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

February 19, 2013

Boyce Technologies, Inc.
40 Wall Street, Floor 25
New York, NY 10005

Dear Charles Boyce,

Enclosed is the EMC Wireless test report for compliance testing of the Boyce Technologies, Inc., BTI-HPU-7161 as tested to the requirements of Title 47 of the CFR, Ch. 1 (10-1-06 ed.), Part 15, Subpart B, ICES-003, Issue 4 February 2004 for a Class B Digital Device and FCC Part 15 Subpart C, 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: (\Boyce Technologies, Inc.\EMC34855-FCC247 Rev. 4)

Electromagnetic Compatibility Criteria
Test Report

for the

Boyce Technologies, Inc.
BTI-HPU-7161

Tested under
the FCC Certification Rules
contained in
Title 47 of the CFR, Parts 15 Subpart B & ICES-003
for Class B Digital Devices
&
15.247 Subpart C & RSS-210, Issue 8, Dec. 2010
for Intentional Radiators

MET Report: EMC34855-FCC247 Rev. 4

February 19, 2013

Prepared For:

Boyce Technologies, Inc.
40 Wall Street, Floor 25
New York, NY 10005

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

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for Intentional Radiators

Benjamin 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 the FCC Rules Parts 15B, 15.247 and Industry Canada standards ICES-003, Issue 4 February 2004, RSS-210, Issue 8, Dec. 2010 under normal use and maintenance.

Asad Bajwa,
Director, Electromagnetic Compatibility Lab

Report Status Sheet

Revision	Report Date	Reason for Revision
∅	July 22, 2012	Initial Issue.
1	December 4, 2012	Revised to reflect engineer corrections.
2	December 12, 2012	Revised to reflect engineer corrections.
3	January 7, 2013	Revised to reflect engineer corrections.
4	February 19, 2013	Revised to reflect engineer corrections.

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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
NEBS	**N**etwork **E**quipment-**B**uilding **S**ystem
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 Boyce Technologies, Inc. BTI-HPU-7161, with the requirements of Part 15, §15.247. 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 BTI-HPU-7161. Boyce Technologies, Inc. should retain a copy of this document which should be kept on file for at least two years after the manufacturing of the BTI-HPU-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, §15.247, in accordance with Boyce Technologies, Inc., purchase order number 1059. All tests were conducted using measurement procedure ANSI C63.4-2003.

FCC Reference 47 CFR Part 15.247:2005	IC Reference RSS-210 Issue 8: 2010	Description	Compliance
47 CFR Part 15.107 (a)	ICES-003 Issue 4 February 2004	Conducted Emission Limits for a Class B Digital Device	Compliant
47 CFR Part 15.109 (a)	ICES-003 Issue 4 February 2004	Radiated Emission Limits for a Class B Digital Device	Compliant
Title 47 of the CFR, Part 15 §15.203	N/A	Antenna Requirement	Compliant
Title 47 of the CFR, Part 15 §15.207(a)	RSS-210(7.2.2)	Conducted Emission Limits	Compliant
Title 47 of the CFR, Part 15 §15.247(a)(2)	RSS-Gen(4.6)	6dB Occupied Bandwidth	Compliant
		99% Occupied Bandwidth	Compliant
Title 47 of the CFR, Part 15 §15.247(b)	RSS-210(A8.4)	Peak Power Output	Compliant
Title 47 of the CFR, Part 15 §15.247(d); §15.209; §15.205	RSS-210(A8.5)	Radiated Spurious Emissions Requirements	Compliant
Title 47 of the CFR, Part 15 §15.247(d)	RSS-210(A8.5)	RF Conducted Spurious Emissions Requirements	Compliant
Title 47 of the CFR, Part 15 §15.247(d)	RSS-210(A8.5)	RF Conducted Band Edge	Compliant
Title 47 of the CFR, Part 15; §15.247(e)	RSS-210(A8.3)	Peak Power Spectral Density	Compliant
Title 47 of the CFR, Part 15 §15.247(i)	RSS-Gen(5.5)	Maximum Permissible Exposure (MPE)	Compliant
N/A	RSS-Gen(4.8)	Receiver Spurious Emissions	Compliant

Table 1. Executive Summary of EMC Part 15.247 ComplianceTesting

II. Equipment Configuration

A. Overview

MET Laboratories, Inc. was contracted by Boyce Technologies, Inc. to perform testing on the BTI-HPU-7161, under Boyce Technologies, Inc.'s purchase order number 1059.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the Boyce Technologies, Inc., BTI-HPU-7161.

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

Model(s) Tested:	BTI-HPU-7161	
Model(s) Covered:	BTI-HPU-7161	
EUT Specifications:	Primary Power: 120 VAC, 60 Hz	
	FCC ID: OEXBTIAP716101	
	Equipment Code:	DTS
	Peak RF Output Power:	2.4 GHz – 23.25 dBm 5.8 GHz – 23.86 dBm
	EUT Frequency Ranges:	2412 – 2462 MHz 5745 – 5825 MHz
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):	February 19, 2013	

Table 2. EUT Summary Table

B. References

CFR 47, Part 15, Subpart C	Federal Communication Commission, Code of Federal Regulations, Title 47, Part 15: General Rules and Regulations, Allocation, Assignment, and Use of Radio Frequencies
RSS-210, Issue 8, Dec. 2010	Low-power Licence-exempt Radiocommunications Devices (All Frequency Bands): Category I Equipment
CFR 47, Part 15, Subpart B	Electromagnetic Compatibility: Criteria for Radio Frequency Devices
ICES-003, Issue 4 February 2004	Electromagnetic Compatibility: Criteria for Radio Frequency Devices
ANSI C63.4:2003	Methods and Measurements of Radio-Noise Emissions from Low-Voltage Electrical And Electronic Equipment in the Range of 9 kHz to 40 GHz
ISO/IEC 17025:2005	General Requirements for the Competence of Testing and Calibration Laboratories
ANSI C63.10-2009	American National Standard for Testing Unlicensed Wireless Devices
EN 55022: 2006/A1:2007 **CISPR 22: 2005/A1:2005**	Information technology equipment - Radio disturbance characteristics - Limits and methods of measurement CISPR 22:2005 (Modified)

Table 3. References

C. Test Site

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

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

D. Description of Test Sample

The Boyce Technologies, Inc. BTI-HPU-7161, Equipment Under Test (EUT), is Wireless Access Point.

