



MET Laboratories, Inc. *Safety Certification - EMI - Telecom Environmental Simulation*

914 WEST PATAPSCO AVENUE • BALTIMORE, MARYLAND 21230-3432 • PHONE (410) 354-3300 • FAX (410) 354-3313

33439 WESTERN AVENUE • UNION CITY, CALIFORNIA 94587 • PHONE (510) 489-6300 • FAX (510) 489-6372

3162 BELICK STREET • SANTA CLARA, CALIFORNIA 95054 • PHONE (408) 748-3585 • FAX (510) 489-6372

November 16, 2012

Motorola Solutions, Inc.
1064 Greenwood Blvd. Suite 400
Lake Mary, FL 32746

Dear Tom Costello,

Enclosed is the EMC Wireless test report for Class II Permissive Change compliance testing of the Motorola Solutions, Inc., AP-7161 as tested to the requirements of Title 47 of the CFR, Ch. 1 (10-1-06 ed.), FCC Part 15.407 and Industry Canada RSS-210, Issue 8, December 2010 for Intentional Radiators.

Thank you for using the services of MET Laboratories, Inc. If you have any questions regarding these results or if MET can be of further service to you, please feel free to contact me.

Sincerely yours,
MET LABORATORIES, INC.

Jennifer Warnell
Documentation Department

Reference: (\Motorola Solutions, Inc.\EMC30461-FCC407 (UNII1) Rev. 2)

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Electromagnetic Compatibility Criteria Test Report Class II Permissive Change

for the

**Motorola Solutions, Inc.
AP-7161**

Tested under
the FCC Certification Rules
contained in
Title 47 of the CFR
FCC Part 15.407 & RSS-210, Issue 8, Dec. 2010
for Intentional Radiators

MET Report: EMC30461-FCC407 (UNII1) Rev. 2

November 16, 2012

Prepared For:

**Motorola Solutions, Inc.
1064 Greenwood Blvd. Suite 400
Lake Mary, FL 32746**

Prepared By:
MET Laboratories, Inc.
914 W. Patapsco Ave.
Baltimore, MD 21230



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Class II Permissive Change**

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for Intentional Radiators

Jeff Pratt, Project Engineer
Electromagnetic Compatibility Lab

Jennifer Warnell
Documentation Department

Engineering Statement: The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of FCC Rules Part 15.407 and Industry Canada standard RSS-210 Issue 8, Dec. 2010 under normal use and maintenance.

Dusmantha Tennakoon, Wireless Manager
Electromagnetic Compatibility Lab



Report Status Sheet

Revision	Report Date	Reason for Revision
Ø	September 24, 2012	Initial Issue.
1	October 23, 2012	Revised to reflect customer corrections.
2	November 16, 2012	Revised to reflect engineer corrections.



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List of Terms and Abbreviations

AC	Alternating Current
ACF	Antenna Correction Factor
Cal	Calibration
<i>d</i>	Measurement Distance
dB	Decibels
dB μ A	Decibels above one microamp
dB μ V	Decibels above one microvolt
dB μ A/m	Decibels above one microamp per meter
dB μ V/m	Decibels above one microvolt per meter
DC	Direct Current
E	Electric Field
DSL	Digital Subscriber Line
ESD	Electrostatic Discharge
EUT	Equipment Under Test
<i>f</i>	Frequency
FCC	Federal Communications Commission
GRP	Ground Reference Plane
H	Magnetic Field
HCP	Horizontal Coupling Plane
Hz	Hertz
IEC	International Electrotechnical Commission
kHz	kilohertz
kPa	kilopascal
kV	kilovolt
LISN	Line Impedance Stabilization Network
MHz	Megahertz
μ H	microhenry
μ	microfarad
μ s	microseconds
PRF	Pulse Repetition Frequency
RF	Radio Frequency
RMS	Root-Mean-Square
TWT	Traveling Wave Tube
V/m	Volts per meter
VCP	Vertical Coupling Plane



I. Executive Summary



A. Purpose of Test

An EMC evaluation was performed to determine compliance of the Motorola Solutions, Inc. AP-7161, with the requirements of FCC Part 15, §15.407 and Industry Canada RSS-210. All references are to the most current version of Title 47 of the Code of Federal Regulations in effect. In accordance with §2.1033, the following data is presented in support of the Certification of the AP-7161. Motorola Solutions, Inc. should retain a copy of this document which should be kept on file for at least two years after the manufacturing of the AP-7161, has been **permanently** discontinued.

B. Executive Summary

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 15, §15.407 and Industry Canada RSS-210, in accordance with Motorola Solutions, Inc., purchase order number NP5280921. All tests were conducted using measurement procedure ANSI C63.4-2003.

FCC Reference	Industry Canada Reference	Description	Results
15.203	RSS-GEN 7.1.4	Antenna Requirements	Compliant
15.403 (i)	A8.2	26dB Occupied Bandwidth	Compliant
15.407 (a)(3)	A9.2(3)	Conducted Transmitter Output Power	Compliant
15.407 (a)(3)	A9.2(3)	Power Spectral Density	Compliant
15.407 (a)(6)	N/A	Peak Excursion	Compliant
15.407 (b)(4), (6)	A9.3(4)	Undesirable Emissions (15.205/15.209 - General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Compliant
15.407(f)	RSS-GEN	RF Exposure	Compliant
15.407(g)	2.1	Frequency Stability	Compliant
N/A	RSS-Gen(4.8)	Receiver Spurious Emissions	Compliant

Table 1. Executive Summary of EMC Part 15.407 & RSS-210 Compliance Testing



II. Equipment Configuration



A. Overview

MET Laboratories, Inc. was contracted by Motorola Solutions, Inc. to perform testing on the AP-7161, under Motorola Solutions, Inc.'s purchase order number NP5280921.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the Motorola Solutions, Inc. AP-7161.

The results obtained relate only to the item(s) tested.

Model(s) Tested:	AP-7161	
Model(s) Covered:	AP-7161	
EUT Specifications:	Primary Power: 120 VAC, 60 Hz	
	FCC ID: QJEAP716101 IC: 4602A-AP716101	
	Type of Modulations:	OFDM
	Emission Designators:	W7D
	Output Power:	802.11a – 5.61mW 802.11n HT20 – 6.08mW 802.11n HT40 – 9.52mW
	Frequency Range:	5180 to 5240 MHz
	Equipment Code:	NII
Analysis:	The results obtained relate only to the item(s) tested.	
Environmental Test Conditions:	Temperature: 15-35° C	
	Relative Humidity: 30-60%	
	Barometric Pressure: 860-1060 mbar	
Evaluated by:	Jeff Pratt	
Report Date(s):	November 16, 2012	

Table 2. EUT Summary

B. References

RSS-210, Issue 7, June 2007	Low-power License-exempt Radiocommunications Devices (All Frequency Bands): Category I Equipment
CFR 47, Part 15, Subpart E	Unlicensed National Information Infrastructure Devices (UNII)
ANSI C63.4:2003	Methods and Measurements of Radio-Noise Emissions from Low-Voltage Electrical And Electronic Equipment in the Range of 9 kHz to 40 GHz
ISO/IEC 17025:2005	General Requirements for the Competence of Testing and Calibration Laboratories
ANSI C63.10-2009	American National Standard for Testing Unlicensed Wireless Devices

Table 3. References

C. Test Site

All testing was performed at MET Laboratories, Inc., 914 W. Patapsco Ave., Baltimore, MD 21230. All equipment used in making physical determinations is accurate and bears recent traceability to the National Institute of Standards and Technology.

Radiated Emissions measurements were performed in a 3 meter semi-anechoic chamber (equivalent to an Open Area Test Site). In accordance with §2.948(a)(3), a complete site description is contained at MET Laboratories.

D. Description of Test Sample

The Motorola Solutions, Inc. AP-7161, Equipment Under Test (EUT), is an outdoor 802.11a/n access point which operates as 3x3 MIMO.



Photograph 1. Motorola Solutions, Inc. AP-7161



E. Equipment Configuration

All cards, racks, etc., incorporated as part of the EUT is included in the following list.

Ref. ID	Name / Description	Model Number
1	AP 7161	AP-7161
2	Power Cable	N/A

Table 4. Equipment Configuration

F. Support Equipment

Ref. ID	Name / Description	Manufacturer	Model Number
1	Laptop with Winprius software	Dell	D600

Table 5. Support Equipment

G. Ports and Cabling Information

Port Name on EUT	Cable Description	Qty.	Length (m)	Shielded (Y/N)	Termination Point
GE1 (LAN)	Cat5	1	N/A	Y	N/A
GE2 (WAN)	Cat5	1	N/A	Y	N/A
Console (Serial)	RJ-45	1	N/A	N	N/A
Power	16 AWG Power Cable	1	6	N/A	N/A

Table 6. Ports and Cabling Information

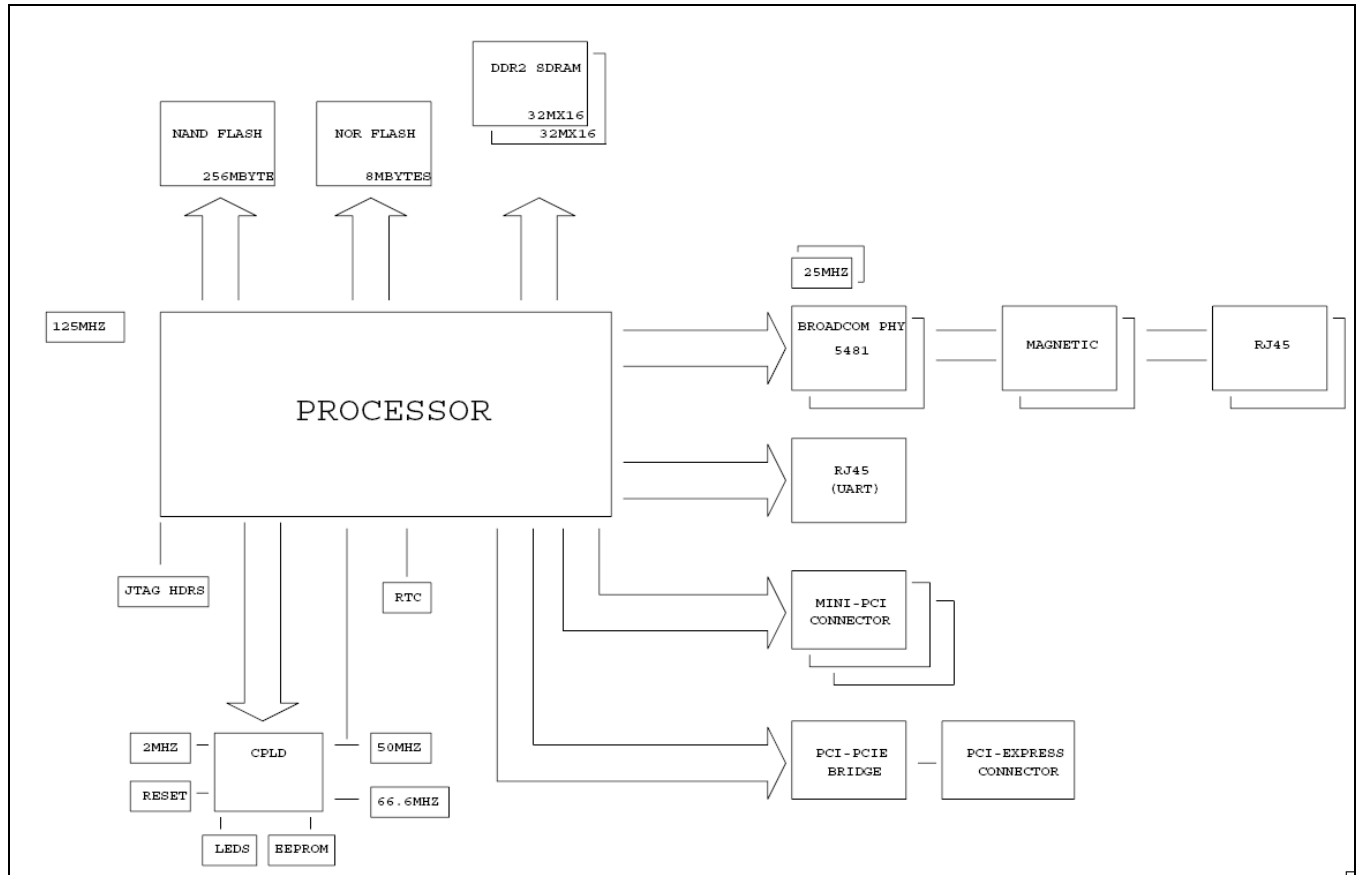


Figure 1. Setup Block Diagram



H. Mode of Operation

Test software WinPrius running on laptop and EUT which communicate over Ethernet.

I. Method of Monitoring

Wireless radios are monitored in the intended frequency bands.

J. Modifications

a) Modifications to EUT

No modifications were made to the EUT.

b) Modifications to Test Standard

No modifications were made to the test standard.

K. Disposition of EUT

The test sample including all support equipment submitted to the Electro-Magnetic Compatibility Lab for testing was returned to Motorola Solutions, Inc. upon completion of testing.

III. Electromagnetic Compatibility Criteria for Intentional Radiators

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.203 Antenna Requirement

Test Requirement: § 15.203: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

The structure and application of the EUT were analyzed to determine compliance with Section 15.203 of the Rules. Section 15.203 states that the subject device must meet at least one of the following criteria:

- a.) Antenna must be permanently attached to the unit.
- b.) Antenna must use a unique type of connector to attach to the EUT.
- c.) Unit must be professionally installed. Installer shall be responsible for verifying that the correct antenna is employed with the unit.

Results: The unit is professionally installed. Therefore, the EUT as tested is compliant with the criteria of §15.203.

Gain (dBi)	Type	Model	Manufacturer
10.5	Omni	ML-5299-HPA10-01R	Laird
8.25	Omni	ML-5299-FHPA6-01R	Motorola, Inc.
10.7	Panel	ML-2452-PNL9M3-036	Motorola, Inc.
10.1	Patch Omni Linear Array	PDM24516-MT1	Motorola, Inc.

Test Engineer(s): Jeff Pratt

Test Date(s): 08/23/12

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.403(c) 26dB Bandwidth

Test Requirements: § 15.403 (i): For purposes of this subpart the emission bandwidth shall be determined by measuring the width of the signal between two points, one below the carrier center frequency and one above the carrier center frequency, that are 26 dB down relative to the maximum level of the modulated carrier. Determination of the emissions bandwidth is based on the use of measurement instrumentation employing a peak detector function with an instrument resolution bandwidth approximately equal to 1.0 percent of the emission bandwidth of the device under measurement.

Test Procedure: The transmitter was set to low, mid and high operating frequencies at the highest output power and connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using a RBW approximately equal to 1% of the total emission bandwidth, VBW > RBW. The 26 dB Bandwidth was measured and recorded.

Test Results The 26 dB Bandwidth was compliant with the requirements of this section and was determined from the plots on the following pages.

Test Engineer(s): Jeff Pratt

Test Date(s): 08/23/12

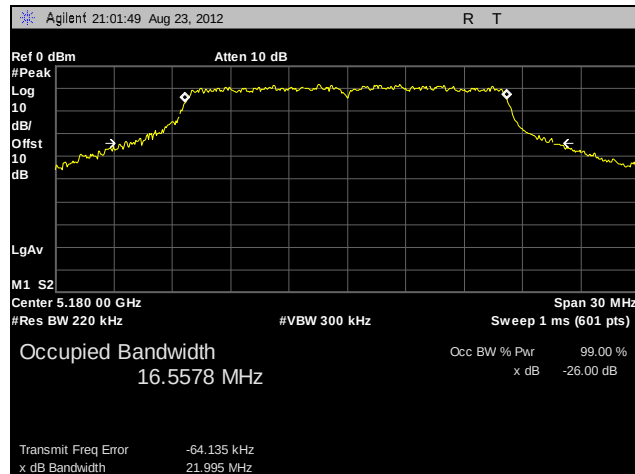


Figure 2. Occupied Bandwidth, Test Setup

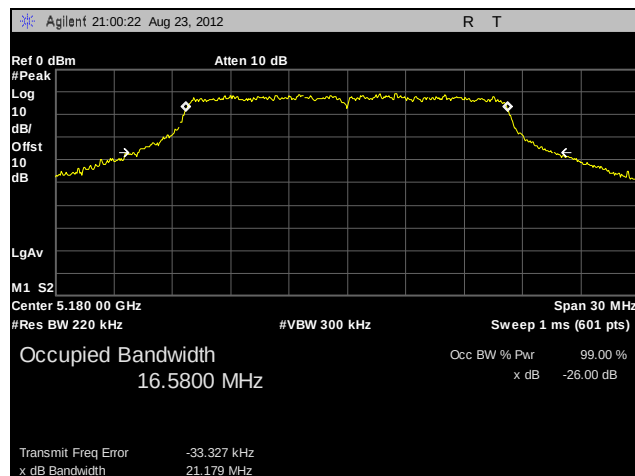
Mode	Frequency (MHz)	26 dB Bandwidth (MHz)			99% Bandwidth (MHz)		
		Port A	Port B	Port C	Port A	Port B	Port C
802.11a	5180	21.995	21.179	22.088	16.5578	16.5800	16.5767
	5200	22.218	21.939	21.781	16.5953	16.5730	16.5992
	5240	21.996	21.504	21.590	16.6079	16.5815	16.5638
802.11n HT20	5180	24.035	23.272	23.511	17.7538	17.7931	17.7795
	5200	23.154	23.098	23.568	17.7987	17.8366	17.8186
	5240	23.347	22.982	23.319	17.7933	17.7938	17.8008
802.11n HT40	5190	47.396	45.285	47.029	36.8000	36.5504	36.5624
	5200	47.555	45.178	46.608	36.7885	36.5619	36.6464
	5230	48.073	46.020	46.020	36.7062	36.5755	36.5755

Table 7. Occupied Bandwidth, Test Results

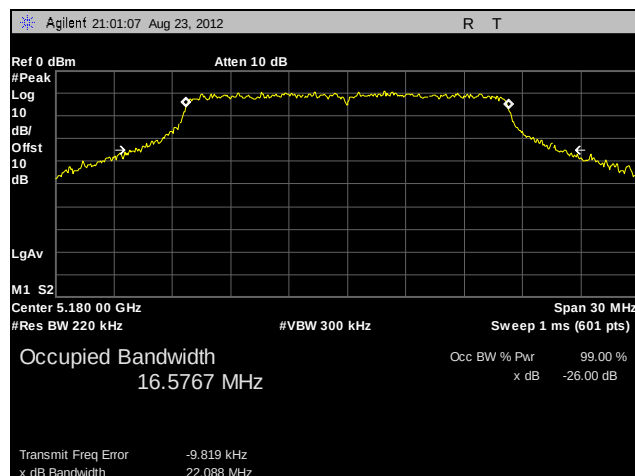
26 dB Occupied Bandwidth Test Results, 802.11a



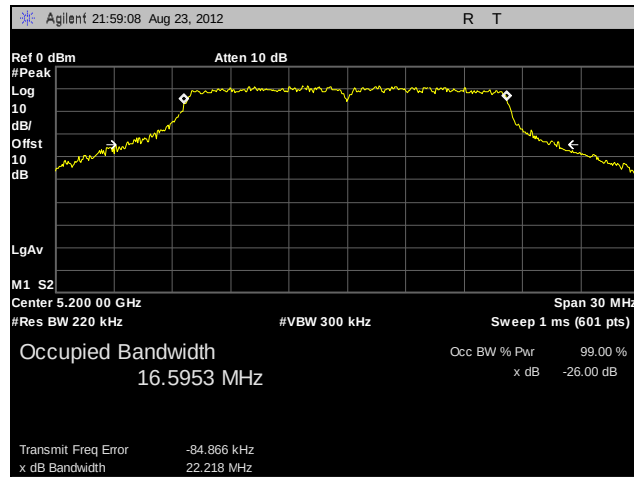
Plot 1. 26 dB Occupied Bandwidth, 802.11a, Low Channel, Port A



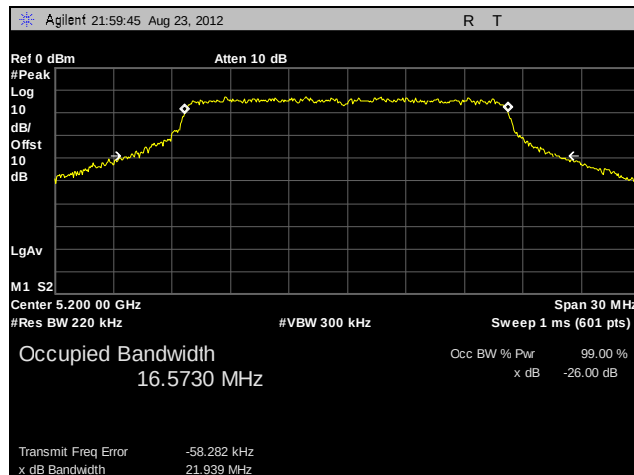
Plot 2. 26 dB Occupied Bandwidth, 802.11a, Low Channel, Port B



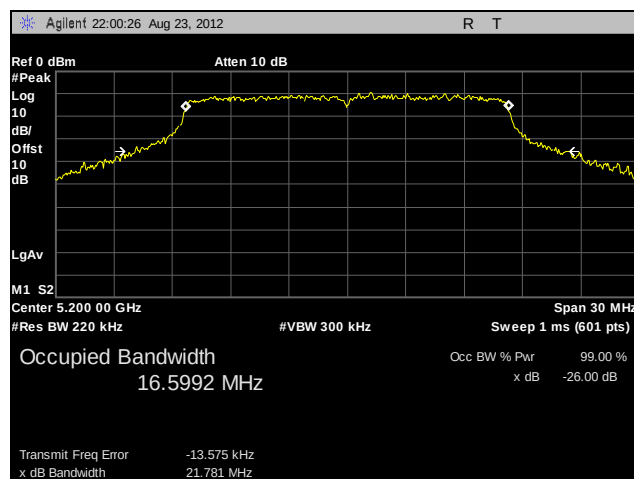
Plot 3. 26 dB Occupied Bandwidth, 802.11a, Low Channel, Port C



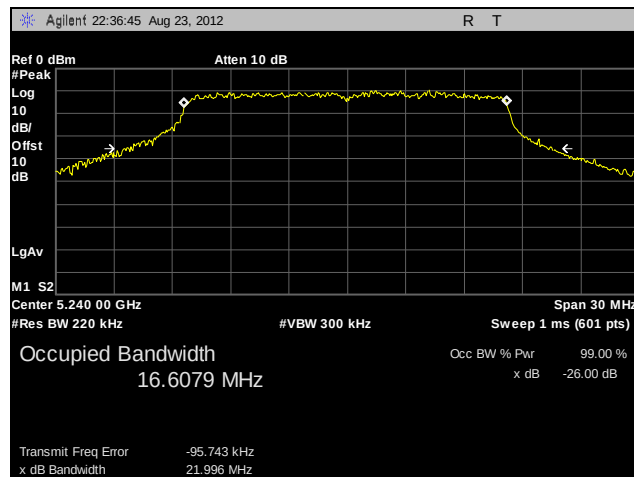
Plot 4. 26 dB Occupied Bandwidth, 802.11a, Mid Channel, Port A



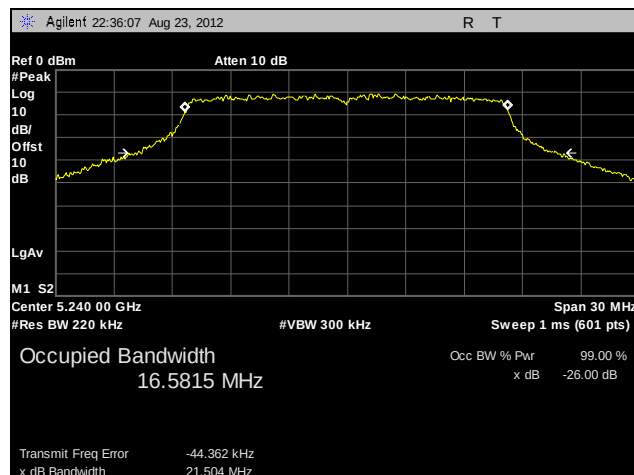
Plot 5. 26 dB Occupied Bandwidth, 802.11a, Mid Channel, Port B



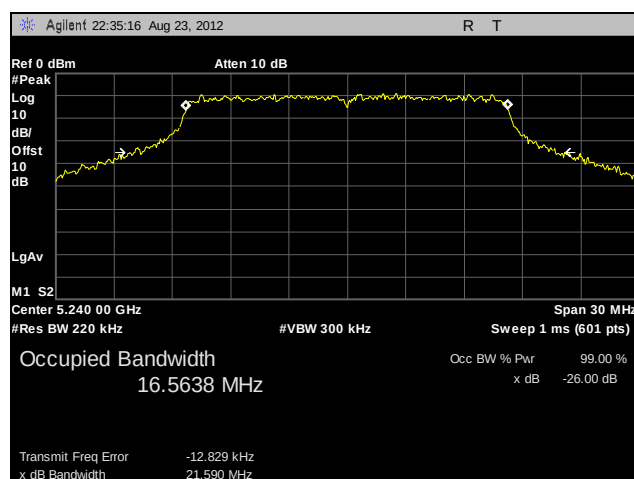
Plot 6. 26 dB Occupied Bandwidth, 802.11a, Mid Channel, Port C



Plot 7. 26 dB Occupied Bandwidth, 802.11a, High Channel, Port A

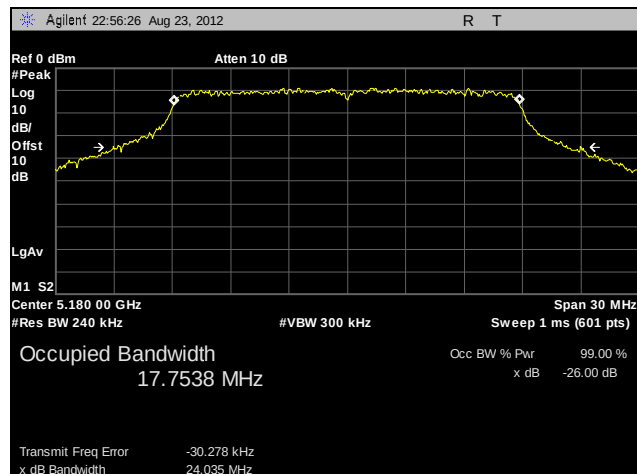


Plot 8. 26 dB Occupied Bandwidth, 802.11a, High Channel, Port B

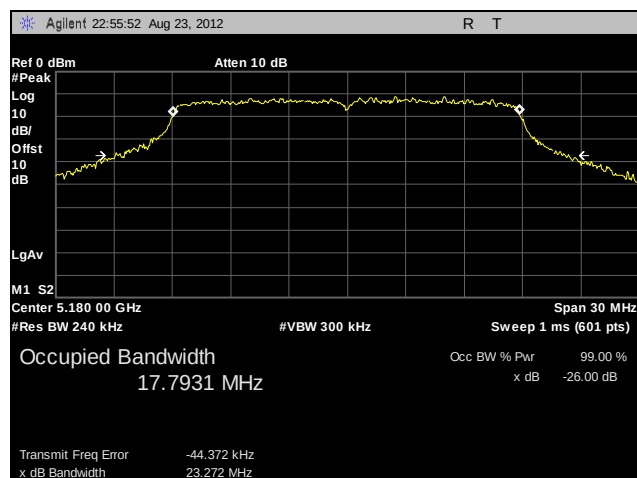


Plot 9. 26 dB Occupied Bandwidth, 802.11a, High Channel, Port C

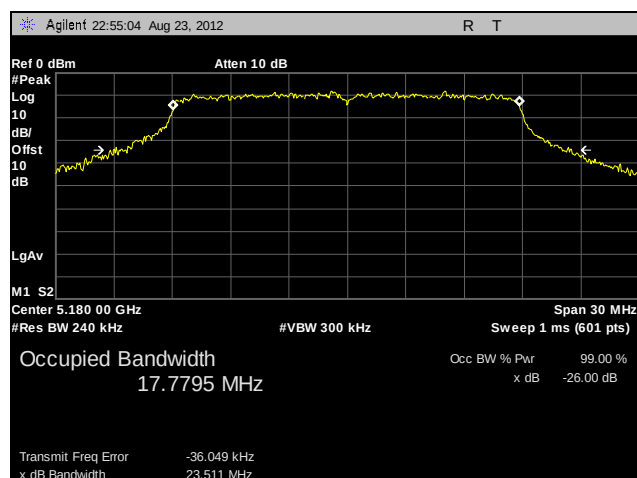
26 dB Occupied Bandwidth Test Results, 802.11n 20 MHz



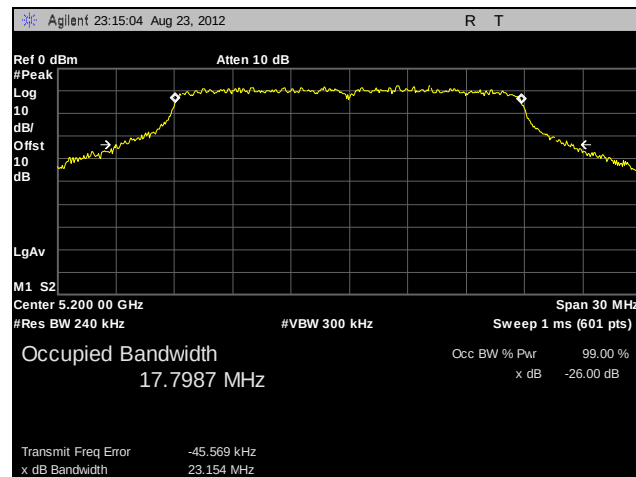
Plot 10. 26 dB Occupied Bandwidth, 802.11n 20 MHz, Low Channel, Port A



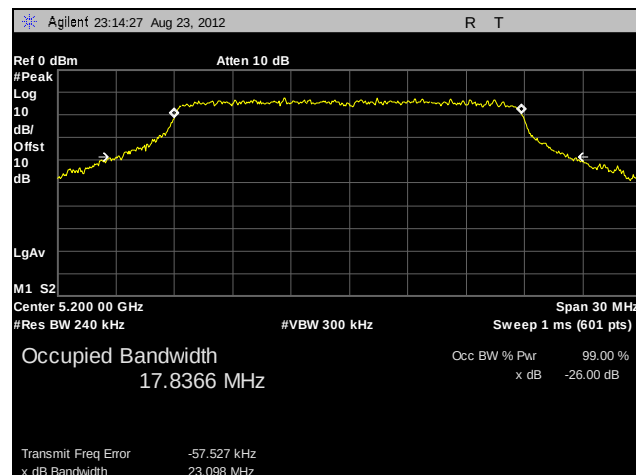
Plot 11. 26 dB Occupied Bandwidth, 802.11n 20 MHz, Low Channel, Port B



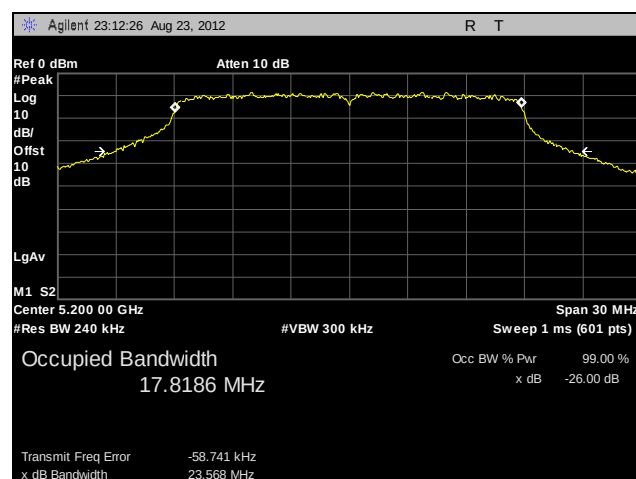
Plot 12. 26 dB Occupied Bandwidth, 802.11n 20 MHz, Low Channel, Port C



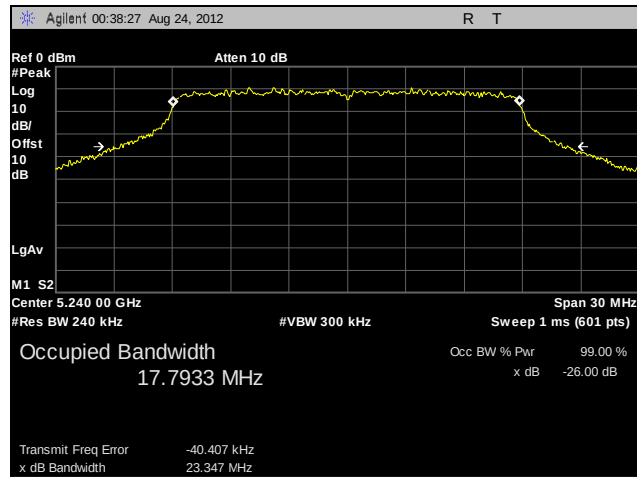
Plot 13. 26 dB Occupied Bandwidth, 802.11n 20 MHz, Mid Channel, Port A



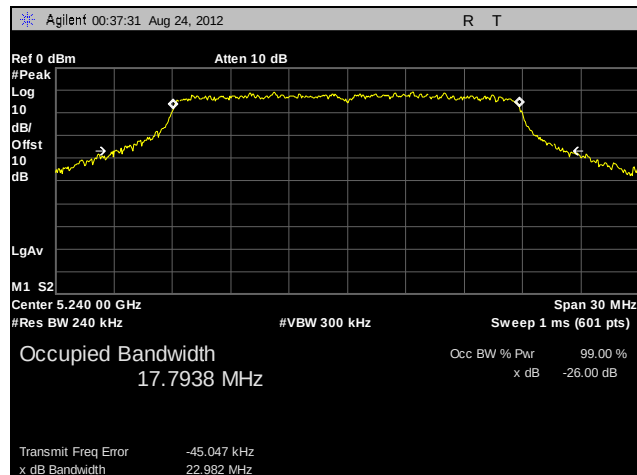
Plot 14. 26 dB Occupied Bandwidth, 802.11n 20 MHz, Mid Channel, Port B



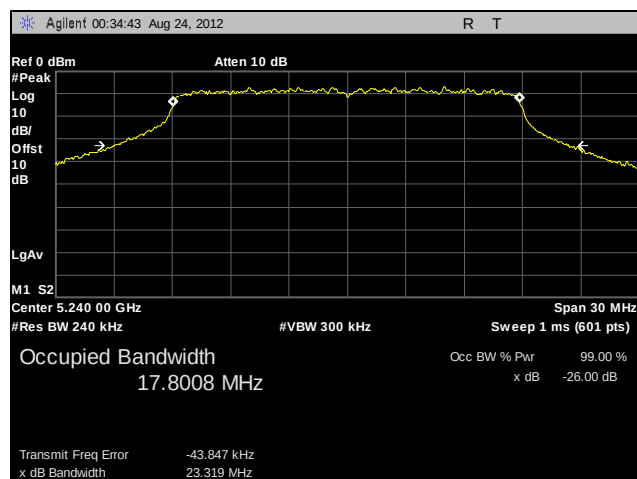
Plot 15. 26 dB Occupied Bandwidth, 802.11n 20 MHz, Mid Channel, Port C



Plot 16. 26 dB Occupied Bandwidth, 802.11n 20 MHz, High Channel, Port A

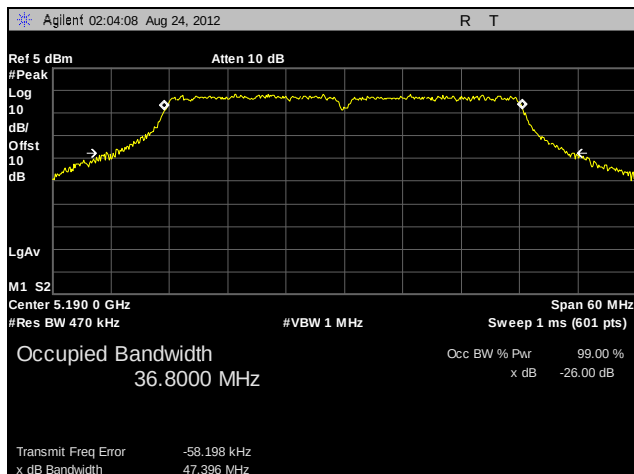


Plot 17. 26 dB Occupied Bandwidth, 802.11n 20 MHz, High Channel, Port B

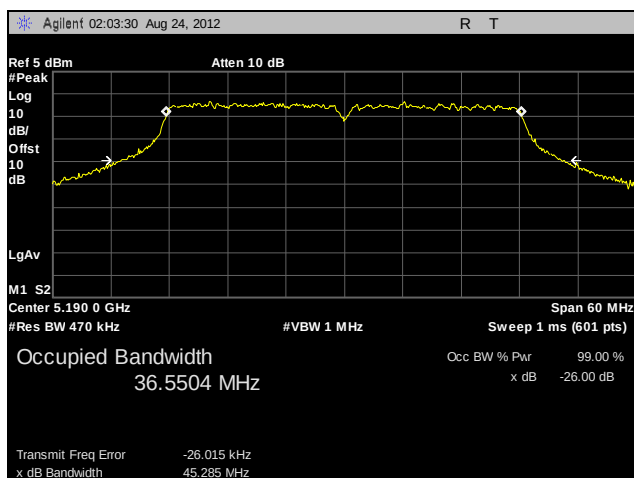


Plot 18. 26 dB Occupied Bandwidth, 802.11n 20 MHz, High Channel, Port C

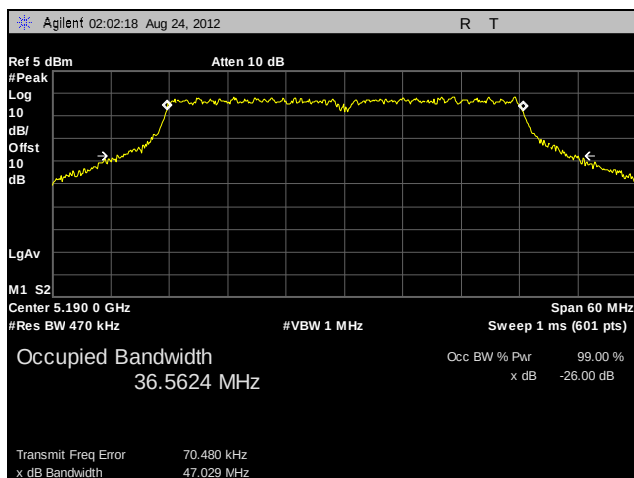
26 dB Occupied Bandwidth Test Results, 802.11n 40 MHz



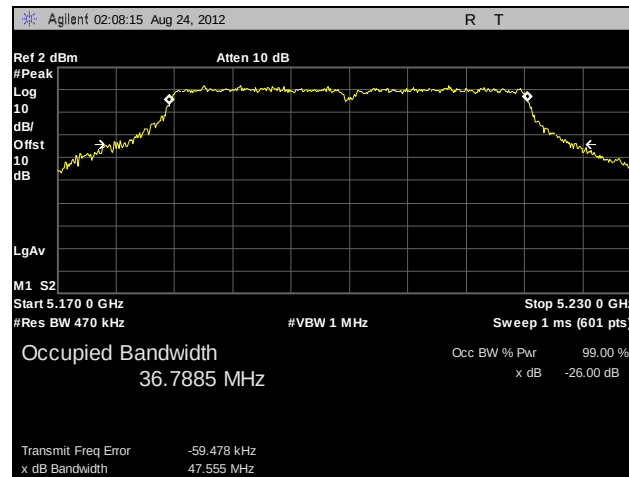
Plot 19. 26 dB Occupied Bandwidth, 802.11n 40 MHz, Low Channel, Port A



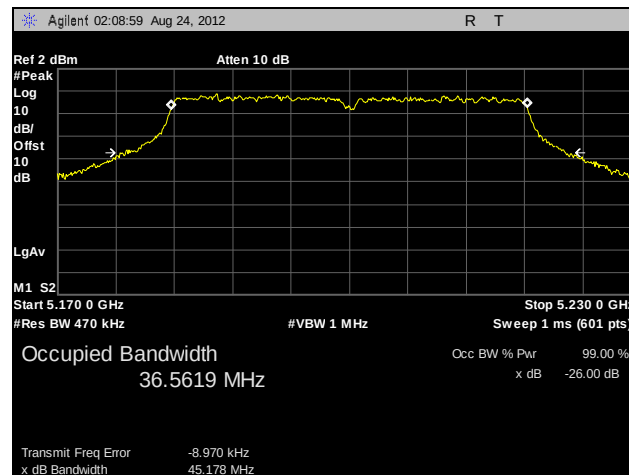
Plot 20. 26 dB Occupied Bandwidth, 802.11n 40 MHz, Low Channel, Port B



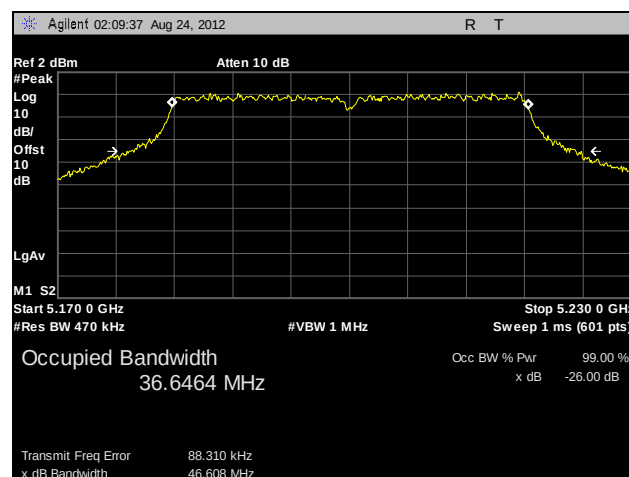
Plot 21. 26 dB Occupied Bandwidth, 802.11n 40 MHz, Low Channel, Port C



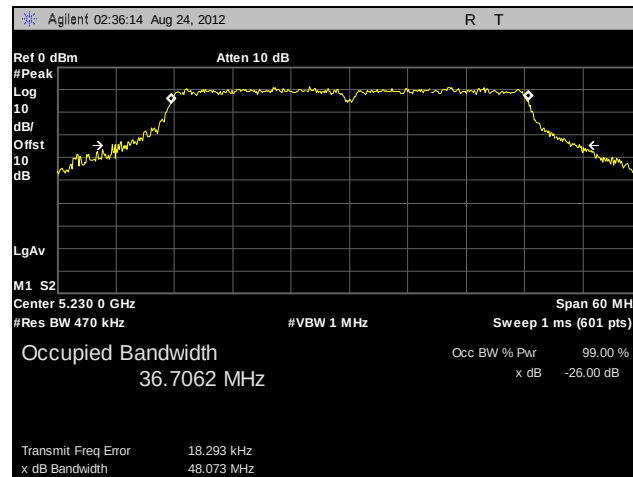
Plot 22. 26 dB Occupied Bandwidth, 802.11n 40 MHz, Mid Channel, Port A



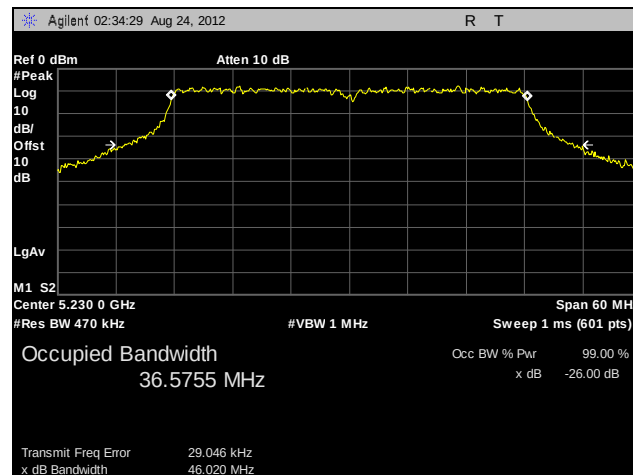
Plot 23. 26 dB Occupied Bandwidth, 802.11n 40 MHz, Mid Channel, Port B



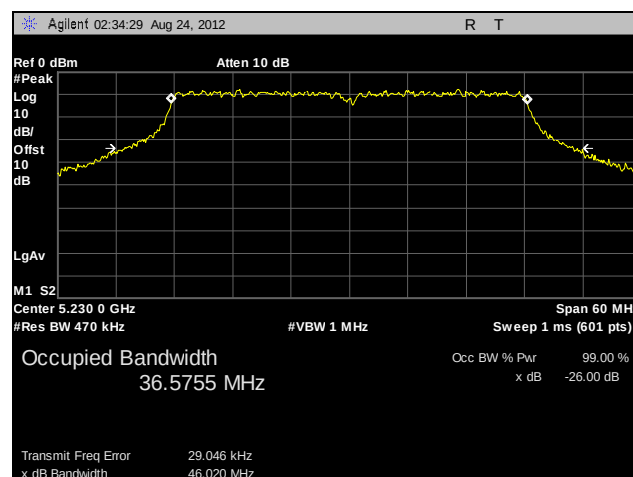
Plot 24. 26 dB Occupied Bandwidth, 802.11n 40 MHz, Mid Channel, Port C



Plot 25. 26 dB Occupied Bandwidth, 802.11n 40 MHz, High Channel, Port A

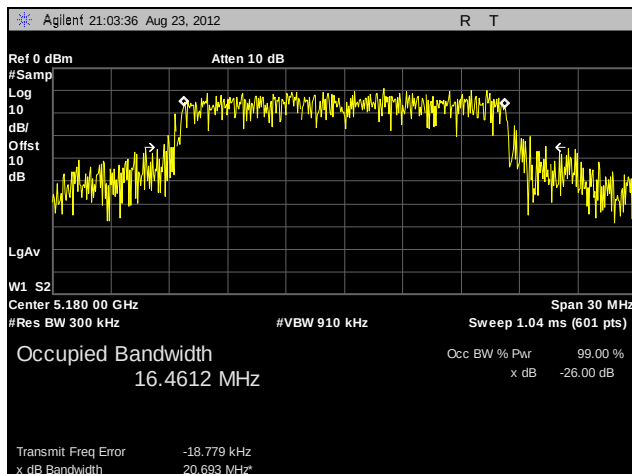


Plot 26. 26 dB Occupied Bandwidth, 802.11n 40 MHz, High Channel, Port B

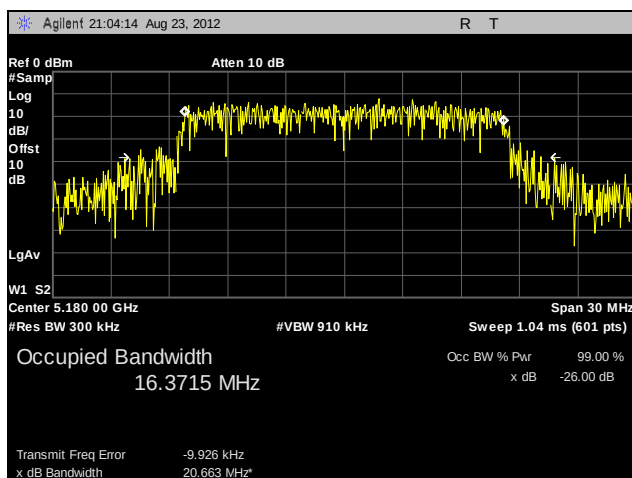


Plot 27. 26 dB Occupied Bandwidth, 802.11n 40 MHz, High Channel, Port C

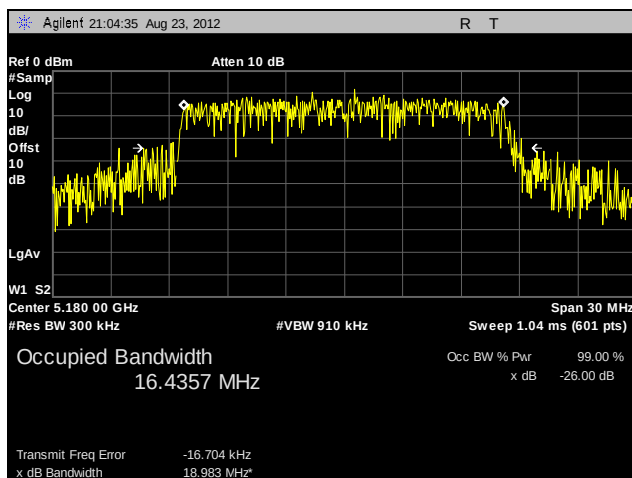
99% Occupied Bandwidth Test Results, 802.11a



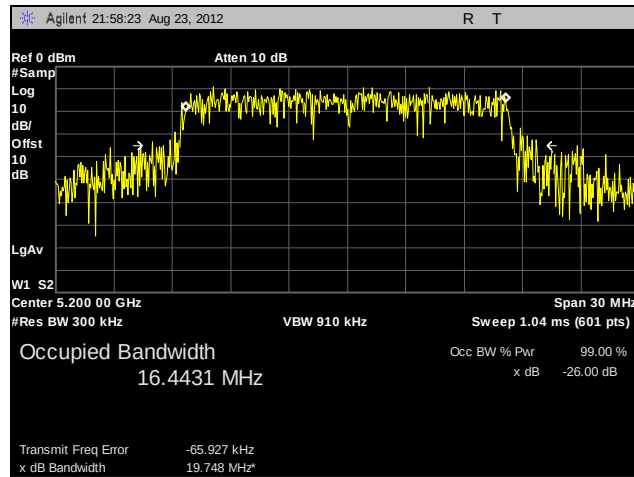
Plot 28. 99% Occupied Bandwidth, 802.11a, Low Channel, Port A



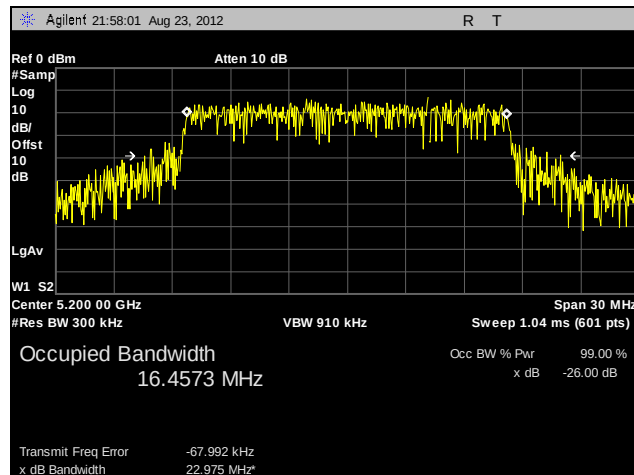
Plot 29. 99% Occupied Bandwidth, 802.11a, Low Channel, Port B



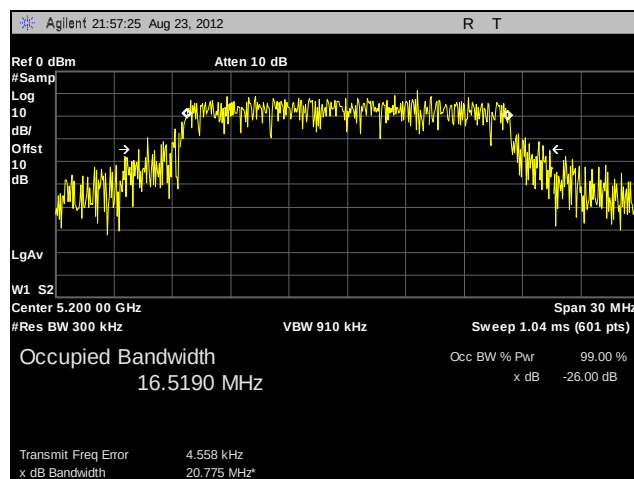
Plot 30. 99% Occupied Bandwidth, 802.11a, Low Channel, Port C



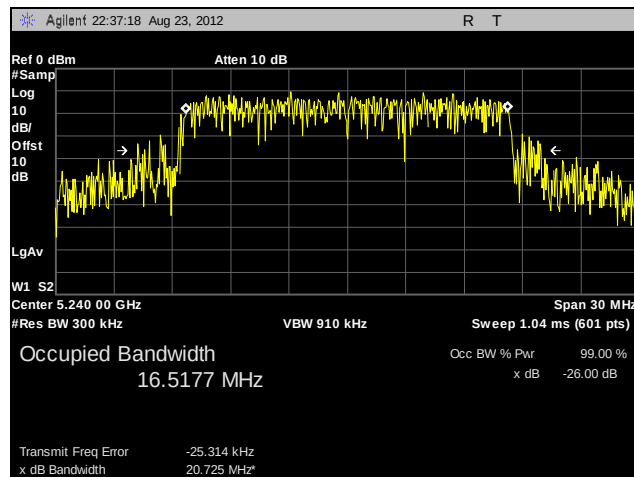
Plot 31. 99% Occupied Bandwidth, 802.11a, Mid Channel, Port A



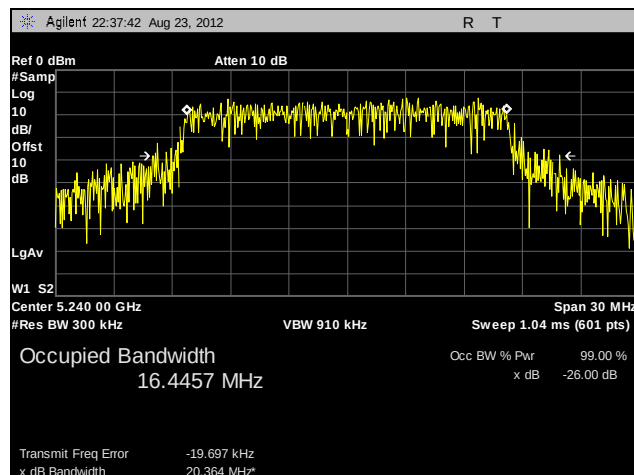
Plot 32. 99% Occupied Bandwidth, 802.11a, Mid Channel, Port B



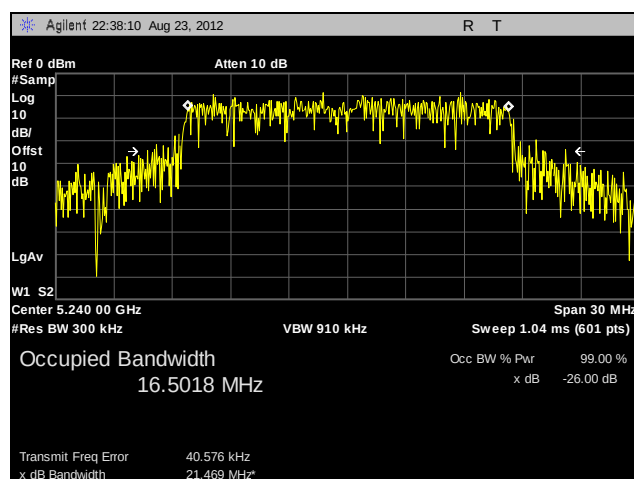
Plot 33. 99% Occupied Bandwidth, 802.11a, Mid Channel, Port C



Plot 34. 99% Occupied Bandwidth, 802.11a, High Channel, Port A

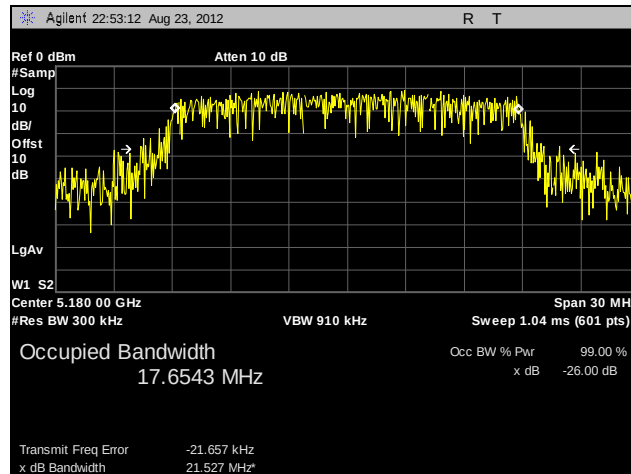


Plot 35. 99% Occupied Bandwidth, 802.11a, High Channel, Port B

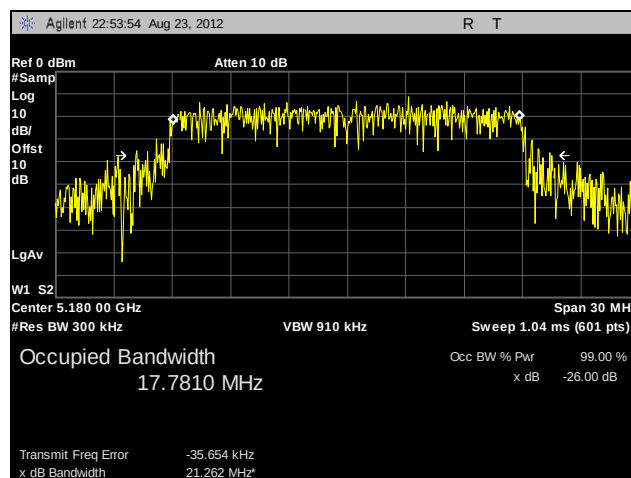


Plot 36. 99% Occupied Bandwidth, 802.11a, High Channel, Port C

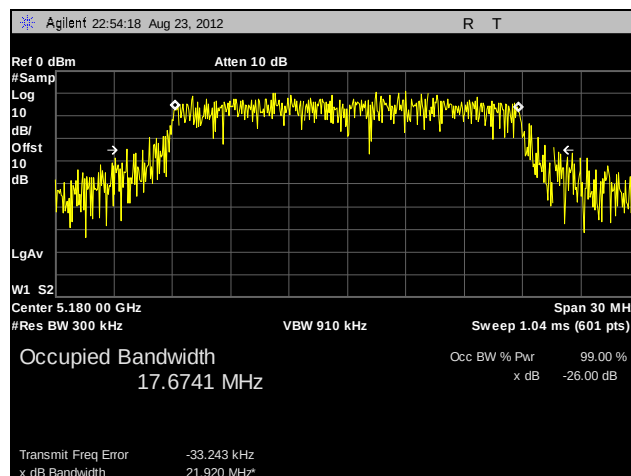
99% Occupied Bandwidth Test Results, 802.11n 20 MHz



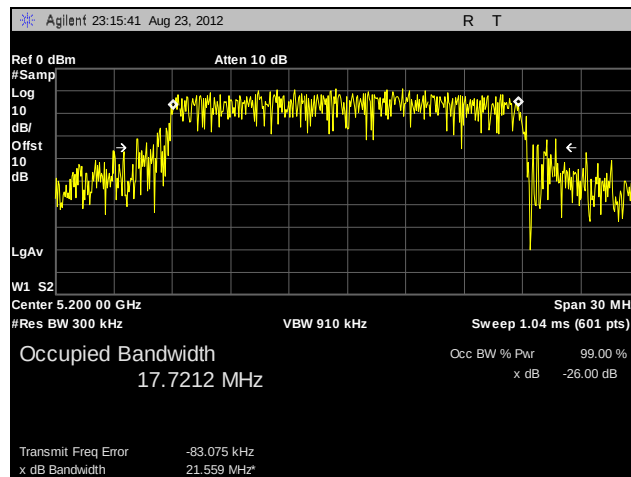
Plot 37. 99% Occupied Bandwidth, 802.11n 20 MHz, Low Channel, Port A



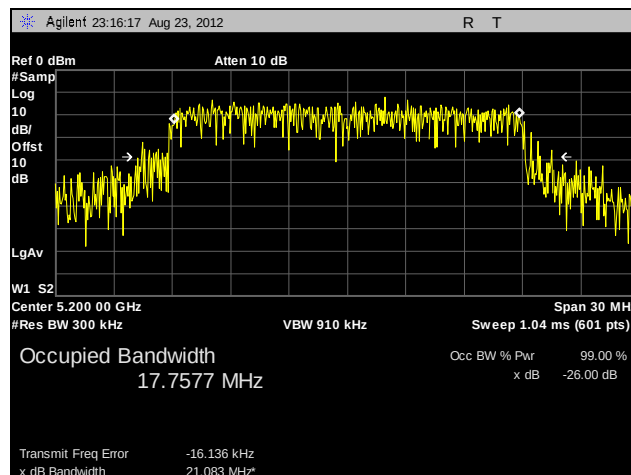
Plot 38. 99% Occupied Bandwidth, 802.11n 20 MHz, Low Channel, Port B



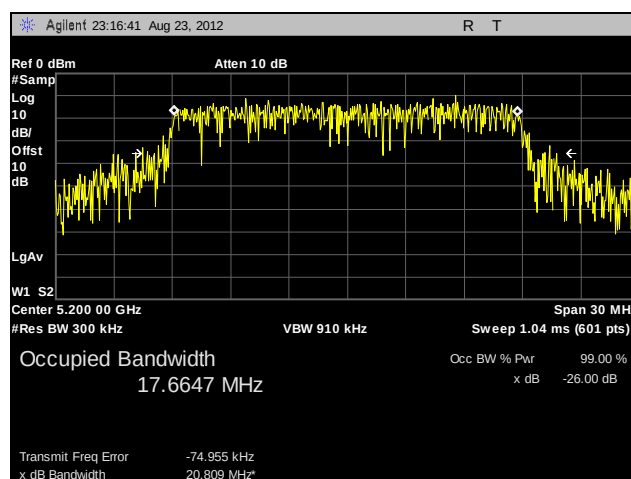
Plot 39. 99% Occupied Bandwidth, 802.11n 20 MHz, Low Channel, Port C



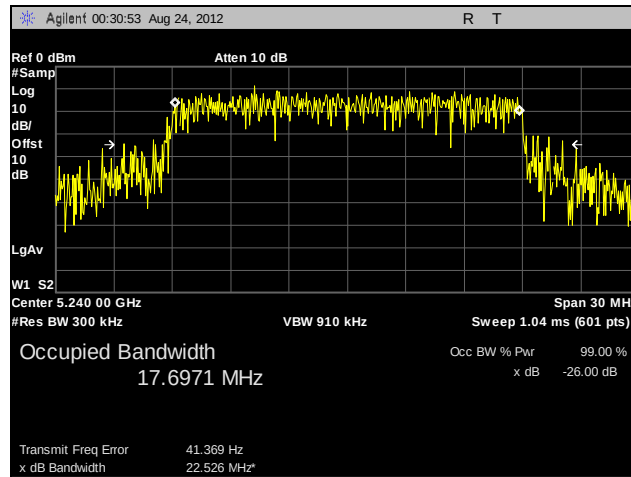
Plot 40. 99% Occupied Bandwidth, 802.11n 20 MHz, Mid Channel, Port A



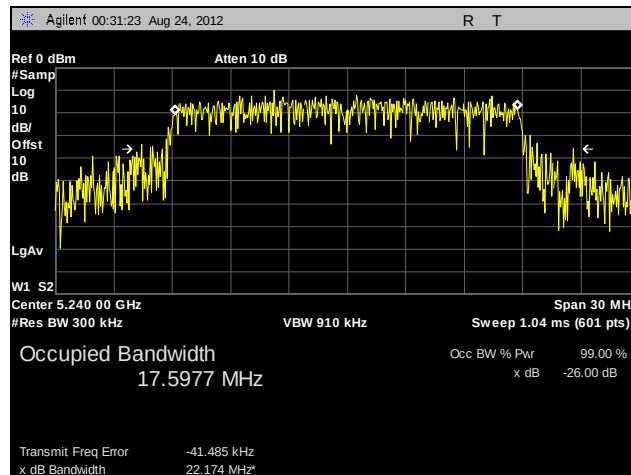
Plot 41. 99% Occupied Bandwidth, 802.11n 20 MHz, Mid Channel, Port B



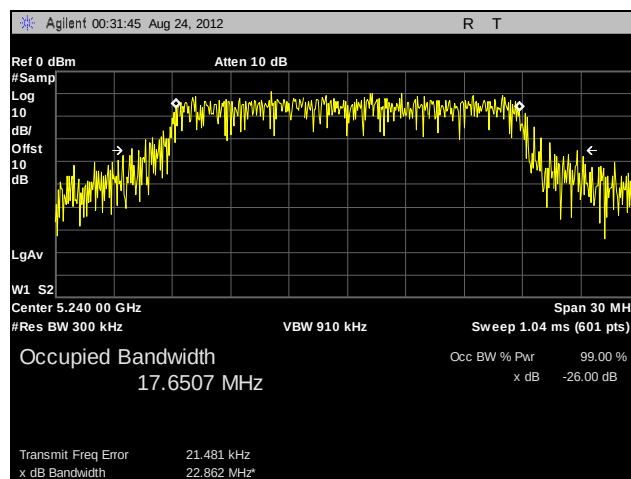
Plot 42. 99% Occupied Bandwidth, 802.11n 20 MHz, Mid Channel, Port C



Plot 43. 99% Occupied Bandwidth, 802.11n 20 MHz, High Channel, Port A

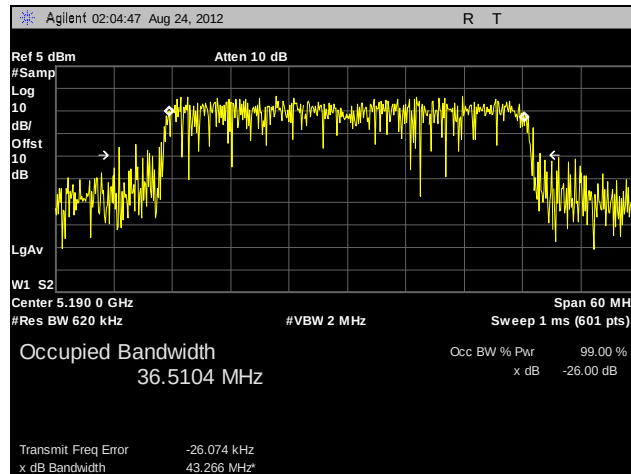


Plot 44. 99% Occupied Bandwidth, 802.11n 20 MHz, High Channel, Port B

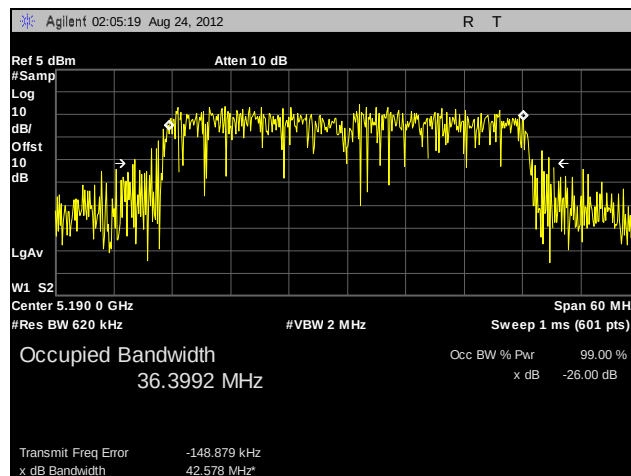


Plot 45. 99% Occupied Bandwidth, 802.11n 20 MHz, High Channel, Port C

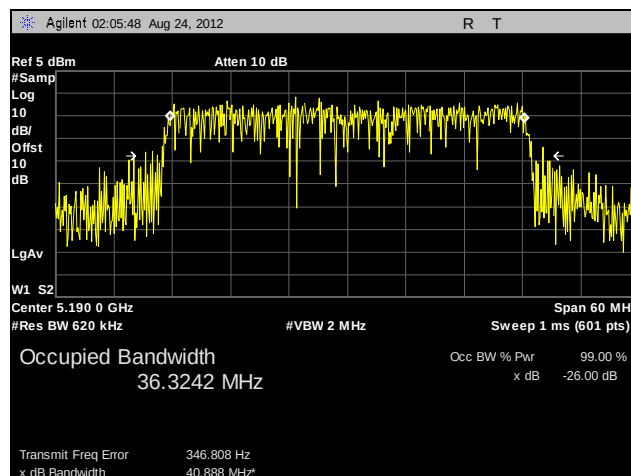
99% Occupied Bandwidth Test Results, 802.11n 40 MHz



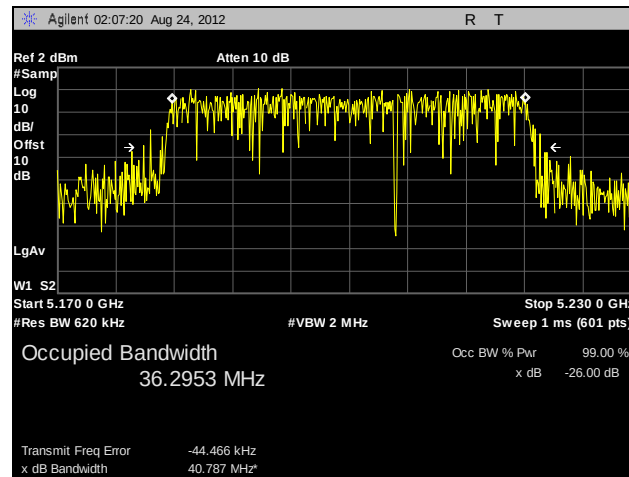
Plot 46. 99% Occupied Bandwidth, 802.11n 40 MHz, Low Channel, Port A



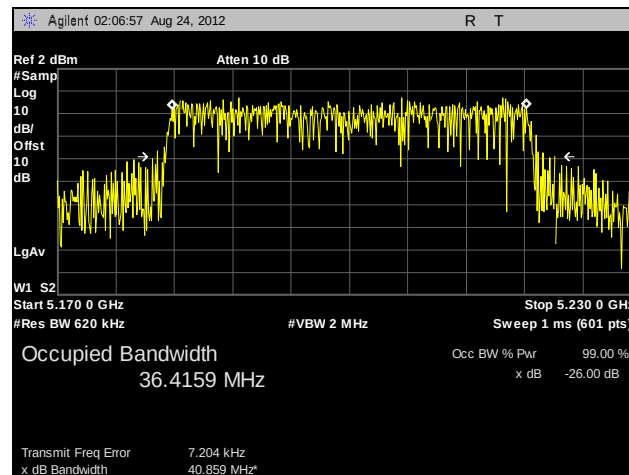
Plot 47. 99% Occupied Bandwidth, 802.11n 40 MHz, Low Channel, Port B



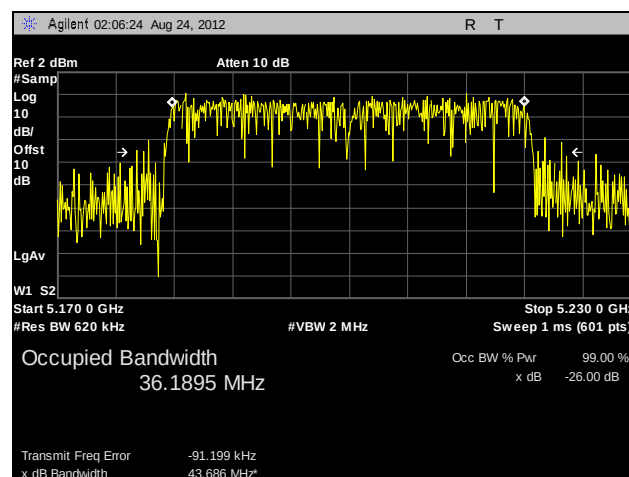
Plot 48. 99% Occupied Bandwidth, 802.11n 40 MHz, Low Channel, Port C



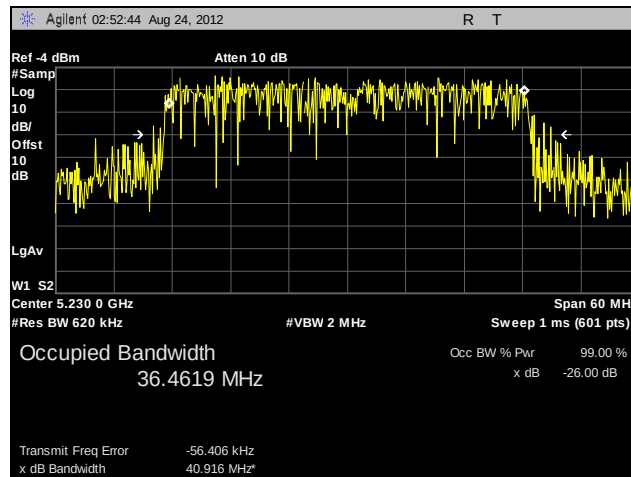
Plot 49. 99% Occupied Bandwidth, 802.11n 40 MHz, Mid Channel, Port A



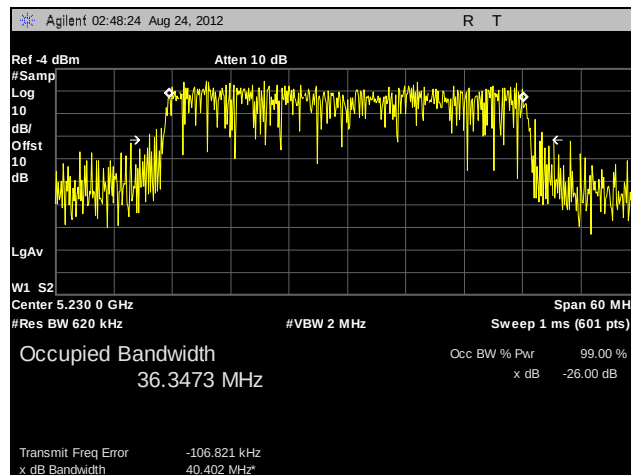
Plot 50. 99% Occupied Bandwidth, 802.11n 40 MHz, Mid Channel, Port B



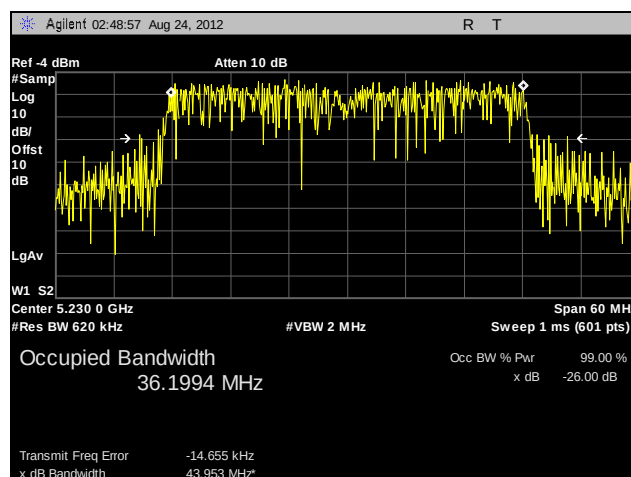
Plot 51. 99% Occupied Bandwidth, 802.11n 40 MHz, Mid Channel, Port C



Plot 52. 99% Occupied Bandwidth, 802.11n 40 MHz, High Channel, Port A



Plot 53. 99% Occupied Bandwidth, 802.11n 40 MHz, High Channel, Port B



Plot 54. 99% Occupied Bandwidth, 802.11n 40 MHz, High Channel, Port C

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.407(a)(1) RF Power Output

Test Requirements: §15.407(a)(1): The maximum output power of the intentional radiator shall not exceed the following:

Digital Transmission Systems (MHz)	Output Limit
5150-5250	50mW
5250-5350	250mW
5470-5725	250mW
5725-5825	1W

Table 8. Output Power Requirements from §15.407

§15.407(a)(1): 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 or $4 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz.

Test Procedure: The EUT was connected to a Spectrum Analyzer. The power was measured on three channels.

Test Results: Equipment was compliant with the Peak Power Output limits of § 15.401(a)(1).

Test Engineer(s): Jeff Pratt

Test Date(s): 08/23/12 – 08/29/12



Figure 3. Power Output Test Setup



Frequency (MHz)	Mode	Port R1-A Power (dBm)	Port R1-B Power (dBm)	Port R1-C Power (dBm)	Summed Power (dBm)	Antenna Gain (dBi)	Limit (dBm)	Margin (dB)
5180	802.11a	1.22	-2.30	0.10	4.68	14.77	8.22	-3.54
5200	802.11a	0.96	-2.22	1.99	5.35	14.77	8.22	-2.87
5240	802.11a	0.74	-0.53	1.27	5.33	14.77	8.22	-2.89
5180	802.11n HT20	1.27	-1.62	1.19	5.24	14.77	8.22	-2.98
5200	802.11n HT20	2.30	-1.59	1.30	5.73	14.77	8.22	-2.49
5240	802.11n HT20	0.69	-1.69	1.90	5.31	14.77	8.22	-2.91
5190	802.11n HT40	3.69	0.94	2.48	7.28	14.77	8.22	-0.93
5200	802.11n HT40	3.73	-0.30	2.54	7.07	14.77	8.22	-1.15
5230	802.11n HT40	3.05	2.00	3.26	7.58	14.77	8.22	-0.64

Table 9. RF Power Output, Test Results, 10 dBi Omni

Note: Antenna gain was calculated using the following equation: Antenna Gain = $G+10\log(N)=10+10\log(3)=14.77\text{dBi}$, where N is the number of summing antenna elements.

Frequency (MHz)	Mode	Port R1-A Power (dBm)	Port R1-B Power (dBm)	Port R1-C Power (dBm)	Summed Power (dBm)	Antenna Gain (dBi)	Limit (dBm)	Margin (dB)
5180	802.11a	2.85	-0.30	1.74	6.39	13.71	9.28	-2.89
5200	802.11a	2.97	-0.37	1.91	6.49	13.71	9.28	-2.79
5240	802.11a	2.00	0.40	0.69	5.86	13.71	9.28	-3.42
5180	802.11n HT20	2.98	0.26	4.23	7.56	13.71	9.28	-1.72
5200	802.11n HT20	3.36	0.34	2.37	6.97	13.71	9.28	-2.31
5240	802.11n HT20	2.31	0.95	3.51	7.15	13.71	9.28	-2.13
5190	802.11n HT40	5.73	1.99	3.98	8.93	13.71	9.28	-0.35
5200	802.11n HT40	5.65	2.46	3.94	8.98	13.71	9.28	-0.30
5230	802.11n HT40	5.01	3.28	4.44	9.07	13.71	9.28	-0.21

Table 10. RF Power Output, Test Results, 10.7 dBi Panel

Note: Antenna gain was calculated using the following equation: Antenna Gain = $G+10\log(N)=10.7+10\log(2)=13.71\text{dBi}$, where N is the number of summing antenna elements. Antenna has 1 horizontally polarized port and 2 vertically polarized ports. Only the vertically polarized ports sum.

Frequency (MHz)	Mode	Port R1-A Power (dBm)	Port R1-B Power (dBm)	Port R1-C Power (dBm)	Summed Power (dBm)	Antenna Gain (dBi)	Limit (dBm)	Margin (dB)
5180	802.11a	3.45	0.58	2.37	7.06	13.02	9.97	-2.91
5200	802.11a	3.75	1.13	2.88	7.49	13.02	9.97	-2.48
5240	802.11a	2.98	1.43	1.54	6.81	13.02	9.97	-3.15
5180	802.11n HT20	3.98	0.97	3.67	7.84	13.02	9.97	-2.13
5200	802.11n HT20	3.36	0.34	2.37	6.97	13.02	9.97	-3.00
5240	802.11n HT20	3.03	1.27	4.05	7.70	13.02	9.97	-2.27
5190	802.11n HT40	6.24	2.80	4.56	9.53	13.02	9.97	-0.44
5200	802.11n HT40	5.65	2.46	3.94	8.98	13.02	9.97	-0.99
5230	802.11n HT40	5.57	3.49	5.66	9.79	13.02	9.97	-0.18

Table 11. RF Power Output, Test Results, 8.25 dBi Omni

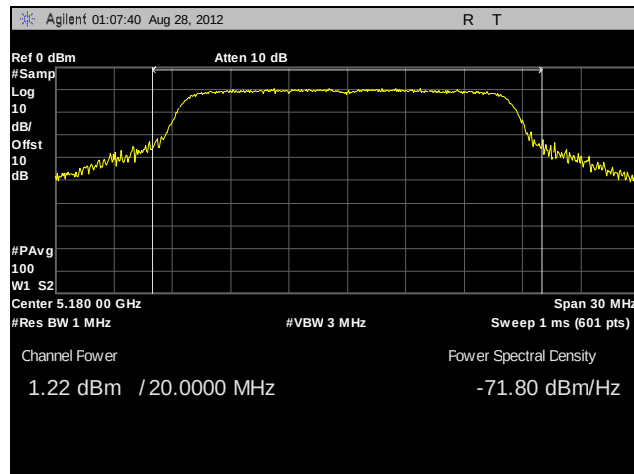
Note: Antenna gain was calculated using the following equation: $\text{Antenna gain} = G + 10\log(N) = 8.25 + 10\log(3) = 13.02\text{dBi}$, where N is the number of summing antenna elements.

Frequency (MHz)	Mode	Port R1-A Power (dBm)	Port R1-B Power (dBm)	Port R1-C Power (dBm)	Summed Power (dBm)	Antenna Gain (dBi)	Limit (dBm)	Margin (dB)
5180	802.11a	1.98	-1.72	-0.01	5.12	14.87	8.12	-3.00
5200	802.11a	2.35	-1.49	0.58	5.53	14.87	8.12	-2.59
5240	802.11a	0.74	-0.53	1.27	5.33	14.87	8.12	-2.79
5180	802.11n HT20	1.27	-1.62	1.19	5.24	14.87	8.12	-2.88
5200	802.11n HT20	2.48	-0.98	1.84	6.12	14.87	8.12	-2.00
5240	802.11n HT20	0.88	-0.69	2.38	5.81	14.87	8.12	-2.31
5190	802.11n HT40	4.36	1.48	3.02	7.88	14.87	8.12	-0.24
5200	802.11n HT40	4.28	1.15	2.58	7.63	14.87	8.12	-0.49
5230	802.11n HT40	3.05	2.00	3.26	7.58	14.87	8.12	-0.54

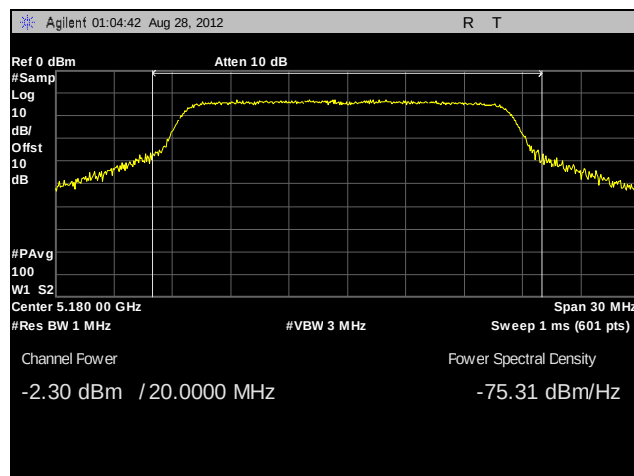
Table 12. RF Power Output, Test Results, 10.1 dBi Patch

Note: Antenna gain was calculated using the following equation: $\text{Antenna Gain} = G + 10\log(N) = 10.1 + 10\log(3) = 14.87\text{dBi}$, where N is the number of summing antenna elements.

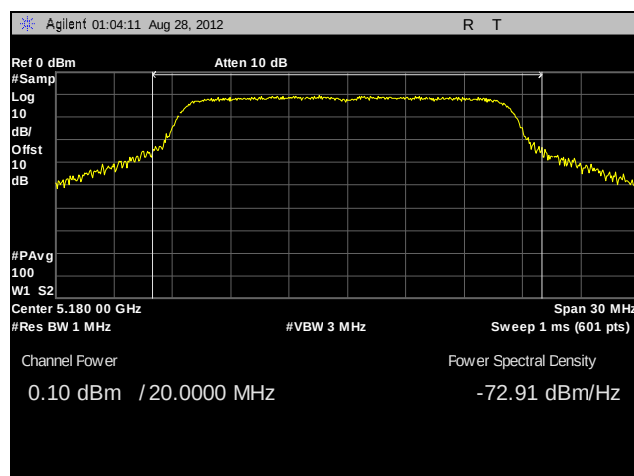
RF Power Output, 802.11a, Omni Antenna



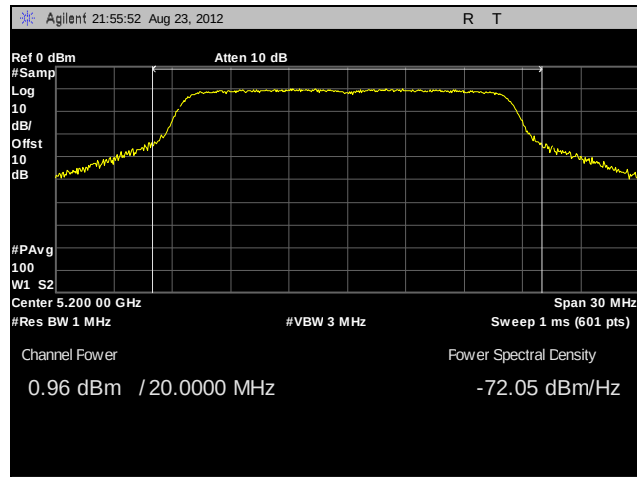
Plot 55. RF Power Output, 802.11a, Low Channel, Port A, Omni Antenna



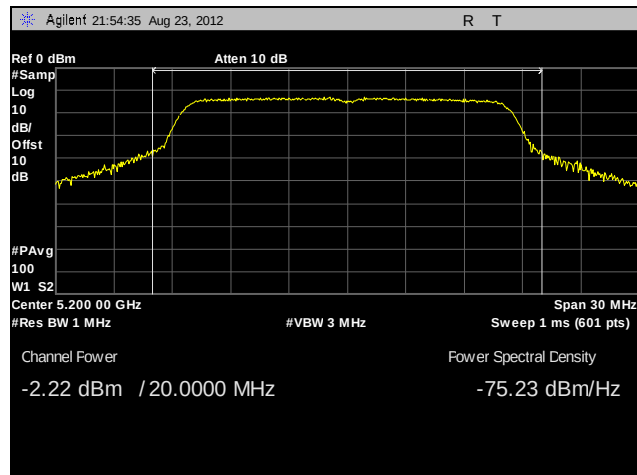
Plot 56. RF Power Output, 802.11a, Low Channel, Port B, Omni Antenna



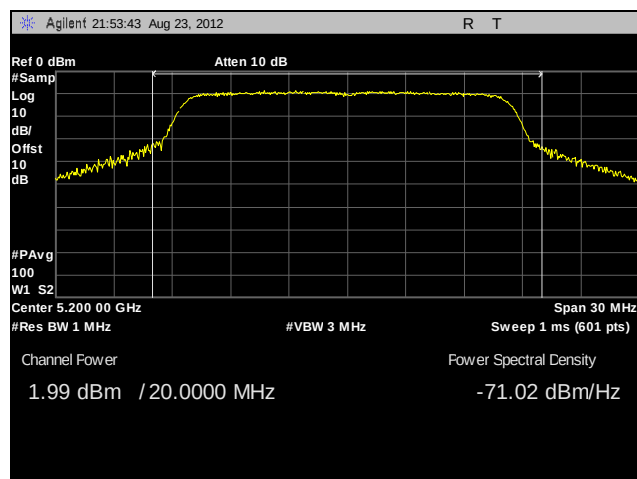
Plot 57. RF Power Output, 802.11a, Low Channel, Port C, Omni Antenna



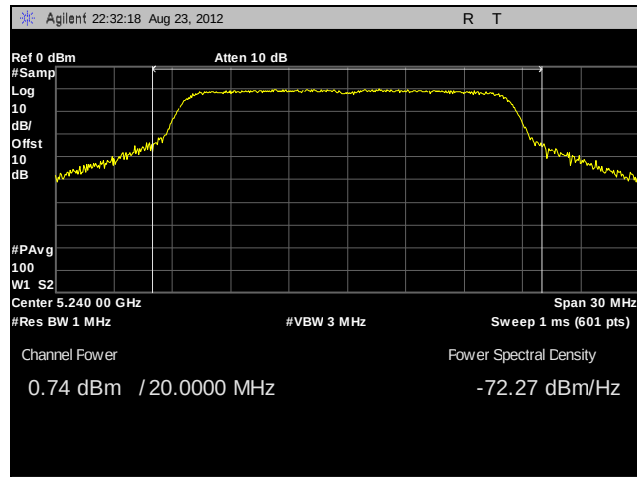
Plot 58. RF Power Output, 802.11a, Mid Channel, Port A, Omni Antenna



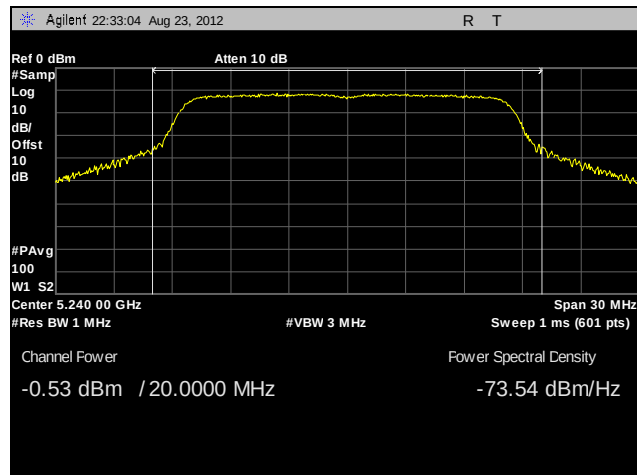
Plot 59. RF Power Output, 802.11a, Mid Channel, Port B, Omni Antenna



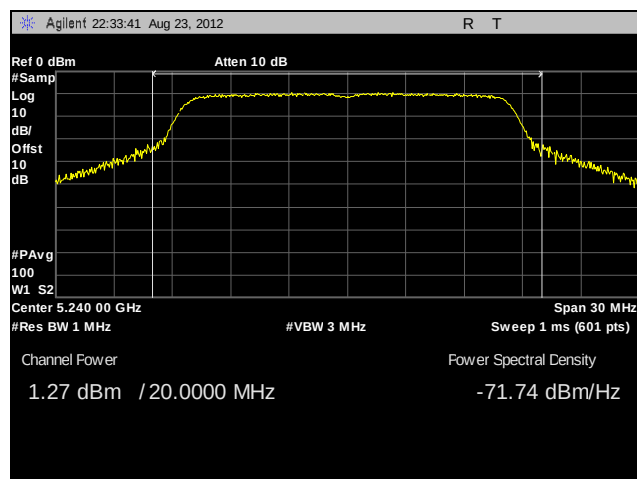
Plot 60. RF Power Output, 802.11a, Mid Channel, Port C, Omni Antenna



Plot 61. RF Power Output, 802.11a, High Channel, Port A, Omni Antenna

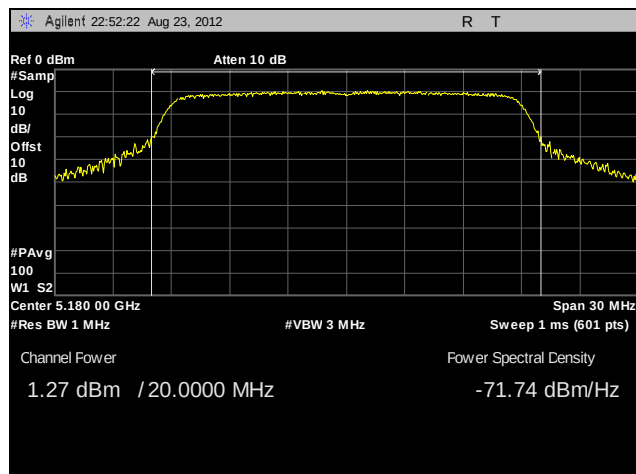


Plot 62. RF Power Output, 802.11a, High Channel, Port B, Omni Antenna

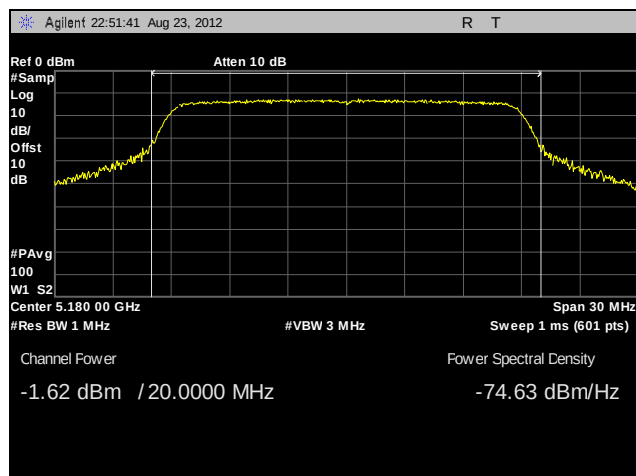


Plot 63. RF Power Output, 802.11a, High Channel, Port C, Omni Antenna

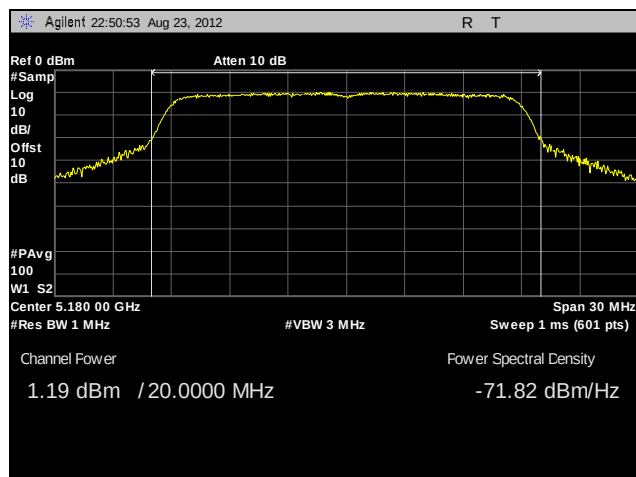
RF Power Output, 802.11n 20 MHz, Omni Antenna



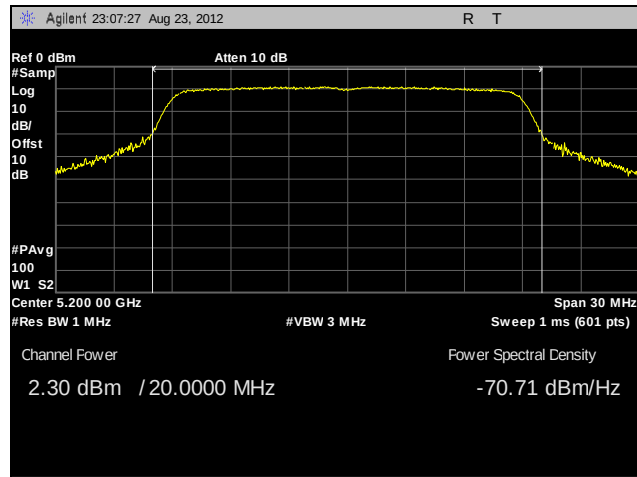
Plot 64. RF Power Output, 802.11n 20 MHz, Low Channel, Port A, Omni Antenna



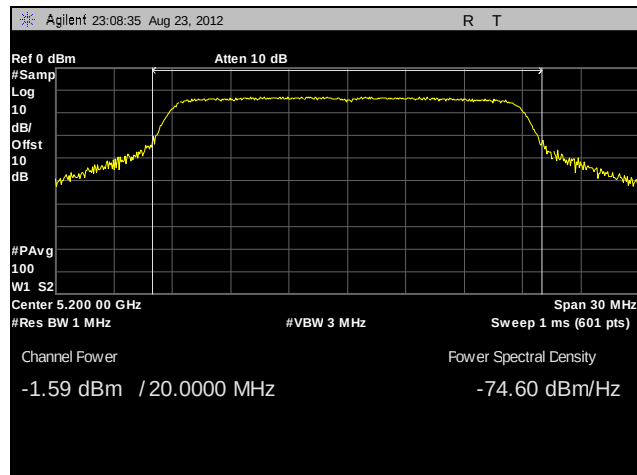
Plot 65. RF Power Output, 802.11n 20 MHz, Low Channel, Port B, Omni Antenna



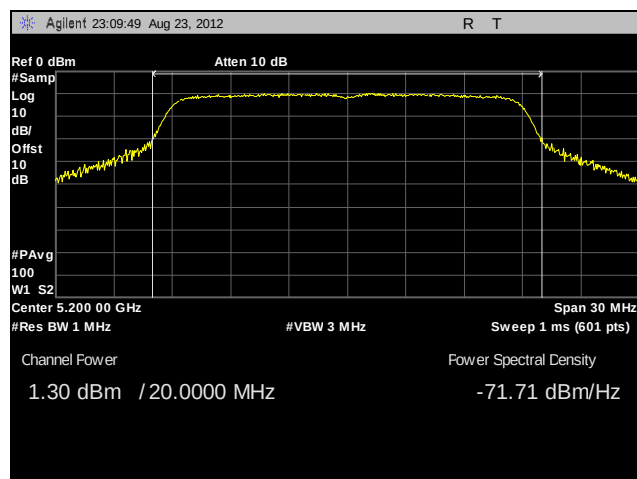
Plot 66. RF Power Output, 802.11n 20 MHz, Low Channel, Port C, Omni Antenna



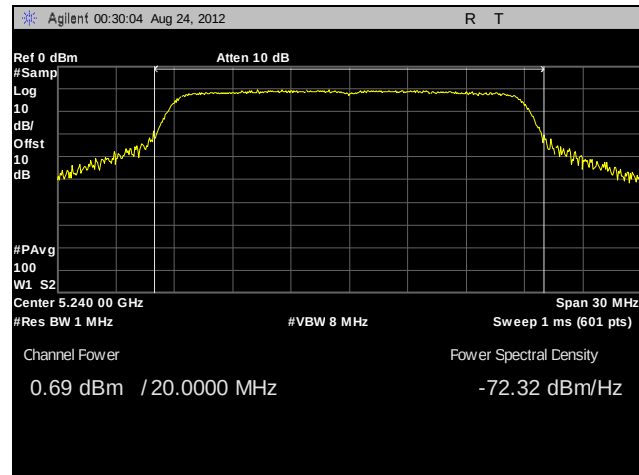
Plot 67. RF Power Output, 802.11n 20 MHz, Mid Channel, Port A, Omni Antenna



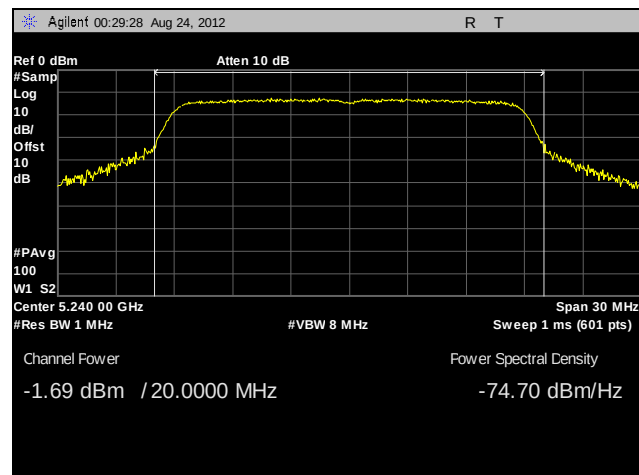
Plot 68. RF Power Output, 802.11n 20 MHz, Mid Channel, Port B, Omni Antenna



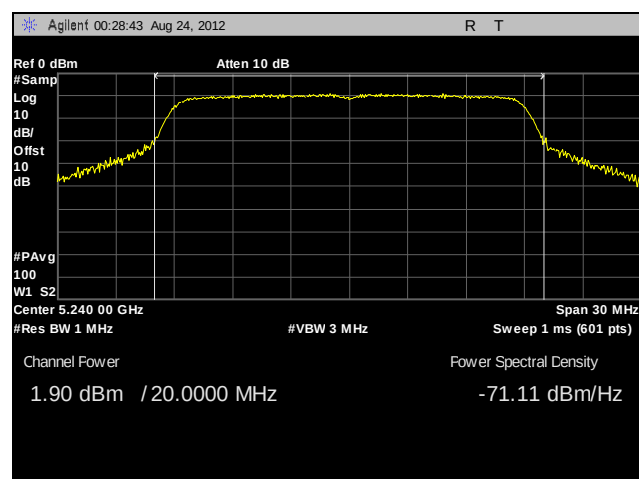
Plot 69. RF Power Output, 802.11n 20 MHz, Mid Channel, Port C, Omni Antenna



