14	Complies
40	5200 MHz	8.12	8.14	Complies
48	5240 MHz	7.96	8.14	Complies
52	5260 MHz	8.02	8.14	Complies
60	5300 MHz	8.09	8.14	Complies
64	5320 MHz	6.68	8.14	Complies
100	5500 MHz	6.11	7.78	Complies
116	5580 MHz	7.75	7.78	Complies
140	5700 MHz	5.78	7.78	Complies
144	5720 MHz	7.65	7.78	Complies

Note: Directional gain= $10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$

For UNII B1, directional gain=8.86dBi>6dBi, so limit=11 – (8.86 – 6)=8.14dBm/MHz.

For UNII B2, directional gain=8.86dBi>6dBi, so limit=11 – (8.86 – 6)=8.14dBm/MHz.

For UNII B3, directional gain=9.22dBi>6dBi, so limit=11 – (9.22 – 6)=7.78dBm/MHz.

Channel	Frequency	Power Density (dBm/3kHz)			BWCF factor	Total Power Density	Power Density Limit	Result
		Chain 1	Chain 2	Total	3kHz to 500kHz	dBm/500kHz		
149	5745 MHz	-10.98	-11.54	-8.24	22.22	13.98	26.78	Complies
157	5785 MHz	-9.11	-8.41	-5.74	22.22	16.48	26.78	Complies
165	5825 MHz	-10.58	-10.38	-7.47	22.22	14.75	26.78	Complies

Note: Directional gain= $10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.22dBi>6dBi, so limit=30 – (9.22 – 6)=26.78dBm/500kHz.

Temperature	20°C	Humidity	52%
Test Engineer	Robert Chang	Configurations	IEEE 802.11ac
Test Function	Beamforming function		

Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	6.40	8.14	Complies
40	5200 MHz	7.67	8.14	Complies
48	5240 MHz	8.06	8.14	Complies
52	5260 MHz	8.07	8.14	Complies
60	5300 MHz	7.75	8.14	Complies
64	5320 MHz	6.39	8.14	Complies
100	5500 MHz	6.68	7.78	Complies
116	5580 MHz	7.55	7.78	Complies
140	5700 MHz	5.34	7.78	Complies
144	5720 MHz	6.66	7.78	

Note: Directional gain= $10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$

For UNII B1, directional gain=8.86dBi>6dBi, so limit=11 – (8.86 – 6)=8.14dBm/MHz.

For UNII B2, directional gain=8.86dBi>6dBi, so limit=11 – (8.86 – 6)=8.14dBm/MHz.

For UNII B3, directional gain=9.22dBi>6dBi, so limit=11 – (9.22 – 6)=7.78dBm/MHz.

Channel	Frequency	Power Density (dBm/3kHz)			BWCF factor	Total Power Density	Power Density Limit	Result
		Chain 1	Chain 2	Total	3kHz to 500kHz	dBm/500kHz		
149	5745 MHz	-11.02	-10.40	-7.69	22.22	14.53	26.78	Complies
157	5785 MHz	-8.30	-7.94	-5.11	22.22	17.11	26.78	Complies
165	5825 MHz	-11.65	-10.61	-8.09	22.22	14.13	26.78	Complies

Note: Directional gain= $10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.22dBi>6dBi, so limit=30 – (9.22 – 6)=26.78dBm/500kHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	0.19	8.14	Complies
46	5230 MHz	4.59	8.14	Complies
54	5270 MHz	4.66	8.14	Complies
62	5310 MHz	1.91	8.14	Complies
102	5510 MHz	1.19	7.78	Complies
110	5550 MHz	4.57	7.78	Complies
134	5670 MHz	2.97	7.78	Complies
142	5710 MHz	3.59	7.78	Complies

Note: Directional gain= $10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$

For UNII B1, directional gain=8.86dBi>6dBi, so limit=11 – (8.86 – 6)=8.14dBm/MHz.

For UNII B2, directional gain=8.86dBi>6dBi, so limit=11 – (8.86 – 6)=8.14dBm/MHz.

For UNII B3, directional gain=9.22dBi>6dBi, so limit=11 – (9.22 – 6)=7.78dBm/MHz.

Channel	Frequency	Power Density (dBm/3kHz)			BWCF factor	Total Power Density	Power Density Limit	Result
		Chain 1	Chain 2	Total	3kHz to 500kHz	dBm/500kHz		
151	5755 MHz	-17.80	-18.15	-14.96	22.22	7.26	26.78	Complies
159	5795 MHz	-13.90	-13.51	-10.69	22.22	11.53	26.78	Complies

Note: Directional gain= $10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.22dBi>6dBi, so limit=30 – (9.22 – 6)=26.78dBm/500kHz.

Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
42	5210 MHz	-2.00	8.14	Complies
58	5290 MHz	-1.05	8.14	Complies
106	5530 MHz	-2.30	7.78	Complies
138	5690 MHz	0.71	7.78	Complies

Note: Directional gain= $10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$

For UNII B1, directional gain=8.86dBi>6dBi, so limit=11 – (8.86 – 6)=8.14dBm/MHz.

For UNII B2, directional gain=8.86dBi>6dBi, so limit=11 – (8.86 – 6)=8.14dBm/MHz.

For UNII B3, directional gain=9.22dBi>6dBi, so limit=11 – (9.22 – 6)=7.78dBm/MHz.

Channel	Frequency	Power Density (dBm/3kHz)			BWCF factor	Total Power Density	Power Density Limit	Result
		Chain 1	Chain 2	Total	3kHz to 500kHz	dBm/500kHz		
155	5775 MHz	-21.30	-22.01	-18.63	22.22	3.59	26.78	Complies

Note: Directional gain= $10 \cdot \log\left[\frac{\sum_{j=1}^{N_{SS}}\left\{\sum_{k=1}^{N_{ANT}} g_{j,k}\right\}^2}{N_{ANT}}\right]$ =9.22dBi>6dBi, so limit=30 – (9.22 – 6)=26.78dBm/500kHz.

Temperature	20°C	Humidity	52%
Test Engineer	Jim Huang	Configurations	IEEE 802.11n
Test Function	STBC function		

Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2

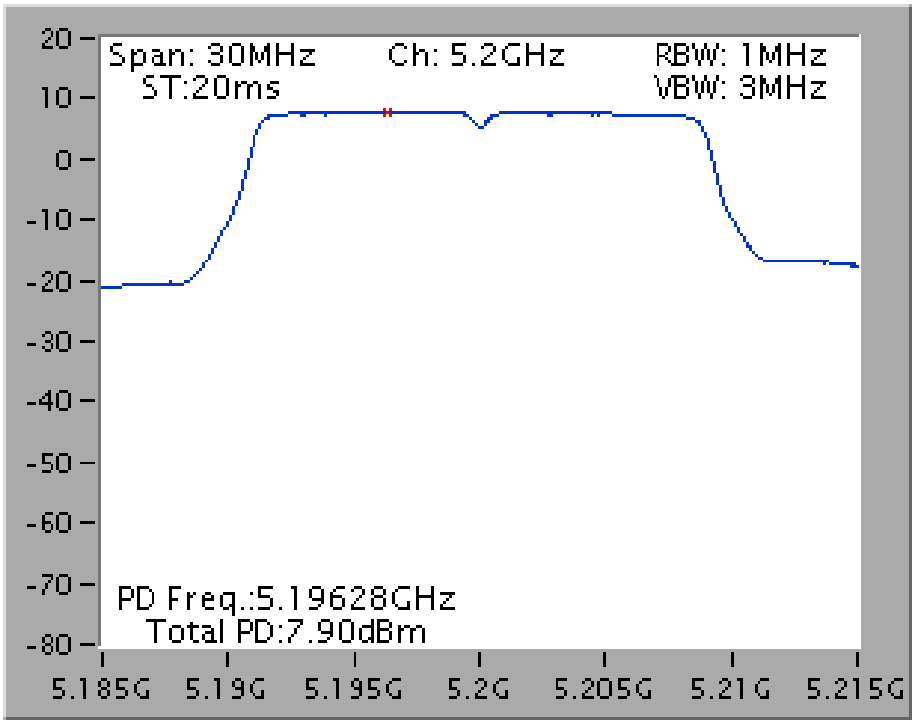
Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	7.08	11.00	Complies
40	5200 MHz	8.33	11.00	Complies
48	5240 MHz	8.15	11.00	Complies

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

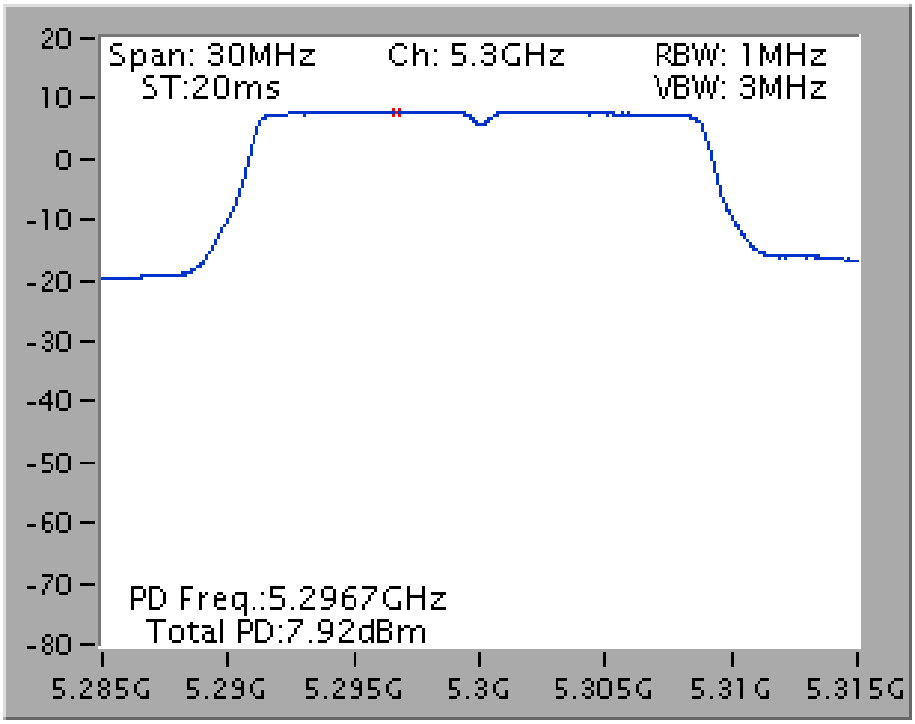
For plots, only the channel with worse result was shown.

For non-beamforming function:

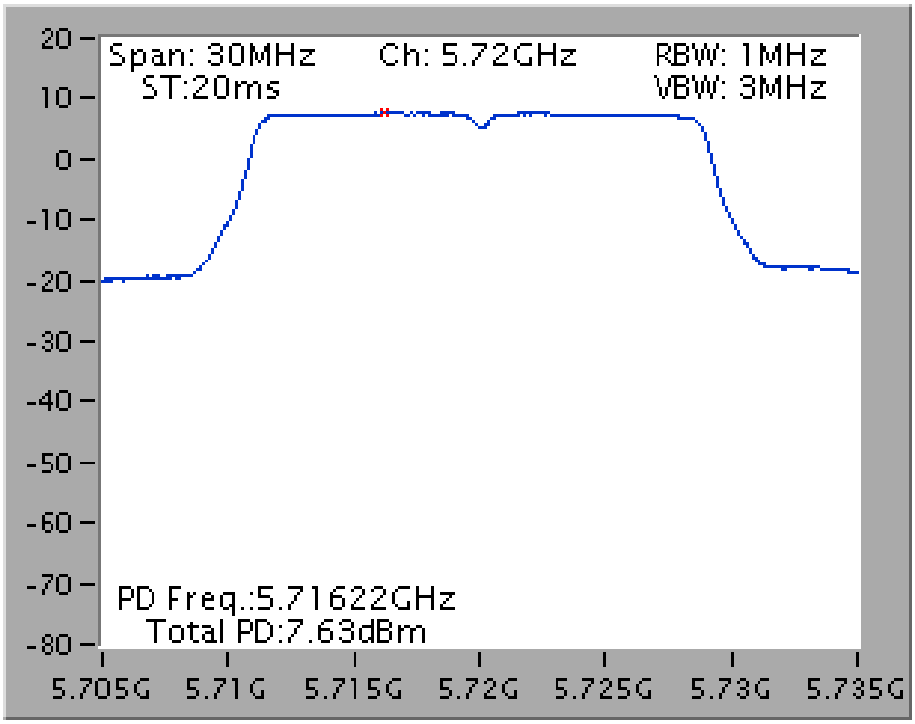
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 / 5200 MHz



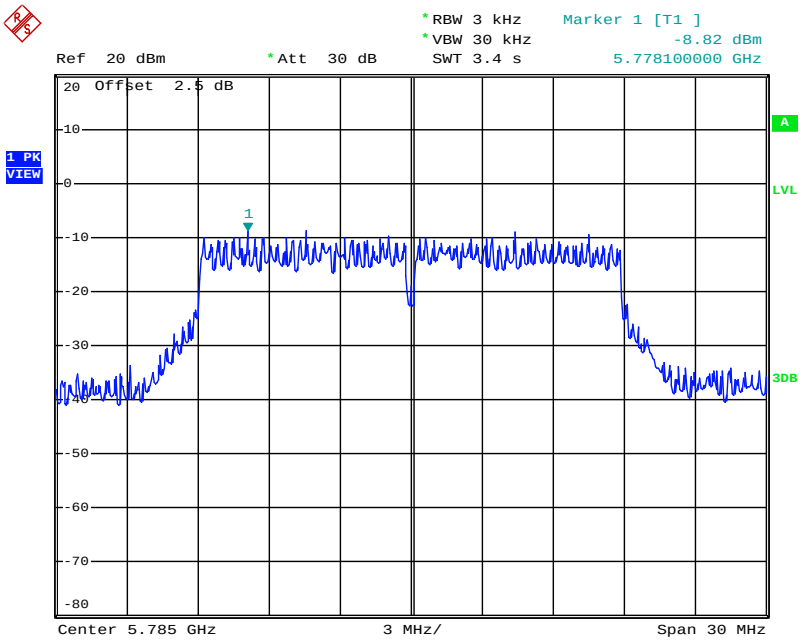
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 / 5300 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 / 5720 MHz

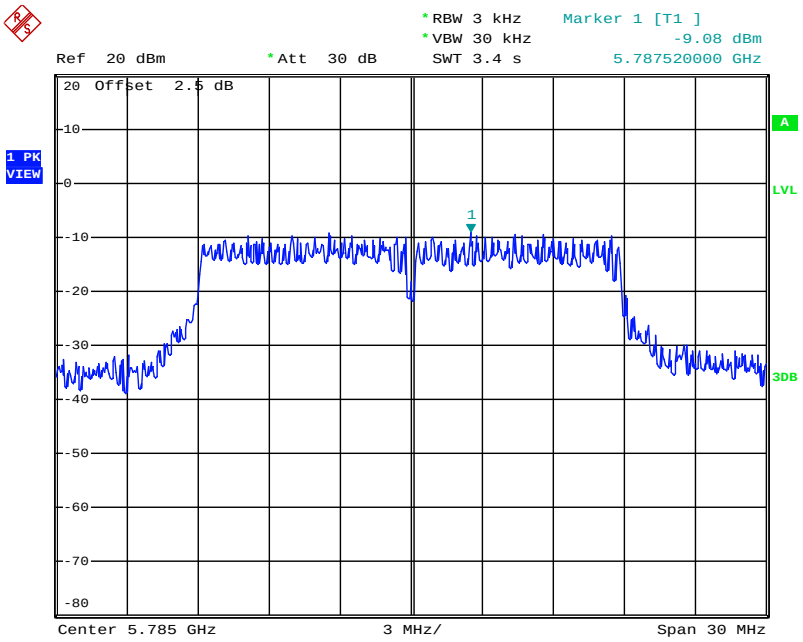


Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5785 MHz



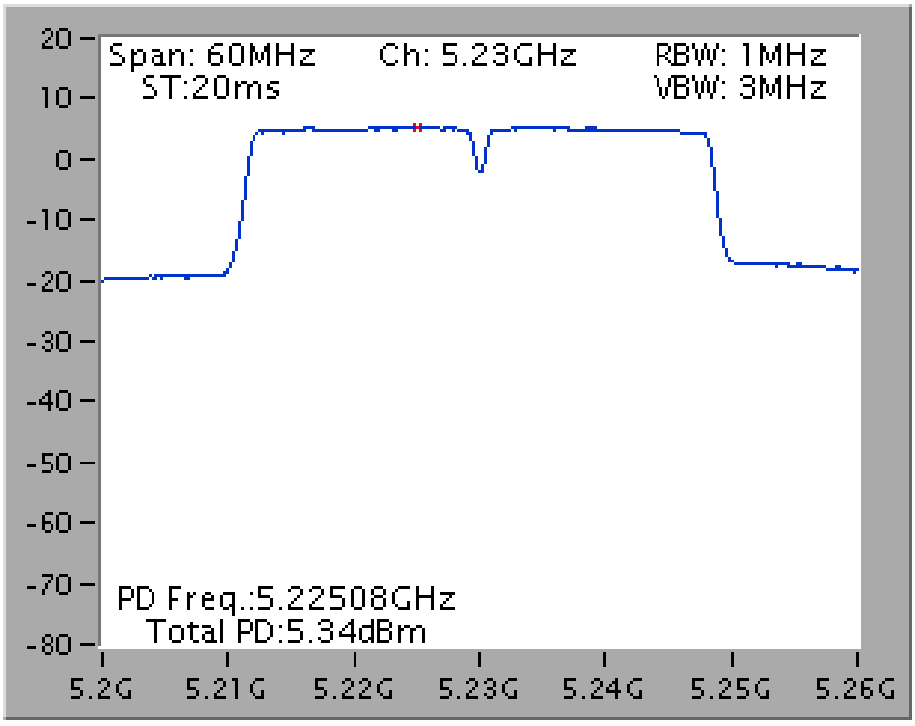
Date: 11.SEP.2014 11:06:44

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 2 / 5785 MHz

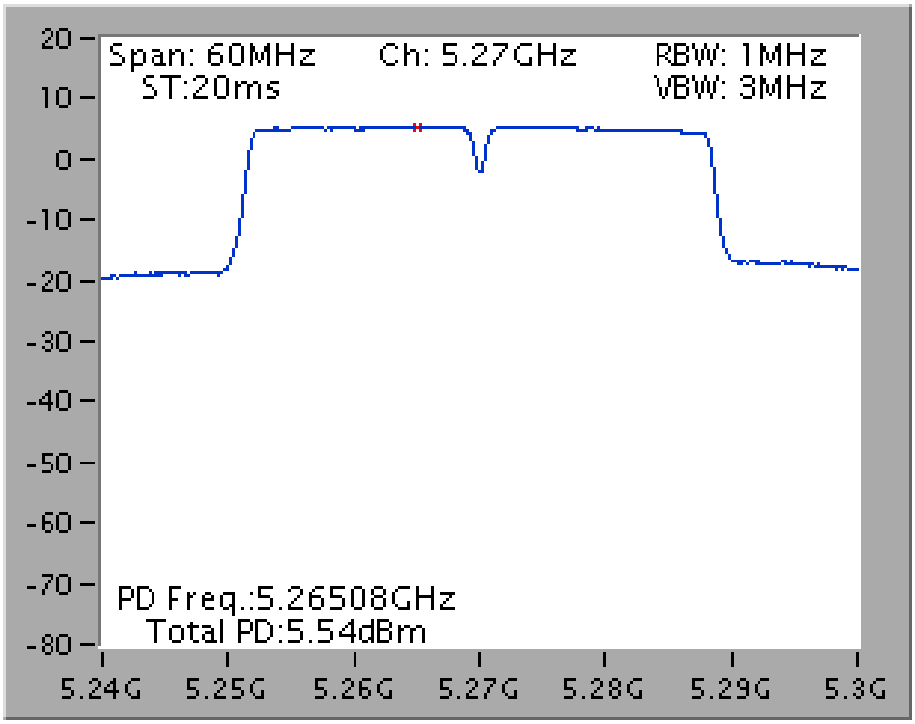


Date: 11.SEP.2014 11:23:38

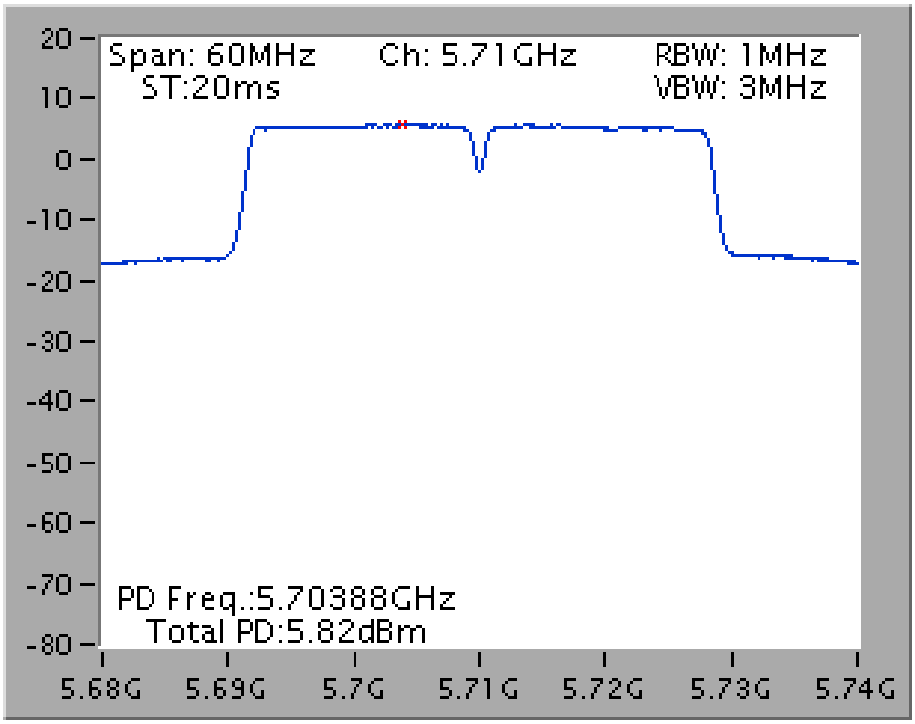
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 / 5230 MHz



