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FCC RADIO TEST REPORT

Applicant's company	Motorola Solutions, Inc.
Applicant Address	One Motorola Plaza Holtsville, NY 11742 USA
FCC ID	UZ7KHAP800
Manufacturer's company	Wistron NeWeb Corporation
Manufacturer Address	20 Park Avenue II, Hsinchu Science Park, Hsinchu 308, Taiwan, R.O.C.

Product Name	802.11 a/b/g/n Module
Brand Name	MOTOROLA
Model No.	KHAP-800
Test Rule Part(s)	47 CFR FCC Part 15 Subpart E § 15.407
Test Freq. Range	5150 ~ 5350MHz / 5470 ~ 5725MHz
Received Date	Apr. 02, 2012
Final Test Date	Nov. 03, 2014
Submission Type	Class II Change
Operating Mode	Master

Statement

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

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

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The measurements and test results shown in this test report were made in accordance with the procedures and found in compliance with the limit given in ANSI C63.10-2009, 47 CFR FCC Part 15 Subpart E, KDB789033 D01 v01r04, KDB662911 D01 v02r01.

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



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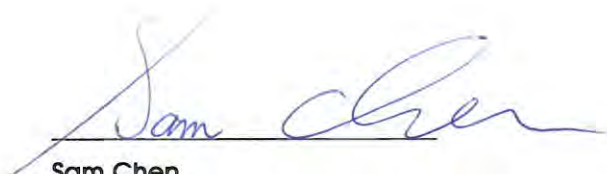
History of This Test Report

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR240223-12AB	Rev. 01	Initial issue of report	Nov. 21, 2014

1. CERTIFICATE OF COMPLIANCE

Product Name : 802.11 a/b/g/n Module
Brand Name : MOTOROLA
Model No. : KHAP-800
Applicant : Motorola Solutions, Inc.
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 Apr. 02, 2012 would like to declare that the tested sample has been evaluated and found to be in compliance with the tested rule parts. The data recorded as well as the test configuration specified is true and accurate for showing the sample's EMC nature.



Sam Chen

SPORTON INTERNATIONAL INC.

2. SUMMARY OF THE TEST RESULT

Applied Standard: 47 CFR FCC Part 15 Subpart E				
Part	Rule Section	Description of Test	Result	Under Limit
4.1	15.407(a)	26dB Spectrum Bandwidth and 99% Occupied Bandwidth	Complies	-
4.2	15.407(a)	Maximum Conducted Output Power	Complies	0.01 dB
4.3	15.407(a)	Power Spectral Density	Complies	0.01 dB
4.4	15.407(b)	Radiated Emissions	Complies	1.01 dB
4.5	15.407(b)	Band Edge Emissions	Complies	1.00 dB
4.6	15.407(g)	Frequency Stability	Complies	-
4.7	15.203	Antenna Requirements	Complies	-

3. GENERAL INFORMATION

3.1. Product Details

IEEE 802.11n

Items	Description
Product Type	WLAN (1/2/3TX, 3RX)
Radio Type	Intentional Transceiver
Power Type	powered by PC and DC power supply
Modulation	see the below table for IEEE 802.11n
Data Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	see the below table for IEEE 802.11n
Frequency Range	5150 ~ 5350MHz / 5470 ~ 5725MHz
Channel Number	16 for 20MHz bandwidth ; 7 for 40MHz bandwidth
Channel Band Width (99%)	<p>Mode 1 (Ant.6 Dipole antenna / 8dBi)</p> <p>For Beamforming Mode</p> <p>For 2TX</p> <p>Band 1: MCS0 (HT20): 18.72 MHz ; MCS0 (HT40): 37.12 MHz</p> <p>Band 2: MCS0 (HT20): 18.88 MHz ; MCS0 (HT40): 36.80 MHz</p> <p>Band 3: MCS0 (HT20): 17.76 MHz ; MCS0 (HT40): 37.44 MHz</p> <p>For 3TX</p> <p>Band 1: MCS0 (HT20): 18.56 MHz ; MCS0 (HT40): 37.12 MHz</p> <p>Band 2: MCS0 (HT20): 18.72 MHz ; MCS0 (HT40): 37.44 MHz</p> <p>Band 3: MCS0 (HT20): 18.56 MHz ; MCS0 (HT40): 37.12 MHz</p> <p>Mode 2 (Ant.16 Panel antenna / 3.5dBi)</p> <p>For Beamforming Mode</p> <p>For 2TX</p> <p>Band 1: MCS0 (HT20): 18.72 MHz ; MCS0 (HT40): 36.48 MHz</p> <p>Band 2: MCS0 (HT20): 20.00 MHz ; MCS0 (HT40): 37.12 MHz</p> <p>Band 3: MCS0 (HT20): 25.92 MHz ; MCS0 (HT40): 36.80 MHz</p> <p>For 3TX</p> <p>Band 1: MCS0 (HT20): 18.88 MHz ; MCS0 (HT40): 37.12 MHz</p> <p>Band 2: MCS0 (HT20): 18.72 MHz ; MCS0 (HT40): 37.44 MHz</p> <p>Band 3: MCS0 (HT20): 18.88 MHz ; MCS0 (HT40): 37.12 MHz</p> <p>Mode 3 (Ant.32 3-Port Dual-Band Directional Panel antenna / Chain 1: 6.7, Chain 2: 4.3, Chain 3: 6.6dBi)</p> <p>For Beamforming Mode</p> <p>For 3TX</p> <p>Band 1: MCS0 (HT20): 18.88 MHz ; MCS0 (HT40): 37.12 MHz</p>

	<p>Band 2: MCS0 (HT20): 19.04 MHz ; MCS0 (HT40): 36.80 MHz Band 3: MCS0 (HT20): 18.56 MHz ; MCS0 (HT40): 37.12 MHz For Non-Beamforming Mode For 1TX Band 1: MCS0 (HT20): 18.59 MHz ; MCS0 (HT40): 37.18 MHz Band 2: MCS0 (HT20): 30.38 MHz ; MCS0 (HT40): 36.92 MHz Band 3: MCS0 (HT20): 33.46 MHz ; MCS0 (HT40): 37.44 MHz For 2TX Band 1: MCS0 (HT20): 18.72 MHz ; MCS0 (HT40): 36.48 MHz Band 2: MCS0 (HT20): 19.68 MHz ; MCS0 (HT40): 37.44 MHz Band 3: MCS0 (HT20): 19.68 MHz ; MCS0 (HT40): 40.32 MHz For 3TX Band 1: MCS0 (HT20): 19.04 MHz ; MCS0 (HT40): 37.12 MHz Band 2: MCS0 (HT20): 18.88 MHz ; MCS0 (HT40): 36.48 MHz Band 3: MCS0 (HT20): 18.72 MHz ; MCS0 (HT40): 37.12 MHz</p>
Maximum Conducted Output Power	<p>Mode 1 (Ant.6 Dipole antenna / 8dBi) For Beamforming Mode For 2TX Band 1: MCS0 (HT20): 11.97 dBm ; MCS0 (HT40): 11.85 dBm Band 2: MCS0 (HT20): 18.97 dBm ; MCS0 (HT40): 18.92 dBm Band 3: MCS0 (HT20): 18.85 dBm ; MCS0 (HT40): 18.76 dBm For 3TX Band 1: MCS0 (HT20): 10.21 dBm ; MCS0 (HT40): 10.21 dBm Band 2: MCS0 (HT20): 15.61 dBm ; MCS0 (HT40): 16.26 dBm Band 3: MCS0 (HT20): 17.18 dBm ; MCS0 (HT40): 17.22 dBm Mode 2 (Ant.16 Panel antenna / 3.5dBi) For Beamforming Mode For 2TX Band 1: MCS0 (HT20): 16.24 dBm ; MCS0 (HT40): 16.47 dBm Band 2: MCS0 (HT20): 23.11 dBm ; MCS0 (HT40): 18.40 dBm Band 3: MCS0 (HT20): 23.46 dBm ; MCS0 (HT40): 20.63 dBm For 3TX Band 1: MCS0 (HT20): 14.59 dBm ; MCS0 (HT40): 14.46 dBm Band 2: MCS0 (HT20): 14.91 dBm ; MCS0 (HT40): 16.79 dBm Band 3: MCS0 (HT20): 21.49 dBm ; MCS0 (HT40): 20.22 dBm Mode 3 (Ant.32 3-Port Dual-Band Directional Panel antenna / Chain 1: 6.7, Chain 2: 4.3, Chain 3: 6.6dBi) For Beamforming Mode</p>

	<p>For 3TX</p> <p>Band 1: MCS0 (HT20): 11.97 dBm ; MCS0 (HT40): 11.96 dBm</p> <p>Band 2: MCS0 (HT20): 19.13 dBm ; MCS0 (HT40): 14.42 dBm</p> <p>Band 3: MCS0 (HT20): 19.14 dBm ; MCS0 (HT40): 18.61 dBm</p> <p>For Non-Beamforming Mode</p> <p>For 1TX</p> <p>Band 1: MCS0 (HT20): 16.13 dBm ; MCS0 (HT40): 15.98 dBm</p> <p>Band 2: MCS0 (HT20): 23.11 dBm ; MCS0 (HT40): 15.86 dBm</p> <p>Band 3: MCS0 (HT20): 23.18 dBm ; MCS0 (HT40): 19.62 dBm</p> <p>For 2TX</p> <p>Band 1: MCS0 (HT20): 16.24 dBm ; MCS0 (HT40): 15.84 dBm</p> <p>Band 2: MCS0 (HT20): 23.11 dBm ; MCS0 (HT40): 22.29 dBm</p> <p>Band 3: MCS0 (HT20): 22.92 dBm ; MCS0 (HT40): 22.96 dBm</p> <p>For 3TX</p> <p>Band 1: MCS0 (HT20): 15.37 dBm ; MCS0 (HT40): 16.29 dBm</p> <p>Band 2: MCS0 (HT20): 22.50 dBm ; MCS0 (HT40): 16.51 dBm</p> <p>Band 3: MCS0 (HT20): 22.37 dBm ; MCS0 (HT40): 19.28 dBm</p>
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

IEEE 802.11a

Items	Description
Product Type	WLAN (1/2/3TX, 3RX) Note: PIFA Antenna (Model Name: RAI-INT-ANT and KAP-I INT ANT) only 1TX1RX of 11a function
Radio Type	Intentional Transceiver
Power Type	powered by PC and DC power supply
Modulation	OFDM for IEEE 802.11a
Data Modulation	OFDM (BPSK / QPSK / 16QAM / 64QAM)
Data Rate (Mbps)	OFDM (6/9/12/18/24/36/48/54)
Frequency Range	5150 ~ 5350MHz / 5470 ~ 5725MHz
Channel Number	16
Maximum Conducted Output Power	Mode 3 (Ant.32 3-Port Dual-Band Directional Panel antenna / Chain 1: 6.7, Chain 2: 4.3, Chain 3: 6.6dBi) For Non-Beamforming Mode For 1TX Band 1: 16.13 dBm ; Band 2: 22.73 dBm ; Band 3: 23.15 dBm For 2TX Band 1: 16.23 dBm ; Band 2: 22.84 dBm ; Band 3: 22.92 dBm For 3TX Band 1: 15.54 dBm ; Band 2: 22.54 dBm ; Band 3: 22.51 dBm
Carrier Frequencies	Please refer to section 3.4
Antenna	Please refer to section 3.3

Items	Description	
Communication Mode	<input checked="" type="checkbox"/> IP Based (Load Based)	<input type="checkbox"/> Frame Based
TPC Function	<input checked="" type="checkbox"/> With TPC	<input type="checkbox"/> Without TPC
Weather Band (5600~5650MHz)	<input type="checkbox"/> With 5600~5650MHz	<input checked="" type="checkbox"/> Without 5600~5650MHz
Beamforming Function	<input checked="" type="checkbox"/> With beamforming	<input type="checkbox"/> Without beamforming

Note: The product has beamforming function for 802.11n in 2.4GHz/5GHz.

Antenna and Band width

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

IEEE 11n Spec.

Protocol	Number of Transmit Chains (NTX)	Data Rate / MCS
802.11n (HT20)	1, 2, 3	MCS 0-23
802.11n (HT40)	1, 2, 3	MCS 0-23
<p>Note 1: IEEE Std. 802.11n modulation consists of HT20 and HT40 (HT: High Throughput). Then EUT support HT20 and HT40.</p> <p>Note 2: Modulation modes consist of below configuration: HT20/HT40: IEEE 802.11n</p>		

3.2. Accessories

N/A

3.3. Table for Filed Antenna

Ant.	Model Name	Antenna Type	Chip/Radio	Antenna Gain		Cable loss		True Gain (dBi)	
				2.4GHz	5GHz	2.4GHz	5GHz	2.4GHz	5GHz
1	ML-2499-FHPA9-01R	Dipole	Radio1/2-CH1/2/3	10.5	-	1.5	-	9	-
2	ML-2499-SD3-01R	Patch	Radio1/2-CH1/2/3	4	-	1	-	3	-
3	ML-2499-BPNA3-01R	Panel	Radio1/2-CH1/2/3	15	-	1	-	14	-
4	ML-2499-BYGA2-01R	Yagi	Radio1/2-CH1/2/3	14.5	-	1	-	13.5	-
5	KAP-FACADE-ANT	Facade	Radio1/2-CH1/2/3	3.5	4	1	1.5	2.5	2.5
6	ML-5299-FHPA10-01R	Dipole	Radio1/2-CH1/2/3	-	10.5	-	2.5	-	8
7	ML-5299-PTA1-01R	Patch	Radio1/2-CH1/2/3	-	3.8	-	1.5	-	2.3
8	ML-2452-PNA7-01R	Panel	Radio1/2-CH1/2/3	8	12	-	1.5	8	10.5
9	ML-5299-BYGA15-012	Yagi	Radio1/2-CH1/2/3	-	10.5	-	2.5	-	8
10	ML-2499-5PNL-72-N	Panel	Radio1/2-CH1/2/3	6.5	-	-	-	6.5	-
11	ML-2499-APA2-01	Dipole	Radio1/2-CH1/2/3	3.2	-	-	-	3.2	-
12	ML-2499-HPA3-01R	Dipole	Radio1/2-CH1/2/3	4	-	-	-	4	-
13	ML-5299-APA1-01R	Dipole	Radio1/2-CH1/2/3	-	4	-	-	-	4
14	ML-5299-HPA1-01R	Dipole	Radio1/2-CH1/2/3	-	6	-	-	-	6
15	ML-2452-APA2-01	Dipole	Radio1/2-CH1/2/3	3	5	-	-	3	5
16	ML-2452-PNA5-01R	Panel	Radio1/2-CH1/2/3	5.5	6	1.5	2.5	4	3.5
17	ML-2452-HPA5-036	Dipole	Radio1/2-CH1/2/3	3	5	-	-	3	5
18	ML-2452-APAG2A1-01	Dipole	Radio1/2-CH1/2/3	2.7	2	-	-	2.7	2
19	RAI-INT-ANT	PIFA	Radio1/2-CH1/2/3	4.3	-	-	-	4.3	-
20	ML-2499-HPA4-01	Dipole	Radio1/2-CH1/2/3	4.5	-	1.5	-	3	-
21	ML-2499-HPA8-01	Dipole	Radio1/2-CH1/2/3	8	-	1.5	-	6.5	-
22	ML-5299-HPA5-01	Dipole	Radio1/2-CH1/2/3	-	5.6	-	2.5	-	3.1
23	ML-5299-HPA10-01	Dipole	Radio1/2-CH1/2/3	-	10.5	-	2.5	-	8
24	ML-2452-HPAG5A8-01	Dipole	Radio1/2-CH1/2/3	5	8	1.5	2.5	3.5	5.5
25	ML-2499-HPA3-02R	Dipole	Radio1/2-CH1/2/3	5	-	1	-	4	-
26	ML-2452-HPAG4A6-01	Dipole	Radio1/2-CH1/2/3	4	7.3	1.5	2.5	2.5	4.8
27	ML-2452-HPA6X6-036	Dipole	Radio1/2-CH1/2/3	4	6	1	1.5	3	4.5
28	ML-2452-HPA6M6-072	Dipole	Radio1/2-CH1/2/3	2.8	6.5	1	1.5	1.8	5
29	ML-2452-PNL9M3-036	Panel	Radio1/2-CH1/2/3	11	10.7	1	1.5	10	9.2
30	ML-2452-PTA6M6-036	Panel	Radio1/2-CH1/2/3	5	6	1	1.5	4	4.5
31	KAP-I INT ANT	PIFA	Radio1/2-CH1/2/3	4.4	4.7	-	-	4.4	4.7

Ant.	Model Name	Antenna Type	Chip/Radio	Antenna Gain		Cable loss		True Gain (dBi)	
				2.4GHz	5GHz	2.4GHz	5GHz	2.4GHz	5GHz
32	ML-2452-PNL3M3-1	3-Port Dual-Band Directional Panel	Radio1/2-CH1/2/3	Note 1					

Note 1:

Antenna	Antenna Gain		Cable loss		True Gain (dBi)	
	2.4GHz	5GHz	2.4GHz	5GHz	2.4GHz	5GHz
A	9.5	9.2	1.5	2.5	8	6.7
B	6.6	6.8	1.5	2.5	5.1	4.3
C	9.7	9.1	1.5	2.5	8.2	6.6

Table of TX/RX Function in each antenna:

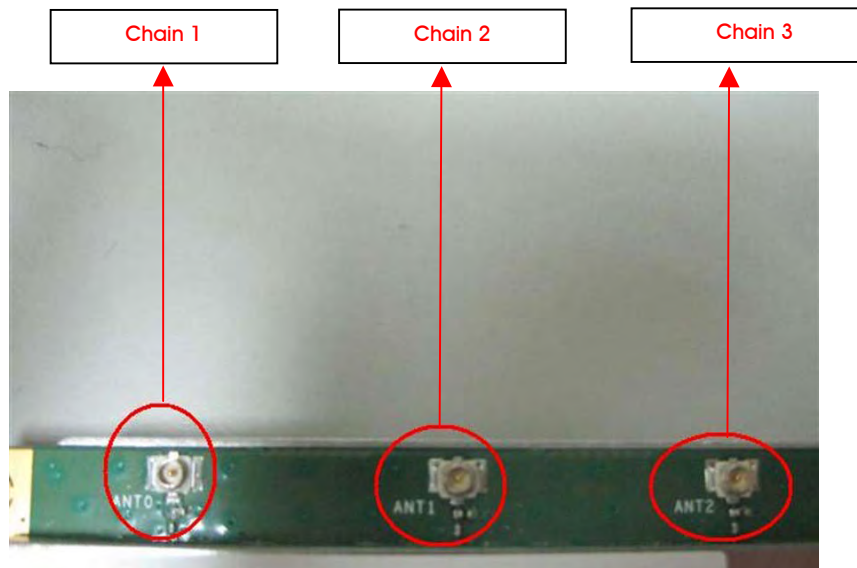
Item			Module					
			Chain 1		Chain 2		Chain 3	
			TX	RX	TX	RX	TX	RX
Ant. 1	2.4GHz	11b	V	V	V	V	V	V
		11g	V	V	V	V	V	V
		11n	V	V	V	V	V	V
Ant.3	2.4GHz	11b	V	V	V	V	V	V
		11g	V	V	V	V	V	V
		11n	V	V	V	V	V	V
Ant.6	5GHz	11a	V	V	V	V	V	V
		11n	V	V	V	V	V	V
Ant.16	5GHz	11a	V	V	V	V	V	V
		11n	V	V	V	V	V	V
Ant.32	2.4GHz	11b	V	V	V	V	V	V
		11g	V	V	V	V	V	V
		11n	V	V	V	V	V	V
	5GHz	11a	V	V	V	V	V	V
		11n	V	V	V	V	V	V

Note : Marked "-" on behalf of no function.

Module	Required 1TX Port
2.4G / 5G	Chain 1

Module	Required 2TX Port
2.4G / 5G	Chain 1 and Chain 2

Module	Required 3TX Port
2.4G / 5G	Chain 1 and Chain 2 and Chain 3



3.4. Table for Carrier Frequencies

The EUT has two bandwidth system.

For 20MHz bandwidth systems, use Channel 36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 132, 136, 140.

For 40MHz bandwidth systems, use Channel 38, 46, 54, 62, 102, 110, 134.

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
5250~5350 MHz Band 2	52	5260 MHz	60	5300 MHz
	54	5270 MHz	62	5310 MHz
	56	5280 MHz	64	5320 MHz
5470~5725 MHz Band 3	100	5500 MHz	116	5580 MHz
	102	5510 MHz	132	5660 MHz
	104	5520 MHz	134	5670 MHz
	108	5540 MHz	136	5680 MHz
	110	5550 MHz	140	5700 MHz
	112	5560 MHz	-	-

3.5. Table for Test Modes

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

Test Items	Mode		Data Rate	Channel	Chain
Max. Conducted Output Power	For Beamforming Mode				
	11n HT20	Band 1-3	MCS0	36/40/48/52/60/64 /100/116/140	1+2 1+2+3
	11n HT40	Band 1-3	MCS0	38/46/54/62/ 102/110/134	1+2 1+2+3
	For Non-Beamforming Mode for Ant. 32 only				
	11n HT20	Band 1-3	MCS0	36/40/48/52/60/64 /100/116/140	1 1+2 1+2+3
	11n HT40	Band 1-3	MCS0	38/46/54/62/ 102/110/134	1 1+2 1+2+3
	11a/BPSK	Band 1-3	6Mbps	36/40/48/52/60/64 /100/116/140	1 1+2 1+2+3
Power Spectral Density	For Beamforming Mode				
	11n HT20	Band 1-3	MCS0	36/40/48/52/60/64 /100/116/140	1+2 1+2+3
	11n HT40	Band 1-3	MCS0	38/46/54/62/ 102/110/134	1+2 1+2+3
	For Non-Beamforming Mode for Ant. 32 only				
	11n HT20	Band 1-3	MCS0	36/40/48/52/60/64 /100/116/140	1 1+2 1+2+3
	11n HT40	Band 1-3	MCS0	38/46/54/62/ 102/110/134	1 1+2 1+2+3

26dB Spectrum Bandwidth 99% Occupied Bandwidth Measurement	For Beamforming Mode				
	11n HT20	Band 1-3	MCS0	36/40/48/52/60/64 /100/116/140	1+2 1+2+3
	11n HT40	Band 1-3	MCS0	38/46/54/62/ 102/110/134	1+2 1+2+3
	For Non-Beamforming Mode for Ant. 32 only				
	11n HT20	Band 1-3	MCS0	36/40/48/52/60/64 /100/116/140	1 1+2 1+2+3
	11n HT40	Band 1-3	MCS0	38/46/54/62/ 102/110/134	1 1+2 1+2+3
Radiated Emission Above 1GHz	For Beamforming Mode				
	11n HT20	Band 1-3	MCS0	36/40/48/52/60/64 /100/116/140	1+2 1+2+3
	11n HT40	Band 1-3	MCS0	38/46/54/62/ 102/110/134	1+2 1+2+3
	For Non-Beamforming Mode for Ant. 32 only				
	11n HT20	Band 1-3	MCS0	36/40/48/52/60/64 /100/116/140	1 1+2 1+2+3
	11n HT40	Band 1-3	MCS0	38/46/54/62/ 102/110/134	1 1+2 1+2+3
Band Edge Emission	For Beamforming Mode				
	11n HT20	Band 1-3	MCS0	36/40/48/52/60/64 /100/116/140	1+2 1+2+3
	11n HT40	Band 1-3	MCS0	38/46/54/62/ 102/110/134	1+2 1+2+3
	For Non-Beamforming Mode for Ant. 32 only				
	11n HT20	Band 1-3	MCS0	36/40/48/52/60/64 /100/116/140	1 1+2 1+2+3
	11n HT40	Band 1-3	MCS0	38/46/54/62/ 102/110/134	1 1+2 1+2+3
	11a/BPSK	Band 1-3	6Mbps	36/40/48/52/60/64 /100/116/140	1 1+2 1+2+3
Frequency Stability	Un-modulation		-	40/60/100	1+2+3

The following test modes were performed for Radiated emission above 1GHz tests:

Antenna/Radio Mode		11b 1TX	11b 2TX	11b 3TX	11a/g 1TX	11a/g 2TX	11a/g 3TX	H20/40 1TX (MCS0)	H20/40 2TX (MCS0)	H20/40 3TX (MCS0)
Mode 1	For Beamforming Mode Dipole-5G, Antenna 6	-	-	-	-	-	-	-	v	v
Mode 2	For Beamforming Mode Patch-5G, Antenna 16	-	-	-	-	-	-	-	v	v
Mode 3	For Beamforming Mode 3-Port Dual-Band Directional Panel-5G, Antenna 32	-	-	-	-	-	-	-	-	v
	For Non-Beamforming Mode 3-Port Dual-Band Directional Panel-5G, Antenna 32	v	v	v	v	v	v	v	v	v

Note 1: For Ant. 32's Non-Beamforming Mode 11g/a 1/2/3 TX just evaluate output power and bandedge, The other test items are covered by 802.11n HT20 1Tx/2TX/3TX MCS0 due to same modulation and bandwidth.

Note 2: For Ant. 32's Maximum Conducted Output Power, Power Spectral Density and 6dB Spectrum Bandwidth tests, non-Beamforming 2TX covers beamforming 2TX due to the array gain is zero.

Note 3: There are two modes of EUT, one is beamforming mode, and the other is non-beamforming mode for 802 11n in 2.4GHz/5GHz. Beamforming mode and non-beamforming mode have been tested and recorded in this test report for Ant. 32 only.

Expected Array Gain Adjustment to Antenna Directivity for 2TX / 3TX Configurations and Supported Operational Modes

In the FCC regulatory domain, conducted testing of systems with multiple transmitters (2Tx transmitter configurations) was performed in accordance with KDB 662911 requires adjustment of antenna directivity by an array gain factor. The array gain factor is dependent on correlation of the multiple tx signals, and is therefore a function of operational mode.

The following table establishes the expected array gain for the 2Tx and 3TX transmitter configuration case for each supported operational mode.

Operational Mode > Tx Config ^	11b (DSSS-CCK)	11a/g (Legacy OFDM)	HT20 1 Stream (MCS0-7)	HT40 1 Stream (MCS0-7)	HT20 2 Stream (MCS8-15)	HT40 2 Stream (MCS8-15)	HT20 3 Stream (MCS16-23)	HT40 3 Stream (MCS16-23)
2TX	3.01dB	3.01dB	3.01dB	3.01dB	NA	NA	NA	NA
3TX	4.77dB	4.77dB	4.77dB	4.77dB	3.01dB	3.01dB	NA	NA

For MPE Test

The module (Model number: KHAP-800) is Limited Module Approval and only limited to install to the AP (MOTOROLA / AP-8132)、(MOTOROLA / AP-8122)、(MOTOROLA / AP-8163)、(MOTOROLA / AP-8232)、(MOTOROLA / AP-8222) and (MOTOROLA / AP-8263), it verified MPE test.

1. MOTOROLA / AP-8132

The AP (MOTOROLA / AP-8132) could be applied with Radio A (2.4G) RF module (FCC ID: UZ7KHAP800), Radio B (5G) RF module (FCC ID: UZ7KHAP800) and 2.4G/5G USB dongle (FCC ID: UZ7KHUSB600); therefore Maximum Permissible Exposure (Please refer to Appendix B) tests are added for simultaneously transmit between 2.4GHz, 5GHz WLAN function and 2.4G, 5G USB dongle.

2. MOTOROLA / AP-8122

The AP (MOTOROLA / AP-8122) could be applied with Radio A (2.4G) RF module (FCC ID: UZ7KHAP800), and Radio B (5G) RF module (FCC ID: UZ7KHAP800); therefore Maximum Permissible Exposure (Please refer to Appendix B) tests are added for simultaneously transmit between 2.4GHz and 5GHz WLAN function.

3. MOTOROLA / AP-8163

The AP (MOTOROLA / AP-8163) could be applied with Radio A (2.4G) RF module (FCC ID: UZ7KHAP800), Radio B (5G) RF module (FCC ID: UZ7KHAP800) and 2.4G/5G USB dongle (FCC ID: UZ7KHUSB601); therefore Maximum Permissible Exposure (Please refer to Appendix B) tests are added for simultaneously transmit between 2.4GHz, 5GHz WLAN function and 2.4G, 5G USB dongle.

4. MOTOROLA / AP-8232

The AP (MOTOROLA / AP-8232) could be applied with Radio A (2.4G) RF module (FCC ID: UZ7KHAP800), Radio B (5G) RF module (FCC ID: UZ7RAAP800) and 2.4G/5G USB dongle (FCC ID: UZ7KHUSB600); therefore Maximum Permissible Exposure (Please refer to Appendix B) tests are added for simultaneously transmit between 2.4GHz, 5GHz WLAN function and 2.4G, 5G USB dongle.

5. MOTOROLA / AP-8222

The AP (MOTOROLA / AP-8222) could be applied with Radio A (2.4G) RF module (FCC ID: UZ7KHAP800), and Radio B (5G) RF module (FCC ID: UZ7RAAP800); therefore Maximum Permissible Exposure (Please refer to Appendix B) tests are added for simultaneously transmit between 2.4GHz WLAN function and 5GHz WLAN function.

6. MOTOROLA / AP-8263

The AP (MOTOROLA / AP-8263) could be applied with Radio A (2.4G) RF module (FCC ID: UZ7KHAP800), Radio B (5G) RF module (FCC ID: UZ7RAAP800) and 2.4G/5G USB dongle (FCC ID: UZ7KHUSB601); therefore Maximum Permissible Exposure (Please refer to Appendix B) tests are added for simultaneously transmit between 2.4GHz, 5GHz WLAN function and 2.4G, 5G USB dongle.

3.6. Table for Testing Locations

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

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

3.7. Table for Class II Change

This product is an extension of original one reported under Sporton project number: 240223-04

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

Modifications	Performance Checking
<ol style="list-style-type: none"> Adding beamforming function for certified antenna (Model: ML-2499-FHPA9-01R, ML-2499-BPNA3-01R, ML-5299-FHPA10-01R and ML-2452-PNA5-01R) at 802.11n. Adding an antenna (Model: ML-2452-PNL3M3-1). 	<ol style="list-style-type: none"> 26dB Bandwidth and 99% Occupied Bandwidth Measurement Maximum Conducted Output Power Measurement Power Spectral Density Measurement Radiated Emissions Measurement Band Edge Emissions Measurement Maximum Permissible Exposure

Note:

The model name shall be same as before. There is no change in hardware or in existing RF relevant portion.

3.8. Table for Supporting Units

Support Unit	Brand	Model	FCC ID
Notebook	DELL	E6430	DoC
Test Fixture	WNC	Express card adapter	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.

Mode 1 (Ant.6 Dipole antenna / 8dBi)

For Beamforming Mode

For 2TX

Power Parameters of IEEE 802.11n MCS0 HT20

Test Software Version	Art2-GUI 2.3								
Frequency	5180 MHz	5200 MHz	5240 MHz	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
MCS0 HT20	9	9	8.5	15.5	15.5	14	12.5	14.5	13

Power Parameters of IEEE 802.11n MCS0 HT40

Test Software Version	Art2-GUI 2.3						
Frequency	5190 MHz	5230 MHz	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz
MCS0 HT40	8	8.5	15	9.5	8.5	13.5	14.5

For 3TX

Power Parameters of IEEE 802.11n MCS0 HT20

Test Software Version	Art2-GUI 2.3								
Frequency	5180 MHz	5200 MHz	5240 MHz	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
MCS0 HT20	5	4.5	4.5	8	8	9.5	10.5	10	10

Power Parameters of IEEE 802.11n MCS0 HT40

Test Software Version	Art2-GUI 2.3						
Frequency	5190 MHz	5230 MHz	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz
MCS0 HT40	5.5	5.5	11	8.5	4	10.5	11.5

Mode 2 (Ant.16 Panel antenna / 3.5dBi)

For Beamforming Mode

For 2TX

Power Parameters of IEEE 802.11n MCS0 HT20

Test Software Version	Art2-GUI 2.3								
Frequency	5180 MHz	5200 MHz	5240 MHz	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
MCS0 HT20	12	12	11.5	17.5	18.5	12.5	13.5	21.5	10.5

Power Parameters of IEEE 802.11n MCS0 HT40

Test Software Version	Art2-GUI 2.3						
Frequency	5190 MHz	5230 MHz	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz
MCS0 HT40	7	12	13.5	7	5	14.5	12

For 3TX

Power Parameters of IEEE 802.11n MCS0 HT20

Test Software Version	Art2-GUI 2.3								
Frequency	5180 MHz	5200 MHz	5240 MHz	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
MCS0 HT20	7.5	9	9	7.5	9	8.5	9	15.5	9

Power Parameters of IEEE 802.11n MCS0 HT40

Test Software Version	Art2-GUI 2.3						
Frequency	5190 MHz	5230 MHz	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz
MCS0 HT40	5	8.5	10.5	6	4.5	14	9

Mode 3 (Ant.32 3-Port Dual-Band Directional Panel antenna / Chain 1: 6.7, Chain 2: 4.3, Chain 3: 6.6dBi)

For Beamforming Mode

For 3TX

Power Parameters of IEEE 802.11n MCS0 HT20

Test Software Version	Art2-GUI 2.3								
Frequency	5180 MHz	5200 MHz	5240 MHz	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
MCS0 HT20	7.5	7	7	14	14	10	12	13	10.5

Power Parameters of IEEE 802.11n MCS0 HT40

Test Software Version	Art2-GUI 2.3						
Frequency	5190 MHz	5230 MHz	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz
MCS0 HT40	6	7	9	6	4	12	11

For Non-Beamforming Mode

For 1TX

Power Parameters of IEEE 802.11n MCS0 HT20

Test Software Version	Art2-GUI 2.3								
Frequency	5180 MHz	5200 MHz	5240 MHz	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
MCS0 HT20	15.5	15	14.5	23	22	16.5	15.5	25	13.5

Power Parameters of IEEE 802.11n MCS0 HT40

Test Software Version	Art2-GUI 2.3						
Frequency	5190 MHz	5230 MHz	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz
MCS0 HT40	9.5	14.5	14	13	10	19	15

Power Parameters of IEEE 802.11a

Test Software Version	Art2-GUI 2.3								
Frequency	5180 MHz	5200 MHz	5240 MHz	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
802.11a	15.5	15.5	15	23	23	17	16	25	14

For 2TX

Power Parameters of IEEE 802.11n MCS0 HT20

Test Software Version	Art2-GUI 2.3								
Frequency	5180 MHz	5200 MHz	5240 MHz	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
MCS0 HT20	12	12	11.5	18	18.5	13.5	15	18	12.5

Power Parameters of IEEE 802.11n MCS0 HT40

Test Software Version	Art2-GUI 2.3						
Frequency	5190 MHz	5230 MHz	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz
MCS0 HT40	8	11	17	11	9.5	18.5	13.5

Power Parameters of IEEE 802.11a

Test Software Version	Art2-GUI 2.3								
Frequency	5180 MHz	5200 MHz	5240 MHz	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
802.11a	12	11.5	11.5	18	18	15	15.5	19	13

For 3TX

Power Parameters of IEEE 802.11n MCS0 HT20

Test Software Version	Art2-GUI 2.3								
Frequency	5180 MHz	5200 MHz	5240 MHz	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
MCS0 HT20	11.5	10	10.5	16.5	17	12.5	13	17	11.5

Power Parameters of IEEE 802.11n MCS0 HT40

Test Software Version	Art2-GUI 2.3						
Frequency	5190 MHz	5230 MHz	5270 MHz	5310 MHz	5510 MHz	5550 MHz	5670 MHz
MCS0 HT40	7	11	11	7	5	13	12

Power Parameters of IEEE 802.11a

Test Software Version	Art2-GUI 2.3								
Frequency	5180 MHz	5200 MHz	5240 MHz	5260 MHz	5300 MHz	5320 MHz	5500 MHz	5580 MHz	5700 MHz
802.11a	11.5	11	10.5	16.5	17	13.5	13	17	12

3.10. EUT Operation during Test

For non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

For Conducted Mode:

The EUT was programmed to be in continuously transmitting mode.

The measured result was added array gain $10 \cdot \log(2) = 3.01 \text{ dBi}$ as worse case in beamforming mode.

The measured result was added array gain $10 \cdot \log(3) = 4.77 \text{ dBi}$ as worse case in beamforming mode.

For Radiated Mode:

The EUT was programmed to be in continuously transmitting mode.

The measured result was added array gain $10 \cdot \log(2) = 3.01 \text{ dBi}$ as worse case in beamforming mode.

The measured result was added array gain $10 \cdot \log(3) = 4.77 \text{ dBi}$ as worse case in beamforming mode

3.11. Duty Cycle

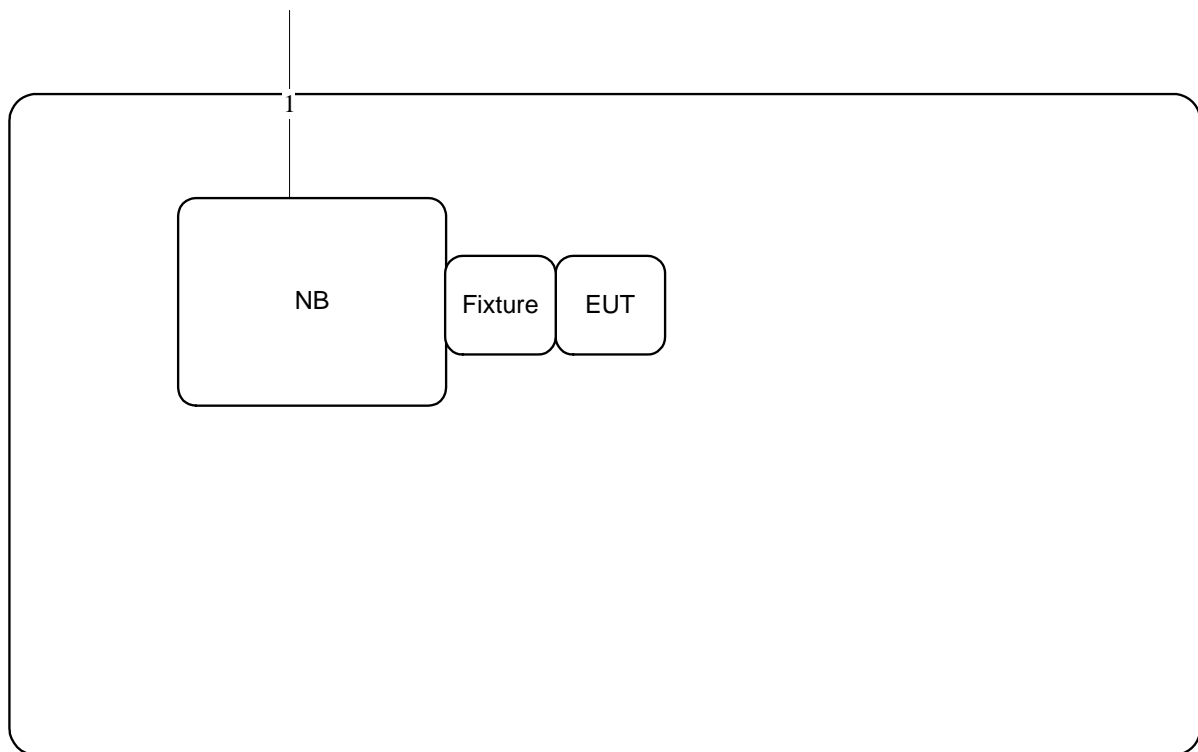
Band	Mode	On Time (ms)	On+Off Time (ms)	Duty Cycle (%)	Duty Factor (dB)	1/T Minimum VBW (kHz)
2.4G	802.11n MCS0 HT20	1.280	1.325	96.60	0.15	0.78
	802.11n MCS0 HT40	0.640	0.670	95.52	0.20	1.56
	802.11b	8.220	8.240	99.76	0.01	0.01
	802.11g	1.370	1.415	96.82	0.14	0.73
5G	802.11n MCS0 HT20	1.285	1.320	97.35	0.12	0.78
	802.11n MCS0 HT40	0.640	0.665	96.24	0.17	1.56
	802.11a	1.370	1.405	97.51	0.11	0.73

3.12. Test Configurations

3.12.1. Radiation Emissions Test Configuration

Test Configuration: above 1GHz

AC Main



Item	Connection	Shielded	Length(m)
1	Power cable	No	2.6m

4. TEST RESULT

4.1. 26dB Bandwidth and 99% Occupied Bandwidth Measurement

4.1.1. Limit

No restriction limits.

4.1.2. Measuring Instruments and Setting

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

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

4.1.3. Test Procedures

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

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

4.1.4. Test Setup Layout

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

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

4.1.5. Test Deviation

There is no deviation with the original standard.

4.1.6. EUT Operation during Test

For non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

4.1.7. Test Result of 26dB Bandwidth and 99% Occupied Bandwidth

Temperature	26°C	Humidity	63%
Test Engineer	Wen Chao / YC Chen	Configurations	IEEE 802.11n/a

Mode 1 (Ant.6 Dipole antenna / 8dBi)

For Beamforming Mode

For 2TX

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

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180 MHz	22.08	17.12
40	5200 MHz	24.32	18.72
48	5240 MHz	23.04	17.60
52	5260 MHz	26.24	18.88
60	5300 MHz	26.40	18.24
64	5320 MHz	22.72	18.24
100	5500 MHz	22.72	17.44
116	5580 MHz	23.36	17.76
140	5700 MHz	23.52	17.60

Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
38	5190 MHz	44.48	37.12
46	5230 MHz	45.12	37.12
54	5270 MHz	59.84	36.80
62	5310 MHz	43.52	36.80
102	5510 MHz	44.16	36.80
110	5550 MHz	50.24	37.44
134	5670 MHz	44.48	36.48

For 3TX

Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180 MHz	23.52	18.02
40	5200 MHz	23.36	18.56
48	5240 MHz	21.44	17.12
52	5260 MHz	23.36	18.72
60	5300 MHz	24.32	18.72
64	5320 MHz	24.48	18.56
100	5500 MHz	23.68	18.08
116	5580 MHz	24.32	18.40
140	5700 MHz	23.52	18.56

Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
38	5190 MHz	44.16	36.48
46	5230 MHz	45.12	37.12
54	5270 MHz	42.56	35.84
62	5310 MHz	42.88	37.44
102	5510 MHz	45.44	37.12
110	5550 MHz	41.28	35.20
134	5670 MHz	46.40	36.48

Mode 2 (Ant.16 Panel antenna / 3.5dBi)

For Beamforming Mode

For 2TX

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

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180 MHz	22.72	17.44
40	5200 MHz	24.80	18.72
48	5240 MHz	25.12	18.72
52	5260 MHz	30.08	19.36
60	5300 MHz	31.68	20.00
64	5320 MHz	23.04	18.24
100	5500 MHz	24.96	19.04
116	5580 MHz	43.84	25.92
140	5700 MHz	22.24	17.44

Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
38	5190 MHz	44.48	36.48
46	5230 MHz	44.80	36.48
54	5270 MHz	50.24	37.12
62	5310 MHz	44.80	36.80
102	5510 MHz	46.00	36.80
110	5550 MHz	47.36	36.80
134	5670 MHz	44.48	36.80

For 3TX

Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180 MHz	23.20	18.88
40	5200 MHz	23.84	18.08
48	5240 MHz	24.16	18.88
52	5260 MHz	23.84	18.72
60	5300 MHz	24.00	18.72
64	5320 MHz	22.88	18.40
100	5500 MHz	23.52	18.88
116	5580 MHz	20.64	17.12
140	5700 MHz	24.16	18.08

Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
38	5190 MHz	42.88	37.12
46	5230 MHz	44.48	36.48
54	5270 MHz	44.80	37.44
62	5310 MHz	43.52	36.16
102	5510 MHz	46.72	36.80
110	5550 MHz	42.88	37.12
134	5670 MHz	45.12	36.80

Mode 3 (Ant.32 3-Port Dual-Band Directional Panel antenna / Chain 1: 6.7, Chain 2: 4.3, Chain 3: 6.6dBi)

For Beamforming Mode

For 3TX

Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180 MHz	24.48	18.88
40	5200 MHz	23.68	18.88
48	5240 MHz	23.36	18.08
52	5260 MHz	24.48	18.24
60	5300 MHz	23.20	19.04
64	5320 MHz	23.04	18.24
100	5500 MHz	23.20	18.40
116	5580 MHz	22.88	18.56
140	5700 MHz	23.04	18.08

Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
38	5190 MHz	46.72	36.80
46	5230 MHz	44.48	37.12
54	5270 MHz	43.84	36.48
62	5310 MHz	43.20	36.80
102	5510 MHz	43.84	37.12
110	5550 MHz	47.04	37.12
134	5670 MHz	43.52	36.80

For Non-Beamforming Mode

For 1TX

Configuration IEEE 802.11n MCS0 HT20 / Chain 1

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180 MHz	25.89	18.58
40	5200 MHz	26.02	18.59
48	5240 MHz	20.96	18.24
52	5260 MHz	47.56	30.38
60	5300 MHz	44.62	24.49
64	5320 MHz	26.28	18.59
100	5500 MHz	25.38	18.46
116	5580 MHz	48.33	33.46
140	5700 MHz	25.26	18.59

Configuration IEEE 802.11n MCS0 HT40 / Chain 1

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
38	5190 MHz	48.72	36.92
46	5230 MHz	49.74	37.18
54	5270 MHz	49.49	36.92
62	5310 MHz	48.72	36.92
102	5510 MHz	47.69	36.92
110	5550 MHz	68.72	37.44
134	5670 MHz	53.08	36.92

For 2TX

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

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180 MHz	22.40	17.44
40	5200 MHz	24.32	18.72
48	5240 MHz	22.88	17.76
52	5260 MHz	29.76	19.52
60	5300 MHz	36.64	19.68
64	5320 MHz	24.00	18.24
100	5500 MHz	24.64	18.88
116	5580 MHz	29.76	19.68
140	5700 MHz	24.32	18.88

Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
38	5190 MHz	45.44	36.48
46	5230 MHz	43.84	36.48
54	5270 MHz	64.32	37.44
62	5310 MHz	44.48	36.48
102	5510 MHz	45.12	36.48
110	5550 MHz	76.16	40.32
134	5670 MHz	45.44	37.12

For 3TX

Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3

Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
36	5180 MHz	23.84	18.88
40	5200 MHz	24.16	19.04
48	5240 MHz	23.68	18.08
52	5260 MHz	27.36	18.40
60	5300 MHz	25.92	18.20
64	5320 MHz	24.16	18.88
100	5500 MHz	23.84	18.72
116	5580 MHz	29.12	18.24
140	5700 MHz	23.36	18.08

Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3

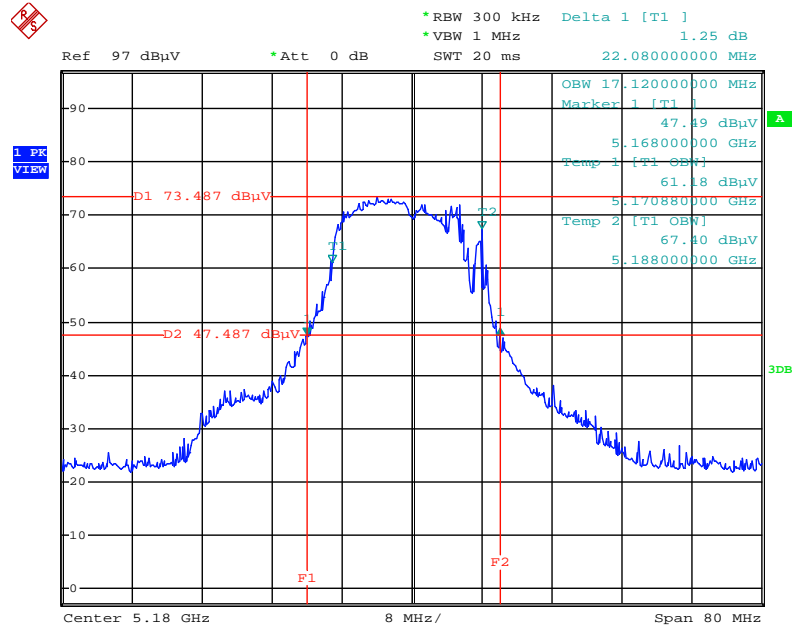
Channel	Frequency	26dB Bandwidth (MHz)	99% Occupied Bandwidth (MHz)
38	5190 MHz	46.72	37.12
46	5230 MHz	44.16	37.12
54	5270 MHz	41.28	35.84
62	5310 MHz	42.88	36.48
102	5510 MHz	44.80	36.48
110	5550 MHz	42.88	37.12
134	5670 MHz	45.12	36.48

Mode 1 (Ant.6 Dipole antenna / 8dBi)

