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
13301 MCCALLEN PASS ● AUSTIN, TX 78753 ● PHONE (512) 287-2500 ● FAX (512) 287-2513

November 7, 2012

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

Dear Bob Greenway,

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.), Title 47 of the CFR, Part 15 Subpart E and RSS-210, Issue 8, Dec. 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.\EMC35330A-FCC407)

MET Laboratories, Inc. *Safety Certification - EMI - Telecom Environmental Simulation*
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Electromagnetic Compatibility Criteria
Class II Permissive Change
Test Report

for the

Motorola Solutions, Inc.
Model AP-7161

Tested under
the FCC Certification Rules
contained in
Title 47 of the CFR, Parts 15 Subpart E
& RSS-210, Issue 8, Dec. 2010
for Intentional Radiators

MET Report: EMC35330A-FCC407

November 7, 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

Electromagnetic Compatibility Criteria
Class II Permissive Change
Test Report

for the

Motorola Solutions, Inc.
Model AP-7161

the Certification Rules
contained in
Title 47 of the CFR, Part 15, Subpart B
for Unintentional Radiators
and
Title 47 of the CFR, Part 15.407
for Intentional Radiators

Ben Taylor, 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 Parts 15B, 15.407, of the FCC Rules under normal use and maintenance.

Dusmantha Tennakoon, Wireless Manager
Electromagnetic Compatibility Lab

Report Status Sheet

Revision	Report Date	Reason for Revision
∅	November 7, 2012	Initial Issue.

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List of Terms and Abbreviations

AC	**A**lternating **C**urrent
ACF	**A**ntenna **C**orrection **F**actor
Cal	**Cal**ibration
d	**M**easurement **D**istance
dB	**D**eci**b**els
dBµA	**D**eci**b**els above one **micro**amp
dBµV	**D**eci**b**els above one **micro**volt
dBµA/m	**D**eci**b**els above one **micro**amp **per m**eter
dBµV/m	**D**eci**b**els above one **micro**volt **per m**eter
DC	**D**irect **C**urrent
E	**E**lectric Field
DSL	**D**igital **S**ubscriber **L**ine
ESD	**E**lectro**s**tatic **D**ischarge
EUT	**E**quipment **U**nder **T**est
f	**F**requency
FCC	**F**ederal **C**ommunications **C**ommission
GRP	**G**round **R**eference **P**lane
H	Magnetic Field
HCP	**H**orizontal **C**oupling **P**lane
Hz	**H**ert**z**
IEC	**I**nternational **E**lectrotechnical **C**ommission
kHz	**k**ilo**h**ert**z**
kPa	**k**ilo**pa**scal
kV	**k**ilo**v**olt
LISN	**L**ine **I**mpedance **S**tabilization **N**etwork
MHz	**M**ega**h**ertz
µH	**microh**enry
µ	**microf**arad
µs	**micros**econds
PRF	**P**ulse **R**epetition **F**requency
RF	**R**adio **F**requency
RMS	**R**oot-**M**ean-**S**quare
TWT	**T**raveling **W**ave **T**ube
V/m	**V**olts **per m**eter
VCP	**V**ertical **C**oupling **P**lane

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 Part 15, §15.407. 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 Part 15, §15.407, in accordance with Motorola Solutions, Inc., purchase order number NP5490326. All tests were conducted using measurement procedure ANSI C63.4-2003.

FCC Reference	Description	Results
15.203	Antenna Requirements	Compliant
15.407 (a)(2)	Conducted Transmitter Output Power	Compliant
15.407 (b)(2), (3), (5), (6)	Undesirable Emissions (15.205/15.209 - General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Compliant

Table 1. Executive Summary of EMC Part 15.407 Class II Permissive Change ComplianceTesting

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 NP5490326.

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
	Equipment Code:	NII
	EUT Frequency Ranges:	5260MHz-5700MHz
Analysis:	The results obtained relate only to the item(s) tested.	
Environmental Test Conditions:	Temperature: 15-35º C	
	Relative Humidity: 30-60%	
	Barometric Pressure: 860-1060 mbar	
Evaluated by:	Ben Taylor	
Report Date(s):	August 17, 2012	

Table 2. EUT Summary

B. References

CFR 47, Part 15, Subpart B	Electromagnetic Compatibility: Criteria for Radio Frequency Devices
CFR 47, Part 15, Subpart E	Unlicensed National Information Infrastructure Devices (UNII)
RSS-210, Issue 8, Dec. 2010	Low-power Licence-exempt Radiocommunications Devices (All Frequency Bands): Category I Equipment
RSS-GEN, Issue 3, Dec. 2010	General Requirements and Information for the Certification of Radio Apparatus
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

Table 3. References

C. Test Site

All testing was performed at MET Laboratories, Inc., 914 W. Patapsco Ave., Baltimore, MD 2130. 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 a Wireless Access Point.

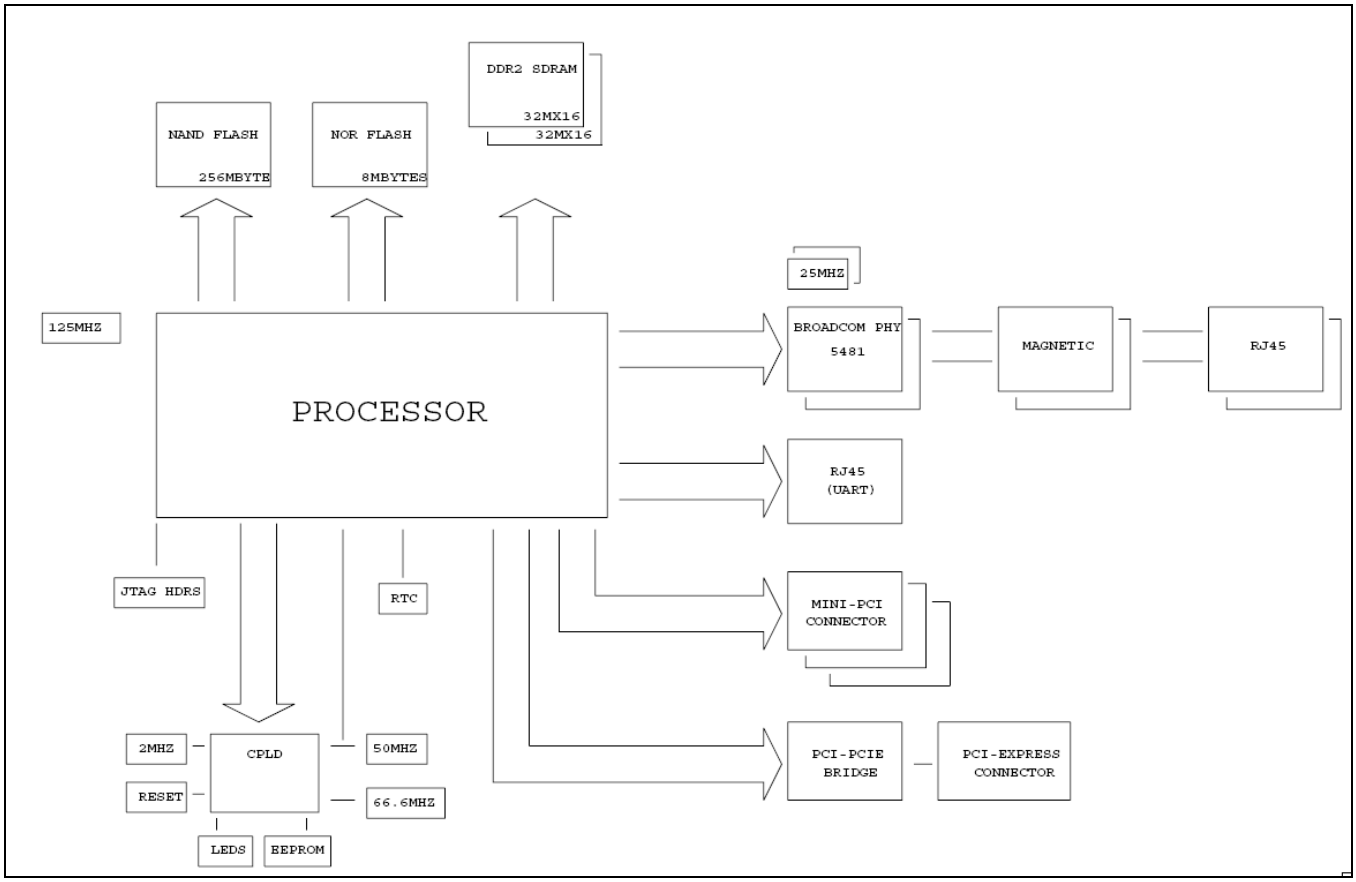


Figure 1. Block Diagram of Test Configuration

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

Motorola Solutions, Inc. supplied support equipment necessary for the operation and testing of the AP-7161. All support equipment supplied is listed in the following Support Equipment List.

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

Table 5. Support Equipment

G. Ports and Cabling Information

Ref. ID	Port Name on EUT	Cable Description	Qty.	Length (m)	Shielded (Y/N)	Termination Point
N/A	GE1/PoE	Cat5	1	N/A	Y	N/A
N/A	Console	RJ-45	1	N/A	N	N/A

Table 6. Ports and Cabling Information

H. Mode of Operation

Laptop connected through Ethernet runs Winprius software. Commands are entered to control channel, power and data rate on all radios.

I. Method of Monitoring EUT Operation

Spectrum Analyzer.

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 EUT is compliant with the criteria of §15.203. The EUT and its antenna require professional installation.

Test Engineer(s): Ben Taylor

Test Date(s): 06/08/12

Antenna Type	Part Number	Gain (dBi)
3-Port Dual-Band Dir Panel (2 Vert and 1 Hor ports)	ML-2452-PNL9M3-036	10.07 / 8.0
Dual-band -3 Patch elements, Vertical Pol	VMT244903PTSM-MT4	6.57 / 5.98

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15. 407(a)(2) RF Power Output

Test Requirements: **§15.407(a)(2):** The maximum output power of the intentional radiator shall not exceed the following:

§15.407(a) (2): For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10log B, where B is the 26 dB emission bandwidth in megahertz.

Test Procedure: The EUT was connected to a Spectrum Analyzer. The power was measured on the EUT's low, mid and high channels.

Test Results: Equipment was compliant with the Peak Power Output limits of **§ 15.401(a)(2)**.

Test Engineer(s): Ben Taylor

Test Date(s): 06/11/12

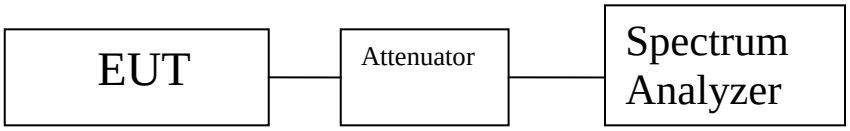


Figure 2. Power Output Test Setup

Frequency (MHz)	Mode/Modulation Type	Port A Conducted Power (dBm)	Port B Conducted Power (dBm)	Port C Conducted Power (dBm)	Summed Conducted Power (mW)	Summed Conducted Power (dBm)
5260	802.11a	10.81	--	--	14.0503594	10.81
5300	802.11a	10.78	--	--	13.9674053	10.78
5320	802.11a	10.92	--	--	14.3594743	10.92
5500	802.11a	10.84	--	--	14.1338885	10.84
5580	802.11a	10.83	--	--	14.1059813	10.83
5700	802.11a	10.88	--	--	14.246162	10.88
5260	802.11n HT20	5.6	5.62	7.11	12.4187565	10.940781
5300	802.11n HT20	4.56	6.11	7.37	12.398363	10.933643
5320	802.11n HT20	3.94	5.82	7.31	11.6795626	10.674266
5500	802.11n HT20	6.54	5.54	5.35	11.5168093	10.613322
5580	802.11n HT20	6.2	5.94	5.34	11.5149376	10.612616
5700	802.11n HT20	4.55	6.24	6.68	11.7141455	10.687106
5270	802.11n HT40	6.15	6.14	6.3	12.4982676	10.968498
5300	802.11n HT40	5.34	5.56	6.79	11.7925805	10.716089
5310	802.11n HT40	3.77	6.24	7.65	12.4106179	10.937934
5510	802.11n HT40	6.19	5.82	6.24	12.1858151	10.858546
5580	802.11n HT40	6.3	6.26	5.83	12.3207288	10.906364
5690	802.11n HT40	5.45	5.99	6.74	12.2000646	10.863621

Table 7. RF Power Output, Test Results

Note: The power values reflected in this table (columns A-J) are based on the Conducted limit's GUI setting (Column K).

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.407(b)(2), (3), (6), (7) Undesirable Emissions

Test Requirements: **§ 15.407(b)(2), (3), (6), (7)**; **§15.205:** Emissions outside the frequency band.

§ 15.407(b)(2): For transmitters operating in the 5.25-5.35 GHz band: all emissions outside of the 5.15-5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz. Devices operating in the 5.25-5.35 GHz band that generate emissions in the 5.15-5.25 GHz band must meet all applicable technical requirements for operation in the 5.15-5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of -27 dBm/MHz in the 5.15-5.25 GHz band.

§ 15.407(b)(3): For transmitters operating in the 5.47-5.725 GHz band: all emissions outside of the 5.47-5.725 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 an acrylic 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.

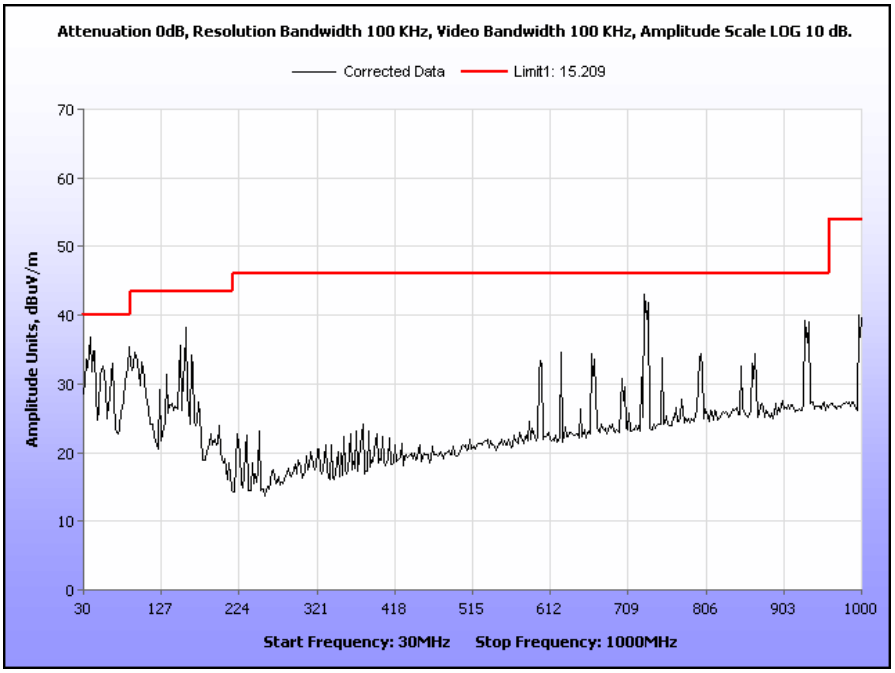
For frequencies from 30 MHz to 1 GHz, measurements were made using a quasi-peak detector with a 120 kHz bandwidth.

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

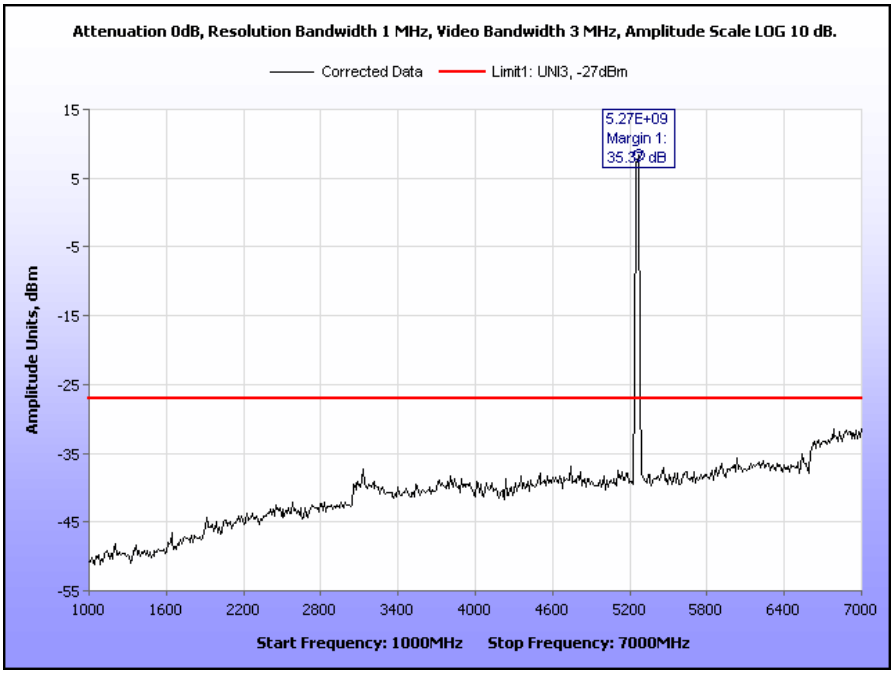
Test Results: The EUT was compliant with the Radiated Emission limits for Intentional Radiators. See following pages for detailed test results.

Test Engineer(s): Ben Taylor

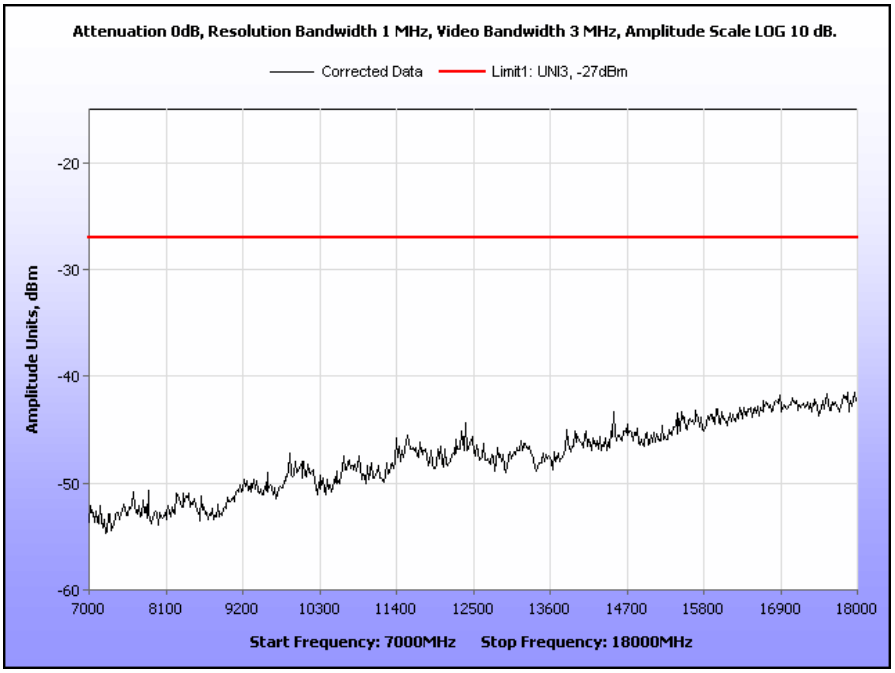
Test Date(s): 06/08/12 – 06/11/12



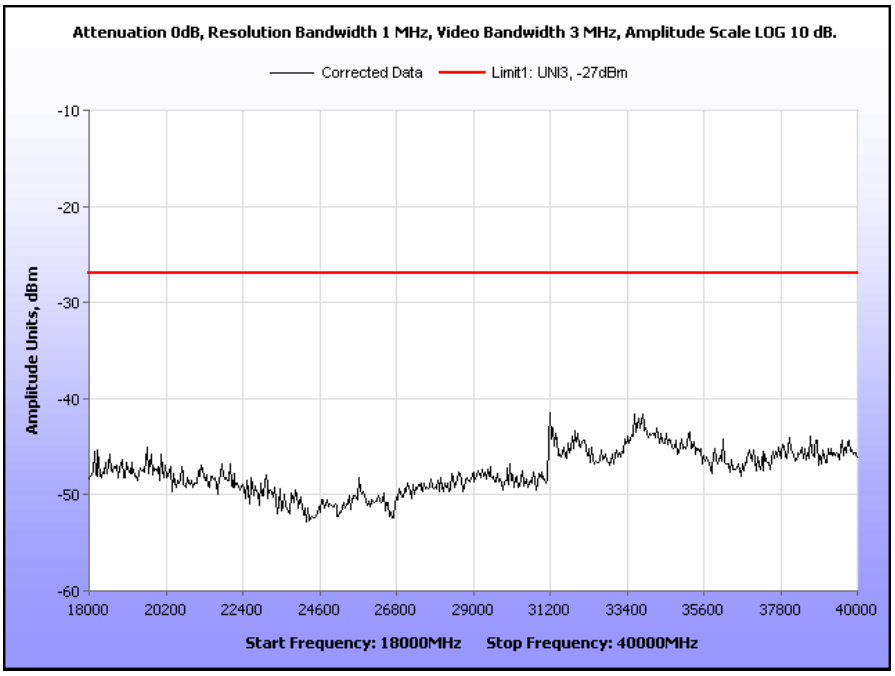
Plot 1. Radiated Spurious Emissions, 802.11a, 5260 MHz, 30 MHz – 1 GHz, Panel



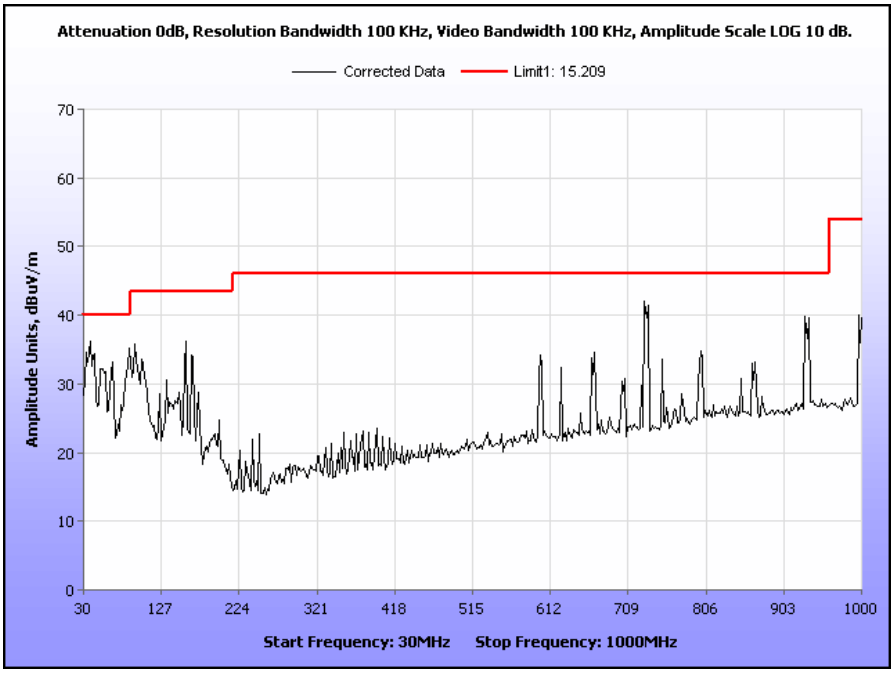
Plot 2. Radiated Spurious Emissions, 802.11a, 5260 MHz, 1 GHz – 7 GHz, Panel



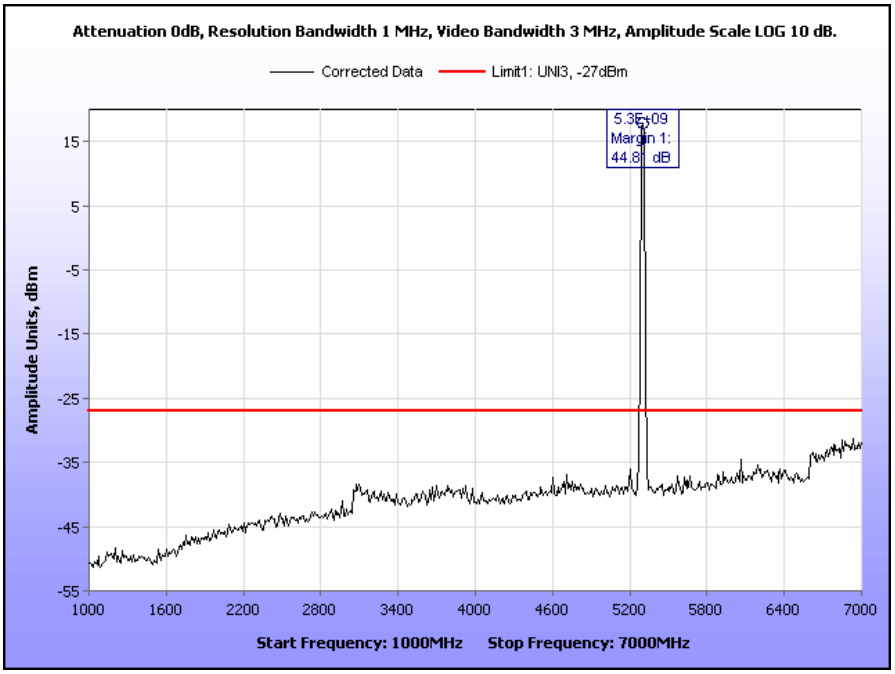
Plot 3. Radiated Spurious Emissions, 802.11a, 5260 MHz, 7 GHz – 18 GHz, Panel



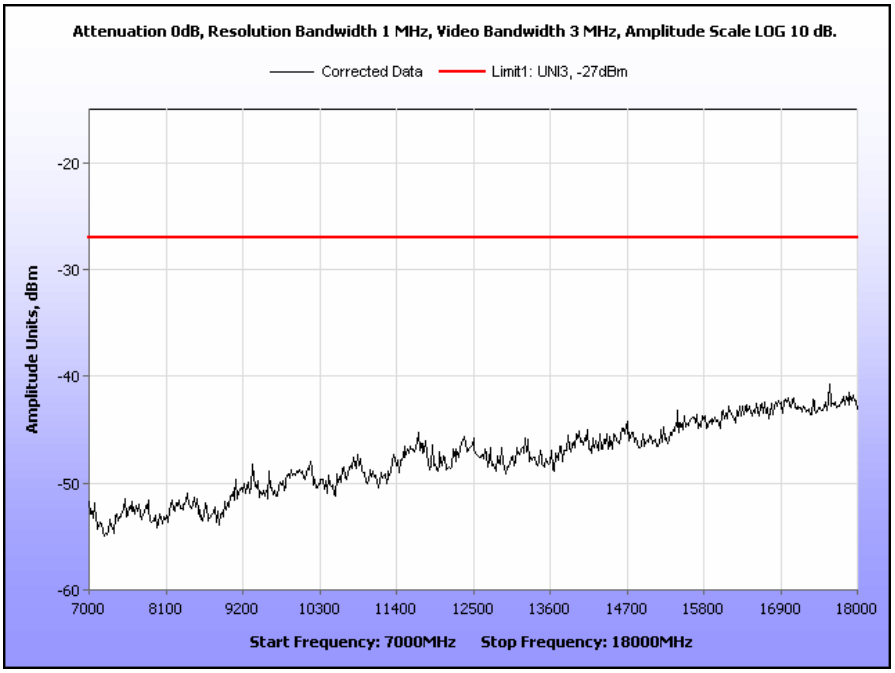
Plot 4. Radiated Spurious Emissions, 802.11a, 5260 MHz, 18 GHz – 40 GHz, Panel



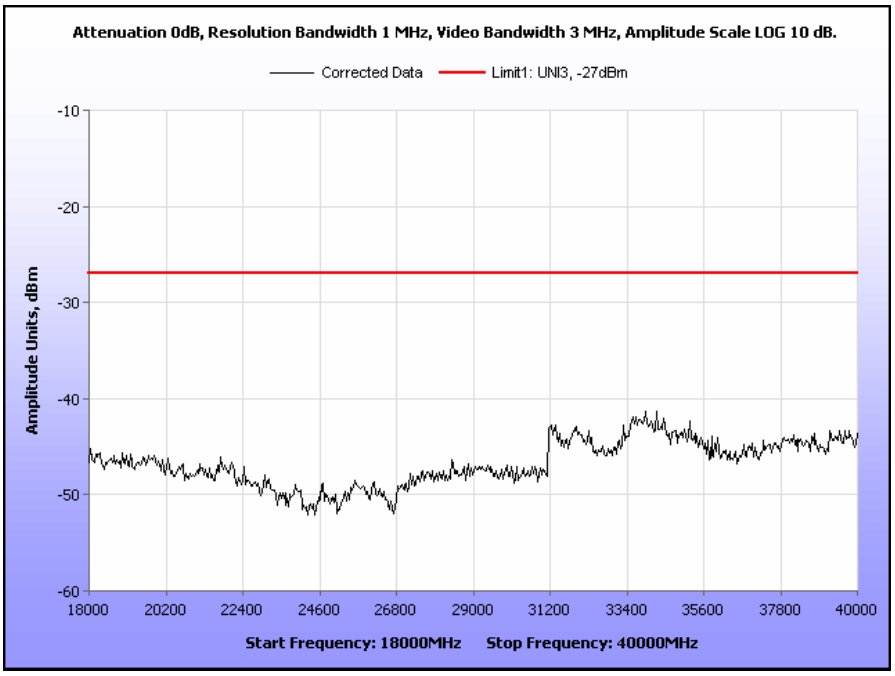
Plot 5. Radiated Spurious Emissions, 802.11a, 5300 MHz, 30 MHz – 1 GHz, Panel



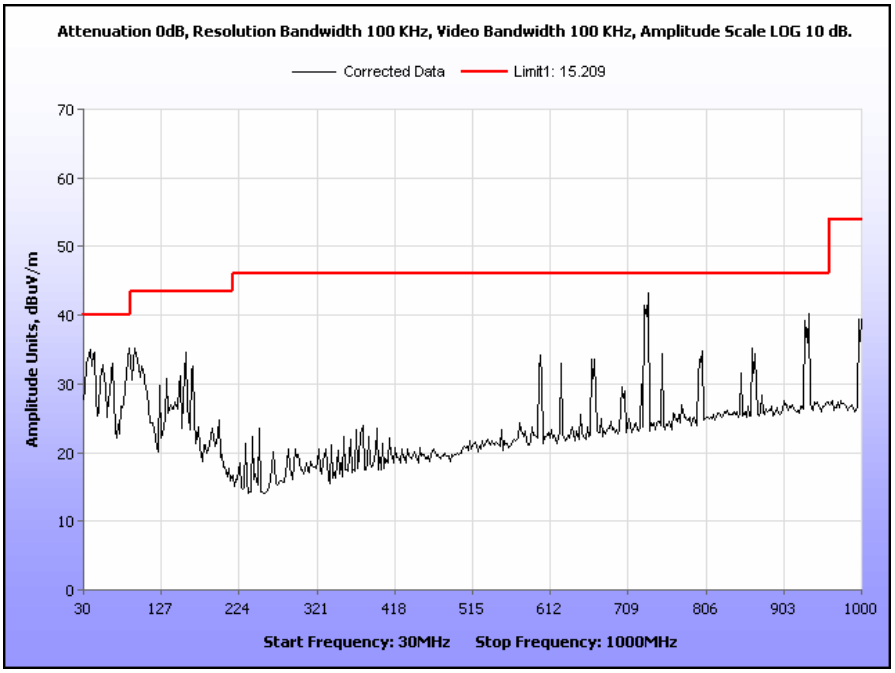
Plot 6. Radiated Spurious Emissions, 802.11a, 5300 MHz, 1 GHz – 7 GHz, Panel



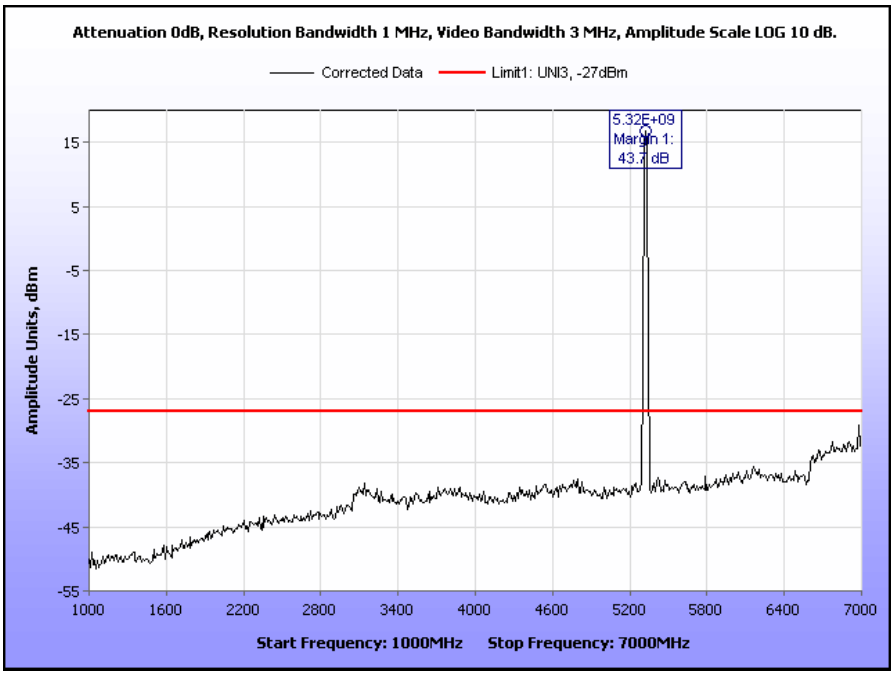
Plot 7. Radiated Spurious Emissions, 802.11a, 5300 MHz, 7 GHz – 18 GHz, Panel



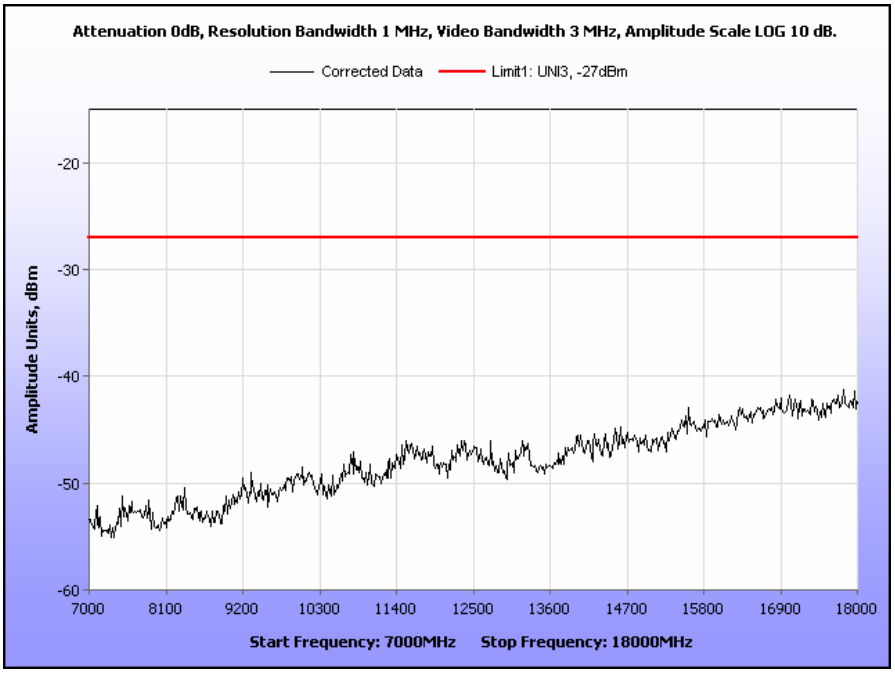
Plot 8. Radiated Spurious Emissions, 802.11a, 5300 MHz, 18 GHz – 40 GHz, Panel



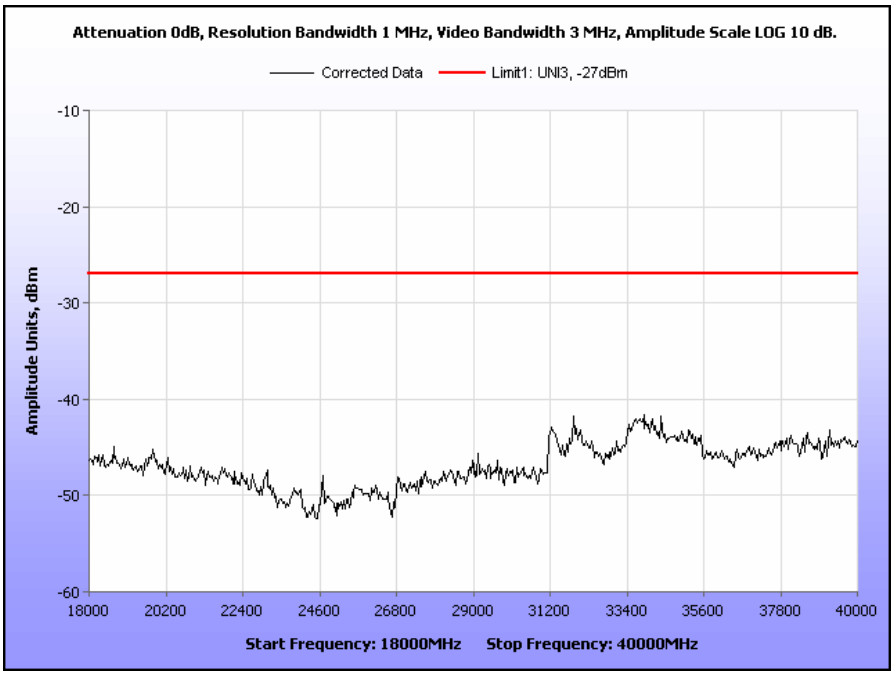
Plot 9. Radiated Spurious Emissions, 802.11a, 5320 MHz, 30 MHz – 1 GHz, Panel



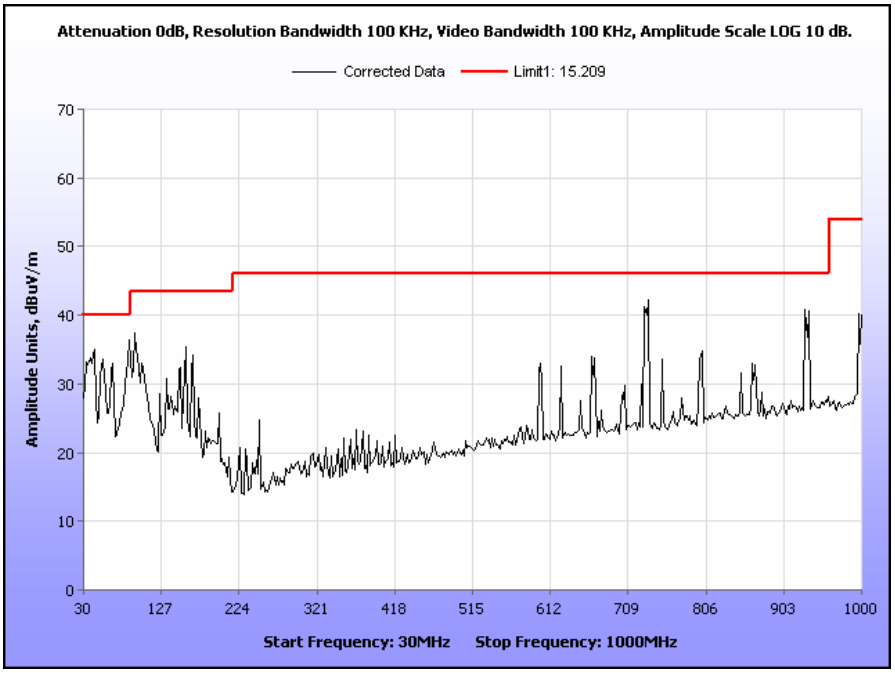
Plot 10. Radiated Spurious Emissions, 802.11a, 5320 MHz, 1 GHz – 7 GHz, Panel



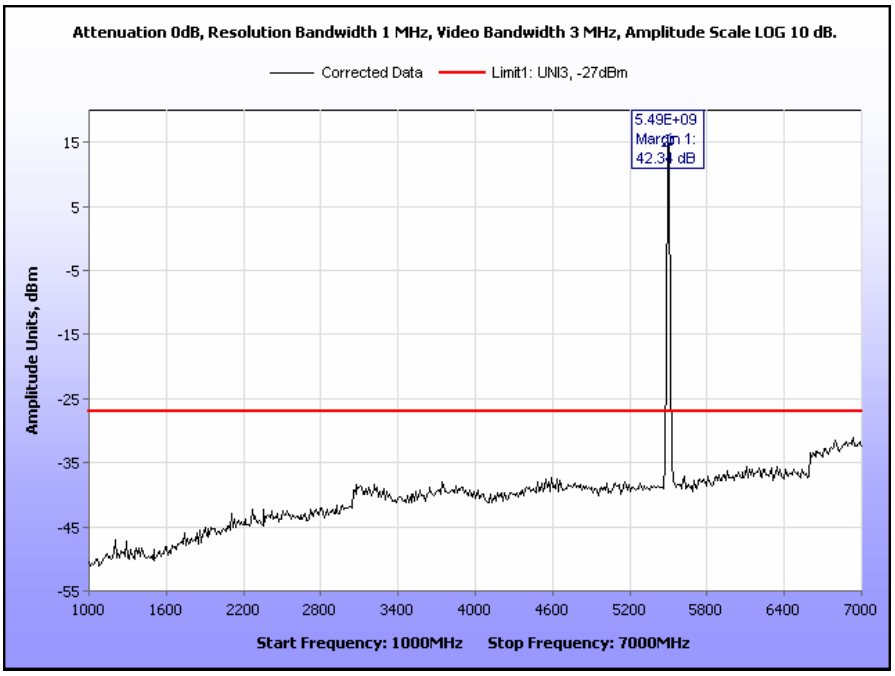
Plot 11. Radiated Spurious Emissions, 802.11a, 5320 MHz, 7 GHz – 18 GHz, Panel



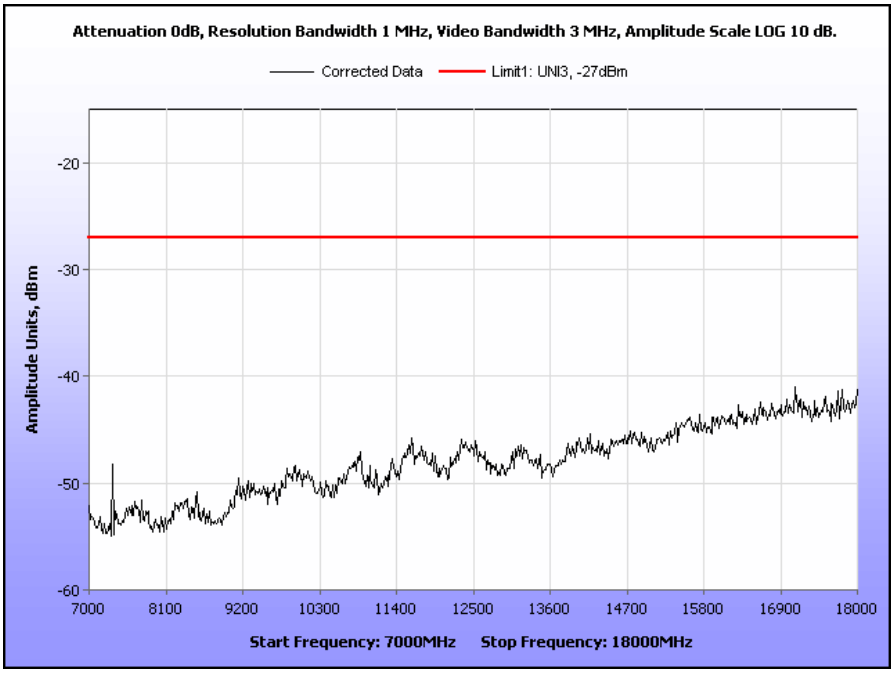
Plot 12. Radiated Spurious Emissions, 802.11a, 5320 MHz, 18 GHz – 40 GHz, Panel



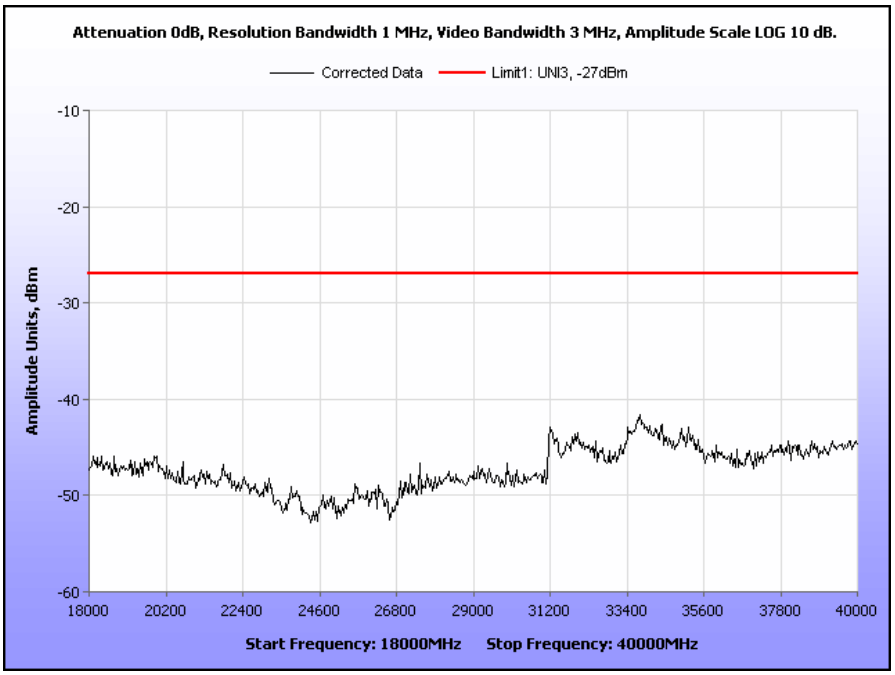
Plot 13. Radiated Spurious Emissions, 802.11a, 5500 MHz, 30 MHz – 1 GHz, Panel



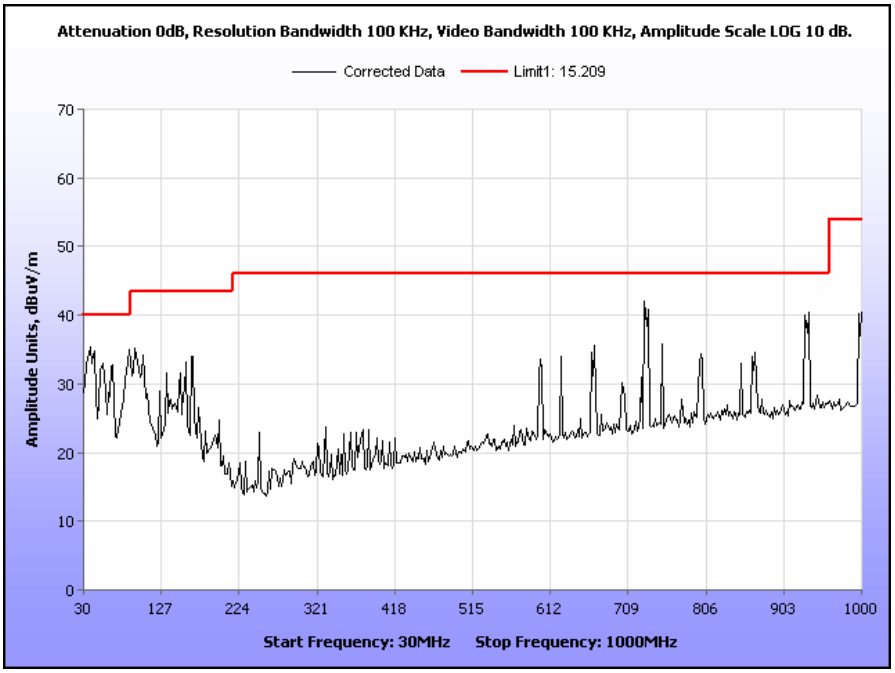
Plot 14. Radiated Spurious Emissions, 802.11a, 5500 MHz, 1 GHz – 7 GHz, Panel



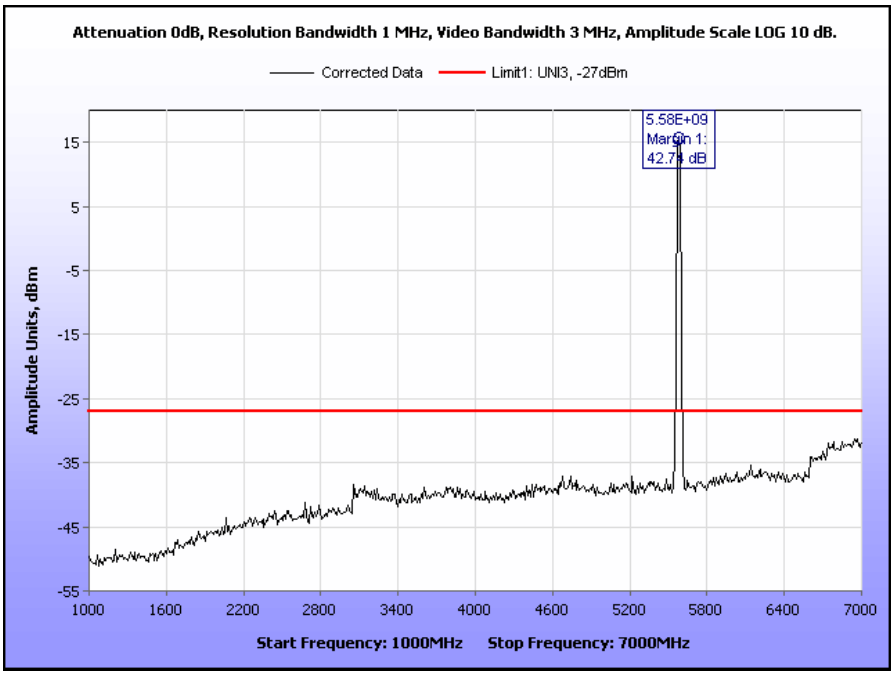
Plot 15. Radiated Spurious Emissions, 802.11a, 5500 MHz, 7 GHz – 18 GHz, Panel



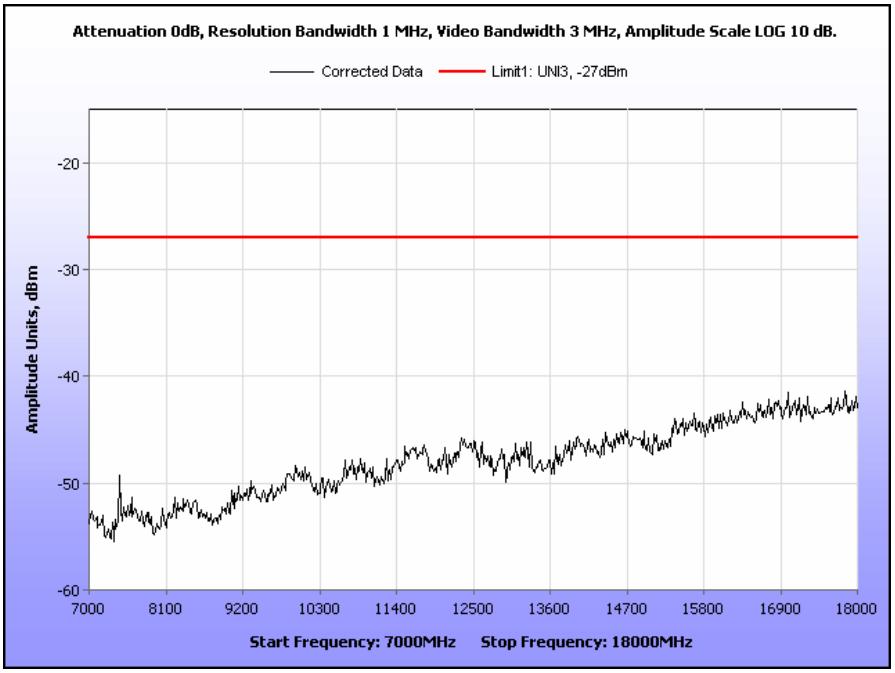
Plot 16. Radiated Spurious Emissions, 802.11a, 5500 MHz, 18 GHz – 40 GHz, Panel