Plot 70. RF Power Output, 802.11n 20 MHz, High Channel, Port A, Omni Antenna

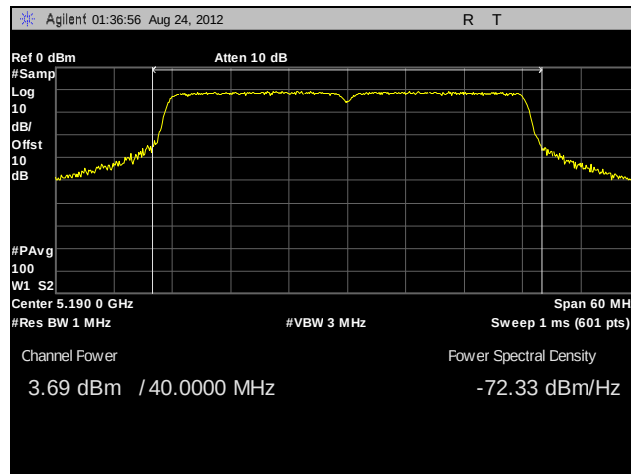


Plot 71. RF Power Output, 802.11n 20 MHz, High Channel, Port B, Omni Antenna

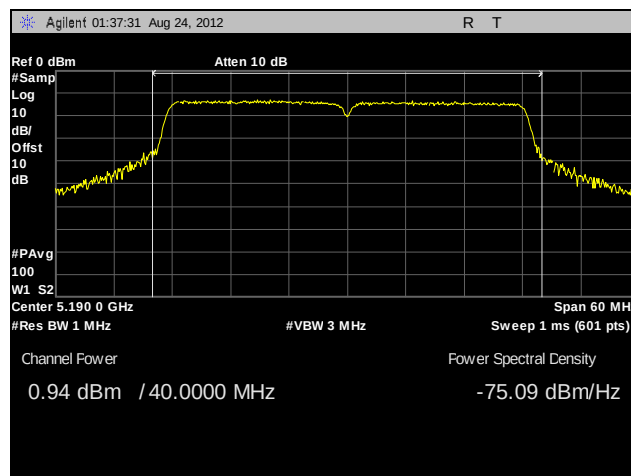


Plot 72. RF Power Output, 802.11n 20 MHz, High Channel, Port C, Omni Antenna

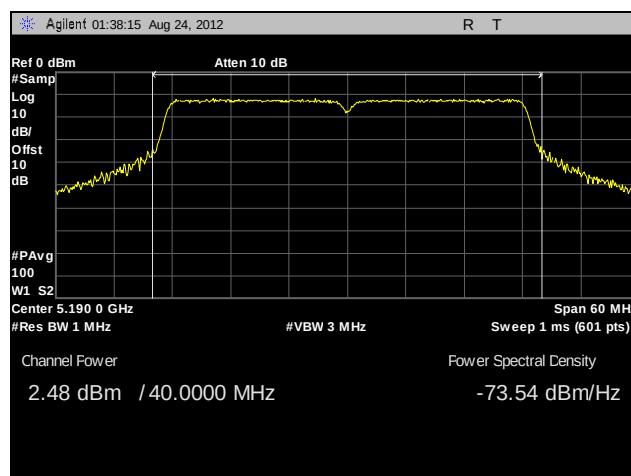
RF Power Output, 802.11n 40 MHz, Omni Antenna



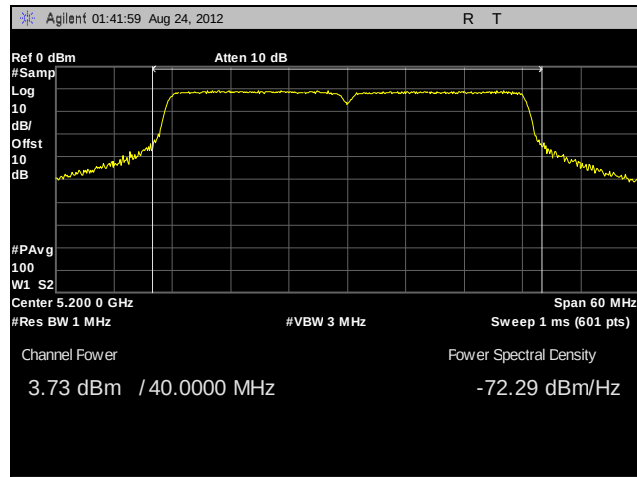
Plot 73. RF Power Output, 802.11n 40 MHz, Low Channel, Port A, Omni Antenna



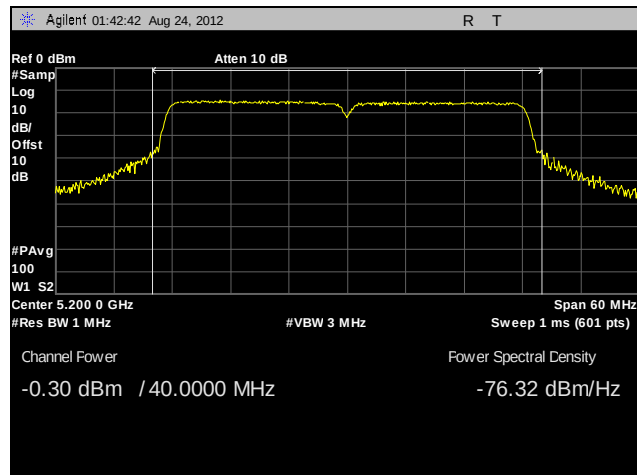
Plot 74. RF Power Output, 802.11n 40 MHz, Low Channel, Port B, Omni Antenna



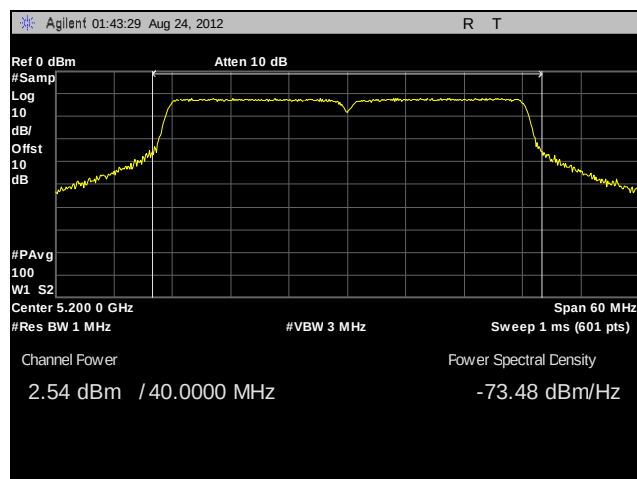
Plot 75. RF Power Output, 802.11n 40 MHz, Low Channel, Port C, Omni Antenna



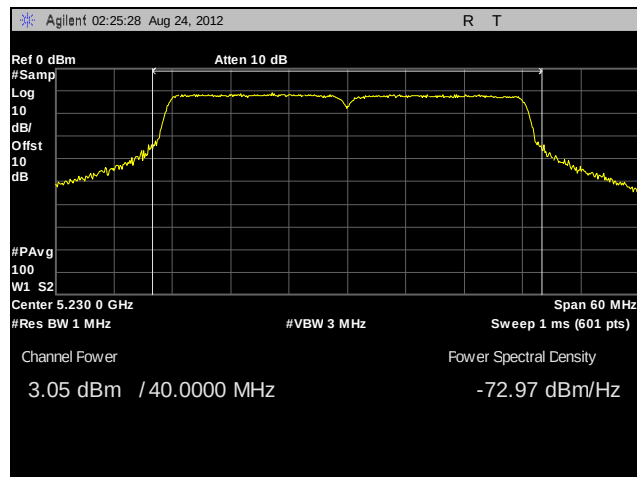
Plot 76. RF Power Output, 802.11n 40 MHz, Mid Channel, Port A, Omni Antenna



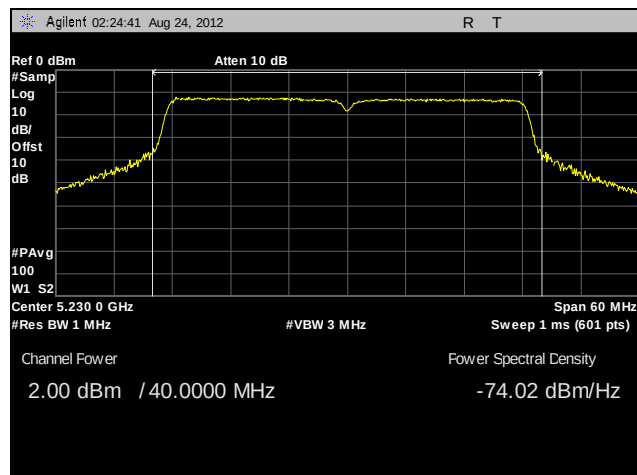
Plot 77. RF Power Output, 802.11n 40 MHz, Mid Channel, Port B, Omni Antenna



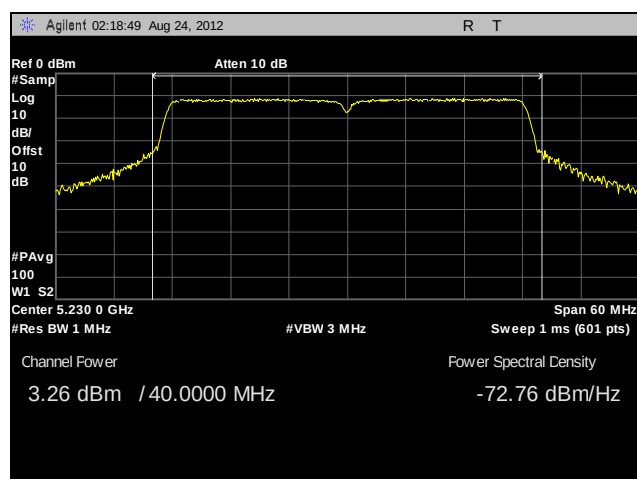
Plot 78. RF Power Output, 802.11n 40 MHz, Mid Channel, Port C, Omni Antenna



Plot 79. RF Power Output, 802.11n 40 MHz, High Channel, Port A, Omni Antenna

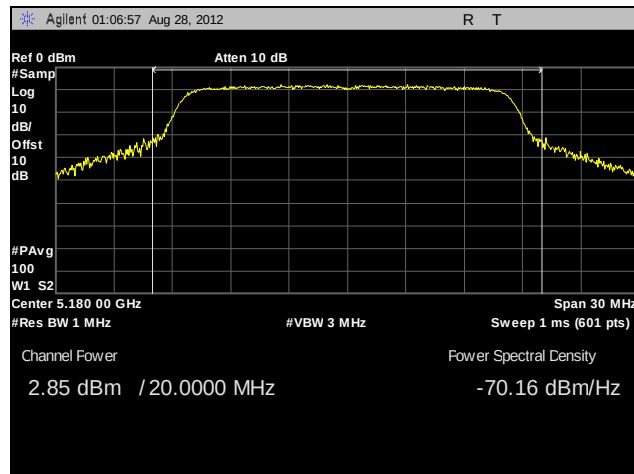


Plot 80. RF Power Output, 802.11n 40 MHz, High Channel, Port B, Omni Antenna

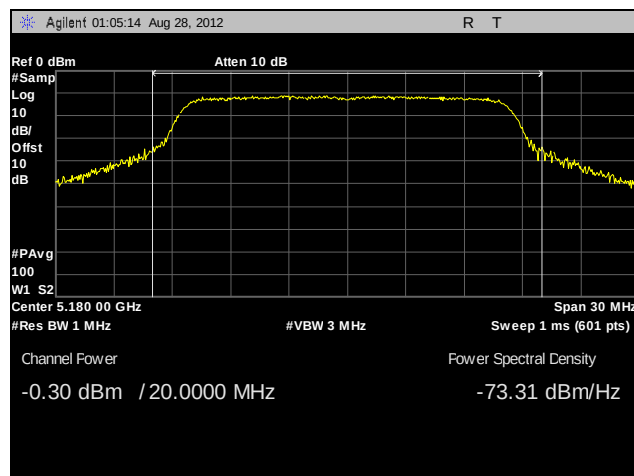


Plot 81. RF Power Output, 802.11n 40 MHz, High Channel, Port C, Omni Antenna

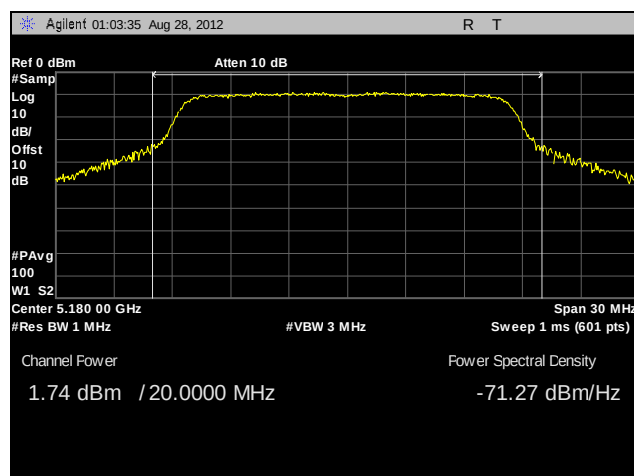
RF Power Output, 802.11a, Panel Antenna



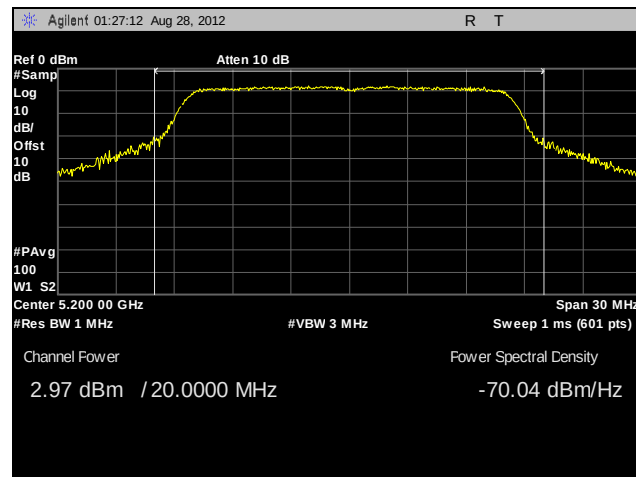
Plot 82. RF Power Output, 802.11a, Low Channel, Port A, Panel Antenna



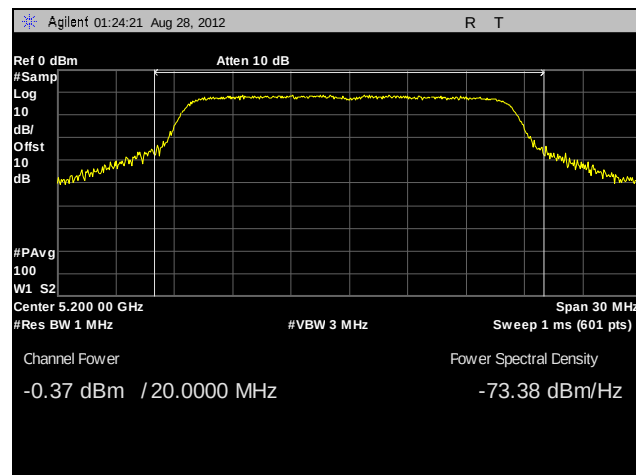
Plot 83. RF Power Output, 802.11a, Low Channel, Port B, Panel Antenna



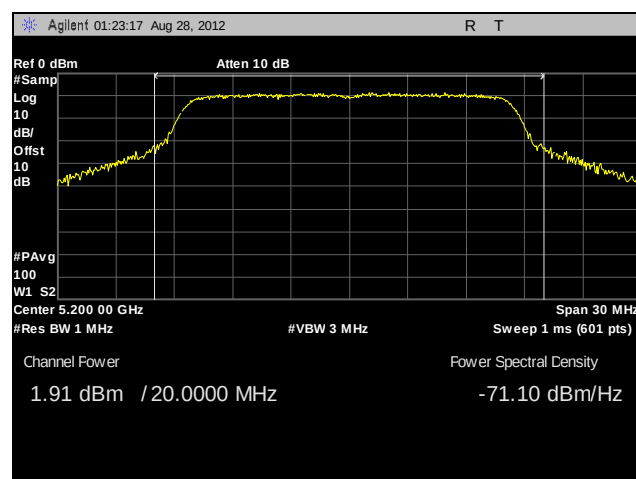
Plot 84. RF Power Output, 802.11a, Low Channel, Port C, Panel Antenna



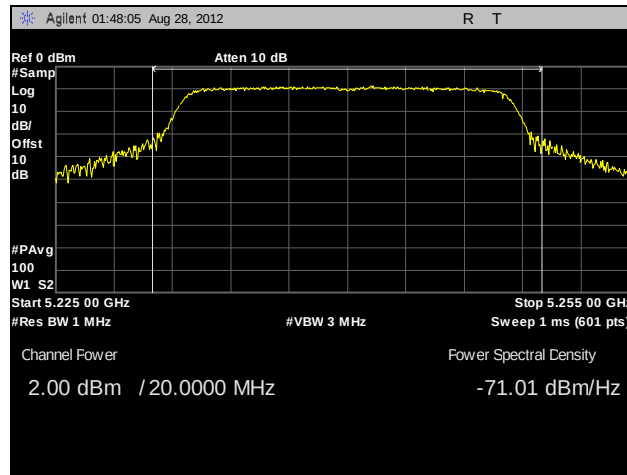
Plot 85. RF Power Output, 802.11a, Mid Channel, Port A, Panel Antenna



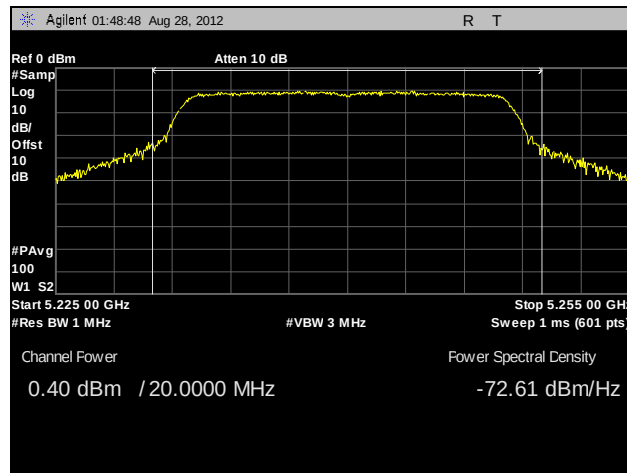
Plot 86. RF Power Output, 802.11a, Mid Channel, Port B, Panel Antenna



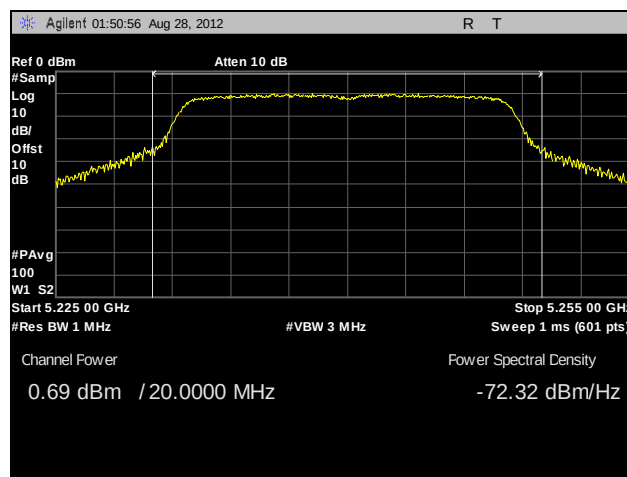
Plot 87. RF Power Output, 802.11a, Mid Channel, Port C, Panel Antenna



Plot 88. RF Power Output, 802.11a, High Channel, Port A, Panel Antenna

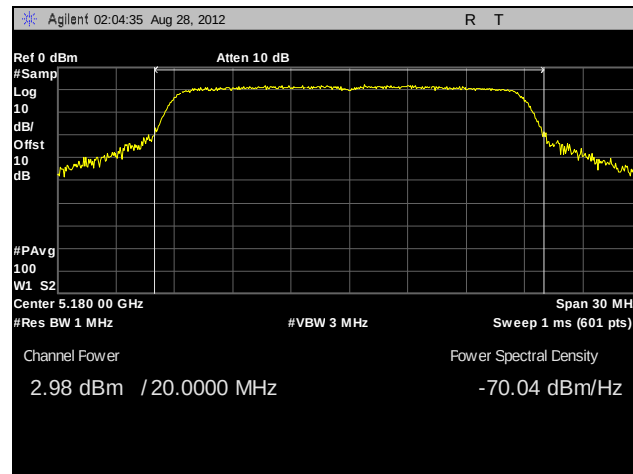


Plot 89. RF Power Output, 802.11a, High Channel, Port B, Panel Antenna

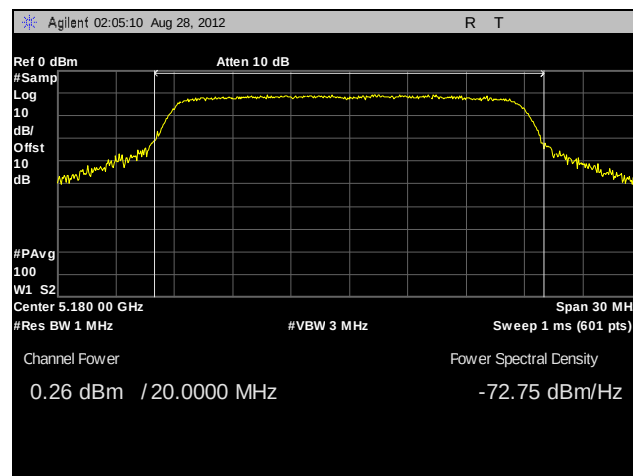


Plot 90. RF Power Output, 802.11a, High Channel, Port C, Panel Antenna

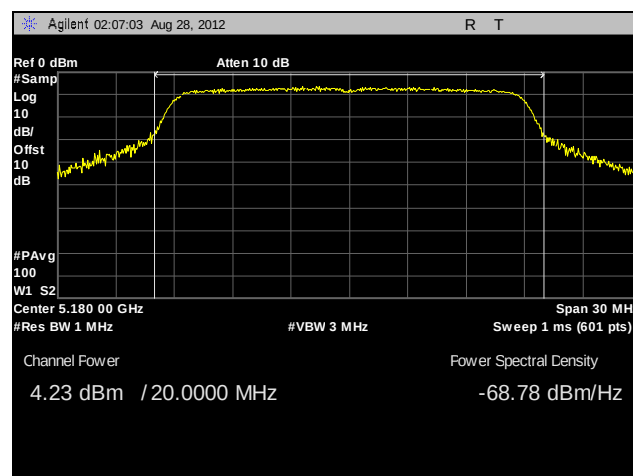
RF Power Output, 802.11n 20 MHz, Panel Antenna



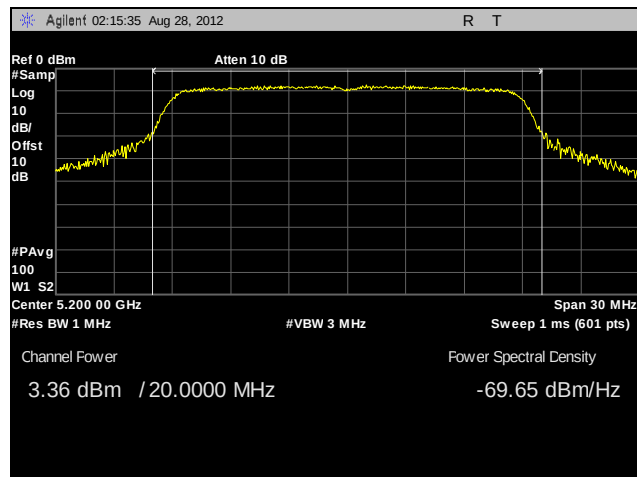
Plot 91. RF Power Output, 802.11n 20 MHz, Low Channel, Port A, Panel Antenna



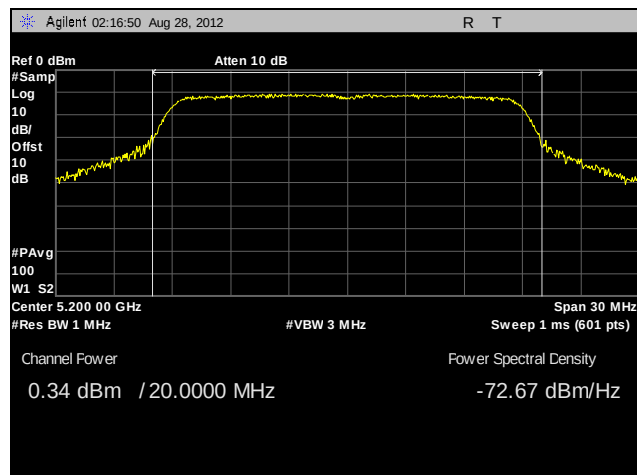
Plot 92. RF Power Output, 802.11n 20 MHz, Low Channel, Port B, Panel Antenna



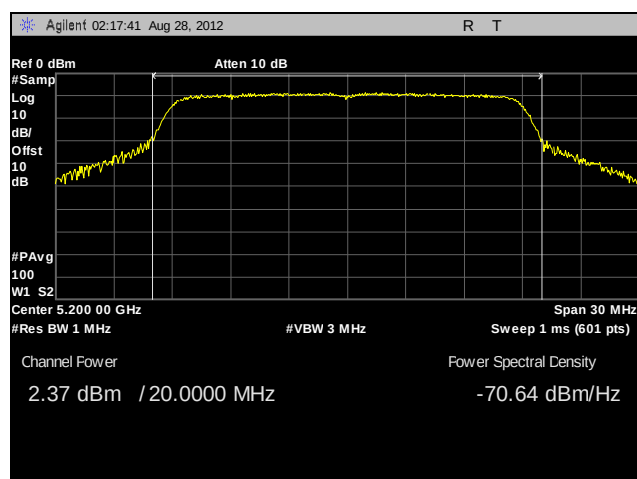
Plot 93. RF Power Output, 802.11n 20 MHz, Low Channel, Port C, Panel Antenna



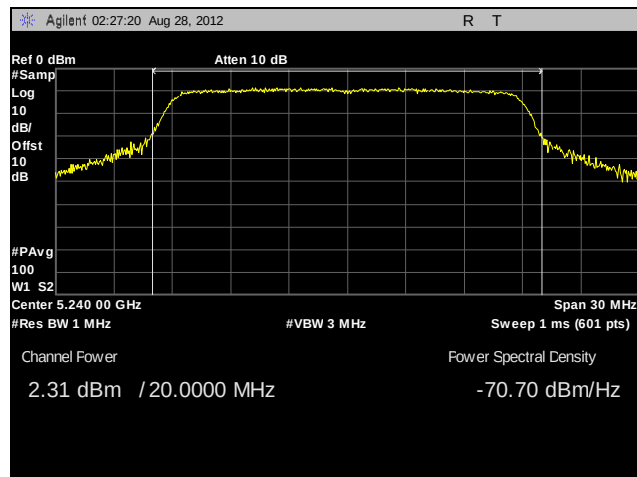
Plot 94. RF Power Output, 802.11n 20 MHz, Mid Channel, Port A, Panel Antenna



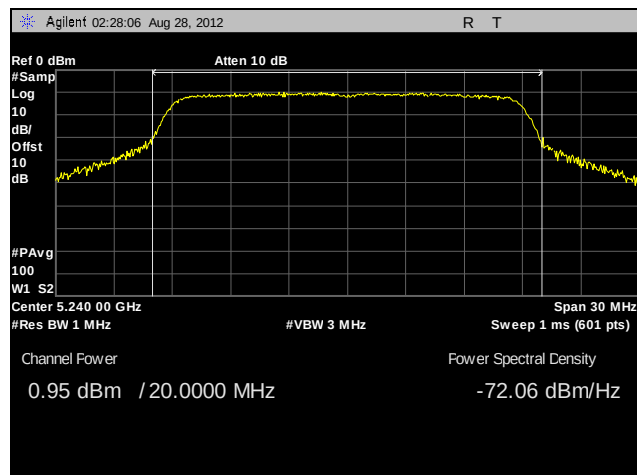
Plot 95. RF Power Output, 802.11n 20 MHz, Mid Channel, Port B, Panel Antenna



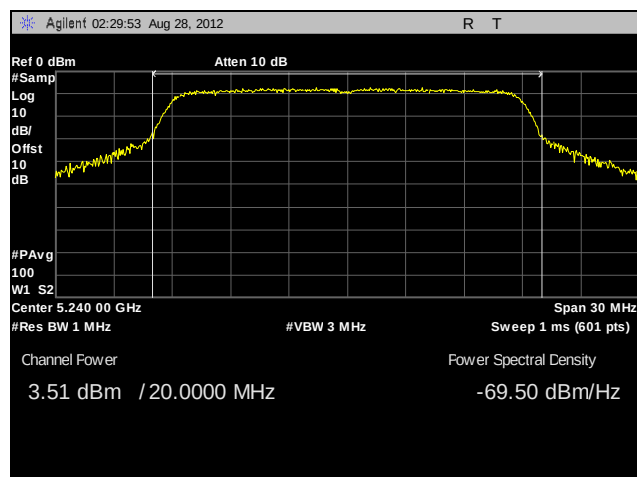
Plot 96. RF Power Output, 802.11n 20 MHz, Mid Channel, Port C, Panel Antenna



Plot 97. RF Power Output, 802.11n 20 MHz, High Channel, Port A, Panel Antenna

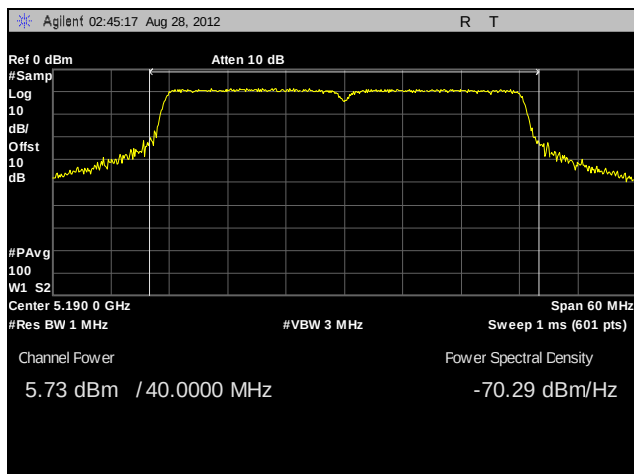


Plot 98. RF Power Output, 802.11n 20 MHz, High Channel, Port B, Panel Antenna

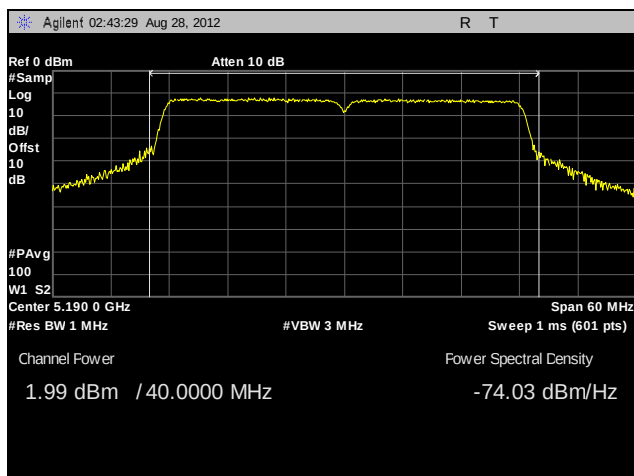


Plot 99. RF Power Output, 802.11n 20 MHz, High Channel, Port C, Panel Antenna

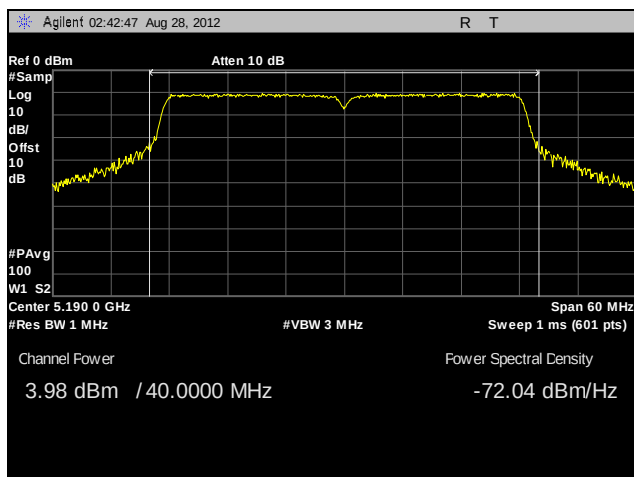
RF Power Output, 802.11n 40 MHz, Panel Antenna



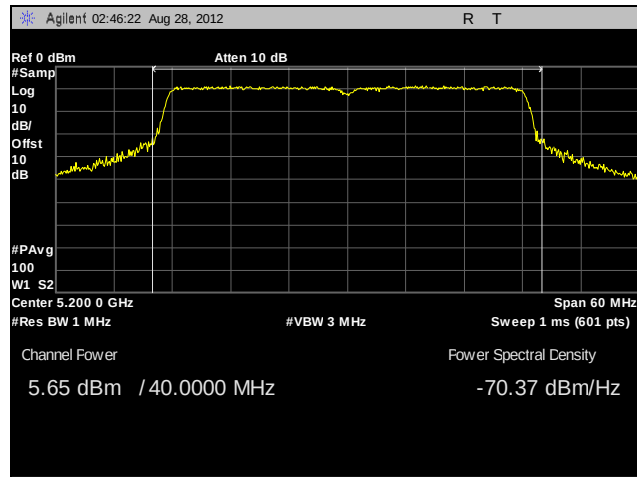
Plot 100. RF Power Output, 802.11n 40 MHz, Low Channel, Port A, Panel Antenna



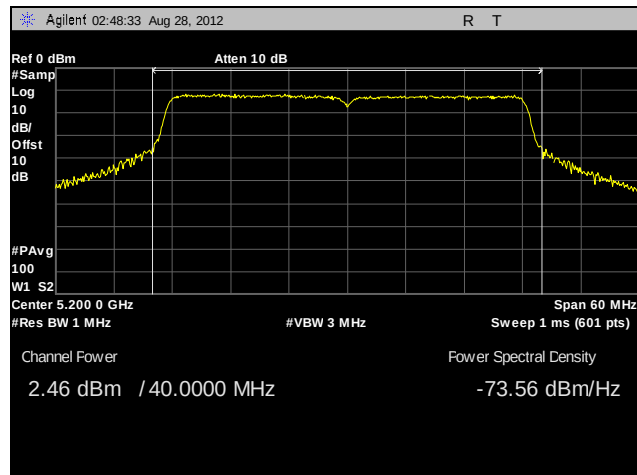
Plot 101. RF Power Output, 802.11n 40 MHz, Low Channel, Port B, Panel Antenna



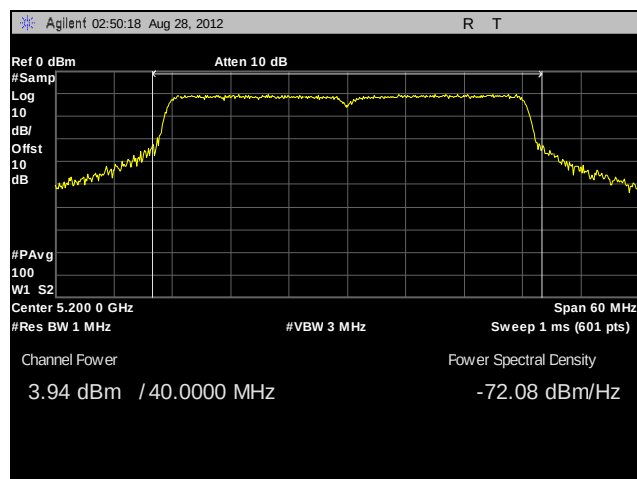
Plot 102. RF Power Output, 802.11n 40 MHz, Low Channel, Port C, Panel Antenna



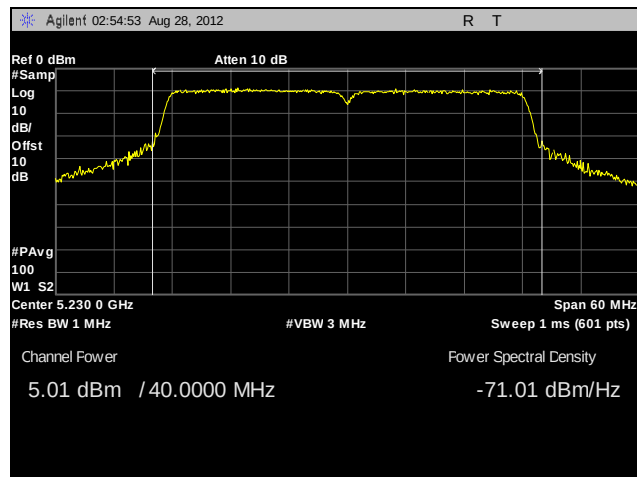
Plot 103. RF Power Output, 802.11n 40 MHz, Mid Channel, Port A, Panel Antenna



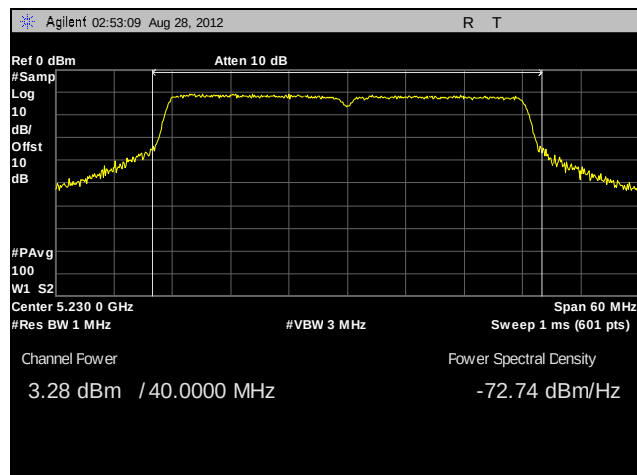
Plot 104. RF Power Output, 802.11n 40 MHz, Mid Channel, Port B, Panel Antenna



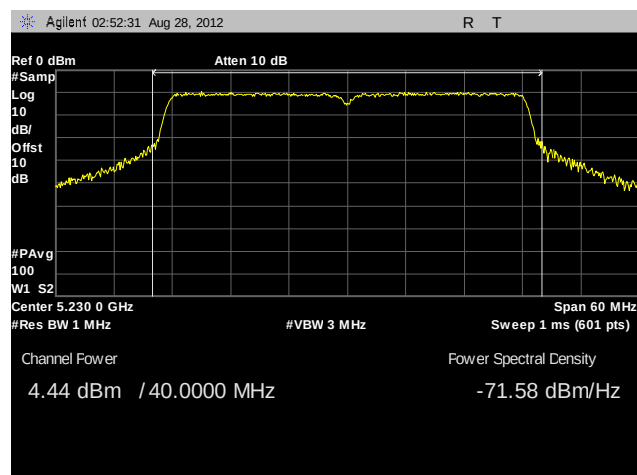
Plot 105. RF Power Output, 802.11n 40 MHz, Mid Channel, Port C, Panel Antenna



Plot 106. RF Power Output, 802.11n 40 MHz, High Channel, Port A, Panel Antenna

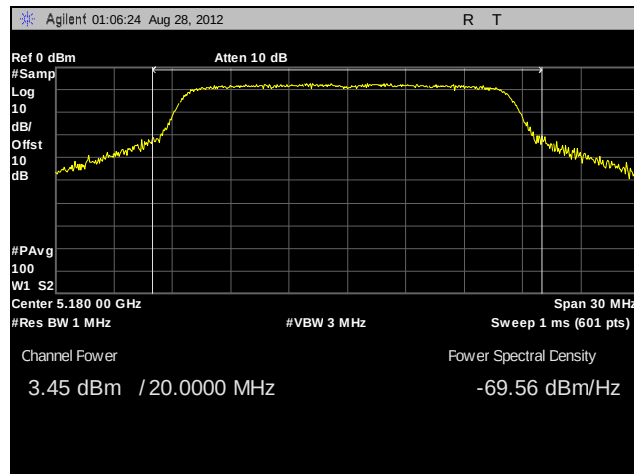


Plot 107. RF Power Output, 802.11n 40 MHz, High Channel, Port B, Panel Antenna

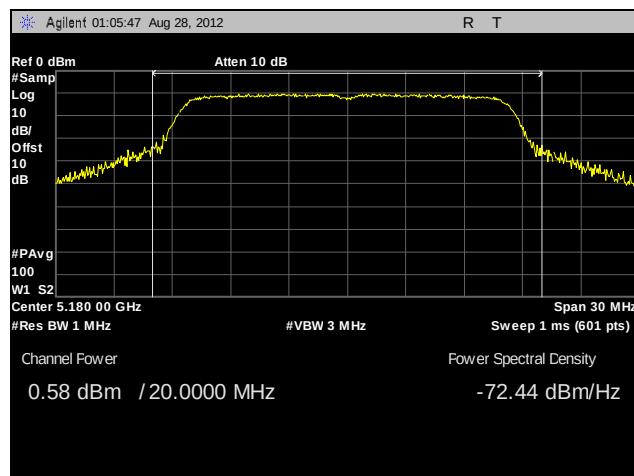


Plot 108. RF Power Output, 802.11n 40 MHz, High Channel, Port C, Panel Antenna

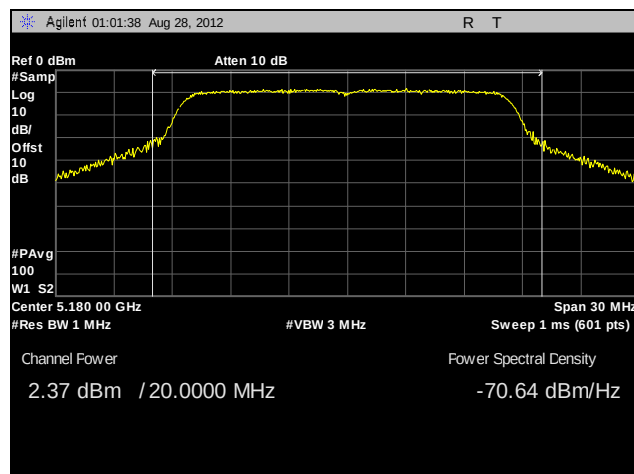
RF Power Output, 802.11a, Lower Gain Omni Antenna



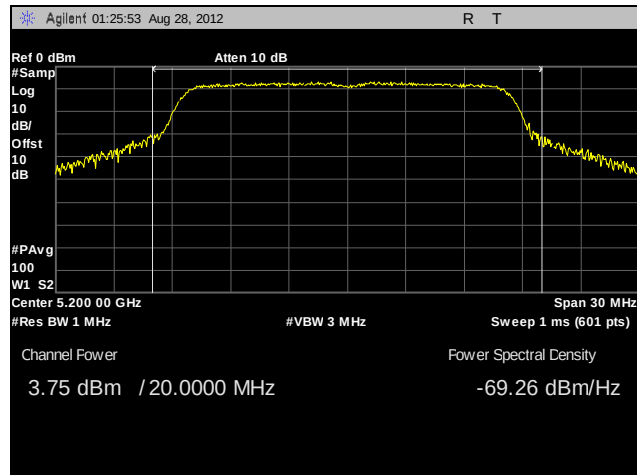
Plot 109. RF Power Output, 802.11a, Low Channel, Port A, Lower Gain Omni Antenna



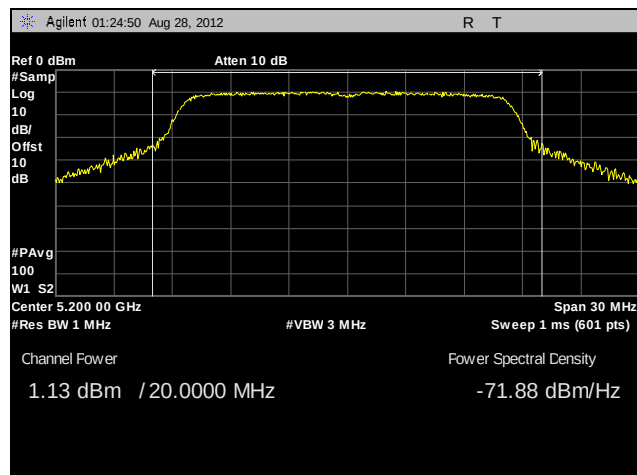
Plot 110. RF Power Output, 802.11a, Low Channel, Port B, Lower Gain Omni Antenna



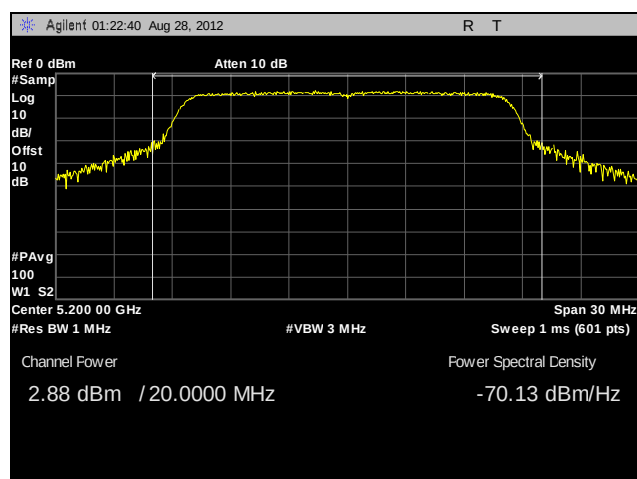
Plot 111. RF Power Output, 802.11a, Low Channel, Port C, Lower Gain Omni Antenna



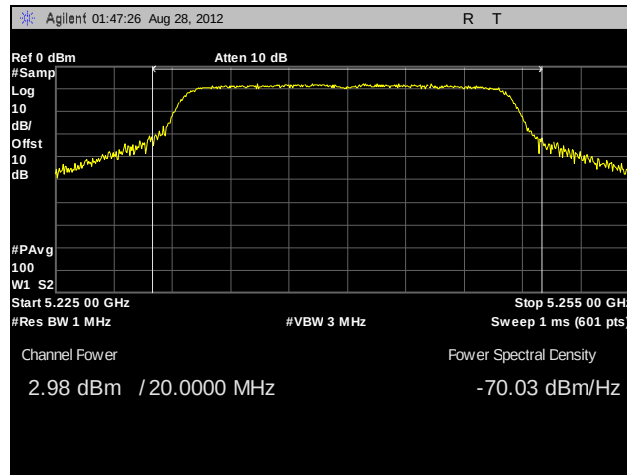
Plot 112. RF Power Output, 802.11a, Mid Channel, Port A, Lower Gain Omni Antenna



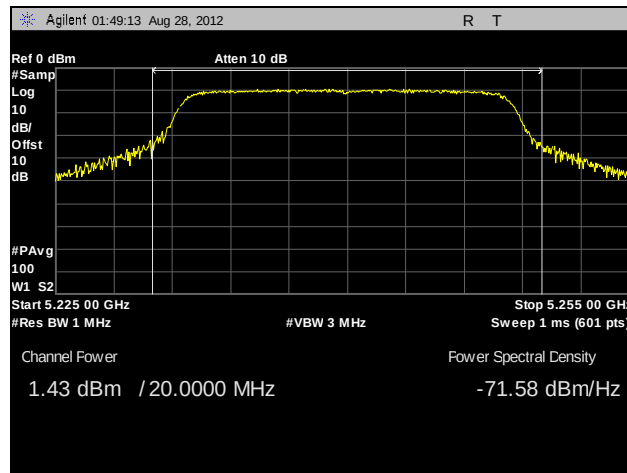
Plot 113. RF Power Output, 802.11a, Mid Channel, Port B, Lower Gain Omni Antenna



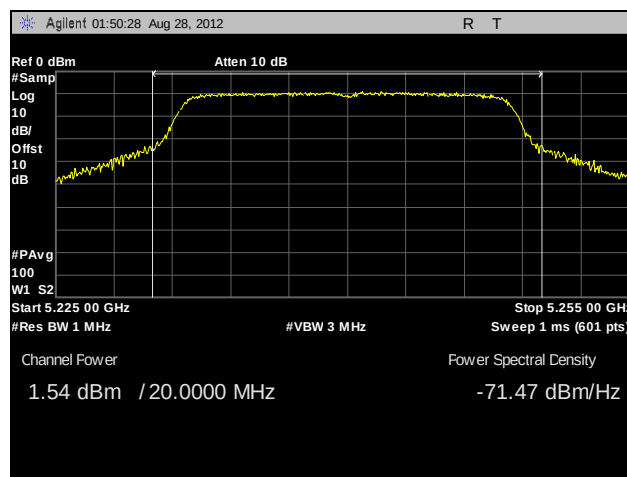
Plot 114. RF Power Output, 802.11a, Mid Channel, Port C, Lower Gain Omni Antenna



Plot 115. RF Power Output, 802.11a, High Channel, Port A, Lower Gain Omni Antenna

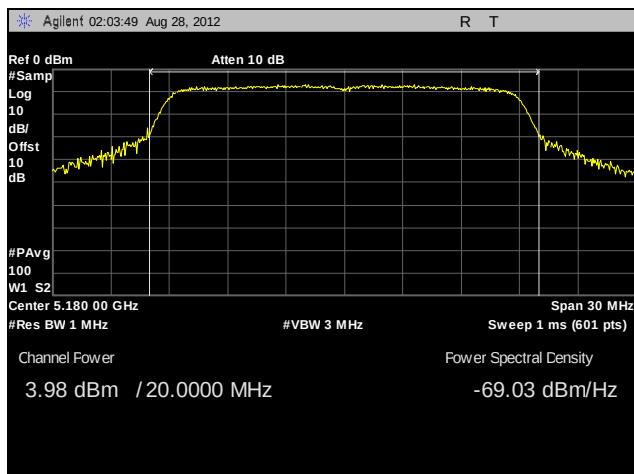


Plot 116. RF Power Output, 802.11a, High Channel, Port B, Lower Gain Omni Antenna

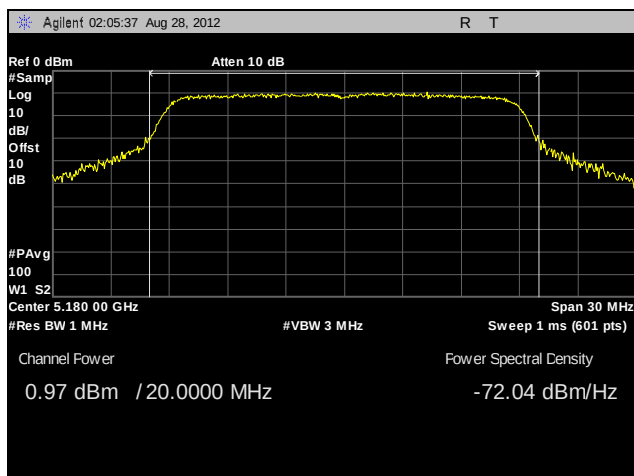


Plot 117. RF Power Output, 802.11a, High Channel, Port C, Lower Gain Omni Antenna

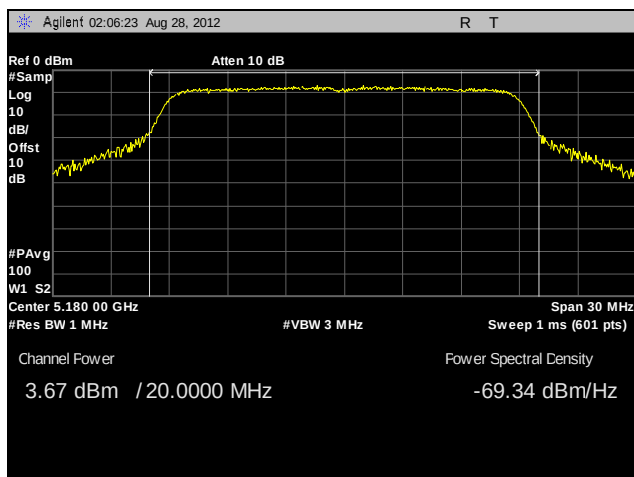
RF Power Output, 802.11n 20 MHz, Lower Gain Omni Antenna



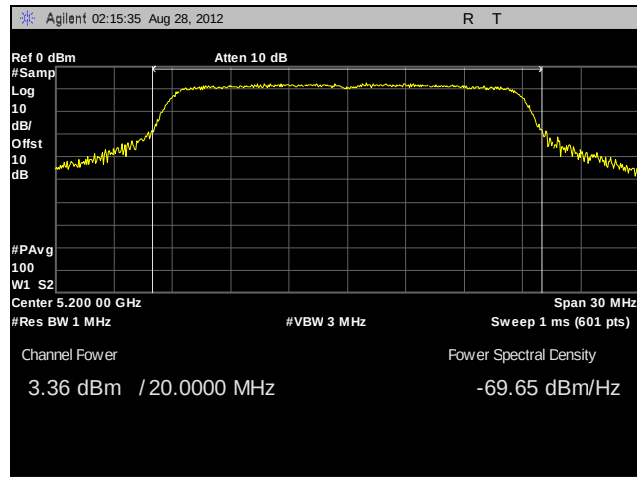
Plot 118. RF Power Output, 802.11n 20 MHz, Low Channel, Port A, Lower Gain Omni Antenna



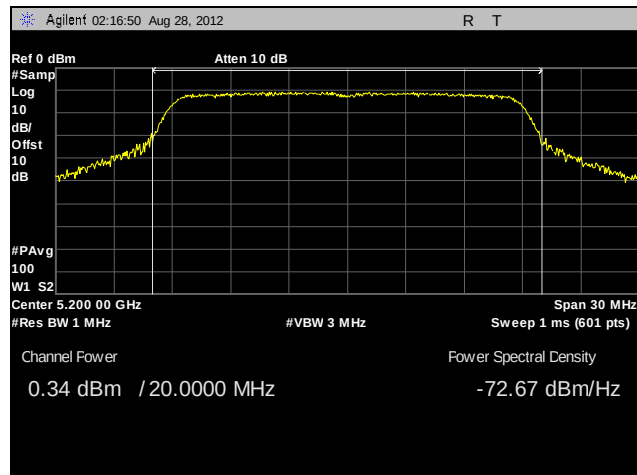
Plot 119. RF Power Output, 802.11n 20 MHz, Low Channel, Port B, Lower Gain Omni Antenna



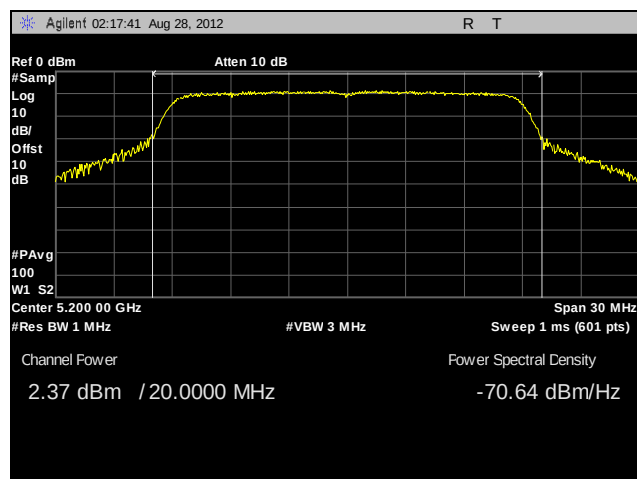
Plot 120. RF Power Output, 802.11n 20 MHz, Low Channel, Port C, Lower Gain Omni Antenna



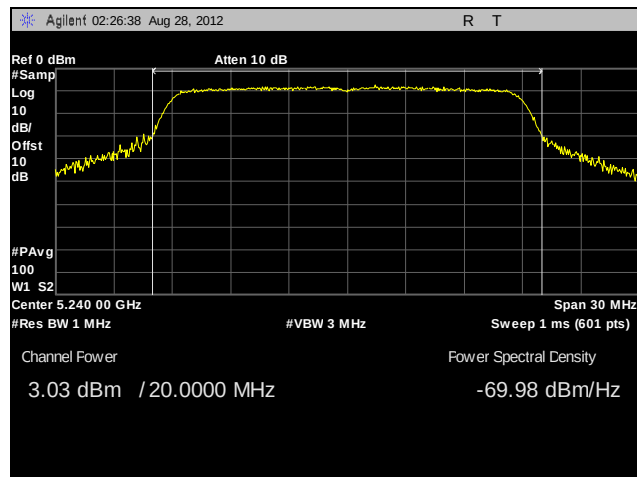
Plot 121. RF Power Output, 802.11n 20 MHz, Mid Channel, Port A, Lower Gain Omni Antenna



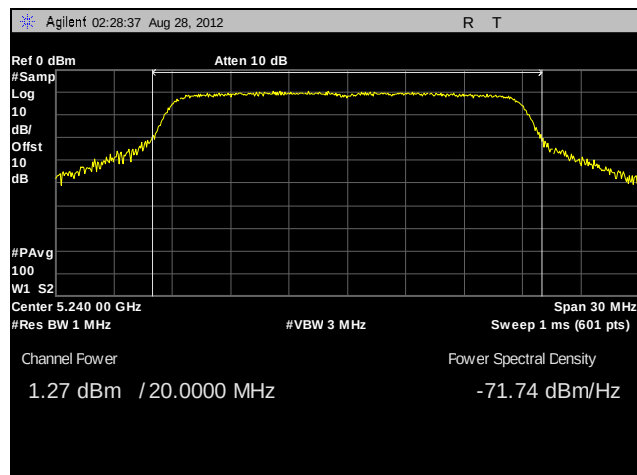
Plot 122. RF Power Output, 802.11n 20 MHz, Mid Channel, Port B, Lower Gain Omni Antenna



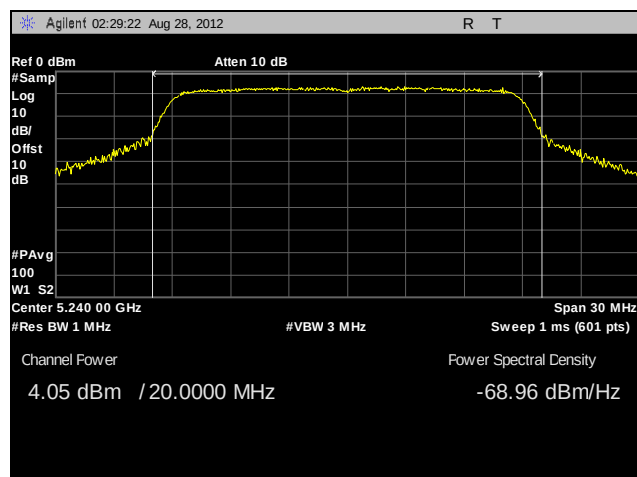
Plot 123. RF Power Output, 802.11n 20 MHz, Mid Channel, Port C, Lower Gain Omni Antenna



Plot 124. RF Power Output, 802.11n 20 MHz, High Channel, Port A, Lower Gain Omni Antenna

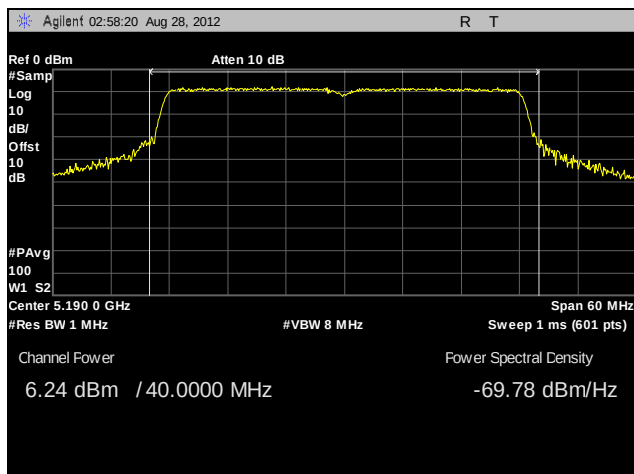


Plot 125. RF Power Output, 802.11n 20 MHz, High Channel, Port B, Lower Gain Omni Antenna

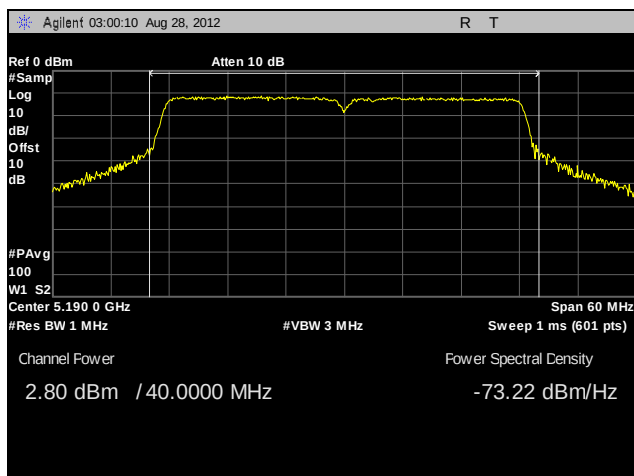


Plot 126. RF Power Output, 802.11n 20 MHz, High Channel, Port C, Lower Gain Omni Antenna

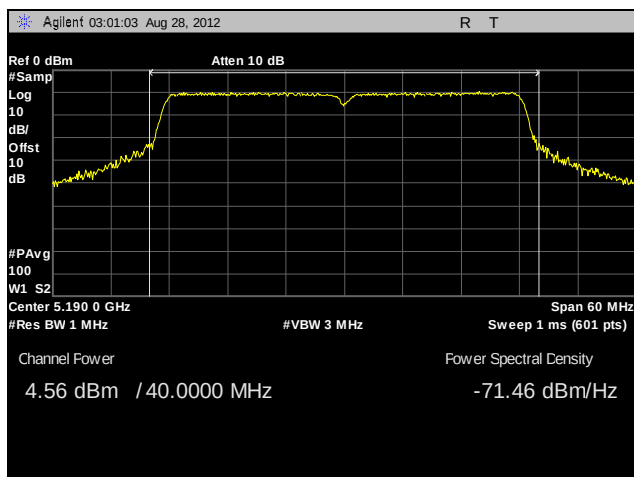
RF Power Output, 802.11n 40 MHz, Lower Gain Omni Antenna



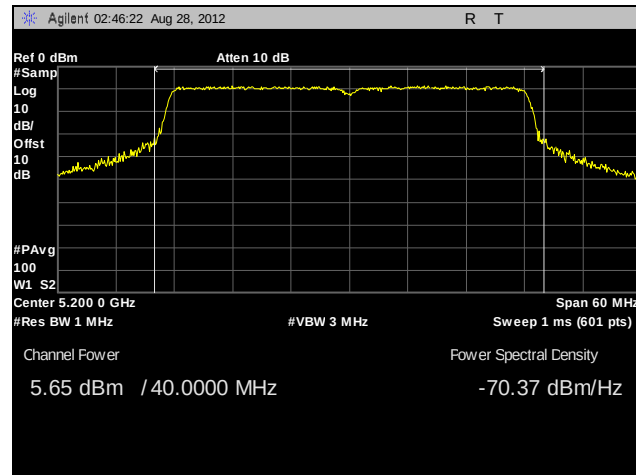
Plot 127. RF Power Output, 802.11n 40 MHz, Low Channel, Port A, Lower Gain Omni Antenna



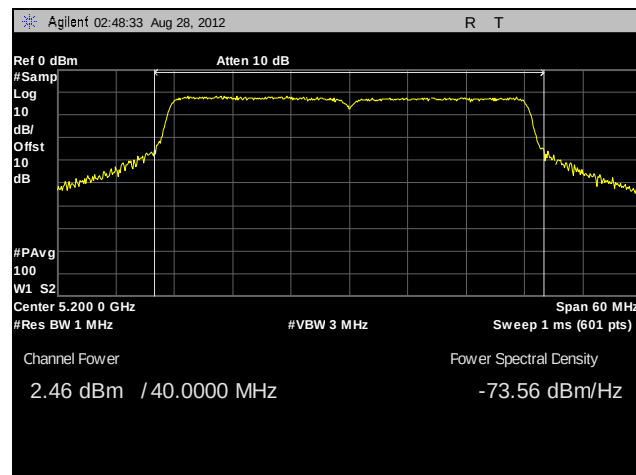
Plot 128. RF Power Output, 802.11n 40 MHz, Low Channel, Port B, Lower Gain Omni Antenna



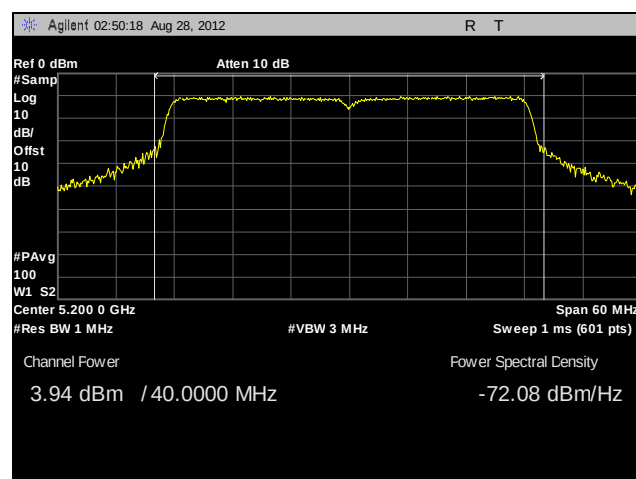
Plot 129. RF Power Output, 802.11n 40 MHz, Low Channel, Port C, Lower Gain Omni Antenna



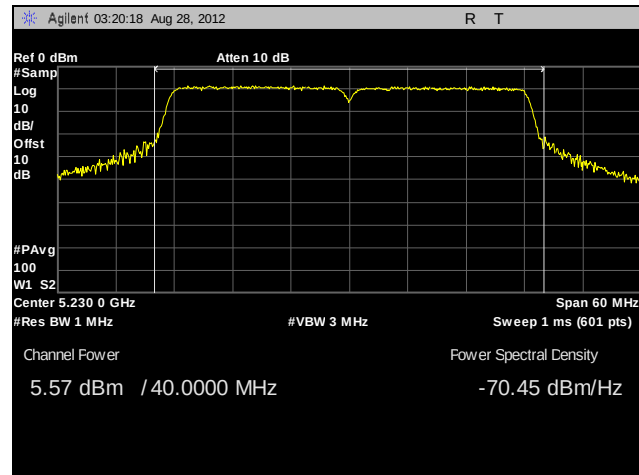
Plot 130. RF Power Output, 802.11n 40 MHz, Mid Channel, Port A, Lower Gain Omni Antenna



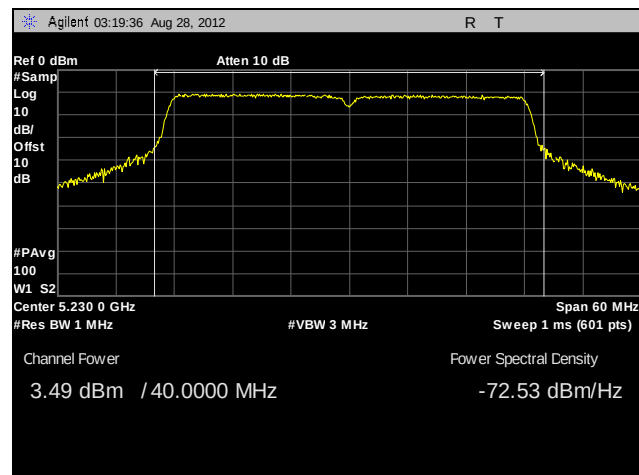
Plot 131. RF Power Output, 802.11n 40 MHz, Mid Channel, Port B, Lower Gain Omni Antenna



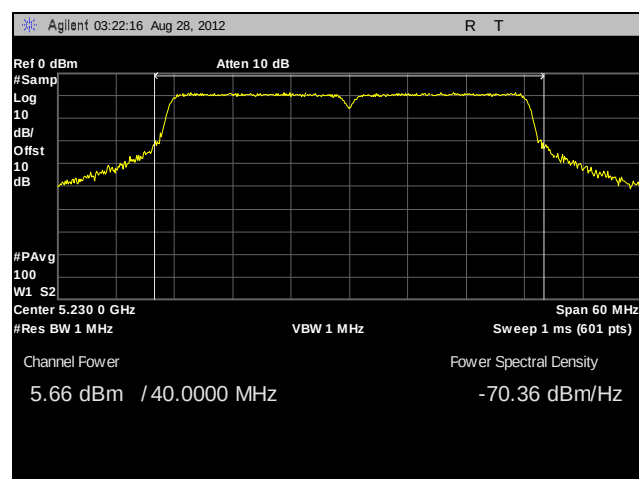
Plot 132. RF Power Output, 802.11n 40 MHz, Mid Channel, Port C, Lower Gain Omni Antenna



Plot 133. RF Power Output, 802.11n 40 MHz, High Channel, Port A, Lower Gain Omni Antenna

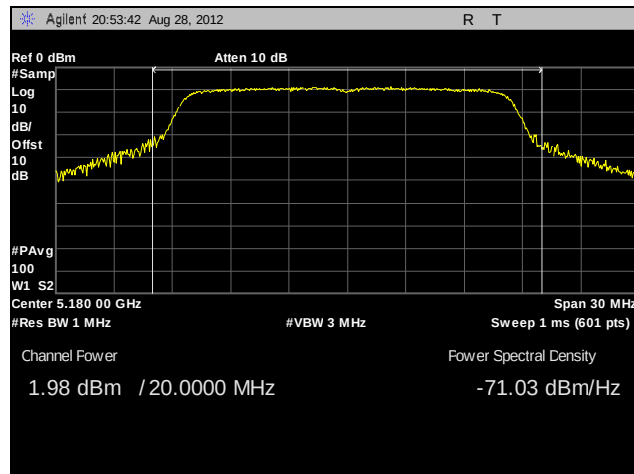


Plot 134. RF Power Output, 802.11n 40 MHz, High Channel, Port B, Lower Gain Omni Antenna

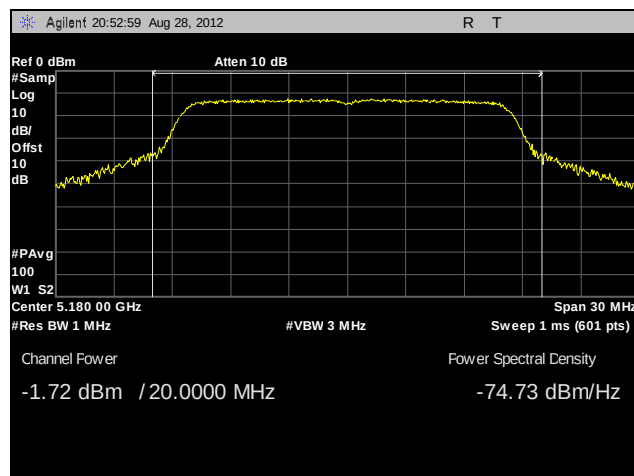


Plot 135. RF Power Output, 802.11n 40 MHz, High Channel, Port C, Lower Gain Omni Antenna

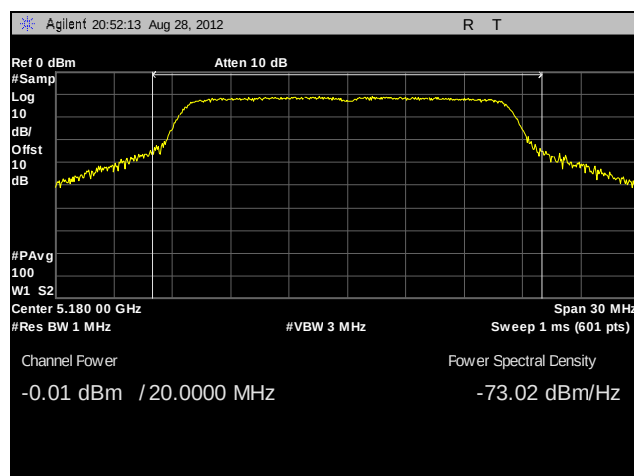
RF Power Output, 802.11a, Patch Antenna



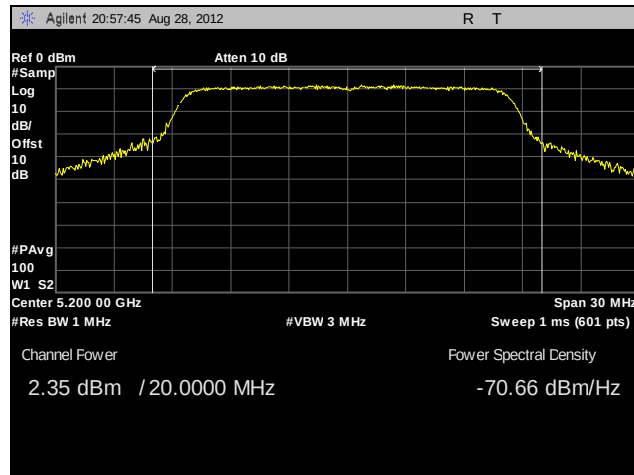
Plot 136. RF Power Output, 802.11a, Low Channel, Port A, Patch Antenna



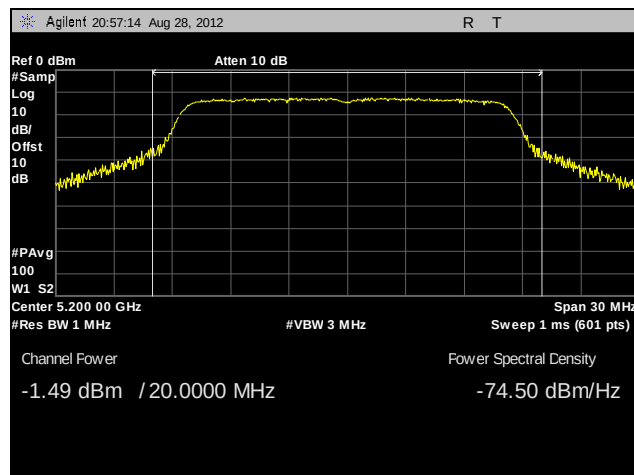
Plot 137. RF Power Output, 802.11a, Low Channel, Port B, Patch Antenna



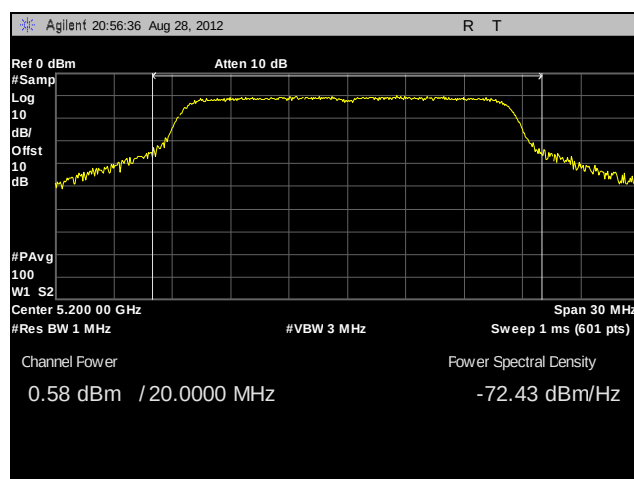
Plot 138. RF Power Output, 802.11a, Low Channel, Port C, Patch Antenna



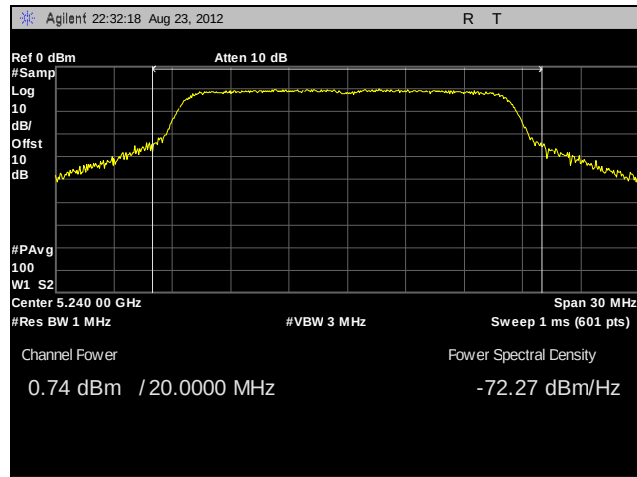
Plot 139. RF Power Output, 802.11a, Mid Channel, Port A, Patch Antenna



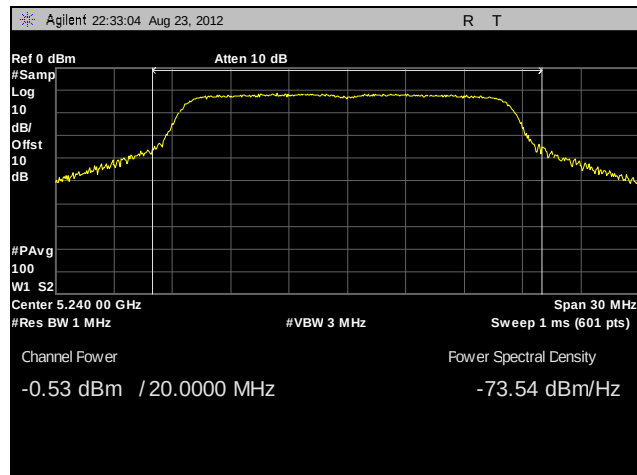
Plot 140. RF Power Output, 802.11a, Mid Channel, Port B, Patch Antenna



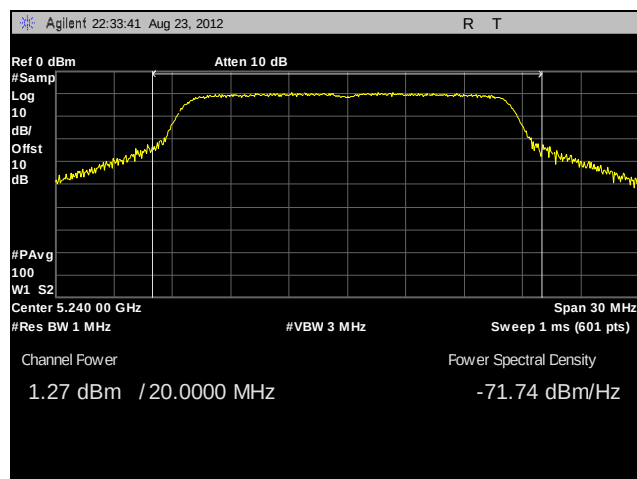
Plot 141. RF Power Output, 802.11a, Mid Channel, Port C, Patch Antenna



Plot 142. RF Power Output, 802.11a, High Channel, Port A, Patch Antenna

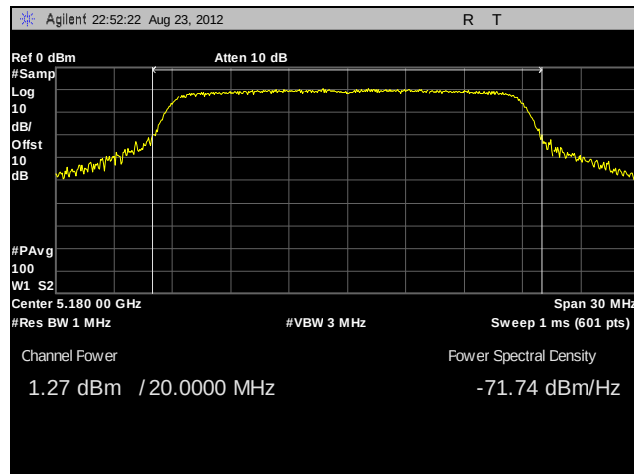


Plot 143. RF Power Output, 802.11a, High Channel, Port B, Patch Antenna

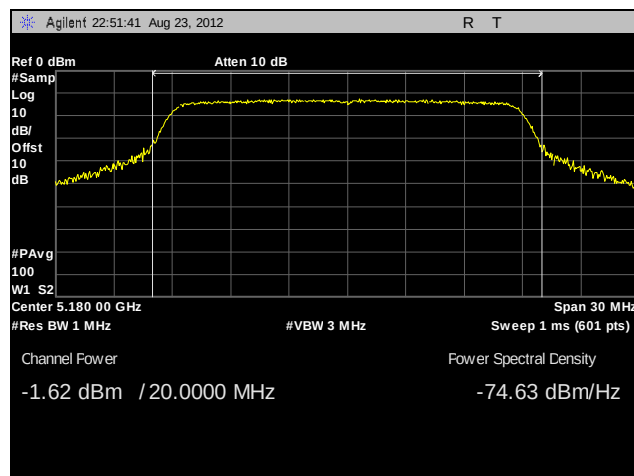


Plot 144. RF Power Output, 802.11a, High Channel, Port C, Patch Antenna

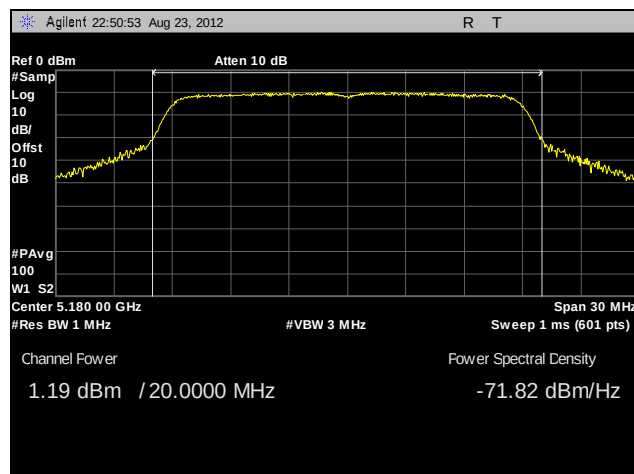
RF Power Output, 802.11n 20 MHz, Patch Antenna



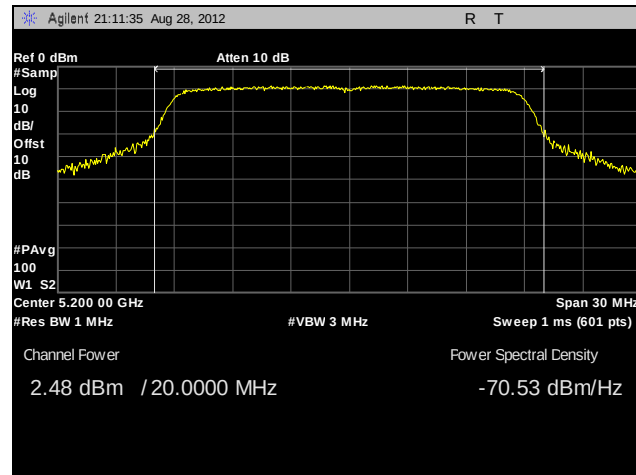
Plot 145. RF Power Output, 802.11n 20 MHz, Low Channel, Port A, Patch Antenna



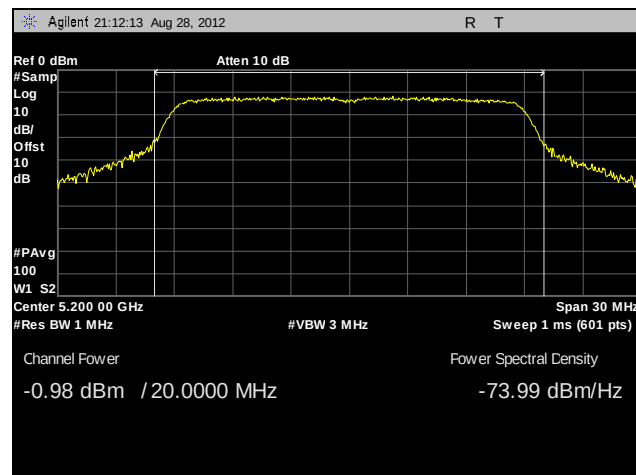
Plot 146. RF Power Output, 802.11n 20 MHz, Low Channel, Port B, Patch Antenna



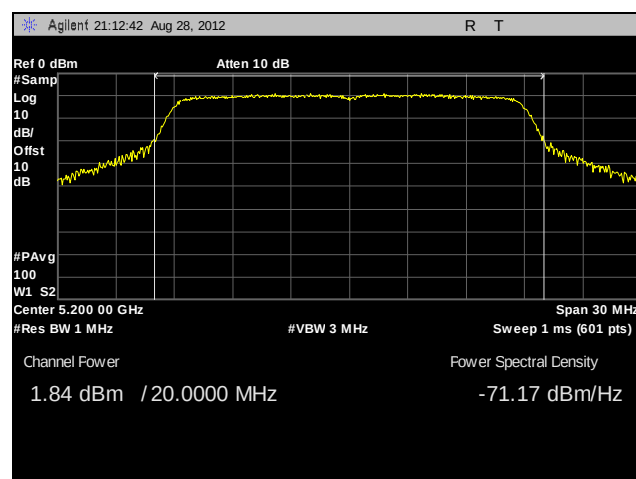
Plot 147. RF Power Output, 802.11n 20 MHz, Low Channel, Port C, Patch Antenna



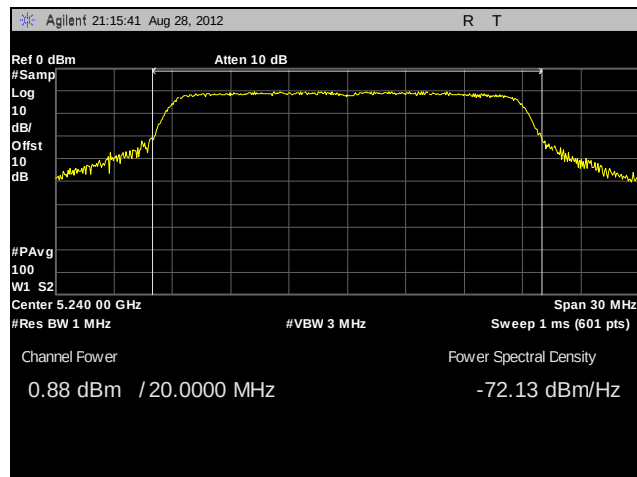
Plot 148. RF Power Output, 802.11n 20 MHz, Mid Channel, Port A, Patch Antenna



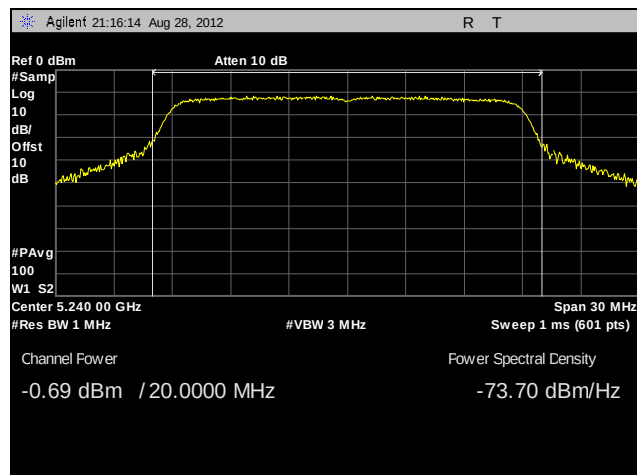
Plot 149. RF Power Output, 802.11n 20 MHz, Mid Channel, Port B, Patch Antenna



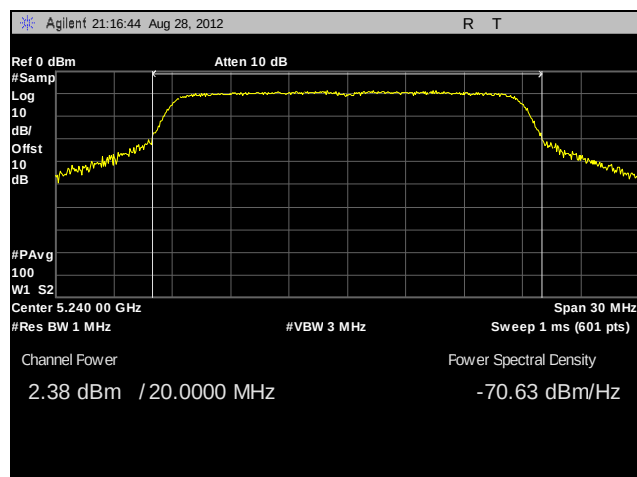
Plot 150. RF Power Output, 802.11n 20 MHz, Mid Channel, Port C, Patch Antenna



Plot 151. RF Power Output, 802.11n 20 MHz, High Channel, Port A, Patch Antenna

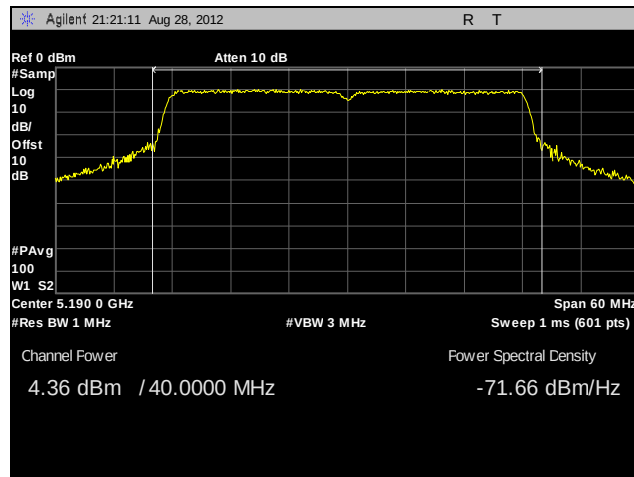


Plot 152. RF Power Output, 802.11n 20 MHz, High Channel, Port B, Patch Antenna

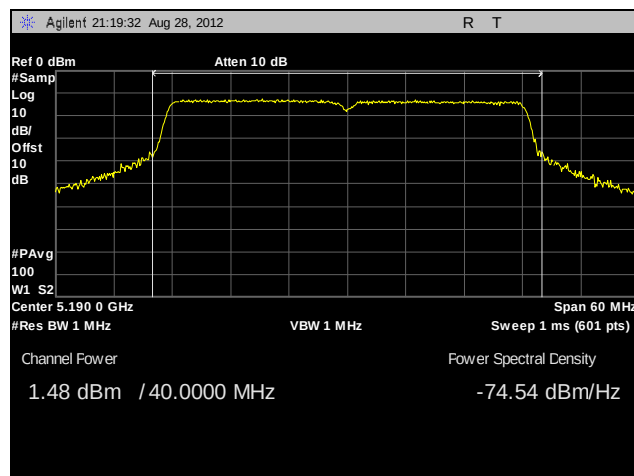


Plot 153. RF Power Output, 802.11n 20 MHz, High Channel, Port C, Patch Antenna

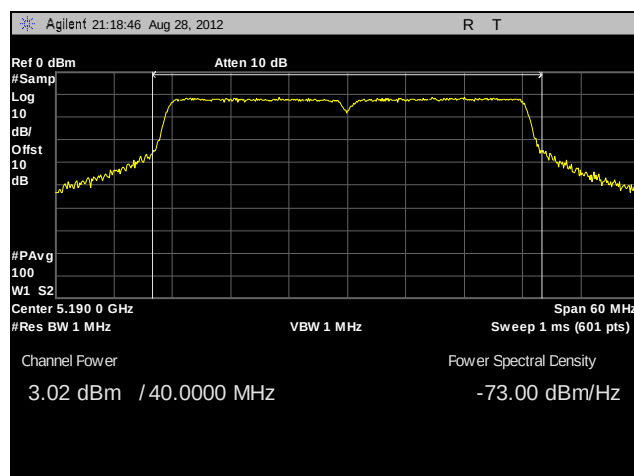
RF Power Output, 802.11n 40 MHz, Patch Antenna



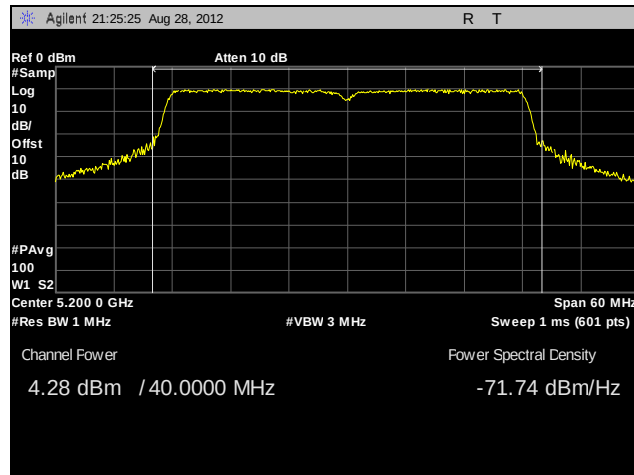
Plot 154. RF Power Output, 802.11n 40 MHz, Low Channel, Port A, Patch Antenna



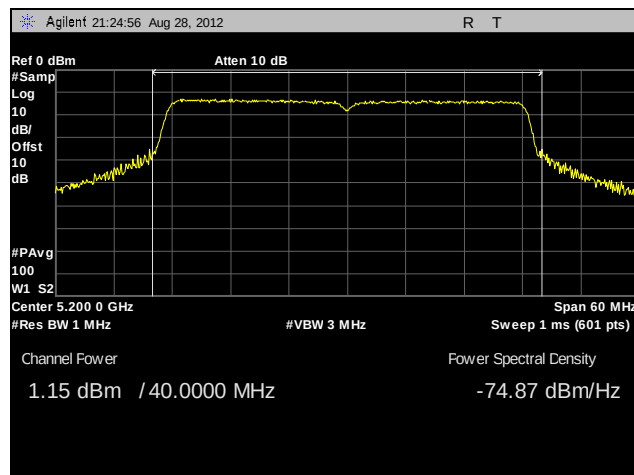
Plot 155. RF Power Output, 802.11n 40 MHz, Low Channel, Port B, Patch Antenna



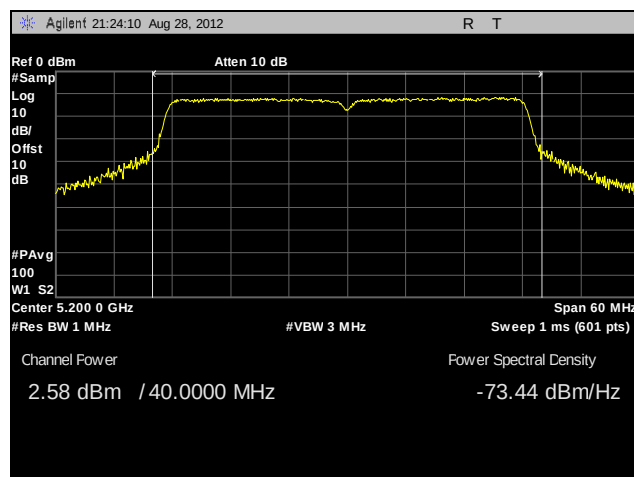
Plot 156. RF Power Output, 802.11n 40 MHz, Low Channel, Port C, Patch Antenna



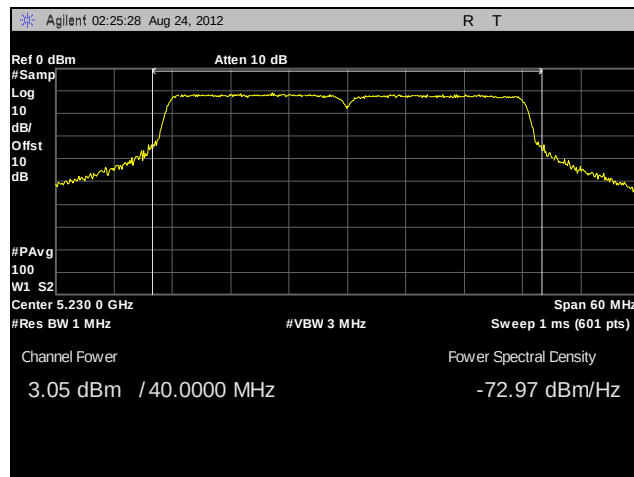
Plot 157. RF Power Output, 802.11n 40 MHz, Mid Channel, Port A, Patch Antenna



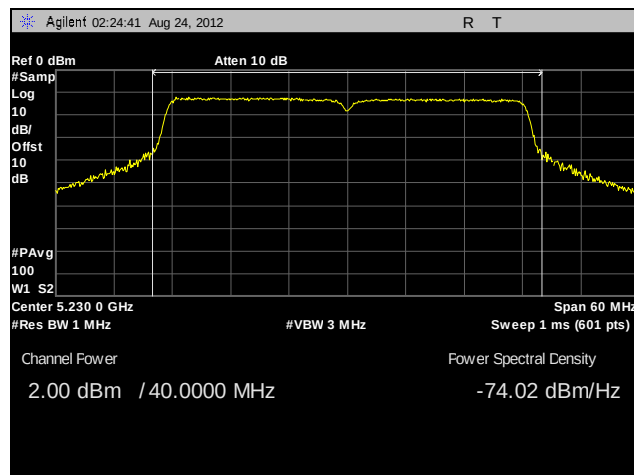
Plot 158. RF Power Output, 802.11n 40 MHz, Mid Channel, Port B, Patch Antenna



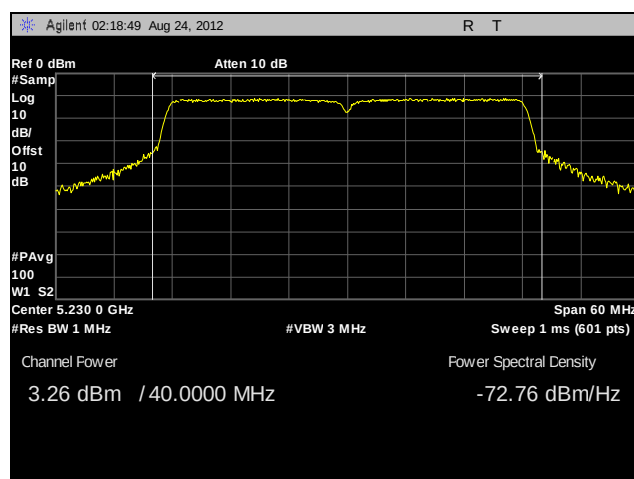
Plot 159. RF Power Output, 802.11n 40 MHz, Mid Channel, Port C, Patch Antenna



Plot 160. RF Power Output, 802.11n 40 MHz, High Channel, Port A, Patch Antenna



Plot 161. RF Power Output, 802.11n 40 MHz, High Channel, Port B, Patch Antenna



Plot 162. RF Power Output, 802.11n 40 MHz, High Channel, Port C, Patch Antenna

§ 15.407(f) RF Exposure

RF Exposure Requirements: §1.1307(b)(1) and §1.1307(b)(2): Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy levels in excess of the Commission's guidelines.

RF Radiation Exposure Limit: §1.1310: As specified in this section, the Maximum Permissible Exposure (MPE) Limit shall be used to evaluate the environmental impact of human exposure to radiofrequency (RF) radiation as specified in Sec. 1.1307(b), except in the case of portable devices which shall be evaluated according to the provisions of Sec. 2.1093 of this chapter.

MPE Limit Calculation: EUT's operating frequencies @ 5180-5240 MHz; highest conducted power = 9.79dBm (avg) therefore, **Limit for Uncontrolled exposure: 1 mW/cm² or 10 W/m²**

Omni Antenna

Gain of Antenna Elements @ 5GHz= 10 dBi

of Summing Antenna Elements = 3

EUT maximum antenna gain = 10dBi + 10*log(3)dBi = 14.77 dBi.

Equation from page 18 of OET 65, Edition 97-01

$$S = PG / 4\pi R^2 \quad \text{or} \quad R = \sqrt{PG / 4\pi S}$$

where, S = Power Density (mW/cm²)

P = Power Input to antenna (5.728 mW)

G = Antenna Gain (29.99)

R = Separation Distance between antenna and user (20 cm)

$$S = (5.728 * 29.99) / (4\pi(20)^2) = 0.0342 \text{ mW/cm}^2$$

Panel Antenna

Gain of Antenna Elements @ 5GHz= 10.7 dBi

of Summing Antenna Elements = 2

EUT maximum antenna gain = 10.7dBi + 10*log(2)dBi = 13.71 dBi.

Equation from page 18 of OET 65, Edition 97-01

$$S = PG / 4\pi R^2 \quad \text{or} \quad R = \sqrt{PG / 4\pi S}$$

where, S = Power Density (mW/cm²)

P = Power Input to antenna (8.072 mW)

G = Antenna Gain (23.496)

R = Separation Distance between antenna and user (20 cm)

$$S = (8.072 * 23.496) / (4\pi(20)^2) = 0.0378 \text{ mW/cm}^2$$

Lower-Gain Omni Antenna

Gain of Antenna Elements @ 5GHz= 8.25 dBi

of Summing Antenna Elements = 3

EUT maximum antenna gain = 8.25dBi + 10*log(3)dBi = 13.02 dBi.

Equation from page 18 of OET 65, Edition 97-01

$$S = PG / 4\pi R^2 \quad \text{or} \quad R = \sqrt{PG / 4\pi S}$$

where, S = Power Density (mW/cm²)

P = Power Input to antenna (9.528 mW)

G = Antenna Gain (20.045)

R = Separation Distance between antenna and user (20 cm)

$$S = (9.528 * 20.045) / (4\pi(20)^2) = 0.0380 \text{ mW/cm}^2$$

Patch Antenna

Gain of Antenna Elements @ 5GHz= 10.1 dBi

of Summing Antenna Elements = 3

EUT maximum antenna gain = 10.1dBi + 10*log(3)dBi = 14.87 dBi.

Equation from page 18 of OET 65, Edition 97-01

$$S = PG / 4\pi R^2 \quad \text{or} \quad R = \sqrt{PG / 4\pi S}$$

where, S = Power Density (mW/cm²)

P = Power Input to antenna (6.138 mW)

G = Antenna Gain (30.690)

R = Separation Distance between antenna and user (20 cm)

$$S = (6.138 * 30.690) / (4\pi(20)^2) = 0.0375 \text{ mW/cm}^2$$

Since S < 1mW/cm² at a separation distance of 20 cm with each antenna, the EUT complies with the limits of RF exposure

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.407(a)(1) Peak Power Spectral Density

Test Requirements: § 15.407(a)(1): In addition, the peak power spectral density shall not exceed 4 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Test Procedure: The transmitter was connected directly to a Spectrum Analyzer through an attenuator. The power level was set to the maximum level on the EUT. The method of measurement SA-1 from KDB publication number 789033.

Test Results: Equipment was compliant with the peak power spectral density limits of § 15.407 (a)(1). The peak power spectral density was determined from plots on the following page(s).