For Beamforming Mode

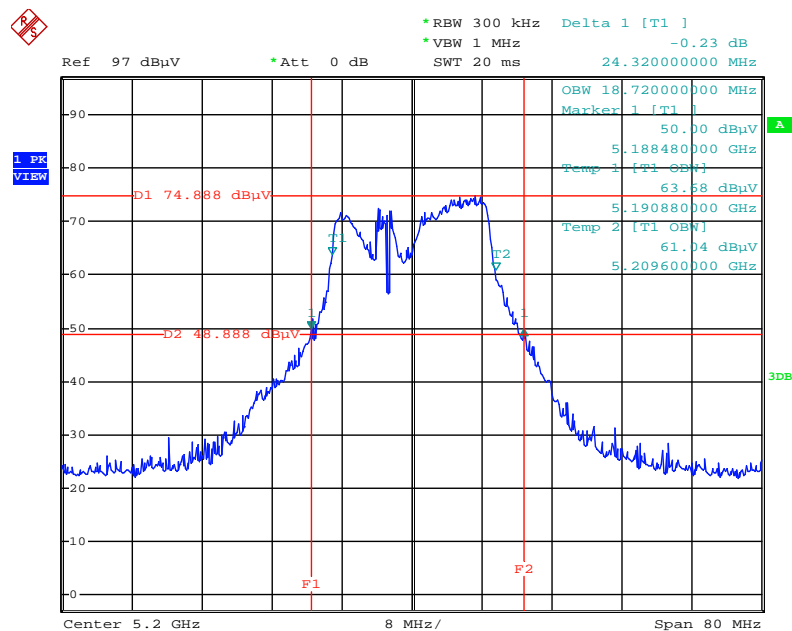
For 2TX

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1
+ Chain 2 / 5180 MHz



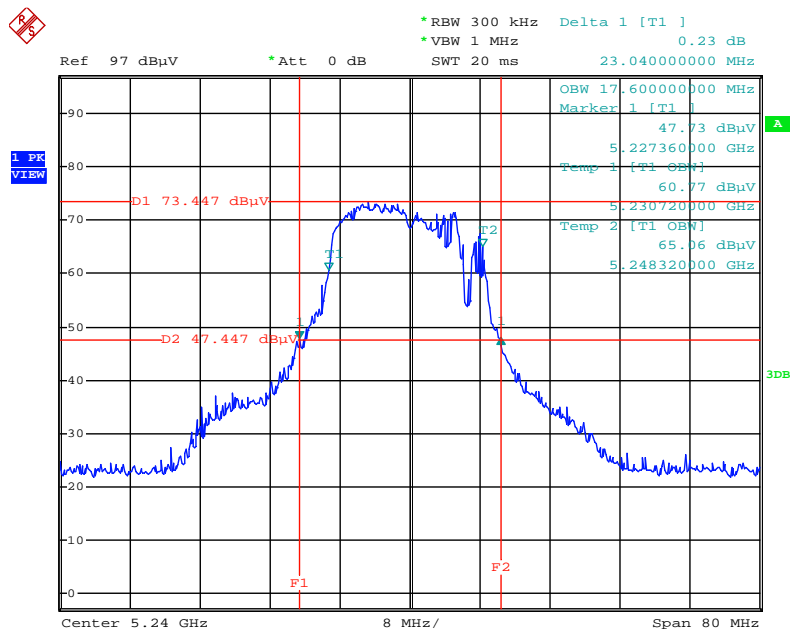
Date: 23.OCT.2014 11:45:33

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1
+ Chain 2 / 5200 MHz



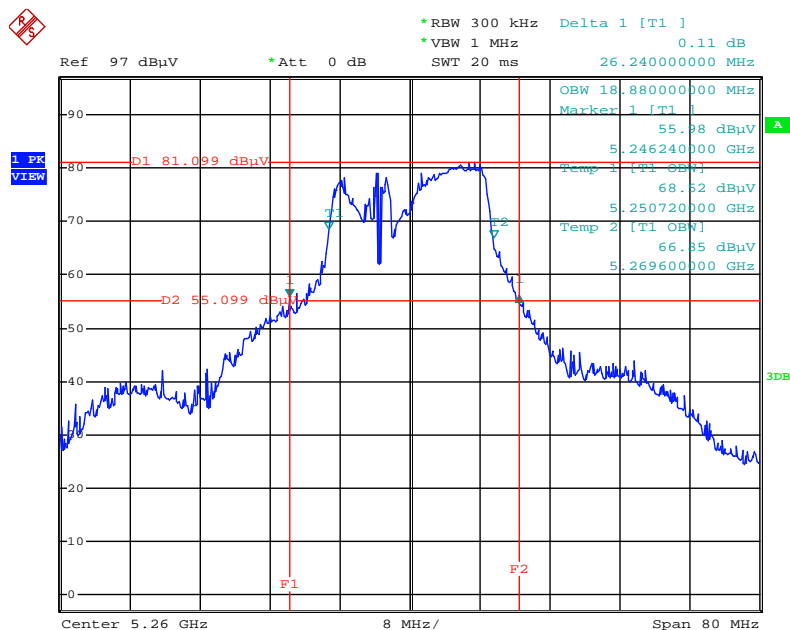
Date: 23.OCT.2014 11:46:14

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 / 5240 MHz



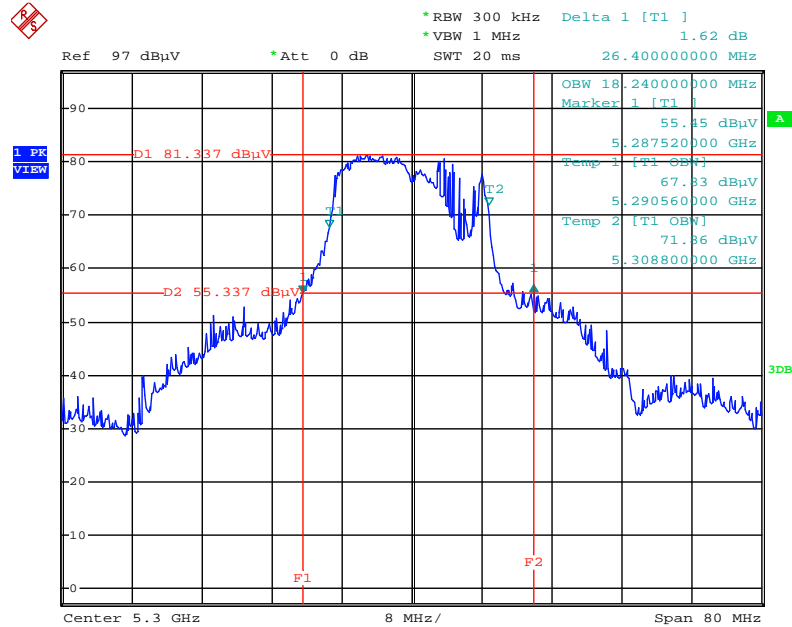
Date: 23.OCT.2014 11:46:49

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 / 5260 MHz



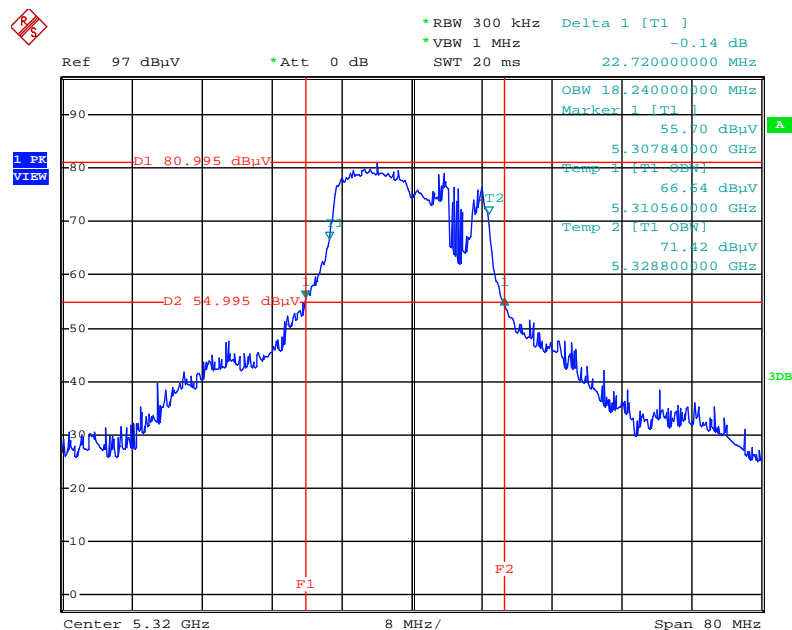
Date: 23.OCT.2014 11:48:21

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 / 5300 MHz



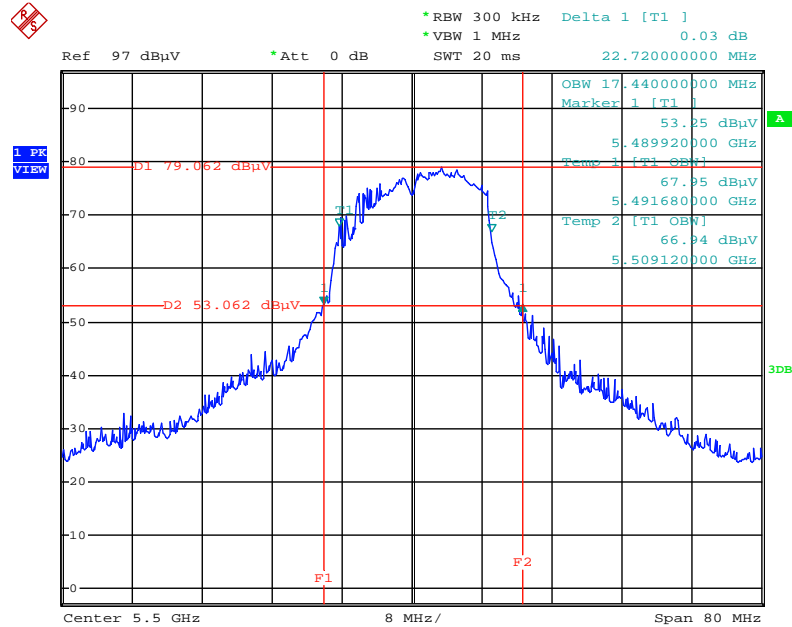
Date: 23.OCT.2014 11:49:08

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 / 5320 MHz



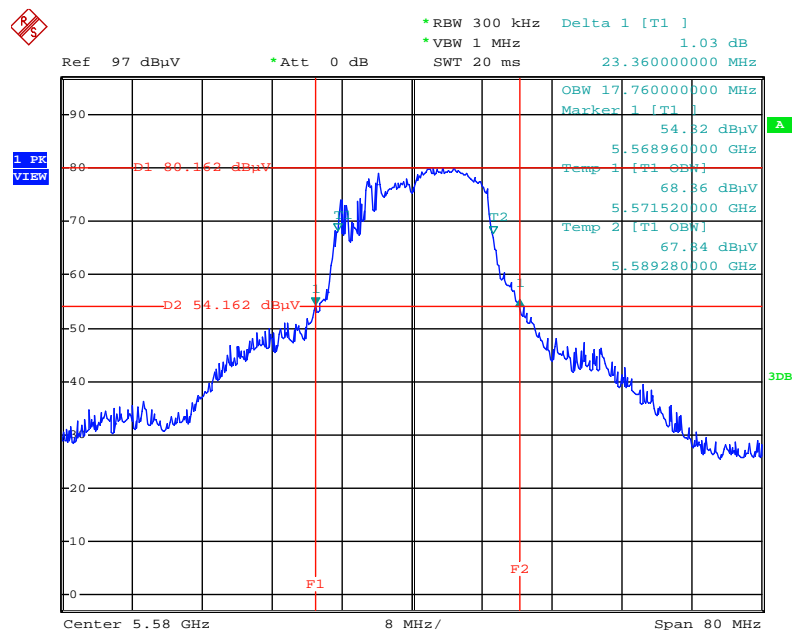
Date: 23.OCT.2014 11:50:34

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 / 5500 MHz



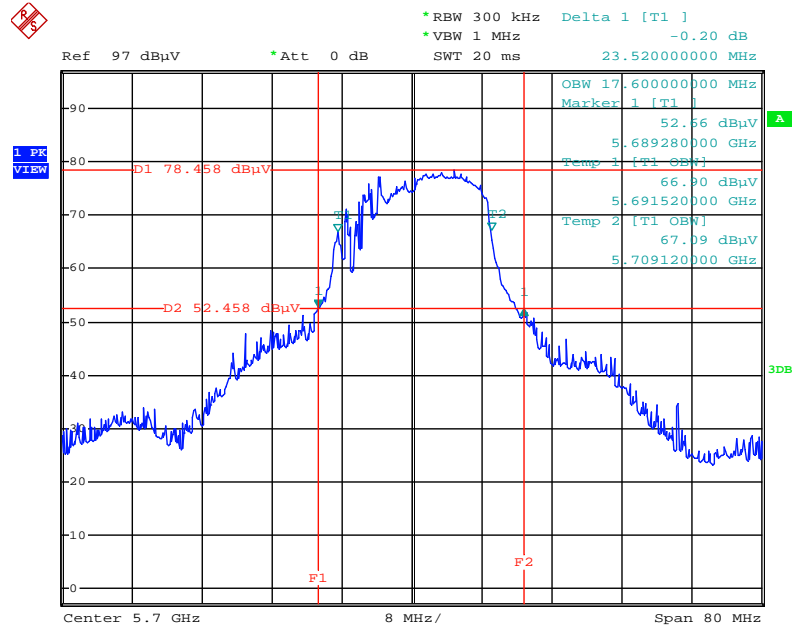
Date: 23.OCT.2014 11:53:55

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 / 5580 MHz



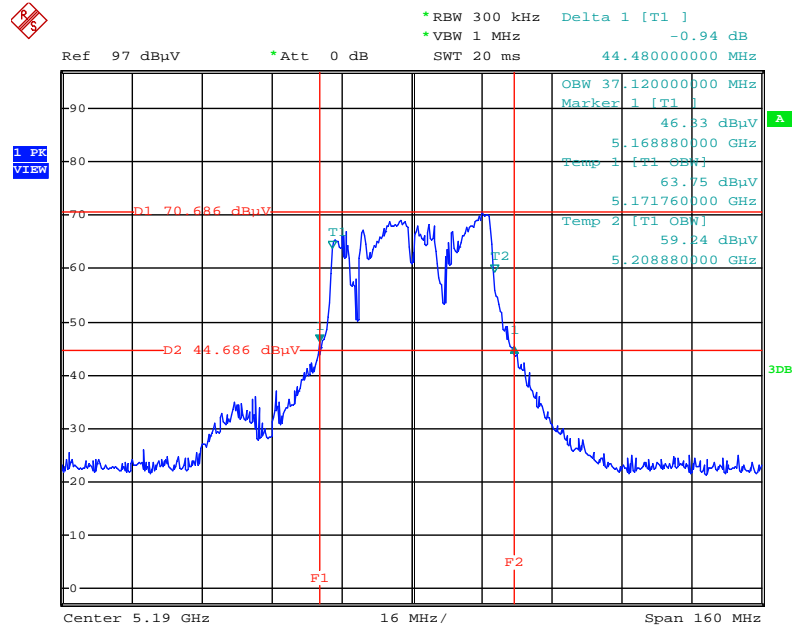
Date: 23.OCT.2014 11:54:55

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 / 5700 MHz



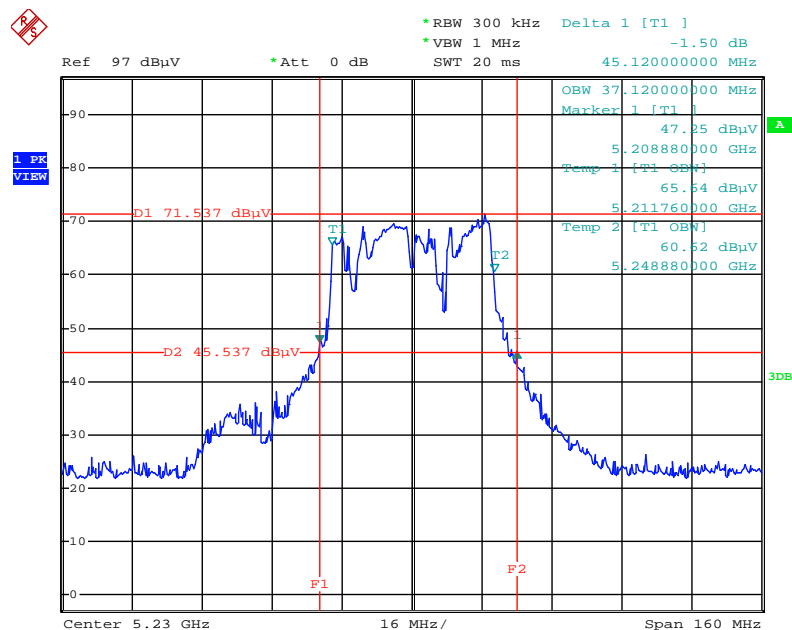
Date: 23.OCT.2014 11:55:42

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 / 5190 MHz



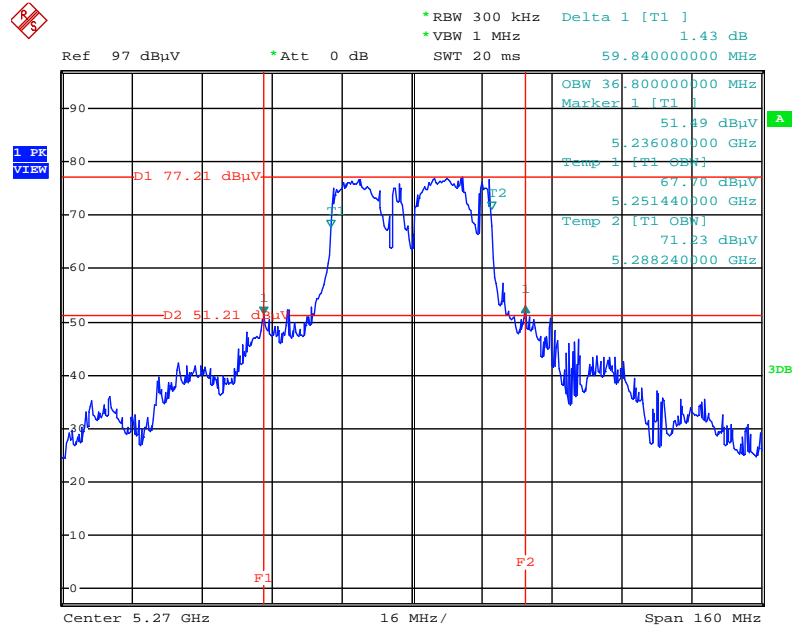
Date: 23.OCT.2014 12:00:52

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 / 5230 MHz



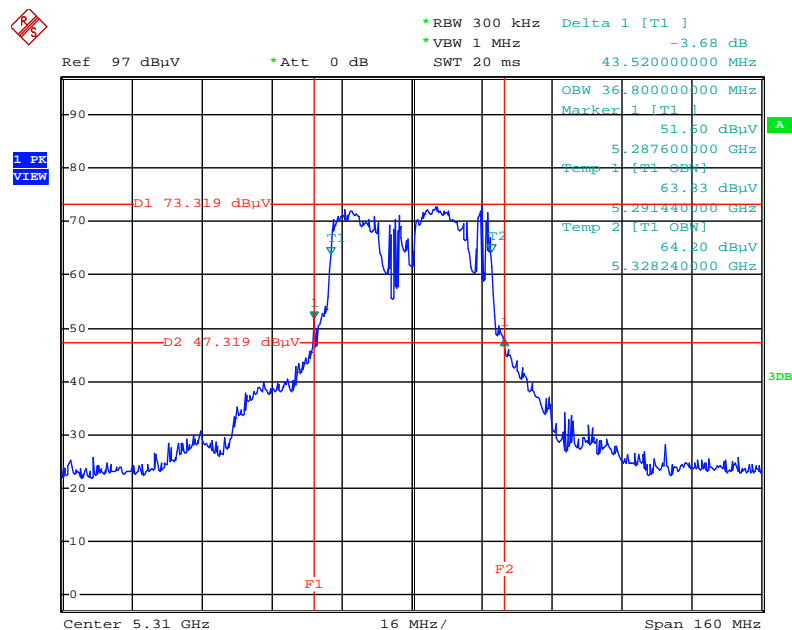
Date: 23.OCT.2014 12:01:52

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 / 5270 MHz



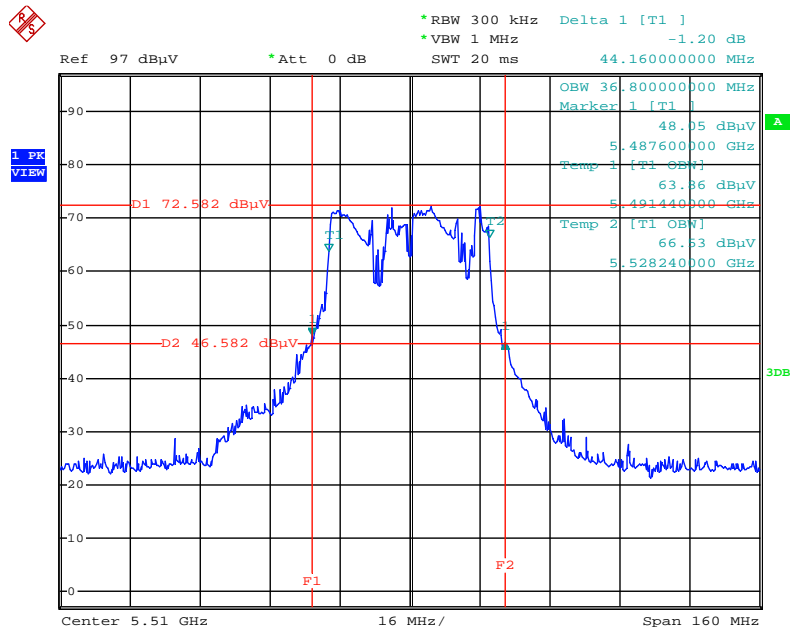
Date: 23.OCT.2014 12:02:37

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 / 5310 MHz



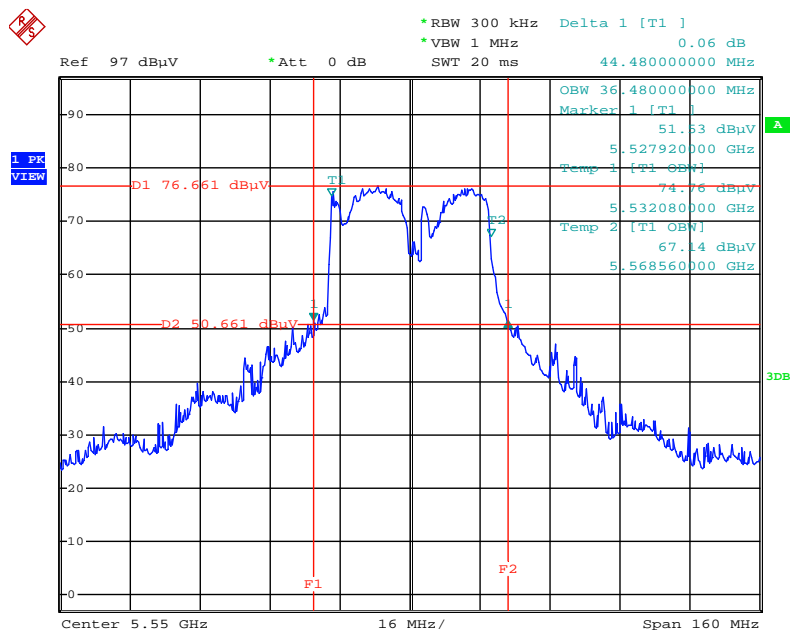
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26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 / 5510 MHz



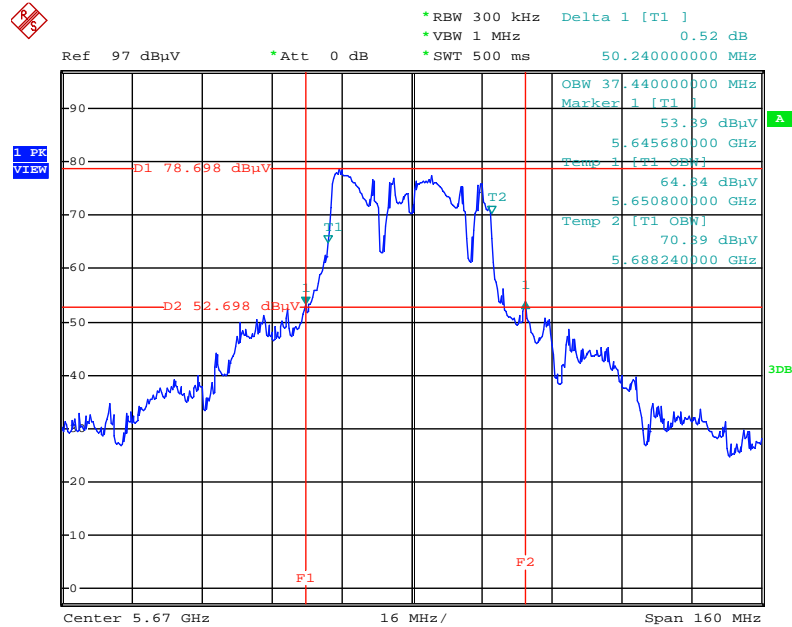
Date: 23.OCT.2014 12:00:05

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 / 5550 MHz



Date: 23.OCT.2014 11:58:45

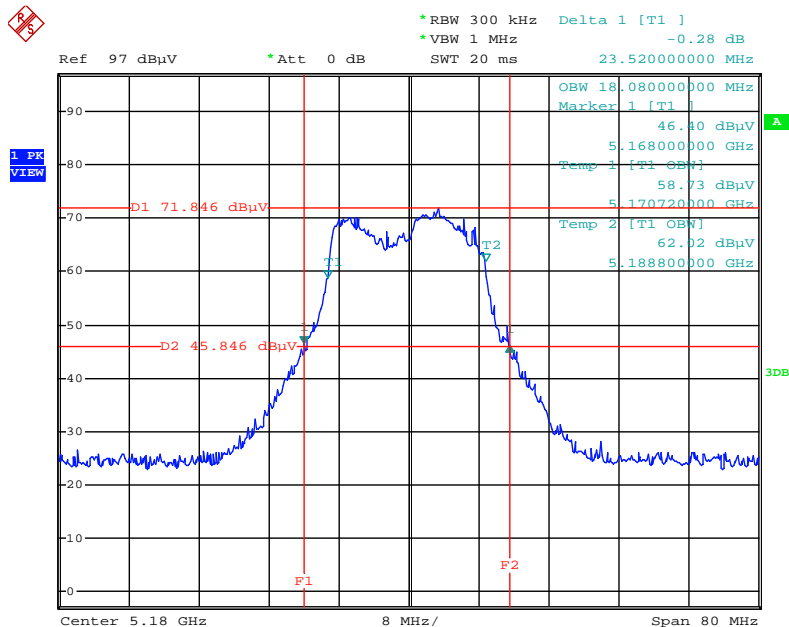
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 / 5670 MHz



Date: 23.OCT.2014 11:57:04

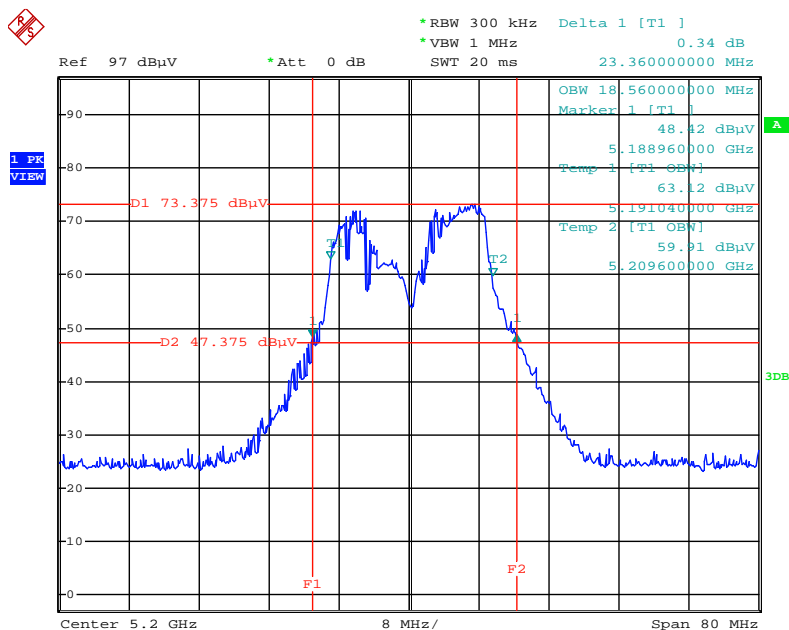
For 3TX

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1
+ Chain 2 + Chain 3 / 5180 MHz



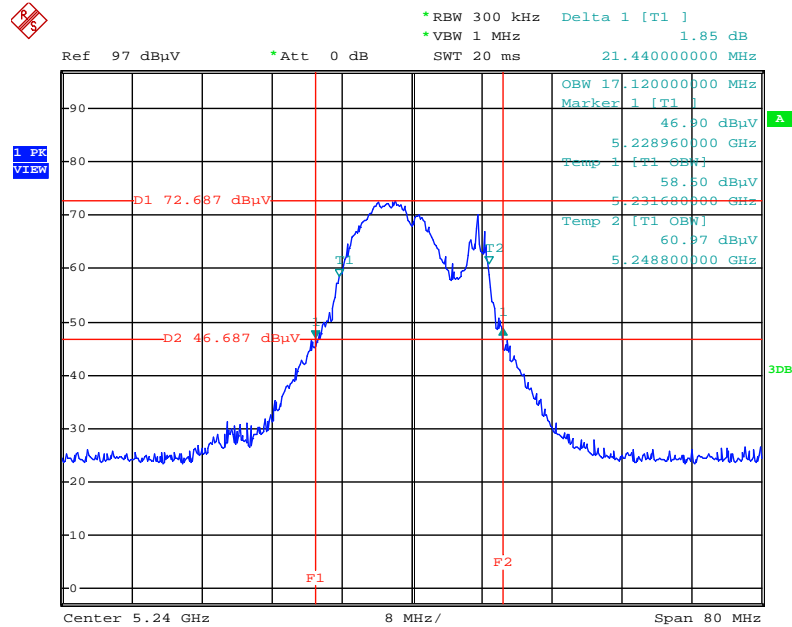
Date: 15.OCT.2014 21:26:03

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1
+ Chain 2 + Chain 3 / 5200 MHz



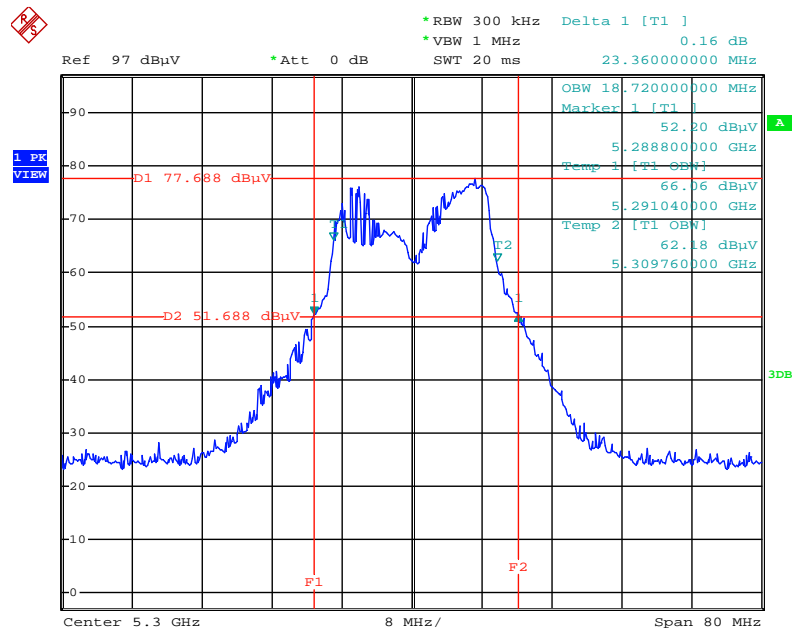
Date: 15.OCT.2014 21:25:27

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5240 MHz



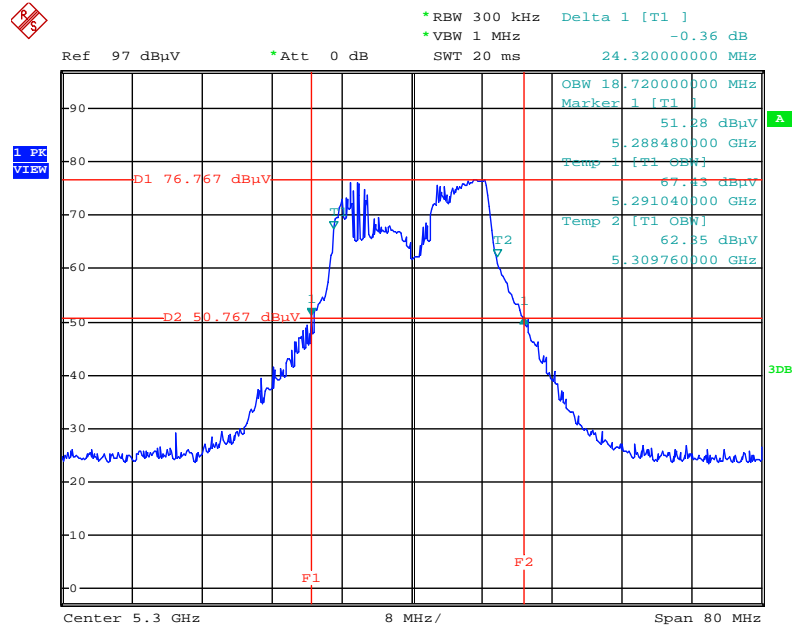
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26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5260 MHz



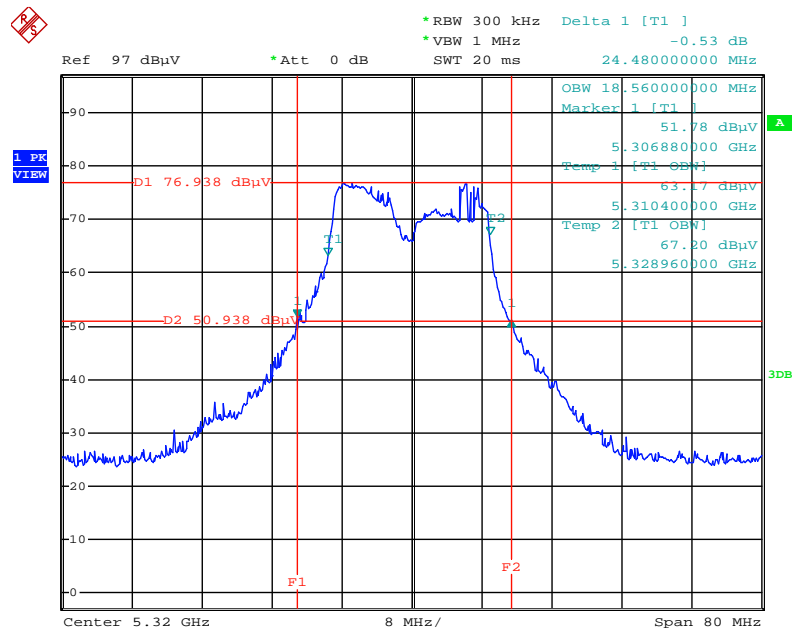
Date: 15.OCT.2014 21:23:49

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5300 MHz



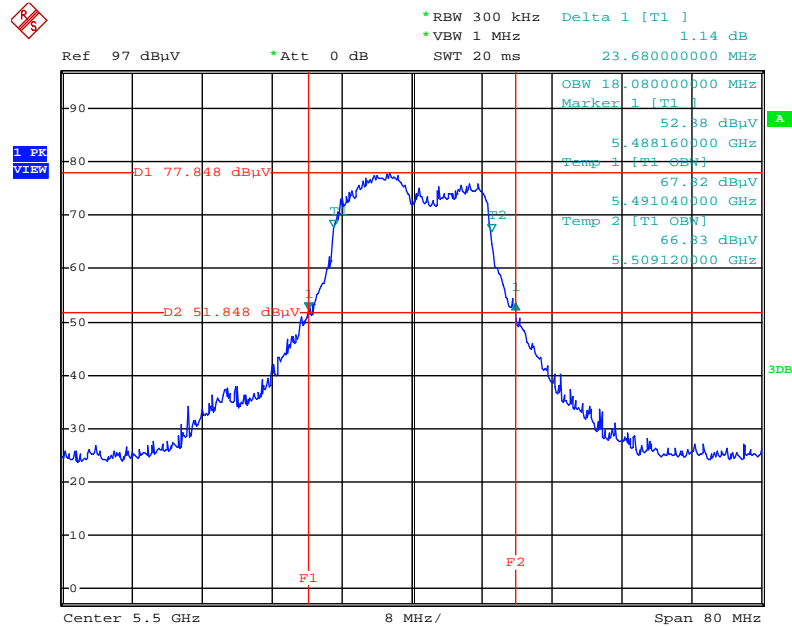
Date: 15.OCT.2014 21:22:33

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5320 MHz



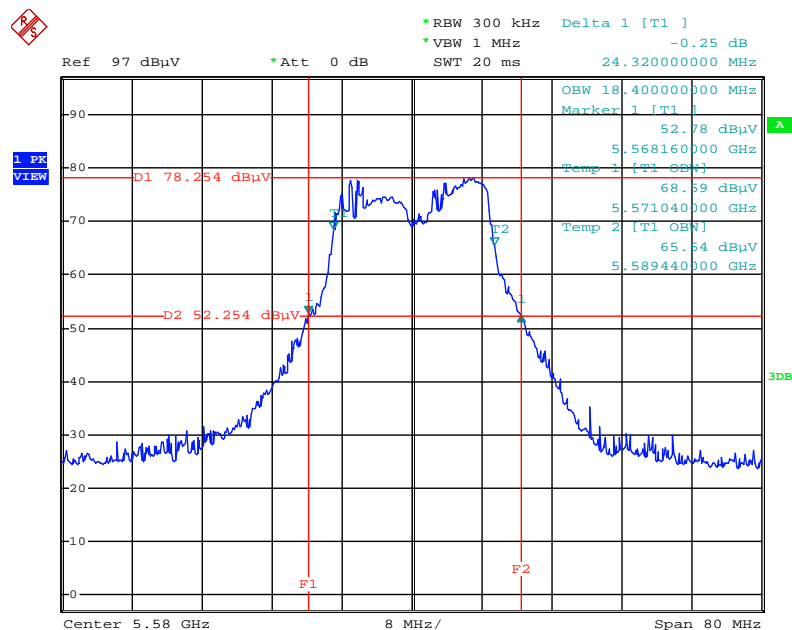
Date: 15.OCT.2014 21:22:02

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5500 MHz



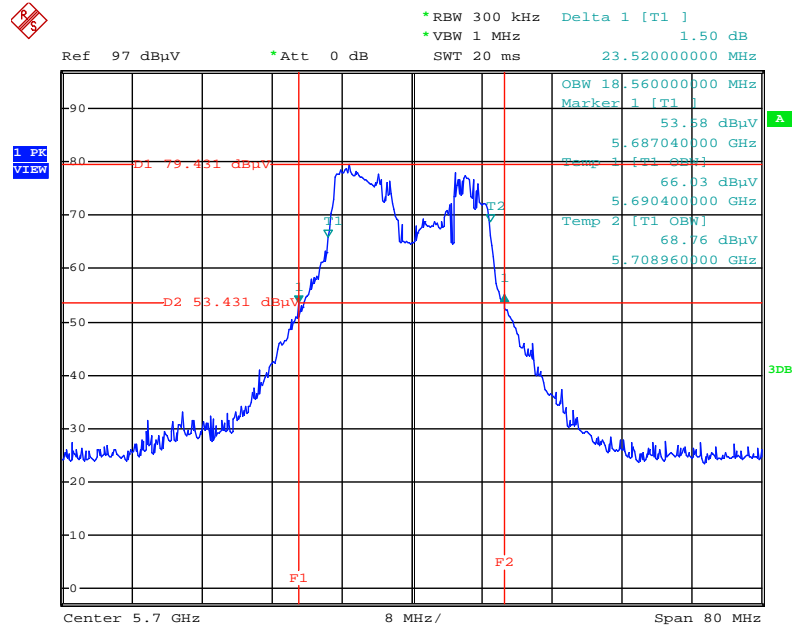
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26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5580 MHz



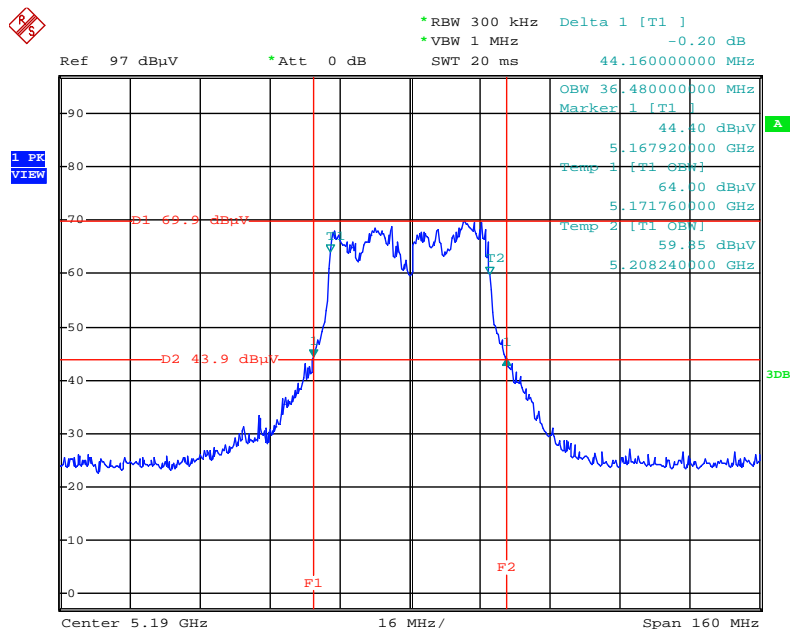
Date: 15.OCT.2014 21:20:00

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5700 MHz



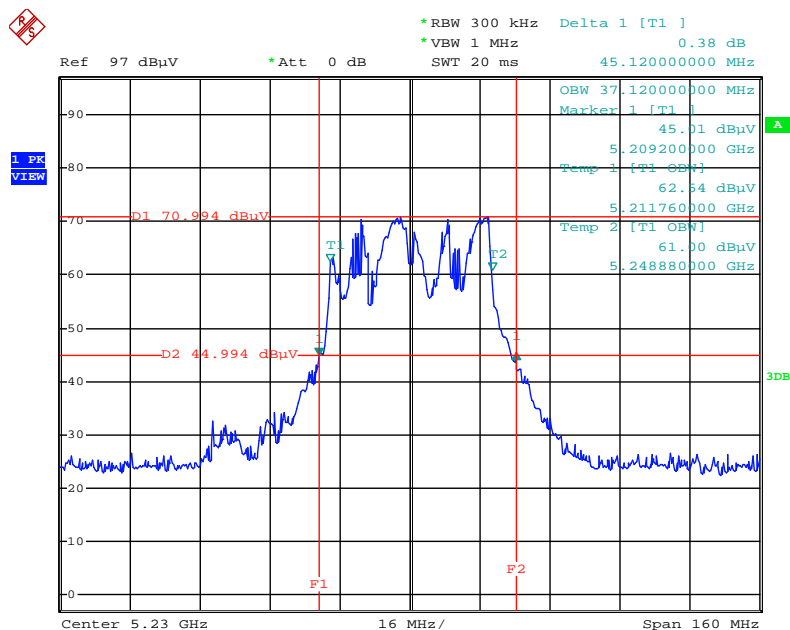
Date: 15.OCT.2014 21:20:48

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5190 MHz



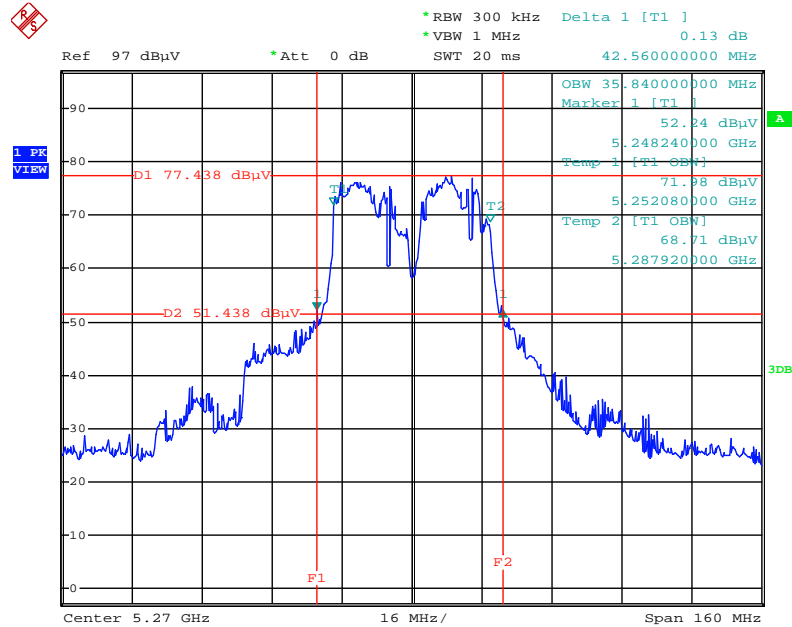
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26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5230 MHz



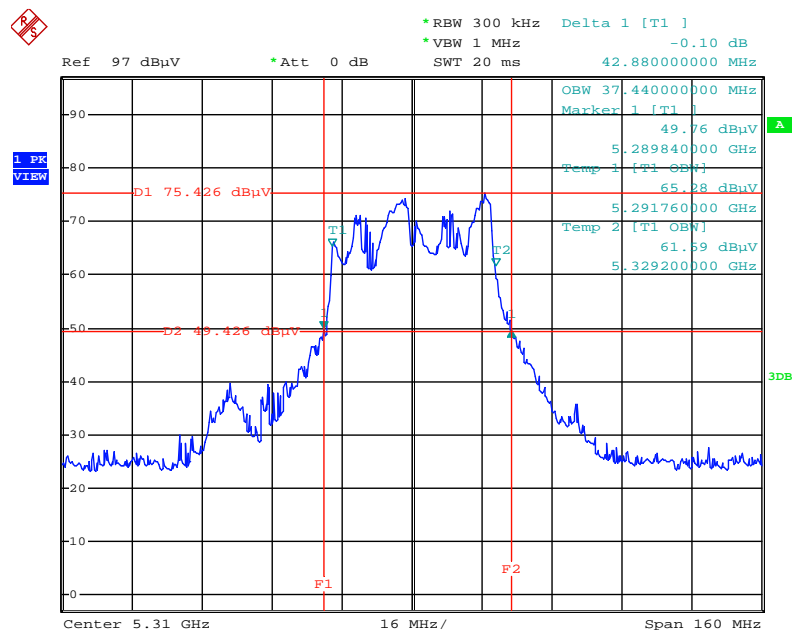
Date: 15.OCT.2014 21:27:54

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5270 MHz



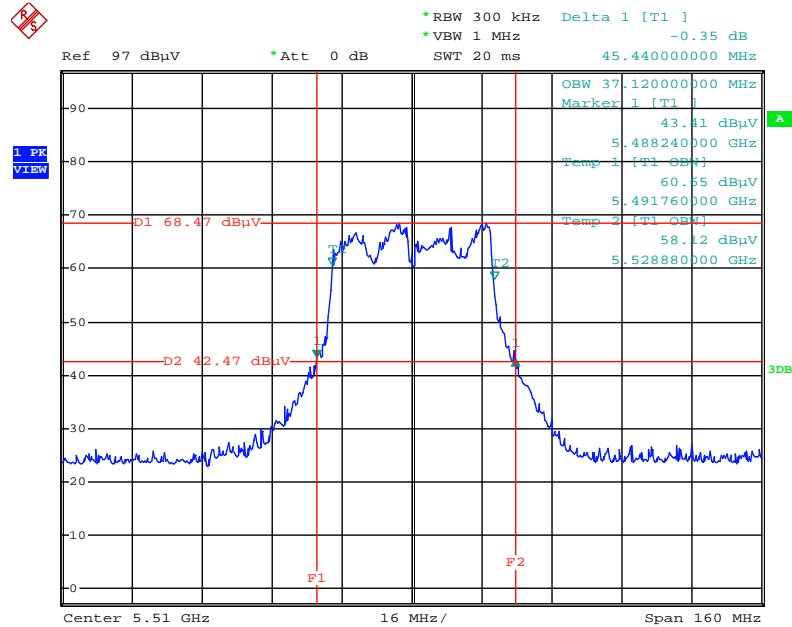
Date: 15.OCT.2014 21:28:38

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5310 MHz



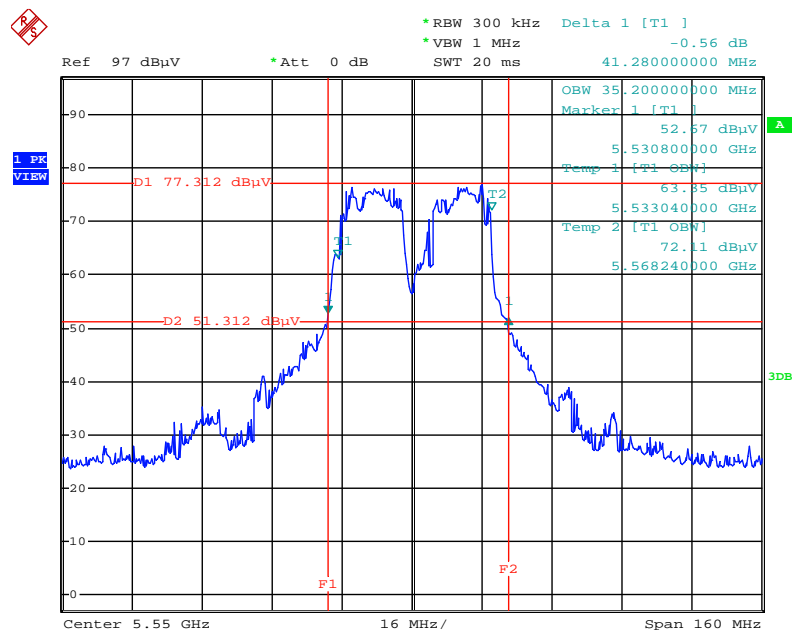
Date: 15.OCT.2014 21:29:10

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5510 MHz



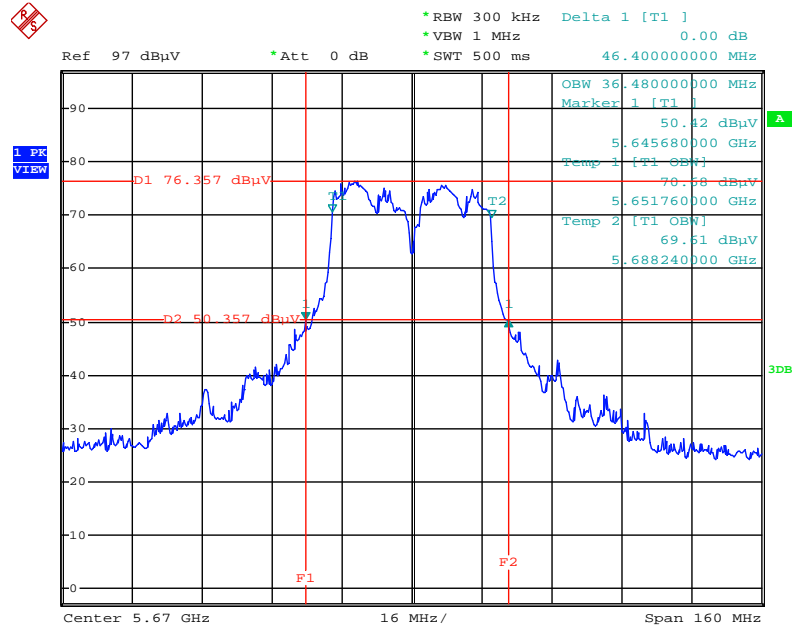
Date: 15.OCT.2014 21:30:03

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5550 MHz



Date: 15.OCT.2014 21:30:46

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5670 MHz



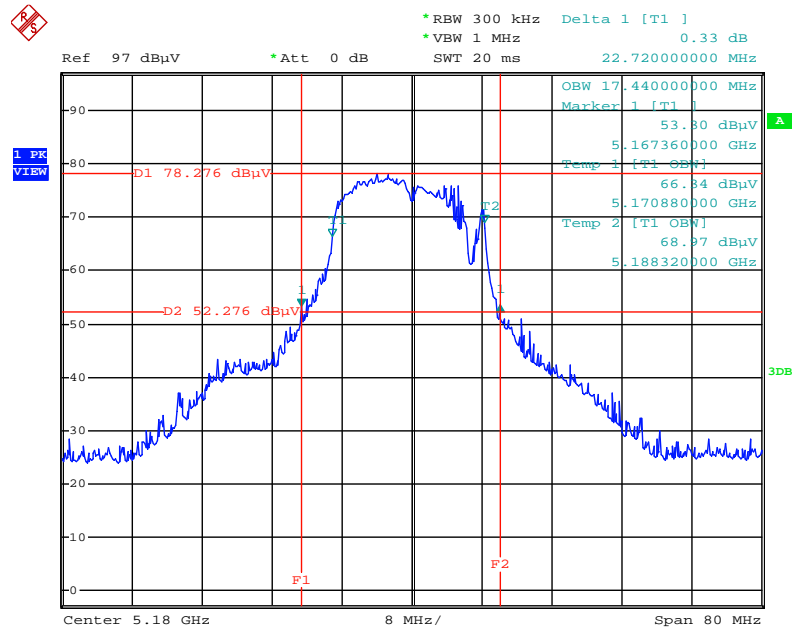
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Mode 2 (Ant.16 Panel antenna / 3.5dBi)

For Beamforming Mode

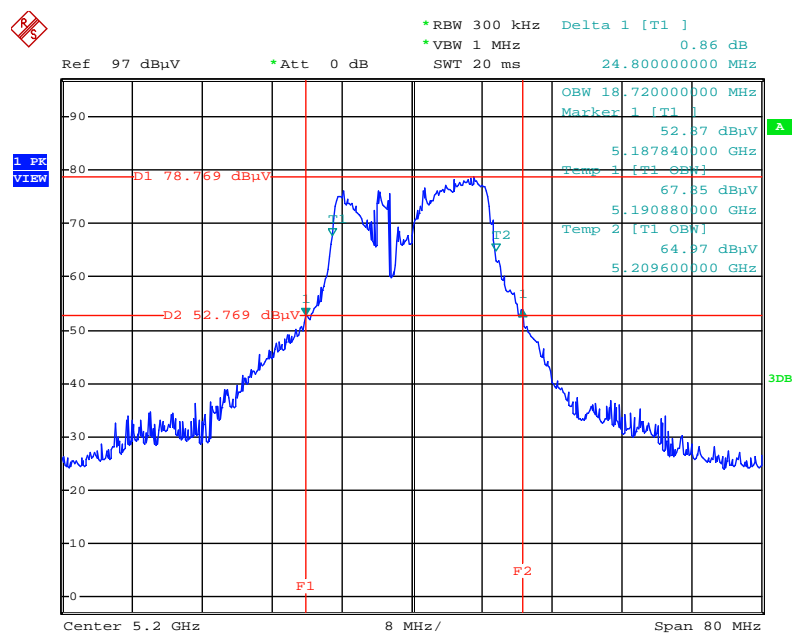
For 2TX

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1
+ Chain 2 / 5180 MHz



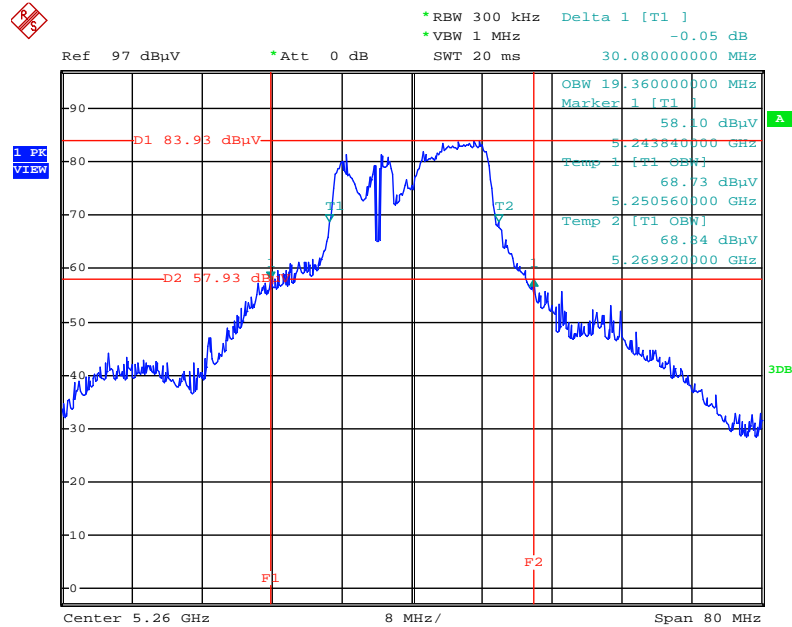
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26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1
+ Chain 2 / 5200 MHz



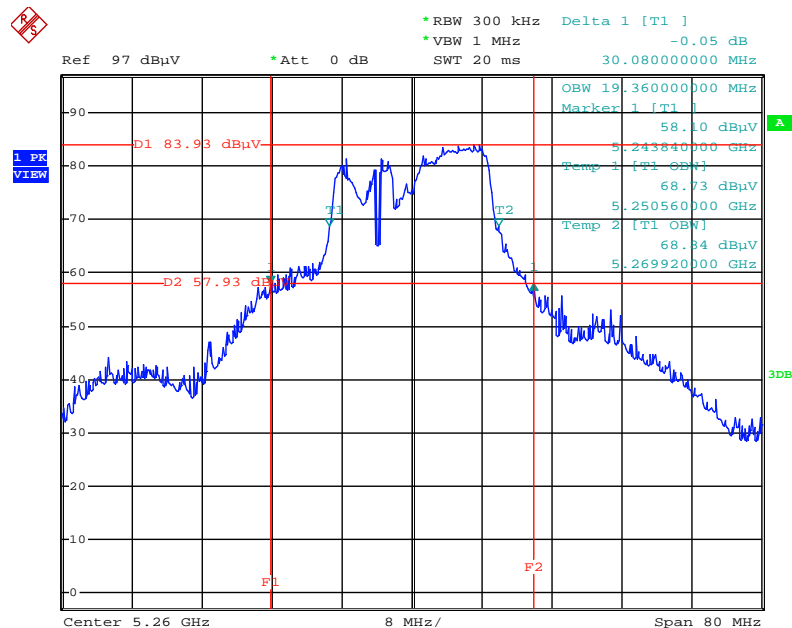
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26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 / 5240 MHz



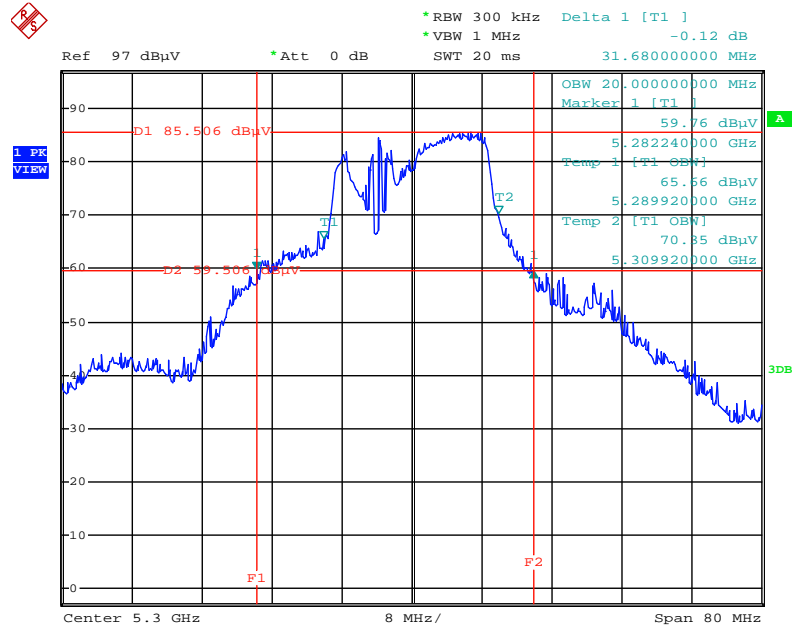
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26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 / 5260 MHz