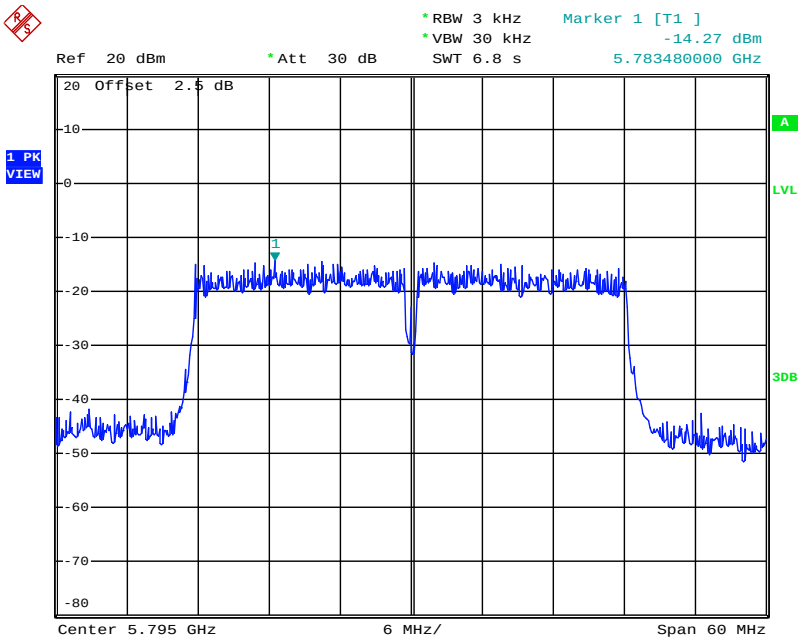
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 / 5270 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 / 5710 MHz

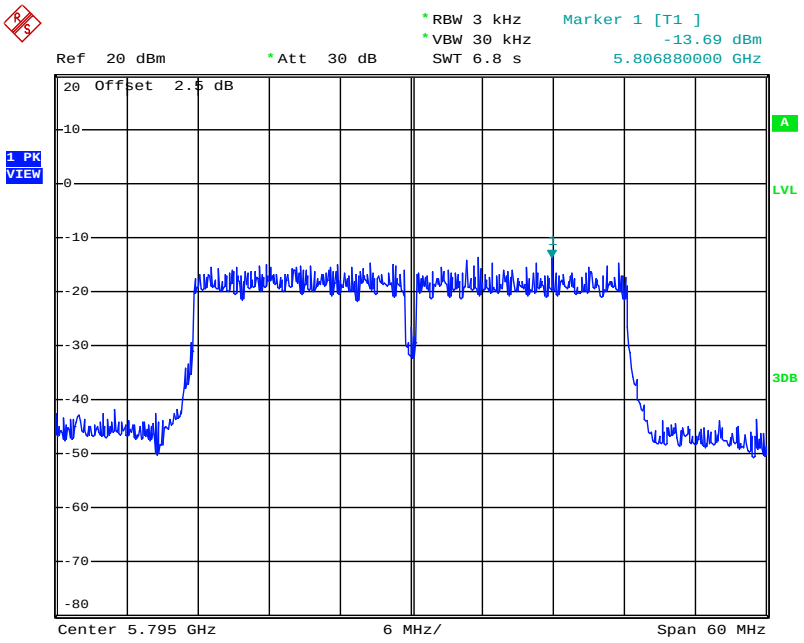


Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5795 MHz



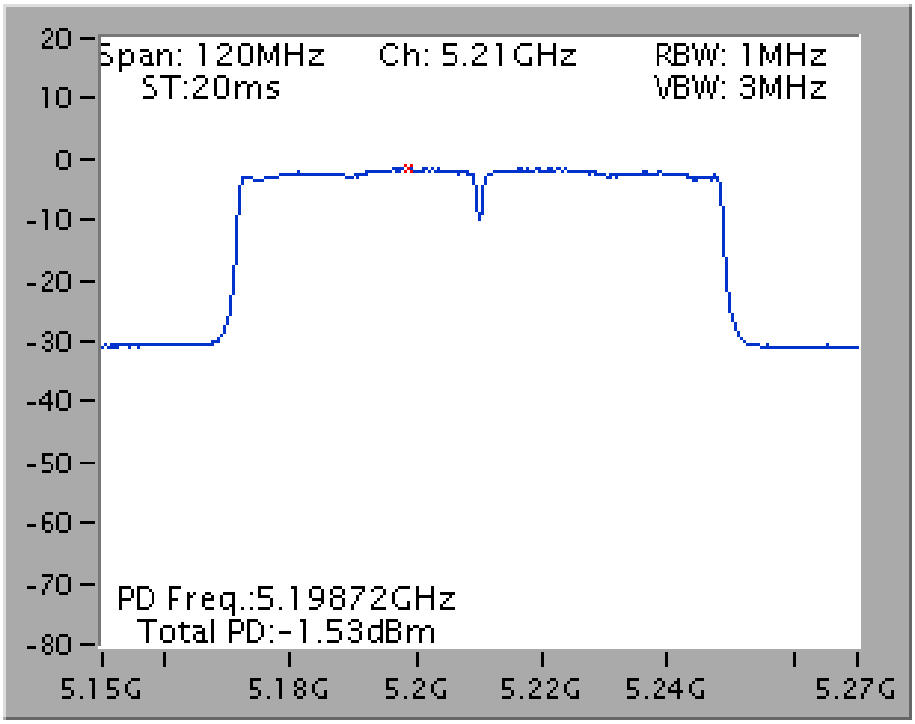
Date: 11.SEP.2014 11:15:39

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 2 / 5795 MHz

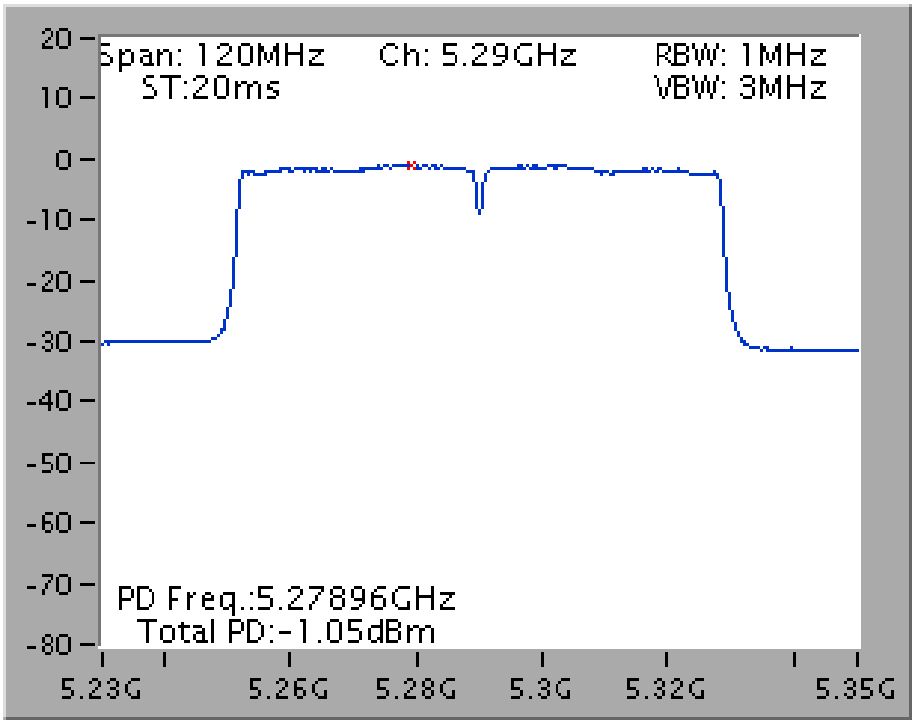


Date: 11.SEP.2014 11:21:31

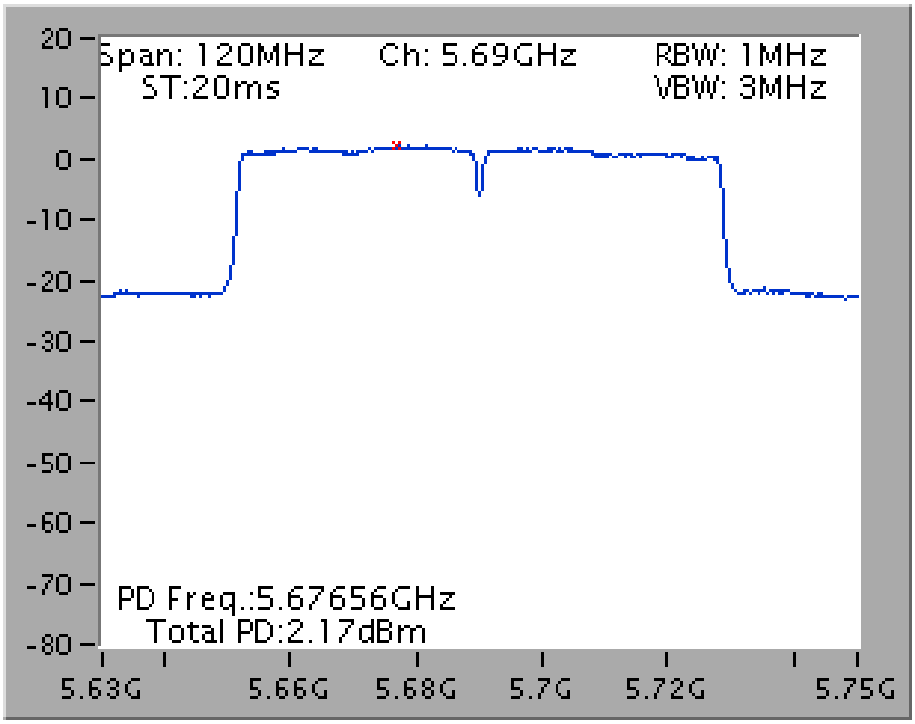
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 / 5210 MHz



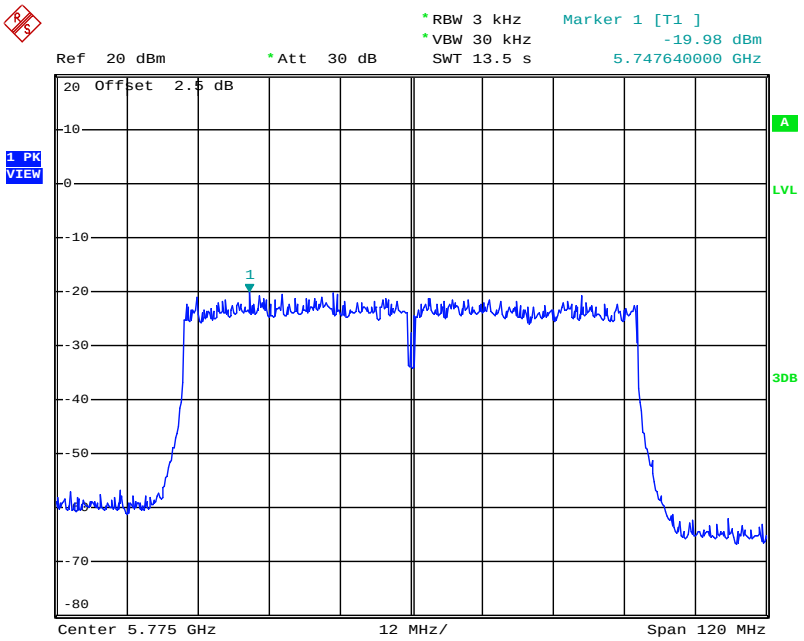
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 / 5290 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 / 5690 MHz

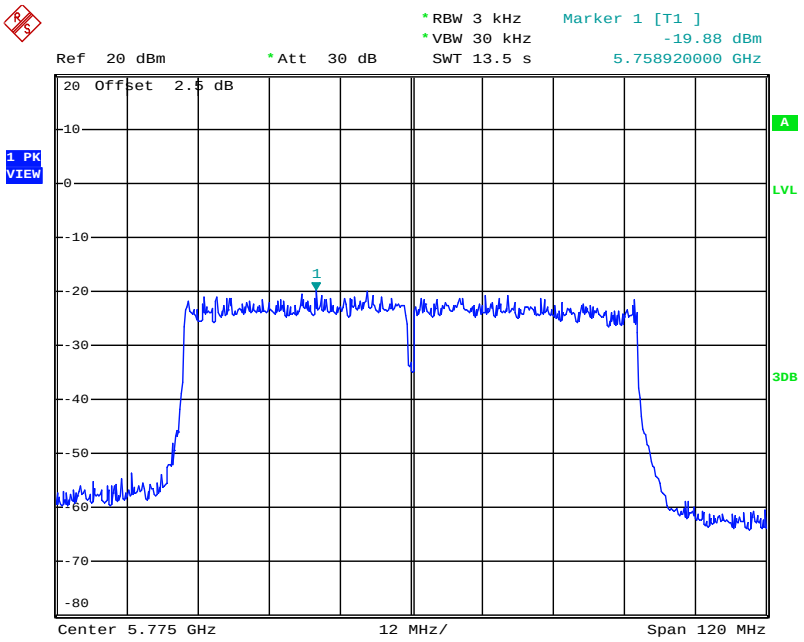


Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 / 5775 MHz



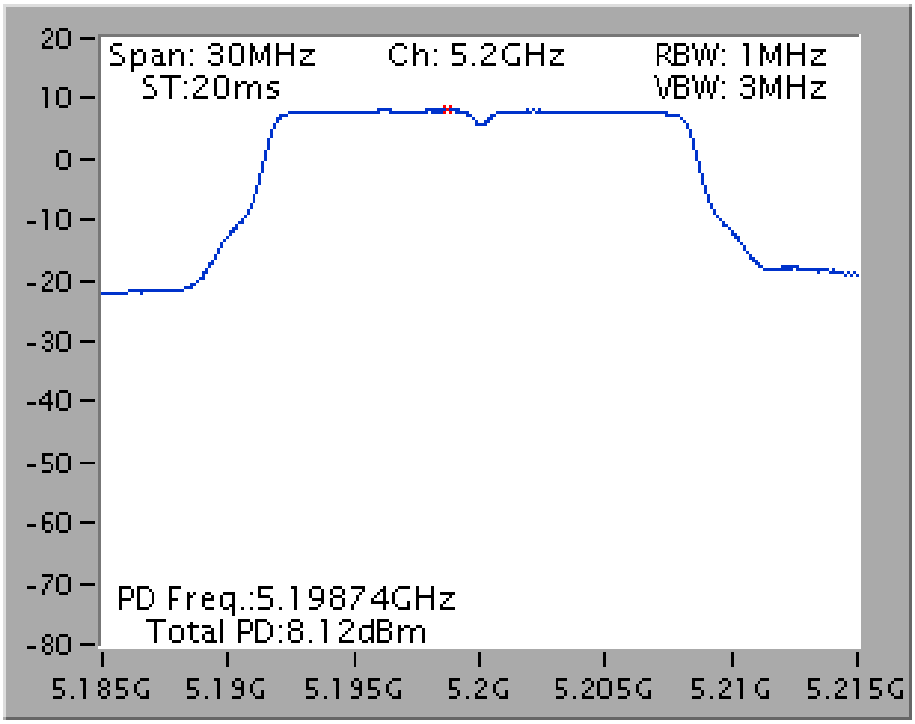
Date: 11.SEP.2014 11:17:08

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 2 / 5775 MHz

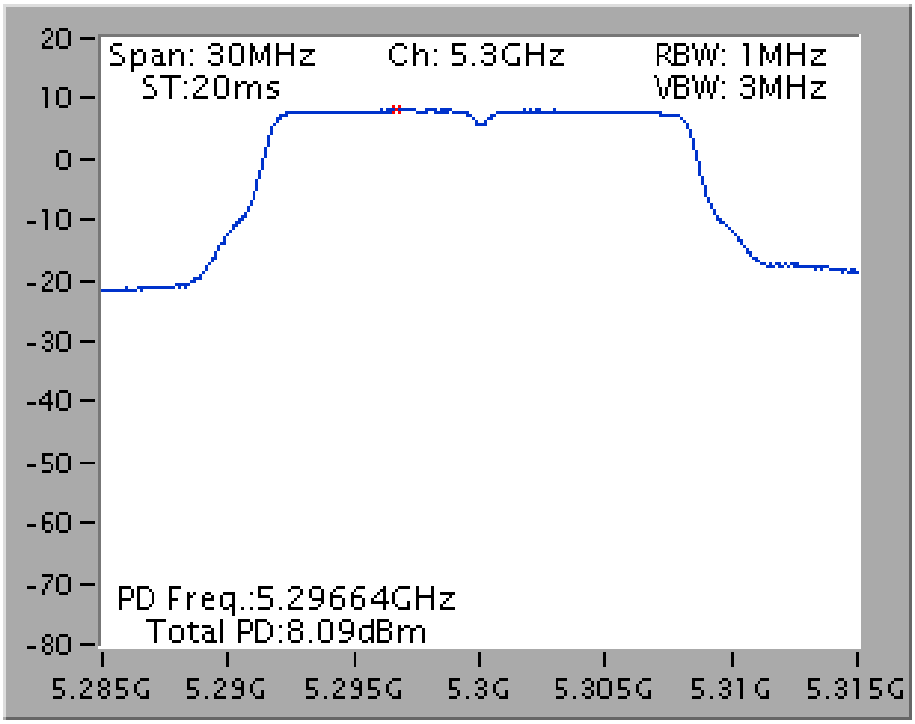


Date: 11.SEP.2014 11:18:53

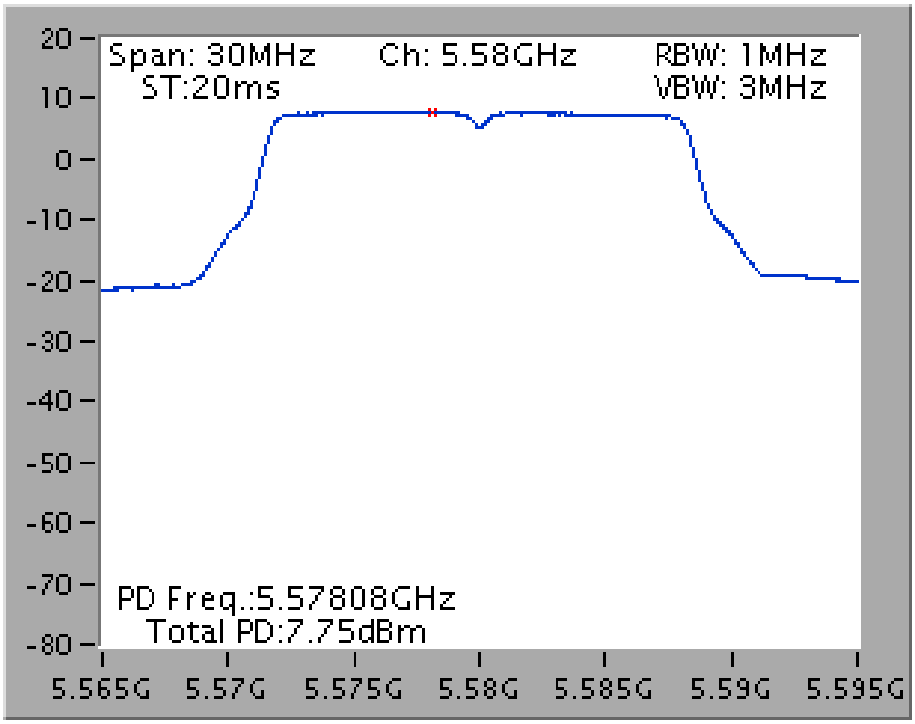
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 / 5200 MHz