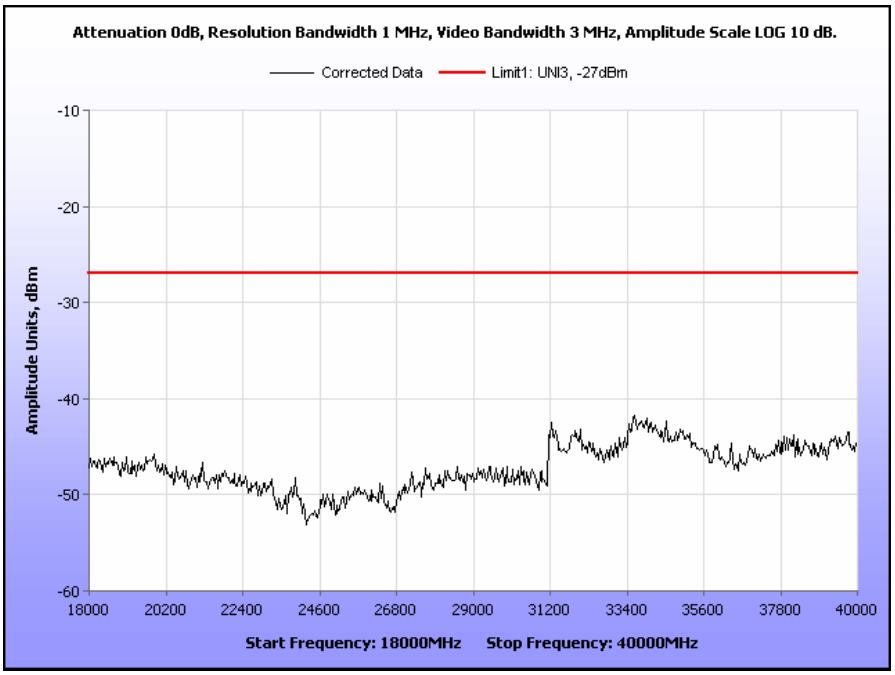
Plot 17. Radiated Spurious Emissions, 802.11a, 5580 MHz, 30 MHz – 1 GHz, Panel



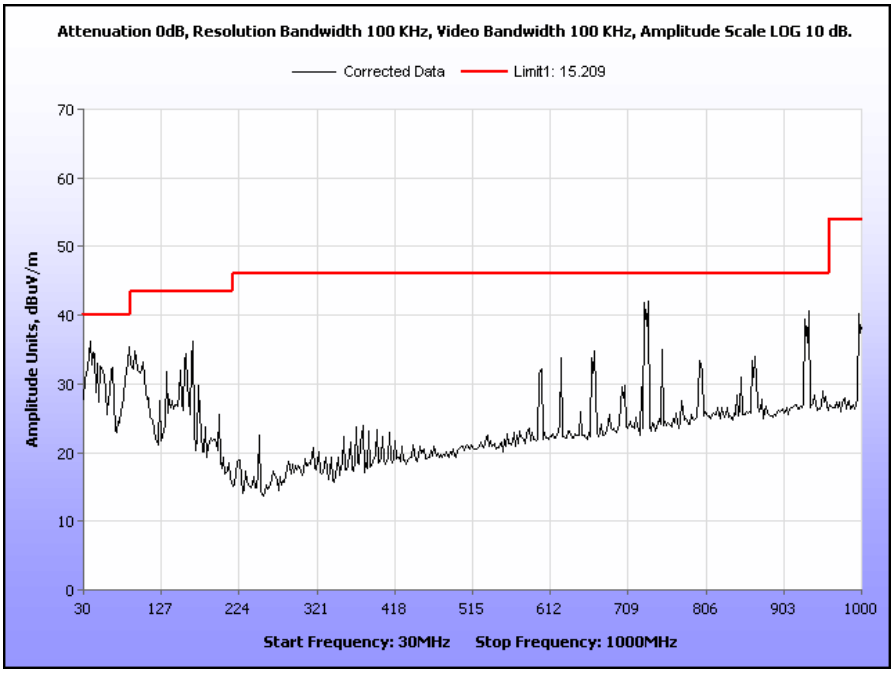
Plot 18. Radiated Spurious Emissions, 802.11a, 5580 MHz, 1 GHz – 7 GHz, Panel



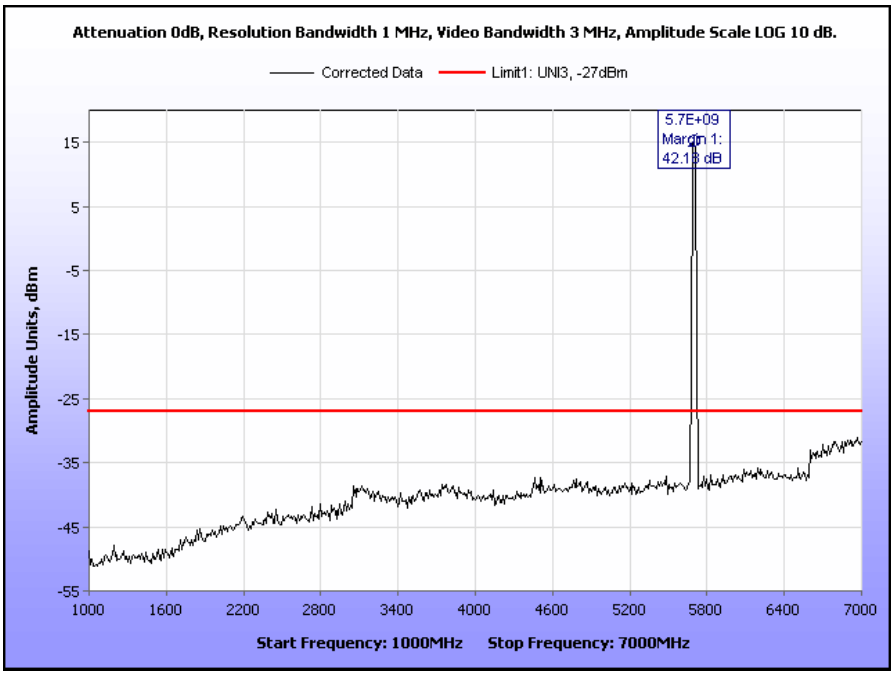
Plot 19. Radiated Spurious Emissions, 802.11a, 5580 MHz, 7 GHz – 18 GHz, Panel



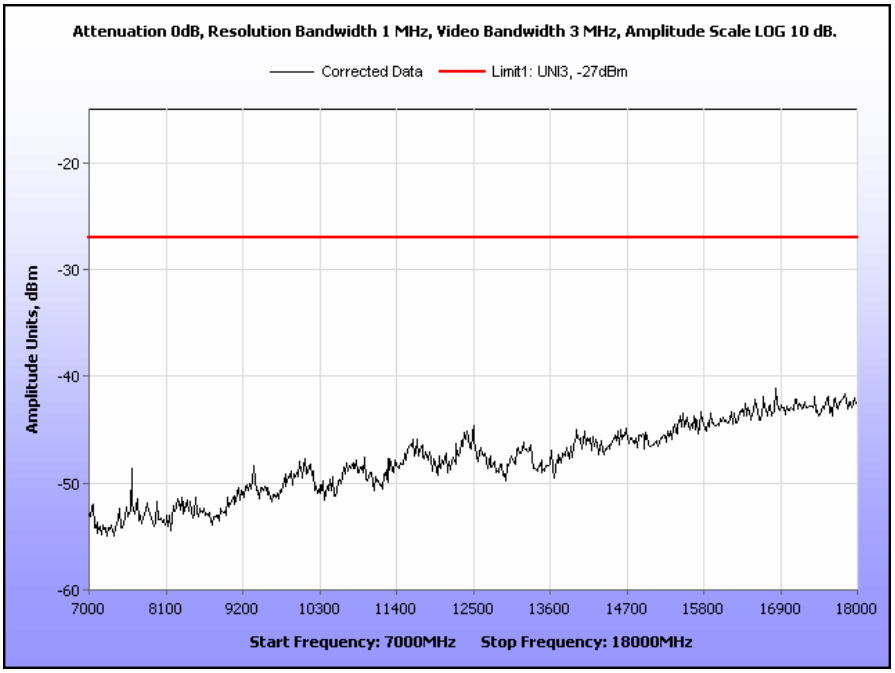
Plot 20. Radiated Spurious Emissions, 802.11a, 5580 MHz, 18 GHz – 40 GHz, Panel



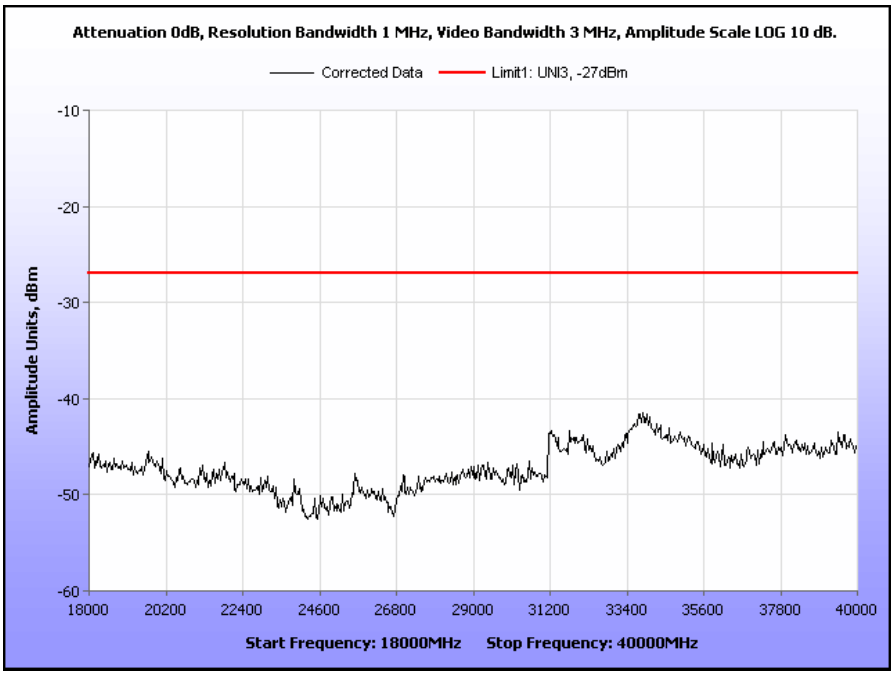
Plot 21. Radiated Spurious Emissions, 802.11a, 5700 MHz, 30 MHz – 1 GHz, Panel



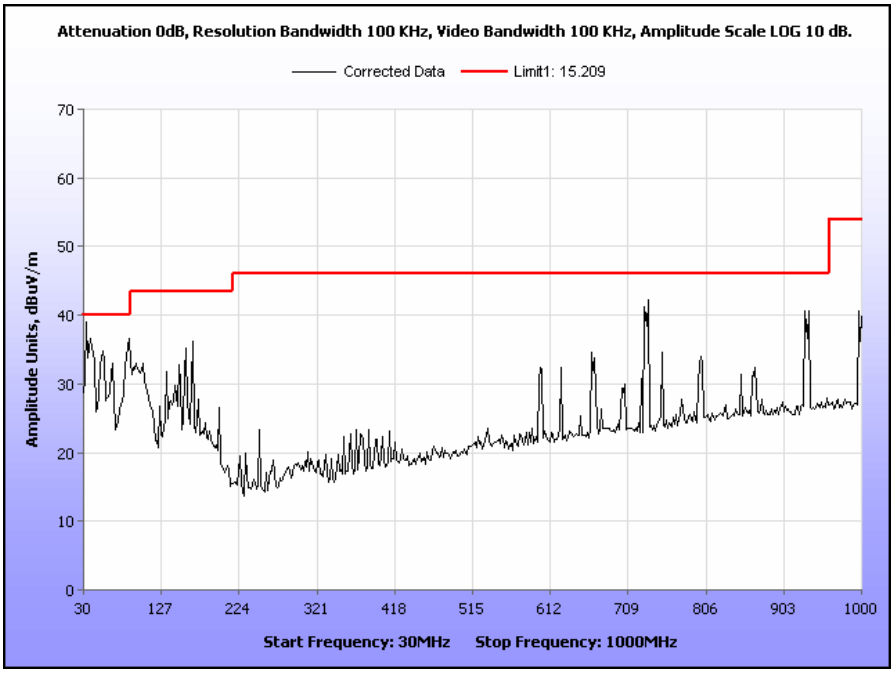
Plot 22. Radiated Spurious Emissions, 802.11a, 5700 MHz, 1 GHz – 7 GHz, Panel



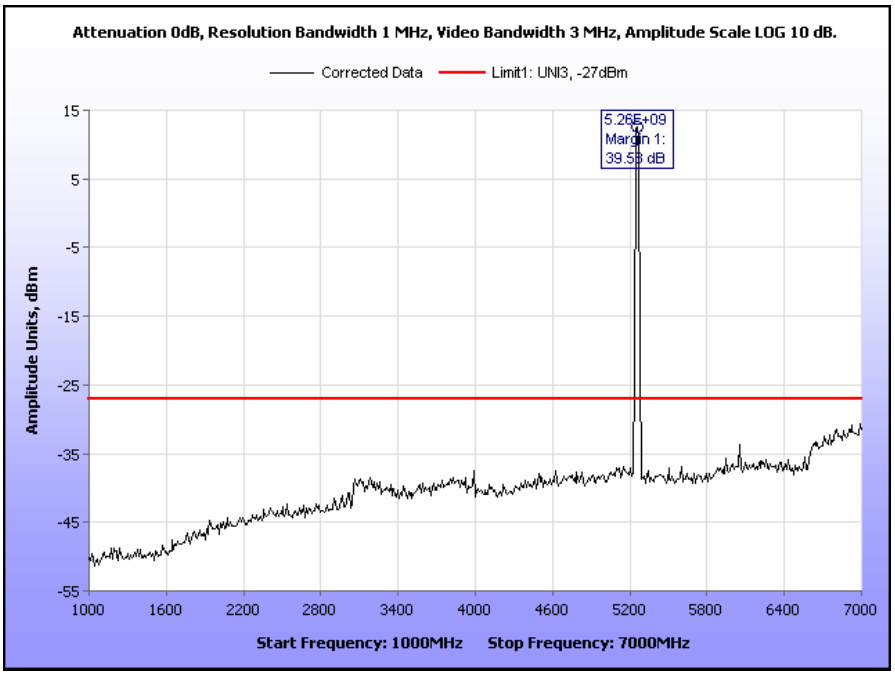
Plot 23. Radiated Spurious Emissions, 802.11a, 5700 MHz, 7 GHz – 18 GHz, Panel



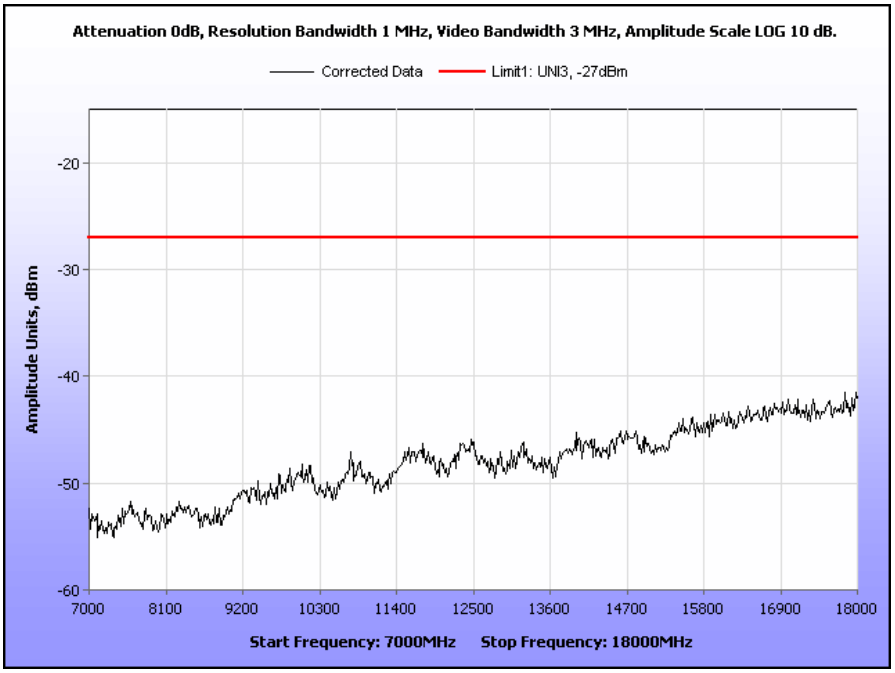
Plot 24. Radiated Spurious Emissions, 802.11a, 5700 MHz, 18 GHz – 40 GHz, Panel



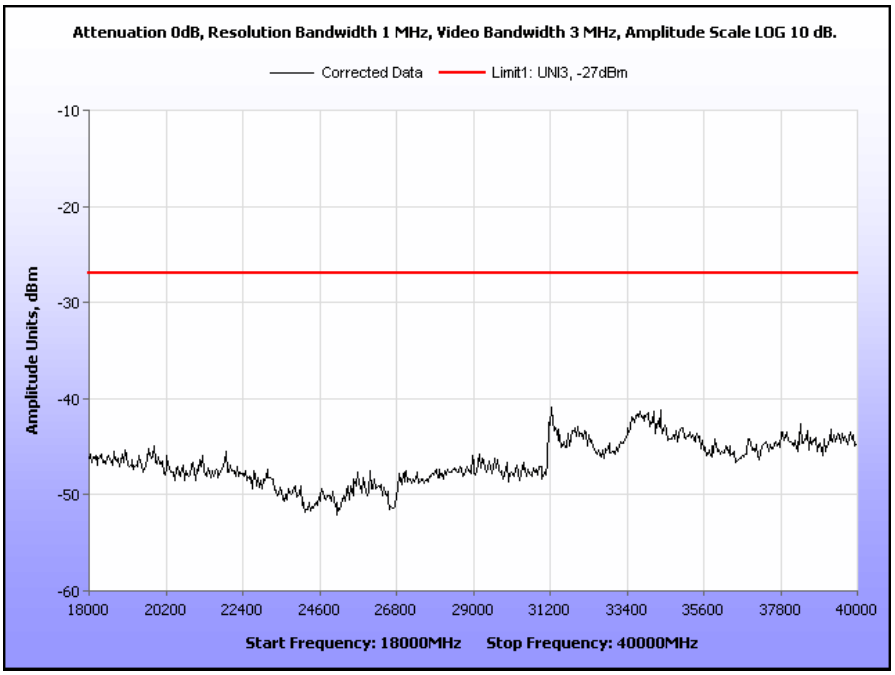
Plot 25. Radiated Spurious Emissions, 802.11n 20 MHz, 5260 MHz, 30 MHz – 1 GHz, Panel



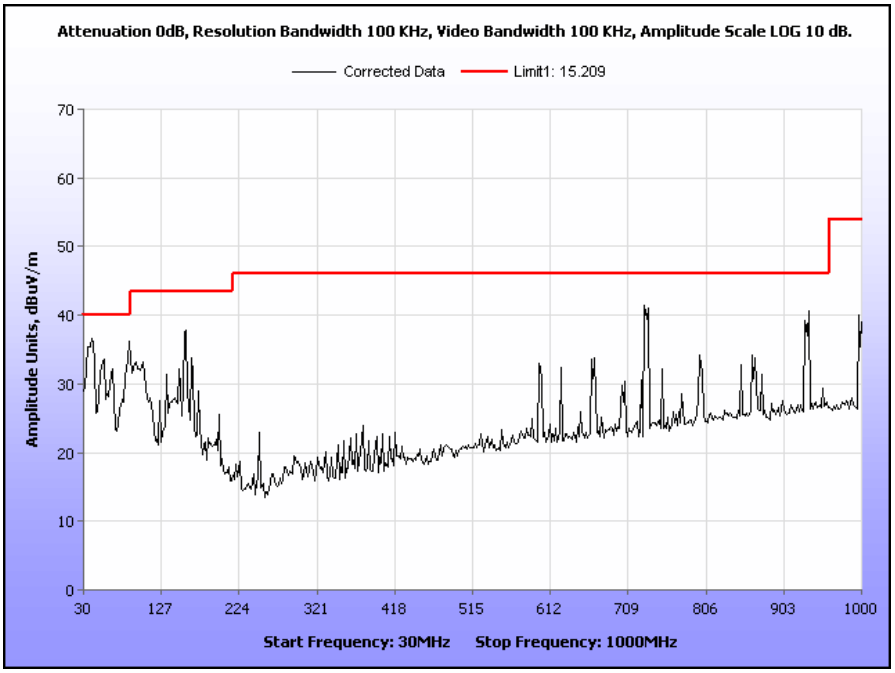
Plot 26. Radiated Spurious Emissions, 802.11n 20 MHz, 5260 MHz, 1 GHz – 7 GHz, Panel



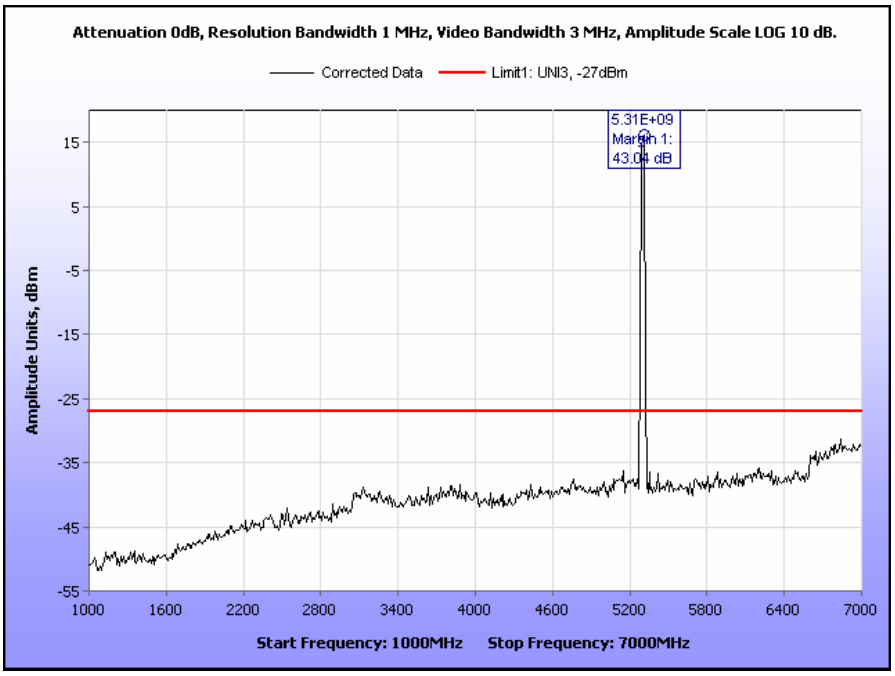
Plot 27. Radiated Spurious Emissions, 802.11n 20 MHz, 5260 MHz, 7 GHz – 18 GHz, Panel



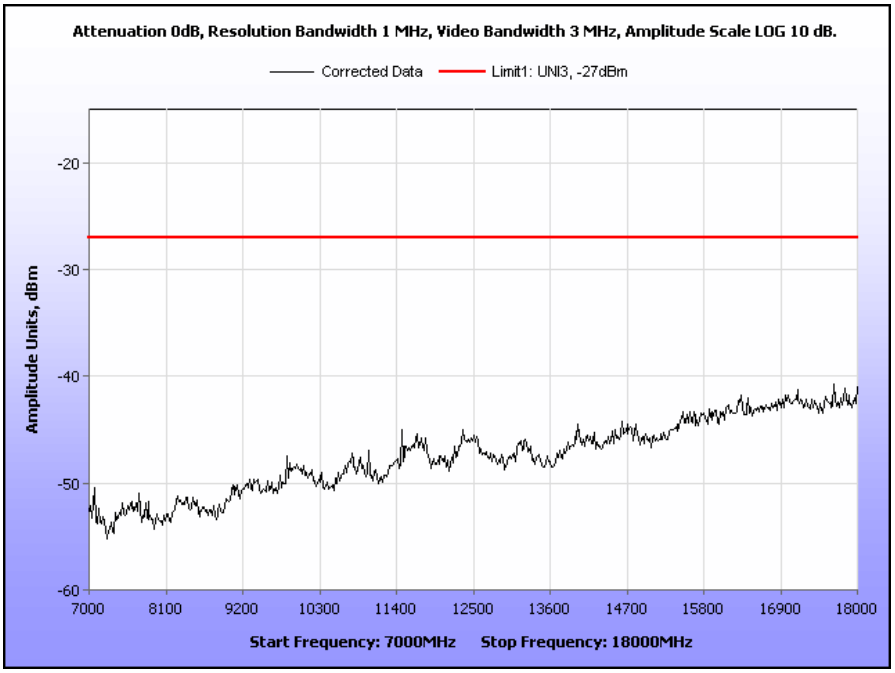
Plot 28. Radiated Spurious Emissions, 802.11n 20 MHz, 5260 MHz, 18 GHz – 40 GHz, Panel



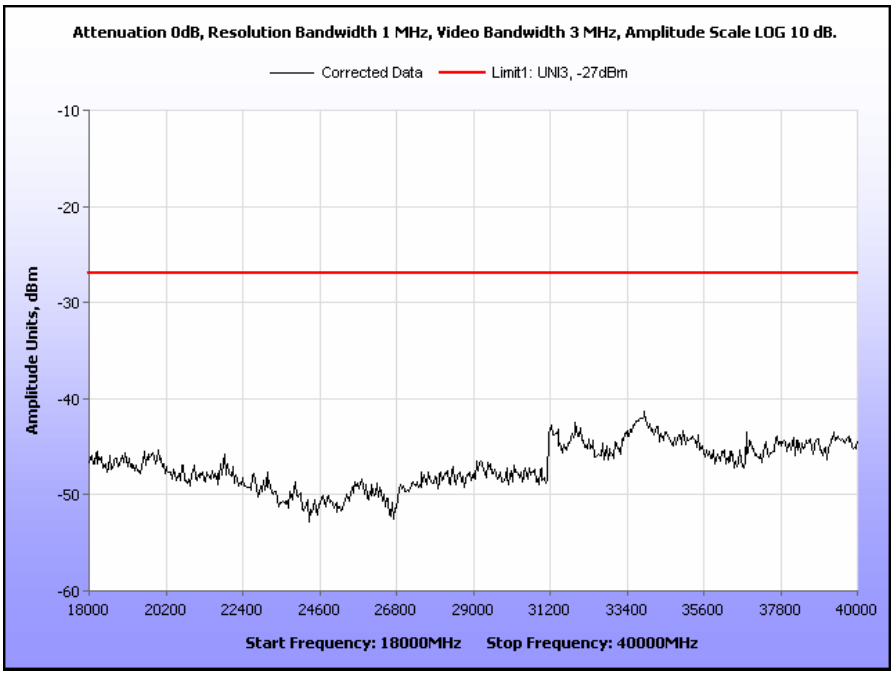
Plot 29. Radiated Spurious Emissions, 802.11n 20 MHz, 5300 MHz, 30 MHz – 1 GHz, Panel



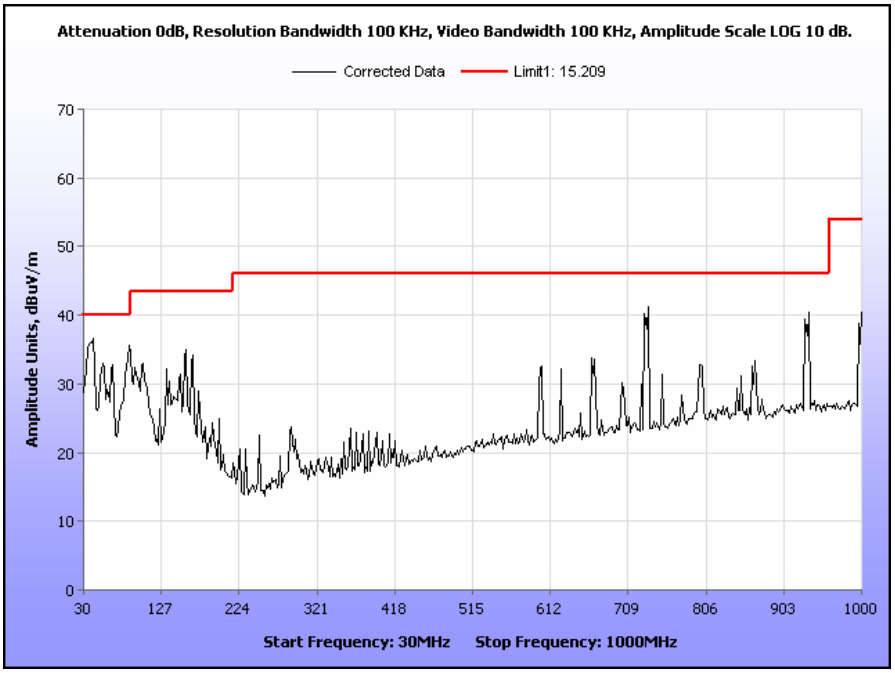
Plot 30. Radiated Spurious Emissions, 802.11n 20 MHz, 5300 MHz, 1 GHz – 7 GHz, Panel



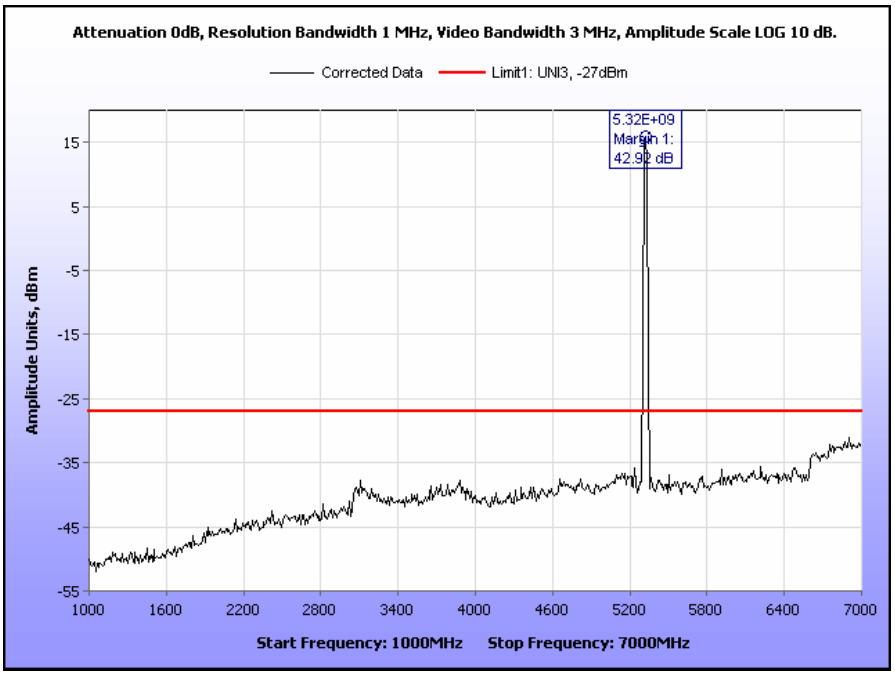
Plot 31. Radiated Spurious Emissions, 802.11n 20 MHz, 5300 MHz, 7 GHz – 18 GHz, Panel



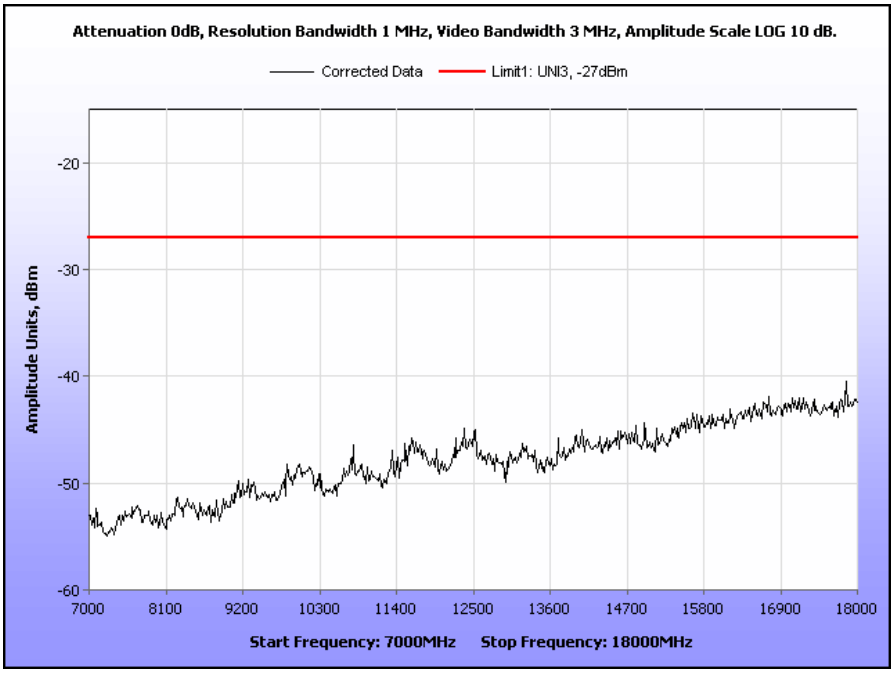
Plot 32. Radiated Spurious Emissions, 802.11n 20 MHz, 5300 MHz, 18 GHz – 40 GHz, Panel



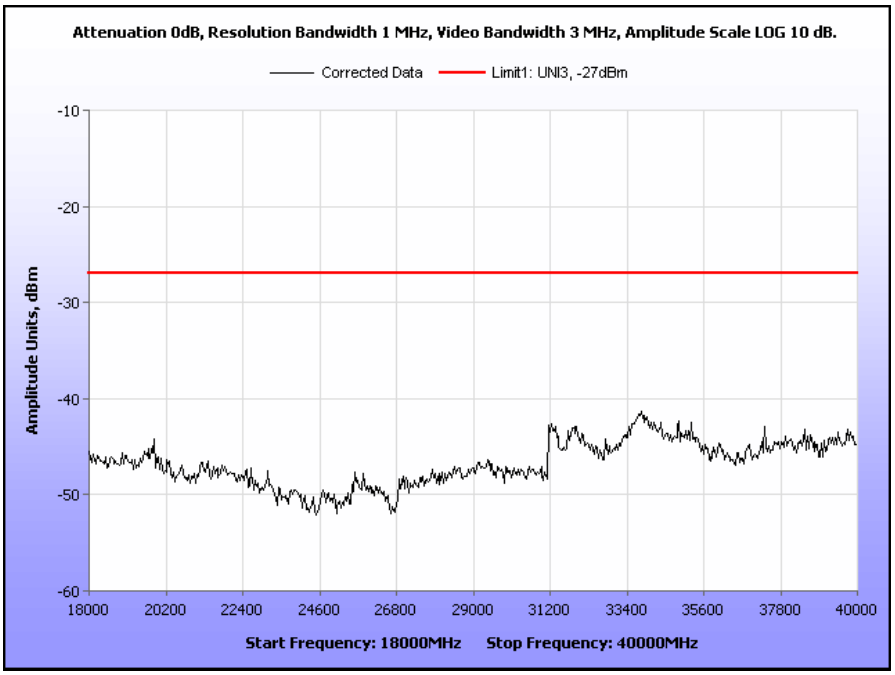
Plot 33. Radiated Spurious Emissions, 802.11n 20 MHz, 5320 MHz, 30 MHz – 1 GHz, Panel



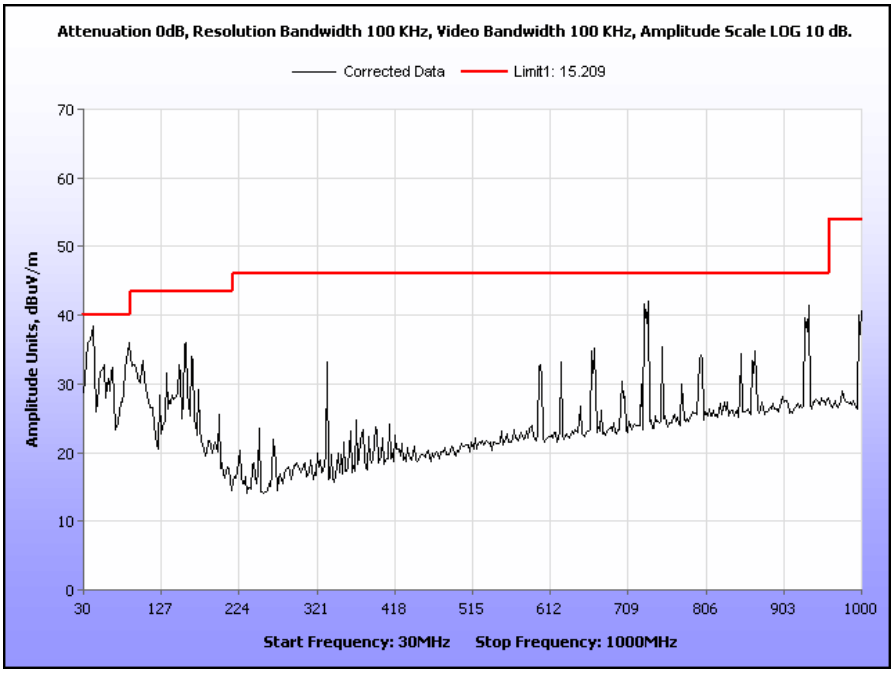
Plot 34. Radiated Spurious Emissions, 802.11n 20 MHz, 5320 MHz, 1 GHz – 7 GHz, Panel



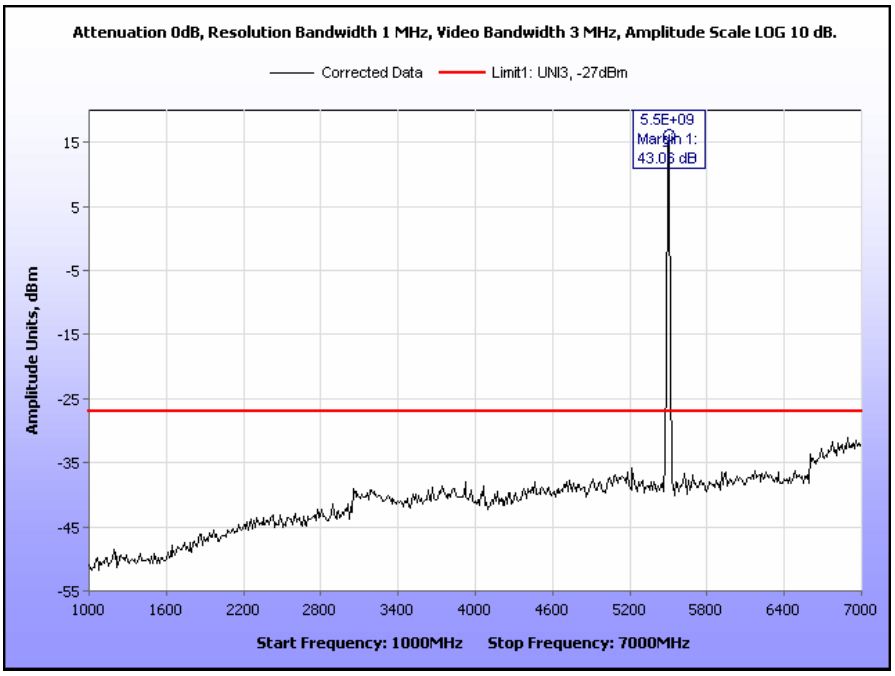
Plot 35. Radiated Spurious Emissions, 802.11n 20 MHz, 5320 MHz, 7 GHz – 18 GHz, Panel



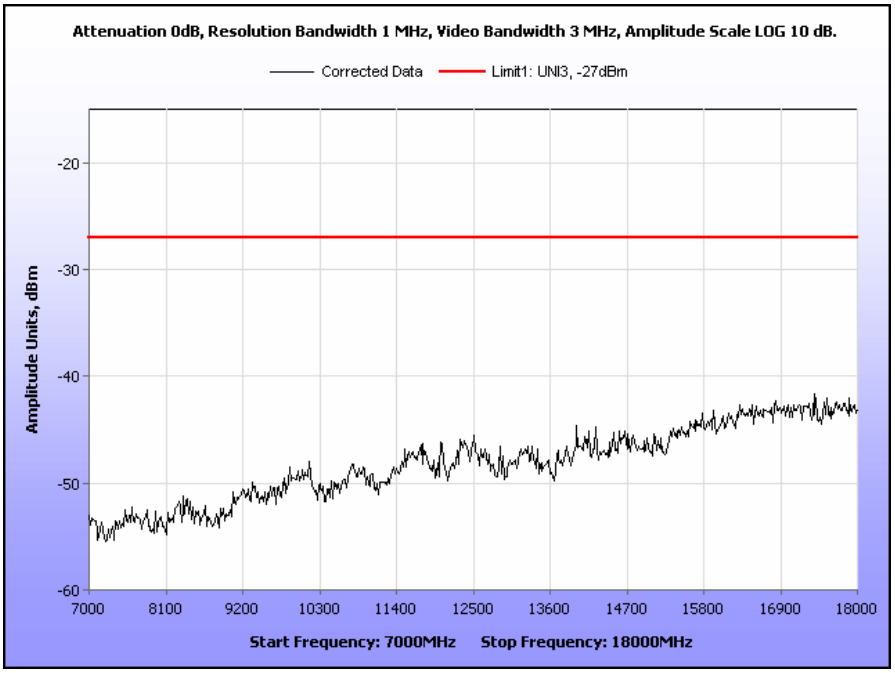
Plot 36. Radiated Spurious Emissions, 802.11n 20 MHz, 5320 MHz, 18 GHz – 40 GHz, Panel



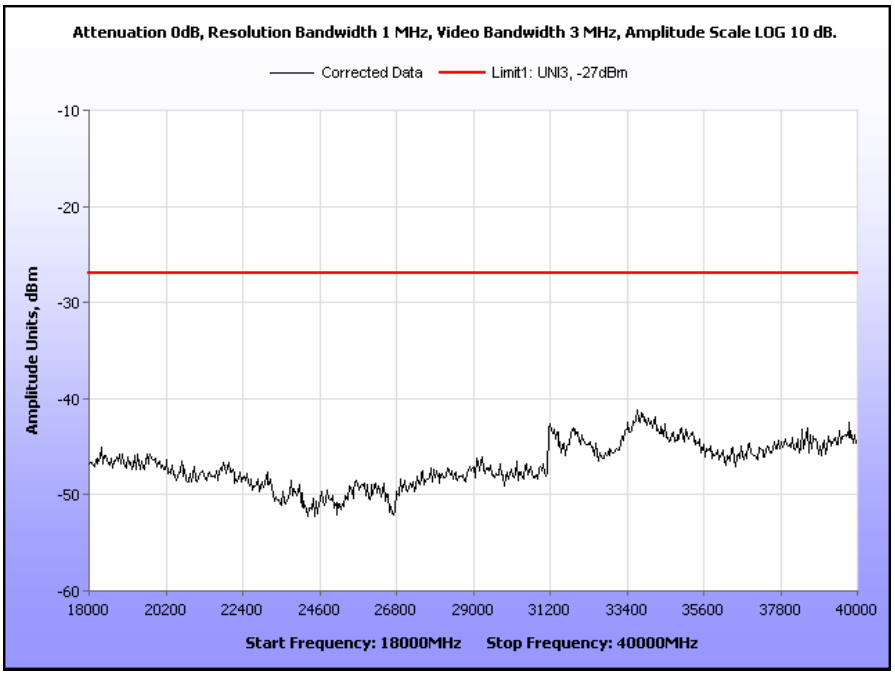
Plot 37. Radiated Spurious Emissions, 802.11n 20 MHz, 5500 MHz, 30 MHz – 1 GHz, Panel



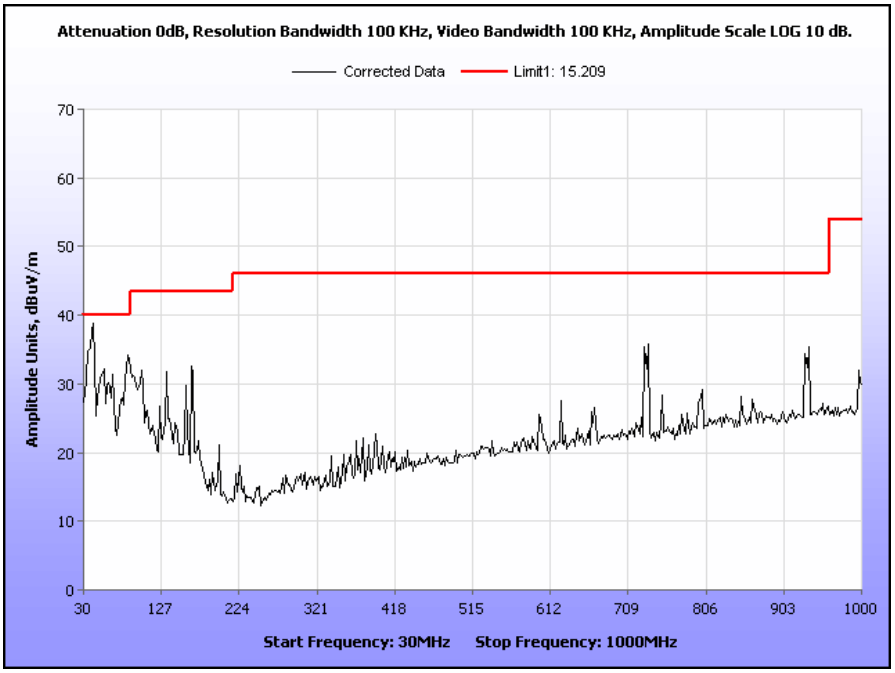
Plot 38. Radiated Spurious Emissions, 802.11n 20 MHz, 5500 MHz, 1 GHz – 7 GHz, Panel



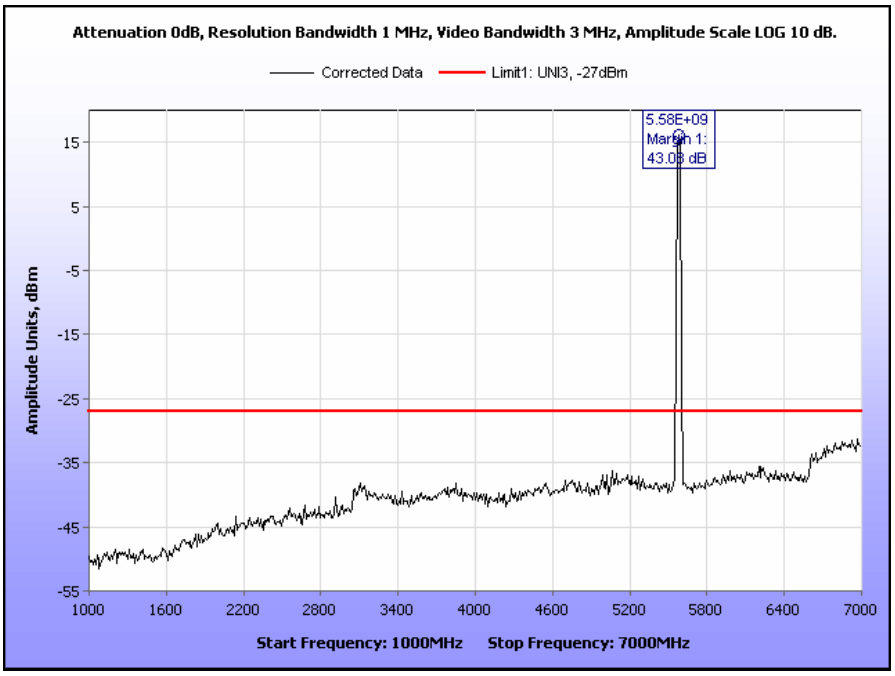
Plot 39. Radiated Spurious Emissions, 802.11n 20 MHz, 5500 MHz, 7 GHz – 18 GHz, Panel



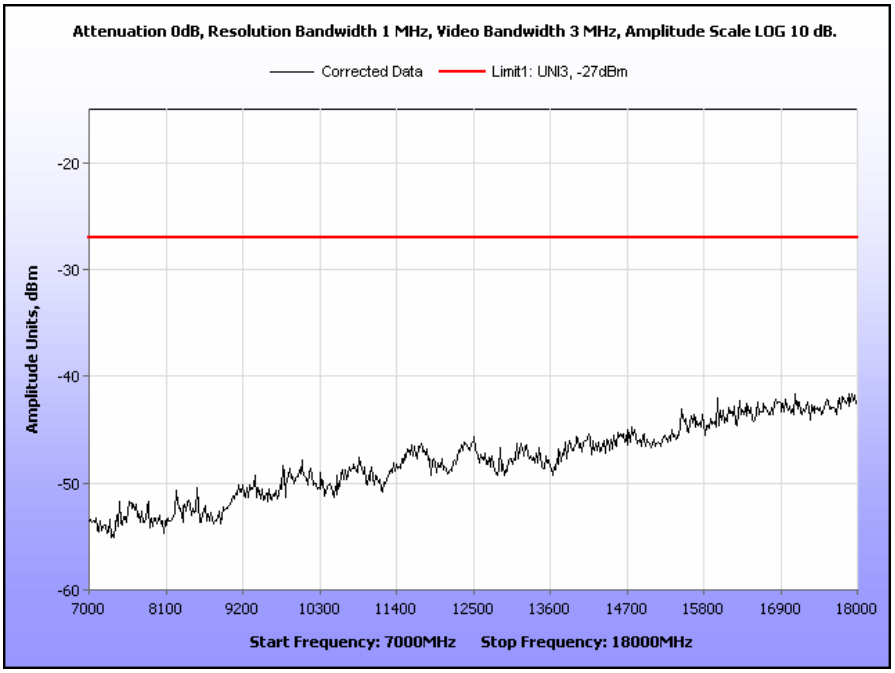
Plot 40. Radiated Spurious Emissions, 802.11n 20 MHz, 5500 MHz, 18 GHz – 40 GHz, Panel



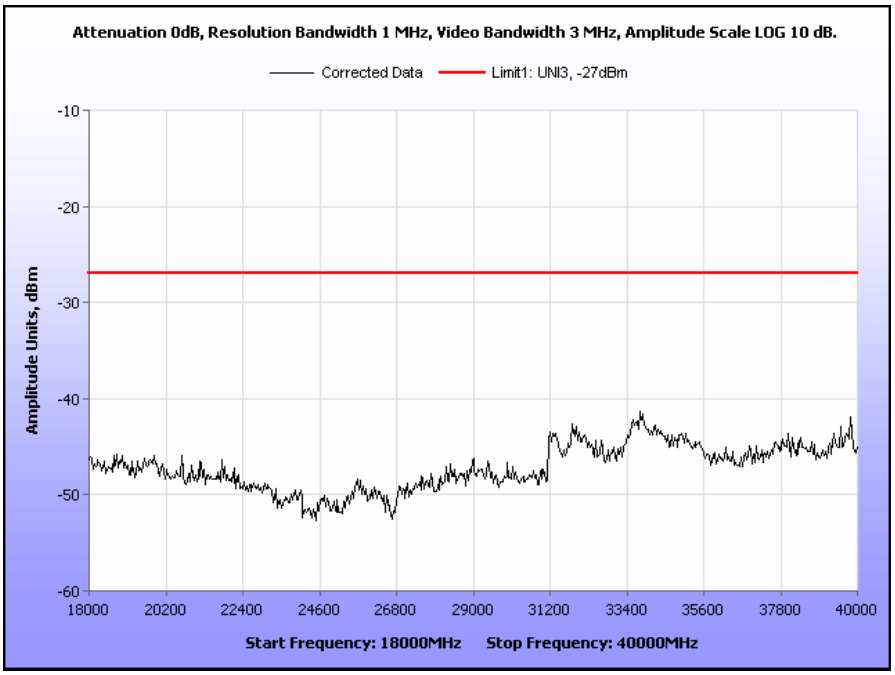
Plot 41. Radiated Spurious Emissions, 802.11n 20 MHz, 5580 MHz, 30 MHz – 1 GHz, Panel