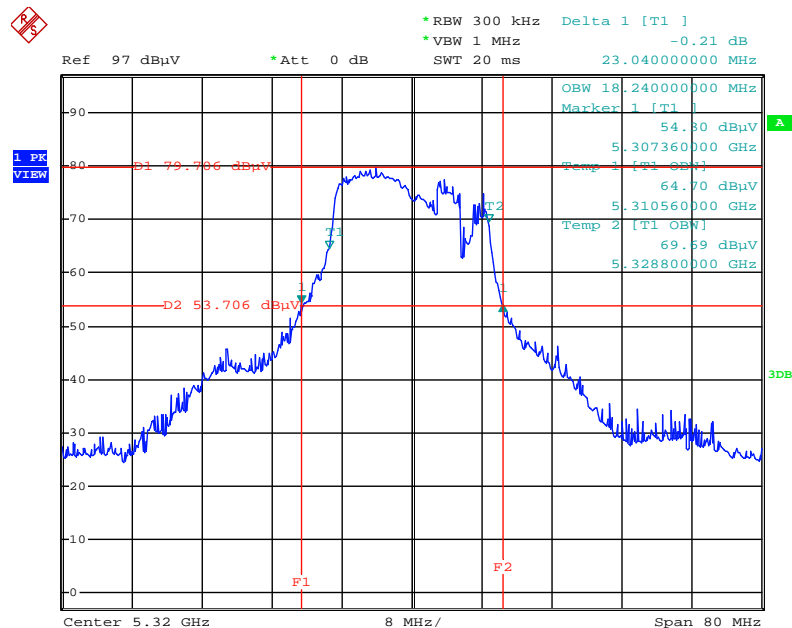
Date: 16.OCT.2014 17:45:52

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 / 5300 MHz



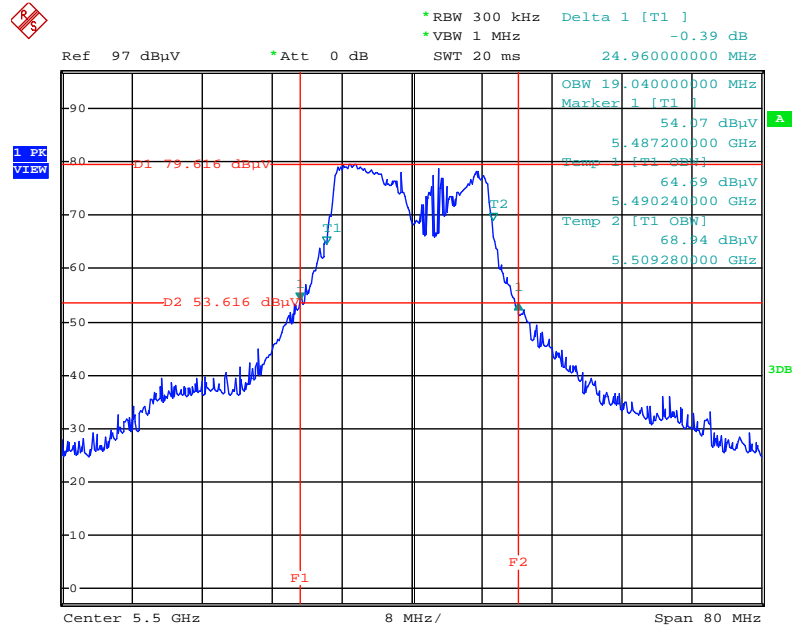
Date: 16.OCT.2014 17:46:38

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 / 5320 MHz



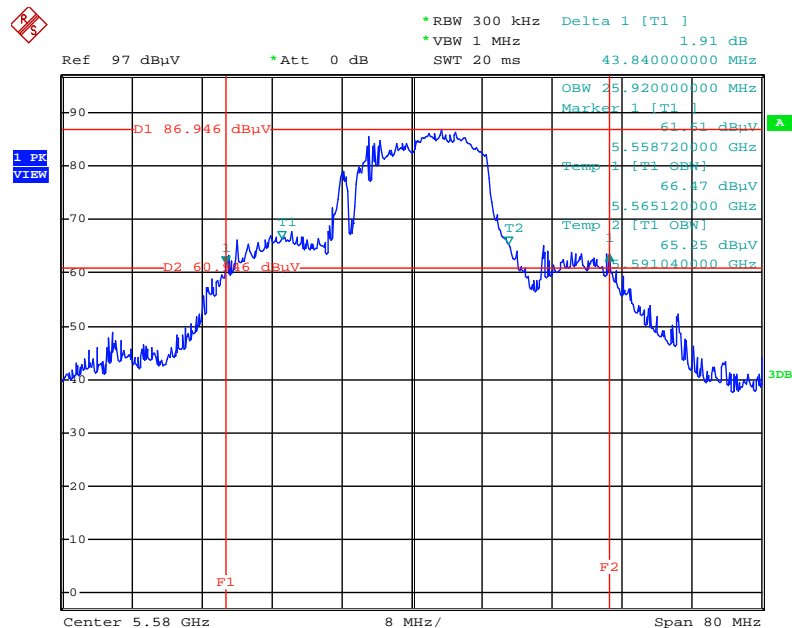
Date: 16.OCT.2014 17:47:35

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 / 5500 MHz



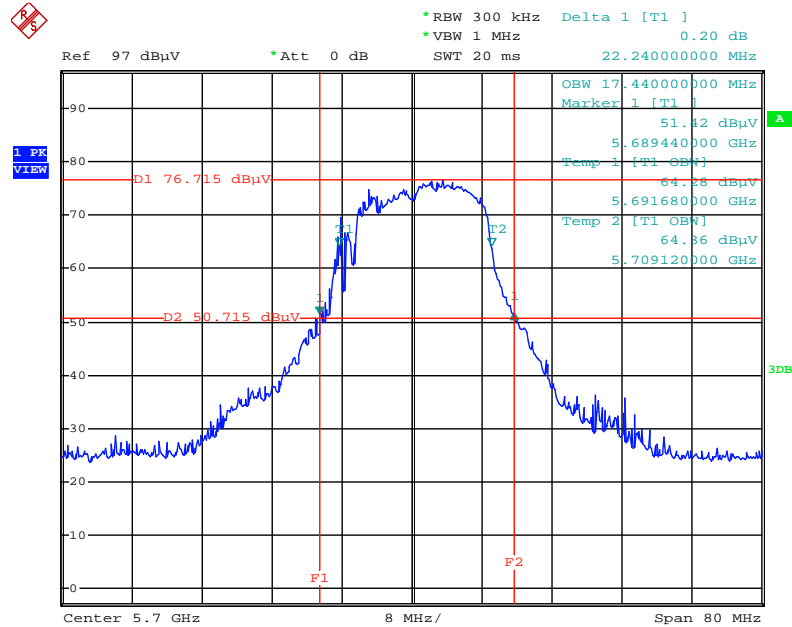
Date: 16.OCT.2014 17:50:38

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 / 5580 MHz



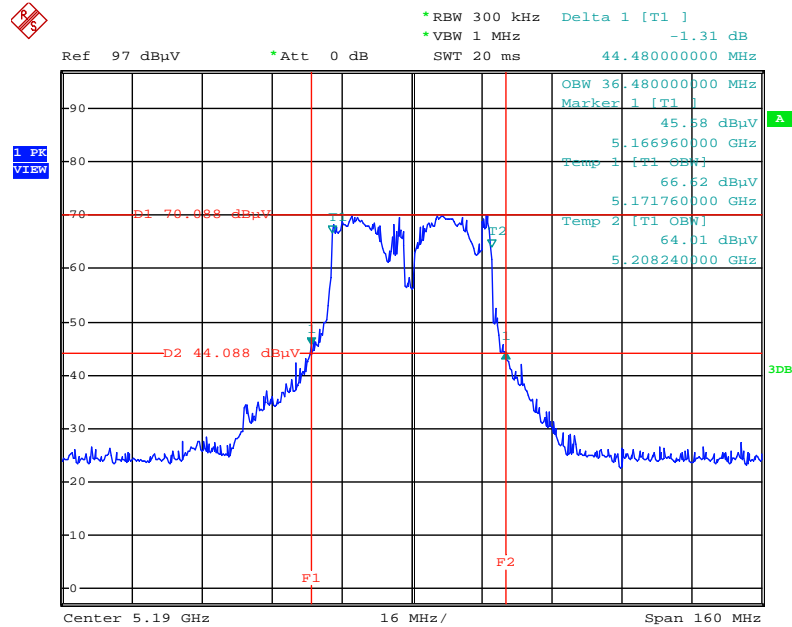
Date: 16.OCT.2014 17:52:45

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 / 5700 MHz



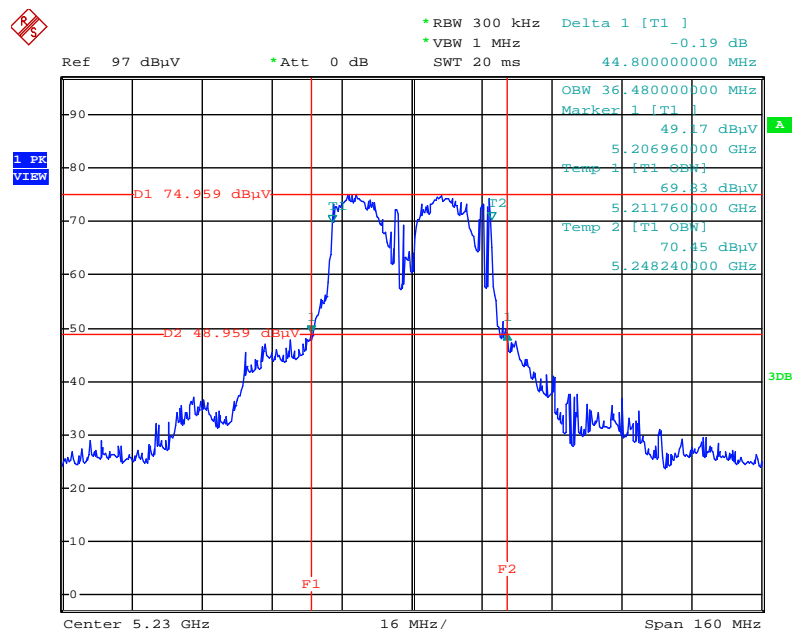
Date: 16.OCT.2014 17:53:46

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 / 5190 MHz



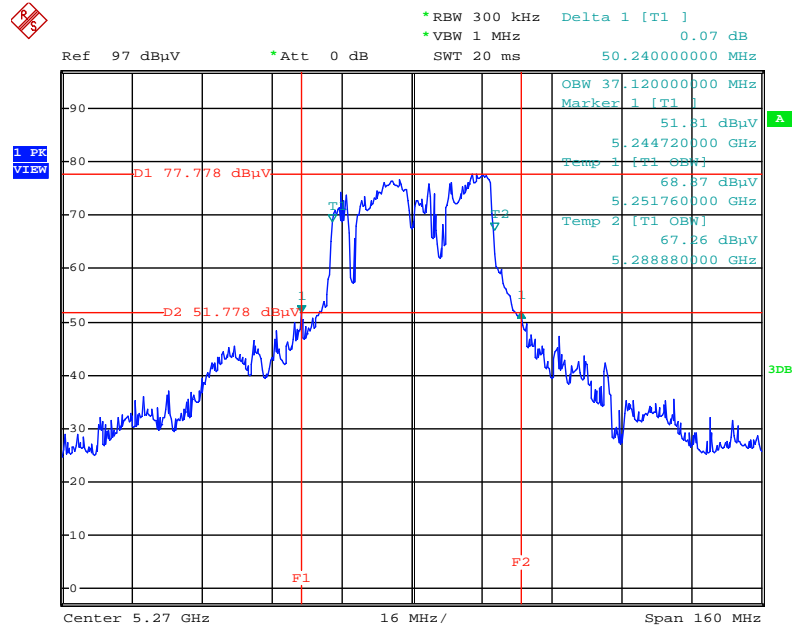
Date: 16.OCT.2014 17:57:51

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 / 5230 MHz



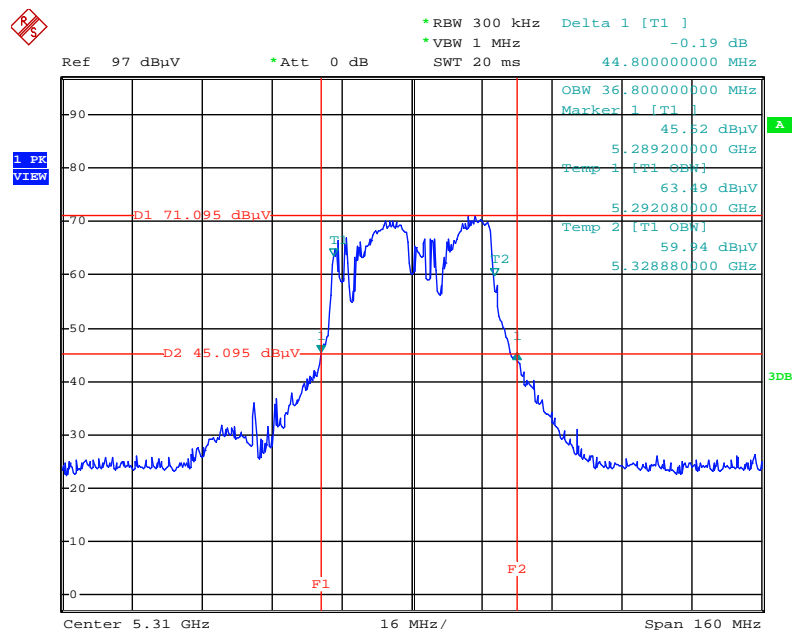
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26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 / 5270 MHz



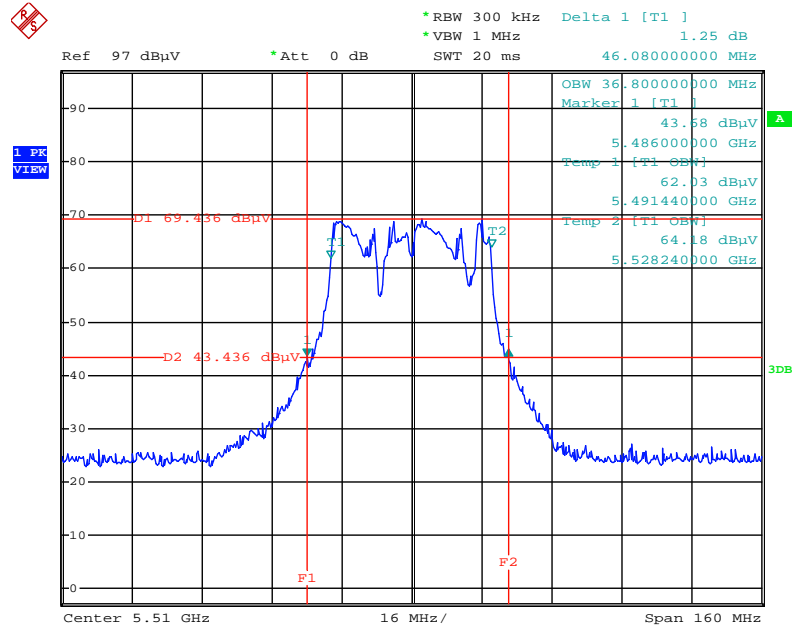
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26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 / 5310 MHz



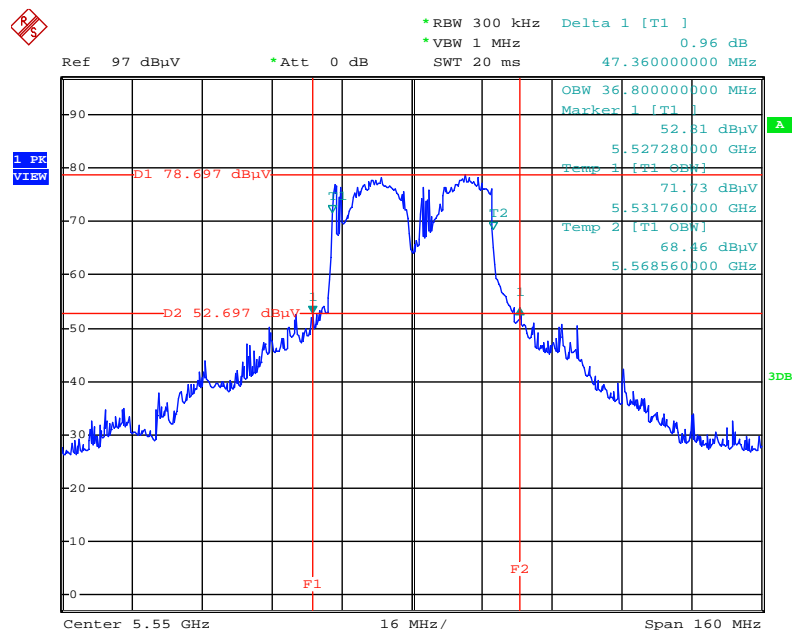
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26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 / 5510 MHz



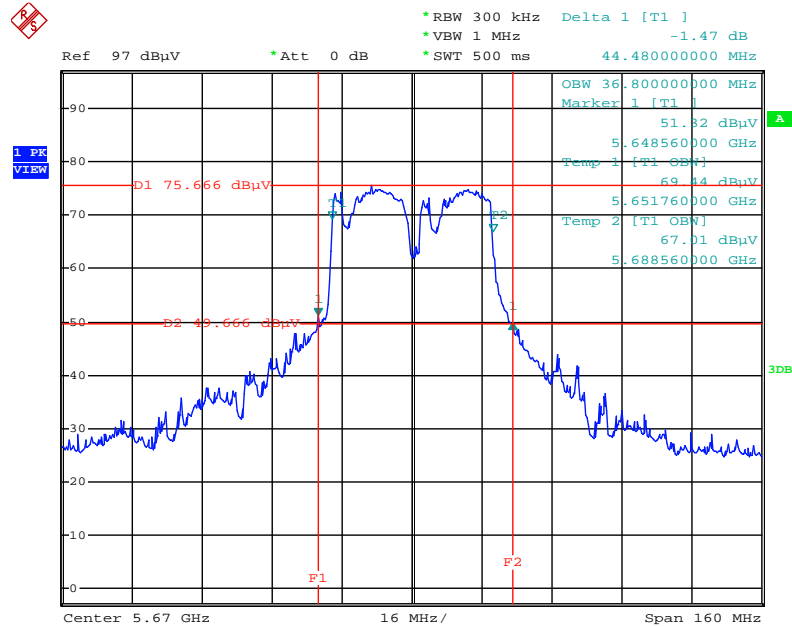
Date: 16.OCT.2014 17:57:05

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 / 5550 MHz



Date: 16.OCT.2014 17:56:14

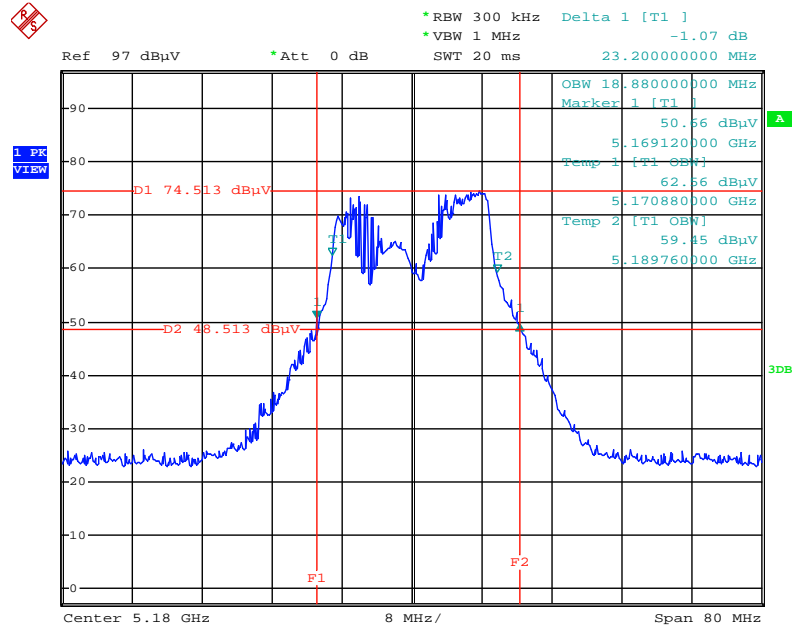
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 / 5670 MHz



Date: 16.OCT.2014 17:55:26

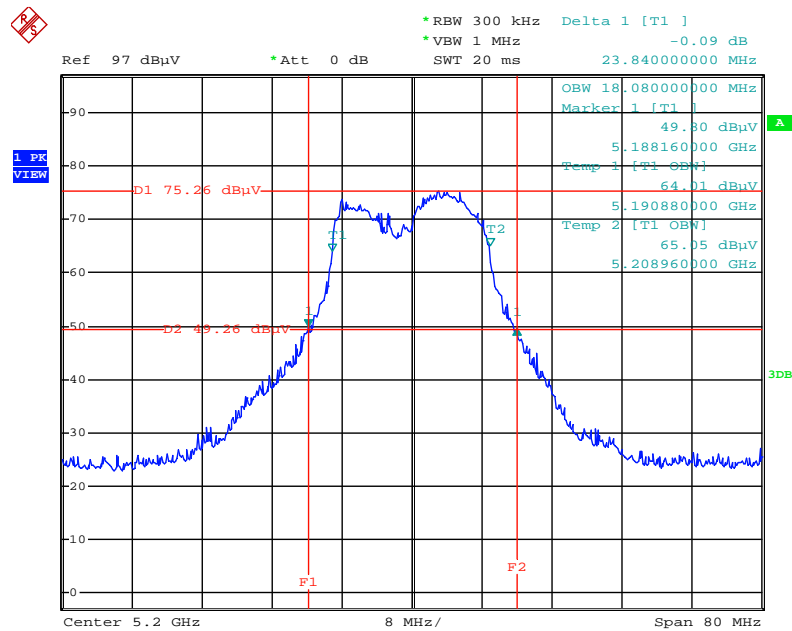
For 3TX

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1
+ Chain 2 + Chain 3 / 5180 MHz



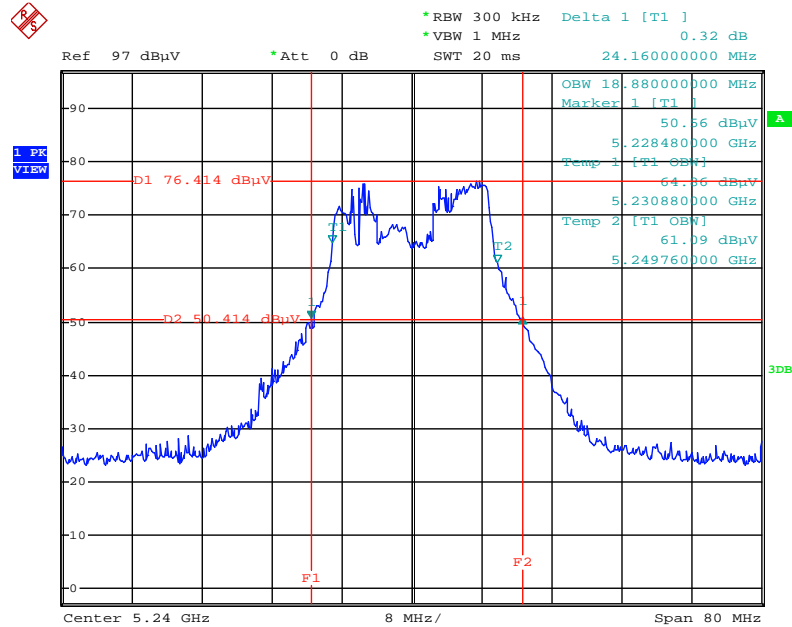
Date: 16.OCT.2014 15:23:56

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1
+ Chain 2 + Chain 3 / 5200 MHz



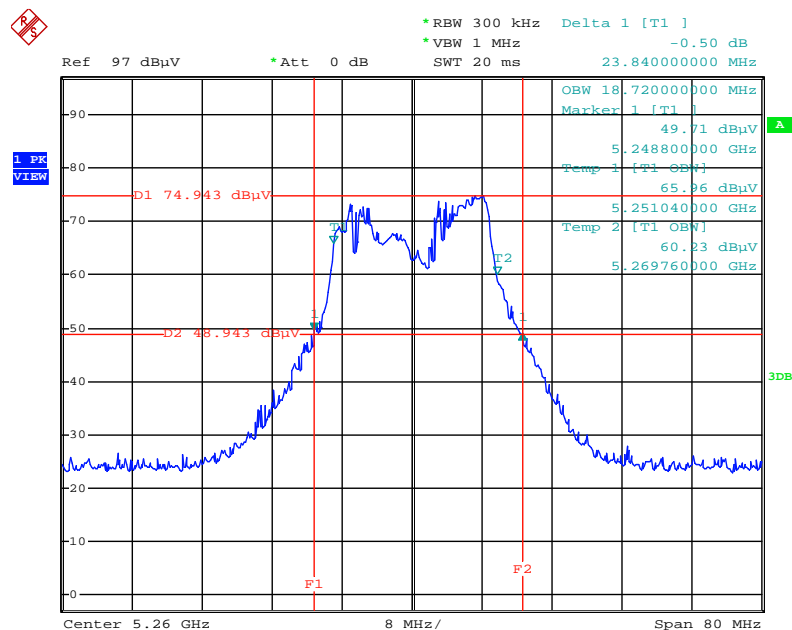
Date: 16.OCT.2014 15:26:11

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5240 MHz



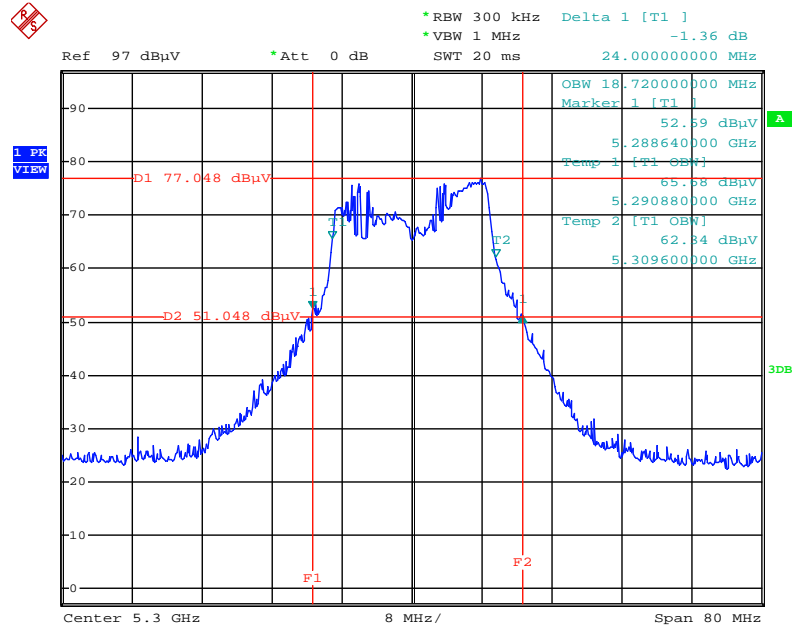
Date: 16.OCT.2014 15:26:47

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5260 MHz



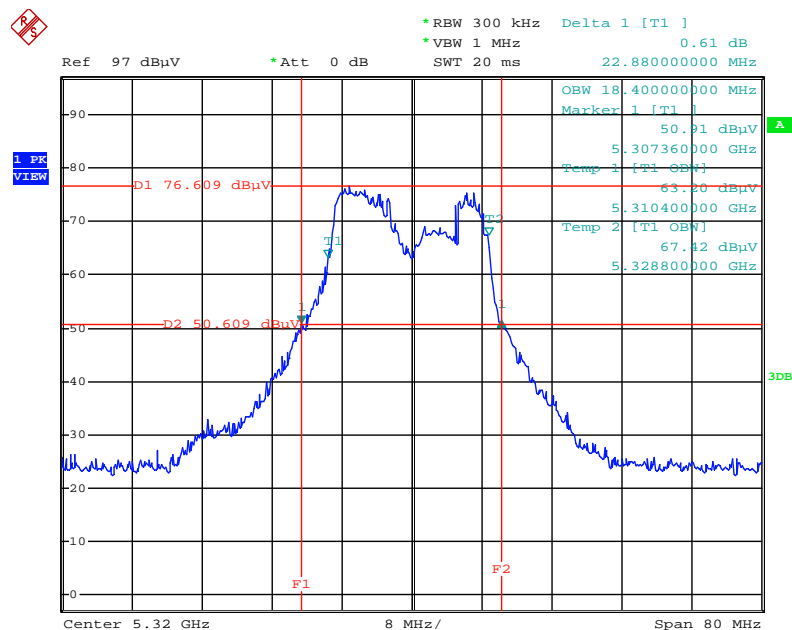
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26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5300 MHz



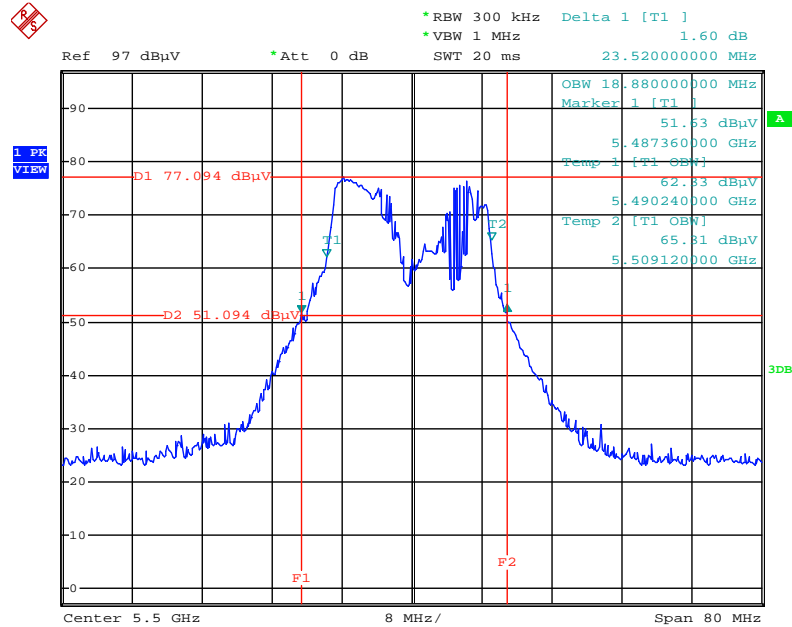
Date: 16.OCT.2014 15:28:06

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5320 MHz



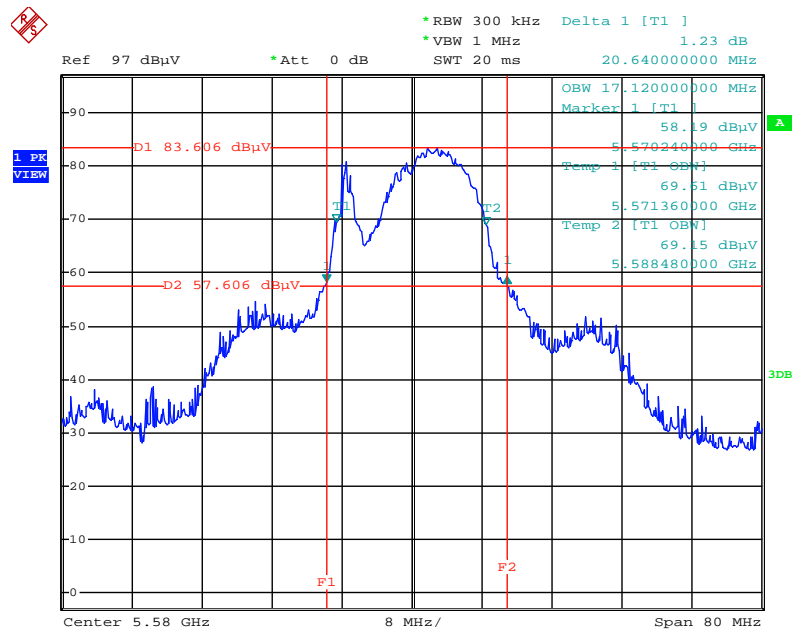
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26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5500 MHz



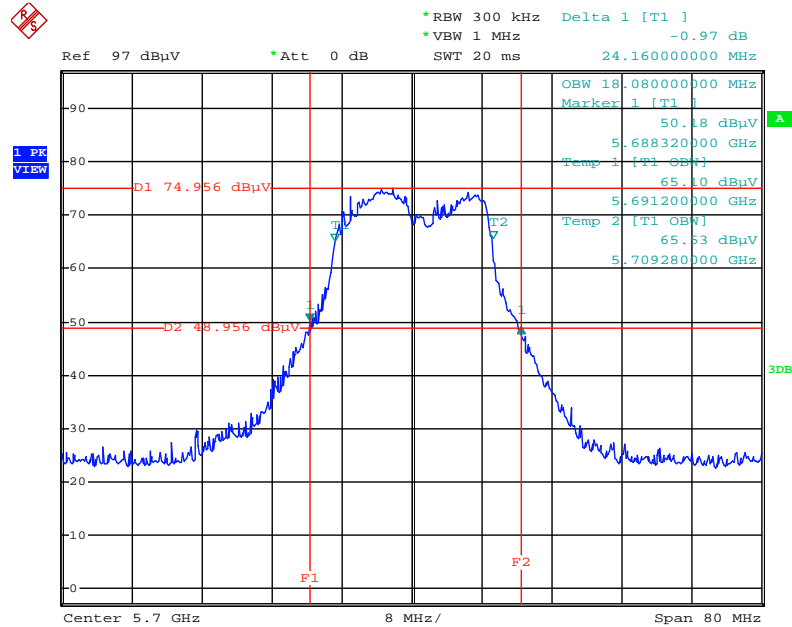
Date: 16.OCT.2014 15:29:38

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5580 MHz



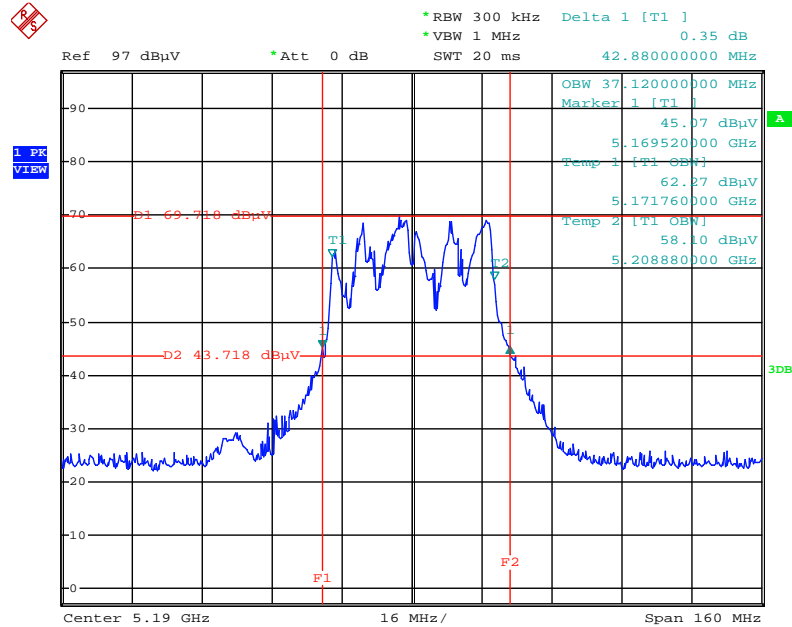
Date: 16.OCT.2014 15:30:27

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5700 MHz



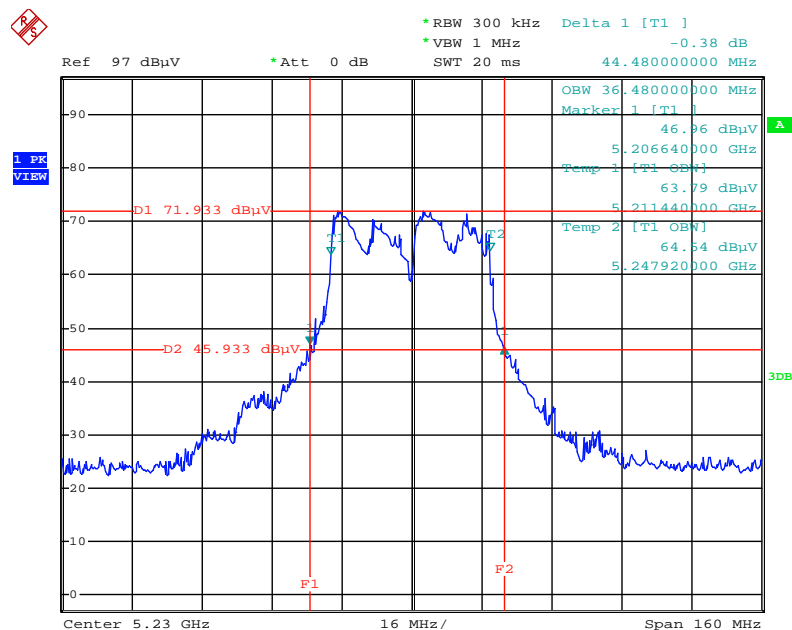
Date: 16.OCT.2014 15:31:25

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5190 MHz



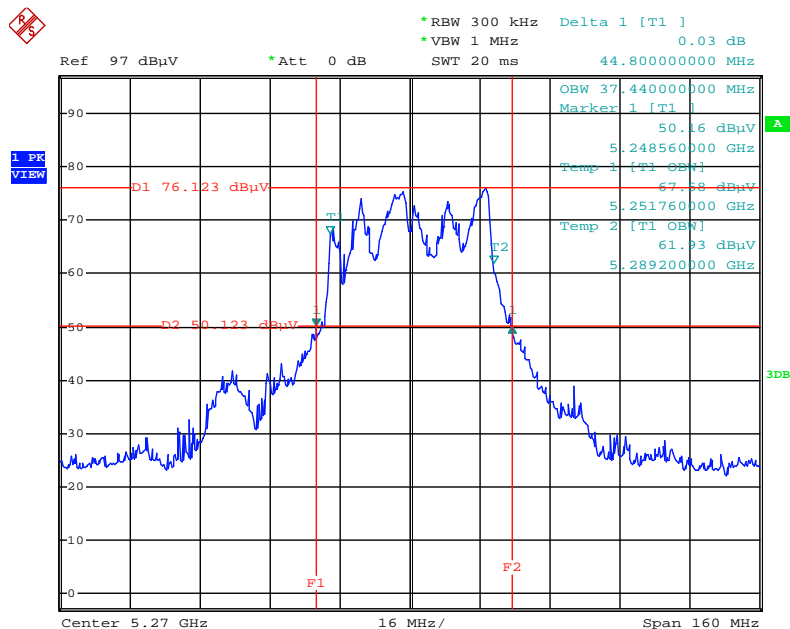
Date: 16.OCT.2014 15:33:15

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5230 MHz



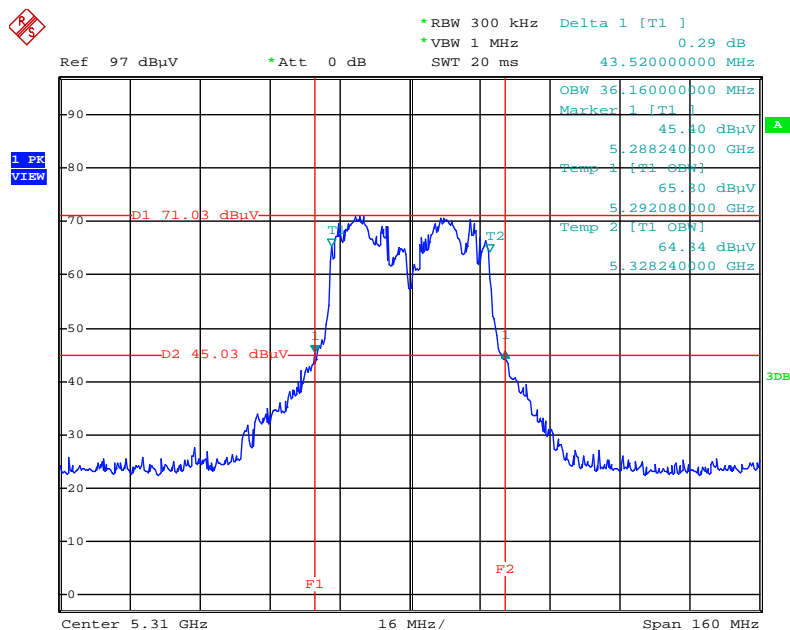
Date: 16.OCT.2014 15:34:13

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5270 MHz



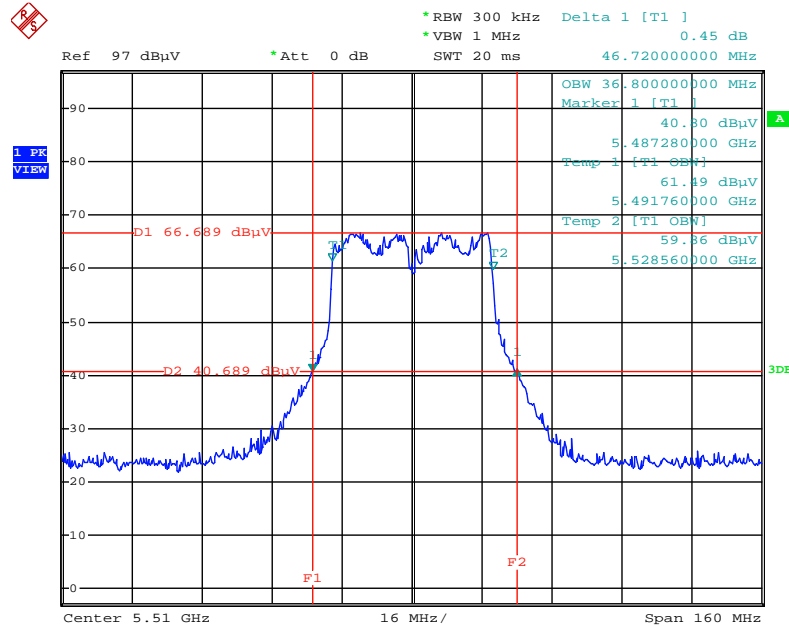
Date: 16.OCT.2014 15:34:59

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5310 MHz



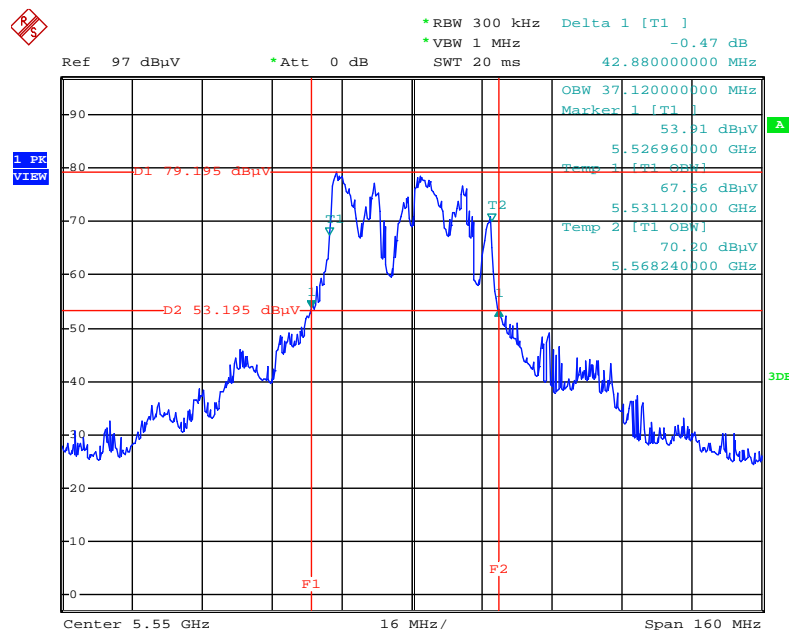
Date: 16.OCT.2014 15:35:45

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5510 MHz



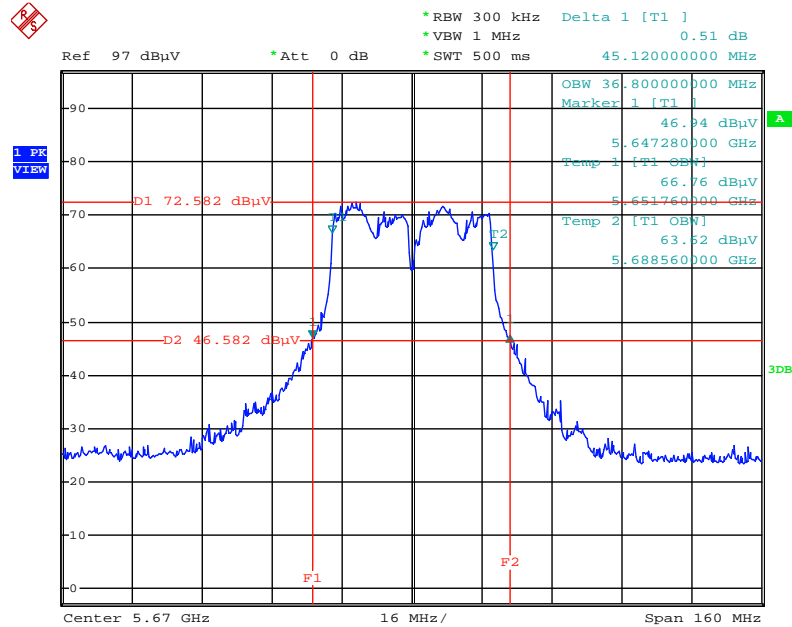
Date: 16.OCT.2014 15:36:35

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5550 MHz



Date: 16.OCT.2014 15:37:17

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5670 MHz



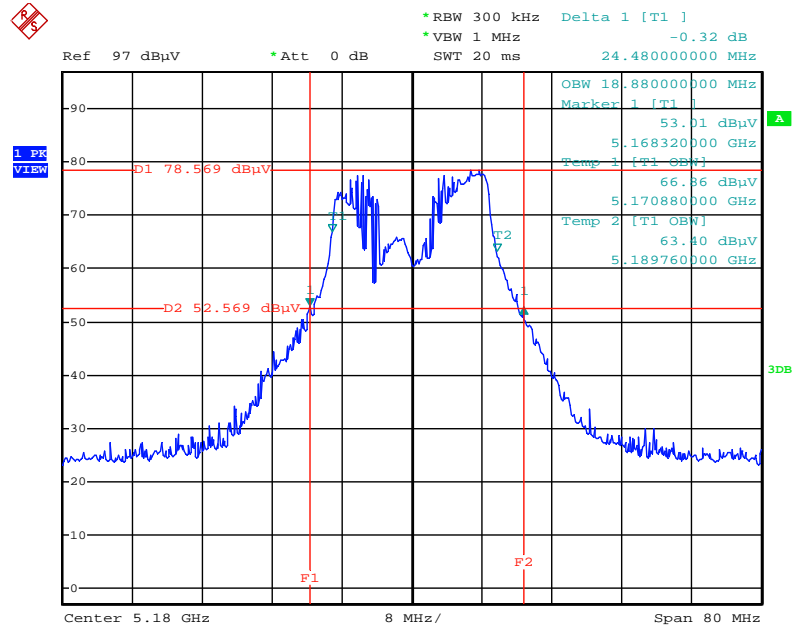
Date: 16.OCT.2014 15:38:02

Mode 3 (Ant.32 3-Port Dual-Band Directional Panel antenna / Chain 1: 6.7, Chain 2: 4.3, Chain 3: 6.6dBi)

For Beamforming Mode

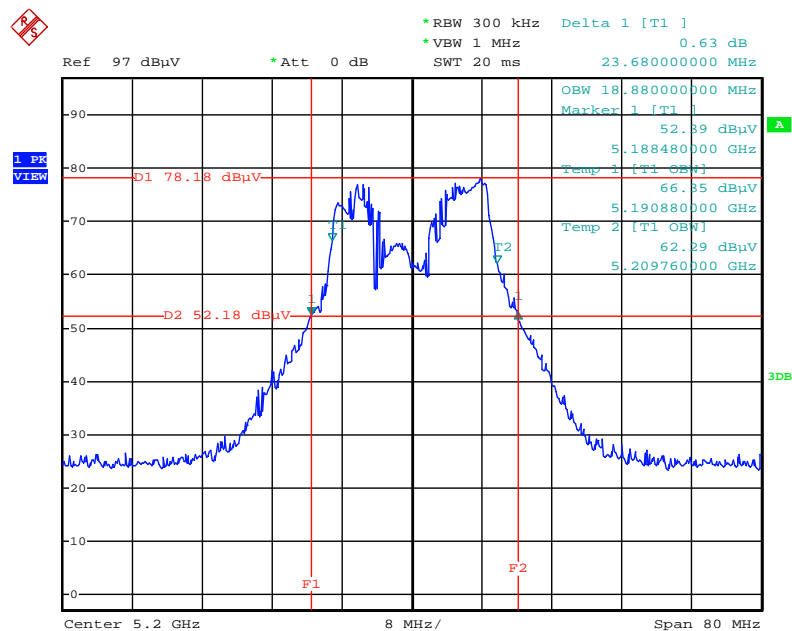
For 3TX

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1
+ Chain 2 + Chain 3 / 5180 MHz



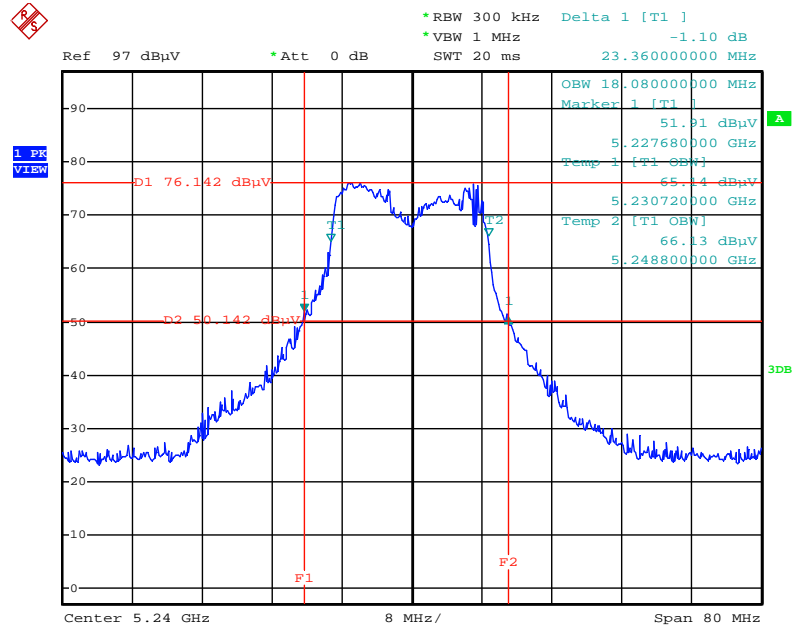
Date: 14.OCT.2014 21:11:42

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1
+ Chain 2 + Chain 3 / 5200 MHz



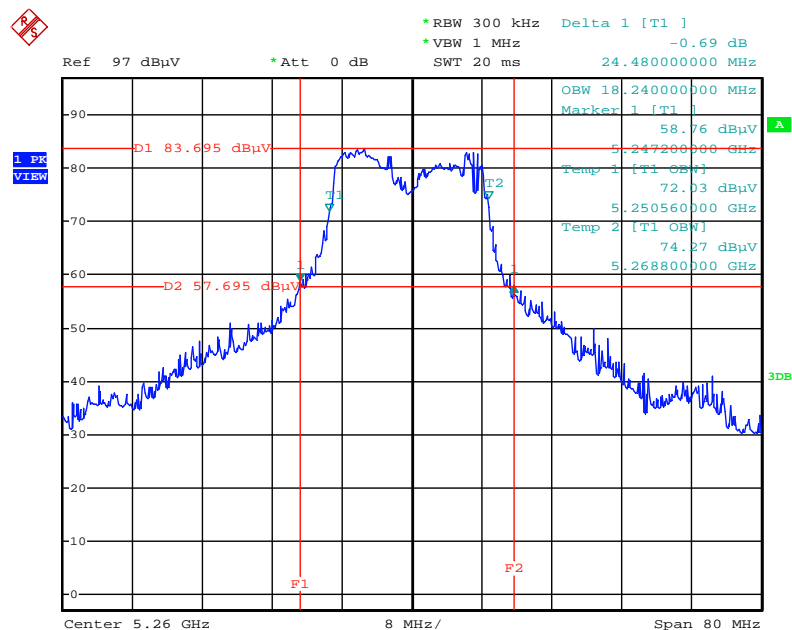
Date: 14.OCT.2014 21:12:12

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5240 MHz



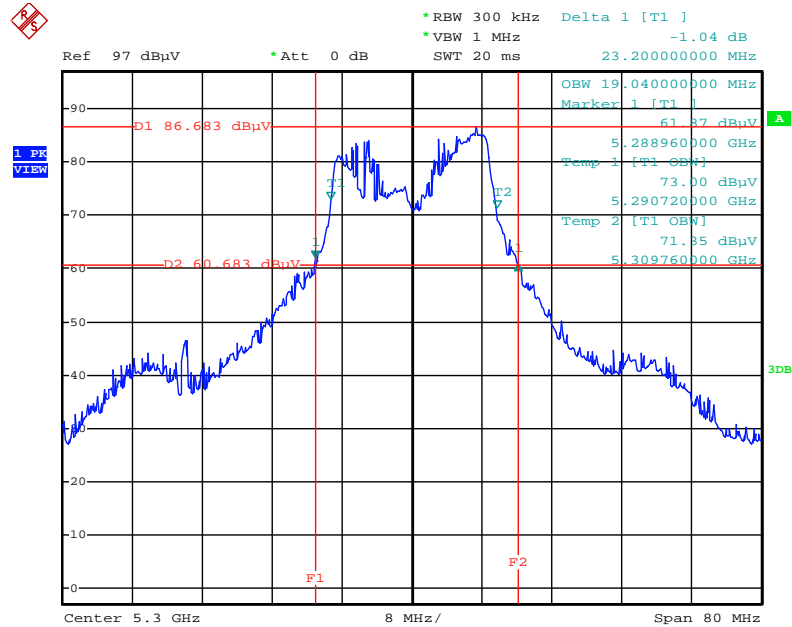
Date: 14.OCT.2014 21:12:52

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5260 MHz



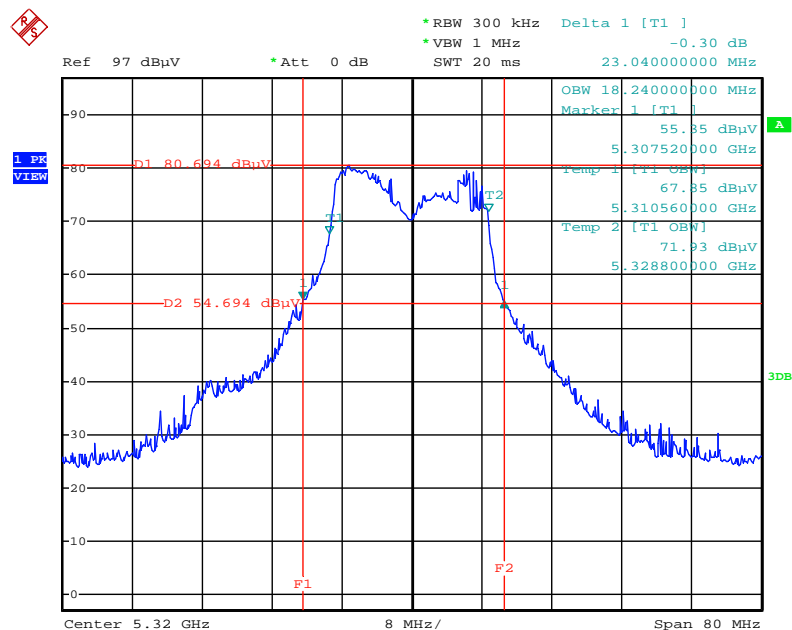
Date: 14.OCT.2014 21:13:21

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5300 MHz



Date: 14.OCT.2014 21:13:45

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5320 MHz



Date: 14.OCT.2014 21:14:16



Ref 97 dBμV *Att 0 dB *RBW 300 kHz Delta 1 [T1] -0.53 dB
 SWT 20 ms 23.20000000 MHz

OBW 18.40000000 MHz
 Marker 1 [T1] 57.90 dBμV 5.48736000 GHz
 Temp 1 [T1 OBW] 68.72 dBμV 5.49040000 GHz
 Temp 2 [T1 OBW] 74.56 dBμV 5.50880000 GHz