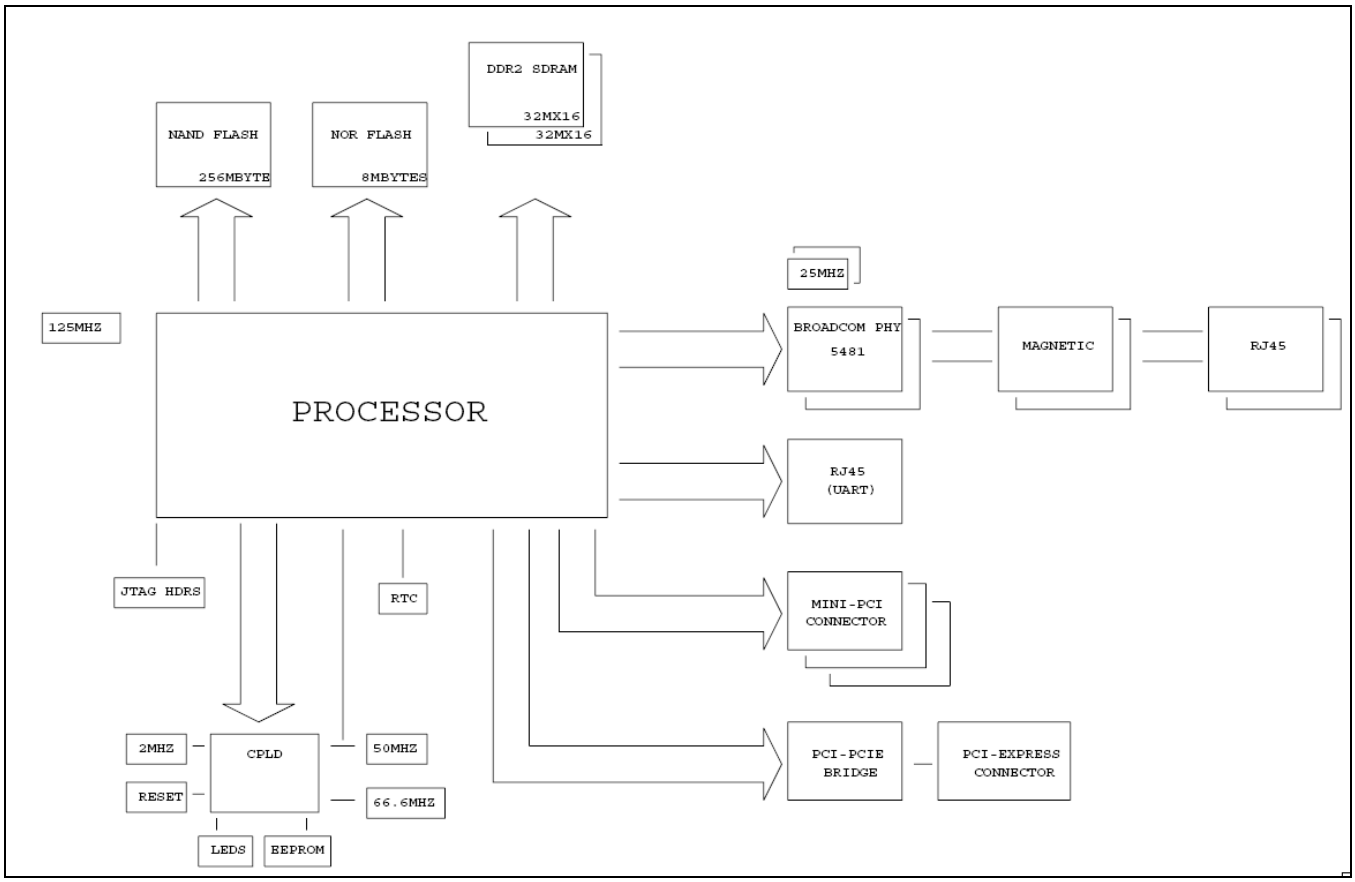


Figure 1. Block Diagram of Test Configuration

E. Equipment Configuration

The EUT was set up as outlined in Figure 1, Block Diagram of Test Setup. All cards, racks, etc., incorporated as part of the EUT is included in the following list.

Name / Description	Model Number	Serial Number
Boyce Wireless Radio	BTI-HPU-7161	000002

Table 4. Equipment Configuration

F. Support Equipment

Support equipment necessary for the operation and testing of the EUT is included in the following list.

Ref. ID	Name / Description	Manufacturer	Model Number
--	Laptop	--	--
--	PoE Injector	--	--

Table 5. Support Equipment

G. Ports and Cabling Information

Port Name on EUT	Cable Description	Qty.	Length (m)	Shielded (Y/N)	Termination Point
--	GE1/PoE	--	--	--	--
--	Console	--	--	--	--

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 Boyce Technologies, Inc. upon completion of testing.

III. Electromagnetic Compatibility Criteria for Unintentional Radiators

Electromagnetic Compatibility Criteria

§ 15.107 Conducted Emissions Limits

Test Requirement(s):

15.107 (a) Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in Table 7. Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminals.

15.107 (b) For a Class A digital device that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in Table 7. Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminals. The lower limit applies at the band edges.

15.207(a), Except as shown in paragraphs (b) and (c) of this section*, charging, AC adapters or battery eliminators the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the Table 7, as measured using a 50 μH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequencies ranges.

Frequency range (MHz)	Class A Conducted Limits (dBμV)		*Class B Conducted Limits (dBμV)	
	Quasi-Peak	Average	Quasi-Peak	Average
* 0.15- 0.45	79	66	66 - 56	56 - 46
0.45 - 0.5	79	66	56	46
0.5 - 30	73	60	60	50
Note 1 — The lower limit shall apply at the transition frequencies. Note 2 — The limit decreases linearly with the logarithm if the frequency in the range 0.15 MHz to 0.5 MHz. * -- Limits per Subsection 15.207(a).				

Table 7. Conducted Limits for Radio Frequency Devices calculated from FCC Part 15 Subsections 15.107(a) (b) and 15.207(a)

Test Results: The EUT was compliant with the Class B requirement(s) of this section. Measured emissions were below applicable limits.

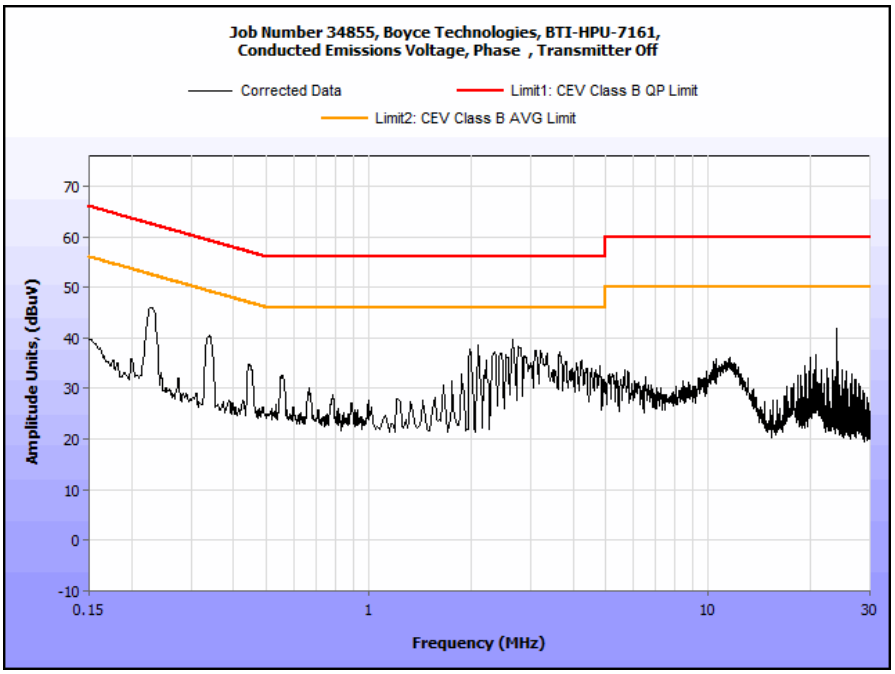
Test Engineer(s): Ben Taylor

Test Date(s): 04/20/12

Conducted Emissions - Voltage, AC Power, Phase Line (120 VAC, 60 Hz)