Test Engineer(s): Jeff Pratt

Test Date(s): 08/23/12 – 08/29/12



Figure 4. Power Spectral Density Test Setup

Frequency (MHz)	Mode	Port R1-A Power (dBm)	Port R1-B Power (dBm)	Port R1-C Power (dBm)	Summed Power (dBm)	Antenna Gain (dBi)	Limit (dBm)	Margin
5180	802.11a	-10.266	-13.224	-9.340	-5.88	14.77	-4.77	-1.11
5200	802.11a	-9.306	-13.149	-8.976	-5.34	14.77	-4.77	-0.57
5240	802.11a	-10.092	-11.332	-9.413	-5.44	14.77	-4.77	-0.67
5180	802.11n HT20	-9.114	-12.357	-9.996	-5.52	14.77	-4.77	-0.74
5200	802.11n HT20	-8.922	-12.974	-9.428	-5.34	14.77	-4.77	-0.56
5240	802.11n HT20	-10.296	-11.696	-9.108	-5.47	14.77	-4.77	-0.70
5190	802.11n HT40	-10.932	-12.899	-11.701	-7.00	14.77	-4.77	-2.23
5200	802.11n HT40	-10.480	-12.937	-11.955	-6.90	14.77	-4.77	-2.13
5230	802.11n HT40	-10.990	-12.170	-12.426	-7.04	14.77	-4.77	-2.27

Table 13. Power Spectral Density, Test Results, 10 dBi Omni

Frequency (MHz)	Mode	Port R1-A Power (dBm)	Port R1-B Power (dBm)	Port R1-C Power (dBm)	Summed Power (dBm)	Antenna Gain (dBi)	Limit (dBm)	Margin
5180	802.11a	-9.213	-10.390	-7.763	-4.22	13.71	-3.71	-0.51
5200	802.11a	-8.023	-10.686	-8.760	-4.25	13.71	-3.71	-0.54
5240	802.11a	-8.456	-10.881	-8.546	-4.39	13.71	-3.71	-0.68
5180	802.11n HT20	-7.113	-9.642	-9.765	-3.89	13.71	-3.71	-0.18
5200	802.11n HT20	-7.803	-10.404	-7.913	-3.78	13.71	-3.71	-0.07
5240	802.11n HT20	-8.086	-10.417	-8.175	-4.00	13.71	-3.71	-0.29
5190	802.11n HT40	-8.337	-12.055	-10.266	-5.19	13.71	-3.71	-1.48
5200	802.11n HT40	-8.654	-11.613	-10.166	-5.21	13.71	-3.71	-1.50
5230	802.11n HT40	-8.920	-10.596	-9.249	-4.76	13.71	-3.71	-1.05

Table 14. Power Spectral Density, Test Results, 10.7 dBi Panel

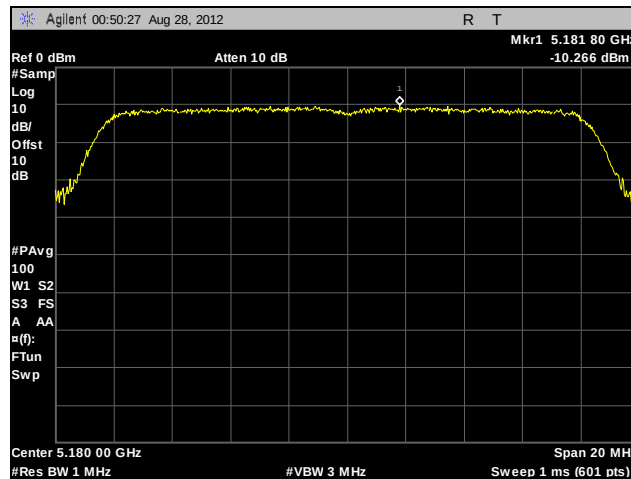
Frequency (MHz)	Mode	Port R1-A Power (dBm)	Port R1-B Power (dBm)	Port R1-C Power (dBm)	Summed Power (dBm)	Antenna Gain (dBi)	Limit (dBm)	Margin
5180	802.11a	-7.016	-10.624	-8.199	-3.60	13.02	-3.02	-0.58
5200	802.11a	-7.287	-9.726	-7.711	-3.35	13.02	-3.02	-0.33
5240	802.11a	-7.489	-9.232	-7.393	-3.19	13.02	-3.02	-0.17
5180	802.11n HT20	-6.705	-11.048	-7.205	-3.17	13.02	-3.02	-0.14
5200	802.11n HT20	-7.803	-10.404	-7.913	-3.78	13.02	-3.02	-0.76
5240	802.11n HT20	-8.060	-9.997	-6.766	-3.31	13.02	-3.02	-0.29
5190	802.11n HT40	-8.178	-11.185	-9.759	-4.76	13.02	-3.02	-1.74
5200	802.11n HT40	-8.654	-11.613	-10.166	-5.21	13.02	-3.02	-2.19
5230	802.11n HT40	-8.411	-10.571	-8.210	-4.17	13.02	-3.02	-1.15

Table 15. Power Spectral Density, Test Results, 8.25 dBi Omni

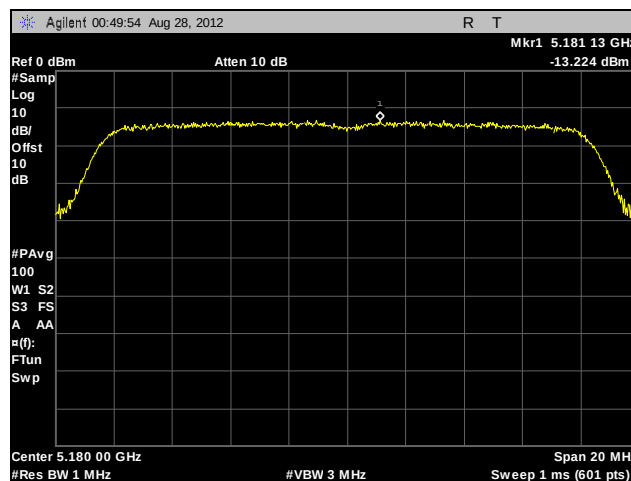
Frequency (MHz)	Mode	Port R1-A Power (dBm)	Port R1-B Power (dBm)	Port R1-C Power (dBm)	Summed Power (dBm)	Antenna Gain (dBi)	Limit (dBm)	Margin
5180	802.11a	-8.551	-11.989	-10.132	-5.23	14.87	-4.87	-0.36
5200	802.11a	-8.611	-12.590	-10.784	-5.59	14.87	-4.87	-0.72
5240	802.11a	-10.092	-11.332	-9.413	-5.44	14.87	-4.87	-0.57
5180	802.11n HT20	-9.114	-12.357	-9.996	-5.52	14.87	-4.87	-0.64
5200	802.11n HT20	-8.259	-12.348	-9.555	-4.97	14.87	-4.87	-0.10
5240	802.11n HT20	-9.397	-11.469	-8.764	-4.96	14.87	-4.87	-0.09
5190	802.11n HT40	-9.859	-12.757	-10.933	-6.25	14.87	-4.87	-1.38
5200	802.11n HT40	-9.977	-12.421	-11.243	-6.33	14.87	-4.87	-1.46
5230	802.11n HT40	-10.990	-12.170	-12.426	-7.04	14.87	-4.87	-2.17

Table 16. Power Spectral Density, Test Results, 10.1 dBi Patch

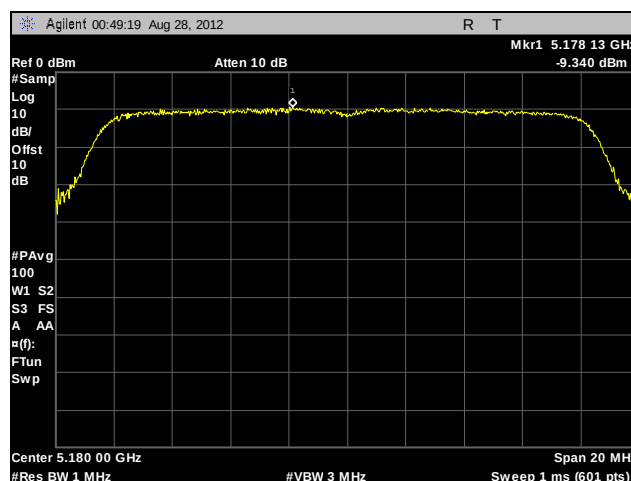
Peak Power Spectral Density, 802.11a, Omni Antenna



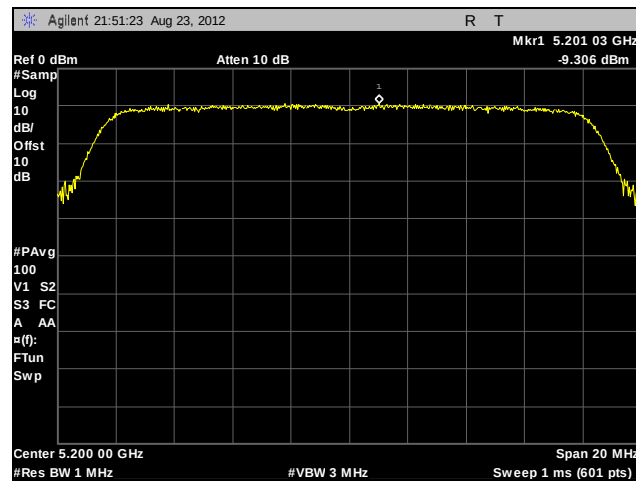
Plot 163. Peak Power Spectral Density, 802.11a, Low Channel, Port A, Omni Antenna



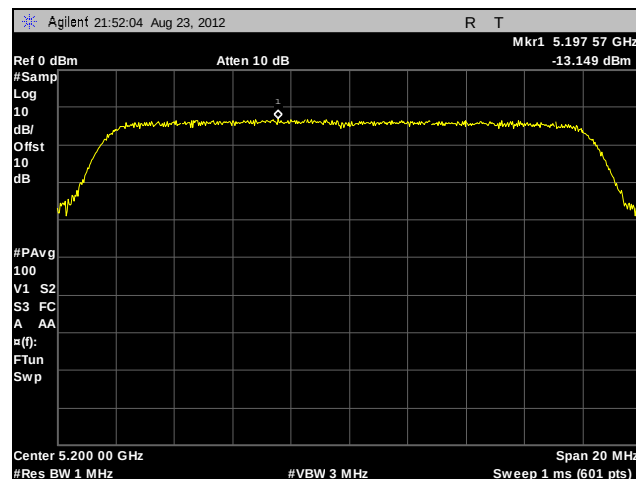
Plot 164. Peak Power Spectral Density, 802.11a, Low Channel, Port B, Omni Antenna



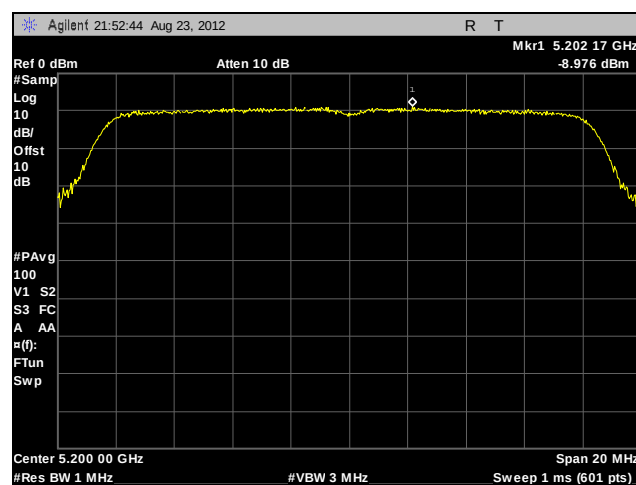
Plot 165. Peak Power Spectral Density, 802.11a, Low Channel, Port C, Omni Antenna



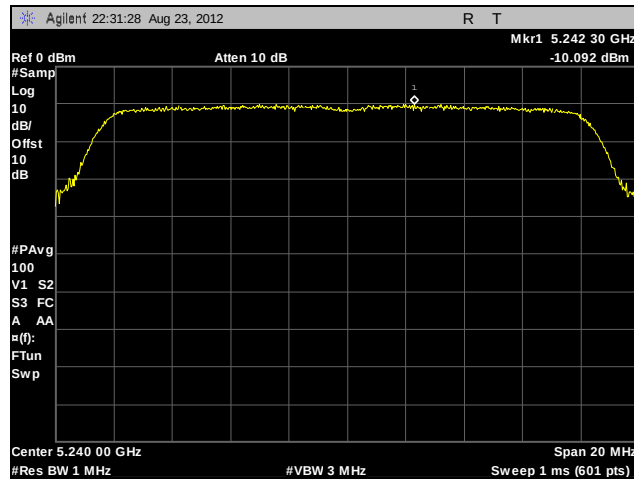
Plot 166. Peak Power Spectral Density, 802.11a, Mid Channel, Port A, Omni Antenna



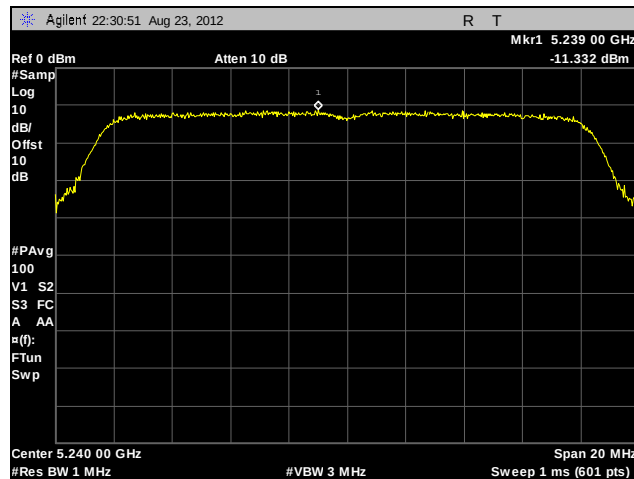
Plot 167. Peak Power Spectral Density, 802.11a, Mid Channel, Port B, Omni Antenna



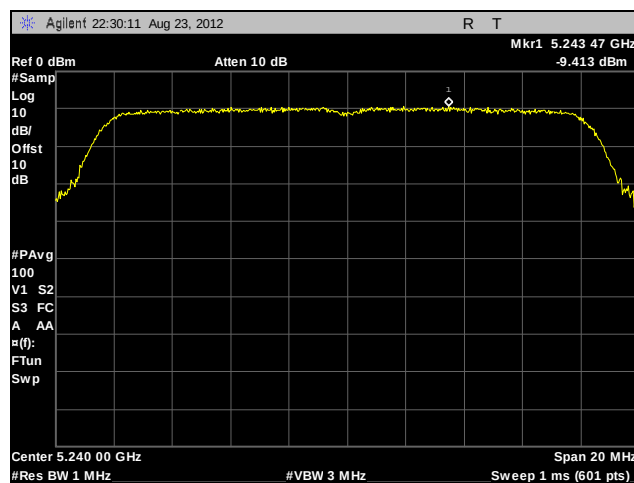
Plot 168. Peak Power Spectral Density, 802.11a, Mid Channel, Port C, Omni Antenna



Plot 169. Peak Power Spectral Density, 802.11a, High Channel, Port A, Omni Antenna

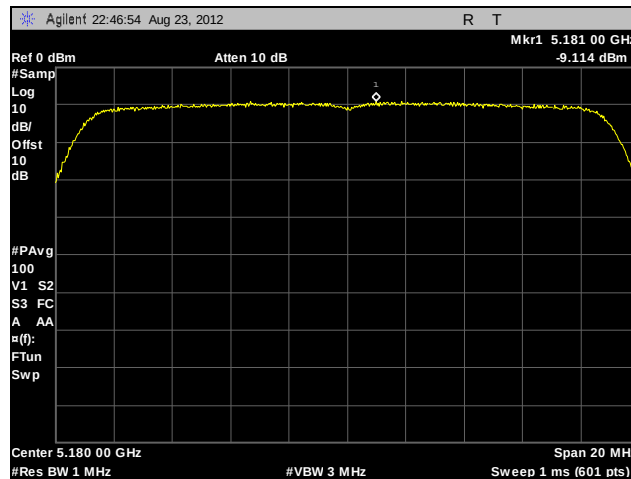


Plot 170. Peak Power Spectral Density, 802.11a, High Channel, Port B, Omni Antenna

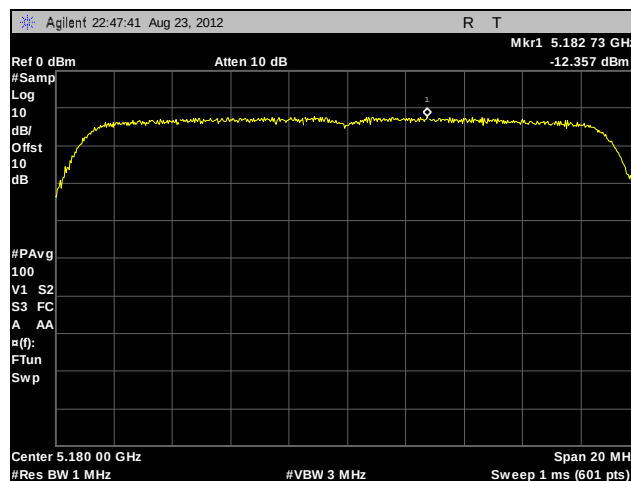


Plot 171. Peak Power Spectral Density, 802.11a, High Channel, Port C, Omni Antenna

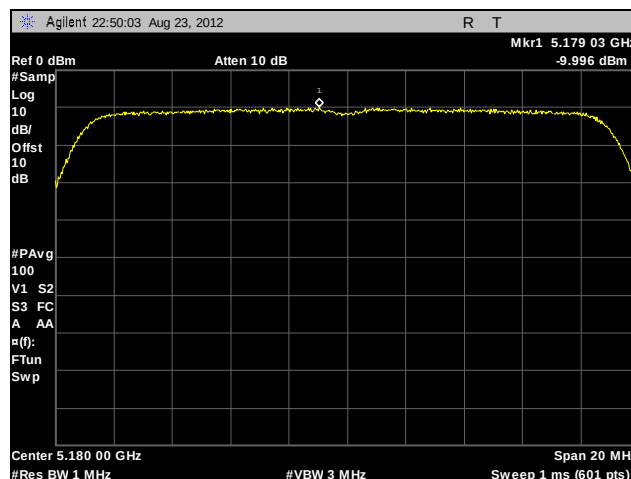
Peak Power Spectral Density, 802.11n 20 MHz, Omni Antenna



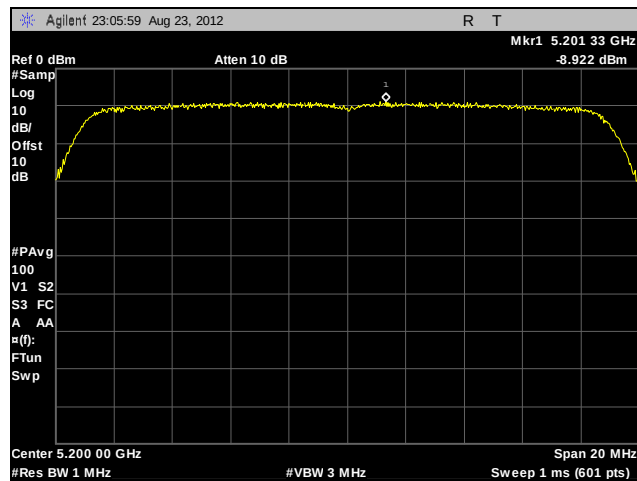
Plot 172. Peak Power Spectral Density, 802.11n 20 MHz, Low Channel, Port A, Omni Antenna



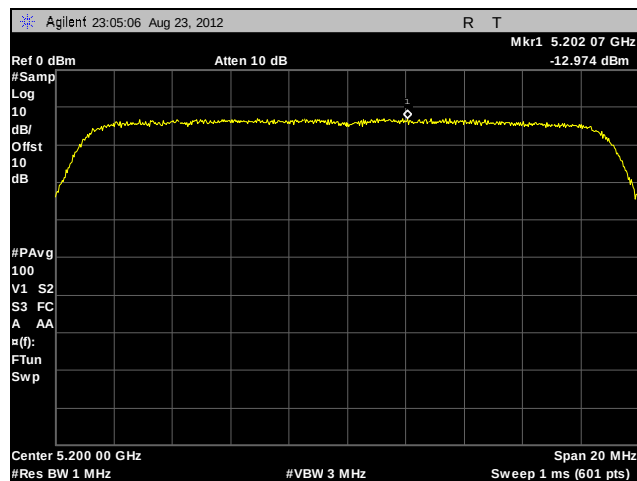
Plot 173. Peak Power Spectral Density, 802.11n 20 MHz, Low Channel, Port B, Omni Antenna



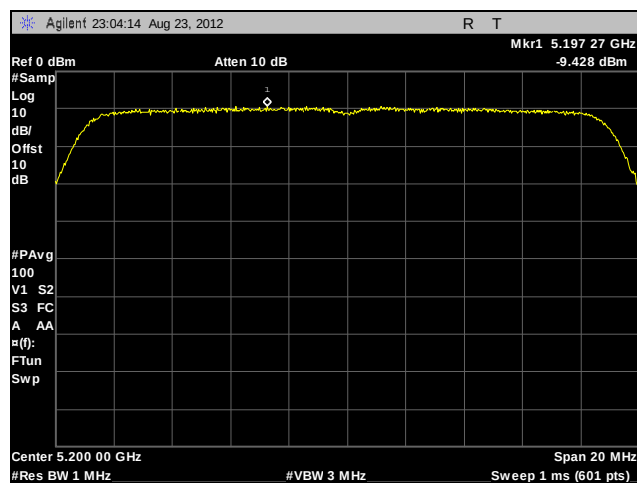
Plot 174. Peak Power Spectral Density, 802.11n 20 MHz, Low Channel, Port C, Omni Antenna



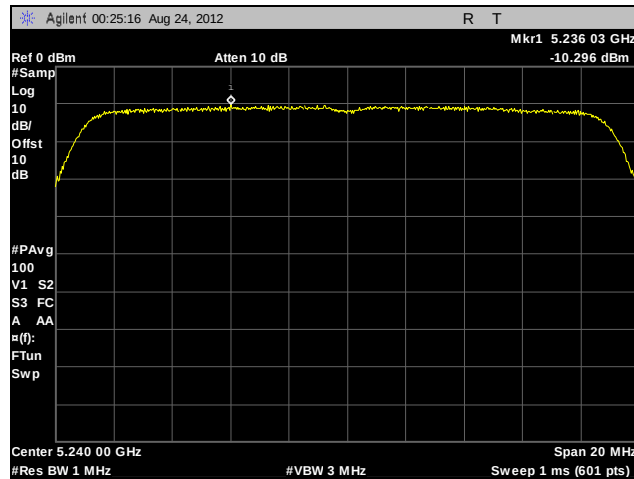
Plot 175. Peak Power Spectral Density, 802.11n 20 MHz, Mid Channel, Port A, Omni Antenna



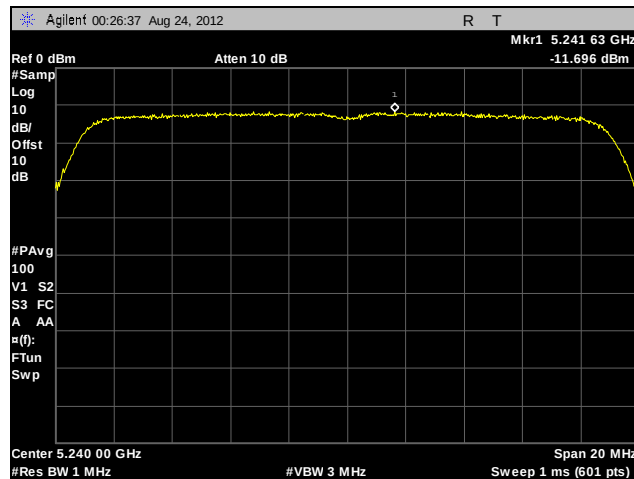
Plot 176. Peak Power Spectral Density, 802.11n 20 MHz, Mid Channel, Port B, Omni Antenna



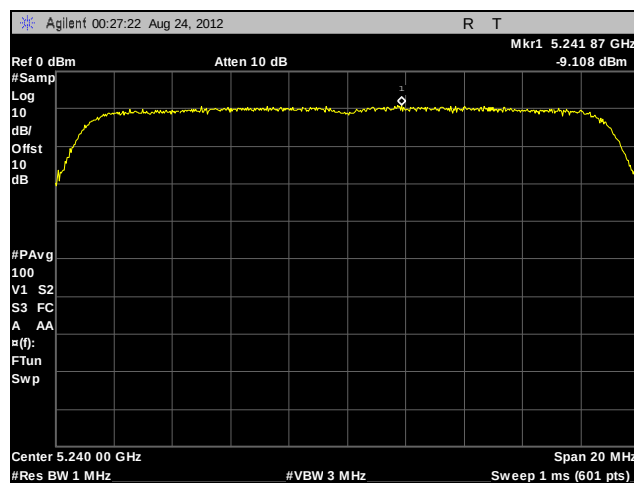
Plot 177. Peak Power Spectral Density, 802.11n 20 MHz, Mid Channel, Port C, Omni Antenna



Plot 178. Peak Power Spectral Density, 802.11n 20 MHz, High Channel, Port A, Omni Antenna

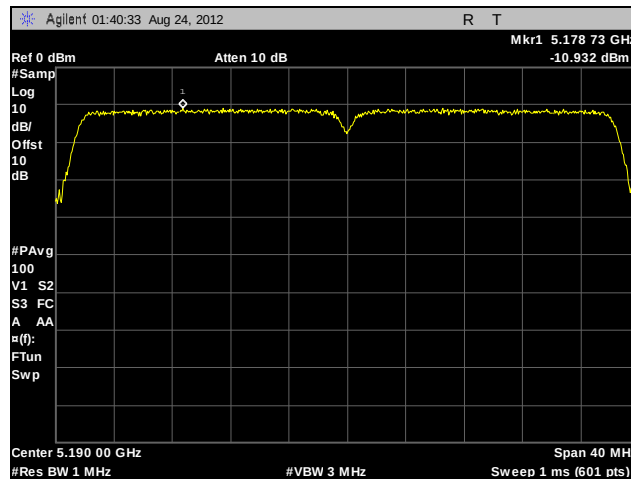


Plot 179. Peak Power Spectral Density, 802.11n 20 MHz, High Channel, Port B, Omni Antenna

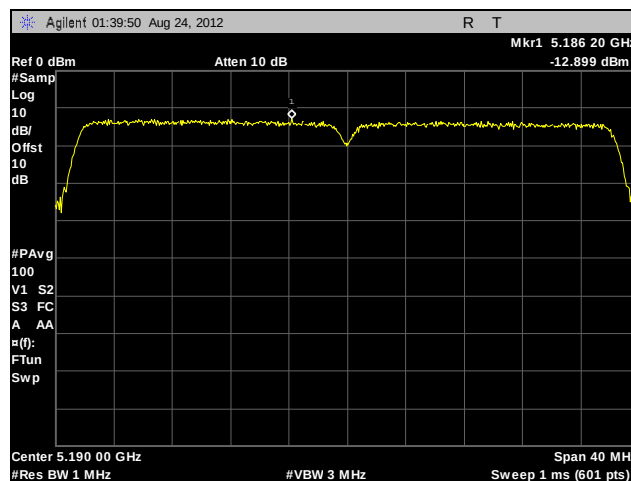


Plot 180. Peak Power Spectral Density, 802.11n 20 MHz, High Channel, Port C, Omni Antenna

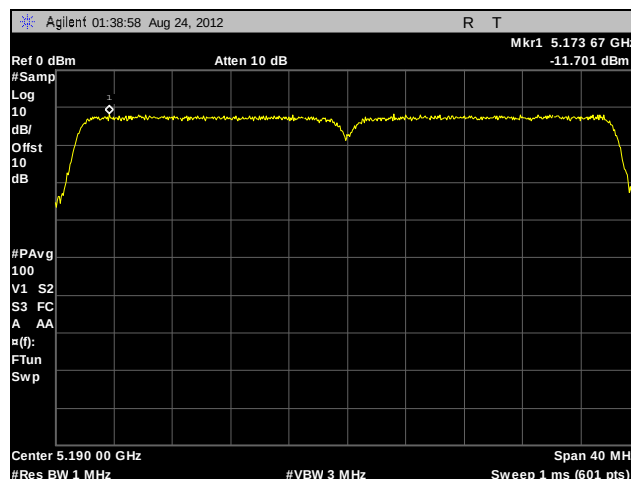
Peak Power Spectral Density, 802.11n 40 MHz, Omni Antenna



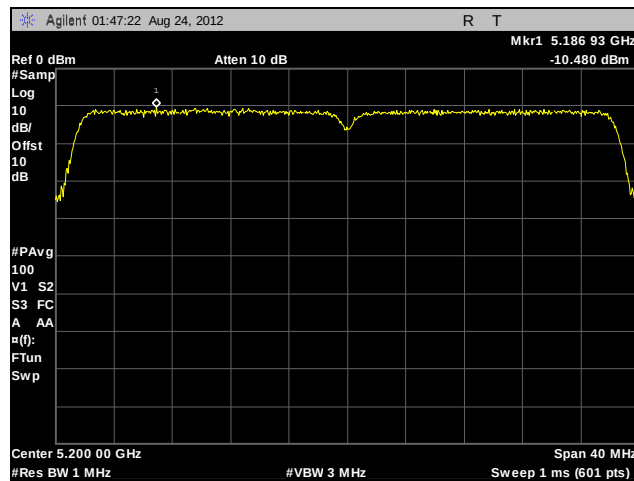
Plot 181. Peak Power Spectral Density, 802.11n 40 MHz, Low Channel, Port A, Omni Antenna



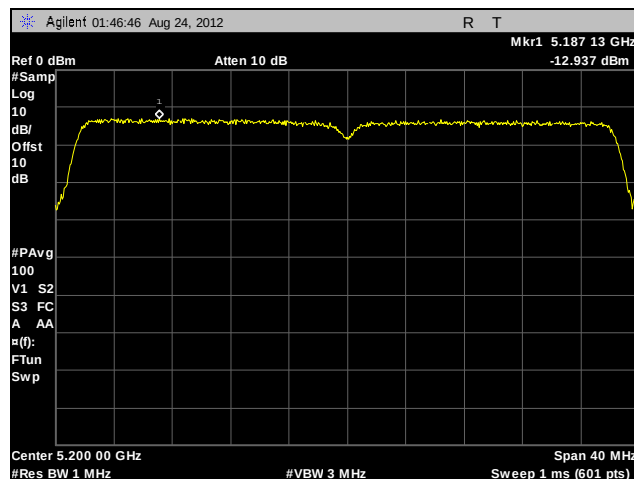
Plot 182. Peak Power Spectral Density, 802.11n 40 MHz, Low Channel, Port B, Omni Antenna



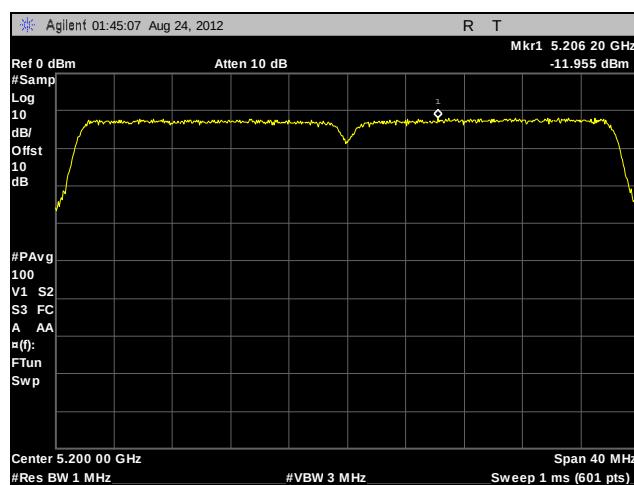
Plot 183. Peak Power Spectral Density, 802.11n 40 MHz, Low Channel, Port C, Omni Antenna



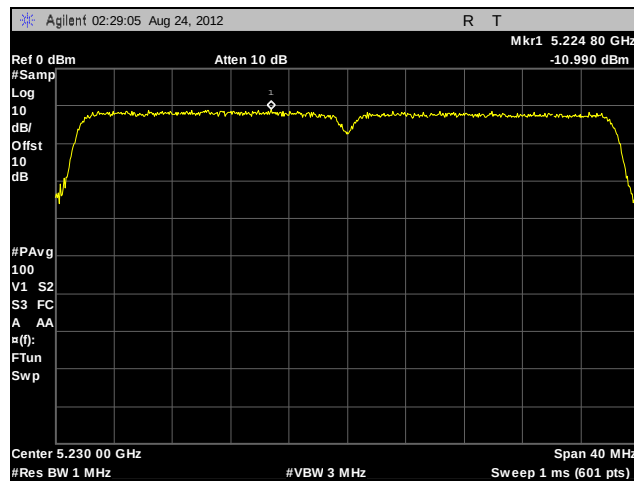
Plot 184. Peak Power Spectral Density, 802.11n 40 MHz, Mid Channel, Port A, Omni Antenna



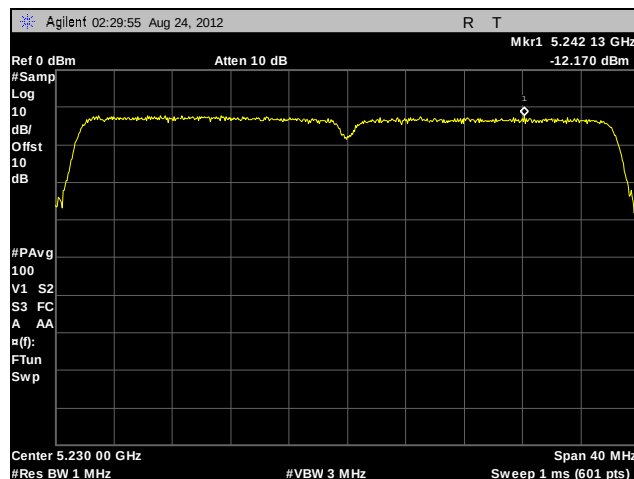
Plot 185. Peak Power Spectral Density, 802.11n 40 MHz, Mid Channel, Port B, Omni Antenna



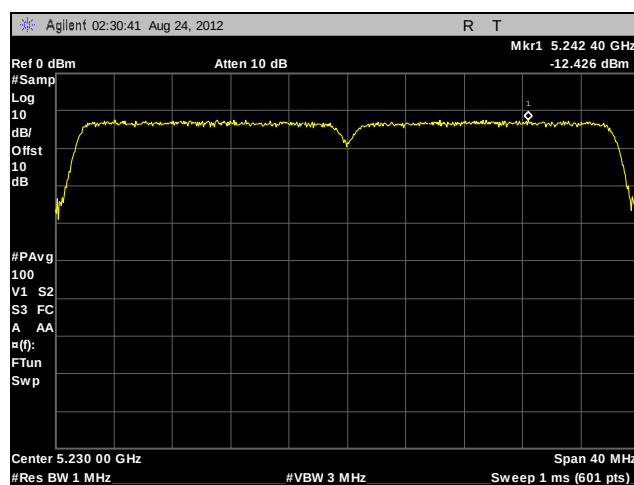
Plot 186. Peak Power Spectral Density, 802.11n 40 MHz, Mid Channel, Port C, Omni Antenna



Plot 187. Peak Power Spectral Density, 802.11n 40 MHz, High Channel, Port A, Omni Antenna

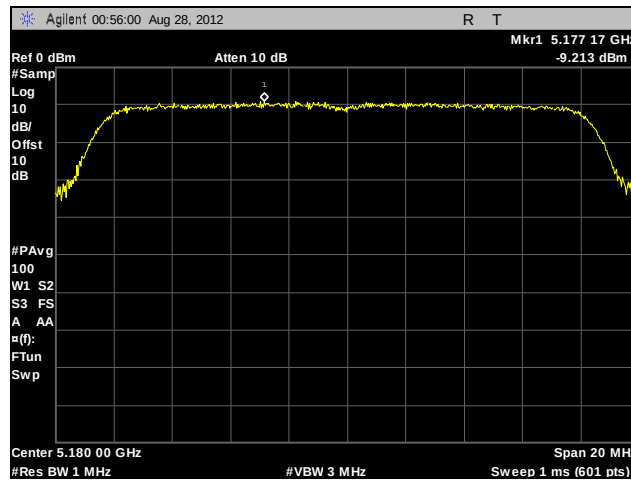


Plot 188. Peak Power Spectral Density, 802.11n 40 MHz, High Channel, Port B, Omni Antenna

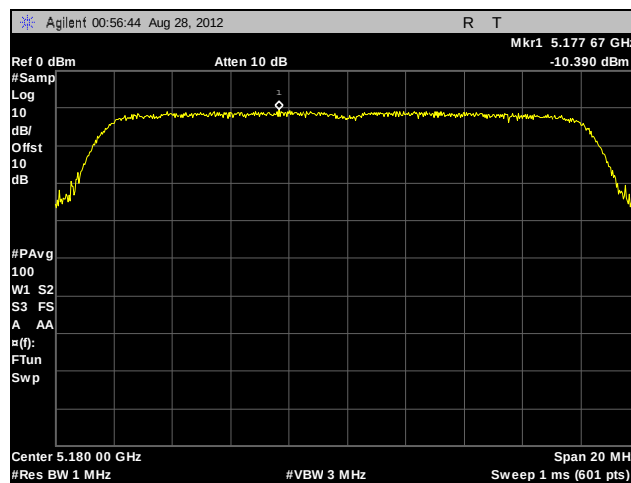


Plot 189. Peak Power Spectral Density, 802.11n 40 MHz, High Channel, Port C, Omni Antenna

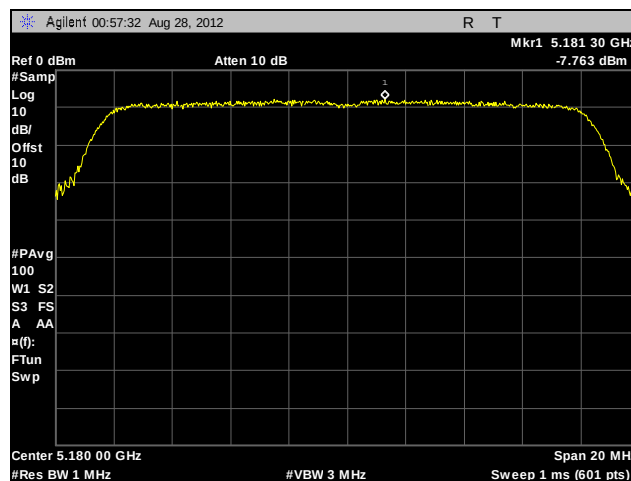
Peak Power Spectral Density, 802.11a, Panel Antenna



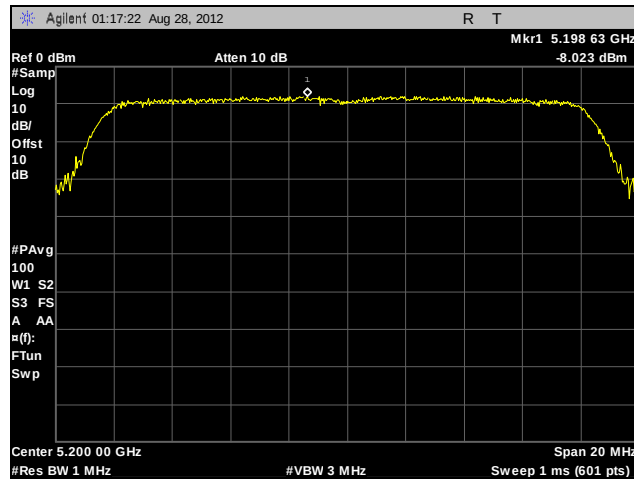
Plot 190. Peak Power Spectral Density, 802.11a, Low Channel, Port A, Panel Antenna



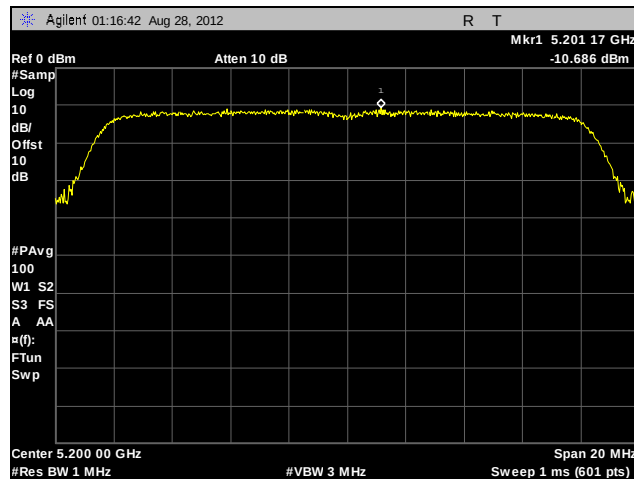
Plot 191. Peak Power Spectral Density, 802.11a, Low Channel, Port B, Panel Antenna



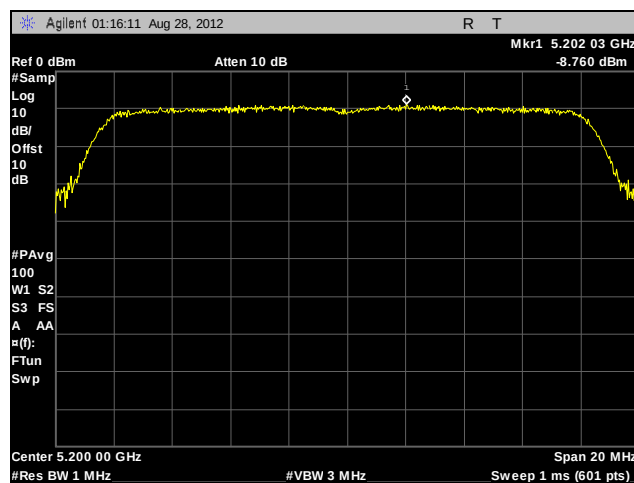
Plot 192. Peak Power Spectral Density, 802.11a, Low Channel, Port C, Panel Antenna



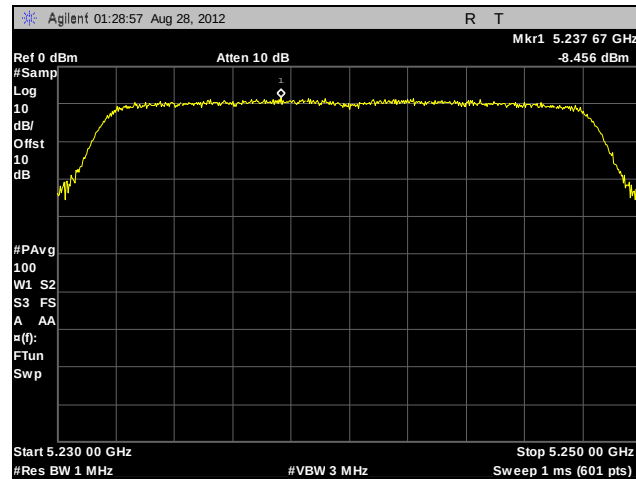
Plot 193. Peak Power Spectral Density, 802.11a, Mid Channel, Port A, Panel Antenna



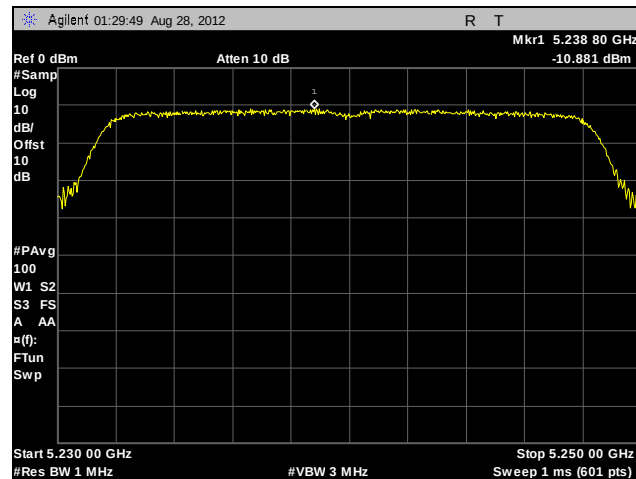
Plot 194. Peak Power Spectral Density, 802.11a, Mid Channel, Port B, Panel Antenna



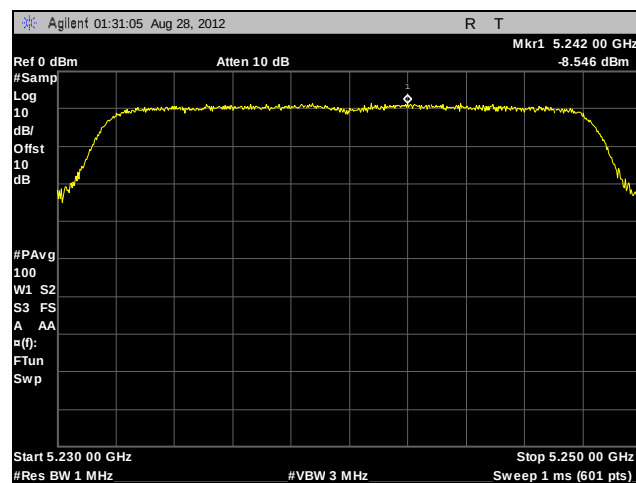
Plot 195. Peak Power Spectral Density, 802.11a, Mid Channel, Port C, Panel Antenna



Plot 196. Peak Power Spectral Density, 802.11a, High Channel, Port A, Panel Antenna

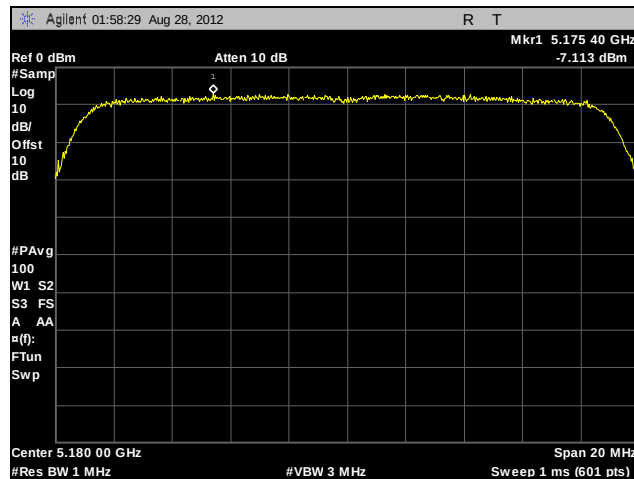


Plot 197. Peak Power Spectral Density, 802.11a, High Channel, Port B, Panel Antenna

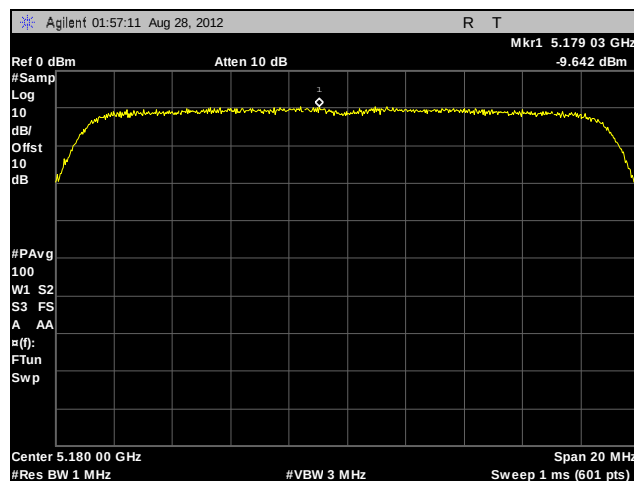


Plot 198. Peak Power Spectral Density, 802.11a, High Channel, Port C, Panel Antenna

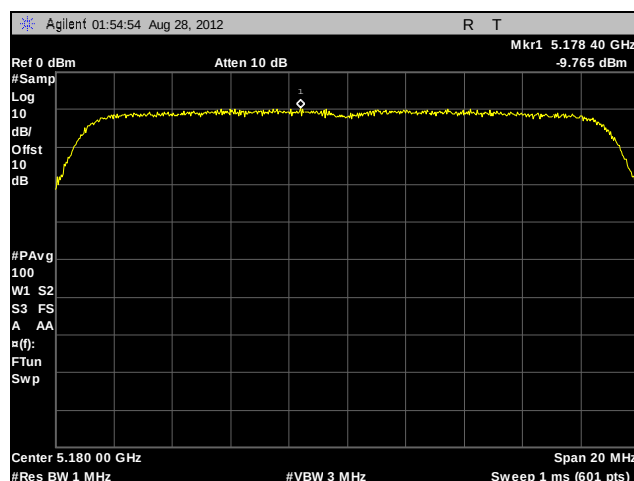
Peak Power Spectral Density, 802.11n 20 MHz, Panel Antenna



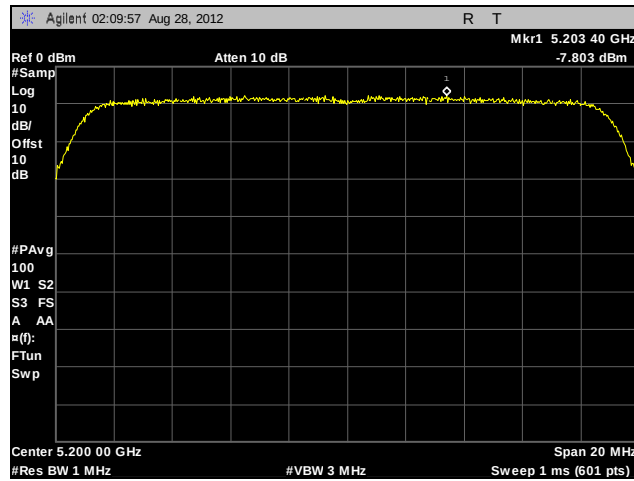
Plot 199. Peak Power Spectral Density, 802.11n 20 MHz, Low Channel, Port A, Panel Antenna



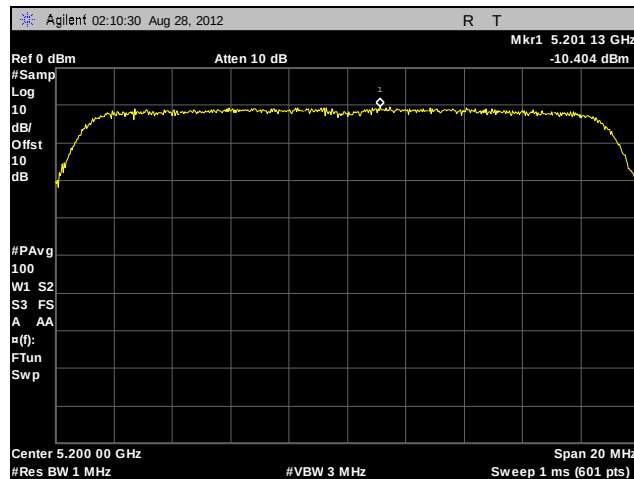
Plot 200. Peak Power Spectral Density, 802.11n 20 MHz, Low Channel, Port B, Panel Antenna



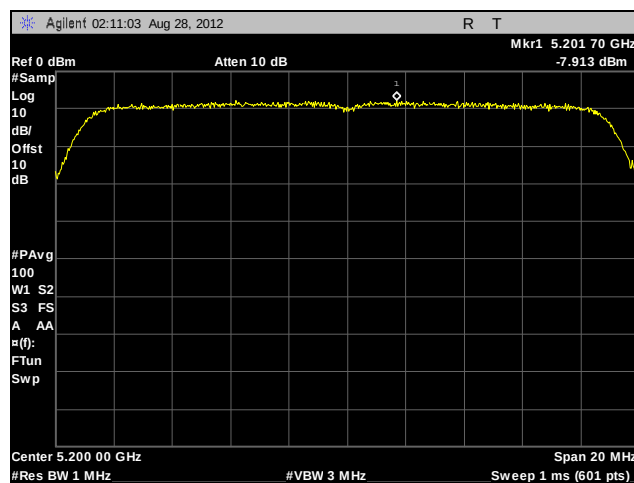
Plot 201. Peak Power Spectral Density, 802.11n 20 MHz, Low Channel, Port C, Panel Antenna



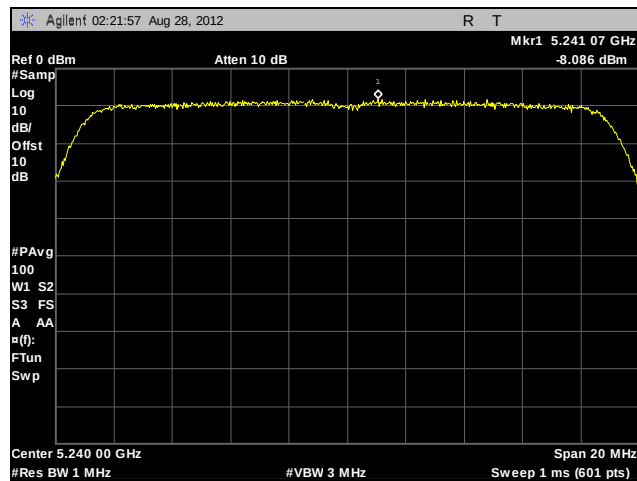
Plot 202. Peak Power Spectral Density, 802.11n 20 MHz, Mid Channel, Port A, Panel Antenna



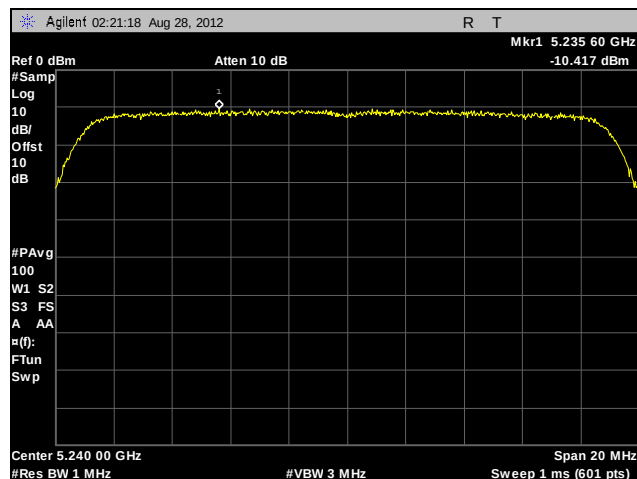
Plot 203. Peak Power Spectral Density, 802.11n 20 MHz, Mid Channel, Port B, Panel Antenna



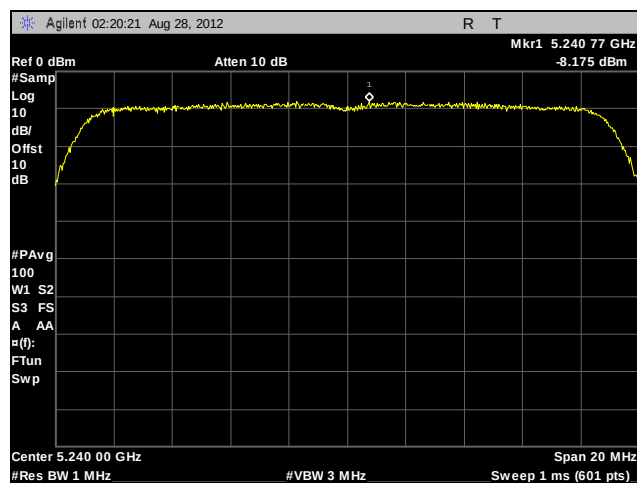
Plot 204. Peak Power Spectral Density, 802.11n 20 MHz, Mid Channel, Port C, Panel Antenna



Plot 205. Peak Power Spectral Density, 802.11n 20 MHz, High Channel, Port A, Panel Antenna

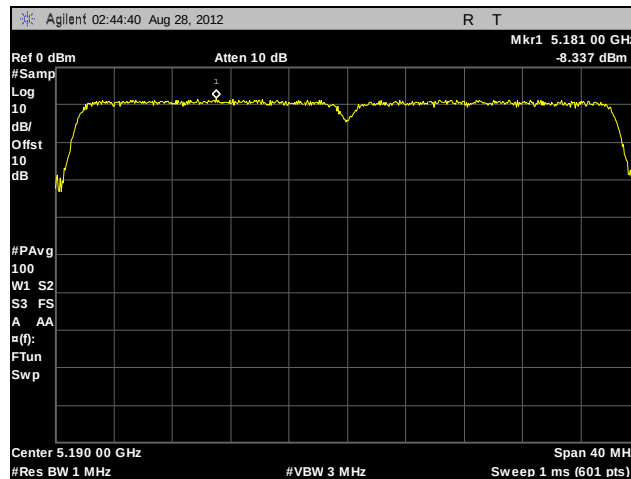


Plot 206. Peak Power Spectral Density, 802.11n 20 MHz, High Channel, Port B, Panel Antenna

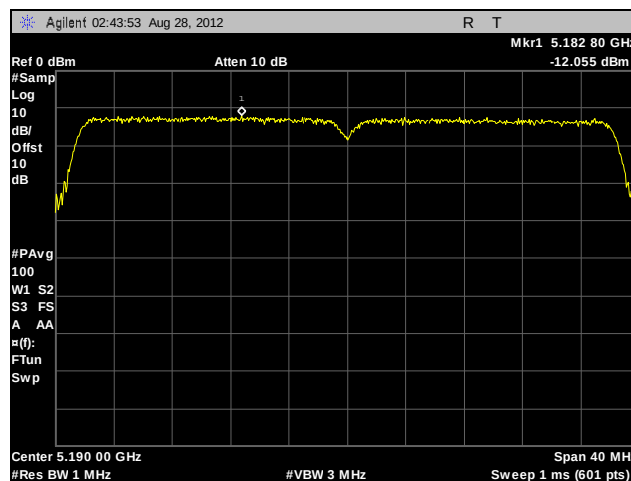


Plot 207. Peak Power Spectral Density, 802.11n 20 MHz, High Channel, Port C, Panel Antenna

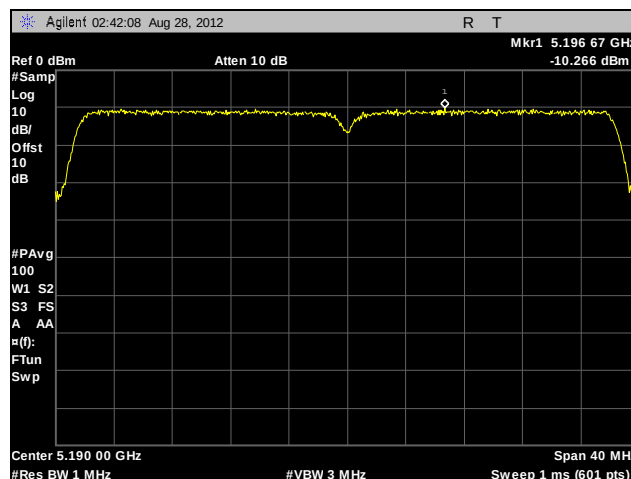
Peak Power Spectral Density, 802.11n 40 MHz, Panel Antenna



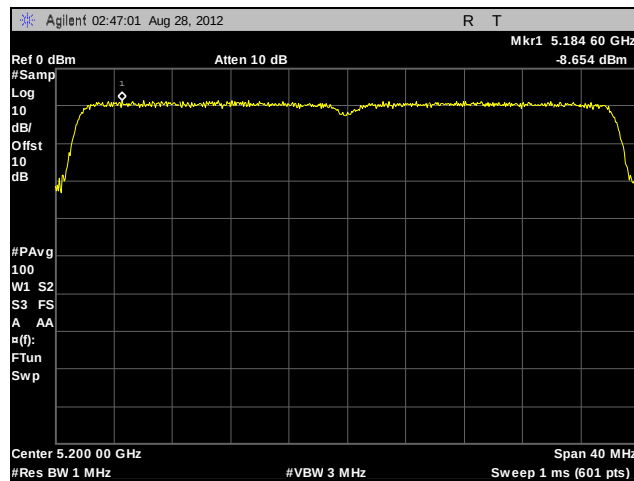
Plot 208. Peak Power Spectral Density, 802.11n 40 MHz, Low Channel, Port A, Panel Antenna



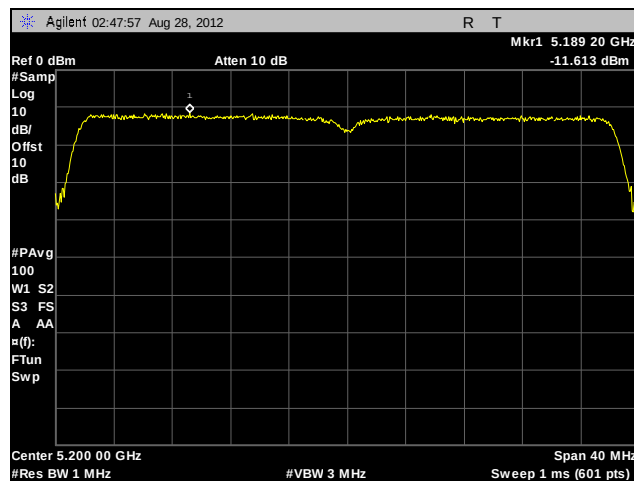
Plot 209. Peak Power Spectral Density, 802.11n 40 MHz, Low Channel, Port B, Panel Antenna



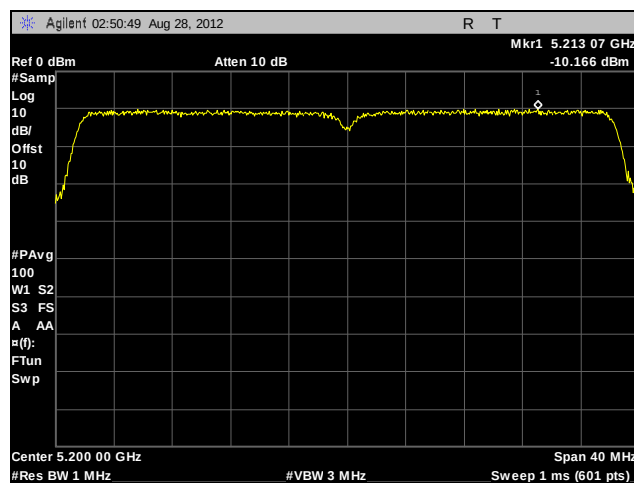
Plot 210. Peak Power Spectral Density, 802.11n 40 MHz, Low Channel, Port C, Panel Antenna



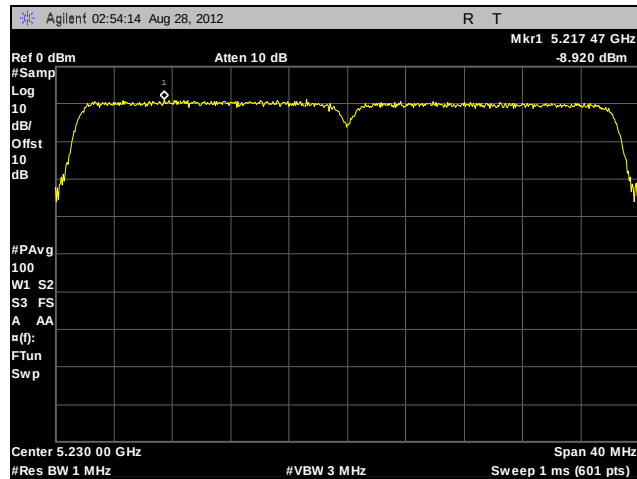
Plot 211. Peak Power Spectral Density, 802.11n 40 MHz, Mid Channel, Port A, Panel Antenna



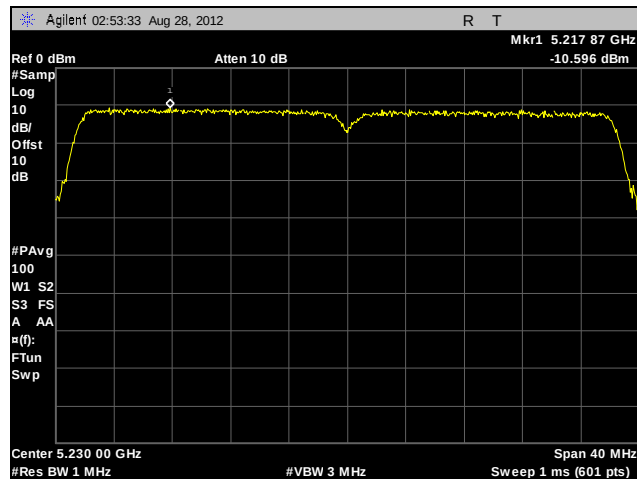
Plot 212. Peak Power Spectral Density, 802.11n 40 MHz, Mid Channel, Port B, Panel Antenna



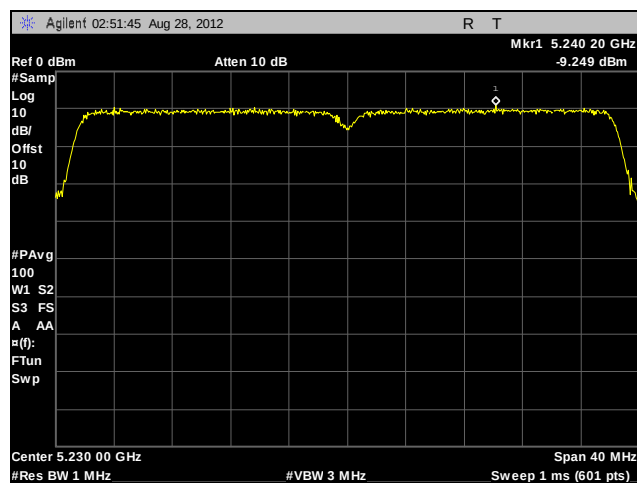
Plot 213. Peak Power Spectral Density, 802.11n 40 MHz, Mid Channel, Port C, Panel Antenna



Plot 214. Peak Power Spectral Density, 802.11n 40 MHz, High Channel, Port A, Panel Antenna

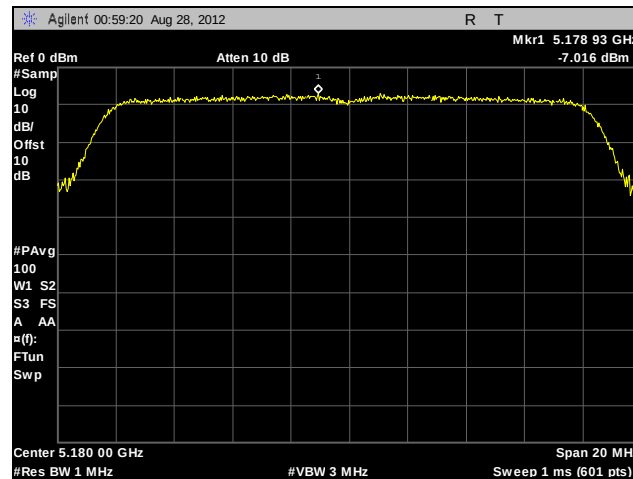


Plot 215. Peak Power Spectral Density, 802.11n 40 MHz, High Channel, Port B, Panel Antenna

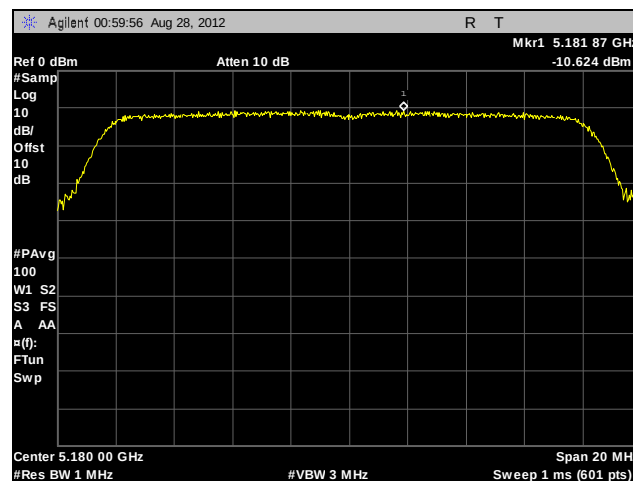


Plot 216. Peak Power Spectral Density, 802.11n 40 MHz, High Channel, Port C, Panel Antenna

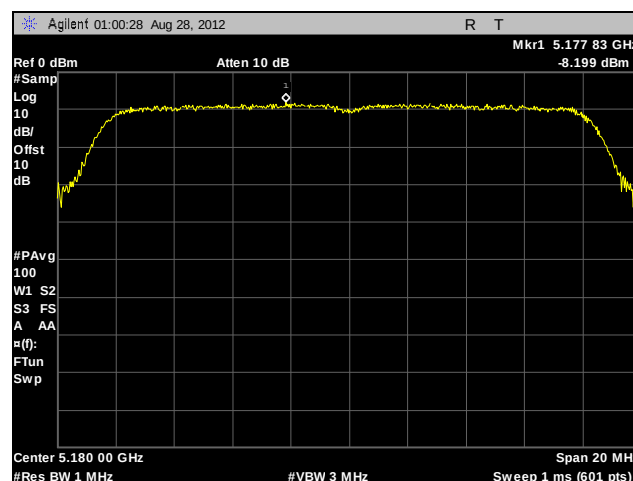
Peak Power Spectral Density, 802.11a, Lower Gain Omni Antenna



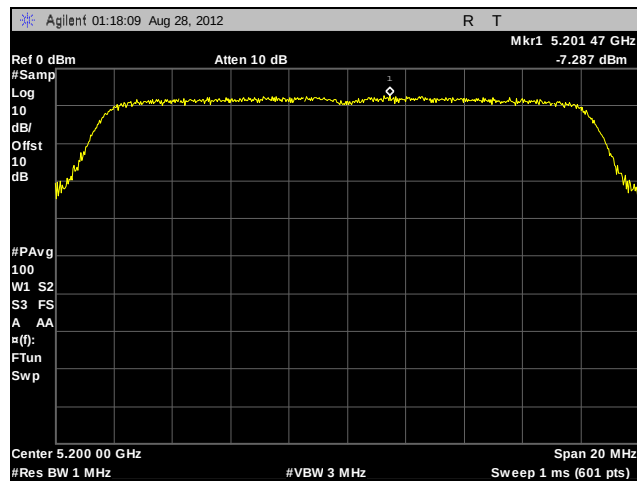
Plot 217. Peak Power Spectral Density, 802.11a, Low Channel, Port A, Lower Gain Omni Antenna



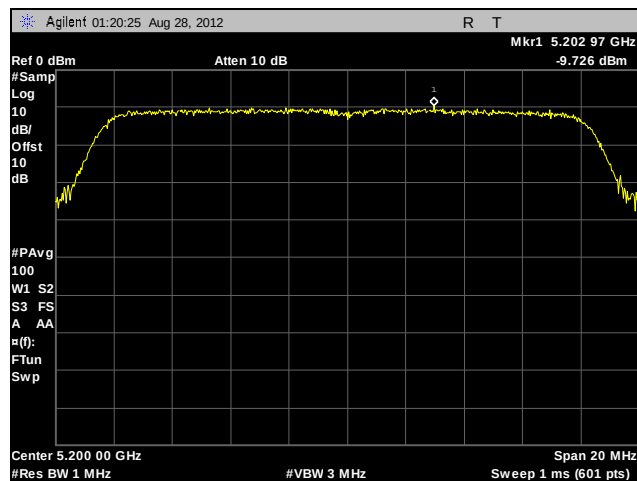
Plot 218. Peak Power Spectral Density, 802.11a, Low Channel, Port B, Lower Gain Omni Antenna



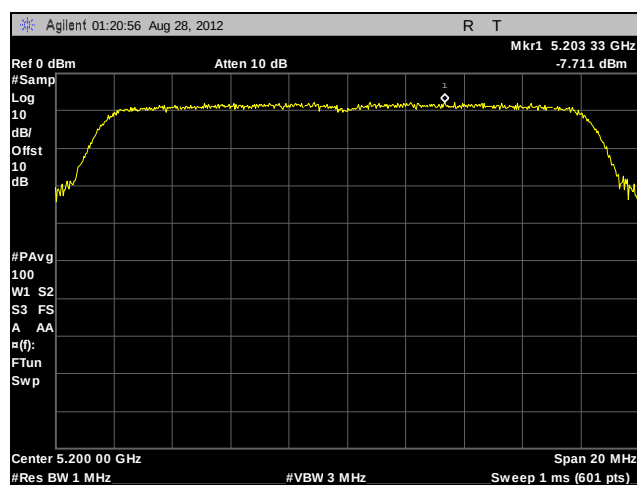
Plot 219. Peak Power Spectral Density, 802.11a, Low Channel, Port C, Lower Gain Omni Antenna



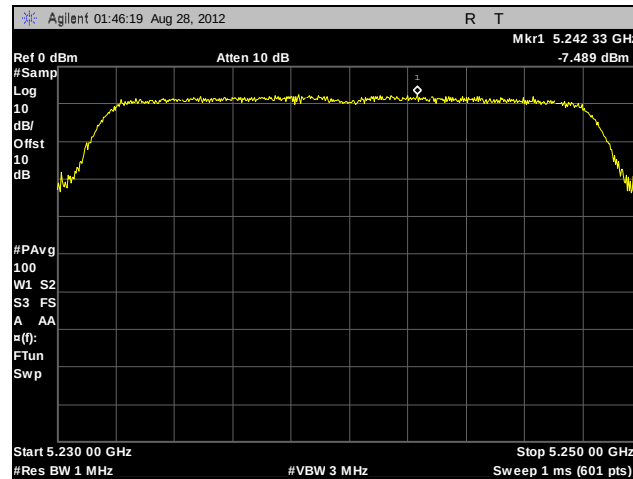
Plot 220. Peak Power Spectral Density, 802.11a, Mid Channel, Port A, Lower Gain Omni Antenna



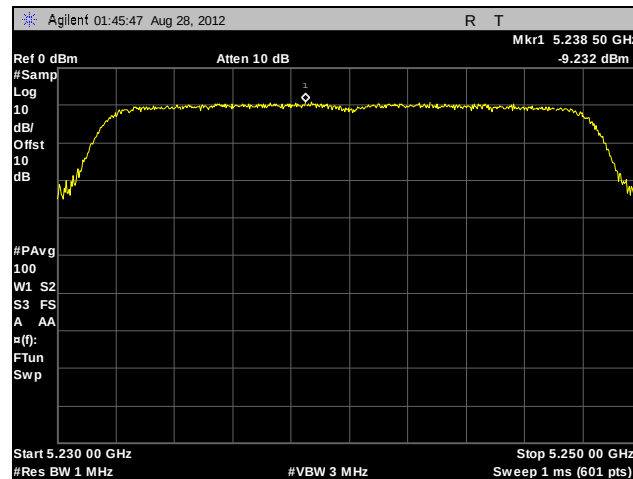
Plot 221. Peak Power Spectral Density, 802.11a, Mid Channel, Port B, Lower Gain Omni Antenna



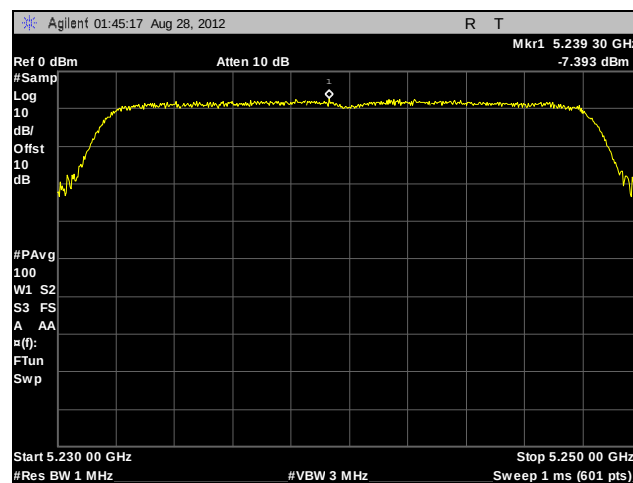
Plot 222. Peak Power Spectral Density, 802.11a, Mid Channel, Port C, Lower Gain Omni Antenna



Plot 223. Peak Power Spectral Density, 802.11a, High Channel, Port A, Lower Gain Omni Antenna

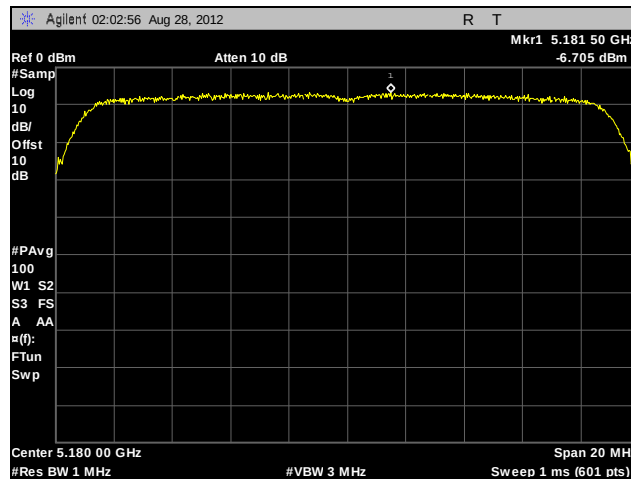


Plot 224. Peak Power Spectral Density, 802.11a, High Channel, Port B, Lower Gain Omni Antenna

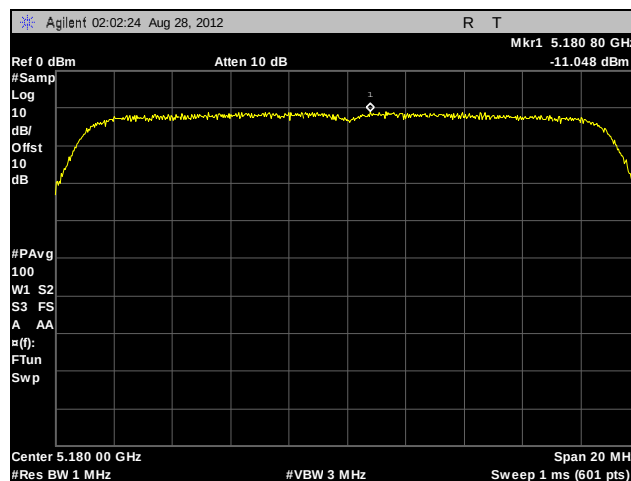


Plot 225. Peak Power Spectral Density, 802.11a, High Channel, Port C, Lower Gain Omni Antenna

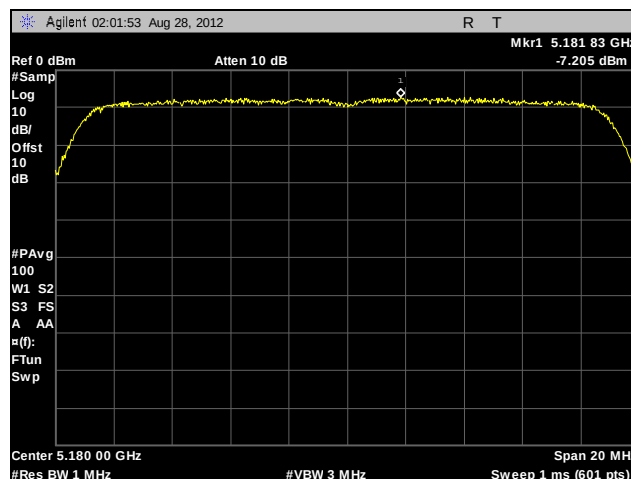
Peak Power Spectral Density, 802.11n 20 MHz, Lower Gain Omni Antenna



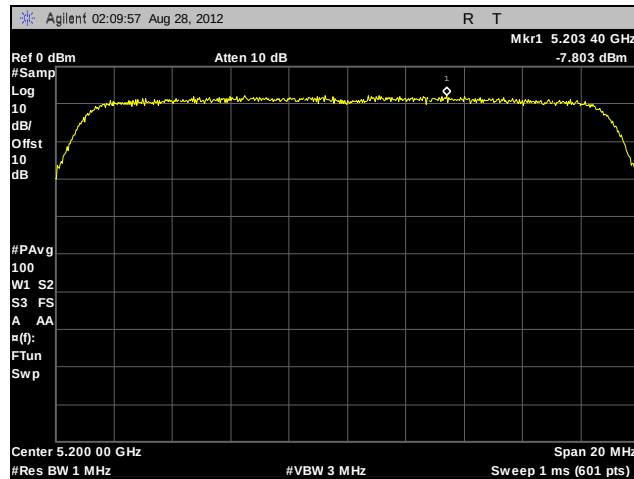
Plot 226. Peak Power Spectral Density, 802.11n 20 MHz, Low Channel, Port A, Lower Gain Omni Antenna



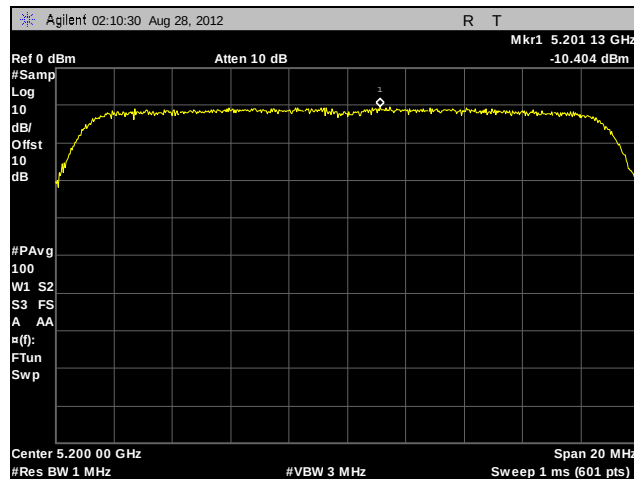
Plot 227. Peak Power Spectral Density, 802.11n 20 MHz, Low Channel, Port B, Lower Gain Omni Antenna



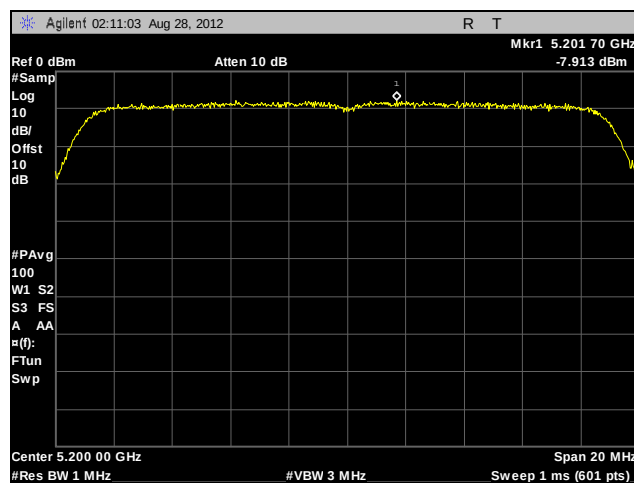
Plot 228. Peak Power Spectral Density, 802.11n 20 MHz, Low Channel, Port C, Lower Gain Omni Antenna



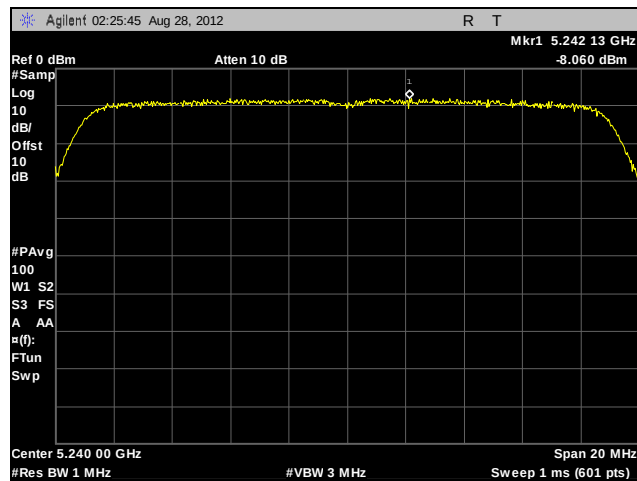
Plot 229. Peak Power Spectral Density, 802.11n 20 MHz, Mid Channel, Port A, Lower Gain Omni Antenna



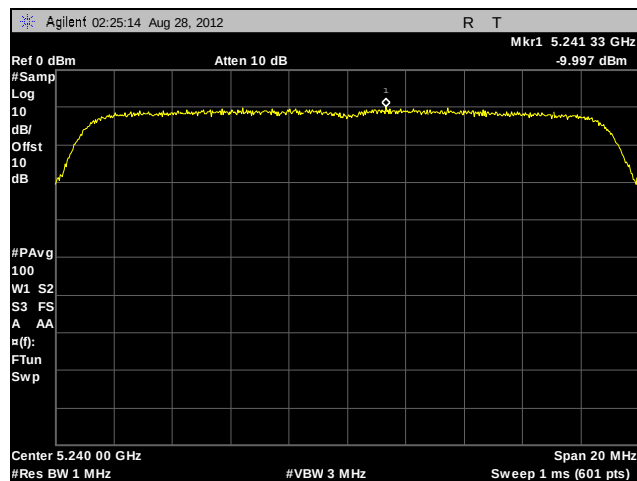
Plot 230. Peak Power Spectral Density, 802.11n 20 MHz, Mid Channel, Port B, Lower Gain Omni Antenna



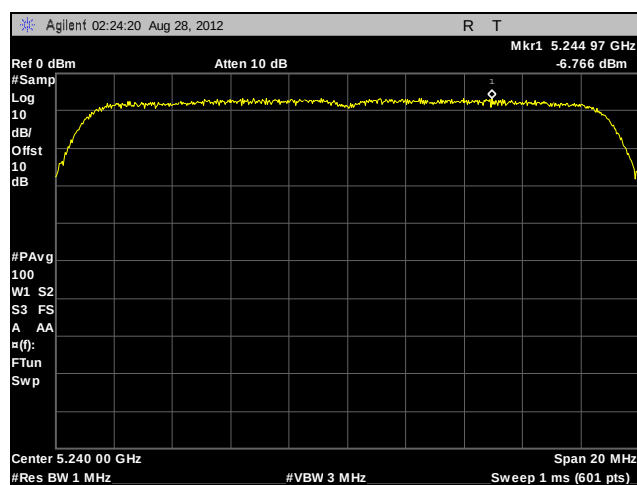
Plot 231. Peak Power Spectral Density, 802.11n 20 MHz, Mid Channel, Port C, Lower Gain Omni Antenna



Plot 232. Peak Power Spectral Density, 802.11n 20 MHz, High Channel, Port A, Lower Gain Omni Antenna

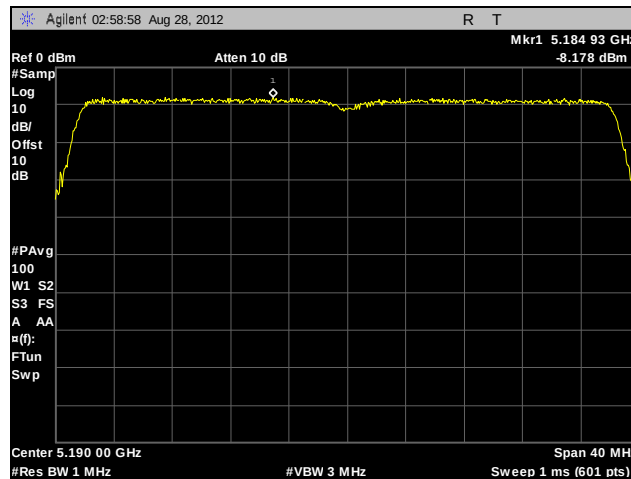


Plot 233. Peak Power Spectral Density, 802.11n 20 MHz, High Channel, Port B, Lower Gain Omni Antenna

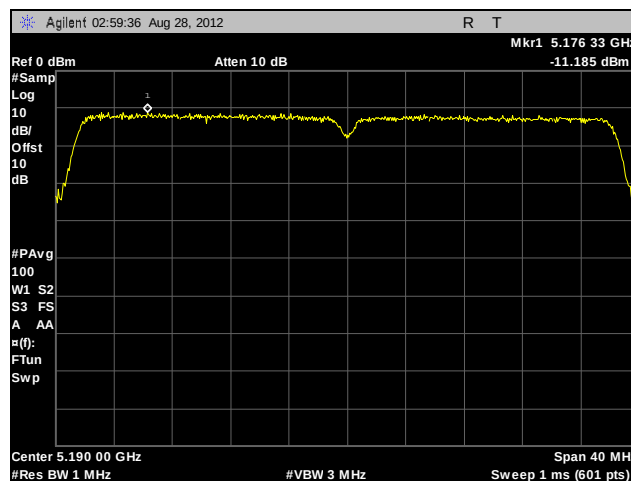


Plot 234. Peak Power Spectral Density, 802.11n 20 MHz, High Channel, Port C, Lower Gain Omni Antenna

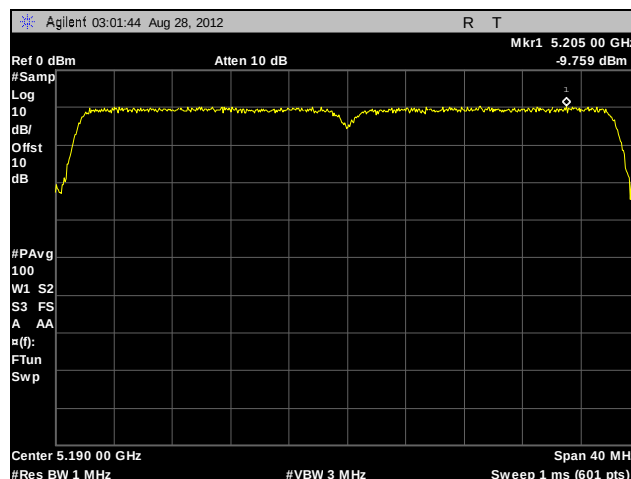
Peak Power Spectral Density, 802.11n 40 MHz, Lower Gain Omni Antenna



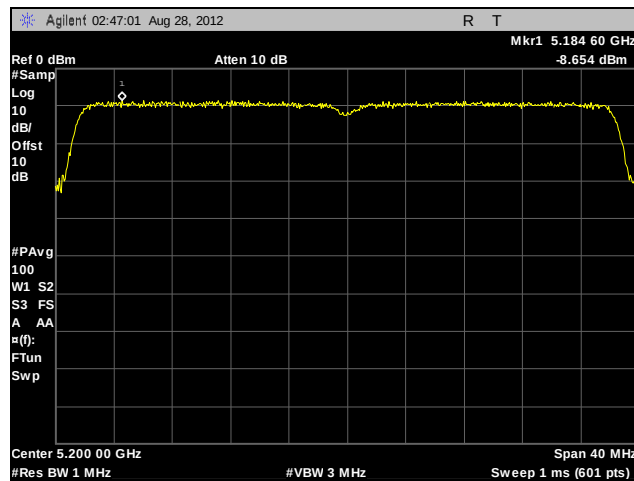
Plot 235. Peak Power Spectral Density, 802.11n 40 MHz, Low Channel, Port A, Lower Gain Omni Antenna



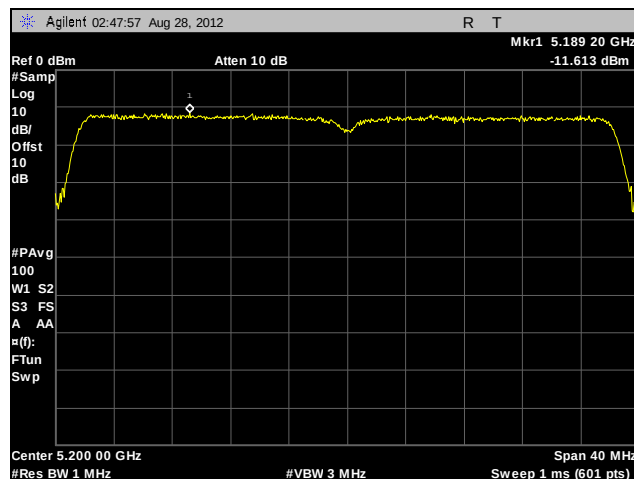
Plot 236. Peak Power Spectral Density, 802.11n 40 MHz, Low Channel, Port B, Lower Gain Omni Antenna



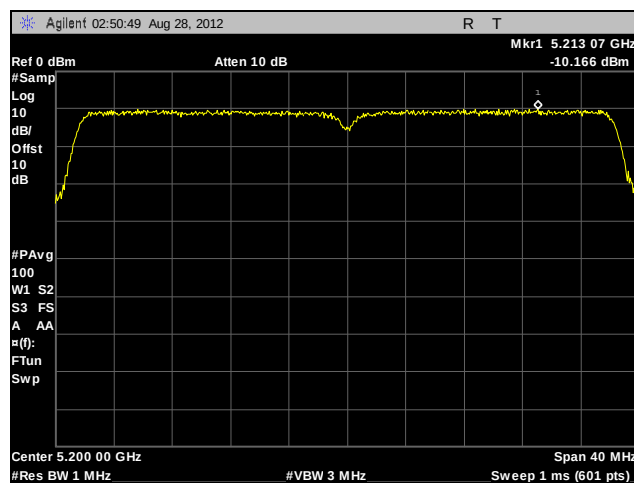
Plot 237. Peak Power Spectral Density, 802.11n 40 MHz, Low Channel, Port C, Lower Gain Omni Antenna



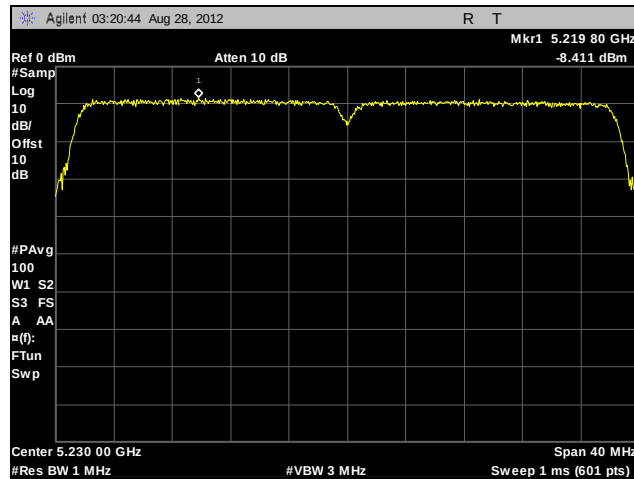
Plot 238. Peak Power Spectral Density, 802.11n 40 MHz, Mid Channel, Port A, Lower Gain Omni Antenna



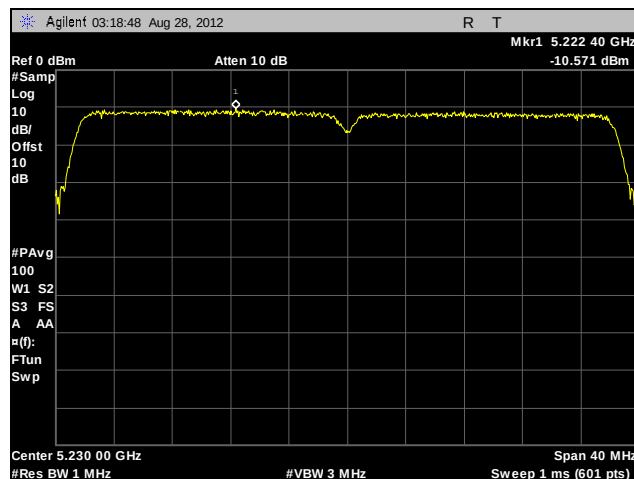
Plot 239. Peak Power Spectral Density, 802.11n 40 MHz, Mid Channel, Port B, Lower Gain Omni Antenna



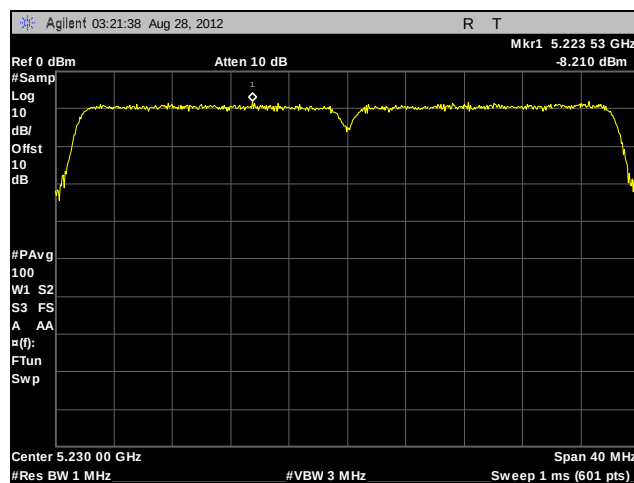
Plot 240. Peak Power Spectral Density, 802.11n 40 MHz, Mid Channel, Port C, Lower Gain Omni Antenna



Plot 241. Peak Power Spectral Density, 802.11n 40 MHz, High Channel, Port A, Lower Gain Omni Antenna

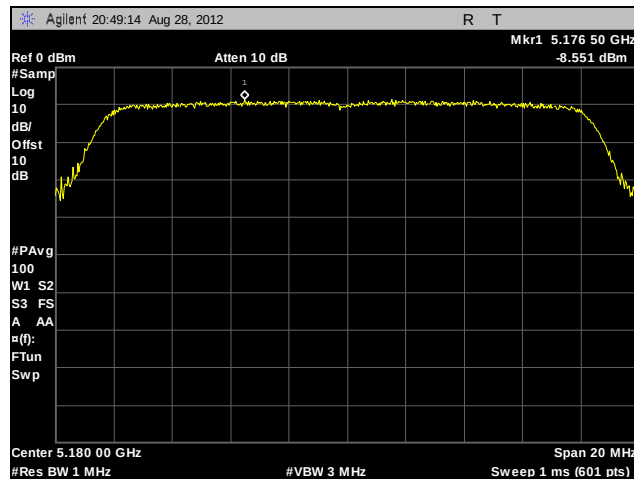


Plot 242. Peak Power Spectral Density, 802.11n 40 MHz, High Channel, Port B, Lower Gain Omni Antenna

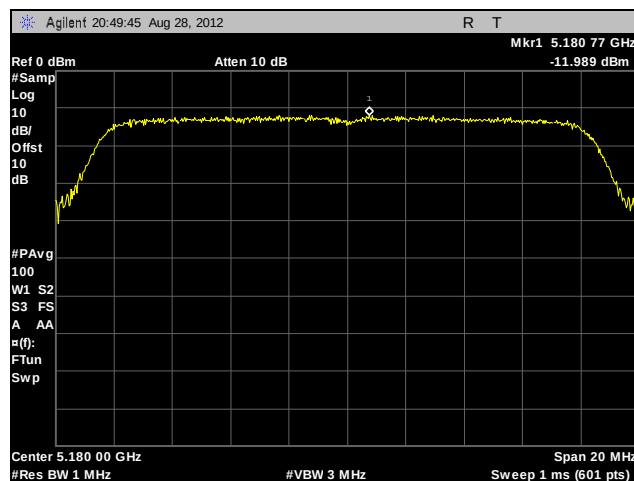


Plot 243. Peak Power Spectral Density, 802.11n 40 MHz, High Channel, Port C, Lower Gain Omni Antenna

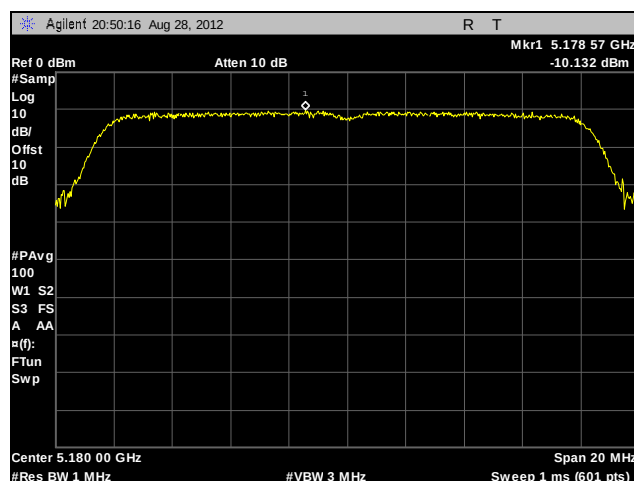
Peak Power Spectral Density, 802.11a, Patch Antenna



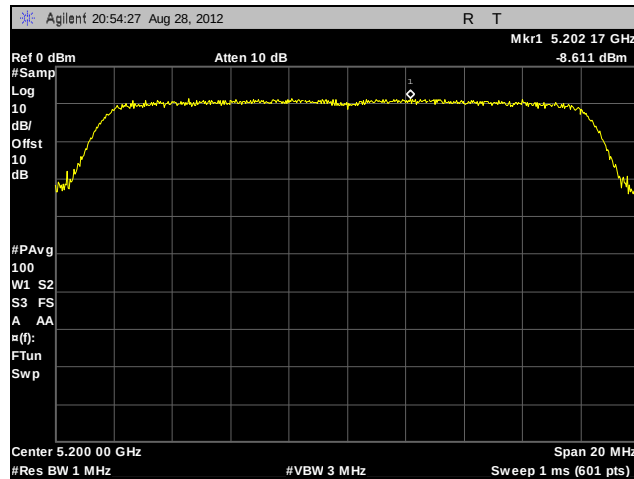
Plot 244. Peak Power Spectral Density, 802.11a, Low Channel, Port A, Patch Antenna