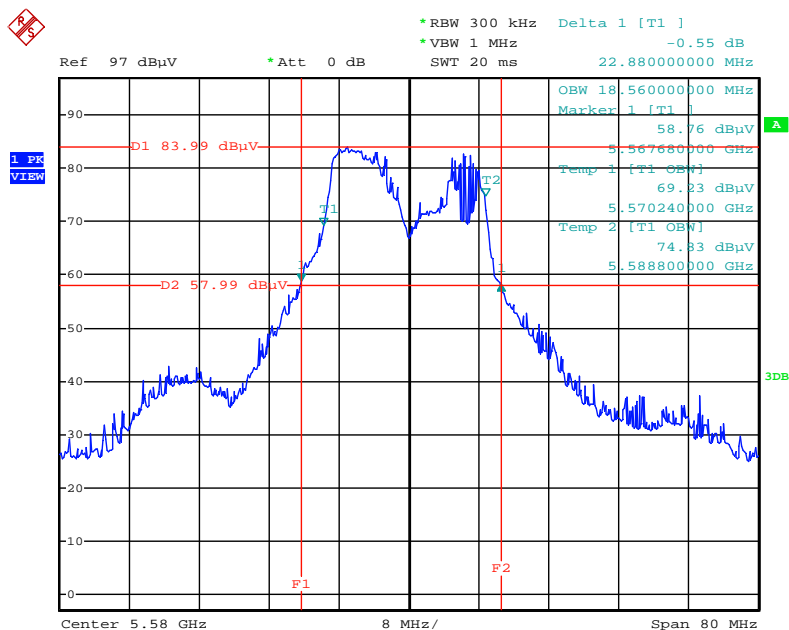
D1 82.902 dBμV
 D2 56.902 dBμV

T1 T2

F1 F2

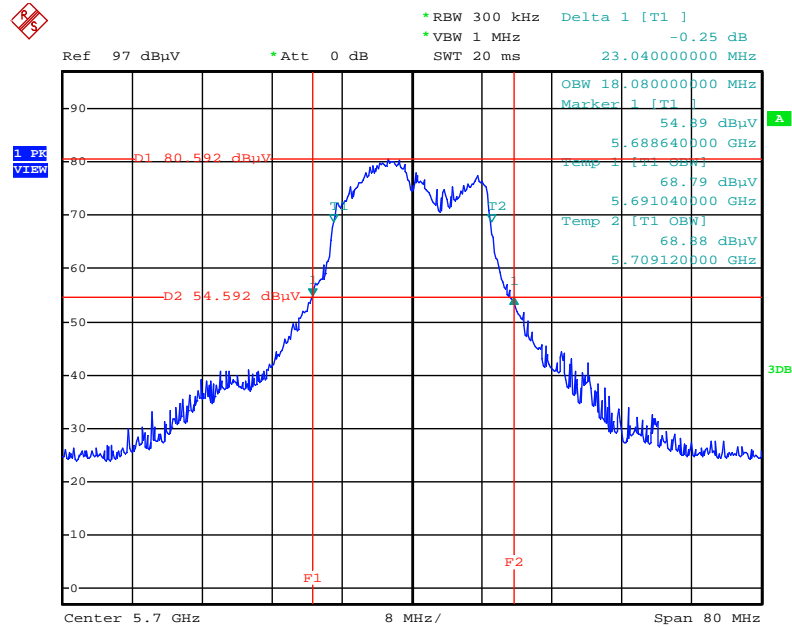
Center 5.5 GHz 8 MHz/ Span 80 MHz

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5580 MHz



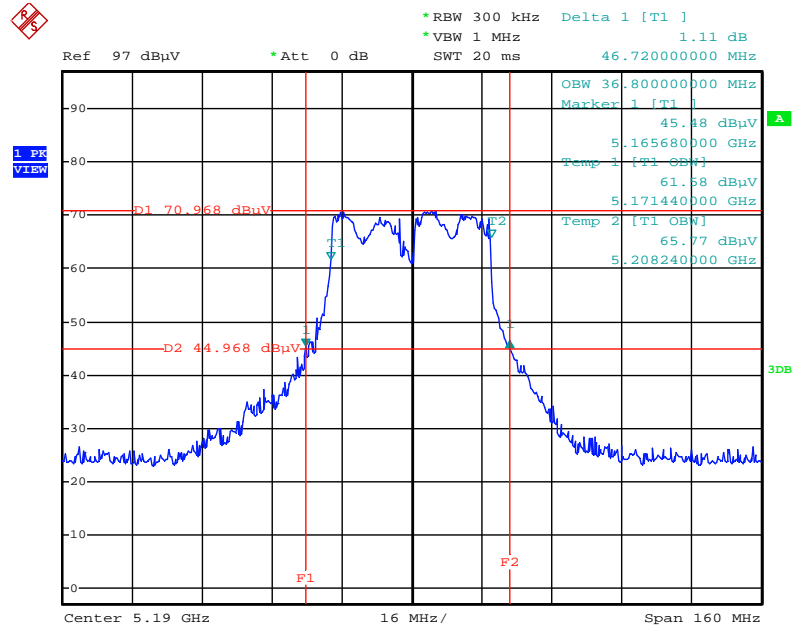
Issued Date : Nov. 21, 2014

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5700 MHz



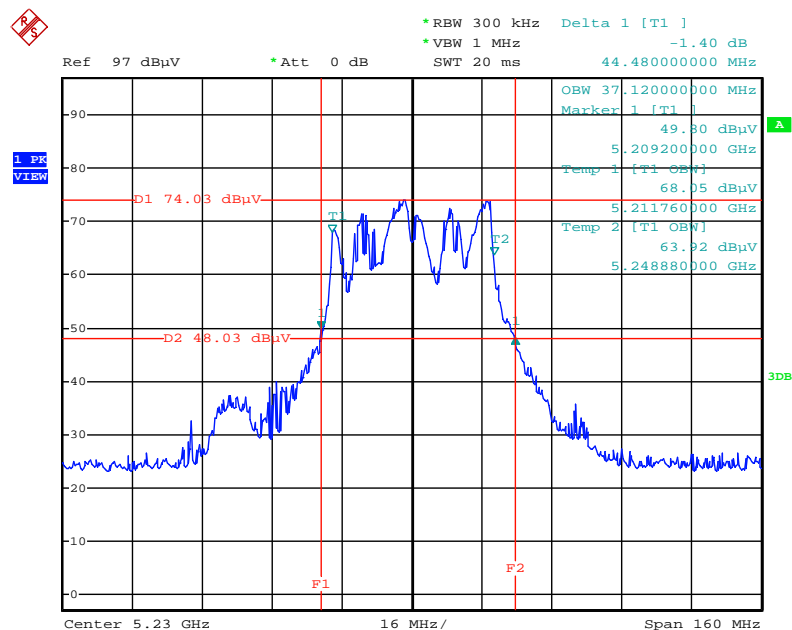
Date: 14.OCT.2014 21:15:45

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5190 MHz



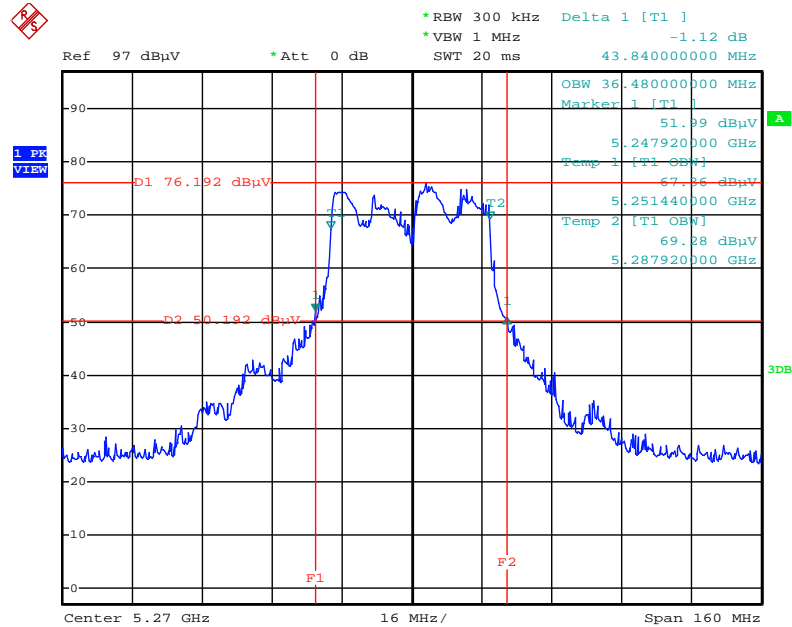
Date: 14.OCT.2014 21:16:47

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5230 MHz



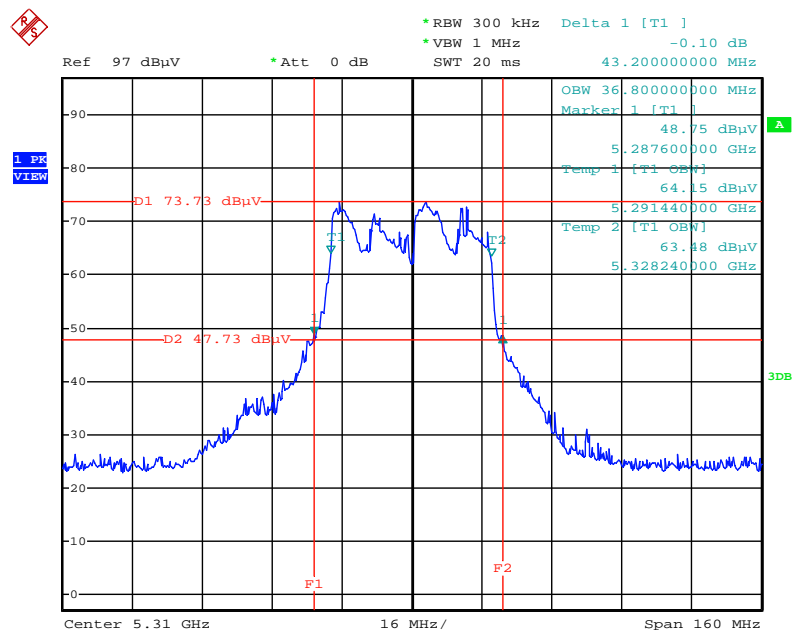
Date: 14.OCT.2014 21:17:15

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5270 MHz



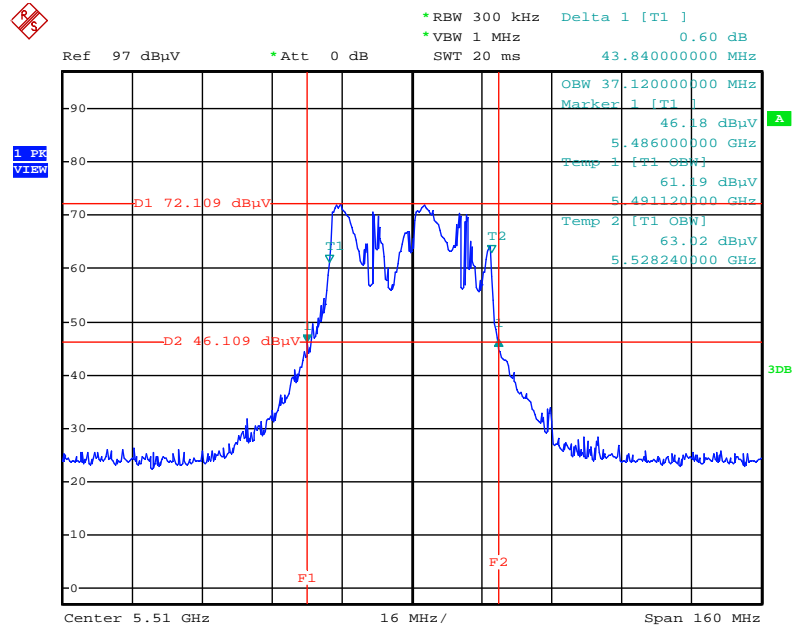
Date: 14.OCT.2014 21:17:42

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5310 MHz



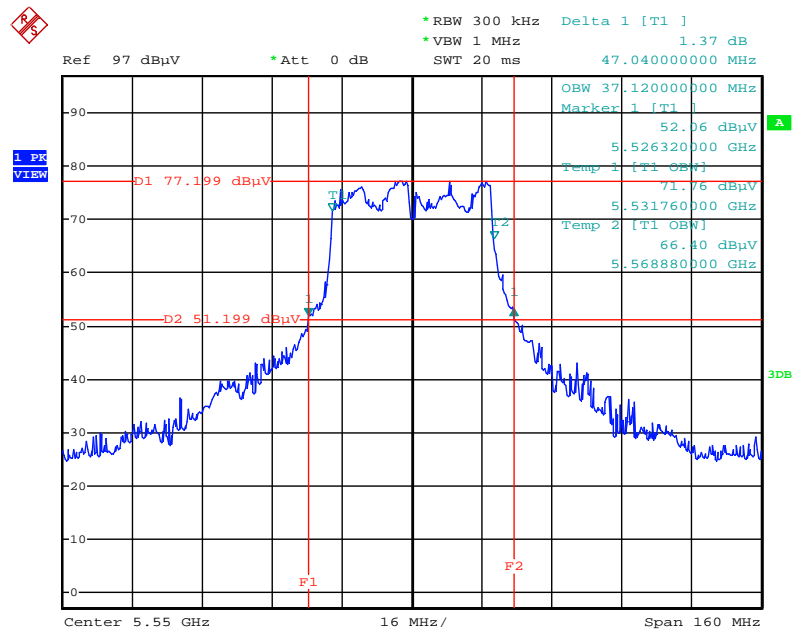
Date: 14.OCT.2014 21:18:10

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5510 MHz



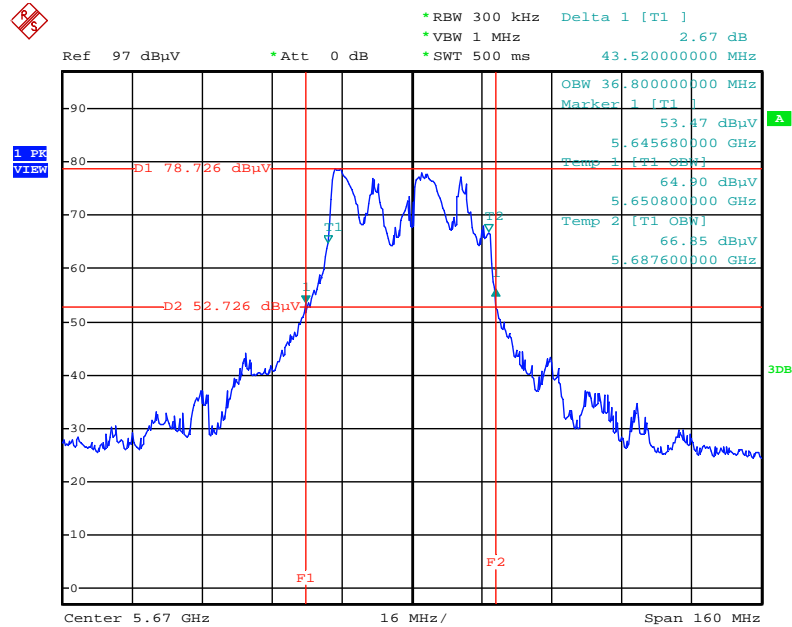
Date: 14.OCT.2014 21:18:44

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5550 MHz



Date: 14.OCT.2014 21:19:18

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5670 MHz

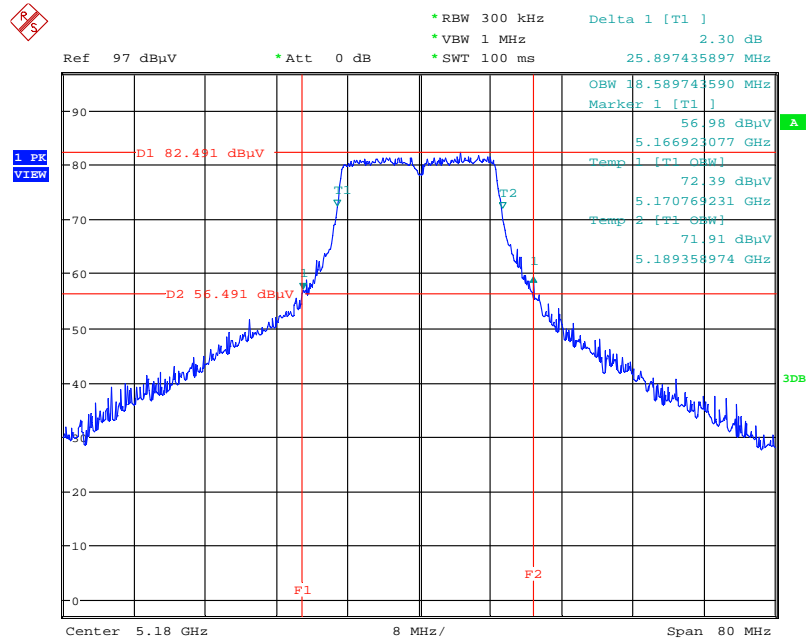


Date: 14.OCT.2014 21:19:47

For Non-Beamforming Mode

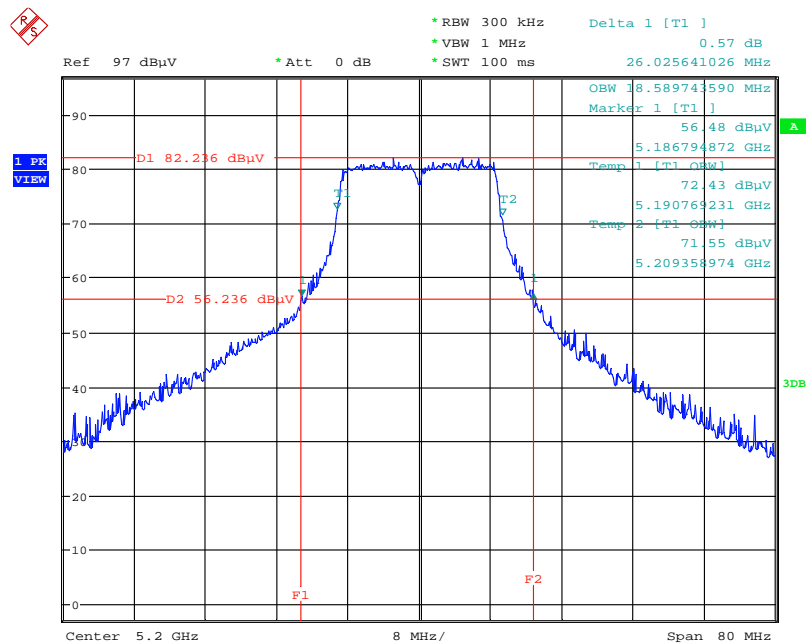
For 1TX

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



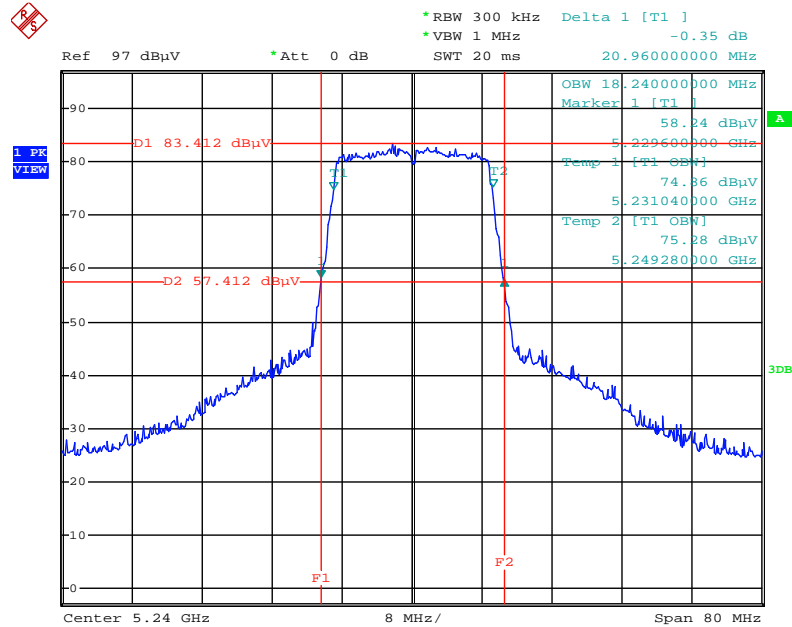
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26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 / 5200 MHz



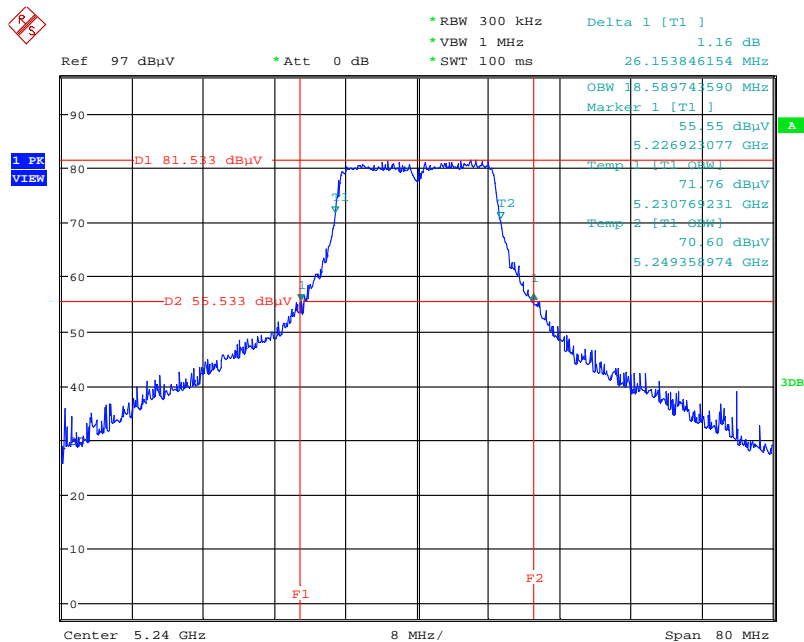
Date: 14.OCT.2014 17:29:42

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



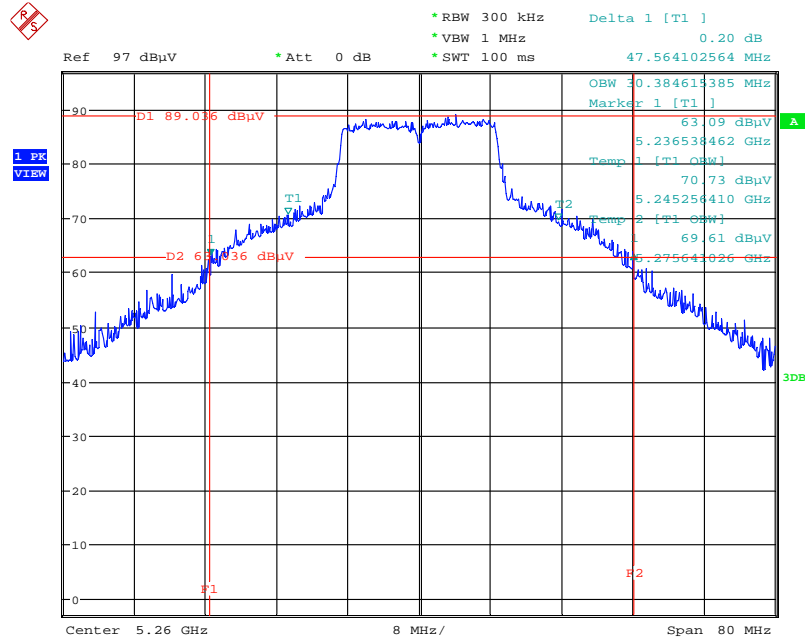
Date: 3.NOV.2014 19:14:53

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 / 5260 MHz



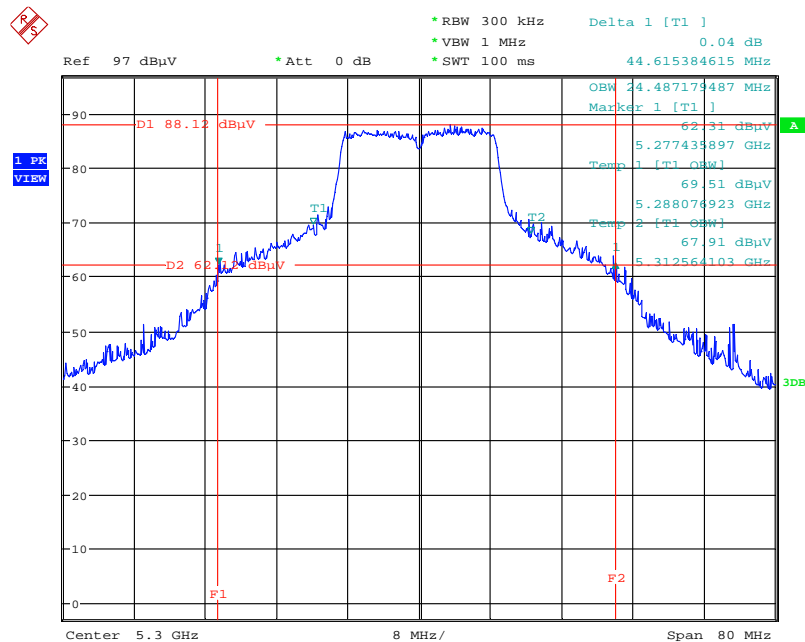
Date: 14.OCT.2014 17:31:16

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 / 5300 MHz



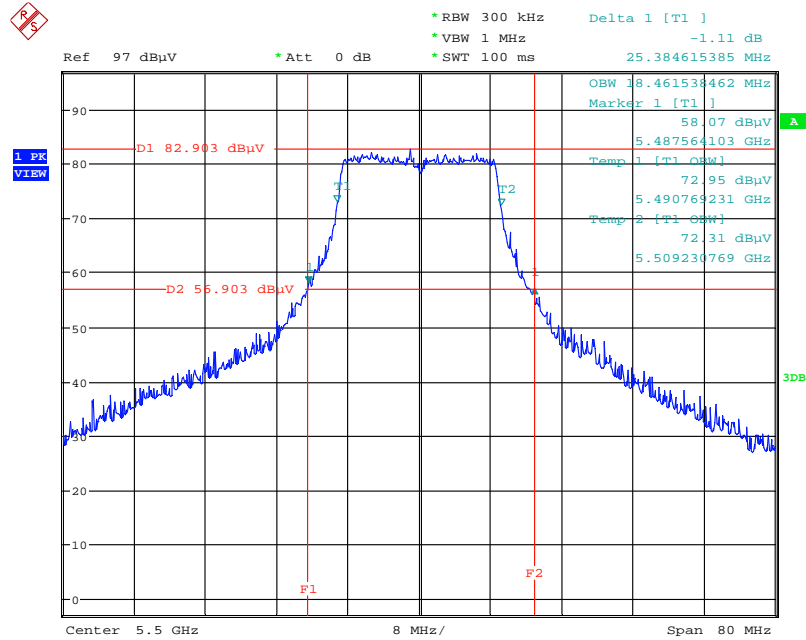
Date: 14.OCT.2014 17:33:16

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 / 5320 MHz



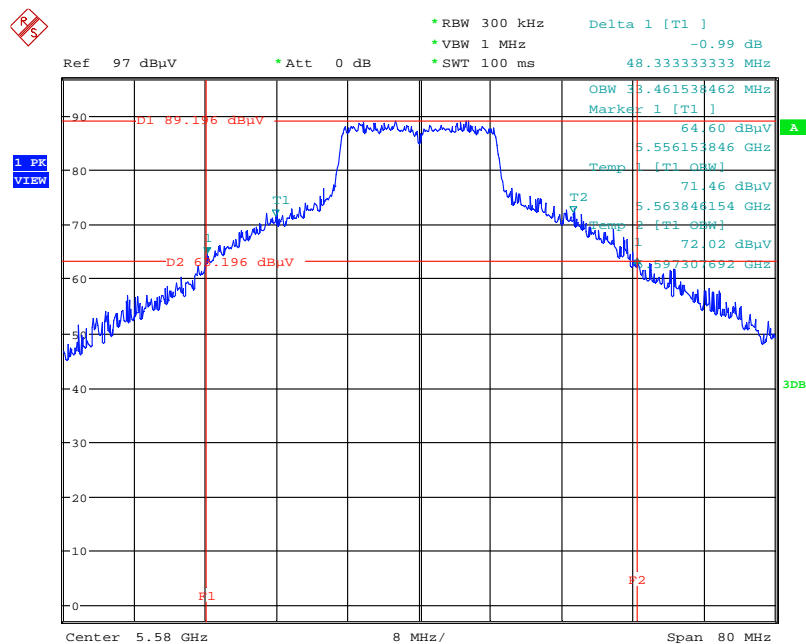
Date: 14.OCT.2014 17:34:19

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 / 5500 MHz



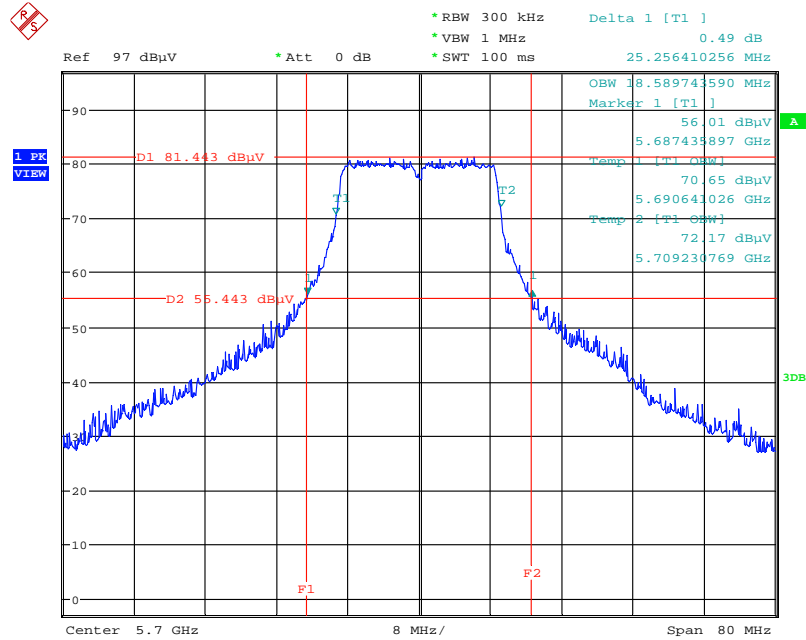
Date: 14.OCT.2014 17:40:36

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 / 5580 MHz



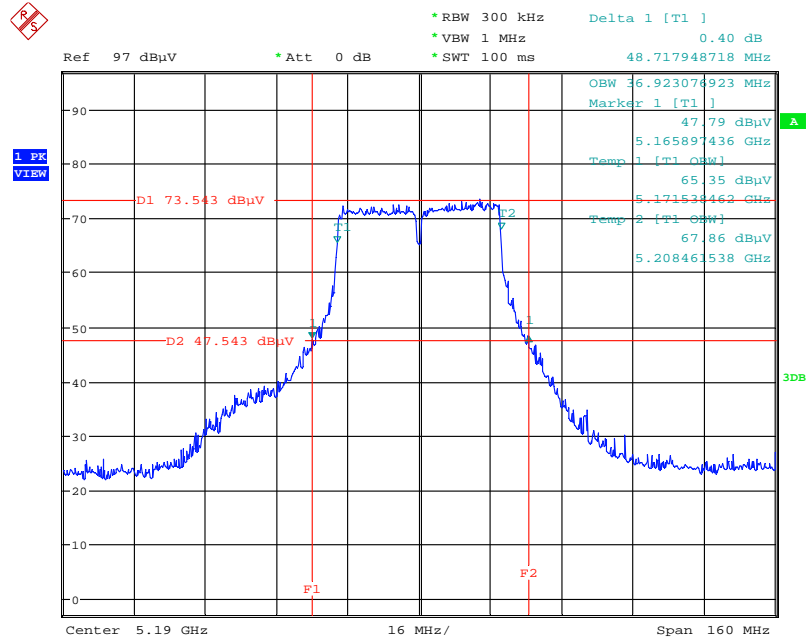
Date: 14.OCT.2014 17:41:28

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 / 5700 MHz



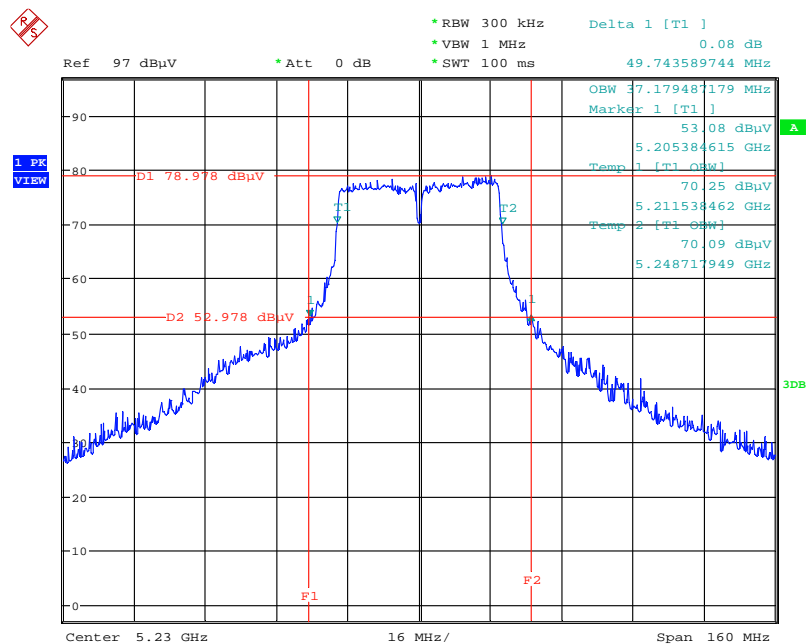
Date: 14.OCT.2014 17:42:17

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 / 5190 MHz



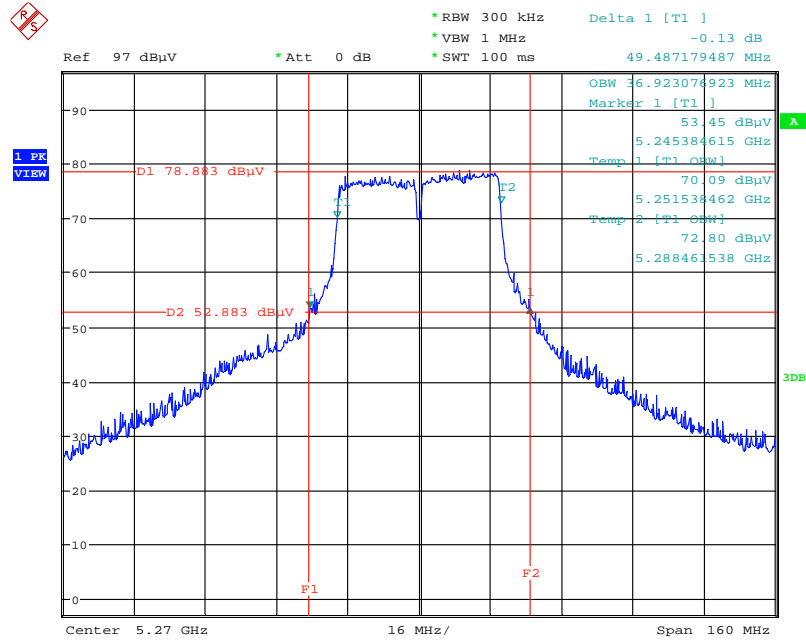
Date: 14.OCT.2014 17:44:03

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 / 5230 MHz



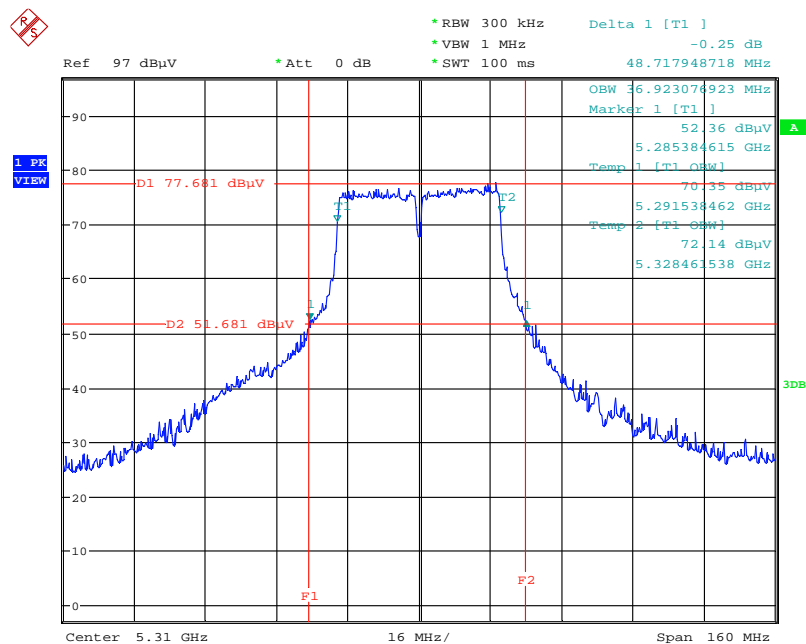
Date: 14.OCT.2014 17:45:37

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 / 5270 MHz



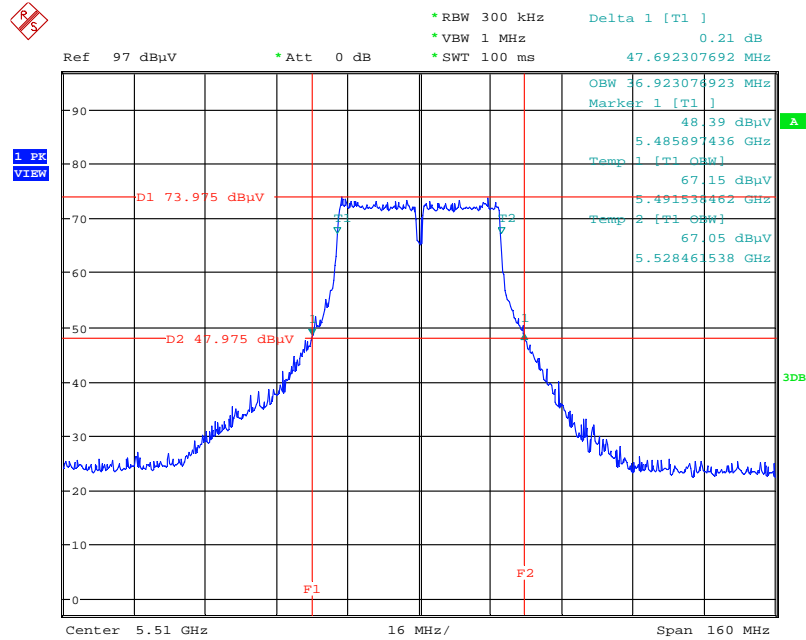
Date: 14.OCT.2014 17:47:16

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 / 5310 MHz



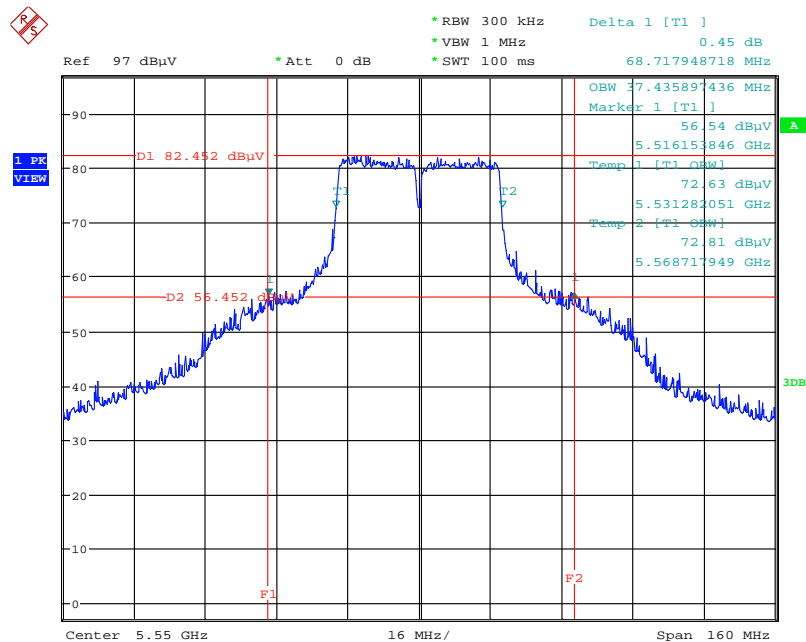
Date: 14.OCT.2014 17:48:08

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 / 5510 MHz



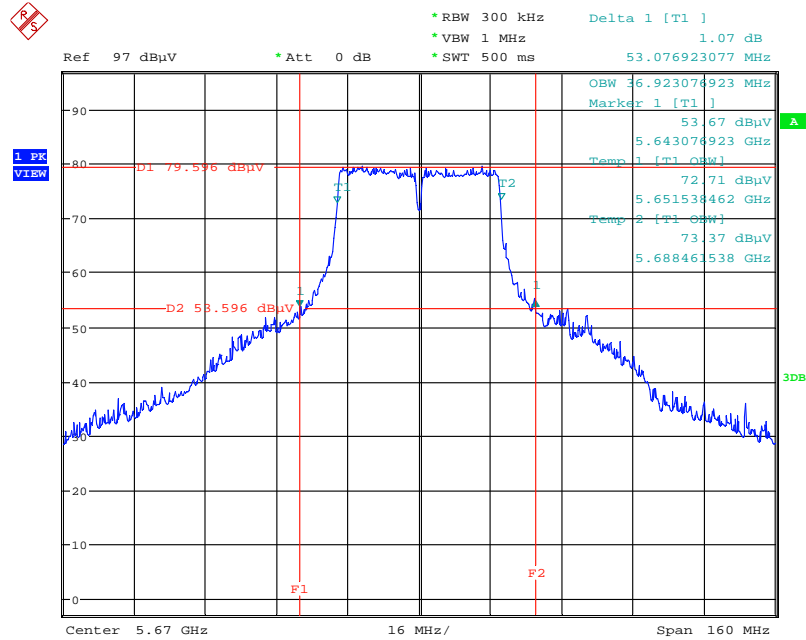
Date: 14.OCT.2014 17:49:41

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 / 5550 MHz



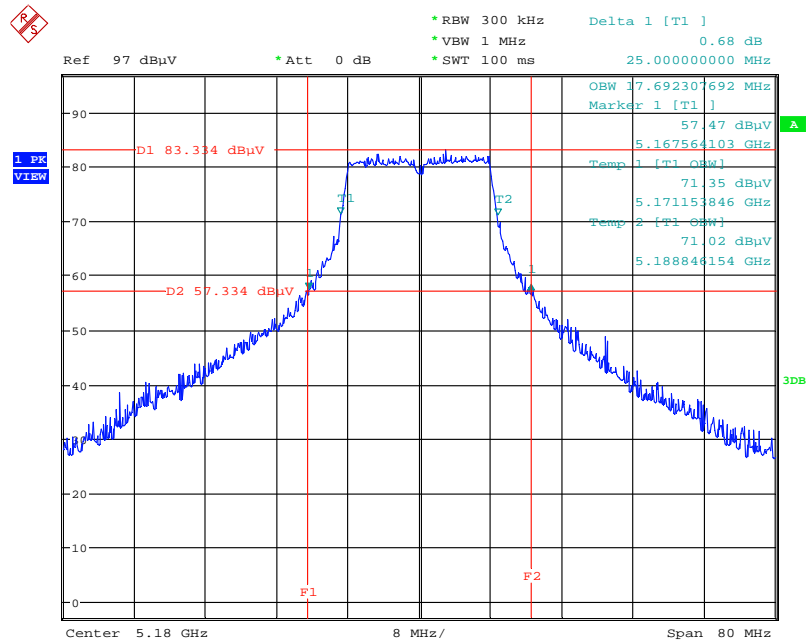
Date: 14.OCT.2014 17:51:07

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 / 5670 MHz



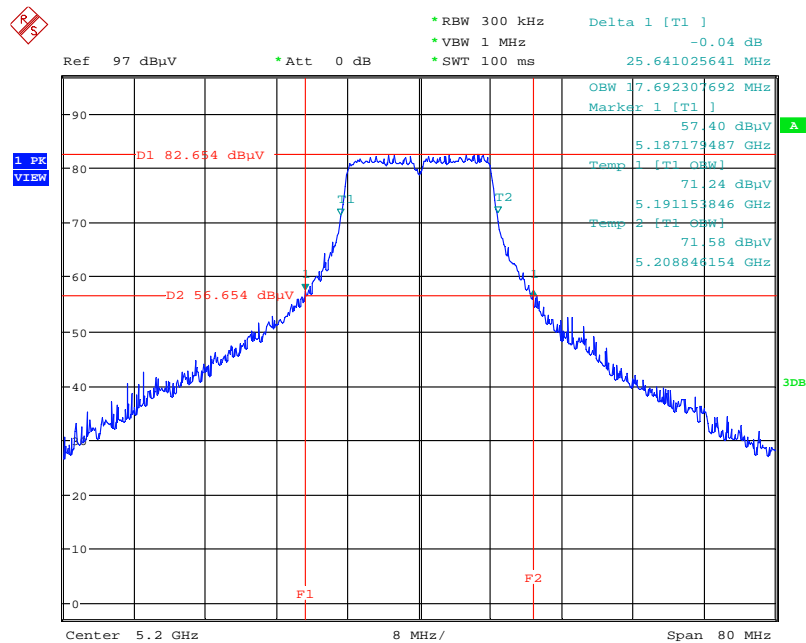
Date: 14.OCT.2014 17:52:31

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



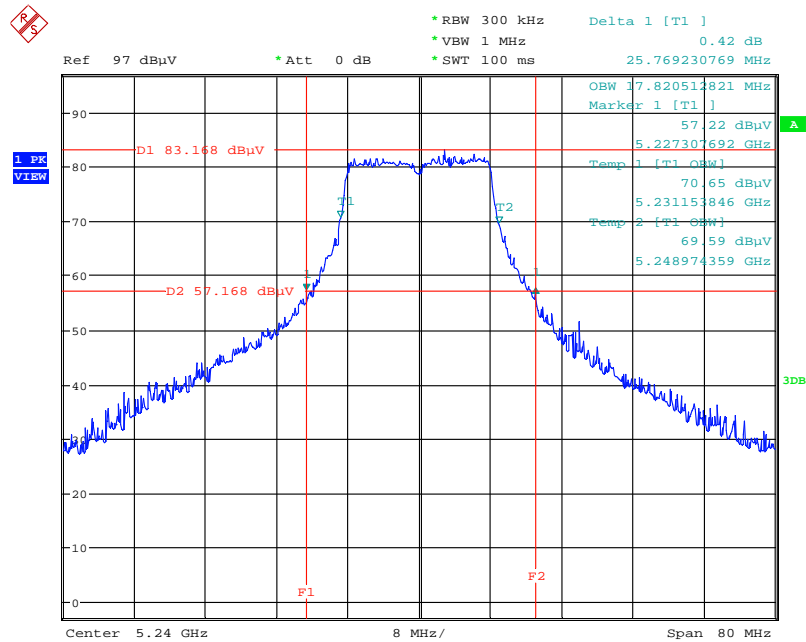
Date: 14.OCT.2014 17:10:11

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



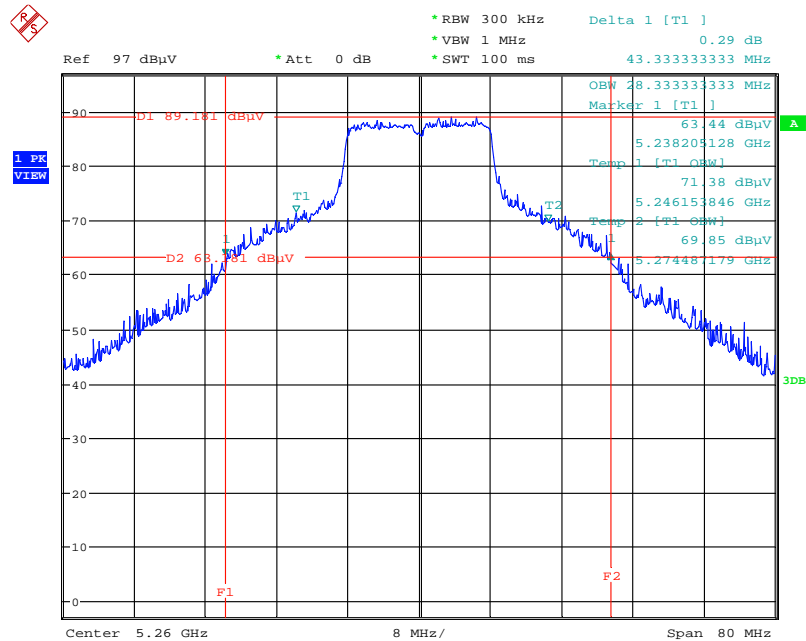
Date: 14.OCT.2014 17:17:00

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



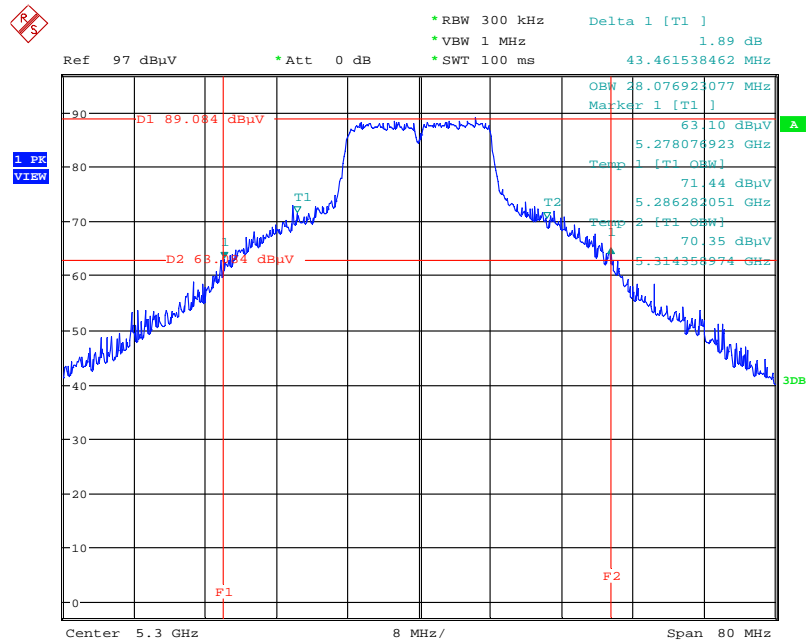
Date: 14.OCT.2014 17:18:00

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



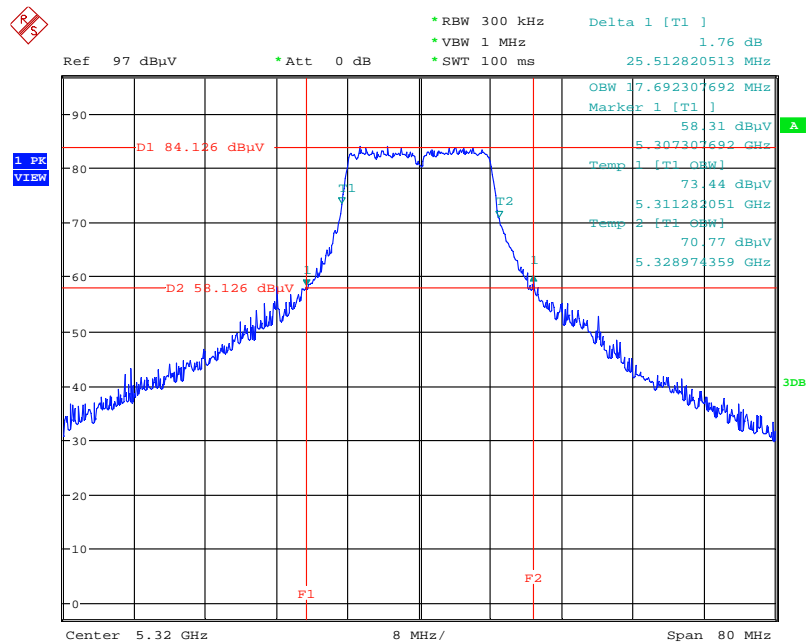
Date: 14.OCT.2014 17:19:40

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



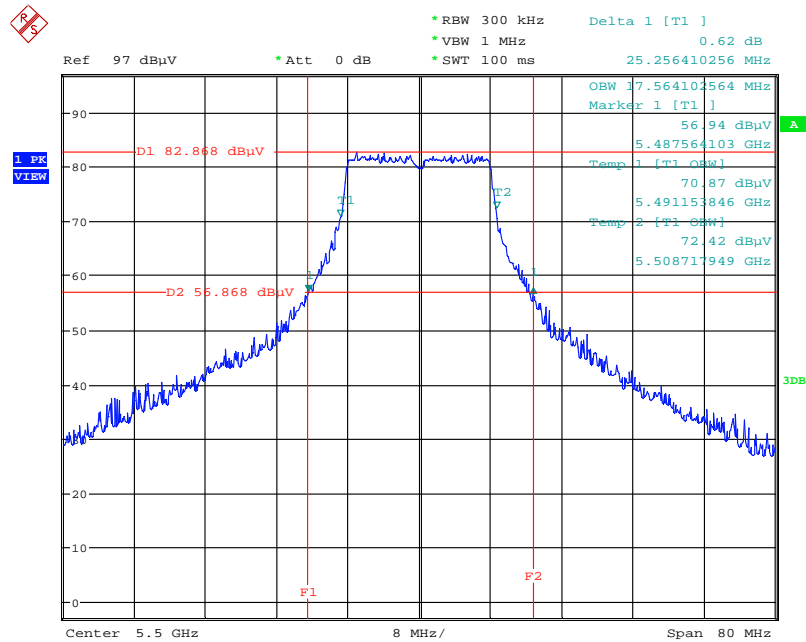
Date: 14.OCT.2014 17:20:31

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



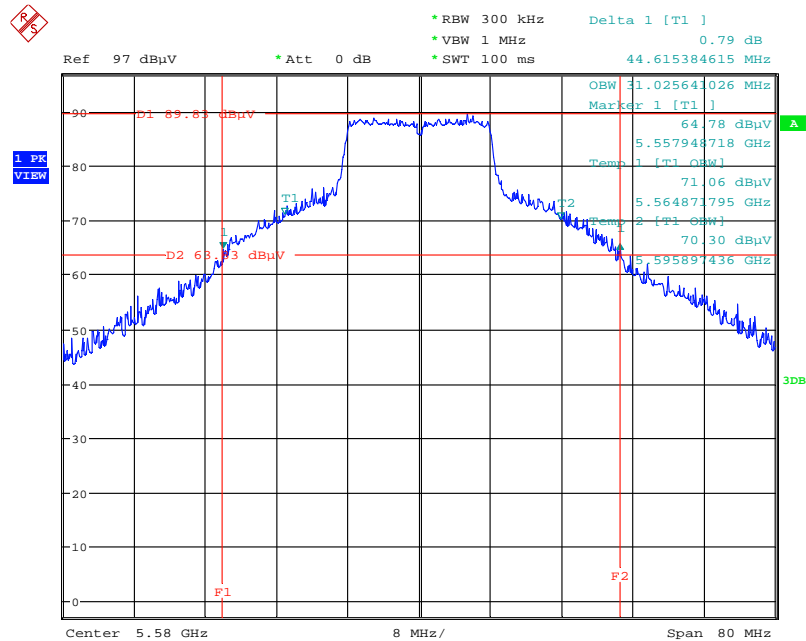
Date: 14.OCT.2014 17:22:49

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



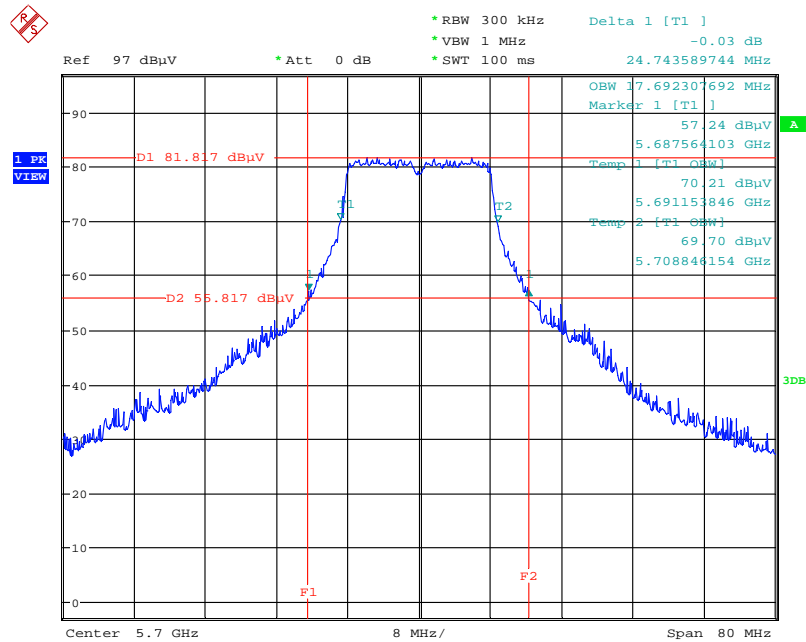
Date: 14.OCT.2014 17:24:13

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



Date: 14.OCT.2014 17:26:09

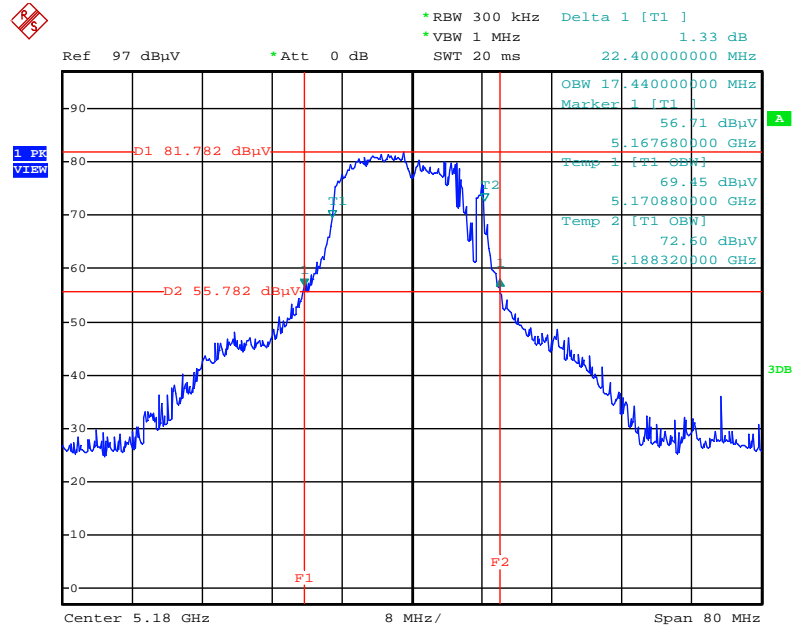
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 / 5700 MHz