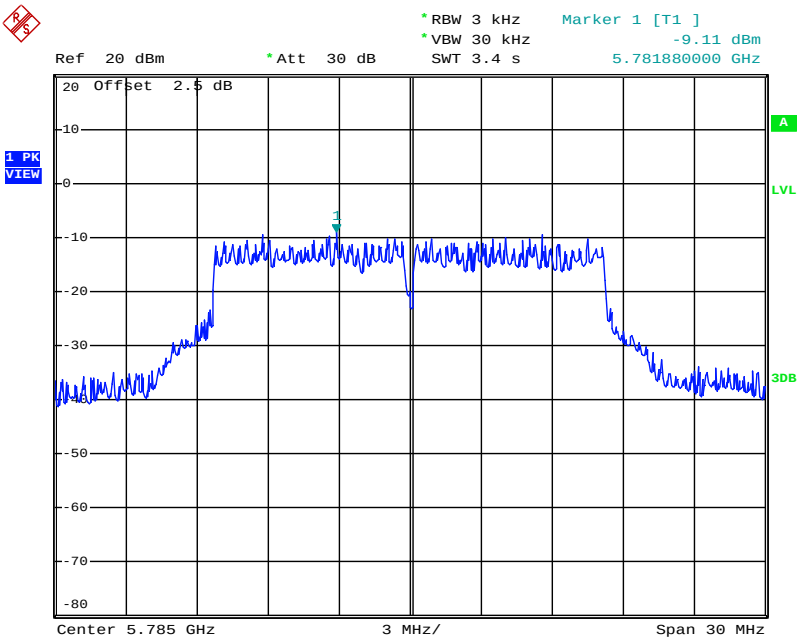
Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 / 5300 MHz



Power Density Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 / 5580 MHz

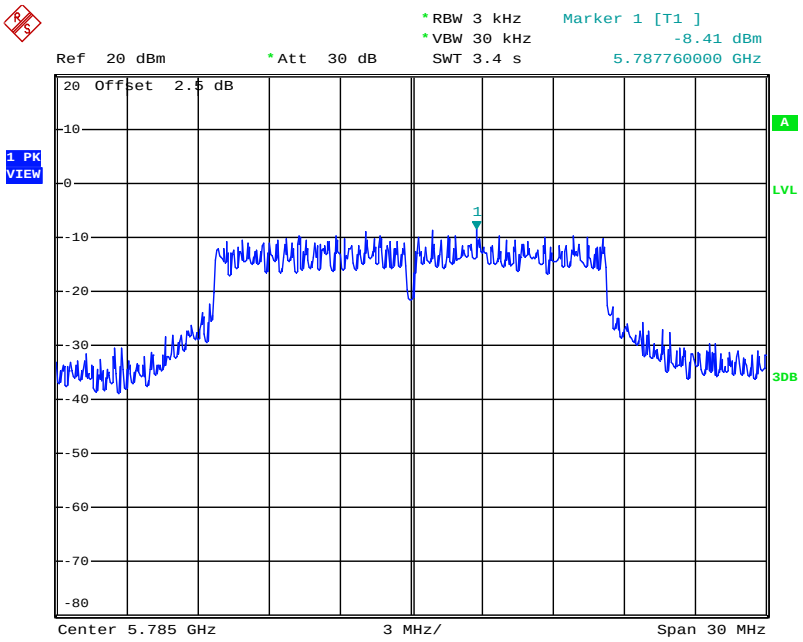


Power Density Plot on Configuration IEEE 802.11a / Chain 1 / 5785 MHz



Date: 11.SEP.2014 11:02:01

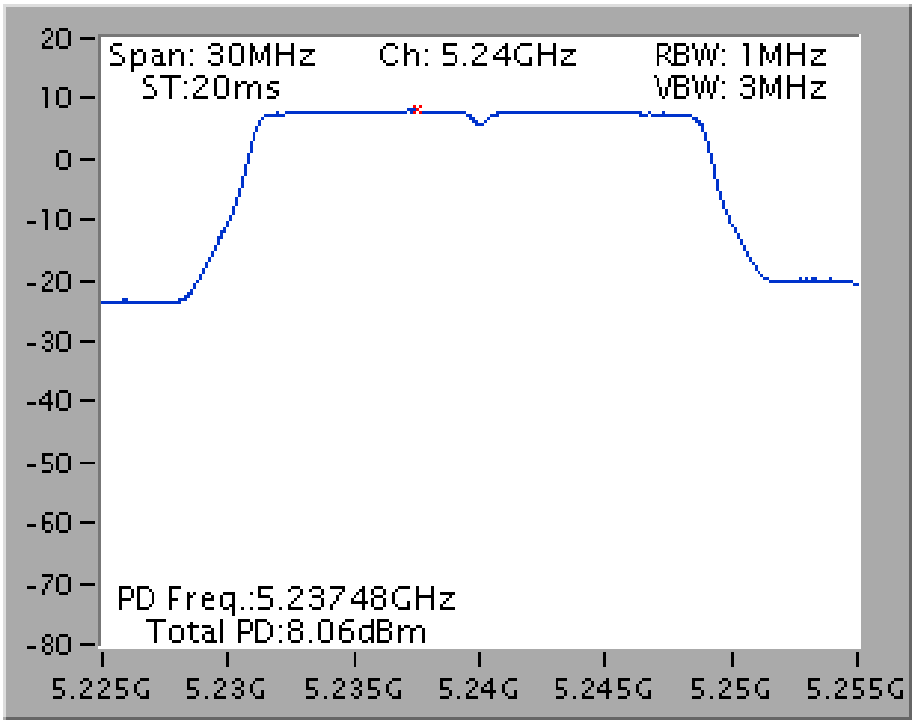
Power Density Plot on Configuration IEEE 802.11a / Chain 2 / 5785 MHz



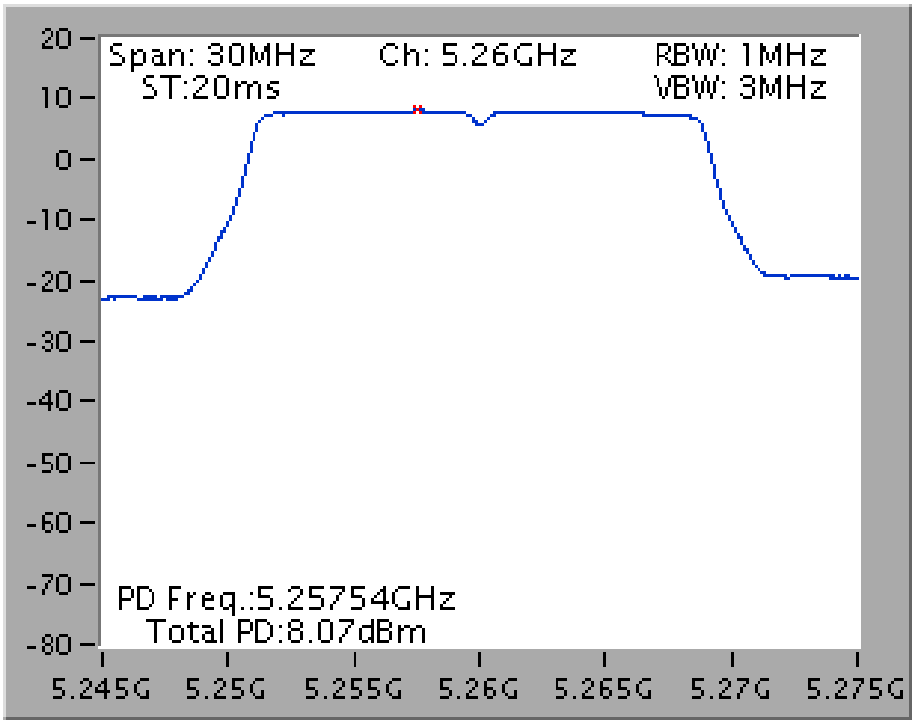
Date: 11.SEP.2014 11:27:46

For beamforming function:

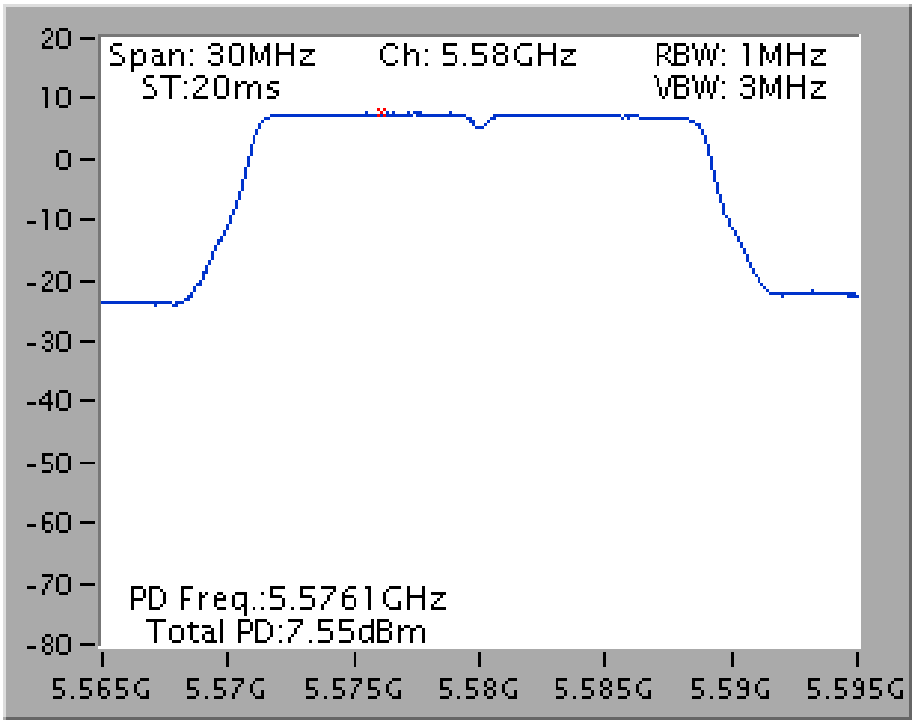
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 / 5240 MHz



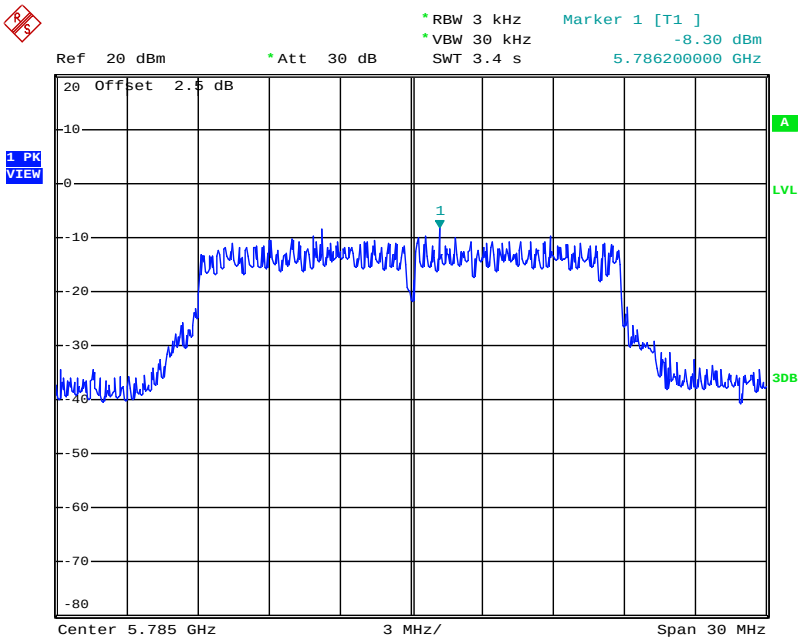
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 / 5260 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 + Chain 2 / 5580 MHz