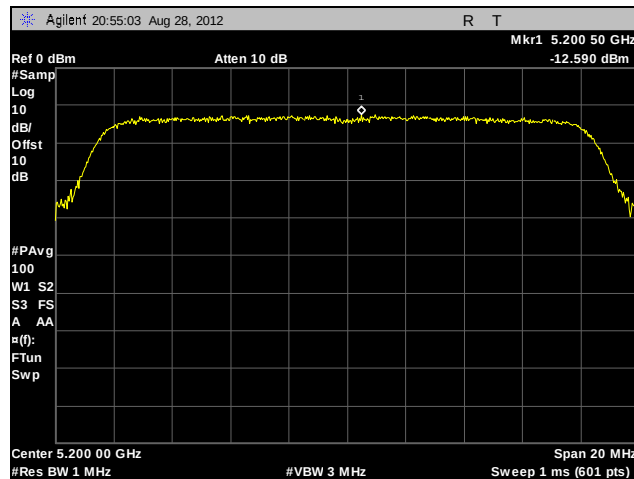
Plot 245. Peak Power Spectral Density, 802.11a, Low Channel, Port B, Patch Antenna



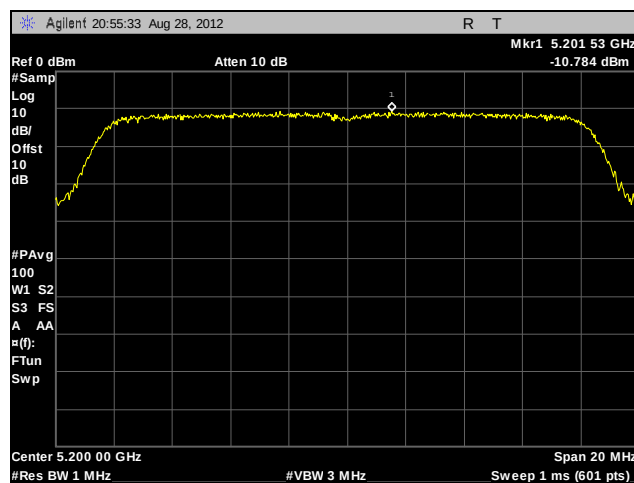
Plot 246. Peak Power Spectral Density, 802.11a, Low Channel, Port C, Patch Antenna



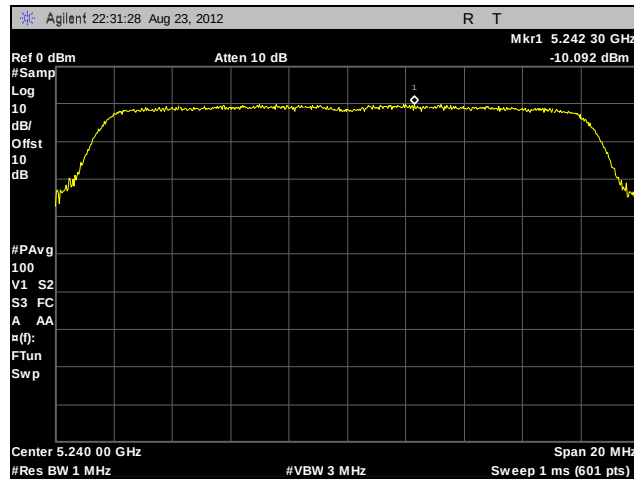
Plot 247. Peak Power Spectral Density, 802.11a, Mid Channel, Port A, Patch Antenna



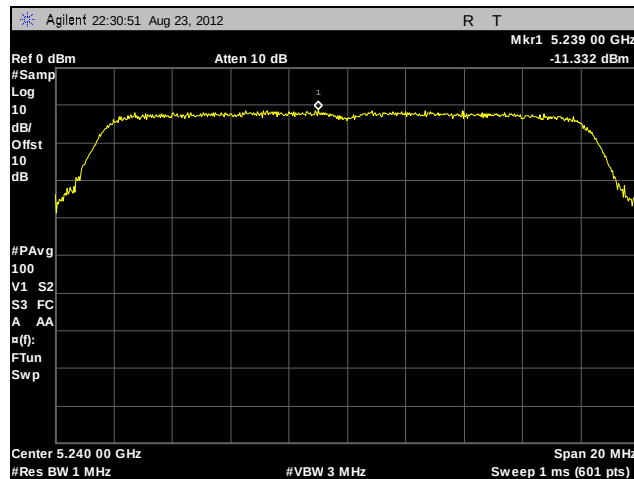
Plot 248. Peak Power Spectral Density, 802.11a, Mid Channel, Port B, Patch Antenna



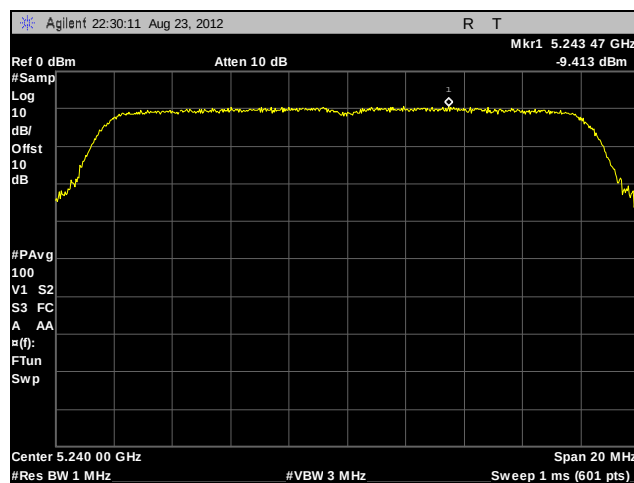
Plot 249. Peak Power Spectral Density, 802.11a, Mid Channel, Port C, Patch Antenna



Plot 250. Peak Power Spectral Density, 802.11a, High Channel, Port A, Patch Antenna

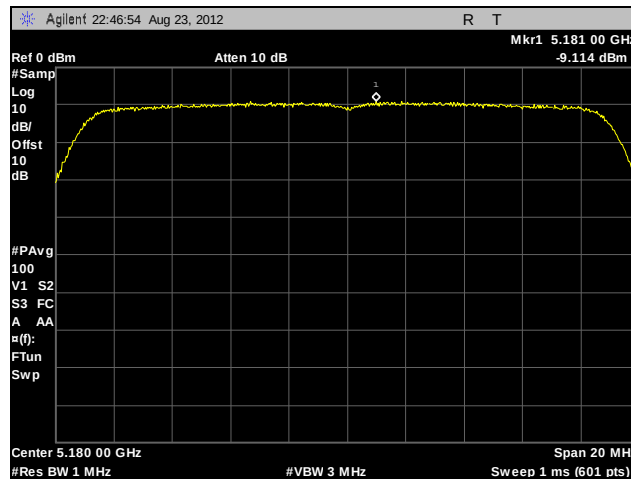


Plot 251. Peak Power Spectral Density, 802.11a, High Channel, Port B, Patch Antenna

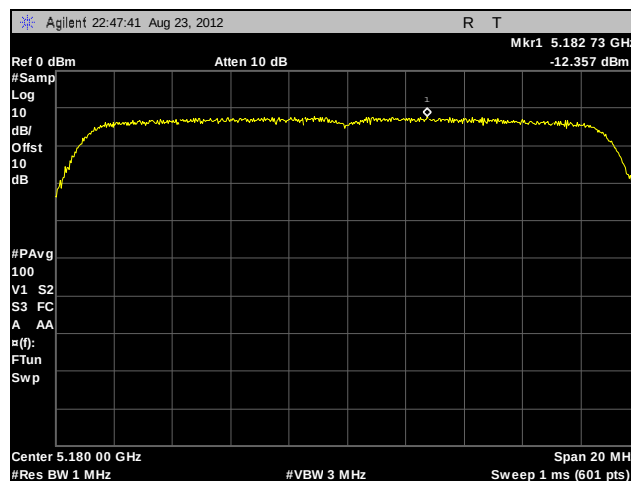


Plot 252. Peak Power Spectral Density, 802.11a, High Channel, Port C, Patch Antenna

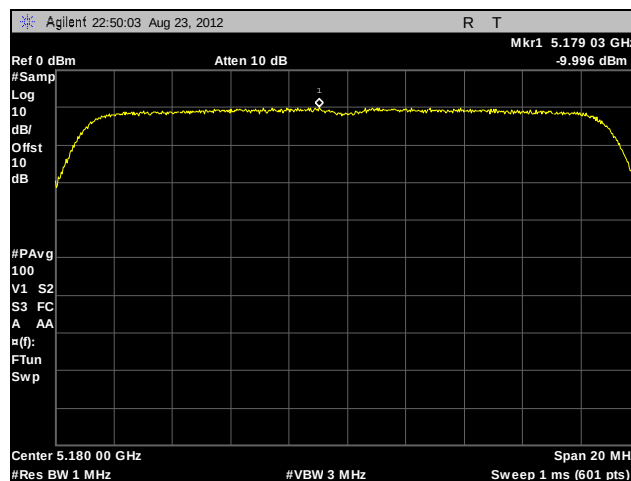
Peak Power Spectral Density, 802.11n 20 MHz, Patch Antenna



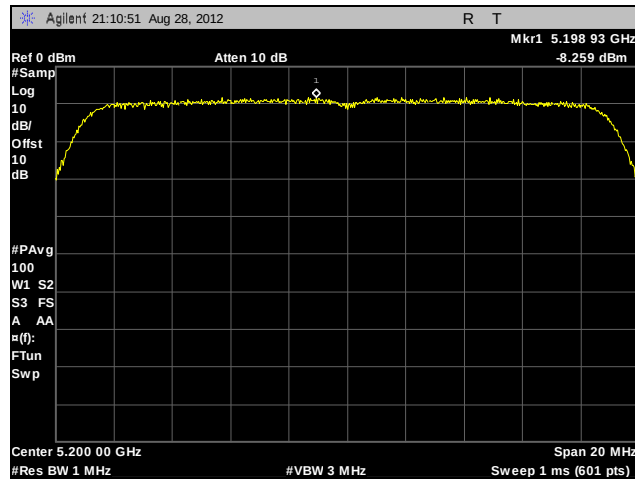
Plot 253. Peak Power Spectral Density, 802.11n 20 MHz, Low Channel, Port A, Patch Antenna



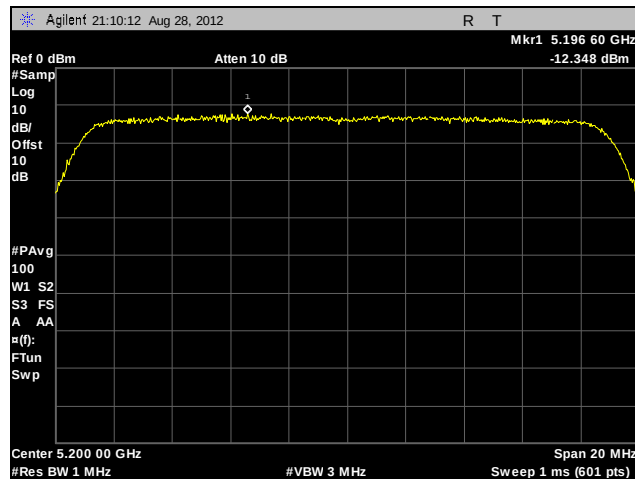
Plot 254. Peak Power Spectral Density, 802.11n 20 MHz, Low Channel, Port B, Patch Antenna



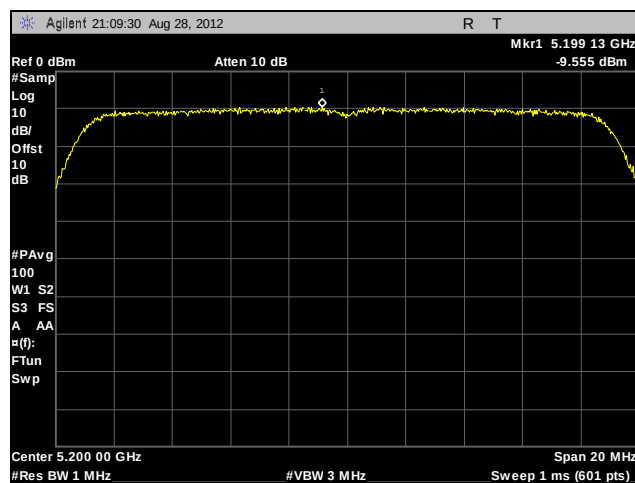
Plot 255. Peak Power Spectral Density, 802.11n 20 MHz, Low Channel, Port C, Patch Antenna



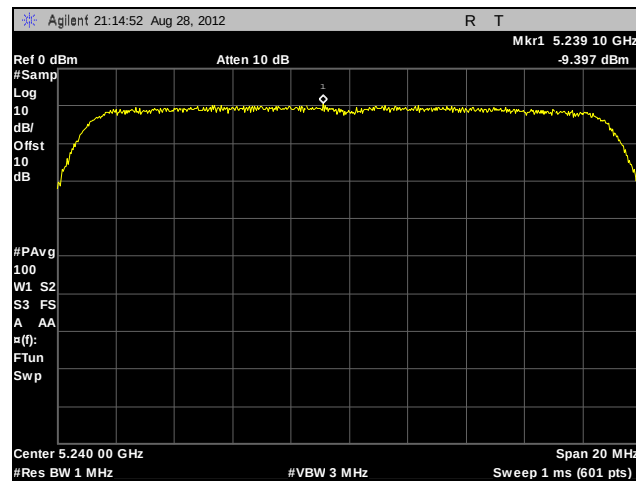
Plot 256. Peak Power Spectral Density, 802.11n 20 MHz, Mid Channel, Port A, Patch Antenna



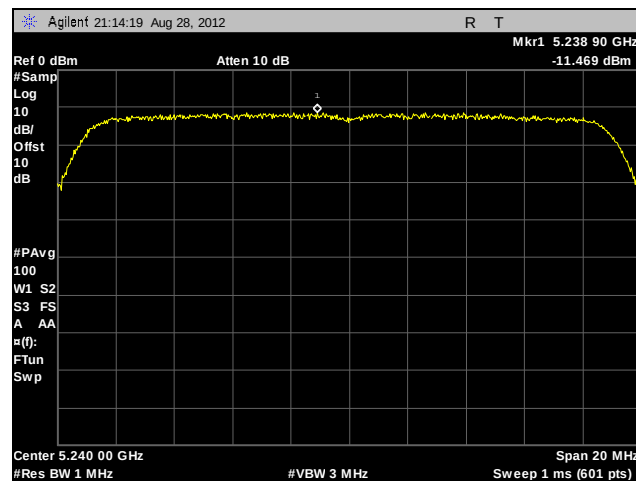
Plot 257. Peak Power Spectral Density, 802.11n 20 MHz, Mid Channel, Port B, Patch Antenna



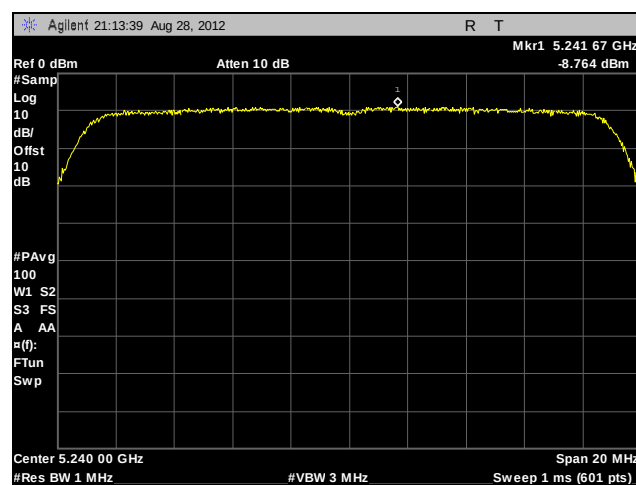
Plot 258. Peak Power Spectral Density, 802.11n 20 MHz, Mid Channel, Port C, Patch Antenna



Plot 259. Peak Power Spectral Density, 802.11n 20 MHz, High Channel, Port A, Patch Antenna

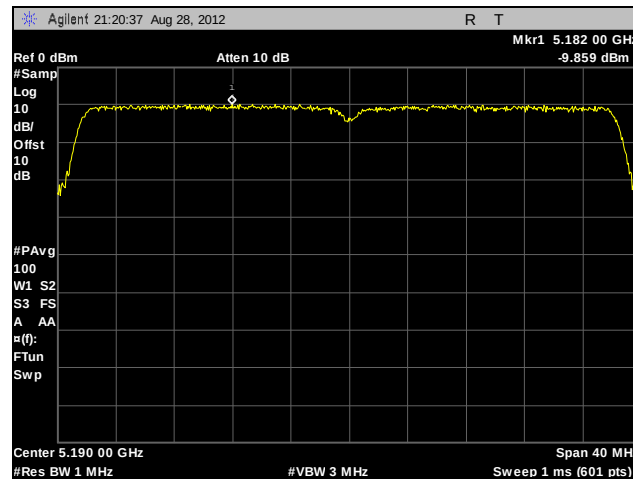


Plot 260. Peak Power Spectral Density, 802.11n 20 MHz, High Channel, Port B, Patch Antenna

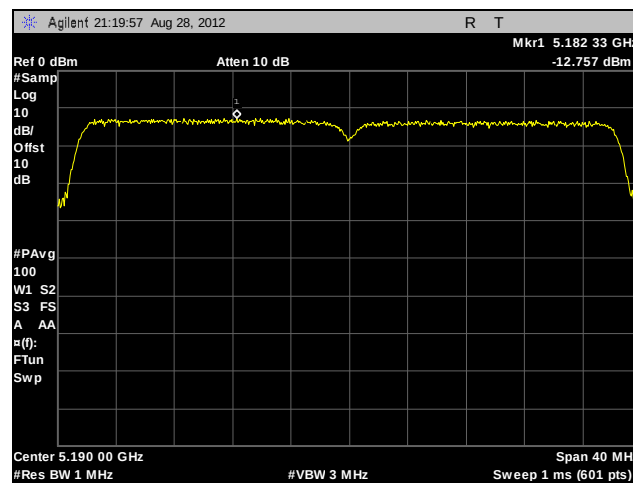


Plot 261. Peak Power Spectral Density, 802.11n 20 MHz, High Channel, Port C, Patch Antenna

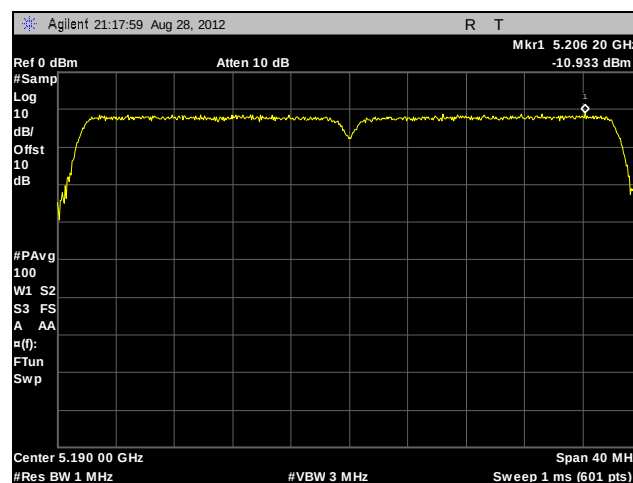
Peak Power Spectral Density, 802.11n 40 MHz, Patch Antenna



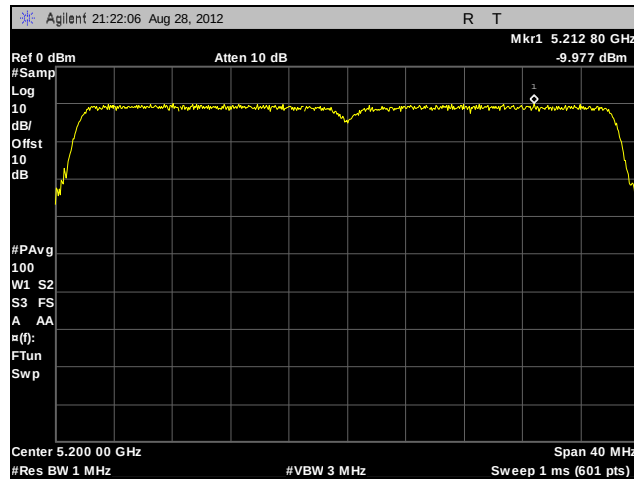
Plot 262. Peak Power Spectral Density, 802.11n 40 MHz, Low Channel, Port A, Patch Antenna



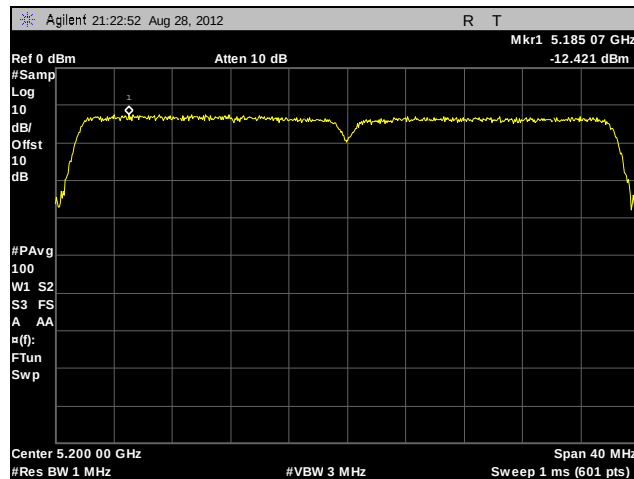
Plot 263. Peak Power Spectral Density, 802.11n 40 MHz, Low Channel, Port B, Patch Antenna



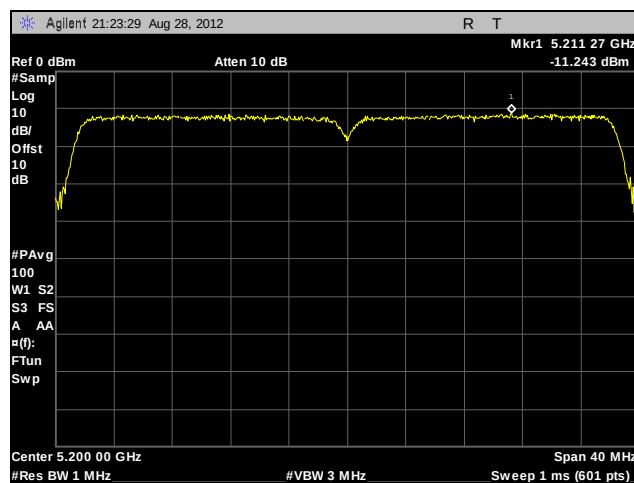
Plot 264. Peak Power Spectral Density, 802.11n 40 MHz, Low Channel, Port C, Patch Antenna



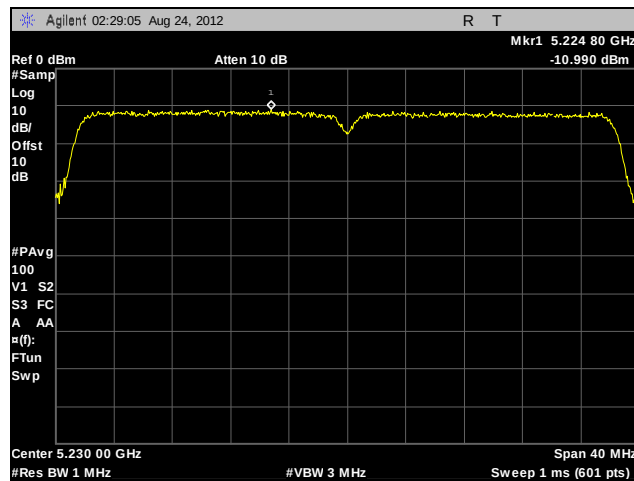
Plot 265. Peak Power Spectral Density, 802.11n 40 MHz, Mid Channel, Port A, Patch Antenna



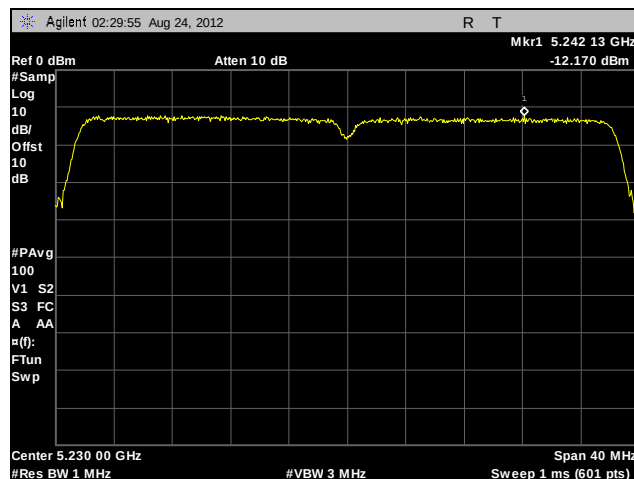
Plot 266. Peak Power Spectral Density, 802.11n 40 MHz, Mid Channel, Port B, Patch Antenna



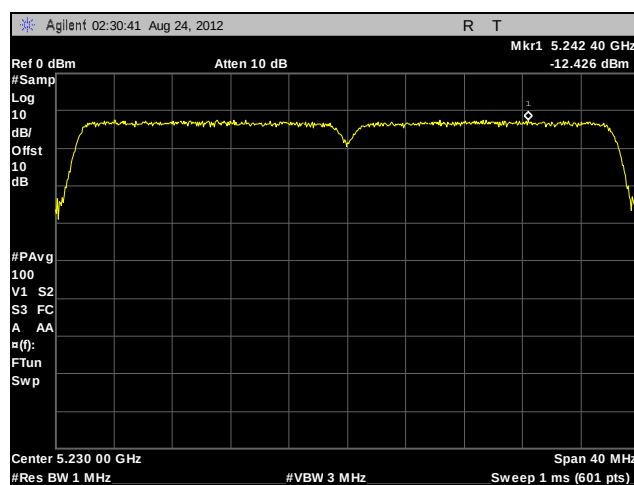
Plot 267. Peak Power Spectral Density, 802.11n 40 MHz, Mid Channel, Port C, Patch Antenna



Plot 268. Peak Power Spectral Density, 802.11n 40 MHz, High Channel, Port A, Patch Antenna



Plot 269. Peak Power Spectral Density, 802.11n 40 MHz, High Channel, Port B, Patch Antenna



Plot 270. Peak Power Spectral Density, 802.11n 40 MHz, High Channel, Port C, Patch Antenna

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.407(a)(6) Peak Excursion Ratio

Test Requirements: § 15.407(a)(6): The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the maximum conducted output power (measured as specified above) shall not exceed 13 dB across any 1 MHz bandwidth or the emission bandwidth whichever is less.

Test Procedure: The EUT was connected directly to the spectrum analyzer through cabling and attenuation. The 1st trace on the spectrum analyzer was set to RBW=1MHz, VBW=3MHz. The peak detector mode was used and the trace max held. The 2nd trace on the spectrum analyzer was set according to Measurement method SA-1 from KDB publication number 789033 for making conducted power measurements.

Test Results: Equipment was compliant with the peak excursion ratio limits of § 15.407(a)(6). The peak excursion ratio was determined from plots on the following page(s).

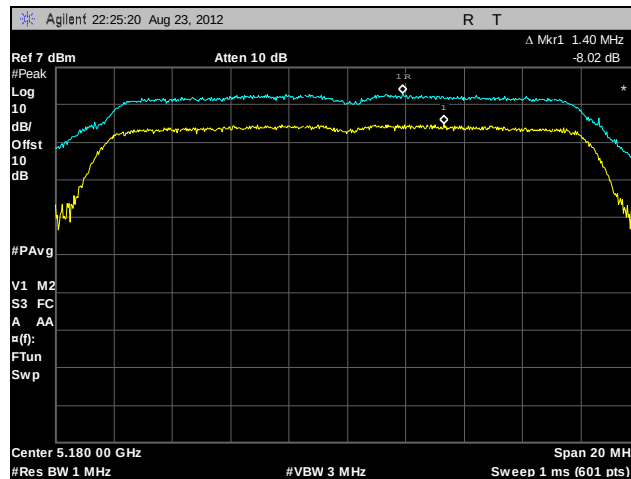
Test Engineer(s): Jeff Pratt

Test Date(s): 08/23/12

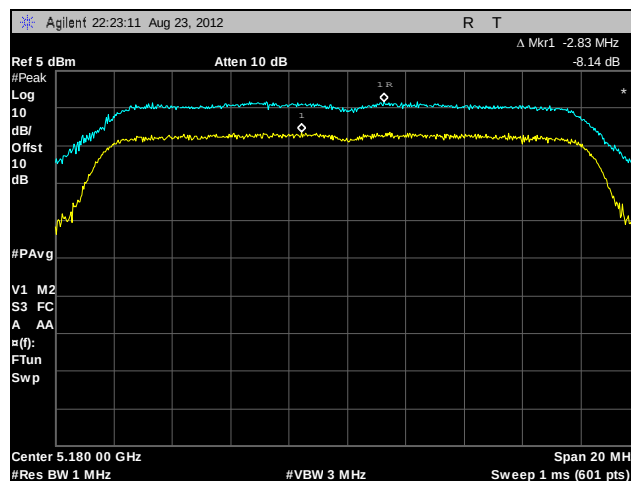


Figure 5. Peak Excursion Ration Test Setup

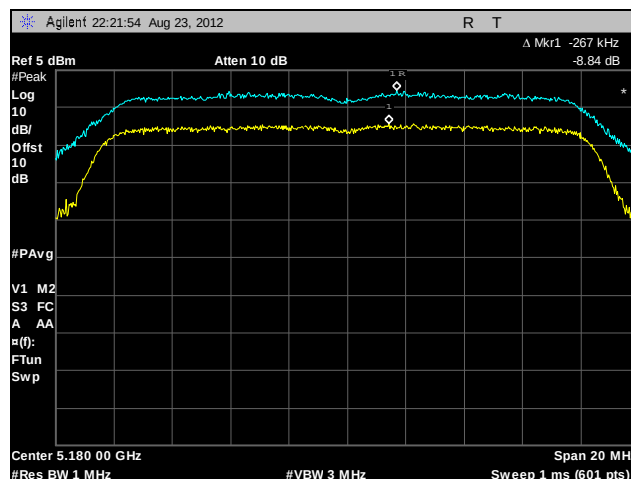
Peak Excursion Test Results, 802.11a



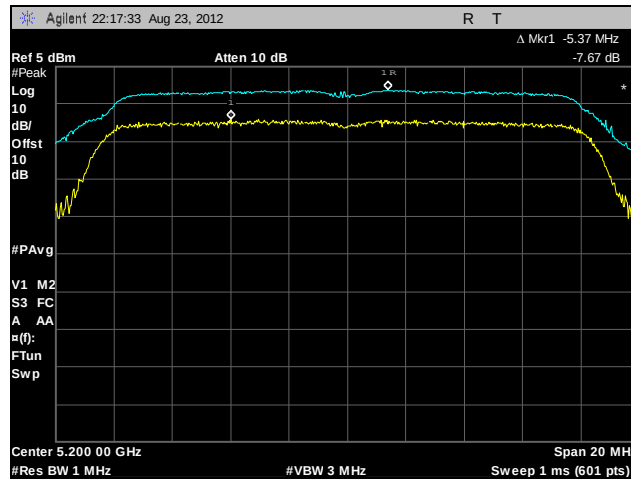
Plot 271. Peak Excursion Ratio, 802.11a, Low Channel, Port A



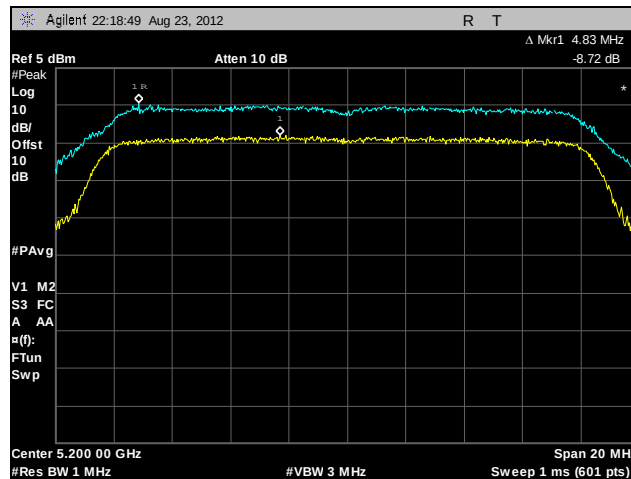
Plot 272. Peak Excursion Ratio, 802.11a, Low Channel, Port B



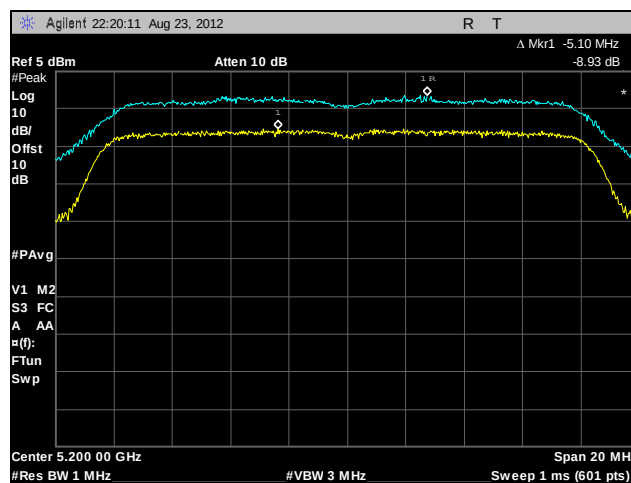
Plot 273. Peak Excursion Ratio, 802.11a, Low Channel, Port C



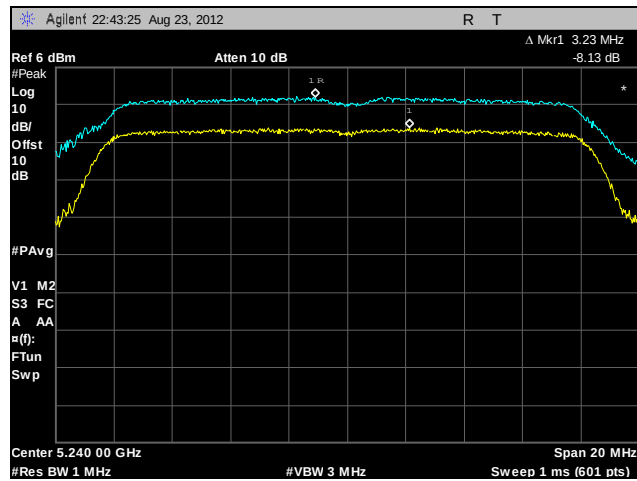
Plot 274. Peak Excursion Ratio, 802.11a, Mid Channel, Port A



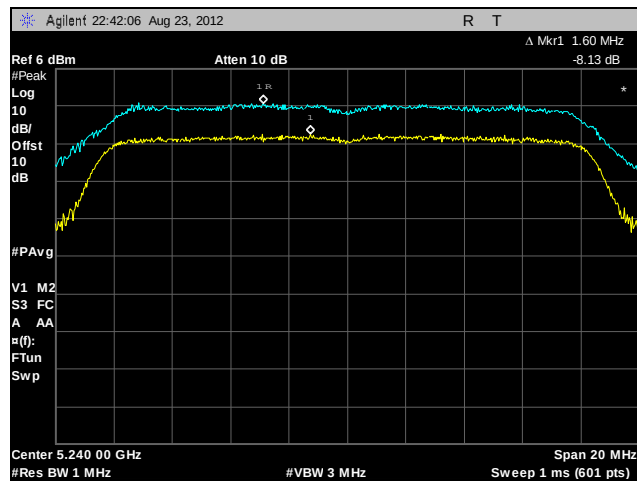
Plot 275. Peak Excursion Ratio, 802.11a, Mid Channel, Port B



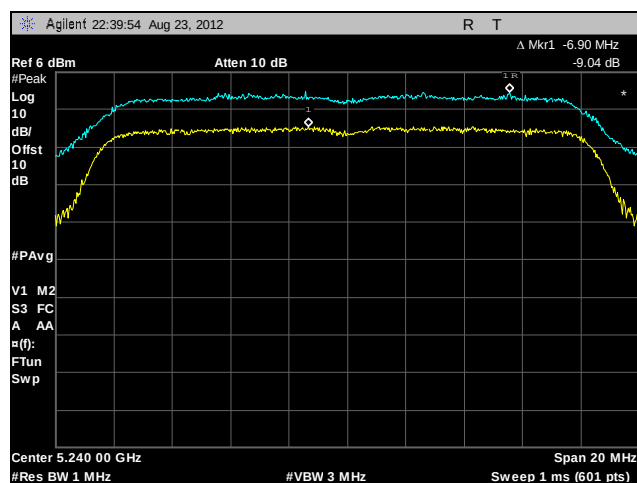
Plot 276. Peak Excursion Ratio, 802.11a, Mid Channel, Port C



Plot 277. Peak Excursion Ratio, 802.11a, High Channel, Port A

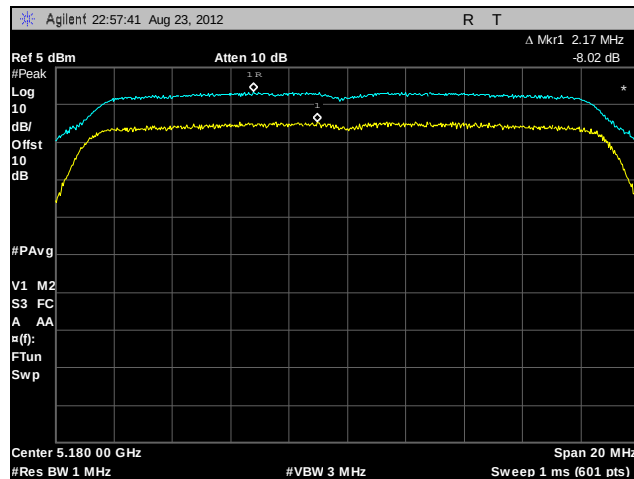


Plot 278. Peak Excursion Ratio, 802.11a, High Channel, Port B

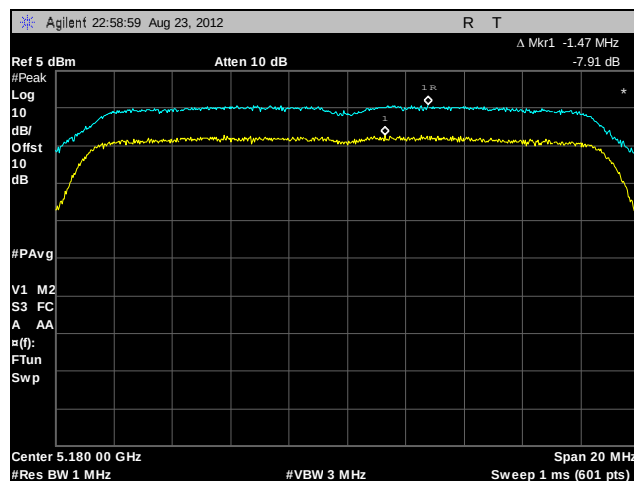


Plot 279. Peak Excursion Ratio, 802.11a, High Channel, Port C

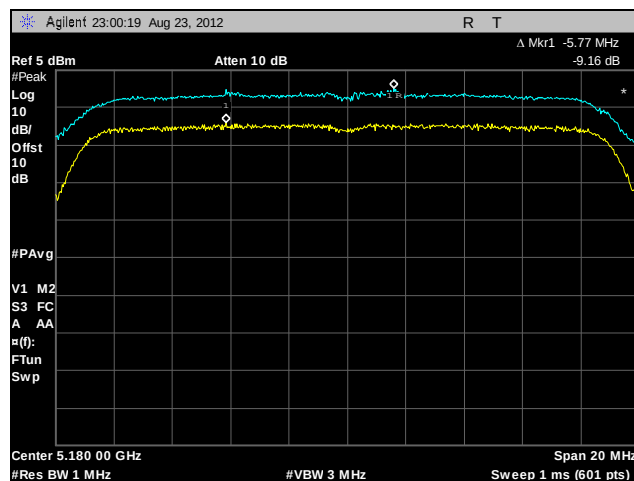
Peak Excursion Test Results, 802.11n HT20



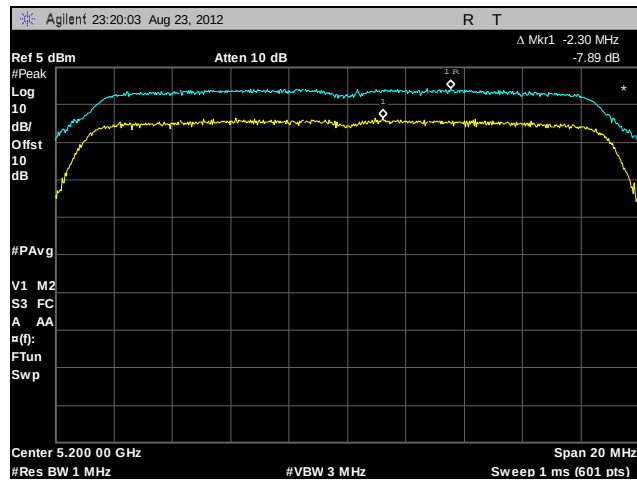
Plot 280. Peak Excursion Ratio, 802.11n 20 MHz, Low Channel, Port A



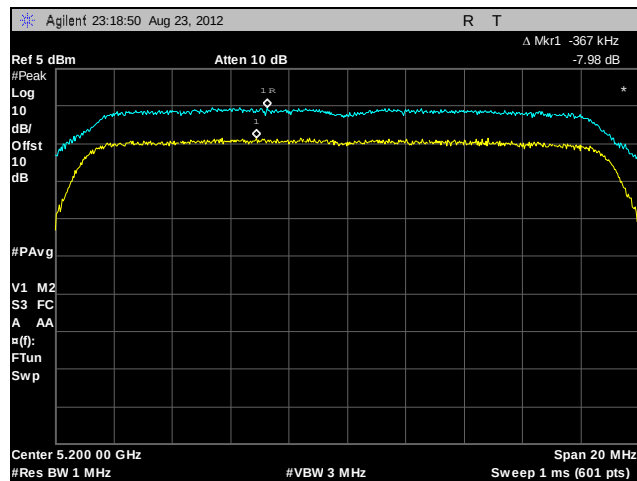
Plot 281. Peak Excursion Ratio, 802.11n 20 MHz, Low Channel, Port B



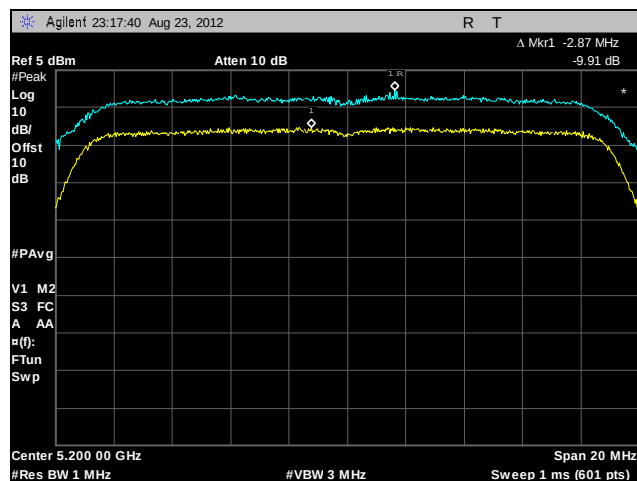
Plot 282. Peak Excursion Ratio, 802.11n 20 MHz, Low Channel, Port C



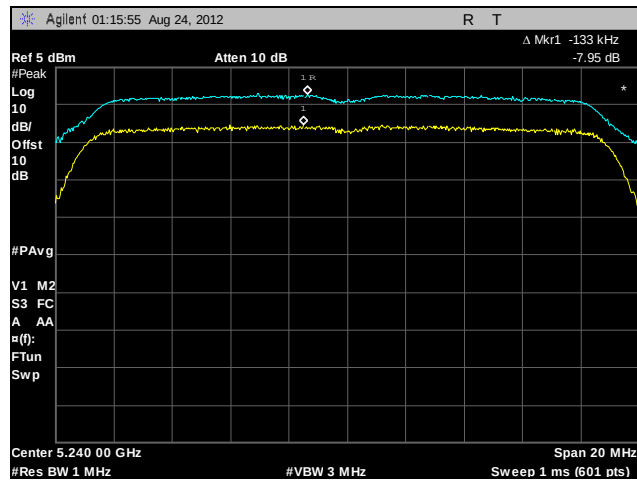
Plot 283. Peak Excursion Ratio, 802.11n 20 MHz, Mid Channel, Port A



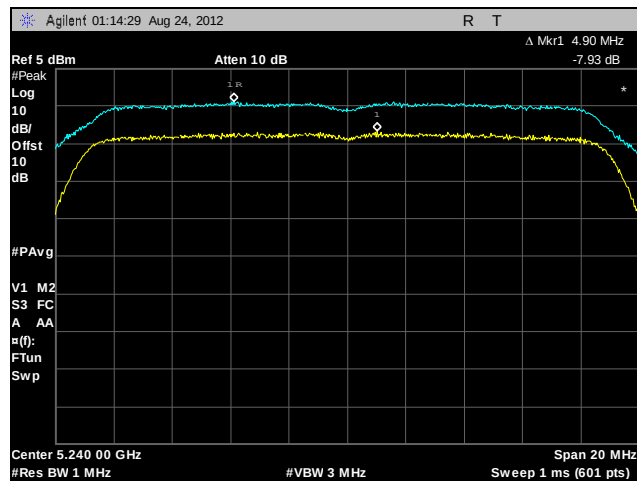
Plot 284. Peak Excursion Ratio, 802.11n 20 MHz, Mid Channel, Port B



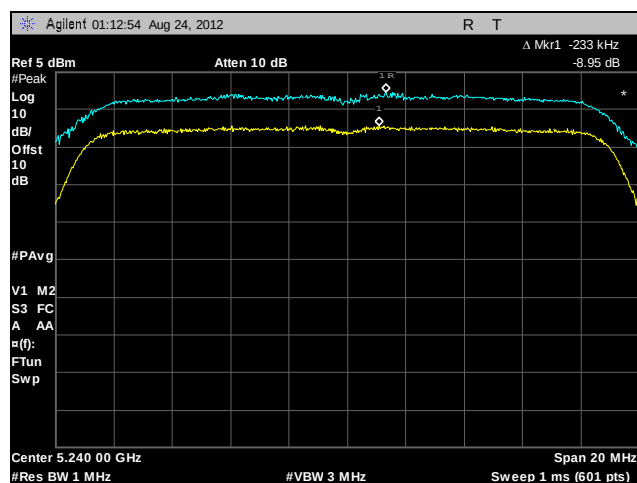
Plot 285. Peak Excursion Ratio, 802.11n 20 MHz, Mid Channel, Port C



Plot 286. Peak Excursion Ratio, 802.11n 20 MHz, High Channel, Port A

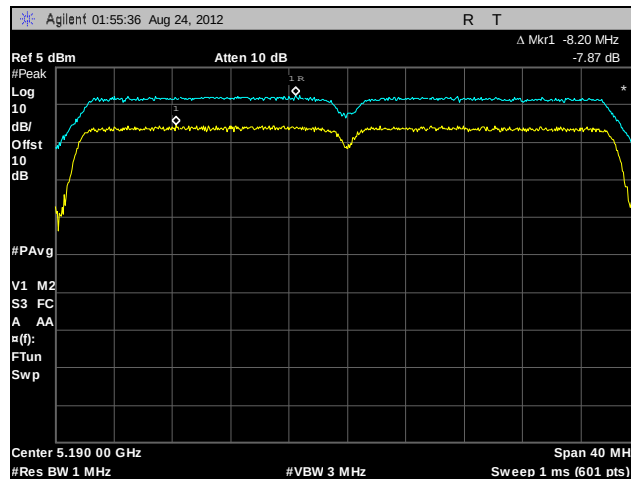


Plot 287. Peak Excursion Ratio, 802.11n 20 MHz, High Channel, Port B

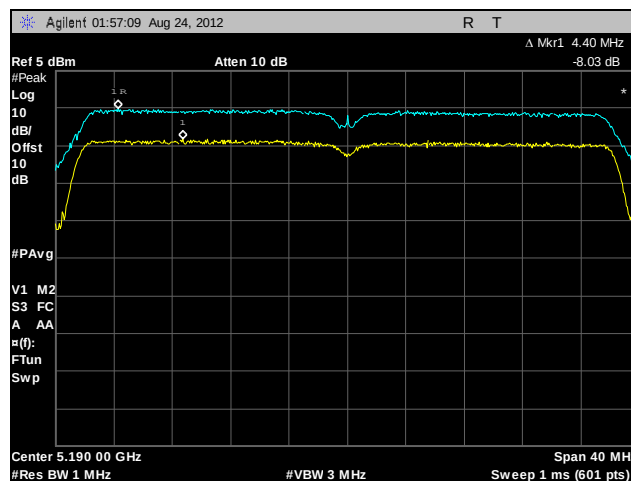


Plot 288. Peak Excursion Ratio, 802.11n 20 MHz, High Channel, Port C

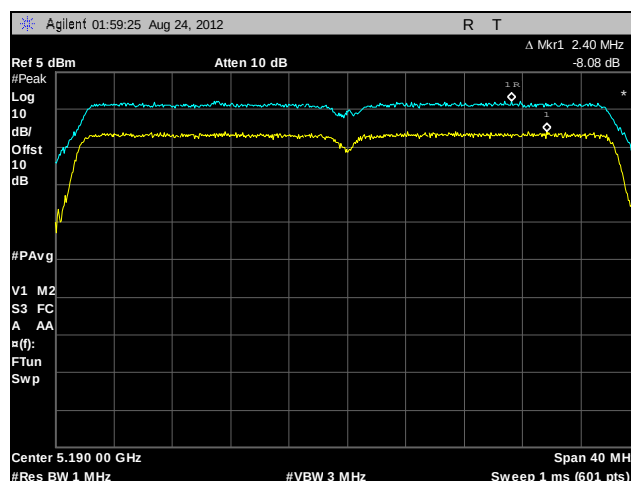
Peak Excursion Test Results, 802.11n HT40



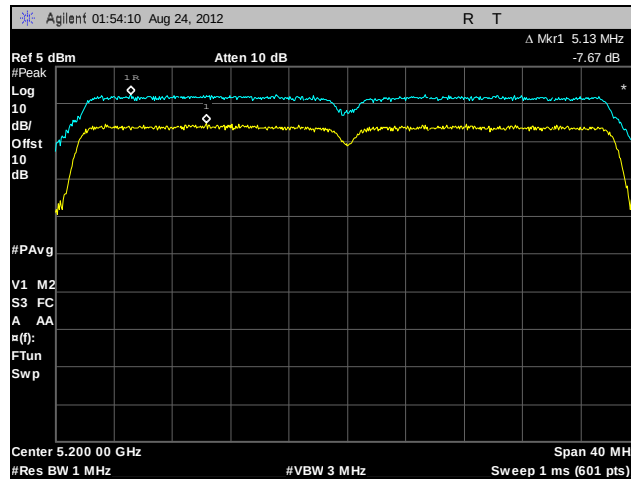
Plot 289. Peak Excursion Ratio, 802.11n 40 MHz, Low Channel, Port A



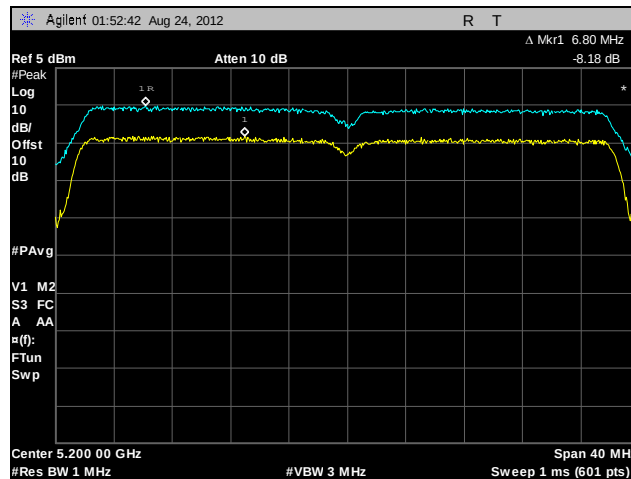
Plot 290. Peak Excursion Ratio, 802.11n 40 MHz, Low Channel, Port B



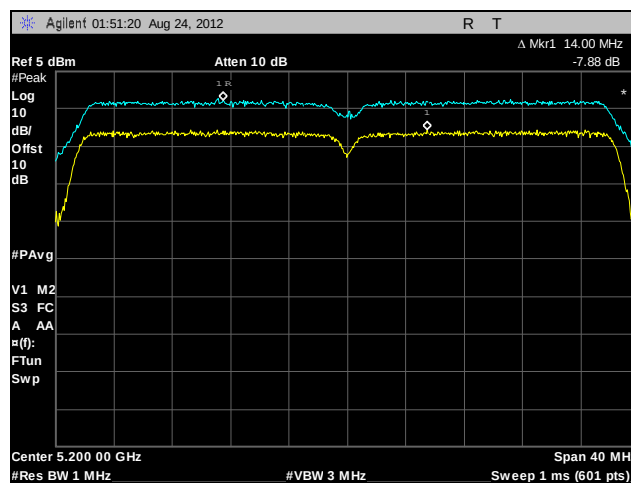
Plot 291. Peak Excursion Ratio, 802.11n 40 MHz, Low Channel, Port C



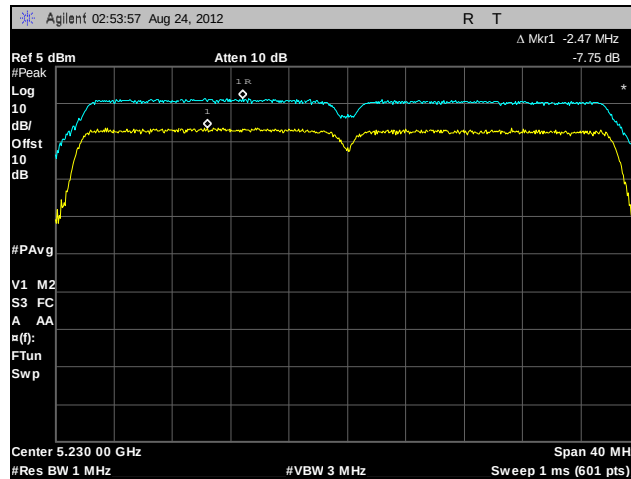
Plot 292. Peak Excursion Ratio, 802.11n 40 MHz, Mid Channel, Port A



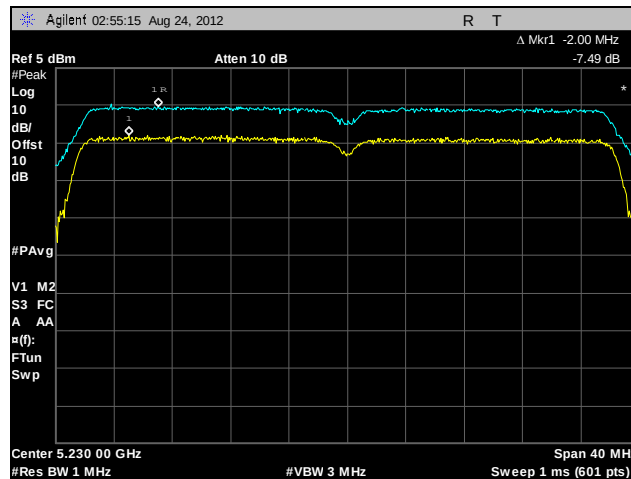
Plot 293. Peak Excursion Ratio, 802.11n 40 MHz, Mid Channel, Port B



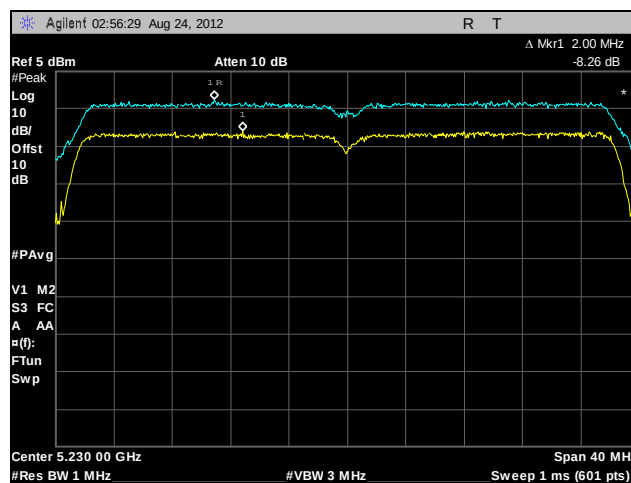
Plot 294. Peak Excursion Ratio, 802.11n 40 MHz, Mid Channel, Port C



Plot 295. Peak Excursion Ratio, 802.11n 40 MHz, High Channel, Port A



Plot 296. Peak Excursion Ratio, 802.11n 40 MHz, High Channel, Port B



Plot 297. Peak Excursion Ratio, 802.11n 40 MHz, High Channel, Port C

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.407(b) Undesirable Emissions

Test Requirements: § 15.407(b)(1), (b)(6), (b)(7), §15.205: Emissions outside the frequency band.

§ 15.407(b)(1): For transmitters operating in the 5.15-5.25 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz.

§ 15.407(b)(6): Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in Section 15.209. Further, any U-NII devices using an AC power line are required to comply also with the conducted limits set forth in Section 15.207.

§ 15.407(b)(7): The provisions of Section 15.205 of this part apply to intentional radiators operating under this section.

Test Procedure: The transmitter was placed on a wooden stand inside in a semi-anechoic chamber. Measurements were performed with the EUT rotated 360 degrees and varying the adjustable antenna mast height to determine worst case orientation for maximum emissions.

For frequencies from 30 MHz to 1 GHz, measurements were made using a quasi-peak detector with a 120 kHz bandwidth. Emissions exceeding the 15.209 limit are digital and meet the 15.109 limits on digital emissions.

For measurements above 1 GHz, measurements were made with a Peak detector with 1 MHz resolution bandwidth. Where the spurious emissions fell into a restricted band, measurements were also made with an average detector to make sure they complied with 15.209 limits. Emissions were explored up to 40 GHz.

The equation, $EIRP = E + 20 \log D - 104.8$ was used to convert an EIRP limit to a field strength limit.

E = field strength (dBuV/m)

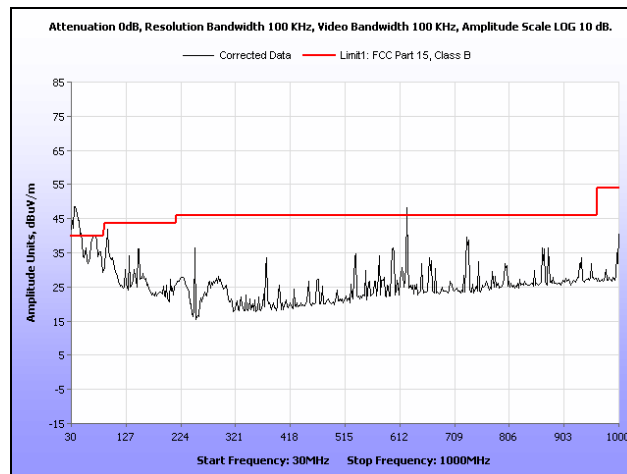
D = Reference measurement distance (m)

Test Results: The EUT was compliant with the Radiated Emission limits for Intentional Radiators. See following pages for detailed test results.

Test Engineer(s): Jeff Pratt

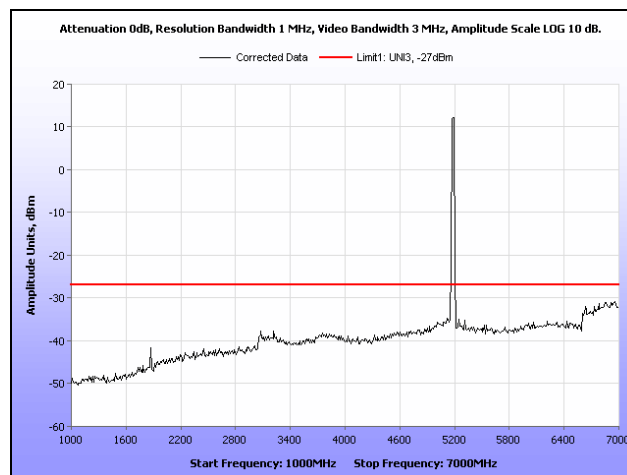
Test Date(s): 08/29/12

Radiated Spurious Emissions Test Results, 802.11a, 10 dBi Omni Antenna

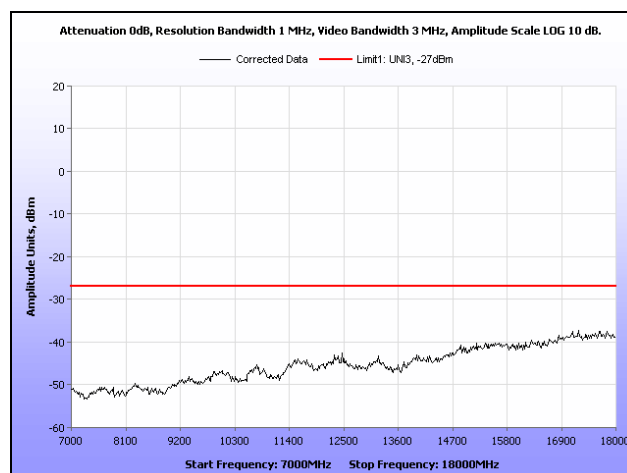


Plot 298. Radiated Spurious Emissions, 802.11a, Low Channel, 30 MHz – 1 GHz, 10 dBi Omni Antenna

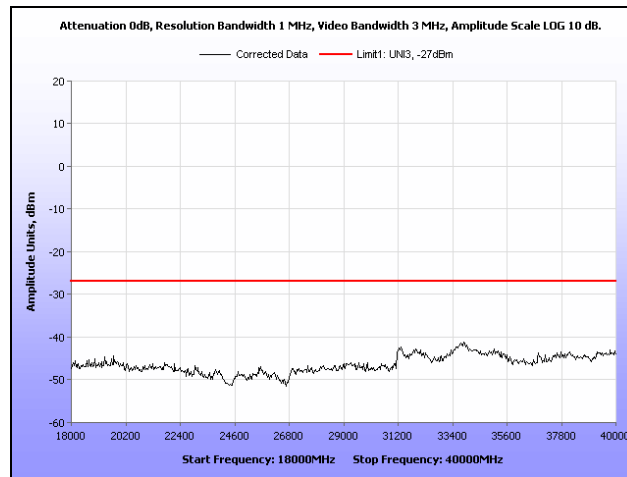
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



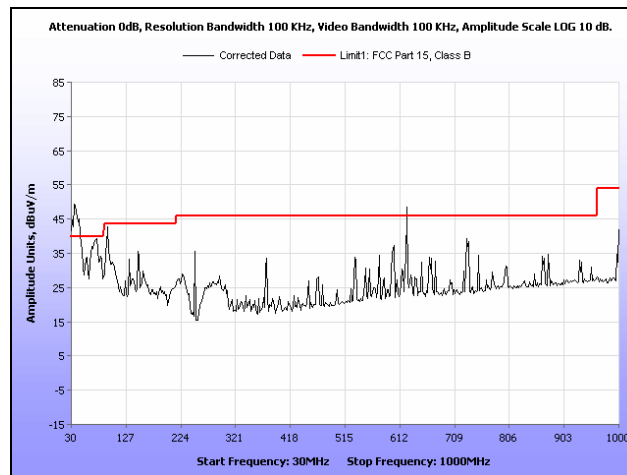
Plot 299. Radiated Spurious Emissions, 802.11a, Low Channel, 1 GHz – 7 GHz, 10 dBi Omni Antenna



Plot 300. Radiated Spurious Emissions, 802.11a, Low Channel, 7 GHz – 18 GHz, 10 dBi Omni Antenna

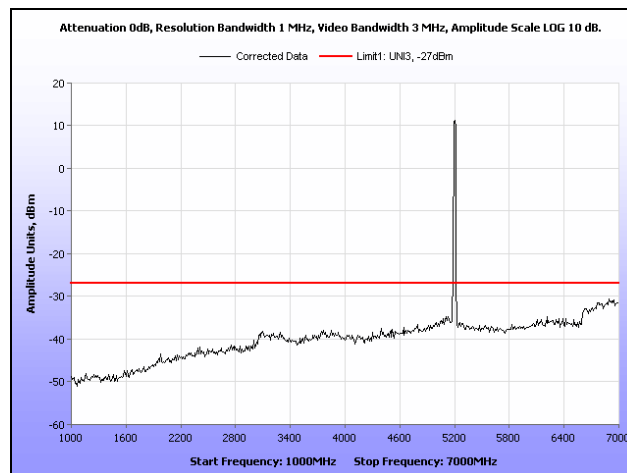


Plot 301. Radiated Spurious Emissions, 802.11a, Low Channel, 18 GHz – 40 GHz, 10 dBi Omni Antenna

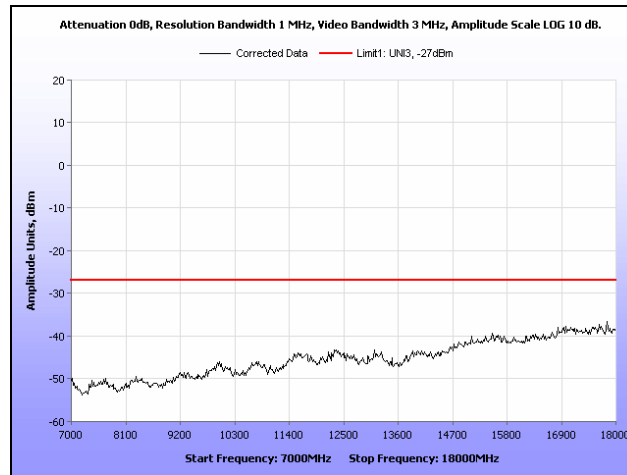


Plot 302. Radiated Spurious Emissions, 802.11a, Mid Channel, 30 MHz – 1 GHz, 10 dBi Omni Antenna

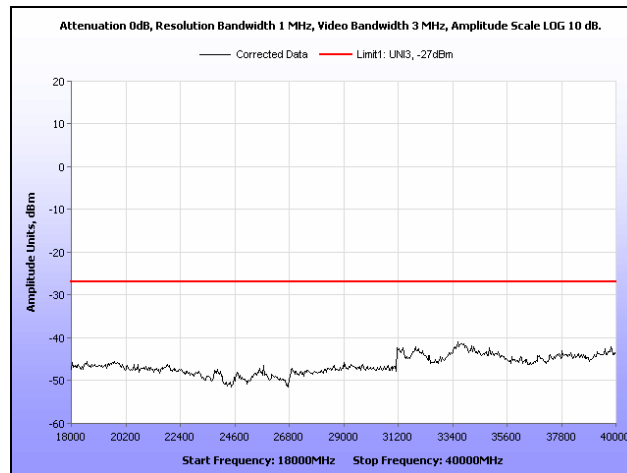
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



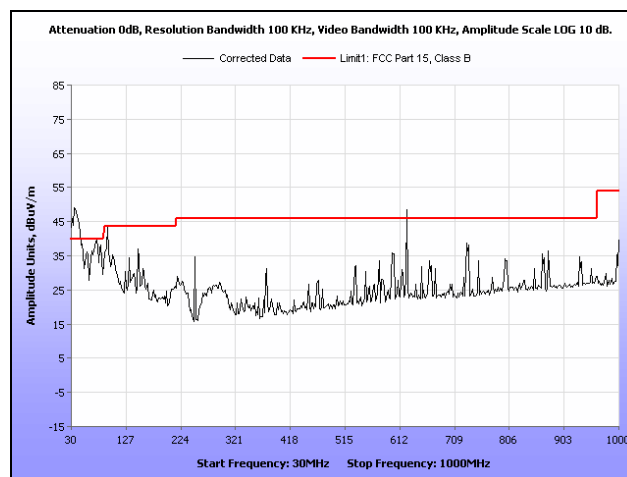
Plot 303. Radiated Spurious Emissions, 802.11a, Mid Channel, 1 GHz – 7 GHz, 10 dBi Omni Antenna



Plot 304. Radiated Spurious Emissions, 802.11a, Mid Channel, 7 GHz – 18 GHz, 10 dBi Omni Antenna

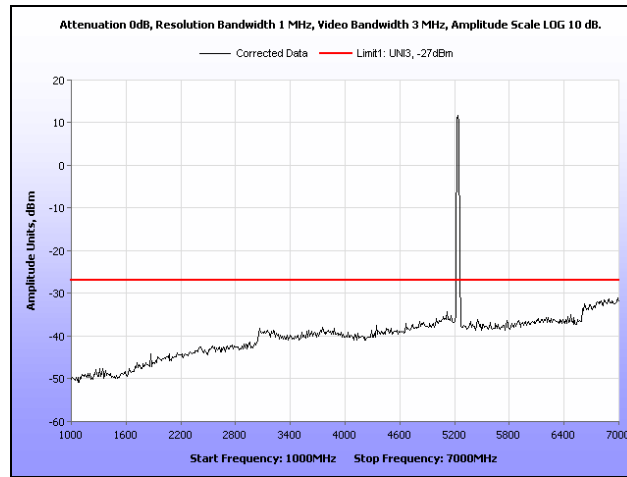


Plot 305. Radiated Spurious Emissions, 802.11a, Mid Channel, 18 GHz – 40 GHz, 10 dBi Omni Antenna

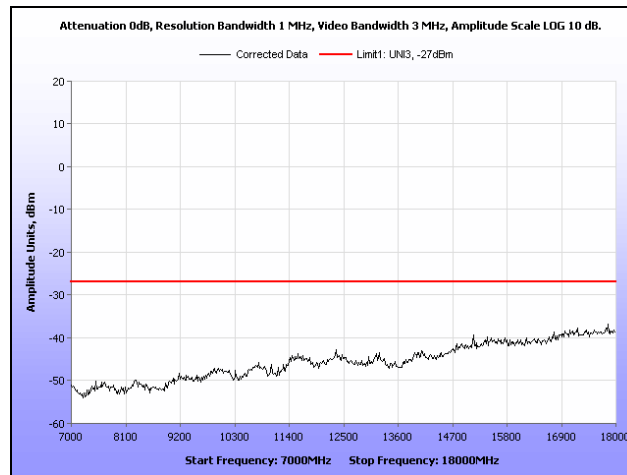


Plot 306. Radiated Spurious Emissions, 802.11a, High Channel, 30 MHz – 1 GHz, 10 dBi Omni Antenna

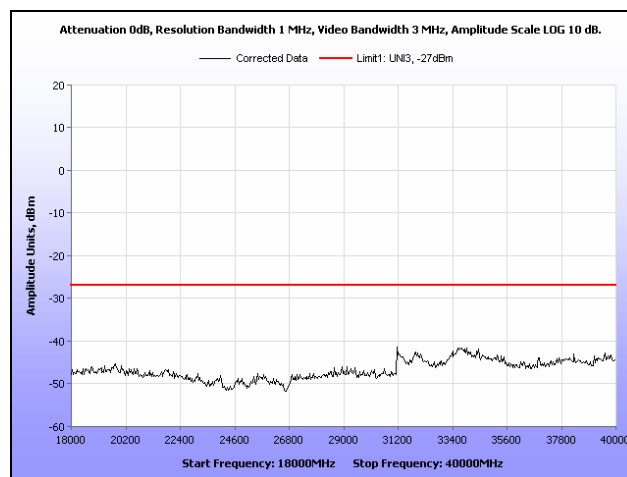
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



Plot 307. Radiated Spurious Emissions, 802.11a, High Channel, 1 GHz – 7 GHz, 10 dBi Omni Antenna

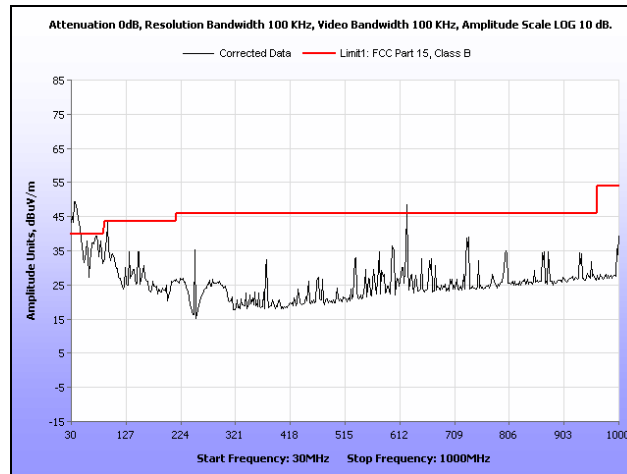


Plot 308. Radiated Spurious Emissions, 802.11a, High Channel, 7 GHz – 18 GHz, 10 dBi Omni Antenna



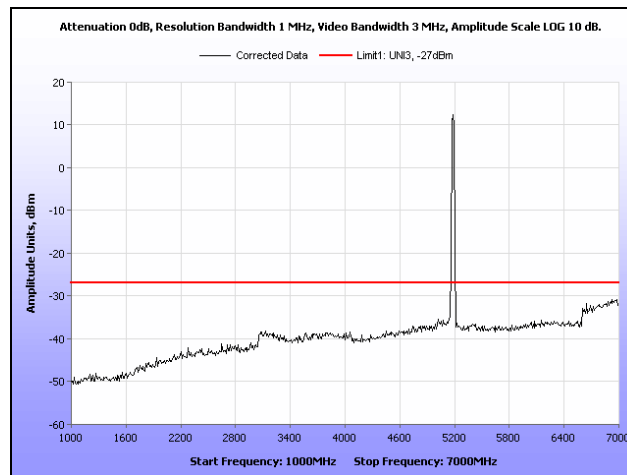
Plot 309. Radiated Spurious Emissions, 802.11a, High Channel, 18 GHz – 40 GHz, 10 dBi Omni Antenna

Radiated Spurious Emissions Test Results, 802.11n HT20, 10 dBi Omni Antenna

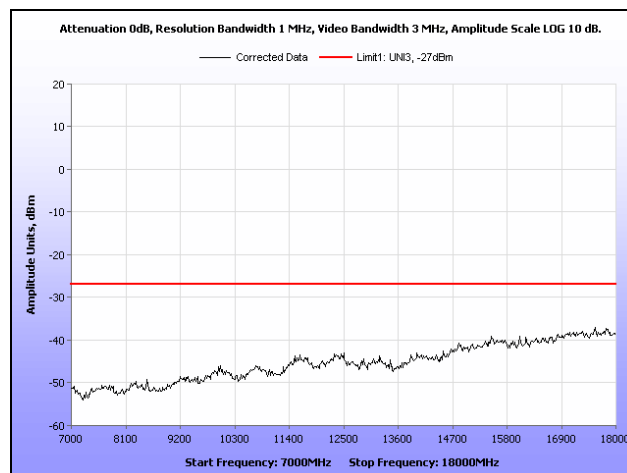


Plot 310. Radiated Spurious Emissions, 802.11n 20 MHz, Low Channel, 30 MHz – 1 GHz, 10 dBi Omni Antenna

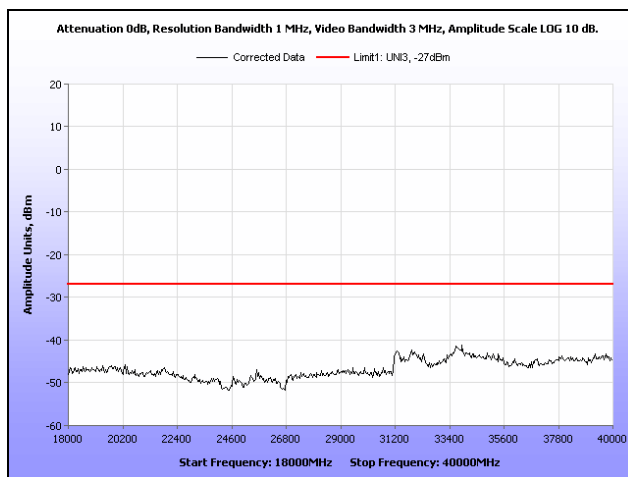
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



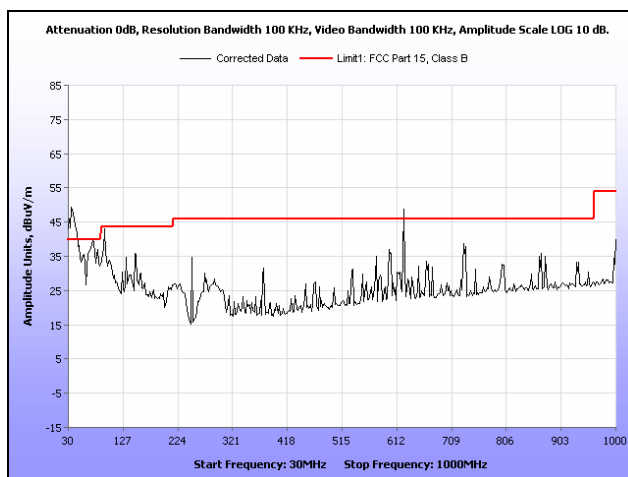
Plot 311. Radiated Spurious Emissions, 802.11n 20 MHz, Low Channel, 1 GHz – 7 GHz, 10 dBi Omni Antenna



Plot 312. Radiated Spurious Emissions, 802.11n 20 MHz, Low Channel, 7 GHz – 18 GHz, 10 dBi Omni Antenna

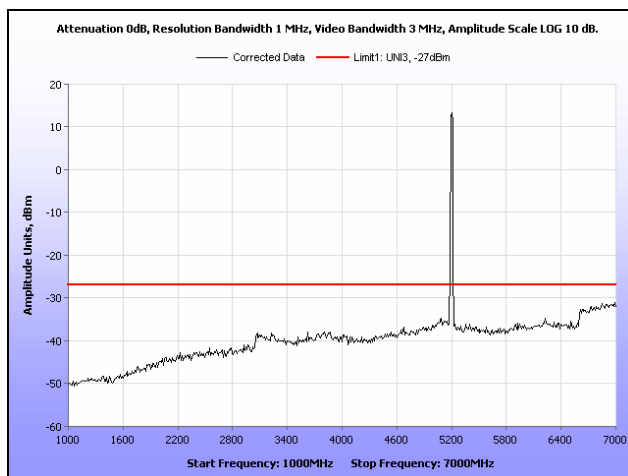


Plot 313. Radiated Spurious Emissions, 802.11n 20 MHz, Low Channel, 18 GHz – 40 GHz, 10 dBi Omni Antenna

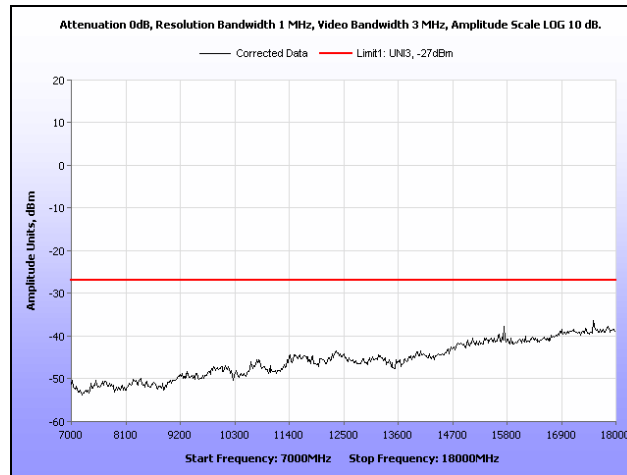


Plot 314. Radiated Spurious Emissions, 802.11n 20 MHz, Mid Channel, 30 MHz – 1 GHz, 10 dBi Omni Antenna

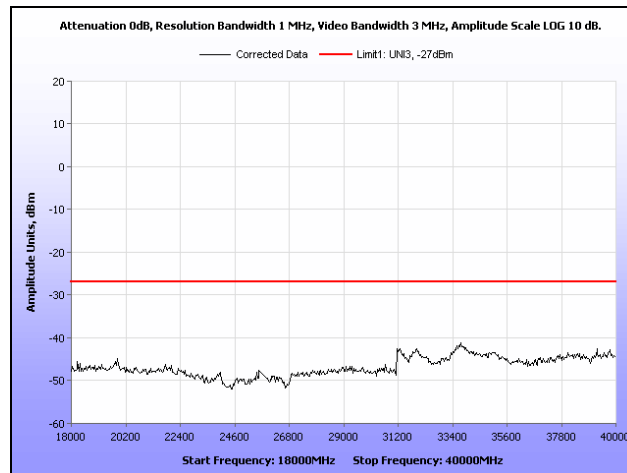
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



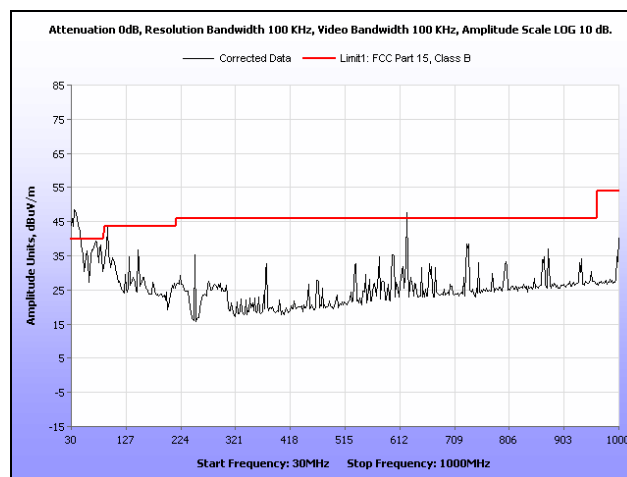
Plot 315. Radiated Spurious Emissions, 802.11n 20 MHz, Mid Channel, 1 GHz – 7 GHz, 10 dBi Omni Antenna



Plot 316. Radiated Spurious Emissions, 802.11n 20 MHz, Mid Channel, 7 GHz – 18 GHz, 10 dBi Omni Antenna

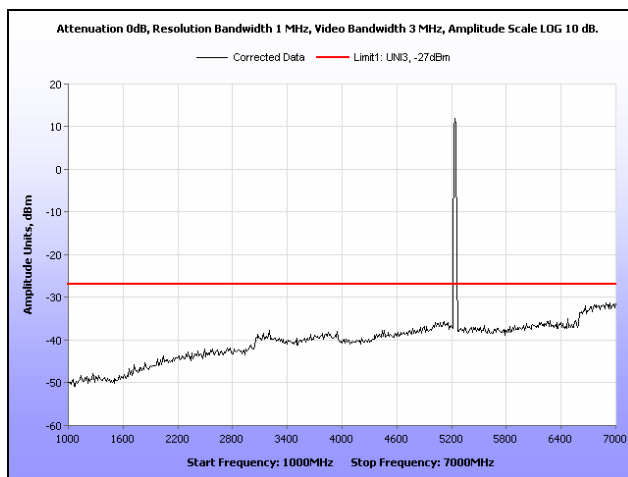


Plot 317. Radiated Spurious Emissions, 802.11n 20 MHz, Mid Channel, 18 GHz – 40 GHz, 10 dBi Omni Antenna

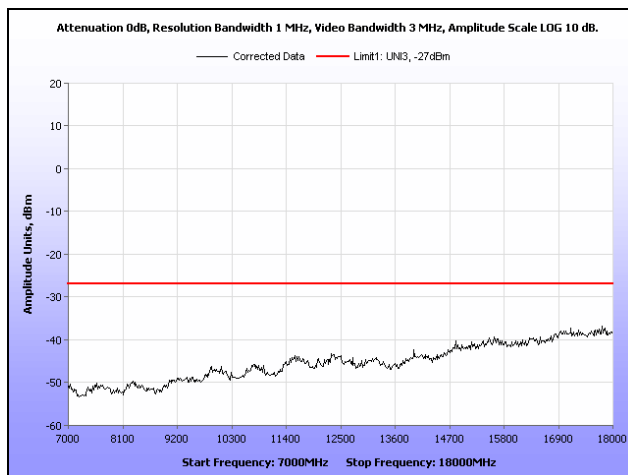


Plot 318. Radiated Spurious Emissions, 802.11n 20 MHz, High Channel, 30 MHz – 1 GHz, 10 dBi Omni Antenna

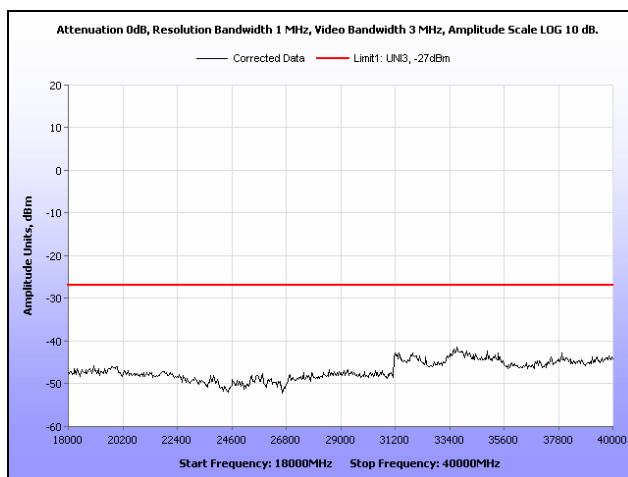
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



Plot 319. Radiated Spurious Emissions, 802.11n 20 MHz, High Channel, 1 GHz – 7 GHz, 10 dBi Omni Antenna

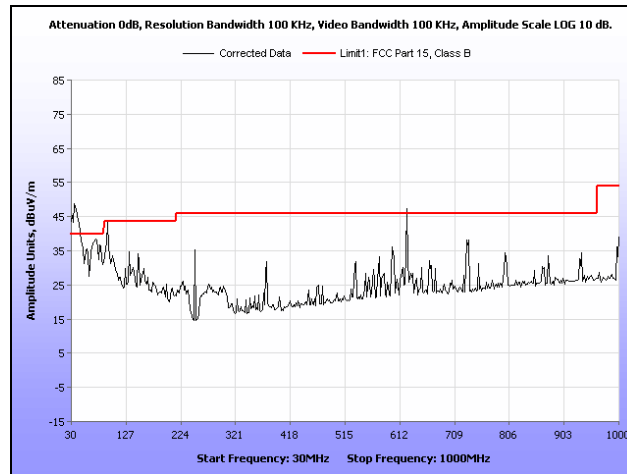


Plot 320. Radiated Spurious Emissions, 802.11n 20 MHz, High Channel, 7 GHz – 18 GHz, 10 dBi Omni Antenna



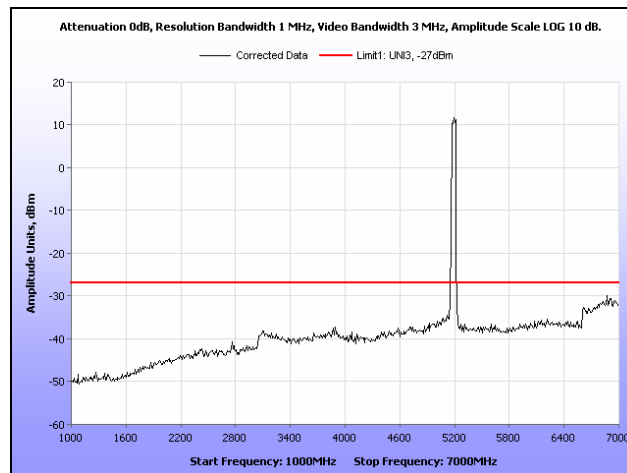
Plot 321. Radiated Spurious Emissions, 802.11n 20 MHz, High Channel, 18 GHz – 40 GHz, 10 dBi Omni Antenna

Radiated Spurious Emissions Test Results, 802.11n HT40, 10 dBi Omni Antenna

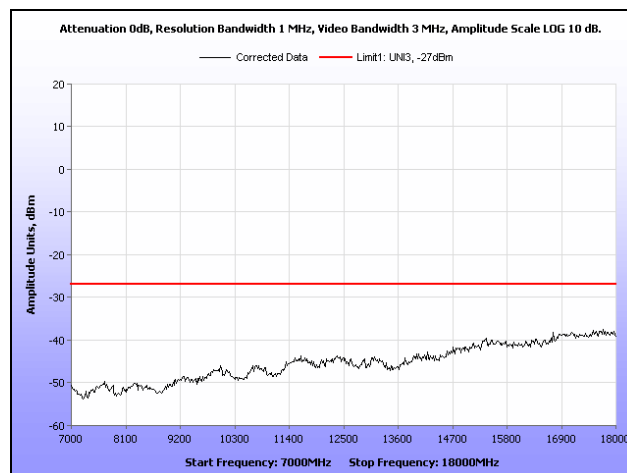


Plot 322. Radiated Spurious Emissions, 802.11n 40 MHz, Low Channel, 30 MHz – 1 GHz, 10 dBi Omni Antenna

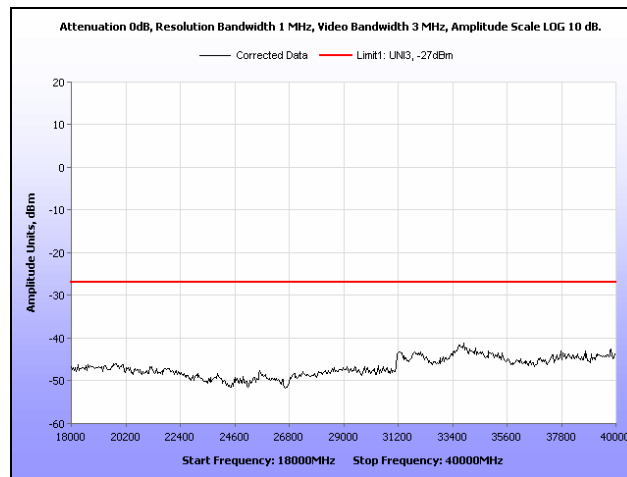
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



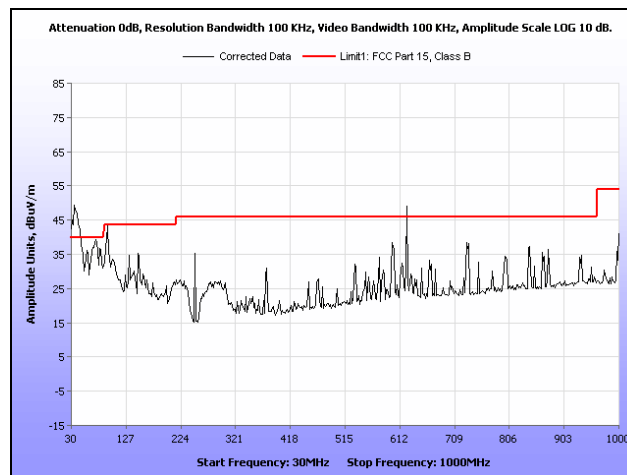
Plot 323. Radiated Spurious Emissions, 802.11n 40 MHz, Low Channel, 1 GHz – 7 GHz, 10 dBi Omni Antenna



Plot 324. Radiated Spurious Emissions, 802.11n 40 MHz, Low Channel, 7 GHz – 18 GHz, 10 dBi Omni Antenna

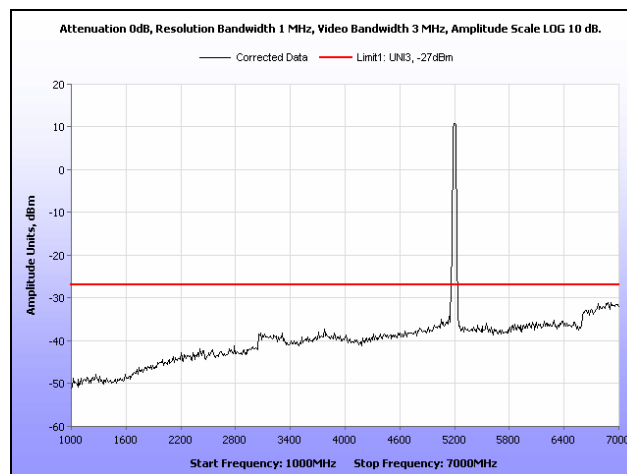


Plot 325. Radiated Spurious Emissions, 802.11n 40 MHz, Low Channel, 18 GHz – 40 GHz, 10 dBi Omni Antenna

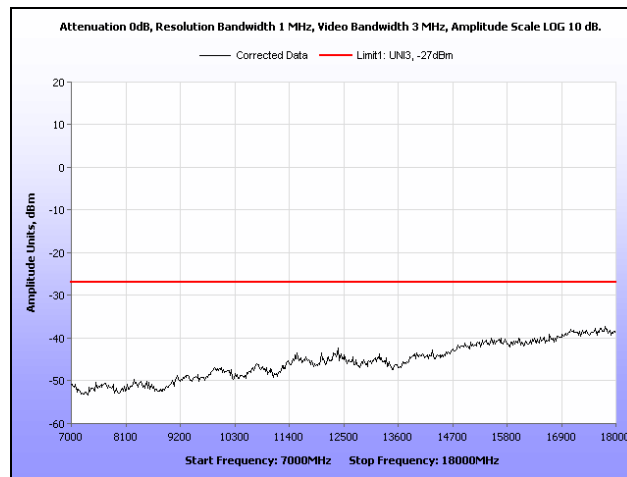


Plot 326. Radiated Spurious Emissions, 802.11n 40 MHz, Mid Channel, 30 MHz – 1 GHz, 10 dBi Omni Antenna

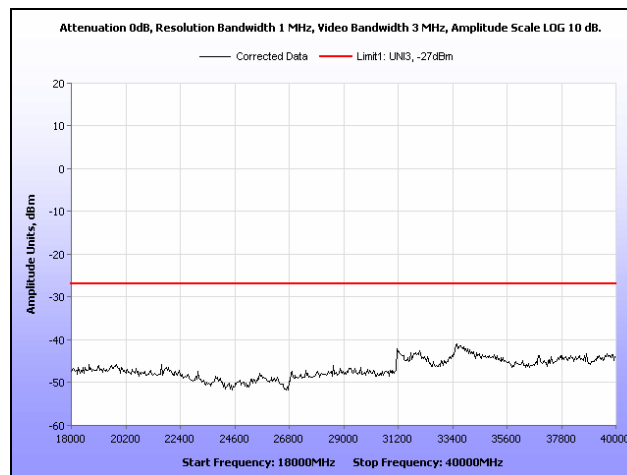
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



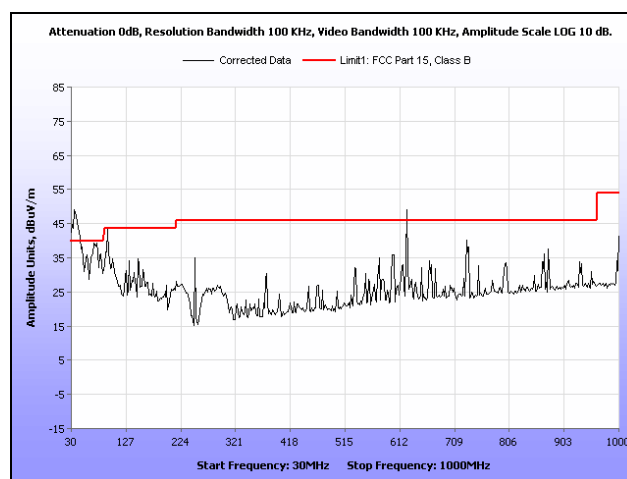
Plot 327. Radiated Spurious Emissions, 802.11n 40 MHz, Mid Channel, 1 GHz – 7 GHz, 10 dBi Omni Antenna



Plot 328. Radiated Spurious Emissions, 802.11n 40 MHz, Mid Channel, 7 GHz – 18 GHz, 10 dBi Omni Antenna

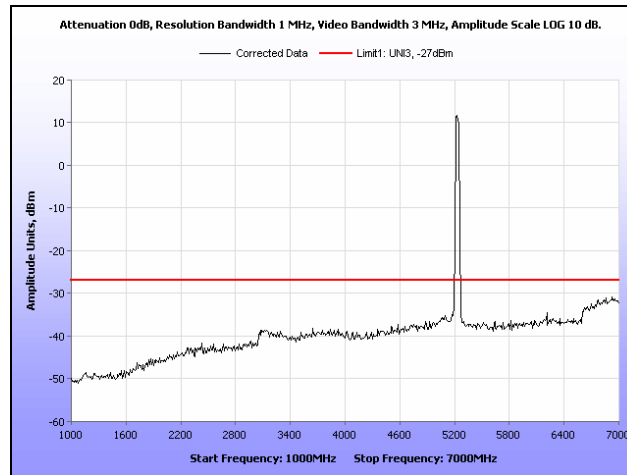


Plot 329. Radiated Spurious Emissions, 802.11n 40 MHz, Mid Channel, 18 GHz – 40 GHz, 10 dBi Omni Antenna

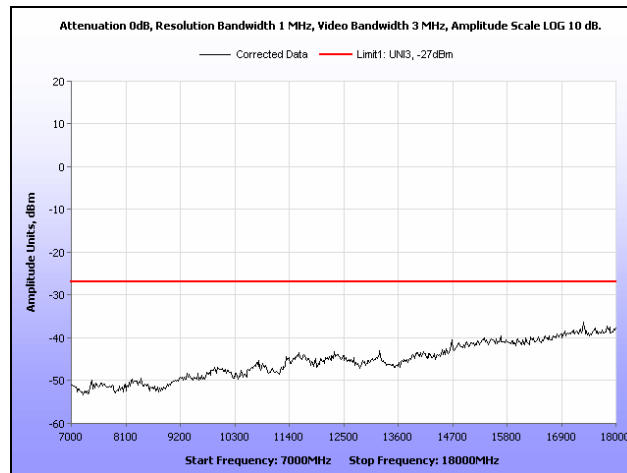


Plot 330. Radiated Spurious Emissions, 802.11n 40 MHz, High Channel, 30 MHz – 1 GHz, 10 dBi Omni Antenna

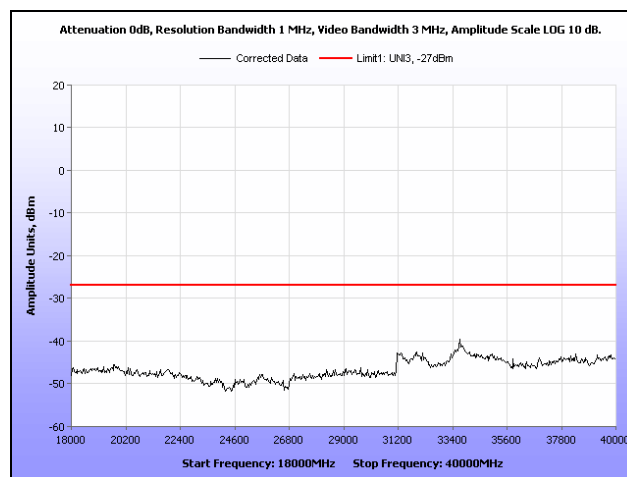
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



Plot 331. Radiated Spurious Emissions, 802.11n 40 MHz, High Channel, 1 GHz – 7 GHz, 10 dBi Omni Antenna

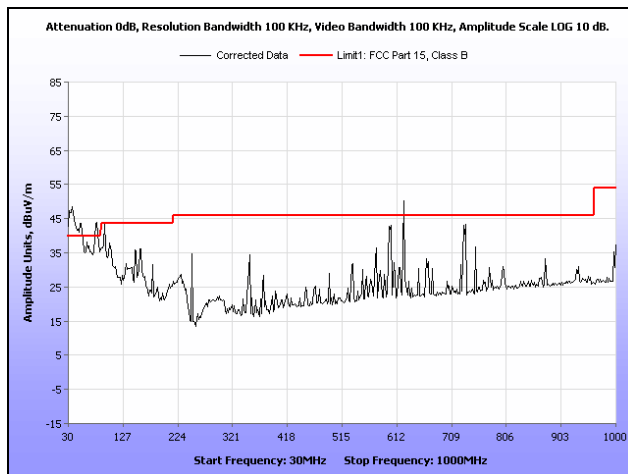


Plot 332. Radiated Spurious Emissions, 802.11n 40 MHz, High Channel, 7 GHz – 18 GHz, 10 dBi Omni Antenna



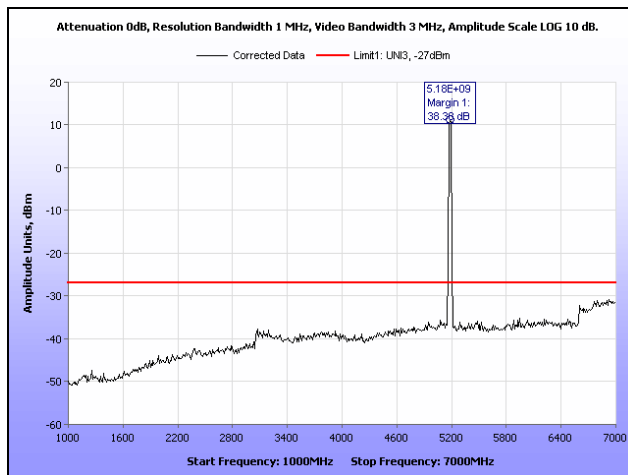
Plot 333. Radiated Spurious Emissions, 802.11n 40 MHz, High Channel, 18 GHz – 40 GHz, 10 dBi Omni Antenna