Date: 14.OCT.2014 17:27:03

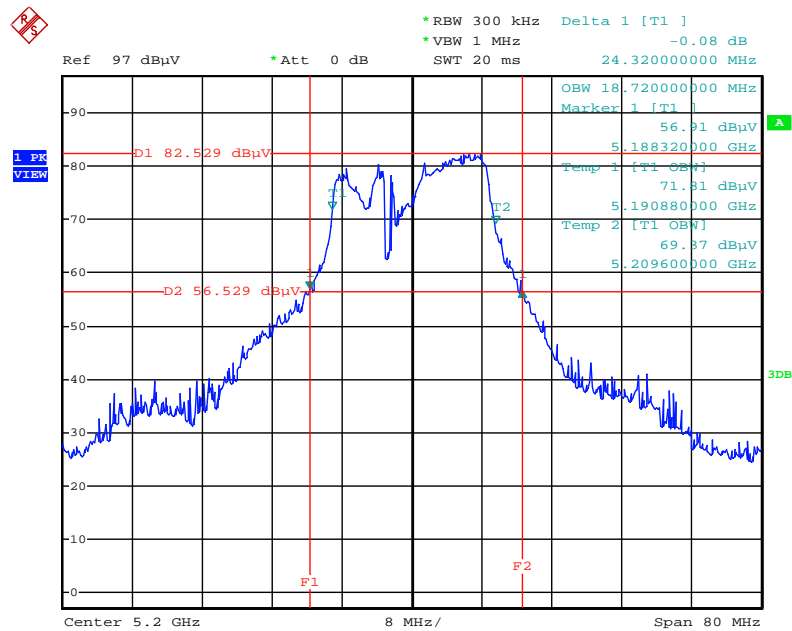
For 2TX

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1
+ Chain 2 / 5180 MHz



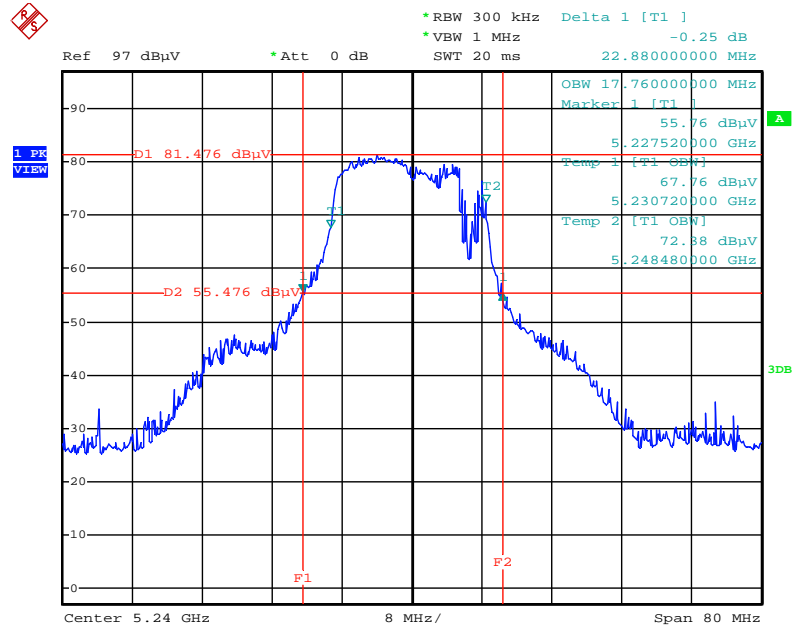
Date: 9.OCT.2014 23:44:52

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1
+ Chain 2 / 5200 MHz



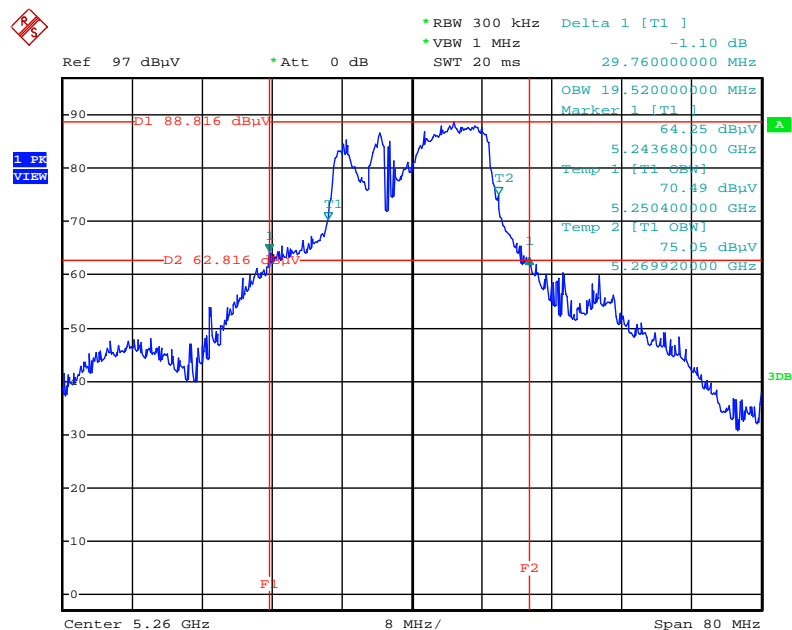
Date: 9.OCT.2014 23:45:27

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 / 5240 MHz



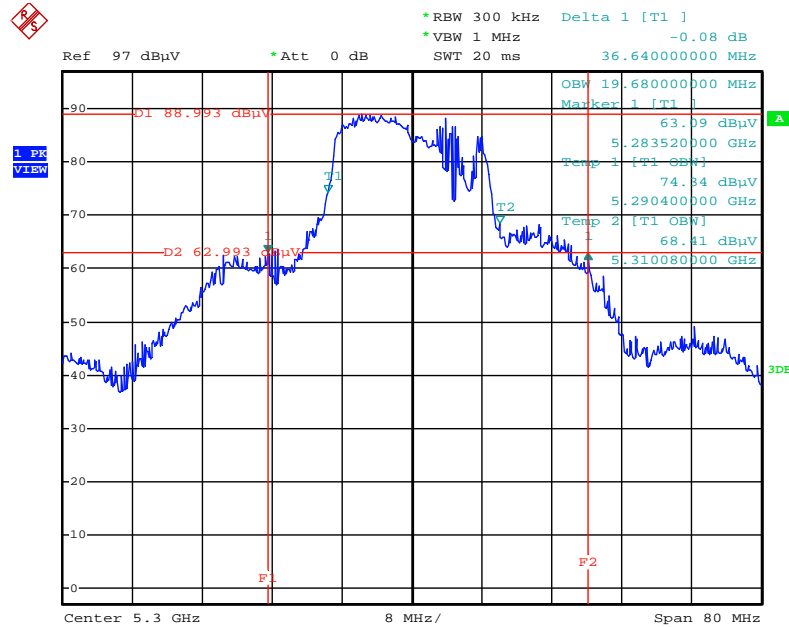
Date: 9.OCT.2014 23:45:51

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 / 5260 MHz



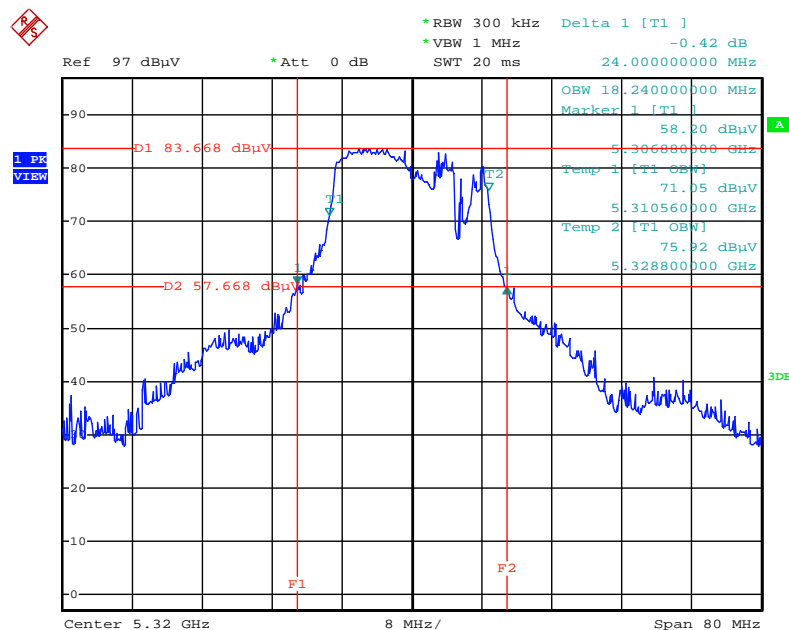
Date: 9.OCT.2014 23:46:24

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 / 5300 MHz



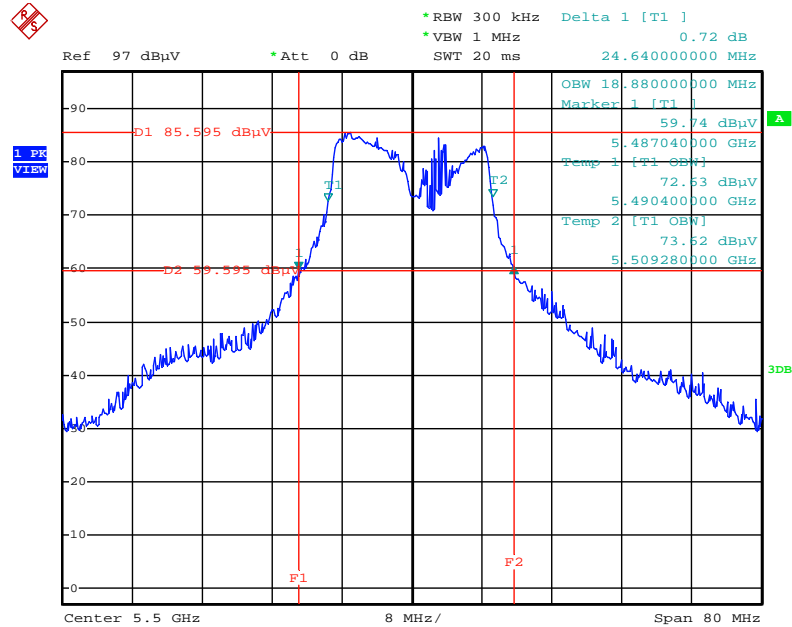
Date: 9.OCT.2014 23:46:50

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 / 5320 MHz



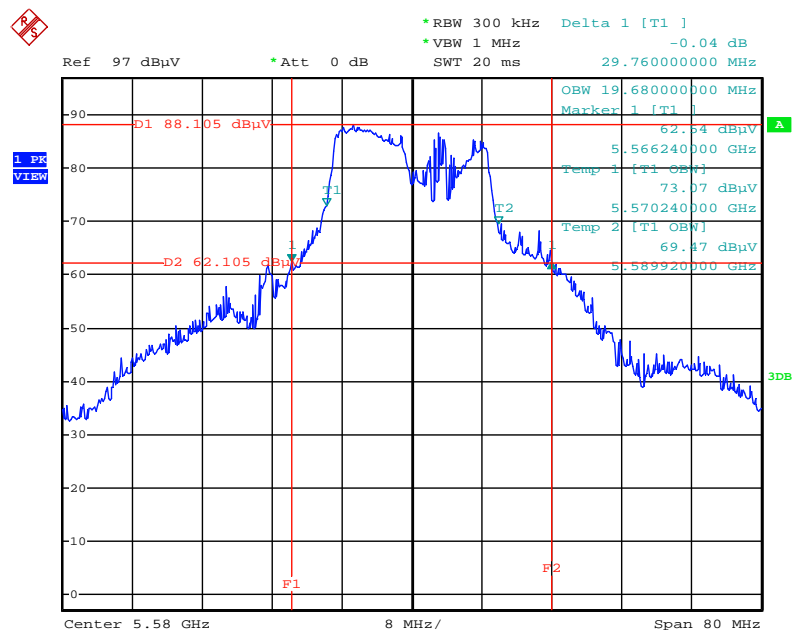
Date: 9.OCT.2014 23:47:19

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 / 5500 MHz



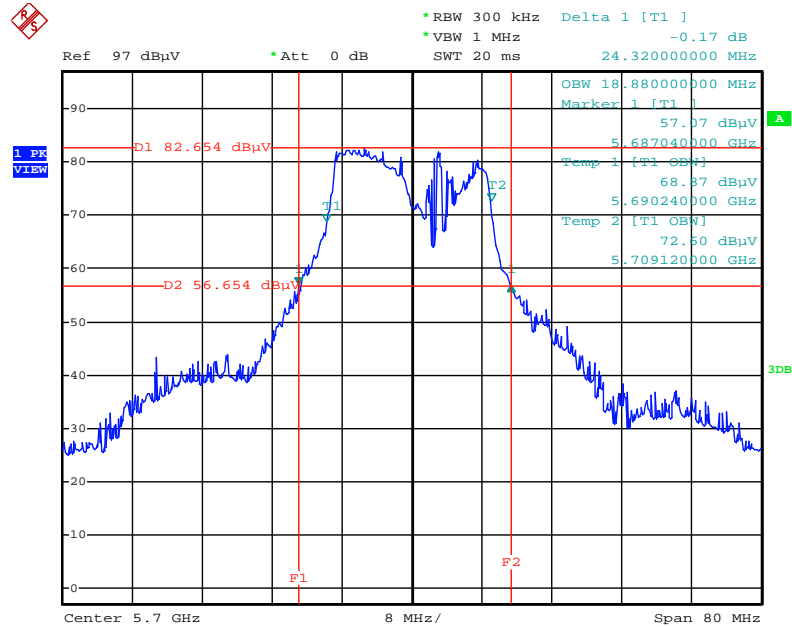
Date: 9.OCT.2014 23:44:23

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 / 5580 MHz



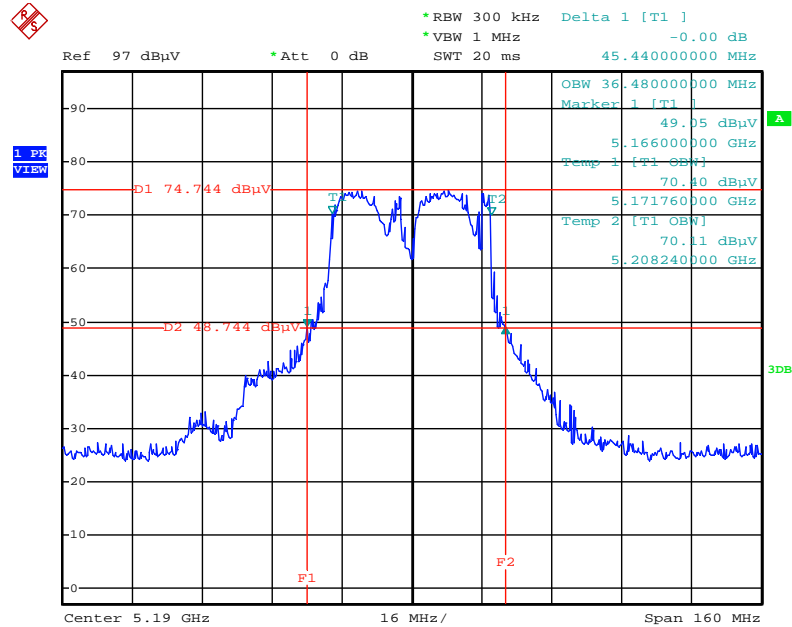
Date: 9.OCT.2014 23:43:53

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 / 5700 MHz



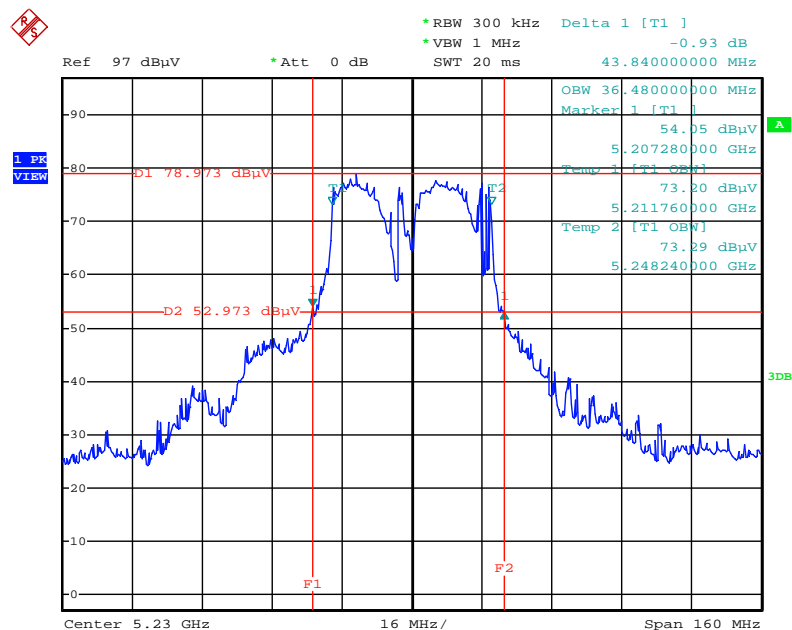
Date: 9.OCT.2014 23:43:20

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 / 5190 MHz



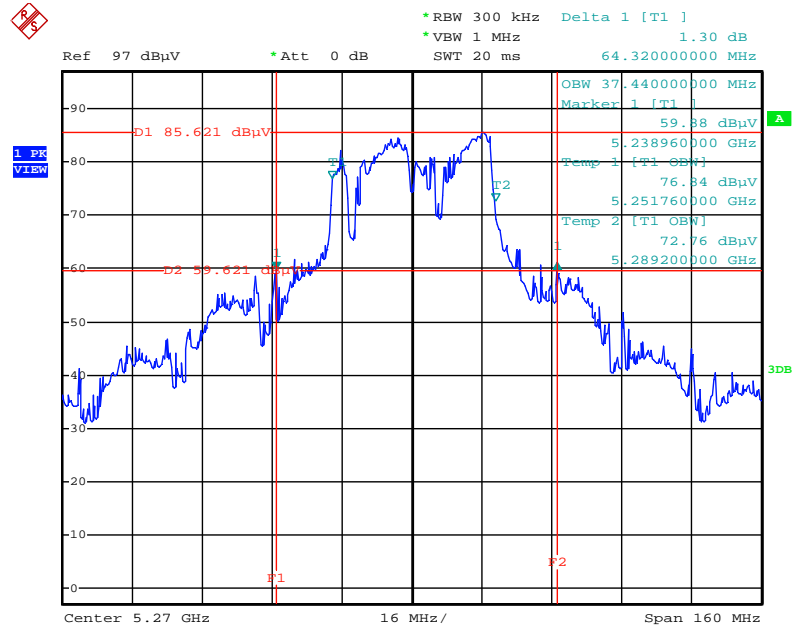
Date: 9.OCT.2014 23:47:54

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 / 5230 MHz



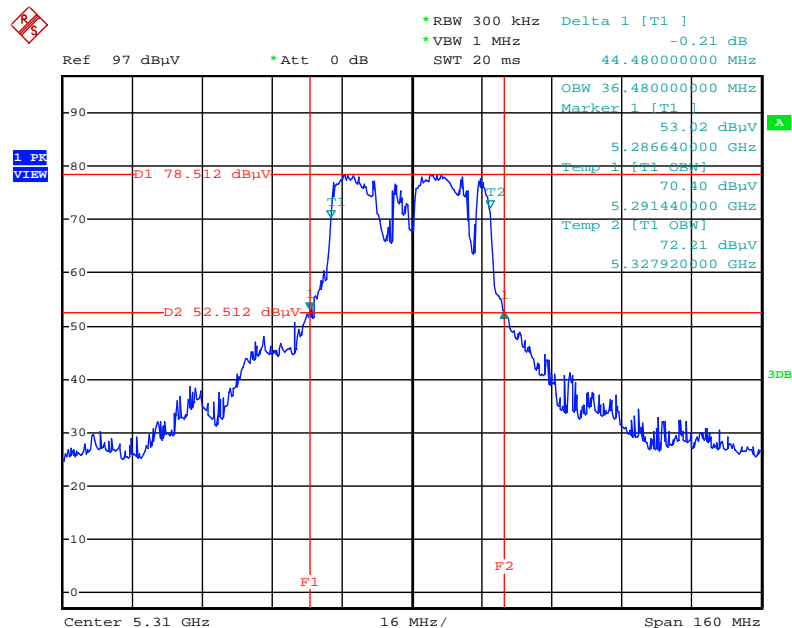
Date: 9.OCT.2014 23:48:19

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 / 5270 MHz



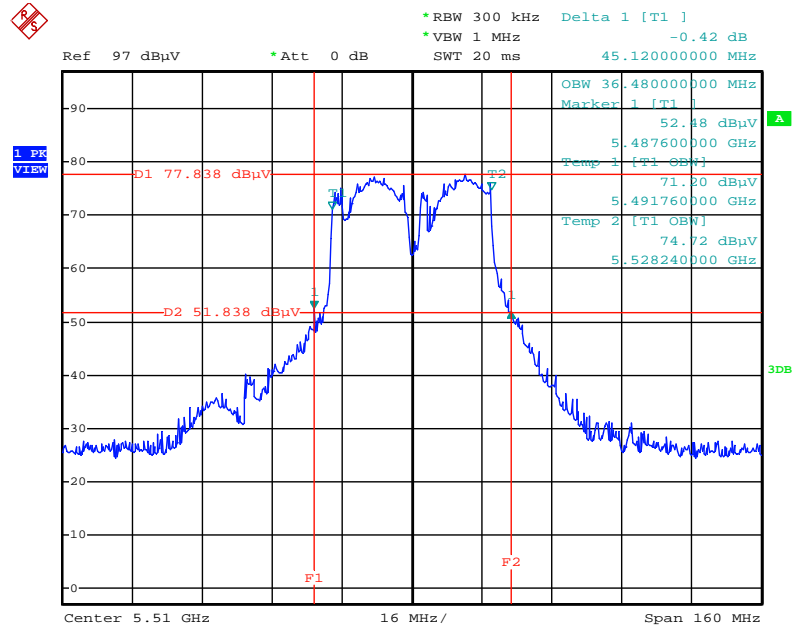
Date: 9.OCT.2014 23:49:03

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 / 5310 MHz



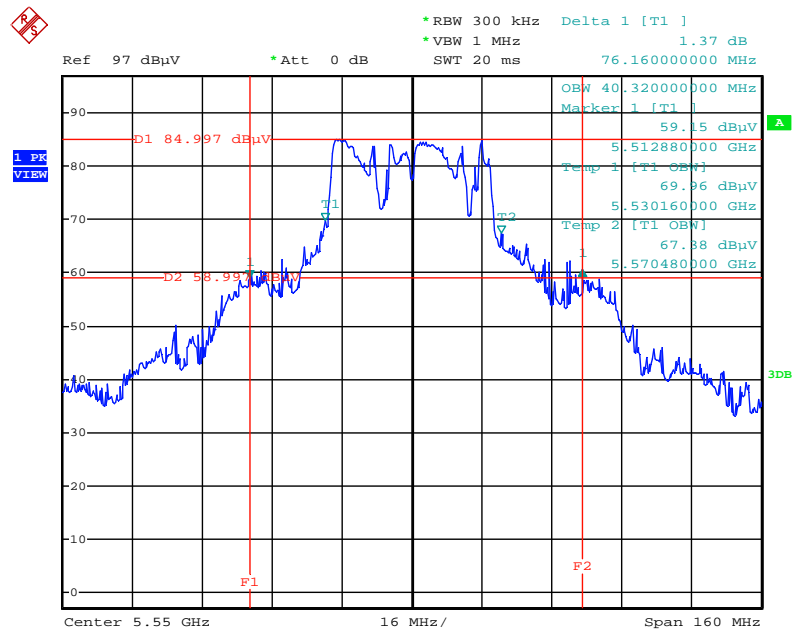
Date: 9.OCT.2014 23:49:40

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 / 5510 MHz



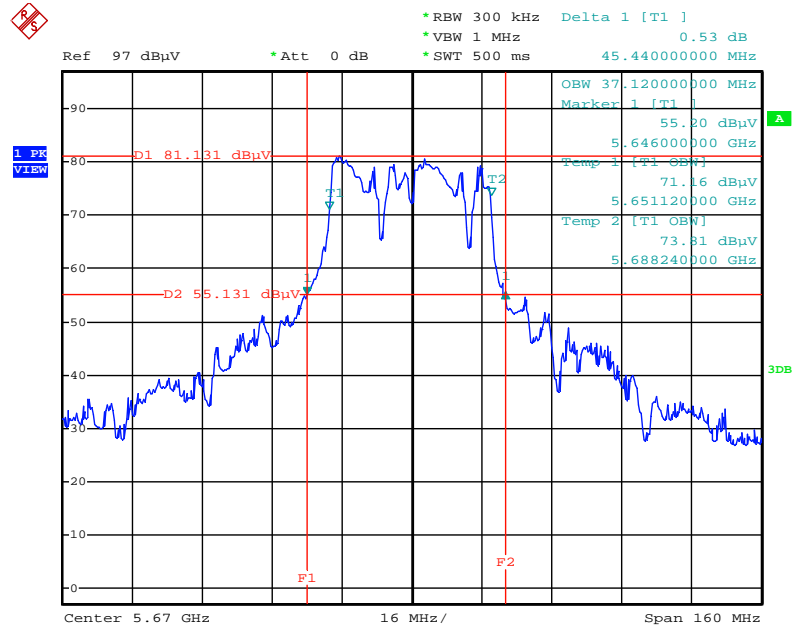
Date: 9.OCT.2014 23:50:16

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 / 5550 MHz



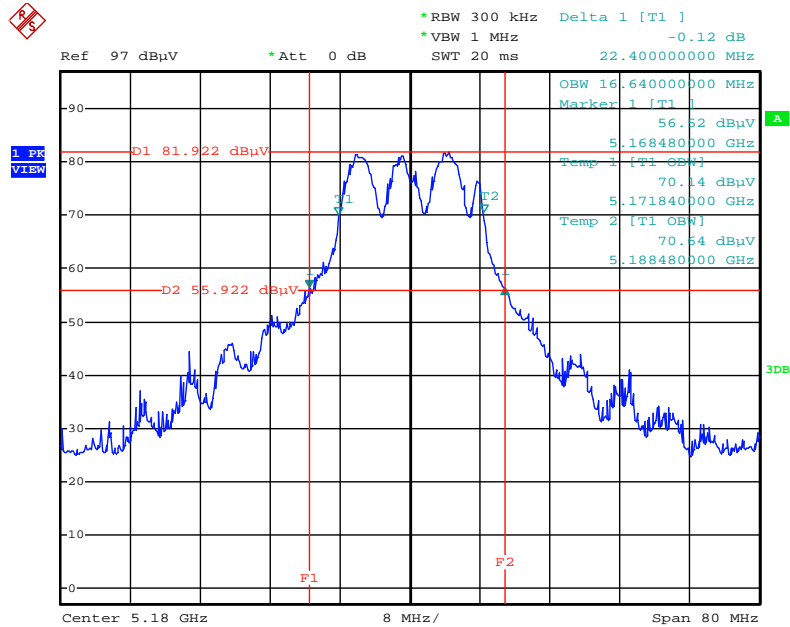
Date: 9.OCT.2014 23:50:44

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 / 5670 MHz



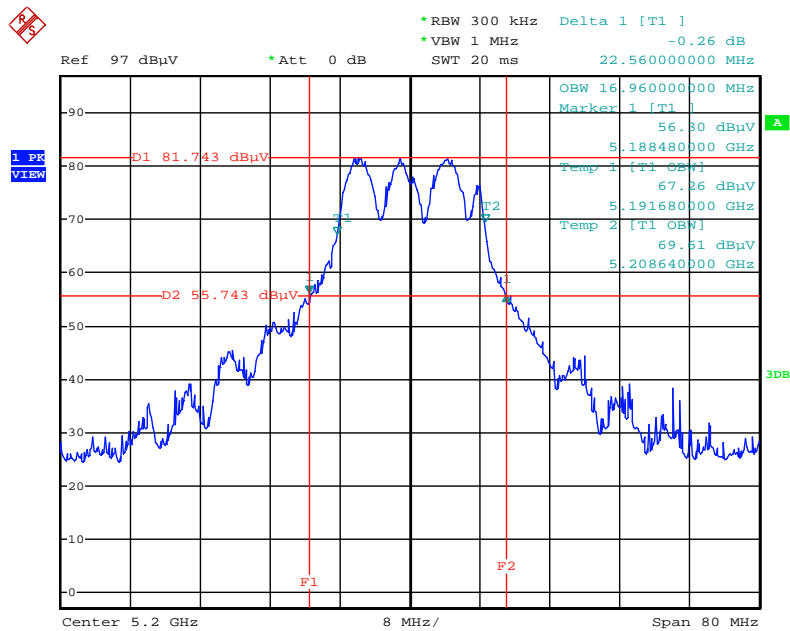
Date: 9.OCT.2014 23:51:14

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 / 5180 MHz



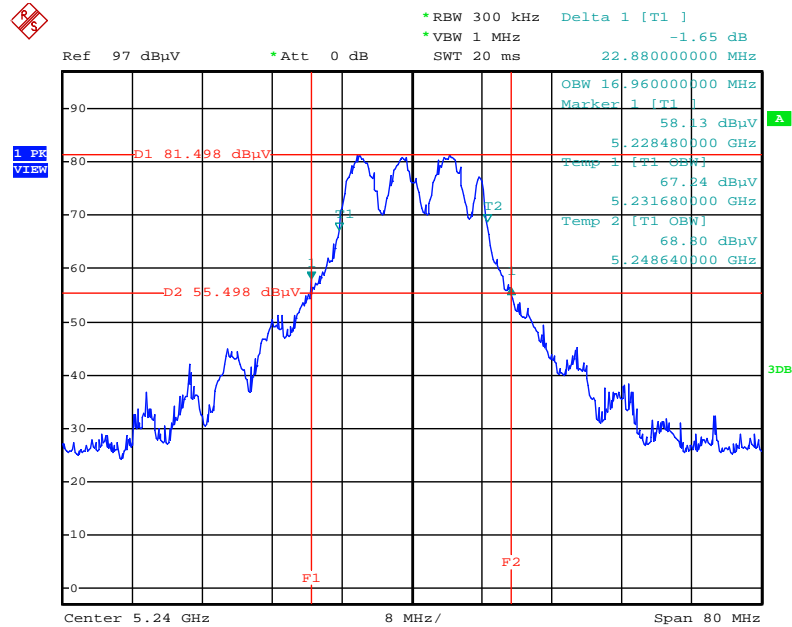
Date: 9.OCT.2014 23:38:27

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 / 5200 MHz



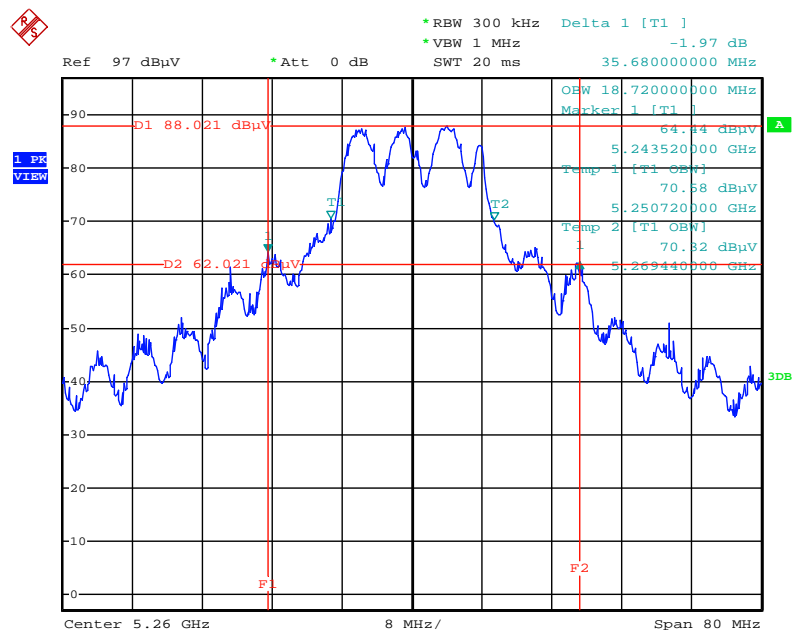
Date: 9.OCT.2014 23:39:14

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 / 5240 MHz



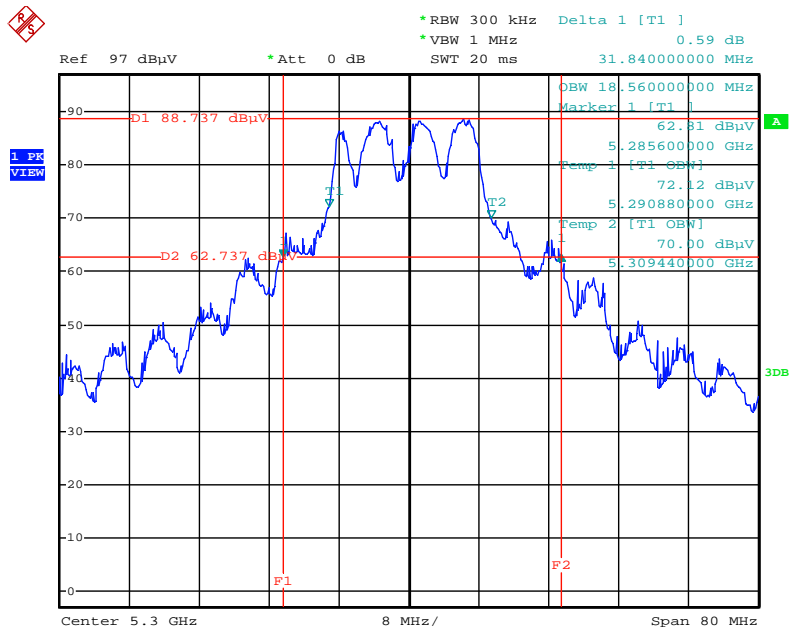
Date: 9.OCT.2014 23:39:42

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



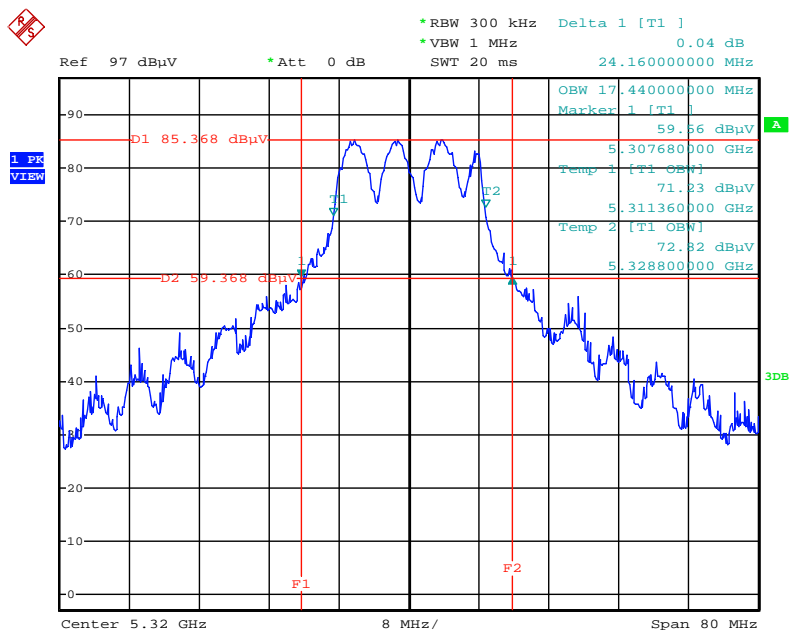
Date: 9.OCT.2014 23:40:11

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



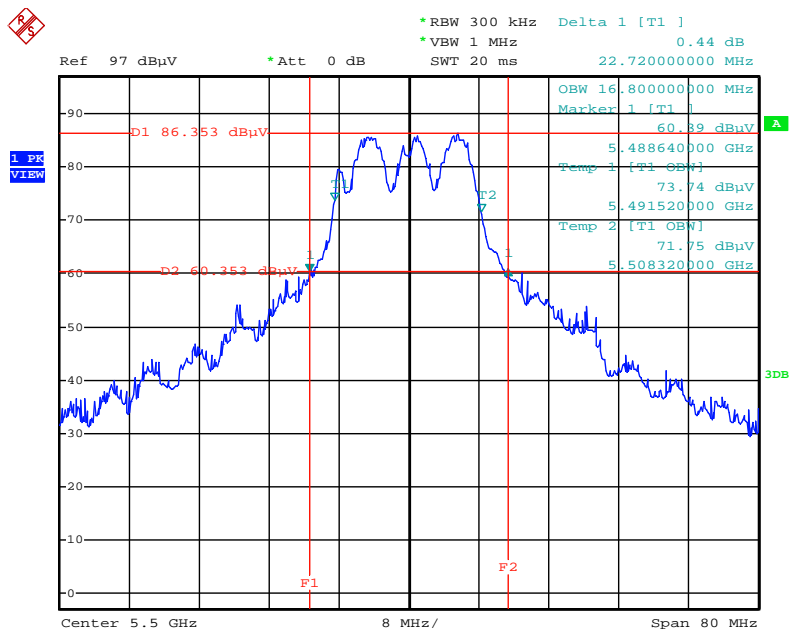
Date: 9.OCT.2014 23:40:38

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



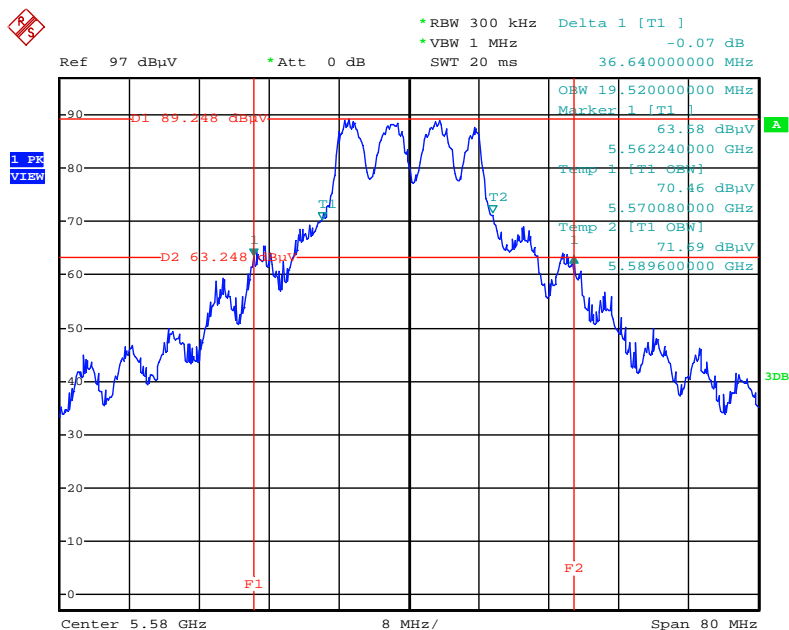
Date: 9.OCT.2014 23:41:11

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



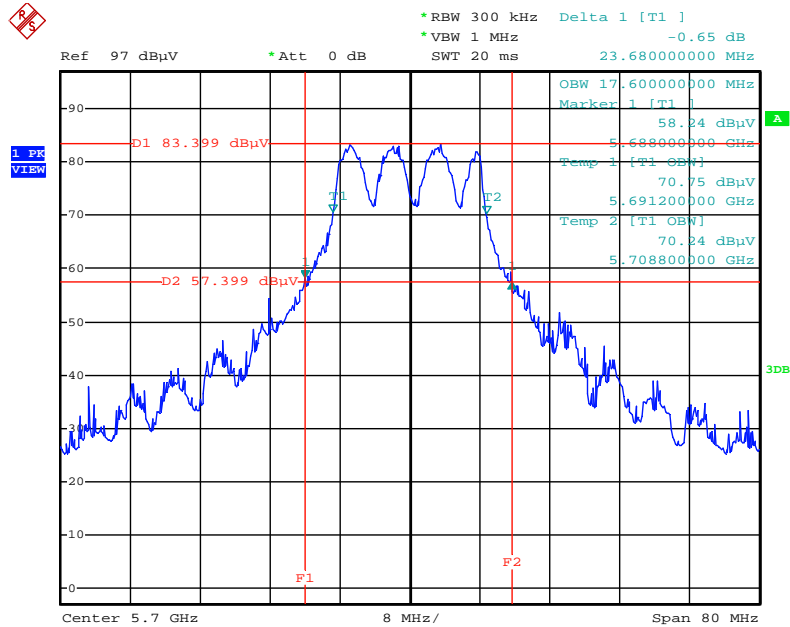
Date: 9.OCT.2014 23:41:43

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



Date: 9.OCT.2014 23:42:13

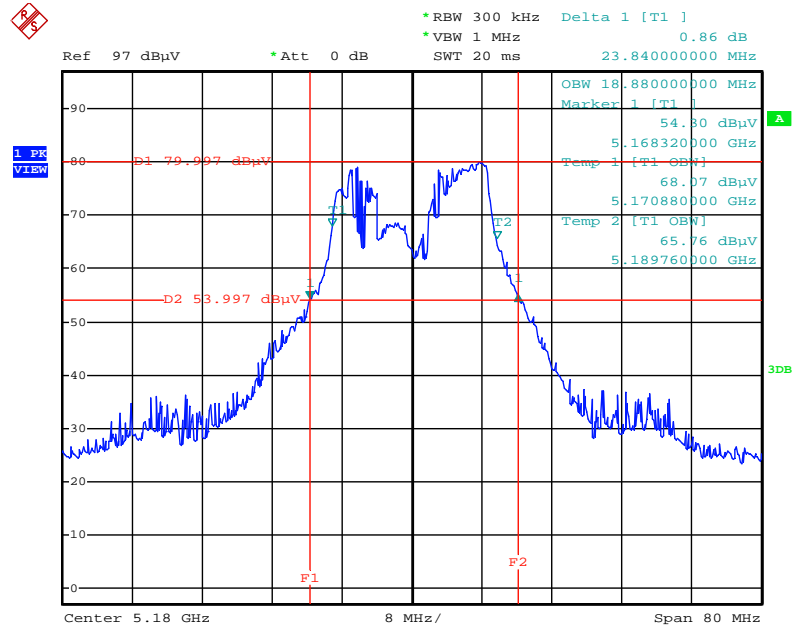
26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 / 5700 MHz



Date: 9.OCT.2014 23:42:47

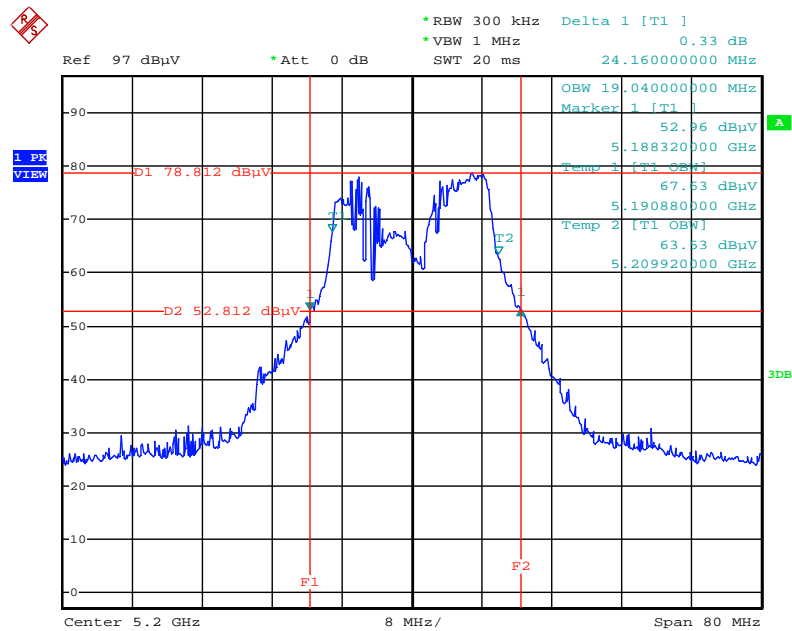
For 3TX

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1
+ Chain 2 + Chain 3 / 5180 MHz



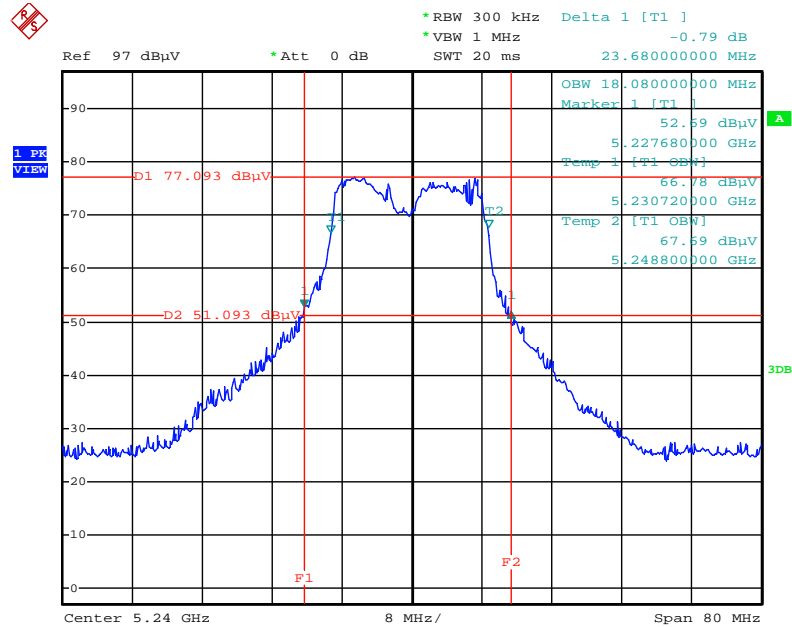
Date: 14.OCT.2014 00:28:00

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1
+ Chain 2 + Chain 3 / 5200 MHz



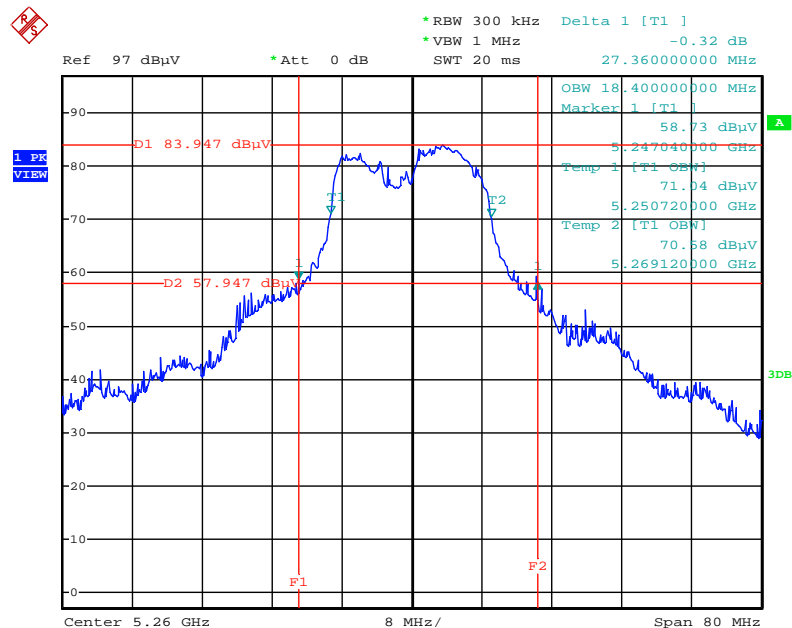
Date: 14.OCT.2014 00:28:27

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5240 MHz



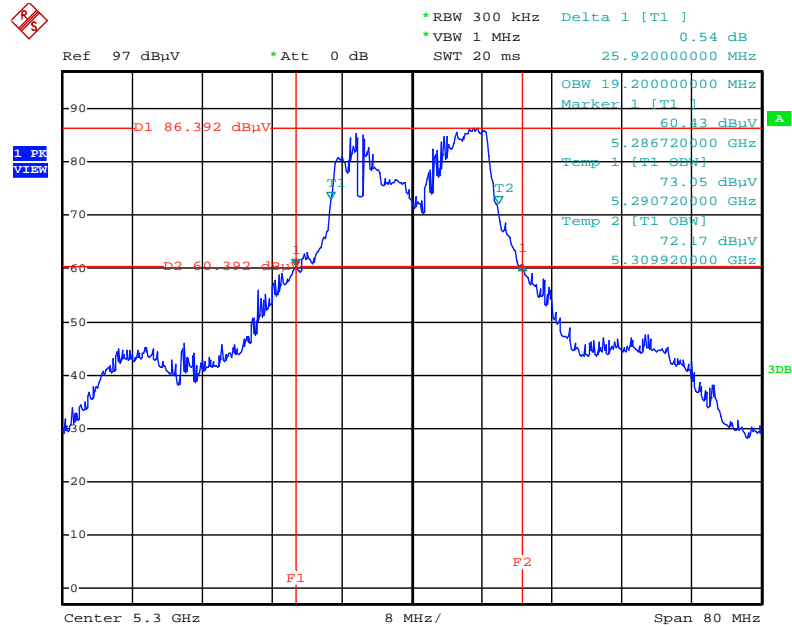
Date: 14.OCT.2014 00:28:57

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5260 MHz



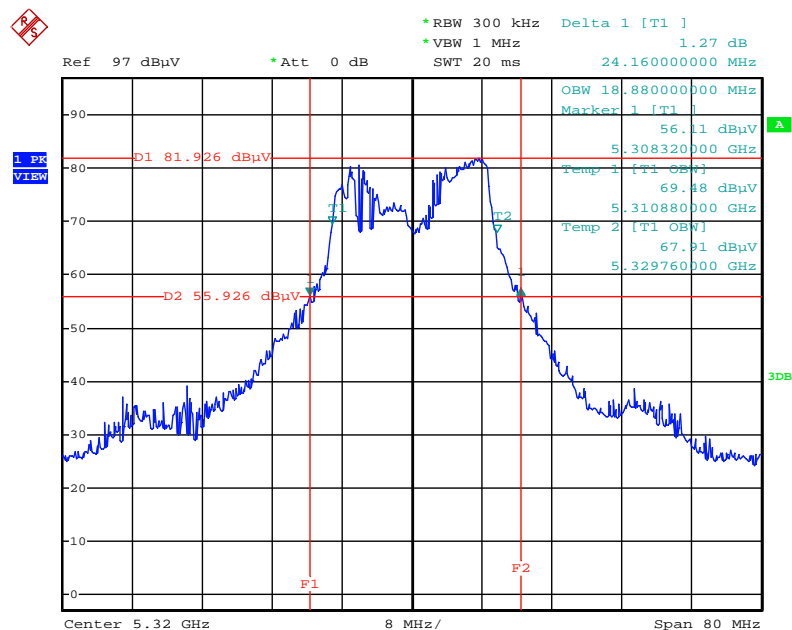
Date: 14.OCT.2014 00:29:30

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5300 MHz



Date: 14.OCT.2014 00:29:58

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5320 MHz



Date: 14.OCT.2014 00:30:35



Ref 97 dBμV * Att 0 dB * RBW 300 kHz Delta 1 [T1] -0.63 dB
 * VBW 1 MHz SWT 20 ms 23.840000000 MHz

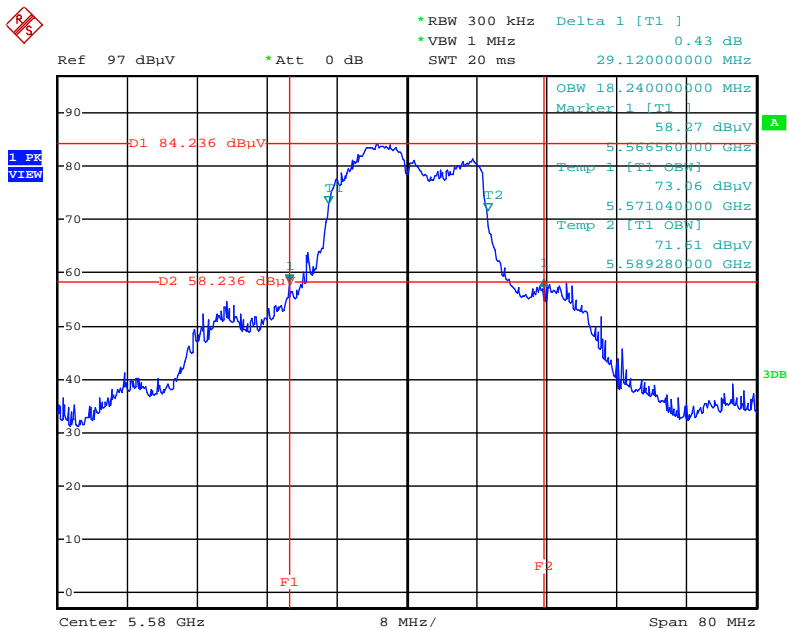
OBW 18.720000000 MHz
 Marker 1 [T1] 56.83 dBμV
 5.487200000 GHz
 Temp 1 [T1 OBW] 67.12 dBμV
 5.490240000 GHz
 Temp 2 [T1 OBW] 71.29 dBμV
 5.508960000 GHz

D1 81.99 dBμV
 D2 55.99 dBμV

F1 F2

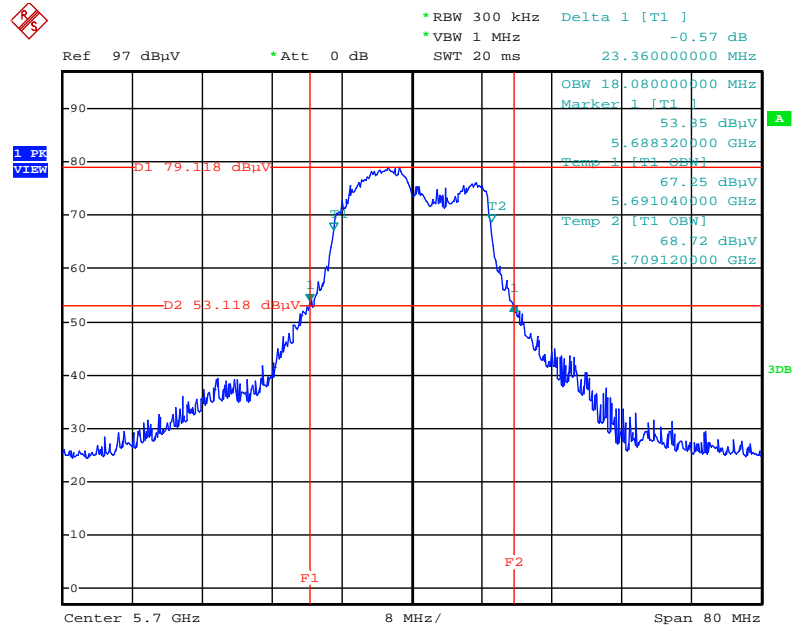
Center 5.5 GHz 8 MHz/ Span 80 MHz

**26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1
+ Chain 2 + Chain 3 / 5580 MHz**



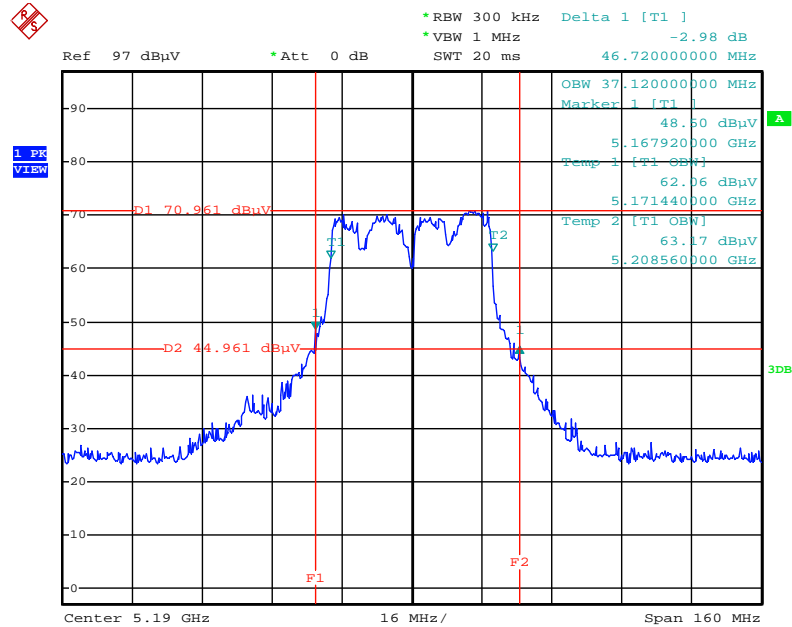
Date: 14.OCT.2014 00:26:55

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5700 MHz



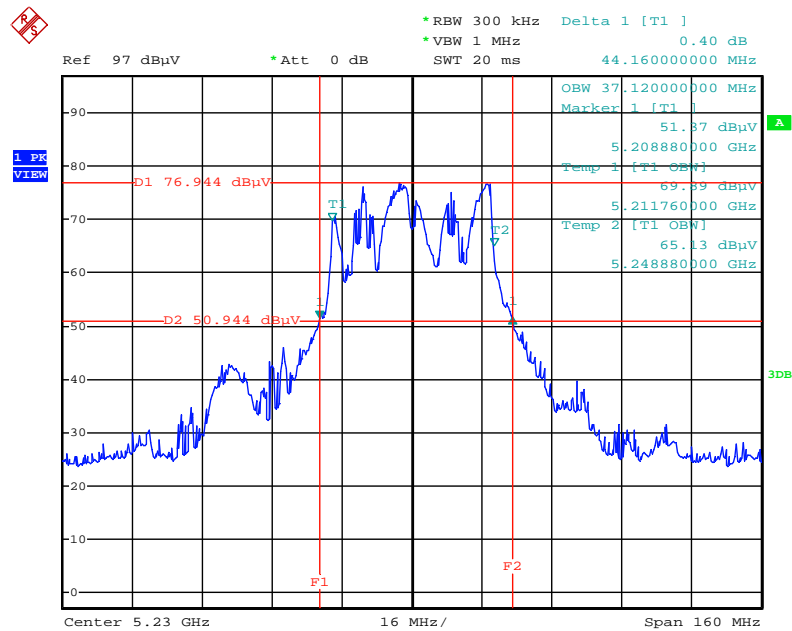
Date: 14.OCT.2014 00:25:58

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5190 MHz



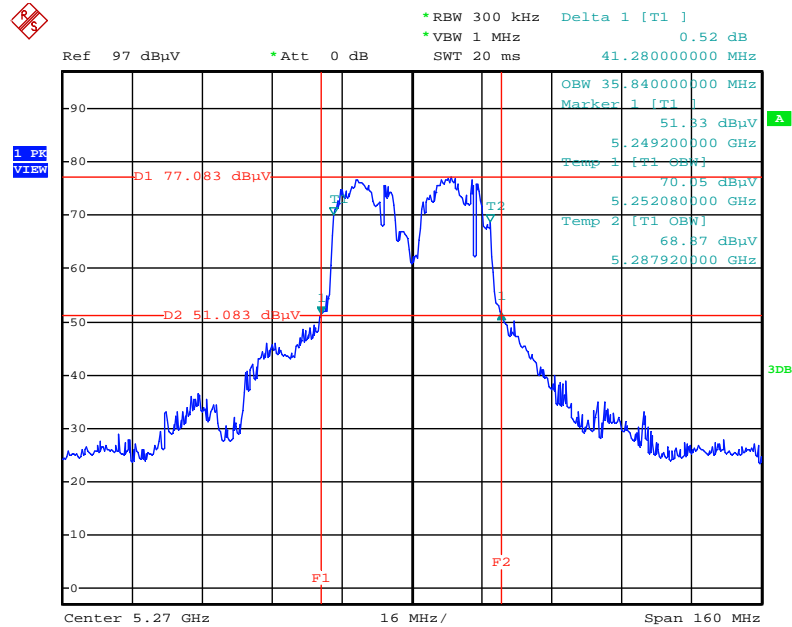
Date: 14.OCT.2014 00:31:23

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5230 MHz



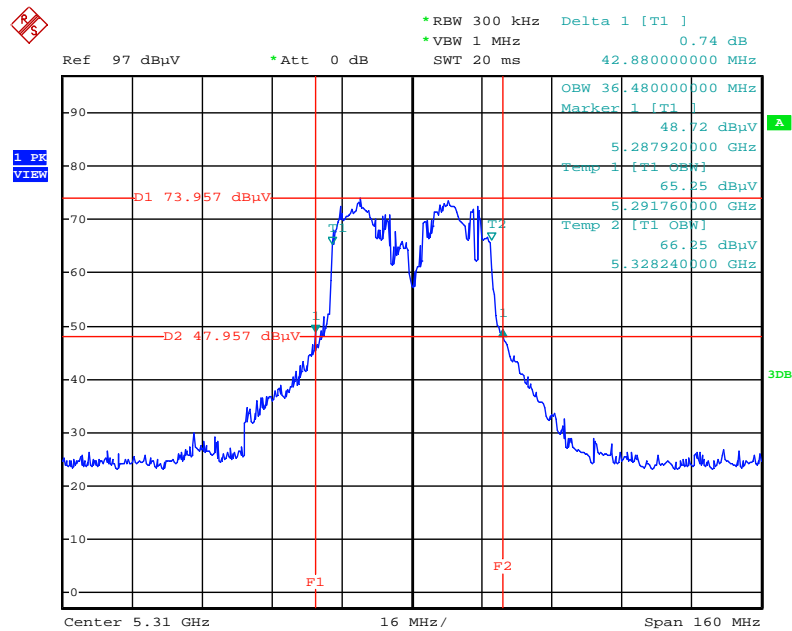
Date: 14.OCT.2014 00:31:54

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5270 MHz



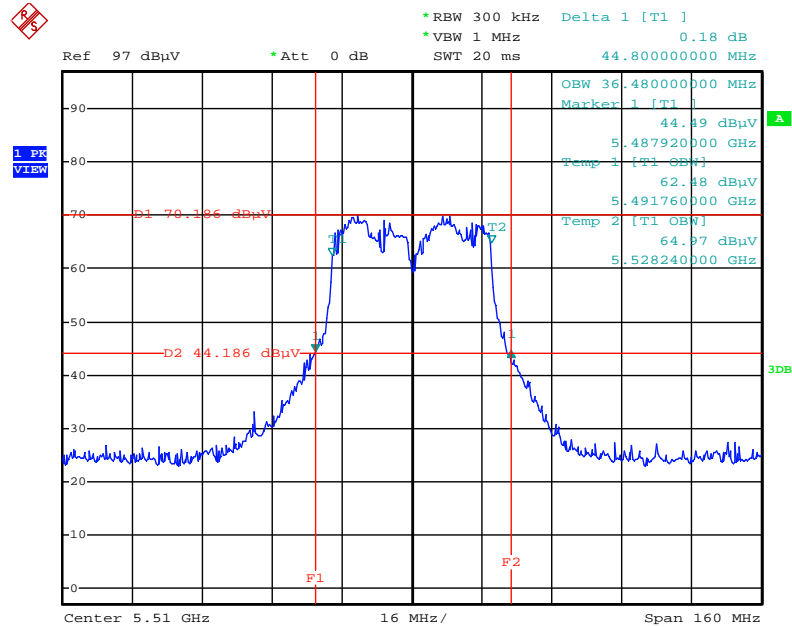
Date: 14.OCT.2014 00:32:47

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5310 MHz



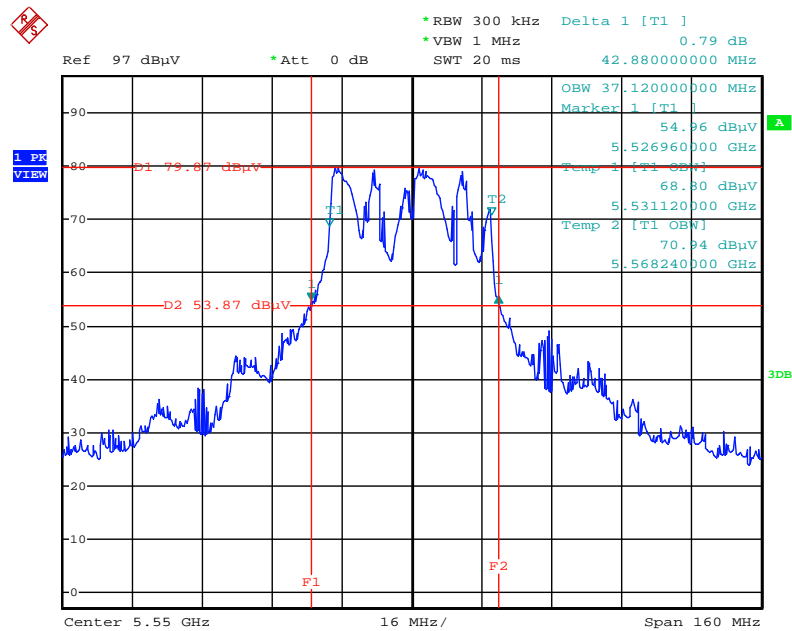
Date: 14.OCT.2014 00:33:27

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5510 MHz



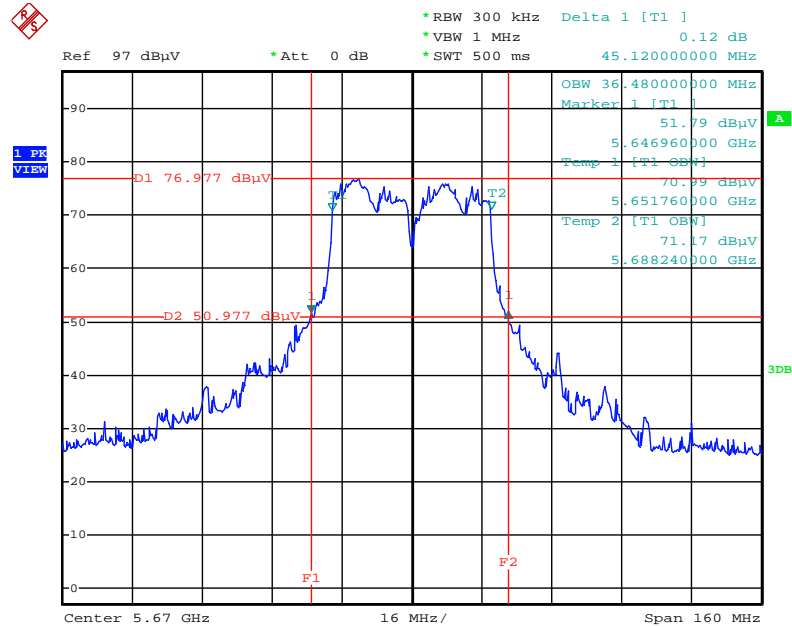
Date: 14.OCT.2014 00:34:04

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5550 MHz



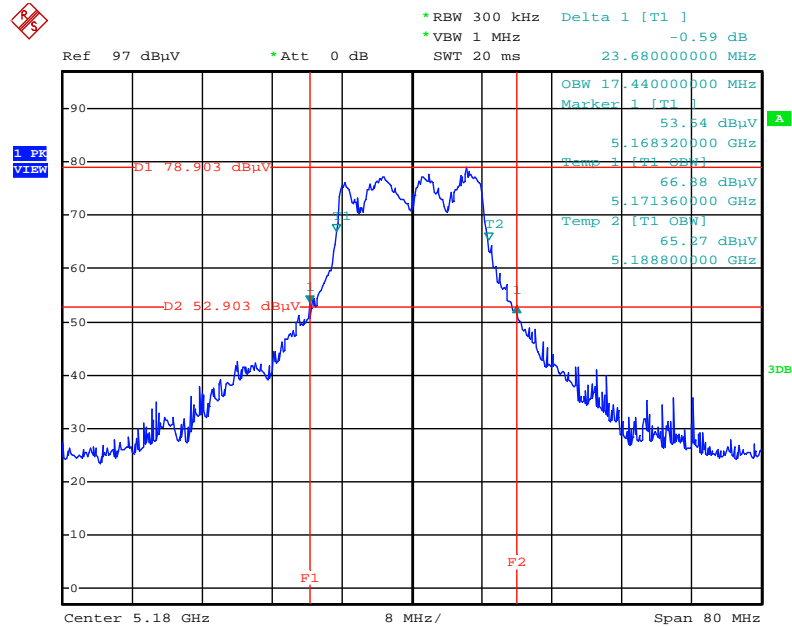
Date: 14.OCT.2014 00:34:36

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5670 MHz



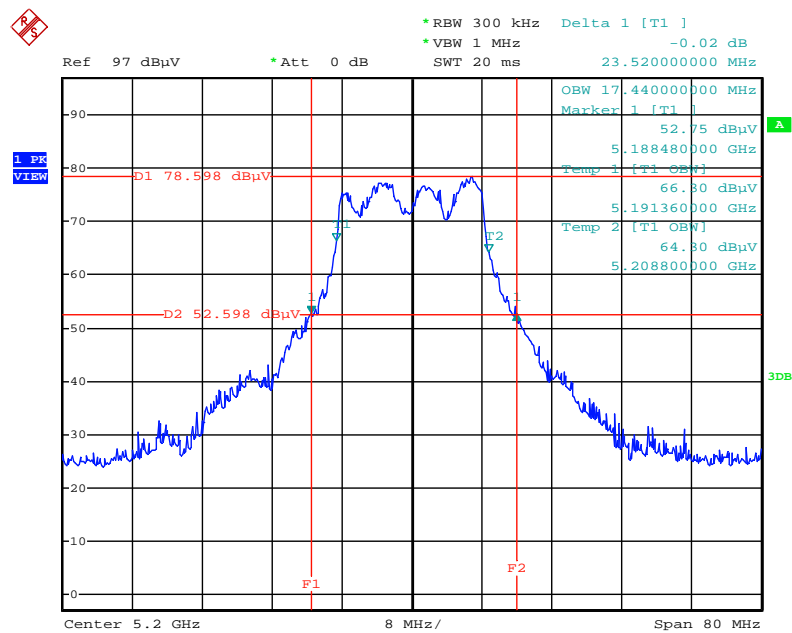
Date: 14.OCT.2014 00:35:09

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 / 5180 MHz



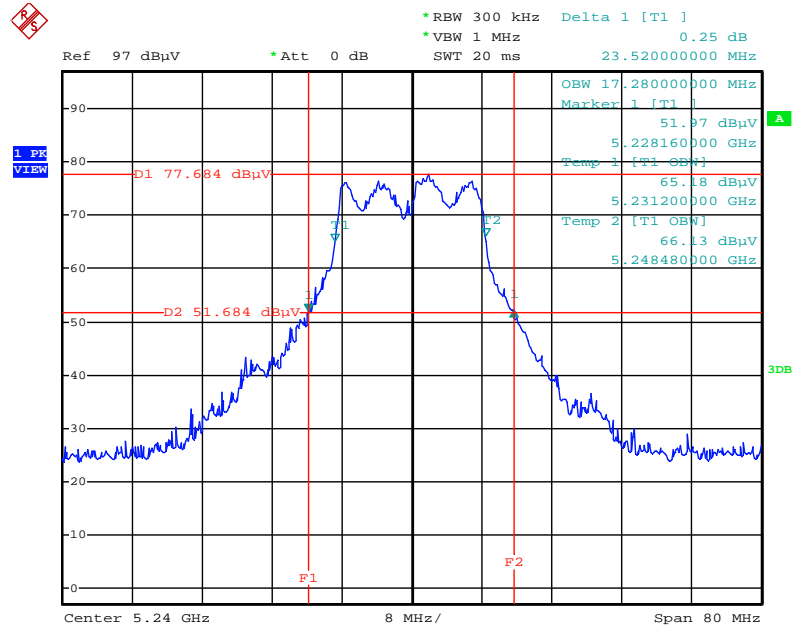
Date: 14.OCT.2014 00:20:31

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 / 5200 MHz



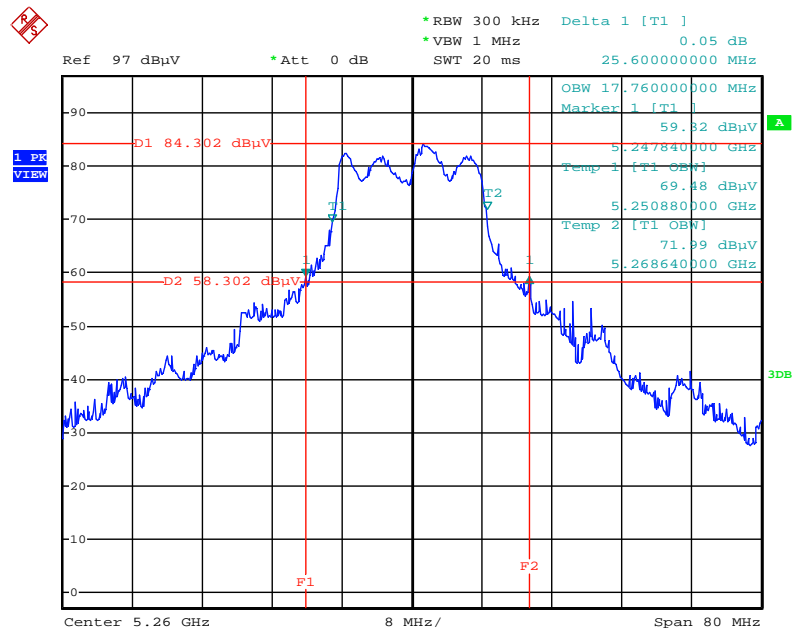
Date: 14.OCT.2014 00:21:22

26dB Bandwidth and 99% Occupied Bandwidth Plot on Configuration IEEE 802.11a / Chain 1 + Chain 2 + Chain 3 / 5240 MHz