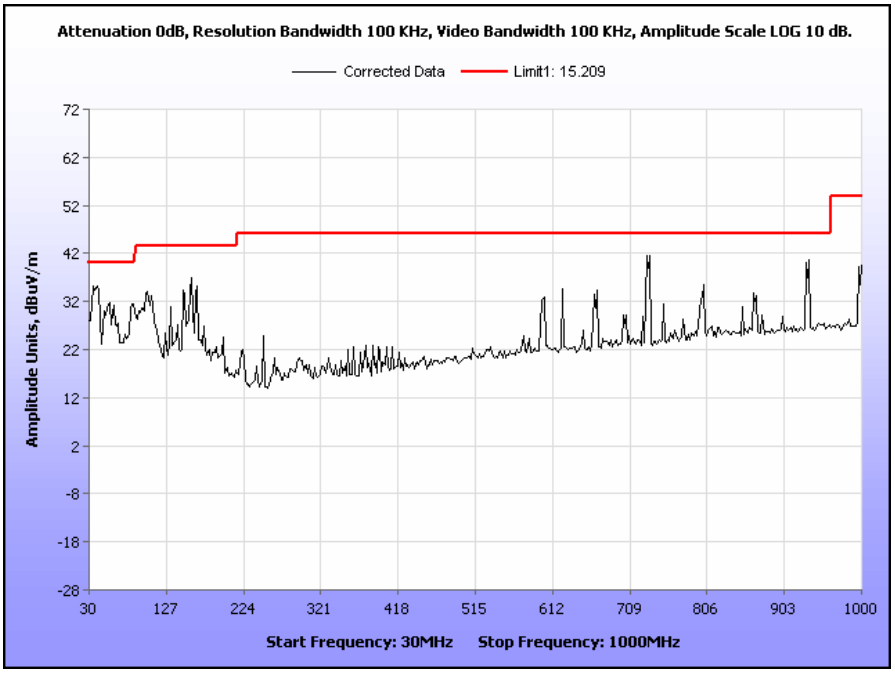
Plot 42. Radiated Spurious Emissions, 802.11n 20 MHz, 5580 MHz, 1 GHz – 7 GHz, Panel



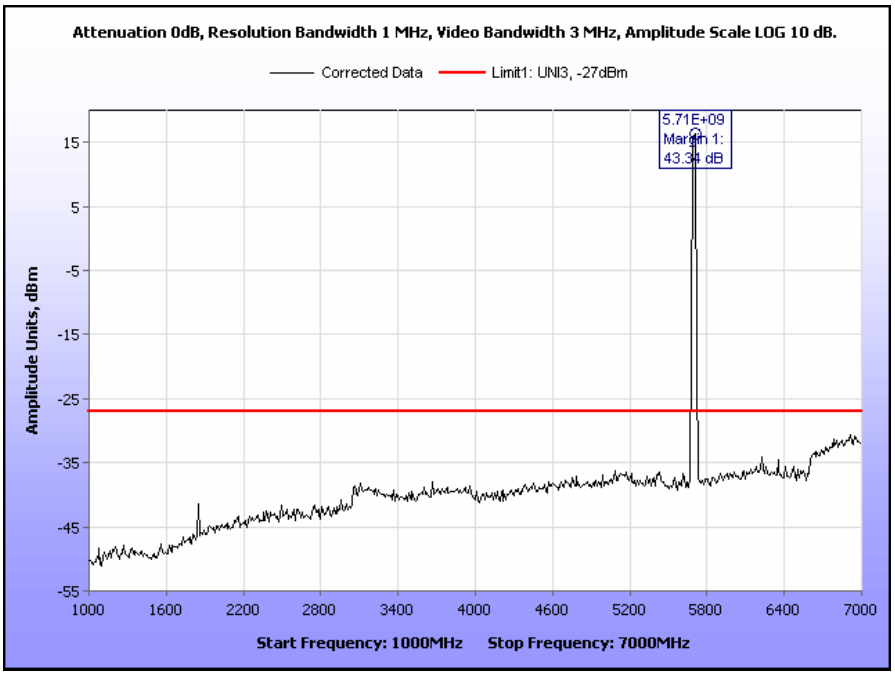
Plot 43. Radiated Spurious Emissions, 802.11n 20 MHz, 5580 MHz, 7 GHz – 18 GHz, Panel



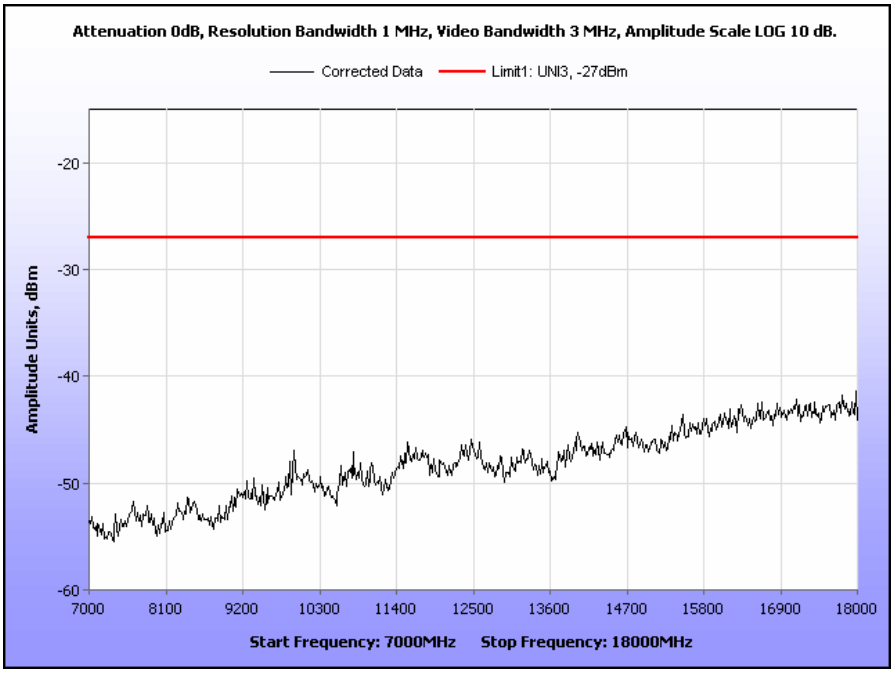
Plot 44. Radiated Spurious Emissions, 802.11n 20 MHz, 5580 MHz, 18 GHz – 40 GHz, Panel



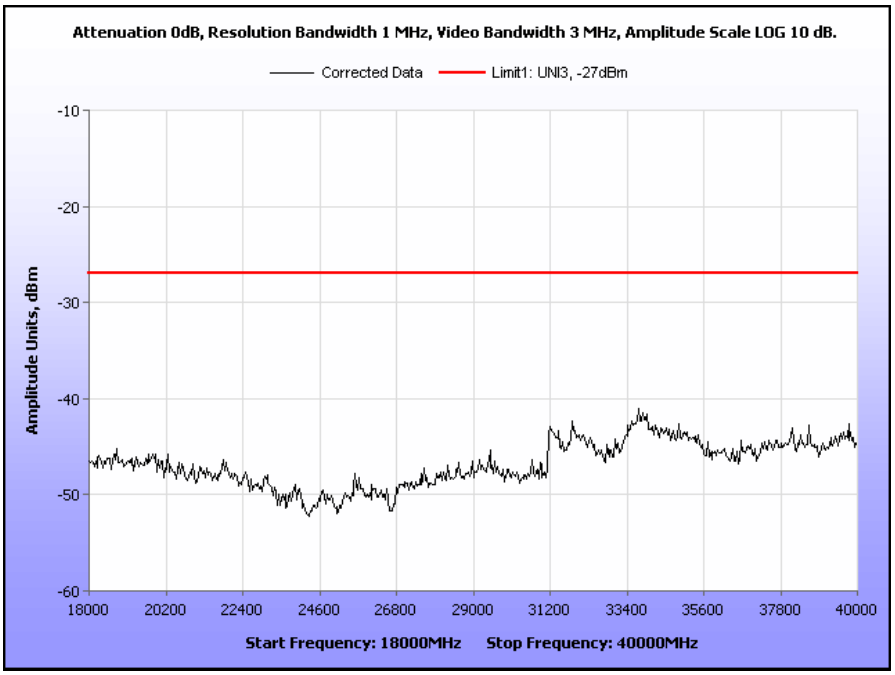
Plot 45. Radiated Spurious Emissions, 802.11n 20 MHz, 5700 MHz, 30 MHz – 1 GHz, Panel



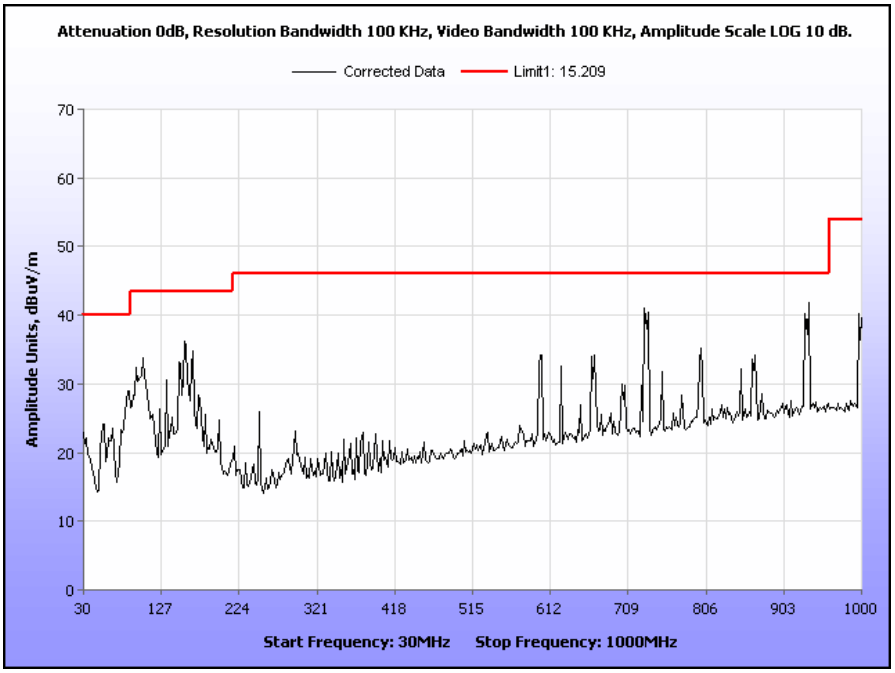
Plot 46. Radiated Spurious Emissions, 802.11n 20 MHz, 5700 MHz, 1 GHz – 7 GHz, Panel



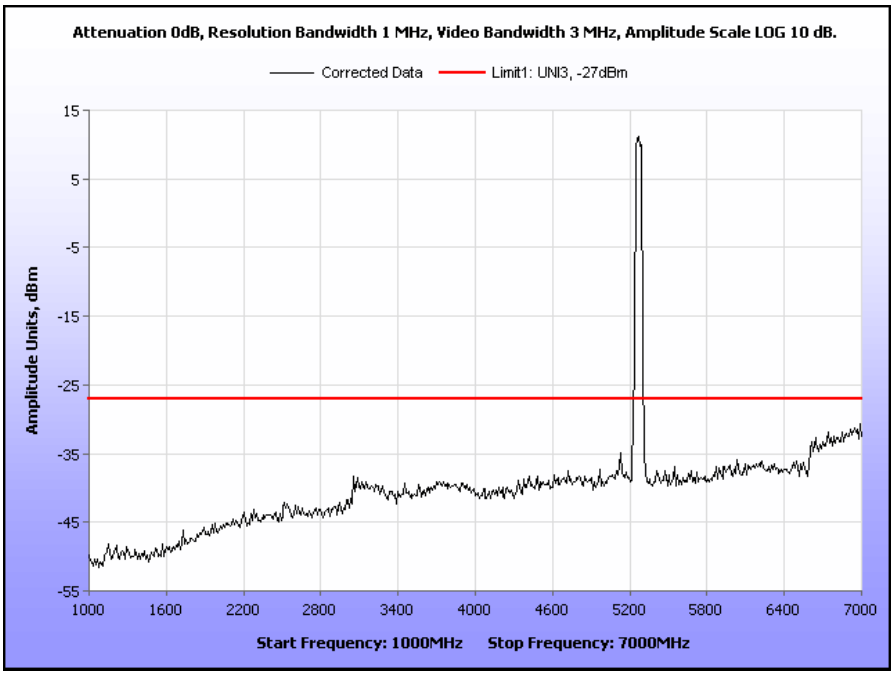
Plot 47. Radiated Spurious Emissions, 802.11n 20 MHz, 5700 MHz, 7 GHz – 18 GHz, Panel



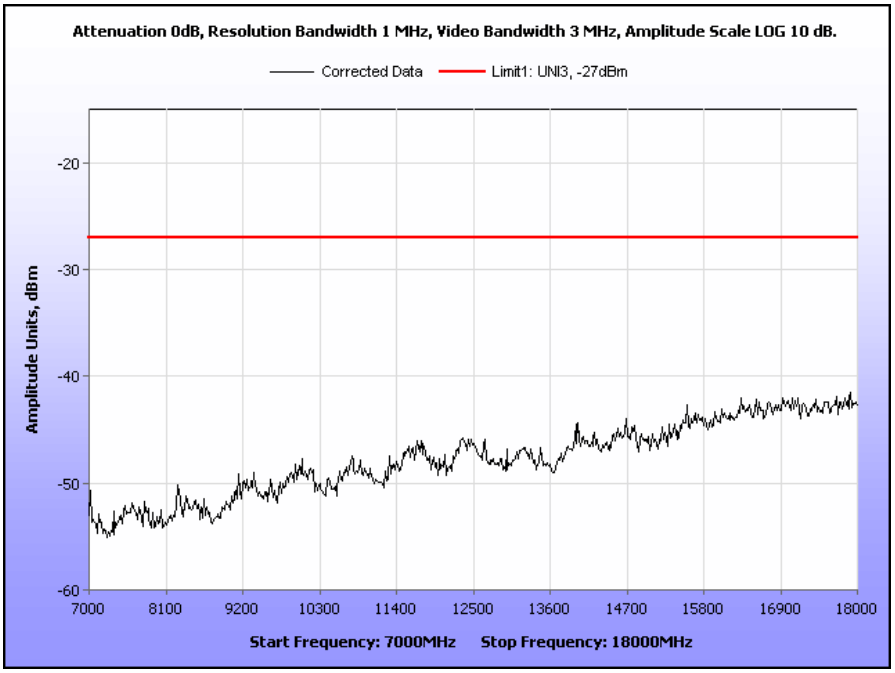
Plot 48. Radiated Spurious Emissions, 802.11n 20 MHz, 5700 MHz, 18 GHz – 40 GHz, Panel



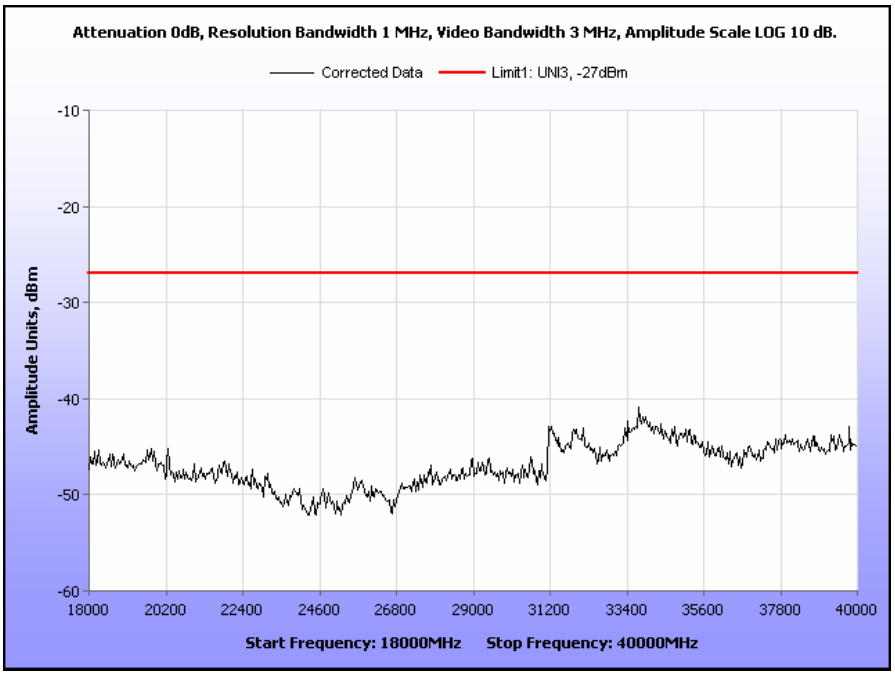
Plot 49. Radiated Spurious Emissions, 802.11n 40 MHz, 5270 MHz, 30 MHz – 1 GHz, Panel



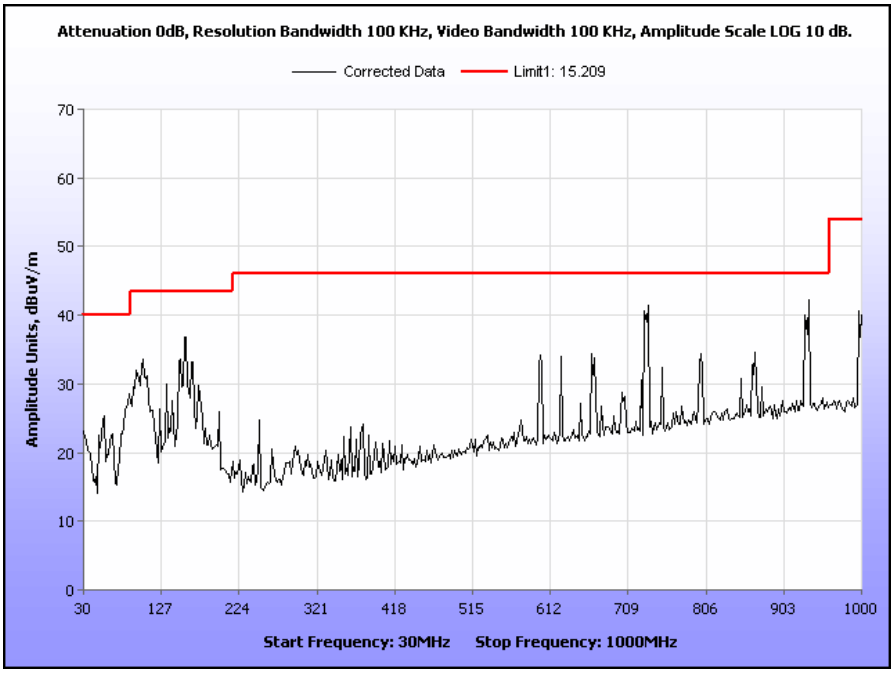
Plot 50. Radiated Spurious Emissions, 802.11n 40 MHz, 5270 MHz, 1 GHz – 7 GHz, Panel



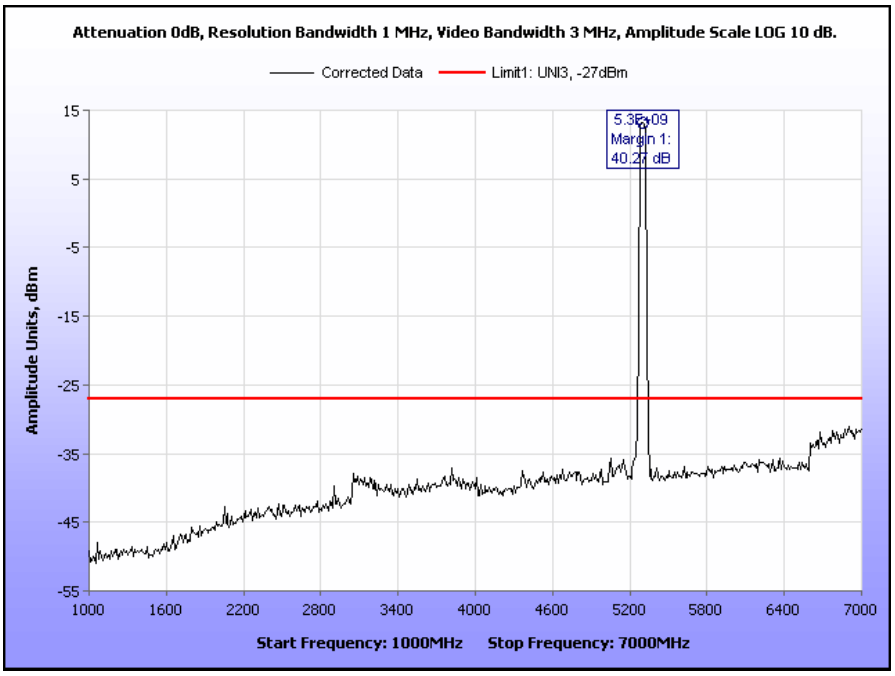
Plot 51. Radiated Spurious Emissions, 802.11n 40 MHz, 5270 MHz, 7 GHz – 18 GHz, Panel



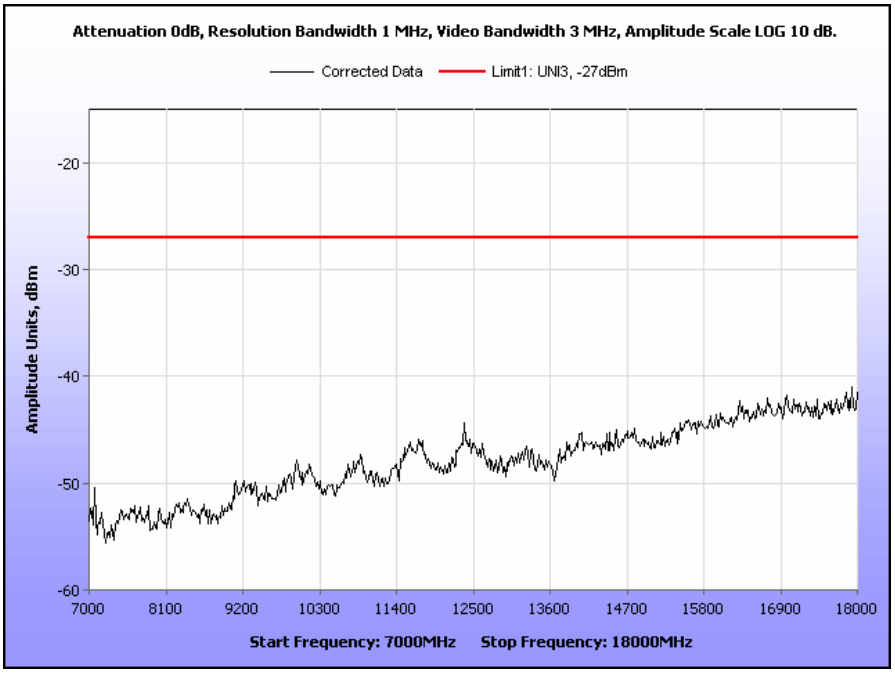
Plot 52. Radiated Spurious Emissions, 802.11n 40 MHz, 5270 MHz, 18 GHz – 40 GHz, Panel



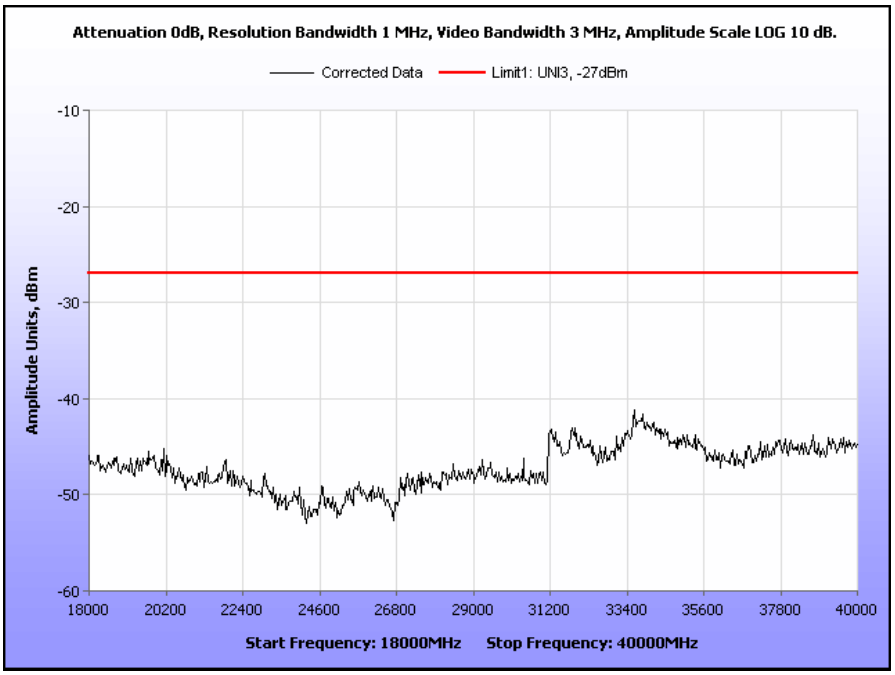
Plot 53. Radiated Spurious Emissions, 802.11n 40 MHz, 5300 MHz, 30 MHz – 1 GHz, Panel



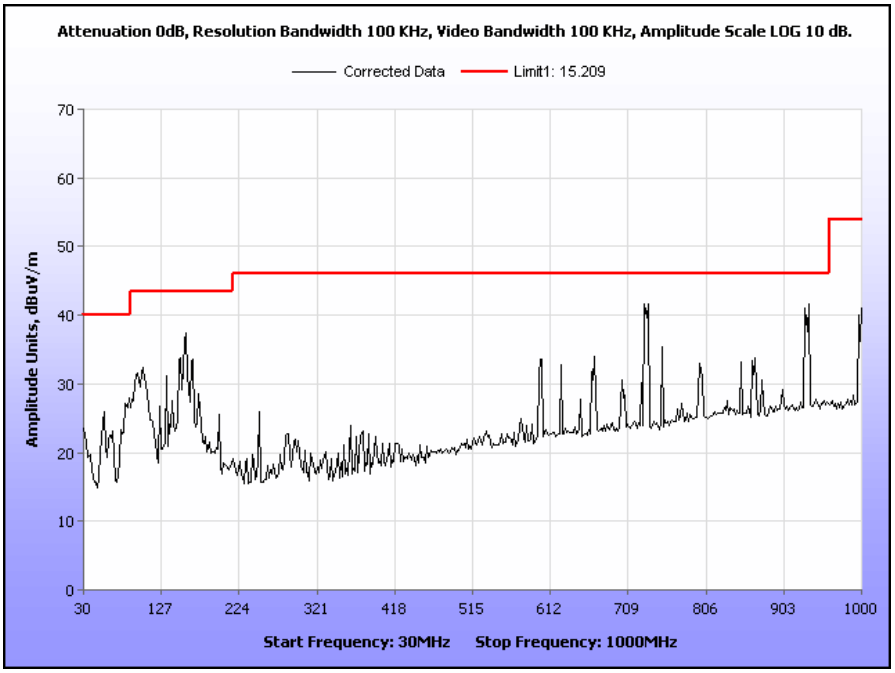
Plot 54. Radiated Spurious Emissions, 802.11n 40 MHz, 5300 MHz, 1 GHz – 7 GHz, Panel



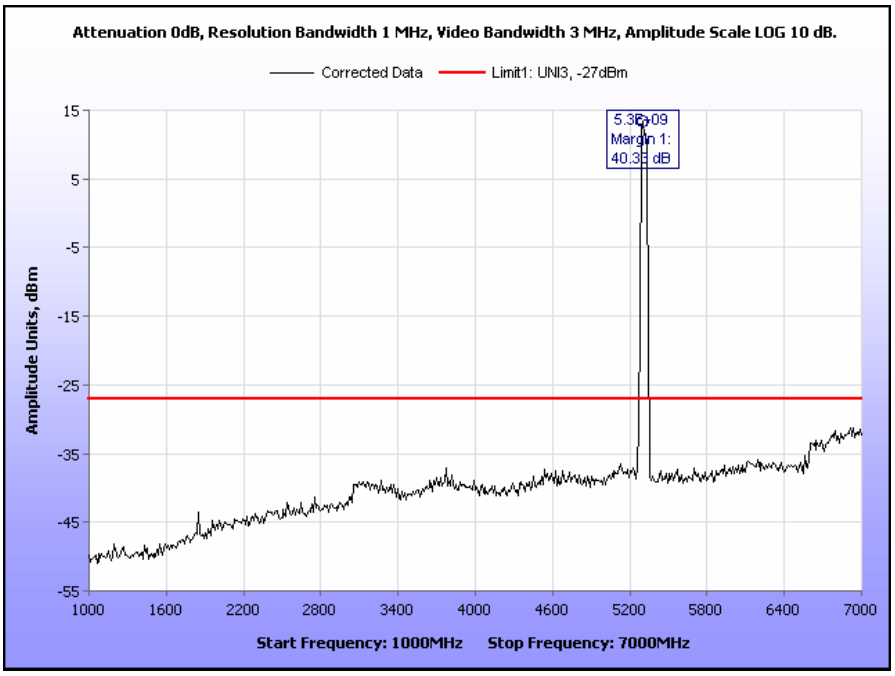
Plot 55. Radiated Spurious Emissions, 802.11n 40 MHz, 5300 MHz, 7 GHz – 18 GHz, Panel



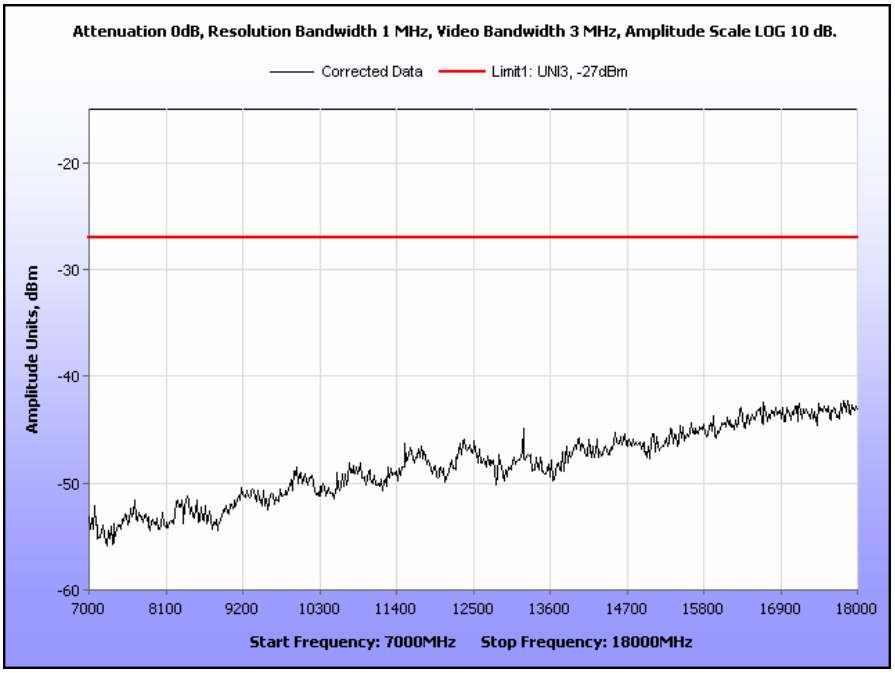
Plot 56. Radiated Spurious Emissions, 802.11n 40 MHz, 5300 MHz, 18 GHz – 40 GHz, Panel



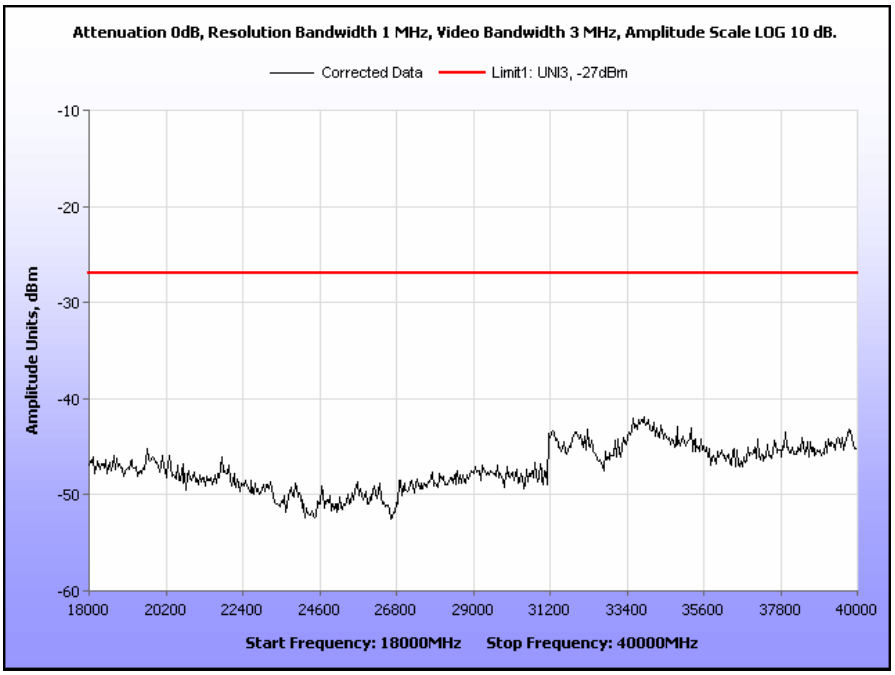
Plot 57. Radiated Spurious Emissions, 802.11n 40 MHz, 5310 MHz, 30 MHz – 1 GHz, Panel



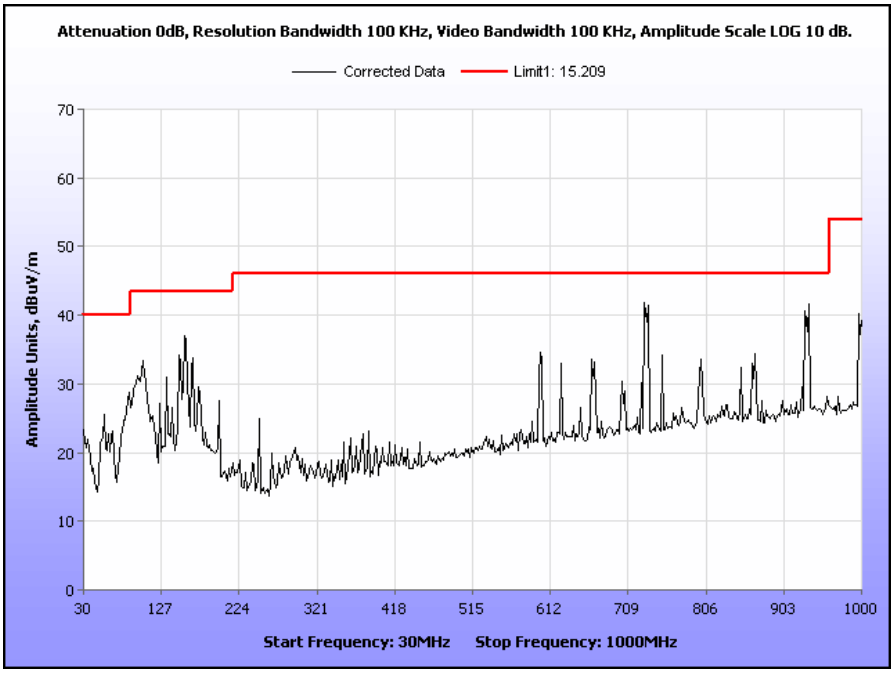
Plot 58. Radiated Spurious Emissions, 802.11n 40 MHz, 5310 MHz, 1 GHz – 7 GHz, Panel



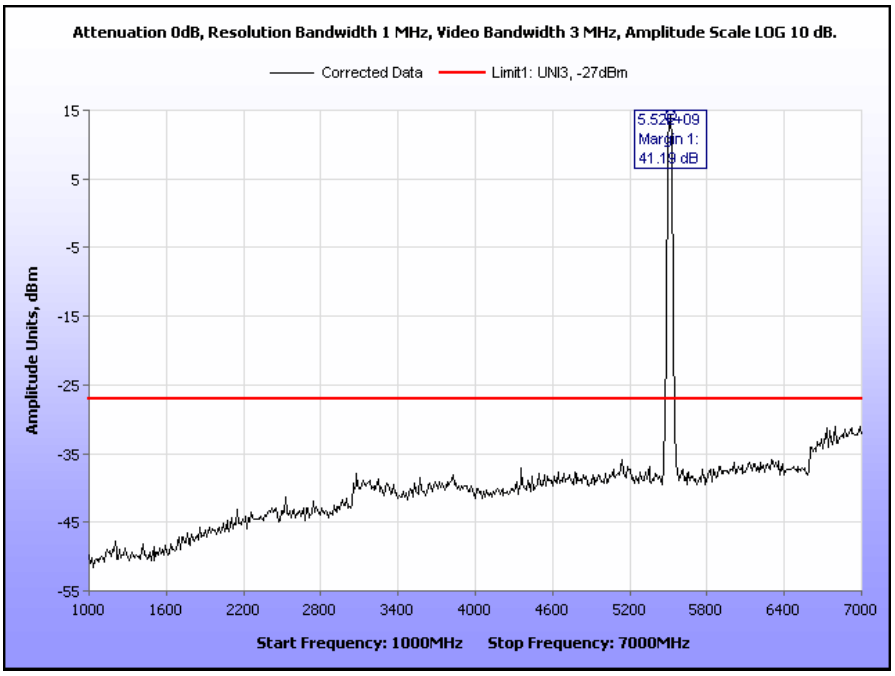
Plot 59. Radiated Spurious Emissions, 802.11n 40 MHz, 5310 MHz, 7 GHz – 18 GHz, Panel



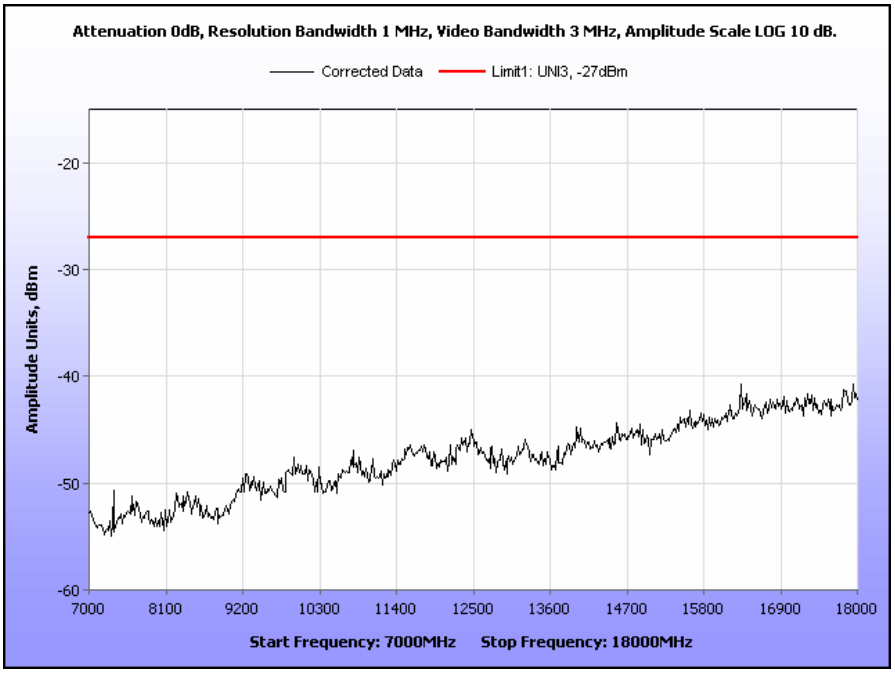
Plot 60. Radiated Spurious Emissions, 802.11n 40 MHz, 5310 MHz, 18 GHz – 40 GHz, Panel



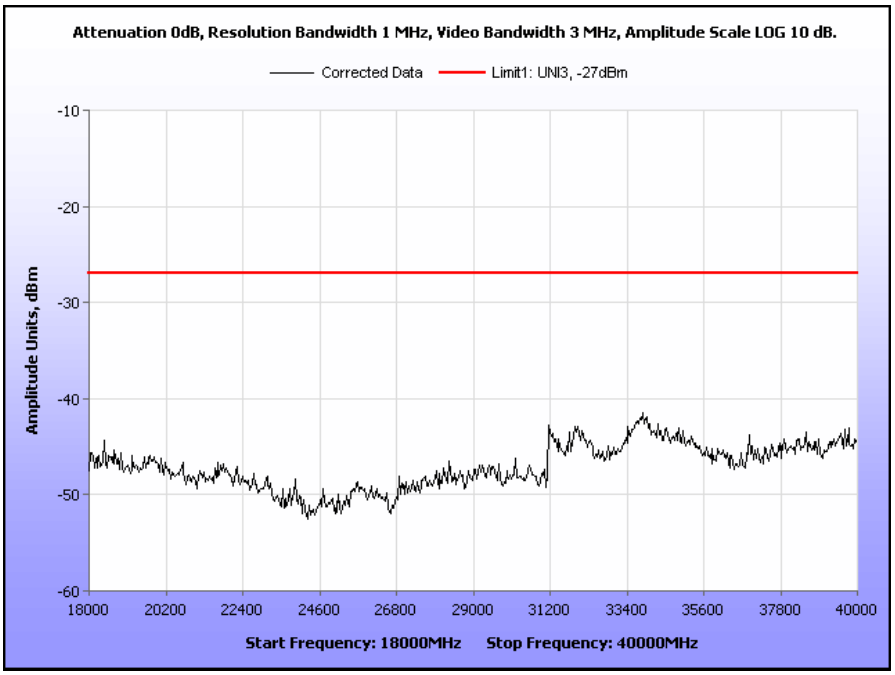
Plot 61. Radiated Spurious Emissions, 802.11n 40 MHz, 5510 MHz, 30 MHz – 1 GHz, Panel



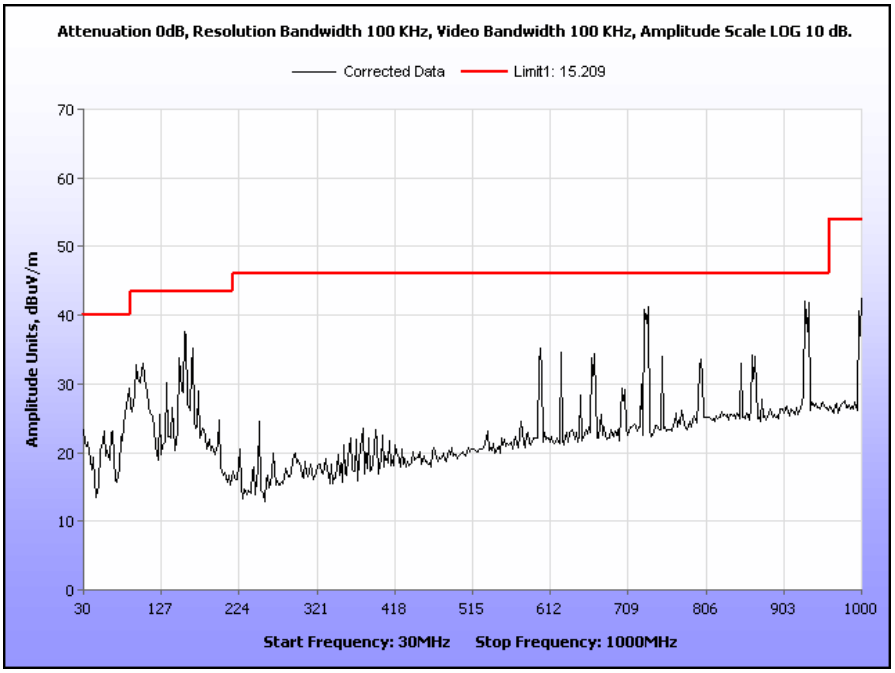
Plot 62. Radiated Spurious Emissions, 802.11n 40 MHz, 5510 MHz, 1 GHz – 7 GHz, Panel



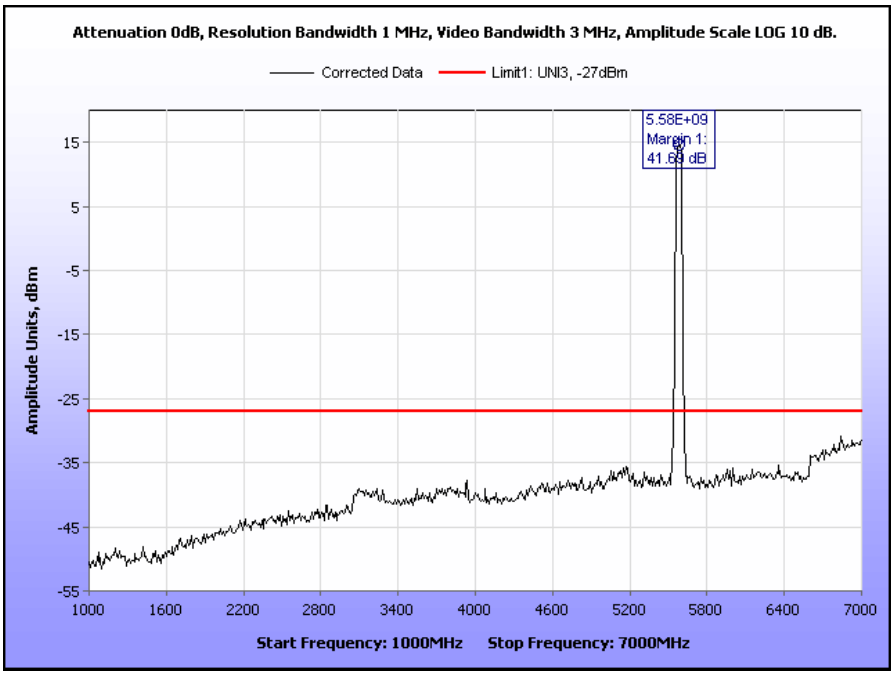
Plot 63. Radiated Spurious Emissions, 802.11n 40 MHz, 5510 MHz, 7 GHz – 18 GHz, Panel



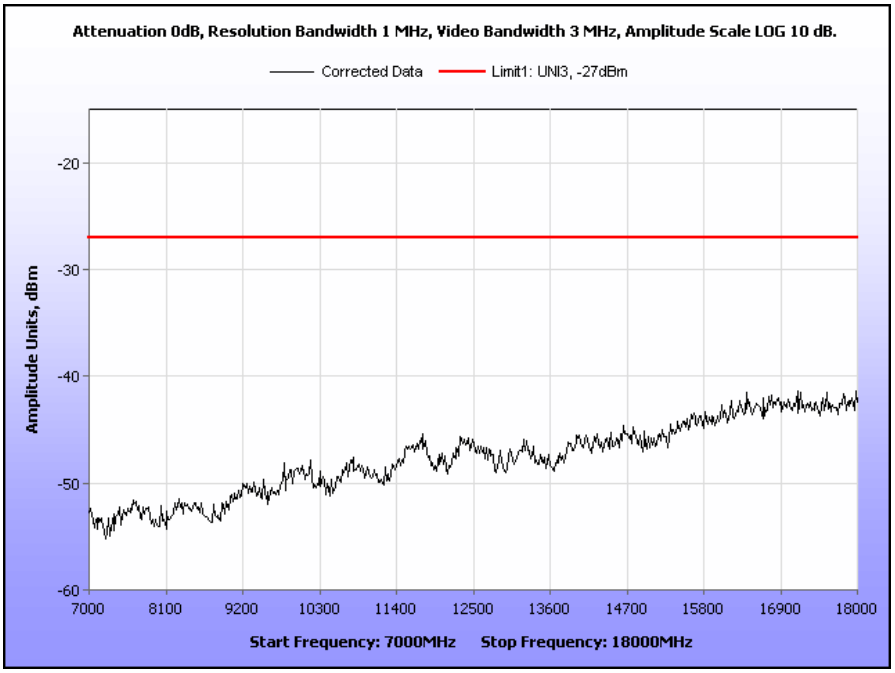
Plot 64. Radiated Spurious Emissions, 802.11n 40 MHz, 5510 MHz, 18 GHz – 40 GHz, Panel



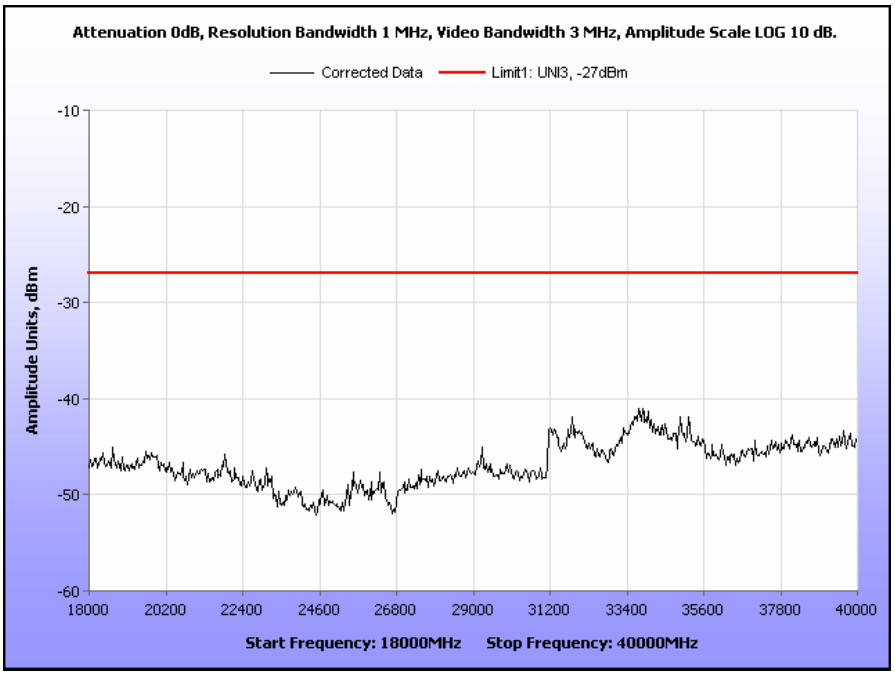
Plot 65. Radiated Spurious Emissions, 802.11n 40 MHz, 5580 MHz, 30 MHz – 1 GHz, Panel



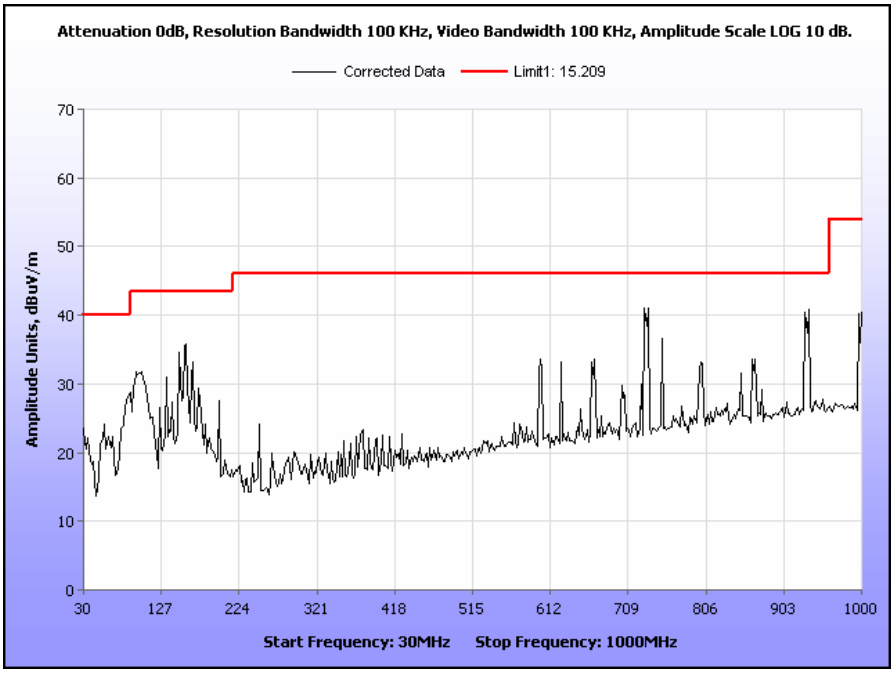
Plot 66. Radiated Spurious Emissions, 802.11n 40 MHz, 5580 MHz, 1 GHz – 7 GHz, Panel



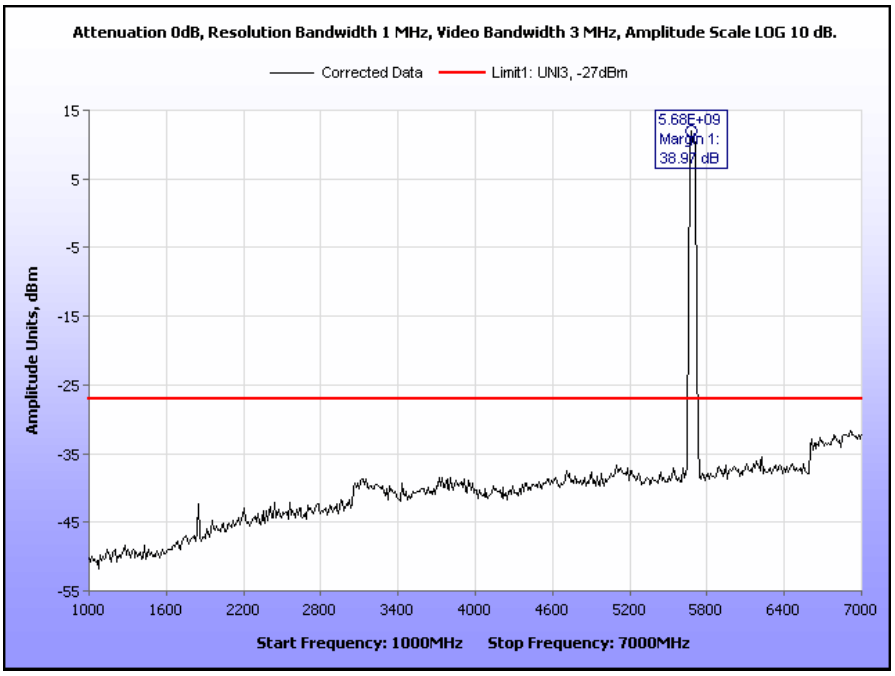
Plot 67. Radiated Spurious Emissions, 802.11n 40 MHz, 5580 MHz, 7 GHz – 18 GHz, Panel