Frequency (MHz)	Uncorrected Meter Reading (dBuV) QP	Cable Loss (dB)	Corrected Measurement (dBuV) QP	Limit (dBuV) QP	Margin (dB) QP	Uncorrected Meter Reading (dBuV) Avg.	Cable Loss (dB)	Corrected Measurement (dBuV) AVG	Limit (dBuV) AVG	Margin (dB) AVG
0.2188	43.64	0.02	43.66	62.86	-19.2	30.76	0.02	30.78	52.86	-22.08
0.3335	38.71	0.04	38.75	59.36	-20.61	34.61	0.04	34.65	49.36	-14.71
0.442	33.31	0.03	33.34	57.02	-23.68	30.52	0.03	30.55	47.02	-16.47
1.972	31.89	0.15	32.04	56	-23.96	16.73	0.15	16.88	46	-29.12
11.866	30.22	0.43	30.65	60	-29.35	22.36	0.43	22.79	50	-27.21
23.923	40.93	0.61	41.54	60	-18.46	40.26	0.61	40.87	50	-9.13

Table 8. Conducted Emissions - Voltage, AC Power, Phase Line (120 VAC, 60 Hz)

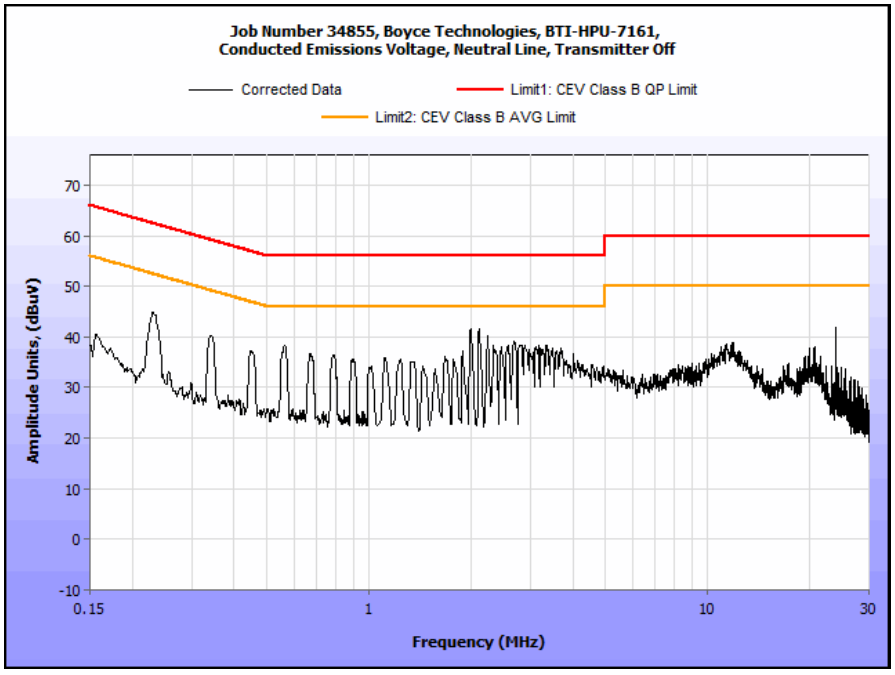


Plot 1. Conducted Emissions, Phase Line Plot

Conducted Emissions - Voltage, AC Power, Neutral Line (120 VAC, 60 Hz)

Frequency (MHz)	Uncorrected Meter Reading (dBuV) QP	Cable Loss (dB)	Corrected Measurement (dBuV) QP	Limit (dBuV) QP	Margin (dB) QP	Uncorrected Meter Reading (dBuV) Avg.	Cable Loss (dB)	Corrected Measurement (dBuV) AVG	Limit (dBuV) AVG	Margin (dB) AVG
0.223	42.98	0.03	43.01	62.71	-19.7	37.22	0.03	37.25	52.71	-15.46
0.3355	38.52	0.04	38.56	59.31	-20.75	34.54	0.04	34.58	49.31	-14.73
0.5602	36.9	0.03	36.93	56	-19.07	33.9	0.03	33.93	46	-12.07
2.112	33.34	0.16	33.5	56	-22.5	22.12	0.16	22.28	46	-23.72
11.833	33.98	0.43	34.41	60	-25.59	24.65	0.43	25.08	50	-24.92
23.938	40.65	0.61	41.26	60	-18.74	40.11	0.61	40.72	50	-9.28

Table 9. Conducted Emissions - Voltage, AC Power, Neutral Line (120 VAC, 60 Hz)



Plot 2. Conducted Emissions, Neutral Line Plot

Radiated Emission Limits

§ 15.109 Radiated Emissions Limits

Test Requirement(s): **15.109 (a)** Except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the Class B limits expressed in Table 10.

15.109 (b) The field strength of radiated emissions from a Class A digital device, as determined at a distance of 10 meters, shall not exceed the Class A limits expressed in Table 10.

Frequency (MHz)	Field Strength (dBµV/m)	
	§15.109 (b), Class A Limit (dBµV) @ 10m	§15.109 (a),Class B Limit (dBµV) @ 3m
30 - 88	39.00	40.00
88 - 216	43.50	43.50
216 - 960	46.40	46.00
Above 960	49.50	54.00

Table 10. Radiated Emissions Limits calculated from FCC Part 15, §15.109 (a) (b)

Test Procedures: The EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber. The method of testing and test conditions of ANSI C63.4 were used. An antenna was located 3 m from the EUT on an adjustable mast. A pre-scan was first performed in order to find prominent radiated emissions. For final emissions measurements at each frequency of interest, the EUT was rotated and the antenna height was varied between 1 m and 4 m in order to maximize the emission. Measurements in both horizontal and vertical polarities were made and the data was recorded. Unless otherwise specified, measurements were made using a quasi-peak detector with a 120 kHz bandwidth.

Test Results: The EUT was compliant with the Class B requirement(s) of this section. Measured emissions were below applicable limits.