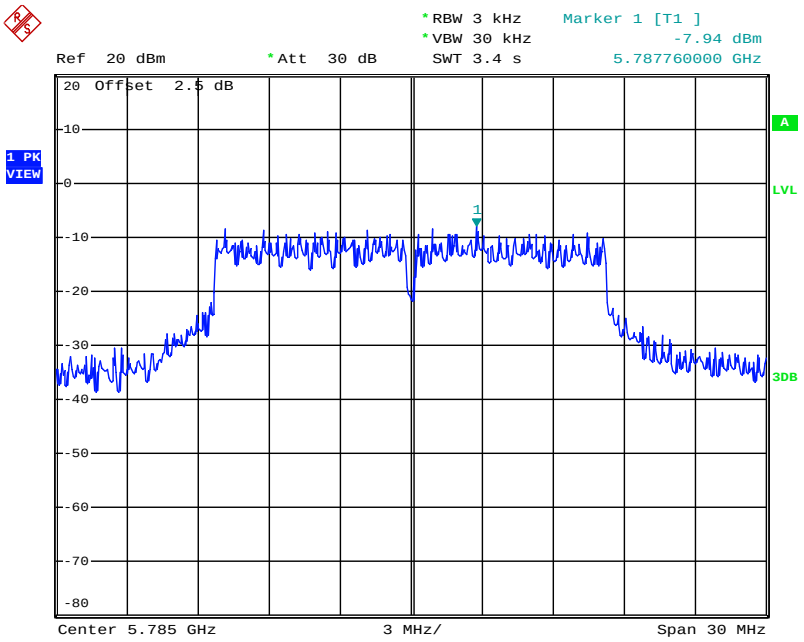


Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 1 / 5785 MHz



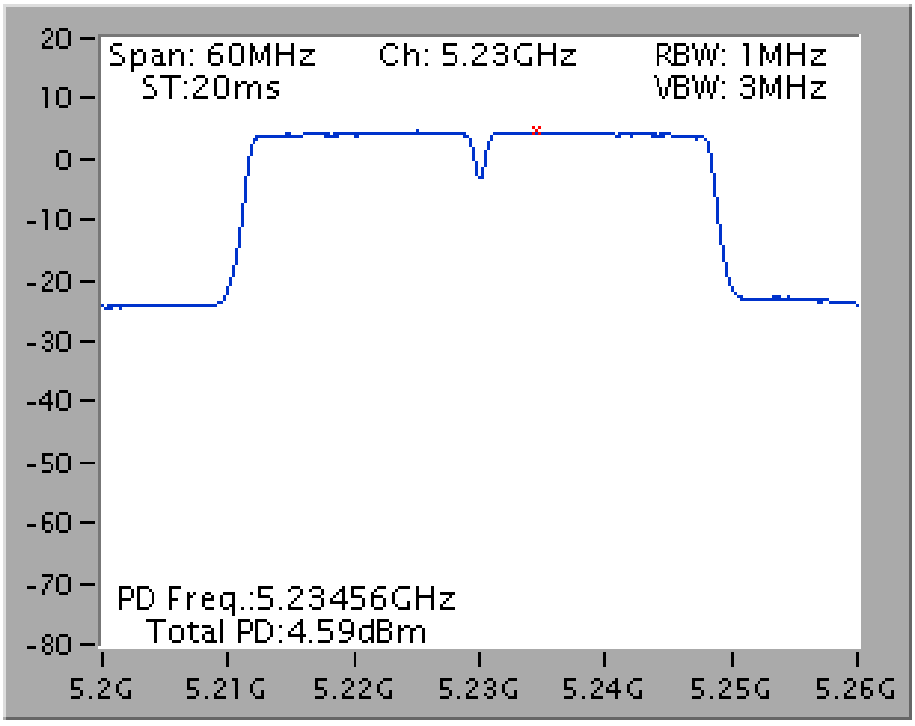
Date: 11.SEP.2014 14:35:49

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT20 / Chain 2 / 5785 MHz

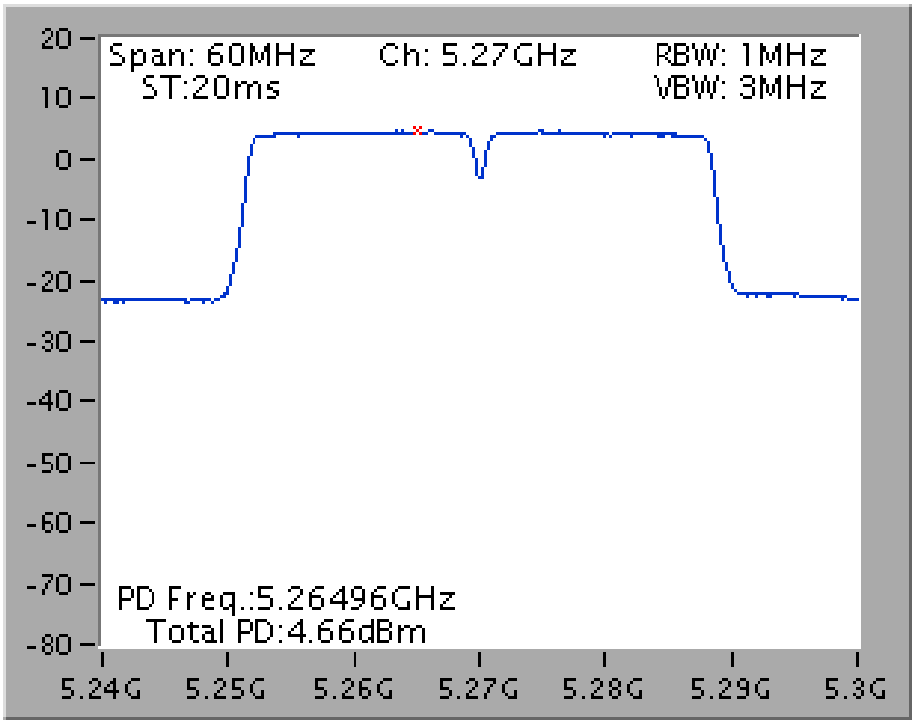


Date: 11.SEP.2014 14:10:33

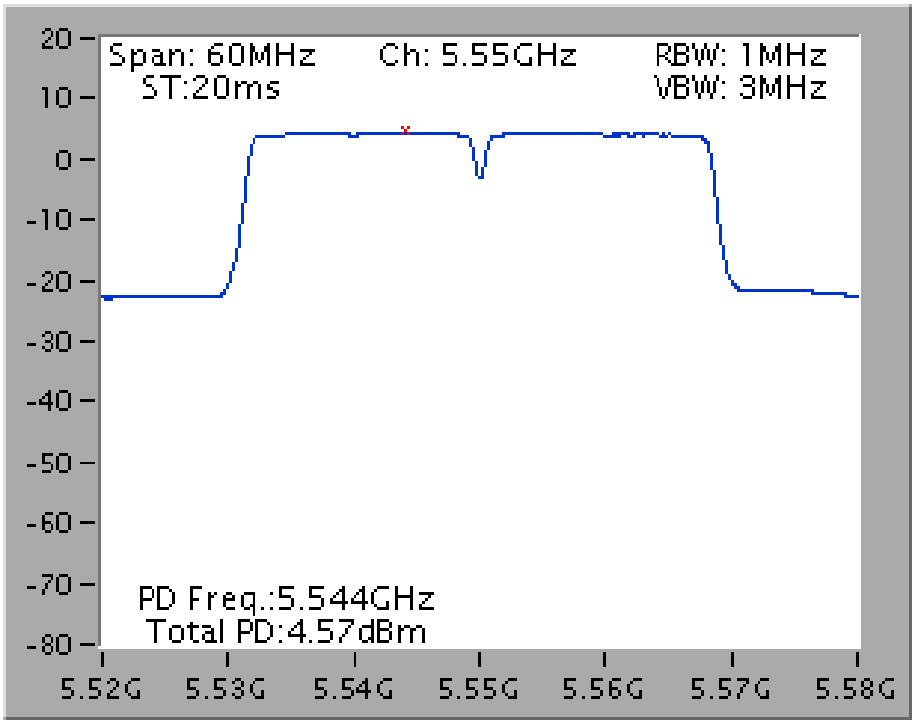
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 / 5230 MHz



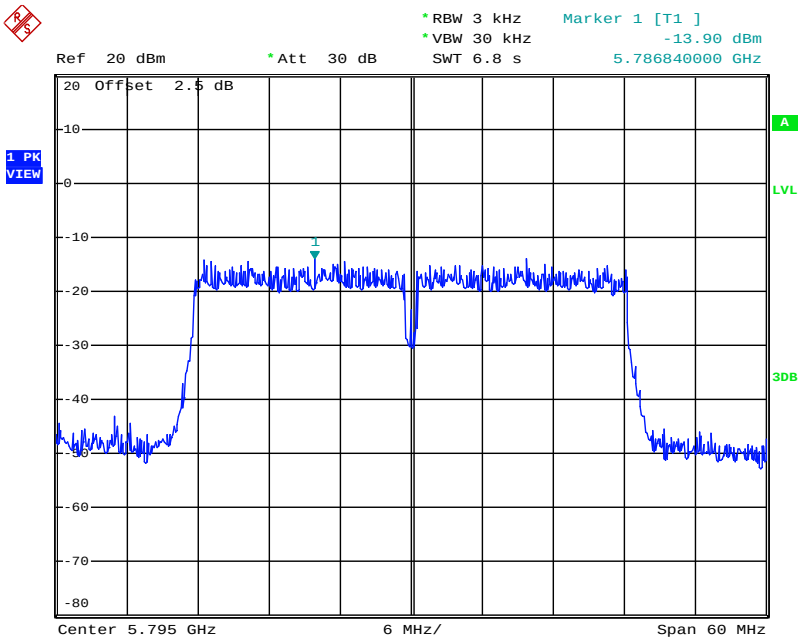
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 + Chain 2 / 5270 MHz



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

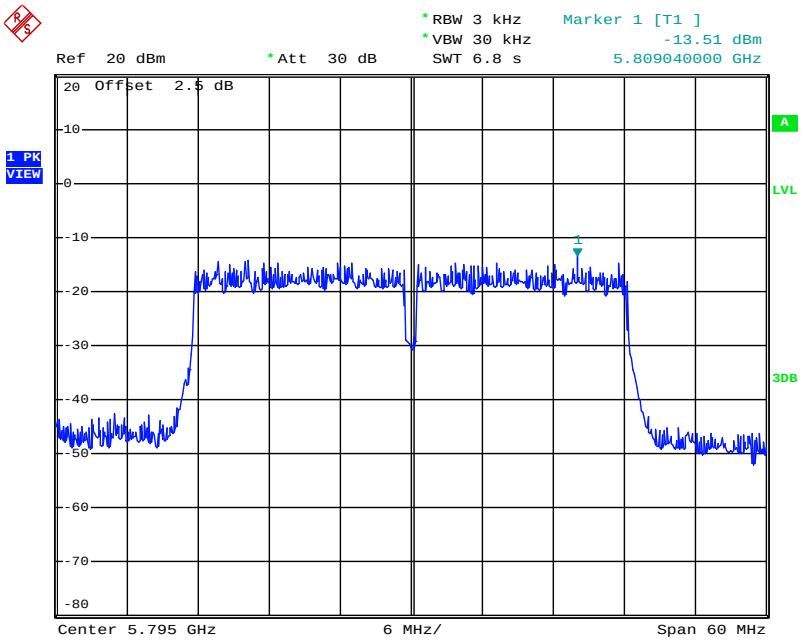


Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 1 / 5795 MHz



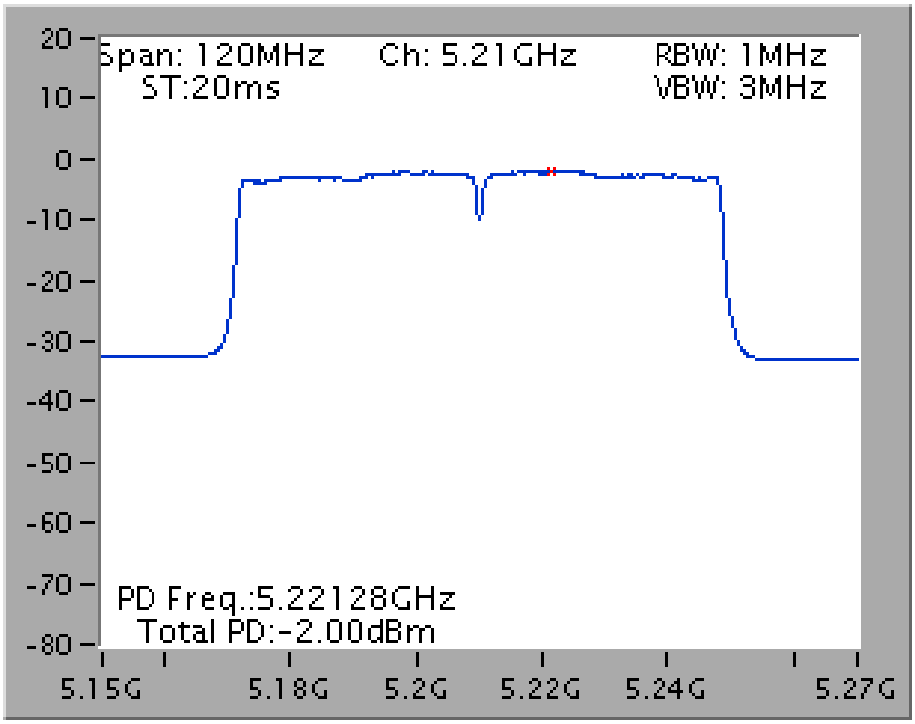
Date: 11.SEP.2014 14:29:25

Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT40 / Chain 2 / 5795 MHz

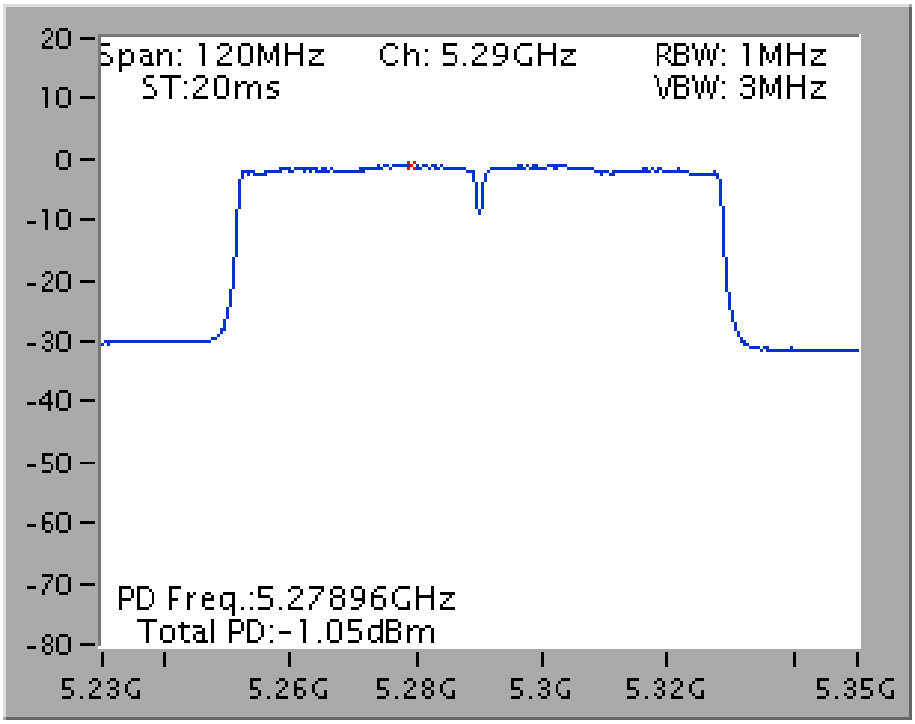


Date: 11.SEP.2014 14:27:34

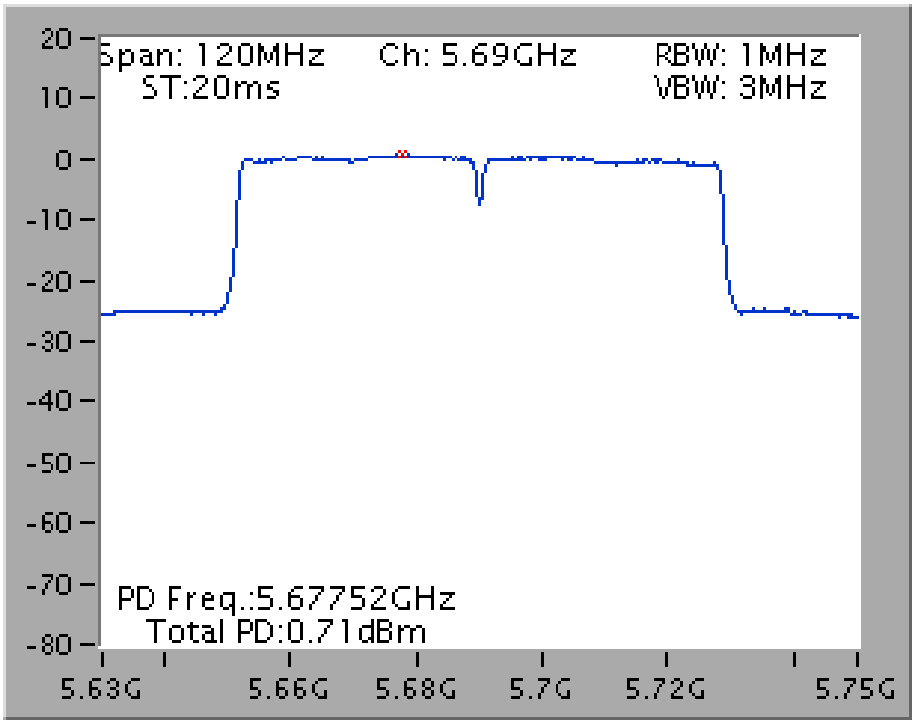
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 / 5210 MHz



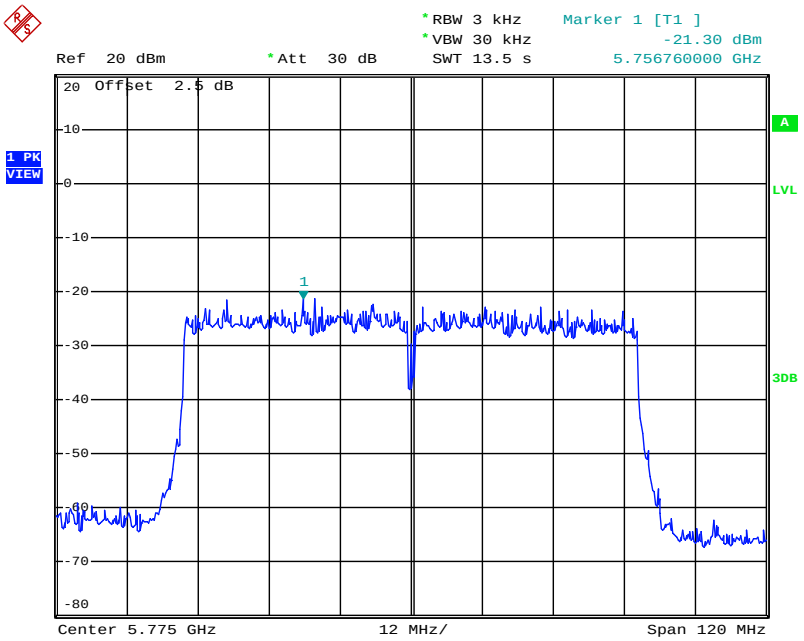
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 / 5290 MHz



Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 + Chain 2 / 5690 MHz

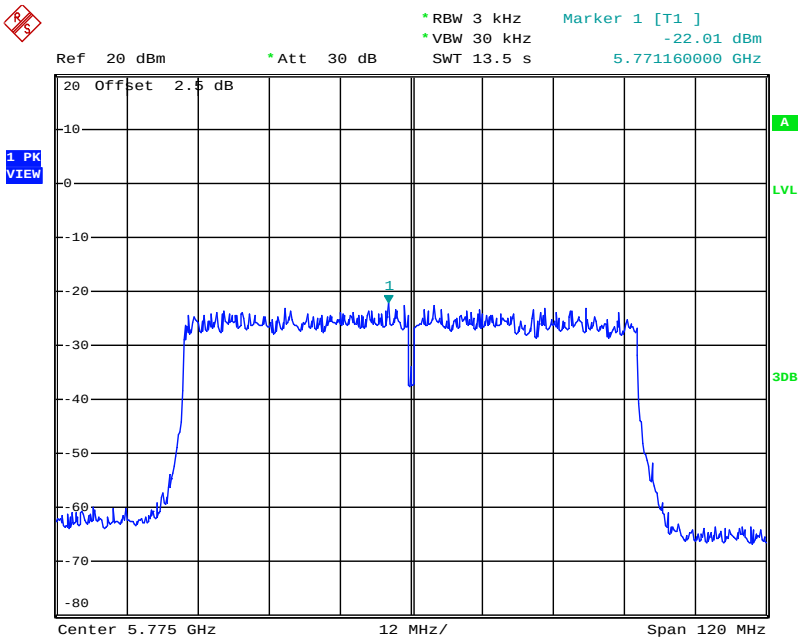


Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 1 / 5775 MHz



Date: 11.SEP.2014 14:33:20

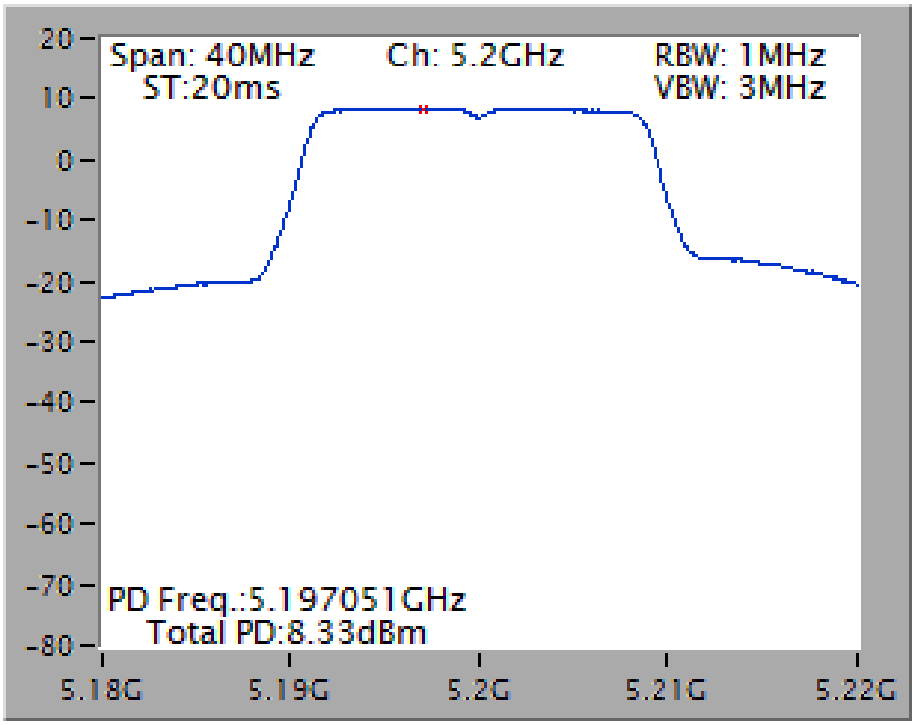
Power Density Plot on Configuration IEEE 802.11ac MCS0/Nss1 VHT80 / Chain 2 / 5775 MHz



Date: 11.SEP.2014 14:26:17

For beamforming function:

Power Density Plot on Configuration 802.11n MCS0 HT20 / Chain 1 + Chain 2 / 5200 MHz



4.6. Radiated Emissions Measurement

4.6.1. Limit

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

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

For transmitters operating in the 5.725-5.85 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz.