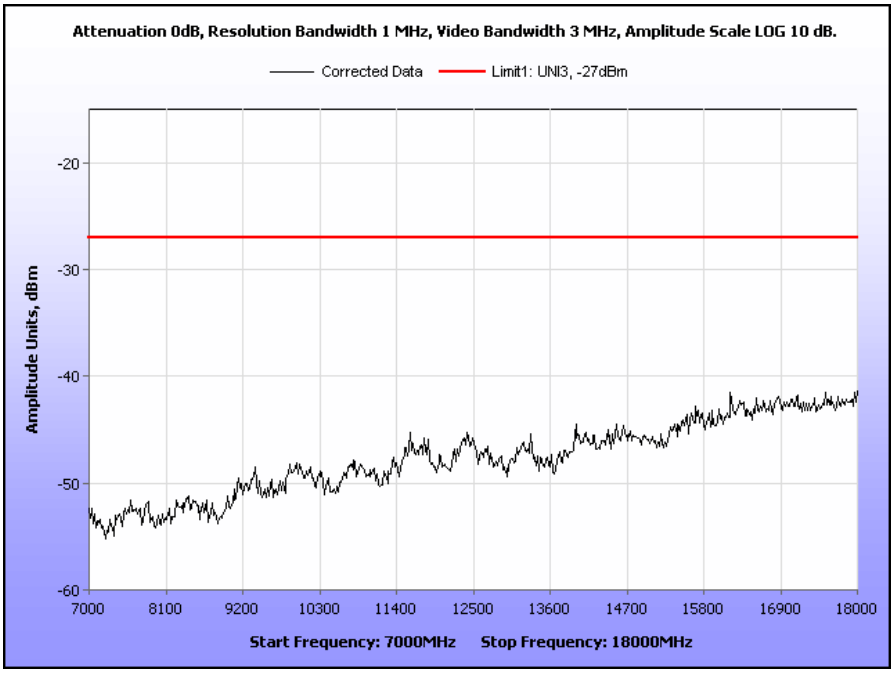
Plot 68. Radiated Spurious Emissions, 802.11n 40 MHz, 5580 MHz, 18 GHz – 40 GHz, Panel



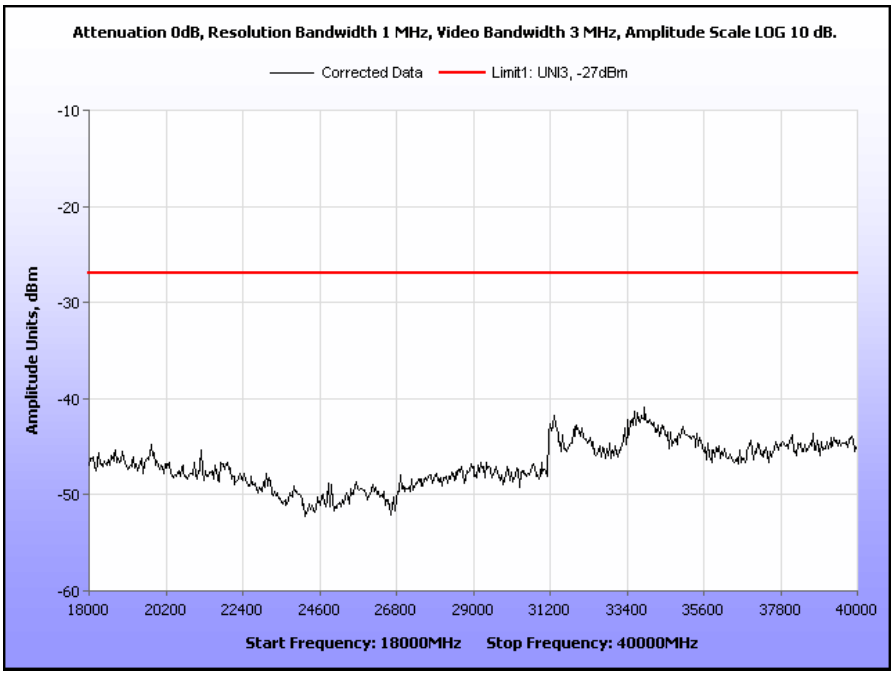
Plot 69. Radiated Spurious Emissions, 802.11n 40 MHz, 5690 MHz, 1 GHz – 7 GHz, Panel



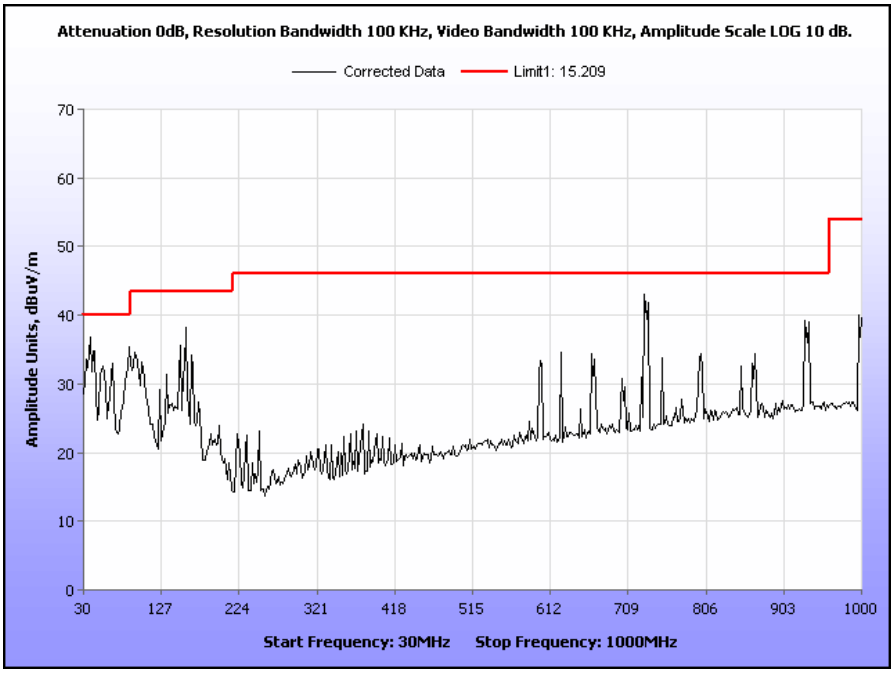
Plot 70. Radiated Spurious Emissions, 802.11n 40 MHz, 5690 MHz, 1 GHz – 7 GHz, Panel



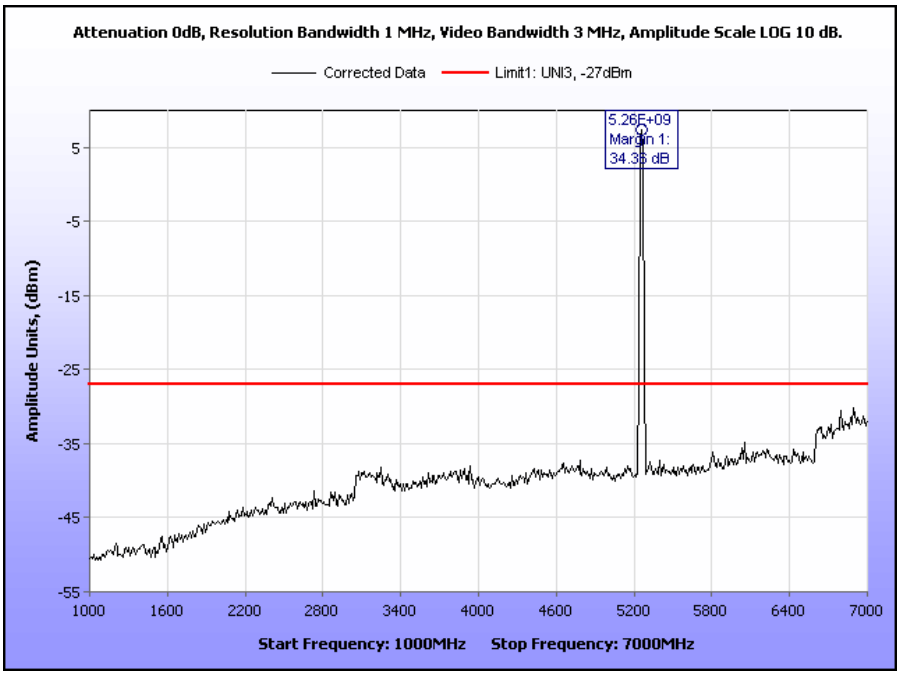
Plot 71. Radiated Spurious Emissions, 802.11n 40 MHz, 5690 MHz, 7 GHz – 18 GHz, Panel



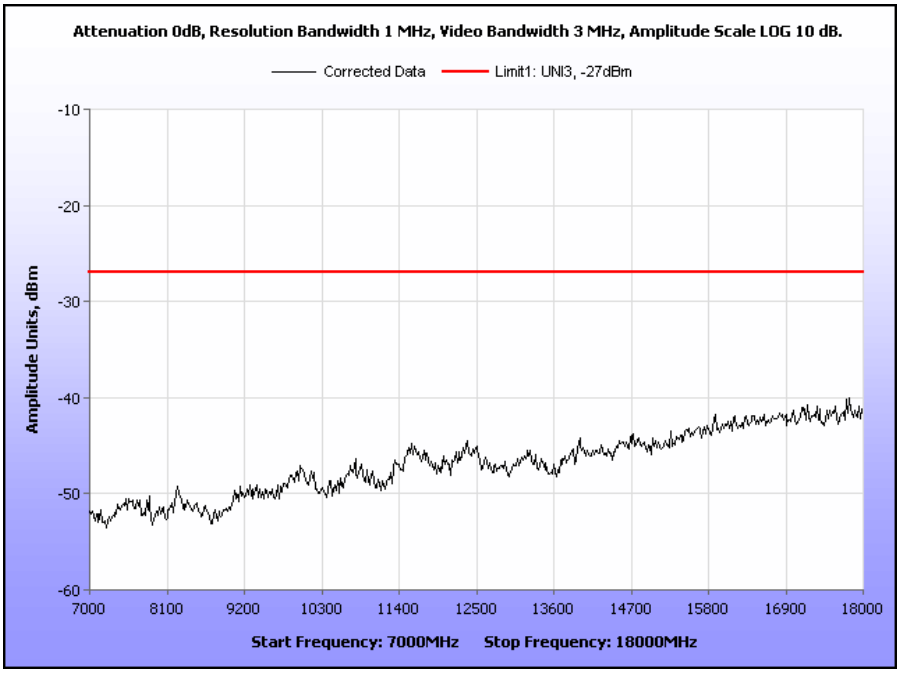
Plot 72. Radiated Spurious Emissions, 802.11n 40 MHz, 5690 MHz, 18 GHz – 40 GHz, Panel



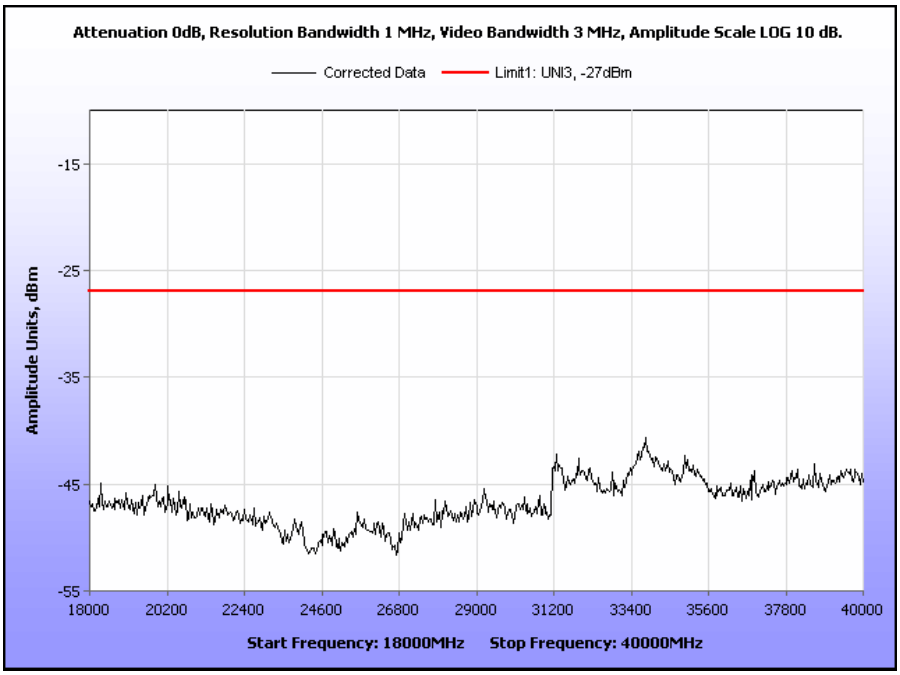
Plot 73. Radiated Spurious Emissions, 802.11a, 5260 MHz, 30 MHz – 1 GHz, VMM



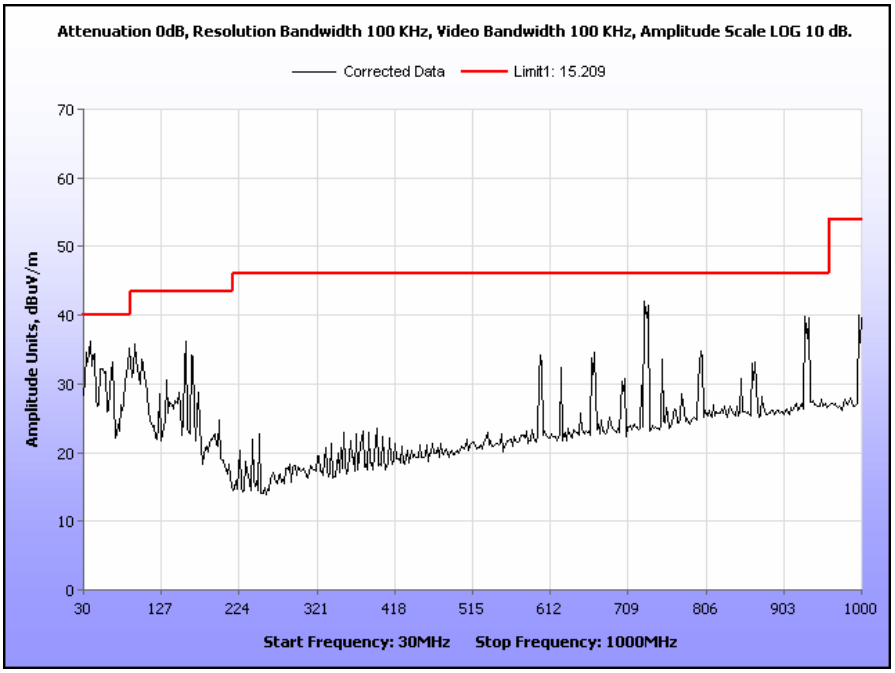
Plot 74. Radiated Spurious Emissions, 802.11a, 5260 MHz, 1 GHz – 7 GHz, VMM



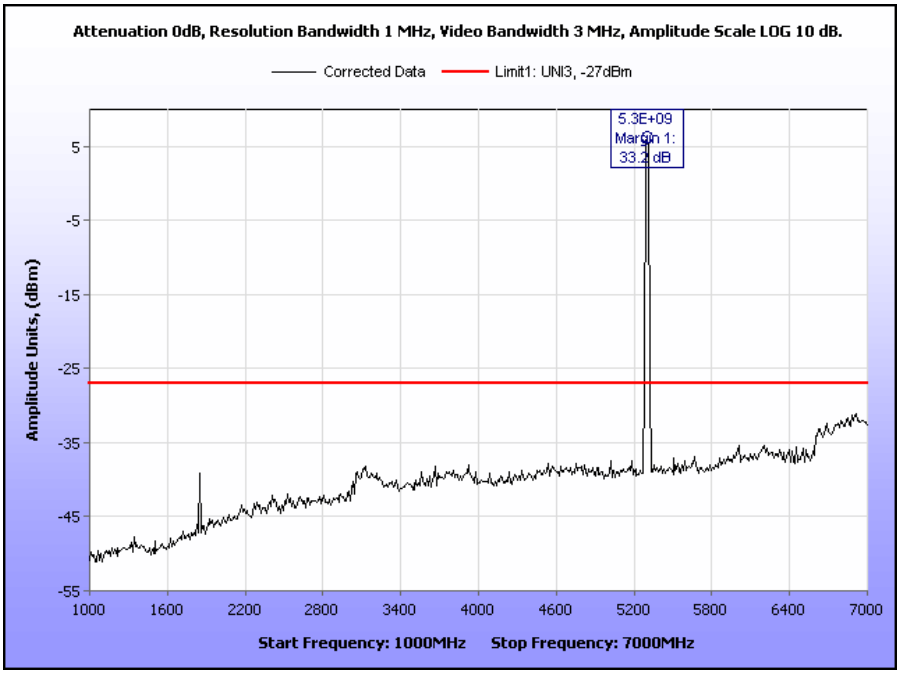
Plot 75. Radiated Spurious Emissions, 802.11a, 5260 MHz, 7 GHz – 18 GHz, VMM



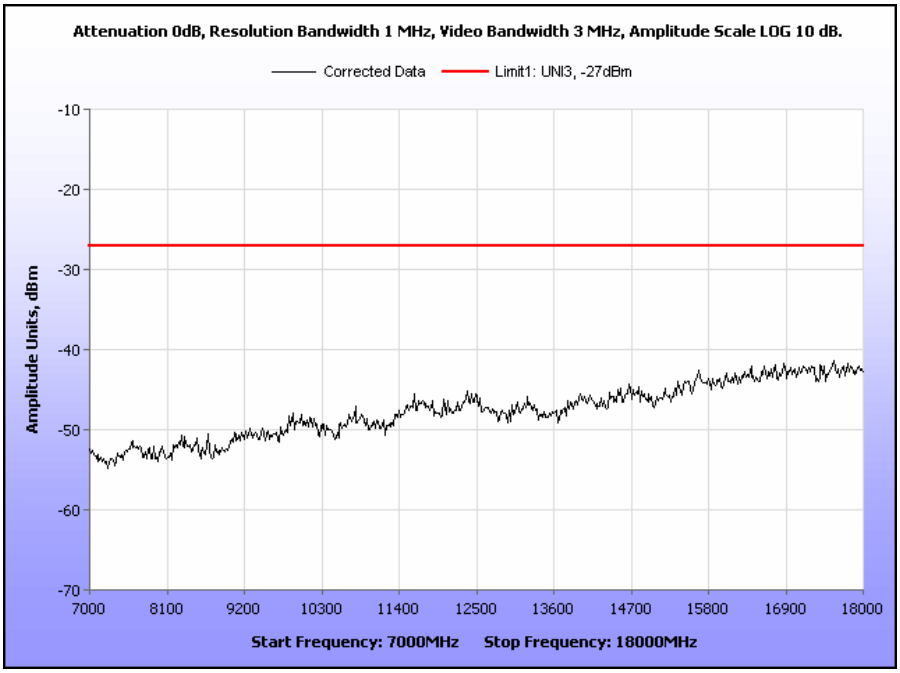
Plot 76. Radiated Spurious Emissions, 802.11a, 5260 MHz, 18 GHz – 40 GHz, VMM



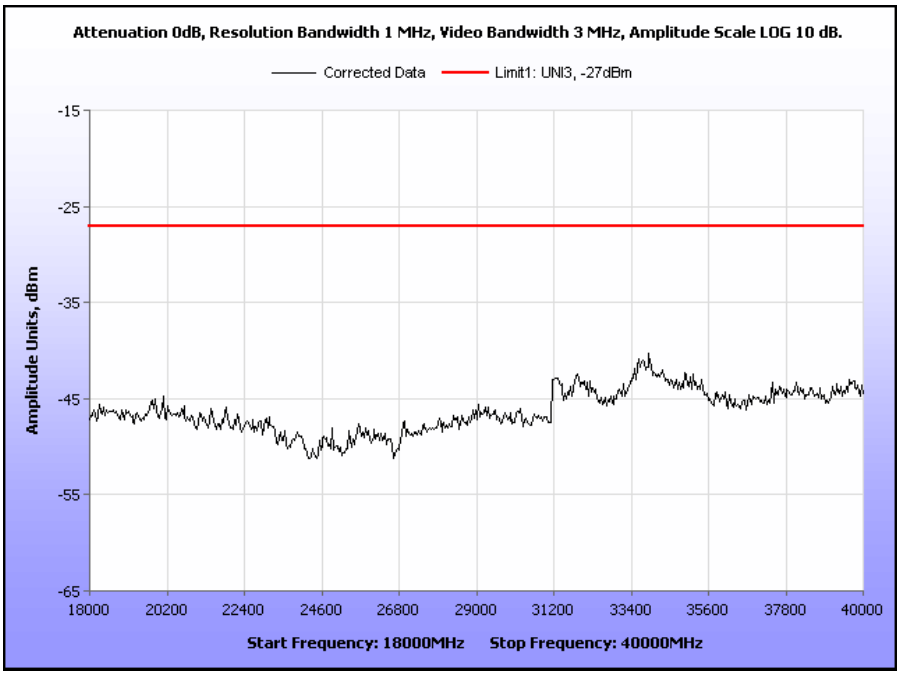
Plot 77. Radiated Spurious Emissions, 802.11a, 5300 MHz, 30 MHz – 1 GHz, VMM



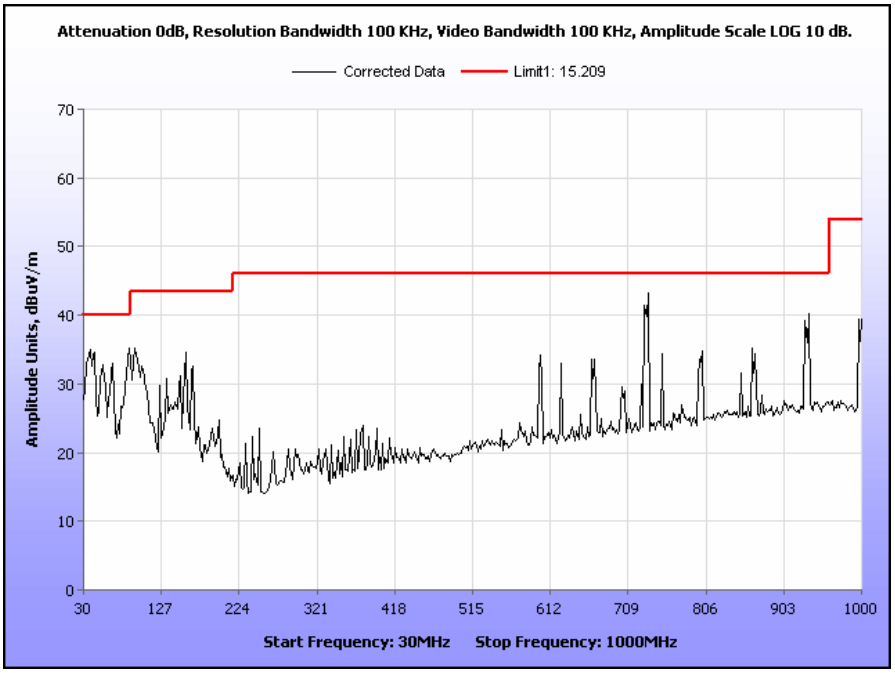
Plot 78. Radiated Spurious Emissions, 802.11a, 5300 MHz, 1 GHz – 7 GHz, VMM



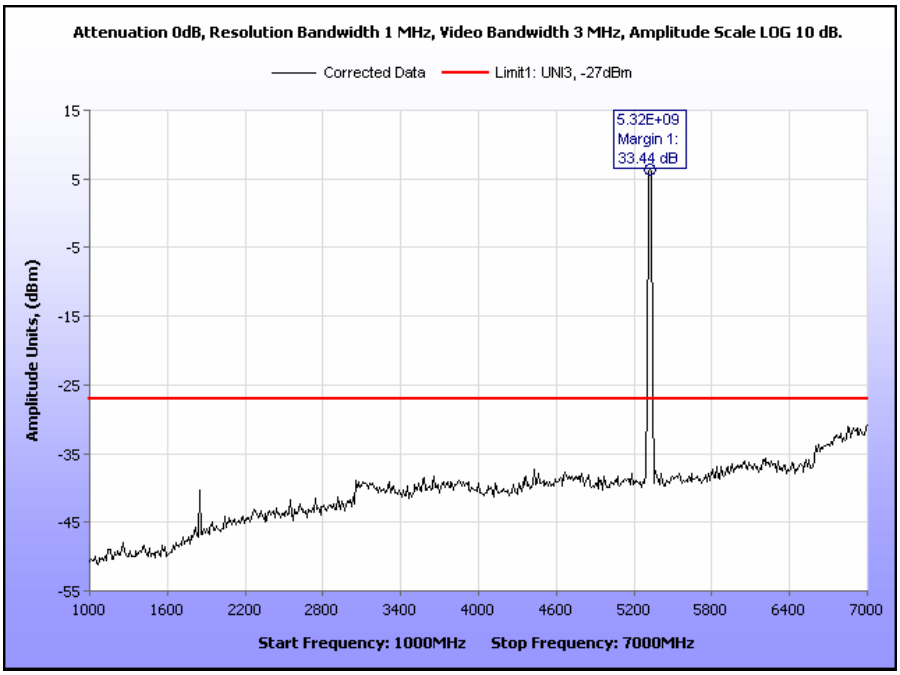
Plot 79. Radiated Spurious Emissions, 802.11a, 5300 MHz, 7 GHz – 18 GHz, VMM



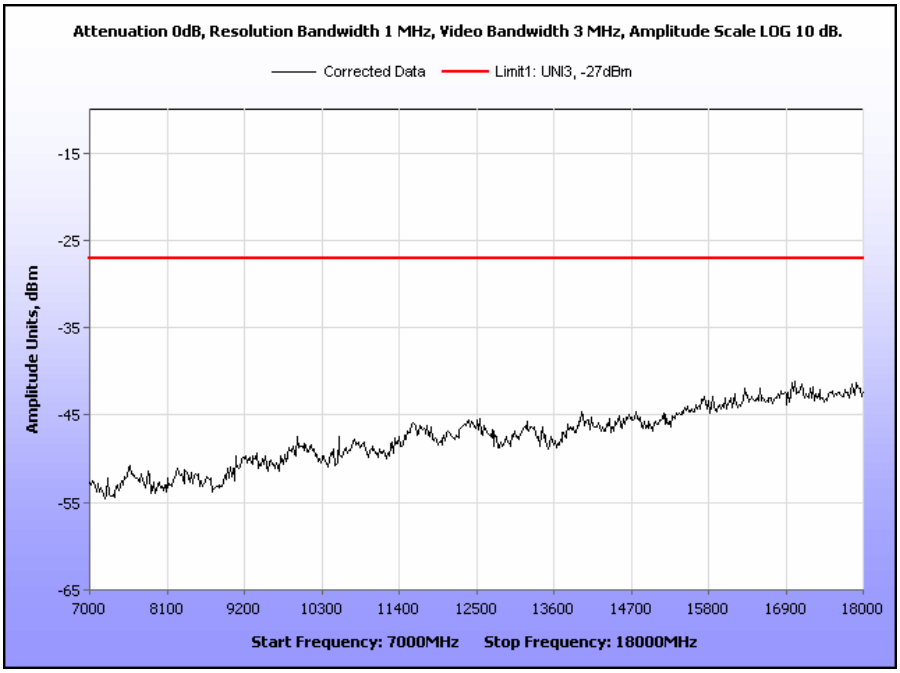
Plot 80. Radiated Spurious Emissions, 802.11a, 5300 MHz, 18 GHz – 40 GHz, VMM



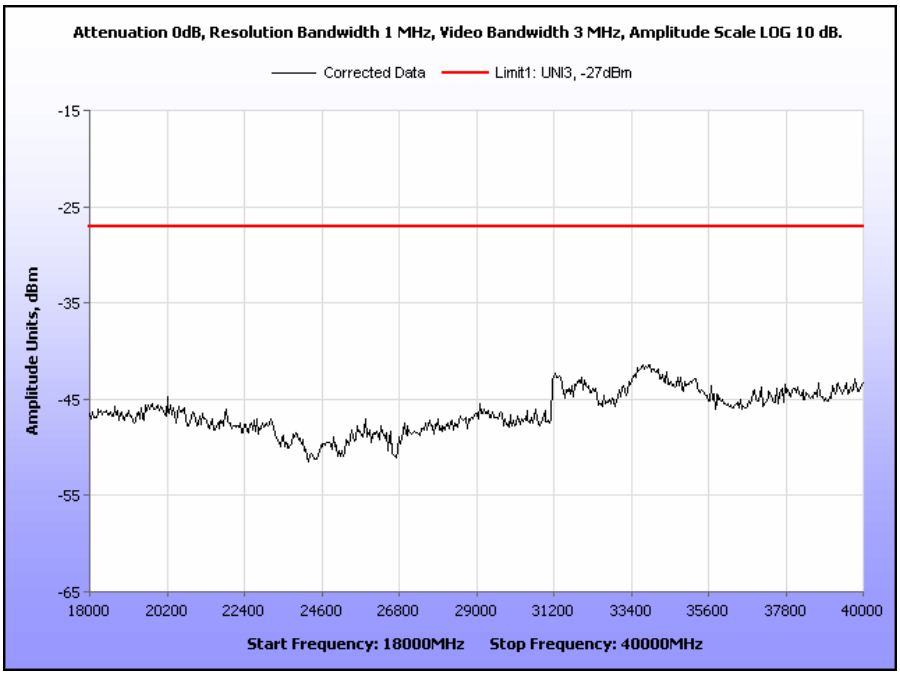
Plot 81. Radiated Spurious Emissions, 802.11a, 5320 MHz, 30 MHz – 1 GHz, VMM



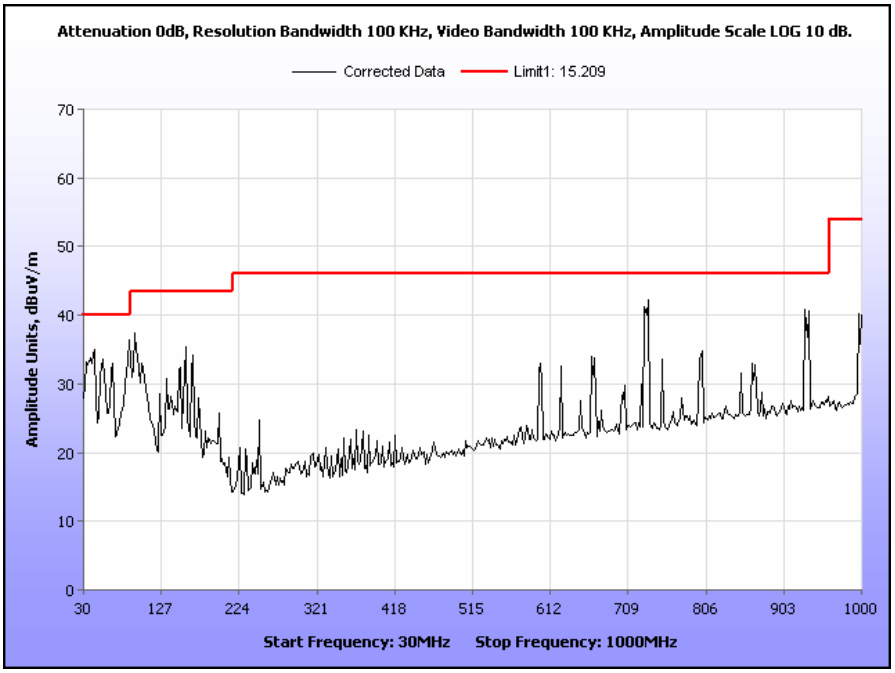
Plot 82. Radiated Spurious Emissions, 802.11a, 5320 MHz, 1 GHz – 7 GHz, VMM



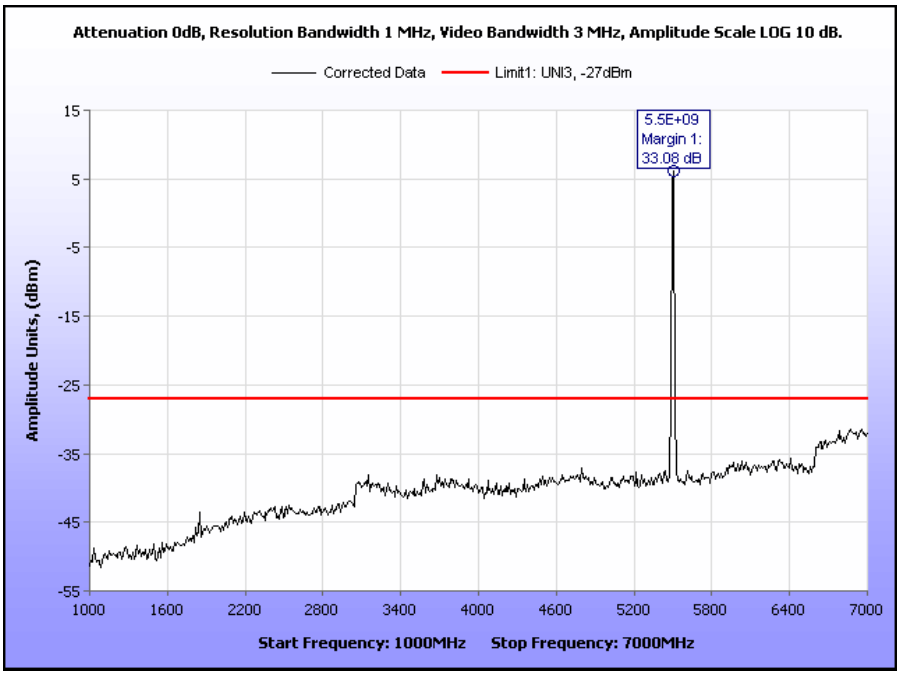
Plot 83. Radiated Spurious Emissions, 802.11a, 5320 MHz, 7 GHz – 18 GHz, VMM



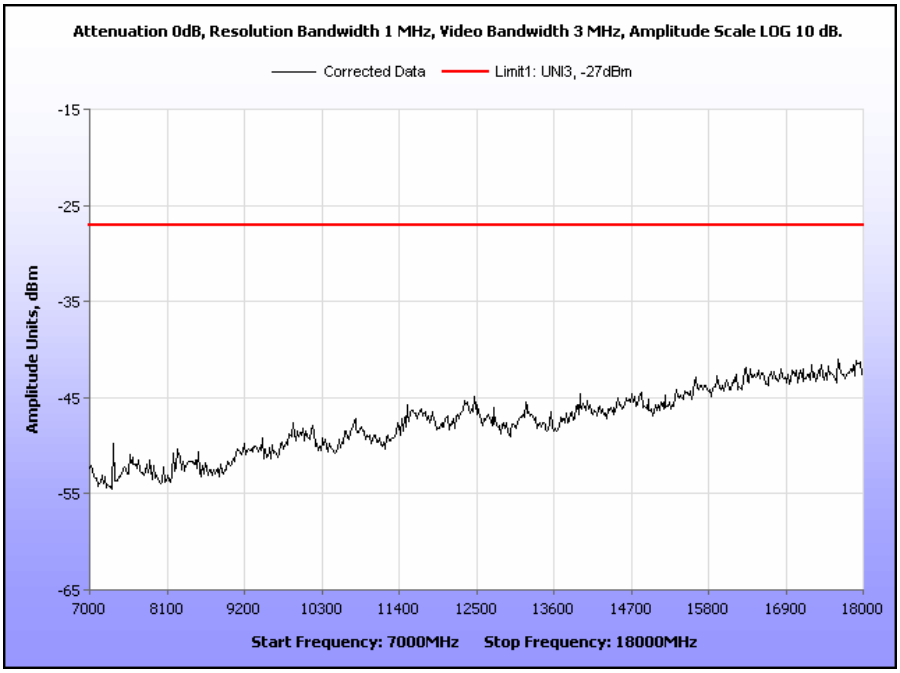
Plot 84. Radiated Spurious Emissions, 802.11a, 5320 MHz, 18 GHz – 40 GHz, VMM



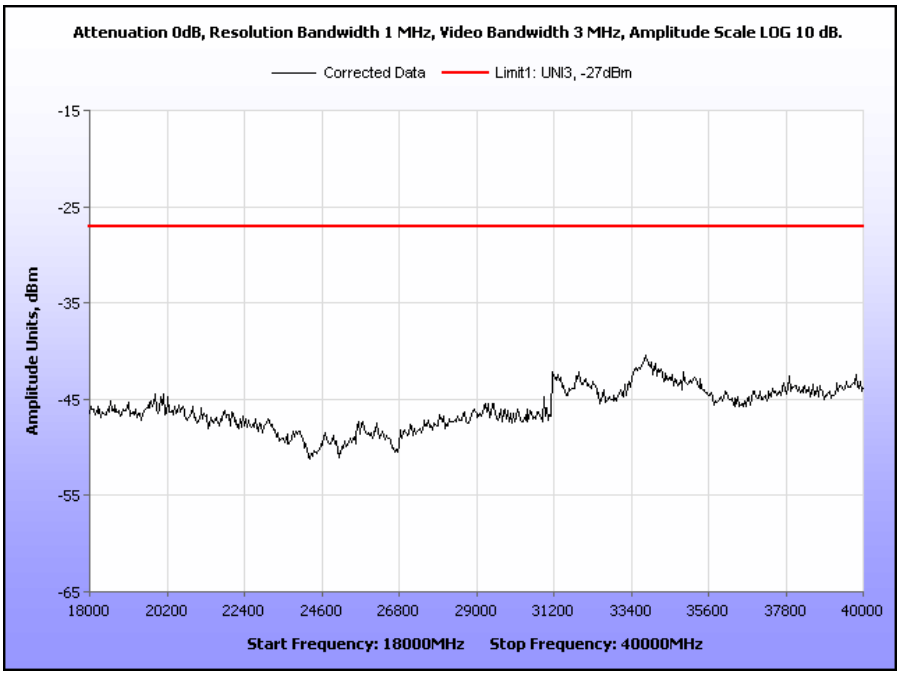
Plot 85. Radiated Spurious Emissions, 802.11a, 5500 MHz, 30 MHz – 1 GHz, VMM



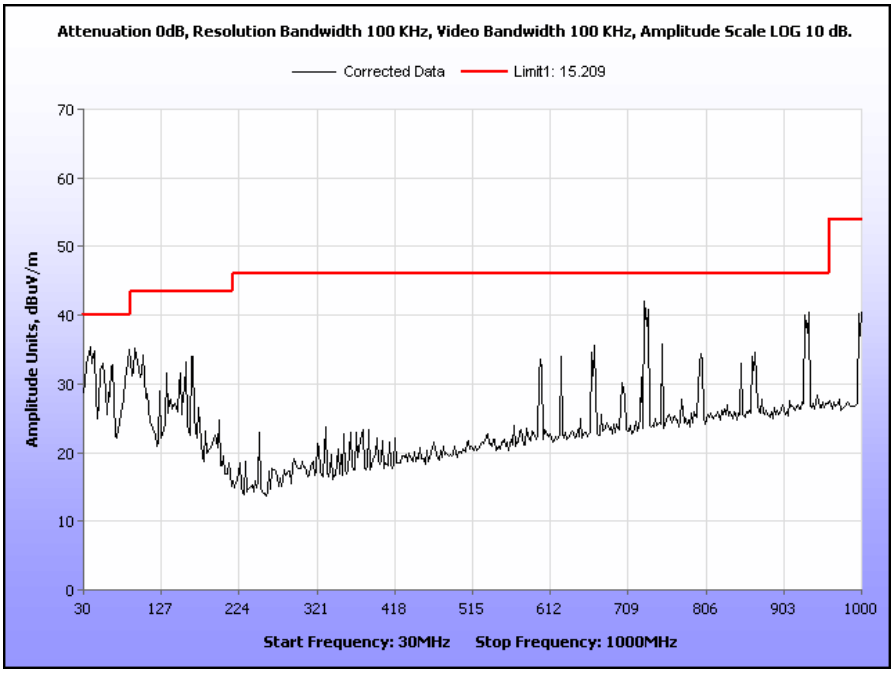
Plot 86. Radiated Spurious Emissions, 802.11a, 5500 MHz, 1 GHz – 7 GHz, VMM



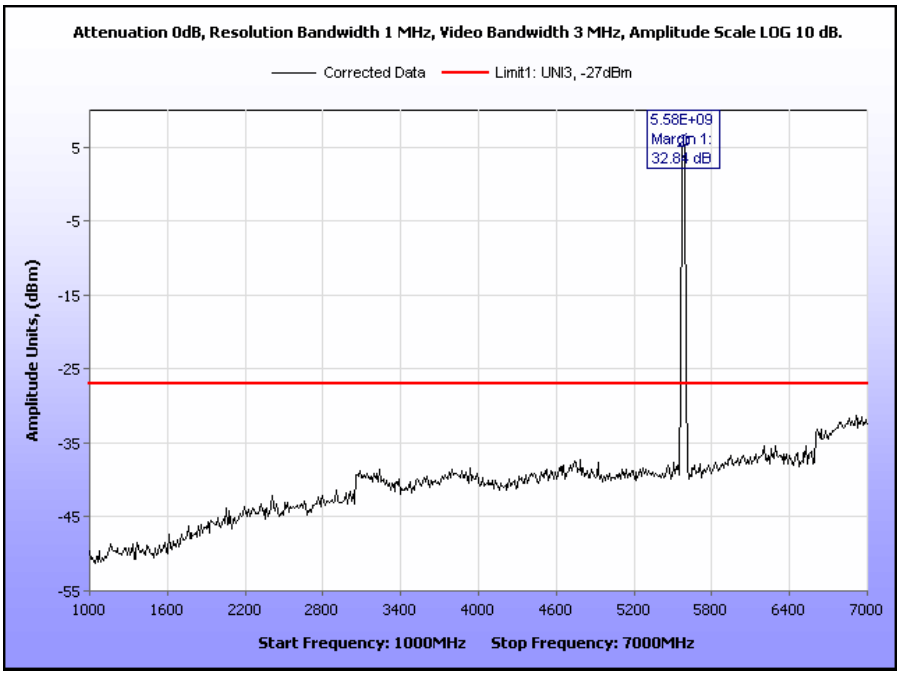
Plot 87. Radiated Spurious Emissions, 802.11a, 5500 MHz, 7 GHz – 18 GHz, VMM



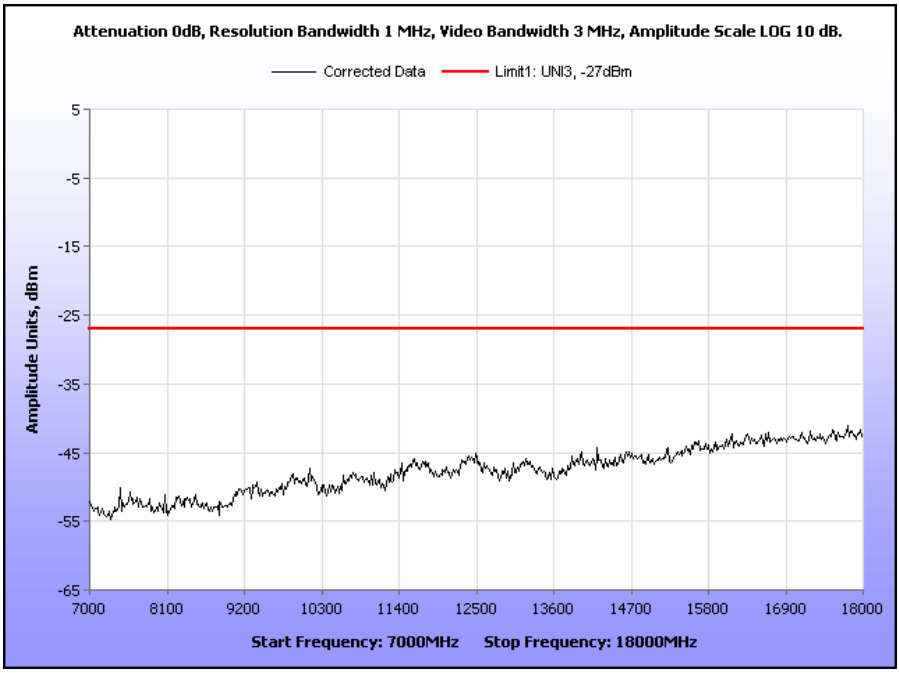
Plot 88. Radiated Spurious Emissions, 802.11a, 5500 MHz, 18 GHz – 40 GHz, VMM



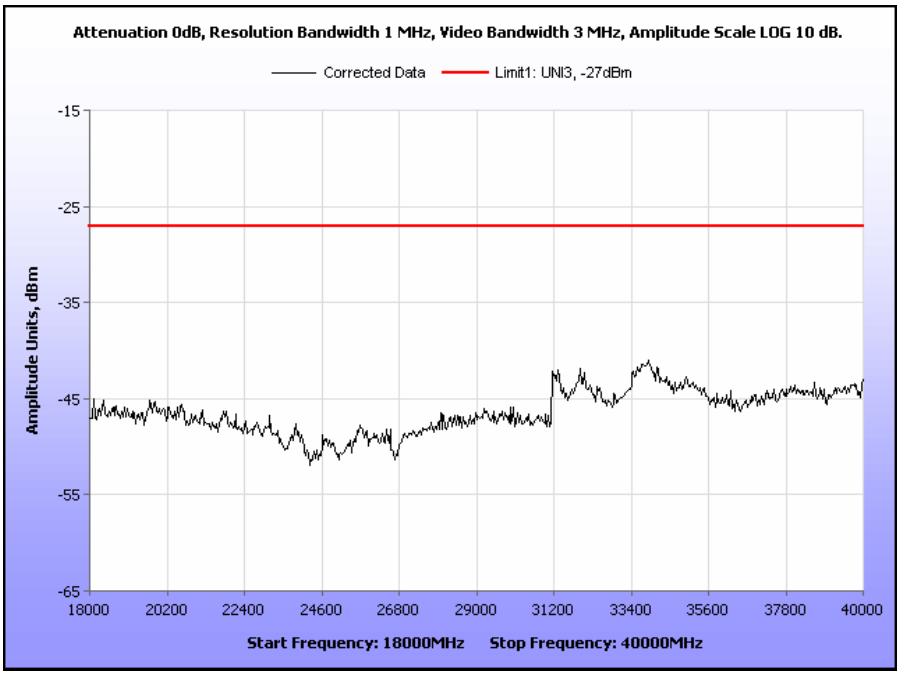
Plot 89. Radiated Spurious Emissions, 802.11a, 5580 MHz, 30 MHz – 1 GHz, VMM



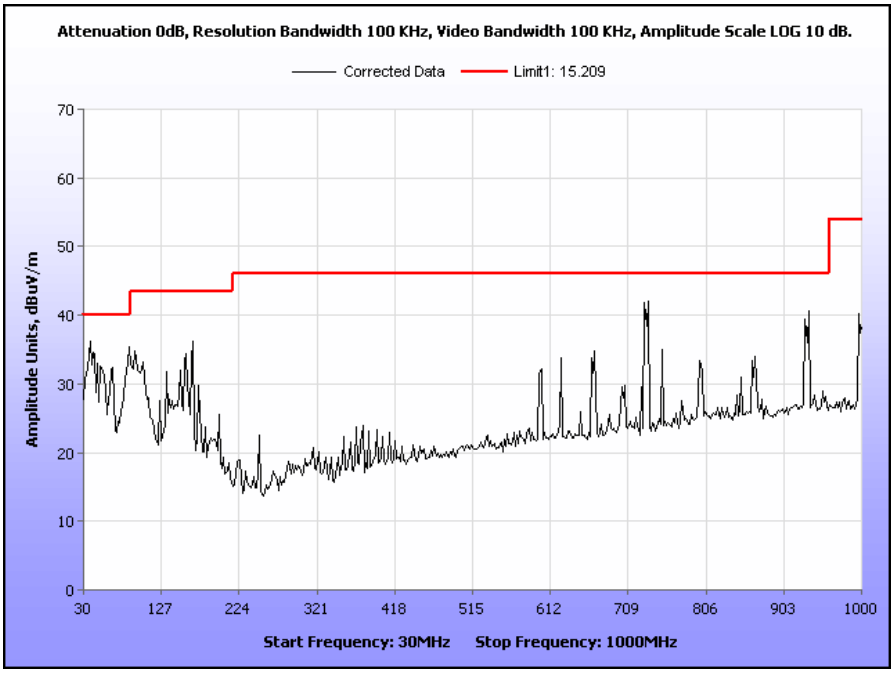
Plot 90. Radiated Spurious Emissions, 802.11a, 5580 MHz, 1 GHz – 7 GHz, VMM



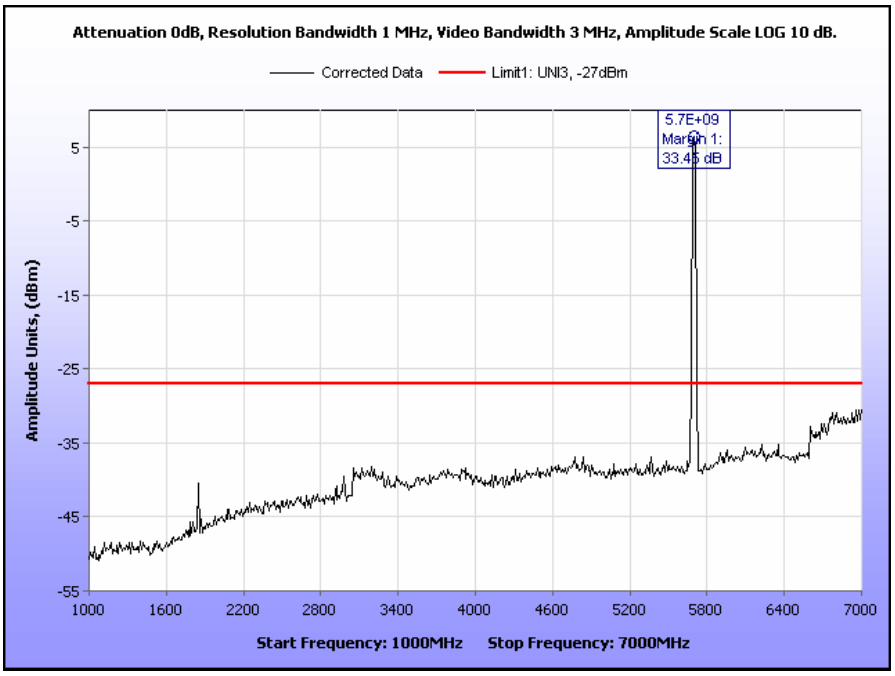
Plot 91. Radiated Spurious Emissions, 802.11a, 5580 MHz, 7 GHz – 18 GHz, VMM



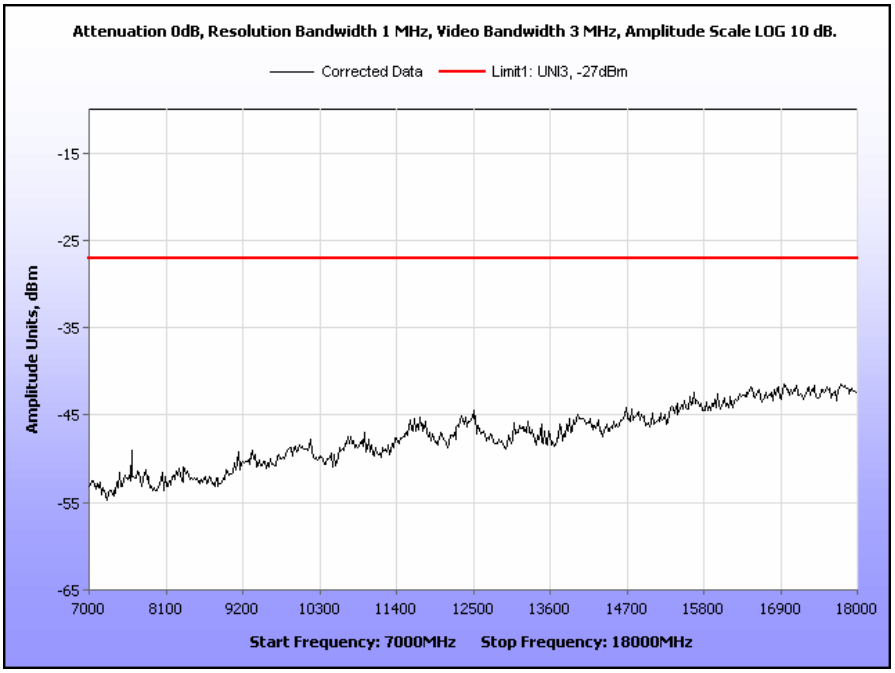
Plot 92. Radiated Spurious Emissions, 802.11a, 5580 MHz, 18 GHz – 40 GHz, VMM