Test Engineer(s): Ben Taylor

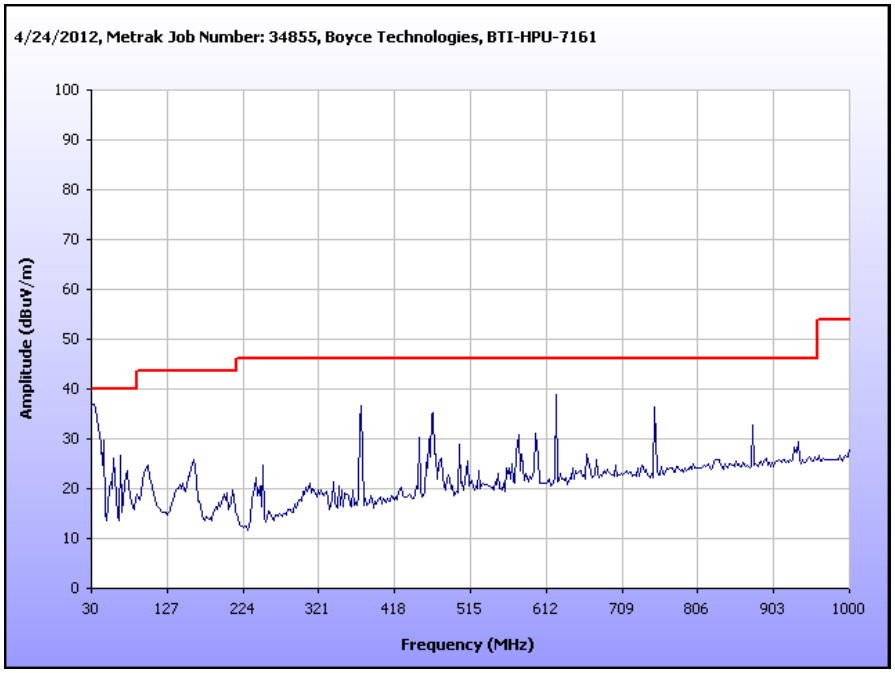
Test Date(s): 04/24/12

Radiated Emissions Limits Test Results, Class B

Frequency (MHz)	EUT Azimuth (Degrees)	Antenna Polarity (H/V)	Antenna HEIGHT (m)	Uncorrected Amplitude (dBuV)	Antenna Correction Factor (dB) (+)	Cable Loss (dB) (+)	Distance Correction Factor (dB) (-)	Corrected Amplitude (dBuV/m)	Limit (dBuV/m)	Margin (dB)
38.777555	280	H	1.12	5.10	15.18	0.42	0.00	20.70	40.00	-19.30
38.777555	329	V	1.01	17.08	15.18	0.42	0.00	32.68	40.00	-7.32
374.9953	295	H	1.01	13.25	15.60	1.54	0.00	30.39	46.00	-15.61
374.9953	357	V	1.03	10.50	15.60	1.54	0.00	27.64	46.00	-18.36
465.63126	65	H	1.02	12.80	17.63	1.78	0.00	32.21	46.00	-13.79
465.63126	56	V	1.02	9.30	17.63	1.78	0.00	28.71	46.00	-17.29
624.97839	187	H	1.02	11.04	19.80	2.09	0.00	32.93	46.00	-13.07
624.97839	175	V	1.03	14.03	19.80	2.09	0.00	35.92	46.00	-10.08
752.24637	15	H	1.01	5.21	21.30	2.41	0.00	28.92	46.00	-17.08
752.24637	25	V	1.03	5.26	21.30	2.41	0.00	28.97	46.00	-17.03
875.8694	11	H	1.03	5.65	22.70	2.51	0.00	30.86	46.00	-15.14
875.8694	21	V	1.01	5.57	22.70	2.51	0.00	30.78	46.00	-15.22

Table 11. Radiated Emissions Limits, Test Results, 30 MHz – 1 GHz, FCC Limits

Note: The EUT was tested at 3 m.



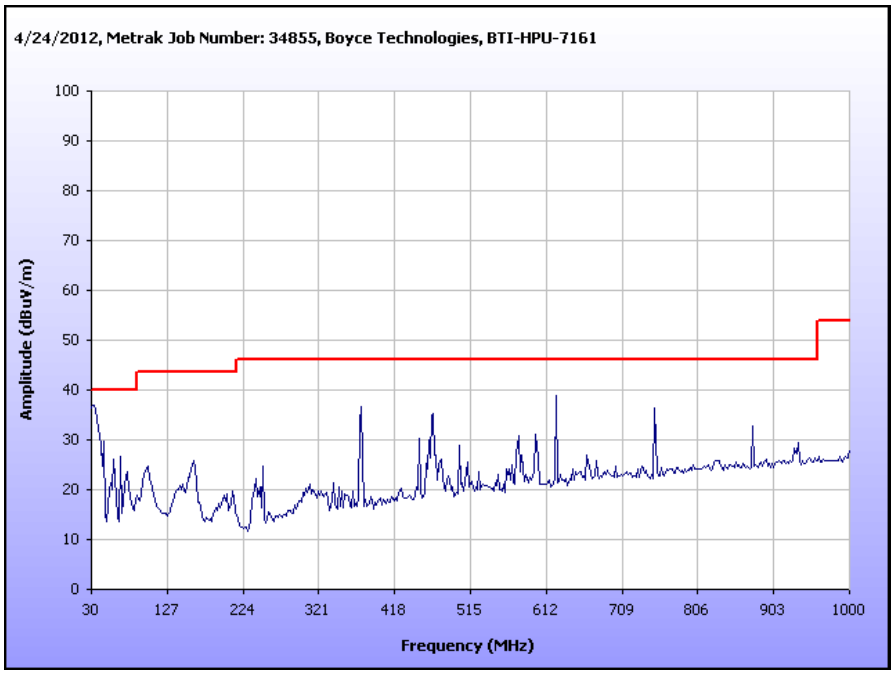
Plot 3. Radiated Emissions, 30 MHz - 1 GHz, FCC Limits

Radiated Emissions Limits Test Results, Class B

Frequency (MHz)	EUT Azimuth (Degrees)	Antenna Polarity (H/V)	Antenna HEIGHT (m)	Uncorrected Amplitude (dBuV)	Antenna Correction Factor (dB) (+)	Cable Loss (dB) (+)	Distance Correction Factor (dB) (-)	Corrected Amplitude (dBuV/m)	Limit (dBuV/m)	Margin (dB)
38.777555	280	H	1.12	5.10	15.18	0.42	10.46	10.24	30.00	-19.76
38.777555	329	V	1.01	17.08	15.18	0.42	10.46	22.22	30.00	-7.78
374.9953	295	H	1.01	13.25	15.60	1.54	10.46	19.93	37.00	-17.07
374.9953	357	V	1.03	10.50	15.60	1.54	10.46	17.18	37.00	-19.82
465.63126	65	H	1.02	12.80	17.63	1.78	10.46	21.75	37.00	-15.25
465.63126	56	V	1.02	9.30	17.63	1.78	10.46	18.25	37.00	-18.75
624.97839	187	H	1.02	11.04	19.80	2.09	10.46	22.47	37.00	-14.53
624.97839	175	V	1.03	14.03	19.80	2.09	10.46	25.46	37.00	-11.54
752.24637	15	H	1.01	5.21	21.30	2.41	10.46	18.46	37.00	-18.54
752.24637	25	V	1.03	5.26	21.30	2.41	10.46	18.51	37.00	-18.49
875.8694	11	H	1.03	5.65	22.70	2.51	10.46	20.40	37.00	-16.60
875.8694	21	V	1.01	5.57	22.70	2.51	10.46	20.32	37.00	-16.68

Table 12. Radiated Emissions Limits, Test Results, ICES-003 Limits

Note: The EUT was tested at 3 m.



Plot 4. Radiated Emissions, ICES-003 Limits

IV. 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 as tested is compliant the criteria of §15.203. The EUT has an integrated antenna.

Test Engineer(s): Ben Taylor

Test Date(s): 04/18/12

taoglas
antenna solutions

I. Introduction

FXP.503 is a 3-in-1 MIMO antenna. The three identical 2.4/5GHz antenna elements on the FPCB can be separately be used as either transmit antenna or receive antenna. Having three antenna integrated in one FPCB can greatly reduce the antenna assembly time.