Radiated Spurious Emissions Test Results, 802.11a, 10.7 dBi Panel Antenna

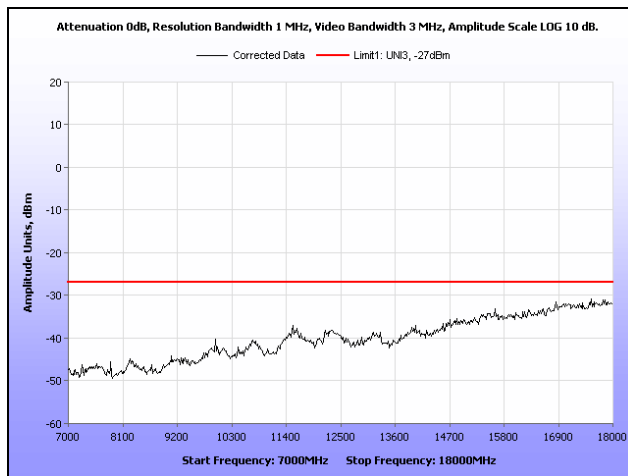


Plot 334. Radiated Spurious Emissions, 802.11a, Low Channel, 30 MHz – 1 GHz, 10.7 dBi Panel Antenna

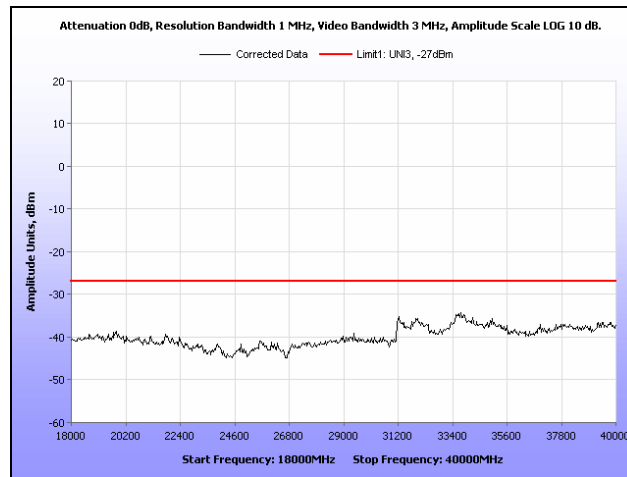
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



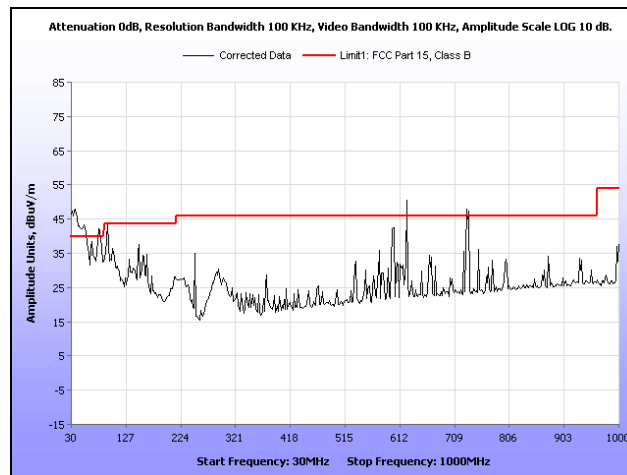
Plot 335. Radiated Spurious Emissions, 802.11a, Low Channel, 1 GHz – 7 GHz, 10.7 dBi Panel Antenna



Plot 336. Radiated Spurious Emissions, 802.11a, Low Channel, 7 GHz – 18 GHz, 10.7 dBi Panel Antenna

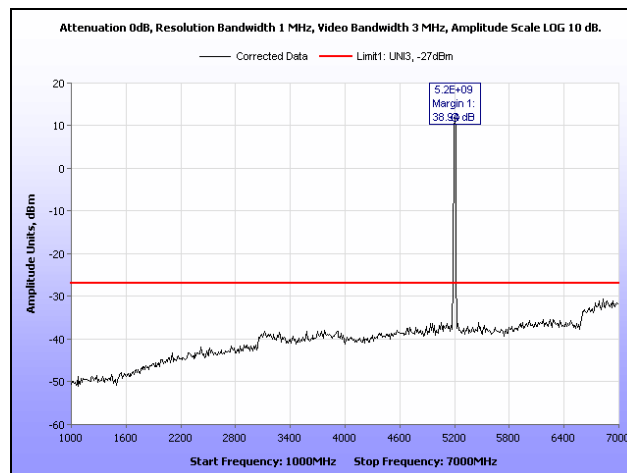


Plot 337. Radiated Spurious Emissions, 802.11a, Low Channel, 18 GHz – 40 GHz, 10.7 dBi Panel Antenna

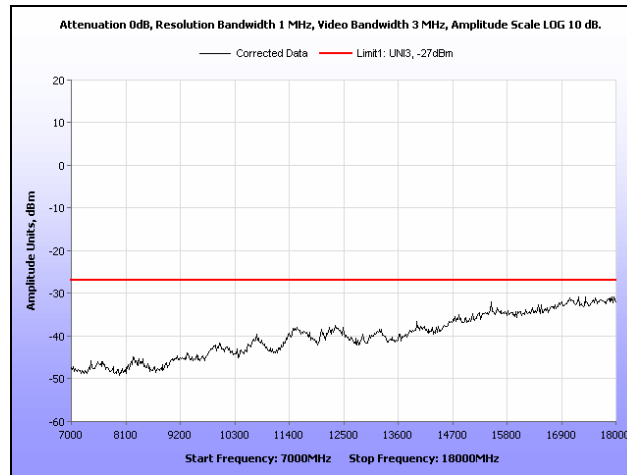


Plot 338. Radiated Spurious Emissions, 802.11a, Mid Channel, 30 MHz – 1 GHz, 10.7 dBi Panel Antenna

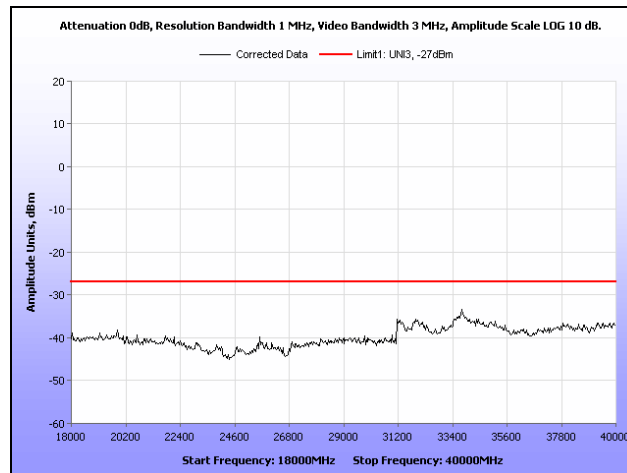
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



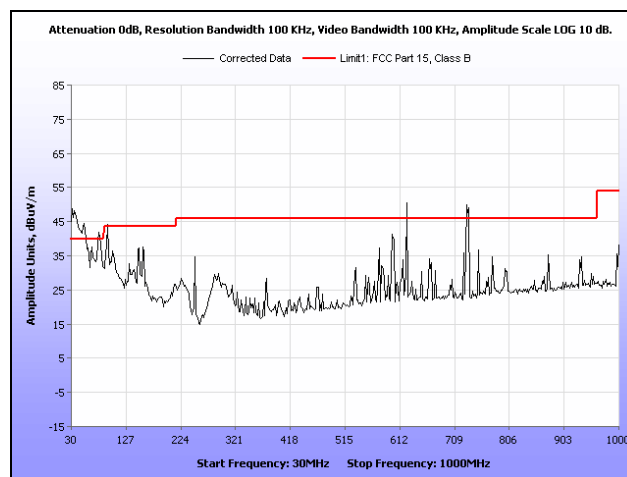
Plot 339. Radiated Spurious Emissions, 802.11a, Mid Channel, 1 GHz – 7 GHz, 10.7 dBi Panel Antenna



Plot 340. Radiated Spurious Emissions, 802.11a, Mid Channel, 7 GHz – 18 GHz, 10.7 dBi Panel Antenna

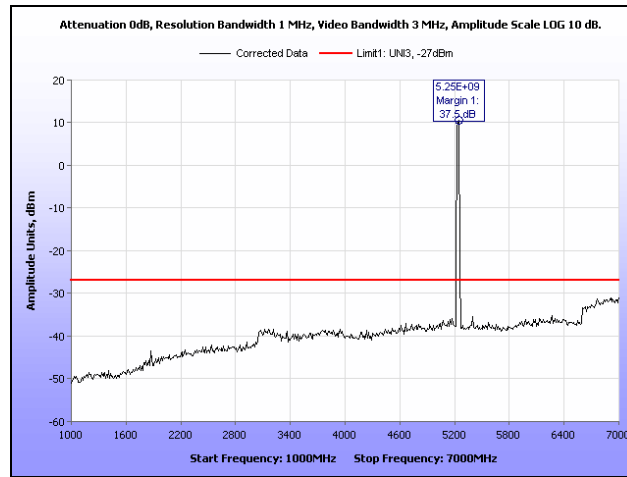


Plot 341. Radiated Spurious Emissions, 802.11a, Mid Channel, 18 GHz – 40 GHz, 10.7 dBi Panel Antenna

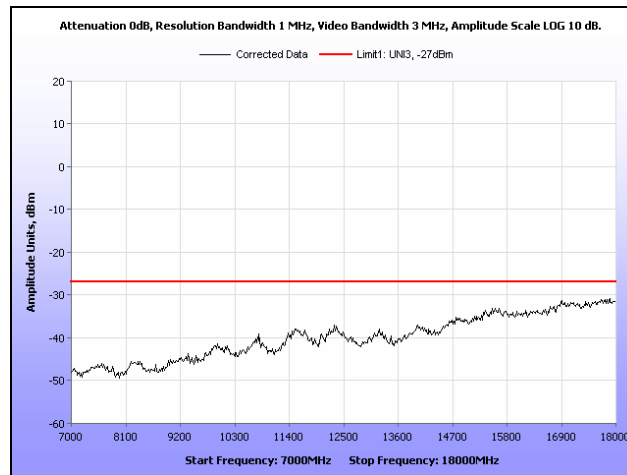


Plot 342. Radiated Spurious Emissions, 802.11a, High Channel, 30 MHz – 1 GHz, 10.7 dBi Panel Antenna

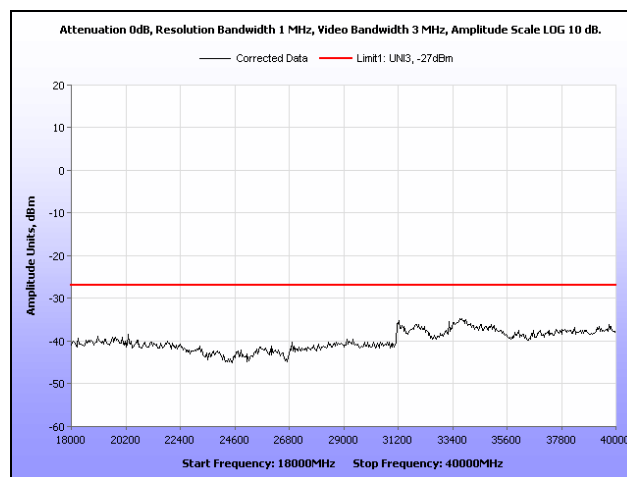
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



Plot 343. Radiated Spurious Emissions, 802.11a, High Channel, 1 GHz – 7 GHz, 10.7 dBi Panel Antenna

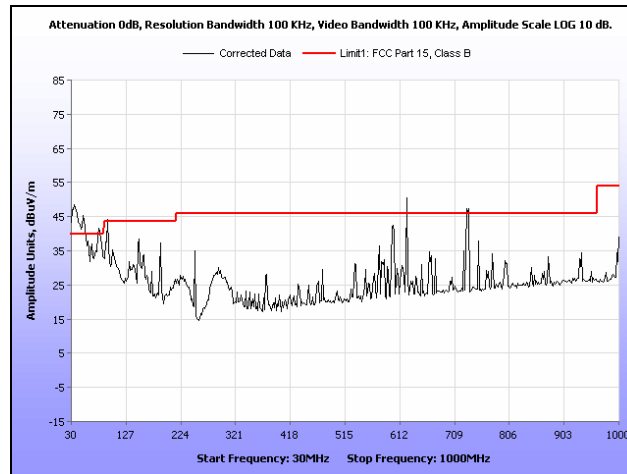


Plot 344. Radiated Spurious Emissions, 802.11a, High Channel, 7 GHz – 18 GHz, 10.7 dBi Panel Antenna

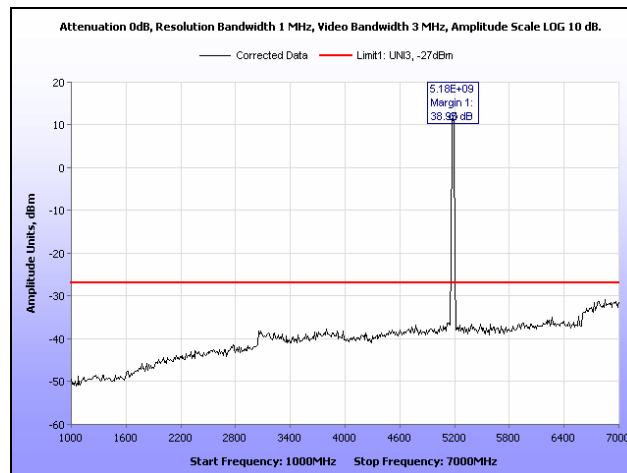


Plot 345. Radiated Spurious Emissions, 802.11a, High Channel, 18 GHz – 40 GHz, 10.7 dBi Panel Antenna

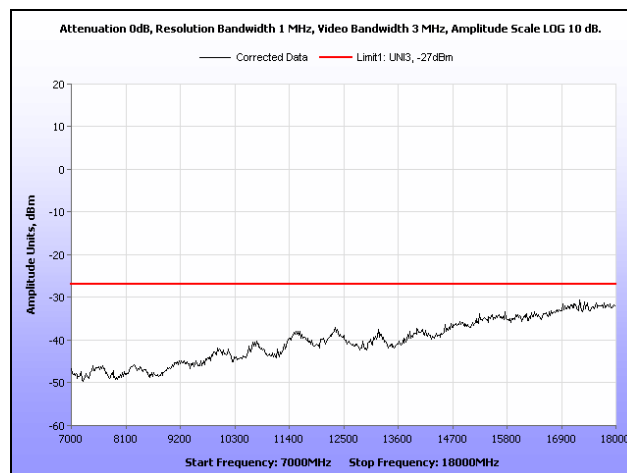
Radiated Spurious Emissions Test Results, 802.11n HT20, 10.7 dBi Panel Antenna



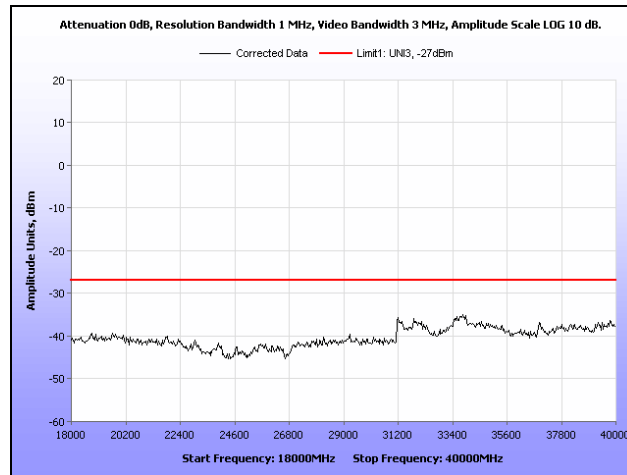
Plot 346. Radiated Spurious Emissions, 802.11n 20 MHz, Low Channel, 30 MHz – 1 GHz, 10.7 dBi Panel Antenna
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



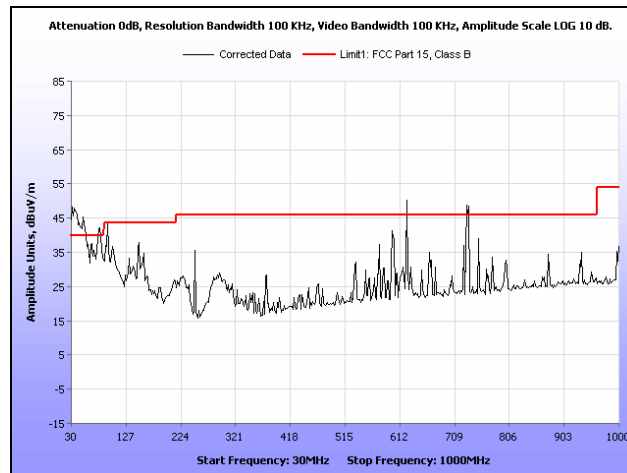
Plot 347. Radiated Spurious Emissions, 802.11n 20 MHz, Low Channel, 1 GHz – 7 GHz, 10.7 dBi Panel Antenna



Plot 348. Radiated Spurious Emissions, 802.11n 20 MHz, Low Channel, 7 GHz – 18 GHz, 10.7 dBi Panel Antenna

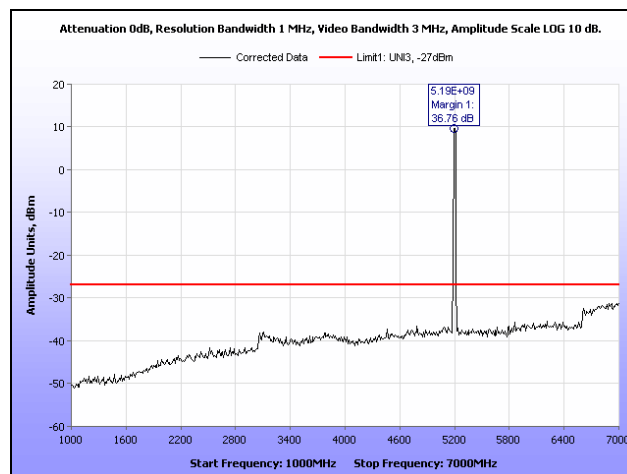


Plot 349. Radiated Spurious Emissions, 802.11n 20 MHz, Low Channel, 18 GHz – 40 GHz, 10.7 dBi Panel Antenna

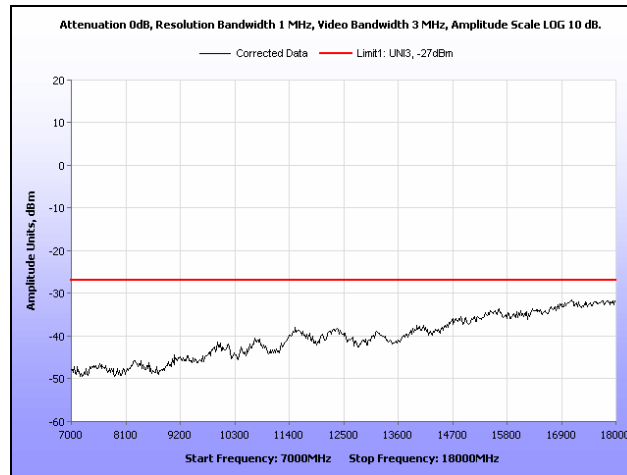


Plot 350. Radiated Spurious Emissions, 802.11n 20 MHz, Mid Channel, 30 MHz – 1 GHz, 10.7 dBi Panel Antenna

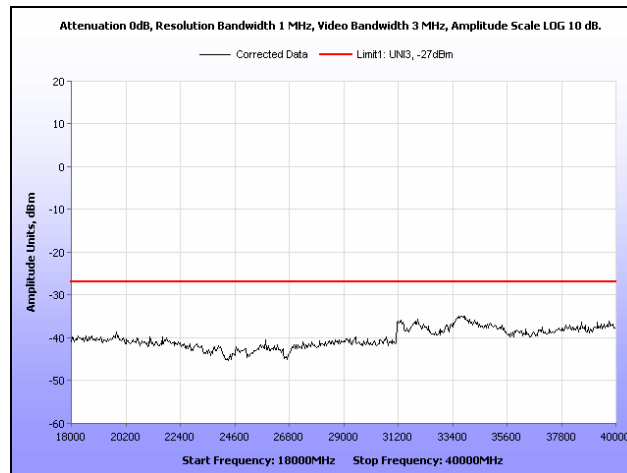
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



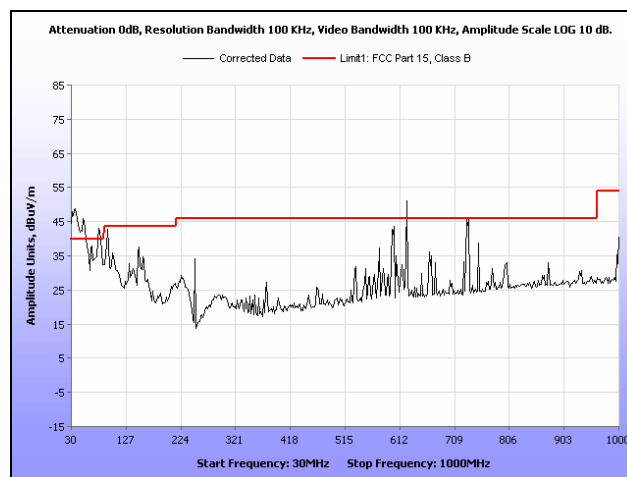
Plot 351. Radiated Spurious Emissions, 802.11n 20 MHz, Mid Channel, 1 GHz – 7 GHz, 10.7 dBi Panel Antenna



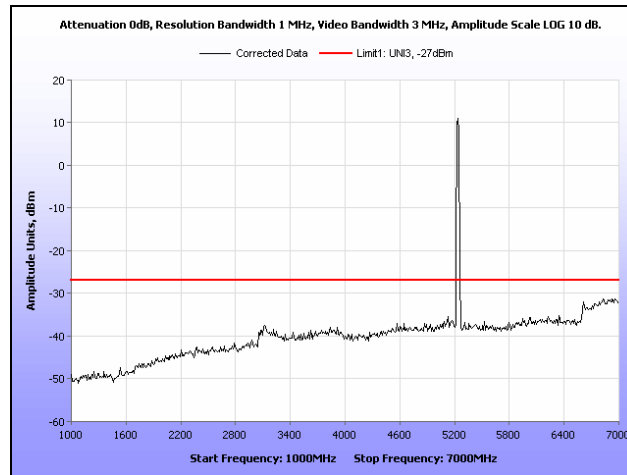
Plot 352. Radiated Spurious Emissions, 802.11n 20 MHz, Mid Channel, 7 GHz – 18 GHz, 10.7 dBi Panel Antenna



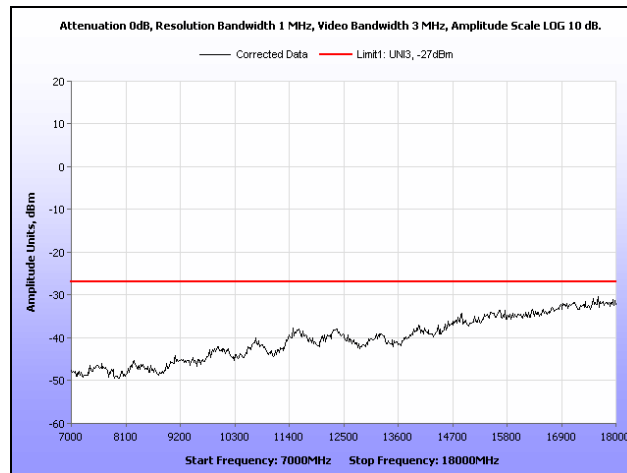
Plot 353. Radiated Spurious Emissions, 802.11n 20 MHz, Mid Channel, 18 GHz – 40 GHz, 10.7 dBi Panel Antenna



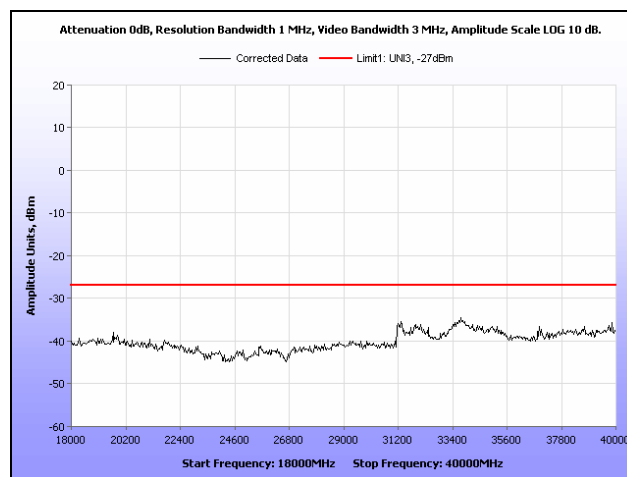
Plot 354. Radiated Spurious Emissions, 802.11n 20 MHz, High Channel, 30 MHz – 1 GHz, 10.7 dBi Panel Antenna
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



Plot 355. Radiated Spurious Emissions, 802.11n 20 MHz, High Channel, 1 GHz – 7 GHz, 10.7 dBi Panel Antenna

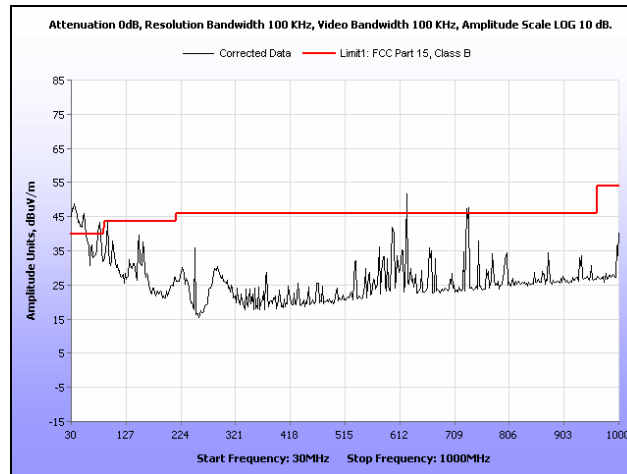


Plot 356. Radiated Spurious Emissions, 802.11n 20 MHz, High Channel, 7 GHz – 18 GHz, 10.7 dBi Panel Antenna

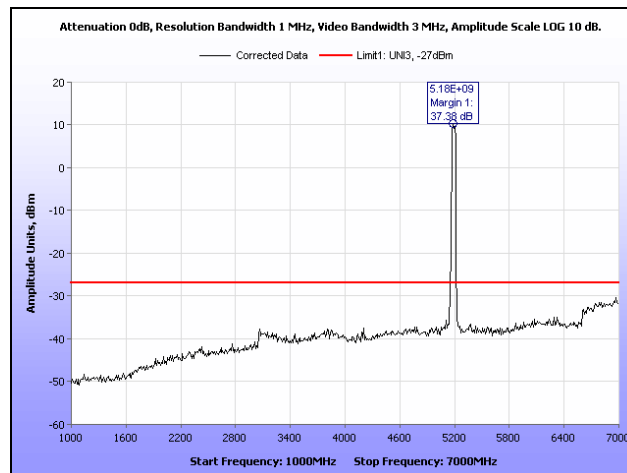


Plot 357. Radiated Spurious Emissions, 802.11n 20 MHz, High Channel, 18 GHz – 40 GHz, 10.7 dBi Panel Antenna

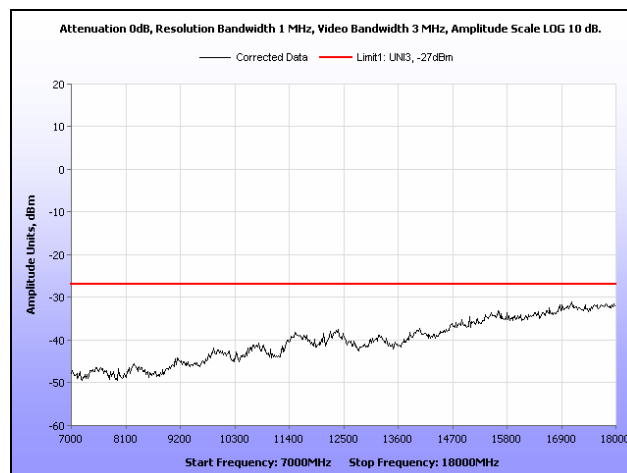
Radiated Spurious Emissions Test Results, 802.11n HT40, 10.7 dBi Panel Antenna



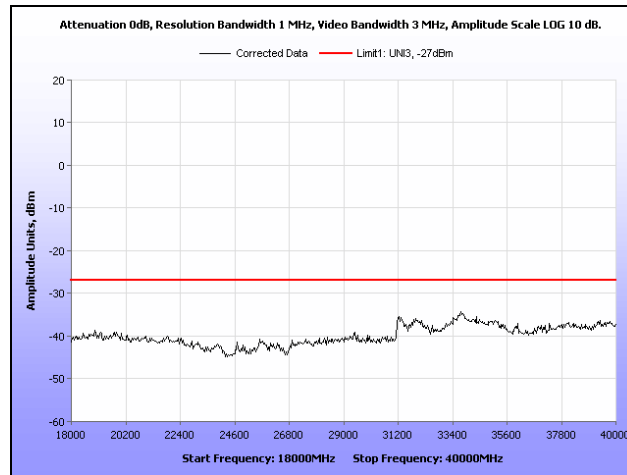
Plot 358. Radiated Spurious Emissions, 802.11n 40 MHz, Low Channel, 30 MHz – 1 GHz, 10.7 dBi Panel Antenna
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



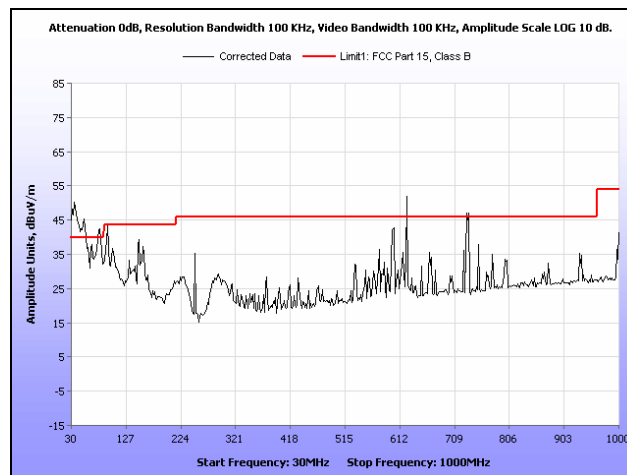
Plot 359. Radiated Spurious Emissions, 802.11n 40 MHz, Low Channel, 1 GHz – 7 GHz, 10.7 dBi Panel Antenna



Plot 360. Radiated Spurious Emissions, 802.11n 40 MHz, Low Channel, 7 GHz – 18 GHz, 10.7 dBi Panel Antenna

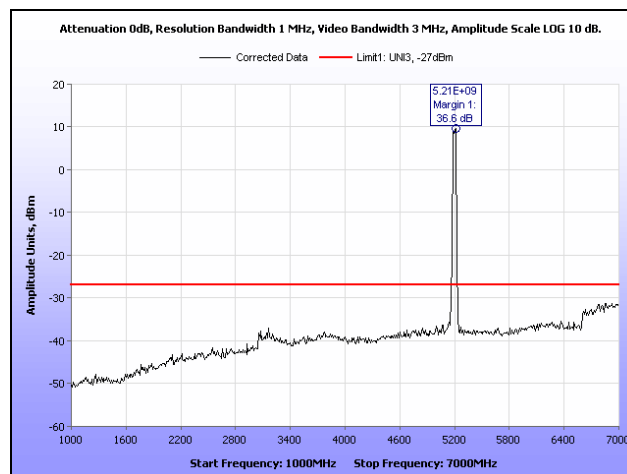


Plot 361. Radiated Spurious Emissions, 802.11n 40 MHz, Low Channel, 18 GHz – 40 GHz, 10.7 dBi Panel Antenna

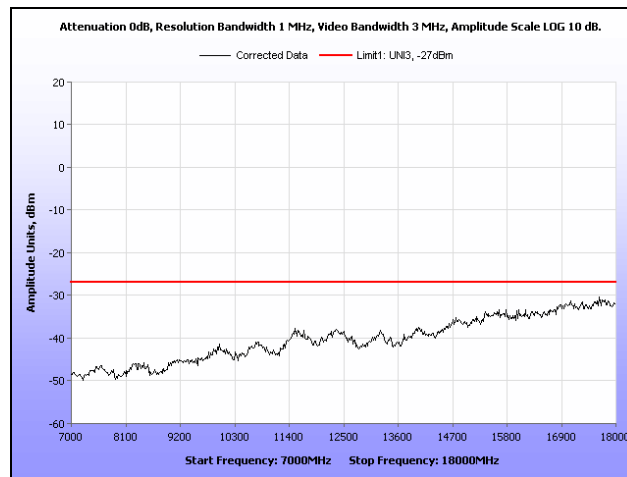


Plot 362. Radiated Spurious Emissions, 802.11n 40 MHz, Mid Channel, 30 MHz – 1 GHz, 10.7 dBi Panel Antenna

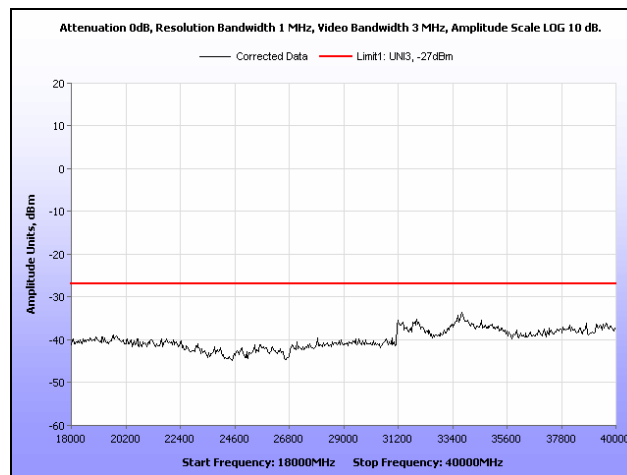
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



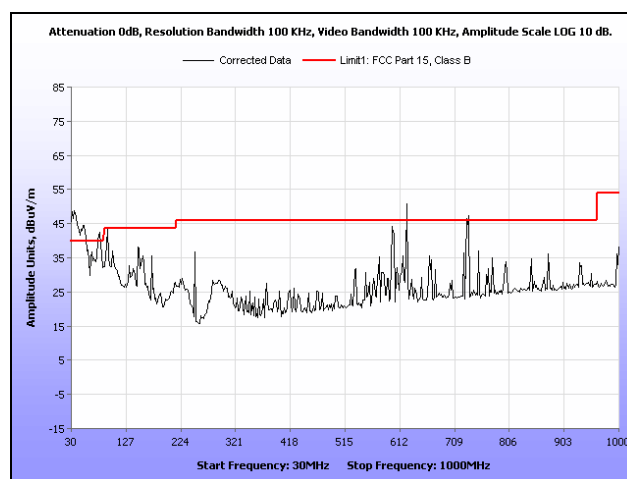
Plot 363. Radiated Spurious Emissions, 802.11n 40 MHz, Mid Channel, 1 GHz – 7 GHz, 10.7 dBi Panel Antenna



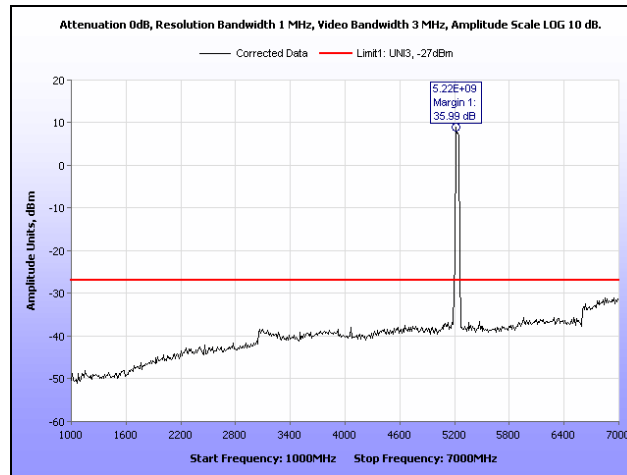
Plot 364. Radiated Spurious Emissions, 802.11n 40 MHz, Mid Channel, 7 GHz – 18 GHz, 10.7 dBi Panel Antenna



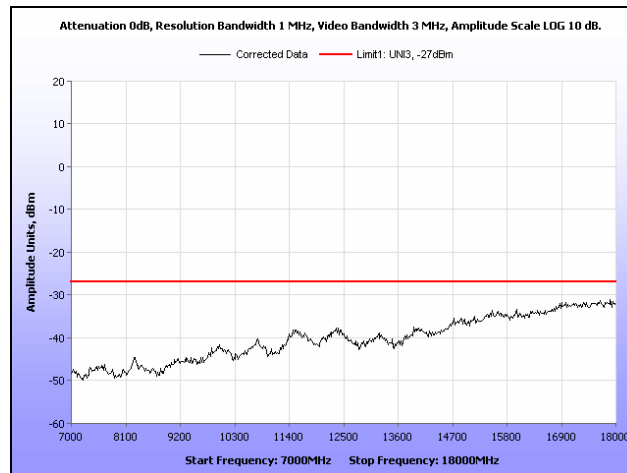
Plot 365. Radiated Spurious Emissions, 802.11n 40 MHz, Mid Channel, 18 GHz – 40 GHz, 10.7 dBi Panel Antenna



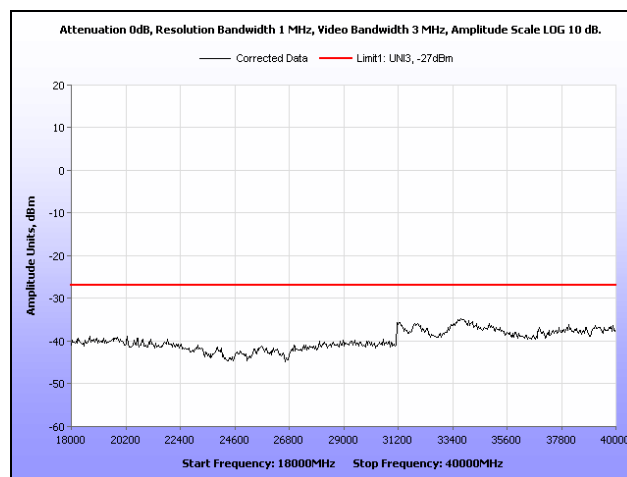
Plot 366. Radiated Spurious Emissions, 802.11n 40 MHz, High Channel, 30 MHz – 1 GHz, 10.7 dBi Panel Antenna
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



Plot 367. Radiated Spurious Emissions, 802.11n 40 MHz, High Channel, 1 GHz – 7 GHz, 10.7 dBi Panel Antenna

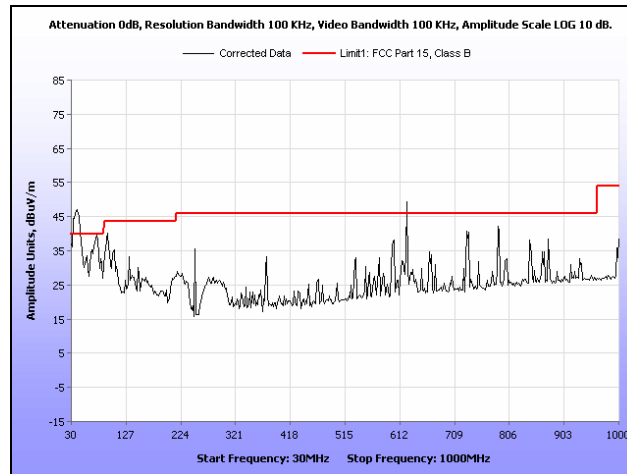


Plot 368. Radiated Spurious Emissions, 802.11n 40 MHz, High Channel, 7 GHz – 18 GHz, 10.7 dBi Panel Antenna



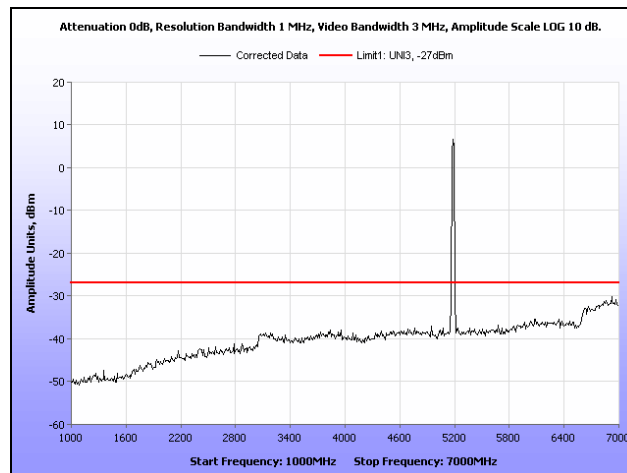
Plot 369. Radiated Spurious Emissions, 802.11n 40 MHz, High Channel, 18 GHz – 40 GHz, 10.7 dBi Panel Antenna

Radiated Spurious Emissions Test Results, 802.11a, 8.25 dBi Omni Antenna

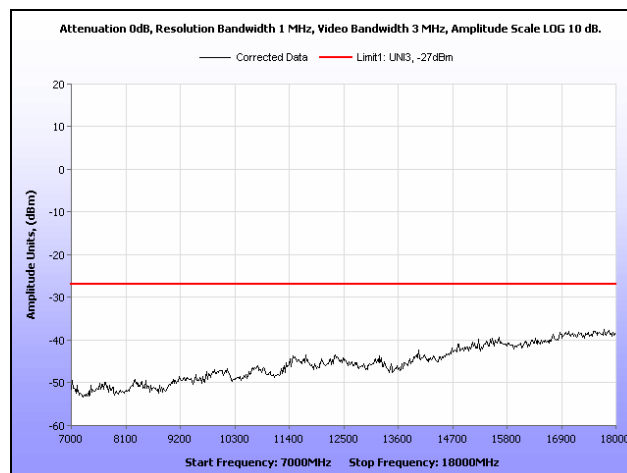


Plot 370. Radiated Spurious Emissions, 802.11a, Low Channel, 30 MHz – 1 GHz, 8.25 dBi Omni Antenna

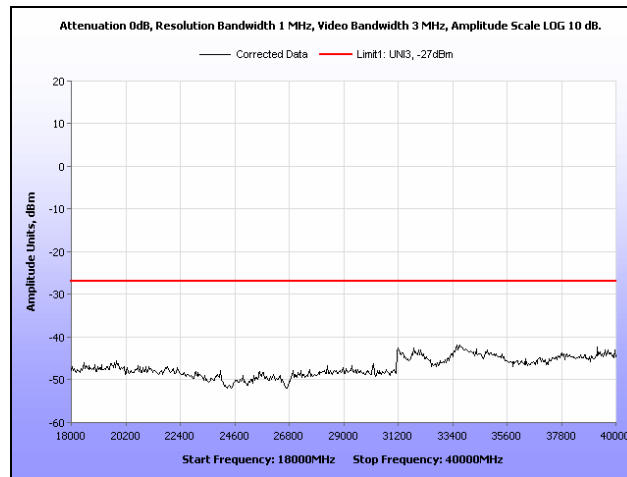
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



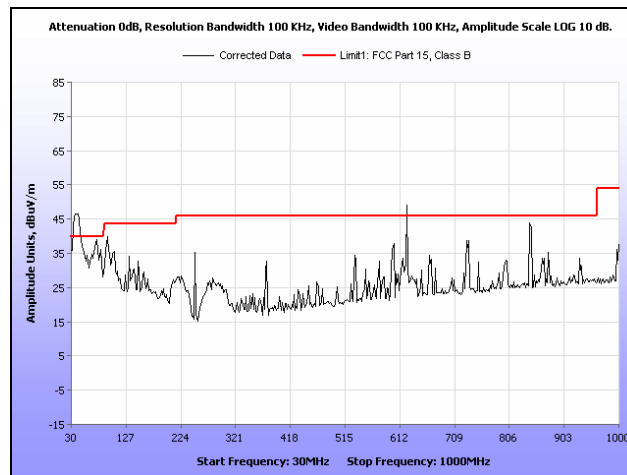
Plot 371. Radiated Spurious Emissions, 802.11a, Low Channel, 1 GHz – 7 GHz, 8.25 dBi Omni Antenna



Plot 372. Radiated Spurious Emissions, 802.11a, Low Channel, 7 GHz – 18 GHz, 8.25 dBi Omni Antenna

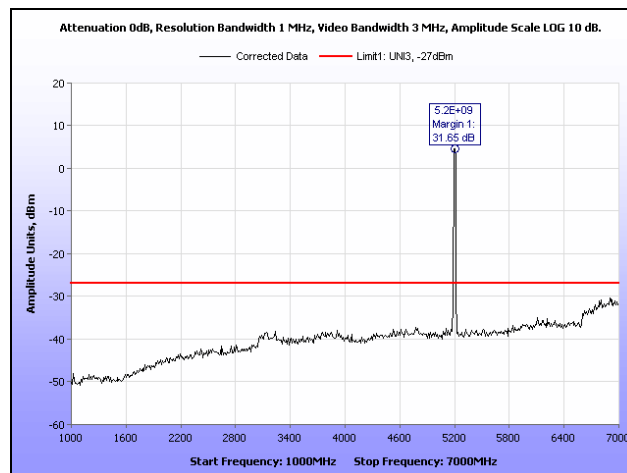


Plot 373. Radiated Spurious Emissions, 802.11a, Low Channel, 18 GHz – 40 GHz, 8.25 dBi Omni Antenna

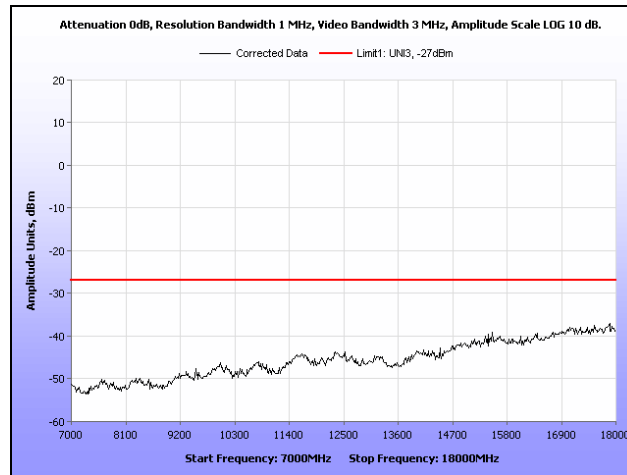


Plot 374. Radiated Spurious Emissions, 802.11a, Mid Channel, 30 MHz – 1 GHz, 8.25 dBi Omni Antenna

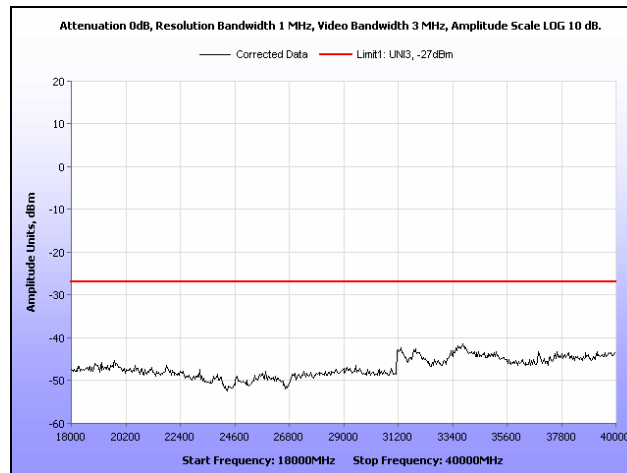
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



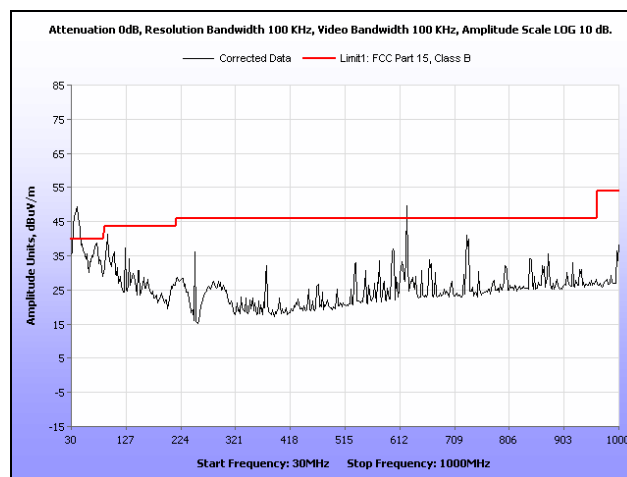
Plot 375. Radiated Spurious Emissions, 802.11a, Mid Channel, 1 GHz – 7 GHz, 8.25 dBi Omni Antenna



Plot 376. Radiated Spurious Emissions, 802.11a, Mid Channel, 7 GHz – 18 GHz, 8.25 dBi Omni Antenna

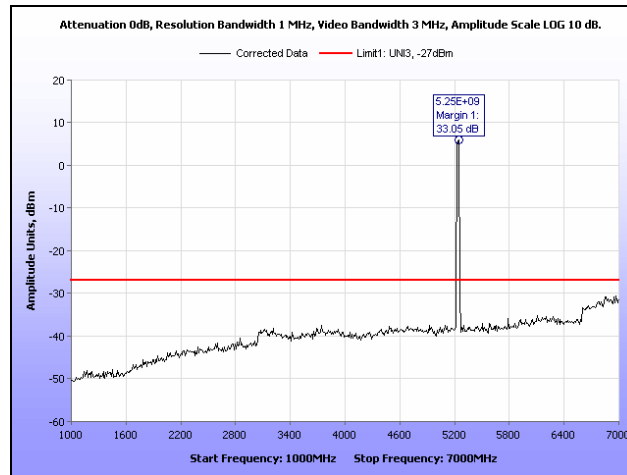


Plot 377. Radiated Spurious Emissions, 802.11a, Mid Channel, 18 GHz – 40 GHz, 8.25 dBi Omni Antenna

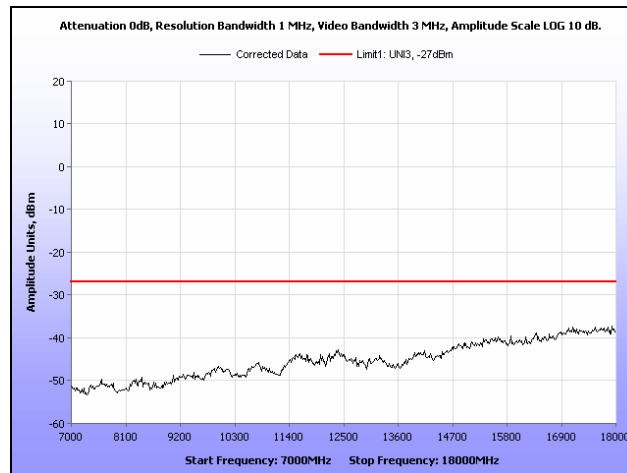


Plot 378. Radiated Spurious Emissions, 802.11a, High Channel, 30 MHz – 1 GHz, 8.25 dBi Omni Antenna

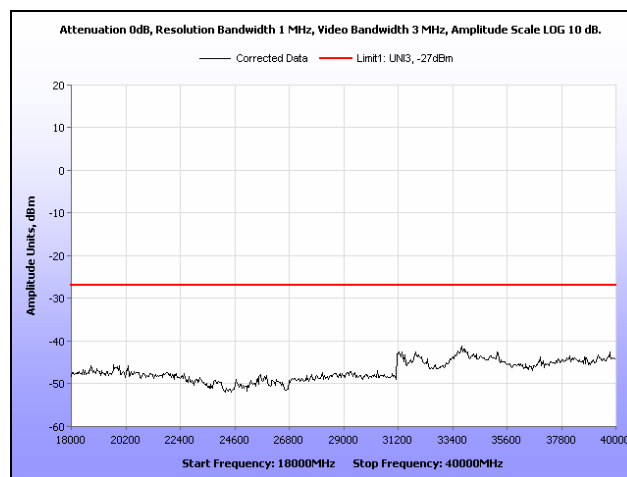
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



Plot 379. Radiated Spurious Emissions, 802.11a, High Channel, 1 GHz – 7 GHz, 8.25 dBi Omni Antenna

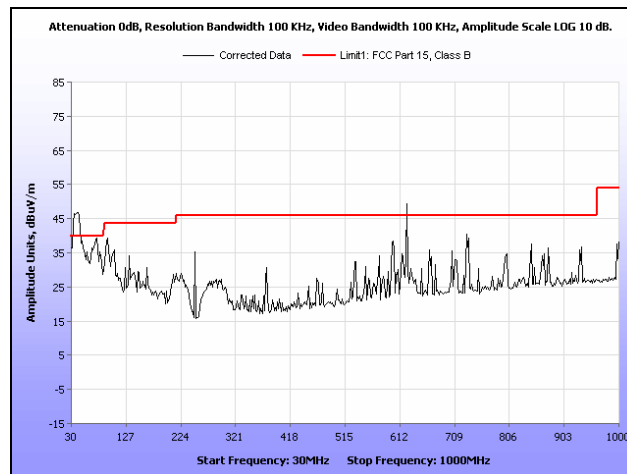


Plot 380. Radiated Spurious Emissions, 802.11a, High Channel, 7 GHz – 18 GHz, 8.25 dBi Omni Antenna

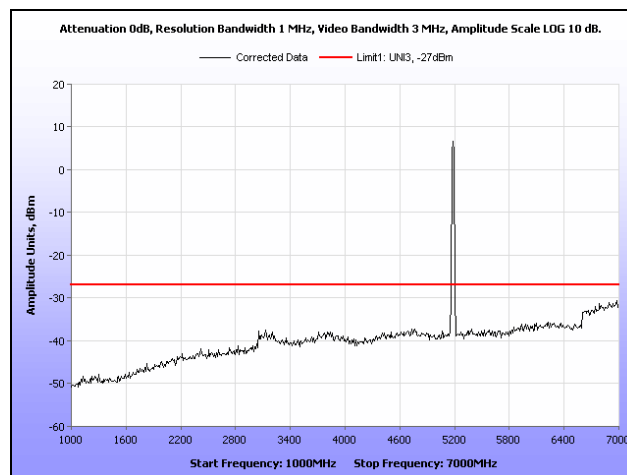


Plot 381. Radiated Spurious Emissions, 802.11a, High Channel, 18 GHz – 40 GHz, 8.25 dBi Omni Antenna

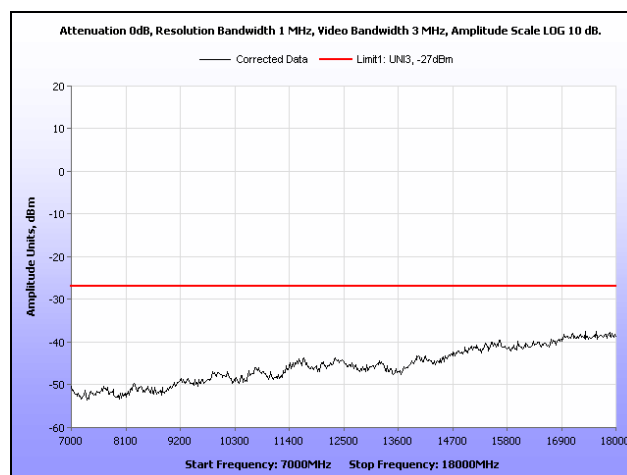
Radiated Spurious Emissions Test Results, 802.11n HT20, 8.25 dBi Omni Antenna



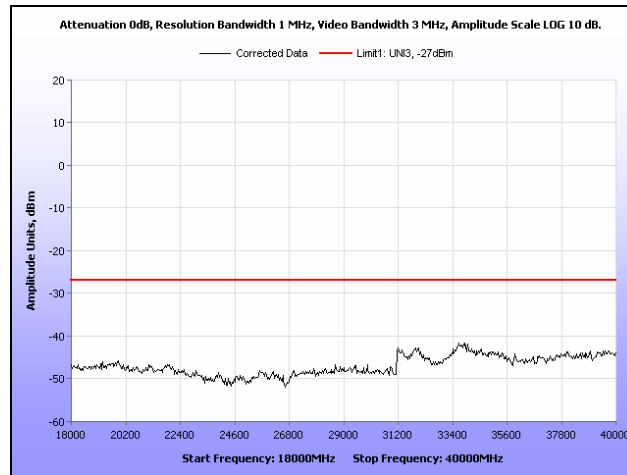
Plot 382. Radiated Spurious Emissions, 802.11n 20 MHz, Low Channel, 30 MHz – 1 GHz, 8.25 dBi Omni Antenna
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



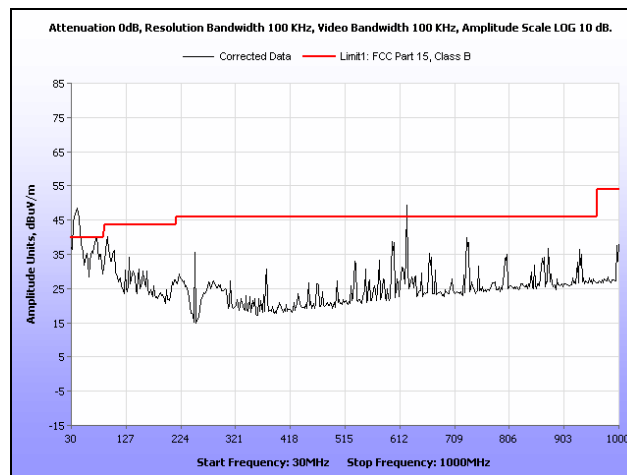
Plot 383. Radiated Spurious Emissions, 802.11n 20 MHz, Low Channel, 1 GHz – 7 GHz, 8.25 dBi Omni Antenna



Plot 384. Radiated Spurious Emissions, 802.11n 20 MHz, Low Channel, 7 GHz – 18 GHz, 8.25 dBi Omni Antenna

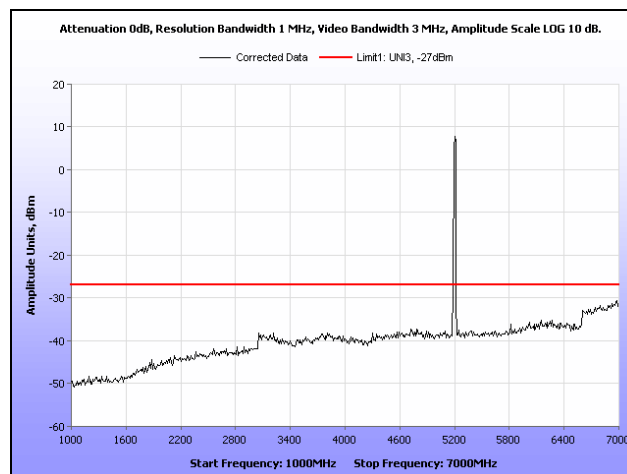


Plot 385. Radiated Spurious Emissions, 802.11n 20 MHz, Low Channel, 18 GHz – 40 GHz, 8.25 dBi Omni Antenna

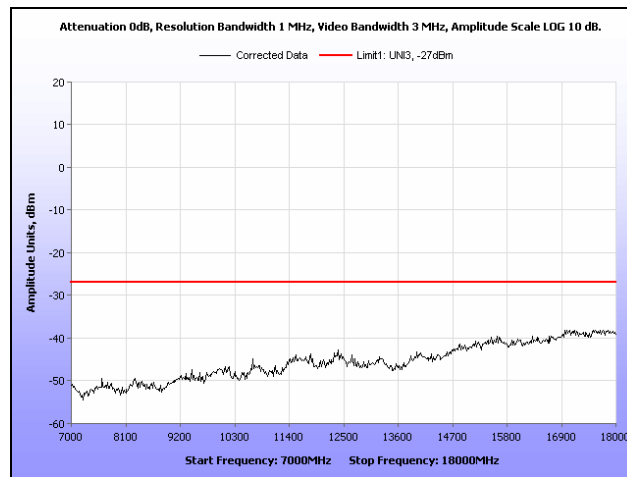


Plot 386. Radiated Spurious Emissions, 802.11n 20 MHz, Mid Channel, 30 MHz – 1 GHz, 8.25 dBi Omni Antenna

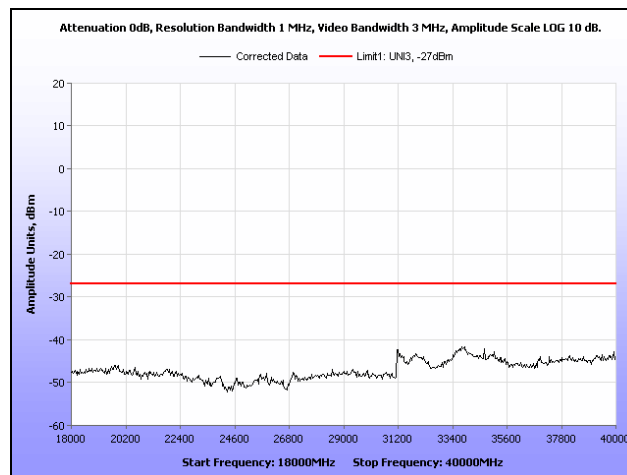
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



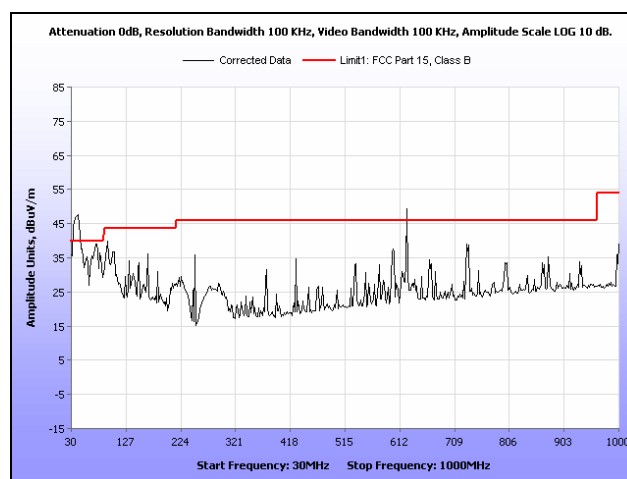
Plot 387. Radiated Spurious Emissions, 802.11n 20 MHz, Mid Channel, 1 GHz – 7 GHz, 8.25 dBi Omni Antenna



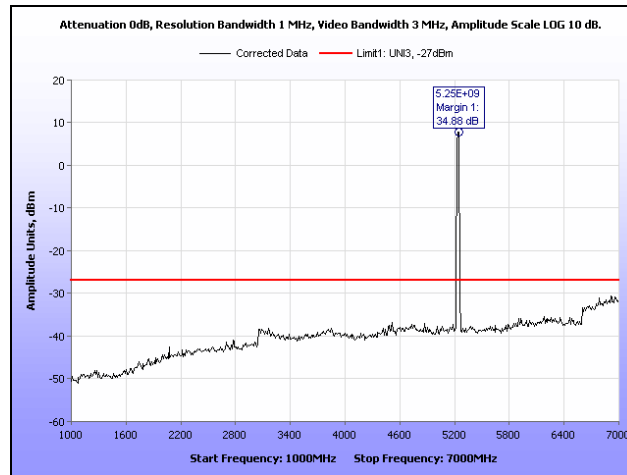
Plot 388. Radiated Spurious Emissions, 802.11n 20 MHz, Mid Channel, 7 GHz – 18 GHz, 8.25 dBi Omni Antenna



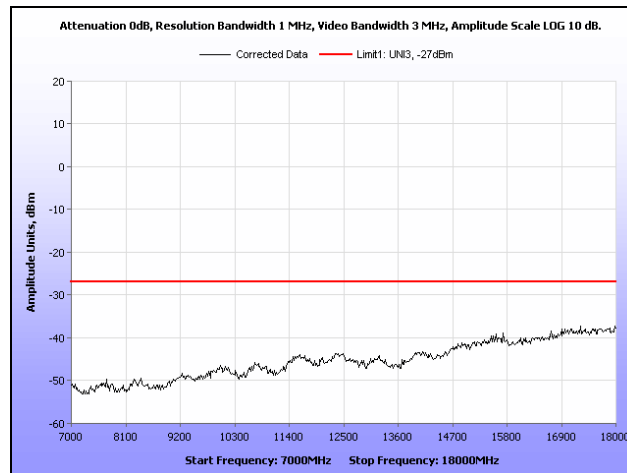
Plot 389. Radiated Spurious Emissions, 802.11n 20 MHz, Mid Channel, 18 GHz – 40 GHz, 8.25 dBi Omni Antenna



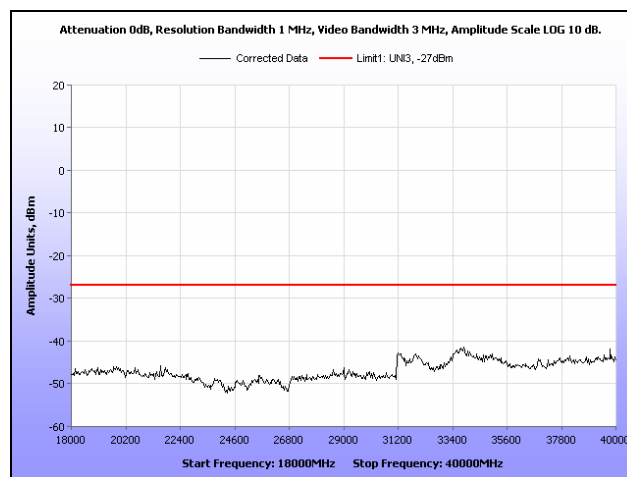
Plot 390. Radiated Spurious Emissions, 802.11n 20 MHz, High Channel, 30 MHz – 1 GHz, 8.25 dBi Omni Antenna
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



Plot 391. Radiated Spurious Emissions, 802.11n 20 MHz, High Channel, 1 GHz – 7 GHz, 8.25 dBi Omni Antenna

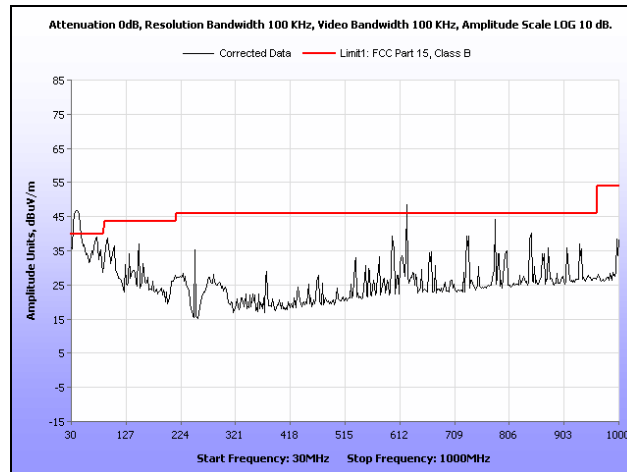


Plot 392. Radiated Spurious Emissions, 802.11n 20 MHz, High Channel, 7 GHz – 18 GHz, 8.25 dBi Omni Antenna

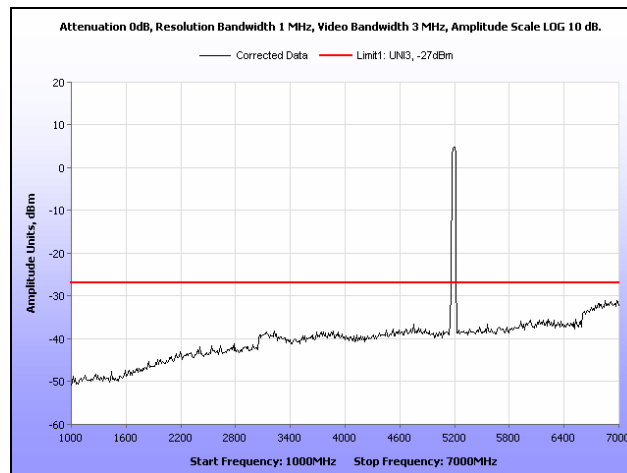


Plot 393. Radiated Spurious Emissions, 802.11n 20 MHz, High Channel, 18 GHz – 40 GHz, 8.25 dBi Omni Antenna

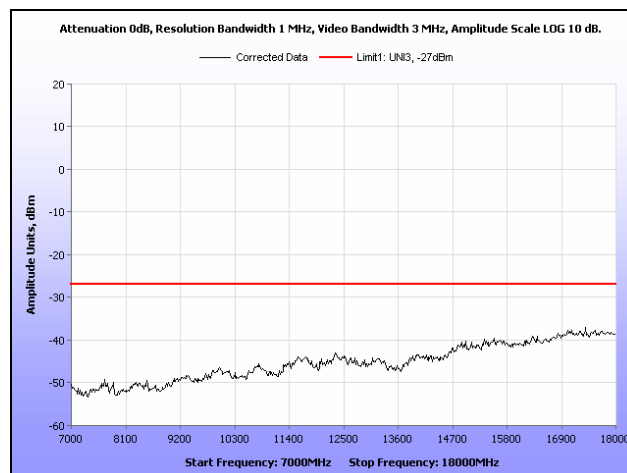
Radiated Spurious Emissions Test Results, 802.11n HT40, 8.25 dBi Omni Antenna



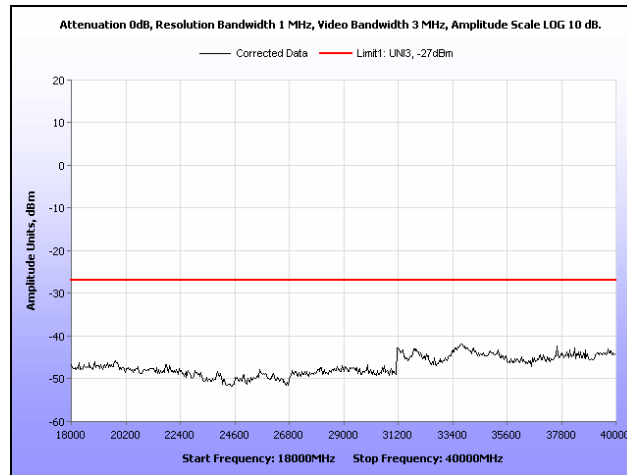
Plot 394. Radiated Spurious Emissions, 802.11n 40 MHz, Low Channel, 30 MHz – 1 GHz, 8.25 dBi Omni Antenna
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



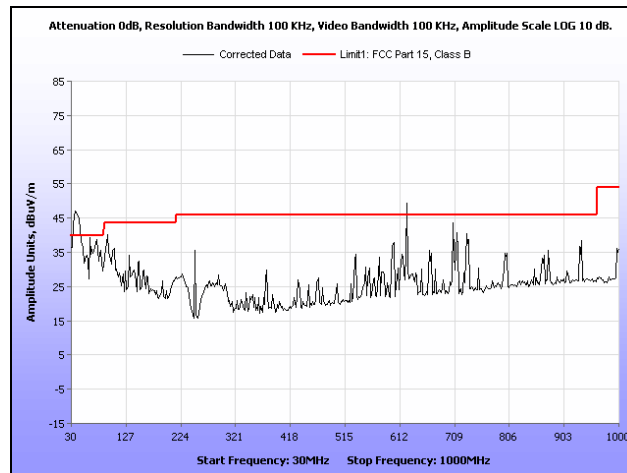
Plot 395. Radiated Spurious Emissions, 802.11n 40 MHz, Low Channel, 1 GHz – 7 GHz, 8.25 dBi Omni Antenna



Plot 396. Radiated Spurious Emissions, 802.11n 40 MHz, Low Channel, 7 GHz – 18 GHz, 8.25 dBi Omni Antenna

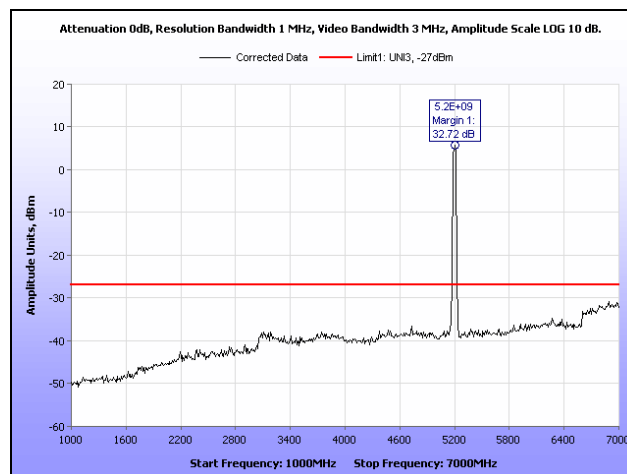


Plot 397. Radiated Spurious Emissions, 802.11n 40 MHz, Low Channel, 18 GHz – 40 GHz, 8.25 dBi Omni Antenna

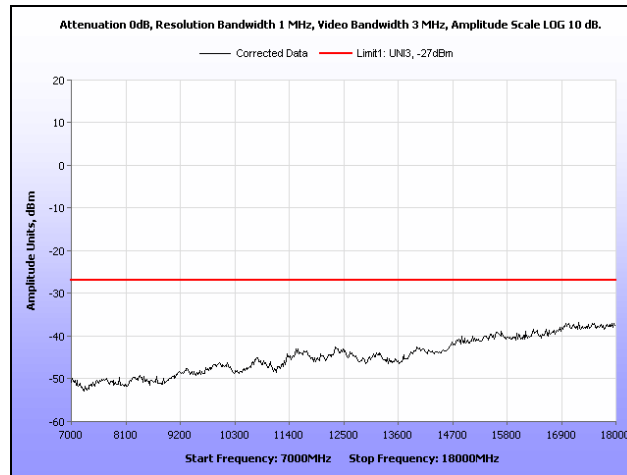


Plot 398. Radiated Spurious Emissions, 802.11n 40 MHz, Mid Channel, 30 MHz – 1 GHz, 8.25 dBi Omni Antenna

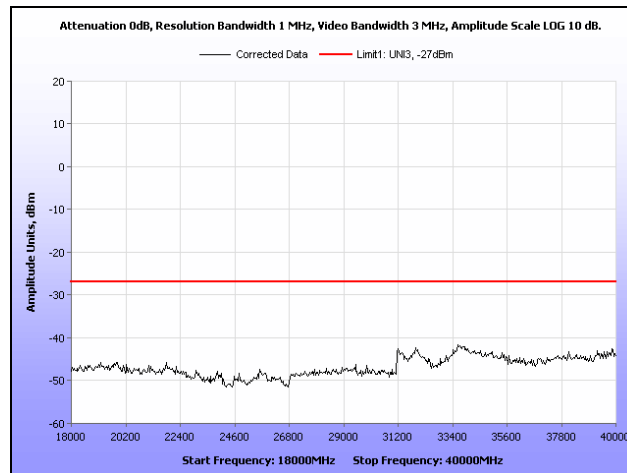
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



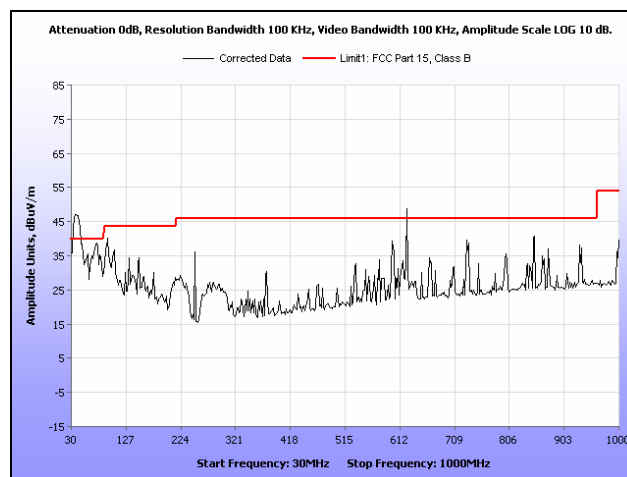
Plot 399. Radiated Spurious Emissions, 802.11n 40 MHz, Mid Channel, 1 GHz – 7 GHz, 8.25 dBi Omni Antenna



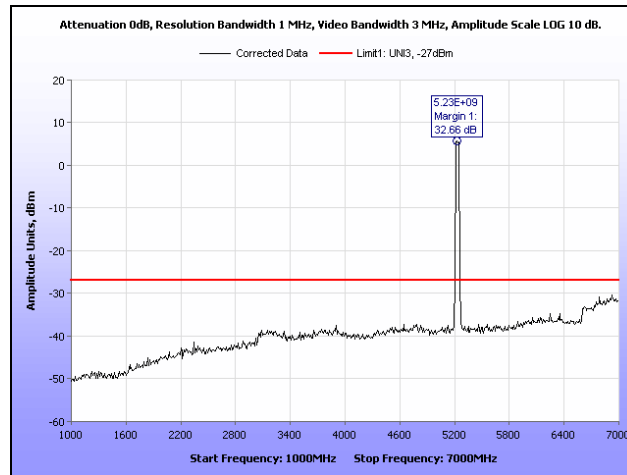
Plot 400. Radiated Spurious Emissions, 802.11n 40 MHz, Mid Channel, 7 GHz – 18 GHz, 8.25 dBi Omni Antenna



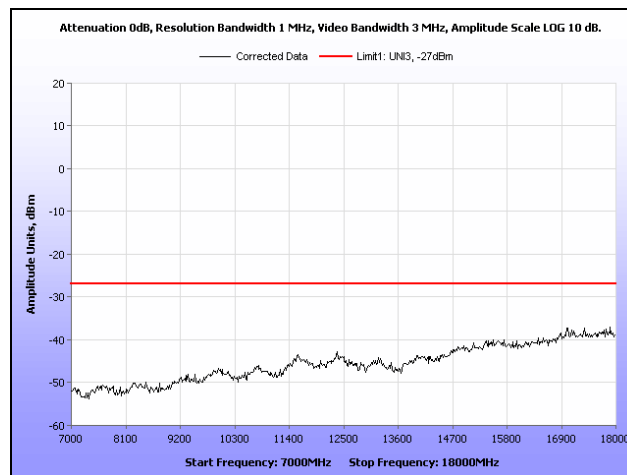
Plot 401. Radiated Spurious Emissions, 802.11n 40 MHz, Mid Channel, 18 GHz – 40 GHz, 8.25 dBi Omni Antenna



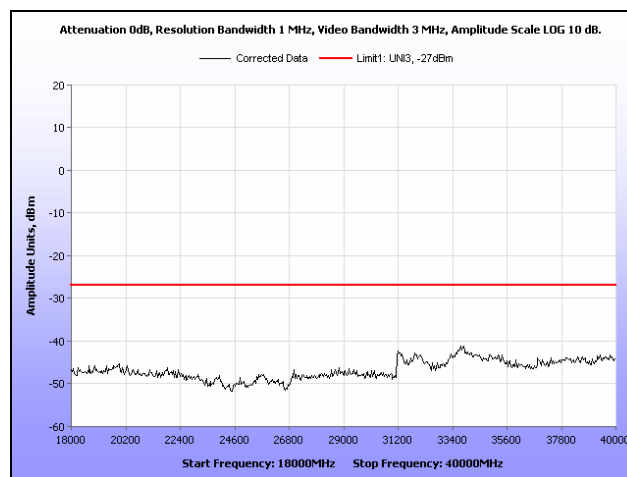
Plot 402. Radiated Spurious Emissions, 802.11n 40 MHz, High Channel, 30 MHz – 1 GHz, 8.25 dBi Omni Antenna
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



Plot 403. Radiated Spurious Emissions, 802.11n 40 MHz, High Channel, 1 GHz – 7 GHz, 8.25 dBi Omni Antenna

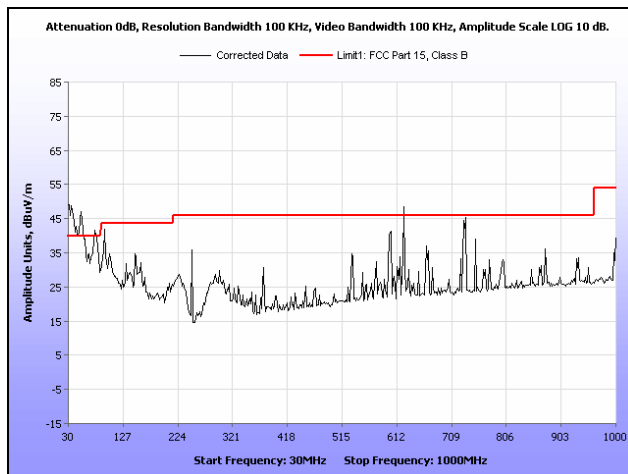


Plot 404. Radiated Spurious Emissions, 802.11n 40 MHz, High Channel, 7 GHz – 18 GHz, 8.25 dBi Omni Antenna



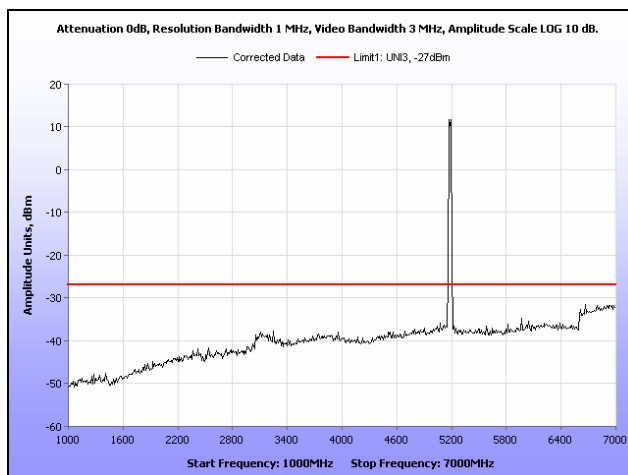
Plot 405. Radiated Spurious Emissions, 802.11n 40 MHz, High Channel, 18 GHz – 40 GHz, 8.25 dBi Omni Antenna

Radiated Spurious Emissions Test Results, 802.11a, 10.1 dBi Patch Antenna

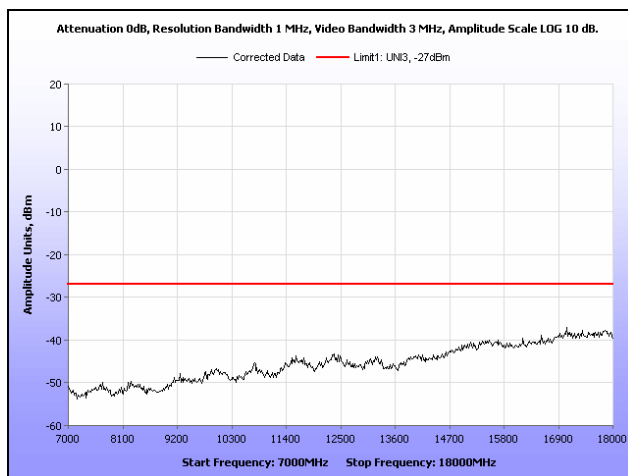


Plot 406. Radiated Spurious Emissions, 802.11a, Low Channel, 30 MHz – 1 GHz, 10.1 dBi Patch Antenna

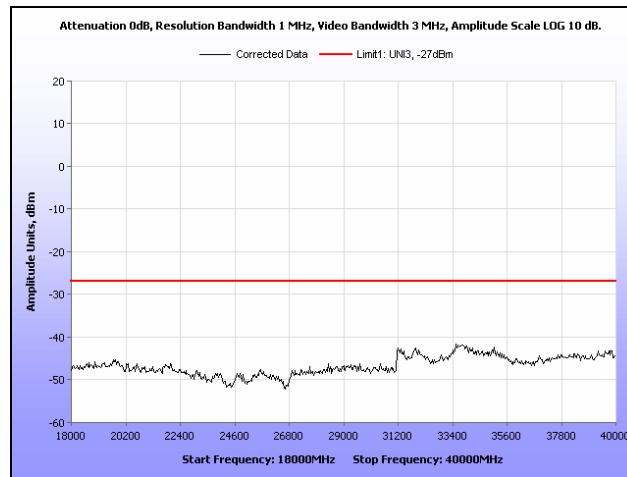
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



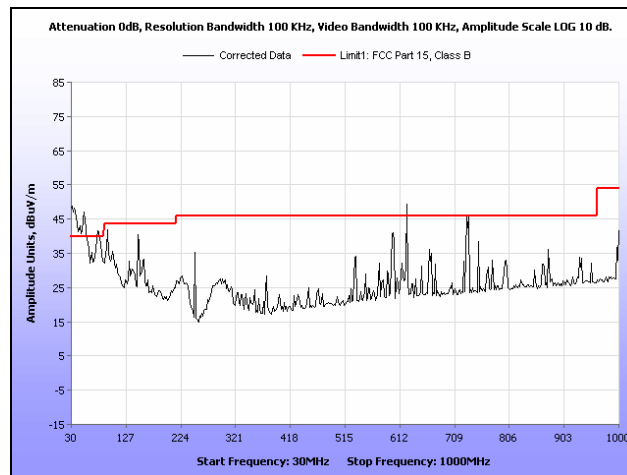
Plot 407. Radiated Spurious Emissions, 802.11a, Low Channel, 1 GHz – 7 GHz, 10.1 dBi Patch Antenna



Plot 408. Radiated Spurious Emissions, 802.11a, Low Channel, 7 GHz – 18 GHz, 10.1 dBi Patch Antenna

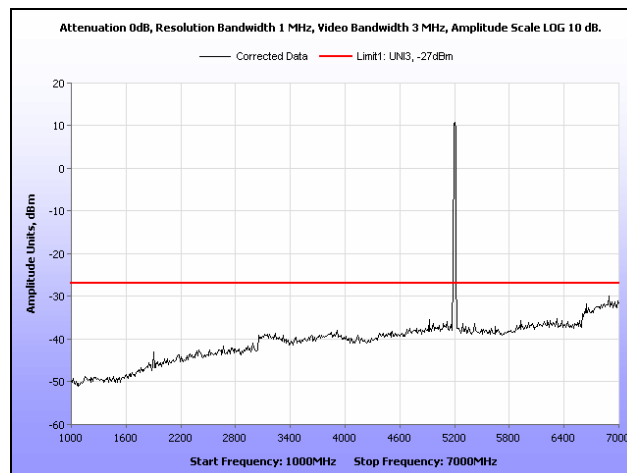


Plot 409. Radiated Spurious Emissions, 802.11a, Low Channel, 18 GHz – 40 GHz, 10.1 dBi Patch Antenna

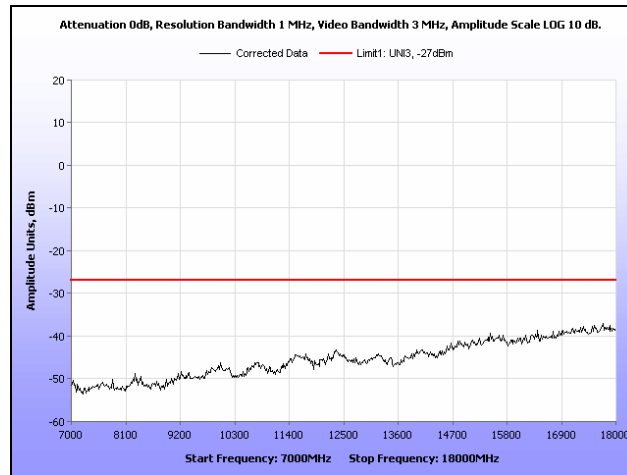


Plot 410. Radiated Spurious Emissions, 802.11a, Mid Channel, 30 MHz – 1 GHz, 10.1 dBi Patch Antenna

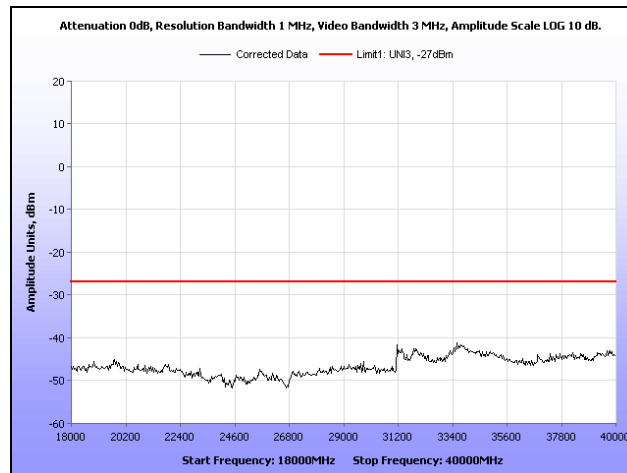
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



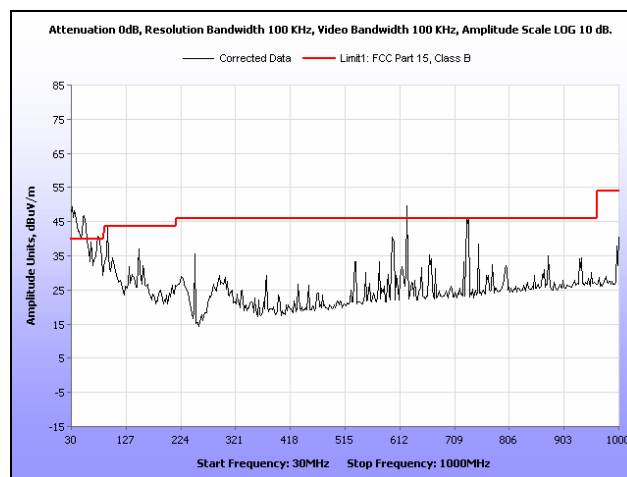
Plot 411. Radiated Spurious Emissions, 802.11a, Mid Channel, 1 GHz – 7 GHz, 10.1 dBi Patch Antenna



Plot 412. Radiated Spurious Emissions, 802.11a, Mid Channel, 7 GHz – 18 GHz, 10.1 dBi Patch Antenna

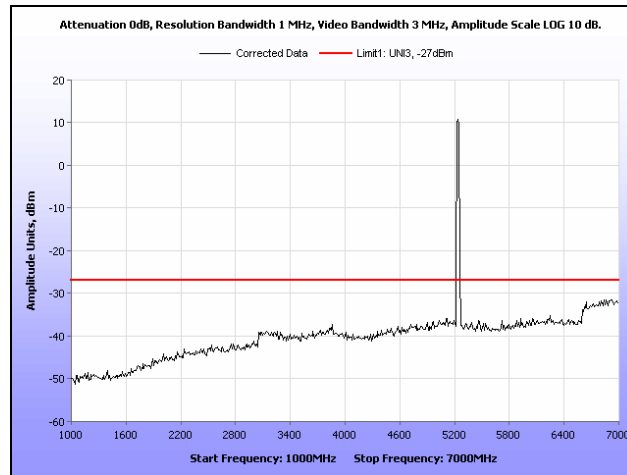


Plot 413. Radiated Spurious Emissions, 802.11a, Mid Channel, 18 GHz – 40 GHz, 10.1 dBi Patch Antenna

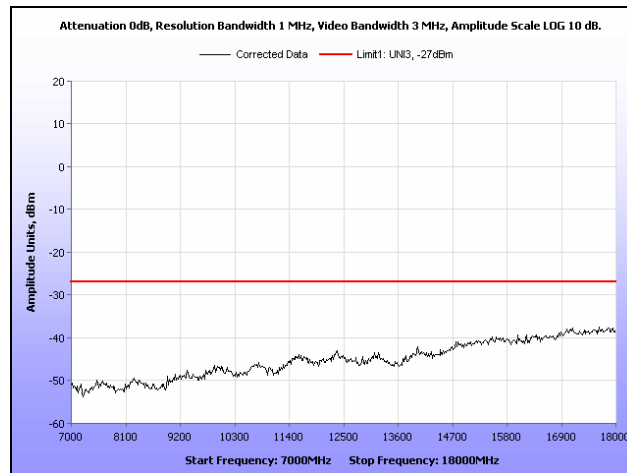


Plot 414. Radiated Spurious Emissions, 802.11a, High Channel, 30 MHz – 1 GHz, 10.1 dBi Patch Antenna

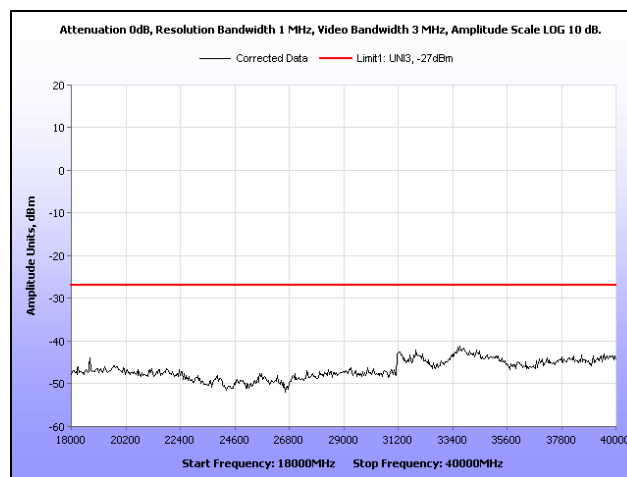
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



Plot 415. Radiated Spurious Emissions, 802.11a, High Channel, 1 GHz – 7 GHz, 10.1 dBi Patch Antenna

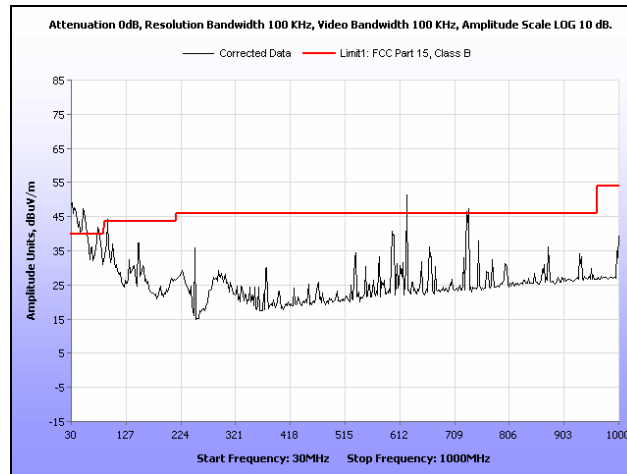


Plot 416. Radiated Spurious Emissions, 802.11a, High Channel, 7 GHz – 18 GHz, 10.1 dBi Patch Antenna

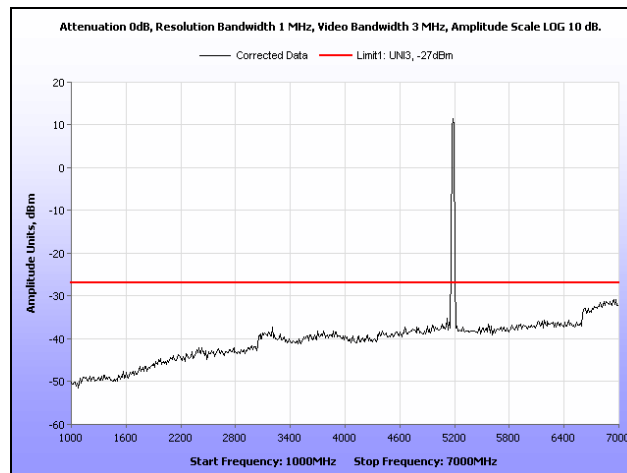


Plot 417. Radiated Spurious Emissions, 802.11a, High Channel, 18 GHz – 40 GHz, 10.1 dBi Patch Antenna

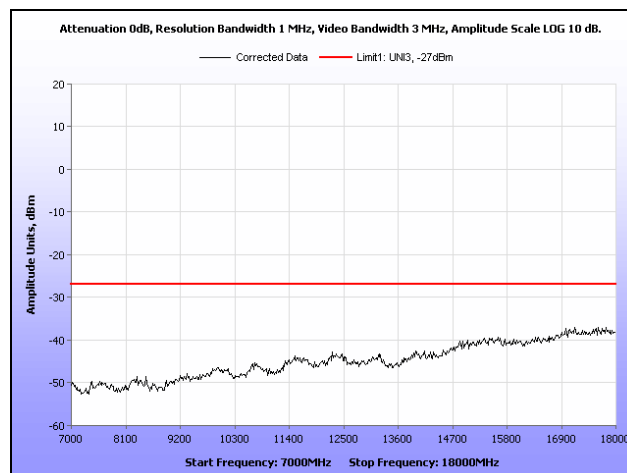
Radiated Spurious Emissions Test Results, 802.11n HT20, 10.1 dBi Patch Antenna



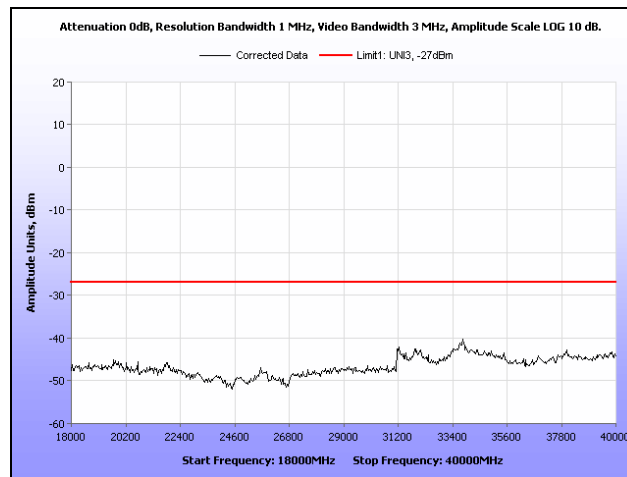
Plot 418. Radiated Spurious Emissions, 802.11n 20 MHz, Low Channel, 30 MHz – 1 GHz, 10.1 dBi Patch Antenna
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



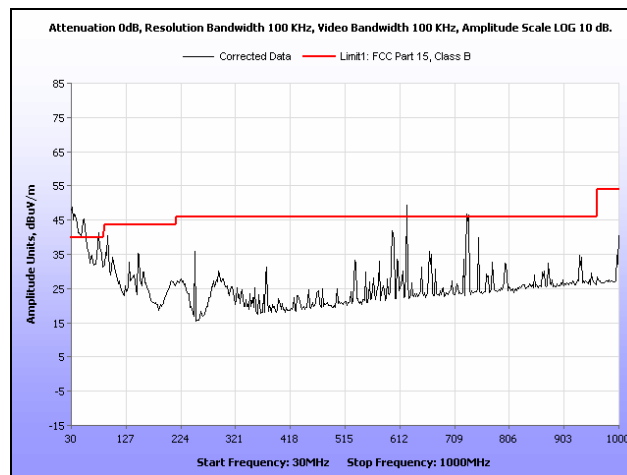
Plot 419. Radiated Spurious Emissions, 802.11n 20 MHz, Low Channel, 1 GHz – 7 GHz, 10.1 dBi Patch Antenna



Plot 420. Radiated Spurious Emissions, 802.11n 20 MHz, Low Channel, 7 GHz – 18 GHz, 10.1 dBi Patch Antenna

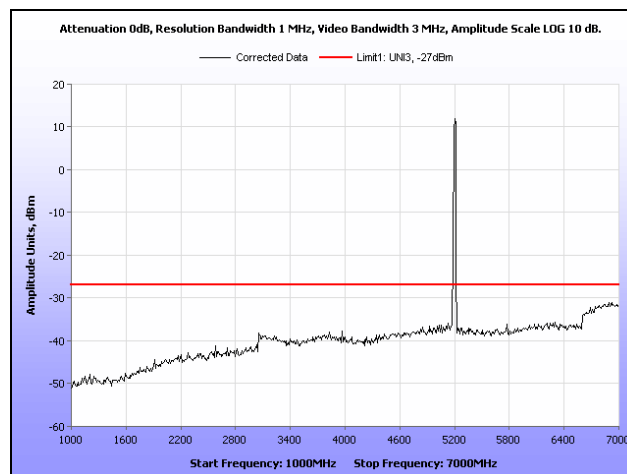


Plot 421. Radiated Spurious Emissions, 802.11n 20 MHz, Low Channel, 18 GHz – 40 GHz, 10.1 dBi Patch Antenna

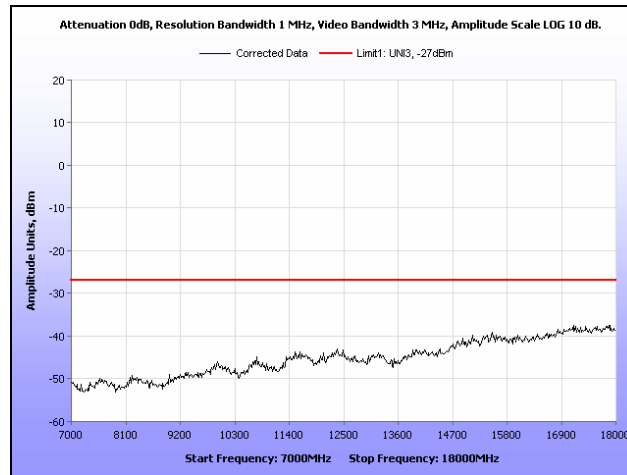


Plot 422. Radiated Spurious Emissions, 802.11n 20 MHz, Mid Channel, 30 MHz – 1 GHz, 10.1 dBi Patch Antenna

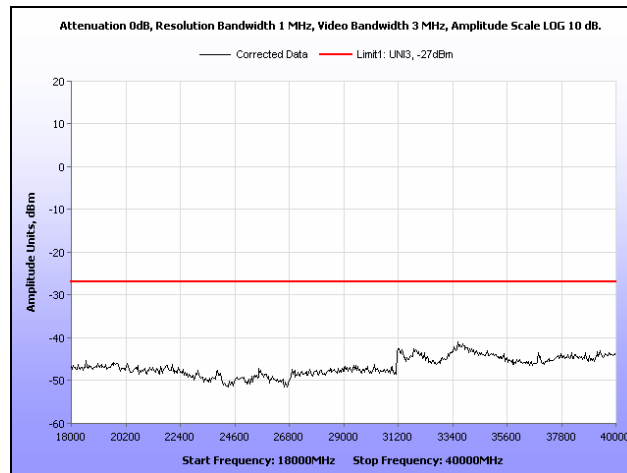
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