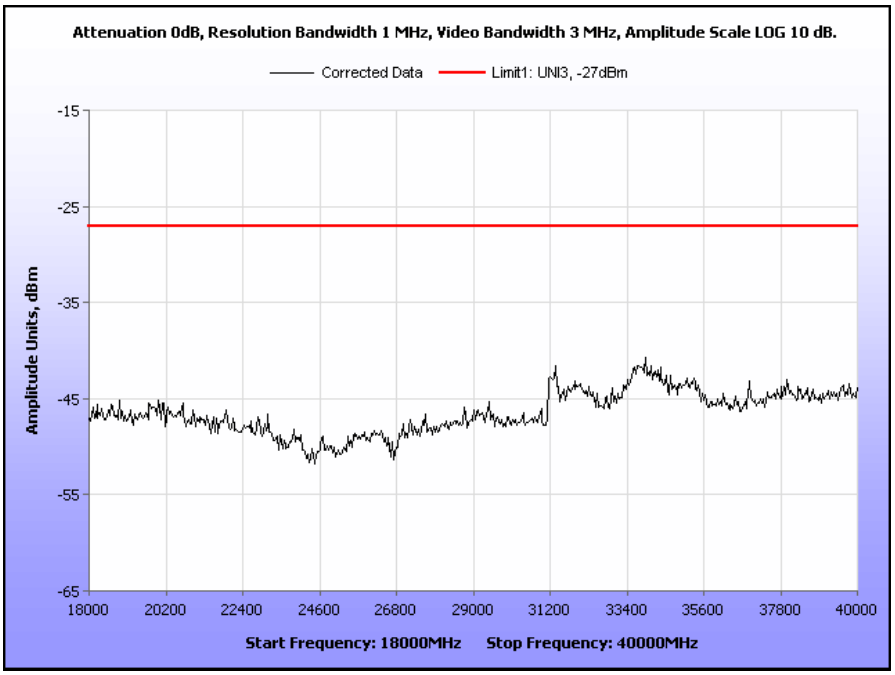
Plot 93. Radiated Spurious Emissions, 802.11a, 5700 MHz, 30 MHz – 1 GHz, VMM



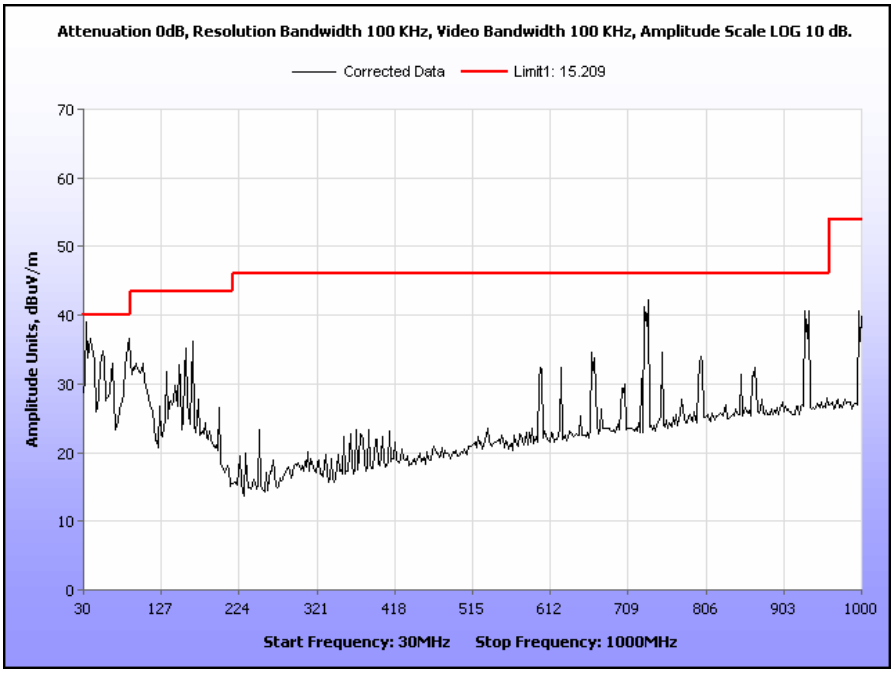
Plot 94. Radiated Spurious Emissions, 802.11a, 5700 MHz, 1 GHz – 7 GHz, VMM



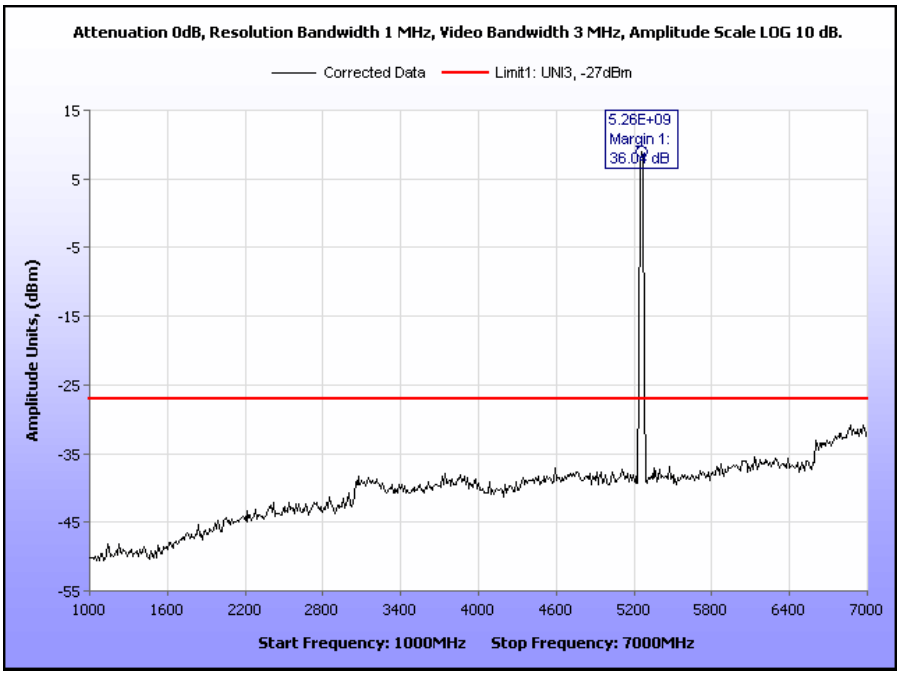
Plot 95. Radiated Spurious Emissions, 802.11a, 5700 MHz, 7 GHz – 18 GHz, VMM



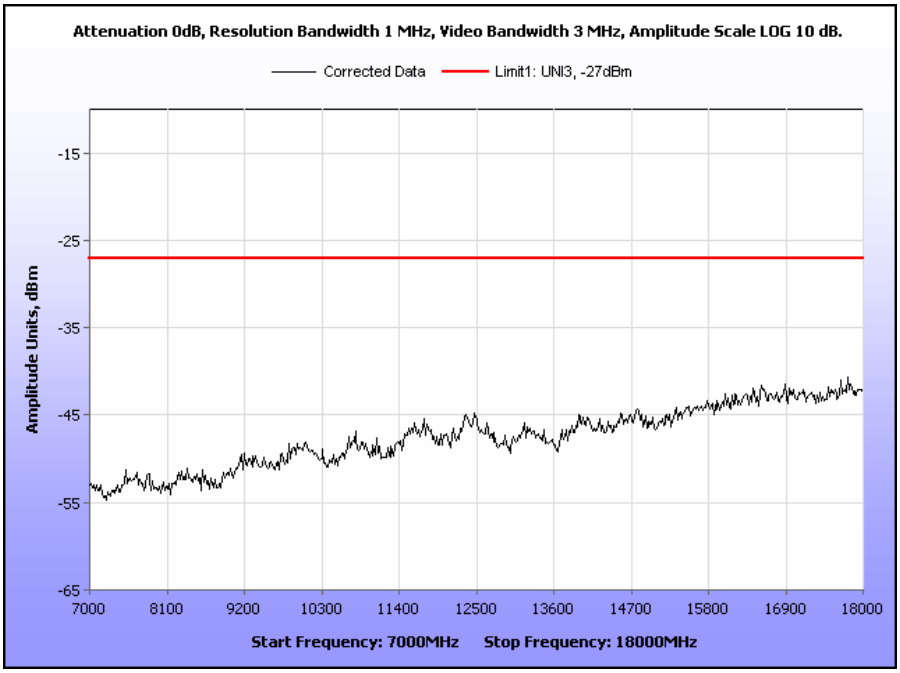
Plot 96. Radiated Spurious Emissions, 802.11a, 5700 MHz, 18 GHz – 40 GHz, VMM



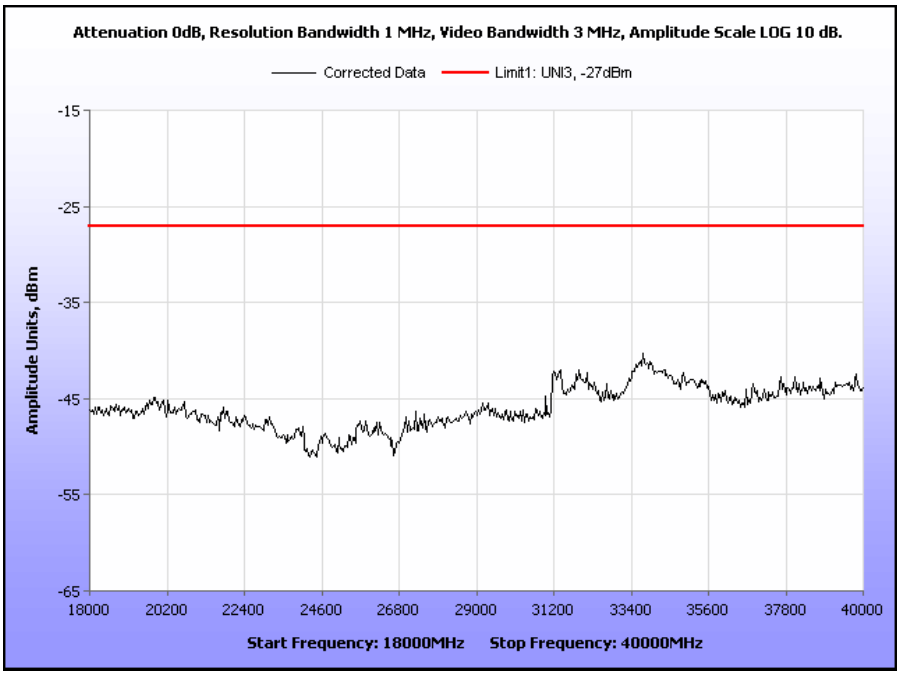
Plot 97. Radiated Spurious Emissions, 802.11n 20 MHz, 5260 MHz, 30 MHz – 1 GHz, VMM



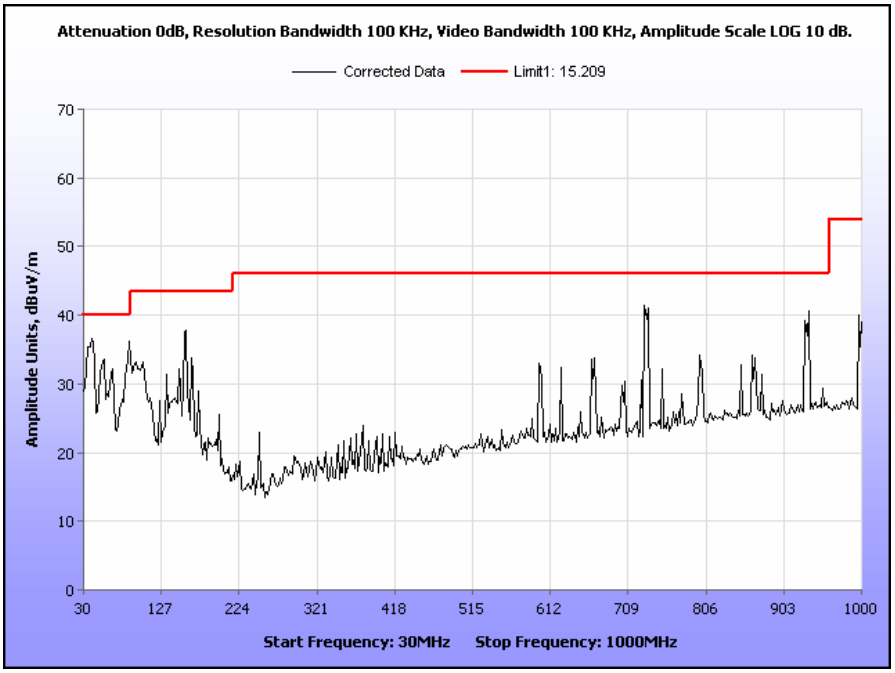
Plot 98. Radiated Spurious Emissions, 802.11n 20 MHz, 5260 MHz, 1 GHz – 7 GHz, VMM



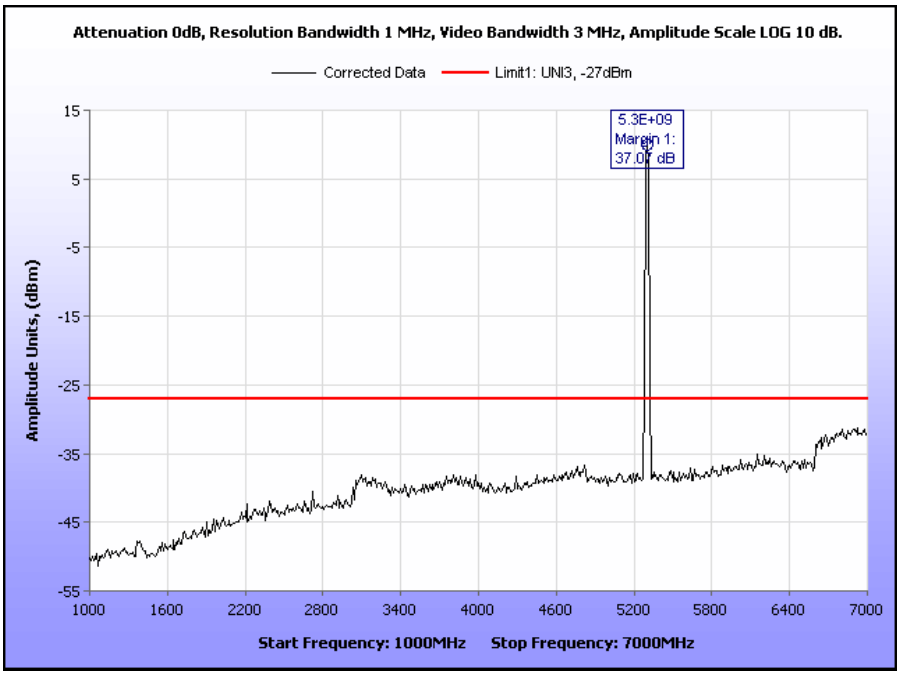
Plot 99. Radiated Spurious Emissions, 802.11n 20 MHz, 5260 MHz, 7 GHz – 18 GHz, VMM



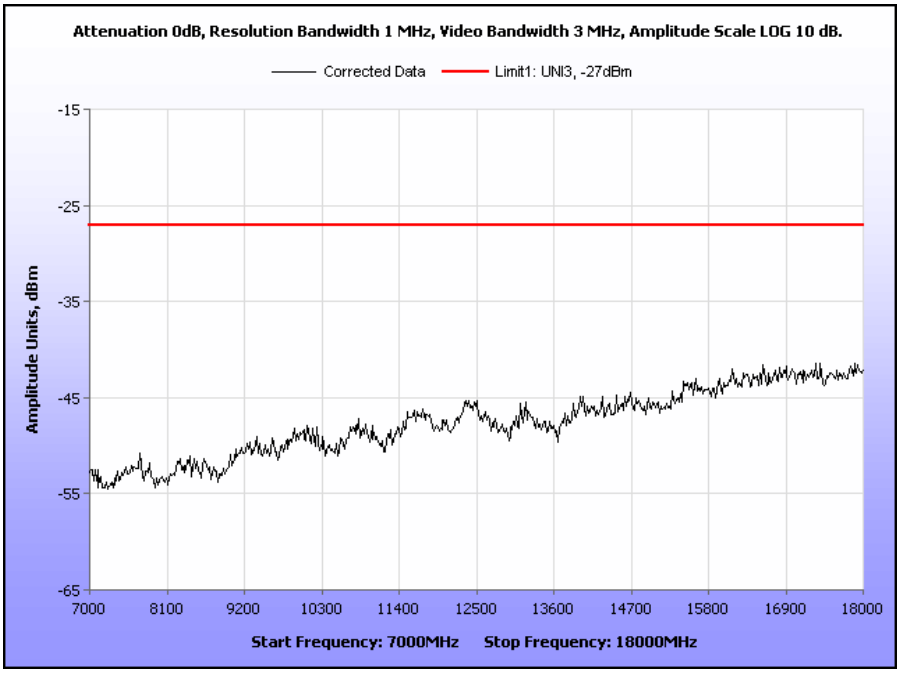
Plot 100. Radiated Spurious Emissions, 802.11n 20 MHz, 5260 MHz, 18 GHz – 40 GHz, VMM



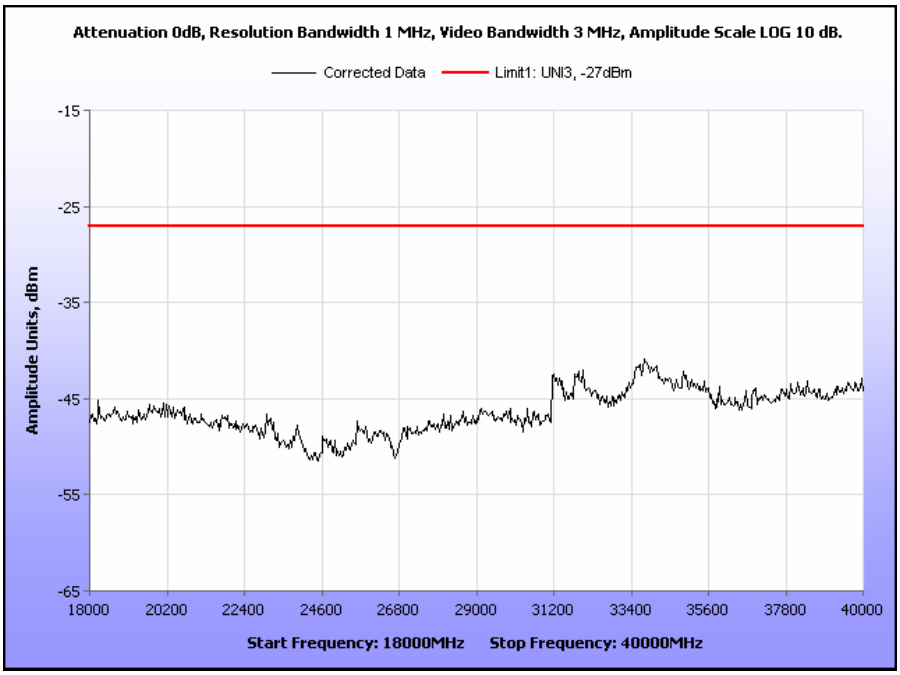
Plot 101. Radiated Spurious Emissions, 802.11n 20 MHz, 5300 MHz, 30 MHz – 1 GHz, VMM



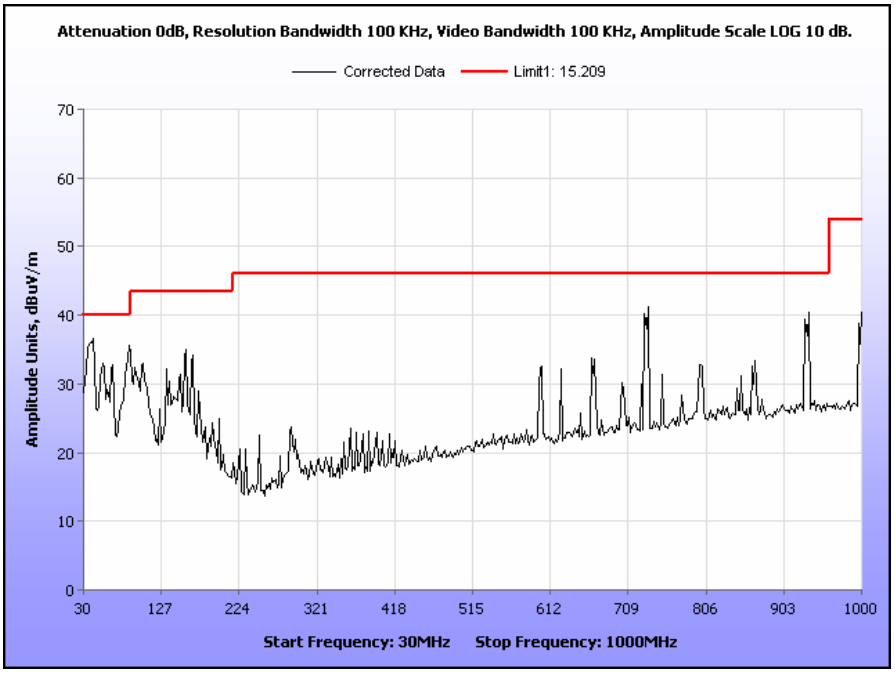
Plot 102. Radiated Spurious Emissions, 802.11n 20 MHz, 5300 MHz, 1 GHz – 7 GHz, VMM



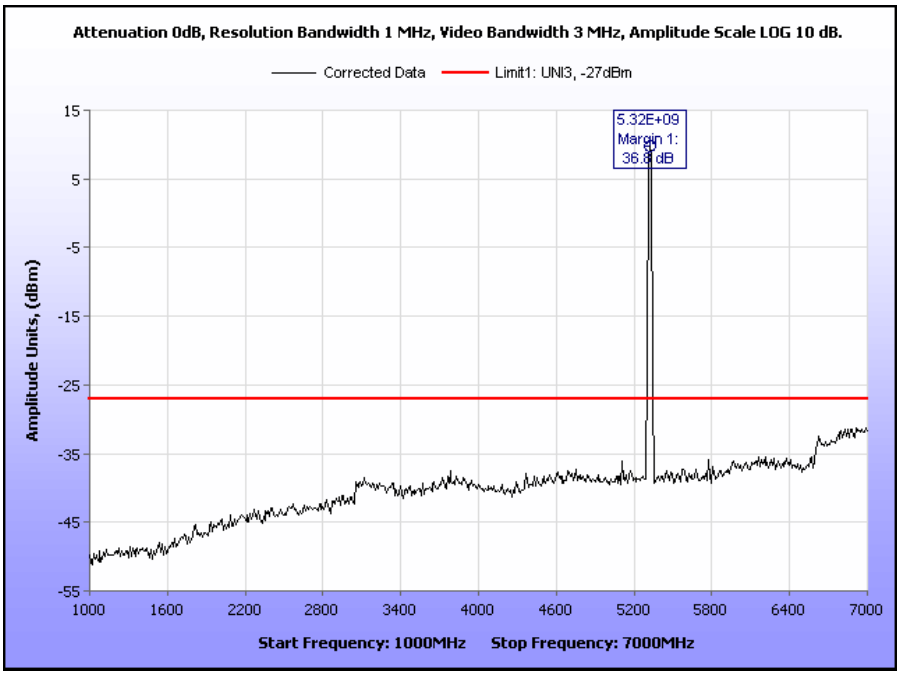
Plot 103. Radiated Spurious Emissions, 802.11n 20 MHz, 5300 MHz, 7 GHz – 18 GHz, VMM



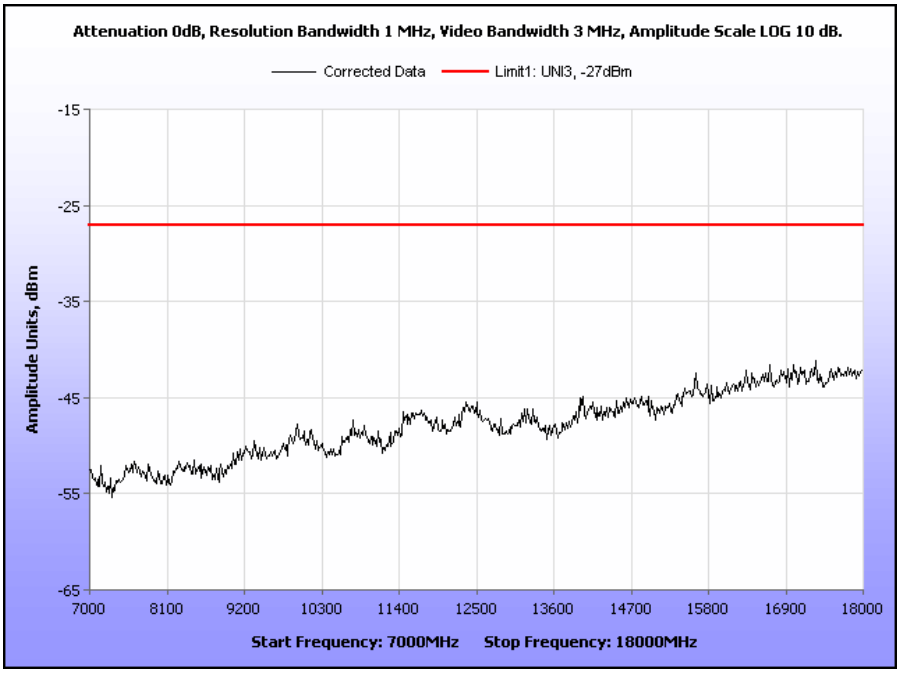
Plot 104. Radiated Spurious Emissions, 802.11n 20 MHz, 5300 MHz, 18 GHz – 40 GHz, VMM



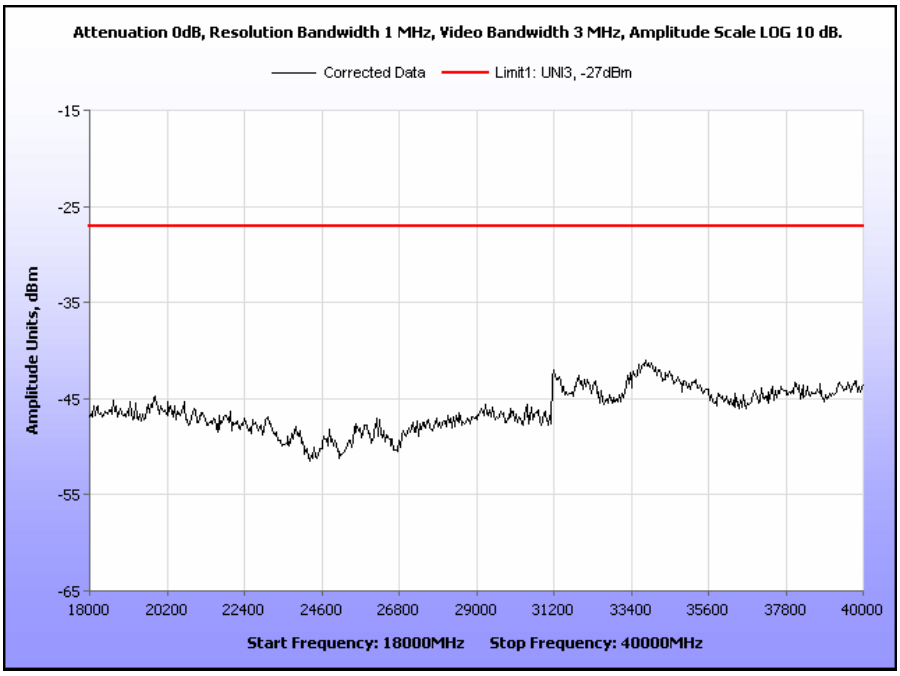
Plot 105. Radiated Spurious Emissions, 802.11n 20 MHz, 5320 MHz, 30 MHz – 1 GHz, VMM



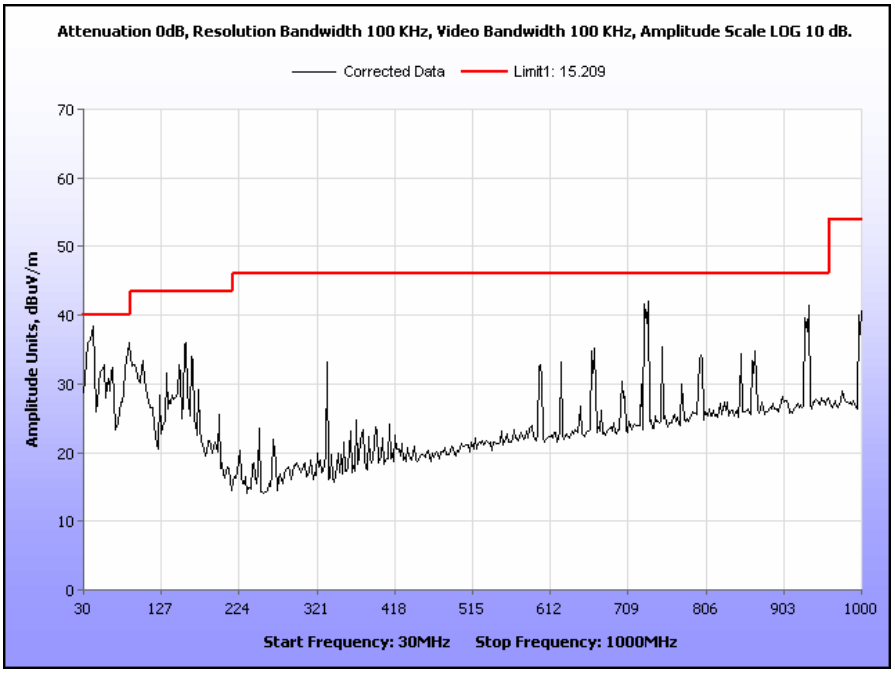
Plot 106. Radiated Spurious Emissions, 802.11n 20 MHz, 5320 MHz, 1 GHz – 7 GHz, VMM



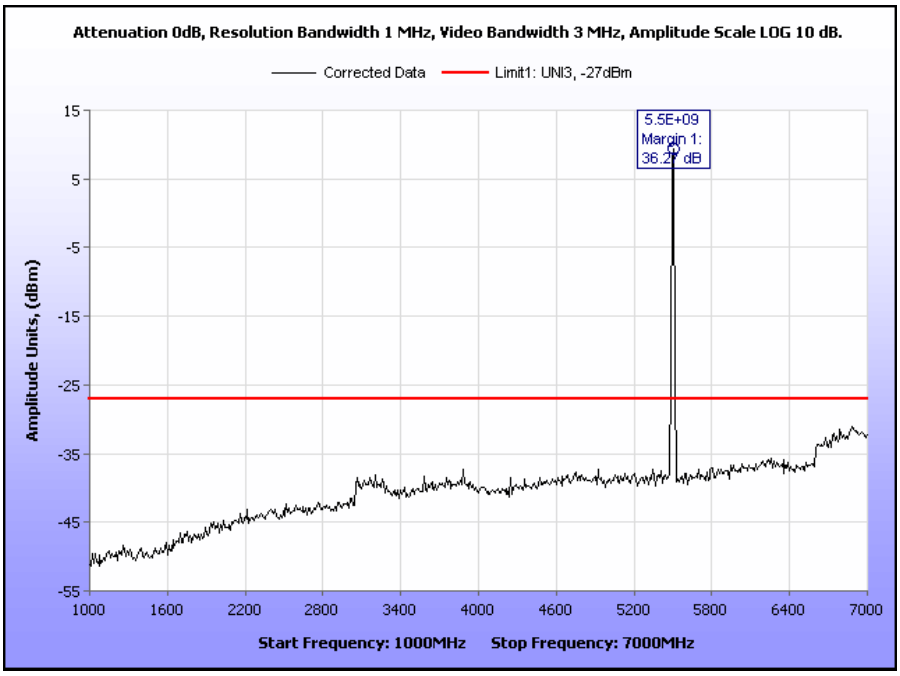
Plot 107. Radiated Spurious Emissions, 802.11n 20 MHz, 5320 MHz, 7 GHz – 18 GHz, VMM



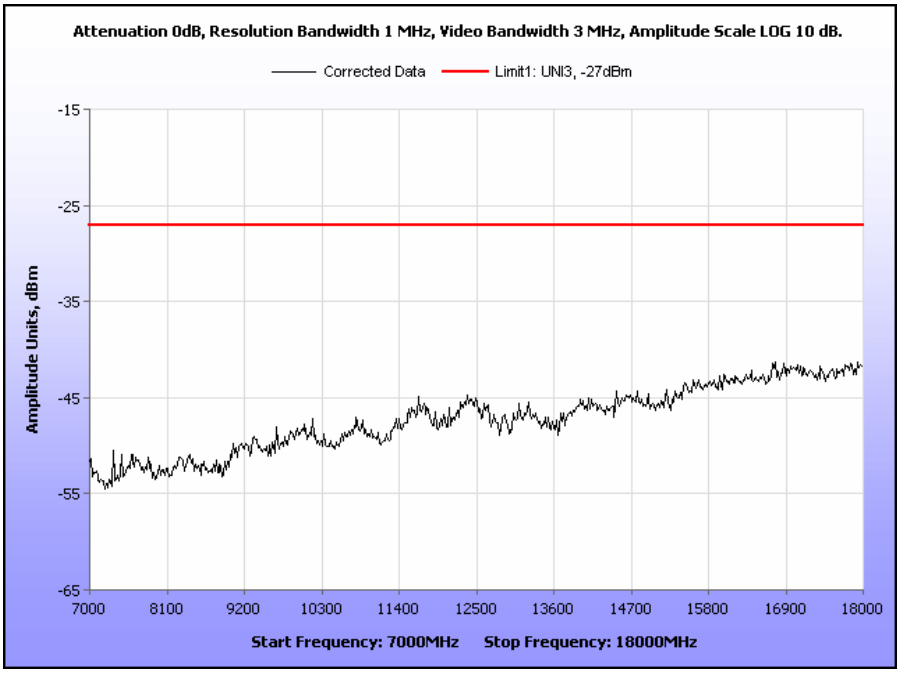
Plot 108. Radiated Spurious Emissions, 802.11n 20 MHz, 5320 MHz, 18 GHz – 40 GHz, VMM



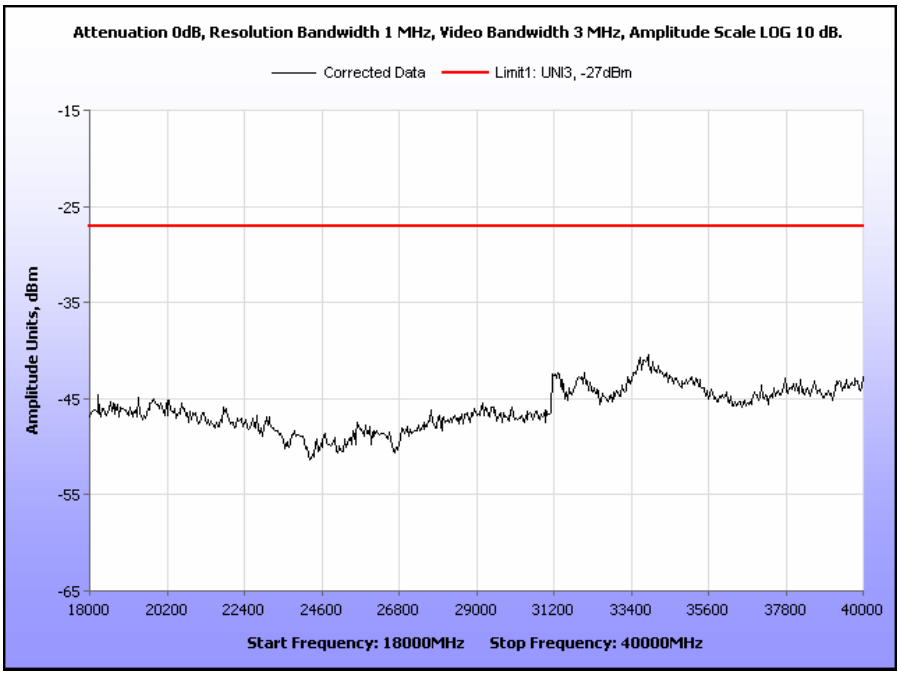
Plot 109. Radiated Spurious Emissions, 802.11n 20 MHz, 5500 MHz, 30 MHz – 1 GHz, VMM



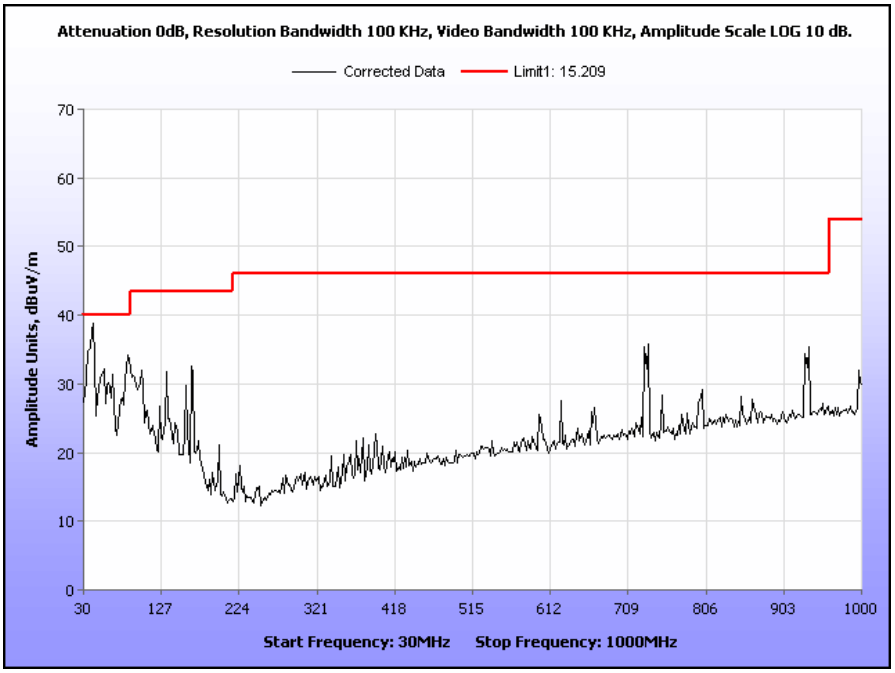
Plot 110. Radiated Spurious Emissions, 802.11n 20 MHz, 5500 MHz, 1 GHz – 7 GHz, VMM



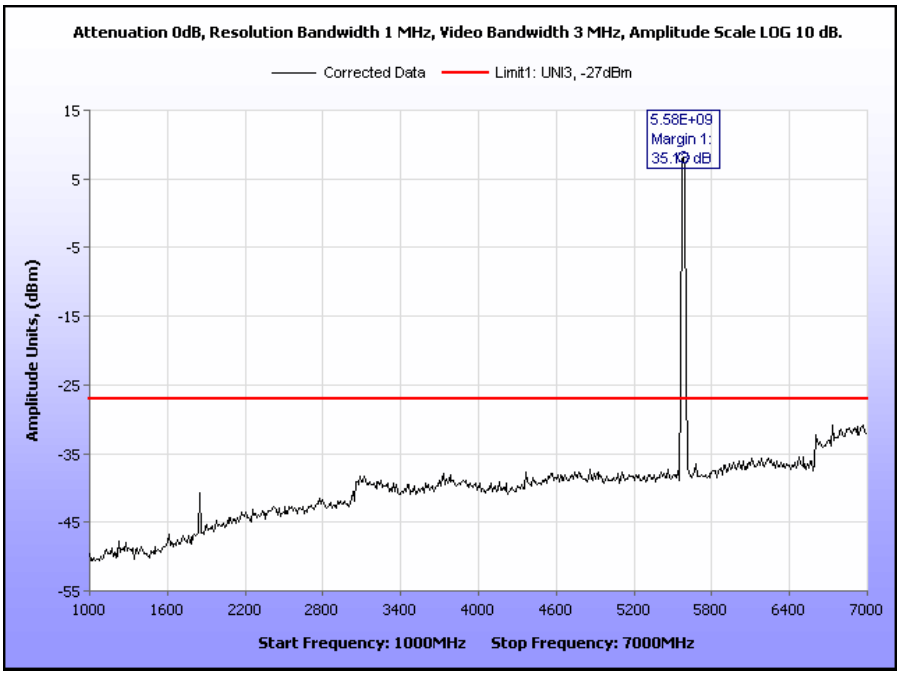
Plot 111. Radiated Spurious Emissions, 802.11n 20 MHz, 5500 MHz, 7 GHz – 18 GHz, VMM



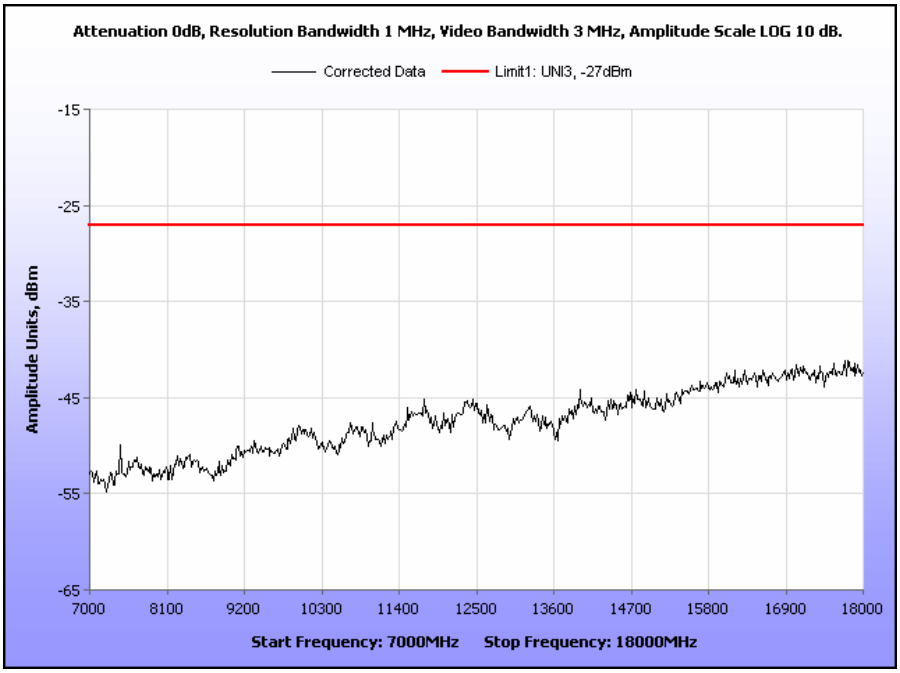
Plot 112. Radiated Spurious Emissions, 802.11n 20 MHz, 5500 MHz, 18 GHz – 40 GHz, VMM



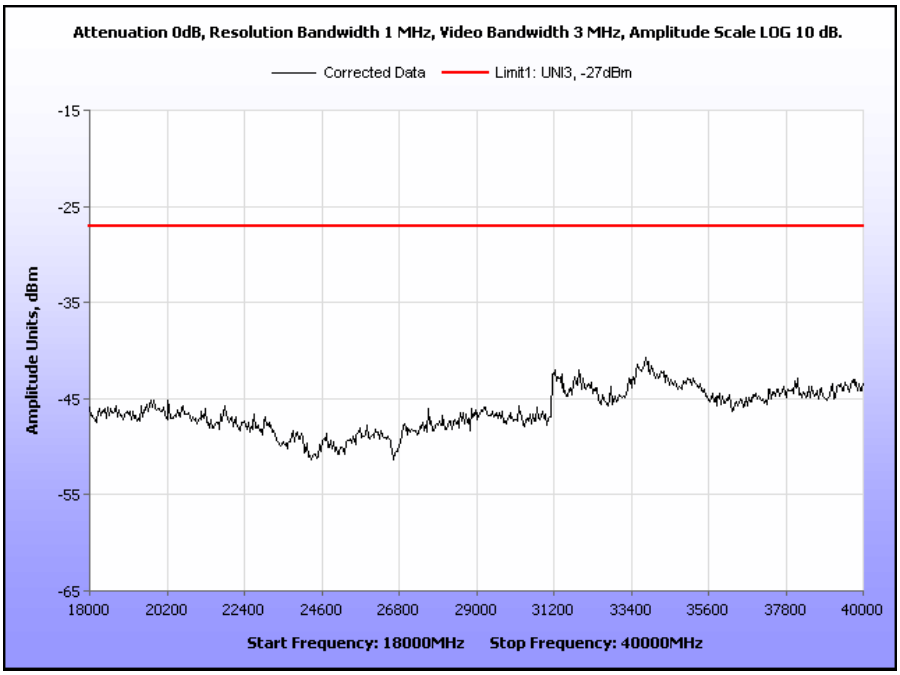
Plot 113. Radiated Spurious Emissions, 802.11n 20 MHz, 5580 MHz, 30 MHz – 1 GHz, VMM



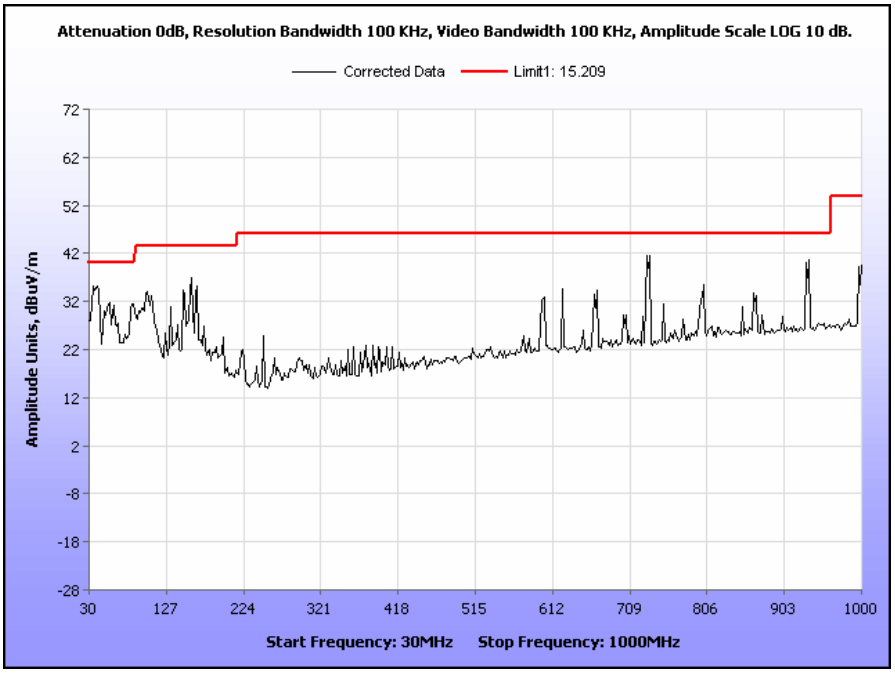
Plot 114. Radiated Spurious Emissions, 802.11n 20 MHz, 5580 MHz, 1 GHz – 7 GHz, VMM



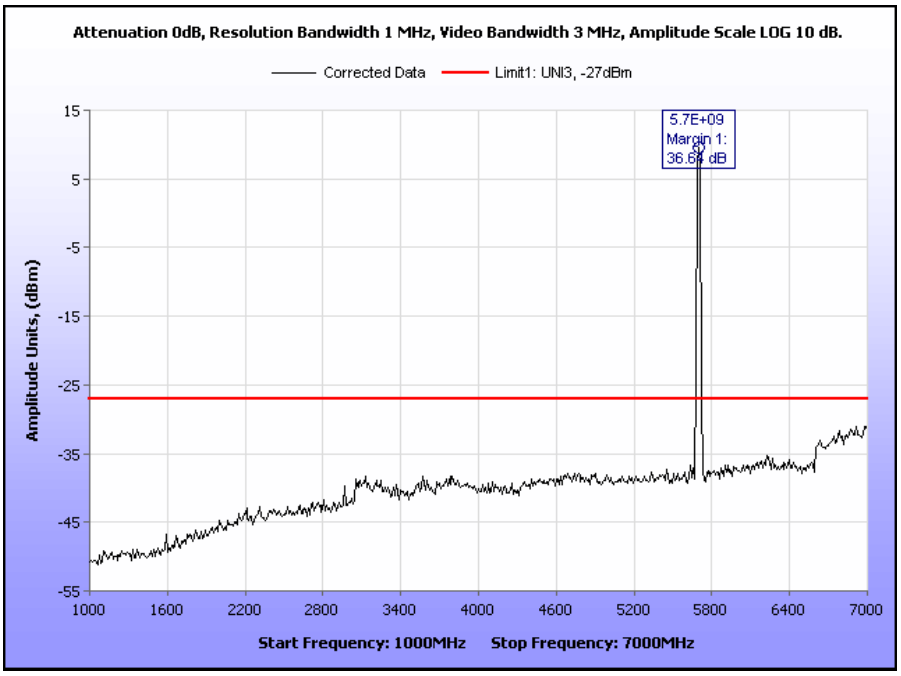
Plot 115. Radiated Spurious Emissions, 802.11n 20 MHz, 5580 MHz, 7 GHz – 18 GHz, VMM



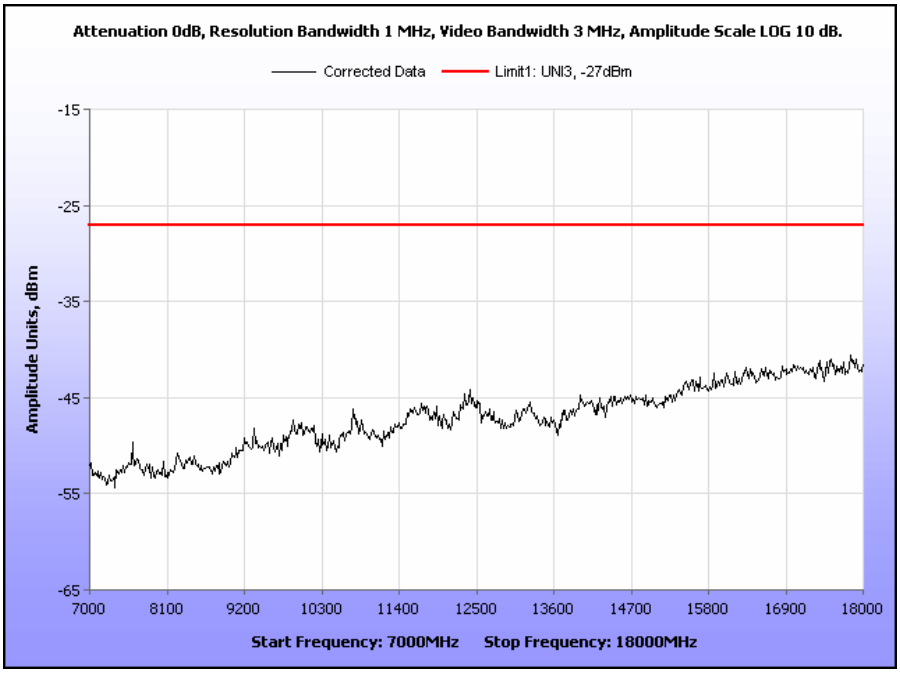
Plot 116. Radiated Spurious Emissions, 802.11n 20 MHz, 5580 MHz, 18 GHz – 40 GHz, VMM