II. Antenna Specification

ELECTRICAL						
Band	2.4 ~ 2.5GHz			4.9 ~ 5.9GHz		
Antenna	Left	Center	Right	Left	Center	Right
Peak Gain (Free Space)	1.3dBi	0.8dBi	0.0dBi	7.2dBi	6.3dBi	4.9dBi
Peak Gain (ABS)	4.2dBi	1.6dBi	2.7dBi	7.5dBi	6.8dBi	7.3dBi
Average Gain (Free Space)	-5.3dBi	-6.0dBi	-6.2dBi	-3.2dBi	-3.2dBi	-5.0dBi
Average Gain (ABS)	-2.6dBi	-3.9dBi	-3.1dBi	-1.5dBi	-1.8dBi	-1.4dBi
Efficiency (Free Space)	31%	26%	24%	52%	50%	34%
Efficiency (ABS)	55%	41%	50%	71%	66%	73%
Polarization	Linear					
Impedance	50 ohms					
Max Input Power	10 watts					
VSWR	<2.5:1					
MECHANICAL						
Dimensions	61 x 41 mm					
Cable	70mm 1.37 co-axial					
Connector	IPEX MHFHT					
ENVIRONMENTAL						
Temperature Range	-40°C to +85°C					
Humidity	Non-condensing 65°C 95% RH					

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Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.207(a) Conducted Emissions Limits

Test Requirement(s): **§ 15.207 (a):** For an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30MHz, shall not exceed the limits in the following table, as measured using a 50 μH/50 Ω line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency range (MHz)	§ 15.207(a), Conducted Limit (dBμV)	
	Quasi-Peak	Average
* 0.15- 0.45	66 - 56	56 - 46
0.45 - 0.5	56	46
0.5 - 30	60	50

Table 13. Conducted Limits for Intentional Radiators from FCC Part 15 § 15.207(a)

Test Procedure: The EUT was placed on a 0.8 m-high wooden table inside a screen room. The EUT was situated such that the back of the EUT was 0.4 m from one wall of the vertical ground plane, and the remaining sides of the EUT were no closer than 0.8 m from any other conductive surface. The EUT was powered from a 50 Ω/50 μH Line Impedance Stabilization Network (LISN). The EMC receiver scanned the frequency range from 150 kHz to 30 MHz. Conducted Emissions measurements were made in accordance with *ANSI C63.4-2003 "Methods and Measurements of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40 GHz"*. The measurements were performed over the frequency range of 0.15 MHz to 30 MHz using a 50 Ω/50 μH LISN as the input transducer to an EMC/field intensity meter. For the purpose of this testing, the transmitter was turned on. Scans were performed with the transmitter on.

Test Results: The EUT was compliant with this requirement. Measured emissions were below applicable limits.

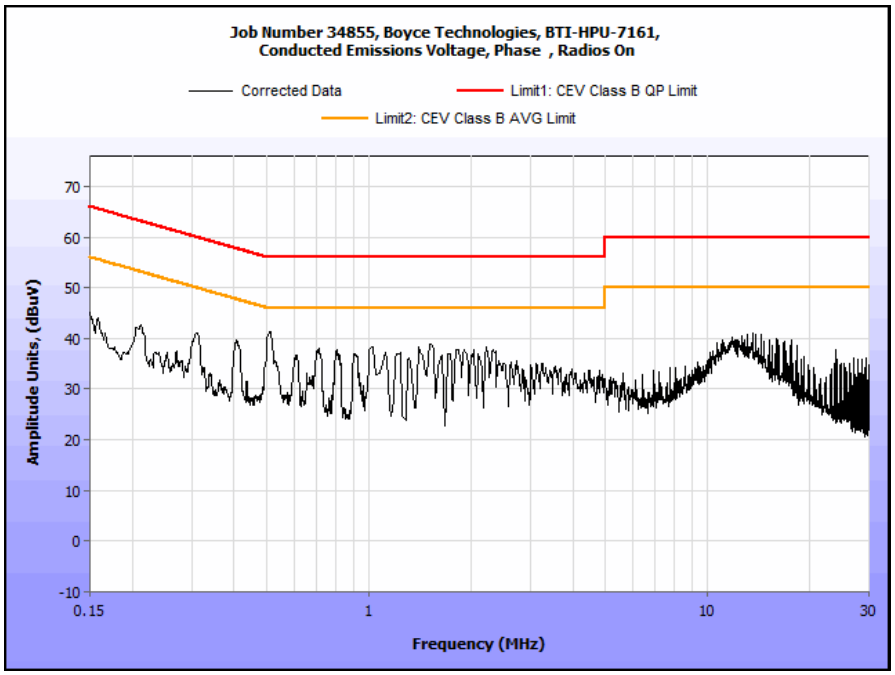
Test Engineer(s): Ben Taylor

Test Date(s): 04/23/12

15.207(a) Conducted Emissions Test Results

Frequency (MHz)	Uncorrected Meter Reading (dBuV) QP	Cable Loss (dB)	Corrected Measurement (dBuV) QP	Limit (dBuV) QP	Margin (dB) QP	Uncorrected Meter Reading (dBuV) Avg.	Cable Loss (dB)	Corrected Measurement (dBuV) AVG	Limit (dBuV) AVG	Margin (dB) AVG
0.2024	41.26	0.01	41.27	63.51	-22.24	36.58	0.01	36.59	53.51	-16.92
0.3047	39.59	0.05	39.64	60.11	-20.47	35.69	0.05	35.74	50.11	-14.37
0.5074	39.89	0.02	39.91	56	-16.09	36.98	0.02	37	46	-9
1.521	36.89	0.13	37.02	56	-18.98	30.34	0.13	30.47	46	-15.53
2.333	35.15	0.16	35.31	56	-20.69	27.35	0.16	27.51	46	-18.49
13.106	39.95	0.44	40.39	60	-19.61	36.37	0.44	36.81	50	-13.19

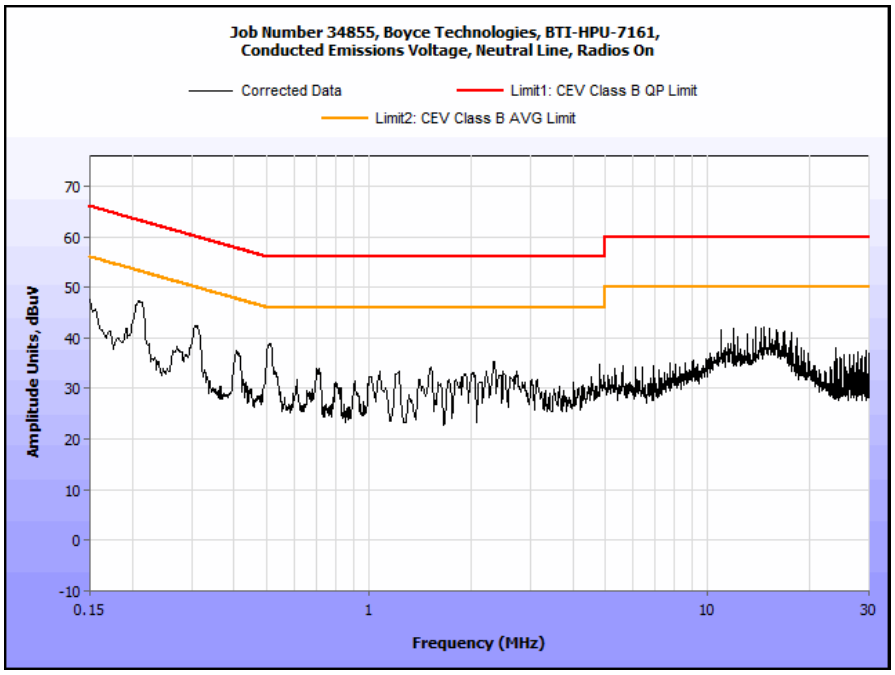
Table 14. Conducted Emissions, 15.207, Test Results, Phase Line