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

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

4.6.2. Measuring Instruments and Setting

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

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

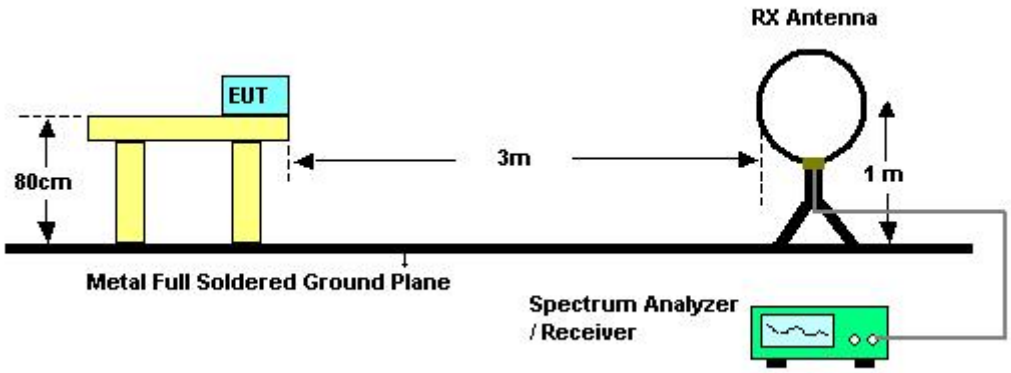
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.6.3. Test Procedures

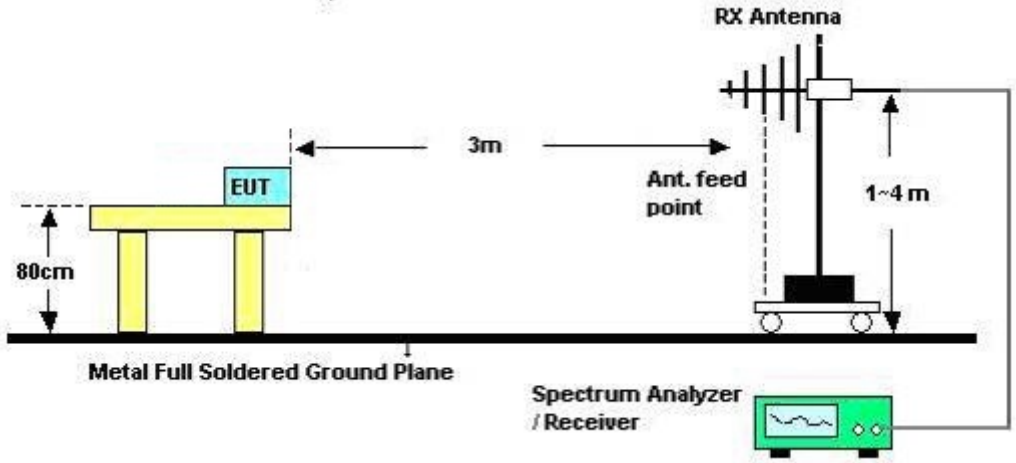
1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 1.5 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting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

4.6.4. Test Setup Layout

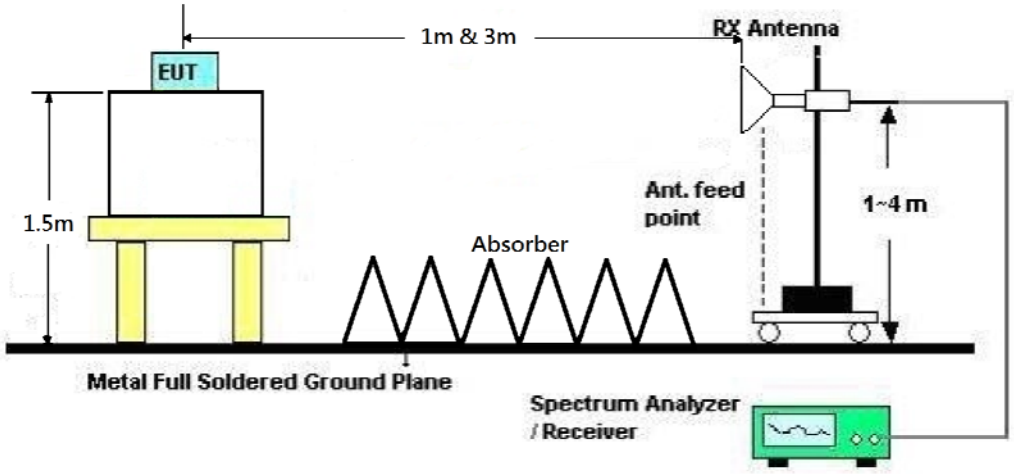
For Radiated Emissions: 9kHz ~30MHz



For Radiated Emissions: 30MHz~1GHz



For Radiated Emissions: Above 1GHz



4.6.5. Test Deviation

There is no deviation with the original standard.

4.6.6. EUT Operation during Test

For non-beamforming function and STBC function:

The EUT was programmed to be in continuously transmitting mode.

For beamforming function:

The EUT was programmed to be in beamforming transmitting mode.

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

Temperature	24°C	Humidity	52%
Test Engineer	Luke Hsieh / Stim Song	Configurations	Normal Link
Test Date	Jan. 07, 2016	Test Mode	Mode 9

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

Note:

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

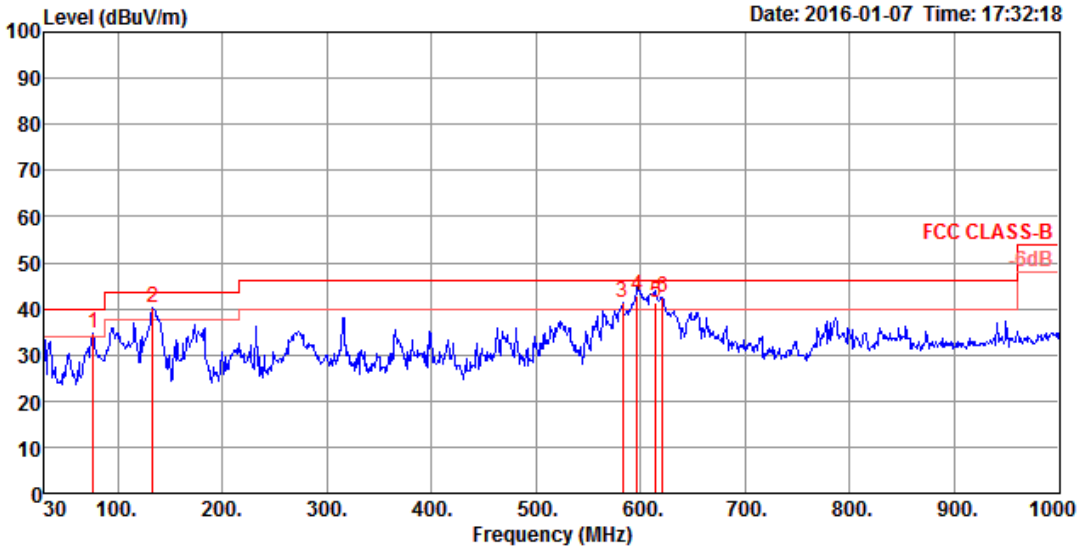
Distance extrapolation factor = 40 log (specific distance / test distance) (dB);

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

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

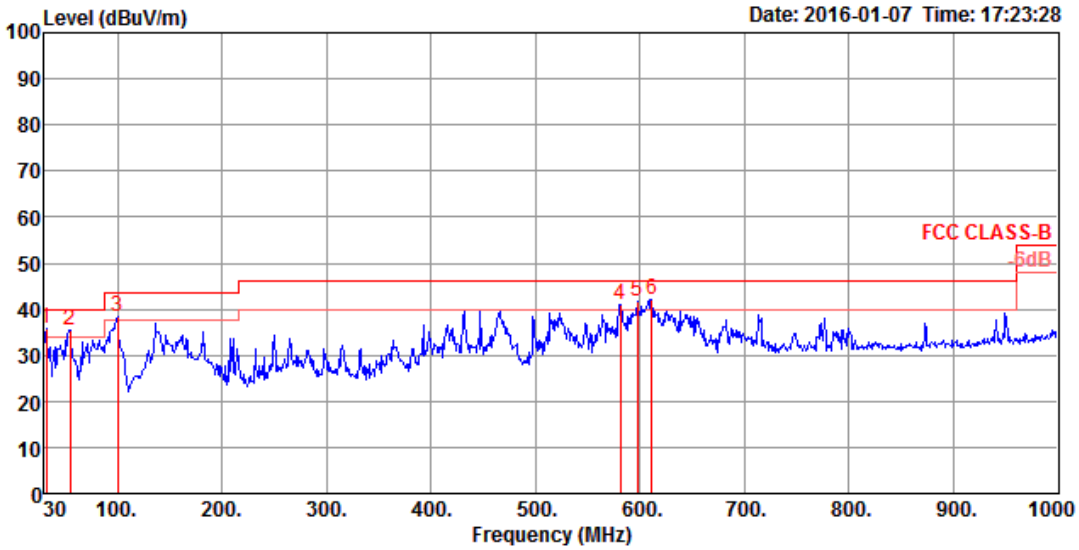
Temperature	24°C	Humidity	52%
Test Engineer	Luke Hsieh / Stim Song	Configurations	Normal Link
Test Mode	Mode 9		

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	76.56	34.65	40.00	-5.35	52.93	0.76	13.36	32.40	125	169	Peak	HORIZONTAL
2	133.79	40.16	43.50	-3.34	52.96	0.99	18.57	32.36	125	292	Peak	HORIZONTAL
3	582.90	41.20	46.00	-4.80	46.31	2.09	25.20	32.40	100	304	Peak	HORIZONTAL
4	596.48	42.96	46.00	-3.04	47.87	2.12	25.38	32.41	114	174	QP	HORIZONTAL
5	614.91	41.24	46.00	-4.76	45.89	2.14	25.61	32.40	123	166	QP	HORIZONTAL
6	620.73	42.39	46.00	-3.61	46.94	2.15	25.70	32.40	100	319	Peak	HORIZONTAL

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	A/Pos	T/Pos	Remark	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB	cm	deg		
1	31.94	35.78	40.00	-4.22	43.02	0.50	24.66	32.40	100	266	Peak	VERTICAL
2	54.25	35.49	40.00	-4.51	52.89	0.64	14.37	32.41	100	234	Peak	VERTICAL
3	99.84	38.33	43.50	-5.17	52.26	0.86	17.60	32.39	100	3	Peak	VERTICAL
4	580.96	41.07	46.00	-4.93	46.21	2.09	25.17	32.40	125	291	Peak	VERTICAL
5	597.45	41.60	46.00	-4.40	46.51	2.12	25.38	32.41	100	164	Peak	VERTICAL
6	611.03	42.18	46.00	-3.82	46.86	2.14	25.58	32.40	100	164	Peak	VERTICAL

Note:

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

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

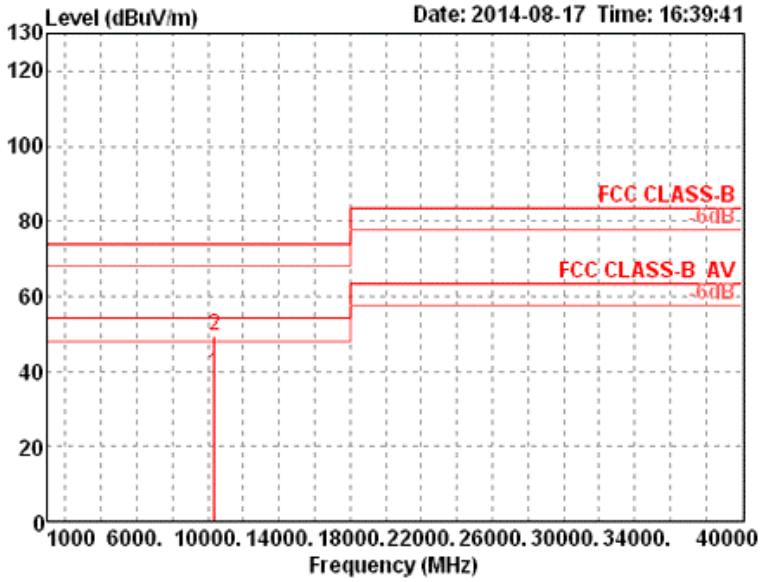
Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level.

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

For Non-beamforming function:

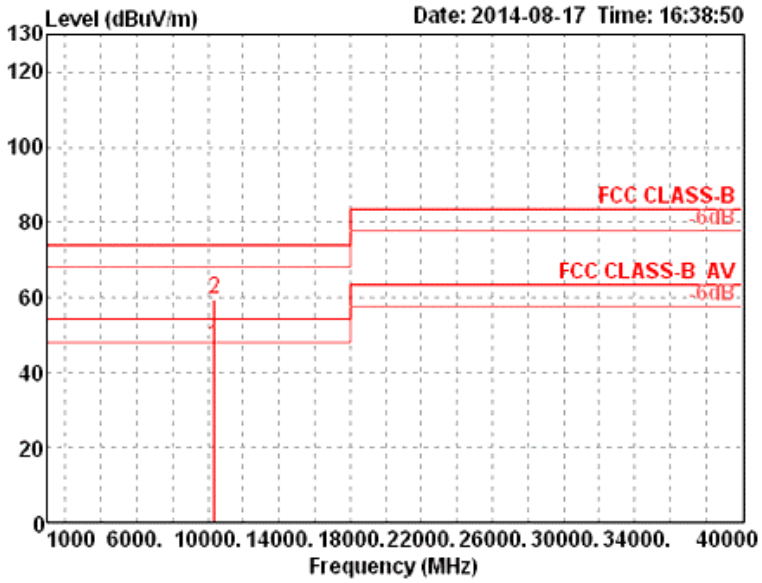
Temperature	23℃	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 36 / Chain 1 + Chain 2

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10361.50	39.39	54.00	-14.61	30.82	4.97	39.01	35.41	Average	150	117	HORIZONTAL
2	10362.40	49.53	74.00	-24.47	40.96	4.97	39.01	35.41	Peak	150	117	HORIZONTAL

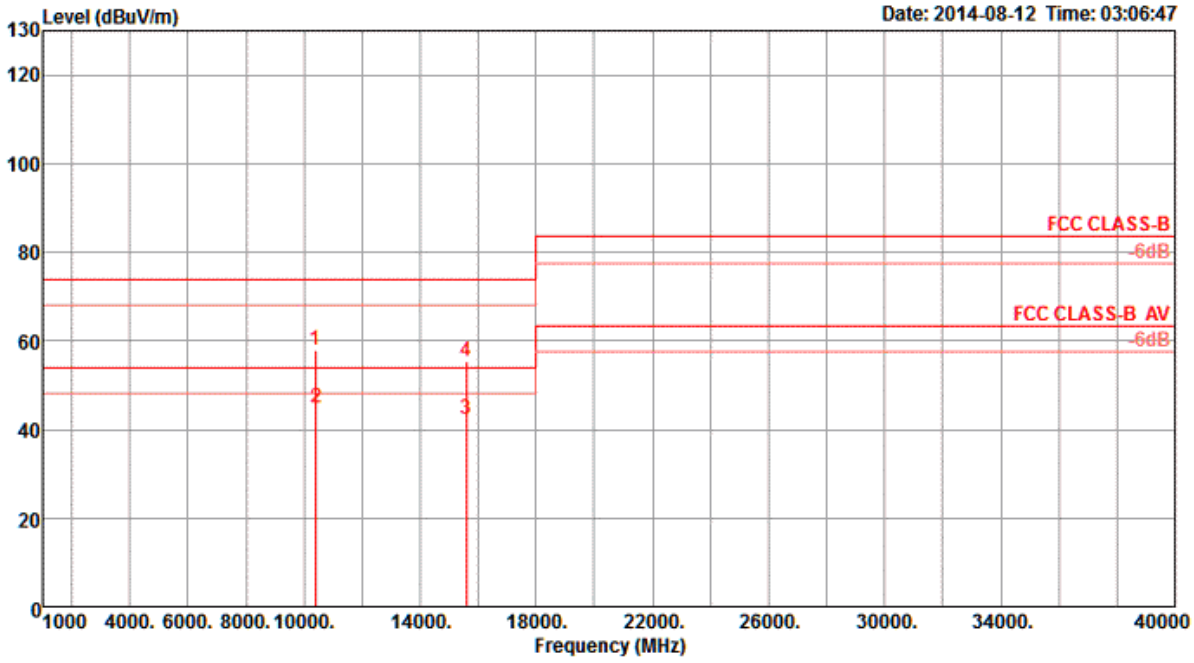
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10359.88	46.77	54.00	-7.23	38.20	4.97	39.01	35.41	Average	157	65	VERTICAL
2	10367.14	59.43	74.00	-14.57	50.86	4.97	39.01	35.41	Peak	157	65	VERTICAL

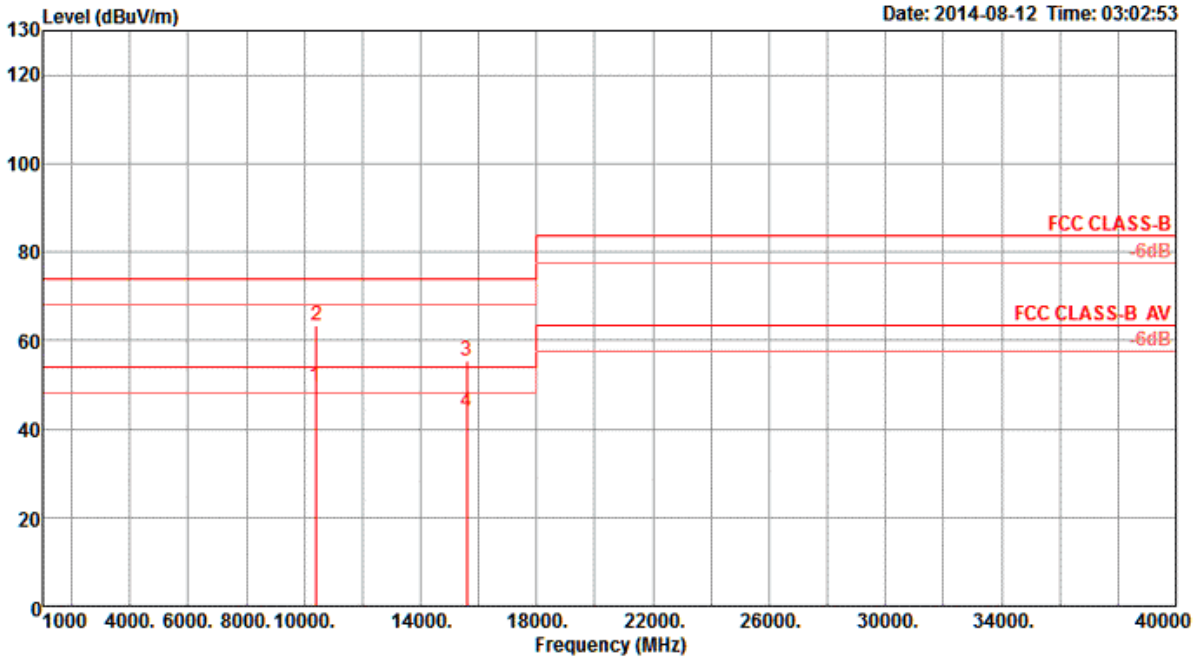
Temperature	23℃	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 40 / Chain 1 + Chain 2

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Pol/Phase	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10394.96	58.05	74.00	-15.95	48.31	6.56	38.34	35.16	HORIZONTAL	158	295	Peak
2	10404.60	44.78	54.00	-9.22	35.02	6.56	38.34	35.14	HORIZONTAL	158	295	Average
3	15599.88	42.38	54.00	-11.62	30.67	7.88	38.62	34.79	HORIZONTAL	100	107	Average
4	15600.52	55.50	74.00	-18.50	43.79	7.88	38.62	34.79	HORIZONTAL	100	107	Peak