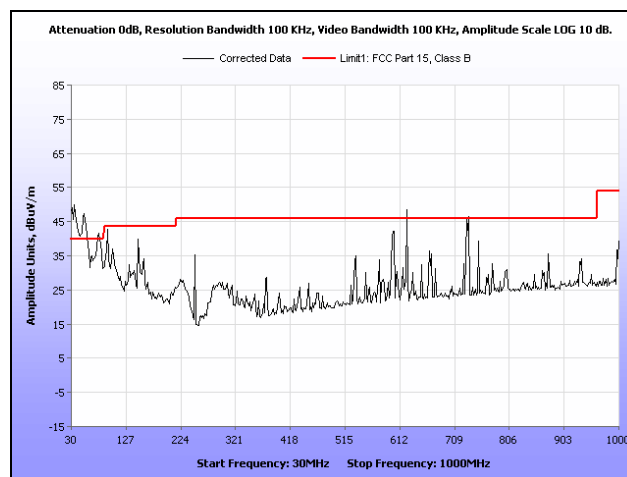
Plot 423. Radiated Spurious Emissions, 802.11n 20 MHz, Mid Channel, 1 GHz – 7 GHz, 10.1 dBi Patch Antenna



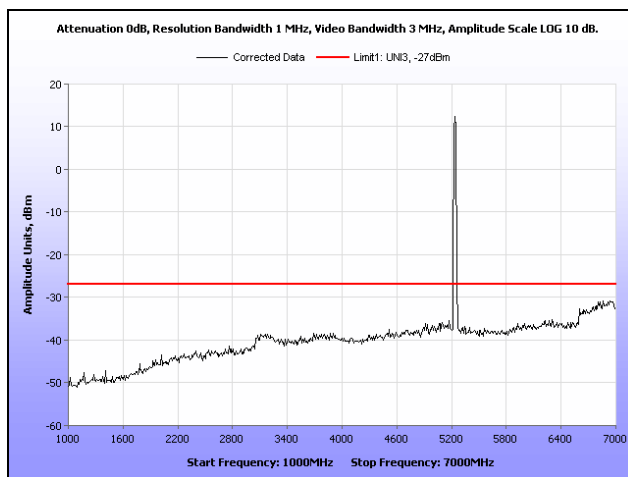
Plot 424. Radiated Spurious Emissions, 802.11n 20 MHz, Mid Channel, 7 GHz – 18 GHz, 10.1 dBi Patch Antenna



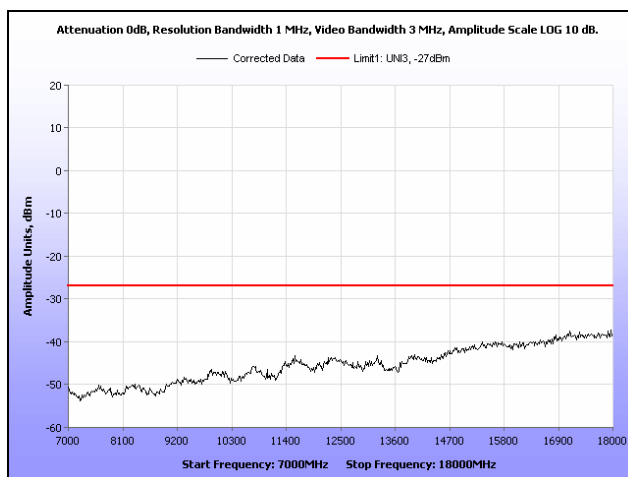
Plot 425. Radiated Spurious Emissions, 802.11n 20 MHz, Mid Channel, 18 GHz – 40 GHz, 10.1 dBi Patch Antenna



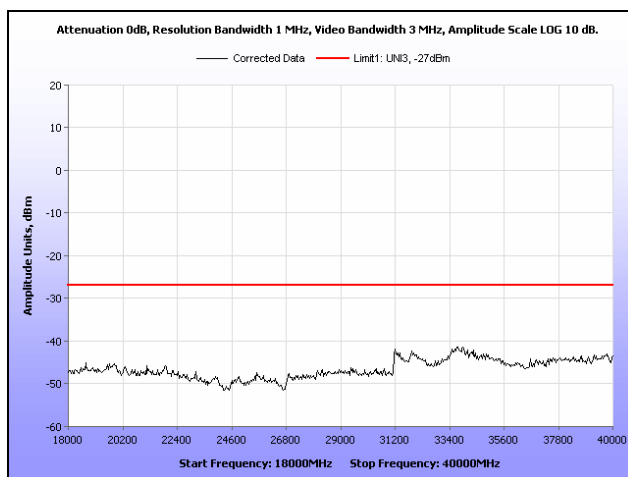
Plot 426. Radiated Spurious Emissions, 802.11n 20 MHz, High Channel, 30 MHz – 1 GHz, 10.1 dBi Patch Antenna
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



Plot 427. Radiated Spurious Emissions, 802.11n 20 MHz, High Channel, 1 GHz – 7 GHz, 10.1 dBi Patch Antenna

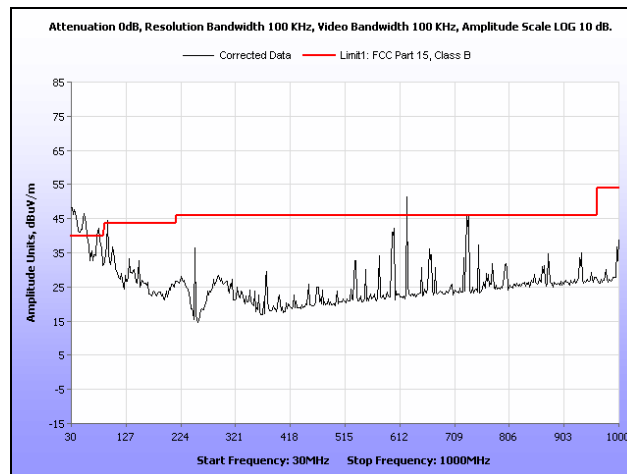


Plot 428. Radiated Spurious Emissions, 802.11n 20 MHz, High Channel, 7 GHz – 18 GHz, 10.1 dBi Patch Antenna

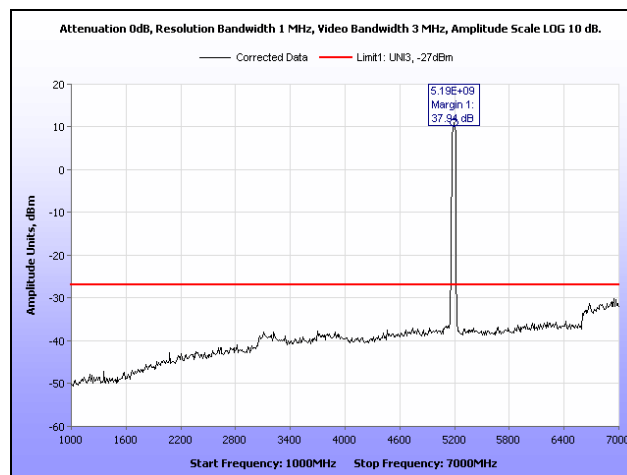


Plot 429. Radiated Spurious Emissions, 802.11n 20 MHz, High Channel, 18 GHz – 40 GHz, 10.1 dBi Patch Antenna

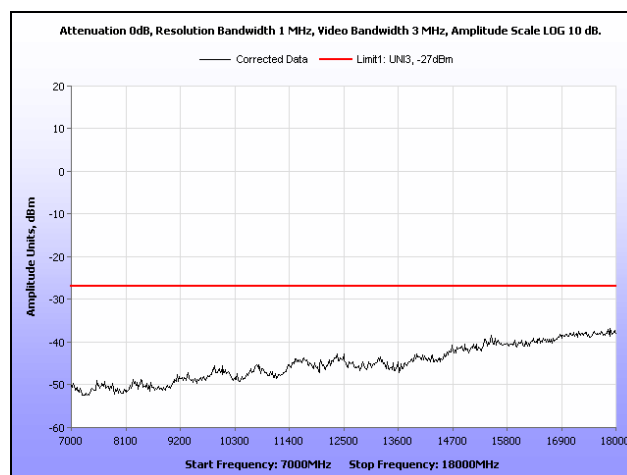
Radiated Spurious Emissions Test Results, 802.11n HT40, 10.1 dBi Patch Antenna



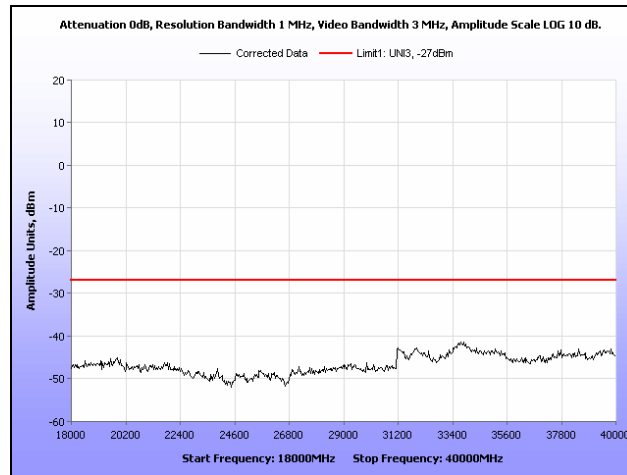
Plot 430. Radiated Spurious Emissions, 802.11n 40 MHz, Low Channel, 30 MHz – 1 GHz, 10.1 dBi Patch Antenna
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



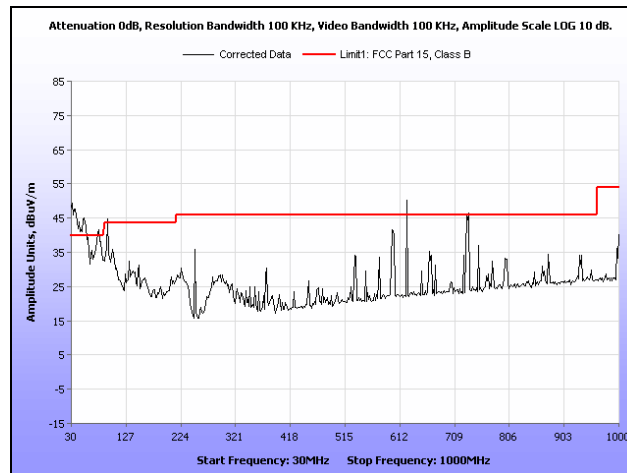
Plot 431. Radiated Spurious Emissions, 802.11n 40 MHz, Low Channel, 1 GHz – 7 GHz, 10.1 dBi Patch Antenna



Plot 432. Radiated Spurious Emissions, 802.11n 40 MHz, Low Channel, 7 GHz – 18 GHz, 10.1 dBi Patch Antenna

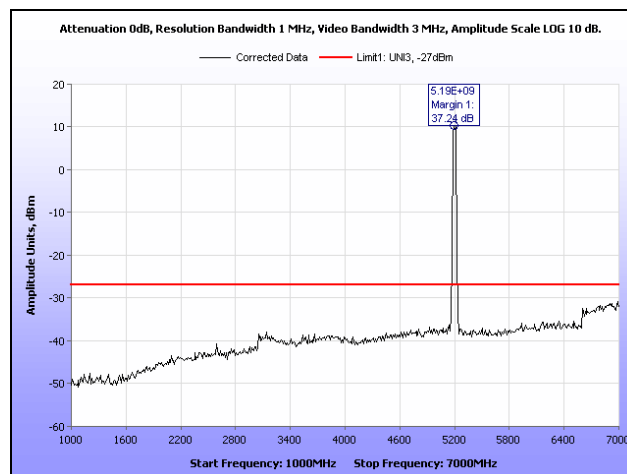


Plot 433. Radiated Spurious Emissions, 802.11n 40 MHz, Low Channel, 18 GHz – 40 GHz, 10.1 dBi Patch Antenna

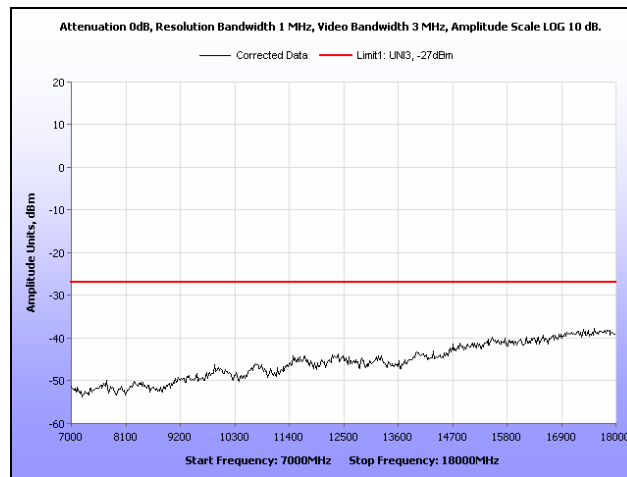


Plot 434. Radiated Spurious Emissions, 802.11n 40 MHz, Mid Channel, 30 MHz – 1 GHz, 10.1 dBi Patch Antenna

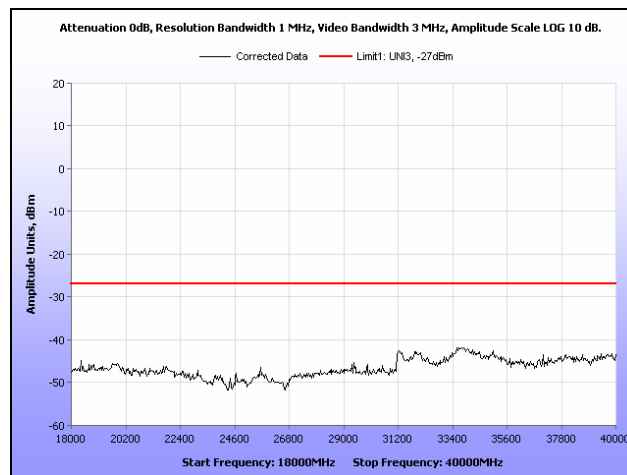
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



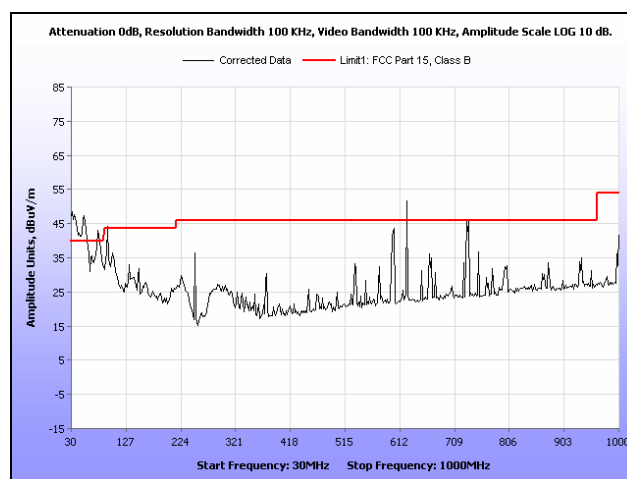
Plot 435. Radiated Spurious Emissions, 802.11n 40 MHz, Mid Channel, 1 GHz – 7 GHz, 10.1 dBi Patch Antenna



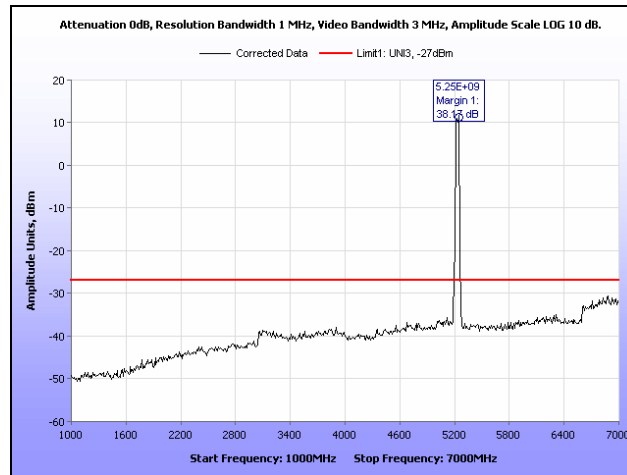
Plot 436. Radiated Spurious Emissions, 802.11n 40 MHz, Mid Channel, 7 GHz – 18 GHz, 10.1 dBi Patch Antenna



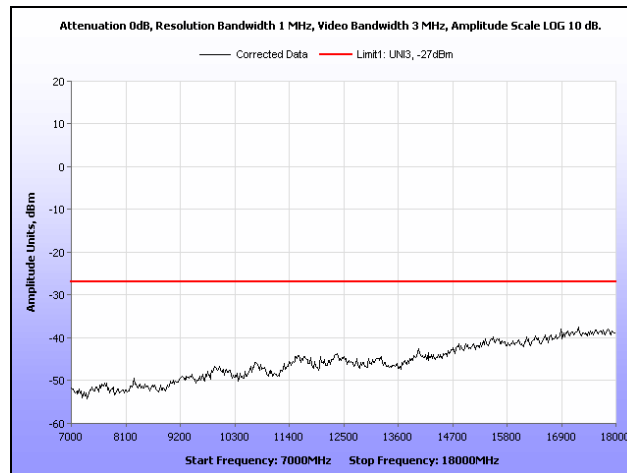
Plot 437. Radiated Spurious Emissions, 802.11n 40 MHz, Mid Channel, 18 GHz – 40 GHz, 10.1 dBi Patch Antenna



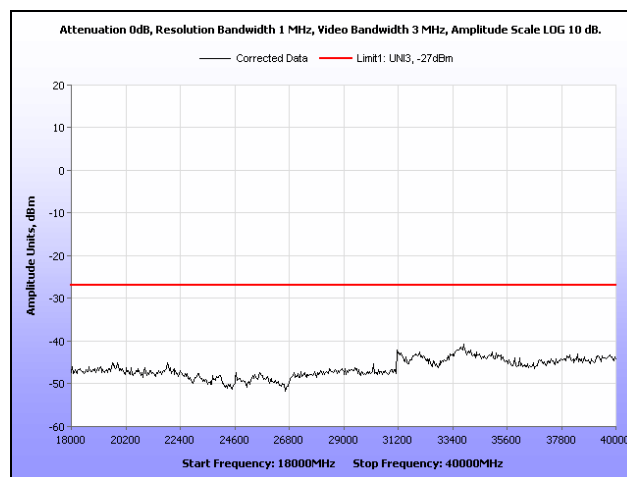
Plot 438. Radiated Spurious Emissions, 802.11n 40 MHz, High Channel, 30 MHz – 1 GHz, 10.1 dBi Patch Antenna
Note: Emissions exceeding the 15.209 limit are digital emissions which meet the Class B limit when measured with a quasi-peak detector. Refer to EMC30461-FCC247 Rev. 4.



Plot 439. Radiated Spurious Emissions, 802.11n 40 MHz, High Channel, 1 GHz – 7 GHz, 10.1 dBi Patch Antenna

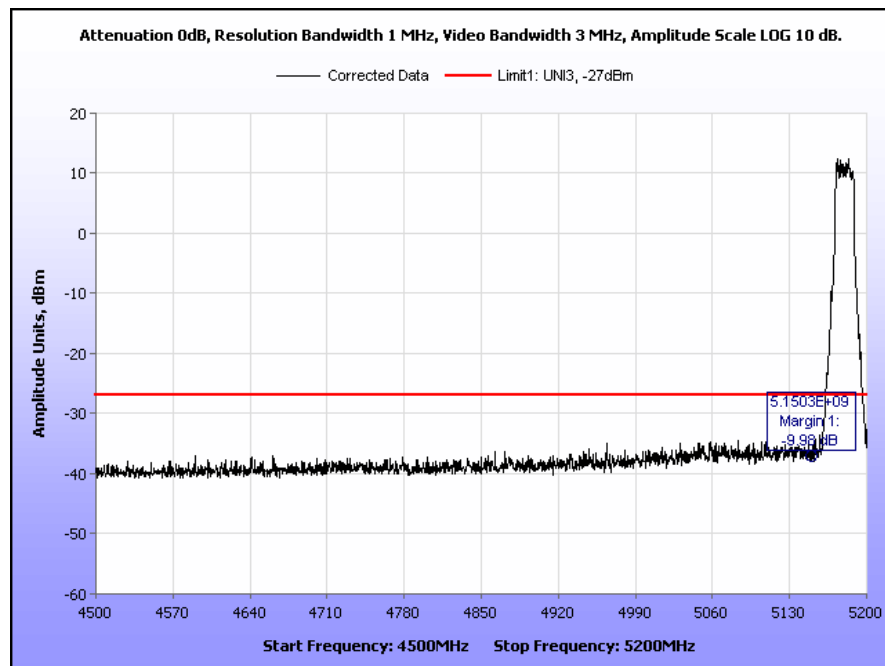


Plot 440. Radiated Spurious Emissions, 802.11n 40 MHz, High Channel, 7 GHz – 18 GHz, 10.1 dBi Patch Antenna

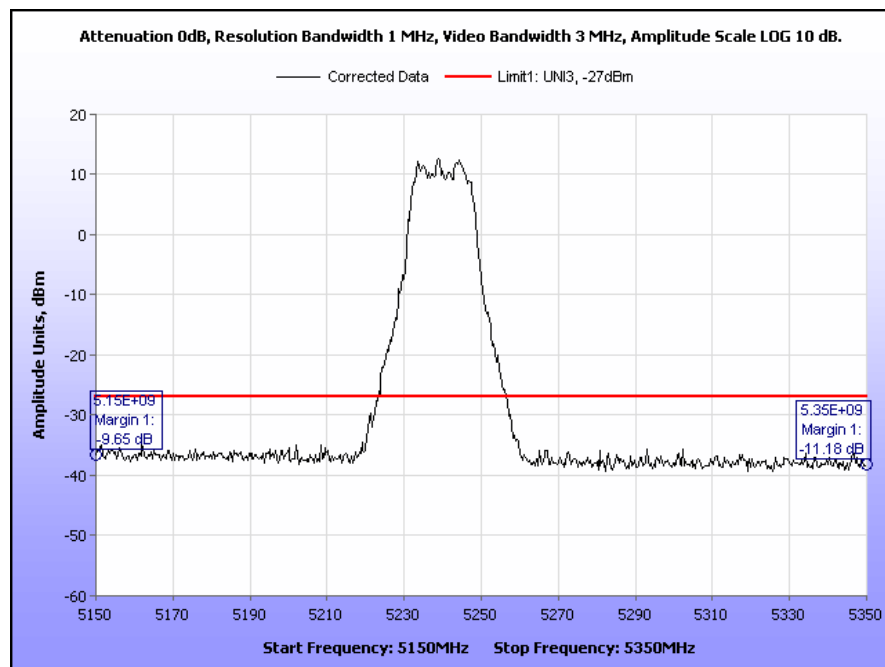


Plot 441. Radiated Spurious Emissions, 802.11n 40 MHz, High Channel, 18 GHz – 40 GHz, 10.1 dBi Patch Antenna

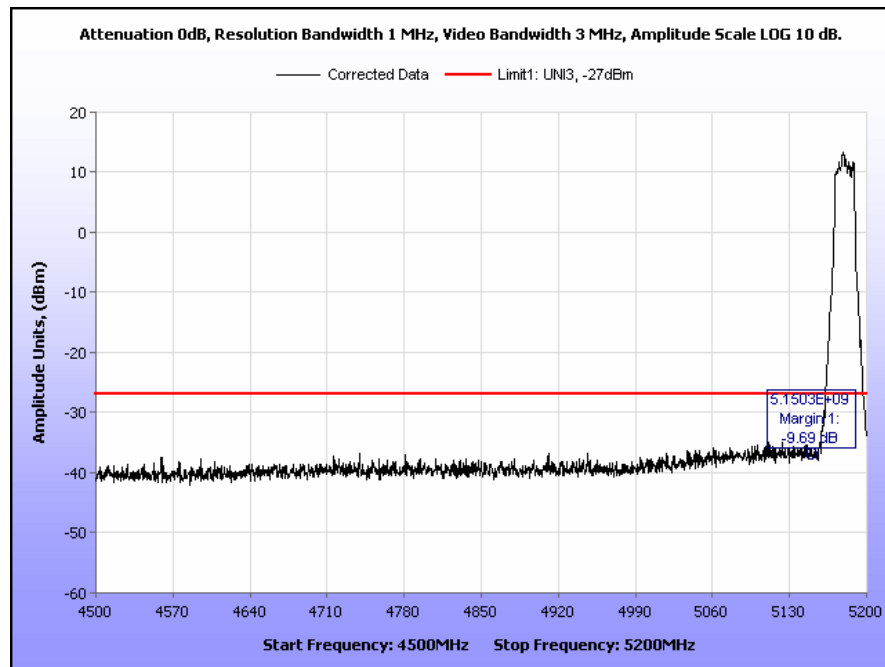
§15.407 (b)(1) Radiated Band Edge, 10 dBi Omni Antenna



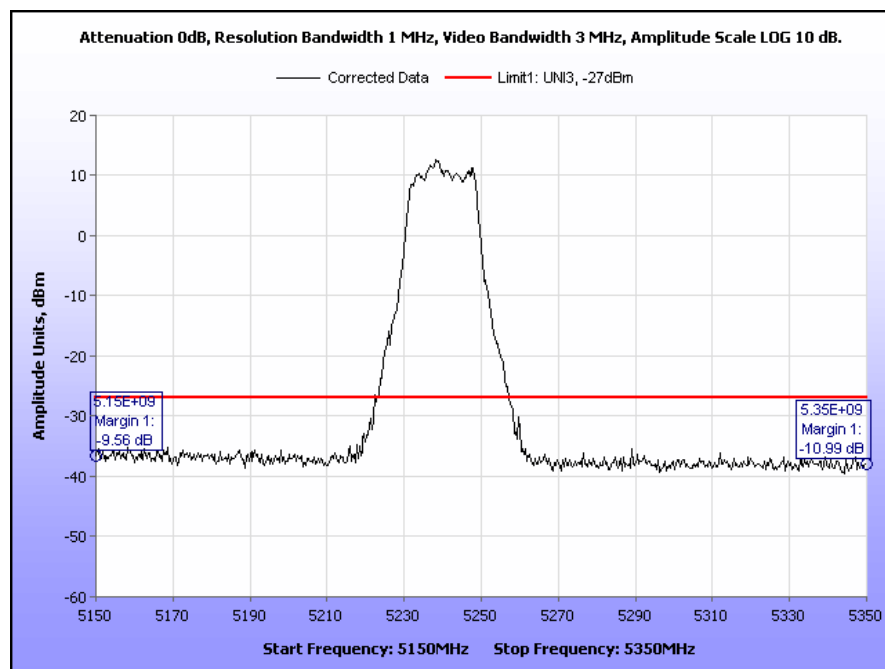
Plot 442. Band Edge, 802.11a, Low Channel, 10 dBi Omni Antenna



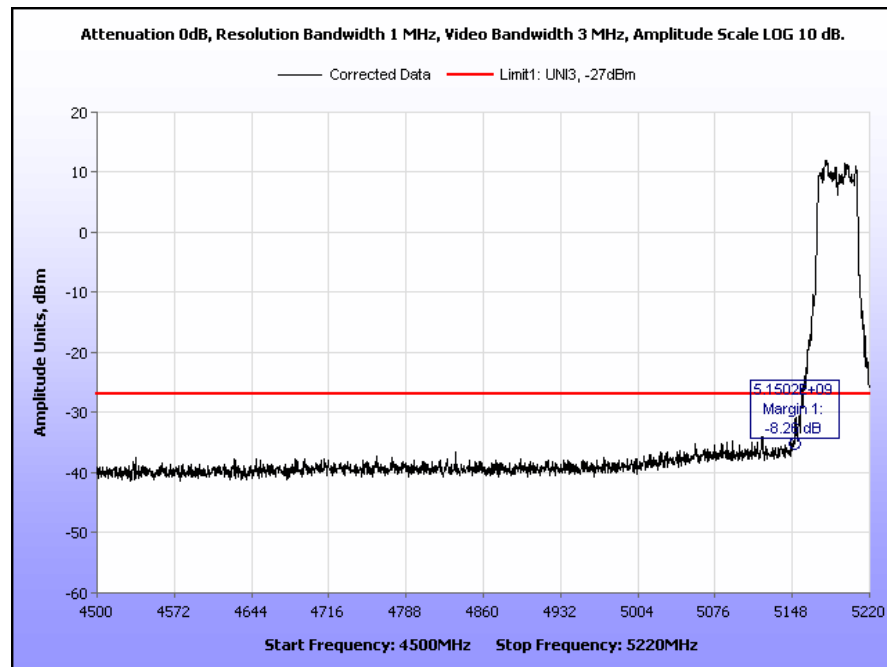
Plot 443. Band Edge, 802.11a, High Channel, 10 dBi Omni Antenna



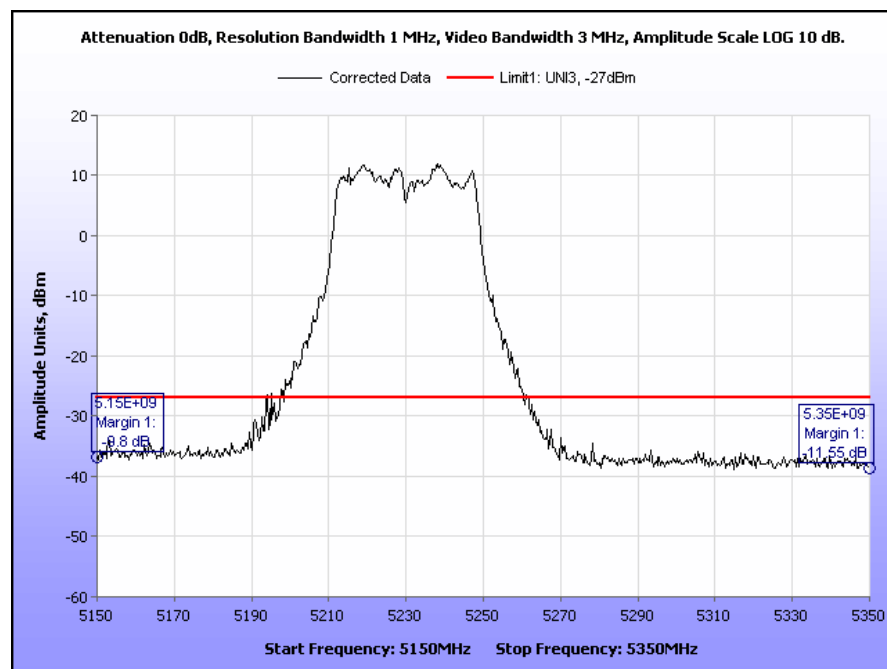
Plot 444. Band Edge, 802.11n 20 MHz, Low Channel, 10 dBi Omni Antenna



Plot 445. Band Edge, 802.11n 20 MHz, High Channel, 10 dBi Omni Antenna

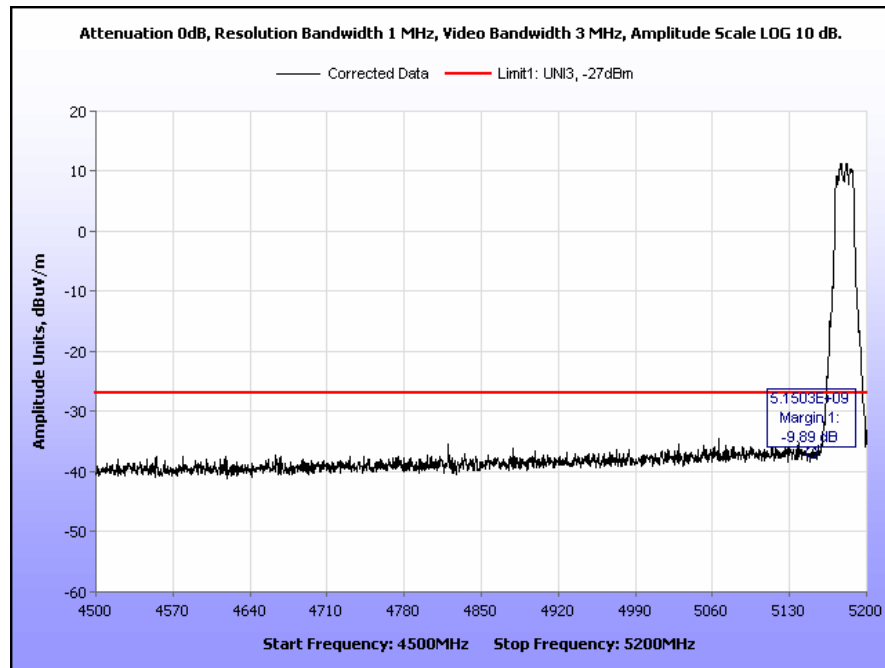


Plot 446. Band Edge, 802.11n 40 MHz, Low Channel, 10 dBi Omni Antenna

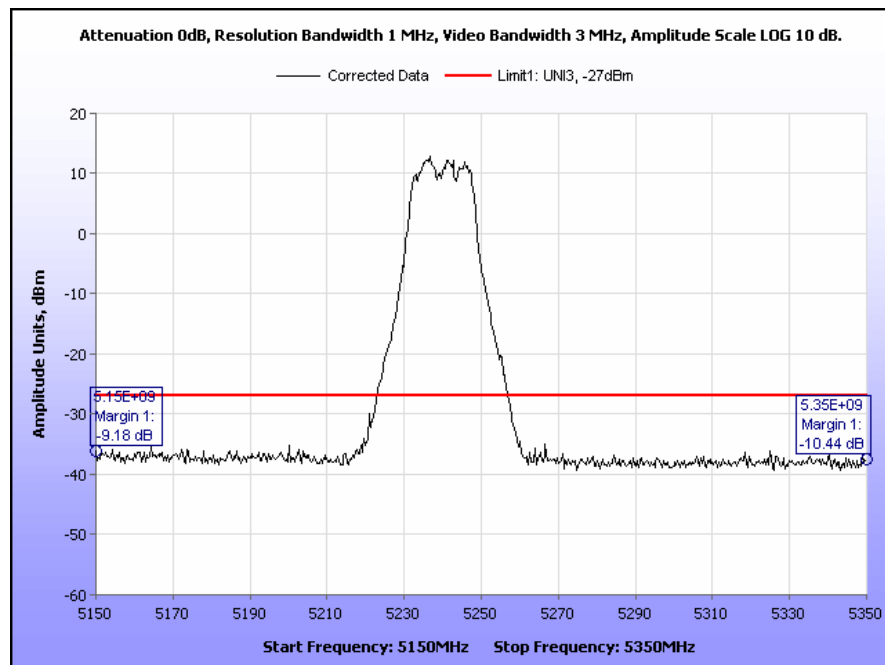


Plot 447. Band Edge, 802.11n 40 MHz, High Channel, 10 dBi Omni Antenna

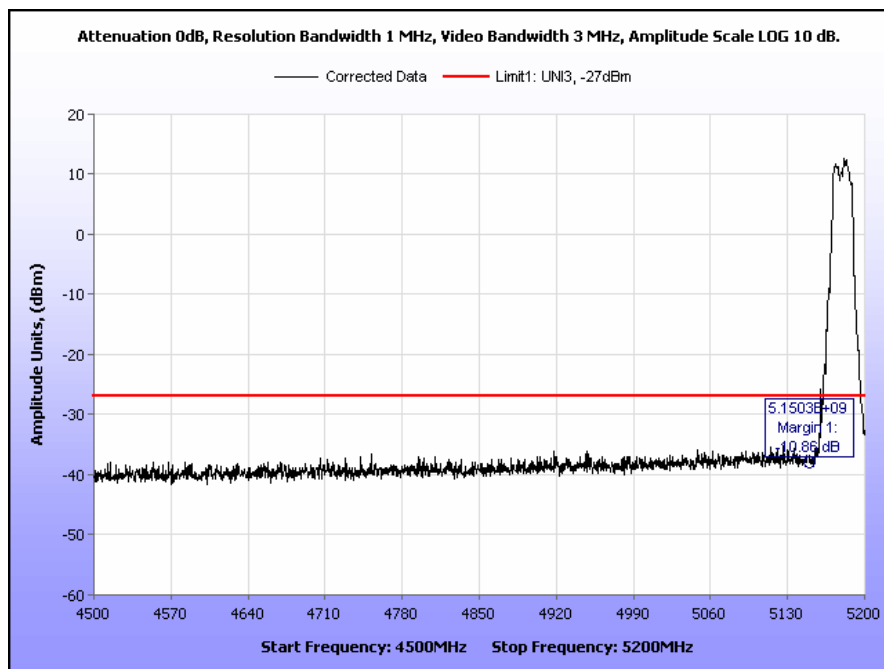
Band Edge, 10.7 dBi Panel Antenna



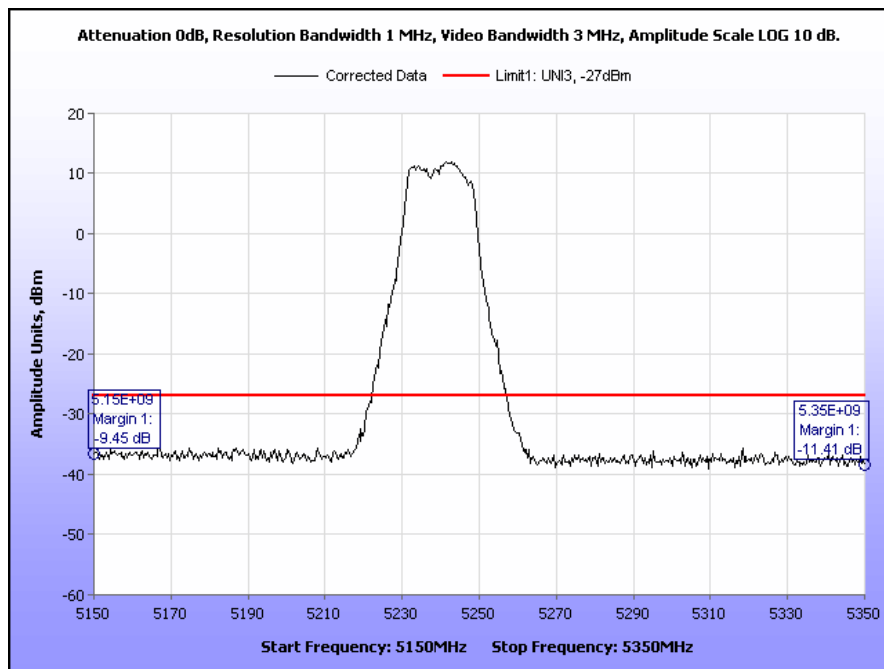
Plot 448. Band Edge, 802.11a, Low Channel, 10.7 dBi Panel Antenna



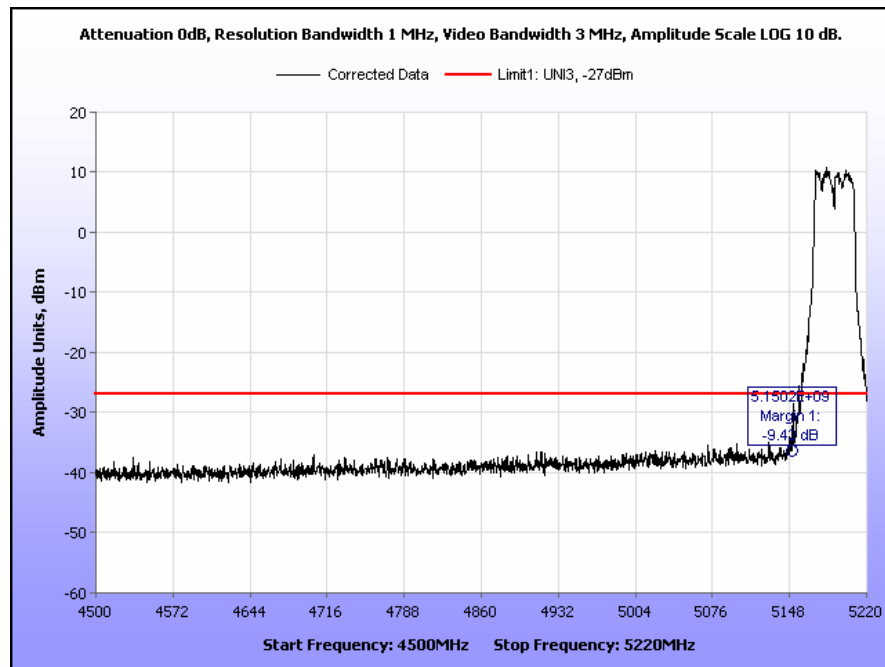
Plot 449. Band Edge, 802.11a, High Channel, 10.7 dBi Panel Antenna



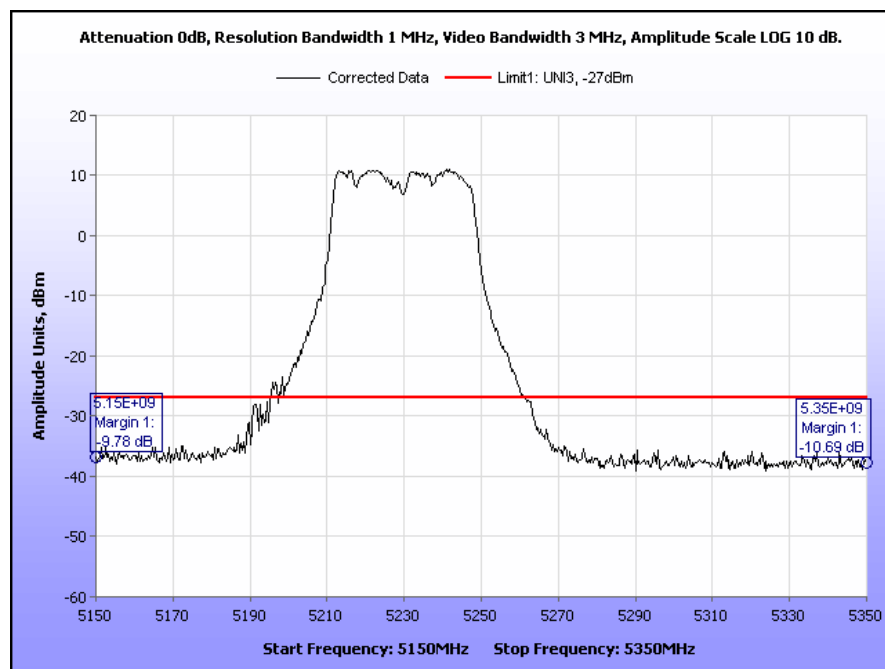
Plot 450. Band Edge, 802.11n 20 MHz, Low Channel, 10.7 dBi Panel Antenna



Plot 451. Band Edge, 802.11n 20 MHz, High Channel, 10.7 dBi Panel Antenna

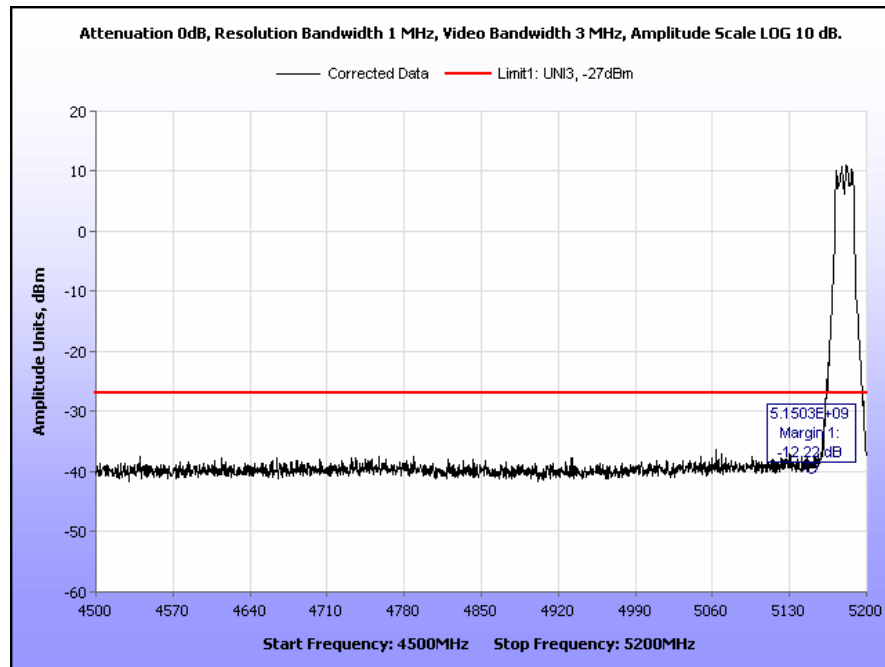


Plot 452. Band Edge, 802.11n 40 MHz, Low Channel, 10.7 dBi Panel Antenna

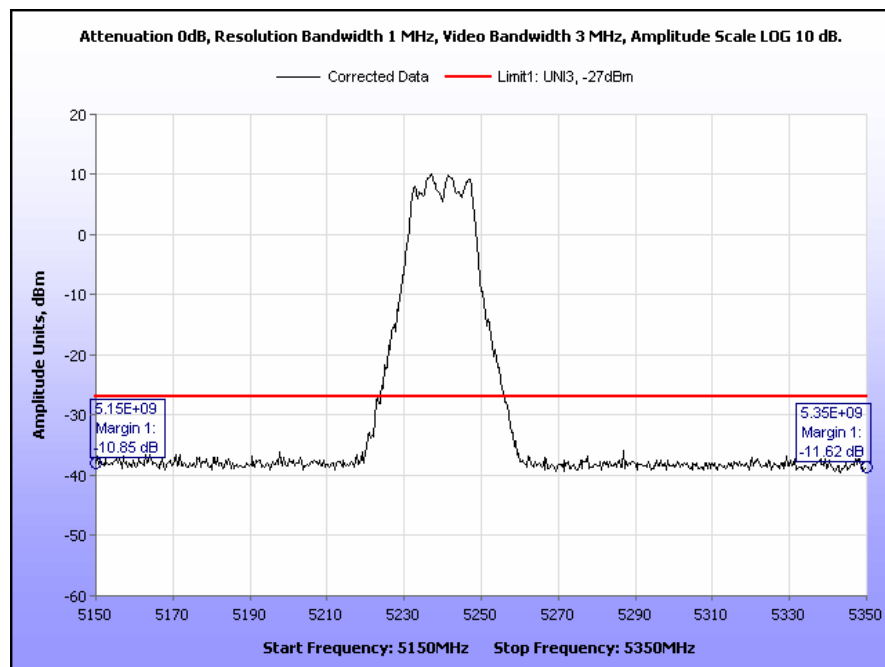


Plot 453. Band Edge, 802.11n 40 MHz, High Channel, 10.7 dBi Panel Antenna

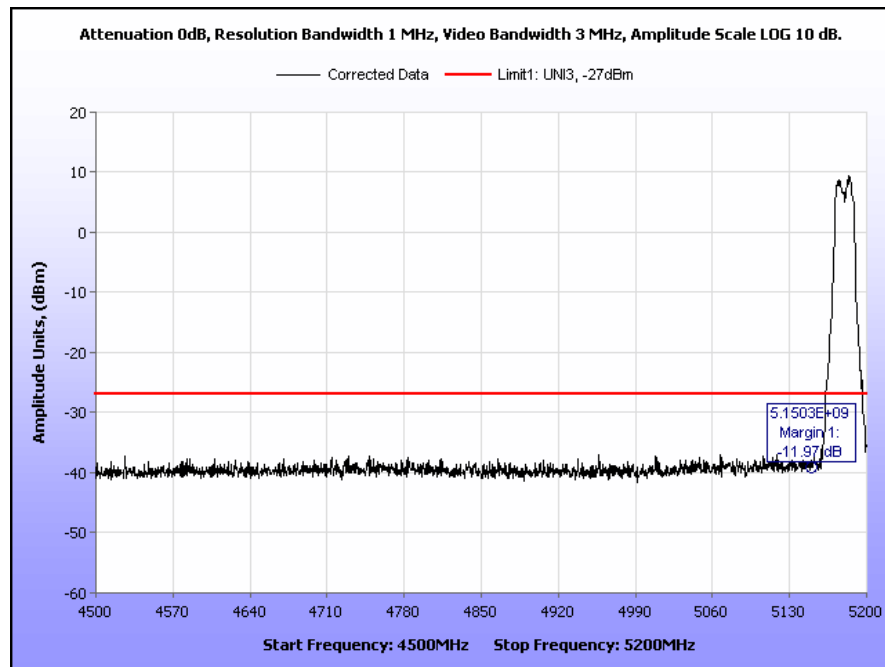
Band Edge, 8.25 dBi Omni Antenna



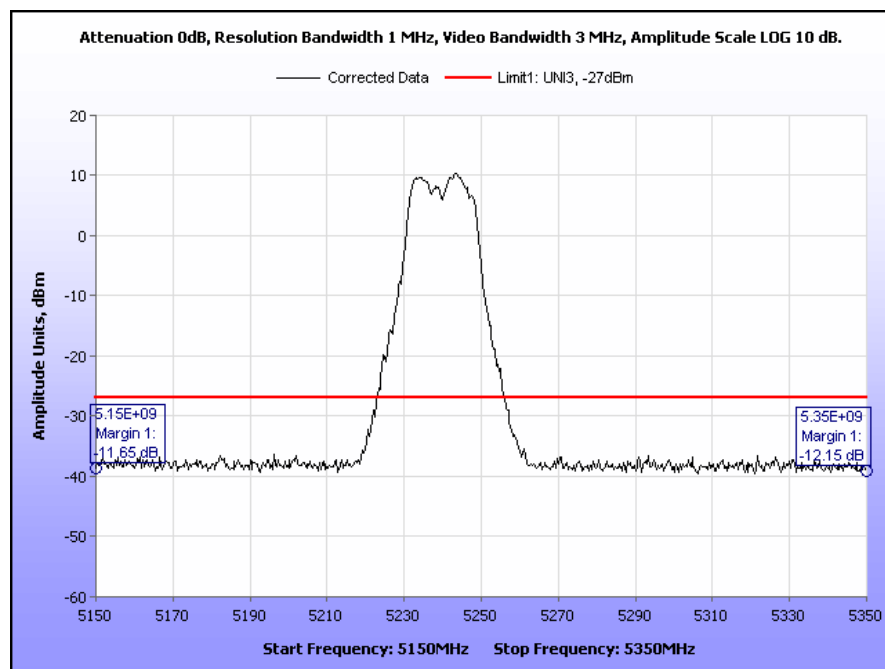
Plot 454. Band Edge, 802.11a, Low Channel, 8.25 dBi Omni Antenna



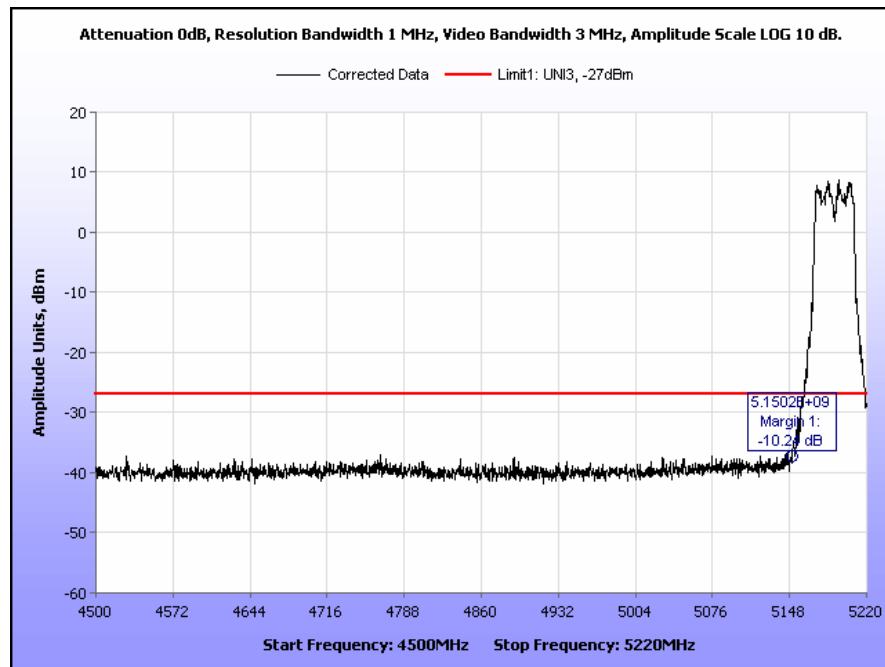
Plot 455. Band Edge, 802.11a, High Channel, 8.25 dBi Omni Antenna



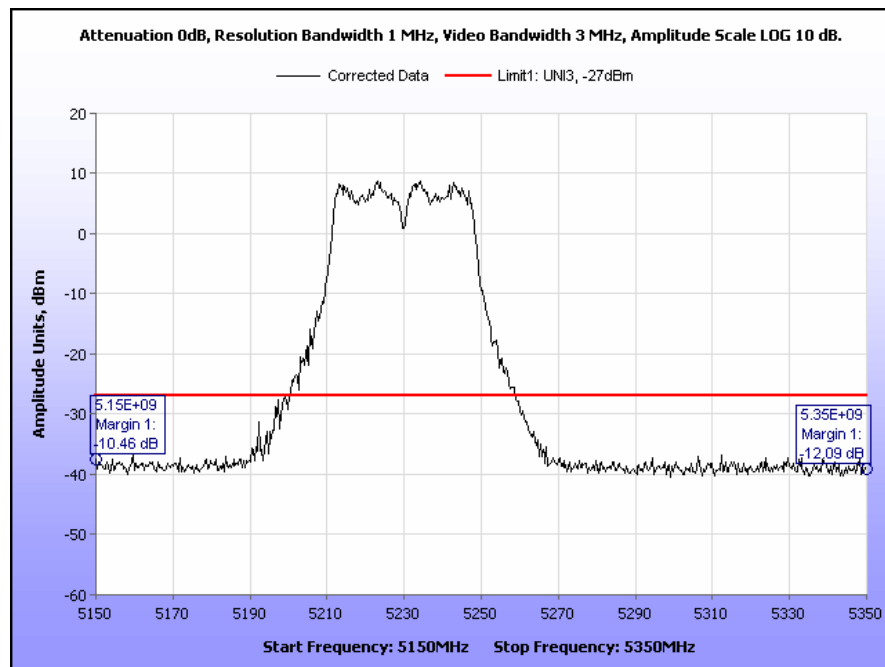
Plot 456. Band Edge, 802.11n 20 MHz, Low Channel, 8.25 dBi Omni Antenna



Plot 457. Band Edge, 802.11n 20 MHz, High Channel, 8.25 dBi Omni Antenna

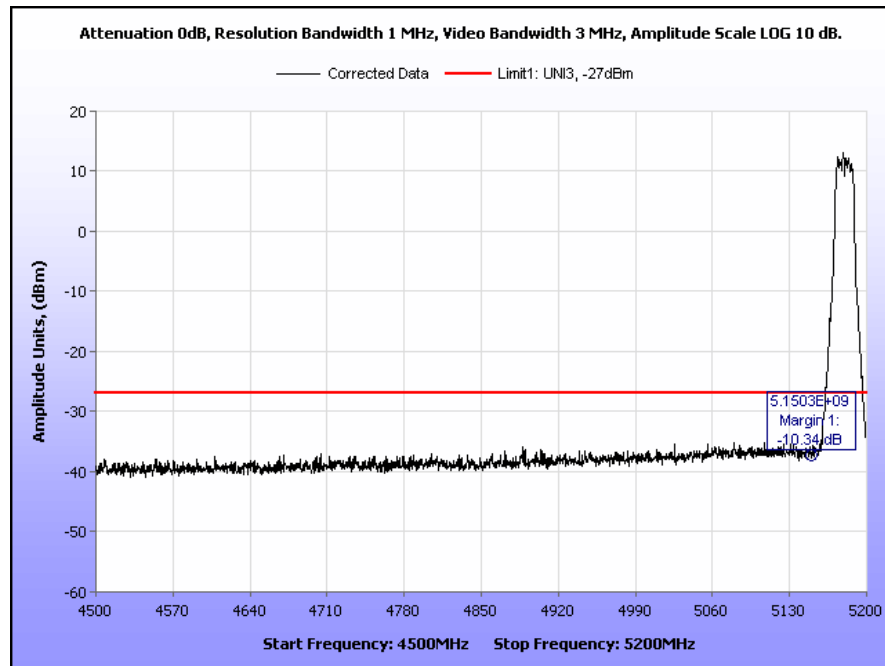


Plot 458. Band Edge, 802.11n 40 MHz, Low Channel, 8.25 dBi Omni Antenna

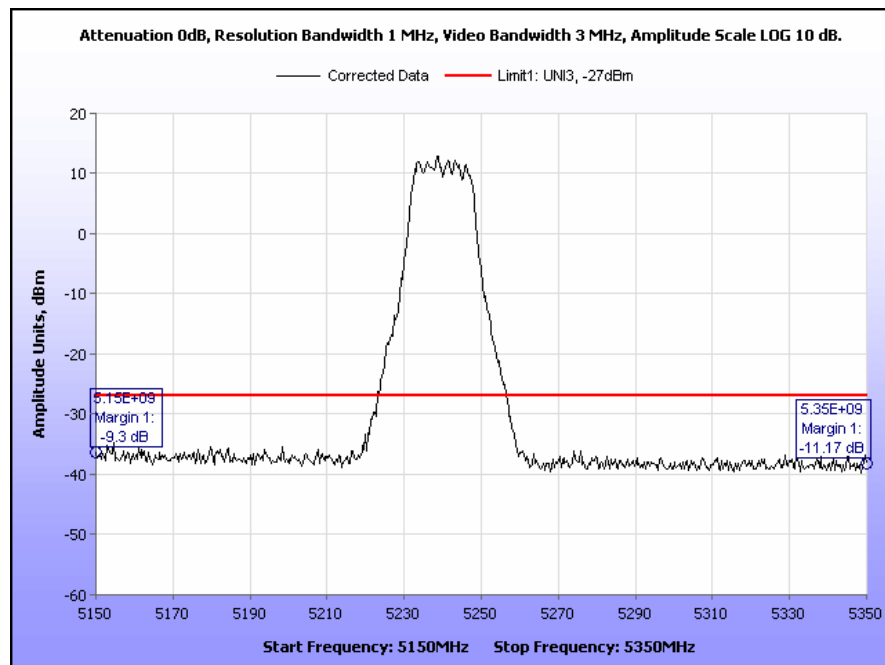


Plot 459. Band Edge, 802.11n 40 MHz, High Channel, 8.25 dBi Omni Antenna

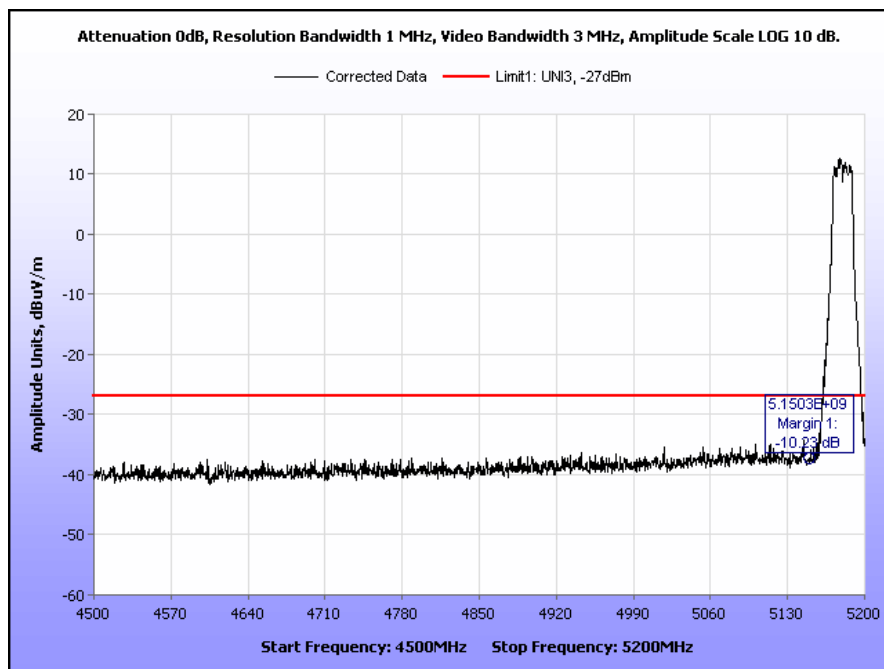
Band Edge, 10.1 dBi Patch Antenna



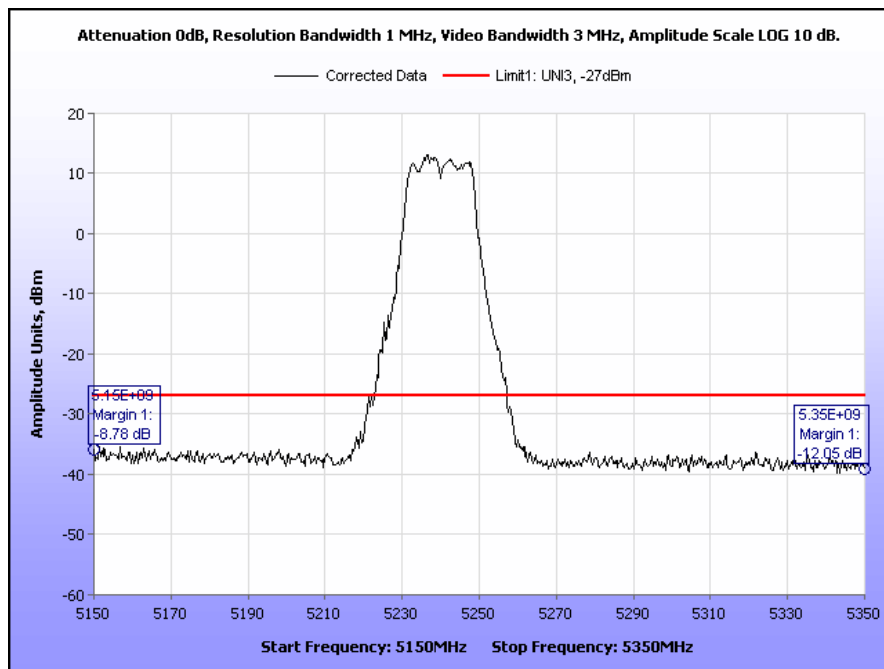
Plot 460. Band Edge, 802.11a, Low Channel, 10.1 dBi Patch Antenna



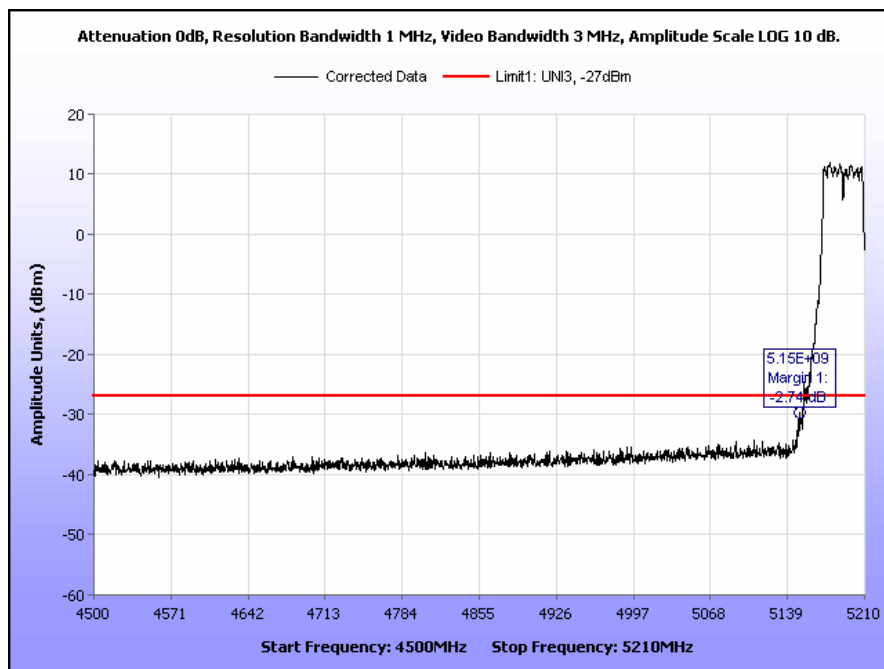
Plot 461. Band Edge, 802.11a, High Channel, 10.1 dBi Patch Antenna



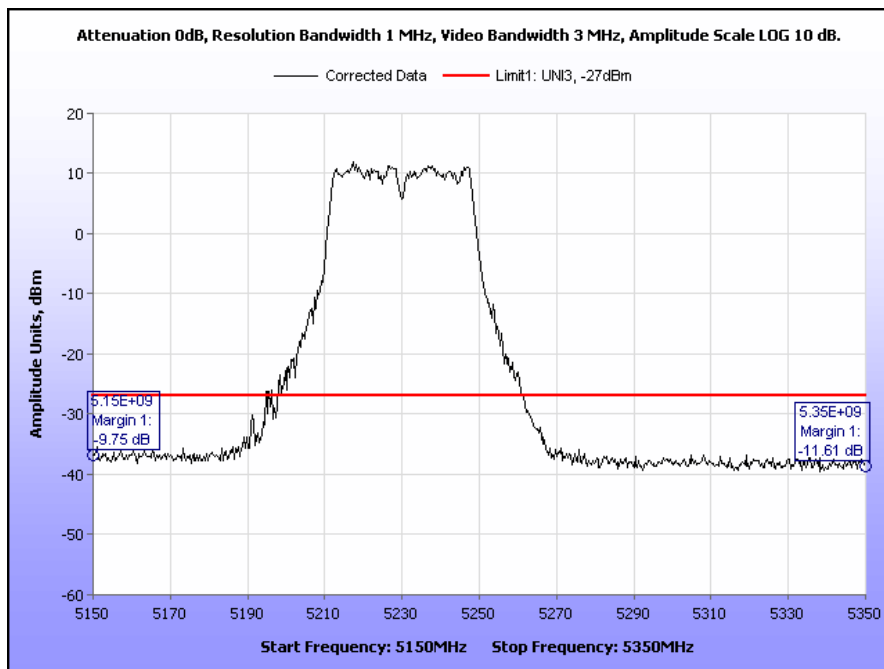
Plot 462. Band Edge, 802.11n 20 MHz, Low Channel, 10.1 dBi Patch Antenna



Plot 463. Band Edge, 802.11n 20 MHz, High Channel, 10.1 dBi Patch Antenna

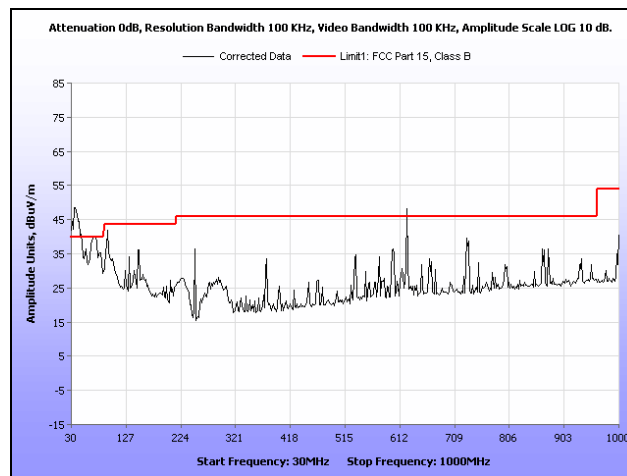


Plot 464. Band Edge, 802.11n 40 MHz, Low Channel, 10.1 dBi Patch Antenna

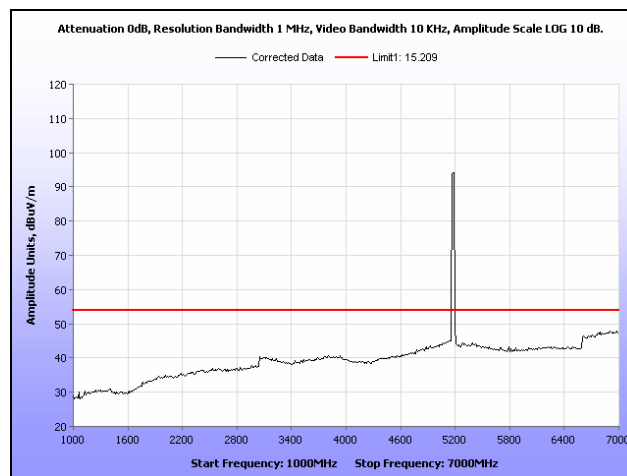


Plot 465. Band Edge, 802.11n 40 MHz, High Channel, 10.1 dBi Patch Antenna

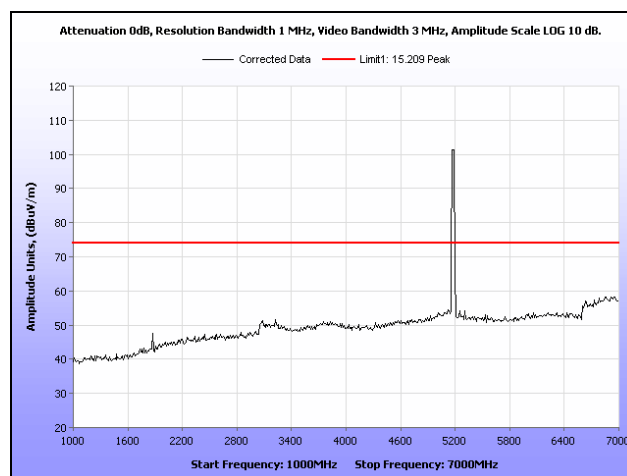
§15.205, 15.209, Radiated Restricted Band, Omni Antenna, 802.11a



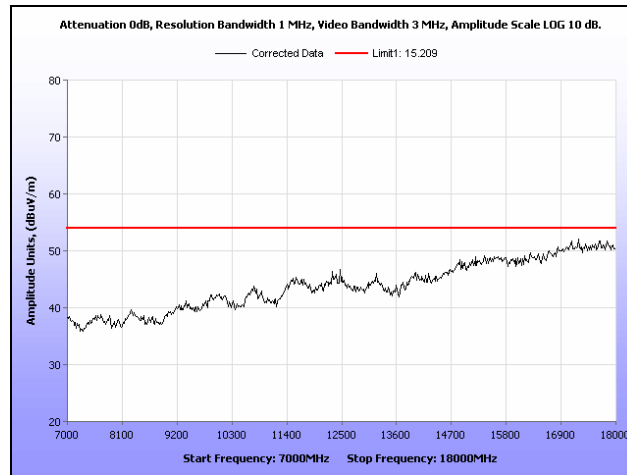
Plot 466. Restricted Band, 802.11a, Low Channel, Omni Antenna, 30 MHz – 1 GHz



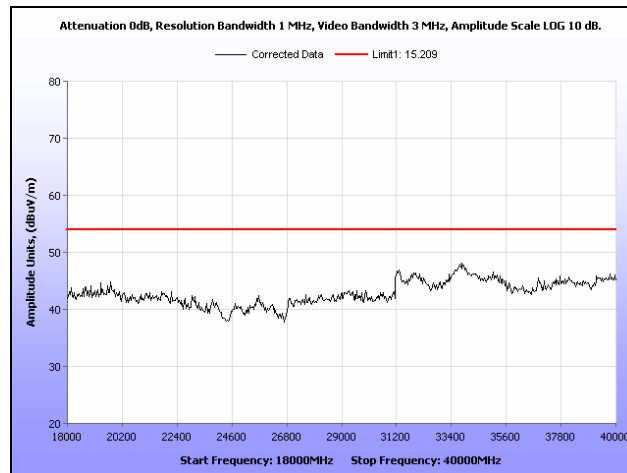
Plot 467. Restricted Band, 802.11a, Low Channel, Omni Antenna, 1 GHz – 7 GHz, Average



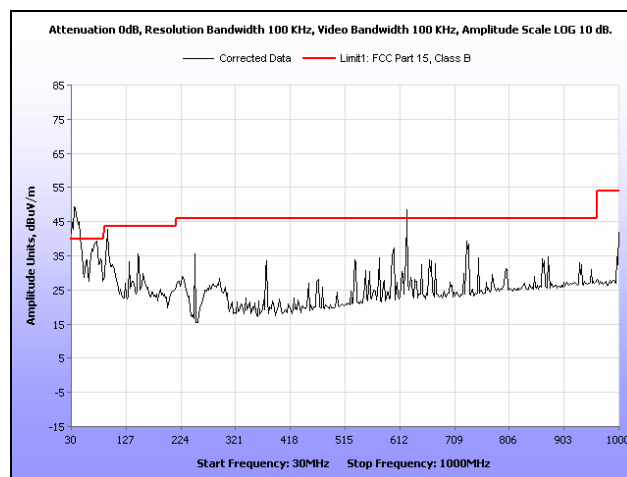
Plot 468. Restricted Band, 802.11a, Low Channel, Omni Antenna, 1 GHz – 7 GHz, Peak



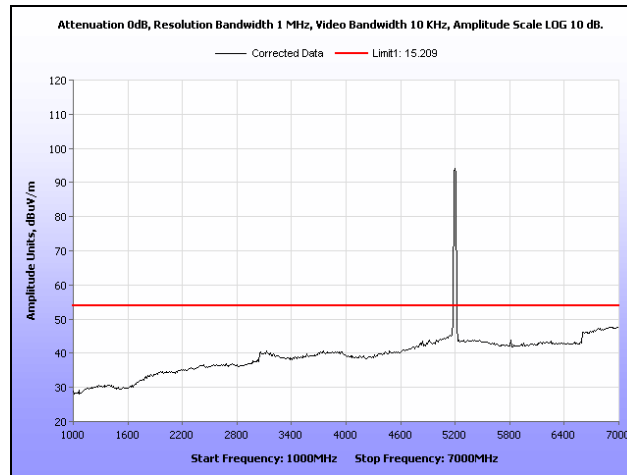
Plot 469. Restricted Band, 802.11a, Low Channel, Omni Antenna, 7 GHz – 18 GHz



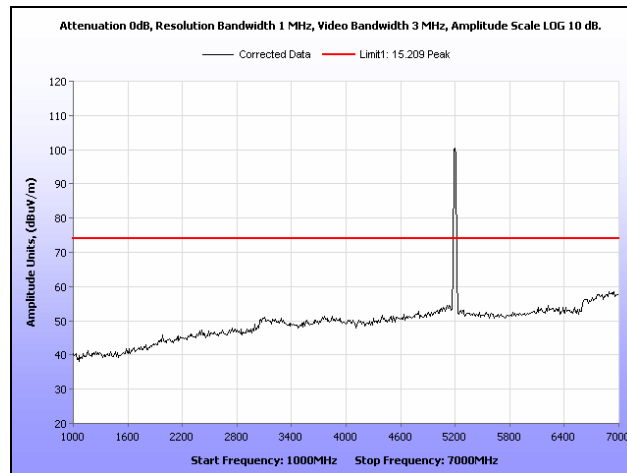
Plot 470. Restricted Band, 802.11a, Low Channel, Omni Antenna, 18 GHz – 40 GHz



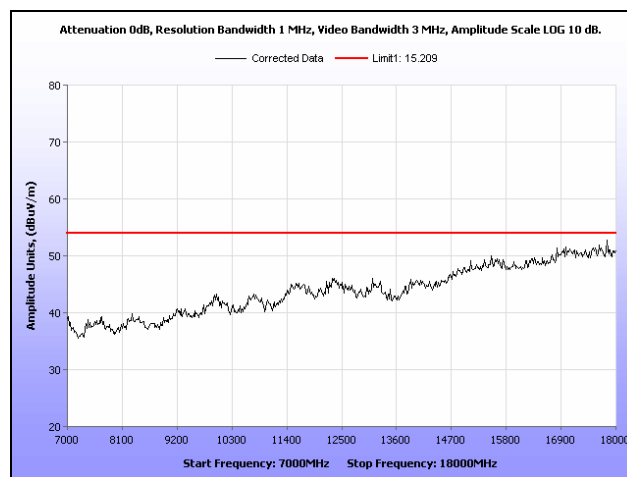
Plot 471. Restricted Band, 802.11a, Mid Channel, Omni Antenna, 30 MHz – 1 GHz



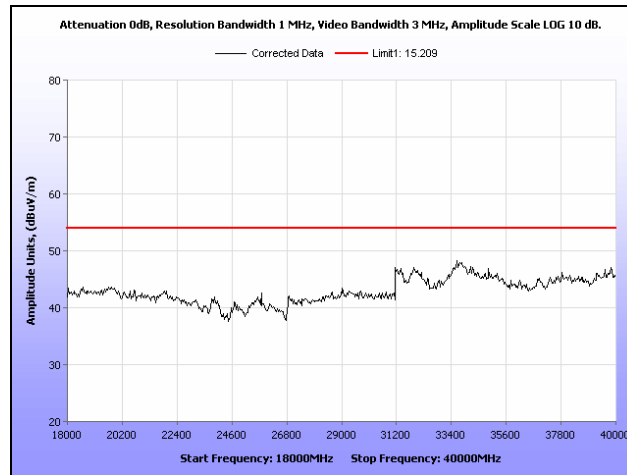
Plot 472. Restricted Band, 802.11a, Mid Channel, Omni Antenna, 1 GHz – 7 GHz, Average



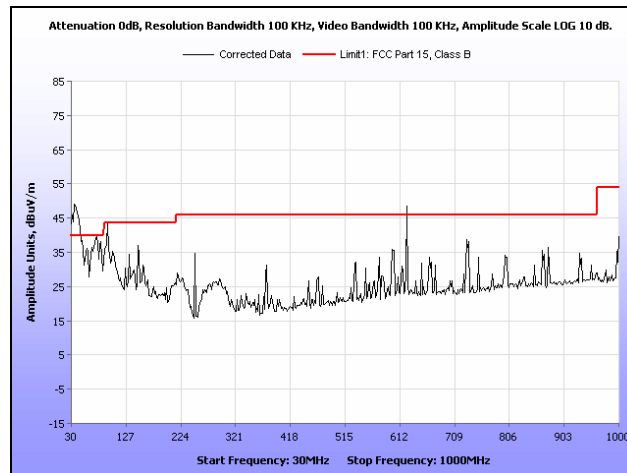
Plot 473. Restricted Band, 802.11a, Mid Channel, Omni Antenna, 1 GHz – 7 GHz, Peak



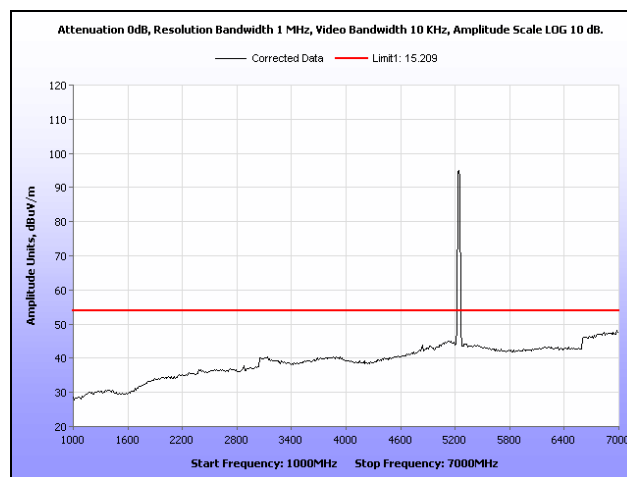
Plot 474. Restricted Band, 802.11a, Mid Channel, Omni Antenna, 7 GHz – 18 GHz



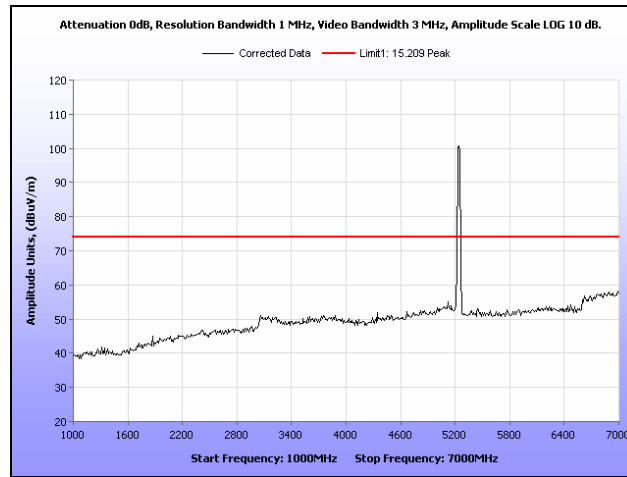
Plot 475. Restricted Band, 802.11a, Mid Channel, Omni Antenna, 18 GHz – 40 GHz



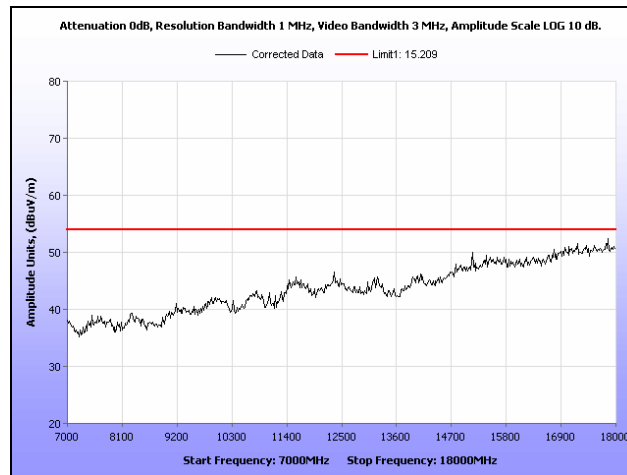
Plot 476. Restricted Band, 802.11a, High Channel, Omni Antenna, 30 MHz – 1 GHz



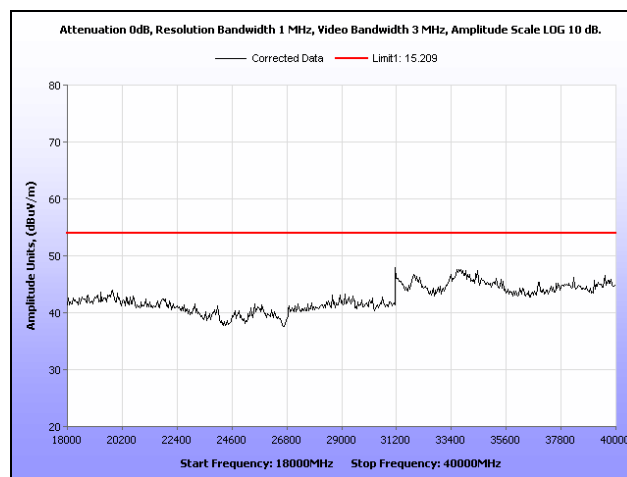
Plot 477. Restricted Band, 802.11a, High Channel, Omni Antenna, 1 GHz – 7 GHz, Average



Plot 478. Restricted Band, 802.11a, High Channel, Omni Antenna, 1 GHz – 7 GHz, Peak

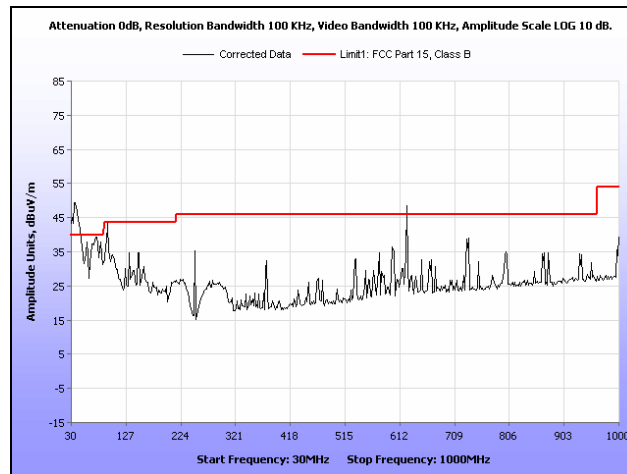


Plot 479. Restricted Band, 802.11a, High Channel, Omni Antenna, 7 GHz – 18 GHz

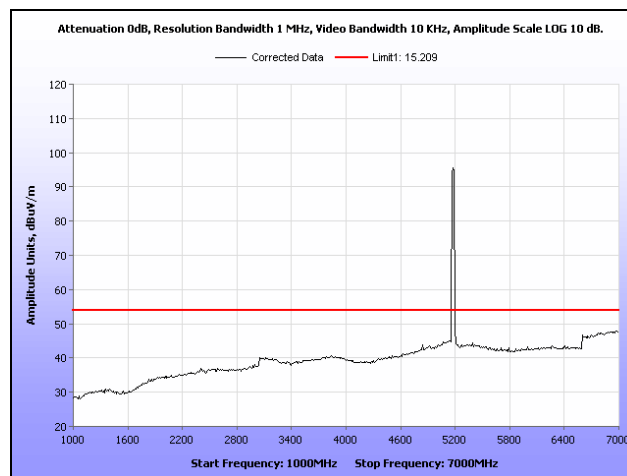


Plot 480. Restricted Band, 802.11a, High Channel, Omni Antenna, 18 GHz – 40 GHz

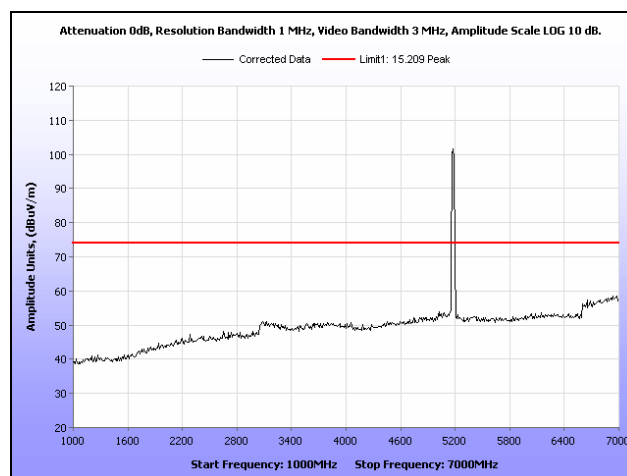
Radiated Restricted Band, Omni Antenna, 802.11n 20 MHz



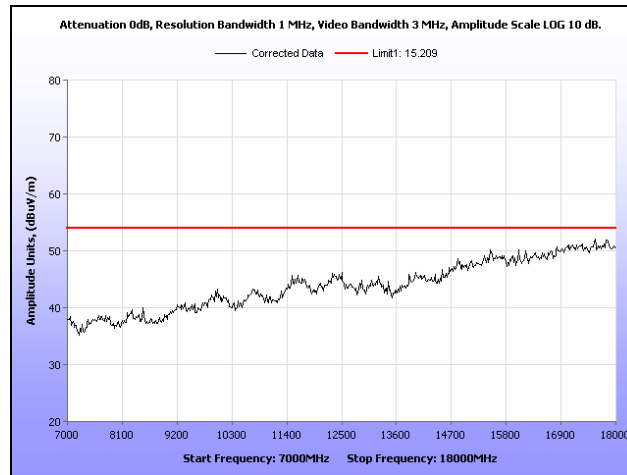
Plot 481. Restricted Band, 802.11n 20 MHz, Low Channel, Omni Antenna, 30 MHz – 1 GHz



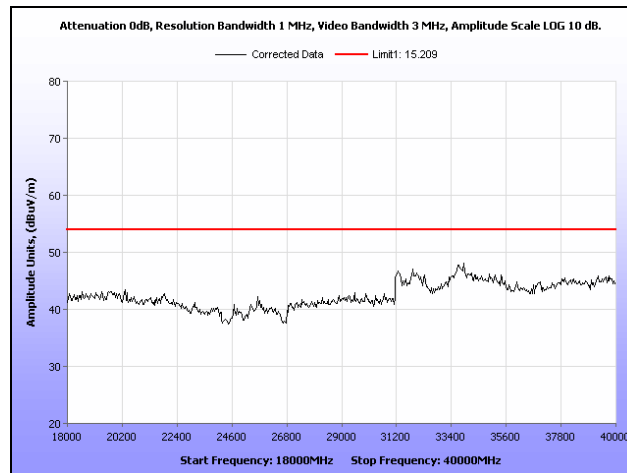
Plot 482. Restricted Band, 802.11n 20 MHz, Low Channel, Omni Antenna, 1 GHz – 7 GHz, Average



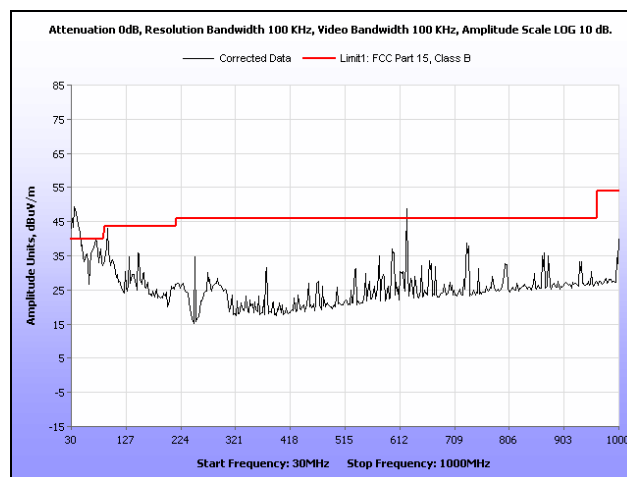
Plot 483. Restricted Band, 802.11n 20 MHz, Low Channel, Omni Antenna, 1 GHz – 7 GHz, Peak



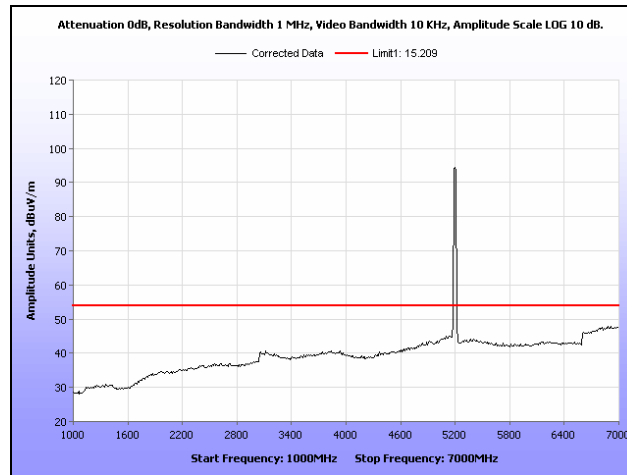
Plot 484. Restricted Band, 802.11n 20 MHz, Low Channel, Omni Antenna, 7 GHz – 18 GHz



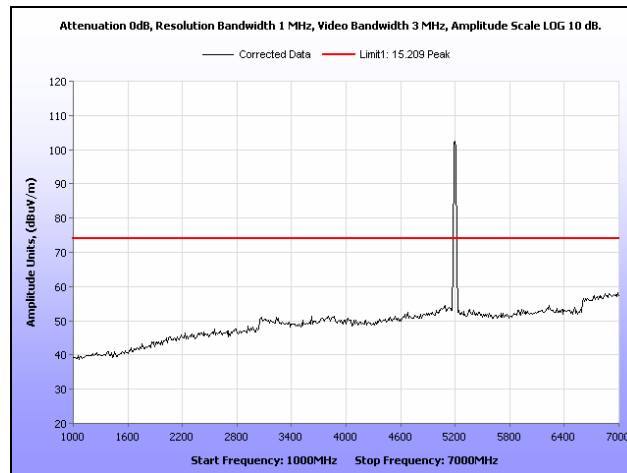
Plot 485. Restricted Band, 802.11n 20 MHz, Low Channel, Omni Antenna, 18 GHz – 40 GHz



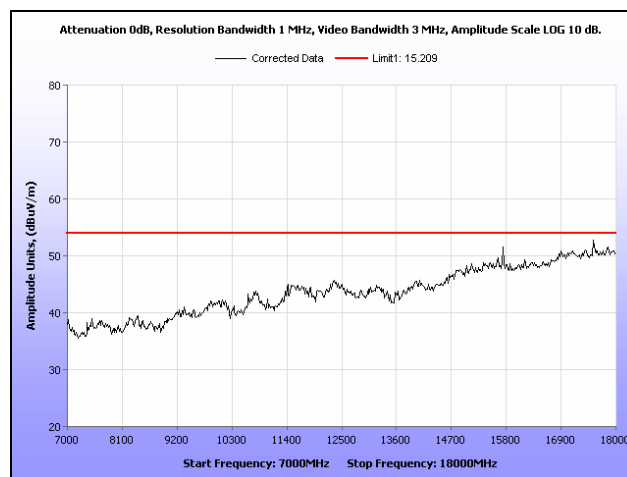
Plot 486. Restricted Band, 802.11n 20 MHz, Mid Channel, Omni Antenna, 30 MHz – 1 GHz



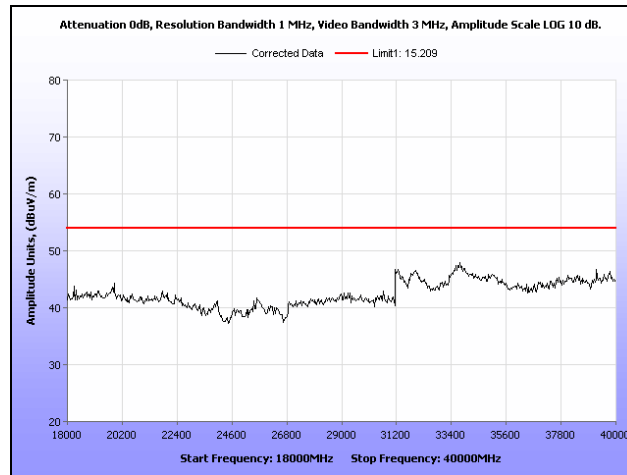
Plot 487. Restricted Band, 802.11n 20 MHz, Mid Channel, Omni Antenna, 1 GHz – 7 GHz, Average



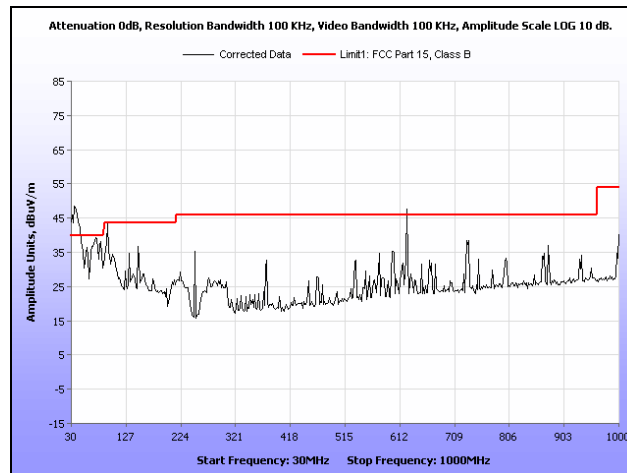
Plot 488. Restricted Band, 802.11n 20 MHz, Mid Channel, Omni Antenna, 1 GHz – 7 GHz, Peak



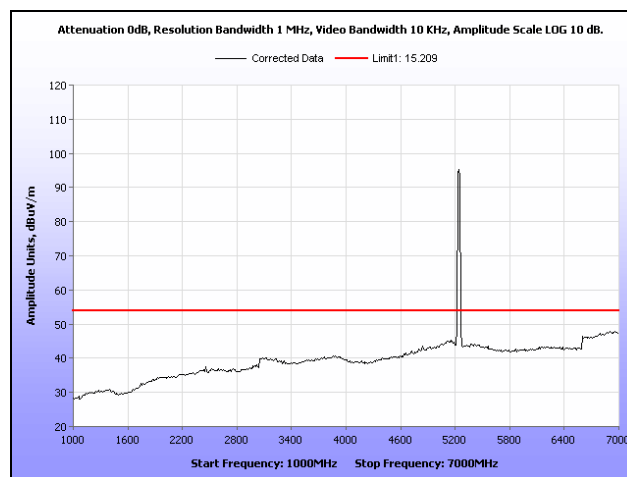
Plot 489. Restricted Band, 802.11n 20 MHz, Mid Channel, Omni Antenna, 7 GHz – 18 GHz



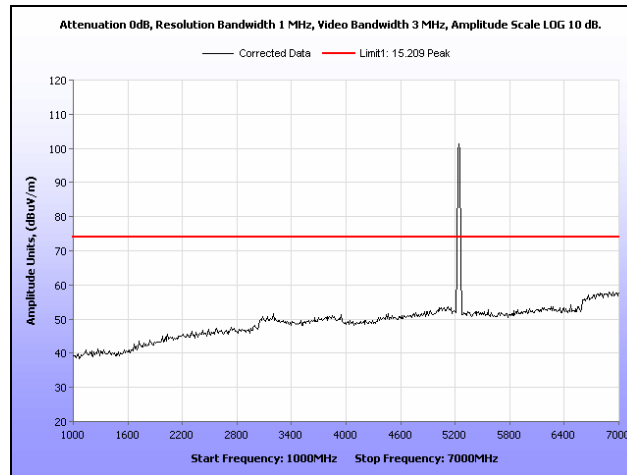
Plot 490. Restricted Band, 802.11n 20 MHz, Mid Channel, Omni Antenna, 18 GHz – 40 GHz



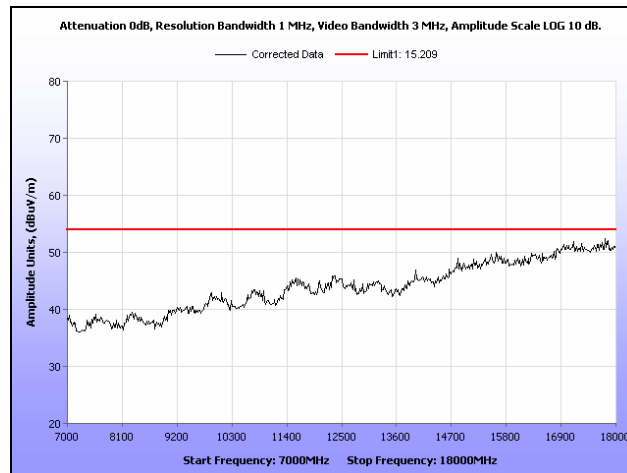
Plot 491. Restricted Band, 802.11n 20 MHz, High Channel, Omni Antenna, 30 MHz – 1 GHz



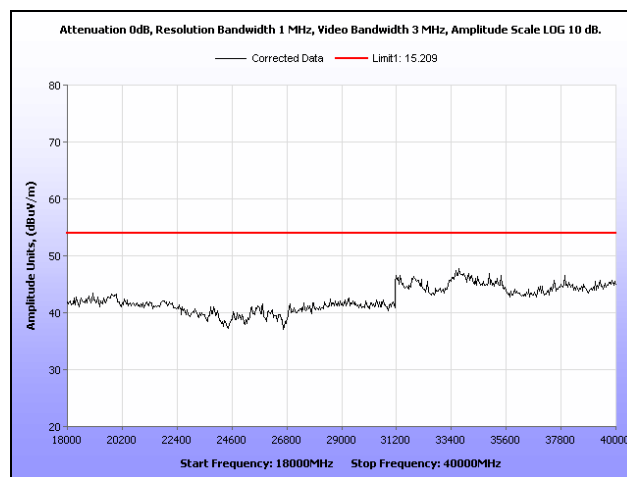
Plot 492. Restricted Band, 802.11n 20 MHz, High Channel, Omni Antenna, 1 GHz – 7 GHz, Average



Plot 493. Restricted Band, 802.11n 20 MHz, High Channel, Omni Antenna, 1 GHz – 7 GHz, Peak

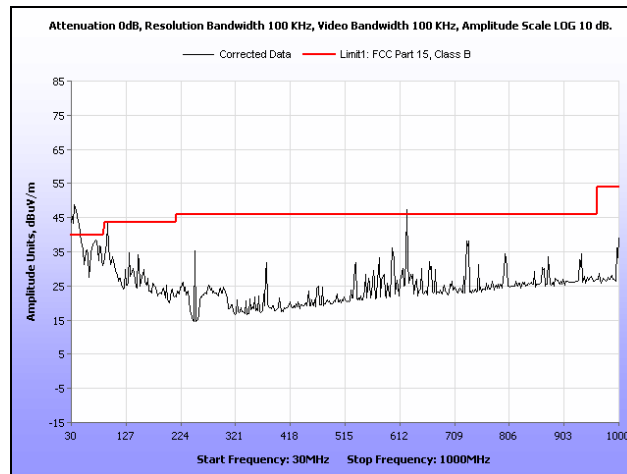


Plot 494. Restricted Band, 802.11n 20 MHz, High Channel, Omni Antenna, 7 GHz – 18 GHz

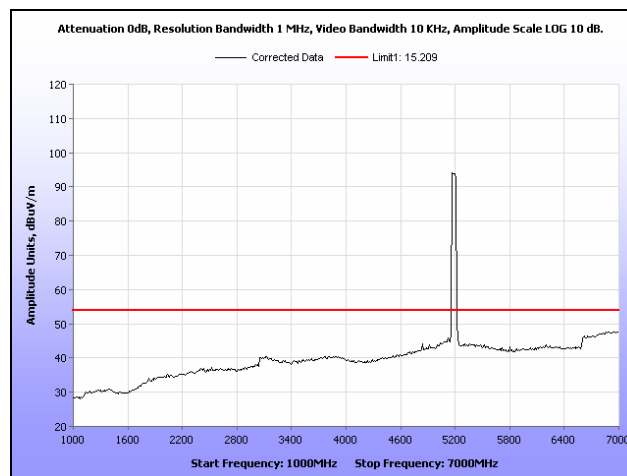


Plot 495. Restricted Band, 802.11n 20 MHz, High Channel, Omni Antenna, 18 GHz – 40 GHz