Plot 5. Conducted Emissions, 15.207(a), Phase Line

Frequency (MHz)	Uncorrected Meter Reading (dBuV) QP	Cable Loss (dB)	Corrected Measurement (dBuV) QP	Limit (dBuV) QP	Margin (dB) QP	Uncorrected Meter Reading (dBuV) Avg.	Cable Loss (dB)	Corrected Measurement (dBuV) AVG	Limit (dBuV) AVG	Margin (dB) AVG
0.201	44.67	0.01	44.68	63.57	-18.89	33.62	0.01	33.63	53.57	-19.94
0.3076	39.16	0.05	39.21	60.04	-20.83	33.91	0.05	33.96	50.04	-16.08
0.504	36.53	0.02	36.55	56	-19.45	32.46	0.02	32.48	46	-13.52
2.3235	31.35	0.16	31.51	56	-24.49	24.44	0.16	24.6	46	-21.4
12.001	40.68	0.43	41.11	60	-18.89	37.82	0.43	38.25	50	-11.75
23.909	37.09	0.61	37.7	60	-22.3	35.46	0.61	36.07	50	-13.93

Table 15. Conducted Emissions, 15.207, Test Results, Neutral Line



Plot 6. Conducted Emissions, 15.207(a), Neutral Line

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.247(a)(2) 6 dB and 99% Bandwidth

Test Requirements: **§ 15.247(a)(2):** Operation under the provisions of this section is limited to frequency hopping and digitally modulated intentional radiators that comply with the following provisions:

For systems using digital modulation techniques, the EUT may operate in the 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz bands. The minimum 6dB bandwidth shall be at least 500 kHz.

Test Procedure: The transmitter was on and transmitting at the highest output power. The bandwidth of the fundamental frequency was measured with the spectrum analyzer using a RBW approximately 1% of the total emission bandwidth, VBW > RBW. The 6 dB Bandwidth was measured and recorded. The measurements were performed on the low, mid and high channels.

Test Results The EUT was compliant with § 15.247 (a)(2).

The 6 dB and 99% Bandwidth was determined from the plots on the following pages.

Test Engineer(s): Jeff Pratt

Test Date(s): 03/07/11

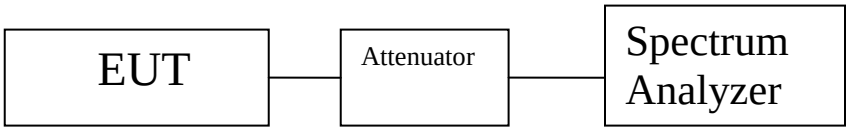


Figure 2. Block Diagram, Occupied Bandwidth Test Setup

Occupied Bandwidth Test Results

Occupied Bandwidth					
Carrier Channel	Frequency (MHz)	Mode	Measured 6 dB Bandwidth (MHz)		
			A	B	C
Low	2412	802.11b	10.313	9.968	10.037
Low	2412	802.11g	15.353	15.868	16.417
Low	2412	802.11g 20 MHz	17.667	13.320	17.528
Low	2422	802.11g 40 MHz	36.136	36.252	36.504
Mid	2437	802.11b	9.574	11.144	9.860
Mid	2437	802.11g	16.281	16.088	16.209
Mid	2437	802.11g 20 MHz	17.563	17.628	17.509
Mid	2437	802.11g 40 MHz	36.354	36.447	36.534
High	2462	802.11b	10.302	10.257	10.898
High	2462	802.11g	16.462	17.728	16.061
High	2462	802.11n 20 MHz	17.721	17.707	17.619
High	2452	802.11n 40 MHz	36.161	36.456	36.130

Table 16. 6 dB Occupied Bandwidth, Test Results, 2.4 GHz

Occupied Bandwidth					
Carrier Channel	Frequency (MHz)	Mode	Measured 6 dB Bandwidth (MHz)		
			A	B	C
Low	5745	802.11a	16.177	16.419	16.532
Low	5745	802.11n 20 MHz	17.461	17.694	16.983
Low	5755	802.11n 40 MHz	36.504	36.314	36.227
Mid	5785	802.11a	16.452	16.357	16.029
Mid	5785	802.11n 20 MHz	16.966	17.607	17.704
Mid	5785	802.11n 40 MHz	36.039	36.471	36.422
High	5825	802.11a	16.449	16.211	16.432
High	5825	802.11n 20 MHz	17.525	17.525	17.351
High	5815	802.11n 40 MHz	36.440	36.200	36.218

Table 17. 6 dB Occupied Bandwidth, Test Results, 5.8 GHz

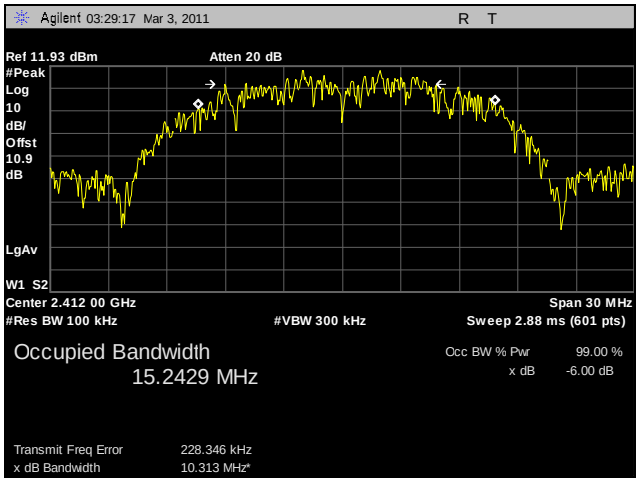
Occupied Bandwidth					
Carrier Channel	Frequency (MHz)	Mode	Measured 99% Bandwidth (MHz)		
			A	B	C
Low	2412	802.11b	15.4710	15.2058	15.1189
Low	2412	802.11g	16.5396	16.3744	16.4058
Low	2412	802.11g 20 MHz	17.6698	17.7558	17.6596
Low	2422	802.11g 40 MHz	36.2915	36.1751	36.2757
Mid	2437	802.11b	15.3713	15.3519	15.1369
Mid	2437	802.11g	16.5249	16.4279	16.4661
Mid	2437	802.11g 20 MHz	17.5187	17.6597	17.6090
Mid	2437	802.11g 40 MHz	36.2355	36.2067	36.3387
High	2462	802.11b	15.4775	15.0114	15.2966
High	2462	802.11g	16.3804	16.4491	16.5060
High	2462	802.11g 20 MHz	17.5750	17.6184	17.6504
High	2452	802.11g 40 MHz	36.2588	36.4039	35.9949