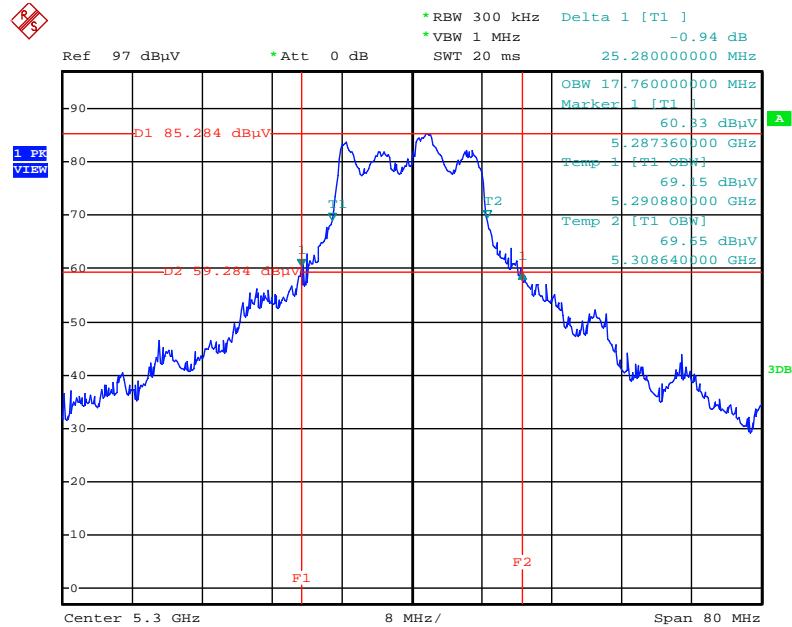
Date: 14.OCT.2014 00:21:49

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



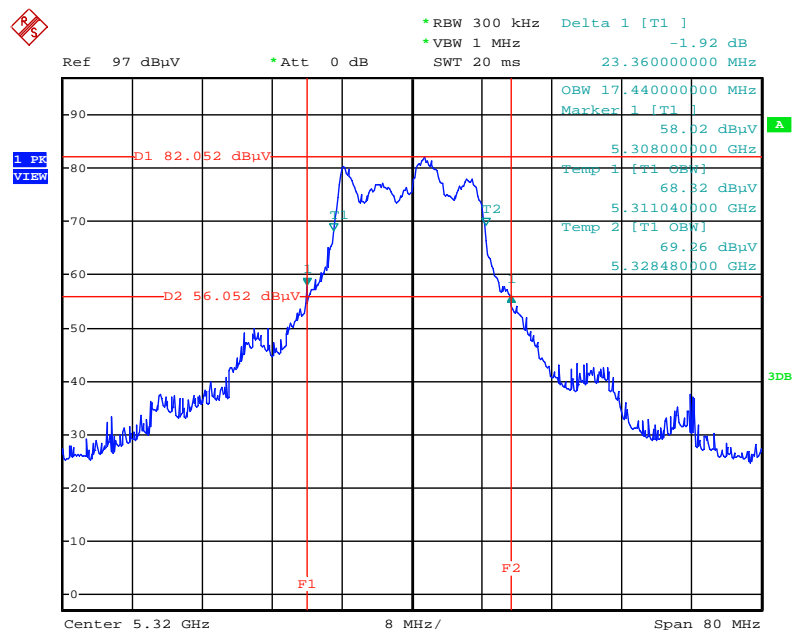
Date: 14.OCT.2014 00:22:19

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



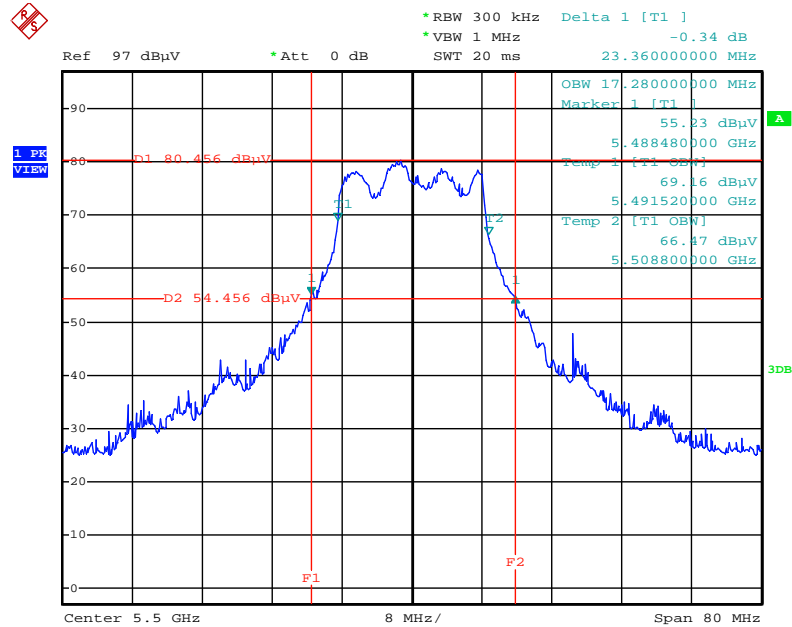
Date: 14.OCT.2014 00:22:52

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



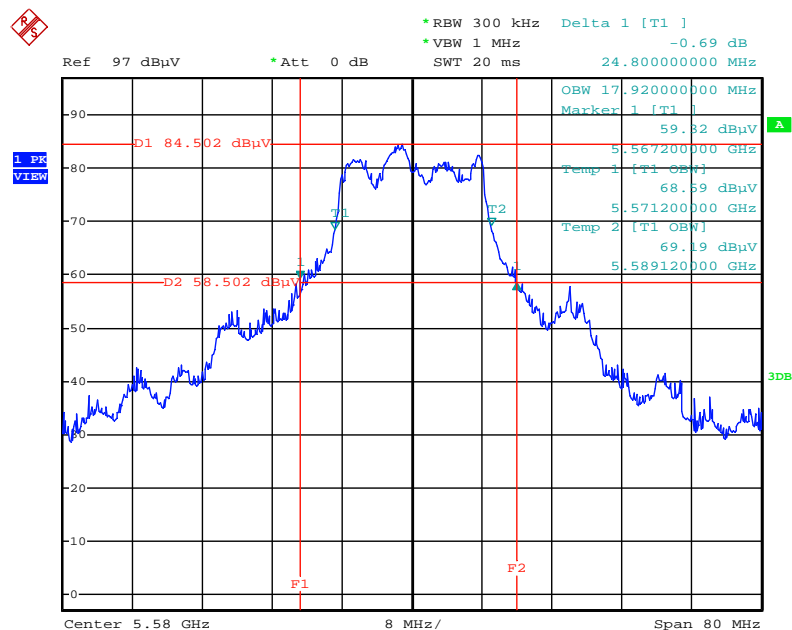
Date: 14.OCT.2014 00:23:21

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



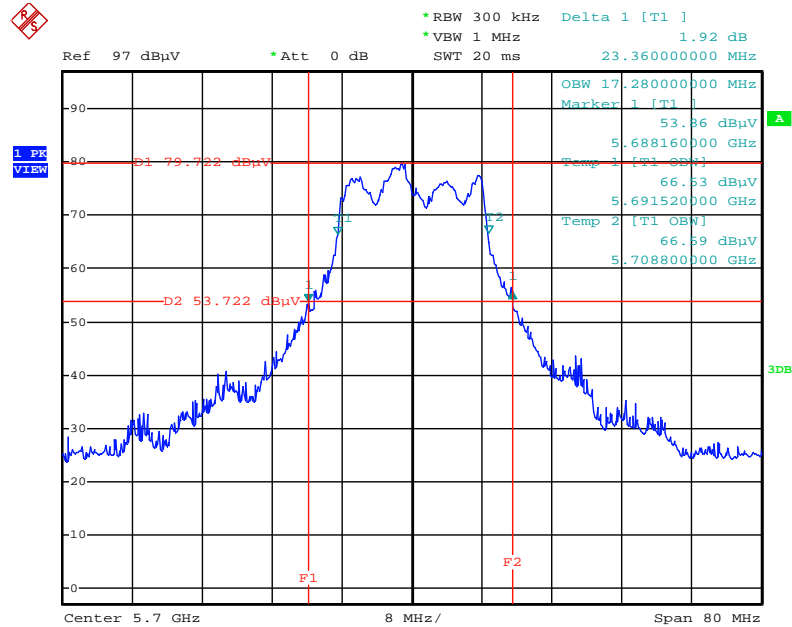
Date: 14.OCT.2014 00:23:54

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



Date: 14.OCT.2014 00:24:27

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



Date: 14.OCT.2014 00:25:17

4.2. Maximum Conducted Output Power Measurement

4.2.1. Limit

For the band 5.15~5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW (17dBm) or $4 \text{ dBm} + 10\log B$, where B is the 26 dB emissions 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 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 $11 \text{ dBm} + 10\log B$, 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.

4.2.2. Measuring Instruments and Setting

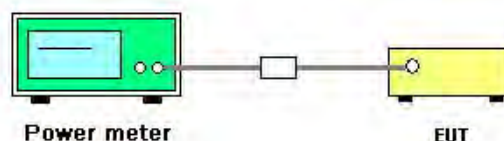
Please refer to section 5 of equipments list in this report. The following table is the setting of the power meter.

Power Meter Parameter	Setting
Bandwidth	50MHz bandwidth is greater than the EUT emission bandwidth
Detector	AVERAGE

4.2.3. Test Procedures

1. The transmitter output (antenna port) was connected to the power meter.
2. Test was performed in accordance with KDB789033 D01 v01r04 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (E) Maximum conducted output power =>3) Measurement using a power meter (PM) =>b) Method PM-G (Measurement using a gated RF average power meter).
3. Multiple antenna systems was performed in accordance with KDB662911 D01 v02r01 Emissions Testing of Transmitters with Multiple Outputs in the Same Band.
4. When measuring maximum conducted output power with multiple antenna systems, add every result of the values by mathematic formula.

4.2.4. Test Setup Layout



4.2.5. Test Deviation

There is no deviation with the original standard.

4.2.6. EUT Operation during Test

For non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

The measured result was added array gain $10 \cdot \log(2) = 3.01 \text{ dBi}$ as worse case in beamforming mode.

The measured result was added array gain $10 \cdot \log(3) = 4.77 \text{ dBi}$ as worse case in beamforming mode.

4.2.7. Test Result of Maximum Conducted Output Power

Temperature	26°C	Humidity	63%
Test Engineer	Wen Chao / YC Chen	Configurations	IEEE 802.11n/a
Test Date	Oct. 09, 2014 ~ Nov. 03, 2014		

Mode 1 (Ant.6 Dipole antenna / 8dBi)

For Beamforming Mode

For 2TX

Configuration IEEE 802.11n MCS0 HT20

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
36	5180 MHz	7.85	9.85	11.97	11.99	Complies
40	5200 MHz	7.95	9.58	11.85	11.99	Complies
48	5240 MHz	8.05	9.15	11.65	11.99	Complies
52	5260 MHz	15.56	16.18	18.89	18.99	Complies
60	5300 MHz	15.15	16.65	18.97	18.99	Complies
64	5320 MHz	13.55	15.25	17.49	18.99	Complies
100	5500 MHz	12.78	14.45	16.71	18.99	Complies
116	5580 MHz	14.95	16.58	18.85	18.99	Complies
140	5700 MHz	13.97	14.95	17.50	18.99	Complies

Note:

$$\text{Ch36, 40, 48} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{\text{sig}}} \left\{ \sum_{k=1}^{N_{\text{ant}}} S_{j,k} \right\}^2}{N_{\text{ANT}}} \right] = 11.01 \text{dBi} > 6 \text{dBi},$$

$$\text{So Limit} = 17 - (11.01 - 6) = 11.99 \text{dBm}$$

$$\text{Ch52, 60, 64, 100, 116, 140} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{\text{sig}}} \left\{ \sum_{k=1}^{N_{\text{ant}}} S_{j,k} \right\}^2}{N_{\text{ANT}}} \right] = 11.01 \text{dBi} > 6 \text{dBi},$$

$$\text{So Limit} = 24 - (11.01 - 6) = 18.99 \text{dBm}$$

Configuration IEEE 802.11n MCS0 HT40

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
38	5190 MHz	7.56	9.02	11.36	11.99	Complies
46	5230 MHz	8.12	9.45	11.85	11.99	Complies
54	5270 MHz	15.53	16.25	18.92	18.99	Complies
62	5310 MHz	10.12	11.12	13.66	18.99	Complies
102	5510 MHz	8.92	11.76	13.58	18.99	Complies
110	5550 MHz	14.25	16.75	18.69	18.99	Complies
134	5670 MHz	15.35	16.12	18.76	18.99	Complies

Note:

$$\text{Ch36, 46} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{\text{AN}}} \left\{ \sum_{k=1}^{N_{\text{AN}}} g_{j,k} \right\}^2}{N_{\text{ANT}}} \right] = 11.01 \text{ dBi} > 6 \text{ dBi},$$

So Limit=17-(11.01-6)=11.99dBm

$$\text{Ch54, 62, 102, 110, 134} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{\text{AN}}} \left\{ \sum_{k=1}^{N_{\text{AN}}} g_{j,k} \right\}^2}{N_{\text{ANT}}} \right] = 11.01 \text{ dBi} > 6 \text{ dBi},$$

So Limit=24-(11.01-6)=18.99dBm

For 3TX

Configuration IEEE 802.11n MCS0 HT20

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
36	5180 MHz	4.68	6.38	5.05	10.20	10.23	Complies
40	5200 MHz	5.03	5.79	4.98	10.05	10.23	Complies
48	5240 MHz	5.47	5.98	4.77	10.21	10.23	Complies
52	5260 MHz	8.82	9.63	8.42	13.76	17.23	Complies
60	5300 MHz	9.12	9.92	8.22	13.91	17.23	Complies
64	5320 MHz	10.84	11.52	10.02	15.61	17.23	Complies
100	5500 MHz	11.80	13.32	11.64	17.09	17.23	Complies
116	5580 MHz	11.61	13.42	11.98	17.18	17.23	Complies
140	5700 MHz	11.87	13.02	11.48	16.94	17.23	Complies

Note:

$$\text{Ch36, 40, 48} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{AS}} \left\{ \sum_{k=1}^{N_{AS}} G_{j/A} \right\}^2}{N_{ANT}} \right] = 12.77\text{dBi} > 6\text{dBi},$$

So Limit=17-(12.77-6)=10.23dBm

$$\text{Ch52, 60, 64, 100, 116, 140} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{AS}} \left\{ \sum_{k=1}^{N_{AS}} G_{j/A} \right\}^2}{N_{ANT}} \right] = 12.77\text{dBi} > 6\text{dBi},$$

So Limit=24-(12.77-6)=17.23dBm

Configuration IEEE 802.11n MCS0 HT40

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
38	5190 MHz	4.95	6.35	4.85	10.21	10.23	Complies
46	5230 MHz	5.56	5.95	4.65	10.19	10.23	Complies
54	5270 MHz	11.45	12.25	10.62	16.26	17.23	Complies
62	5310 MHz	9.32	10.18	8.63	14.19	17.23	Complies
102	5510 MHz	4.16	6.96	3.88	10.01	17.23	Complies
110	5550 MHz	11.35	13.75	11.23	17.04	17.23	Complies
134	5670 MHz	12.25	13.02	12.02	17.22	17.23	Complies

Note:

$$\text{Ch36, 46} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{\text{AN}}} \left\{ \sum_{k=1}^{N_{\text{AN}}} g_{j,k} \right\}^2}{N_{\text{ANT}}} \right] = 12.77 \text{dBi} > 6 \text{dBi},$$

So Limit=17-(12.77-6)=10.23dBm

$$\text{Ch54, 62, 102, 110, 134} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{\text{AN}}} \left\{ \sum_{k=1}^{N_{\text{AN}}} g_{j,k} \right\}^2}{N_{\text{ANT}}} \right] = 12.77 \text{dBi} > 6 \text{dBi},$$

So Limit=24-(12.77-6)=17.23dBm

Mode 2 (Ant.16 Panel antenna / 3.5dBi)

For Beamforming Mode

For 2TX

Configuration IEEE 802.11n MCS0 HT20

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
36	5180 MHz	12.42	13.89	16.23	16.49	Complies
40	5200 MHz	12.32	13.98	16.24	16.49	Complies
48	5240 MHz	12.33	13.64	16.04	16.49	Complies
52	5260 MHz	18.54	19.69	22.16	23.49	Complies
60	5300 MHz	19.36	20.73	23.11	23.49	Complies
64	5320 MHz	12.98	14.75	16.96	23.49	Complies
100	5500 MHz	14.04	15.96	18.12	23.49	Complies
116	5580 MHz	19.98	20.87	23.46	23.49	Complies
140	5700 MHz	11.98	12.75	15.39	23.49	Complies

Note:

$$\text{Ch36, 40, 48} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{AS}} \left\{ \sum_{k=1}^{N_{AE}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 6.51 \text{ dBi} > 6 \text{ dBi},$$

So Limit=17-(6.51-6)=16.49dBm

$$\text{Ch52, 60, 64, 100, 116, 140} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{AS}} \left\{ \sum_{k=1}^{N_{AE}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 6.51 \text{ dBi} > 6 \text{ dBi},$$

So Limit=24-(6.51-6)=23.49dBm

Configuration IEEE 802.11n MCS0 HT40

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
38	5190 MHz	7.52	8.73	11.18	16.49	Complies
46	5230 MHz	13.12	13.77	16.47	16.49	Complies
54	5270 MHz	15.11	15.65	18.40	23.49	Complies
62	5310 MHz	8.71	9.37	12.06	23.49	Complies
102	5510 MHz	5.26	8.56	10.23	23.49	Complies
110	5550 MHz	16.41	18.56	20.63	23.49	Complies
134	5670 MHz	13.28	14.05	16.69	23.49	Complies

Note:

$$\text{Ch36, 46} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{\text{AN}}} \left\{ \sum_{k=1}^{N_{\text{AN}}} g_{j,k} \right\}^2}{N_{\text{ANT}}} \right] = 6.51 \text{ dBi} > 6 \text{ dBi},$$

$$\text{So Limit} = 17 - (6.51 - 6) = 16.49 \text{ dBm}$$

$$\text{Ch54, 62, 102, 110, 134} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{\text{AN}}} \left\{ \sum_{k=1}^{N_{\text{AN}}} g_{j,k} \right\}^2}{N_{\text{ANT}}} \right] = 6.51 \text{ dBi} > 6 \text{ dBi},$$

$$\text{So Limit} = 24 - (6.51 - 6) = 23.49 \text{ dBm}$$

For 3TX

Configuration IEEE 802.11n MCS0 HT20

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
36	5180 MHz	7.66	9.07	7.59	12.93	14.73	Complies
40	5200 MHz	9.19	10.73	9.36	14.59	14.73	Complies
48	5240 MHz	9.31	10.54	9.29	14.53	14.73	Complies
52	5260 MHz	8.16	8.67	7.82	13.00	21.73	Complies
60	5300 MHz	10.13	11.01	9.04	14.91	21.73	Complies
64	5320 MHz	9.18	10.35	8.65	14.22	21.73	Complies
100	5500 MHz	9.56	11.26	9.99	15.10	21.73	Complies
116	5580 MHz	16.23	17.56	16.21	21.49	21.73	Complies
140	5700 MHz	11.26	11.14	10.75	15.83	21.73	Complies

Note:

$$\text{Ch36, 40, 48} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{AS}} \left\{ \sum_{k=1}^{N_{AE}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 8.27 \text{dBi} > 6 \text{dBi},$$

So Limit=17-(8.27-6)=14.73dBm

$$\text{Ch52, 60, 64, 100, 116, 140} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{AS}} \left\{ \sum_{k=1}^{N_{AE}} g_{j,k} \right\}^2}{N_{ANT}} \right] = 8.27 \text{dBi} > 6 \text{dBi},$$

So Limit=24-(8.27-6)=21.73dBm

Configuration IEEE 802.11n MCS0 HT40

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
38	5190 MHz	5.71	6.41	5.29	10.60	14.73	Complies
46	5230 MHz	9.47	10.35	9.16	14.46	14.73	Complies
54	5270 MHz	12.27	12.67	10.94	16.79	21.73	Complies
62	5310 MHz	7.66	8.38	6.89	12.46	21.73	Complies
102	5510 MHz	4.81	7.83	5.04	10.89	21.73	Complies
110	5550 MHz	14.65	16.89	14.34	20.22	21.73	Complies
134	5670 MHz	10.21	10.51	10.11	15.05	21.73	Complies

Note:

$$\text{Ch36, 46} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{\text{AN}}} \left\{ \sum_{k=1}^{N_{\text{AN}}} g_{j,k} \right\}^2}{N_{\text{ANT}}} \right] = 8.27 \text{dBi} > 6 \text{dBi},$$

So Limit=17-(8.27-6)=14.73dBm

$$\text{Ch54, 62, 102, 110, 134} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{\text{AN}}} \left\{ \sum_{k=1}^{N_{\text{AN}}} g_{j,k} \right\}^2}{N_{\text{ANT}}} \right] = 8.27 \text{dBi} > 6 \text{dBi},$$

So Limit=24-(8.27-6)=21.73dBm

Mode 3 (Ant.32 3-Port Dual-Band Directional Panel antenna / Chain 1: 6.7, Chain 2: 4.3, Chain 3: 6.6dBi)

For Beamforming Mode

For 3TX

Configuration IEEE 802.11n MCS0 HT20

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
36	5180 MHz	6.65	7.86	6.72	11.88	15.24	Complies
40	5200 MHz	6.85	8.05	6.48	11.95	15.24	Complies
48	5240 MHz	6.92	7.98	6.56	11.97	15.24	Complies
52	5260 MHz	14.65	14.95	13.32	19.13	22.24	Complies
60	5300 MHz	13.92	15.32	13.57	19.11	22.24	Complies
64	5320 MHz	10.25	11.55	9.95	15.41	22.24	Complies
100	5500 MHz	12.25	14.35	13.23	18.13	22.24	Complies
116	5580 MHz	13.43	15.35	14.12	19.14	22.24	Complies
140	5700 MHz	11.45	12.32	11.56	16.57	22.24	Complies

Note:

$$\text{Ch36, 40, 48} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{AS}} \left\{ \sum_{k=1}^{N_{AS}} g_{j/A} \right\}^2}{N_{ANT}} \right] = 7.76\text{dBi} > 6\text{dBi},$$

So Limit=17-(7.76-6)=15.24dBm

$$\text{Ch52, 60, 64, 100, 116, 140} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{AS}} \left\{ \sum_{k=1}^{N_{AS}} g_{j/A} \right\}^2}{N_{ANT}} \right] = 7.76\text{dBi} > 6\text{dBi},$$

So Limit=24-(7.76-6)=22.24dBm

Configuration IEEE 802.11n MCS0 HT40

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
38	5190 MHz	5.45	6.95	5.25	10.72	15.24	Complies
46	5230 MHz	7.03	7.95	6.45	11.96	15.24	Complies
54	5270 MHz	9.32	10.53	8.92	14.42	22.24	Complies
62	5310 MHz	6.53	7.35	5.95	11.42	22.24	Complies
102	5510 MHz	4.13	7.02	3.75	10.00	22.24	Complies
110	5550 MHz	13.05	15.08	13.07	18.61	22.24	Complies
134	5670 MHz	11.75	12.53	11.68	16.78	22.24	Complies

Note:

$$\text{Ch36, 46} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{\text{AN}}} \left\{ \sum_{k=1}^{N_{\text{AN}}} g_{j,k} \right\}^2}{N_{\text{ANT}}} \right] = 7.76 \text{dBi} > 6 \text{dBi},$$

So Limit=17-(7.76-6)=15.24dBm

$$\text{Ch54, 62, 102, 110, 134} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{\text{AN}}} \left\{ \sum_{k=1}^{N_{\text{AN}}} g_{j,k} \right\}^2}{N_{\text{ANT}}} \right] = 7.76 \text{dBi} > 6 \text{dBi},$$

So Limit=24-(7.76-6)=22.24dBm

For Non-Beamforming Mode

For 1TX

Configuration IEEE 802.11n MCS0 HT20

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain 1		
36	5180 MHz	16.13	16.30	Complies
40	5200 MHz	16.06	16.30	Complies
48	5240 MHz	15.93	16.30	Complies
52	5260 MHz	23.11	23.30	Complies
60	5300 MHz	21.95	23.30	Complies
64	5320 MHz	17.27	23.30	Complies
100	5500 MHz	16.16	23.30	Complies
116	5580 MHz	23.18	23.30	Complies
140	5700 MHz	14.98	23.30	Complies

Note:

Ch36, 40, 48 = Max Gain 6.7dBi>6dBi, So Limit=17-(6.7-6)=16.30dBm

Ch52, 60, 64, 100, 116, 140 = Max Gain 6.7dBi>6dBi, So Limit=24-(6.7-6)=23.30dBm

Configuration IEEE 802.11n MCS0 HT40

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain 1		
38	5190 MHz	10.03	16.30	Complies
46	5230 MHz	15.98	16.30	Complies
54	5270 MHz	15.86	23.30	Complies
62	5310 MHz	14.64	23.30	Complies
102	5510 MHz	11.05	23.30	Complies
110	5550 MHz	19.62	23.30	Complies
134	5670 MHz	16.21	23.30	Complies

Note:

Ch38, 46 = Max Gain 6.7dBi>6dBi, So Limit=17-(6.7-6)=16.30dBm

Ch54, 62, 102, 110, 134 = Max Gain 6.7dBi>6dBi, So Limit=24-(6.7-6)=23.30dBm

Configuration IEEE 802.11a

Channel	Frequency	Conducted Power (dBm)	Max. Limit (dBm)	Result
		Chain 1		
36	5180 MHz	16.09	16.30	Complies
40	5200 MHz	16.13	16.30	Complies
48	5240 MHz	16.06	16.30	Complies
52	5260 MHz	23.12	23.30	Complies
60	5300 MHz	22.73	23.30	Complies
64	5320 MHz	17.82	23.30	Complies
100	5500 MHz	16.53	23.30	Complies
116	5580 MHz	23.15	23.30	Complies
140	5700 MHz	15.46	23.30	Complies

Note:

Ch36, 40, 48 = Max Gain 6.7dBi>6dBi, So Limit=17-(6.7-6)=16.30dBm

Ch52, 60, 64, 100, 116, 140 = Max Gain 6.7dBi>6dBi, So Limit=24-(6.7-6)=23.30dBm

For 2TX

Configuration IEEE 802.11n MCS0 HT20

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
36	5180 MHz	12.42	13.89	16.23	16.30	Complies
40	5200 MHz	12.32	13.98	16.24	16.30	Complies
48	5240 MHz	12.33	13.64	16.04	16.30	Complies
52	5260 MHz	19.38	20.36	22.91	23.30	Complies
60	5300 MHz	19.36	20.73	23.11	23.30	Complies
64	5320 MHz	14.67	15.98	18.38	23.30	Complies
100	5500 MHz	15.25	17.53	19.55	23.30	Complies
116	5580 MHz	19.32	20.43	22.92	23.30	Complies
140	5700 MHz	13.84	14.67	17.29	23.30	Complies

Note:

Ch36, 40, 48 = Max Gain 6.7dBi>6dBi, So Limit=17-(6.7-6)=16.30dBm

Ch52, 60, 64, 100, 116, 140 = Max Gain 6.7dBi>6dBi, So Limit=24-(6.7-6)=23.30dBm

Configuration IEEE 802.11n MCS0 HT40

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
38	5190 MHz	9.06	10.15	12.65	16.30	Complies
46	5230 MHz	12.38	13.24	15.84	16.30	Complies
54	5270 MHz	18.76	19.75	22.29	23.30	Complies
62	5310 MHz	12.42	13.87	16.22	23.30	Complies
102	5510 MHz	10.46	12.75	14.76	23.30	Complies
110	5550 MHz	19.33	20.49	22.96	23.30	Complies
134	5670 MHz	15.52	16.47	19.03	23.30	Complies

Note:

Ch38, 46 = Max Gain 6.7dBi>6dBi, So Limit=17-(6.7-6)=16.30dBm

Ch54, 62, 102, 110, 134 = Max Gain 6.7dBi>6dBi, So Limit=24-(6.7-6)=23.30dBm

Configuration IEEE 802.11a

Channel	Frequency	Conducted Power (dBm)			Max. Limit (dBm)	Result
		Chain 1	Chain 2	Total		
36	5180 MHz	12.46	13.86	16.23	16.30	Complies
40	5200 MHz	12.56	13.56	16.10	16.30	Complies
48	5240 MHz	12.63	13.48	16.09	16.30	Complies
52	5260 MHz	19.24	20.35	22.84	23.30	Complies
60	5300 MHz	19.18	20.34	22.81	23.30	Complies
64	5320 MHz	15.82	17.28	19.62	23.30	Complies
100	5500 MHz	15.78	17.87	19.96	23.30	Complies
116	5580 MHz	19.26	20.48	22.92	23.30	Complies
140	5700 MHz	14.57	15.02	17.81	23.30	Complies

Note:

Ch36, 40, 48 = Max Gain 6.7dBi>6dBi, So Limit=17-(6.7-6)=16.30dBm

Ch52, 60, 64, 100, 116, 140 = Max Gain 6.7dBi>6dBi, So Limit=24-(6.7-6)=23.30dBm

For 3TX

Configuration IEEE 802.11n MCS0 HT20

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
36	5180 MHz	10.16	11.65	10.23	15.51	16.30	Complies
40	5200 MHz	10.34	11.16	10.23	15.37	16.30	Complies
48	5240 MHz	10.56	11.42	9.40	15.31	16.30	Complies
52	5260 MHz	17.26	18.17	17.06	22.30	23.30	Complies
60	5300 MHz	17.56	18.69	16.71	22.50	23.30	Complies
64	5320 MHz	14.13	15.46	13.91	19.33	23.30	Complies
100	5500 MHz	12.84	15.32	13.25	18.72	23.30	Complies
116	5580 MHz	16.42	18.88	17.12	22.37	23.30	Complies
140	5700 MHz	11.66	13.41	12.06	17.21	23.30	Complies

Note:

Ch36, 40, 48 = Max Gain 6.7dBi>6dBi, So Limit=17-(6.7-6)=16.30dBm

Ch52, 60, 64, 100, 116, 140 = Max Gain 6.7dBi>6dBi, So Limit=24-(6.7-6)=23.30dBm

Configuration IEEE 802.11n MCS0 HT40

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
38	5190 MHz	6.95	7.51	6.77	11.86	16.30	Complies
46	5230 MHz	11.39	12.12	10.97	16.29	16.30	Complies
54	5270 MHz	11.59	12.36	11.19	16.51	23.30	Complies
62	5310 MHz	7.83	8.96	7.76	12.99	23.30	Complies
102	5510 MHz	4.42	8.31	5.15	11.08	23.30	Complies
110	5550 MHz	12.89	16.14	13.84	19.28	23.30	Complies
134	5670 MHz	12.29	13.68	12.76	17.72	23.30	Complies

Note:

Ch38, 46 = Max Gain 6.7dBi>6dBi, So Limit=17-(6.7-6)=16.30dBm

Ch54, 62, 102, 110, 134 = Max Gain 6.7dBi>6dBi, So Limit=24-(6.7-6)=23.30dBm

Configuration IEEE 802.11a

Channel	Frequency	Conducted Power (dBm)				Max. Limit (dBm)	Result
		Chain 1	Chain 2	Chain 3	Total		
36	5180 MHz	10.76	11.27	9.85	15.44	16.30	Complies
40	5200 MHz	10.74	11.14	9.72	15.34	16.30	Complies
48	5240 MHz	11.01	11.23	9.96	15.54	16.30	Complies
52	5260 MHz	17.90	18.23	17.06	22.53	23.30	Complies
60	5300 MHz	17.52	18.56	17.09	22.54	23.30	Complies
64	5320 MHz	14.15	15.32	13.72	19.22	23.30	Complies
100	5500 MHz	12.86	15.36	13.34	18.77	23.30	Complies
116	5580 MHz	16.77	19.02	17.08	22.51	23.30	Complies
140	5700 MHz	12.37	13.76	12.40	17.66	23.30	Complies

Note:

Ch36, 40, 48 = Max Gain 6.7dBi>6dBi, So Limit=17-(6.7-6)=16.30dBm

Ch52, 60, 64, 100, 116, 140 = Max Gain 6.7dBi>6dBi, So Limit=24-(6.7-6)=23.30dBm

4.3. Power Spectral Density Measurement

4.3.1. 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 4.2.1.

Frequency Range	Power Spectral Density limit (dBm/MHz)
5.15~5.25 GHz	4
5.25-5.35 GHz	11
5.470-5.725 GHz	11

4.3.2. Measuring Instruments and Setting

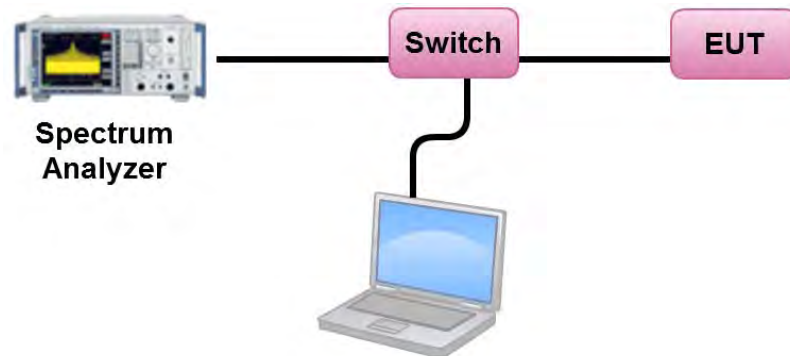
Please refer to section 5 of equipments list in this report. The following table is the setting of the spectrum analyzer.

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

4.3.3. Test Procedures

1. The transmitter output (antenna port) was connected RF switch to the spectrum analyzer.
2. Test was performed in accordance with KDB789033 D01 v01r04 for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices - section (F) Peak power spectral density (PPSD).
3. Multiple antenna systems was performed in accordance KDB662911 D01 v02r01 in-Band Power Spectral Density (PSD) Measurements (a) Measure and sum the spectra across the outputs.
4. When measuring first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3 and so on up to the Nth output to obtain the value for the first frequency bin of the summed spectrum. The summed spectrum value for each of the other frequency bins is computed in the same way.

4.3.4. Test Setup Layout



4.3.5. Test Deviation

There is no deviation with the original standard.

4.3.6. EUT Operation during Test

For non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

The measured result was added array gain $10 \cdot \log(2) = 3.01 \text{ dBi}$ as worse case in beamforming mode.

The measured result was added array gain $10 \cdot \log(3) = 4.77 \text{ dBi}$ as worse case in beamforming mode.

4.3.7. Test Result of Power Spectral Density

Temperature	26°C	Humidity	63%
Test Engineer	Wen Chao / YC Chen	Configurations	IEEE 802.11n
Test Date	Oct. 09, 2014 ~ Nov. 03, 2014		

Mode 1 (Ant.6 Dipole antenna / 8dBi)

For Beamforming Mode

For 2TX

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	-1.69	-1.01	Complies
40	5200 MHz	-1.02	-1.01	Complies
48	5240 MHz	-1.34	-1.01	Complies
52	5260 MHz	5.89	5.99	Complies
60	5300 MHz	5.44	5.99	Complies
64	5320 MHz	4.96	5.99	Complies
100	5500 MHz	4.03	5.99	Complies
116	5580 MHz	5.62	5.99	Complies
140	5700 MHz	2.85	5.99	Complies

Note:

$$CH36, 40, 48 = DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{AS}} \left\{ \sum_{k=1}^{N_{ASj}} g_{jA} \right\}^2}{N_{ANT}} \right] = 11.01 \text{ dBi} > 6 \text{ dBi},$$

So Limit=4-(11.01-6)=-1.01dBm/MHz

$$CH52, 60, 64, 100, 116, 140 = DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{AS}} \left\{ \sum_{k=1}^{N_{ASj}} g_{jA} \right\}^2}{N_{ANT}} \right] = 11.01 \text{ dBi} > 6 \text{ dBi},$$

So Limit=11-(11.01-6)=5.99dBm/MHz

Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	-4.29	-1.01	Complies
46	5230 MHz	-3.65	-1.01	Complies
54	5270 MHz	4.46	5.99	Complies
62	5310 MHz	-1.58	5.99	Complies
102	5510 MHz	-2.69	5.99	Complies
110	5550 MHz	2.44	5.99	Complies
134	5670 MHz	2.35	5.99	Complies

Note:

$$CH38, 46 = DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{AS}} \left\{ \sum_{k=1}^{N_{ASj}} g_{j/A} \right\}^2}{N_{ANT}} \right] = 11.01 \text{ dBi} > 6 \text{ dBi},$$

So Limit=4-(11.01-6)=-1.01dBm/MHz

$$CH54, 62, 102, 110, 134 = DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{AS}} \left\{ \sum_{k=1}^{N_{ASj}} g_{j/A} \right\}^2}{N_{ANT}} \right] = 11.01 \text{ dBi} > 6 \text{ dBi},$$

So Limit=11-(11.01-6)=5.99dBm/MHz

For 3TX

Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	-2.78	-2.77	Complies
40	5200 MHz	-2.86	-2.77	Complies
48	5240 MHz	-3.17	-2.77	Complies
52	5260 MHz	0.80	4.23	Complies
60	5300 MHz	1.18	4.23	Complies
64	5320 MHz	2.03	4.23	Complies
100	5500 MHz	3.30	4.23	Complies
116	5580 MHz	3.33	4.23	Complies
140	5700 MHz	2.51	4.23	Complies

Note:

$$\text{CH36, 40, 48} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{\text{SS}}} \left\{ \sum_{k=1}^{N_{\text{SS}}} g_{j/A} \right\}^2}{N_{\text{ANT}}} \right] = 12.77 \text{dBi} > 6 \text{dBi},$$

So Limit=4-(12.77-6)=-2.77dBm/MHz

$$\text{CH52, 60, 64, 100, 116, 140} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{\text{SS}}} \left\{ \sum_{k=1}^{N_{\text{SS}}} g_{j/A} \right\}^2}{N_{\text{ANT}}} \right] = 12.77 \text{dBi} > 6 \text{dBi},$$

So Limit=11-(12.77-6)=4.23dBm/MHz

Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	-4.35	-2.77	Complies
46	5230 MHz	-4.50	-2.77	Complies
54	5270 MHz	1.83	4.23	Complies
62	5310 MHz	-1.07	4.23	Complies
102	5510 MHz	-5.68	4.23	Complies
110	5550 MHz	0.93	4.23	Complies
134	5670 MHz	1.36	4.23	Complies

Note:

$$\text{CH38, 46} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{AS}} \left\{ \sum_{k=1}^{N_{ASj}} g_{j/A} \right\}^2}{N_{ANT}} \right] = 12.77 \text{dBi} > 6 \text{dBi},$$

So Limit=4-(12.77-6)=-2.77dBm/MHz

$$\text{CH54, 62, 102, 110, 134} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{AS}} \left\{ \sum_{k=1}^{N_{ASj}} g_{j/A} \right\}^2}{N_{ANT}} \right] = 12.77 \text{dBi} > 6 \text{dBi},$$

So Limit=11-(12.77-6)=4.23dBm/MHz

Mode 2 (Ant.16 Panel antenna / 3.5dBi)

For Beamforming Mode

For 2TX

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	2.76	3.49	Complies
40	5200 MHz	3.22	3.49	Complies
48	5240 MHz	2.63	3.49	Complies
52	5260 MHz	8.64	10.49	Complies
60	5300 MHz	10.15	10.49	Complies
64	5320 MHz	3.42	10.49	Complies
100	5500 MHz	4.88	10.49	Complies
116	5580 MHz	10.39	10.49	Complies
140	5700 MHz	1.66	10.49	Complies

Note:

$$\text{CH36, 40, 48} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{AS}} \left\{ \sum_{k=1}^{N_{ASj}} g_{j/A} \right\}^2}{N_{ANT}} \right] = 6.51 \text{ dBi} > 6 \text{ dBi},$$

So Limit=4-(6.51-6)=3.49dBm/MHz

$$\text{CH52, 60, 64, 100, 116, 140} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{AS}} \left\{ \sum_{k=1}^{N_{ASj}} g_{j/A} \right\}^2}{N_{ANT}} \right] = 6.51 \text{ dBi} > 6 \text{ dBi},$$

So Limit=11-(6.51-6)=10.49dBm/MHz

Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	-4.66	3.49	Complies
46	5230 MHz	0.30	3.49	Complies
54	5270 MHz	3.12	10.49	Complies
62	5310 MHz	-4.14	10.49	Complies
102	5510 MHz	-5.59	10.49	Complies
110	5550 MHz	3.08	10.49	Complies
134	5670 MHz	0.20	10.49	Complies

Note:

$$\text{CH38, 46} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{AS}} \left\{ \sum_{k=1}^{N_{ASj}} g_{j/A} \right\}^2}{N_{ANT}} \right] = 6.51 \text{ dBi} > 6 \text{ dBi},$$

So Limit=4-(6.51-6)=3.49dBm/MHz

$$\text{CH54, 62, 102, 110, 134} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{AS}} \left\{ \sum_{k=1}^{N_{ASj}} g_{j/A} \right\}^2}{N_{ANT}} \right] = 6.51 \text{ dBi} > 6 \text{ dBi},$$

So Limit=11-(6.51-6)=10.49dBm/MHz

For 3TX

Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	-1.28	1.73	Complies
40	5200 MHz	1.12	1.73	Complies
48	5240 MHz	1.41	1.73	Complies
52	5260 MHz	-0.22	8.73	Complies
60	5300 MHz	1.90	8.73	Complies
64	5320 MHz	0.63	8.73	Complies
100	5500 MHz	1.42	8.73	Complies
116	5580 MHz	7.80	8.73	Complies
140	5700 MHz	1.25	8.73	Complies

Note:

$$\text{CH36, 40, 48} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{\text{SS}}} \left\{ \sum_{k=1}^{N_{\text{SS}}} g_{j/A} \right\}^2}{N_{\text{ANT}}} \right] = 8.27 \text{dBi} > 6 \text{dBi},$$

So Limit=4-(8.27-6)=1.73dBm/MHz

$$\text{CH52, 60, 64, 100, 116, 140} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{\text{SS}}} \left\{ \sum_{k=1}^{N_{\text{SS}}} g_{j/A} \right\}^2}{N_{\text{ANT}}} \right] = 8.27 \text{dBi} > 6 \text{dBi},$$

So Limit=11-(8.27-6)=8.73dBm/MHz

Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	-5.43	1.73	Complies
46	5230 MHz	-1.92	1.73	Complies
54	5270 MHz	1.13	8.73	Complies
62	5310 MHz	-3.62	8.73	Complies
102	5510 MHz	-5.65	8.73	Complies
110	5550 MHz	3.61	8.73	Complies
134	5670 MHz	-1.56	8.73	Complies

Note:

$$\text{CH38, 46} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{\text{AS}}} \left\{ \sum_{k=1}^{N_{\text{AS}}} g_{j/A} \right\}^2}{N_{\text{ANT}}} \right] = 8.27 \text{dBi} > 6 \text{dBi},$$

So Limit=4-(8.27-6)=1.73dBm/MHz

$$\text{CH54, 62, 102, 110, 134} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{\text{AS}}} \left\{ \sum_{k=1}^{N_{\text{AS}}} g_{j/A} \right\}^2}{N_{\text{ANT}}} \right] = 8.27 \text{dBi} > 6 \text{dBi},$$

So Limit=11-(8.27-6)=8.73dBm/MHz

Mode 3 (Ant.32 3-Port Dual-Band Directional Panel antenna / Chain 1: 6.7, Chain 2: 4.3, Chain 3: 6.6dBi)

For Beamforming Mode

For 3TX

Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	-1.33	2.24	Complies
40	5200 MHz	-1.10	2.24	Complies
48	5240 MHz	-1.22	2.24	Complies
52	5260 MHz	5.68	9.24	Complies
60	5300 MHz	6.03	9.24	Complies
64	5320 MHz	1.63	9.24	Complies
100	5500 MHz	4.53	9.24	Complies
116	5580 MHz	5.87	9.24	Complies
140	5700 MHz	2.90	9.24	Complies

Note:

$$\text{CH36, 40, 48} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{\text{AG}}} \left\{ \sum_{k=1}^{N_{\text{AG}}} g_{j/A} \right\}^2}{N_{\text{ANT}}} \right] = 7.76\text{dBi} > 6\text{dBi},$$

So Limit=4-(7.76-6)=2.24dBm/MHz

$$\text{CH52, 60, 64, 100, 116, 140} = \text{DirectionalGain} = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{\text{AG}}} \left\{ \sum_{k=1}^{N_{\text{AG}}} g_{j/A} \right\}^2}{N_{\text{ANT}}} \right] = 7.76\text{dBi} > 6\text{dBi},$$

So Limit=11-(7.76-6)=9.24dBm/MHz

Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	-3.94	2.24	Complies
46	5230 MHz	-2.74	2.24	Complies
54	5270 MHz	0.20	9.24	Complies
62	5310 MHz	-2.94	9.24	Complies
102	5510 MHz	-5.88	9.24	Complies
110	5550 MHz	1.87	9.24	Complies
134	5670 MHz	0.44	9.24	Complies

Note:

$$CH38, 46 = DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{AS}} \left\{ \sum_{k=1}^{N_{ASj}} g_{j/A} \right\}^2}{N_{ANT}} \right] = 7.76dBi > 6dBi,$$

So Limit=4-(7.76-6)=2.24dBm/MHz

$$CH54, 62, 102, 110, 134 = DirectionalGain = 10 \cdot \log \left[\frac{\sum_{j=1}^{N_{AS}} \left\{ \sum_{k=1}^{N_{ASj}} g_{j/A} \right\}^2}{N_{ANT}} \right] = 7.76dBi > 6dBi,$$

So Limit=11-(7.76-6)=9.24dBm/MHz

For Non-Beamforming Mode

For 1TX

Configuration IEEE 802.11n MCS0 HT20 / Chain 1

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	2.75	3.30	Complies
40	5200 MHz	2.66	3.30	Complies
48	5240 MHz	2.50	3.30	Complies
52	5260 MHz	8.55	10.30	Complies
60	5300 MHz	8.49	10.30	Complies
64	5320 MHz	3.77	10.30	Complies
100	5500 MHz	2.92	10.30	Complies
116	5580 MHz	9.97	10.30	Complies
140	5700 MHz	1.64	10.30	Complies

Note:

CH36, 40, 48 = Max Gain = 6.7dBi > 6dBi, So Limit = 4 - (6.7 - 6) = 3.30dBm/MHz

CH52, 60, 64, 100, 116, 140 = Max Gain = 6.7dBi > 6dBi, So Limit = 11 - (6.7 - 6) = 10.30dBm/MHz

Configuration IEEE 802.11n MCS0 HT40 / Chain 1

Channel	Frequency	Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	-5.83	3.30	Complies
46	5230 MHz	-0.29	3.30	Complies
54	5270 MHz	-0.31	10.30	Complies
62	5310 MHz	-1.58	10.30	Complies
102	5510 MHz	-5.21	10.30	Complies
110	5550 MHz	3.53	10.30	Complies
134	5670 MHz	0.14	10.30	Complies

Note:

CH38, 46 = Max Gain = 6.7dBi > 6dBi, So Limit = 4 - (6.7 - 6) = 3.30dBm/MHz

CH54, 62, 102, 110, 134 = Max Gain = 6.7dBi > 6dBi, So Limit = 11 - (6.7 - 6) = 10.30dBm/MHz

For 2TX

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	2.87	3.30	Complies
40	5200 MHz	2.44	3.30	Complies
48	5240 MHz	2.63	3.30	Complies
52	5260 MHz	9.68	10.30	Complies
60	5300 MHz	9.65	10.30	Complies
64	5320 MHz	5.07	10.30	Complies
100	5500 MHz	6.11	10.30	Complies
116	5580 MHz	9.57	10.30	Complies
140	5700 MHz	3.94	10.30	Complies

Note:

CH36, 40, 48 = Max Gain = 6.7dBi > 6dBi, So Limit = $4 - (6.7 - 6) = 3.30$ dBm/MHz

CH52, 60, 64, 100, 116, 140 = Max Gain = 6.7dBi > 6dBi, So Limit = $11 - (6.7 - 6) = 10.30$ dBm/MHz

Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	-3.50	3.30	Complies
46	5230 MHz	-0.42	3.30	Complies
54	5270 MHz	6.13	10.30	Complies
62	5310 MHz	0.13	10.30	Complies
102	5510 MHz	-1.48	10.30	Complies
110	5550 MHz	6.71	10.30	Complies
134	5670 MHz	2.89	10.30	Complies

Note:

CH38, 46 = Max Gain = 6.7dBi > 6dBi, So Limit = $4 - (6.7 - 6) = 3.30$ dBm/MHz

CH54, 62, 102, 110, 134 = Max Gain = 6.7dBi > 6dBi, So Limit = $11 - (6.7 - 6) = 10.30$ dBm/MHz

For 3TX

Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
36	5180 MHz	2.18	2.24	Complies
40	5200 MHz	2.16	2.24	Complies
48	5240 MHz	2.19	2.24	Complies
52	5260 MHz	9.22	9.24	Complies
60	5300 MHz	9.21	9.24	Complies
64	5320 MHz	4.37	9.24	Complies
100	5500 MHz	5.34	9.24	Complies
116	5580 MHz	9.21	9.24	Complies
140	5700 MHz	3.52	9.24	Complies

Note:

CH36, 40, 48 = Max Gain = 7.76dBi > 6dBi, So Limit = $4 - (7.76 - 6) = 2.24$ dBm/MHz

CH52, 60, 64, 100, 116, 140 = Max Gain = 7.76dBi > 6dBi, So Limit = $11 - (7.76 - 6) = 9.24$ dBm/MHz

Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3

Channel	Frequency	Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Result
38	5190 MHz	-3.77	2.24	Complies
46	5230 MHz	2.16	2.24	Complies
54	5270 MHz	1.56	9.24	Complies
62	5310 MHz	-2.66	9.24	Complies
102	5510 MHz	-5.05	9.24	Complies
110	5550 MHz	3.30	9.24	Complies
134	5670 MHz	1.12	9.24	Complies

Note:

CH38, 46 = Max Gain = 7.76dBi > 6dBi, So Limit = $4 - (7.76 - 6) = 2.24$ dBm/MHz

CH54, 62, 102, 110, 134 = Max Gain = 7.76dBi > 6dBi, So Limit = $11 - (7.76 - 6) = 9.24$ dBm/MHz

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

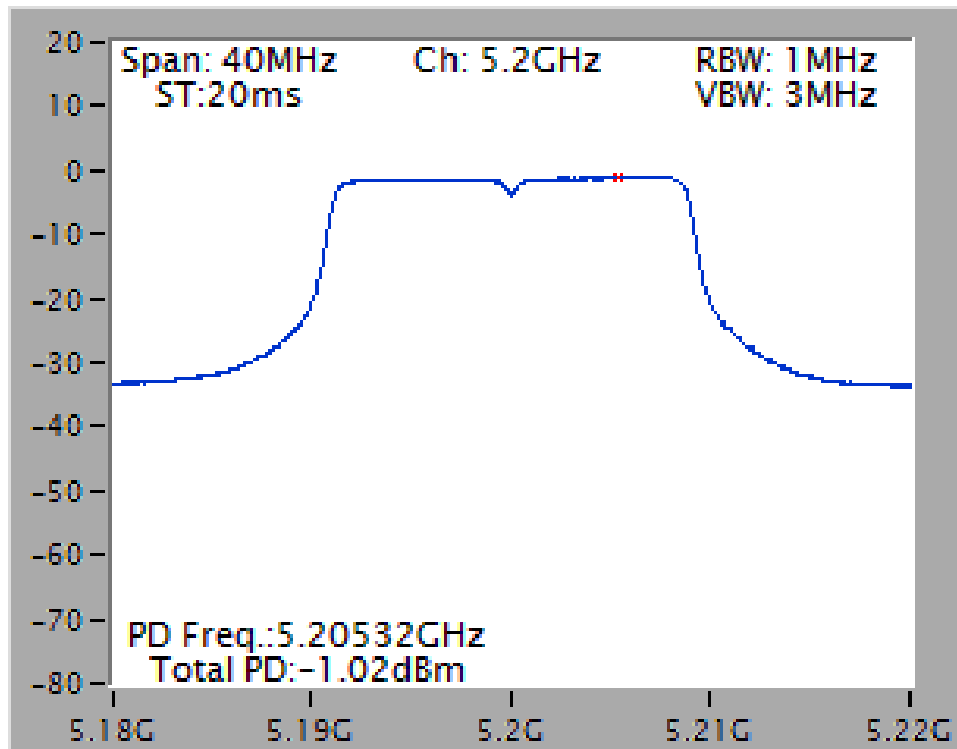
For plots, only the channel with worse result was shown.