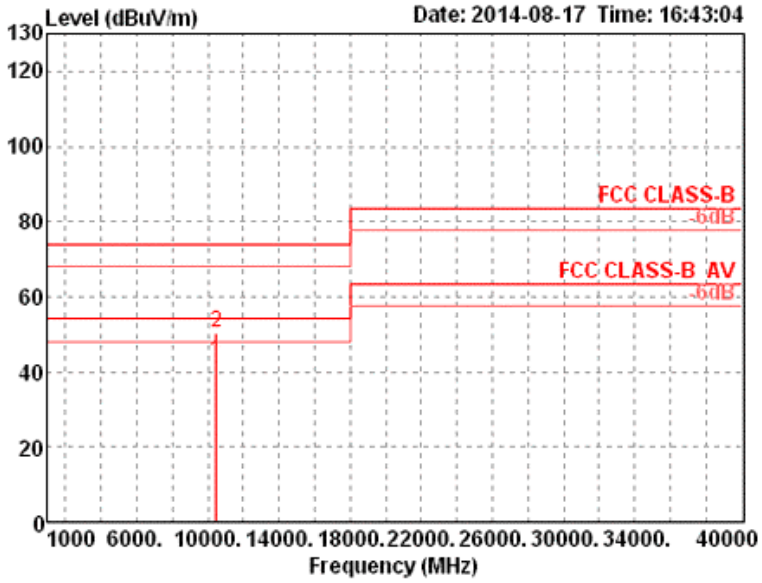
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Pol/Phase	A/Pos	T/Pos	Remark
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10400.52	49.67	54.00	-4.33	39.91	6.56	38.34	35.14	VERTICAL	101	224	Average
2	10405.88	63.21	74.00	-10.79	53.45	6.56	38.34	35.14	VERTICAL	101	224	Peak
3	15591.88	55.47	74.00	-18.53	43.74	7.87	38.63	34.77	VERTICAL	100	269	Peak
4	15601.52	43.68	54.00	-10.32	31.97	7.88	38.62	34.79	VERTICAL	100	269	Average

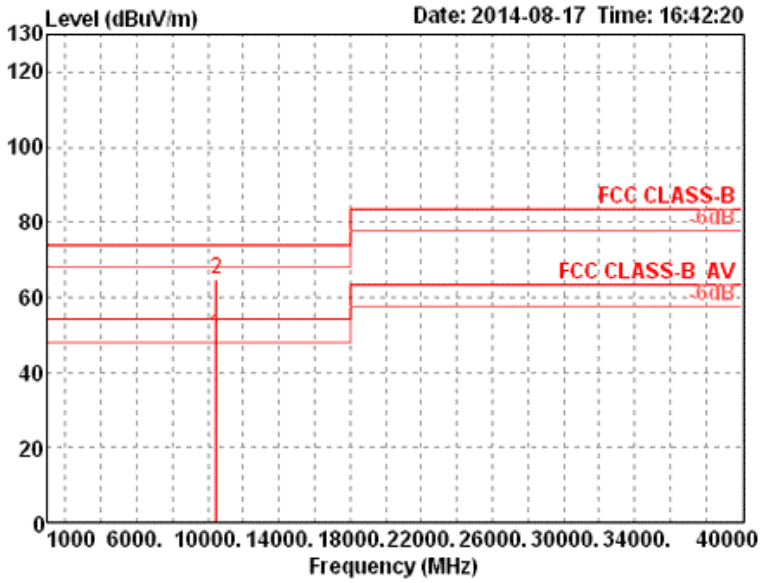
Temperature	23℃	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 48 / Chain 1 + Chain 2

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10481.26	42.46	54.00	-11.54	33.87	5.00	38.91	35.32	Average	178	197	HORIZONTAL
2	10489.84	50.30	74.00	-23.70	41.71	5.00	38.91	35.32	Peak	178	197	HORIZONTAL

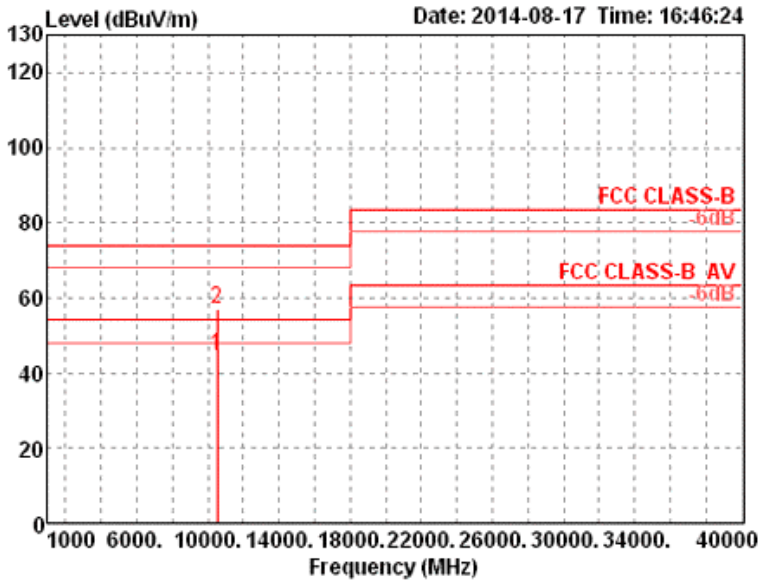
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10479.46	49.87	54.00	-4.13	41.28	5.00	38.91	35.32	Average	150	141	VERTICAL
2	10479.70	64.53	74.00	-9.47	55.94	5.00	38.91	35.32	Peak	150	141	VERTICAL

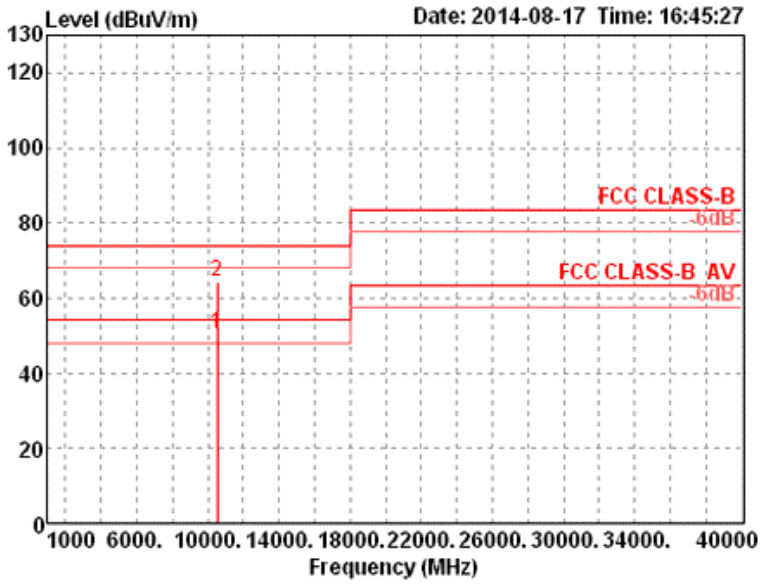
Temperature	23℃	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 52 / Chain 1 + Chain 2

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10520.78	44.53	54.00	-9.47	35.92	5.01	38.90	35.30	Average	151	150	HORIZONTAL
2	10526.00	57.10	74.00	-16.90	48.47	5.01	38.90	35.28	Peak	151	150	HORIZONTAL

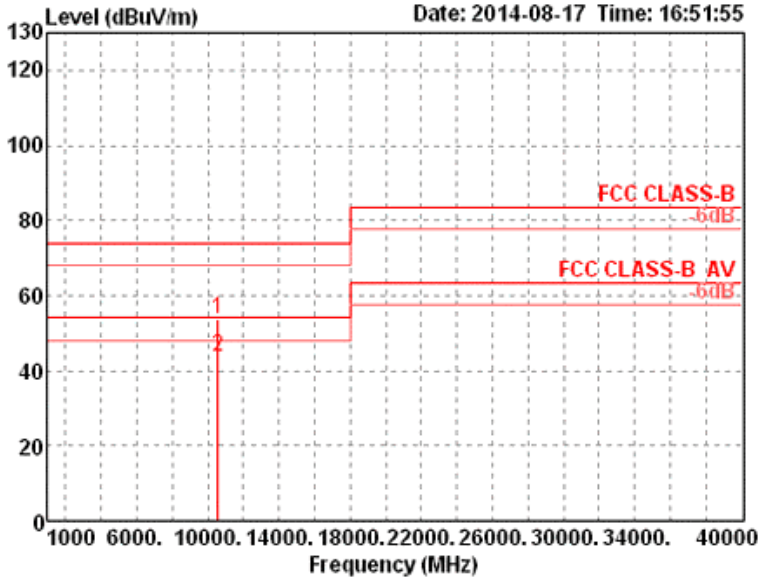
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10519.76	50.31	54.00	-3.69	41.70	5.01	38.90	35.30	Average	150	63	VERTICAL
2	10522.34	64.14	74.00	-9.86	55.53	5.01	38.90	35.30	Peak	150	63	VERTICAL

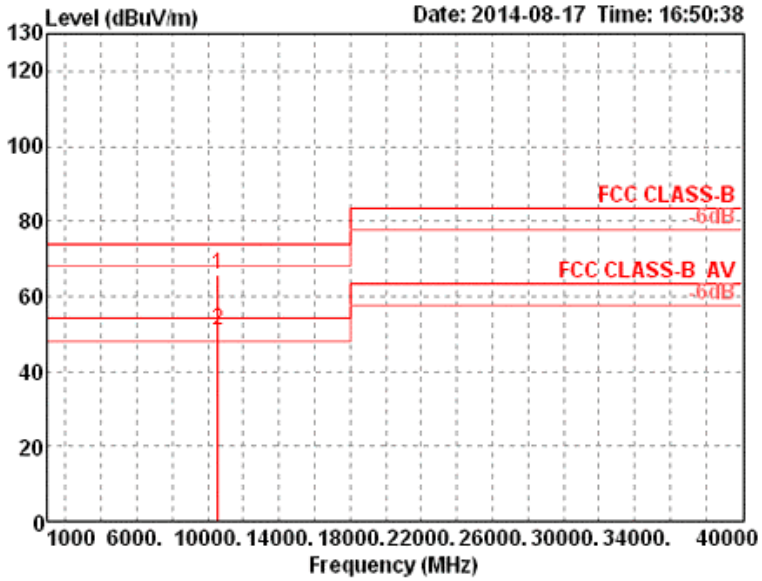
Temperature	23℃	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 60 / Chain 1 + Chain 2

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10597.18	53.51	74.00	-20.49	44.83	5.01	38.92	35.25	Peak	157	299	HORIZONTAL
2	10597.72	43.70	54.00	-10.30	35.02	5.01	38.92	35.25	Average	157	299	HORIZONTAL

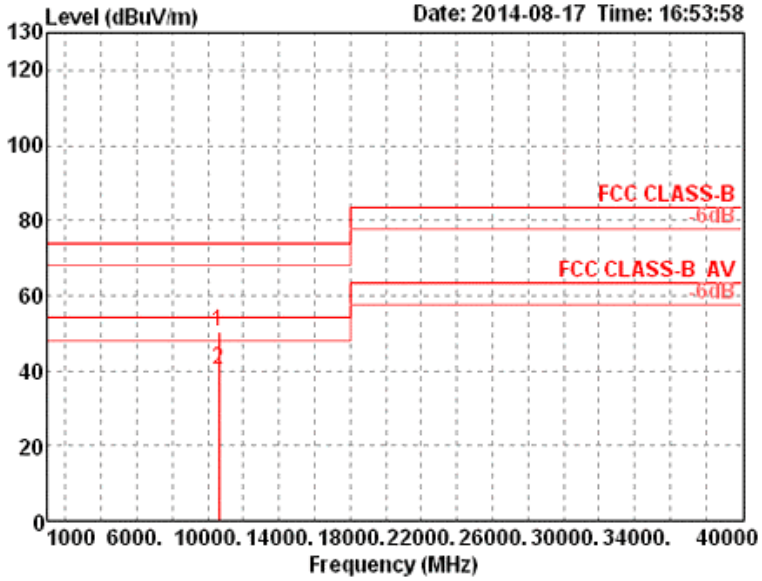
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10597.84	65.85	74.00	-8.15	57.17	5.01	38.92	35.25	Peak	155	143	VERTICAL
2	10599.82	51.04	54.00	-2.96	42.36	5.01	38.92	35.25	Average	155	143	VERTICAL

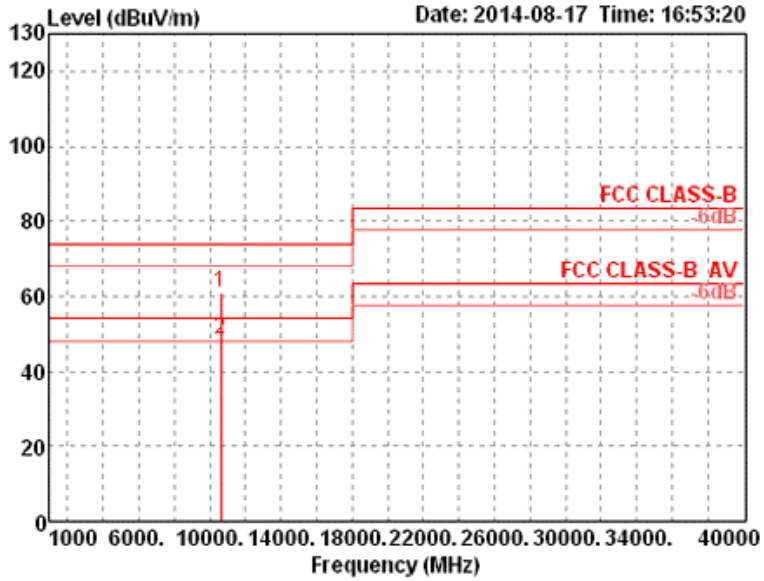
Temperature	23℃	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 64 / Chain 1 + Chain 2

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10625.06	50.27	74.00	-23.73	41.57	5.01	38.92	35.23	Peak	147	55	HORIZONTAL
2	10640.48	40.19	54.00	-13.81	31.47	5.01	38.93	35.22	Average	147	55	HORIZONTAL

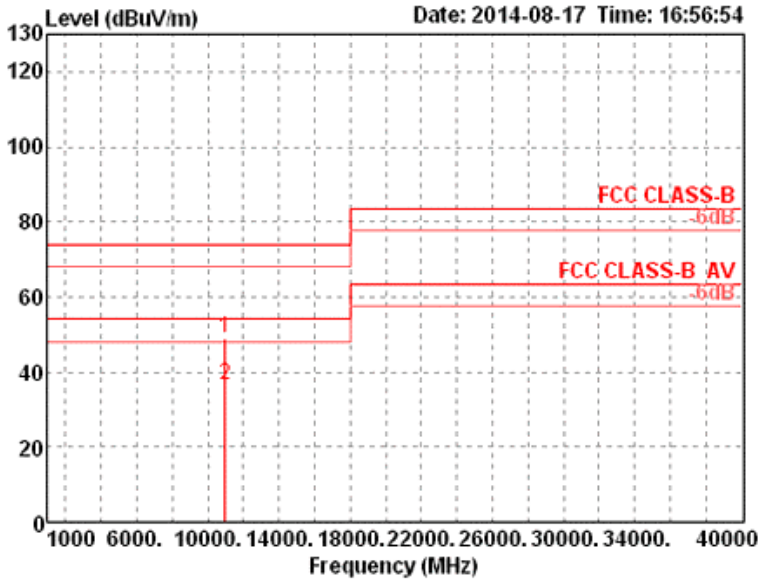
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10637.00	60.71	74.00	-13.29	51.99	5.01	38.93	35.22	Peak	146	65	VERTICAL
2	10639.88	48.38	54.00	-5.62	39.66	5.01	38.93	35.22	Average	146	65	VERTICAL

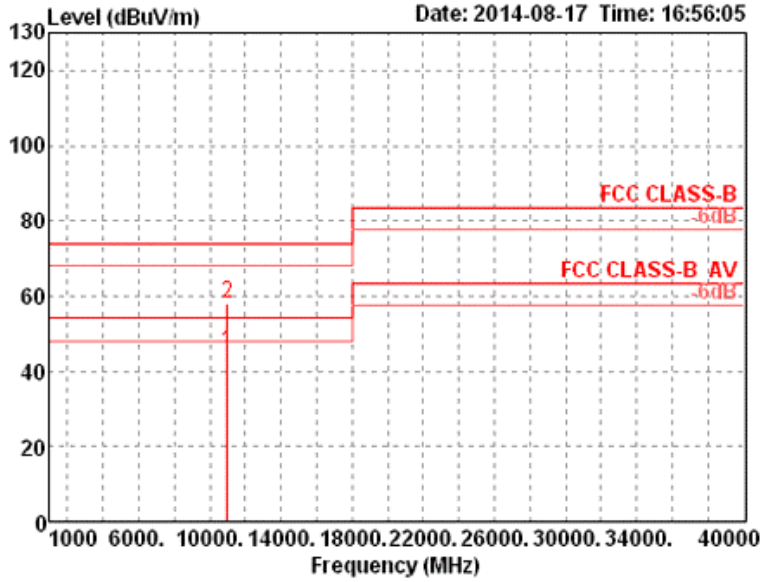
Temperature	23℃	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 100 / Chain 1 + Chain 2

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10985.48	49.04	74.00	-24.96	40.01	5.01	39.00	34.98	Peak	145	132	HORIZONTAL
2	11001.86	36.60	54.00	-17.40	27.57	5.01	39.00	34.98	Average	145	132	HORIZONTAL

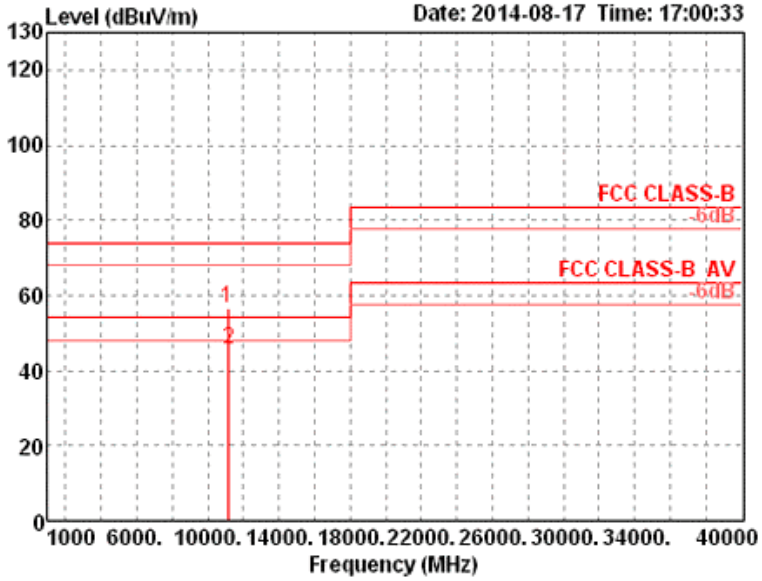
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11000.54	44.88	54.00	-9.12	35.85	5.01	39.00	34.98	Average	145	148	VERTICAL
2	11005.82	58.01	74.00	-15.99	48.97	5.01	39.01	34.98	Peak	145	148	VERTICAL