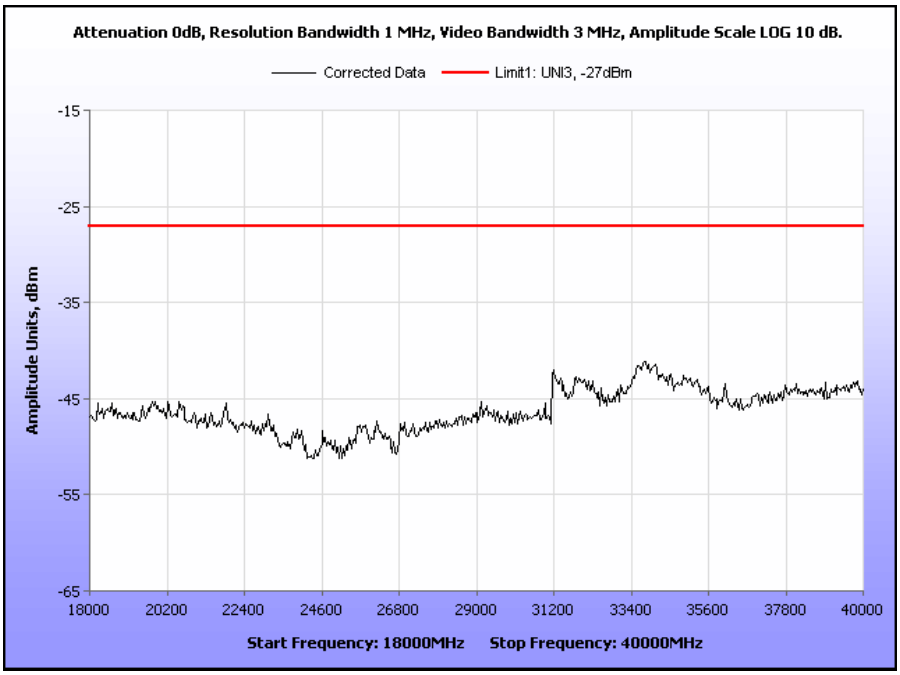
Plot 117. Radiated Spurious Emissions, 802.11n 20 MHz, 5700 MHz, 30 MHz – 1 GHz, VMM



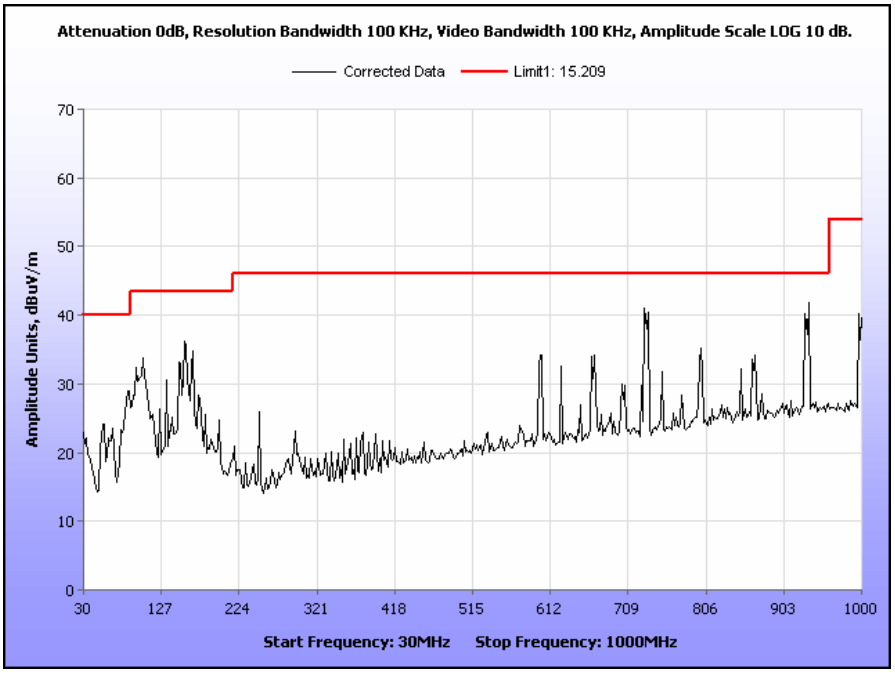
Plot 118. Radiated Spurious Emissions, 802.11n 20 MHz, 5700 MHz, 1 GHz – 7 GHz, VMM



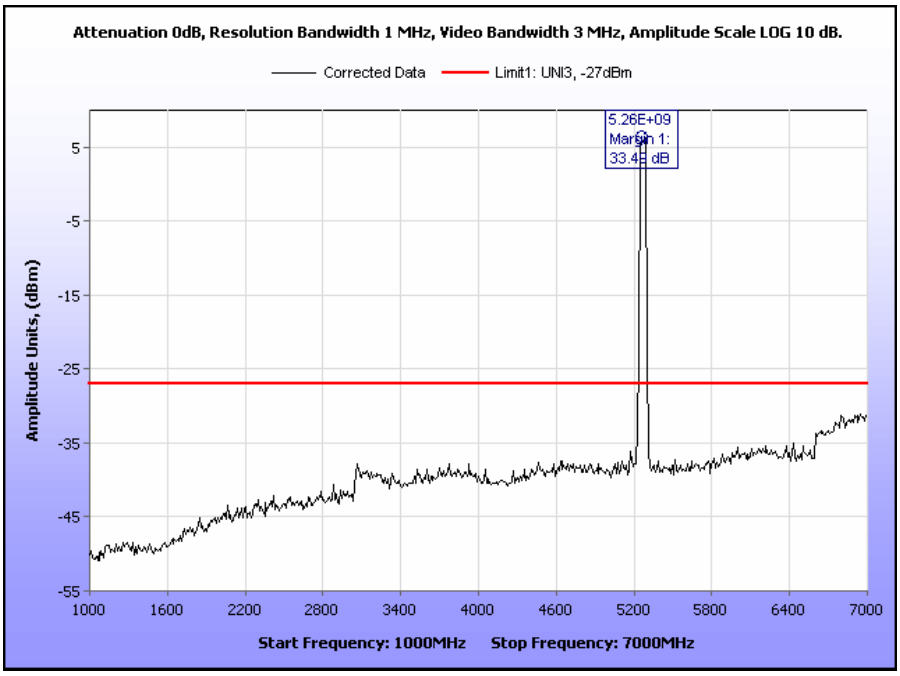
Plot 119. Radiated Spurious Emissions, 802.11n 20 MHz, 5700 MHz, 7 GHz – 18 GHz, VMM



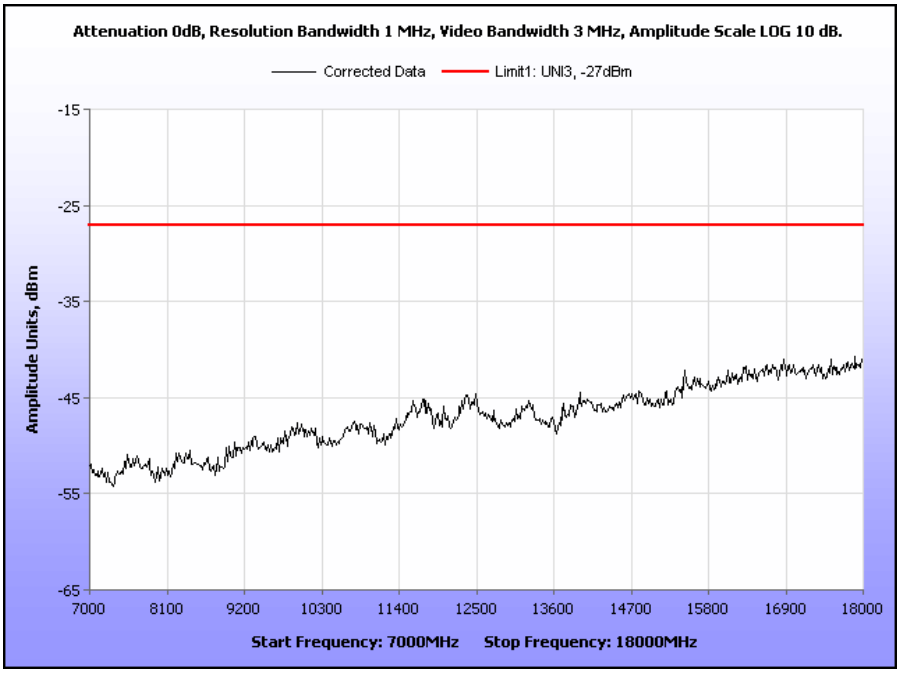
Plot 120. Radiated Spurious Emissions, 802.11n 20 MHz, 5700 MHz, 18 GHz – 40 GHz, VMM



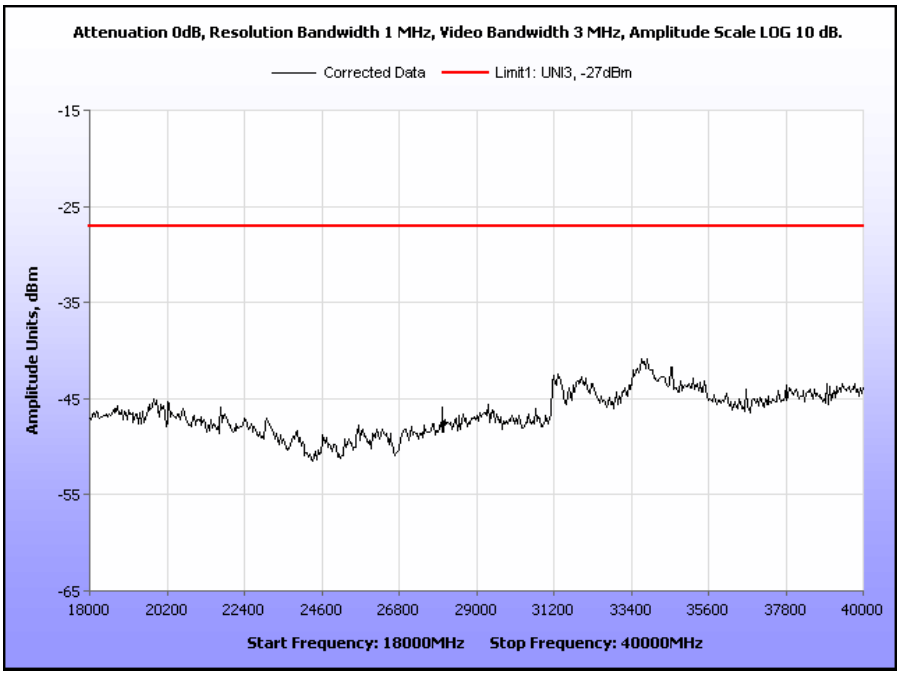
Plot 121. Radiated Spurious Emissions, 802.11n 40 MHz, 5270 MHz, 30 MHz – 1 GHz, VMM



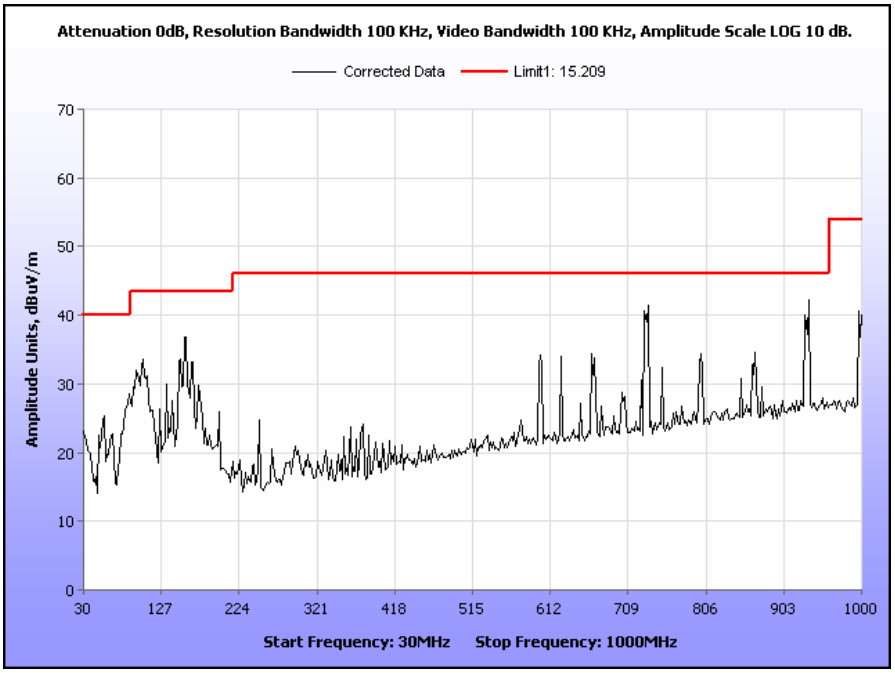
Plot 122. Radiated Spurious Emissions, 802.11n 40 MHz, 5270 MHz, 1 GHz – 7 GHz, VMM



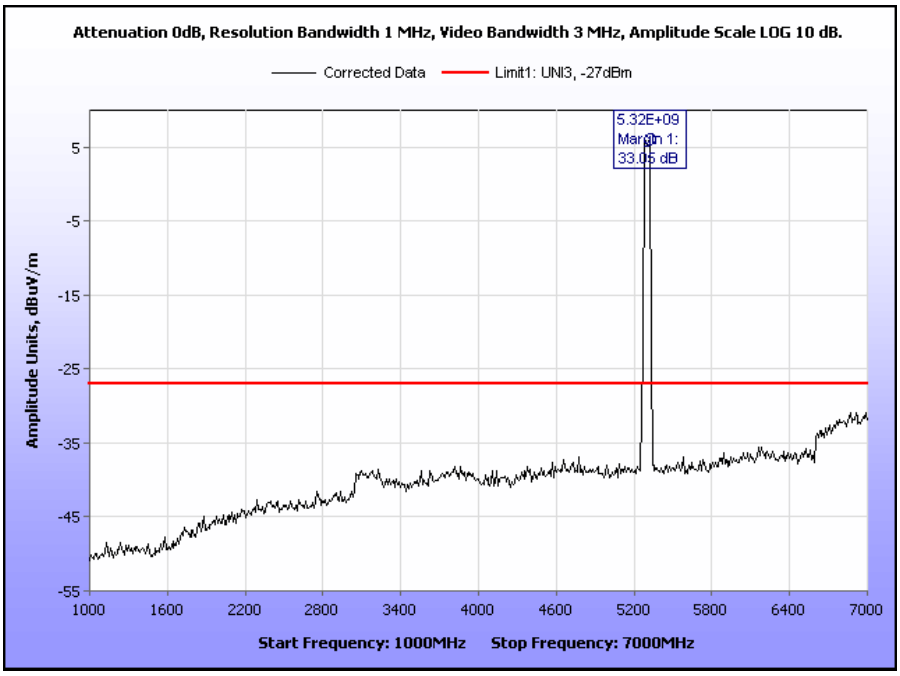
Plot 123. Radiated Spurious Emissions, 802.11n 40 MHz, 5270 MHz, 7 GHz – 18 GHz, VMM



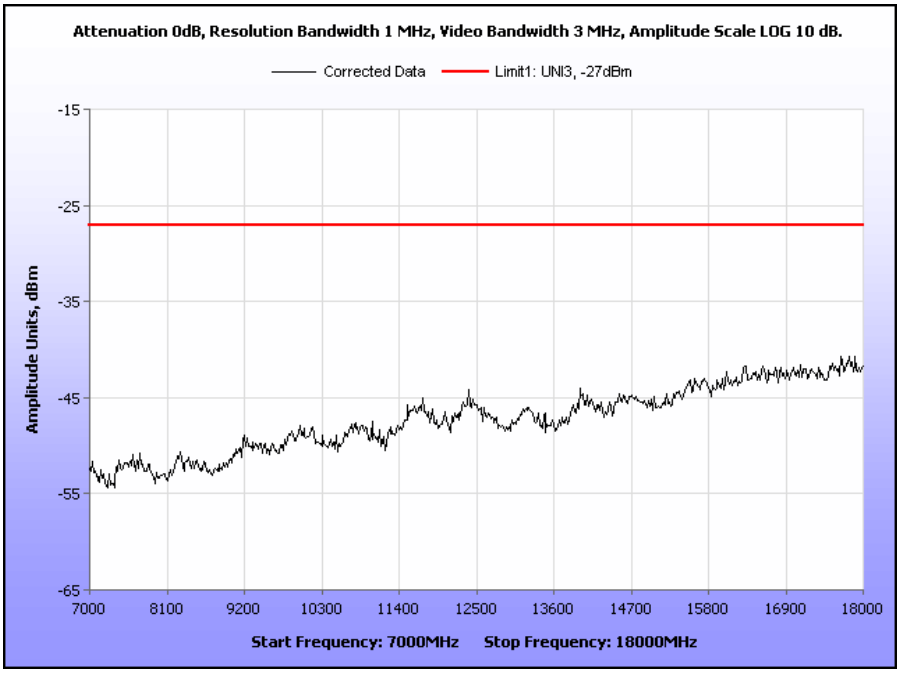
Plot 124. Radiated Spurious Emissions, 802.11n 40 MHz, 5270 MHz, 18 GHz – 40 GHz, VMM



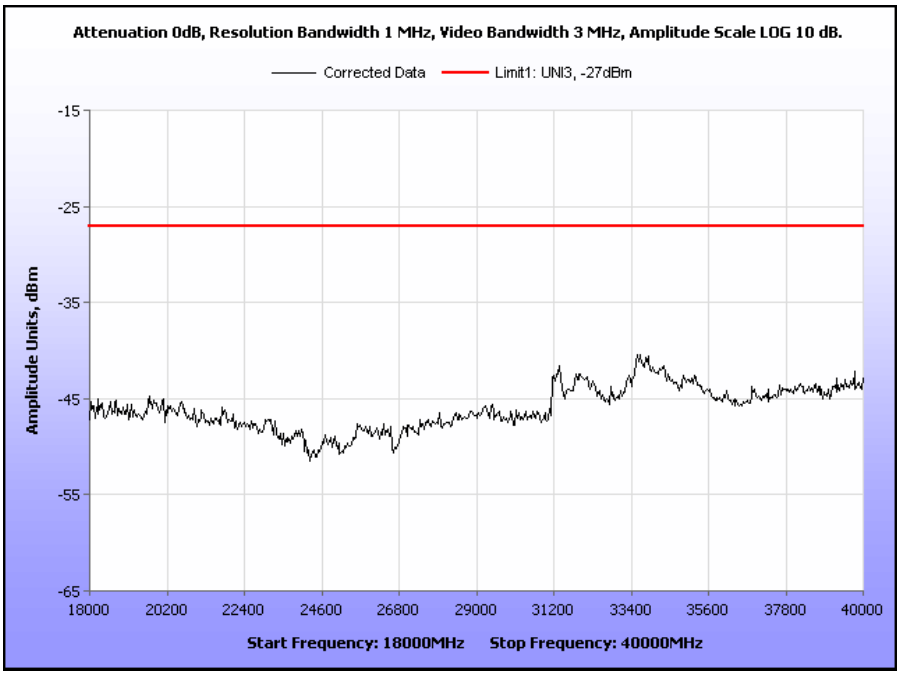
Plot 125. Radiated Spurious Emissions, 802.11n 40 MHz, 5300 MHz, 30 MHz – 1 GHz, VMM



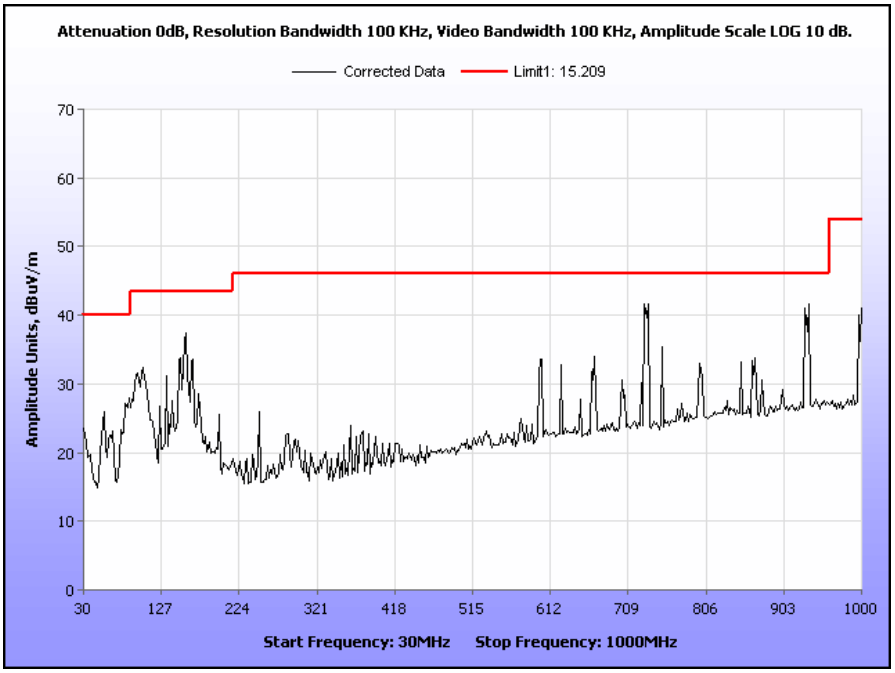
Plot 126. Radiated Spurious Emissions, 802.11n 40 MHz, 5300 MHz, 1 GHz – 7 GHz, VMM



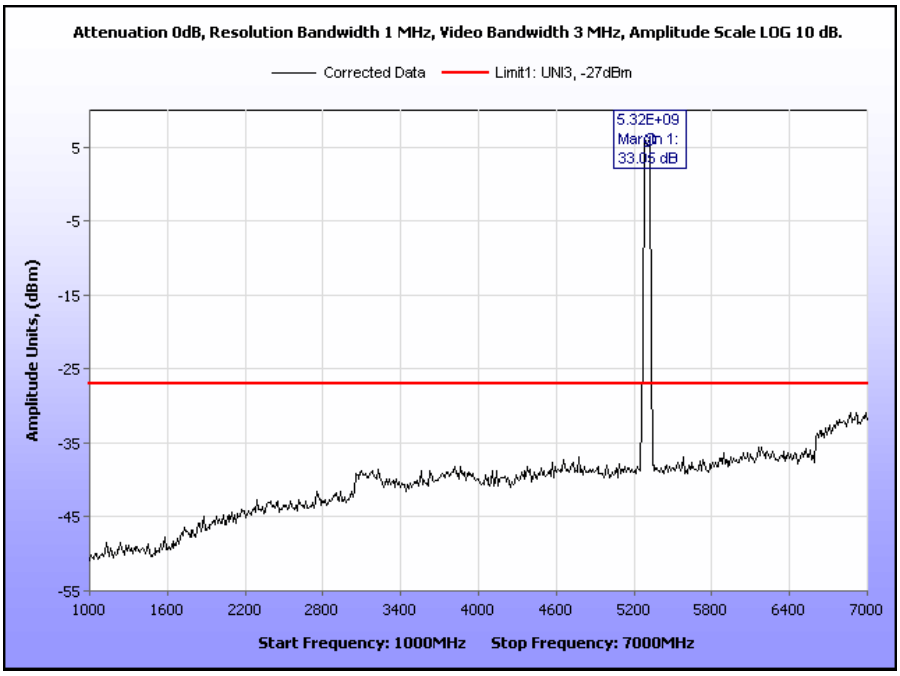
Plot 127. Radiated Spurious Emissions, 802.11n 40 MHz, 5300 MHz, 7 GHz – 18 GHz, VMM



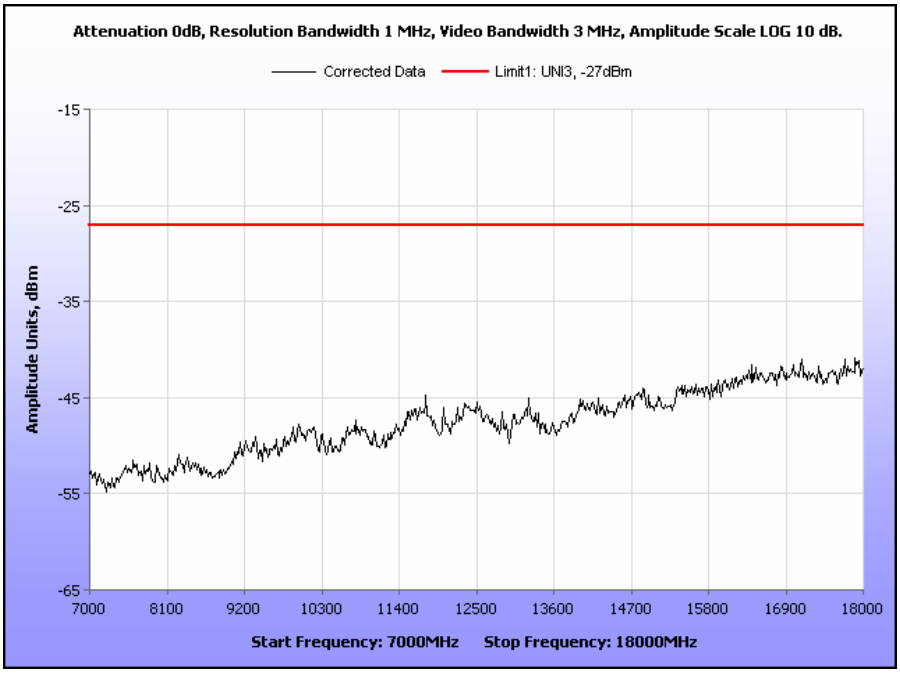
Plot 128. Radiated Spurious Emissions, 802.11n 40 MHz, 5300 MHz, 18 GHz – 40 GHz, VMM



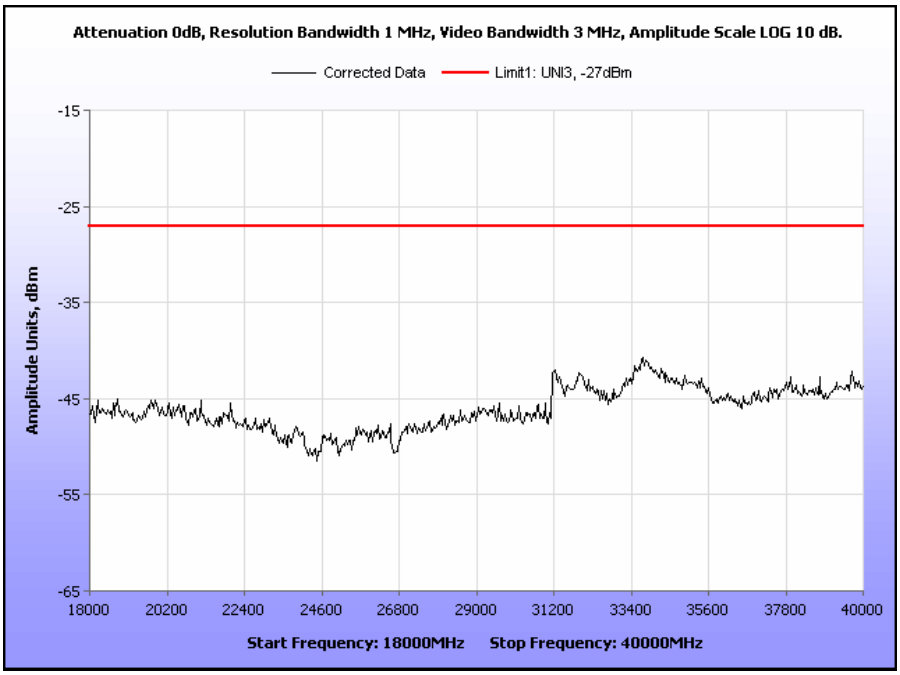
Plot 129. Radiated Spurious Emissions, 802.11n 40 MHz, 5310 MHz, 30 MHz – 1 GHz, VMM



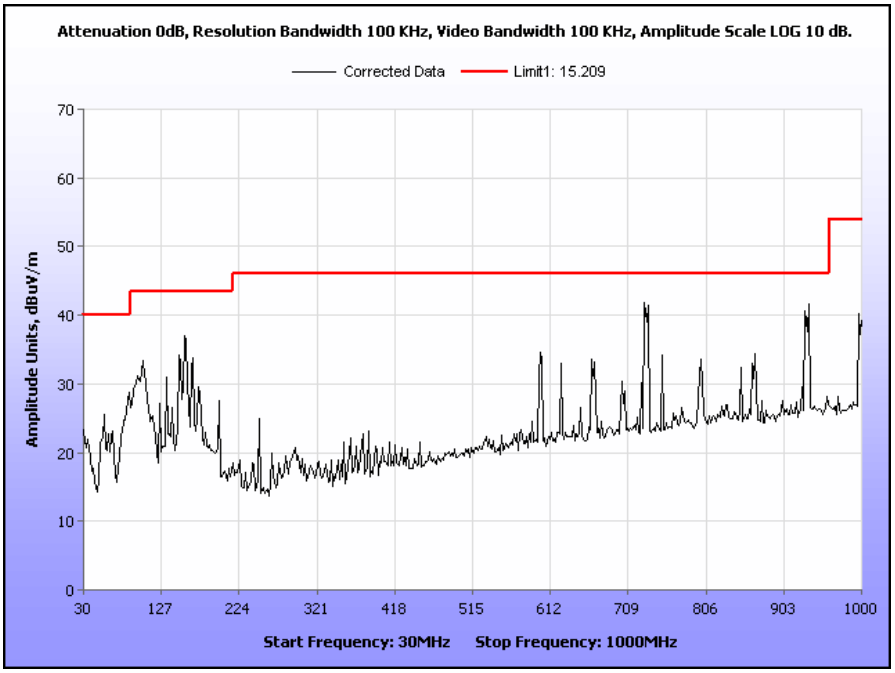
Plot 130. Radiated Spurious Emissions, 802.11n 40 MHz, 5310 MHz, 1 GHz – 7 GHz, VMM



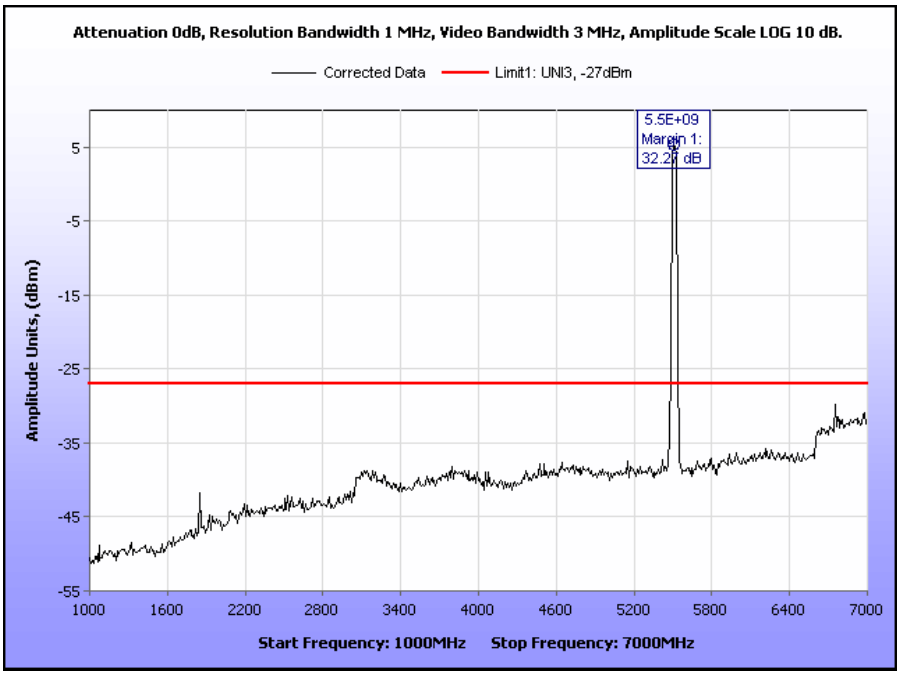
Plot 131. Radiated Spurious Emissions, 802.11n 40 MHz, 5310 MHz, 7 GHz – 18 GHz, VMM



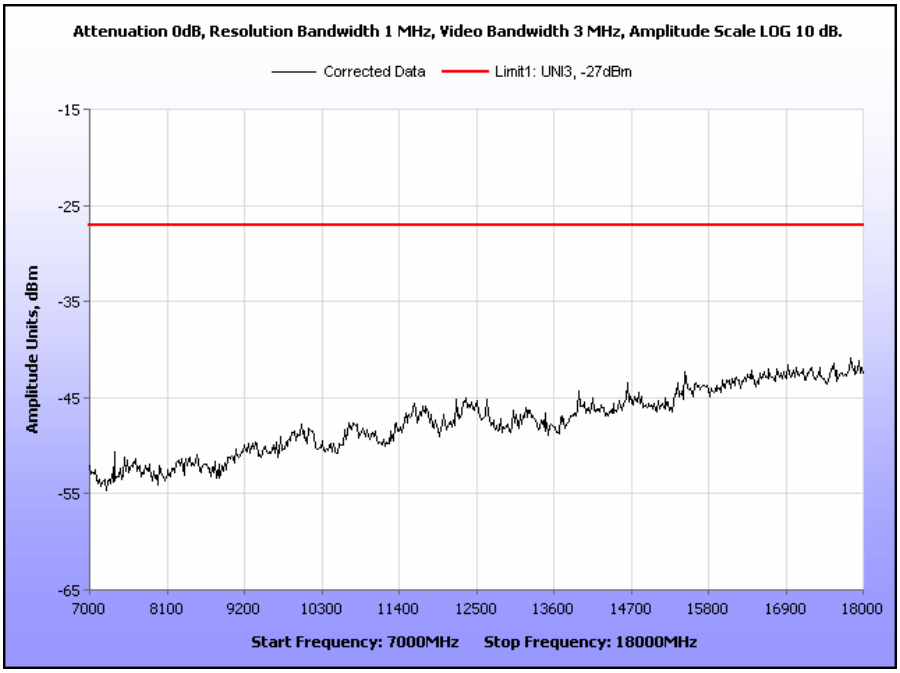
Plot 132. Radiated Spurious Emissions, 802.11n 40 MHz, 5310 MHz, 18 GHz – 40 GHz, VMM



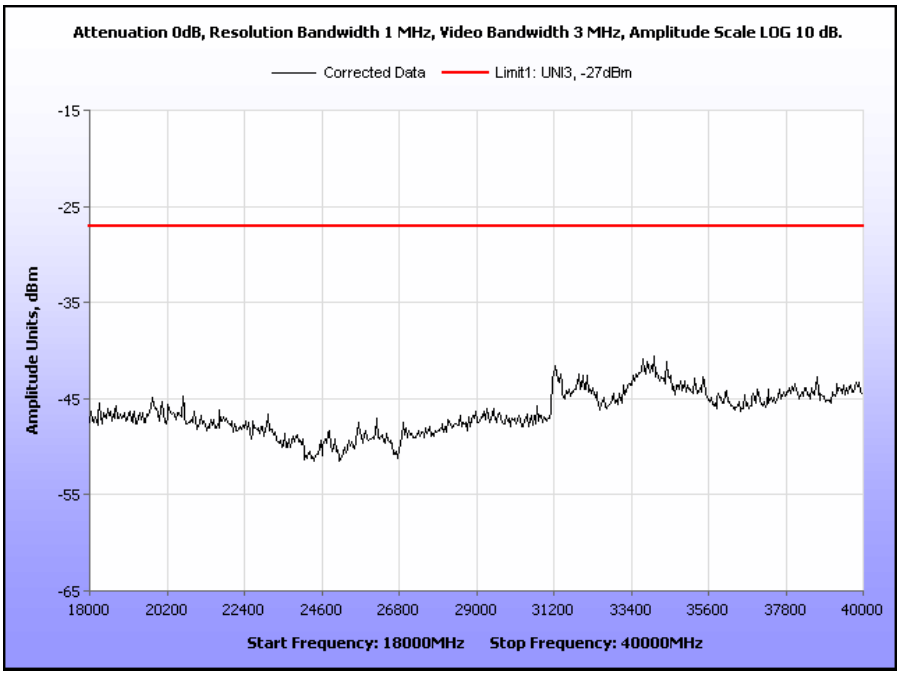
Plot 133. Radiated Spurious Emissions, 802.11n 40 MHz, 5510 MHz, 30 MHz – 1 GHz, VMM



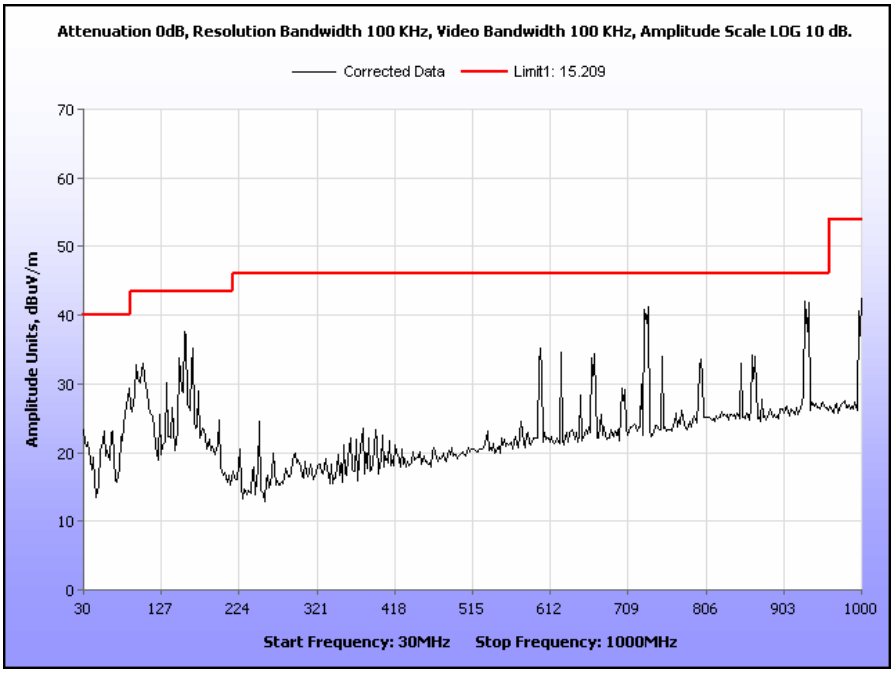
Plot 134. Radiated Spurious Emissions, 802.11n 40 MHz, 5510 MHz, 1 GHz – 7 GHz, VMM



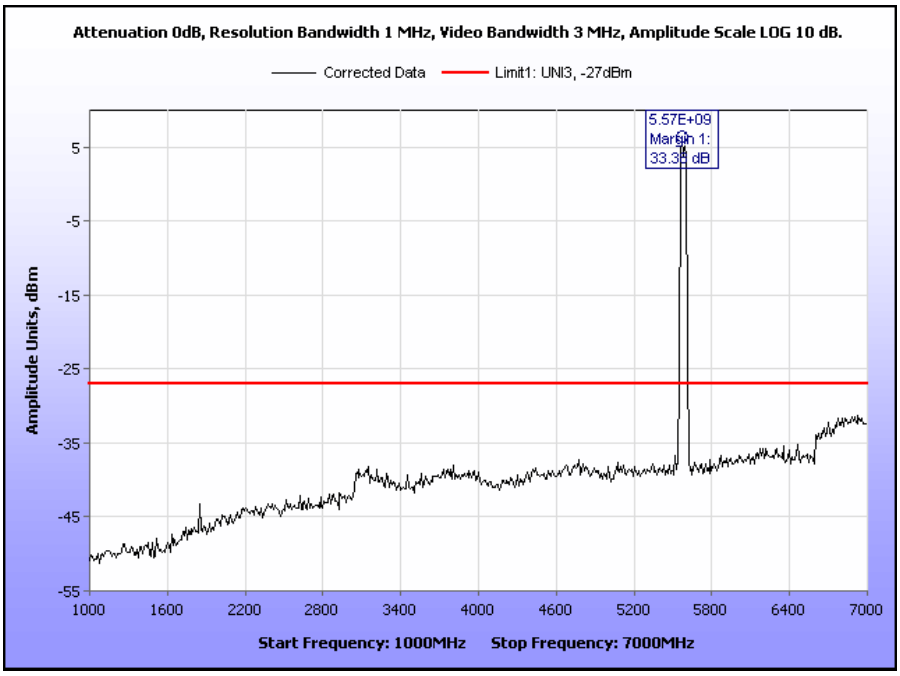
Plot 135. Radiated Spurious Emissions, 802.11n 40 MHz, 5510 MHz, 7 GHz – 18 GHz, VMM



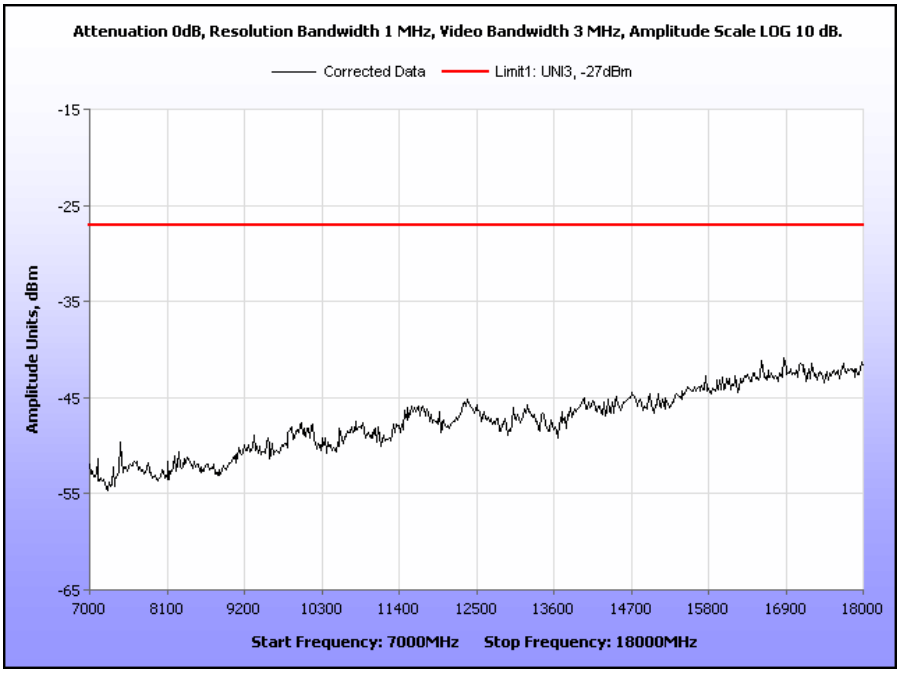
Plot 136. Radiated Spurious Emissions, 802.11n 40 MHz, 5510 MHz, 18 GHz – 40 GHz, VMM



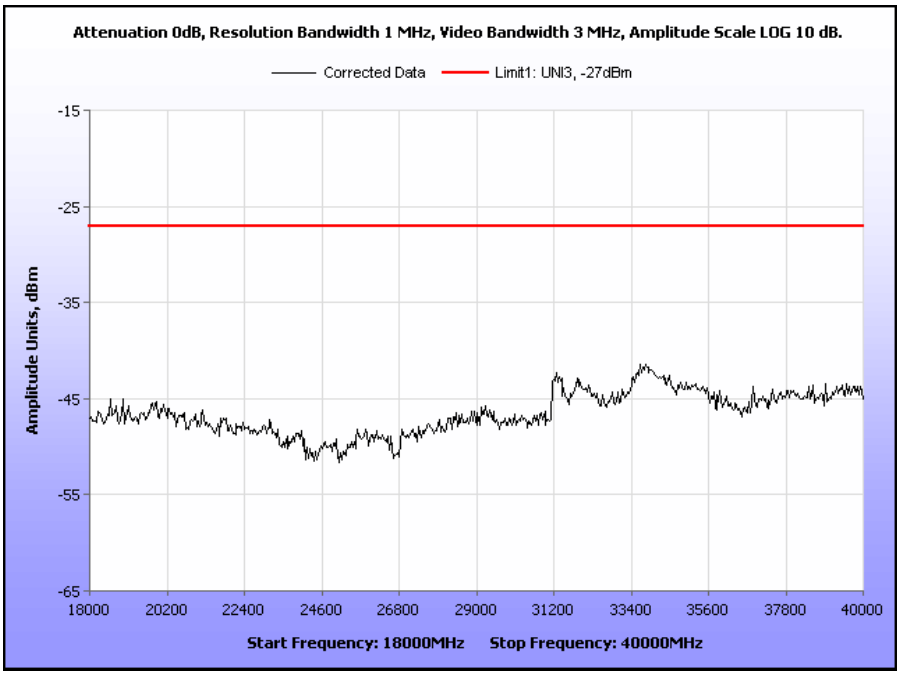
Plot 137. Radiated Spurious Emissions, 802.11n 40 MHz, 5580 MHz, 30 MHz – 1 GHz, VMM



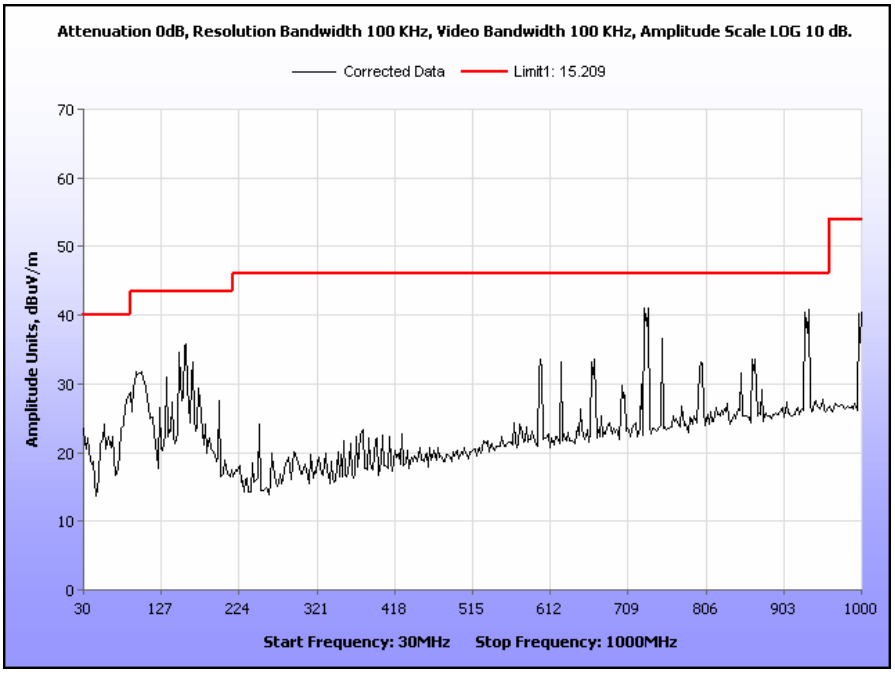
Plot 138. Radiated Spurious Emissions, 802.11n 40 MHz, 5580 MHz, 1 GHz – 7 GHz, VMM



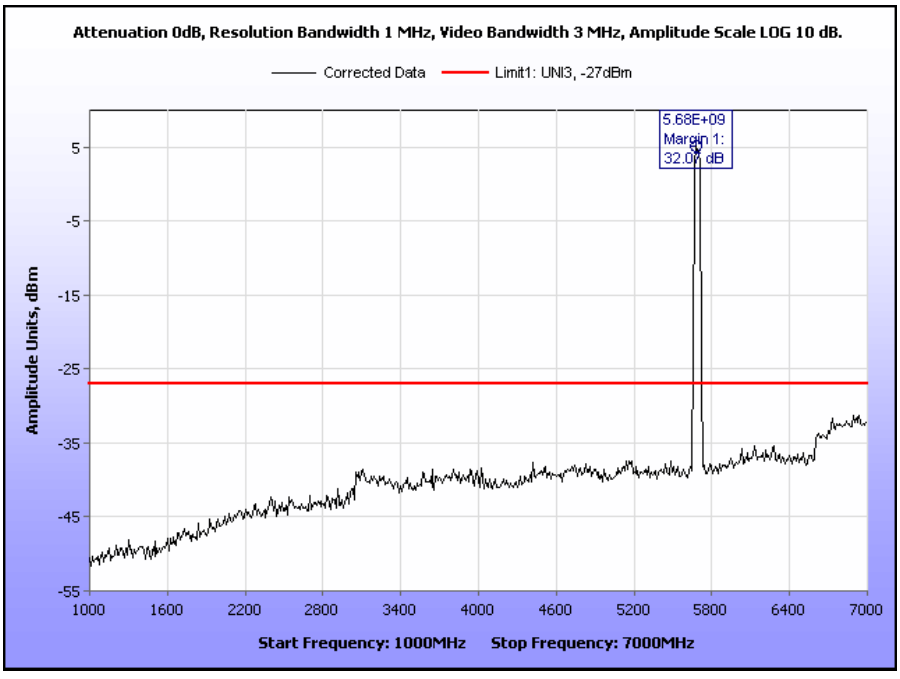
Plot 139. Radiated Spurious Emissions, 802.11n 40 MHz, 5580 MHz, 7 GHz – 18 GHz, VMM



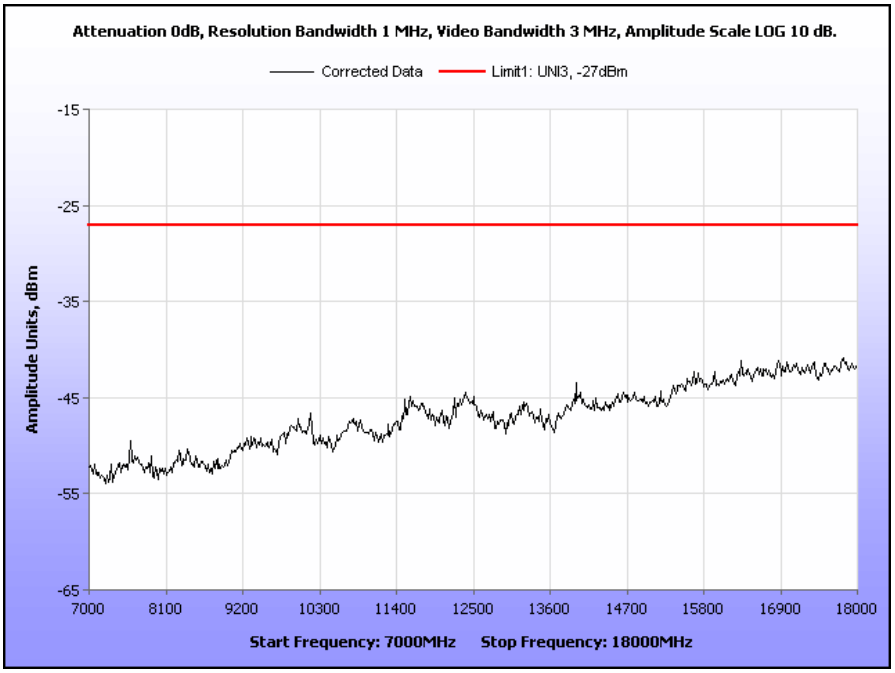
Plot 140. Radiated Spurious Emissions, 802.11n 40 MHz, 5580 MHz, 18 GHz – 40 GHz, VMM



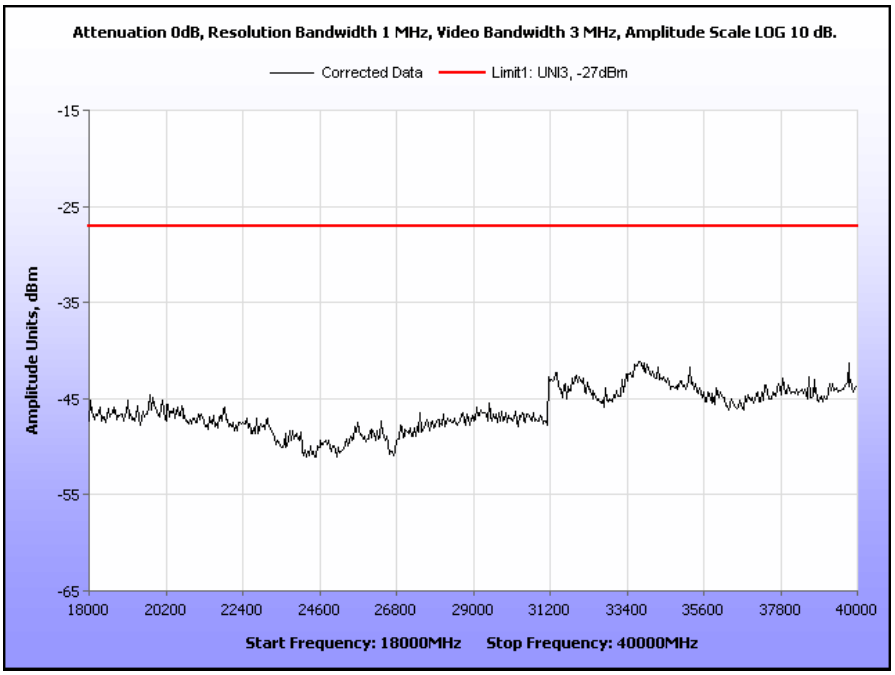
Plot 141. Radiated Spurious Emissions, 802.11n 40 MHz, 5690 MHz, 30 MHz – 1 GHz, VMM



Plot 142. Radiated Spurious Emissions, 802.11n 40 MHz, 5690 MHz, 1 GHz – 7 GHz, VMM