Table 18. 99% Occupied Bandwidth, Test Results, 2.4 GHz

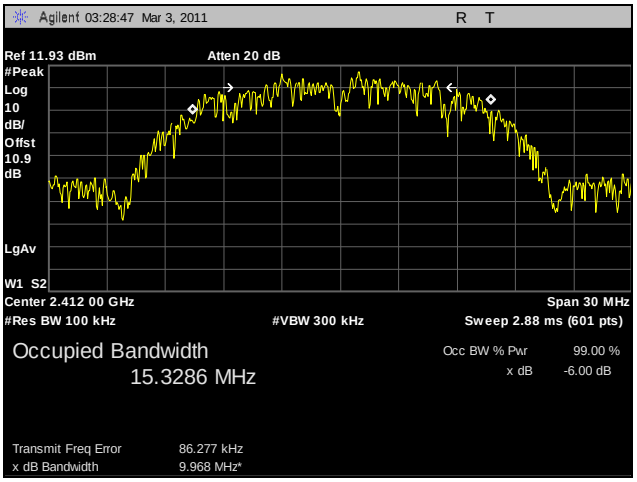
Occupied Bandwidth					
Carrier Channel	Frequency (MHz)	Mode	Measured 99% Bandwidth (MHz)		
			A	B	C
Low	5745	802.11a	16.4877	16.4656	16.5717
Low	5745	802.11n 20 MHz	17.6661	17.5847	17.7479
Low	5755	802.11n 40 MHz	36.2385	36.2898	36.2931
Mid	5785	802.11a	16.4517	16.4316	16.5043
Mid	5785	802.11n 20 MHz	17.7007	17.6184	17.6288
Mid	5785	802.11n 40 MHz	36.2431	36.1860	36.1892
High	5825	802.11a	16.4233	16.3744	16.4229
High	5825	802.11n 20 MHz	17.6650	17.7196	17.6977
High	5815	802.11n 40 MHz	36.3933	36.2438	36.2710

Table 19. 99% Occupied Bandwidth, Test Results, 5.8 GHz

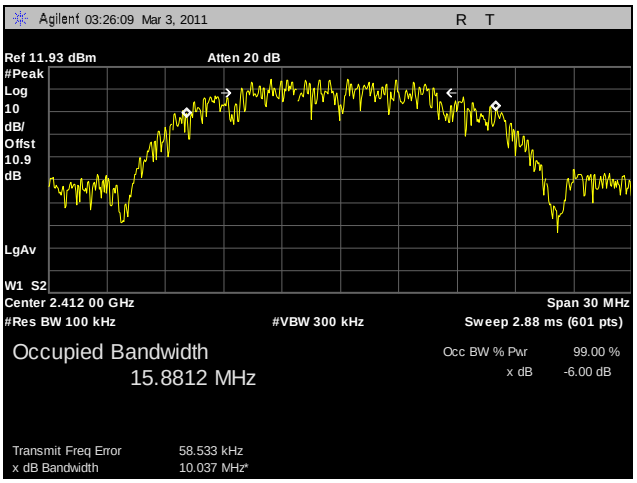
6 dB Occupied Bandwidth Test Results, 2.4 GHz



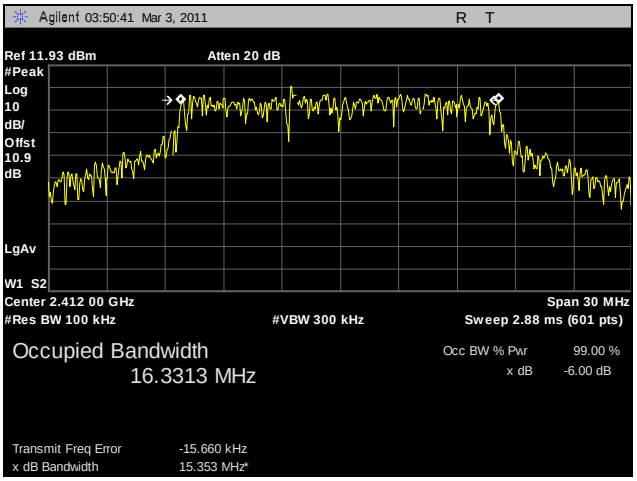
Plot 7. 6dB Occupied Bandwidth, Low Channel, 802.11b, 2.4 GHz, A



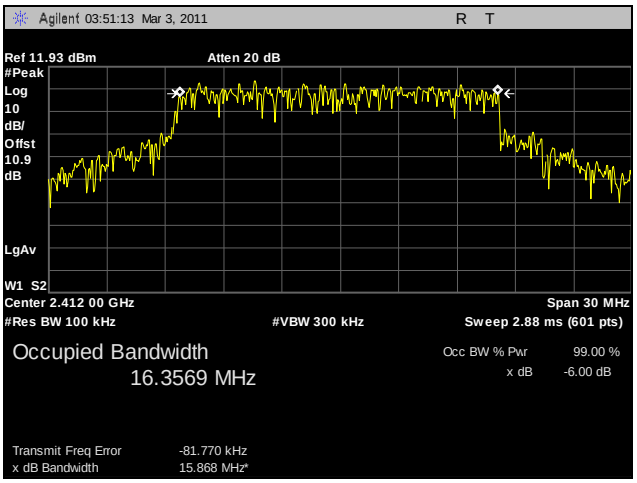
Plot 8. 6dB Occupied Bandwidth, Low Channel, 802.11b, 2.4 GHz, B



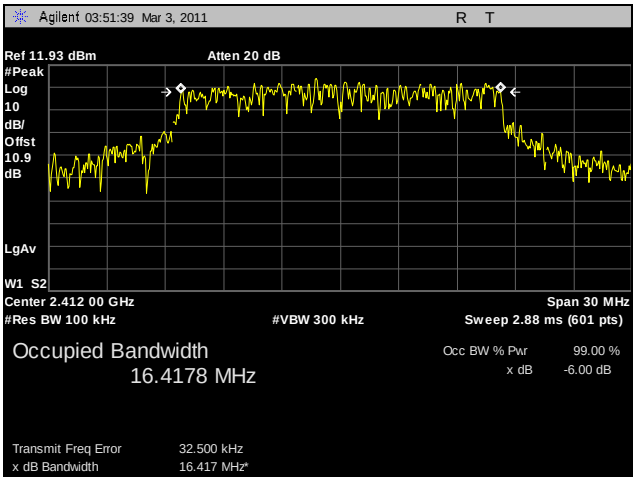
Plot 9. 6dB Occupied Bandwidth, Low Channel, 802.11b, 2.4 GHz, C



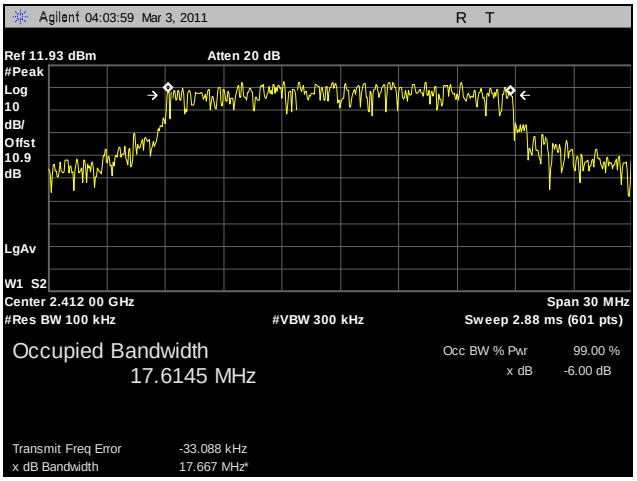
Plot 10. 6dB Occupied Bandwidth, Low Channel, 802.11g, 2.4 GHz, A