Mode 1 (Ant.6 Dipole antenna / 8dBi)

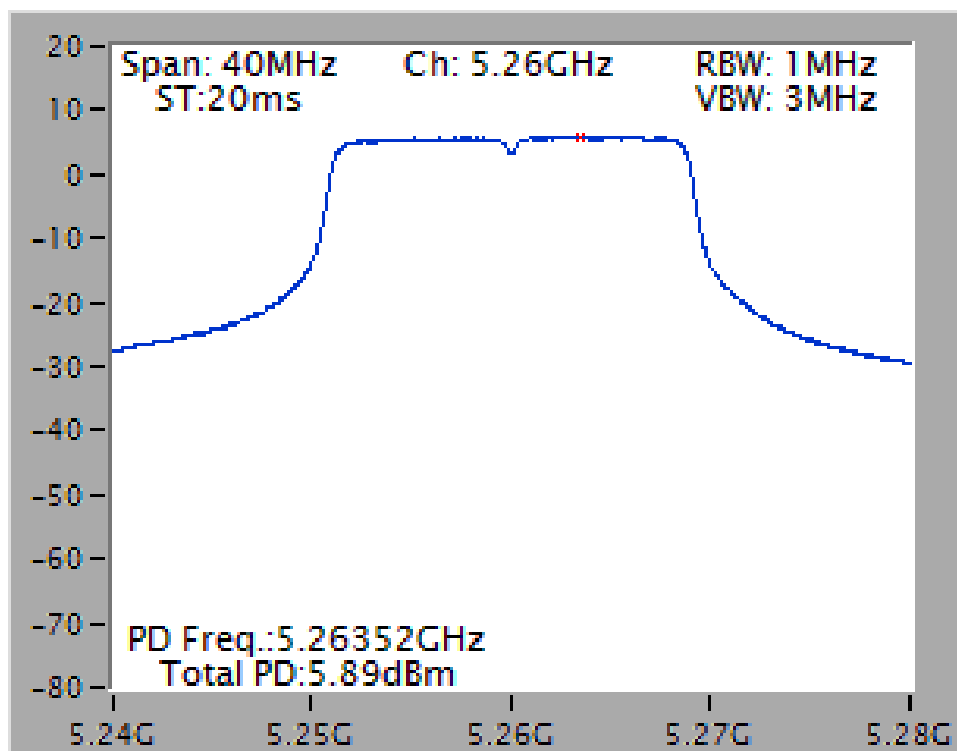
For Beamforming Mode

For 2TX

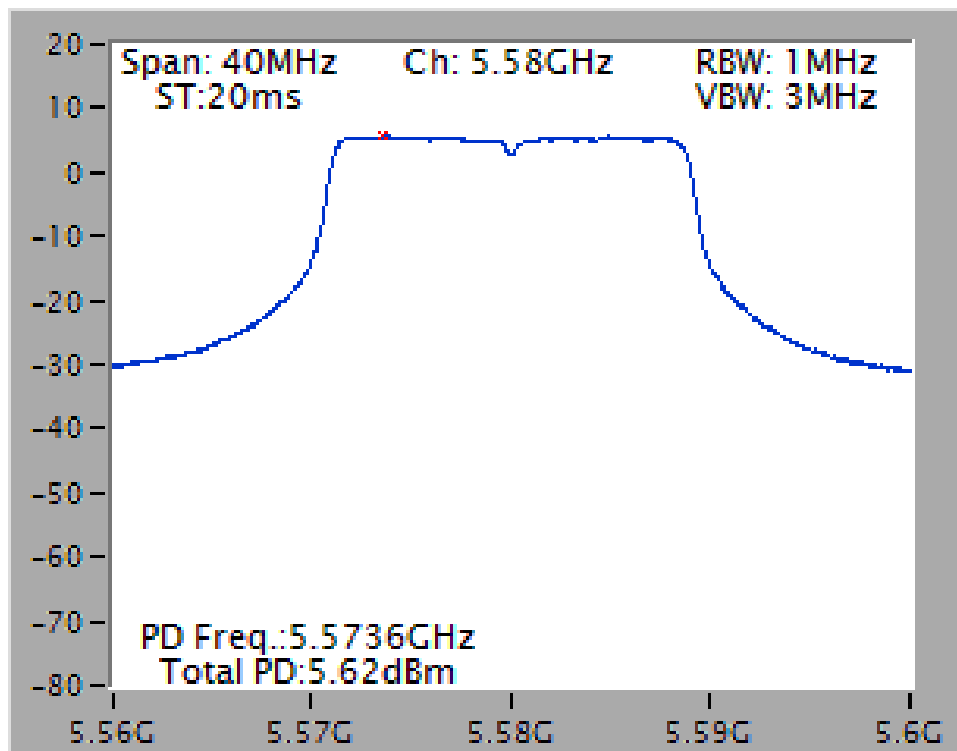
Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 / 5200 MHz



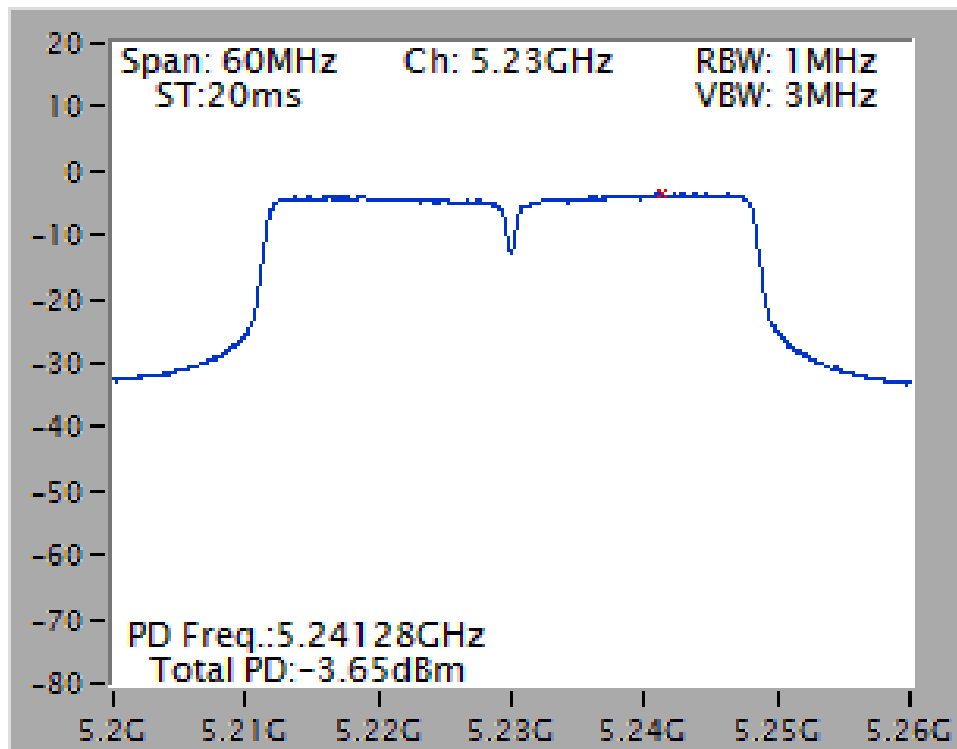
Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 / 5260 MHz



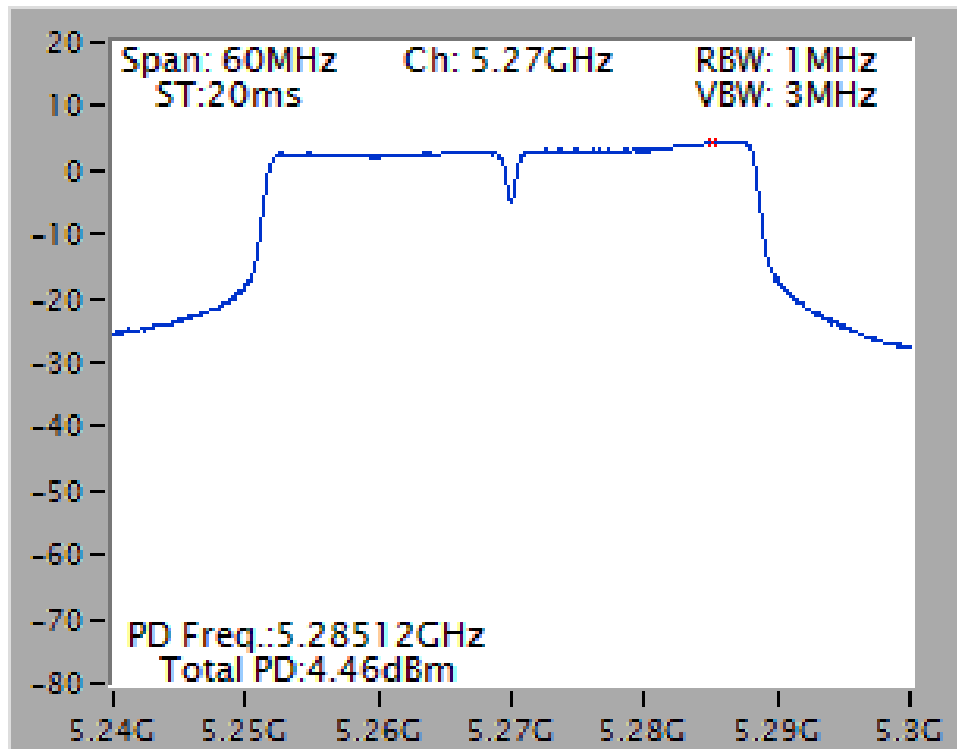
Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 / 5580 MHz



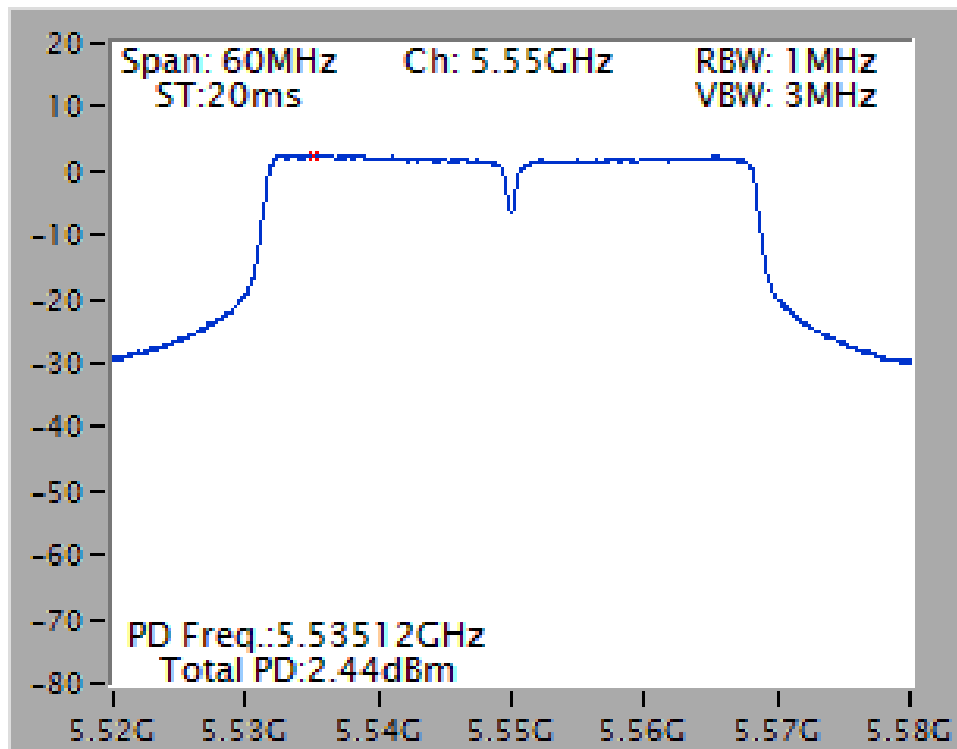
Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 / 5230 MHz



Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 / 5270 MHz

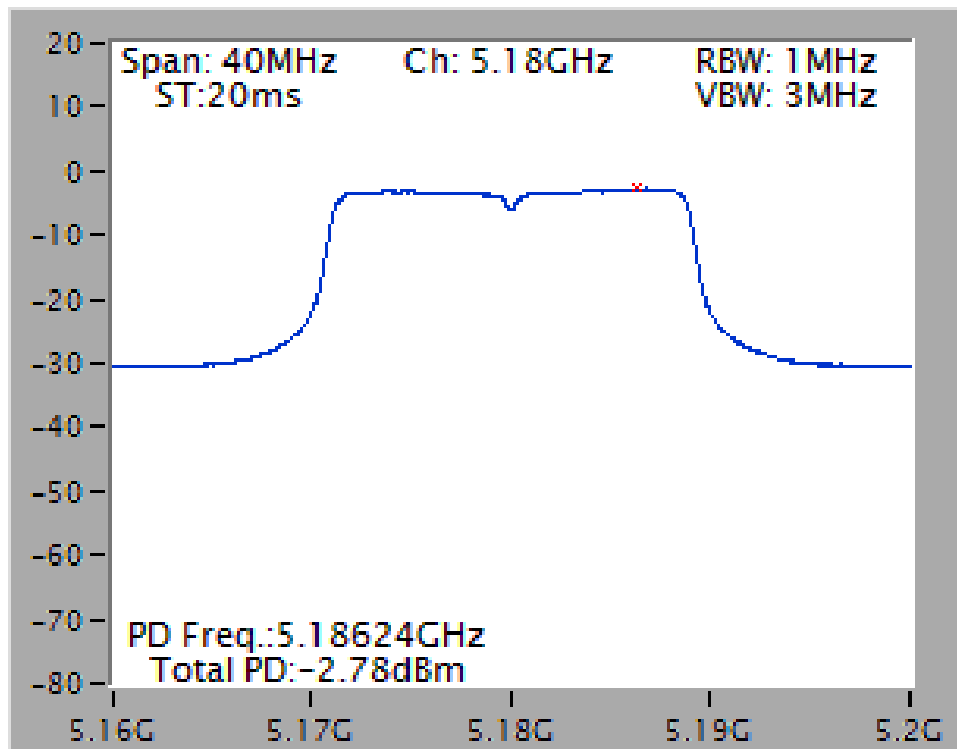


Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 / 5550 MHz

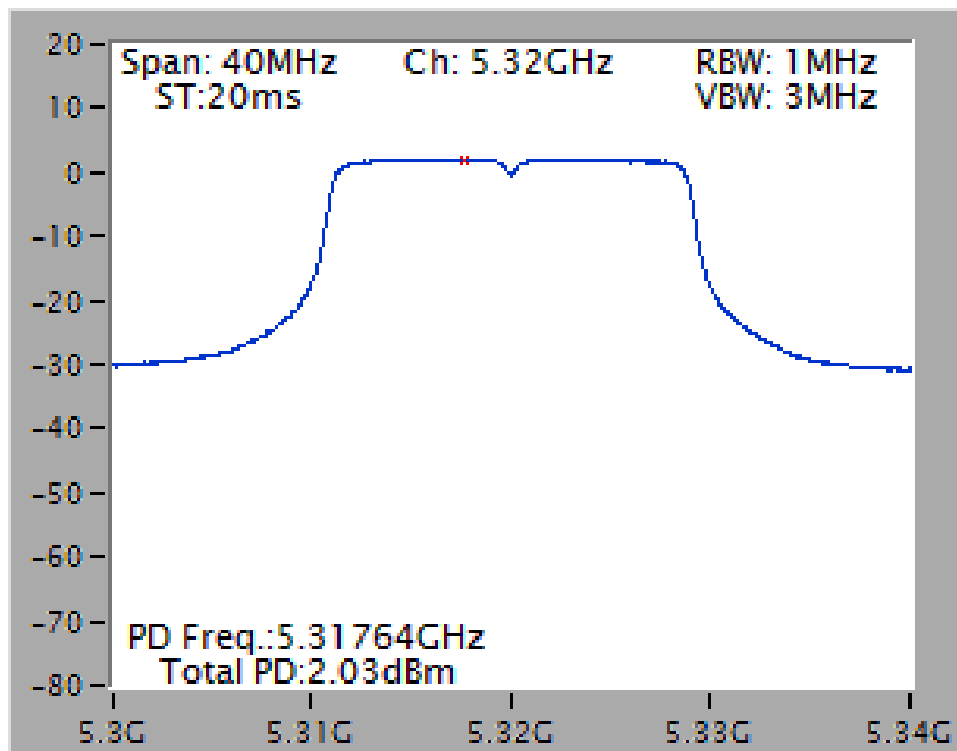


For 3TX

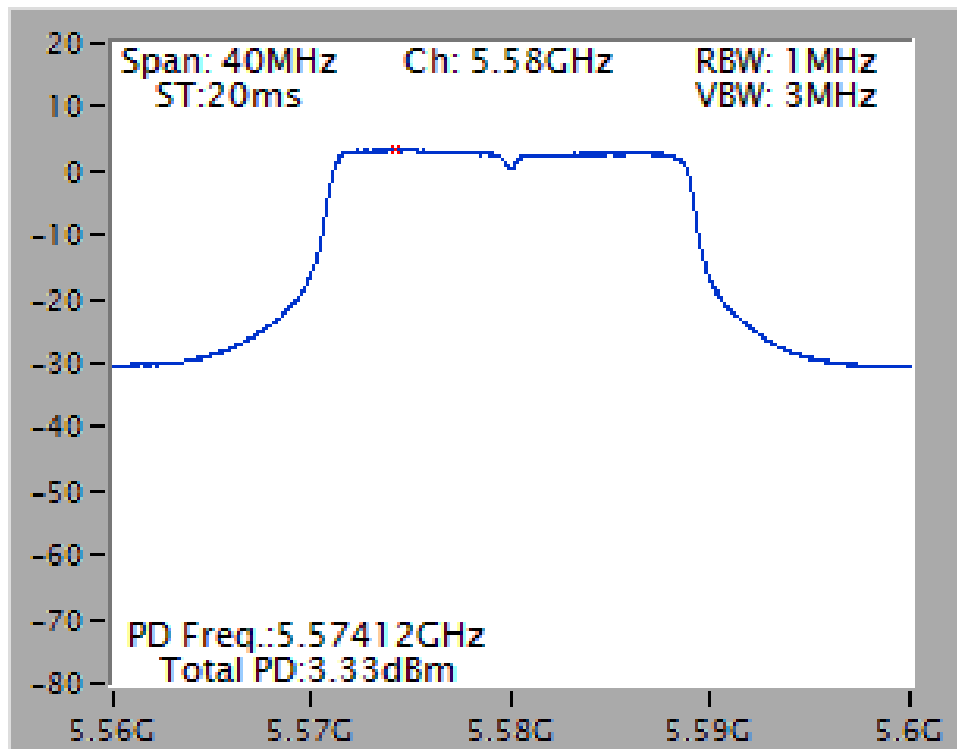
Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5180 MHz



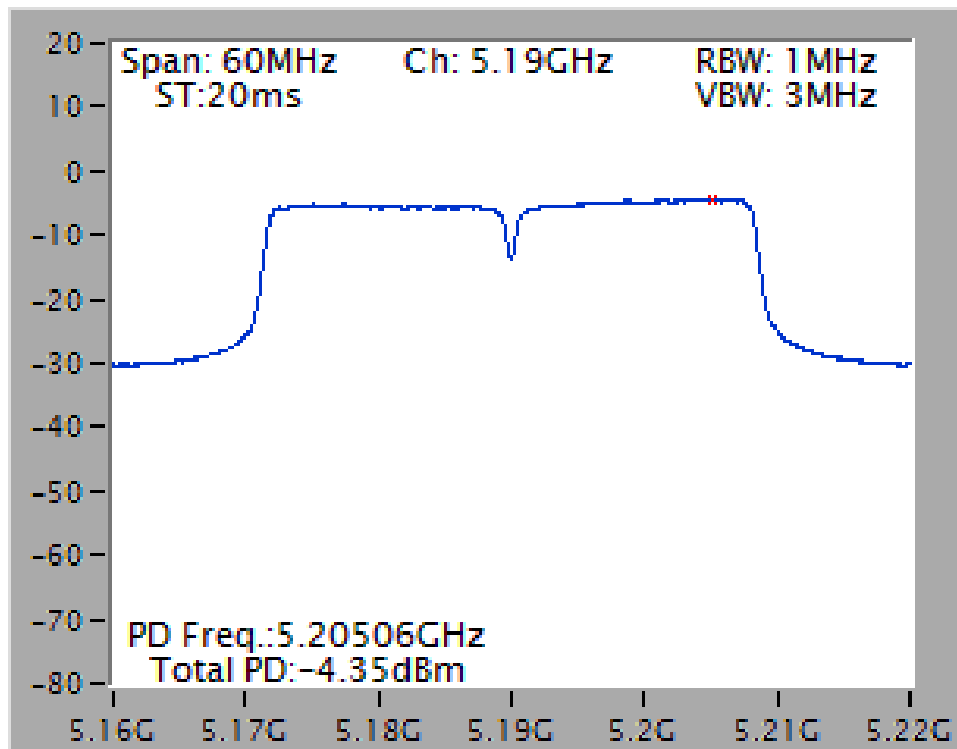
Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5320 MHz



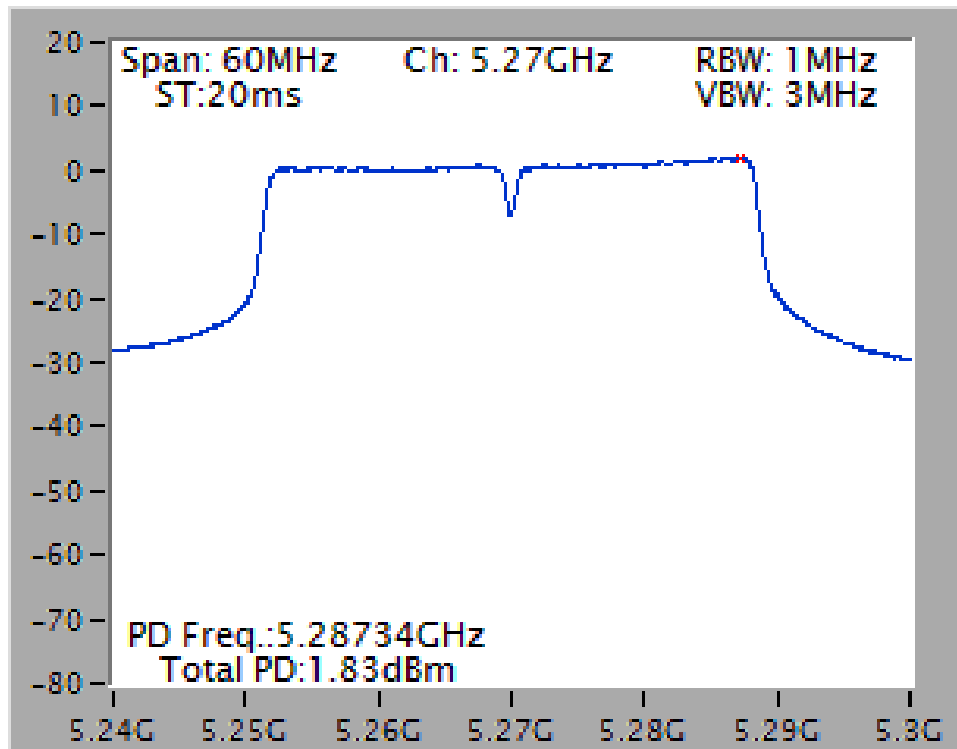
Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5580 MHz



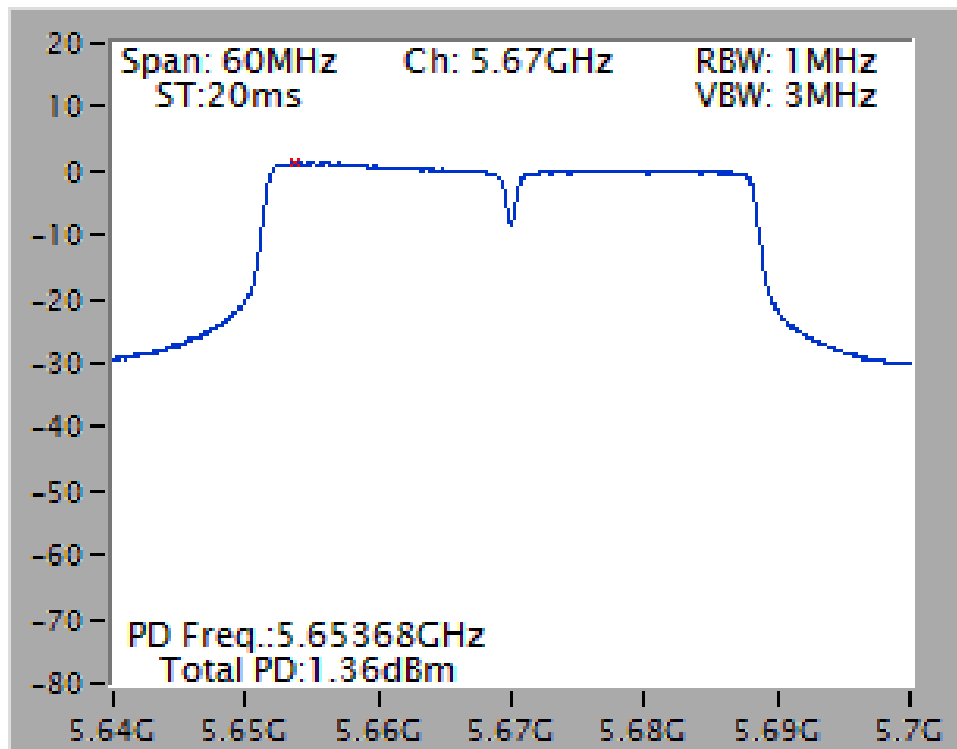
Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5190 MHz



Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5270 MHz



Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5670 MHz

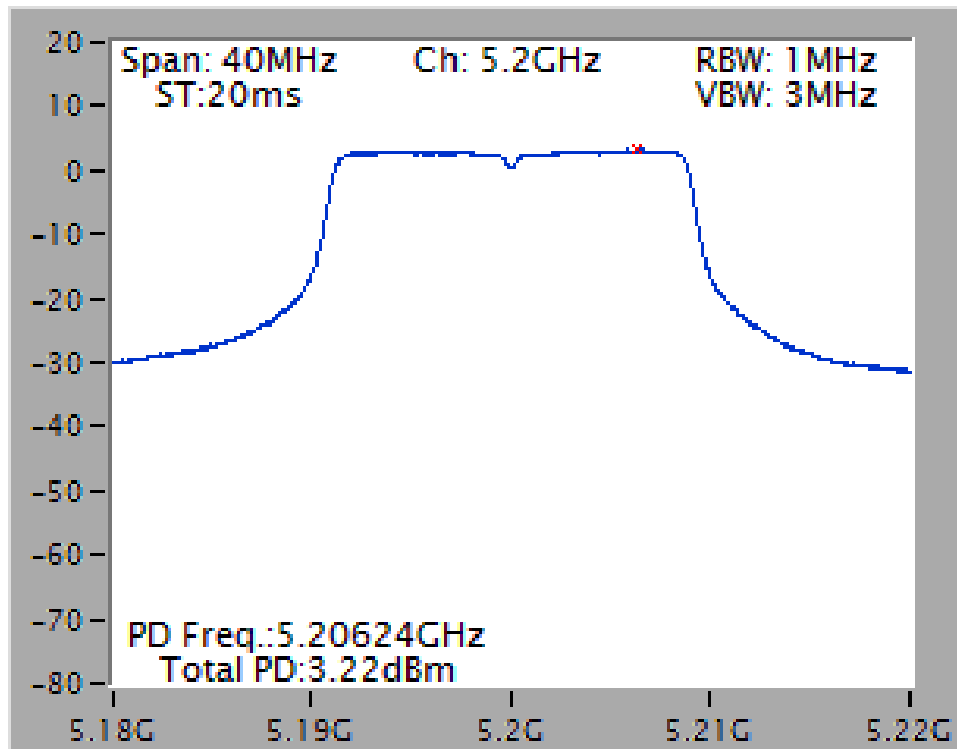


Mode 2 (Ant.16 Panel antenna / 3.5dBi)

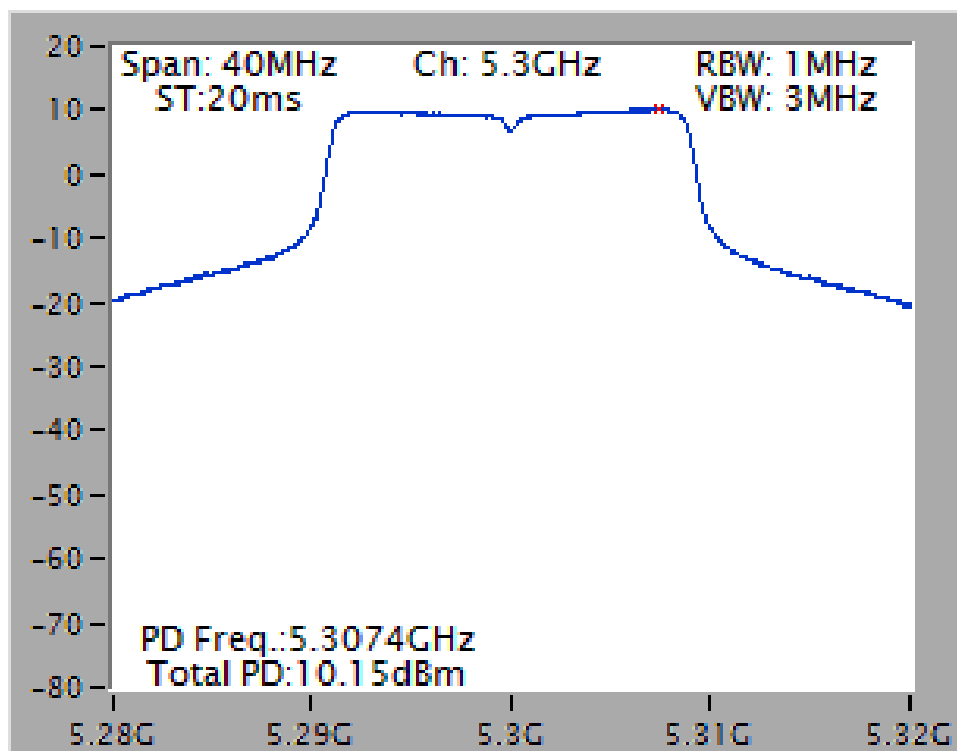
For Beamforming Mode

For 2TX

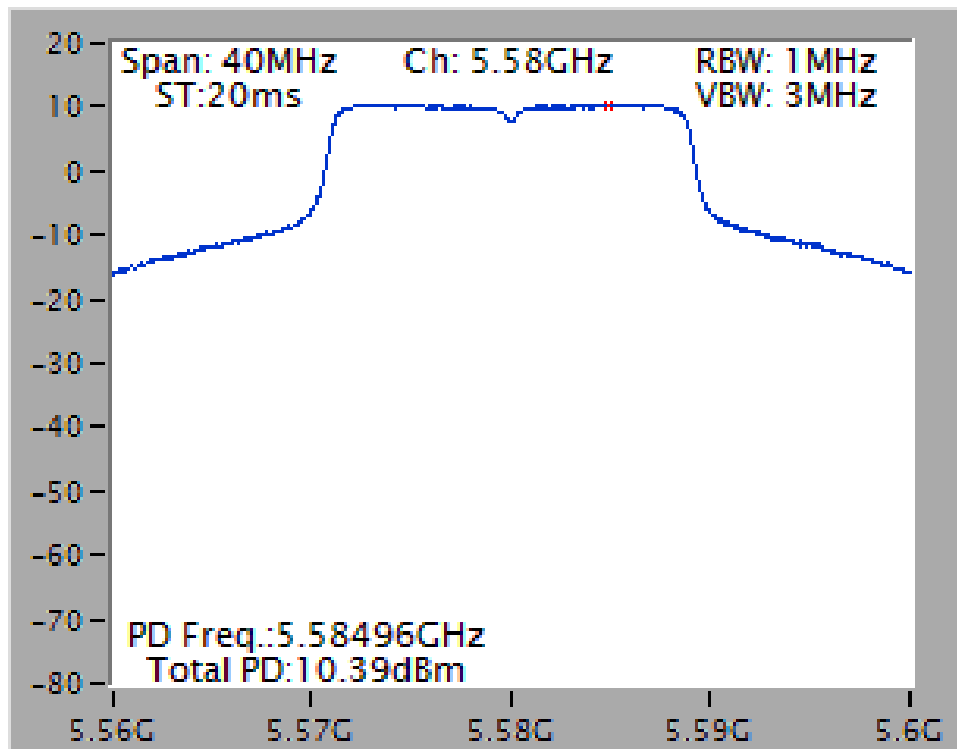
Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 / 5200 MHz



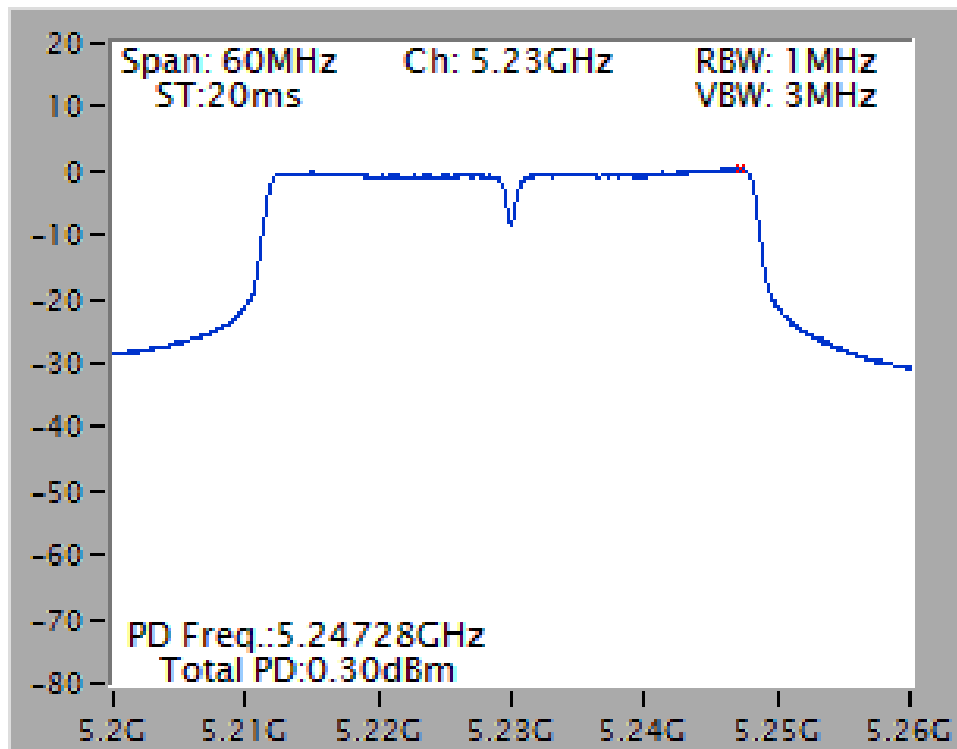
Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 / 5300 MHz



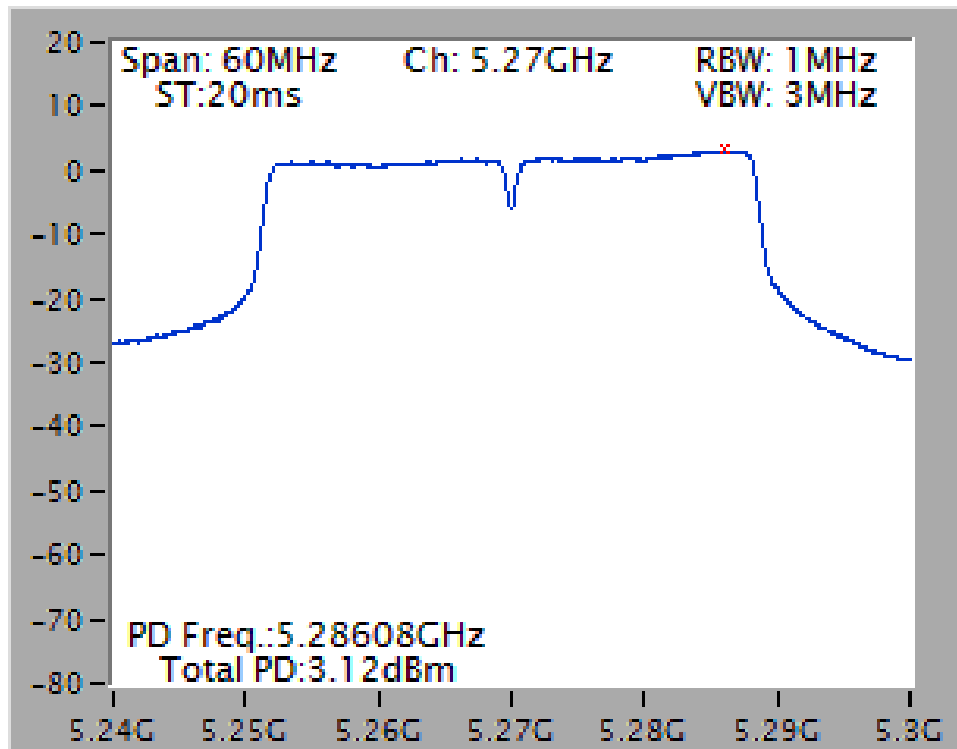
Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 / 5580 MHz



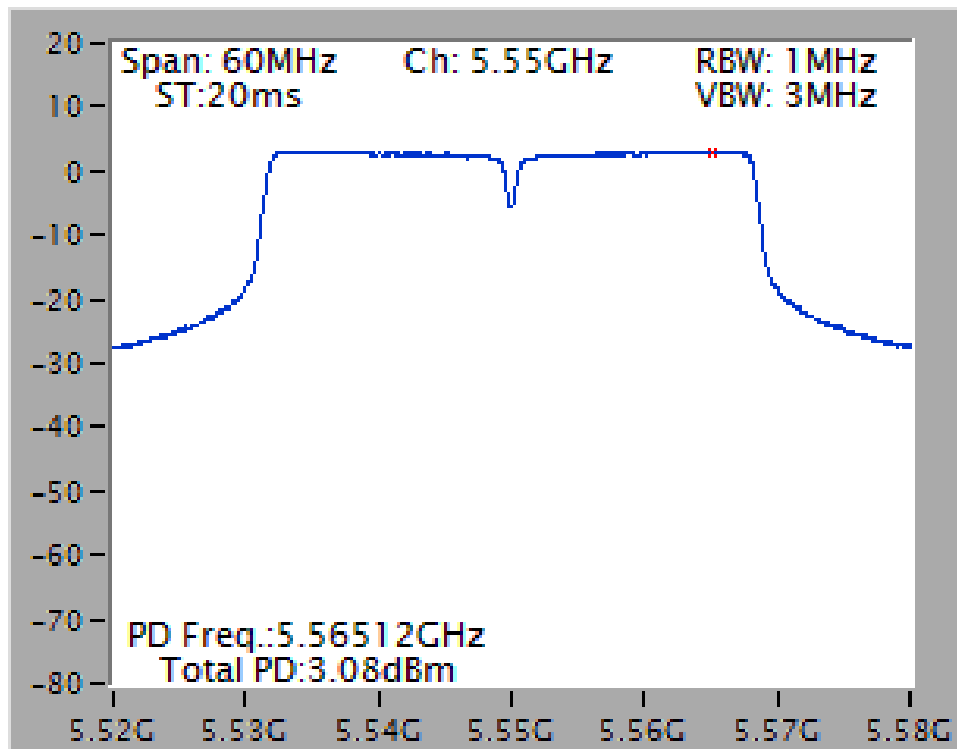
Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 / 5230 MHz



Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 / 5270 MHz

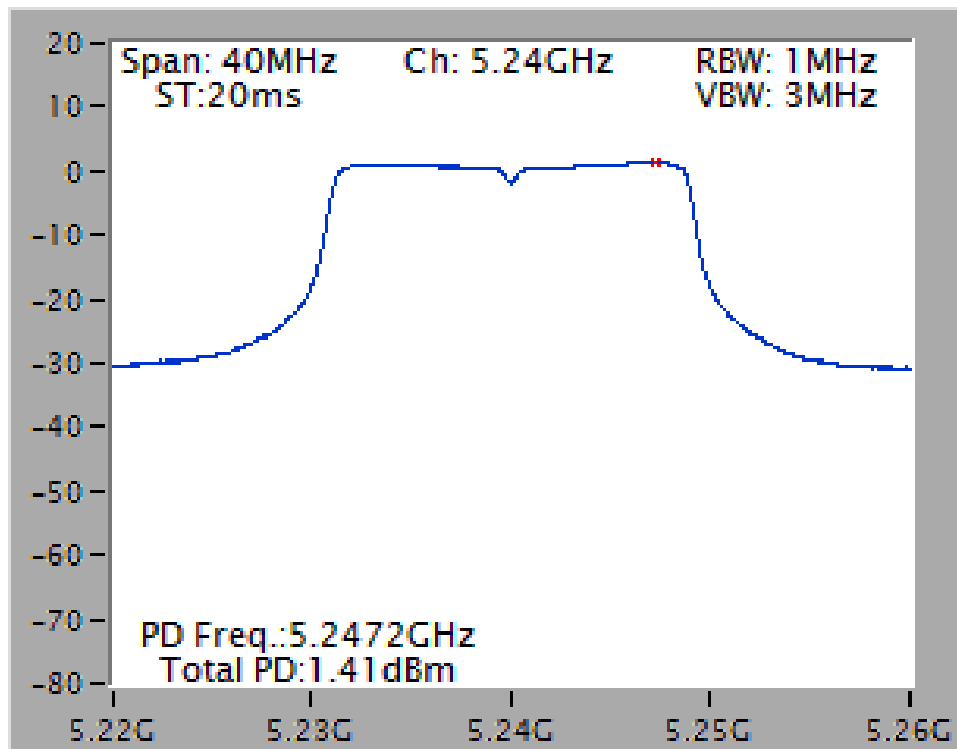


Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 / 5550 MHz

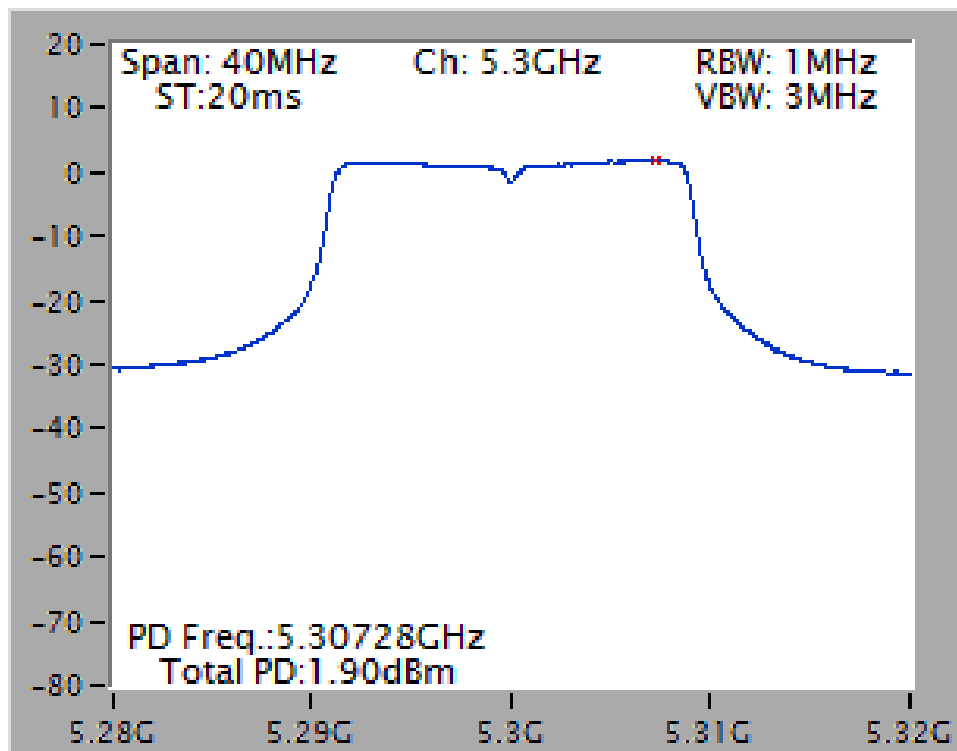


For 3TX

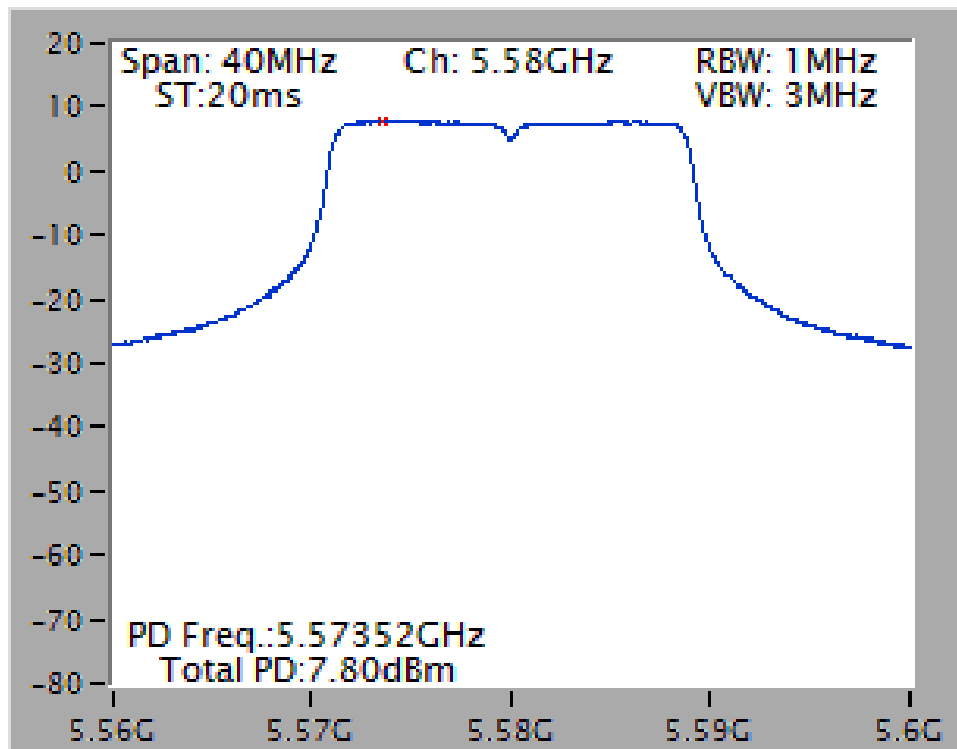
Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5240 MHz



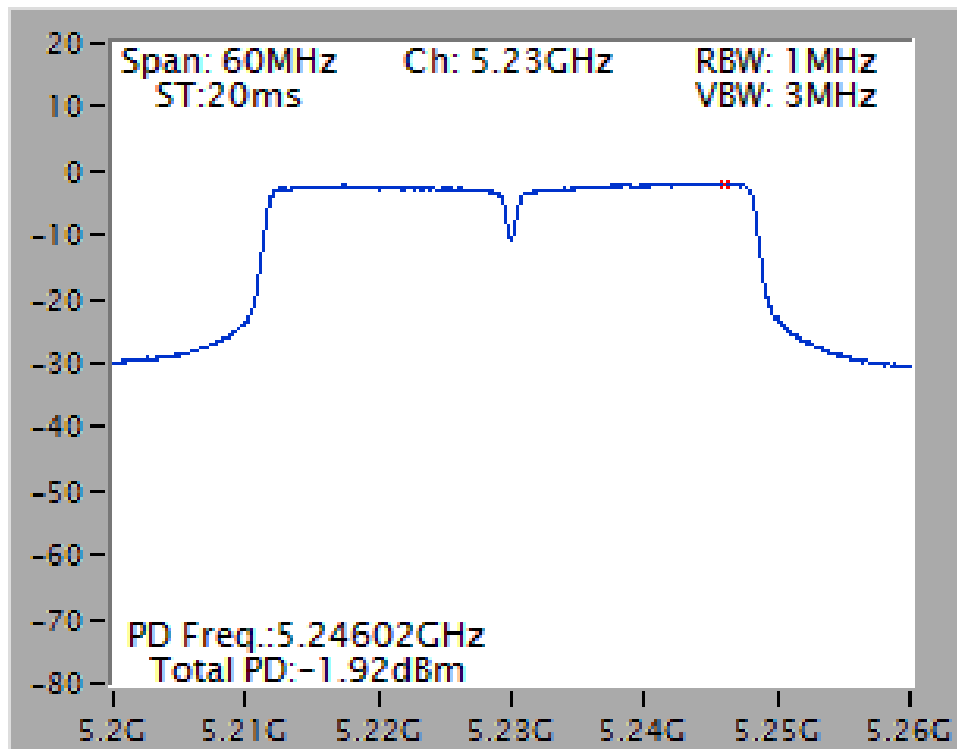
Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5300 MHz



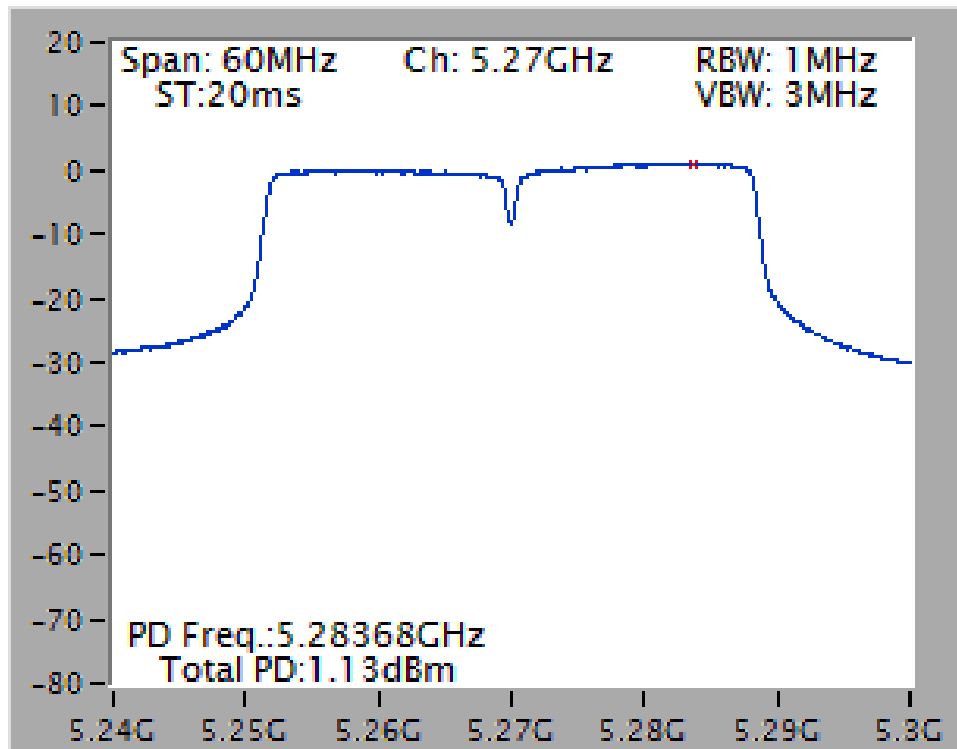
Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5580 MHz



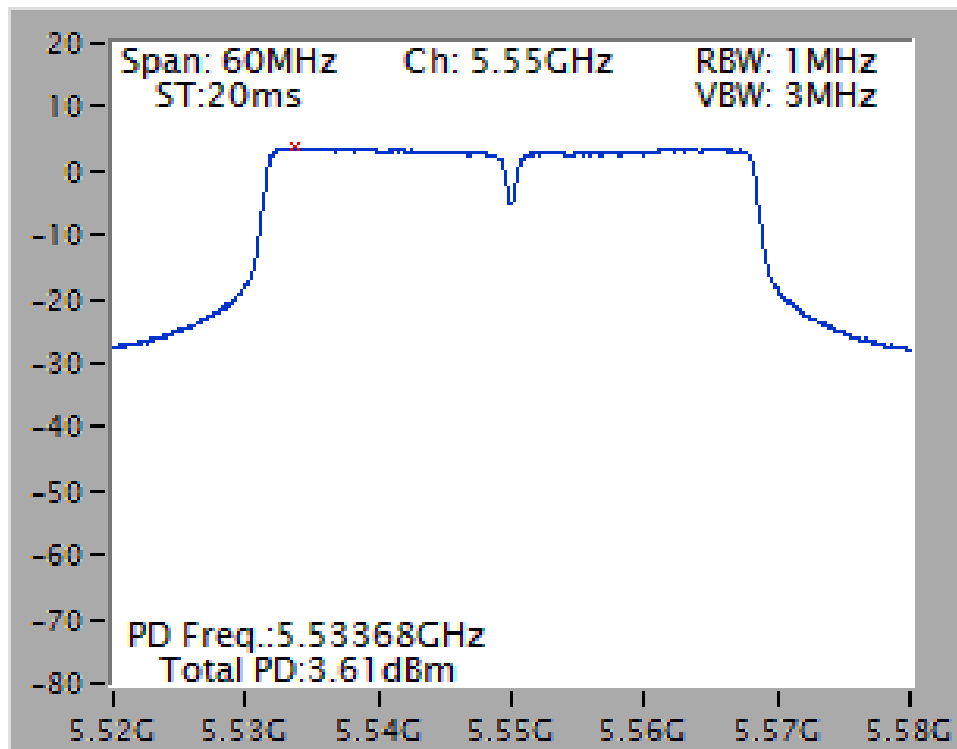
Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5230 MHz



Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5270 MHz



Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5550 MHz

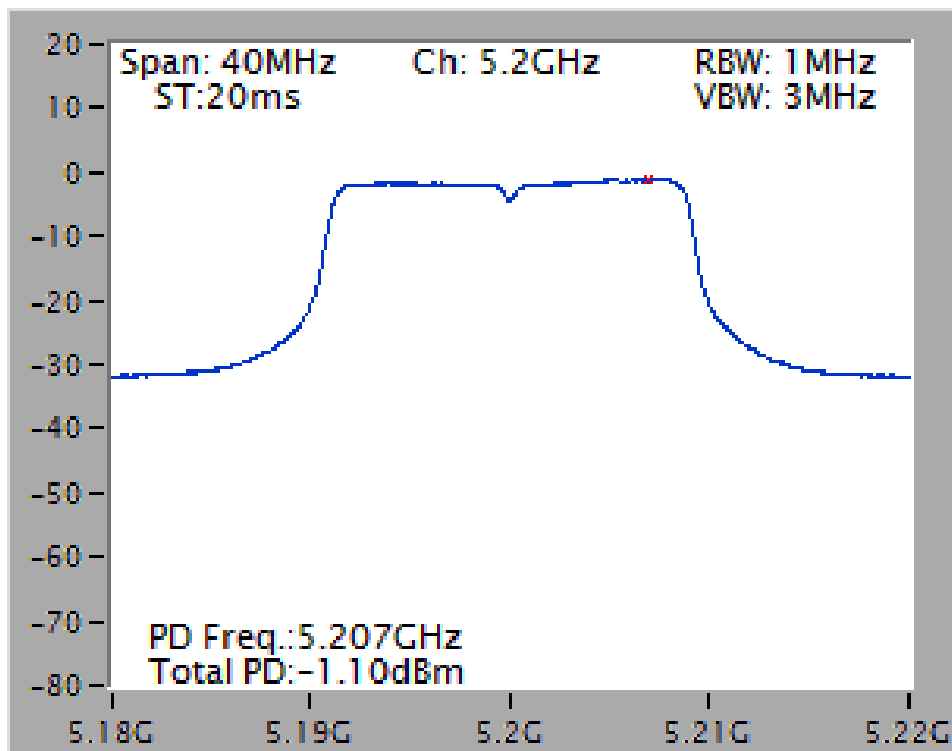


Mode 3 (Ant.32 3-Port Dual-Band Directional Panel antenna / Chain 1: 6.7, Chain 2: 4.3, Chain 3: 6.6dBi)