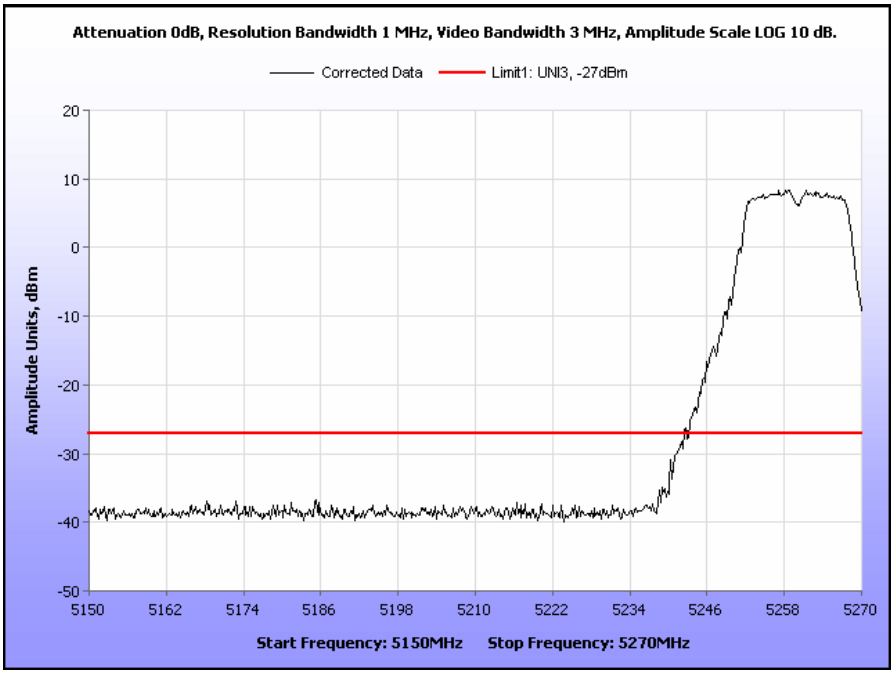


Plot 143. Radiated Spurious Emissions, 802.11n 40 MHz, 5690 MHz, 7 GHz – 18 GHz, VMM

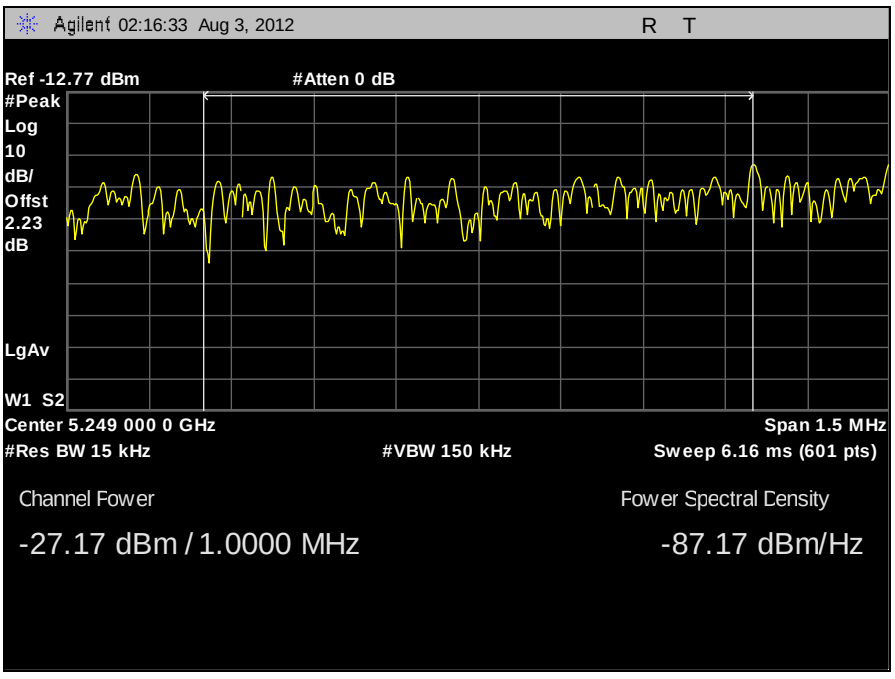


Plot 144. Radiated Spurious Emissions, 802.11n 40 MHz, 5690 MHz, 18 GHz – 40 GHz, VMM

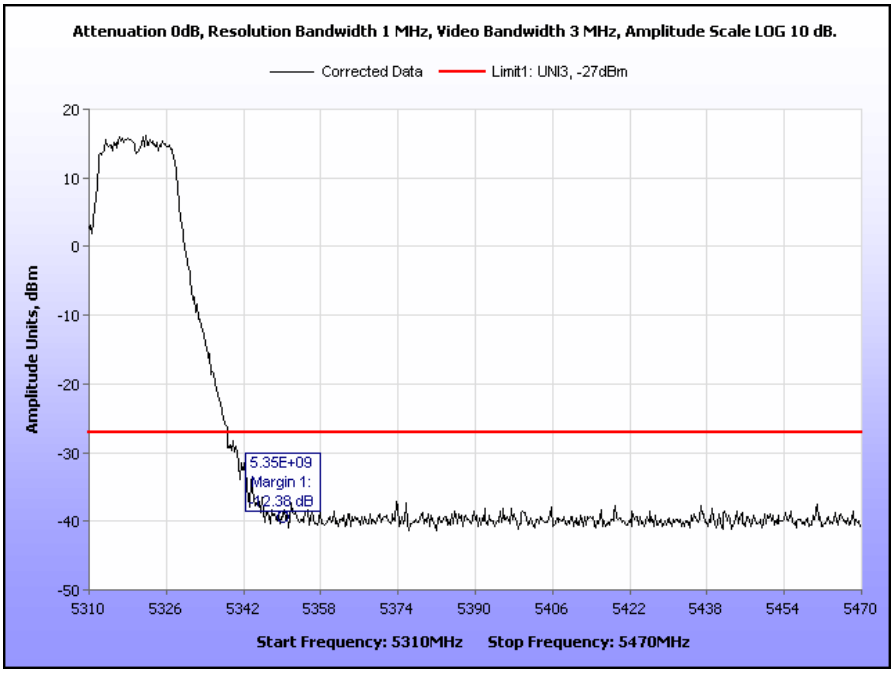
Restricted Band, Panel Antenna



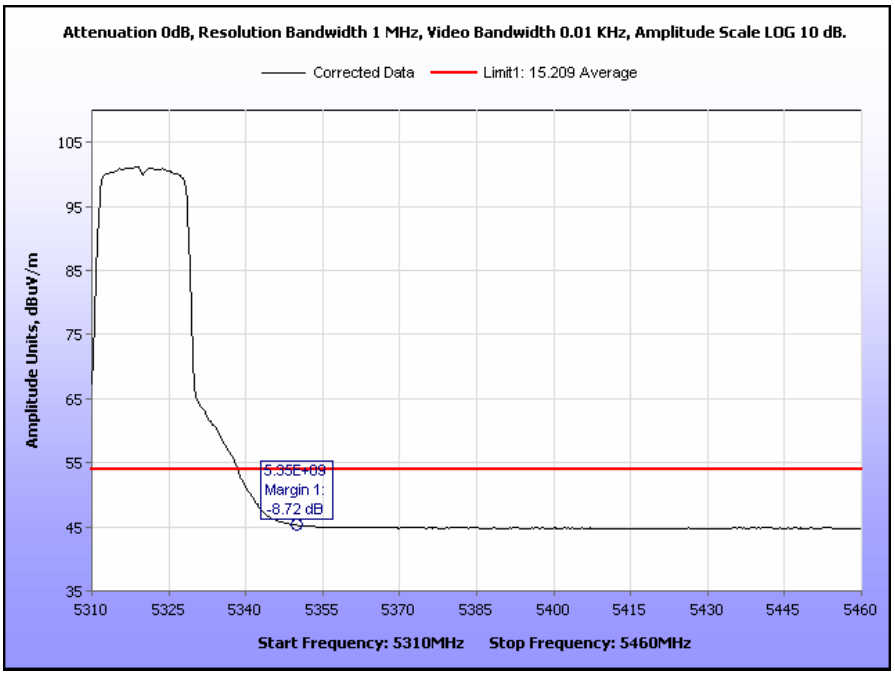
Plot 145. Radiated Band Edge, 802.11a, 5260 MHz, Panel



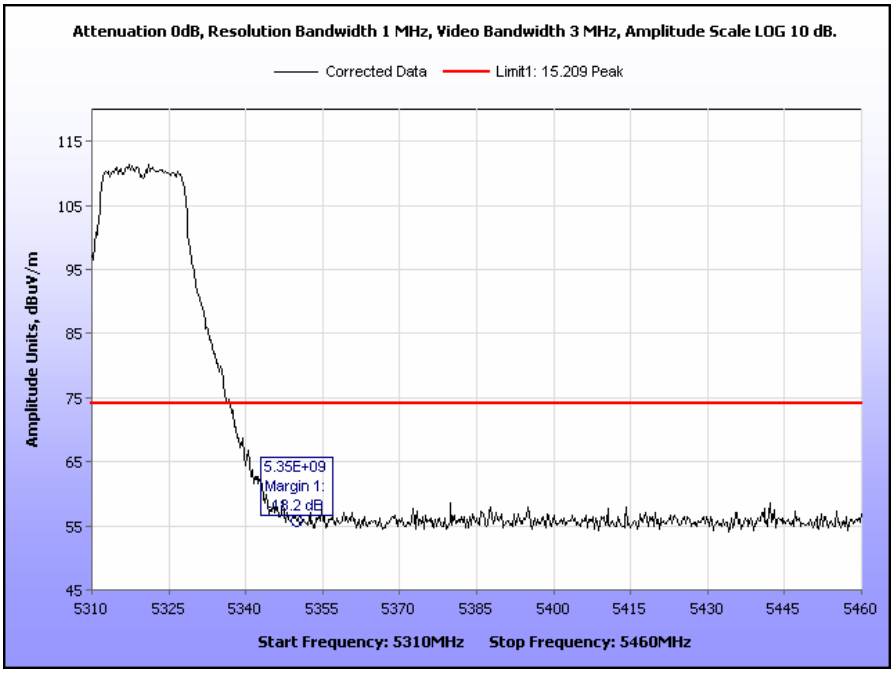
Plot 146. Radiated Band Edge, 802.11a, 5260 MHz, 1 MHz Integration, Panel



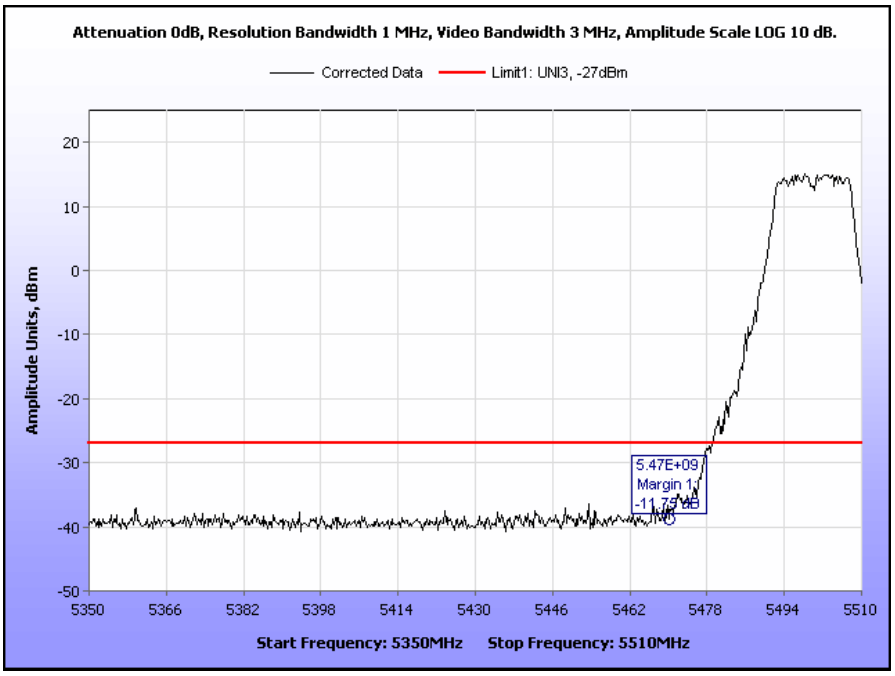
Plot 147. Radiated Band Edge, 802.11a, 5350 MHz, Panel



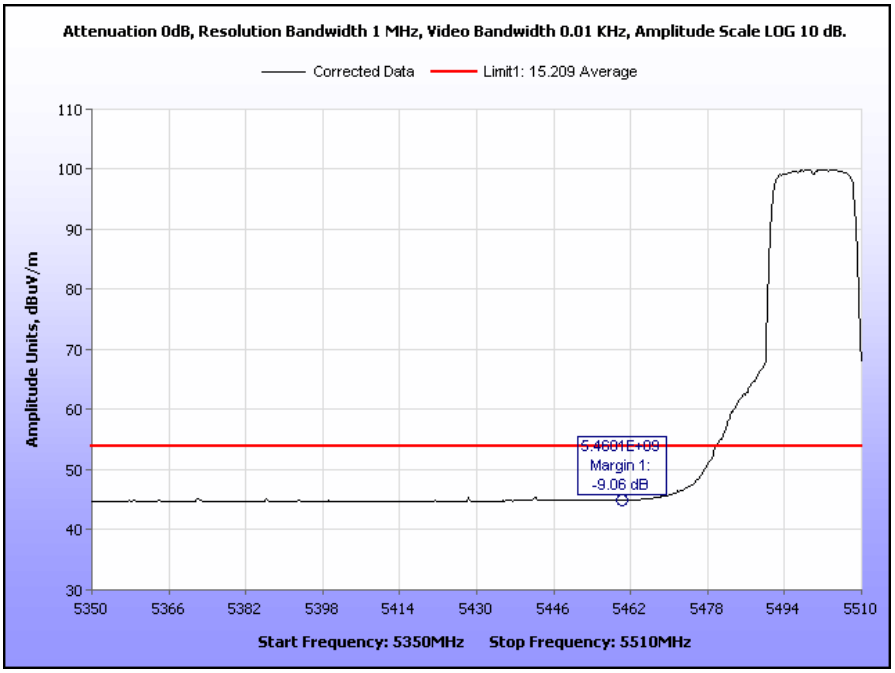
Plot 148. Radiated Band Edge, 802.11a, 5350 MHz, Average, Panel



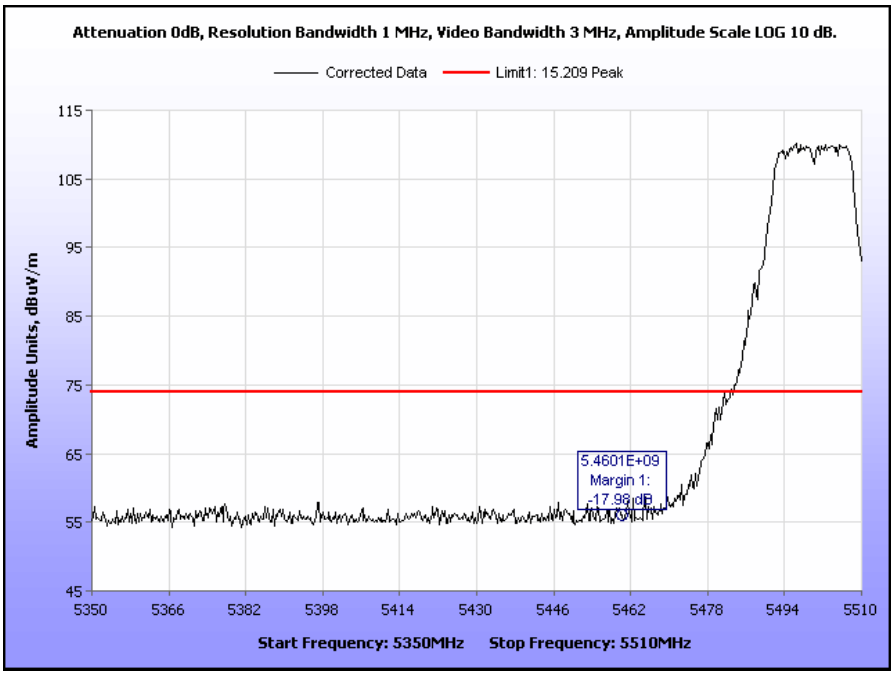
Plot 149. Radiated Band Edge, 802.11a, 5350 MHz, Peak, Panel



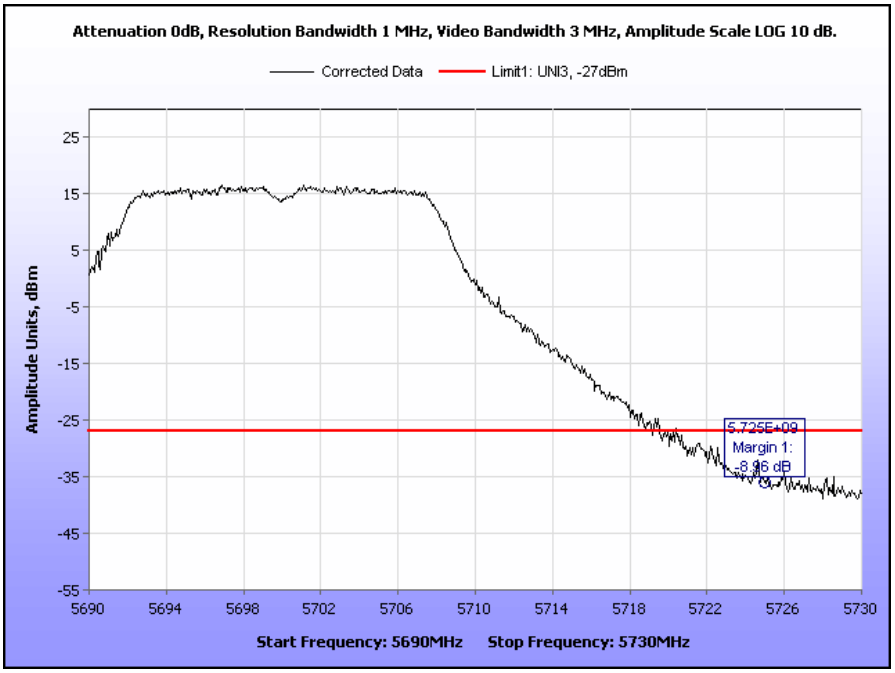
Plot 150. Radiated Band Edge, 802.11a, 5500 MHz, Panel



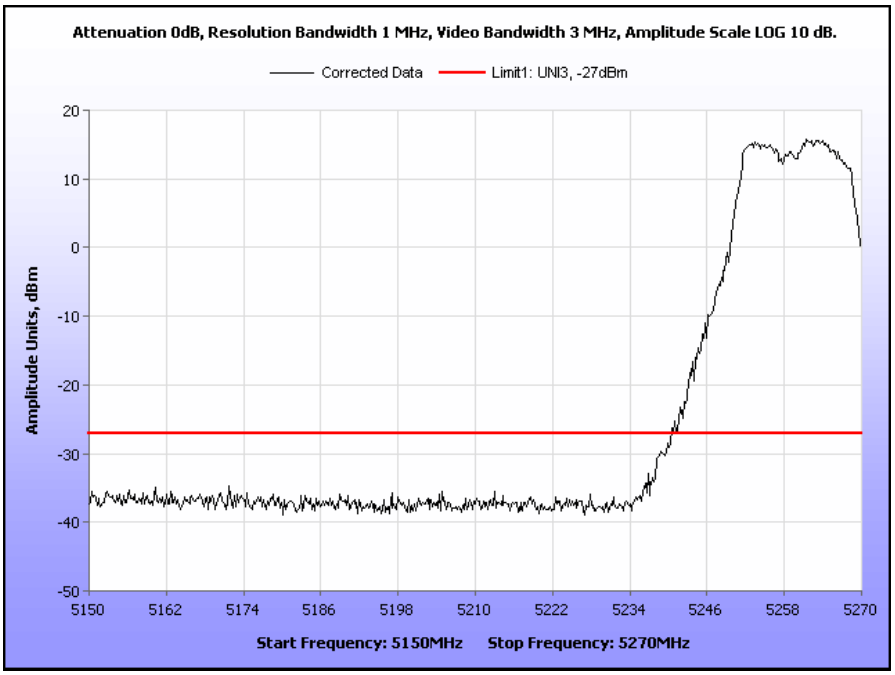
Plot 151. Radiated Band Edge, 802.11a, 5500 MHz, Average, Panel



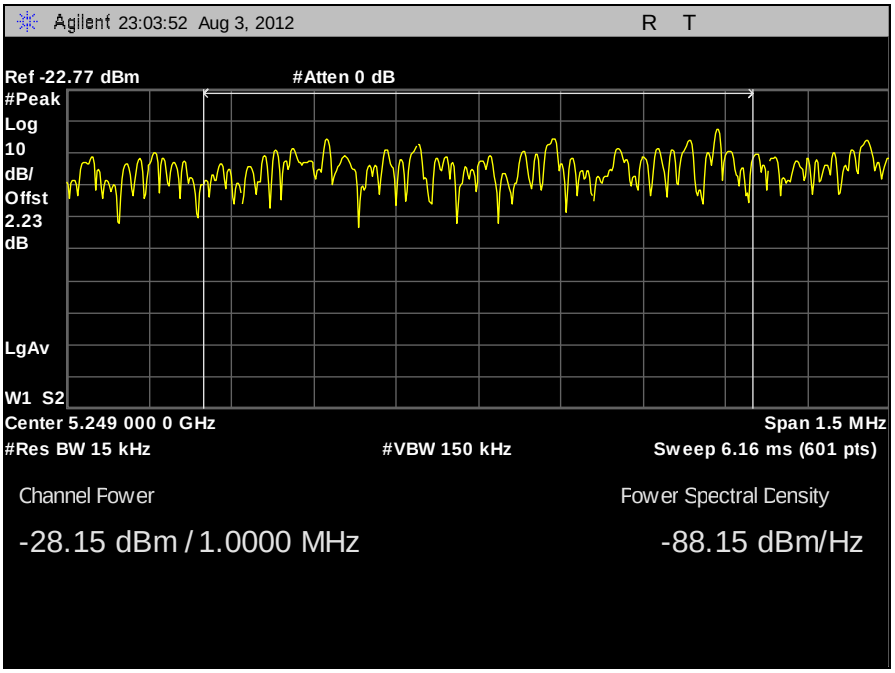
Plot 152. Radiated Band Edge, 802.11a, 5500 MHz, Peak, Panel



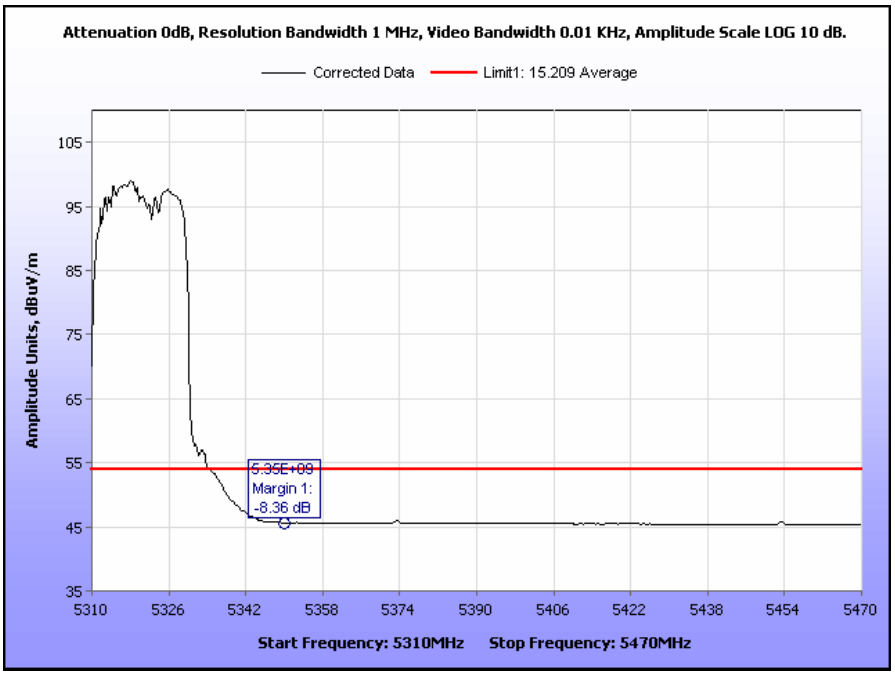
Plot 153. Radiated Band Edge, 802.11a, 5400 MHz, Panel



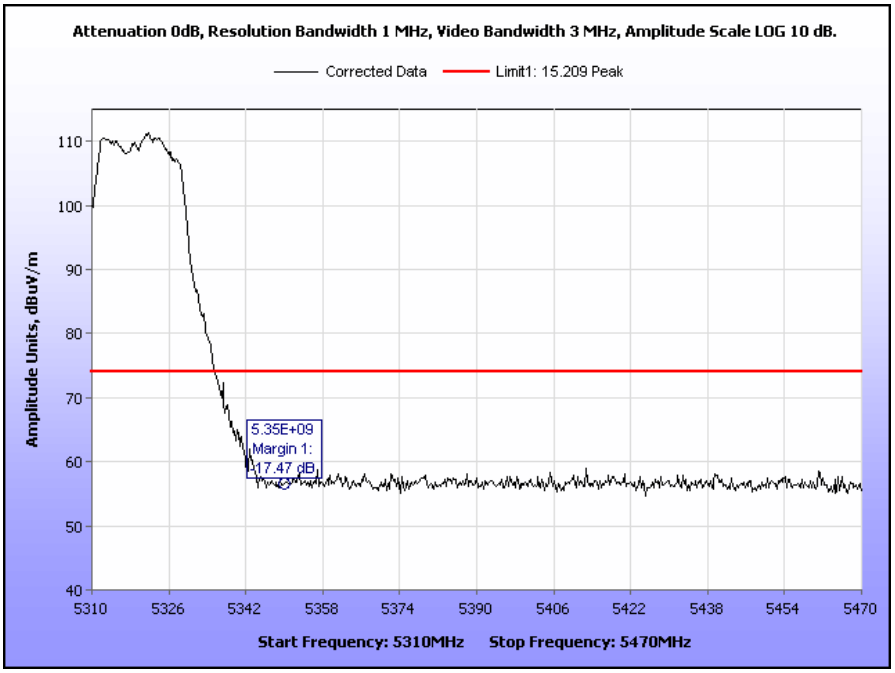
Plot 154. Radiated Band Edge, 802.11n 20 MHz, 5260 MHz, Panel



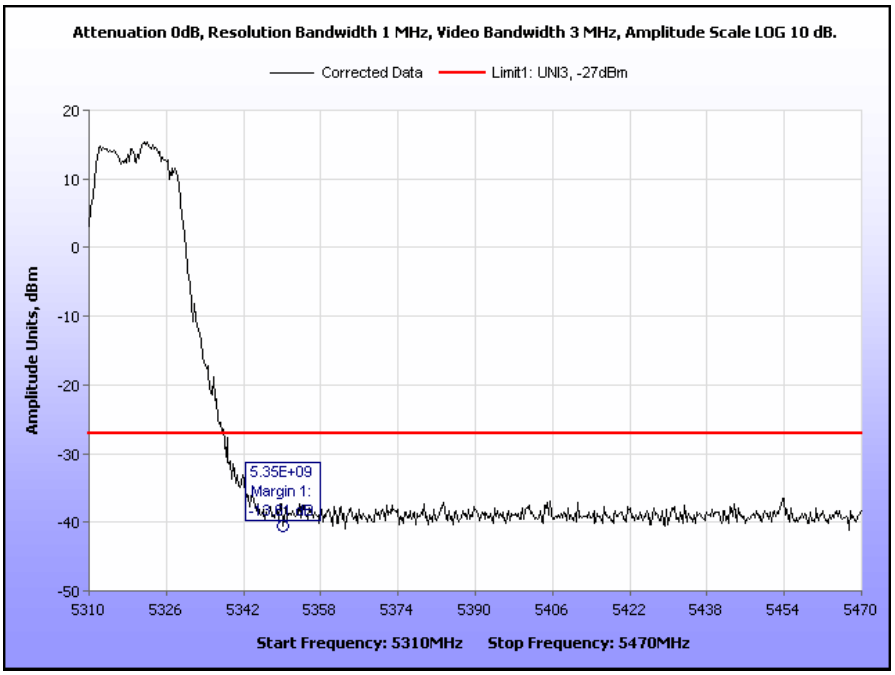
Plot 155. Radiated Band Edge, 802.11n 20 MHz, 5260 MHz, 1 MHz Integration, Panel



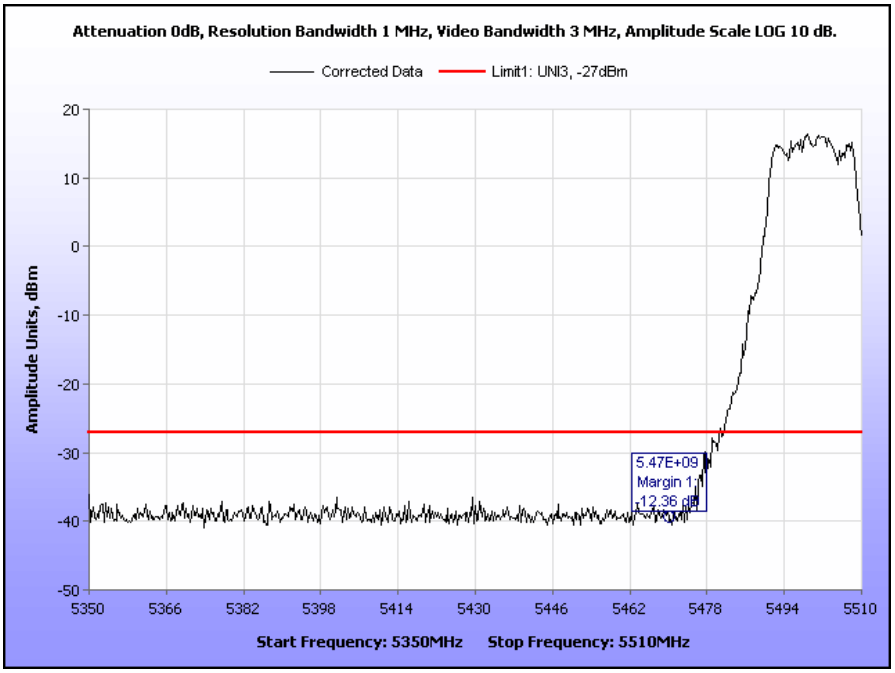
Plot 156. Radiated Band Edge, 802.11n 20 MHz, 5320 MHz, Panel



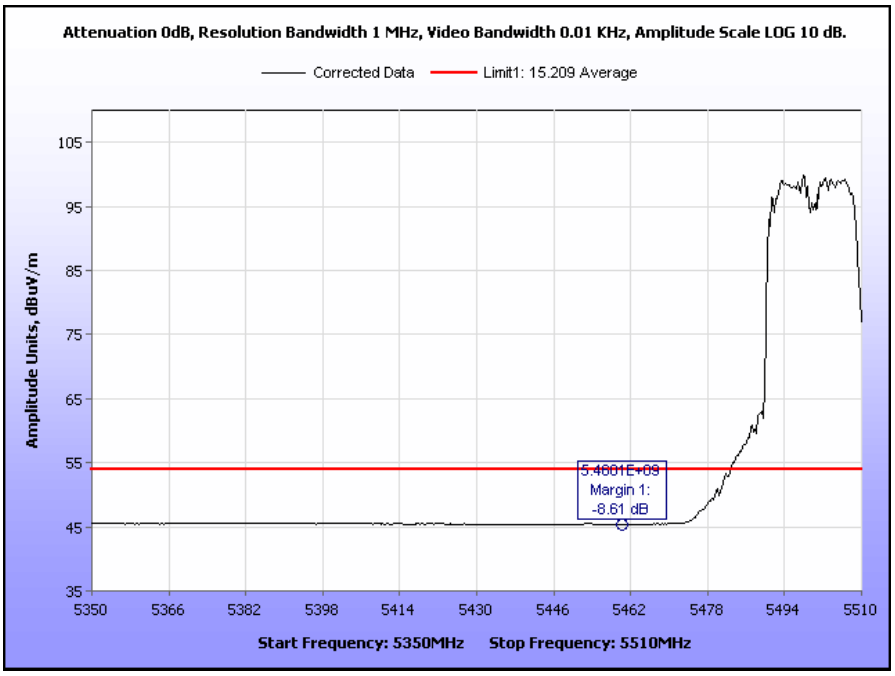
Plot 157. Radiated Band Edge, 802.11n 20 MHz, 5320 MHz, Peak, Panel



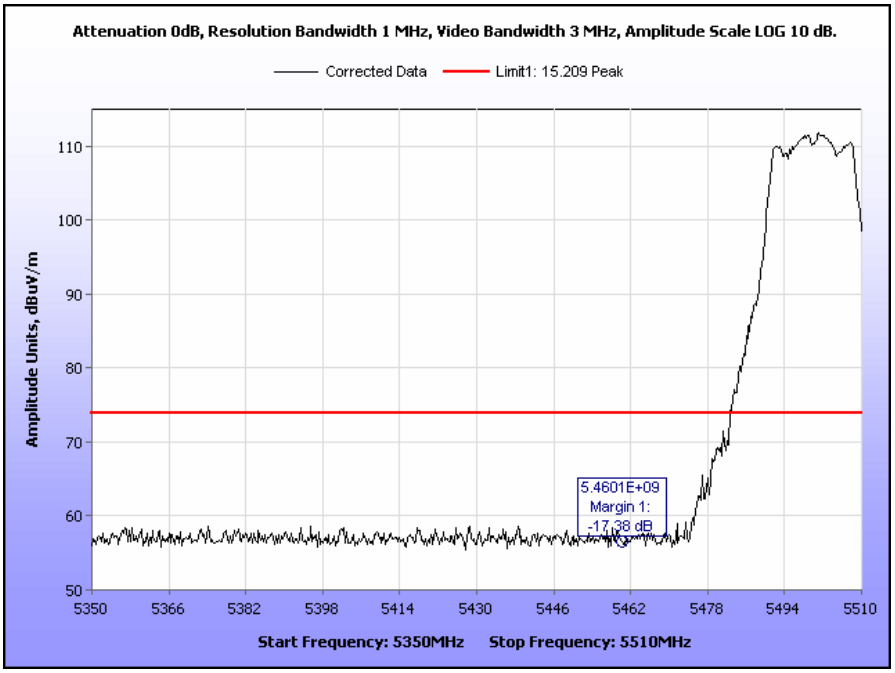
Plot 158. Radiated Band Edge, 802.11n 20 MHz, 5350 MHz, Panel



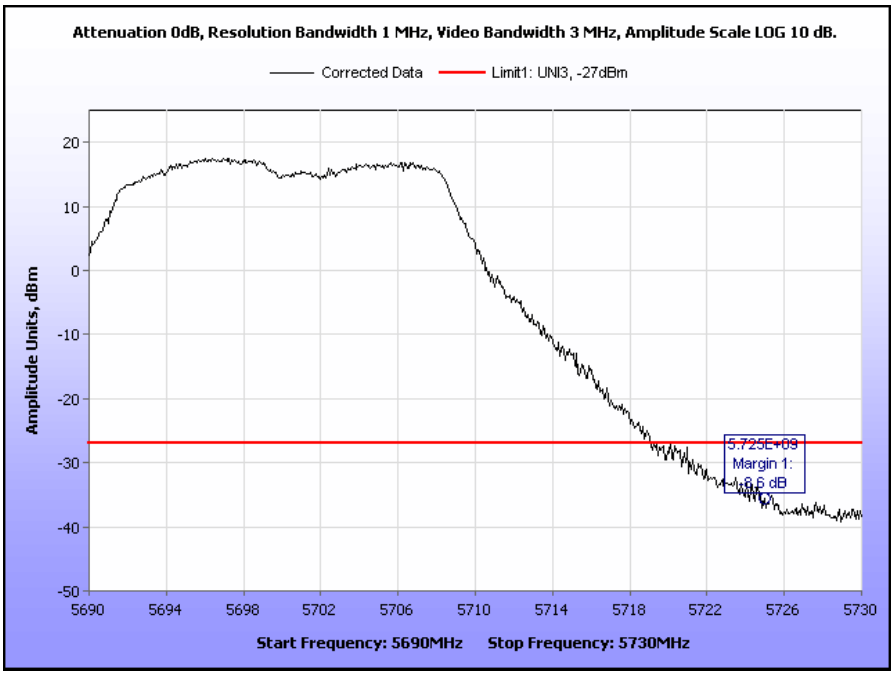
Plot 159. Radiated Band Edge, 802.11n 20 MHz, 5500 MHz, Panel



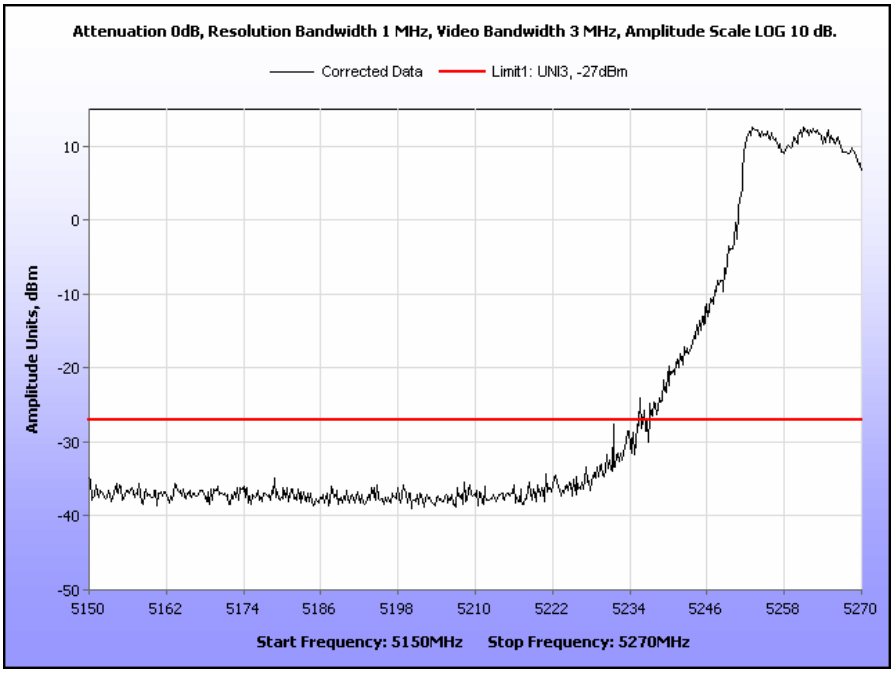
Plot 160. Radiated Band Edge, 802.11n 20 MHz, 5500 MHz, Average, Panel



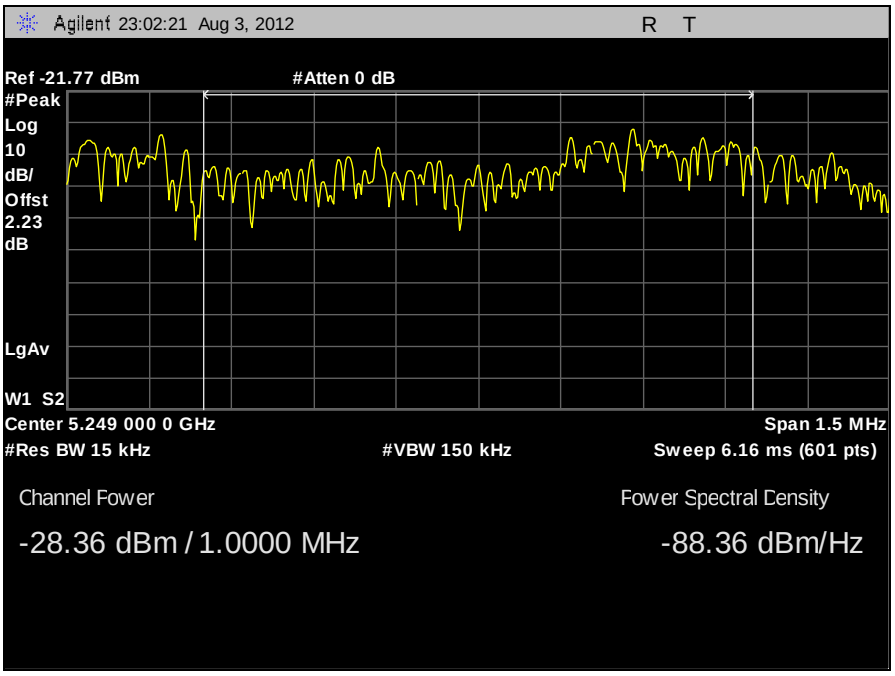
Plot 161. Radiated Band Edge, 802.11n 20 MHz, 5500 MHz, Peak, Panel



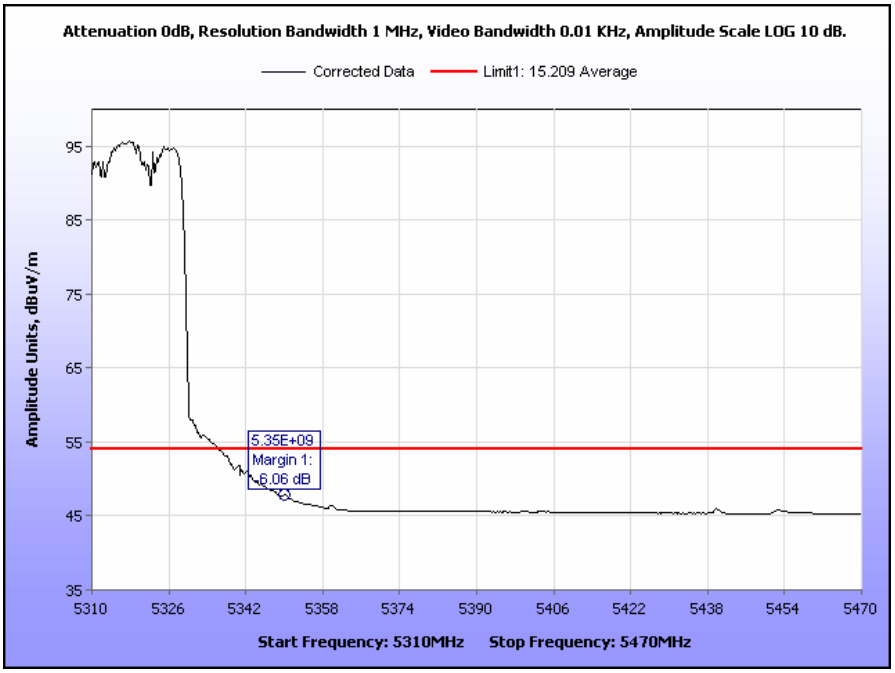
Plot 162. Radiated Band Edge, 802.11n 20 MHz, 5700 MHz, Panel



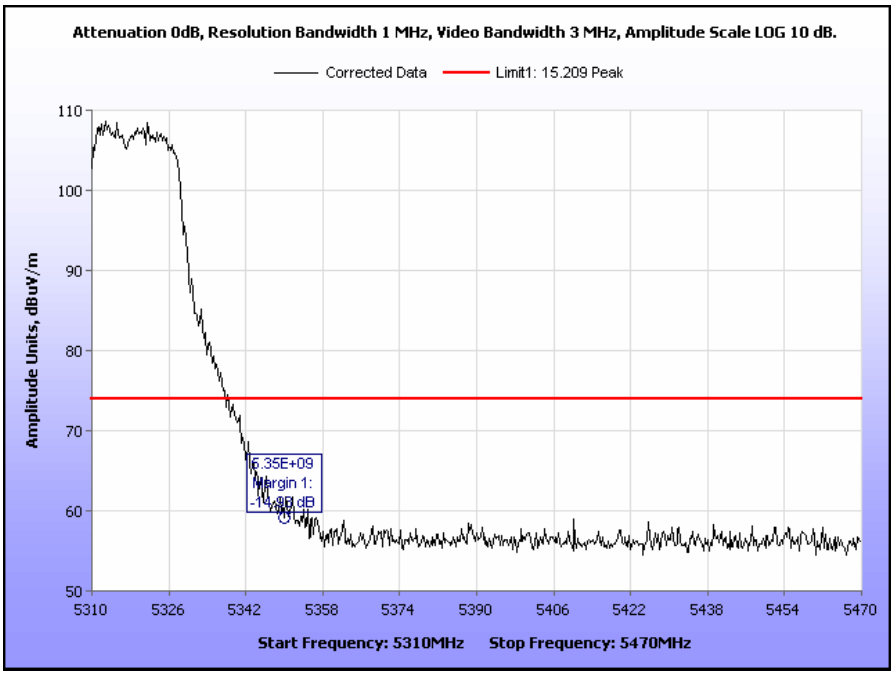
Plot 163. Radiated Band Edge, 802.11n 40 MHz, 5270 MHz, Panel



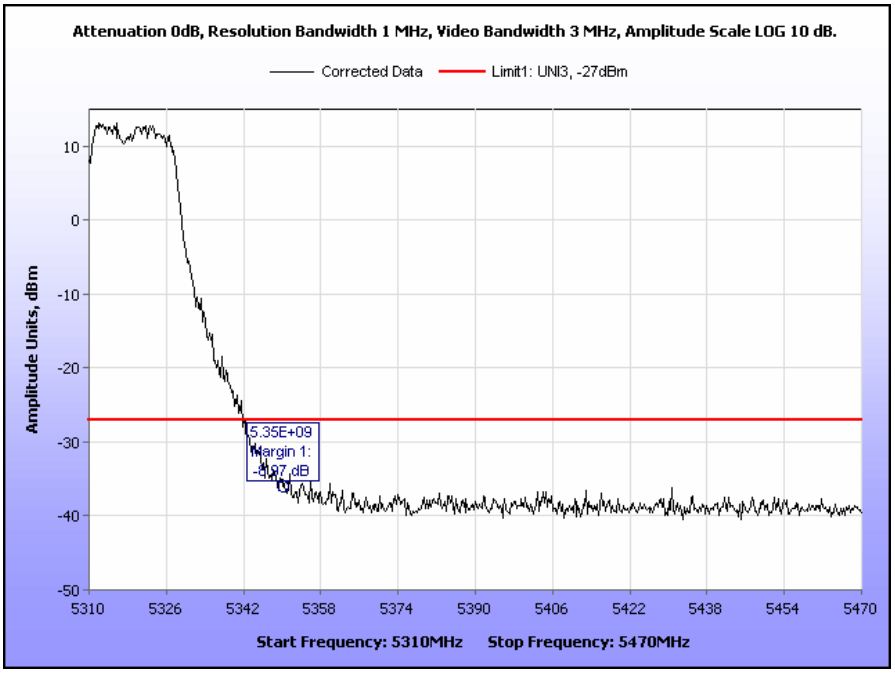
Plot 164. Radiated Band Edge, 802.11n 40 MHz, 5270 MHz, 1 MHz Integration, Panel



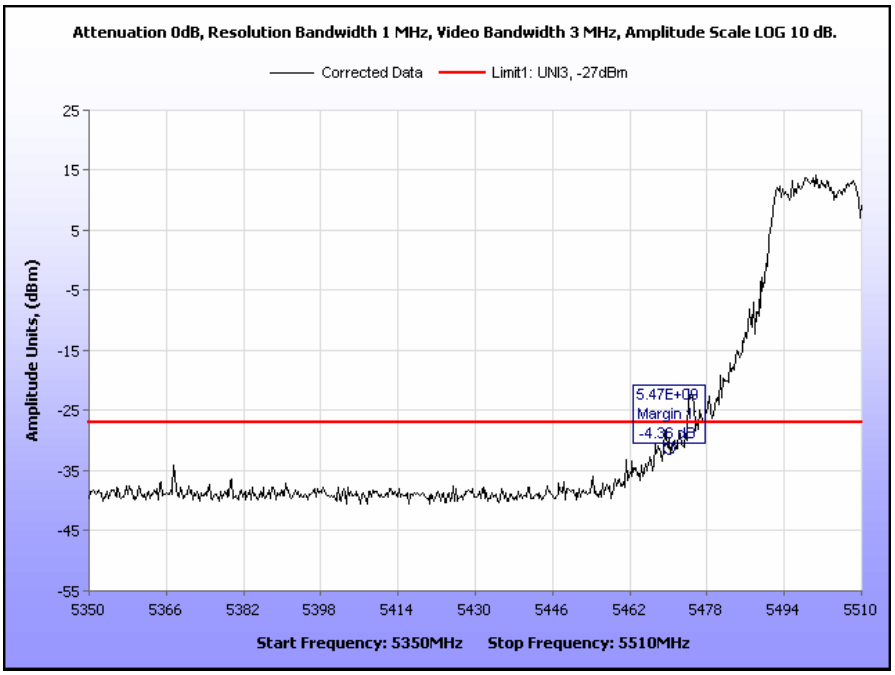
Plot 165. Radiated Band Edge, 802.11n 40 MHz, 5310 MHz, Average, Panel



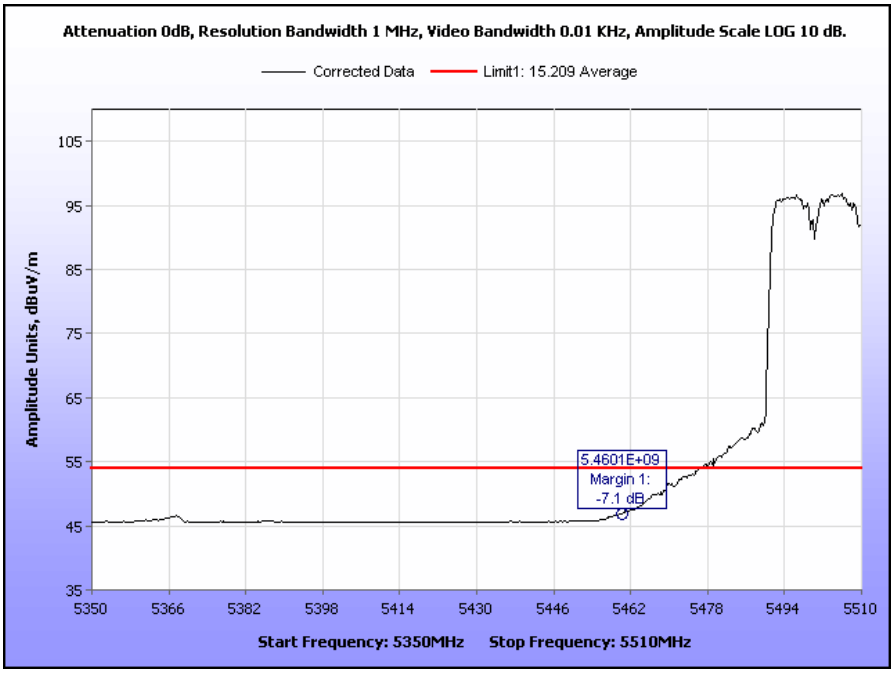
Plot 166. Radiated Band Edge, 802.11n 40 MHz, 5310 MHz, Peak, Panel



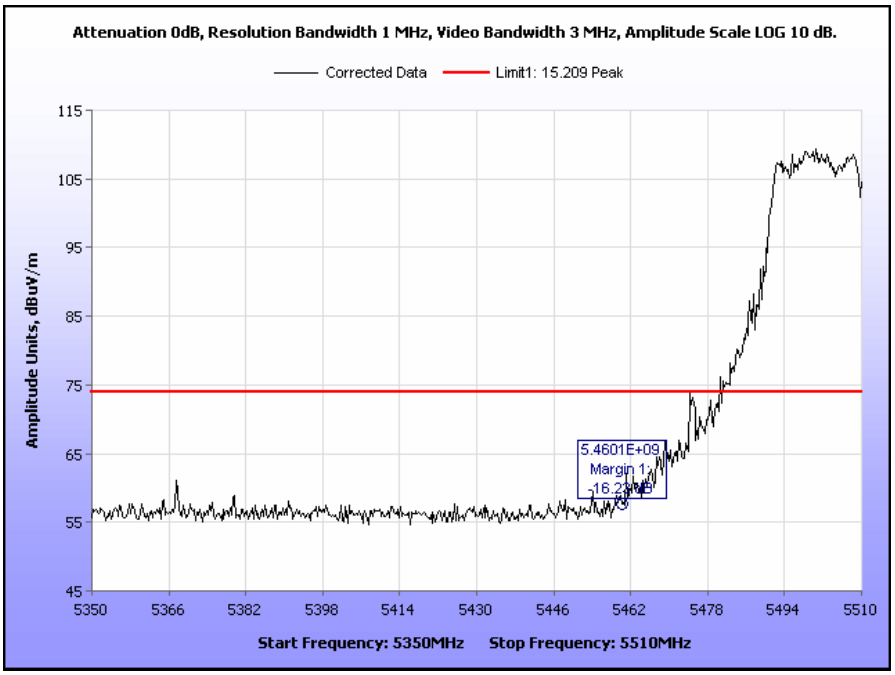
Plot 167. Radiated Band Edge, 802.11n 40 MHz, 5350 MHz, Panel