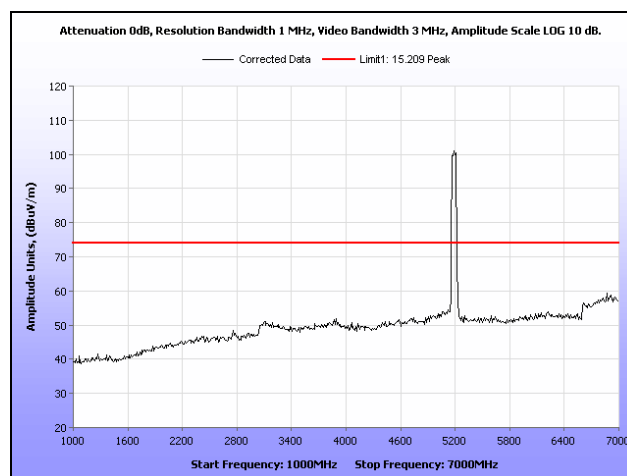
Radiated Restricted Band, Omni Antenna, 802.11n 40 MHz



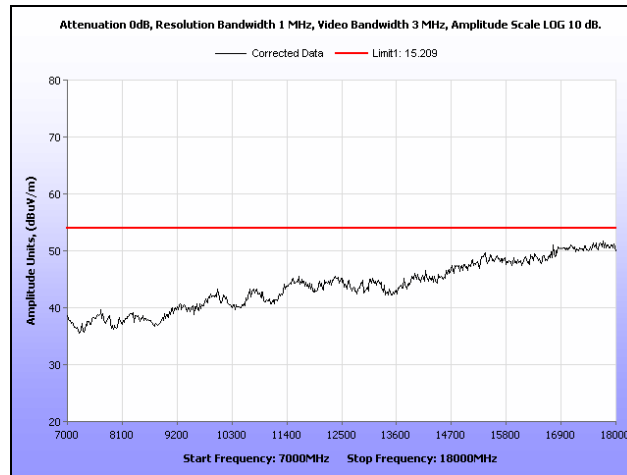
Plot 496. Restricted Band, 802.11n 40 MHz, Low Channel, Omni Antenna, 30 MHz – 1 GHz



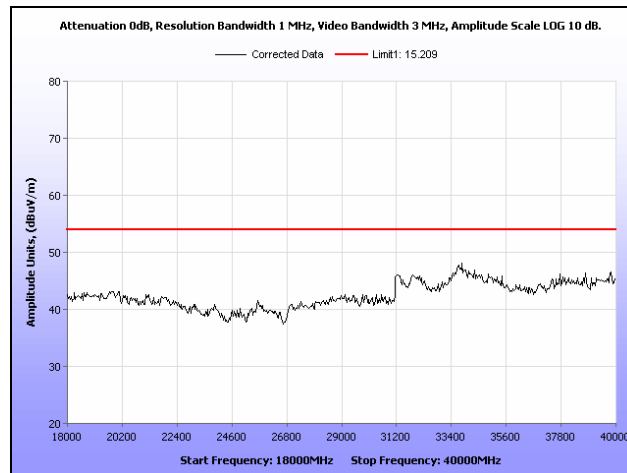
Plot 497. Restricted Band, 802.11n 40 MHz, Low Channel, Omni Antenna, 1 GHz – 7 GHz, Average



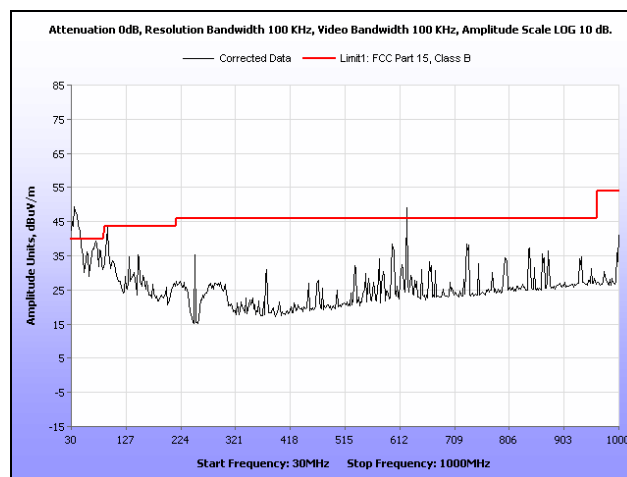
Plot 498. Restricted Band, 802.11n 40 MHz, Low Channel, Omni Antenna, 1 GHz – 7 GHz, Peak



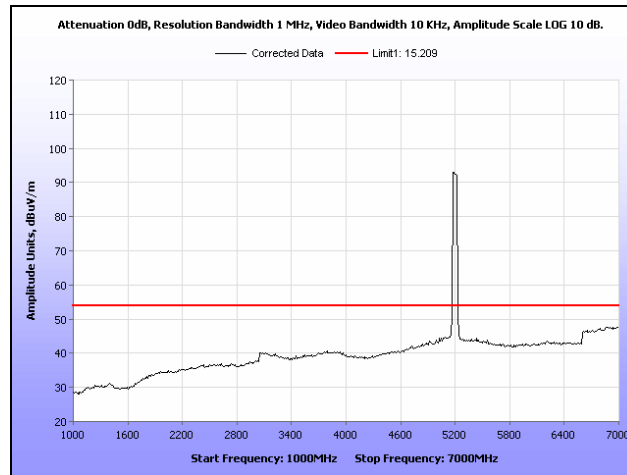
Plot 499. Restricted Band, 802.11n 40 MHz, Low Channel, Omni Antenna, 7 GHz – 18 GHz



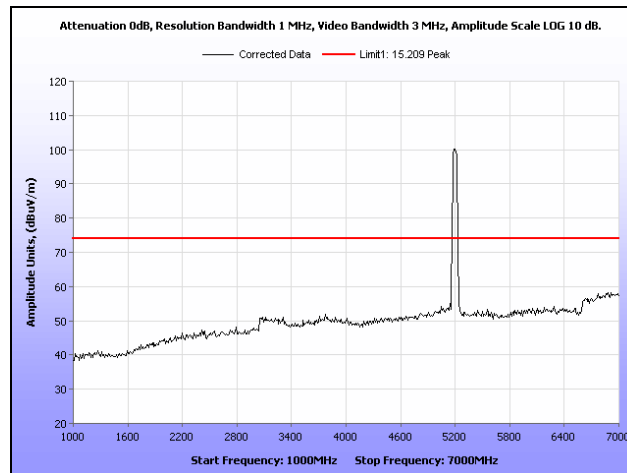
Plot 500. Restricted Band, 802.11n 40 MHz, Low Channel, Omni Antenna, 18 GHz – 40 GHz



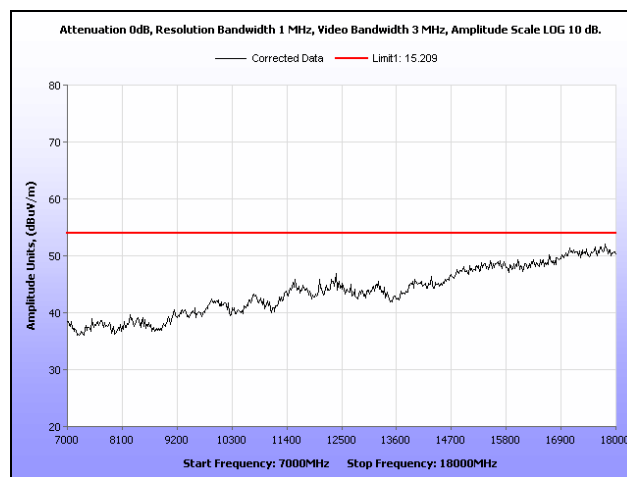
Plot 501. Restricted Band, 802.11n 40 MHz, Mid Channel, Omni Antenna, 30 MHz – 1 GHz



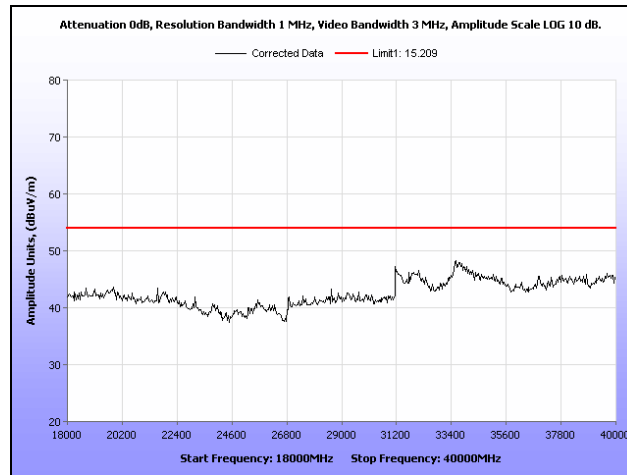
Plot 502. Restricted Band, 802.11n 40 MHz, Mid Channel, Omni Antenna, 1 GHz – 7 GHz, Average



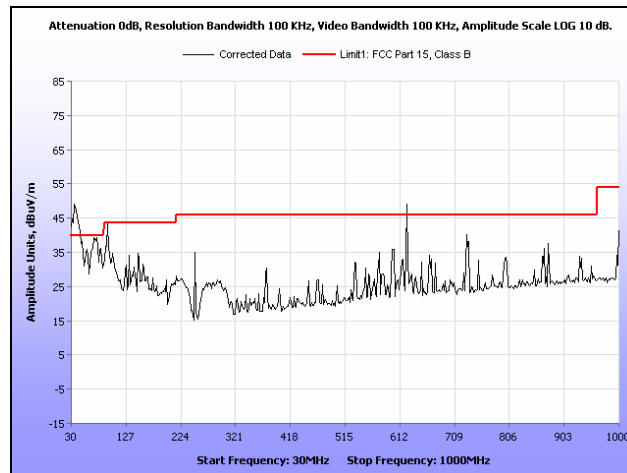
Plot 503. Restricted Band, 802.11n 40 MHz, Mid Channel, Omni Antenna, 1 GHz – 7 GHz, Peak



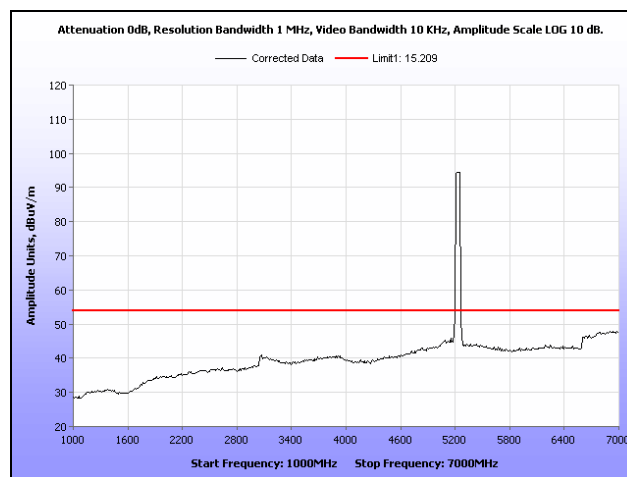
Plot 504. Restricted Band, 802.11n 40 MHz, Mid Channel, Omni Antenna, 7 GHz – 18 GHz



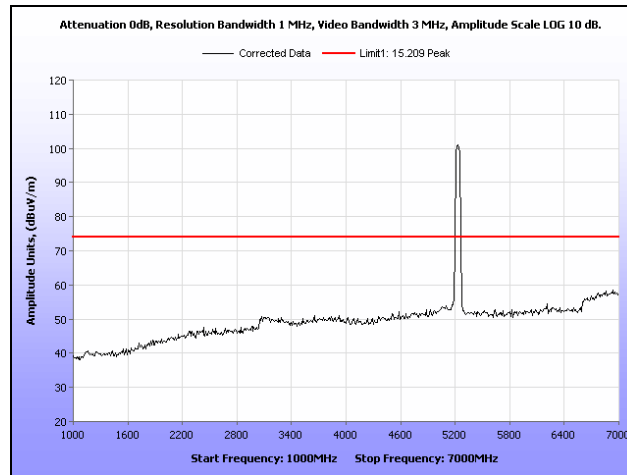
Plot 505. Restricted Band, 802.11n 40 MHz, Mid Channel, Omni Antenna, 18 GHz – 40 GHz



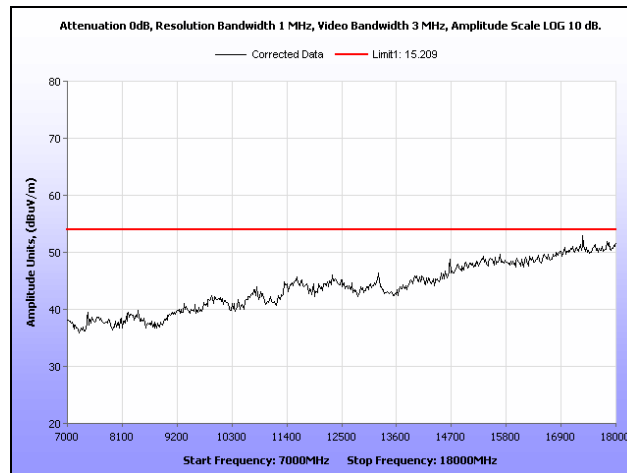
Plot 506. Restricted Band, 802.11n 40 MHz, High Channel, Omni Antenna, 30 MHz – 1 GHz



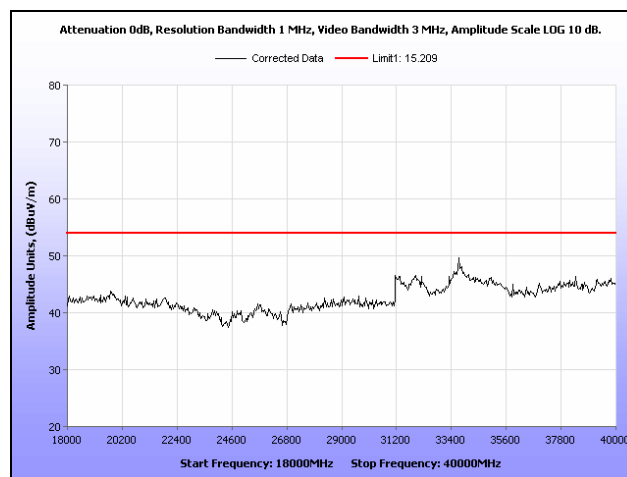
Plot 507. Restricted Band, 802.11n 40 MHz, High Channel, Omni Antenna, 1 GHz – 7 GHz, Average



Plot 508. Restricted Band, 802.11n 40 MHz, High Channel, Omni Antenna, 1 GHz – 7 GHz, Peak

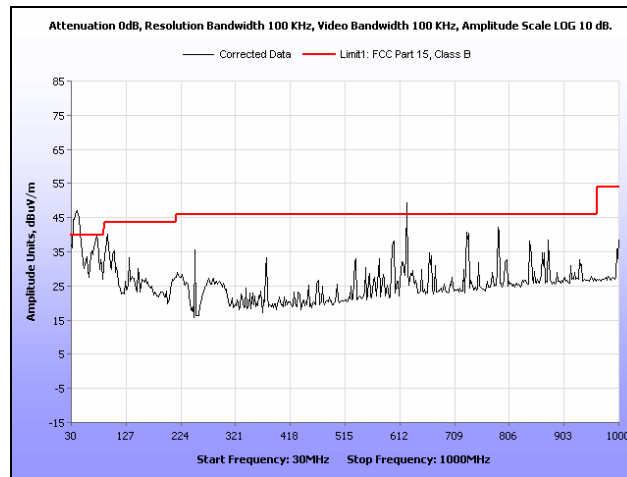


Plot 509. Restricted Band, 802.11n 40 MHz, High Channel, Omni Antenna, 7 GHz – 18 GHz

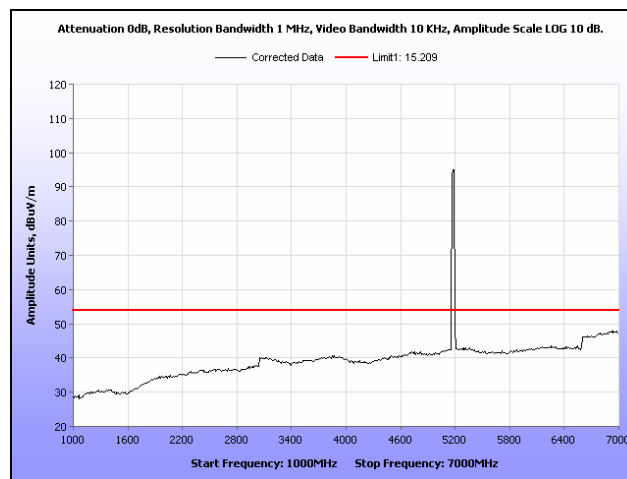


Plot 510. Restricted Band, 802.11n 40 MHz, High Channel, Omni Antenna, 18 GHz – 40 GHz

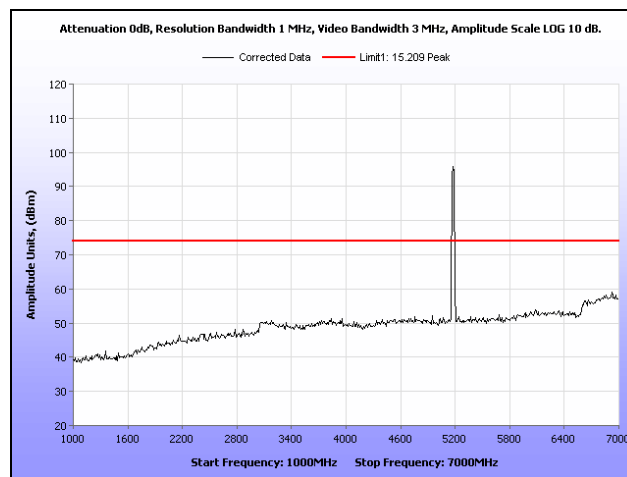
Radiated Restricted Band, Low Gain Omni Antenna, 802.11a



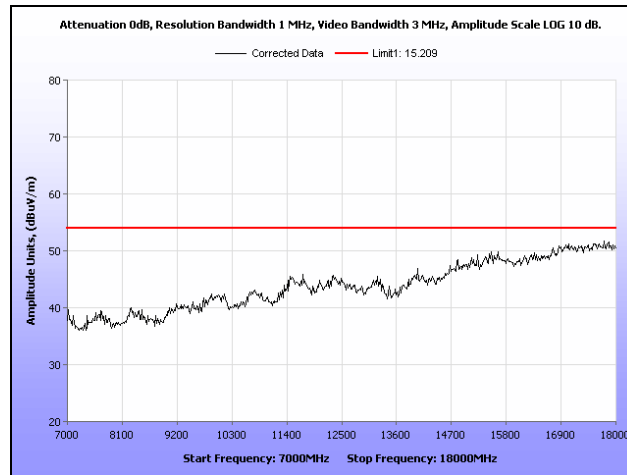
Plot 511. Restricted Band, 802.11a, Low Channel, Low Gain Omni Antenna, 30 MHz – 1 GHz



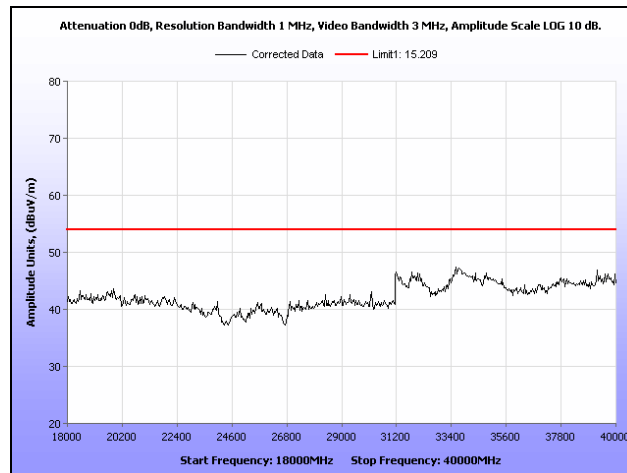
Plot 512. Restricted Band, 802.11a, Low Channel, Low Gain Omni Antenna, 1 GHz – 7 GHz, Average



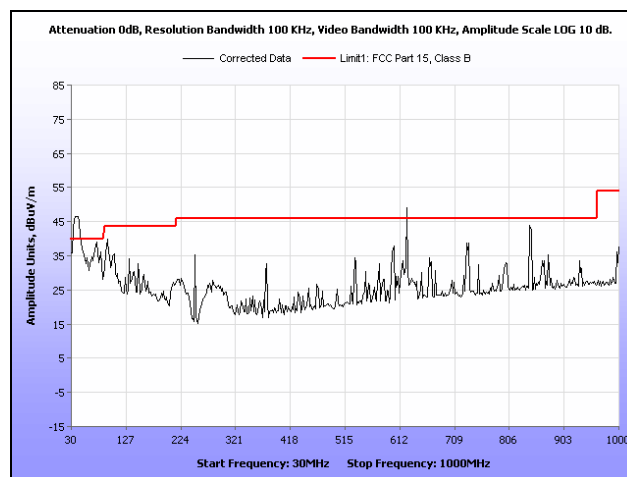
Plot 513. Restricted Band, 802.11a, Low Channel, Low Gain Omni Antenna, 1 GHz – 7 GHz, Peak



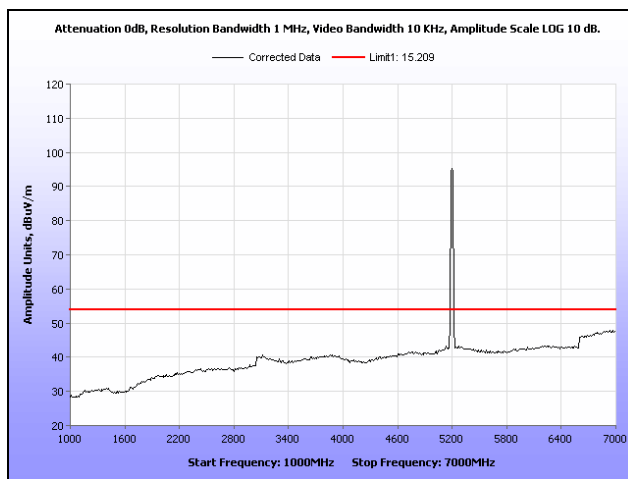
Plot 514. Restricted Band, 802.11a, Low Channel, Low Gain Omni Antenna, 7 GHz – 18 GHz



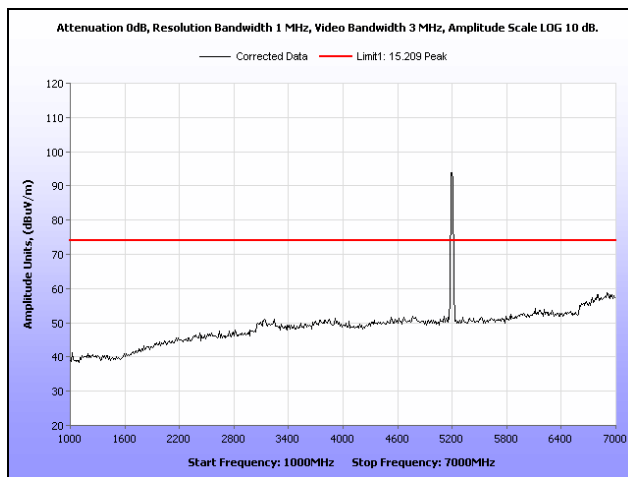
Plot 515. Restricted Band, 802.11a, Low Channel, Low Gain Omni Antenna, 18 GHz – 40 GHz



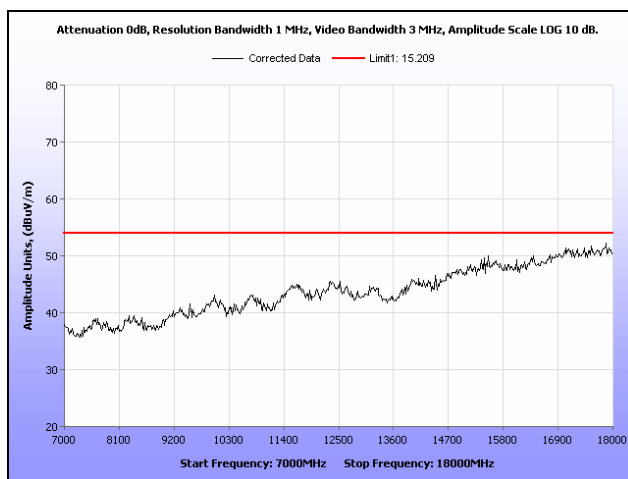
Plot 516. Restricted Band, 802.11a, Mid Channel, Low Gain Omni Antenna, 30 MHz – 1 GHz



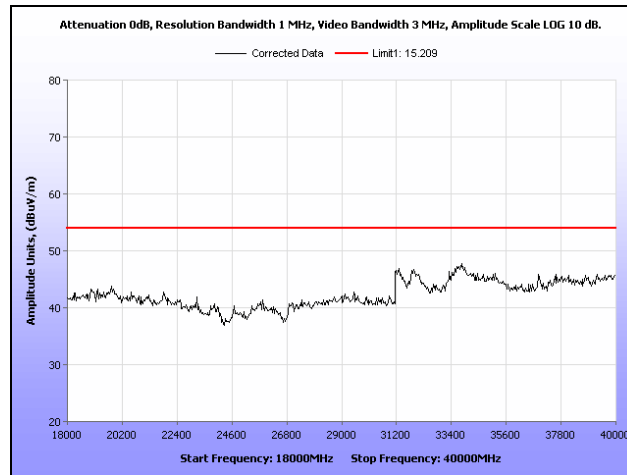
Plot 517. Restricted Band, 802.11a, Mid Channel, Low Gain Omni Antenna, 1 GHz – 7 GHz, Average



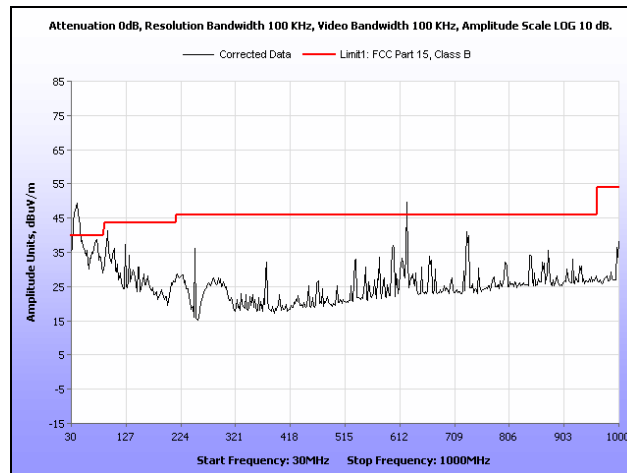
Plot 518. Restricted Band, 802.11a, Mid Channel, Low Gain Omni Antenna, 1 GHz – 7 GHz, Peak



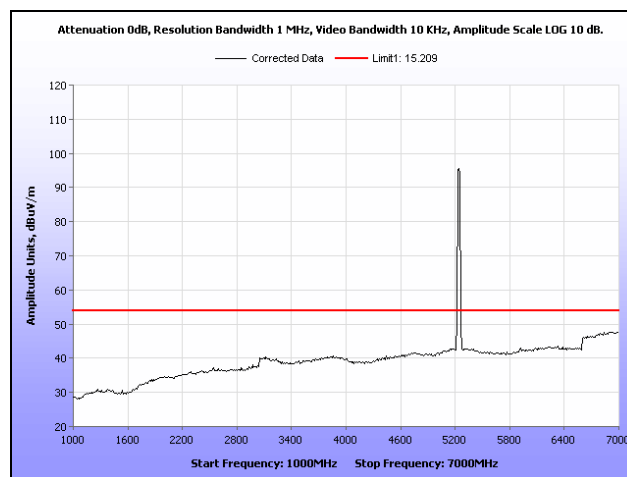
Plot 519. Restricted Band, 802.11a, Mid Channel, Low Gain Omni Antenna, 7 GHz – 18 GHz



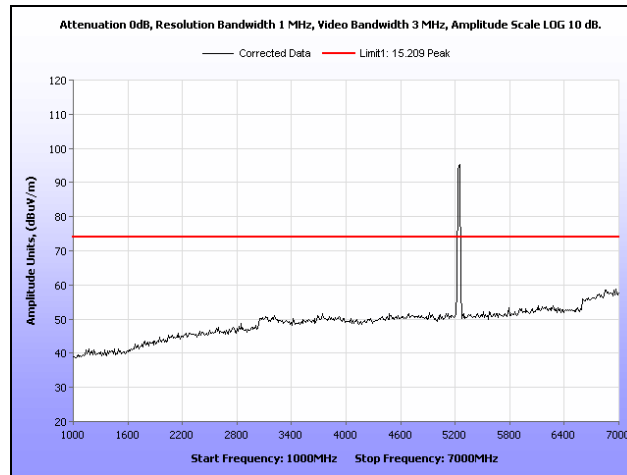
Plot 520. Restricted Band, 802.11a, Mid Channel, Low Gain Omni Antenna, 18 GHz – 40 GHz



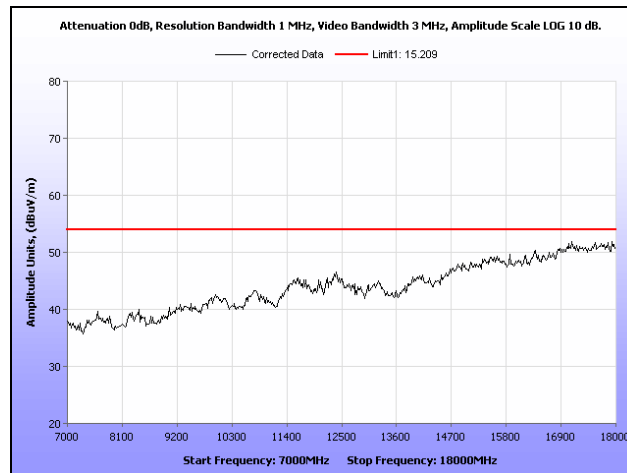
Plot 521. Restricted Band, 802.11a, High Channel, Low Gain Omni Antenna, 30 MHz – 1 GHz



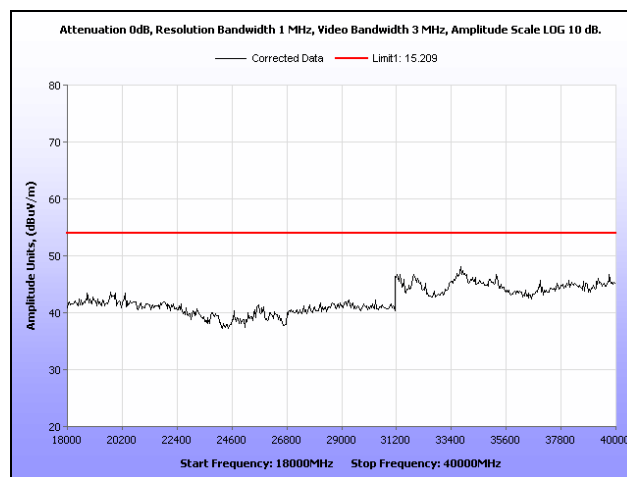
Plot 522. Restricted Band, 802.11a, High Channel, Low Gain Omni Antenna, 1 GHz – 7 GHz, Average



Plot 523. Restricted Band, 802.11a, High Channel, Low Gain Omni Antenna, 1 GHz – 7 GHz, Peak

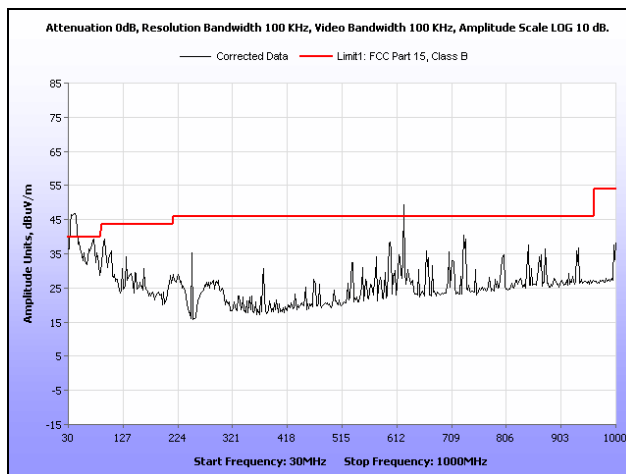


Plot 524. Restricted Band, 802.11a, High Channel, Low Gain Omni Antenna, 7 GHz – 18 GHz

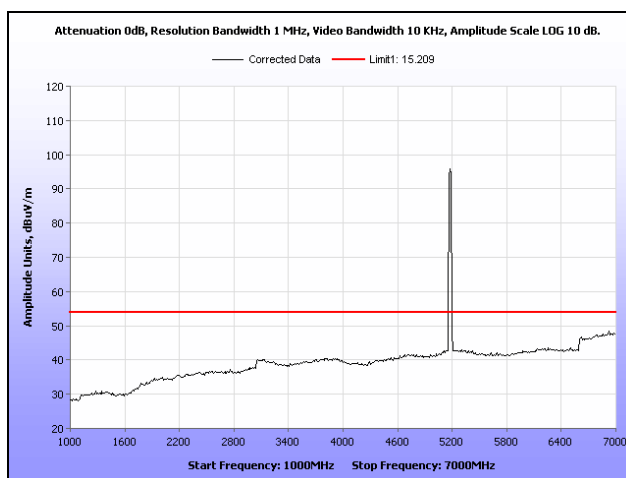


Plot 525. Restricted Band, 802.11a, High Channel, Low Gain Omni Antenna, 18 GHz – 40 GHz

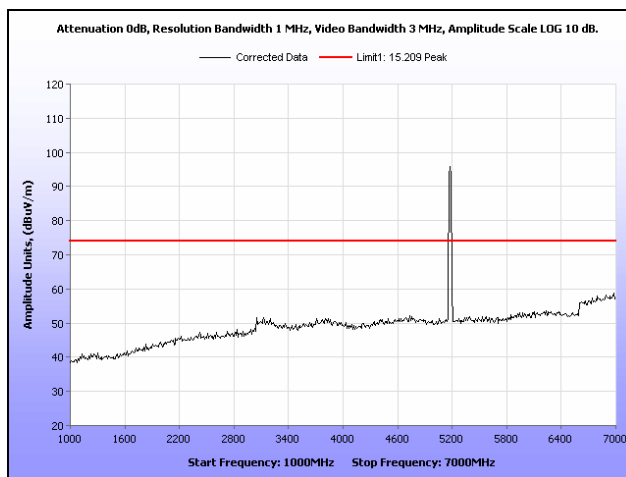
Radiated Restricted Band, Low Gain Omni Antenna, 802.11n 20 MHz



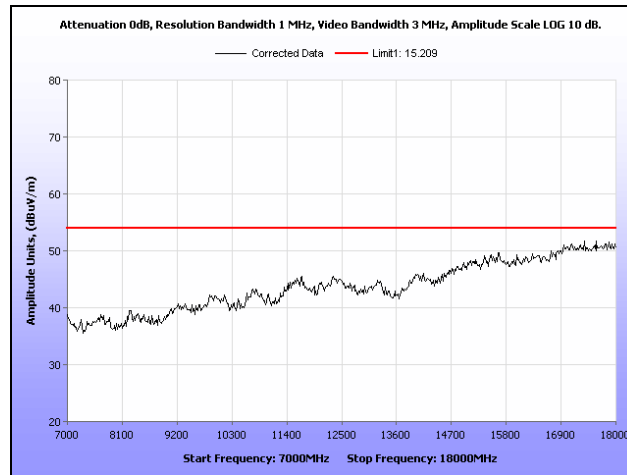
Plot 526. Restricted Band, 802.11n 20 MHz, Low Channel, Low Gain Omni Antenna, 30 MHz – 1 GHz



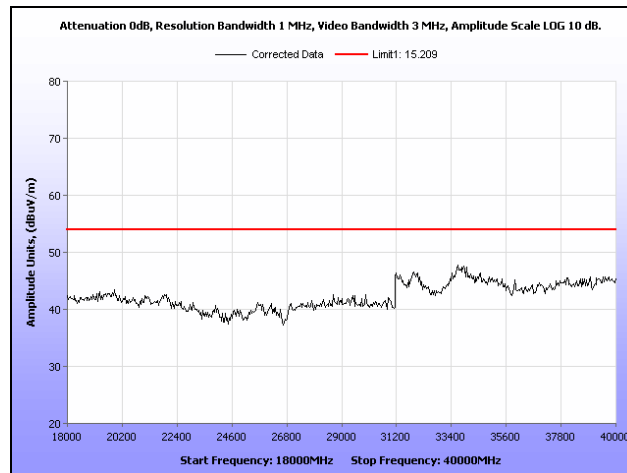
Plot 527. Restricted Band, 802.11n 20 MHz, Low Channel, Low Gain Omni Antenna, 1 GHz – 7 GHz, Average



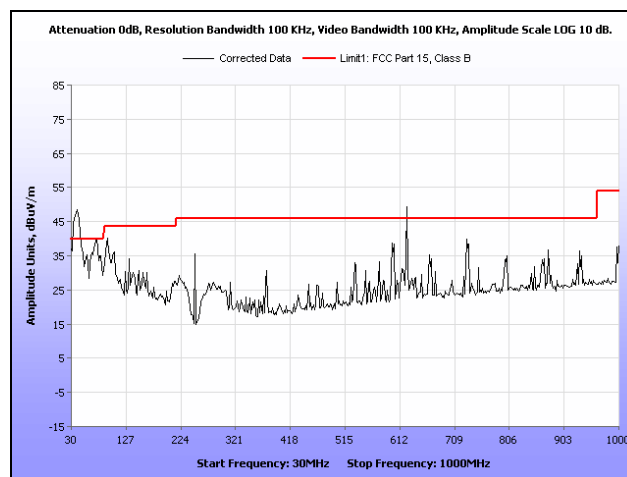
Plot 528. Restricted Band, 802.11n 20 MHz, Low Channel, Low Gain Omni Antenna, 1 GHz – 7 GHz, Peak



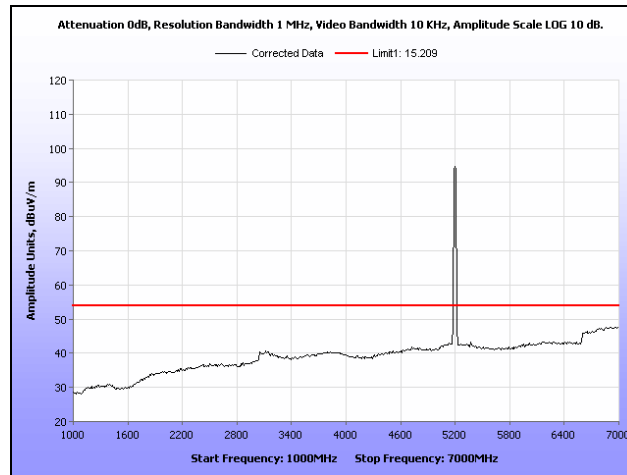
Plot 529. Restricted Band, 802.11n 20 MHz, Low Channel, Low Gain Omni Antenna, 7 GHz – 18 GHz



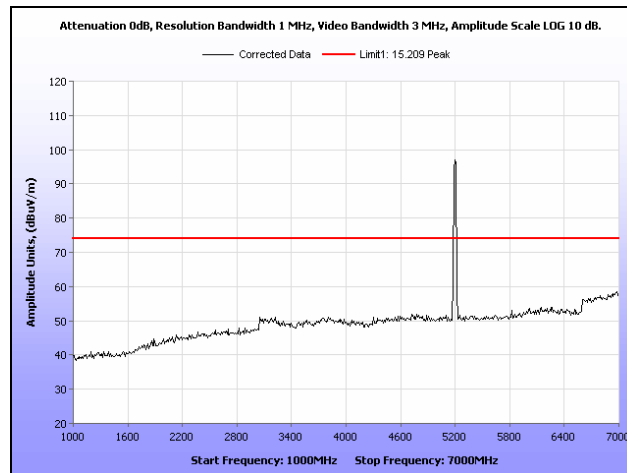
Plot 530. Restricted Band, 802.11n 20 MHz, Low Channel, Low Gain Omni Antenna, 18 GHz – 40 GHz



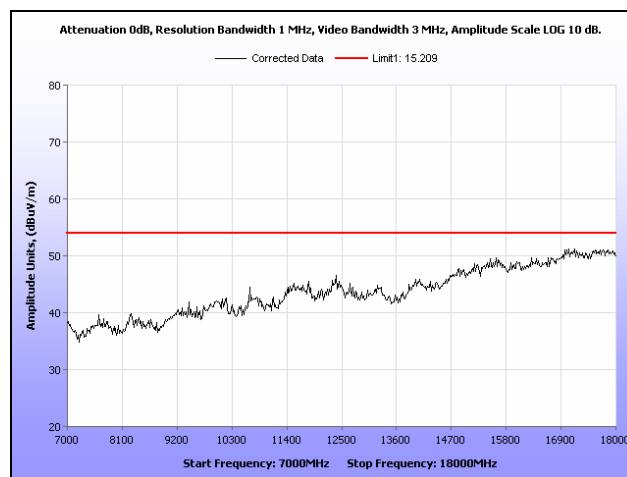
Plot 531. Restricted Band, 802.11n 20 MHz, Mid Channel, Low Gain Omni Antenna, 30 MHz – 1 GHz



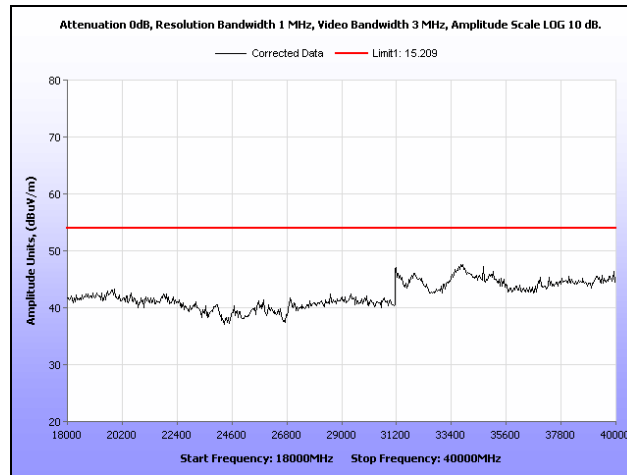
Plot 532. Restricted Band, 802.11n 20 MHz, Mid Channel, Low Gain Omni Antenna, 1 GHz – 7 GHz, Average



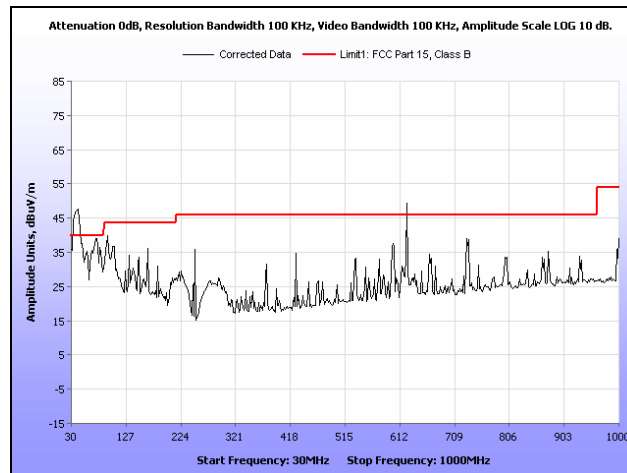
Plot 533. Restricted Band, 802.11n 20 MHz, Mid Channel, Low Gain Omni Antenna, 1 GHz – 7 GHz, Peak



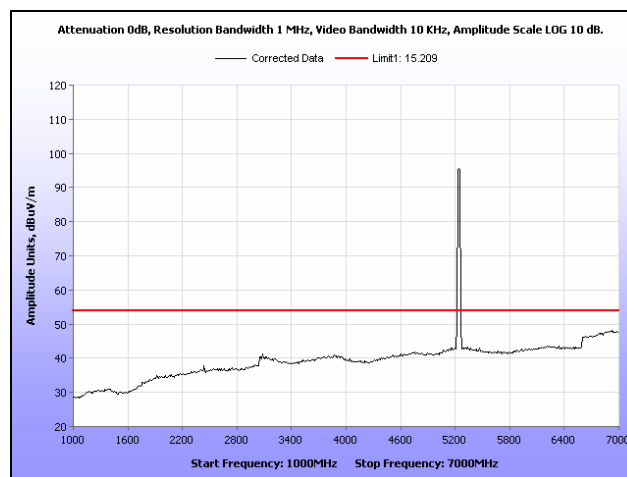
Plot 534. Restricted Band, 802.11n 20 MHz, Mid Channel, Low Gain Omni Antenna, 7 GHz – 18 GHz



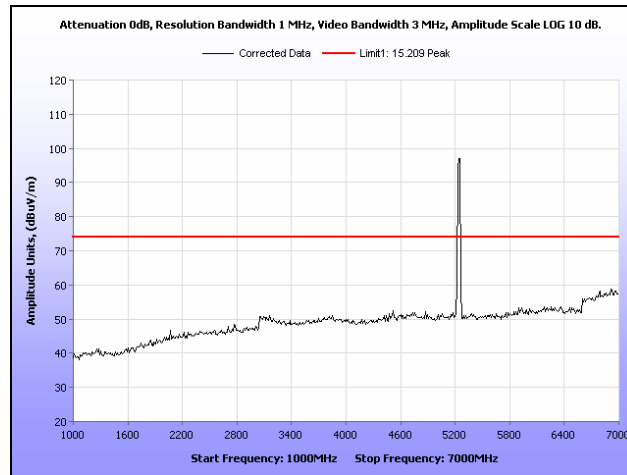
Plot 535. Restricted Band, 802.11n 20 MHz, Mid Channel, Low Gain Omni Antenna, 18 GHz – 40 GHz



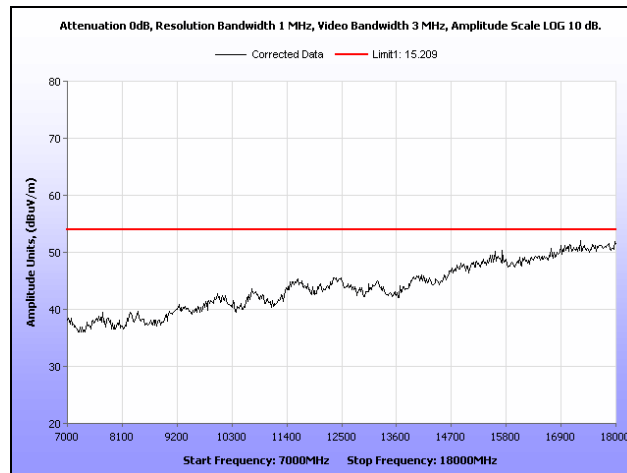
Plot 536. Restricted Band, 802.11n 20 MHz, High Channel, Low Gain Omni Antenna, 30 MHz – 1 GHz



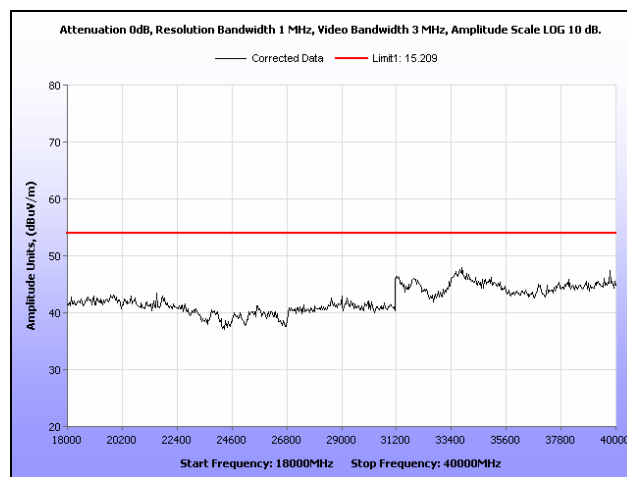
Plot 537. Restricted Band, 802.11n 20 MHz, High Channel, Low Gain Omni Antenna, 1 GHz – 7 GHz, Average



Plot 538. Restricted Band, 802.11n 20 MHz, High Channel, Low Gain Omni Antenna, 1 GHz – 7 GHz, Peak

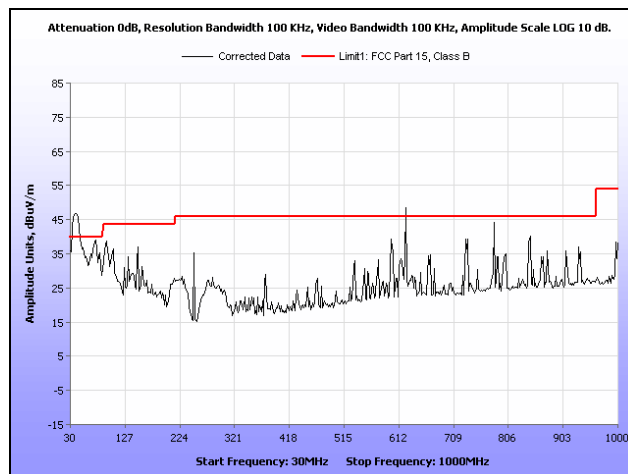


Plot 539. Restricted Band, 802.11n 20 MHz, High Channel, Low Gain Omni Antenna, 7 GHz – 18 GHz

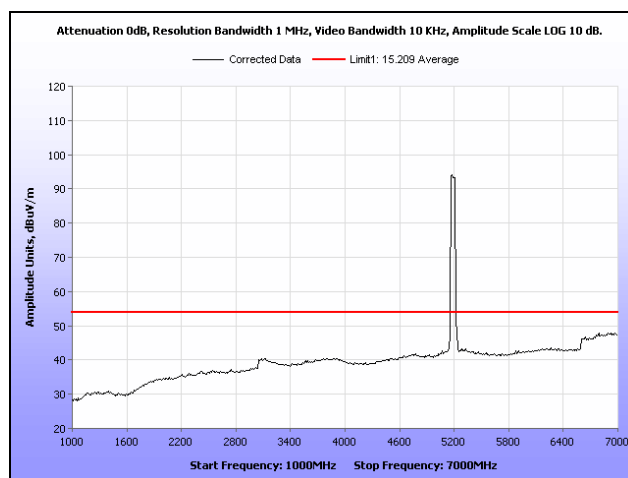


Plot 540. Restricted Band, 802.11n 20 MHz, High Channel, Low Gain Omni Antenna, 18 GHz – 40 GHz

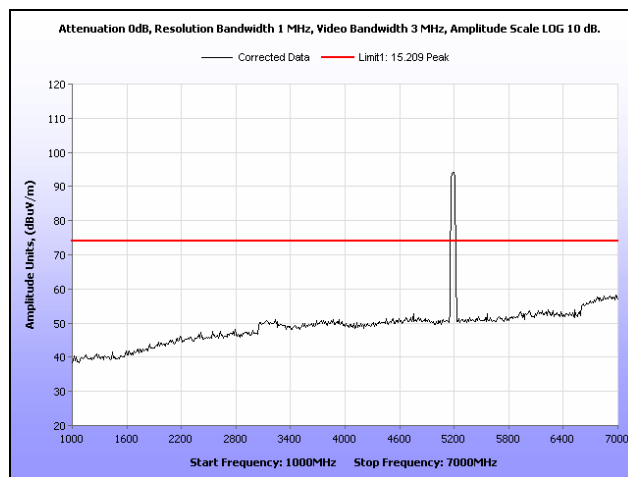
Radiated Restricted Band, Low Gain Omni Antenna, 802.11n 40 MHz



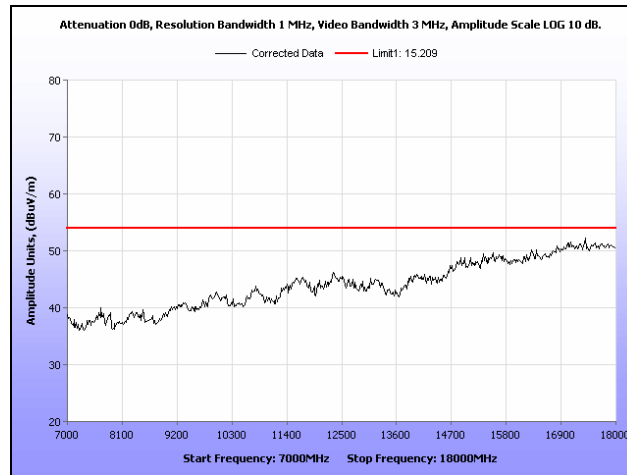
Plot 541. Restricted Band, 802.11n 40 MHz, Low Channel, Low Gain Omni Antenna, 30 MHz – 1 GHz



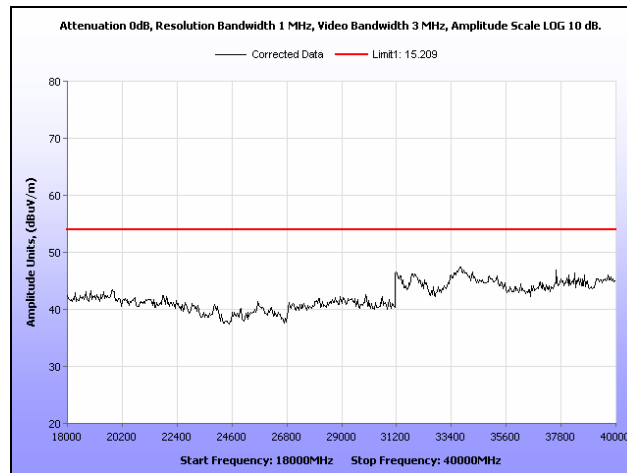
Plot 542. Restricted Band, 802.11n 40 MHz, Low Channel, Low Gain Omni Antenna, 1 GHz – 7 GHz, Average



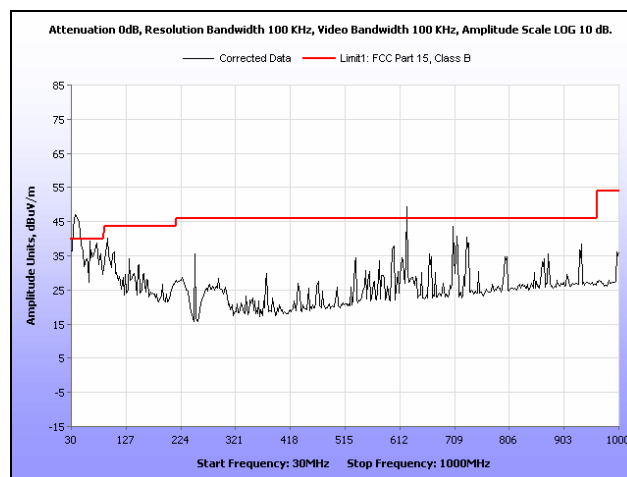
Plot 543. Restricted Band, 802.11n 40 MHz, Low Channel, Low Gain Omni Antenna, 1 GHz – 7 GHz, Peak



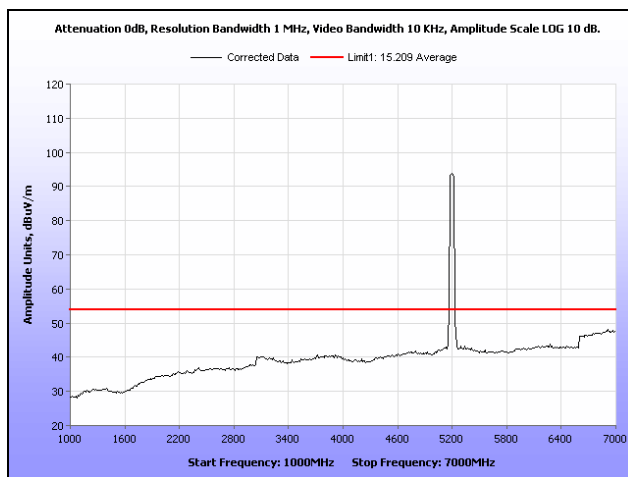
Plot 544. Restricted Band, 802.11n 40 MHz, Low Channel, Low Gain Omni Antenna, 7 GHz – 18 GHz



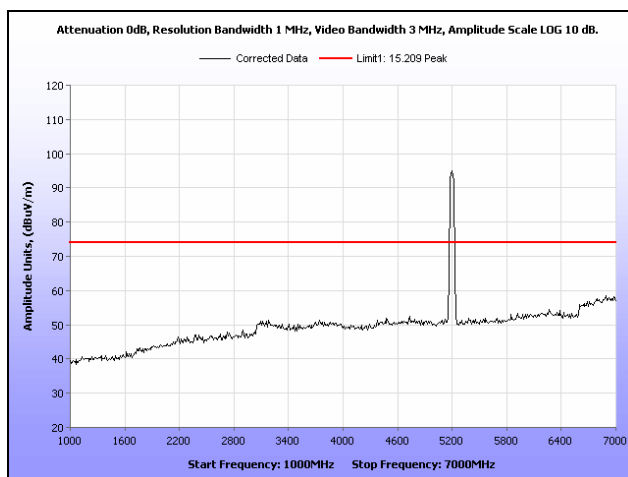
Plot 545. Restricted Band, 802.11n 40 MHz, Low Channel, Low Gain Omni Antenna, 18 GHz – 40 GHz



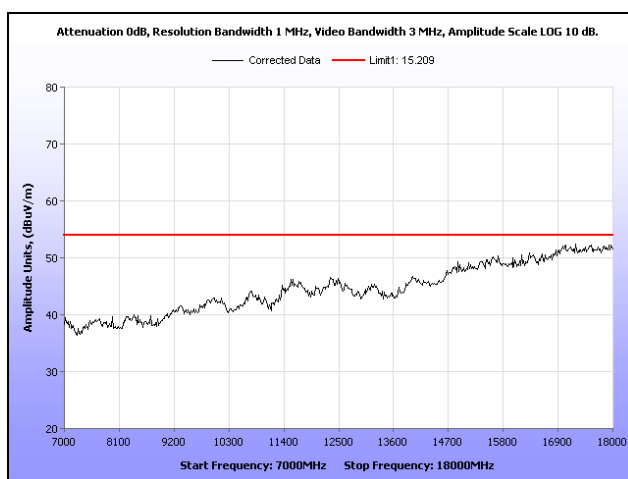
Plot 546. Restricted Band, 802.11n 40 MHz, Mid Channel, Low Gain Omni Antenna, 30 MHz – 1 GHz



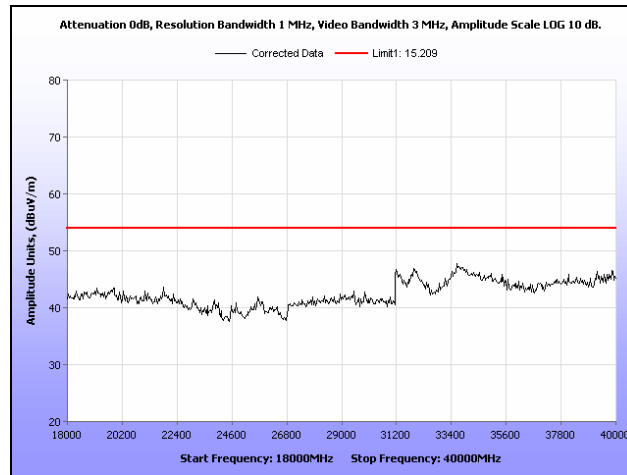
Plot 547. Restricted Band, 802.11n 40 MHz, Mid Channel, Low Gain Omni Antenna, 1 GHz – 7 GHz, Average



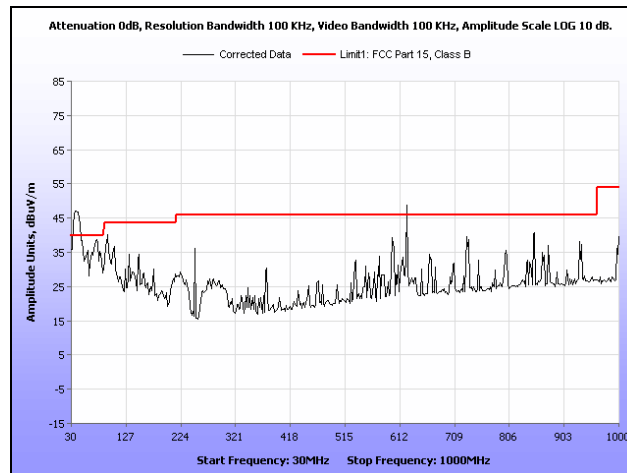
Plot 548. Restricted Band, 802.11n 40 MHz, Mid Channel, Low Gain Omni Antenna, 1 GHz – 7 GHz, Peak



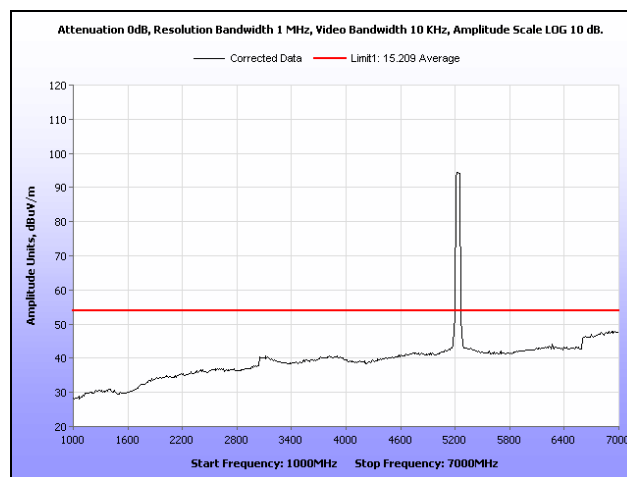
Plot 549. Restricted Band, 802.11n 40 MHz, Mid Channel, Low Gain Omni Antenna, 7 GHz – 18 GHz



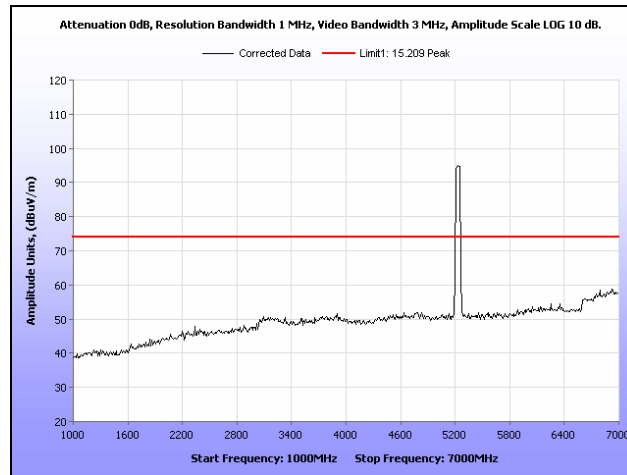
Plot 550. Restricted Band, 802.11n 40 MHz, Mid Channel, Low Gain Omni Antenna, 18 GHz – 40 GHz



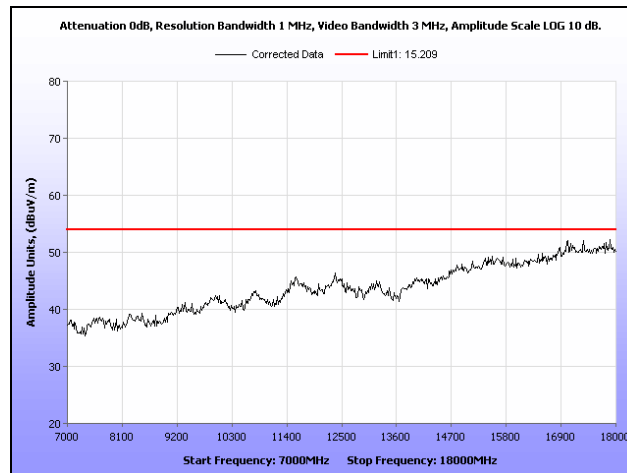
Plot 551. Restricted Band, 802.11n 40 MHz, High Channel, Low Gain Omni Antenna, 30 MHz – 1 GHz



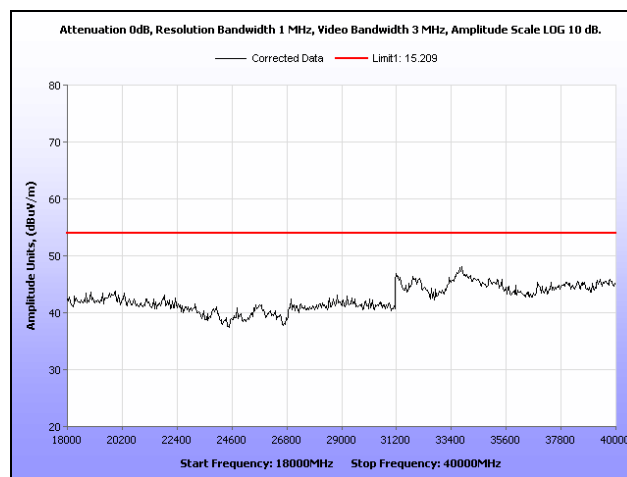
Plot 552. Restricted Band, 802.11n 40 MHz, High Channel, Low Gain Omni Antenna, 1 GHz – 7 GHz, Average



Plot 553. Restricted Band, 802.11n 40 MHz, High Channel, Low Gain Omni Antenna, 1 GHz – 7 GHz, Peak

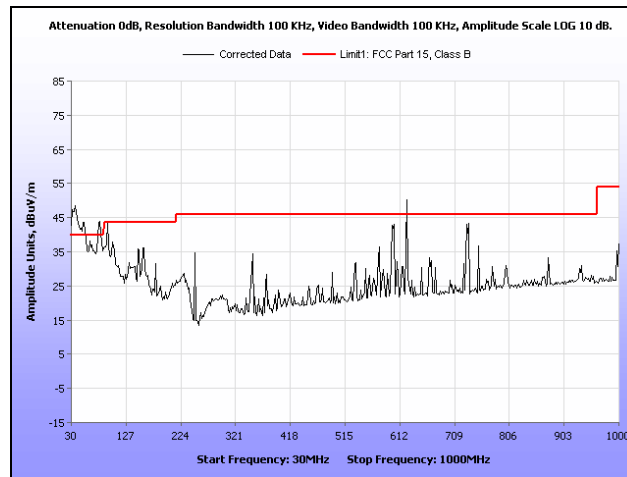


Plot 554. Restricted Band, 802.11n 40 MHz, High Channel, Low Gain Omni Antenna, 7 GHz – 18 GHz

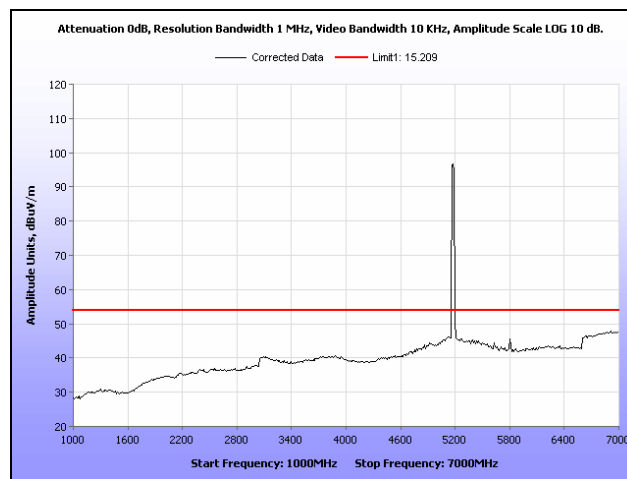


Plot 555. Restricted Band, 802.11n 40 MHz, High Channel, Low Gain Omni Antenna, 18 GHz – 40 GHz

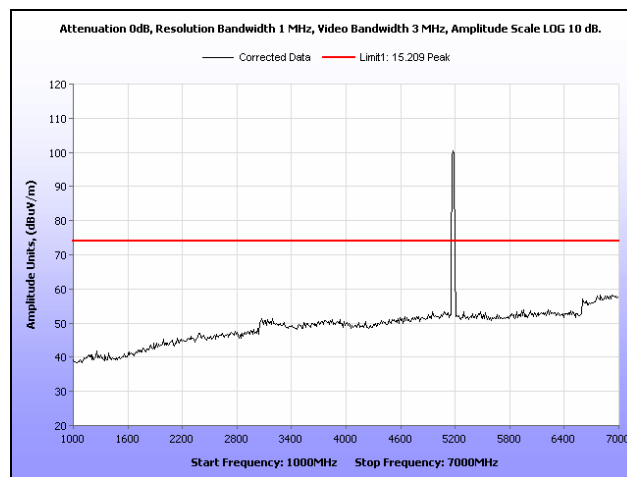
Radiated Restricted Band, Panel Antenna, 802.11a



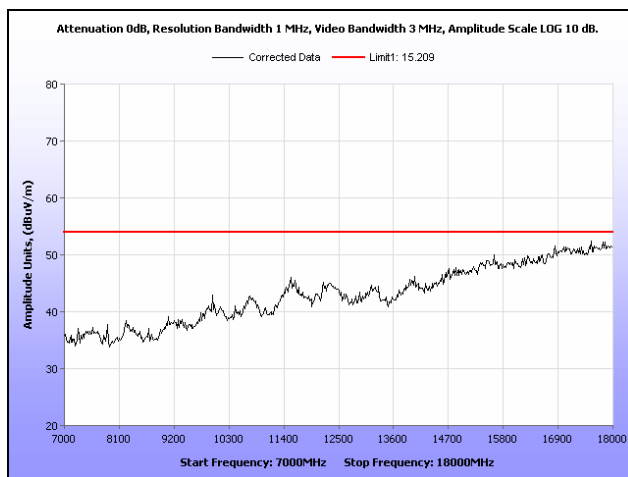
Plot 556. Restricted Band, 802.11a, Low Channel, Panel Antenna, 30 MHz – 1 GHz



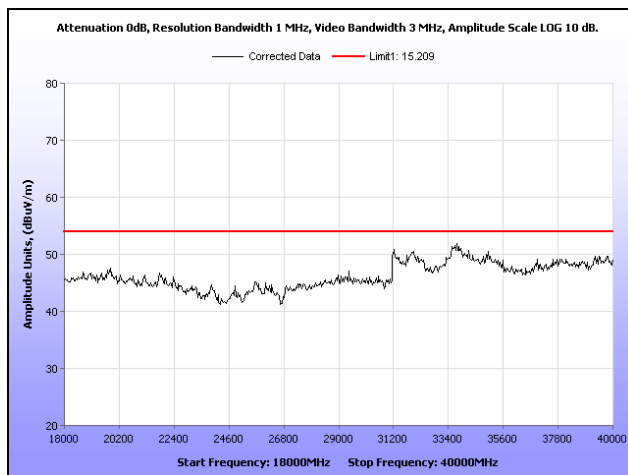
Plot 557. Restricted Band, 802.11a, Low Channel, Panel Antenna, 1 GHz – 7 GHz, Average



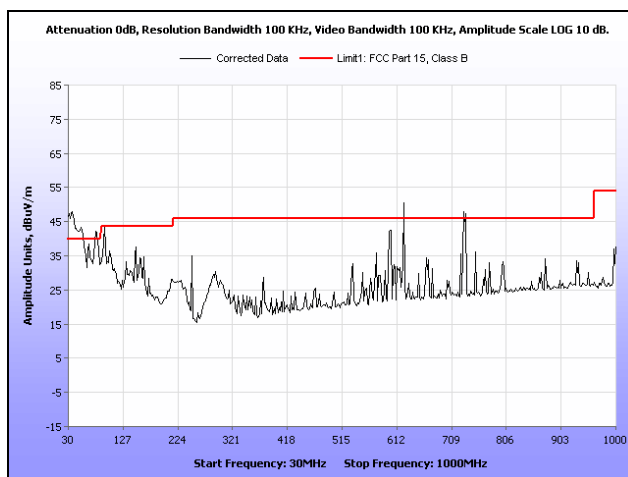
Plot 558. Restricted Band, 802.11a, Low Channel, Panel Antenna, 1 GHz – 7 GHz, Peak



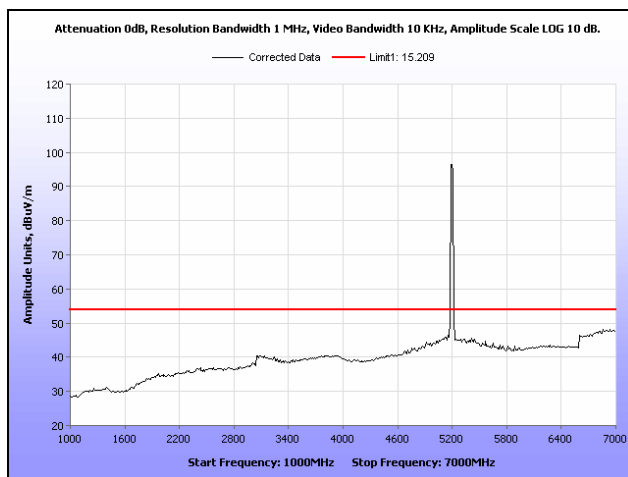
Plot 559. Restricted Band, 802.11a, Low Channel, Panel Antenna, 7 GHz – 18 GHz



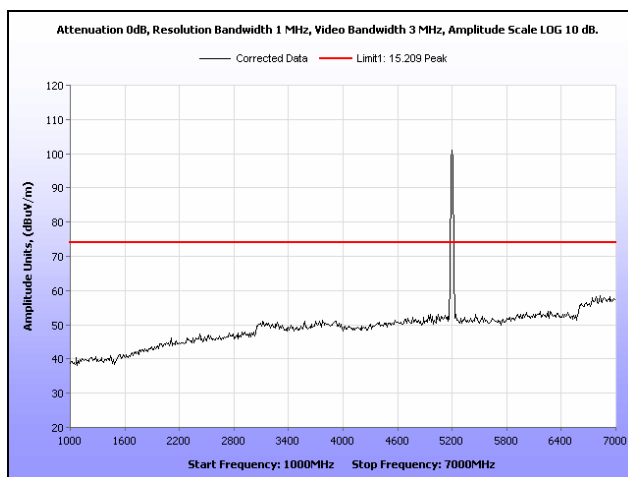
Plot 560. Restricted Band, 802.11a, Low Channel, Panel Antenna, 18 GHz – 40 GHz



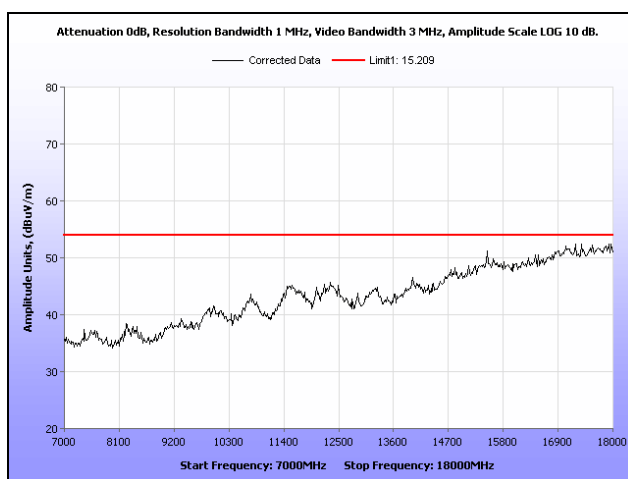
Plot 561. Restricted Band, 802.11a, Mid Channel, Panel Antenna, 30 MHz – 1 GHz



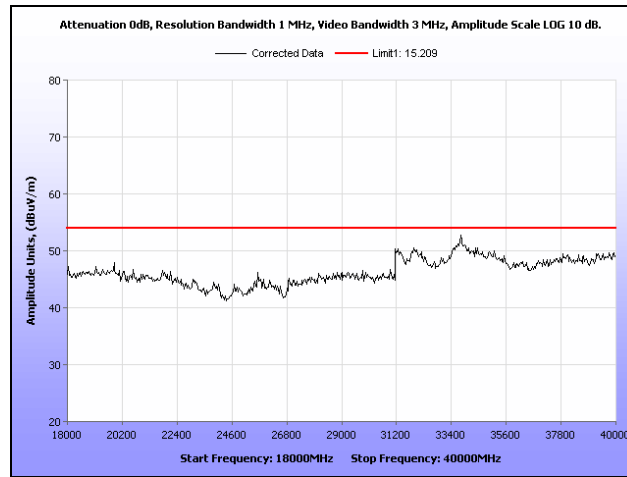
Plot 562. Restricted Band, 802.11a, Mid Channel, Panel Antenna, 1 GHz – 7 GHz, Average



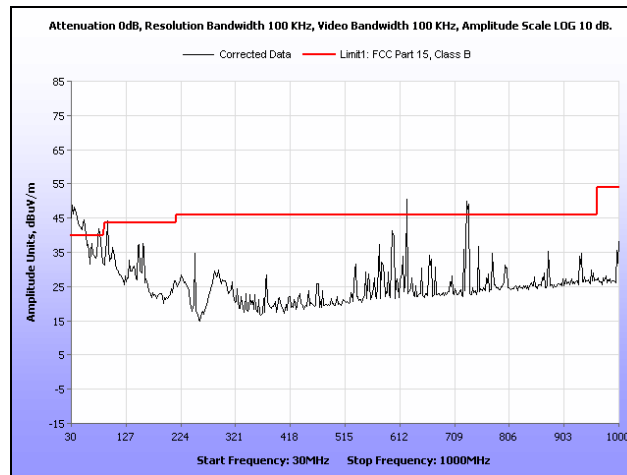
Plot 563. Restricted Band, 802.11a, Mid Channel, Panel Antenna, 1 GHz – 7 GHz, Peak



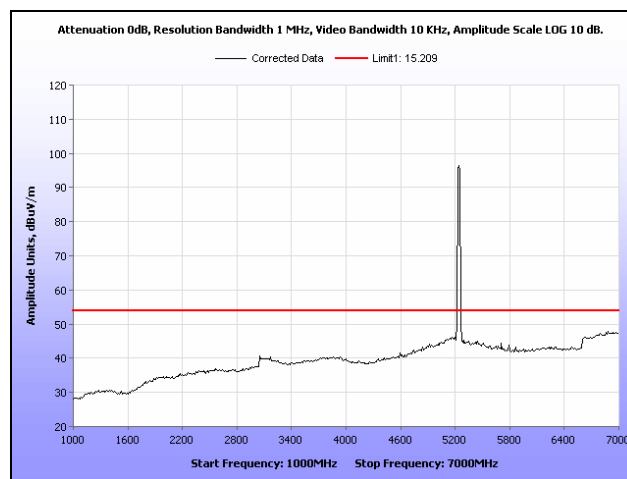
Plot 564. Restricted Band, 802.11a, Mid Channel, Panel Antenna, 7 GHz – 18 GHz



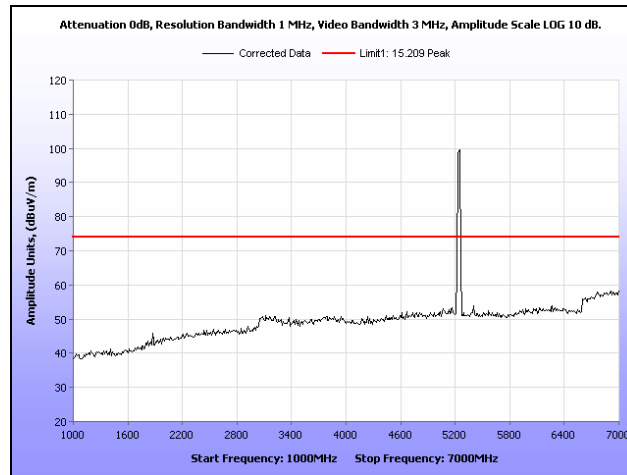
Plot 565. Restricted Band, 802.11a, Mid Channel, Panel Antenna, 18 GHz – 40 GHz



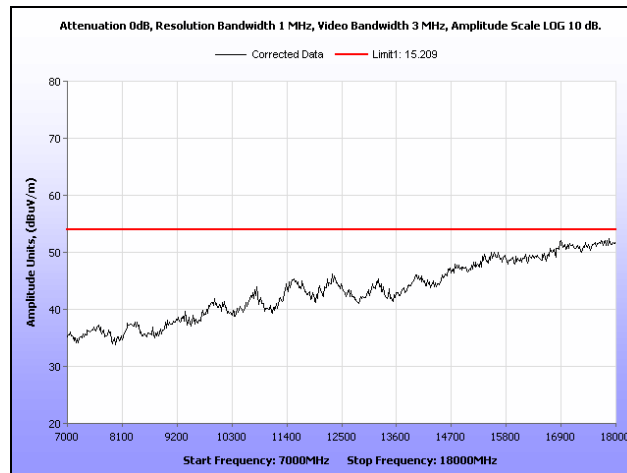
Plot 566. Restricted Band, 802.11a, High Channel, Panel Antenna, 30 MHz – 1 GHz



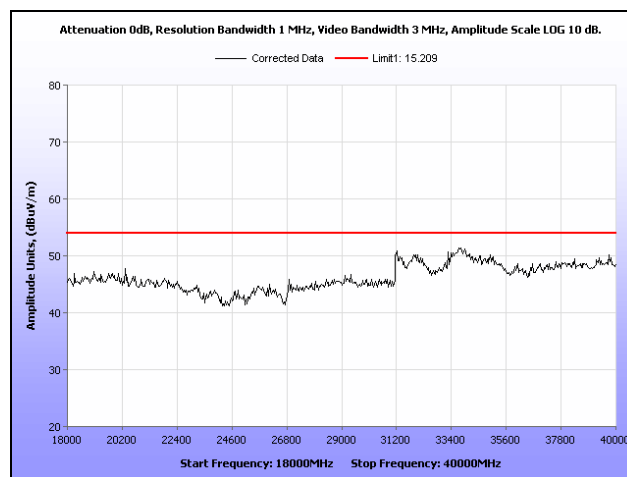
Plot 567. Restricted Band, 802.11a, High Channel, Panel Antenna, 1 GHz – 7 GHz, Average



Plot 568. Restricted Band, 802.11a, High Channel, Panel Antenna, 1 GHz – 7 GHz, Peak

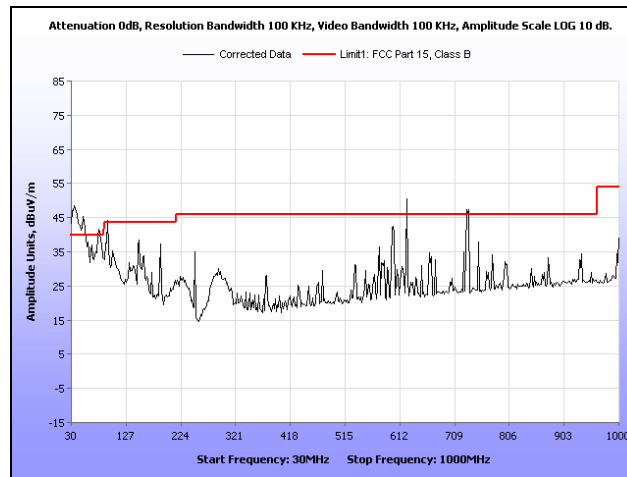


Plot 569. Restricted Band, 802.11a, High Channel, Panel Antenna, 7 GHz – 18 GHz

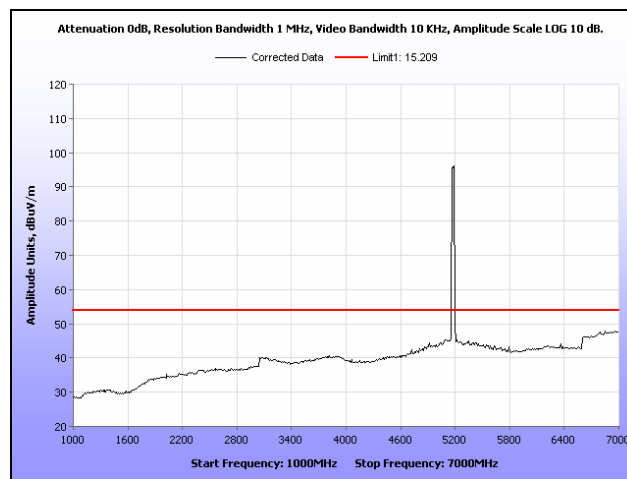


Plot 570. Restricted Band, 802.11a, High Channel, Panel Antenna, 18 GHz – 40 GHz

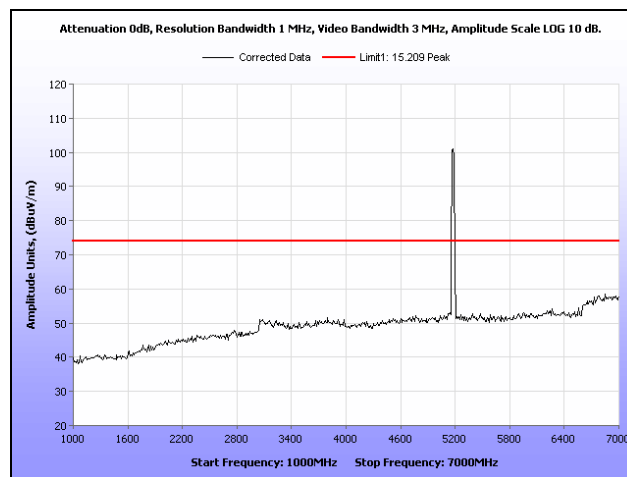
Radiated Restricted Band, Panel Antenna, 802.11n 20 MHz



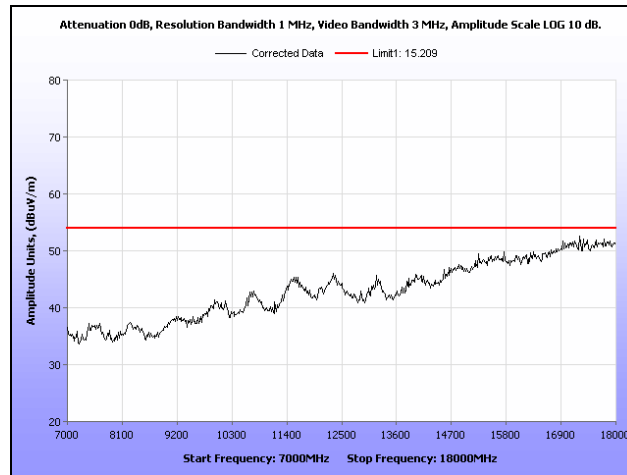
Plot 571. Restricted Band, 802.11n 20 MHz, Low Channel, Panel Antenna, 30 MHz – 1 GHz



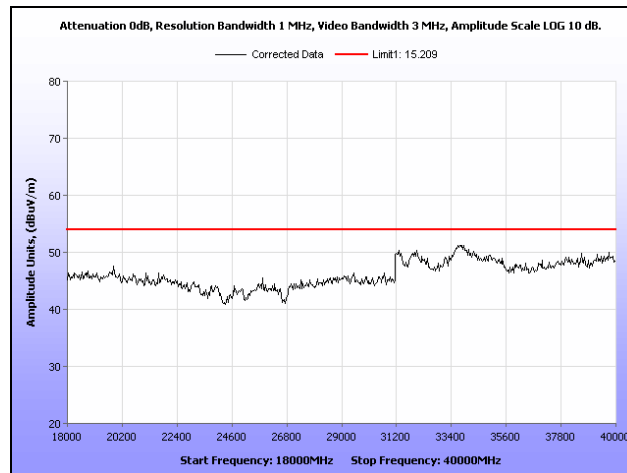
Plot 572. Restricted Band, 802.11n 20 MHz, Low Channel, Panel Antenna, 1 GHz – 7 GHz, Average



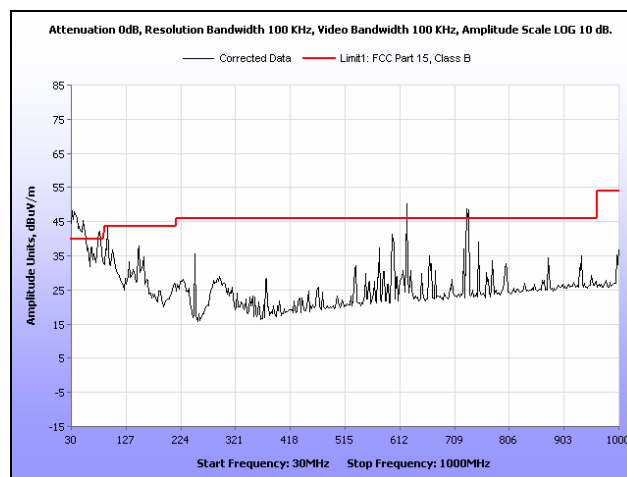
Plot 573. Restricted Band, 802.11n 20 MHz, Low Channel, Panel Antenna, 1 GHz – 7 GHz, Peak



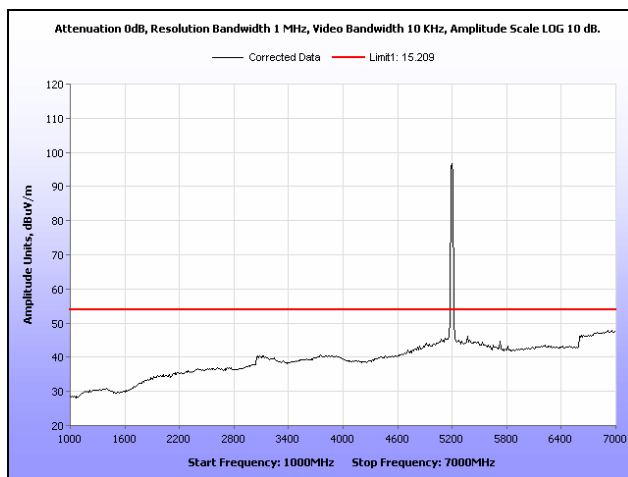
Plot 574. Restricted Band, 802.11n 20 MHz, Low Channel, Panel Antenna, 7 GHz – 18 GHz



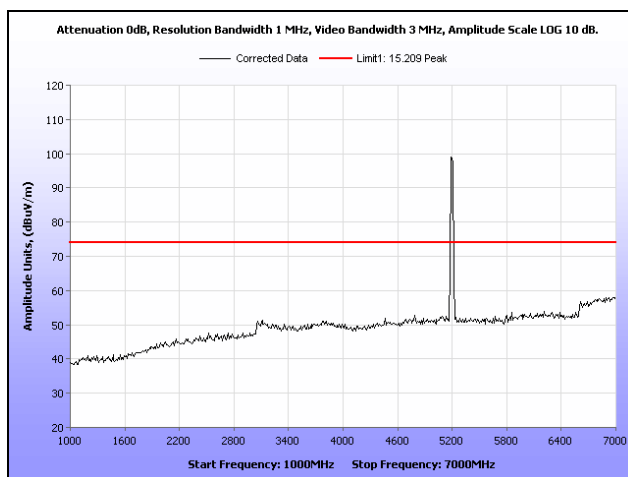
Plot 575. Restricted Band, 802.11n 20 MHz, Low Channel, Panel Antenna, 18 GHz – 40 GHz



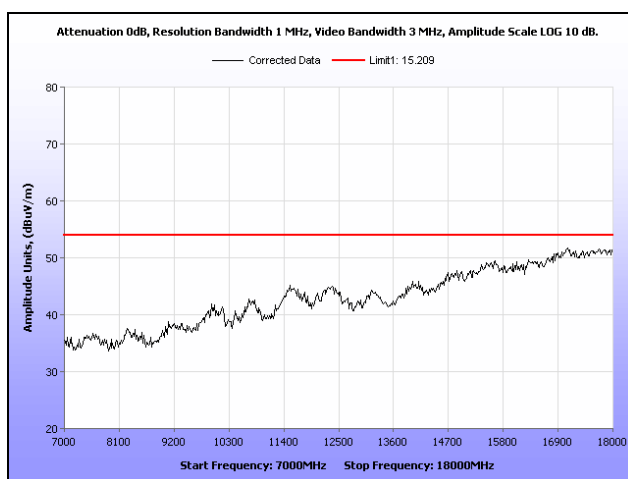
Plot 576. Restricted Band, 802.11n 20 MHz, Mid Channel, Panel Antenna, 30 MHz – 1 GHz



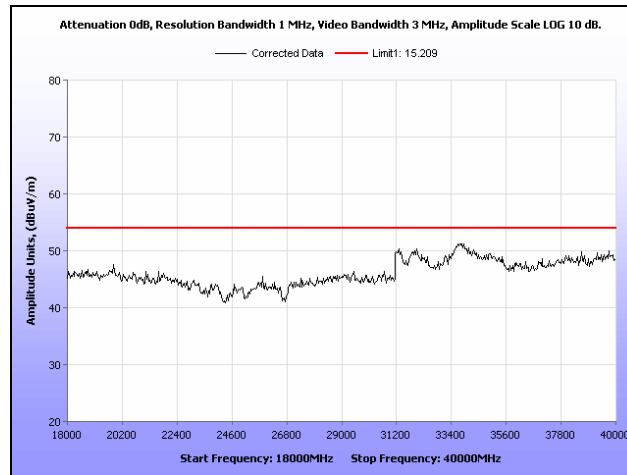
Plot 577. Restricted Band, 802.11n 20 MHz, Mid Channel, Panel Antenna, 1 GHz – 7 GHz, Average



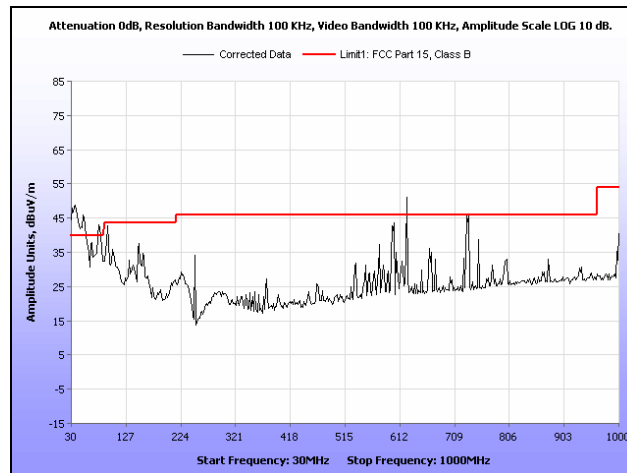
Plot 578. Restricted Band, 802.11n 20 MHz, Mid Channel, Panel Antenna, 1 GHz – 7 GHz, Peak



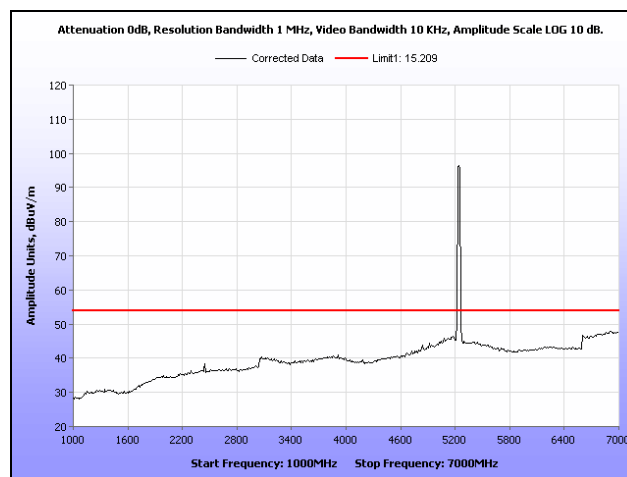
Plot 579. Restricted Band, 802.11n 20 MHz, Mid Channel, Panel Antenna, 7 GHz – 18 GHz



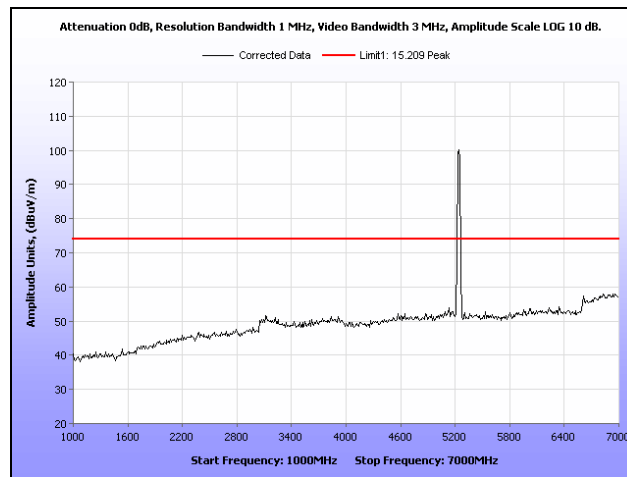
Plot 580. Restricted Band, 802.11n 20 MHz, Mid Channel, Panel Antenna, 18 GHz – 40 GHz



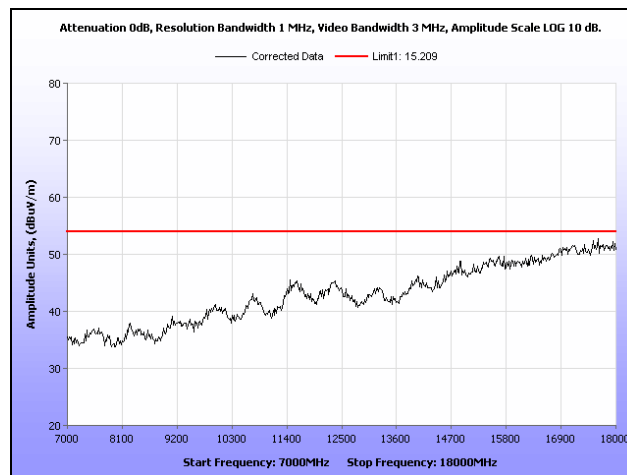
Plot 581. Restricted Band, 802.11n 20 MHz, High Channel, Panel Antenna, 30 MHz – 1 GHz



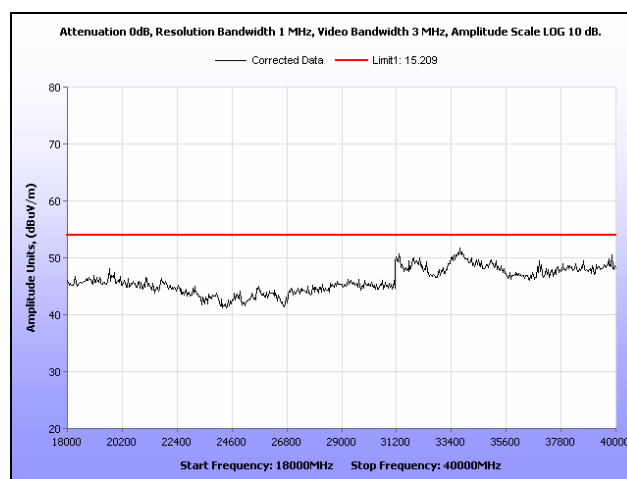
Plot 582. Restricted Band, 802.11n 20 MHz, High Channel, Panel Antenna, 1 GHz – 7 GHz, Average



Plot 583. Restricted Band, 802.11n 20 MHz, High Channel, Panel Antenna, 1 GHz – 7 GHz, Peak

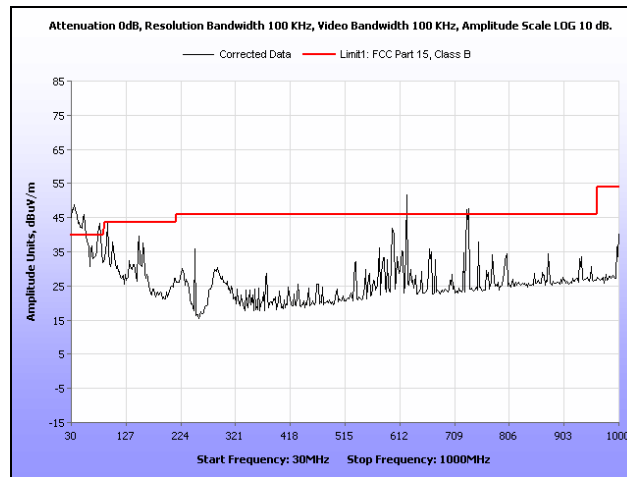


Plot 584. Restricted Band, 802.11n 20 MHz, High Channel, Panel Antenna, 7 GHz – 18 GHz

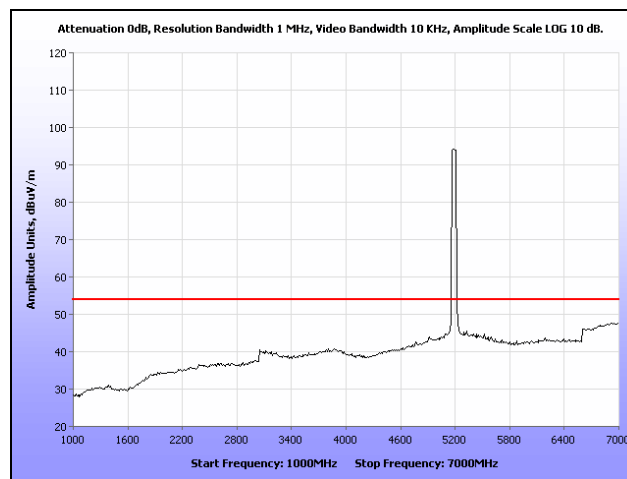


Plot 585. Restricted Band, 802.11n 20 MHz, High Channel, Panel Antenna, 18 GHz – 40 GHz