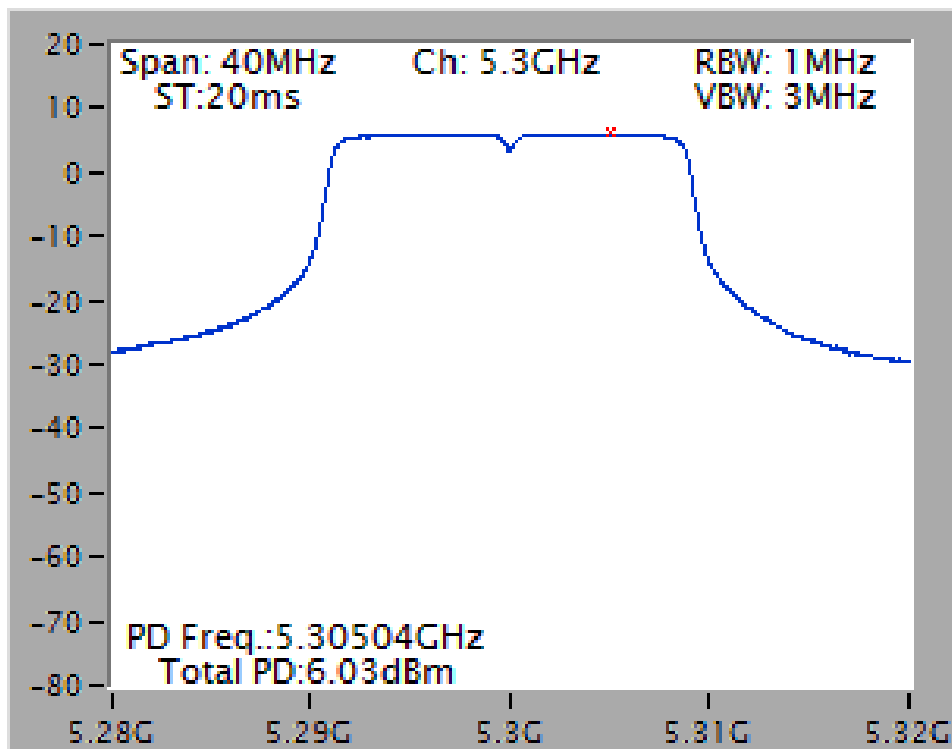
For Beamforming Mode

For 3TX

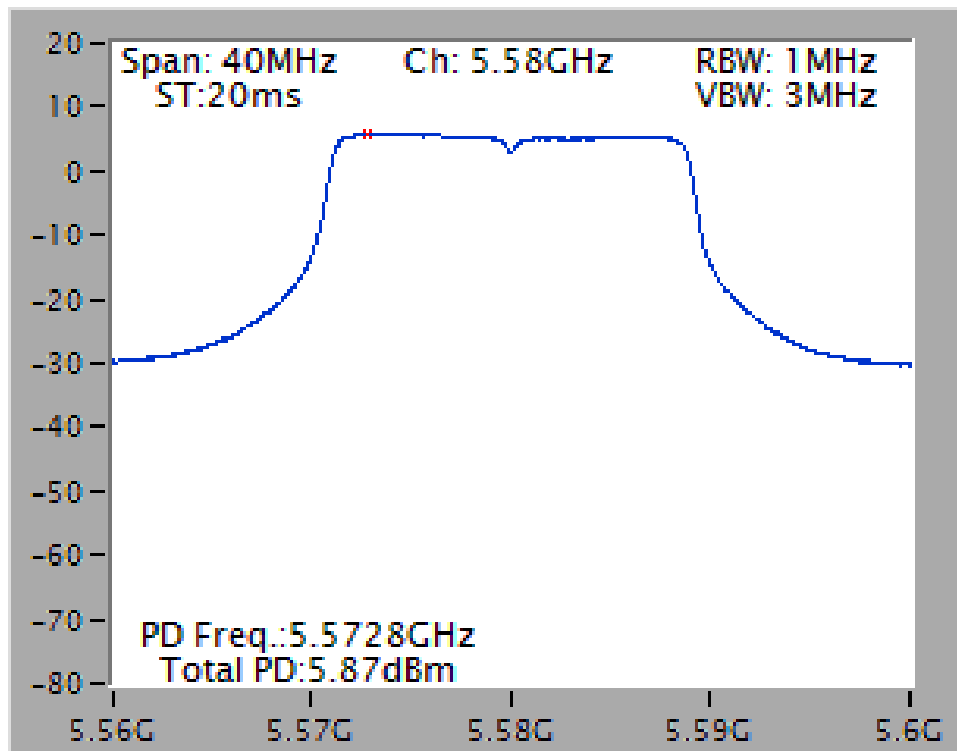
Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5200 MHz



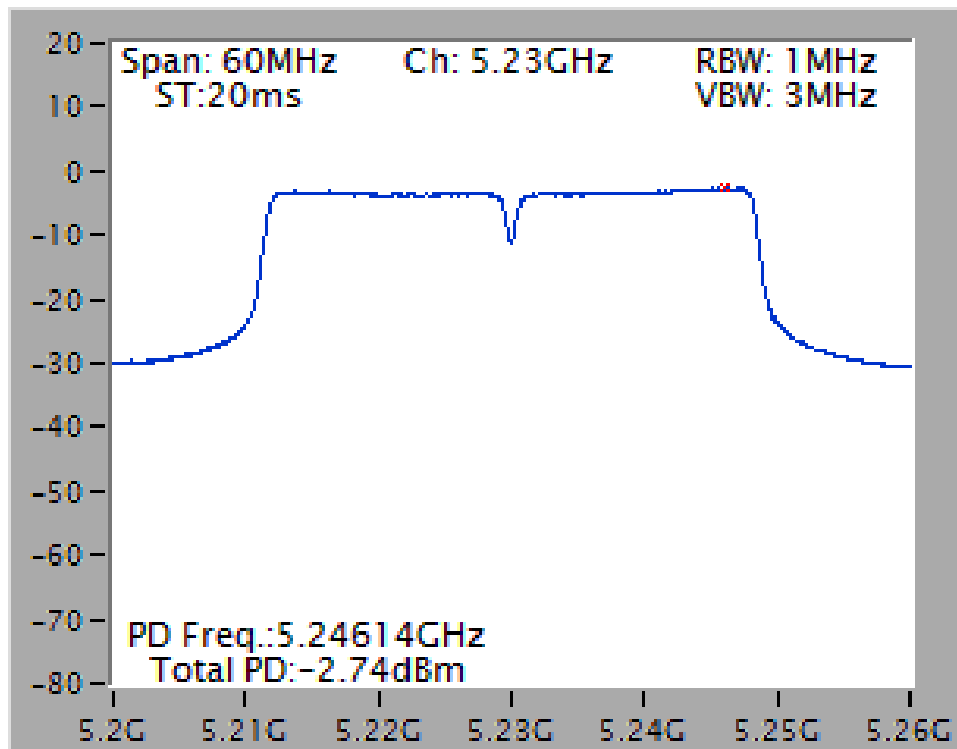
Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5300 MHz



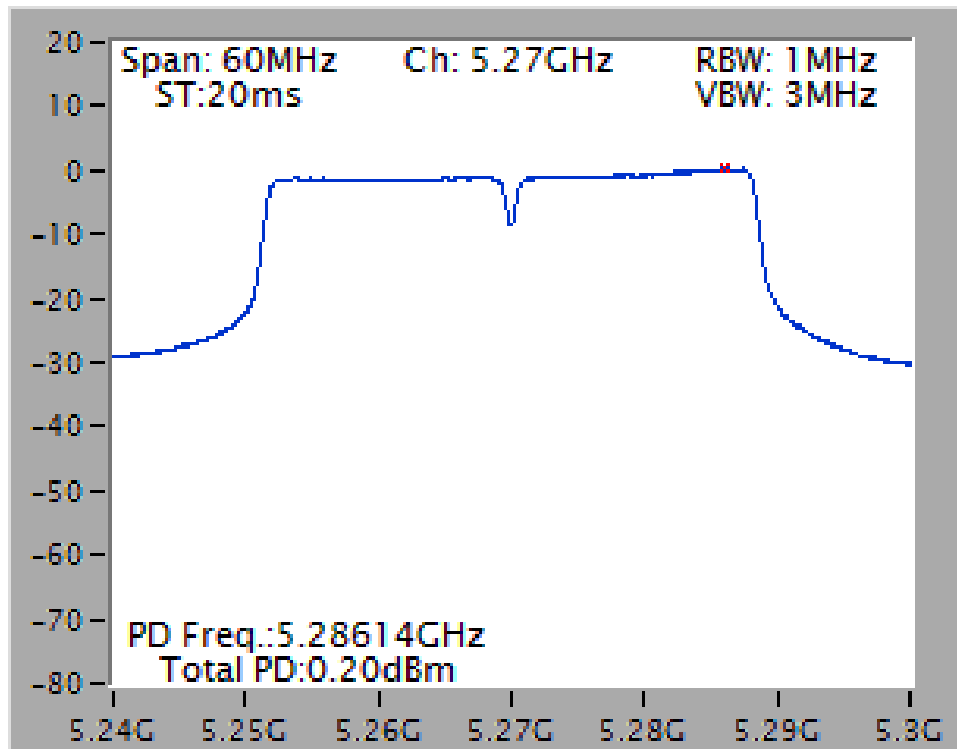
Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5580 MHz



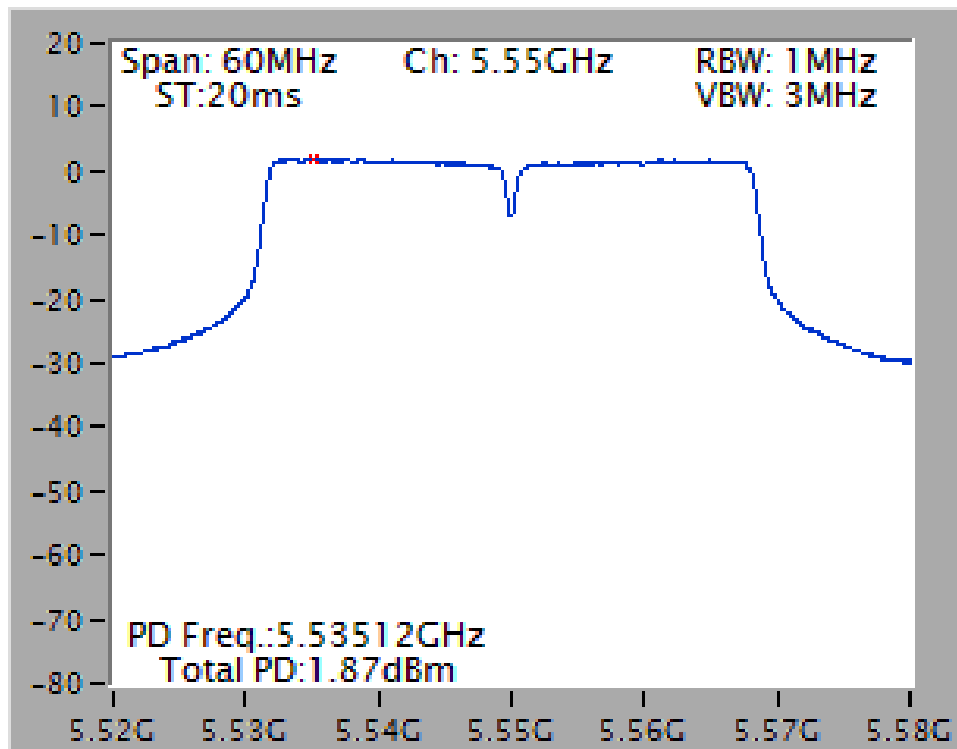
Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5230 MHz



Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5270 MHz



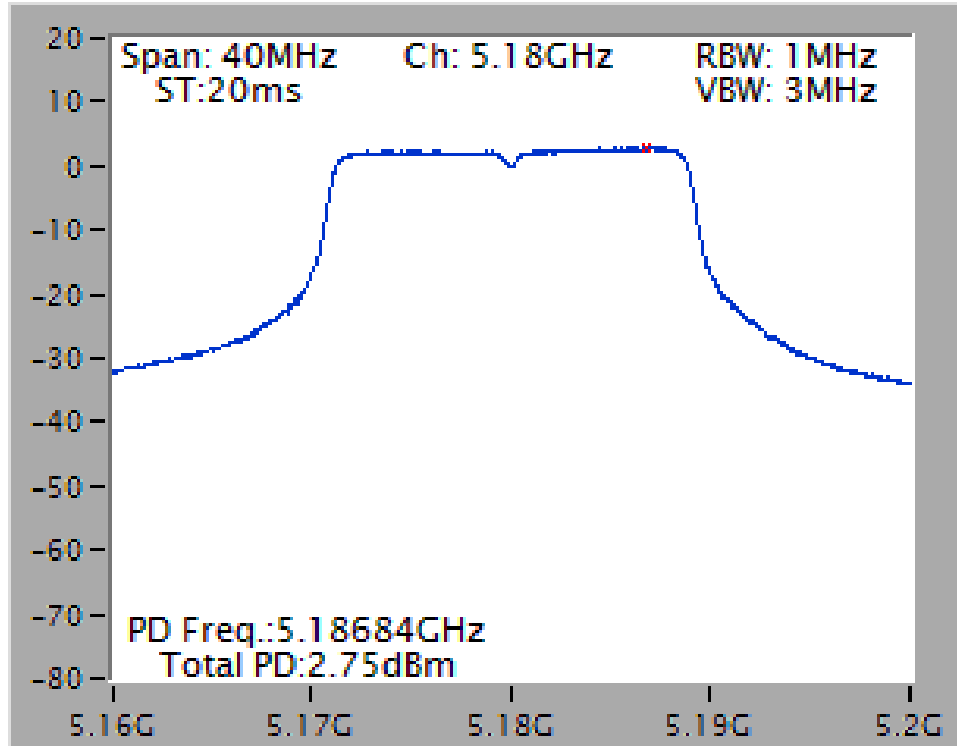
Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5550 MHz



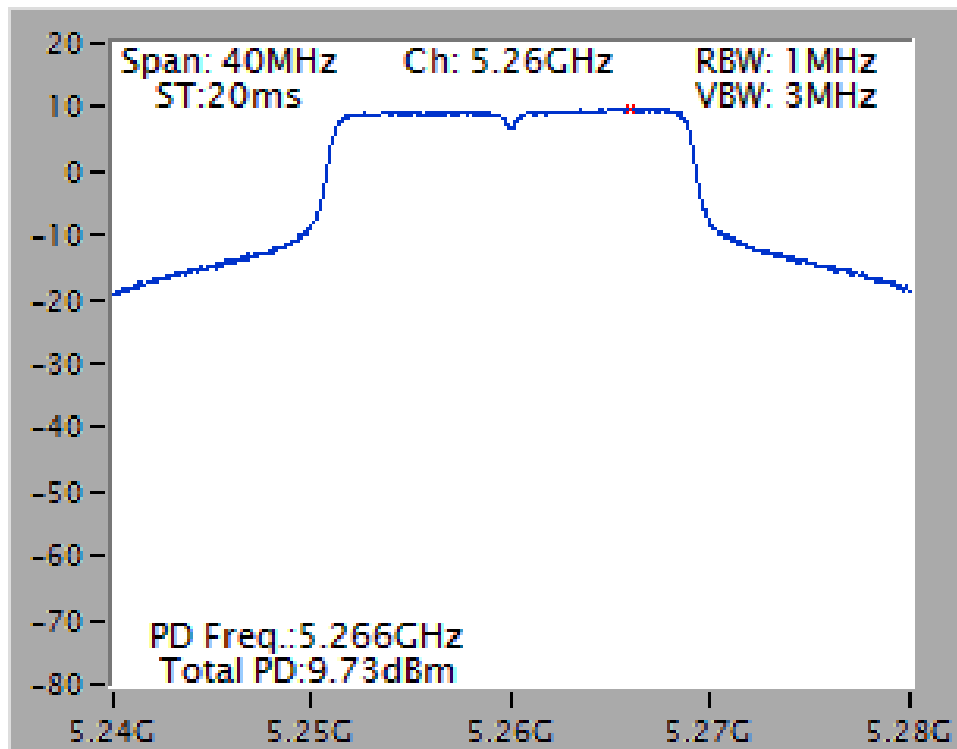
For Non-Beamforming Mode

For 1TX

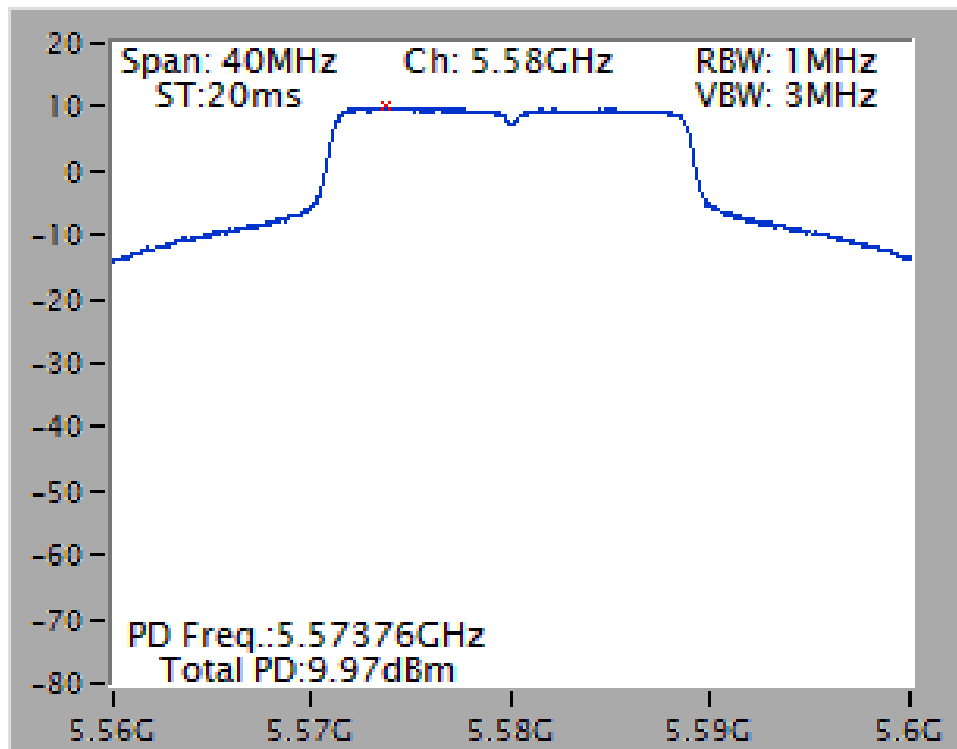
Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 / 5180 MHz



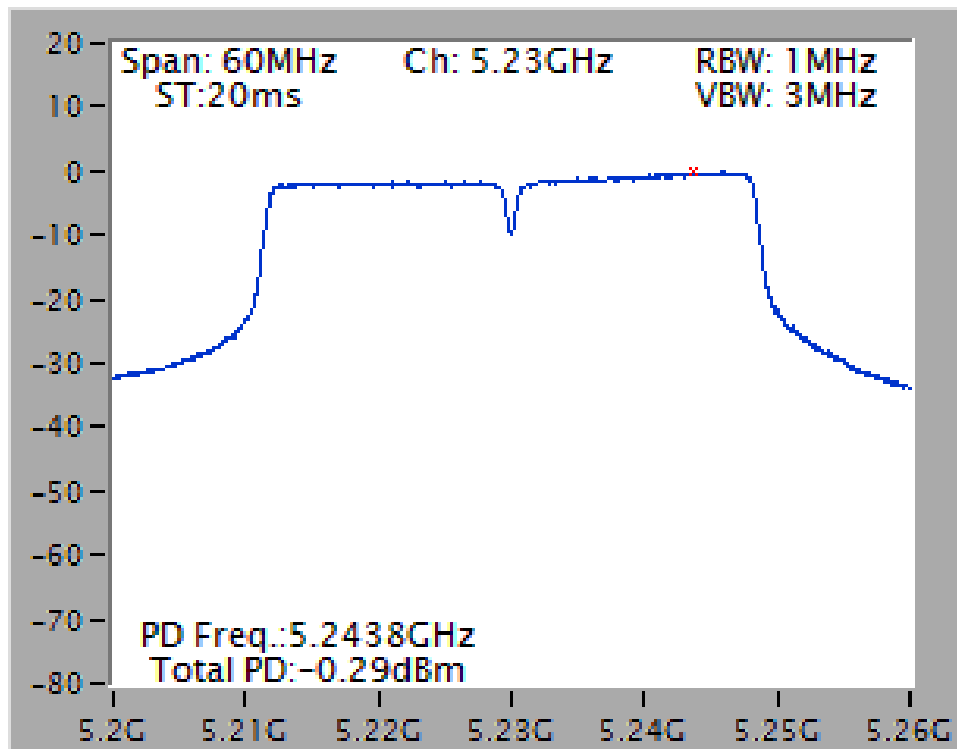
Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 / 5260 MHz



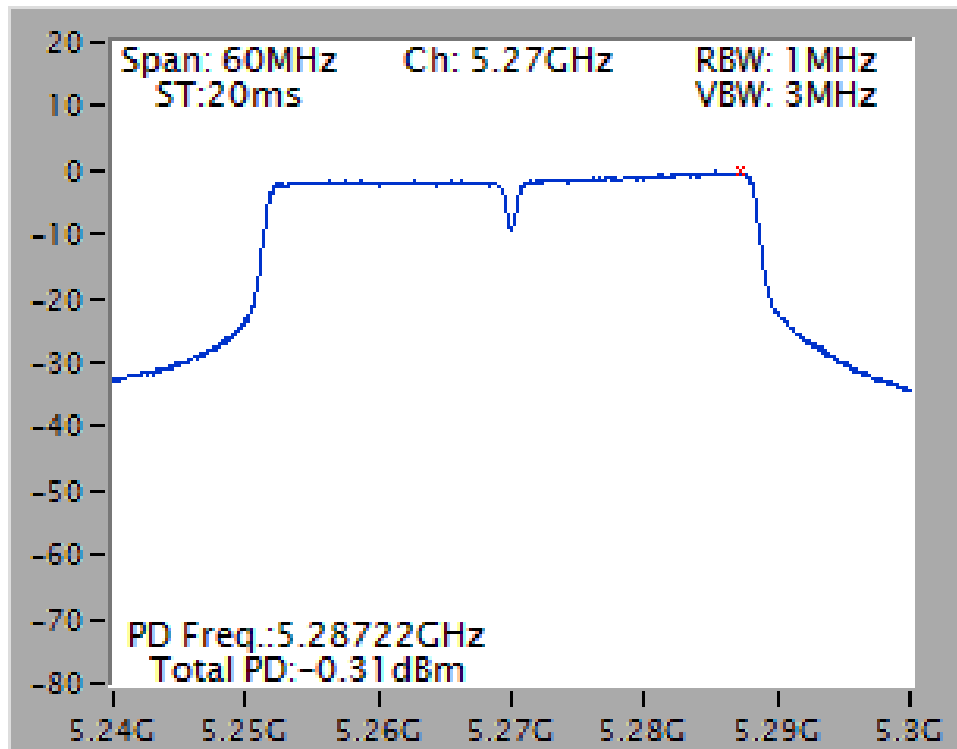
Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 / 5580 MHz



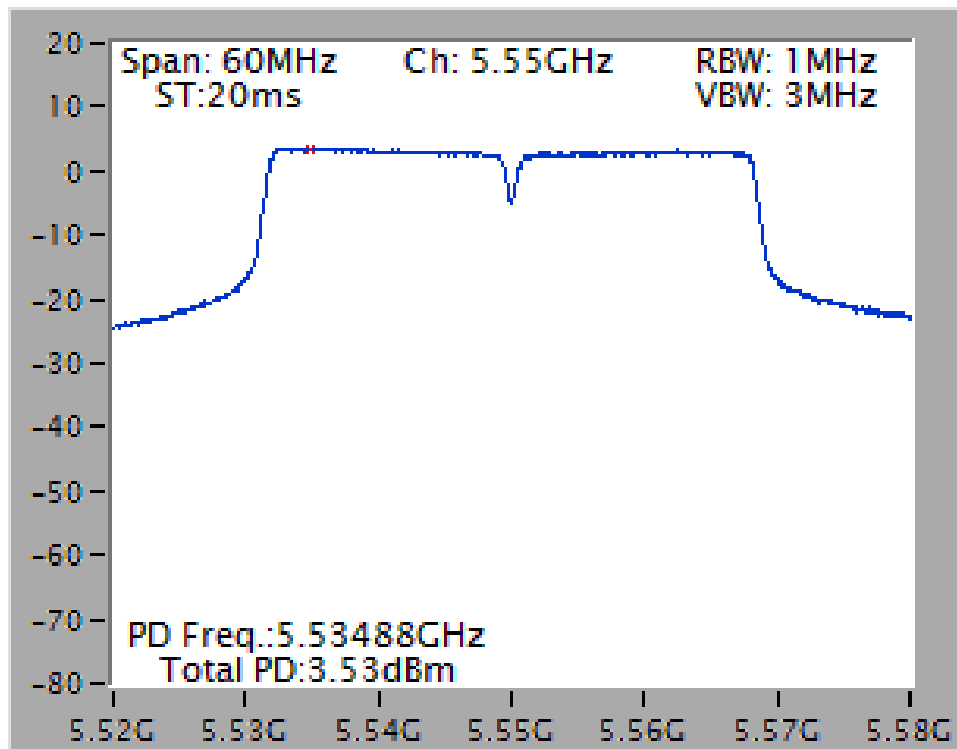
Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 / 5230 MHz



Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 / 5270 MHz

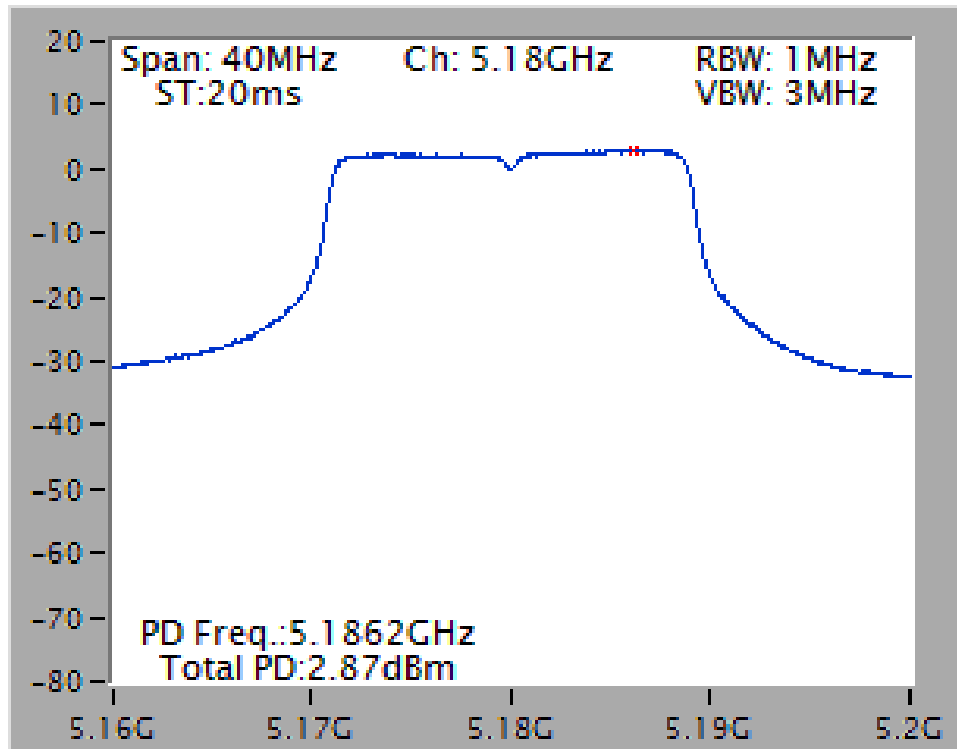


Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 / 5550 MHz

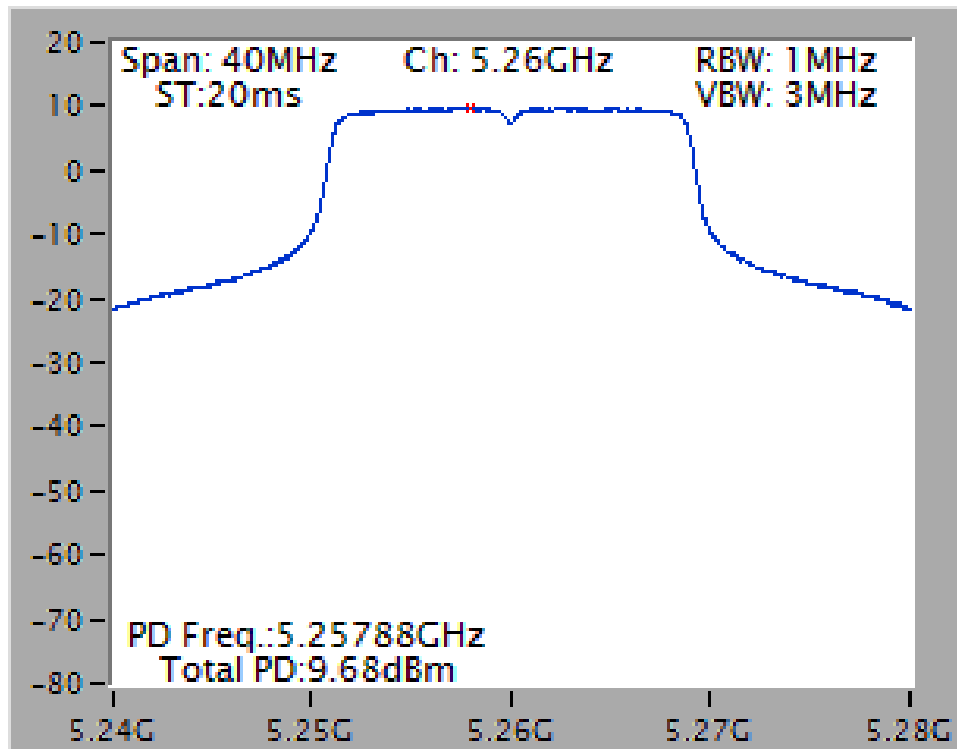


For 2TX

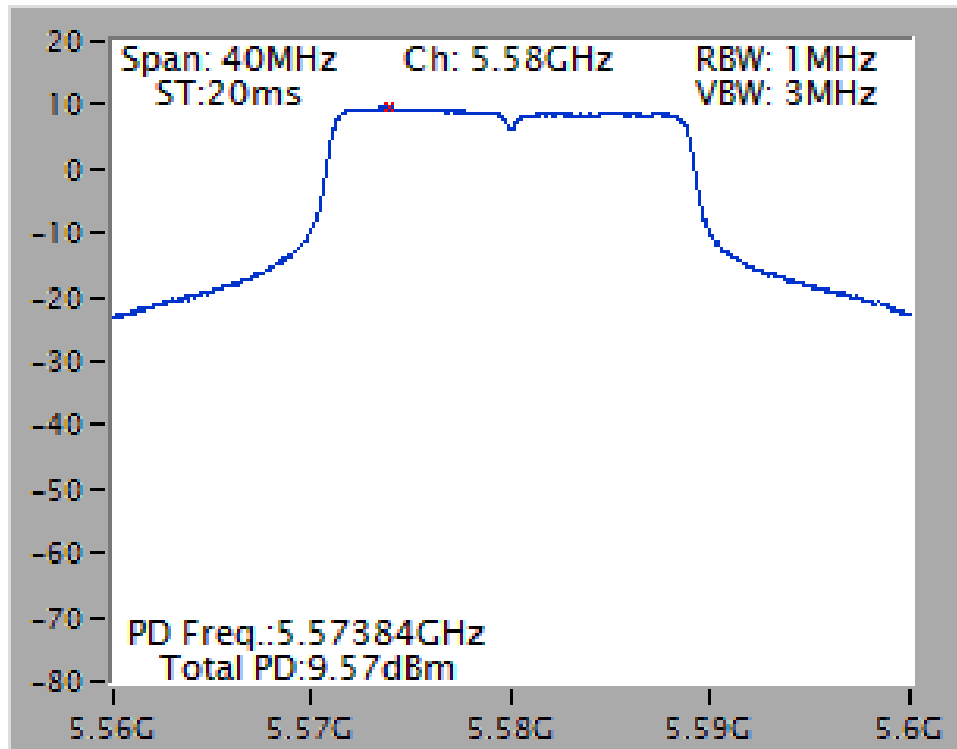
Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 / 5180 MHz



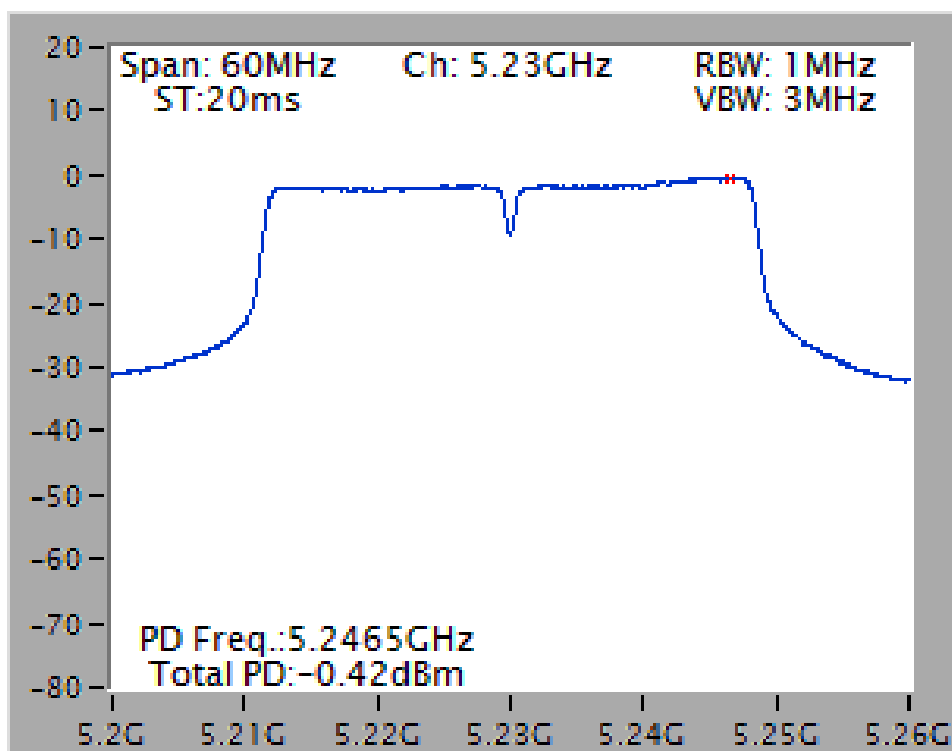
Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 / 5260 MHz



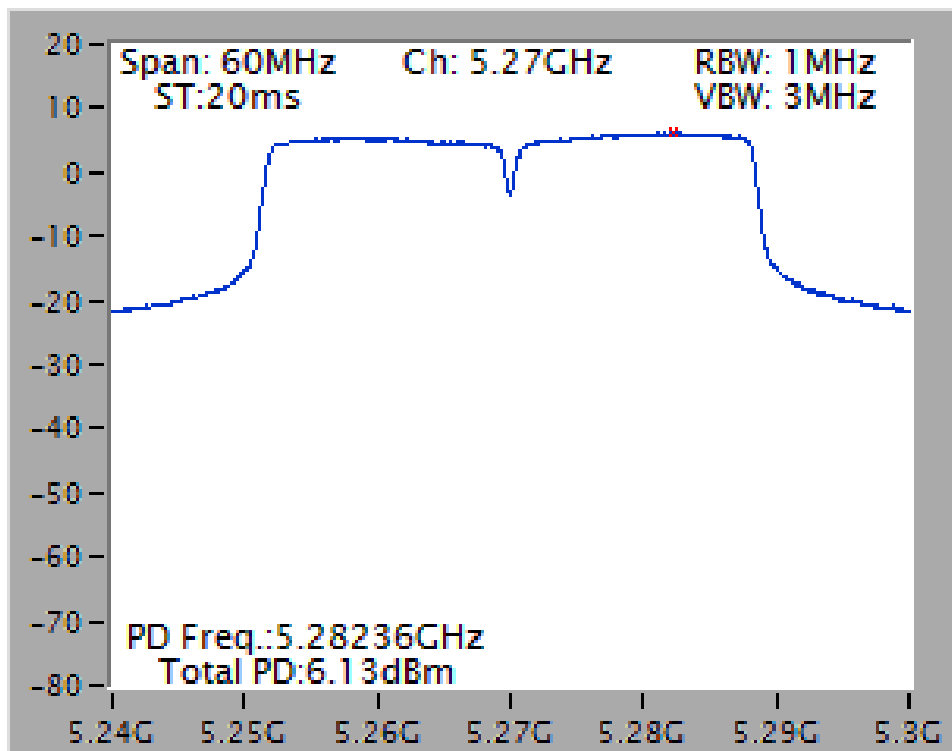
Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 / 5580 MHz



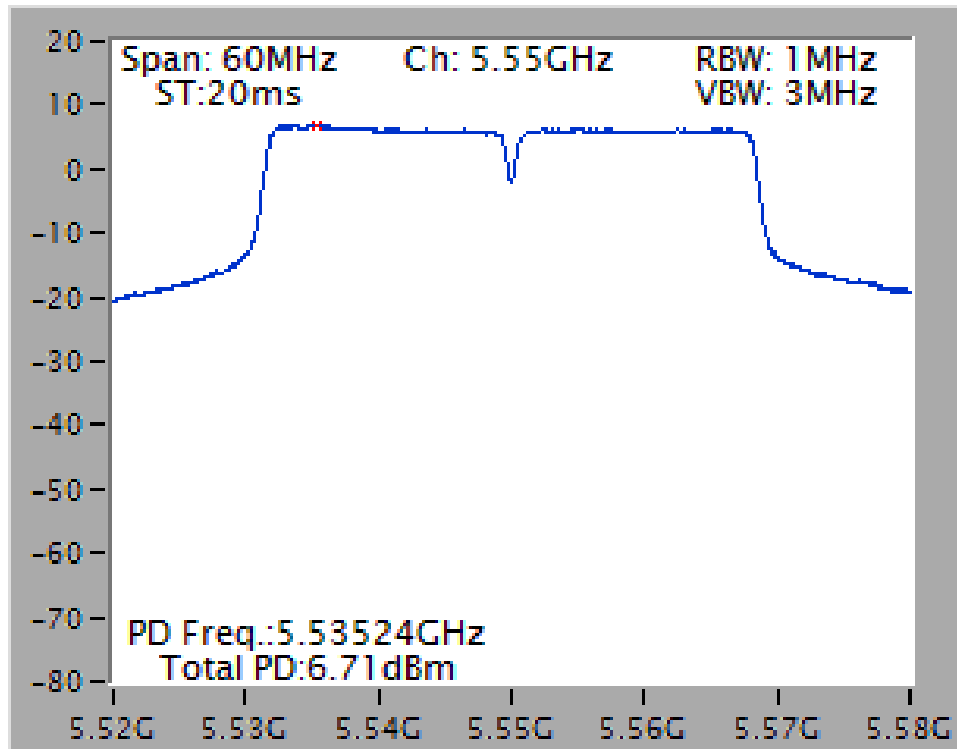
Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 / 5230 MHz



Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 / 5270 MHz

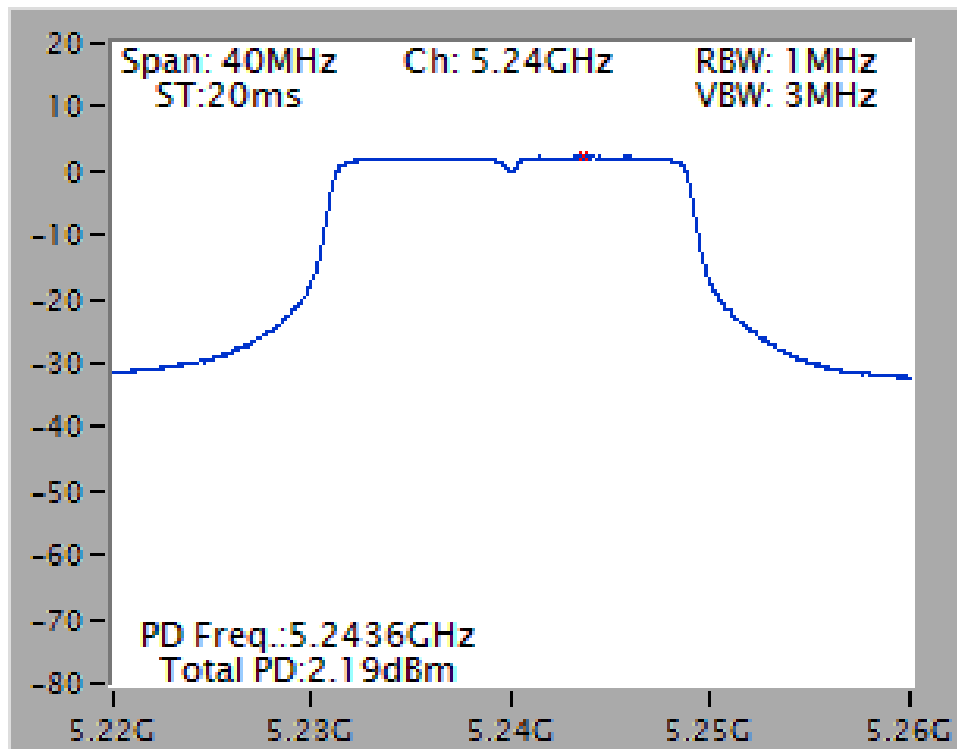


Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 / 5550 MHz

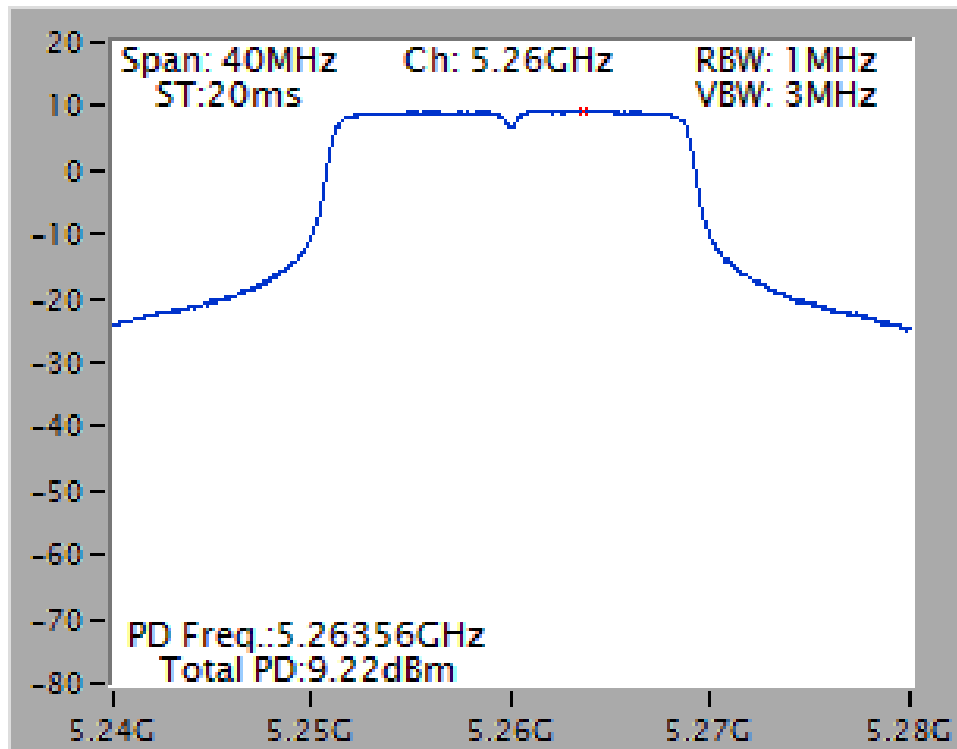


For 3TX

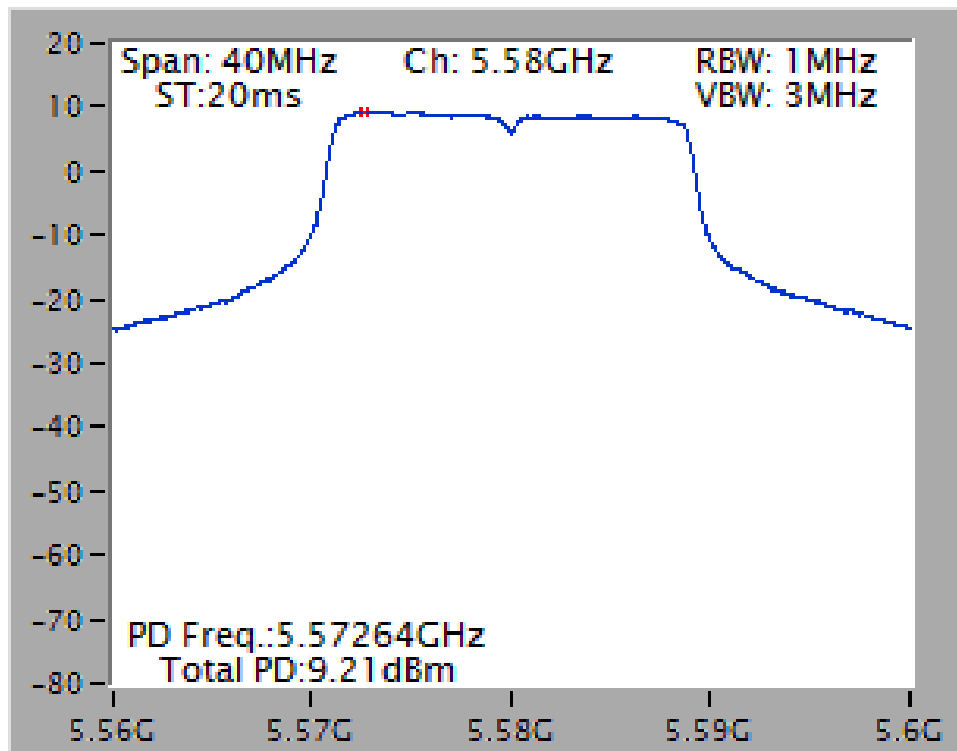
Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5240 MHz



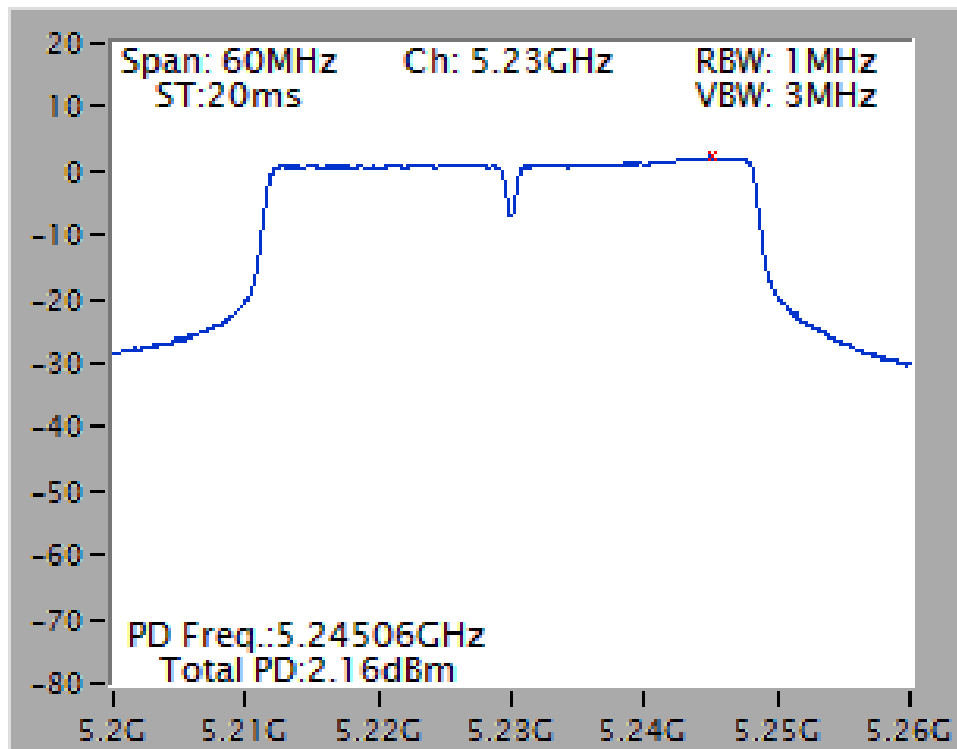
Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5260 MHz



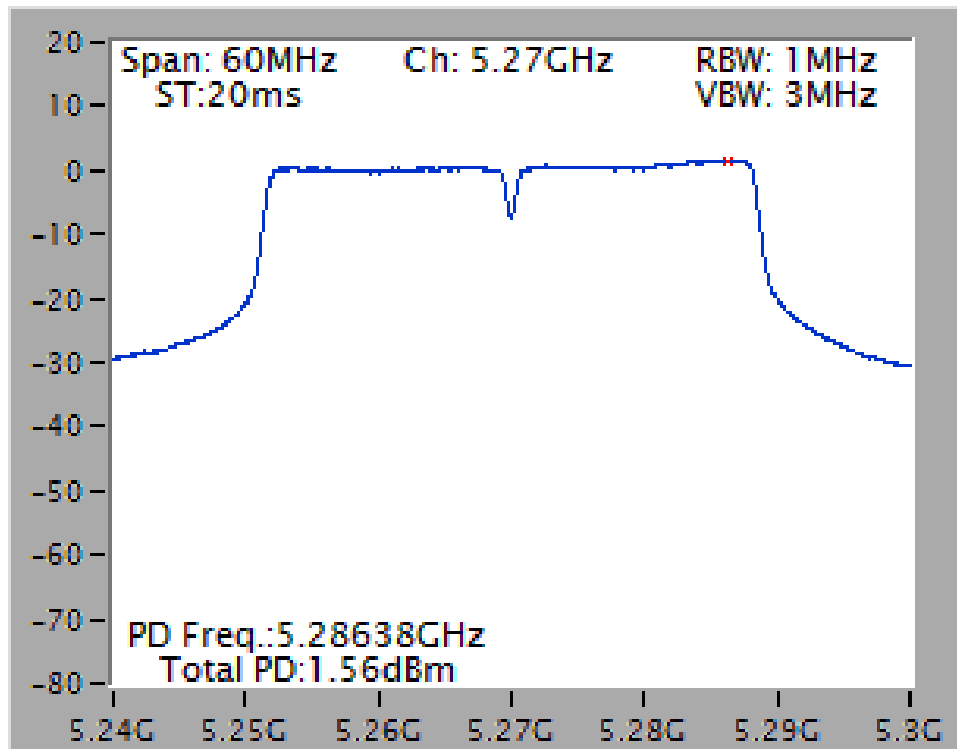
Power Density Plot on Configuration IEEE 802.11n MCS0 HT20 / Chain 1 + Chain 2 + Chain 3 / 5580 MHz



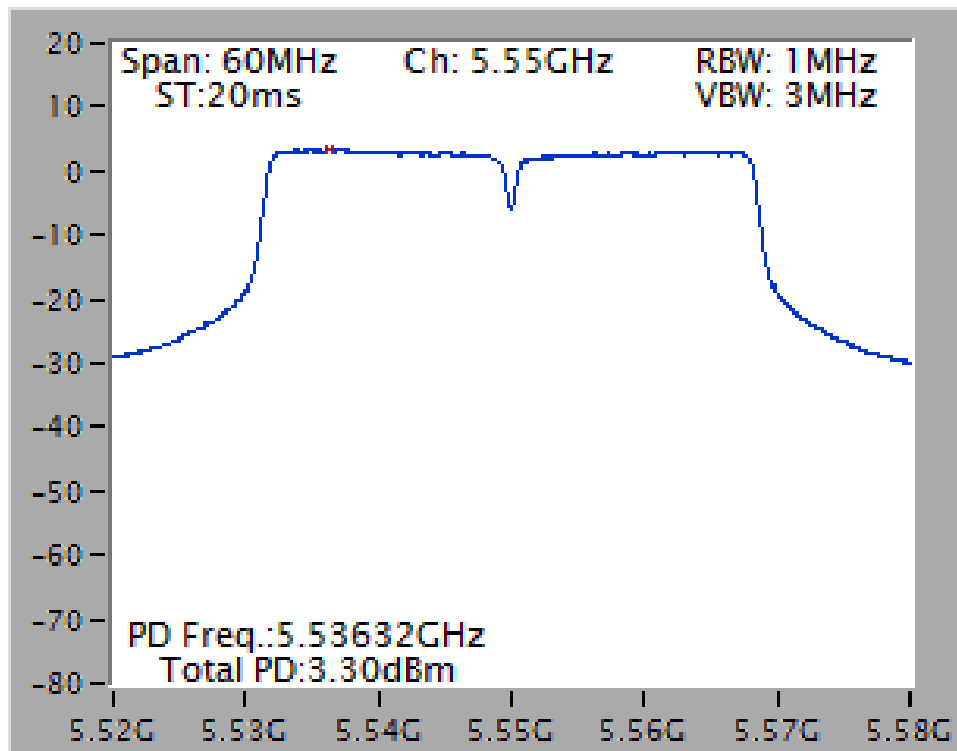
Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5230 MHz



Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5270 MHz



Power Density Plot on Configuration IEEE 802.11n MCS0 HT40 / Chain 1 + Chain 2 + Chain 3 / 5550 MHz



4.4. Radiated Emissions Measurement

4.4.1. 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 a -27dBm peak limit or average 54dBuV/m and peak 74dBuV/m limits. For transmitters operating in the 5.470-5.725 GHz band: all emissions outside of the 5.470-5.725 GHz band shall not exceed a -27dBm peak limit or average 54dBuV/m and peak 74dBuV/m limits. In addition, In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed.

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

4.4.2. Measuring Instruments and Setting

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

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

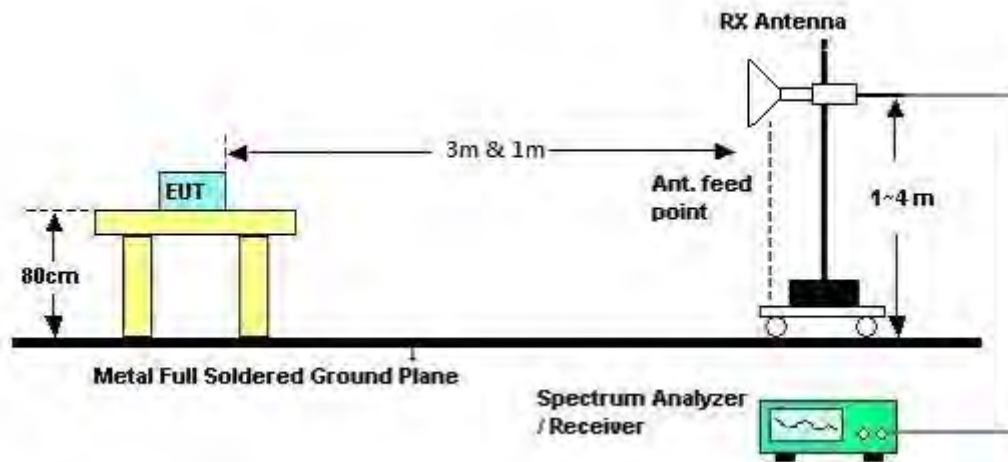
Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RBW 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RBW 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RBW 120kHz for QP

4.4.3. Test Procedures

1. Configure the EUT according to ANSI C63.10. The EUT was placed on the top of the turntable 0.8 meter above ground. The phase center of the receiving antenna mounted on the top of a height-variable antenna tower was placed 3 meters far away from the turntable.
2. Power on the EUT and all the supporting units. The turntable was rotated by 360 degrees to determine the position of the highest radiation.
3. The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emissions field strength of both horizontal and vertical polarization.
4. For each suspected emissions, the antenna tower was scan (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.
5. Set the test-receiver system to Peak or CISPR quasi-peak Detect Function with specified bandwidth under Maximum Hold Mode.
6. For emissions above 1GHz, use 1MHz VBW and 3MHz RBW for peak reading. Then 1MHz RBW and 1/T VBW for average reading in spectrum analyzer.
7. If the emissions level of the EUT in peak mode was 3 dB lower than the average limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 3 dB margin will be repeated one by one using the quasi-peak method for below 1GHz.
8. For testing above 1GHz, the emissions level of the EUT in peak mode was lower than average limit (that means the emissions level in peak mode also complies with the limit in average mode), then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
9. In case the emission is lower than 30MHz, loop antenna has to be used for measurement and the recorded data should be QP measured by receiver. High – Low scan is not required in this case.

4.4.4. Test Setup Layout

For Radiated Emissions: Above 1GHz



4.4.5. Test Deviation

There is no deviation with the original standard.

4.4.6. EUT Operation during Test

For non-beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

For beamforming mode:

The EUT was programmed to be in continuously transmitting mode.

The measured result was added array gain $10 \cdot \log(2) = 3.01 \text{ dBi}$ as worse case in beamforming mode.

The measured result was added array gain $10 \cdot \log(3) = 4.77 \text{ dBi}$ as worse case in beamforming mode.