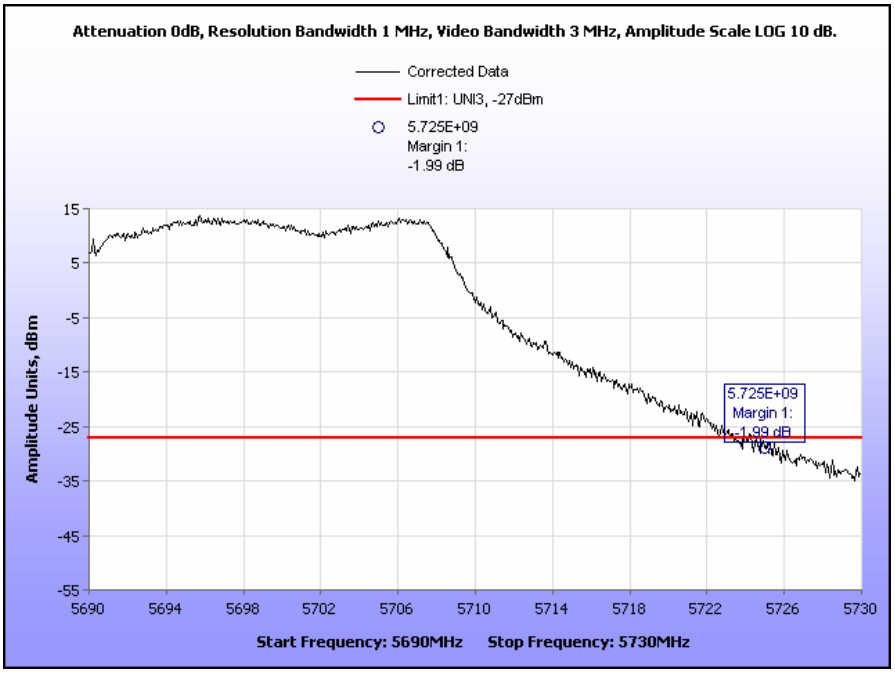
Plot 168. Radiated Band Edge, 802.11n 40 MHz, 5500 MHz, Panel



Plot 169. Radiated Band Edge, 802.11n 40 MHz, 5510 MHz, Average, Panel

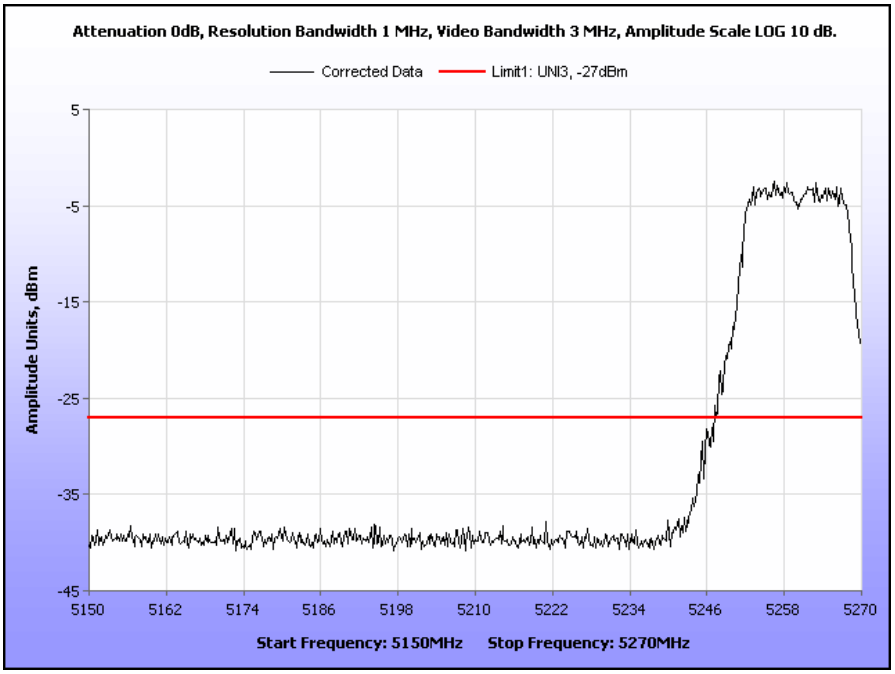


Plot 170. Radiated Band Edge, 802.11n 40 MHz, 5510 MHz, Peak, Panel

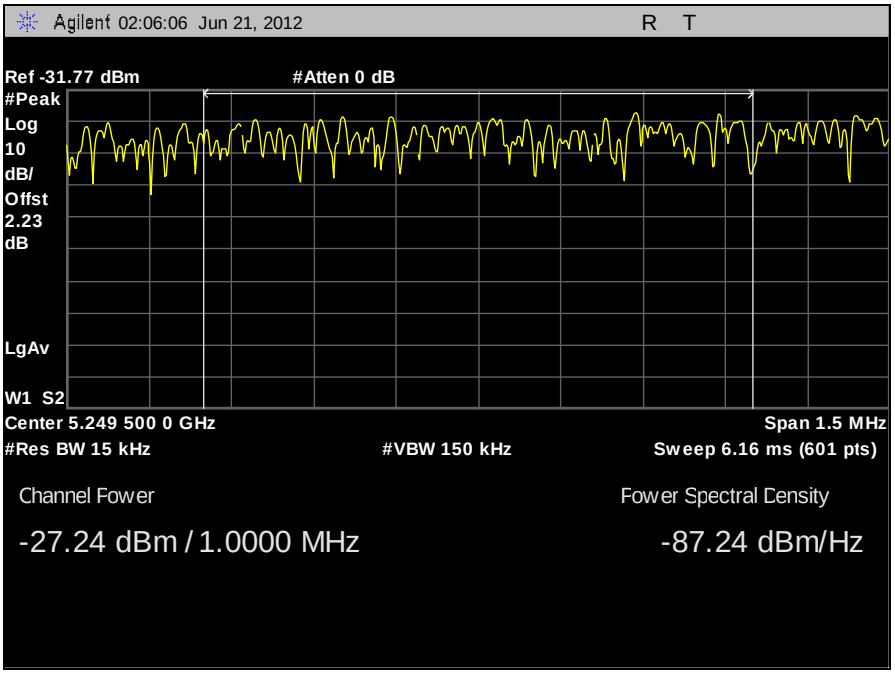


Plot 171. Radiated Band Edge, 802.11n 40 MHz, 5690 MHz, Panel

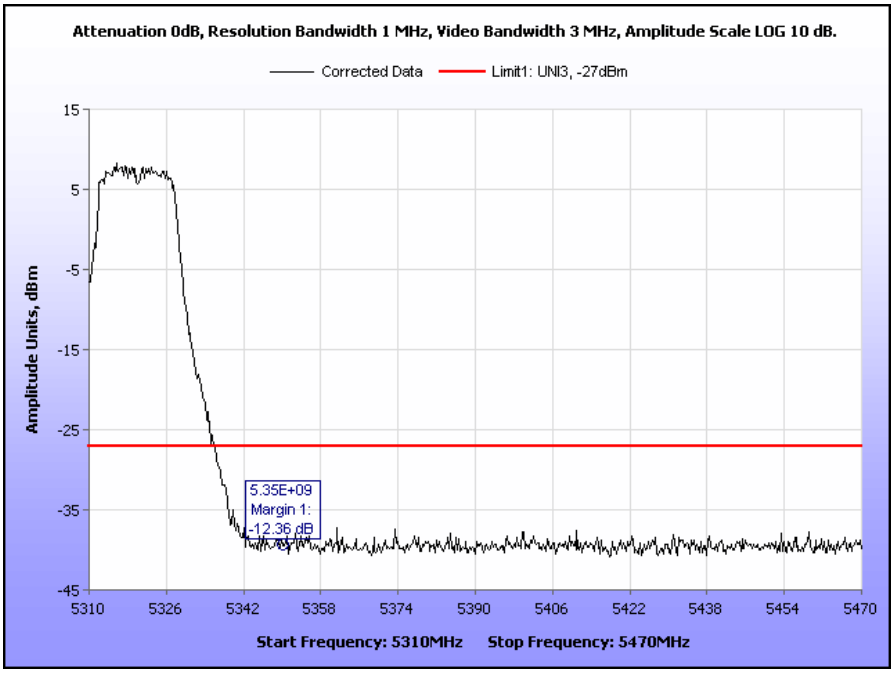
Restricted Band, VMM Antenna



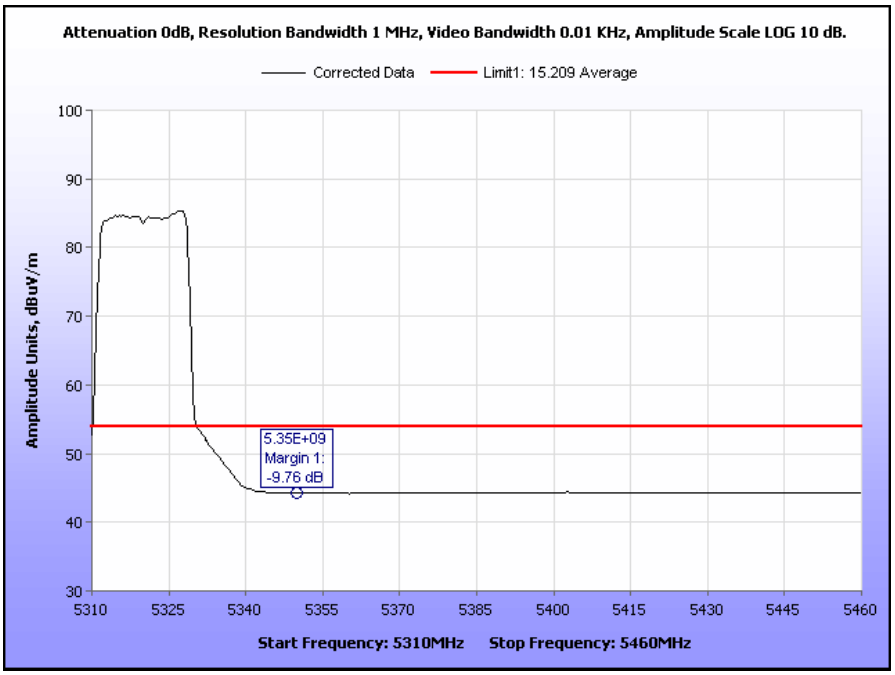
Plot 172. Radiated Band Edge, 802.11a, 5260 MHz, VMM



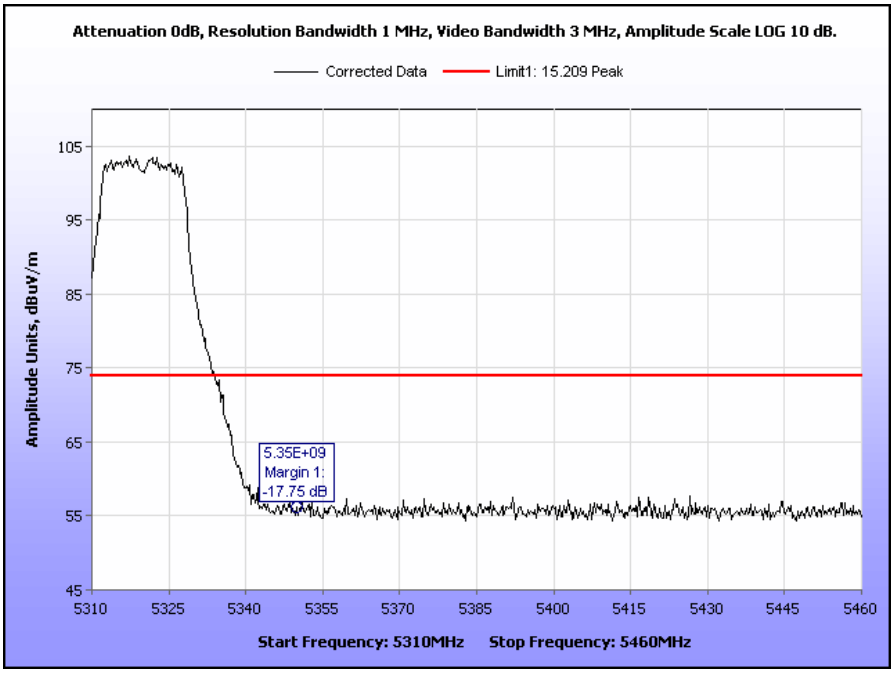
Plot 173. Radiated Band Edge, 802.11a, 5260 MHz, 1 MHz Integration, VMM



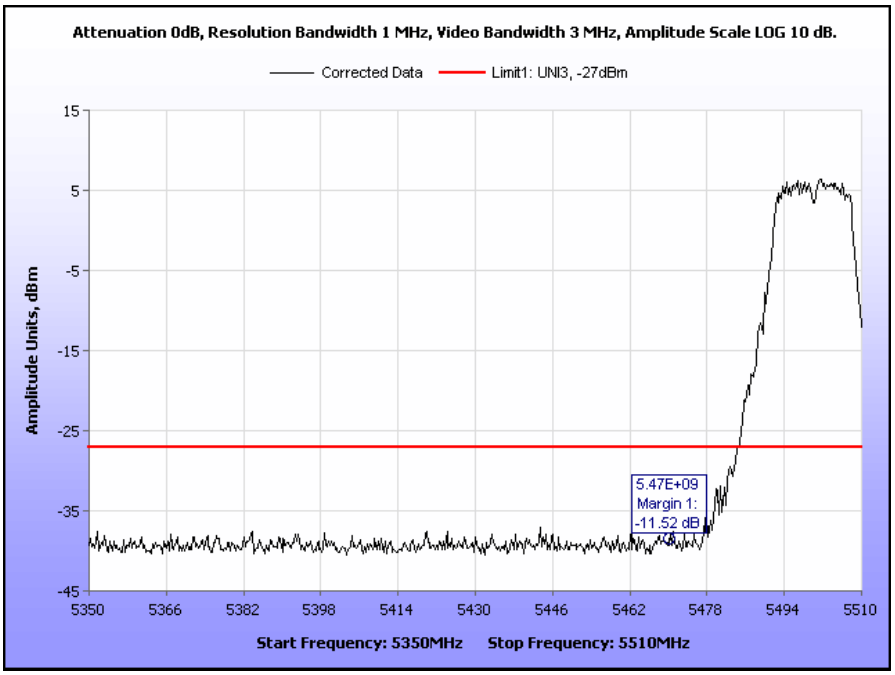
Plot 174. Radiated Band Edge, 802.11a, 5320 MHz, VMM



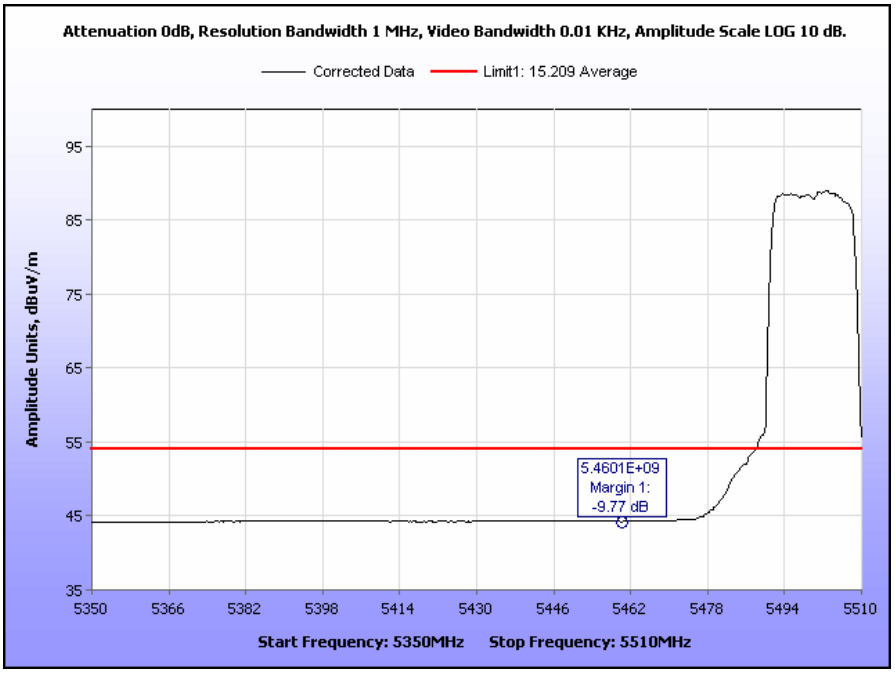
Plot 175. Radiated Band Edge, 802.11a, 5320 MHz, Average, VMM



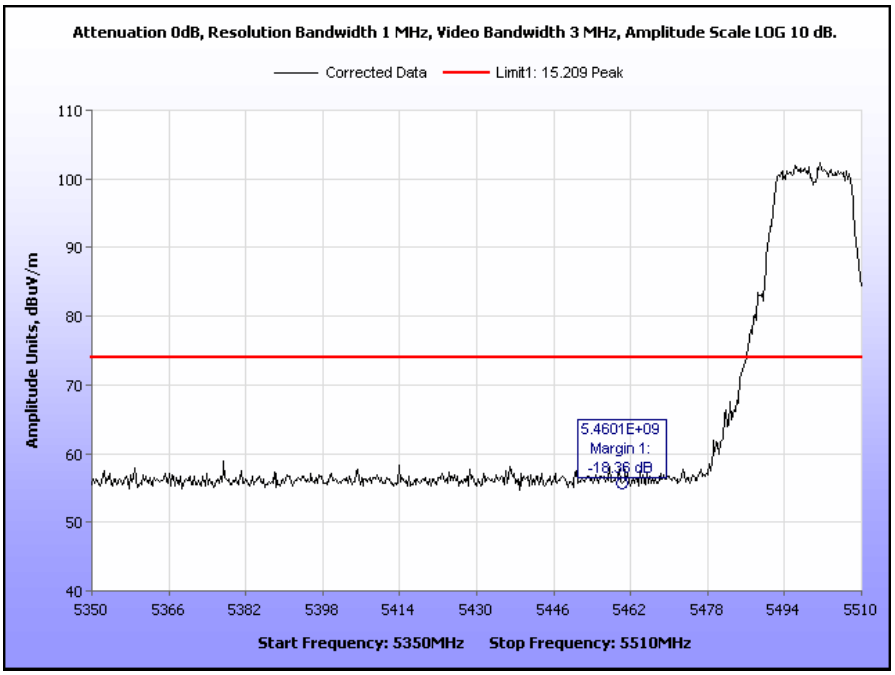
Plot 176. Radiated Band Edge, 802.11a, 5320 MHz, Peak, VMM



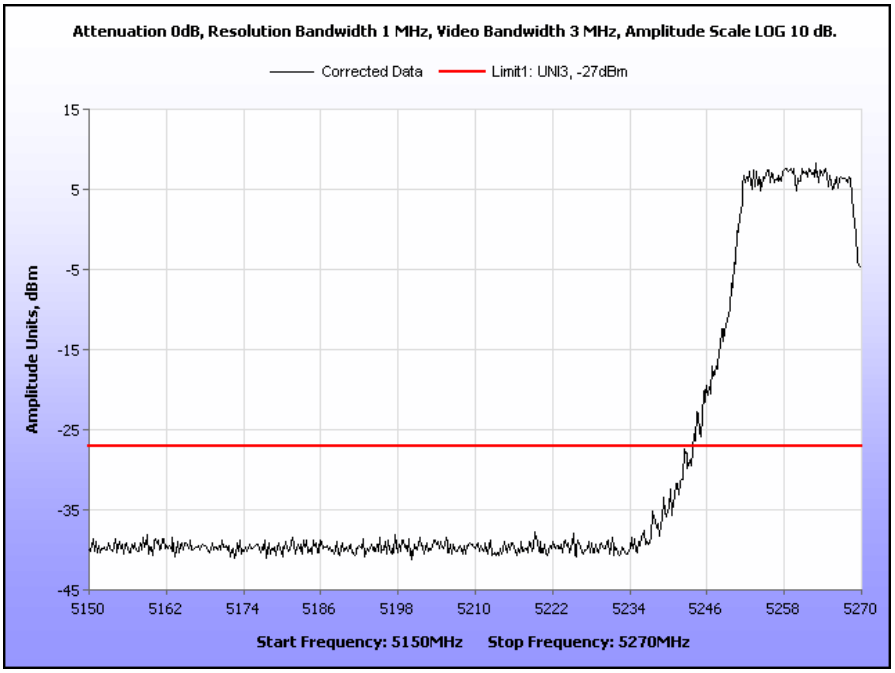
Plot 177. Radiated Band Edge, 802.11a, 5500 MHz, VMM



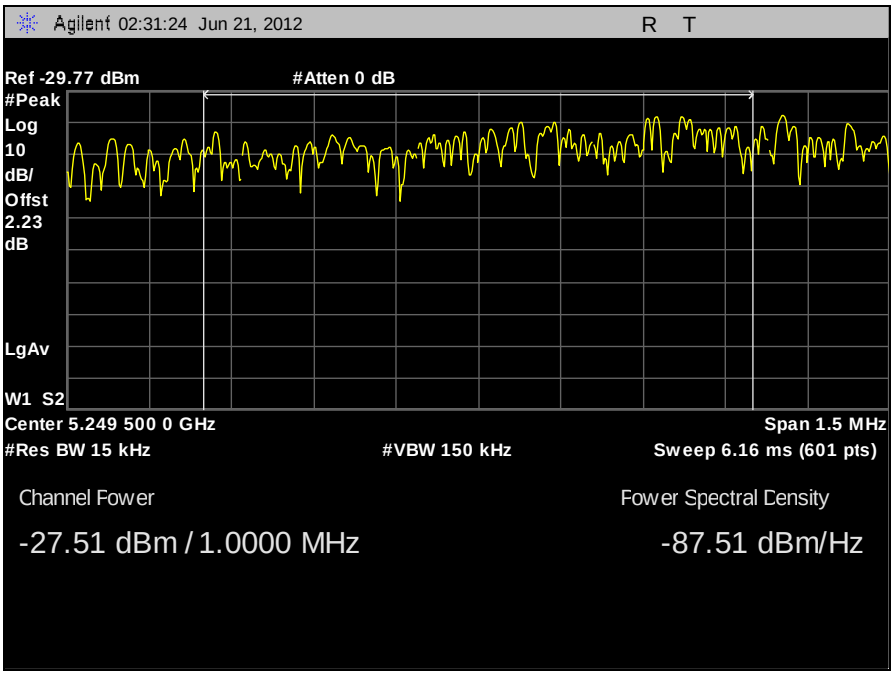
Plot 178. Radiated Band Edge, 802.11a, 5500 MHz, Average, VMM



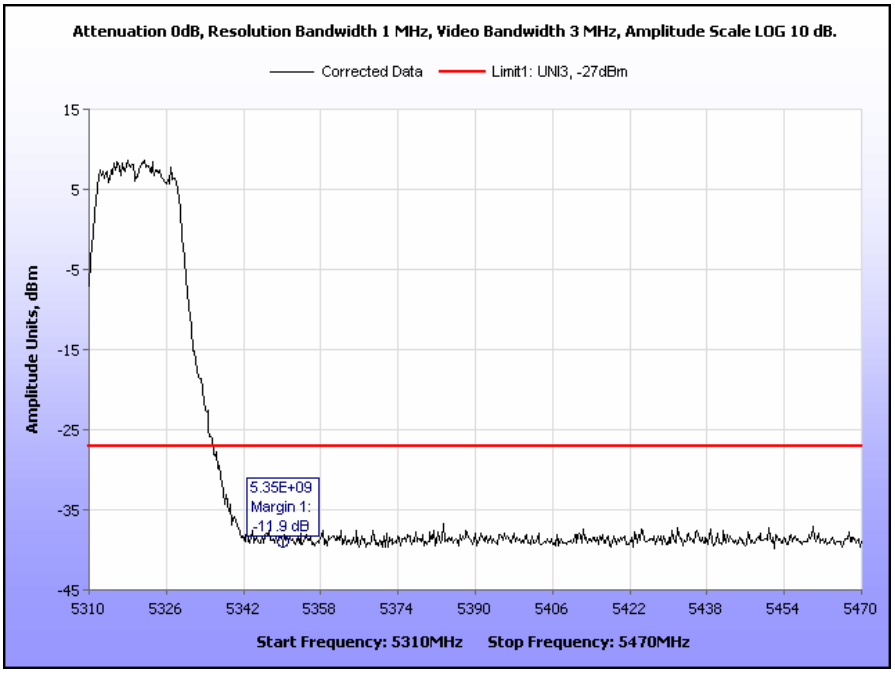
Plot 179. Radiated Band Edge, 802.11a, 5500 MHz, Peak, VMM



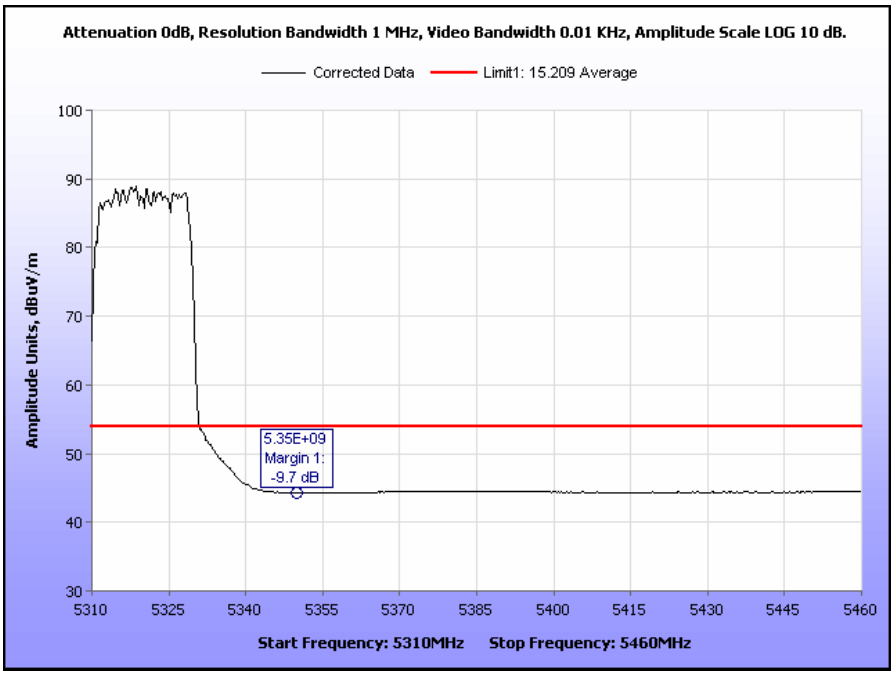
Plot 180. Radiated Band Edge, 802.11n 20 MHz, 5260 MHz, VMM



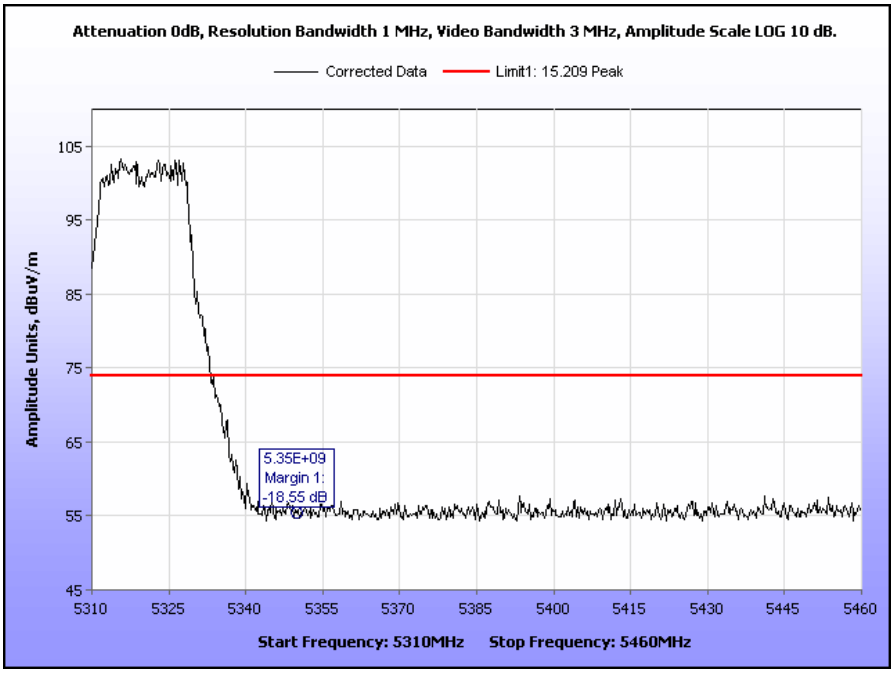
Plot 181. Radiated Band Edge, 802.11n 20 MHz, 5260 MHz, 1 MHz Integration, VMM



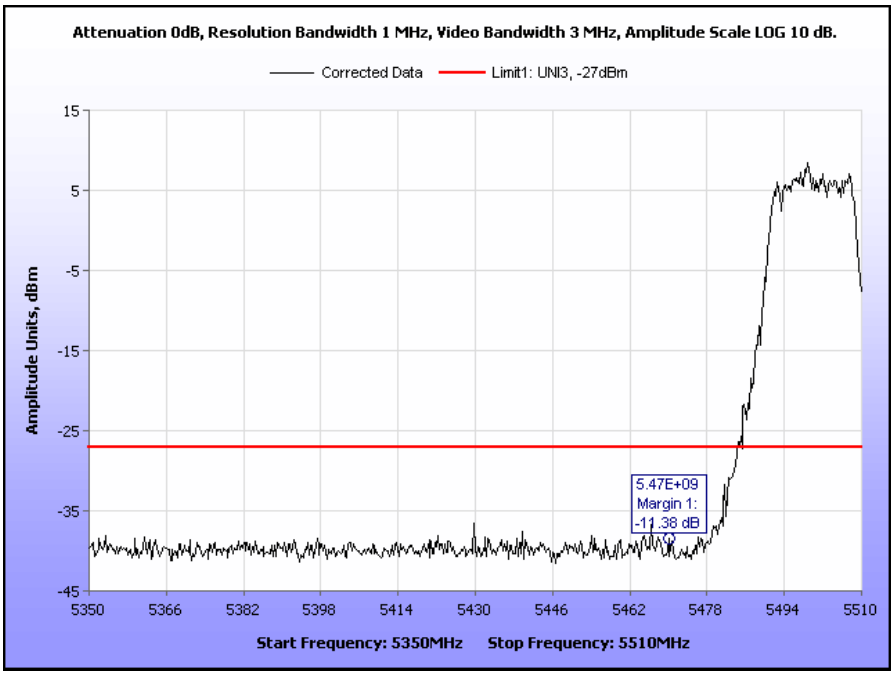
Plot 182. Radiated Band Edge, 802.11n 20 MHz, 5320 MHz, VMM



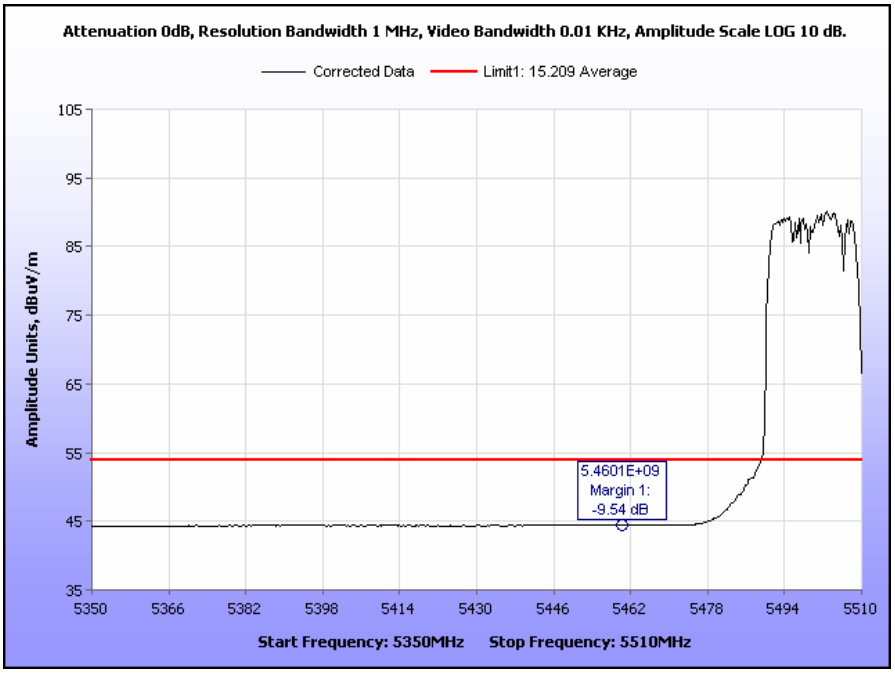
Plot 183. Radiated Band Edge, 802.11n 20 MHz, 5320 MHz, Average, VMM



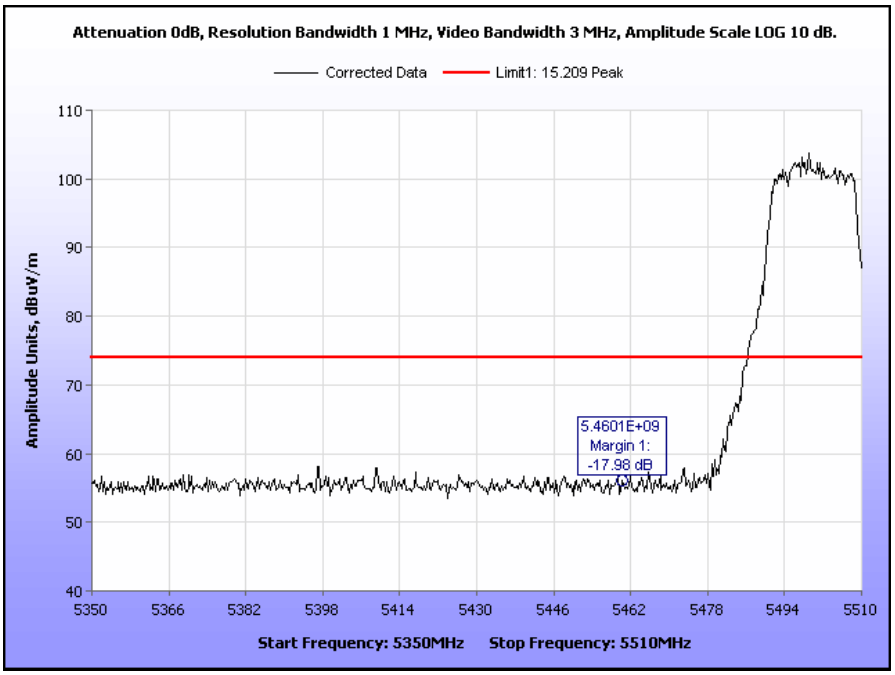
Plot 184. Radiated Band Edge, 802.11n 20 MHz, 5320 MHz, Peak, VMM



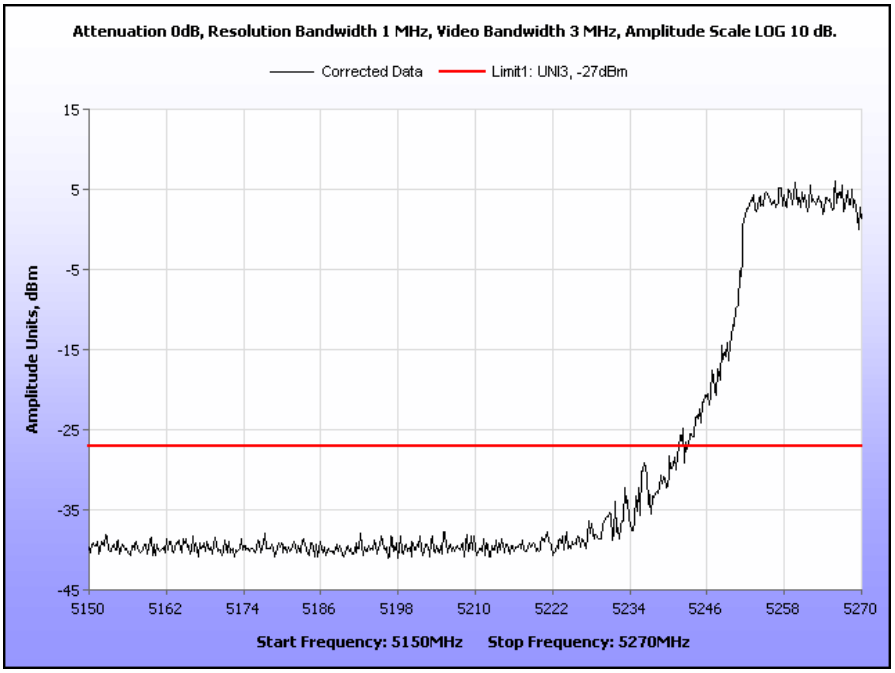
Plot 185. Radiated Band Edge, 802.11n 20 MHz, 5500 MHz, VMM



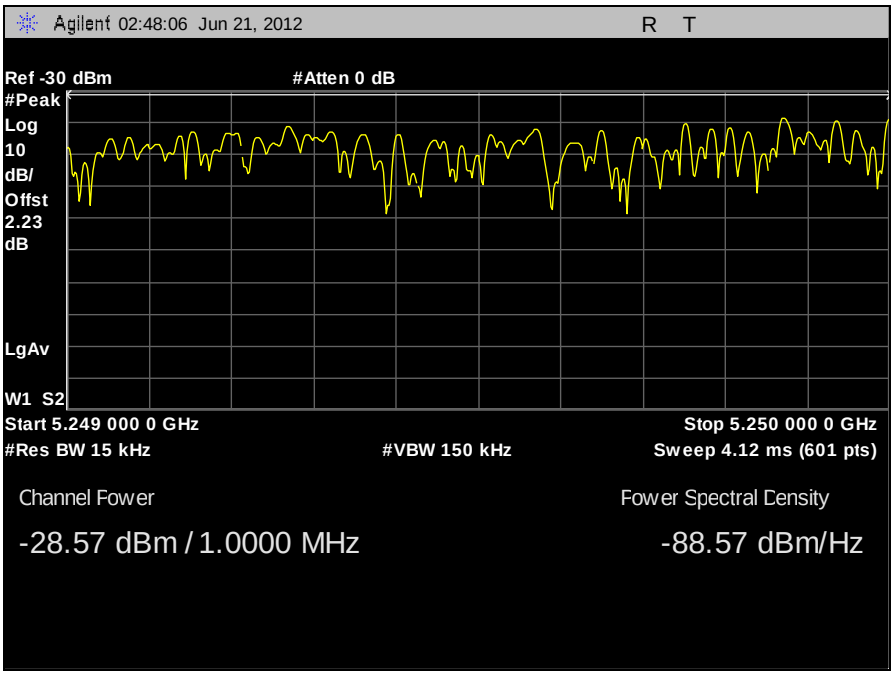
Plot 186. Radiated Band Edge, 802.11n 20 MHz, 5500 MHz, Average, VMM



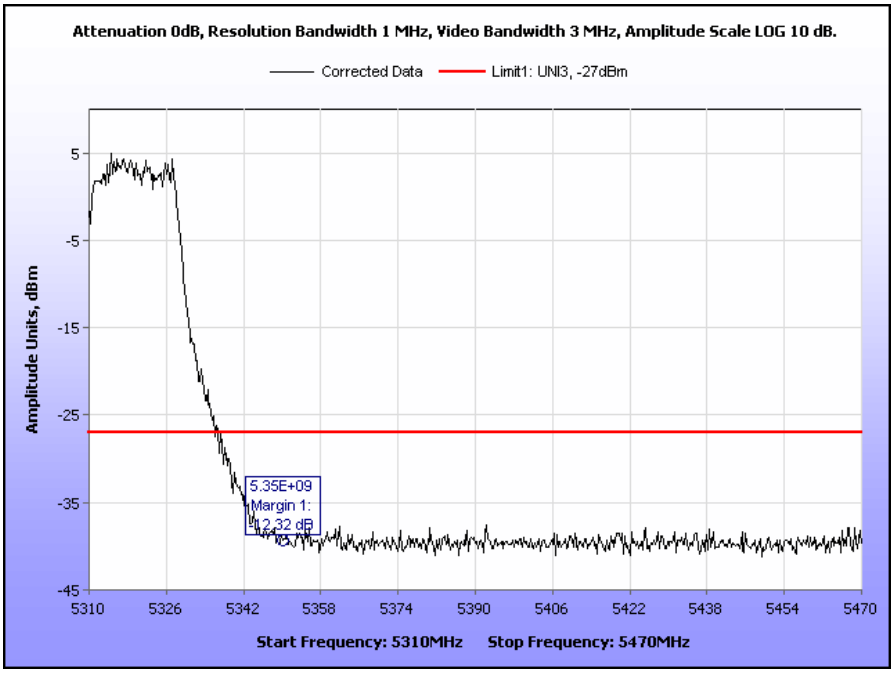
Plot 187. Radiated Band Edge, 802.11n 20 MHz, 5500 MHz, Peak, VMM



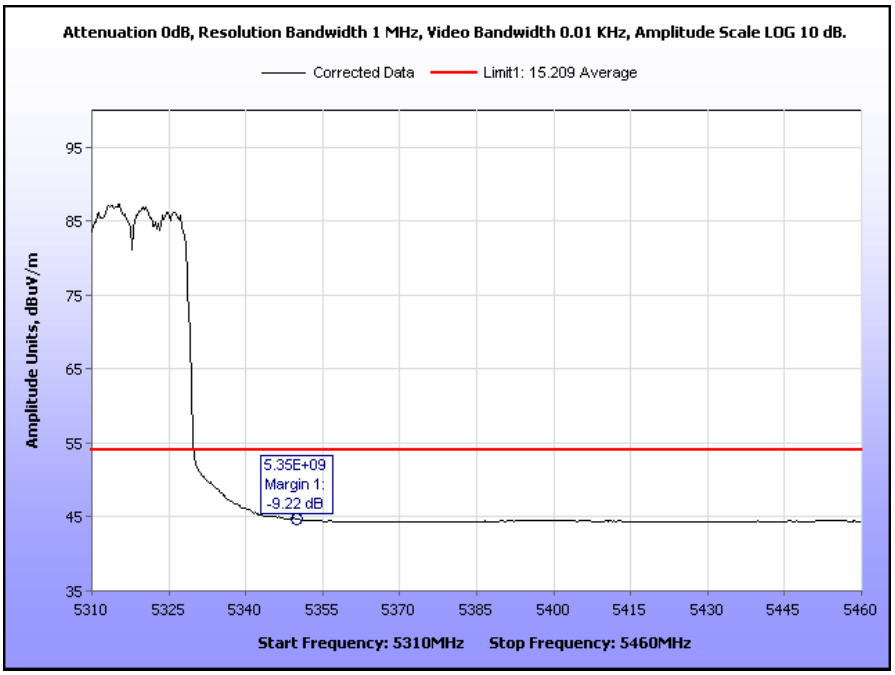
Plot 188. Radiated Band Edge, 802.11n 40 MHz, 5270 MHz, VMM



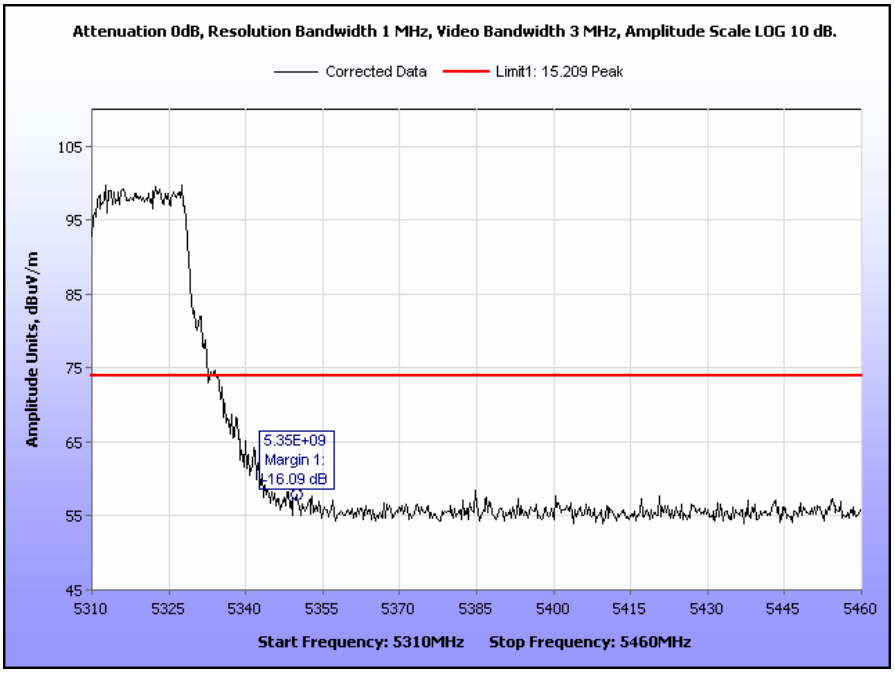
Plot 189. Radiated Band Edge, 802.11n 40 MHz, 5270 MHz, 1 MHz Integration, VMM



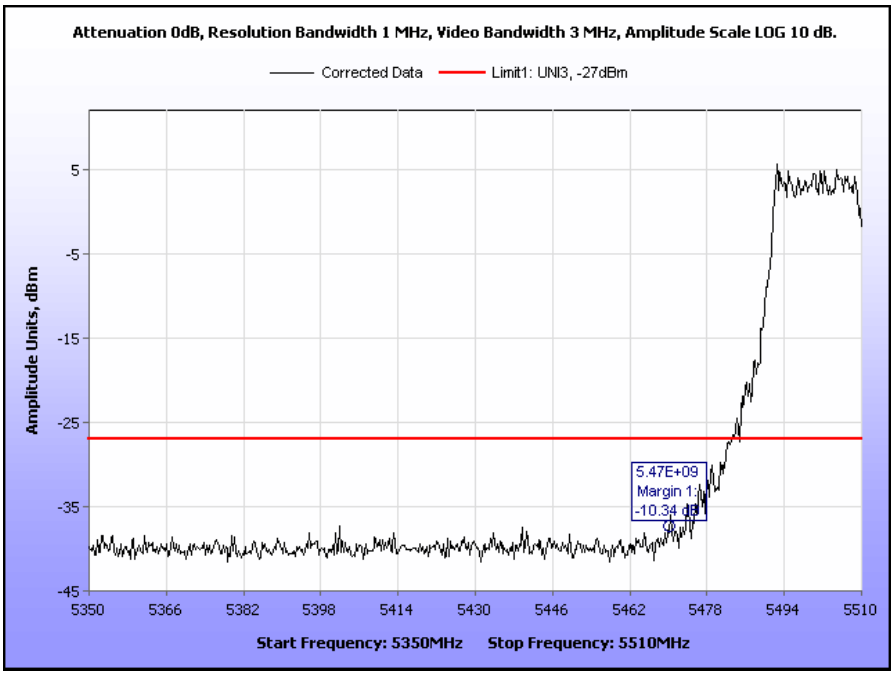
Plot 190. Radiated Band Edge, 802.11n 40 MHz, 5310 MHz, VMM



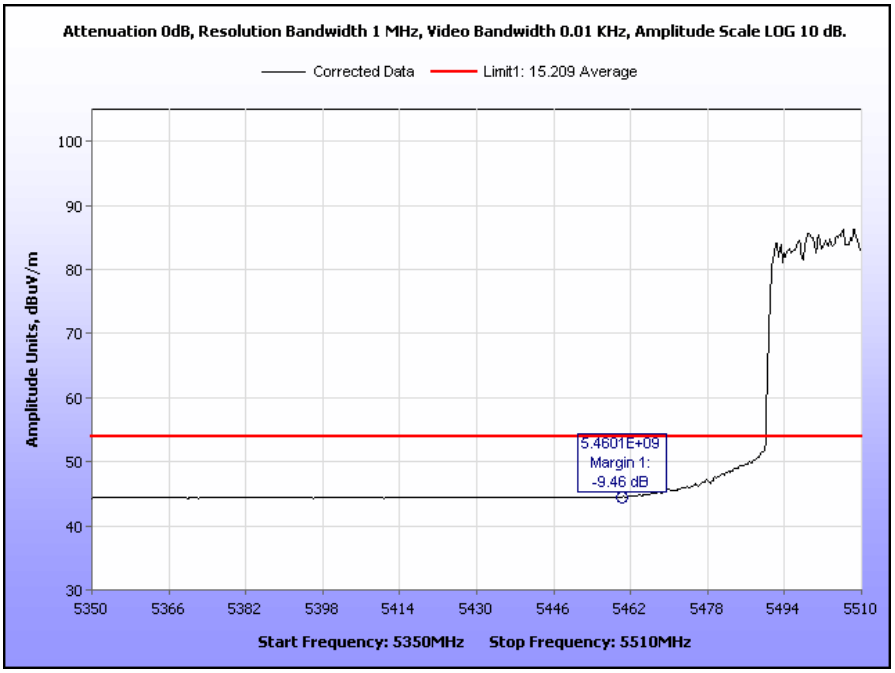
Plot 191. Radiated Band Edge, 802.11n 40 MHz, 5310 MHz, Average, VMM



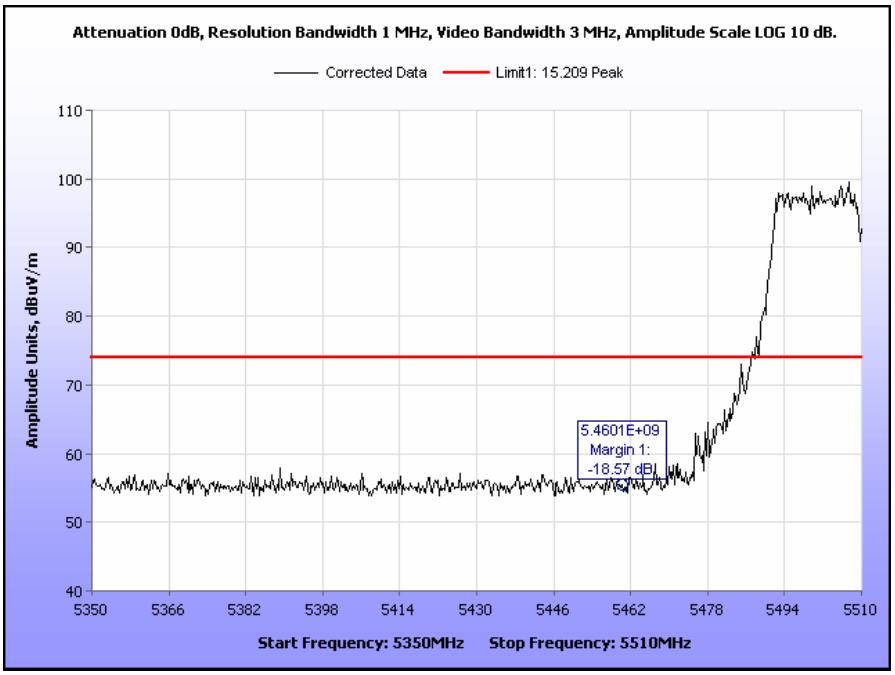
Plot 192. Radiated Band Edge, 802.11n 40 MHz, 5310 MHz, Peak, VMM



Plot 193. Radiated Band Edge, 802.11n 40 MHz, 5510 MHz, VMM



Plot 194. Radiated Band Edge, 802.11n 40 MHz, 5510 MHz, Average, VMM



Plot 195. Radiated Band Edge, 802.11n 40 MHz, 5510 MHz, Peak, VMM

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
1T4149	HIGH-FREQUENCY ANECHOIC CHAMBER	RAY-PROOF	81	NOT REQUIRED	
1T4771	SPECTRUM ANALYZER	AGILENT TECHNOLOGIES	E4446A	12/12/2011	12/12/2012
1T4300B	SEMI-ANECHOIC CHAMBER # 1 D (2043A-1) (IC)	EMC TEST SYSTEMS	NONE	01/25/2012	01/25/2015
1T4751	ANTENNA - BILOG	SUNOL SCIENCES	JB6	12/07/2011	12/07/2012
1T4409	EMI RECEIVER	ROHDE & SCHWARZ	ESIB7	07/16/2012	07/16/2013
1T4745	ANTENNA, HORN	ETS-LINDGREN	3116	10/04/2011	10/04/2012
1T4757	ANTENNA; HORN	ETS-LINDGREN	3117	02/18/2012	08/18/2013
1T4752	PRE-AMPLIFIER	MITEQ	JS44-18004000-35-8P	SEE NOTE	

Table 8. 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.

End of Report