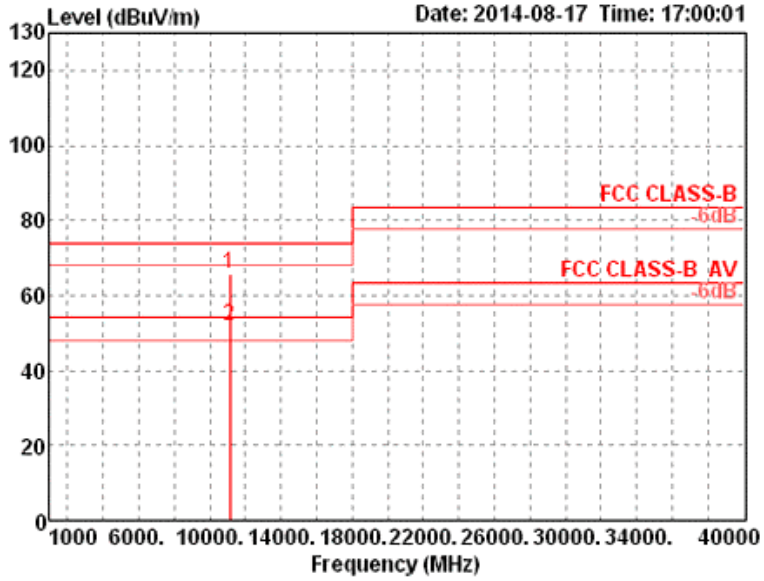
Temperature	23℃	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 116 / Chain 1 + Chain 2

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11149.86	56.53	74.00	-17.47	47.37	5.04	39.12	35.00	Peak	153	145	HORIZONTAL
2	11160.90	45.38	54.00	-8.62	36.21	5.04	39.13	35.00	Average	153	145	HORIZONTAL

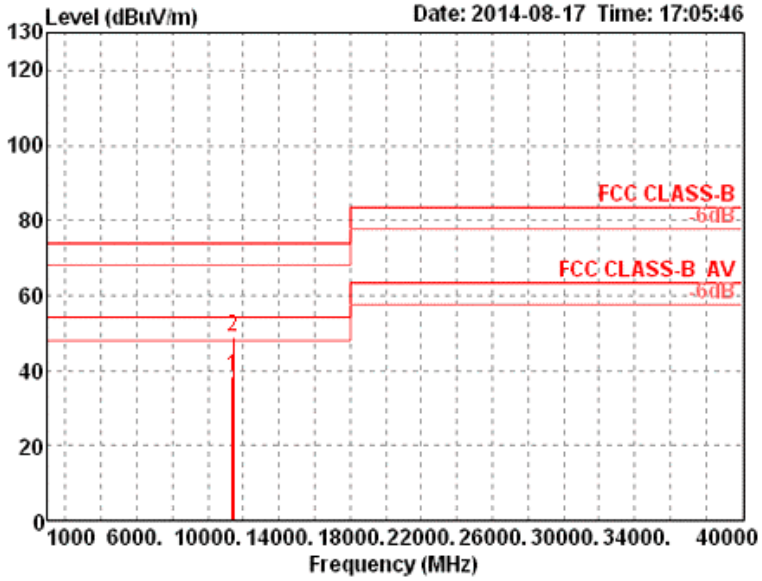
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11158.68	65.95	74.00	-8.05	56.78	5.04	39.13	35.00	Peak	153	140	VERTICAL
2	11158.92	51.62	54.00	-2.38	42.45	5.04	39.13	35.00	Average	153	140	VERTICAL

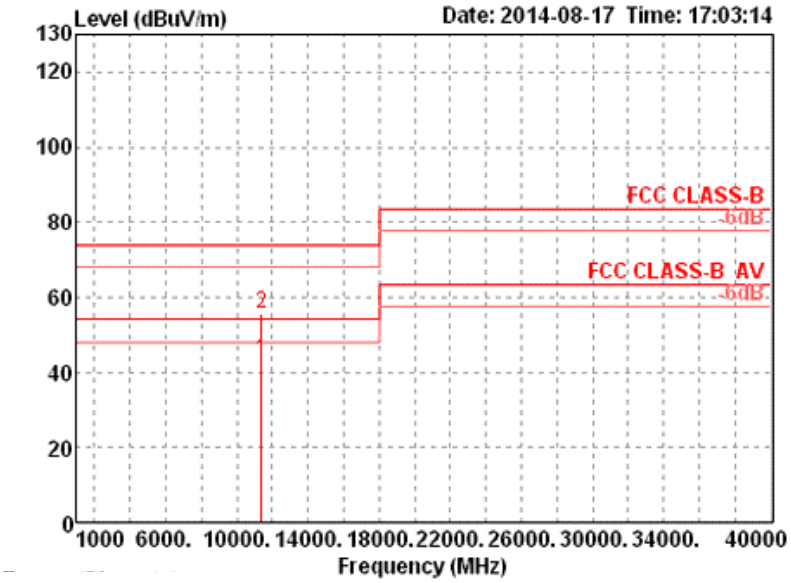
Temperature	23℃	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 140 / Chain 1 + Chain 2

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11400.00	38.30	54.00	-15.70	28.92	5.10	39.32	35.04	Average	147	232	HORIZONTAL
2	11414.46	49.03	74.00	-24.97	39.64	5.10	39.33	35.04	Peak	147	232	HORIZONTAL

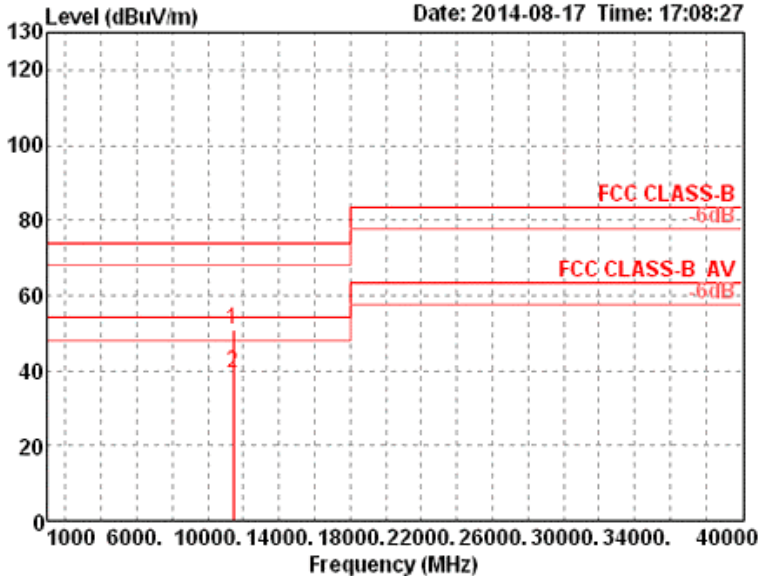
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11399.40	43.34	54.00	-10.66	33.96	5.10	39.32	35.04	Average	147	145	VERTICAL
2	11399.88	55.56	74.00	-18.44	46.18	5.10	39.32	35.04	Peak	147	145	VERTICAL

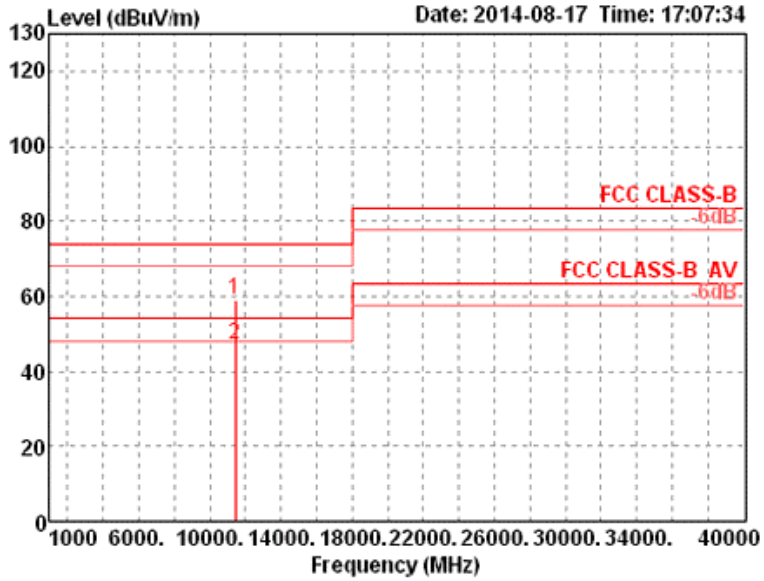
Temperature	23℃	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 144 / Chain 1 + Chain 2

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11438.50	50.86	74.00	-23.14	41.45	5.10	39.35	35.04	Peak	156	113	HORIZONTAL
2	11440.84	39.29	54.00	-14.71	29.88	5.10	39.35	35.04	Average	156	113	HORIZONTAL

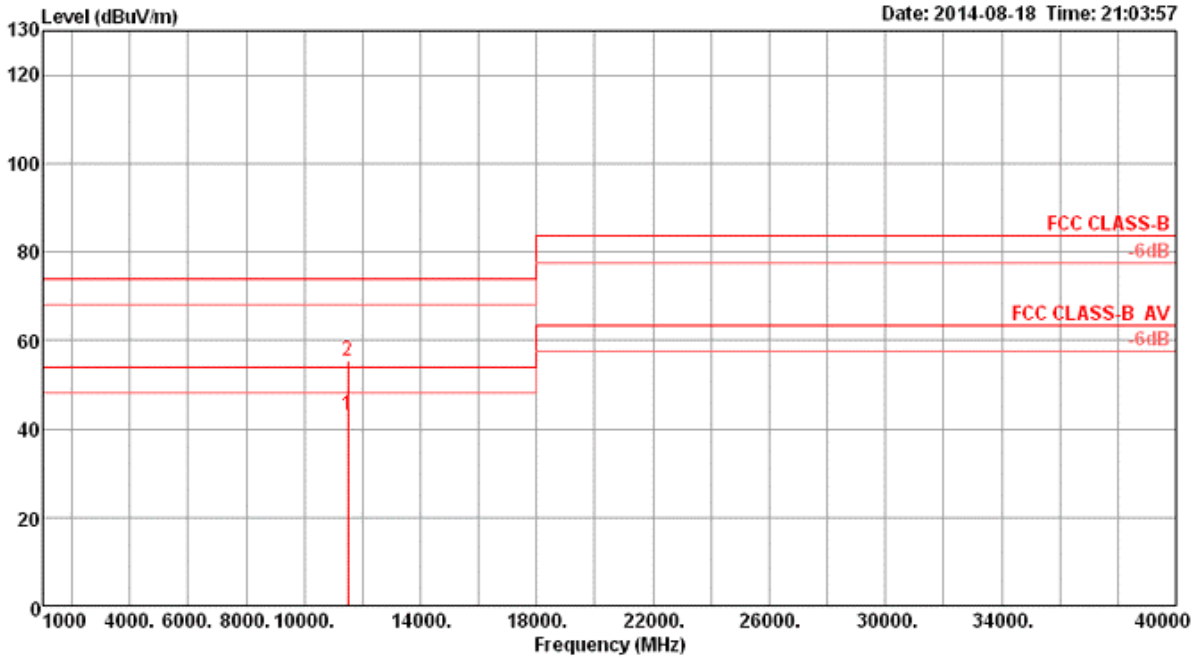
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11429.26	58.88	74.00	-15.12	49.49	5.10	39.33	35.04	Peak	156	144	VERTICAL
2	11439.28	47.09	54.00	-6.91	37.68	5.10	39.35	35.04	Average	156	144	VERTICAL

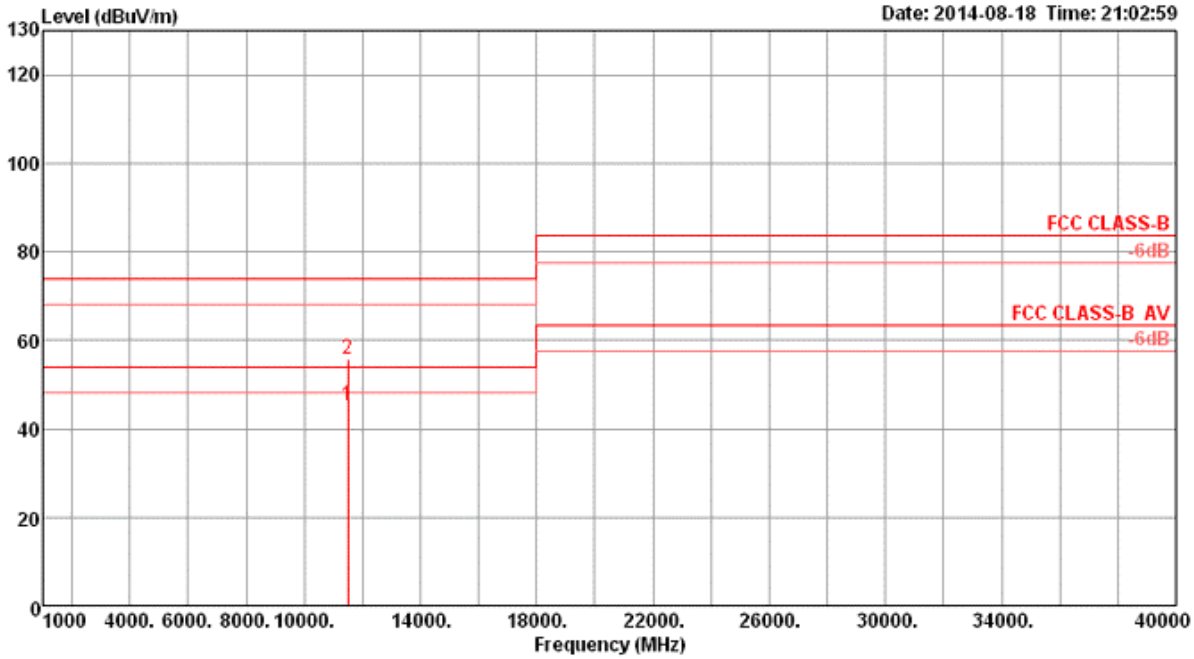
Temperature	23℃	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 149 / Chain 1 + Chain 2

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11484.39	43.19	54.00	-10.81	29.53	9.24	39.50	35.08	Average	150	34	HORIZONTAL
2	11488.72	55.53	74.00	-18.47	41.87	9.24	39.50	35.08	Peak	150	34	HORIZONTAL

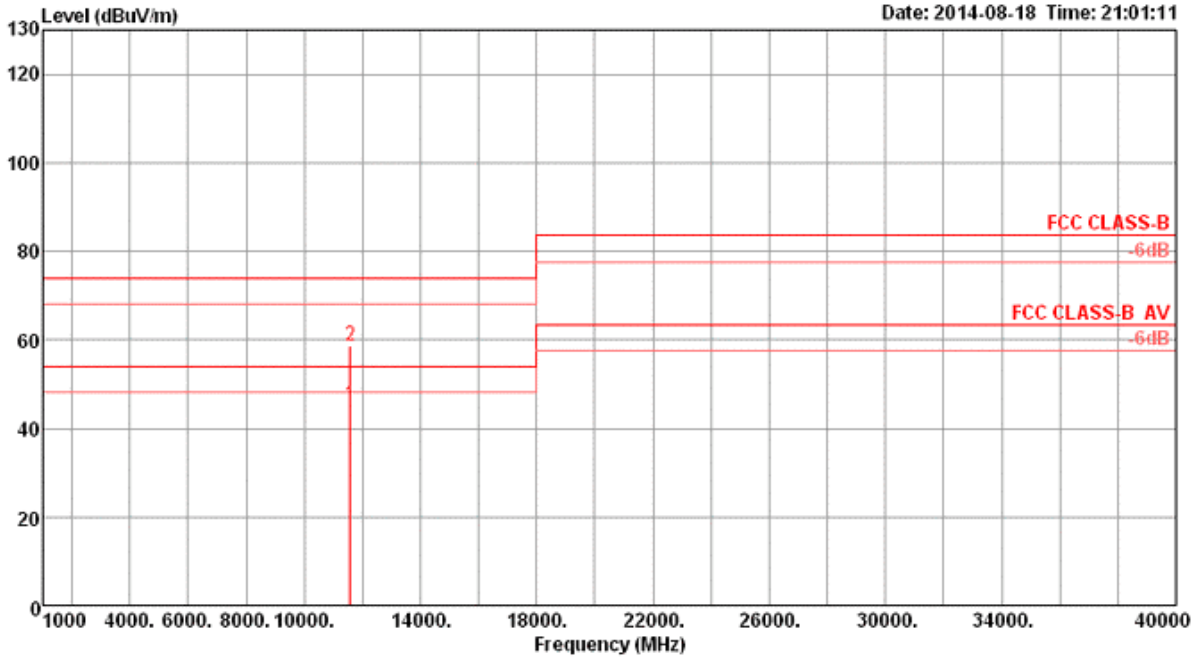
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11491.04	45.37	54.00	-8.63	31.71	9.24	39.50	35.08	Average	150	322	VERTICAL
2	11498.49	55.82	74.00	-18.18	42.17	9.25	39.50	35.10	Peak	150	322	VERTICAL

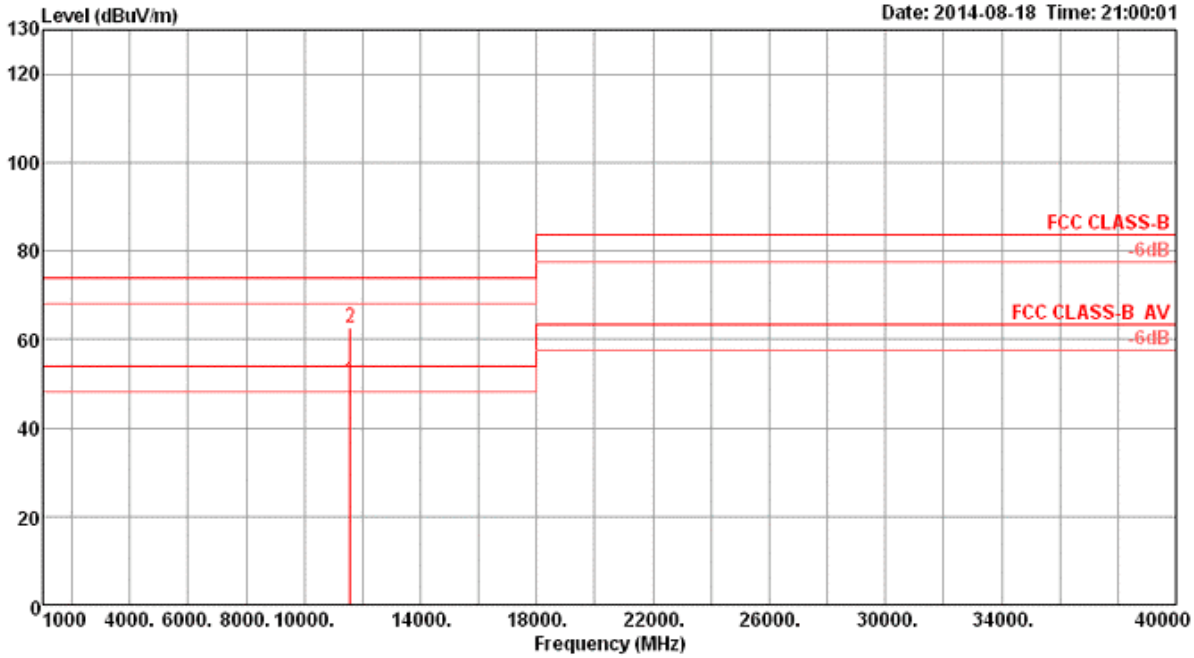
Temperature	23℃	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 157 / Chain 1 + Chain 2

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11569.60	45.31	54.00	-8.69	31.67	9.26	39.47	35.09	Average	150	69	HORIZONTAL
2	11570.16	58.61	74.00	-15.39	44.97	9.26	39.47	35.09	Peak	150	69	HORIZONTAL