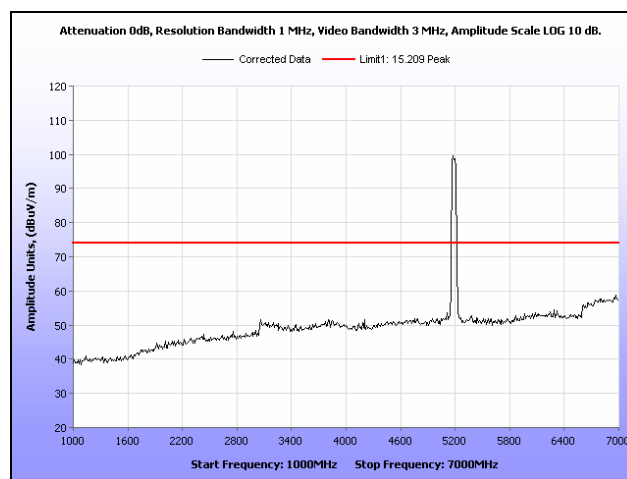
Radiated Restricted Band, Panel Antenna, 802.11n 40 MHz



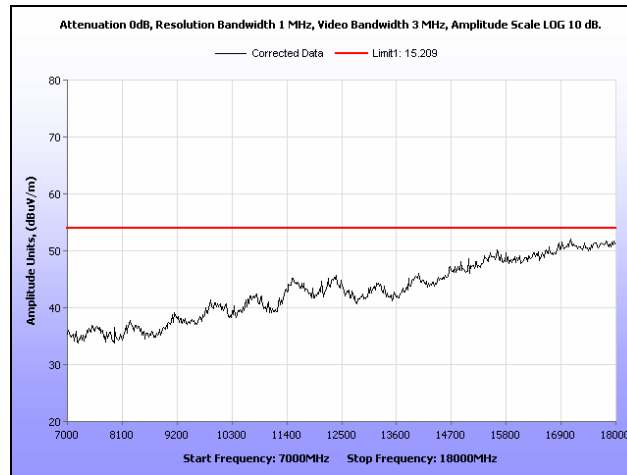
Plot 586. Restricted Band, 802.11n 40 MHz, Low Channel, Panel Antenna, 30 MHz – 1 GHz



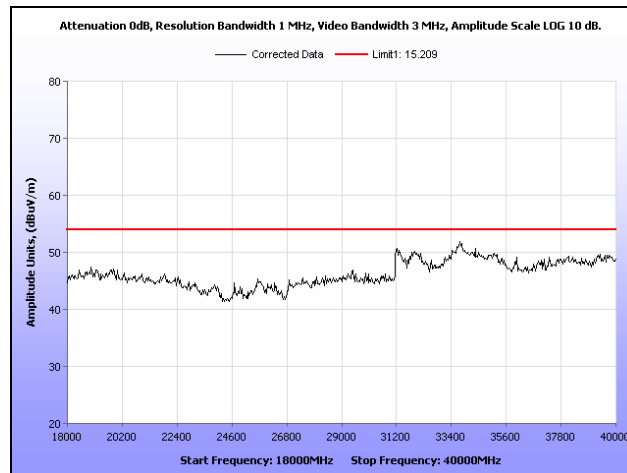
Plot 587. Restricted Band, 802.11n 40 MHz, Low Channel, Panel Antenna, 1 GHz – 7 GHz, Average



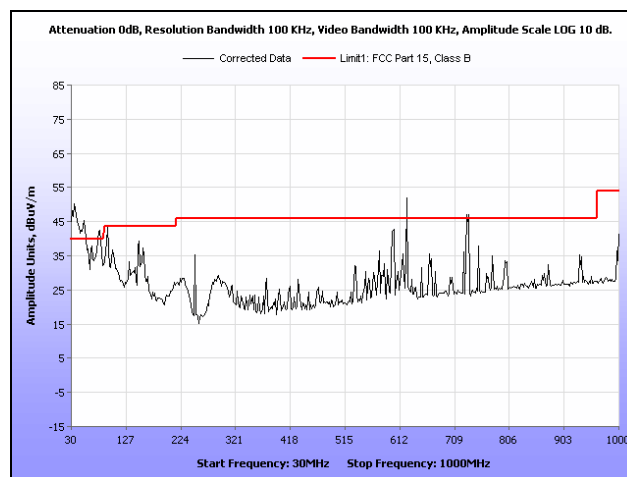
Plot 588. Restricted Band, 802.11n 40 MHz, Low Channel, Panel Antenna, 1 GHz – 7 GHz, Peak



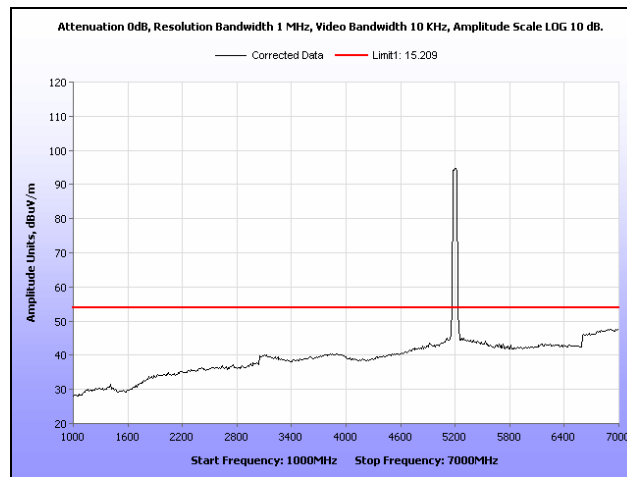
Plot 589. Restricted Band, 802.11n 40 MHz, Low Channel, Panel Antenna, 7 GHz – 18 GHz



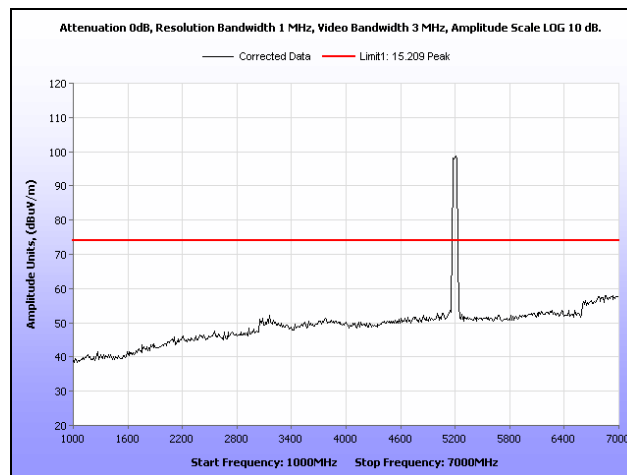
Plot 590. Restricted Band, 802.11n 40 MHz, Low Channel, Panel Antenna, 18 GHz – 40 GHz



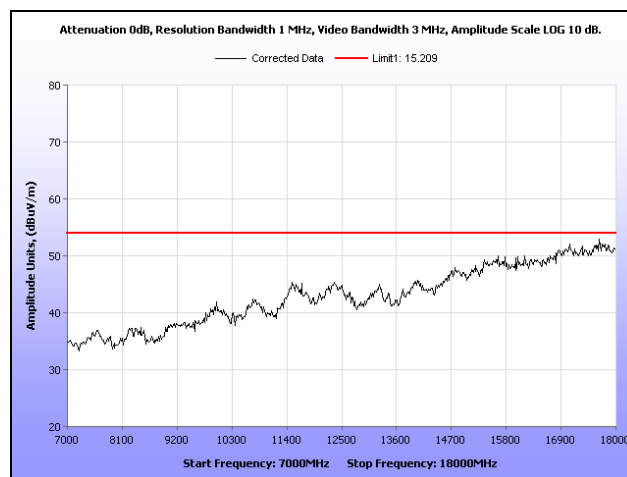
Plot 591. Restricted Band, 802.11n 40 MHz, Mid Channel, Panel Antenna, 30 MHz – 1 GHz



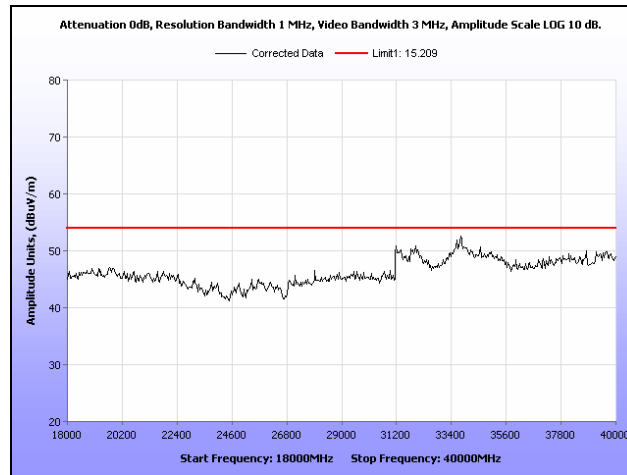
Plot 592. Restricted Band, 802.11n 40 MHz, Mid Channel, Panel Antenna, 1 GHz – 7 GHz, Average



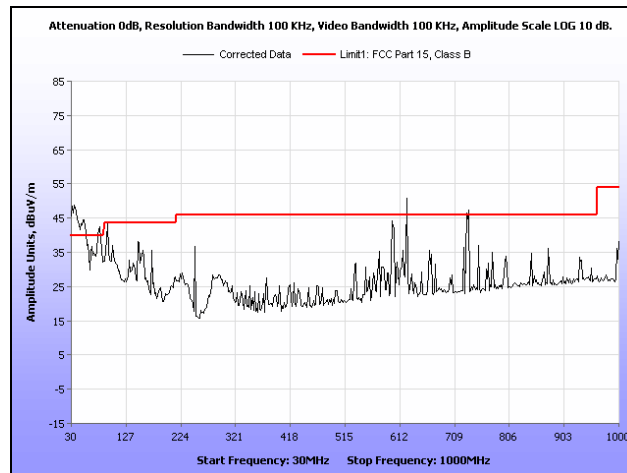
Plot 593. Restricted Band, 802.11n 40 MHz, Mid Channel, Panel Antenna, 1 GHz – 7 GHz, Peak



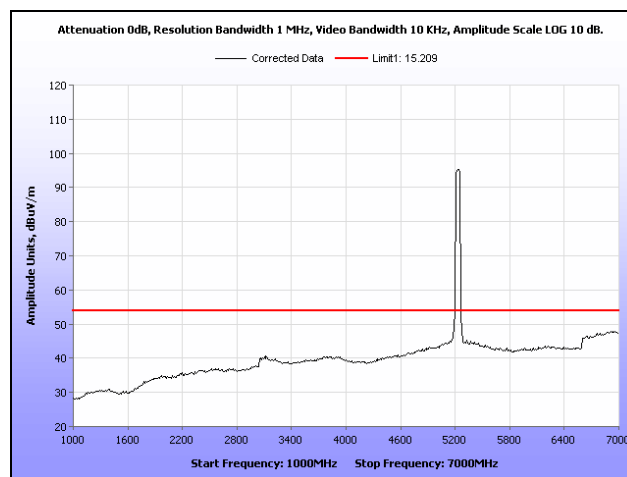
Plot 594. Restricted Band, 802.11n 40 MHz, Mid Channel, Panel Antenna, 7 GHz – 18 GHz



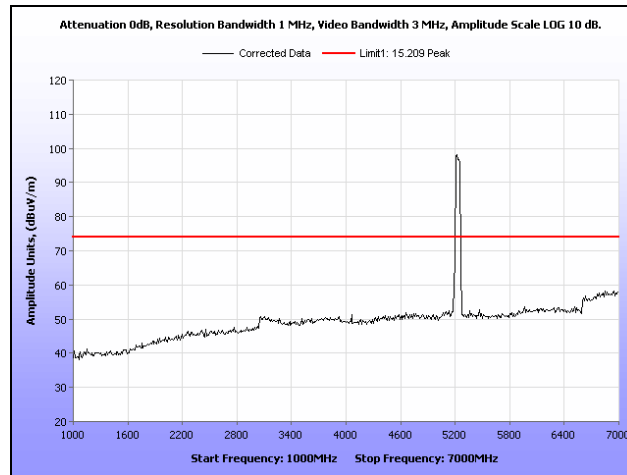
Plot 595. Restricted Band, 802.11n 40 MHz, Mid Channel, Panel Antenna, 18 GHz – 40 GHz



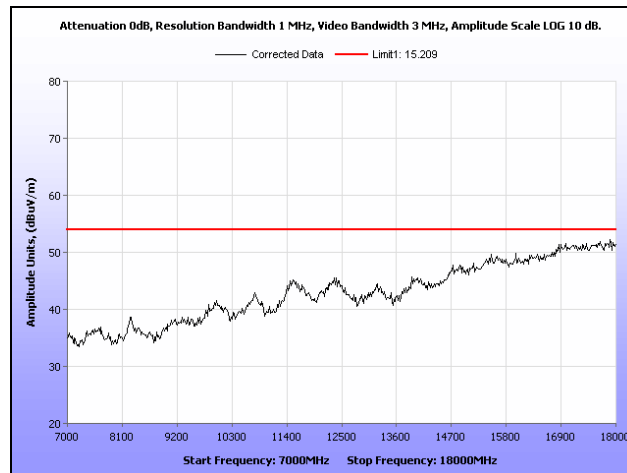
Plot 596. Restricted Band, 802.11n 40 MHz, High Channel, Panel Antenna, 30 MHz – 1 GHz



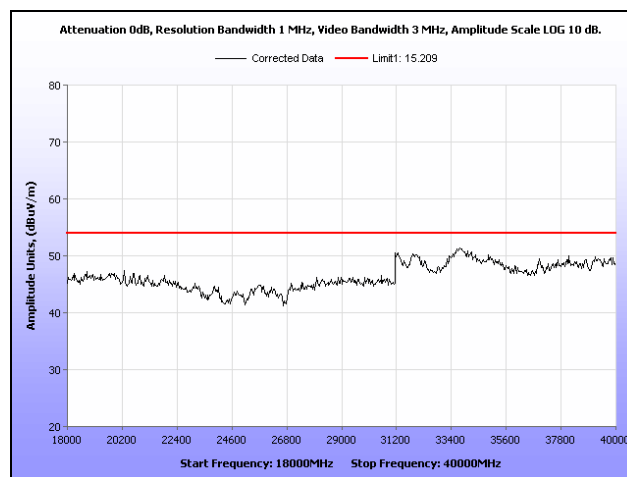
Plot 597. Restricted Band, 802.11n 40 MHz, High Channel, Panel Antenna, 1 GHz – 7 GHz, Average



Plot 598. Restricted Band, 802.11n 40 MHz, High Channel, Panel Antenna, 1 GHz – 7 GHz, Peak

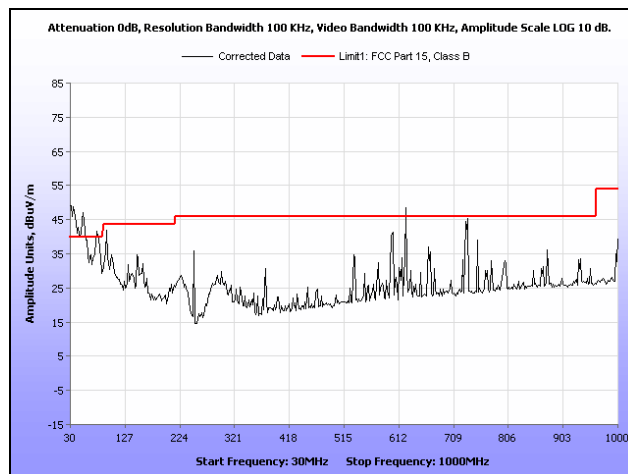


Plot 599. Restricted Band, 802.11n 40 MHz, High Channel, Panel Antenna, 7 GHz – 18 GHz

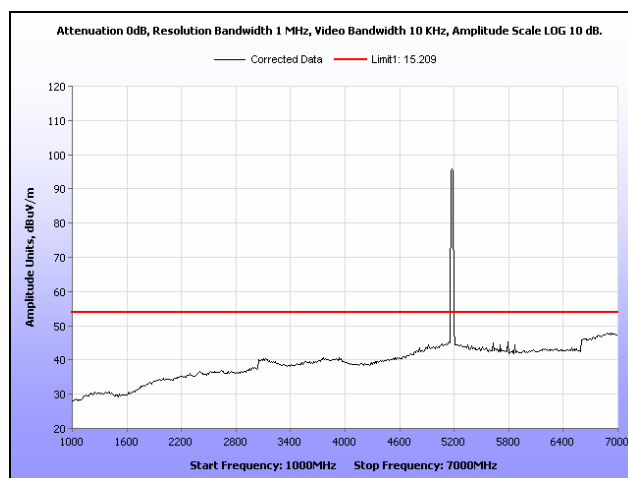


Plot 600. Restricted Band, 802.11n 40 MHz, High Channel, Panel Antenna, 18 GHz – 40 GHz

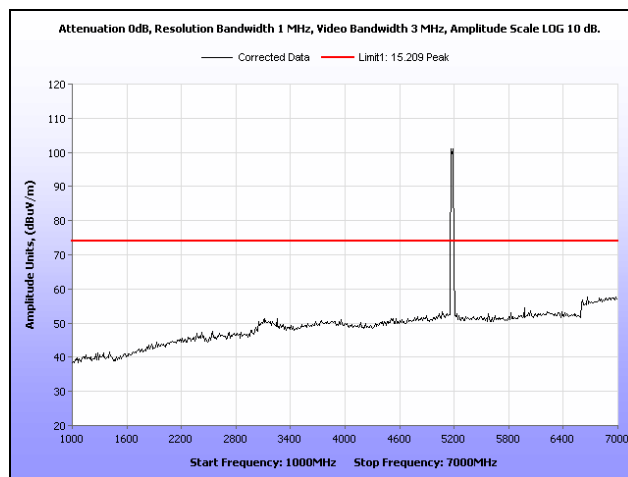
Radiated Restricted Band, Patch Antenna, 802.11a



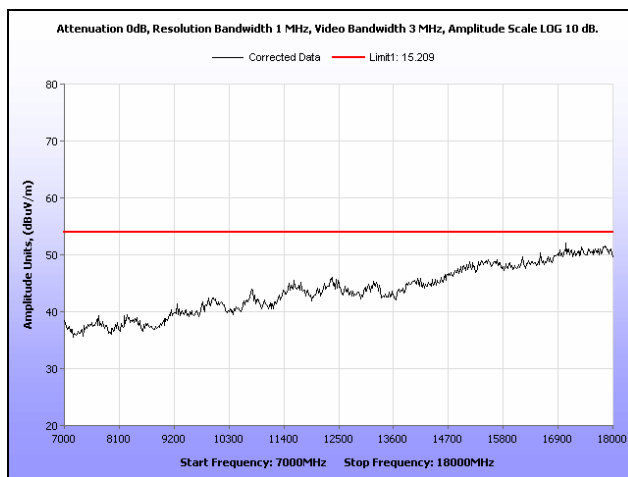
Plot 601. Restricted Band, 802.11a, Low Channel, Patch Antenna, 30 MHz – 1 GHz



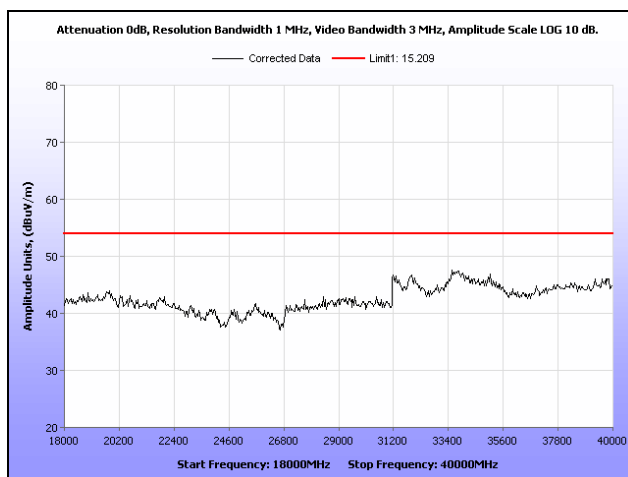
Plot 602. Restricted Band, 802.11a, Low Channel, Patch Antenna, 1 GHz – 7 GHz, Average



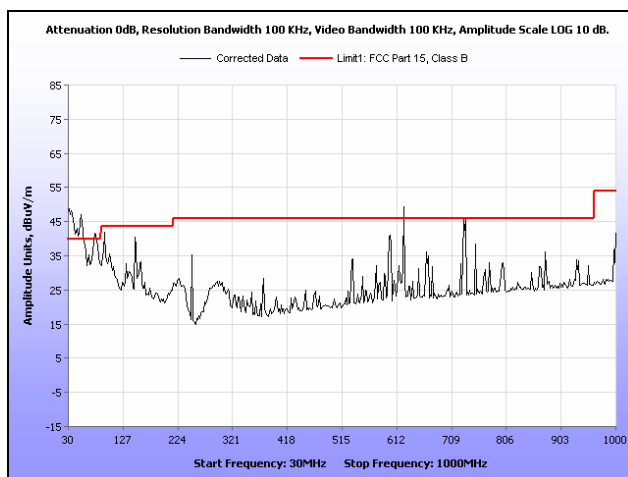
Plot 603. Restricted Band, 802.11a, Low Channel, Patch Antenna, 1 GHz – 7 GHz, Peak



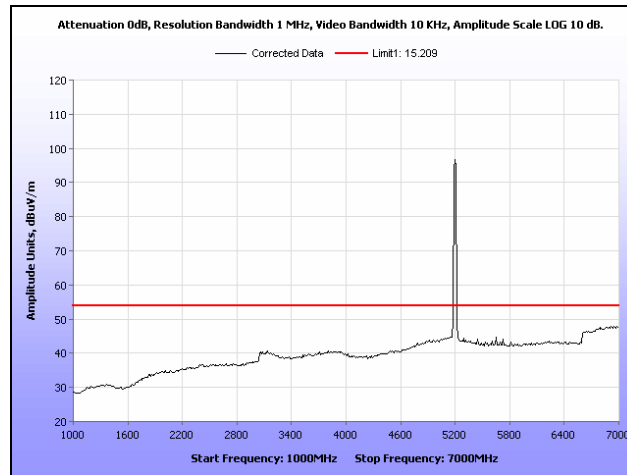
Plot 604. Restricted Band, 802.11a, Low Channel, Patch Antenna, 7 GHz – 18 GHz



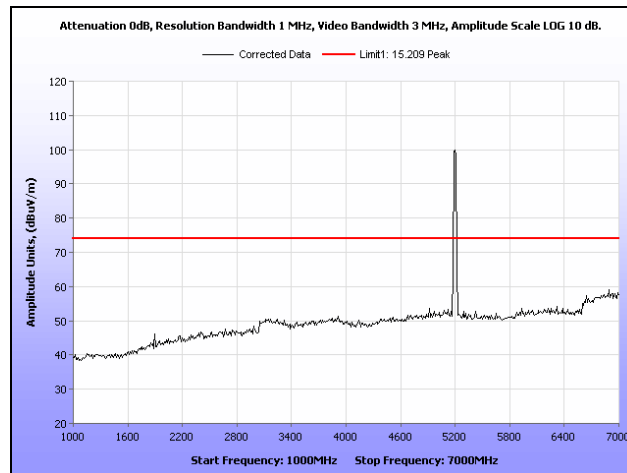
Plot 605. Restricted Band, 802.11a, Low Channel, Patch Antenna, 18 GHz – 40 GHz



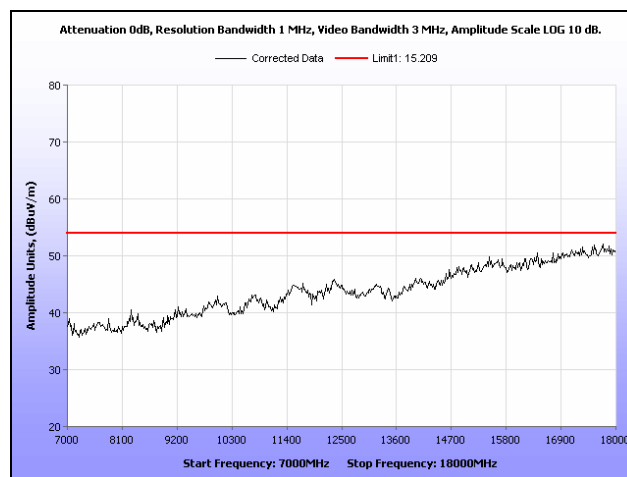
Plot 606. Restricted Band, 802.11a, Mid Channel, Patch Antenna, 30 MHz – 1 GHz



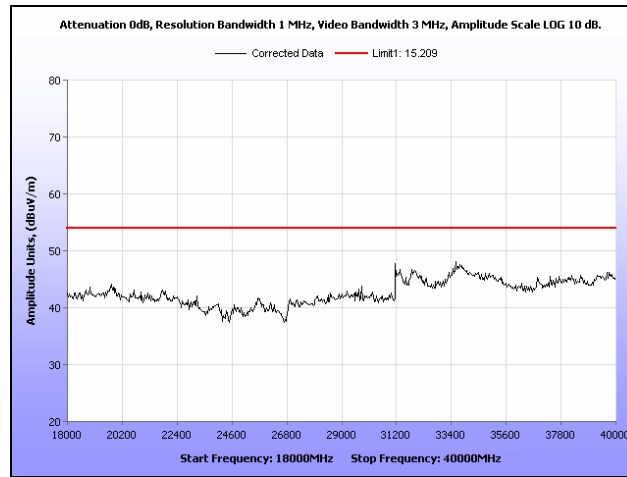
Plot 607. Restricted Band, 802.11a, Mid Channel, Patch Antenna, 1 GHz – 7 GHz, Average



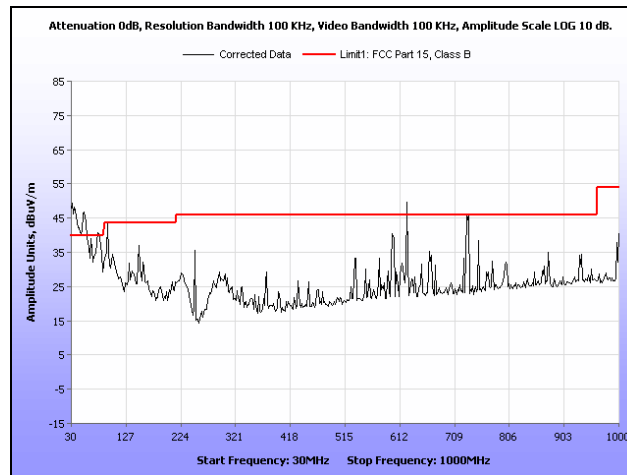
Plot 608. Restricted Band, 802.11a, Mid Channel, Patch Antenna, 1 GHz – 7 GHz, Peak



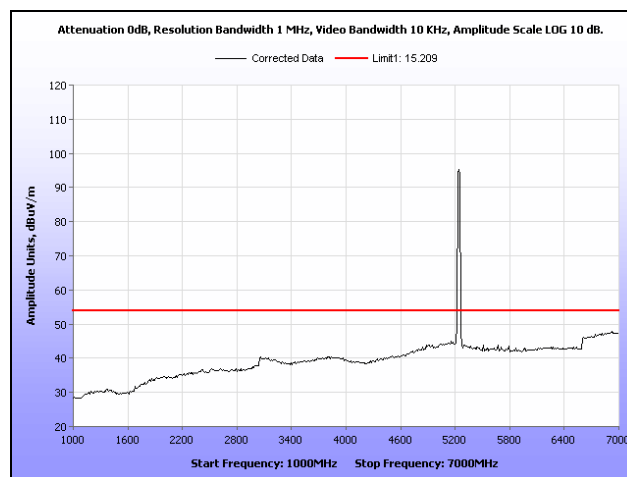
Plot 609. Restricted Band, 802.11a, Mid Channel, Patch Antenna, 7 GHz – 18 GHz



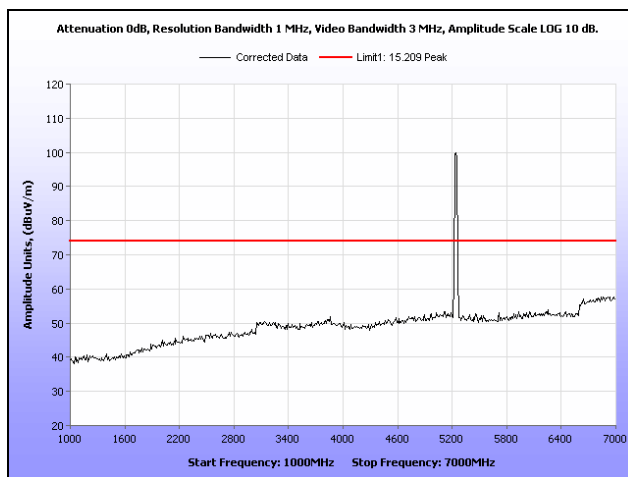
Plot 610. Restricted Band, 802.11a, Mid Channel, Patch Antenna, 18 GHz – 40 GHz



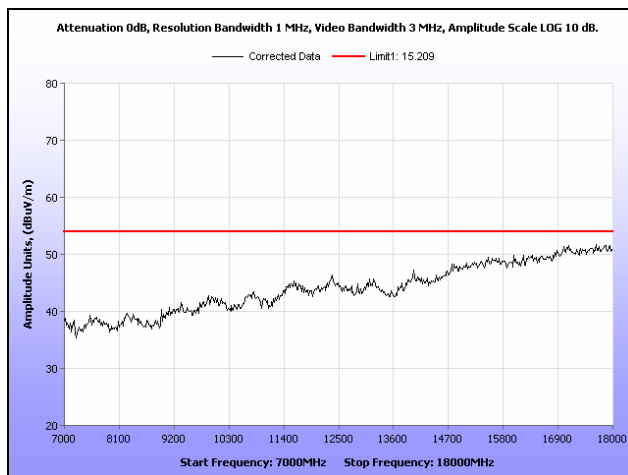
Plot 611. Restricted Band, 802.11a, High Channel, Patch Antenna, 30 MHz – 1 GHz



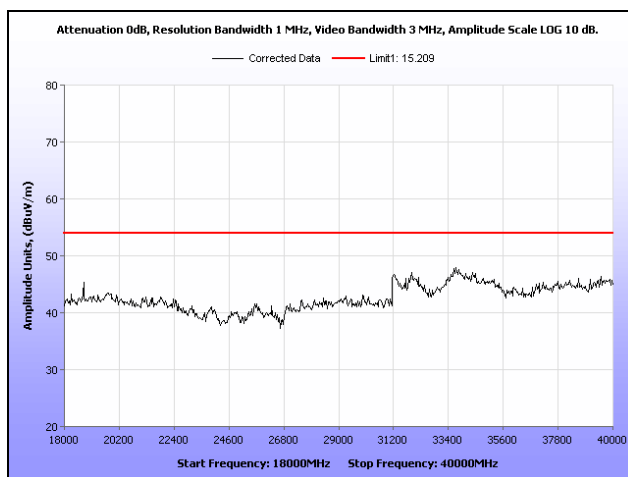
Plot 612. Restricted Band, 802.11a, High Channel, Patch Antenna, 1 GHz – 7 GHz, Average



Plot 613. Restricted Band, 802.11a, High Channel, Patch Antenna, 1 GHz – 7 GHz, Peak

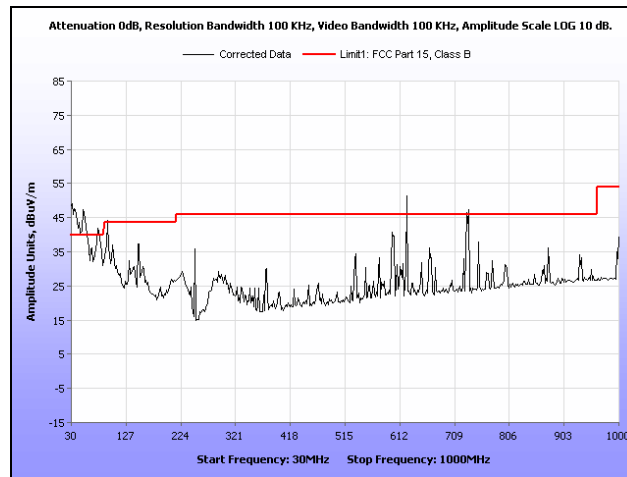


Plot 614. Restricted Band, 802.11a, High Channel, Patch Antenna, 7 GHz – 18 GHz

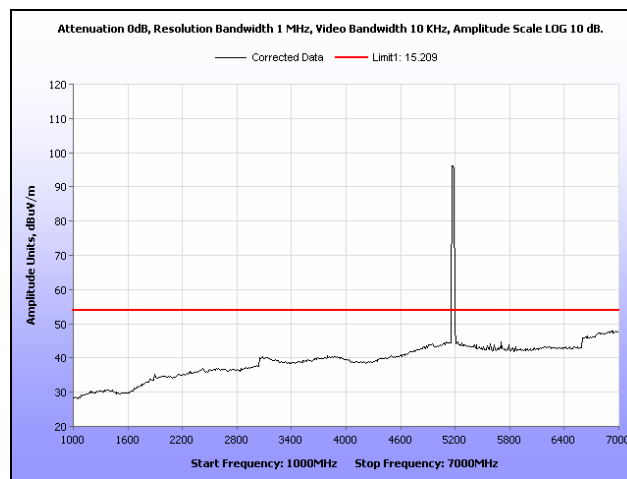


Plot 615. Restricted Band, 802.11a, High Channel, Patch Antenna, 18 GHz – 40 GHz

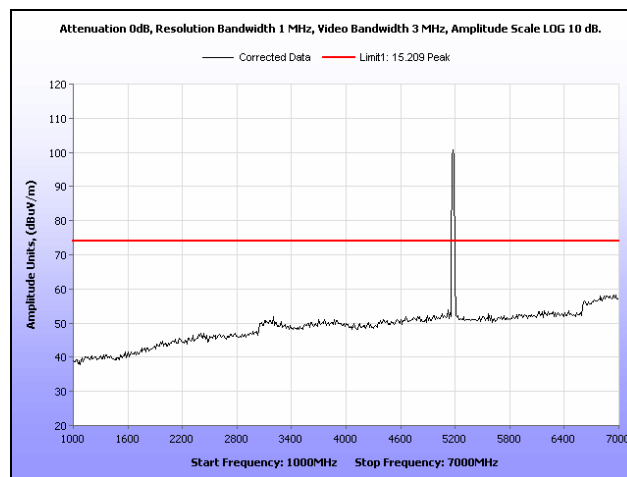
Radiated Restricted Band, Patch Antenna, 802.11n 20 MHz



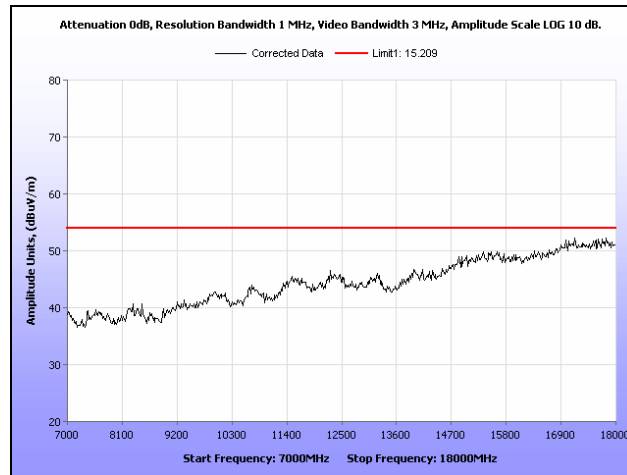
Plot 616. Restricted Band, 802.11n 20 MHz, Low Channel, Patch Antenna, 30 MHz – 1 GHz



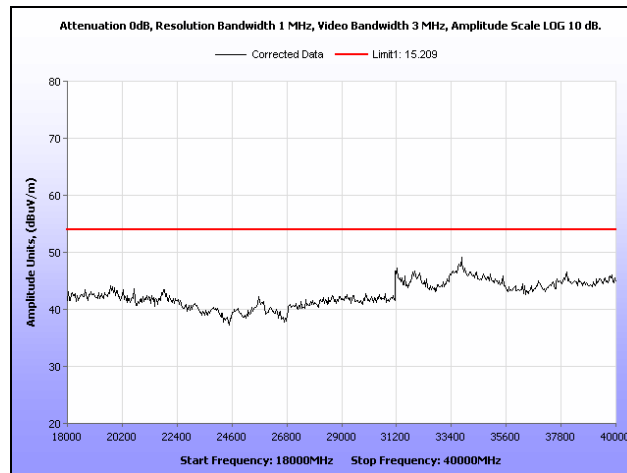
Plot 617. Restricted Band, 802.11n 20 MHz, Low Channel, Patch Antenna, 1 GHz – 7 GHz, Average



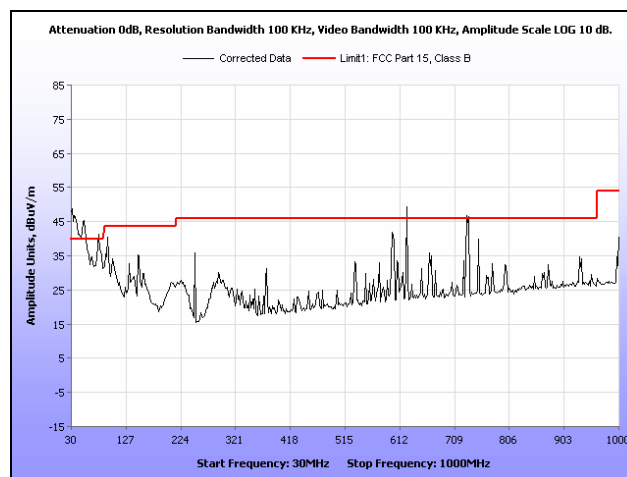
Plot 618. Restricted Band, 802.11n 20 MHz, Low Channel, Patch Antenna, 1 GHz – 7 GHz, Peak



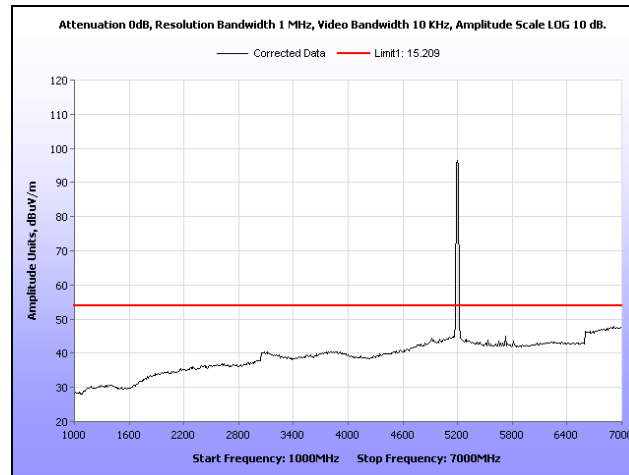
Plot 619. Restricted Band, 802.11n 20 MHz, Low Channel, Patch Antenna, 7 GHz – 18 GHz



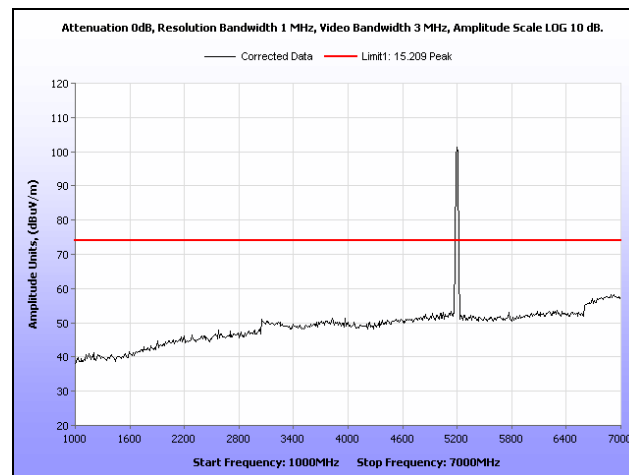
Plot 620. Restricted Band, 802.11n 20 MHz, Low Channel, Patch Antenna, 18 GHz – 40 GHz



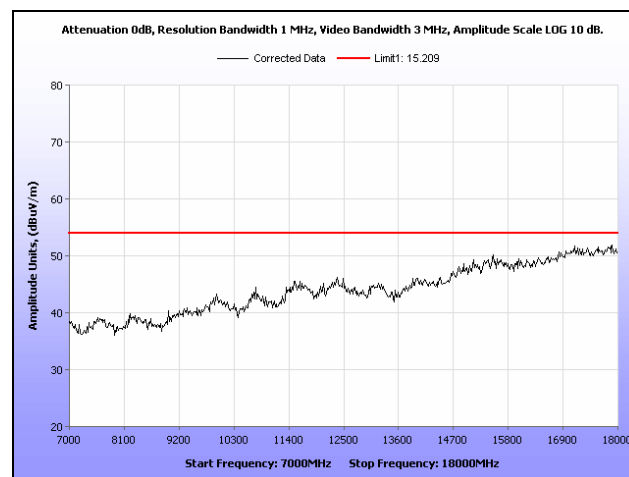
Plot 621. Restricted Band, 802.11n 20 MHz, Mid Channel, Patch Antenna, 30 MHz – 1 GHz



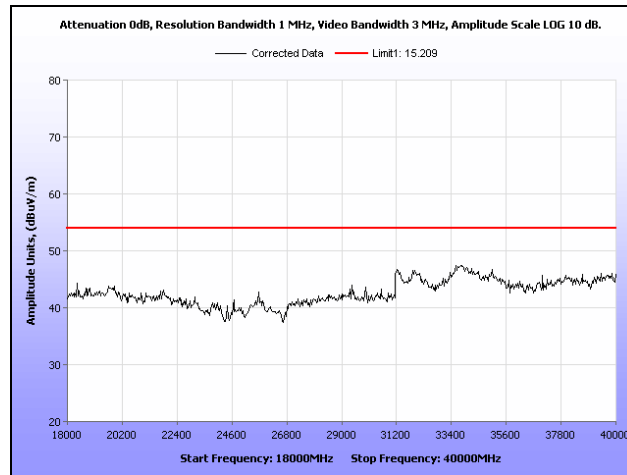
Plot 622. Restricted Band, 802.11n 20 MHz, Mid Channel, Patch Antenna, 1 GHz – 7 GHz, Average



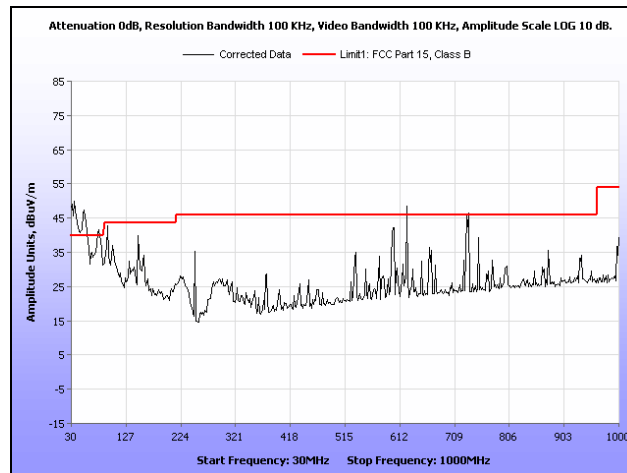
Plot 623. Restricted Band, 802.11n 20 MHz, Mid Channel, Patch Antenna, 1 GHz – 7 GHz, Peak



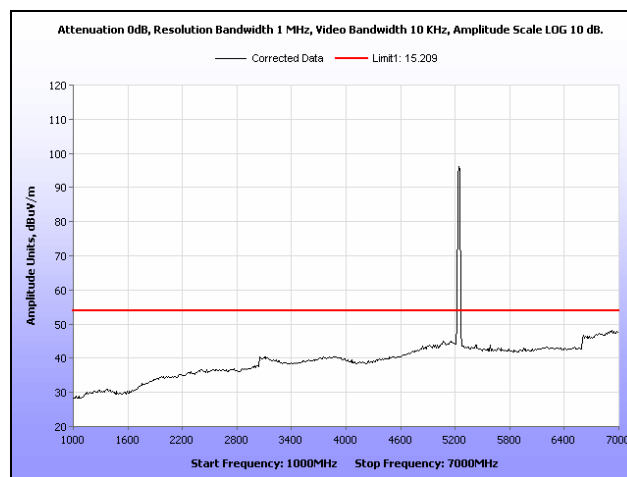
Plot 624. Restricted Band, 802.11n 20 MHz, Mid Channel, Patch Antenna, 7 GHz – 18 GHz



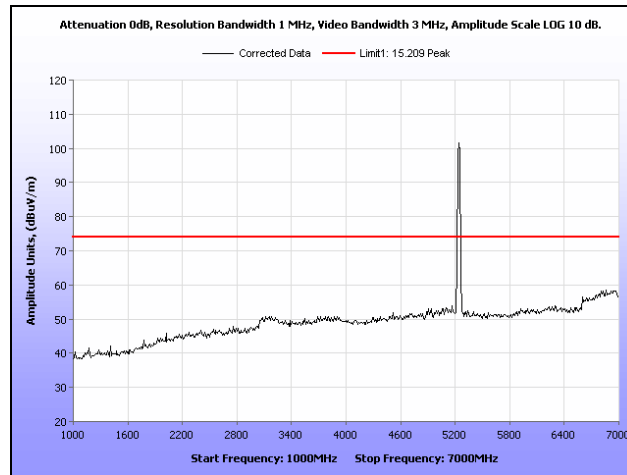
Plot 625. Restricted Band, 802.11n 20 MHz, Mid Channel, Patch Antenna, 18 GHz – 40 GHz



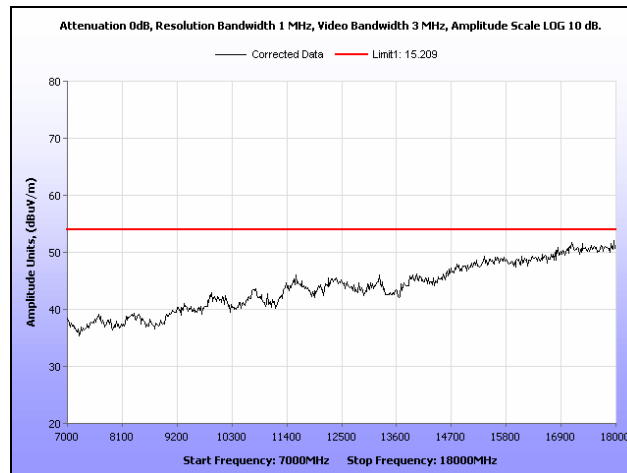
Plot 626. Restricted Band, 802.11n 20 MHz, High Channel, Patch Antenna, 30 MHz – 1 GHz



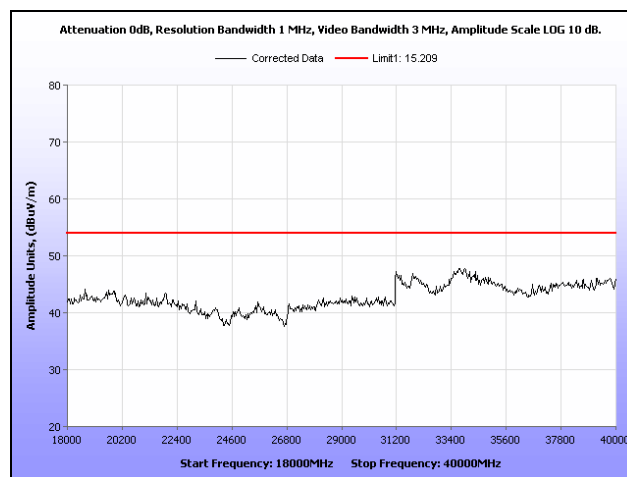
Plot 627. Restricted Band, 802.11n 20 MHz, High Channel, Patch Antenna, 1 GHz – 7 GHz, Average



Plot 628. Restricted Band, 802.11n 20 MHz, High Channel, Patch Antenna, 1 GHz – 7 GHz, Peak

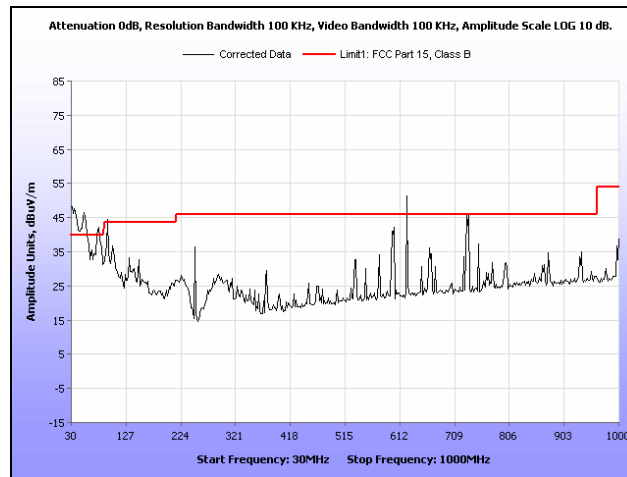


Plot 629. Restricted Band, 802.11n 20 MHz, High Channel, Patch Antenna, 7 GHz – 18 GHz

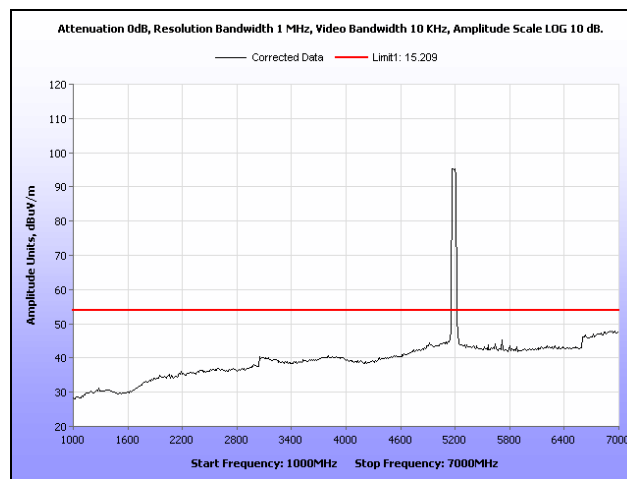


Plot 630. Restricted Band, 802.11n 20 MHz, High Channel, Patch Antenna, 18 GHz – 40 GHz

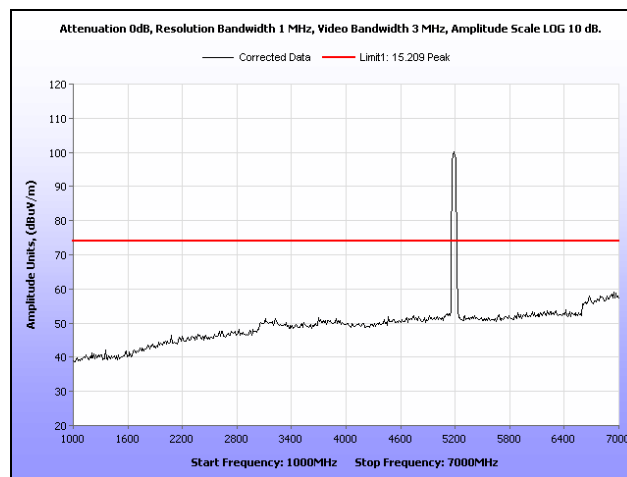
Radiated Restricted Band, Patch Antenna, 802.11n 40 MHz



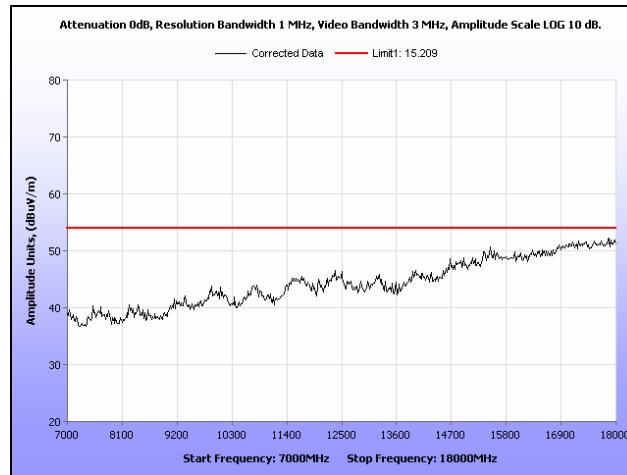
Plot 631. Restricted Band, 802.11n 40 MHz, Low Channel, Patch Antenna, 30 MHz – 1 GHz



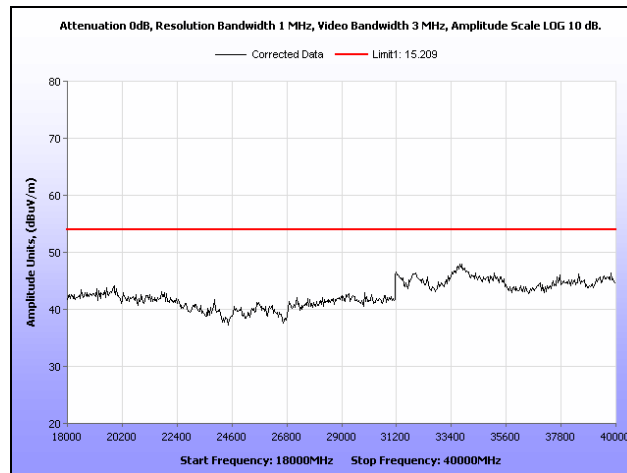
Plot 632. Restricted Band, 802.11n 40 MHz, Low Channel, Patch Antenna, 1 GHz – 7 GHz, Average



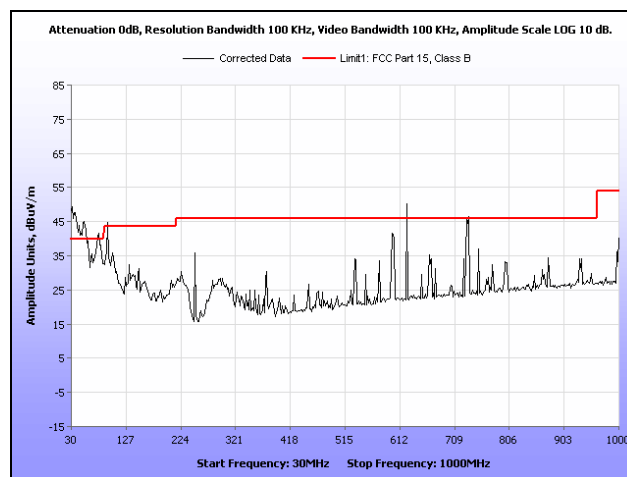
Plot 633. Restricted Band, 802.11n 40 MHz, Low Channel, Patch Antenna, 1 GHz – 7 GHz, Peak



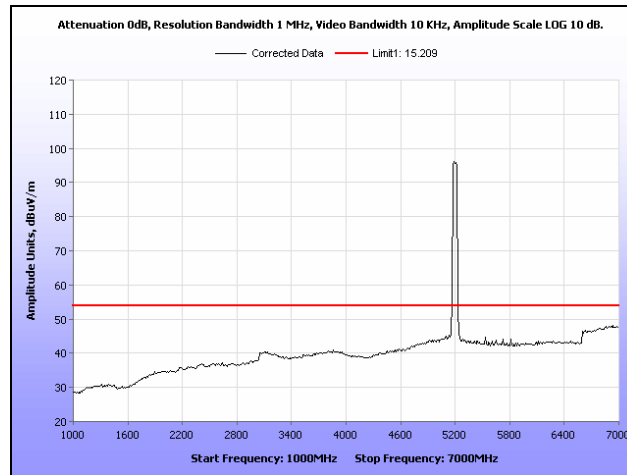
Plot 634. Restricted Band, 802.11n 40 MHz, Low Channel, Patch Antenna, 7 GHz – 18 GHz



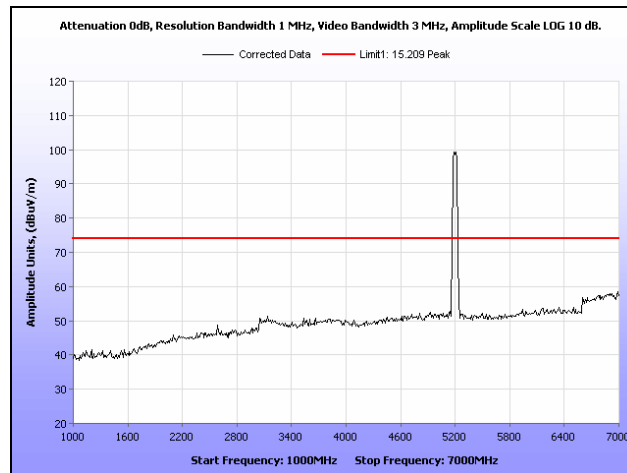
Plot 635. Restricted Band, 802.11n 40 MHz, Low Channel, Patch Antenna, 18 GHz – 40 GHz



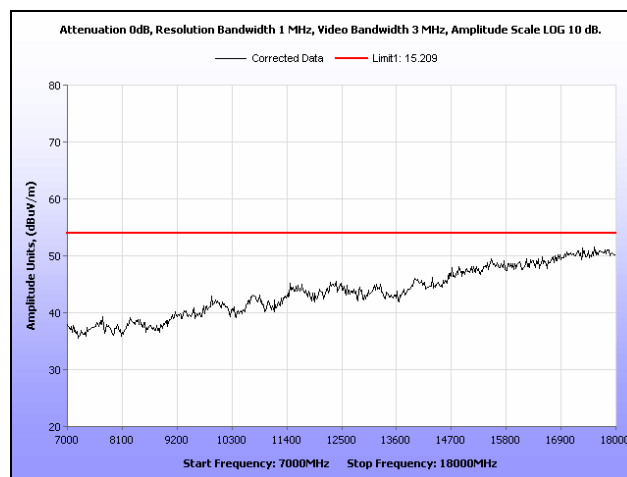
Plot 636. Restricted Band, 802.11n 40 MHz, Mid Channel, Patch Antenna, 30 MHz – 1 GHz



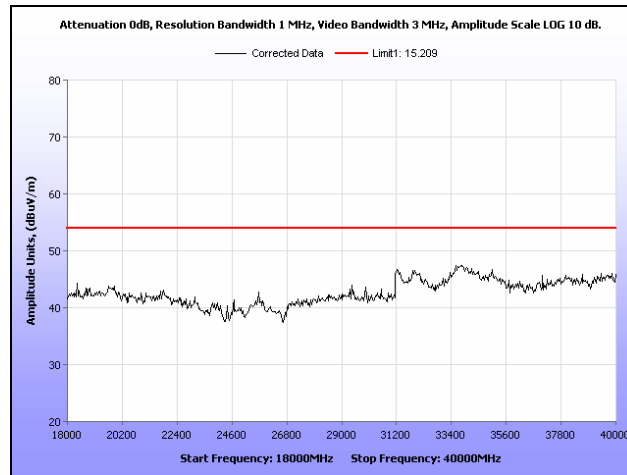
Plot 637. Restricted Band, 802.11n 40 MHz, Mid Channel, Patch Antenna, 1 GHz – 7 GHz, Average



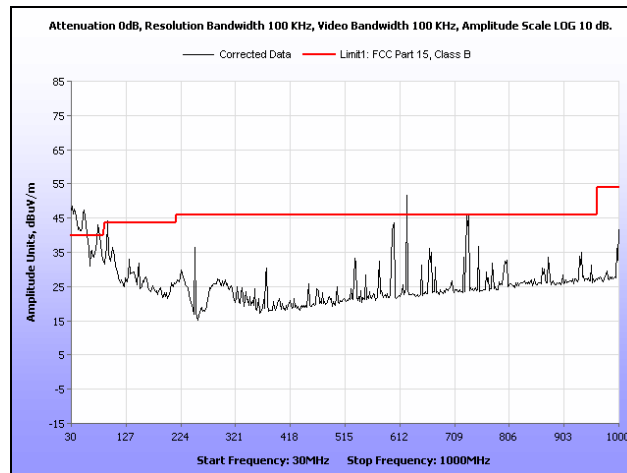
Plot 638. Restricted Band, 802.11n 40 MHz, Mid Channel, Patch Antenna, 1 GHz – 7 GHz, Peak



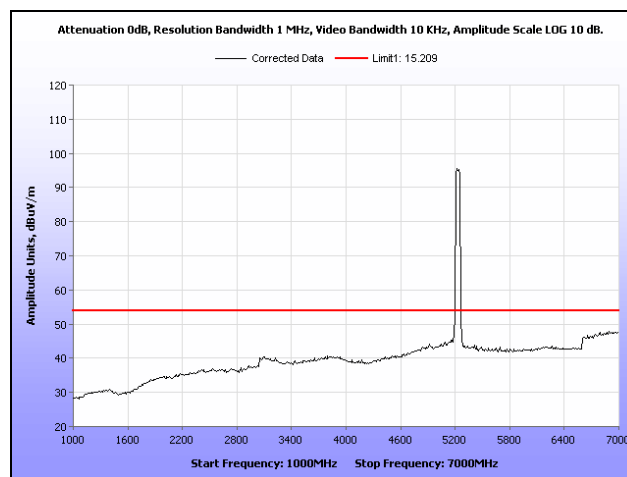
Plot 639. Restricted Band, 802.11n 40 MHz, Mid Channel, Patch Antenna, 7 GHz – 18 GHz



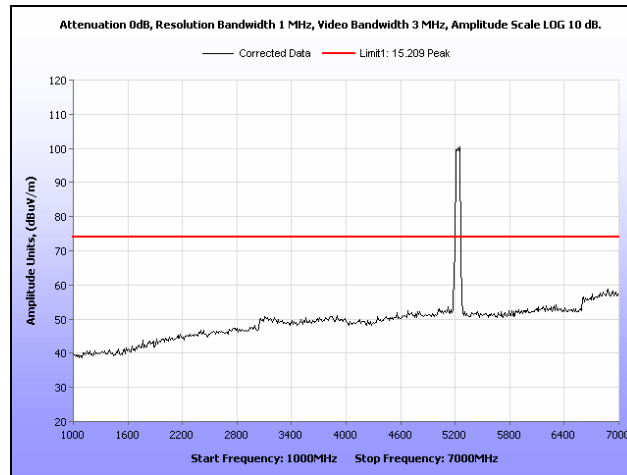
Plot 640. Restricted Band, 802.11n 40 MHz, Mid Channel, Patch Antenna, 18 GHz – 40 GHz



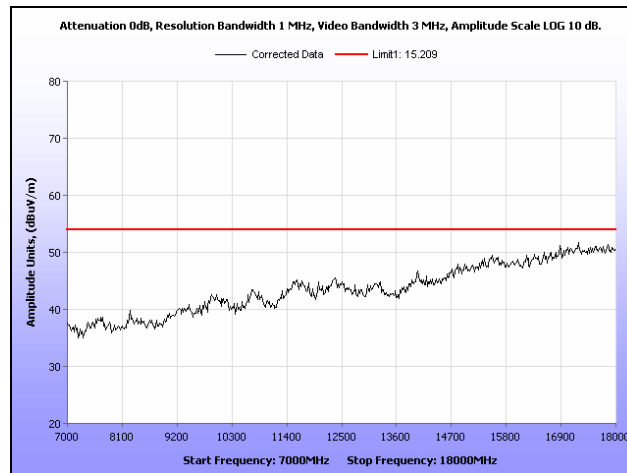
Plot 641. Restricted Band, 802.11n 40 MHz, High Channel, Patch Antenna, 30 MHz – 1 GHz



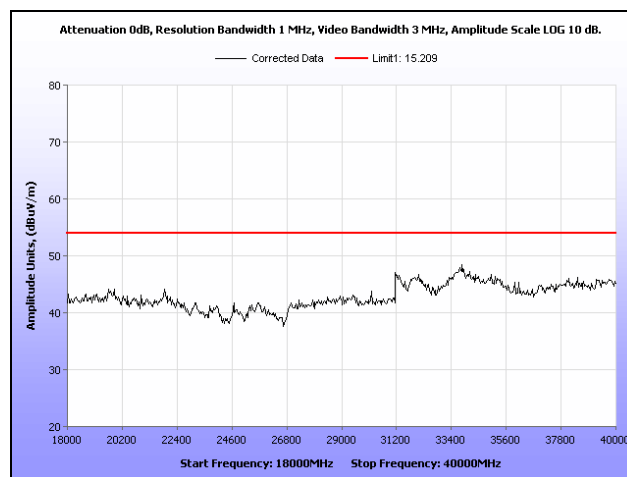
Plot 642. Restricted Band, 802.11n 40 MHz, High Channel, Patch Antenna, 1 GHz – 7 GHz, Average



Plot 643. Restricted Band, 802.11n 40 MHz, High Channel, Patch Antenna, 1 GHz – 7 GHz, Peak



Plot 644. Restricted Band, 802.11n 40 MHz, High Channel, Patch Antenna, 7 GHz – 18 GHz



Plot 645. Restricted Band, 802.11n 40 MHz, High Channel, Patch Antenna, 18 GHz – 40 GHz

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.407(g) Frequency Stability

Test Requirements: § 15.407(g): Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user manual.

Test Procedure: The EUT was connected directly to a spectrum analyzer through a attenuator. The resolution band width of the spectrum analyzer was set to 1 MHz.

Test Results: The EUT was compliant with the requirements of §15.407(g).

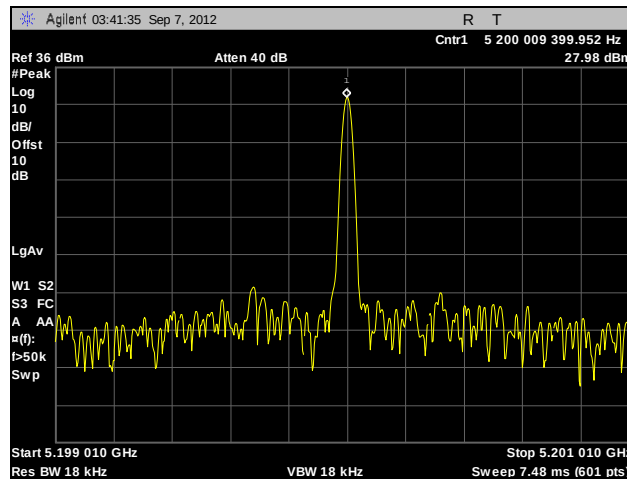
Test Engineer(s): Jeff Pratt

Test Date(s): 09/07/12

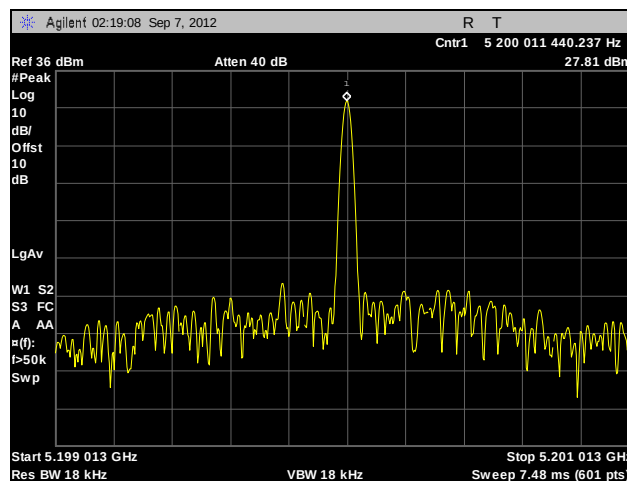
5200 MHz	Temperature (C)	Voltage (V)	Center Frequency (MHz)	Drift (PPM)	Limit (PPM)
Reference @ 120VAC and 20C	-40	120	5200.009399	6.594262	20
	-30	120	5200.01144	6.986764	20
	-20	120	5200.007111	6.15426	20
	-10	120	5200.010021	6.713878	20
	0	120	5199.989434	2.754821	20
	10	120	5199.980575	1.051159	20
	20	102	5199.97511	0.000192	20
5199.975109	20	120	5199.975109	0	20
	20	138	5199.975109	0	20
	30	120	5199.974894	-0.041346	20
	40	120	5199.982181	1.360007	20
	50	120	5199.991251	3.104246	20
	60	120	5200.014116	7.501382	20
	70	120	5200.047426	13.90718	20

Table 17. Frequency Stability, Test Results

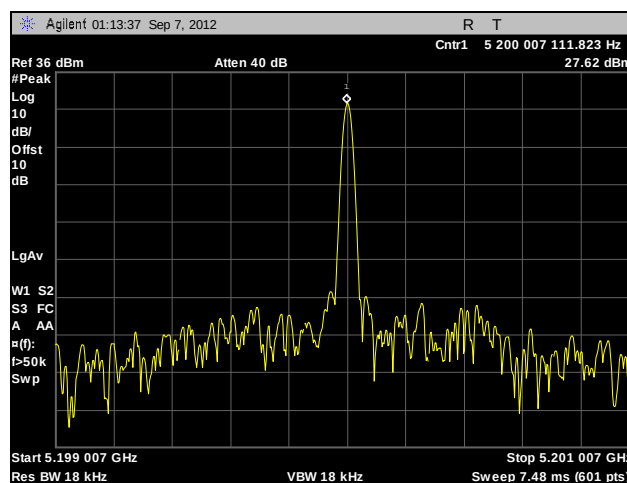
Frequency Stability Test Results



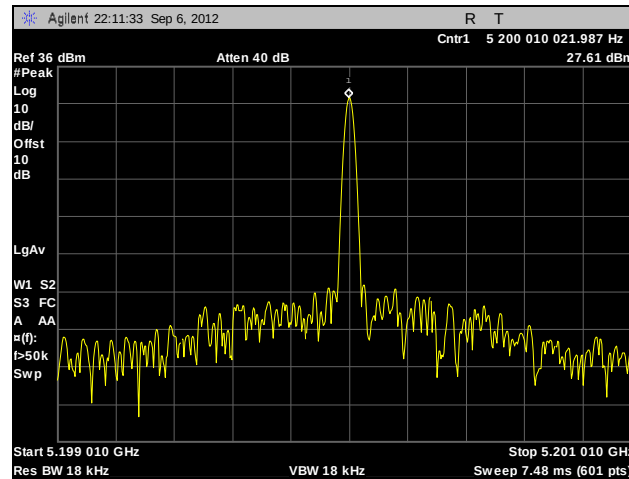
Plot 646. Frequency Stability, 5200 MHz, -40°C, 120 VAC



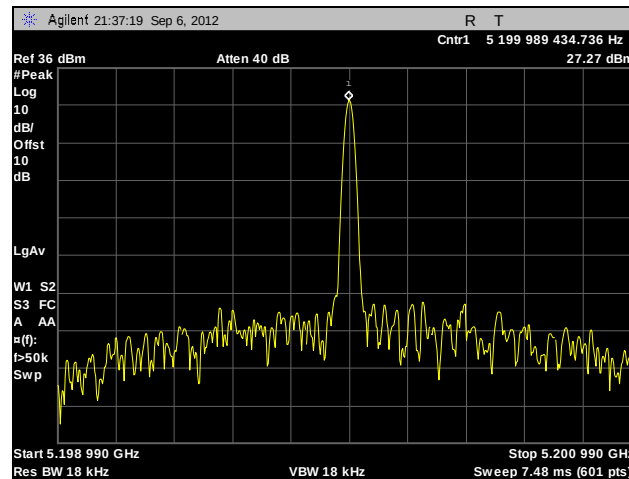
Plot 647. Frequency Stability, 5200 MHz, -30°C, 120 VAC



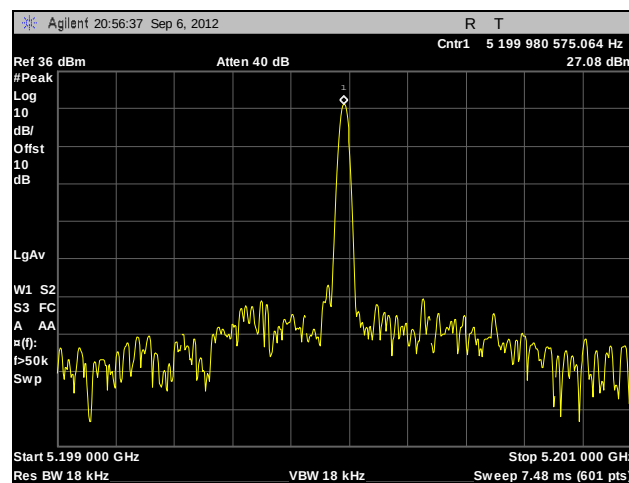
Plot 648. Frequency Stability, 5200 MHz, -20°C, 120 VAC



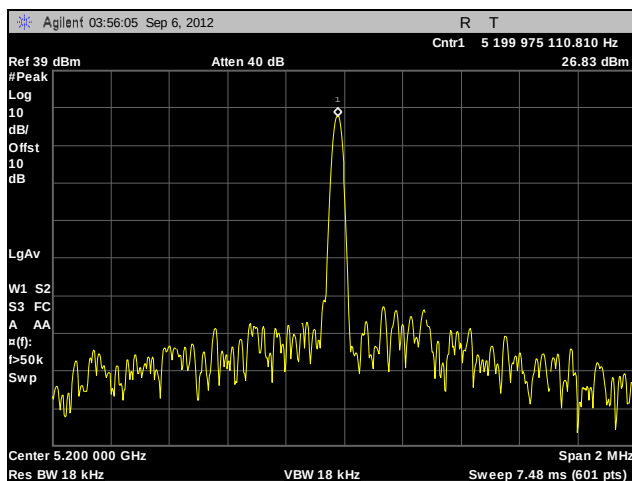
Plot 649. Frequency Stability, 5200 MHz, -10°C, 120 VAC



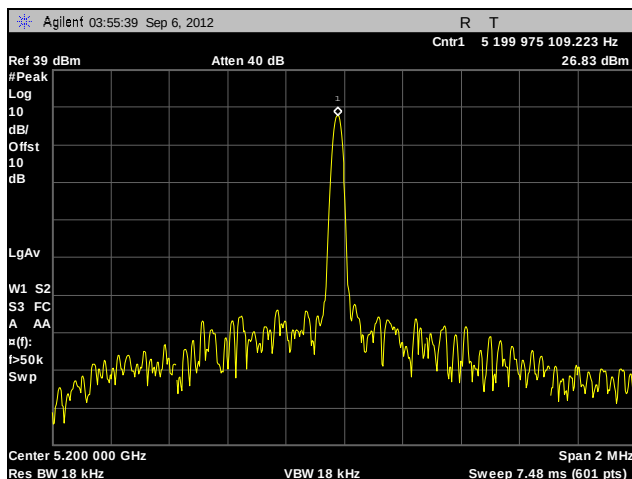
Plot 650. Frequency Stability, 5200 MHz, 0°C, 120 VAC



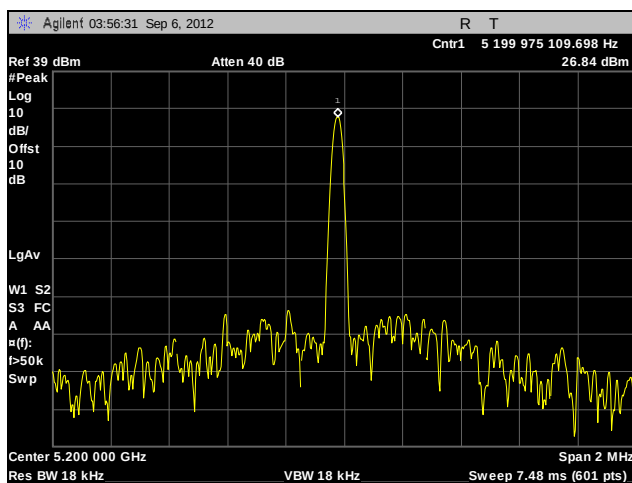
Plot 651. Frequency Stability, 5200 MHz, 10°C, 120 VAC



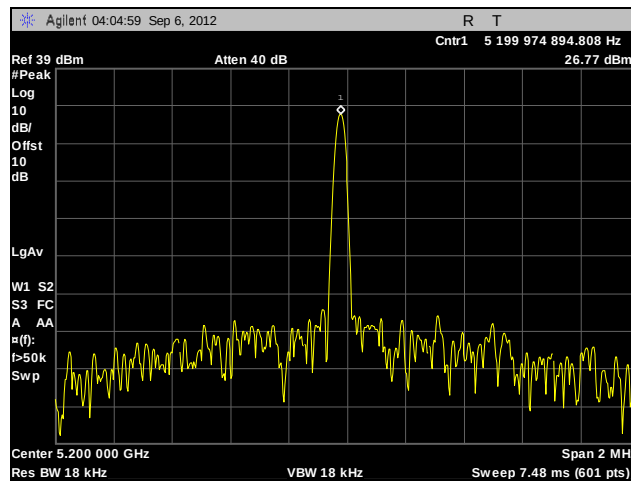
Plot 652. Frequency Stability, 5200 MHz, 20°C, 102 VAC



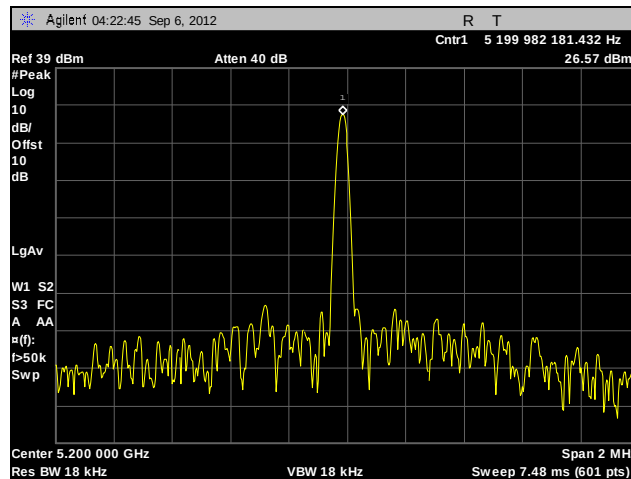
Plot 653. Frequency Stability, 5200 MHz, 20°C, 120 VAC



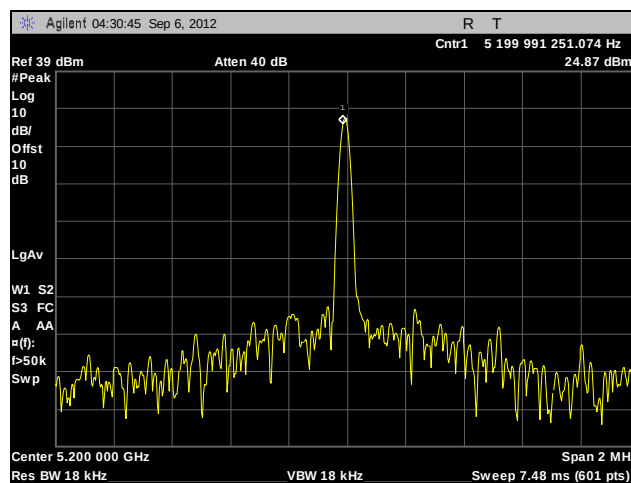
Plot 654. Frequency Stability, 5200 MHz, 20°C, 138 VAC



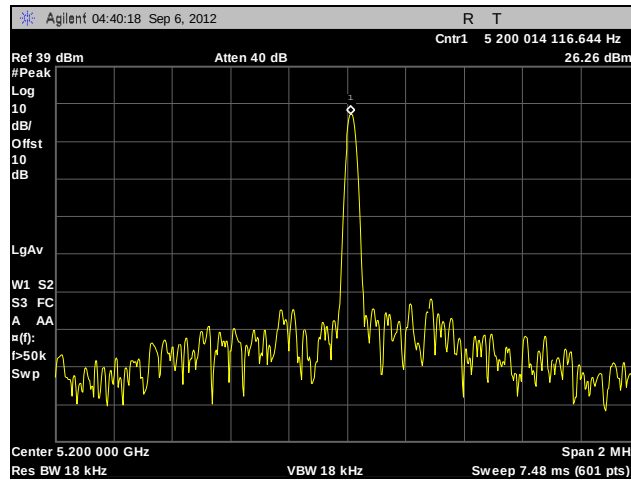
Plot 655. Frequency Stability, 5200 MHz, 30°C, 120 VAC



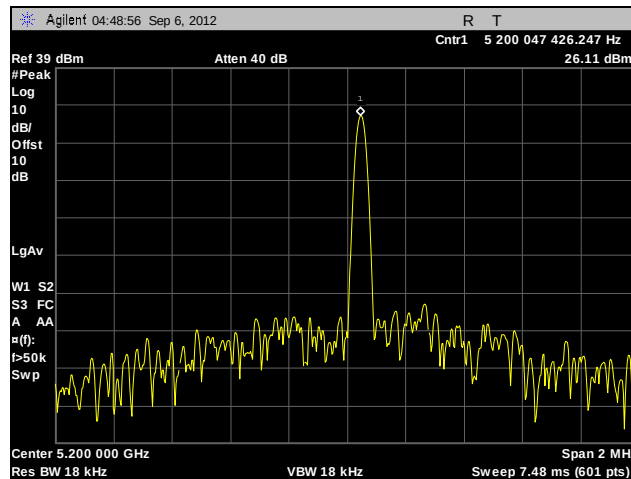
Plot 656. Frequency Stability, 5200 MHz, 40°C, 120 VAC



Plot 657. Frequency Stability, 5200 MHz, 50°C, 120 VAC



Plot 658. Frequency Stability, 5200 MHz, 60°C, 120 VAC



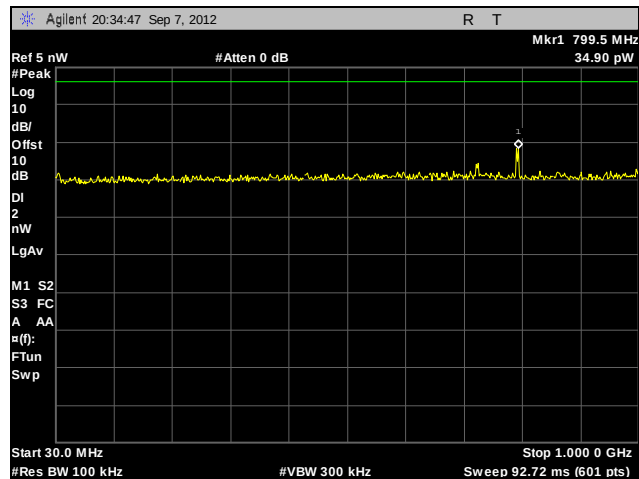
Plot 659. Frequency Stability, 5200 MHz, 70°C, 120 VAC

Electromagnetic Compatibility Criteria for Intentional Radiators

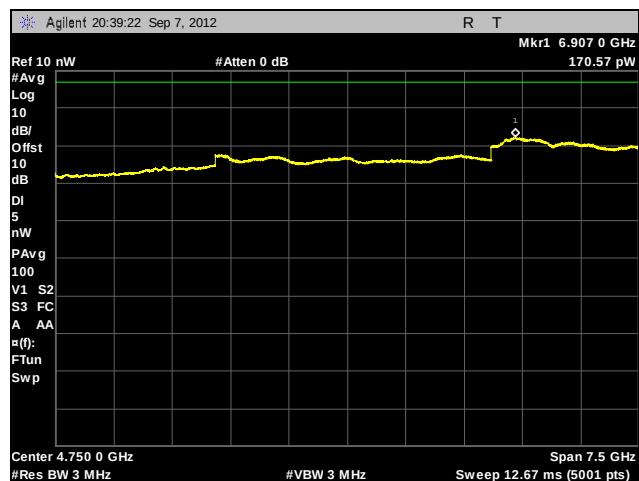
RSS-GEN Receiver Spurious

Test Requirement:	If the device has a detachable antenna of known antenna impedance, then the antenna conducted method is permitted in lieu of a radiated measurement. If a conducted measurement is made, no spurious output signals appearing at the antenna terminals shall exceed 2 nanowatts per any 4 kHz spurious frequency in the band 30 – 1000 MHz, or 5 nanowatts above 1 GHz.
Test Procedure:	The EUT was directly connected to a spectrum analyzer. Testing was performed when the EUT was receiving on the mid channel (i.e. 5200MHz).
Results:	The EUT as tested is compliant with the requirements of RSS-GEN.
Test Engineer(s):	Jeff Pratt
Test Date(s):	09/07/12

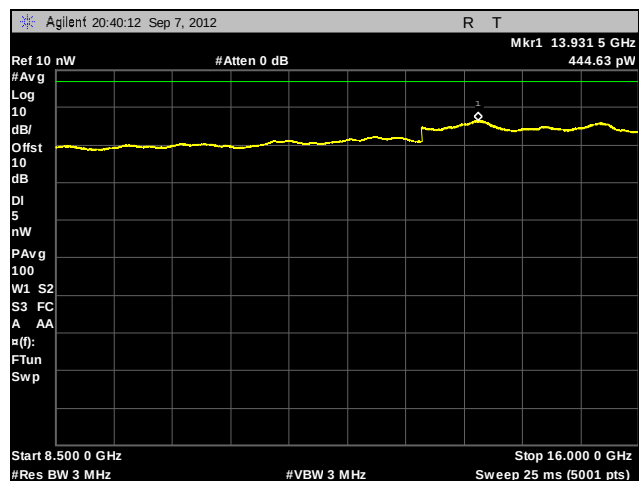
Receiver Spurious Emissions Test Results



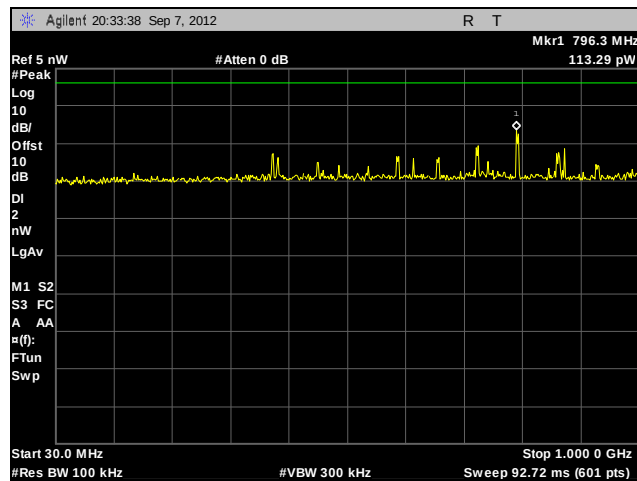
Plot 660. Receiver Spurious Emission, Port A, 30 MHz – 1 GHz



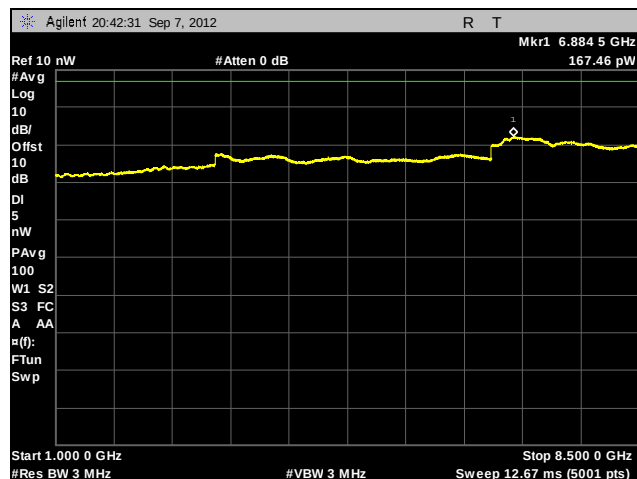
Plot 661. Receiver Spurious Emission, Port A, 1 GHz – 8.5 GHz



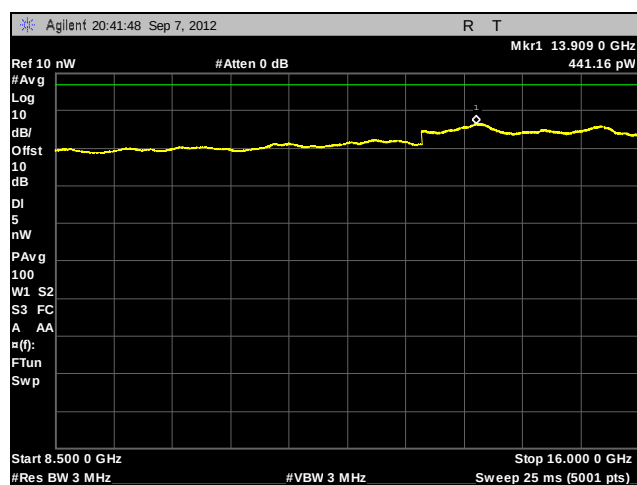
Plot 662. Receiver Spurious Emission, Port A, 8.5 GHz – 16 GHz



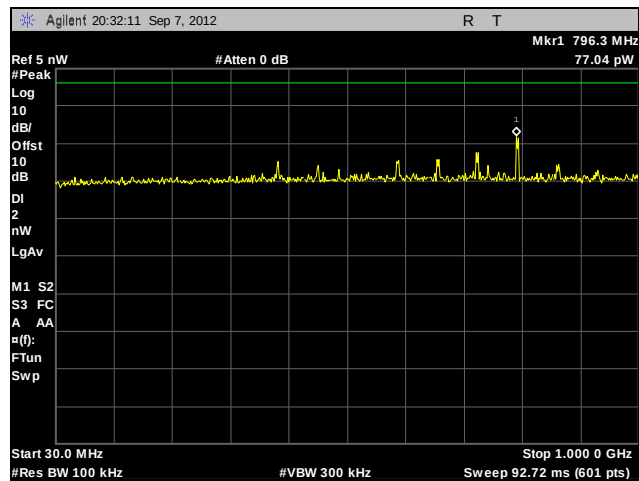
Plot 663. Receiver Spurious Emission, Port B, 30 MHz – 1 GHz



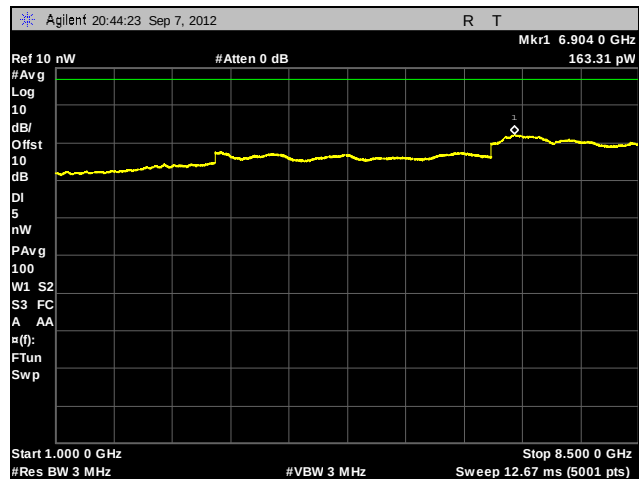
Plot 664. Receiver Spurious Emission, Port B, 1 GHz – 8.5 GHz



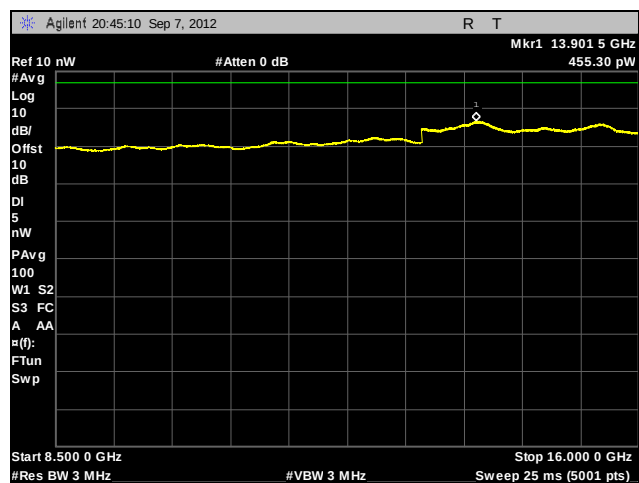
Plot 665. Receiver Spurious Emission, Port B, 8.5 GHz – 16 GHz



Plot 666. Receiver Spurious Emission, Port C, 30 MHz – 1 GHz



Plot 667. Receiver Spurious Emission, Port C, 1 GHz – 8.5 GHz



Plot 668. Receiver Spurious Emission, Port C, 8.5 GHz – 16 GHz



IV. Test Equipment



Test Equipment

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:2005.

MET Asset #	Equipment	Manufacturer	Model	Last Cal Date	Cal Due Date
1T4505	TEMPERATURE CHAMBER	TEST EQUITY	115	11/30/2011	11/30/2012
1T4564	LISN (24 AMP)	SOLAR ELECTRONICS	9252-50-R-24-BNC	10/28/2010	10/28/2011
1T4565	LISN (24 AMP)	SOLAR ELECTRONICS	9252-50-R-24-BNC	10/06/2010	10/06/2011
1T4787	HYGROMETER / THERMOMETER / BAROMETER / DEW POINT PEN	CONTROL COMPANY	15-078-198	2/15/2012	2/15/2014
1T4442	PREAMPLIFIER; MICROWAVE	MITEQ	AFS42-01001800-30-10P	SEE NOTE	
1T4752	PRE-AMPLIFIER	MITEQ	JS44-18004000-35-8P	SEE NOTE	
1T4771	SPECTRUM ANALYZER	AGILENT TECHNOLOGIES	E4446A	12/12/2011	12/12/2012
1T4612	SPECTRUM ANALYZER	AGILENT TECHNOLOGIES	E4407B	5/23/2012	11/23/2013
1T4409	EMI RECEIVER	ROHDE & SCHWARZ	ESIB7	7/16/2012	7/16/2013
1T4751	ANTENNA – BILOG	SUNOL SCIENCES	JB6	12/7/2011	12/7/2012
1T4757	ANTENNA; HORN	ETS-LINDGREN	3117	2/18/2012	8/18/2013
1T4745	ANTENNA; HORN	ETS-LINDGREN	3116	10/4/2011	10/4/2012

Table 18. Test Equipment List

Note: Functionally tested equipment is verified using calibrated instrumentation at the time of testing.



V. Certification & User's Manual Information



Certification & User's Manual Information

A. Certification Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 2, Subpart I — Marketing of Radio frequency devices:

§ 2.801 Radio-frequency device defined.

As used in this part, a radio-frequency device is any device which in its operation is capable of Emitting radio-frequency energy by radiation, conduction, or other means. Radio- frequency devices include, but are not limited to:

- (a) The various types of radio communication transmitting devices described throughout this chapter.
- (b) *The incidental, unintentional and intentional radiators defined in Part 15 of this chapter.*
- (c) The industrial, scientific, and medical equipment described in Part 18 of this chapter.
- (d) Any part or component thereof which in use emits radio-frequency energy by radiation, conduction, or other means.

§ 2.803 Marketing of radio frequency devices prior to equipment authorization.

- (a) Except as provided elsewhere in this chapter, no person shall sell or lease, or offer for sale or lease (including advertising for sale or lease), or import, ship or distribute for the purpose of selling or leasing or offering for sale or lease, any radio frequency device unless:
 - (1) In the case of a device subject to certification, such device has been authorized by the Commission in accordance with the rules in this chapter and is properly identified and labeled as required by §2.925 and other relevant sections in this chapter; or
 - (2) In the case of a device that is not required to have a grant of equipment authorization issued by the Commission, but which must comply with the specified technical standards prior to use, such device also complies with all applicable administrative (including verification of the equipment or authorization under a Declaration of Conformity, where required), technical, labeling and identification requirements specified in this chapter.
- (d) Notwithstanding the provisions of paragraph (a) of this section, the offer for sale solely to business, commercial, industrial, scientific or medical users (but not an offer for sale to other parties or to end users located in a residential environment) of a radio frequency device that is in the conceptual, developmental, design or pre-production stage is permitted prior to equipment authorization or, for devices not subject to the equipment authorization requirements, prior to a determination of compliance with the applicable technical requirements *provided* that the prospective buyer is advised in writing at the time of the offer for sale that the equipment is subject to the FCC rules and that the equipment will comply with the appropriate rules before delivery to the buyer or to centers of distribution.



- (e)(1) Notwithstanding the provisions of paragraph (a) of this section, prior to equipment authorization or determination of compliance with the applicable technical requirements any radio frequency device may be operated, but not marketed, for the following purposes and under the following conditions:
- (i) *Compliance testing;*
 - (ii) Demonstrations at a trade show provided the notice contained in paragraph (c) of this section is displayed in a conspicuous location on, or immediately adjacent to, the device;
 - (iii) Demonstrations at an exhibition conducted at a business, commercial, industrial, scientific or medical location, but excluding locations in a residential environment, provided the notice contained in paragraphs (c) or (d) of this section, as appropriate, is displayed in a conspicuous location on, or immediately adjacent to, the device;
 - (iv) Evaluation of product performance and determination of customer acceptability, provided such operation takes place at the manufacturer's facilities during developmental, design or pre-production states; or
 - (v) Evaluation of product performance and determination of customer acceptability where customer acceptability of a radio frequency device cannot be determined at the manufacturer's facilities because of size or unique capability of the device, provided the device is operated at a business, commercial, industrial, scientific or medical user's site, but not at a residential site, during the development, design or pre-production stages.
- (e)(2) For the purpose of paragraphs (e)(1)(iv) and (e)(1)(v) of this section, the term *manufacturer's facilities* includes the facilities of the party responsible for compliance with the regulations and the manufacturer's premises, as well as the facilities of other entities working under the authorization of the responsible party in connection with the development and manufacture, but not the marketing, of the equipment.
- (f) For radio frequency devices subject to verification and sold solely to business, commercial, industrial, scientific and medical users (excluding products sold to other parties or for operation in a residential environment), parties responsible for verification of the devices shall have the option of ensuring compliance with the applicable technical specifications of this chapter at each end user's location after installation, provided that the purchase or lease agreement includes a proviso that such a determination of compliance be made and is the responsibility of the party responsible for verification of the equipment.



Certification & User's Manual Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 2, Subpart J — Equipment Authorization Procedures:

§ 2.901 Basis and Purpose

- (a) In order to carry out its responsibilities under the Communications Act and the various treaties and international regulations, and in order to promote efficient use of the radio spectrum, the Commission has developed technical standards for radio frequency equipment and parts or components thereof. The technical standards applicable to individual types of equipment are found in that part of the rules governing the service wherein the equipment is to be operated.¹ *In addition to the technical standards provided, the rules governing the service may require that such equipment be verified by the manufacturer or importer, be authorized under a Declaration of Conformity, or receive an equipment authorization from the Commission by one of the following procedures: certification or registration.*
- (b) The following sections describe the verification procedure, the procedure for a Declaration of Conformity, and the procedures to be followed in obtaining certification from the Commission and the conditions attendant to such a grant.

§ 2.907 Certification.

- (a) Certification is an equipment authorization issued by the Commission, based on representation and test data submitted by the applicant.
- (b) Certification attaches to all units subsequently marketed by the grantee which are identical (see Section 2.908) to the sample tested except for permissive changes or other variations authorized by the Commission pursuant to Section 2.1043.

¹ In this case, the equipment is subject to the rules of Part 15. More specifically, the equipment falls under Subpart B (of Part 15), which deals with unintentional radiators.



Certification & User's Manual Information

§ 2.948 Description of measurement facilities.

- (a) Each party making measurements of equipment that is subject to an equipment authorization under Part 15 or Part 18 of this chapter, regardless of whether the measurements are filed with the Commission or kept on file by the party responsible for compliance of equipment marketed within the U.S. or its possessions, shall compile a description of the measurement facilities employed.
 - (1) If the measured equipment is subject to the verification procedure, the description of the measurement facilities shall be retained by the party responsible for verification of the equipment.
 - (i) *If the equipment is verified through measurements performed by an independent laboratory, it is acceptable for the party responsible for verification of the equipment to rely upon the description of the measurement facilities retained by or placed on file with the Commission by that laboratory. In this situation, the party responsible for the verification of the equipment is not required to retain a duplicate copy of the description of the measurement facilities.*
 - (ii) If the equipment is verified based on measurements performed at the installation site of the equipment, no specific site calibration data is required. It is acceptable to retain the description of the measurement facilities at the site at which the measurements were performed.
 - (2) If the equipment is to be authorized by the Commission under the certification procedure, the description of the measurement facilities shall be filed with the Commission's Laboratory in Columbia, Maryland. The data describing the measurement facilities need only be filed once but must be updated as changes are made to the measurement facilities or as otherwise described in this section. At least every three years, the organization responsible for filing the data with the Commission shall certify that the data on file is current.



Certification & User's Manual Information

Label and User's Manual Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 15, Subpart A — General:

§ 15.19 Labeling requirements.

(a) *In addition to the requirements in Part 2 of this chapter, a device subject to certification or verification shall be labeled as follows:*

- (1) Receivers associated with the operation of a licensed radio service, e.g., FM broadcast under Part 73 of this chapter, land mobile operation under Part 90, etc., shall bear the following statement in a conspicuous location on the device:

This device complies with Part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.

- (2) A stand-alone cable input selector switch, shall bear the following statement in a conspicuous location on the device:

This device is verified to comply with Part 15 of the FCC Rules for use with cable television service.

- (3) All other devices shall bear the following statement in a conspicuous location on the device:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

- (4) Where a device is constructed in two or more sections connected by wires and marketed together, the statement specified under paragraph (a) of this section is required to be affixed only to the main control unit.

- (5) When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (a) of this section on it, the information required by this paragraph shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed. However, the FCC identifier or the unique identifier, as appropriate, must be displayed on the device.

§ 15.21 Information to user.

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.



Verification & User's Manual Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 15, Subpart B — Unintentional Radiators:

§ 15.105 Information to the user.

- (a) For a Class A digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at own expense.

- (b) For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.



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