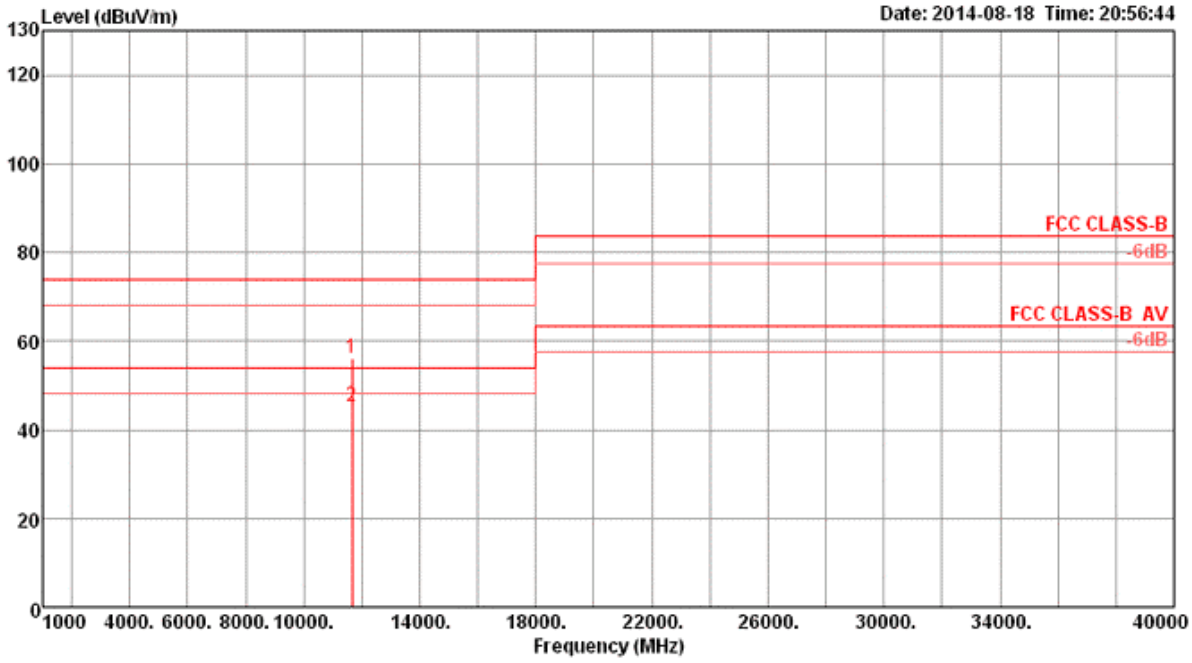
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11570.40	50.87	54.00	-3.13	37.23	9.26	39.47	35.09	Average	150	227	VERTICAL
2	11573.13	62.52	74.00	-11.48	48.87	9.26	39.47	35.08	Peak	150	227	VERTICAL

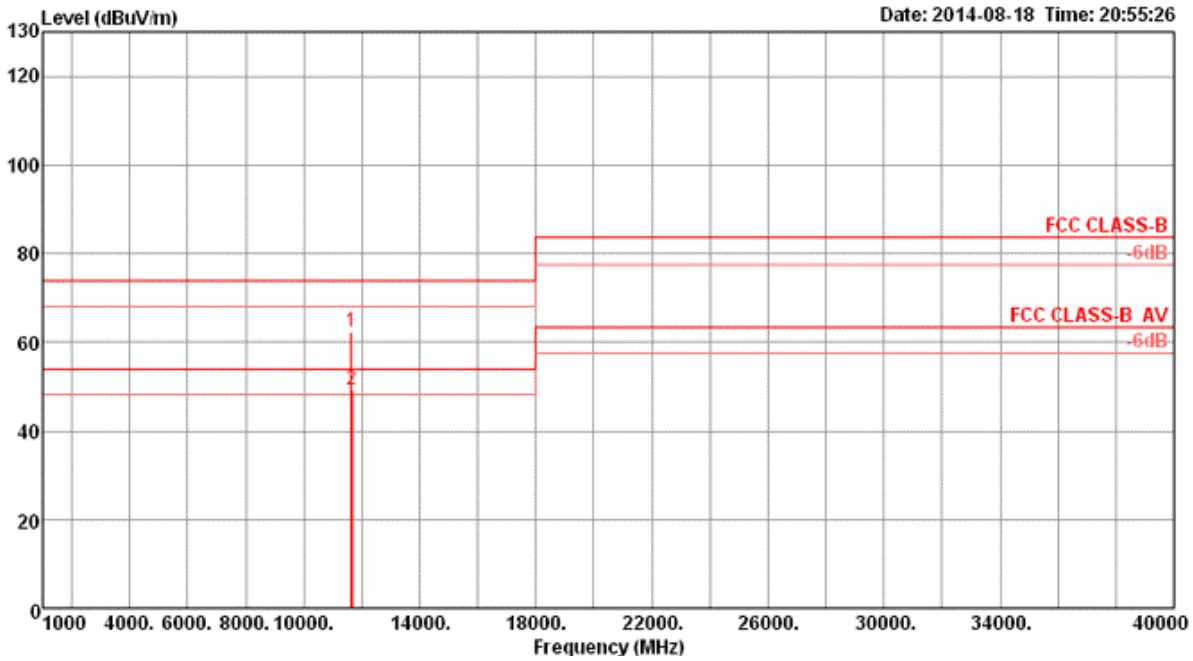
Temperature	23℃	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT20 CH 165 / Chain 1 + Chain 2

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11649.20	56.24	74.00	-17.76	42.59	9.28	39.44	35.07	Peak	163	308	HORIZONTAL
2	11653.14	45.14	54.00	-8.86	31.49	9.28	39.44	35.07	Average	163	308	HORIZONTAL

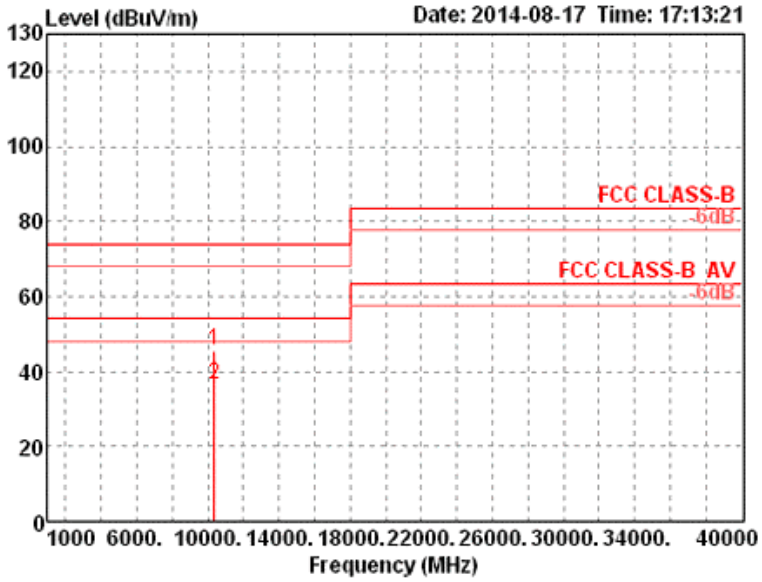
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	11647.55	62.19	74.00	-11.81	48.54	9.28	39.44	35.07	Peak	150	23	VERTICAL
2	11649.94	49.10	54.00	-4.90	35.45	9.28	39.44	35.07	Average	150	23	VERTICAL

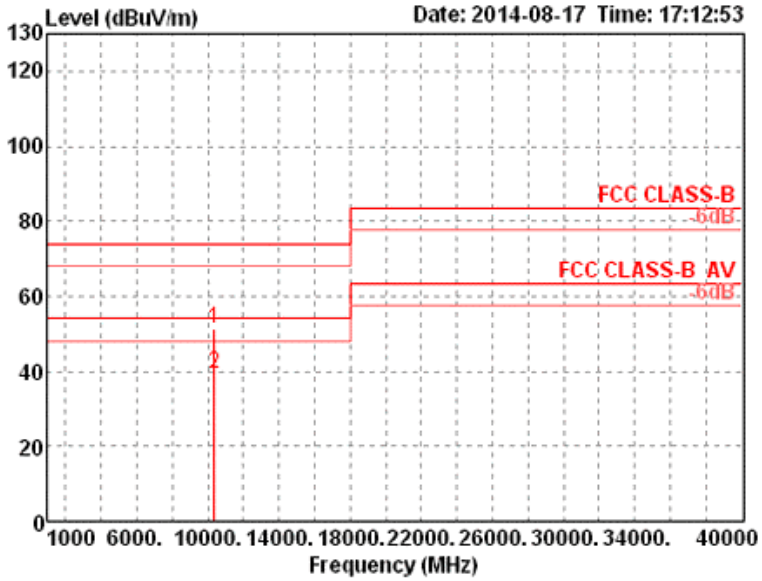
Temperature	23℃	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 38 / Chain 1 + Chain 2

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10362.88	45.57	74.00	-28.43	37.00	4.97	39.01	35.41	Peak	151	96	HORIZONTAL
2	10370.80	36.43	54.00	-17.57	27.86	4.97	39.01	35.41	Average	151	96	HORIZONTAL

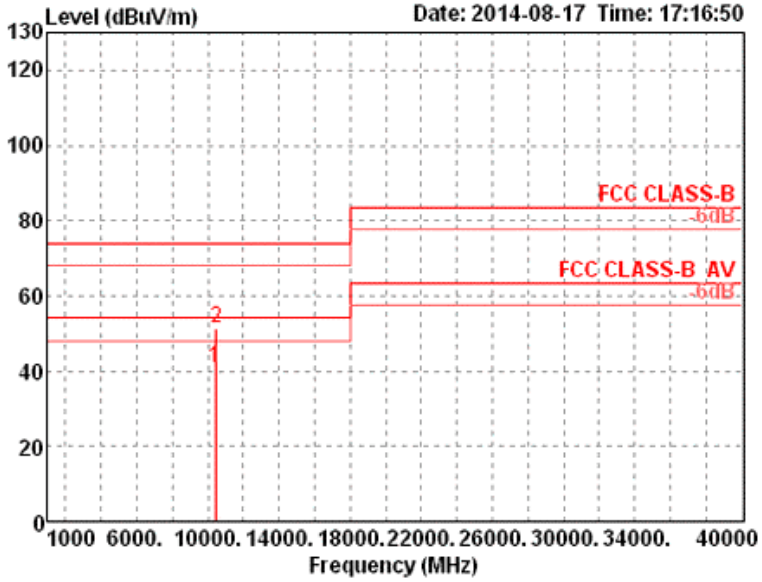
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10380.32	51.50	74.00	-22.50	42.92	4.98	38.99	35.39	Peak	148	83	VERTICAL
2	10380.56	39.12	54.00	-14.88	30.54	4.98	38.99	35.39	Average	148	83	VERTICAL

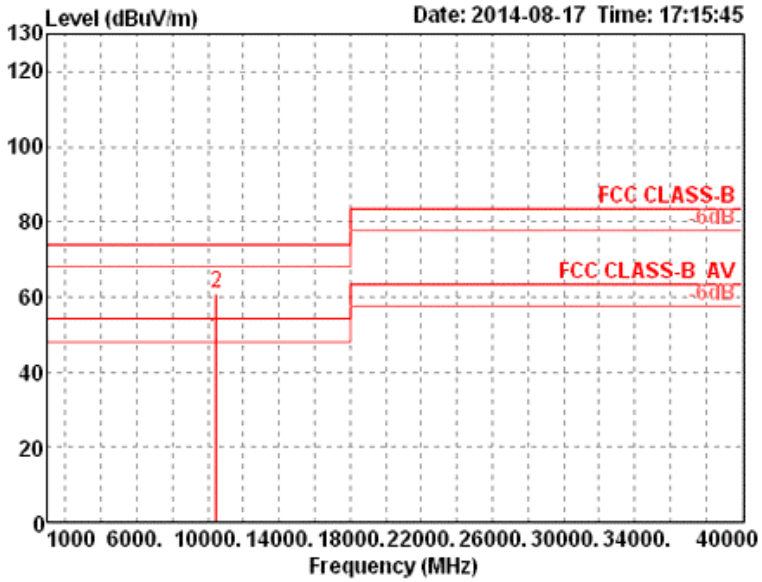
Temperature	23℃	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 46 / Chain 1 + Chain 2

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10450.80	40.76	54.00	-13.24	32.16	5.00	38.94	35.34	Average	163	226	HORIZONTAL
2	10471.76	51.17	74.00	-22.83	42.58	5.00	38.93	35.34	Peak	163	226	HORIZONTAL

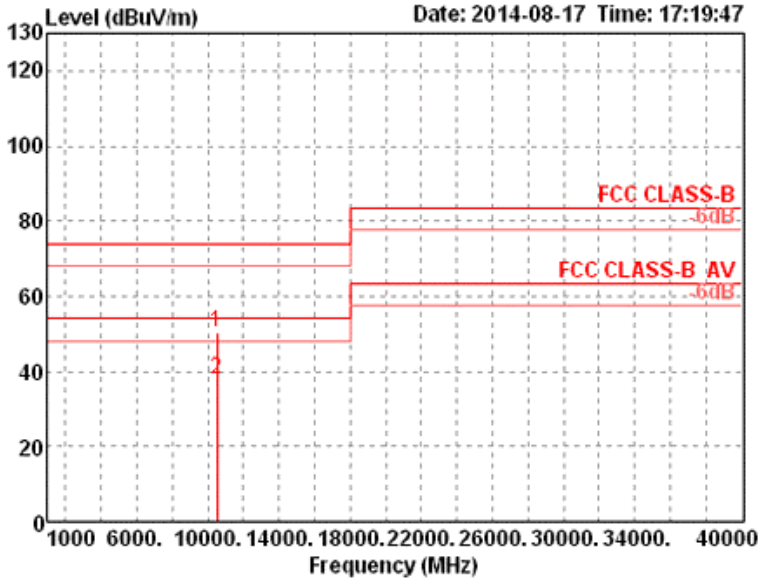
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10459.60	48.71	54.00	-5.29	40.11	5.00	38.94	35.34	Average	150	143	VERTICAL
2	10462.56	61.13	74.00	-12.87	52.54	5.00	38.93	35.34	Peak	150	143	VERTICAL

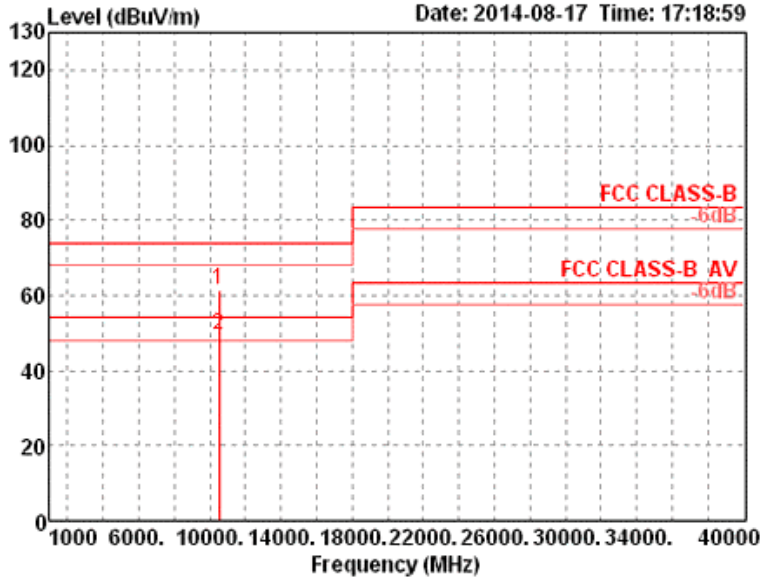
Temperature	23℃	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 54 / Chain 1 + Chain 2

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10524.72	50.59	74.00	-23.41	41.96	5.01	38.90	35.28	Peak	149	157	HORIZONTAL
2	10552.72	38.05	54.00	-15.95	29.40	5.01	38.91	35.27	Average	149	157	HORIZONTAL

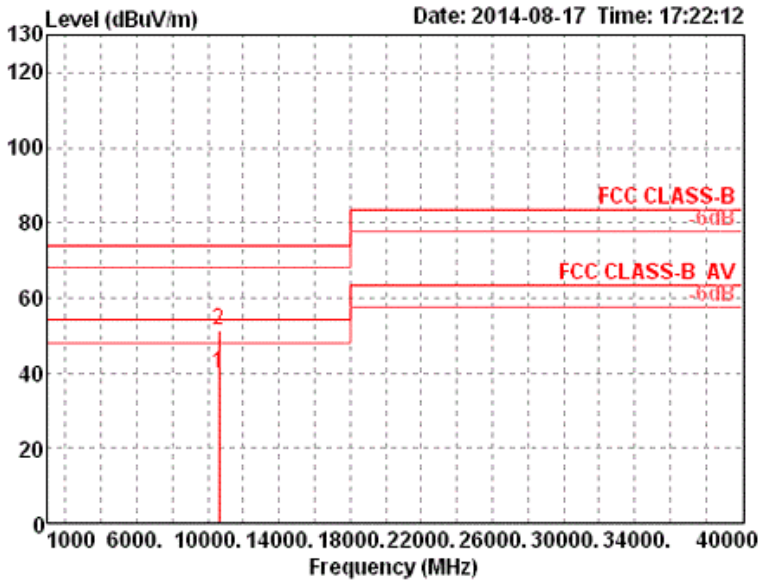
Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10540.16	61.41	74.00	-12.59	52.77	5.01	38.91	35.28	Peak	149	144	VERTICAL
2	10542.56	49.50	54.00	-4.50	40.86	5.01	38.91	35.28	Average	149	144	VERTICAL

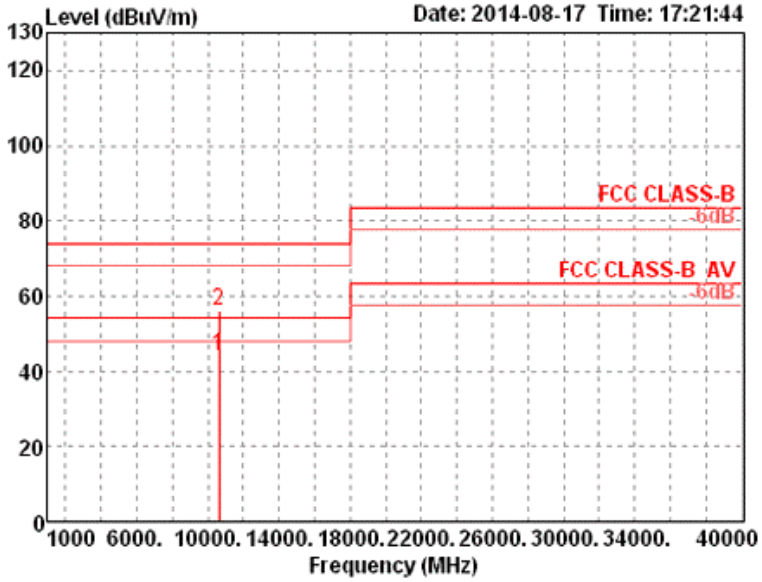
Temperature	23℃	Humidity	61%
Test Engineer	YC Chen	Configurations	IEEE 802.11ac MCS0/Nss1 VHT40 CH 62 / Chain 1 + Chain 2

Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10621.60	39.58	54.00	-14.42	30.88	5.01	38.92	35.23	Average	163	269	HORIZONTAL
2	10629.84	51.20	74.00	-22.80	42.49	5.01	38.92	35.22	Peak	163	269	HORIZONTAL

Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	10620.24	44.05	54.00	-9.95	35.35	5.01	38.92	35.23	Average	151	146	VERTICAL
2	10627.68	56.01	74.00	-17.99	47.30	5.01	38.92	35.22	Peak	151	146	VERTICAL