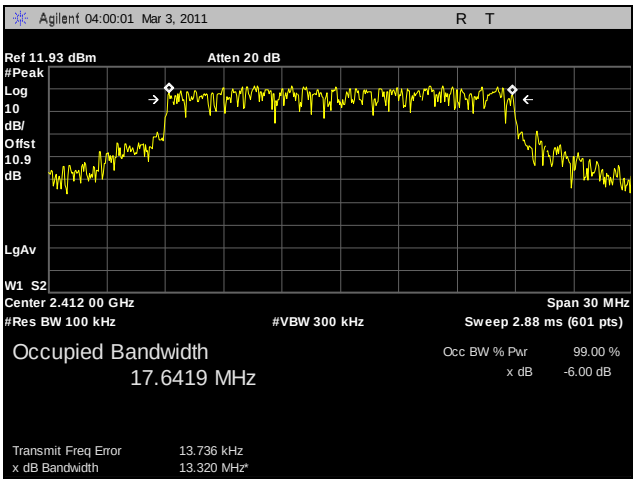
Plot 11. 6dB Occupied Bandwidth, Low Channel, 802.11g, 2.4 GHz, B



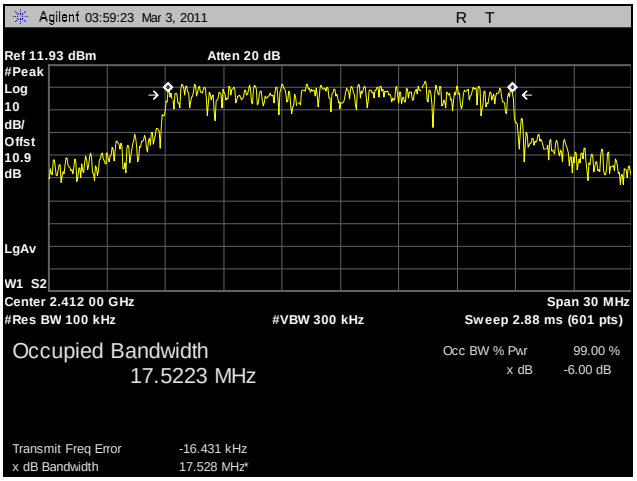
Plot 12. 6dB Occupied Bandwidth, Low Channel, 802.11g, 2.4 GHz, C



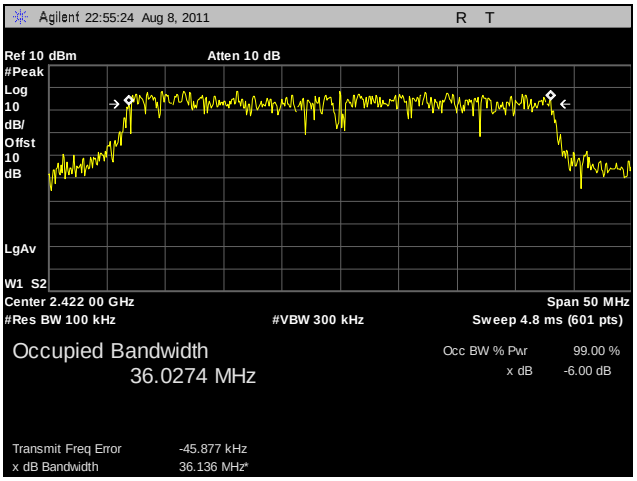
Plot 13. 6dB Occupied Bandwidth, Low Channel, 802.11g 20 MHz, 2.4 GHz, A



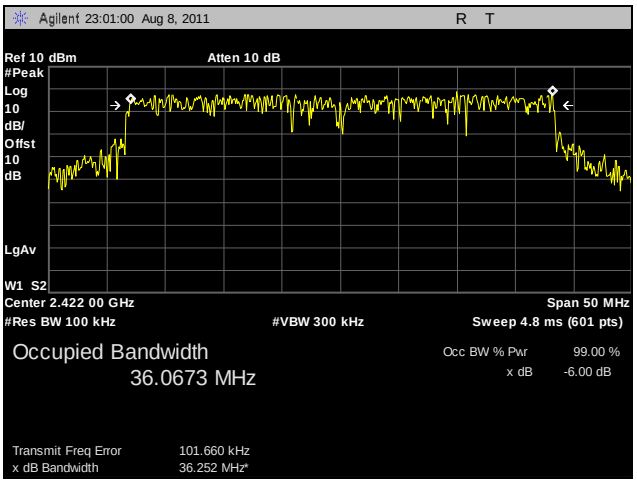
Plot 14. 6dB Occupied Bandwidth, Low Channel, 802.11g 20 MHz, 2.4 GHz, B



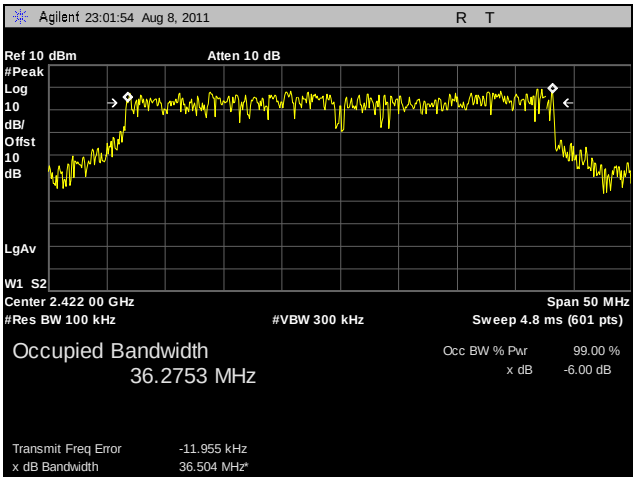
Plot 15. 6dB Occupied Bandwidth, Low Channel, 802.11g 20 MHz, 2.4 GHz, C



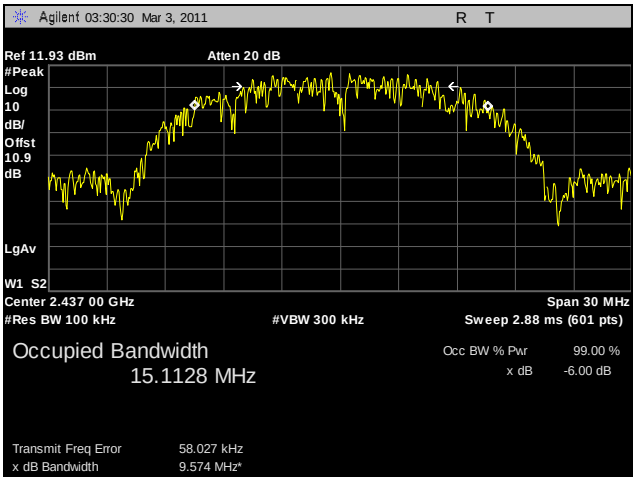
Plot 16. 6dB Occupied Bandwidth, Low Channel, 802.11g 40 MHz, 2.4 GHz, A



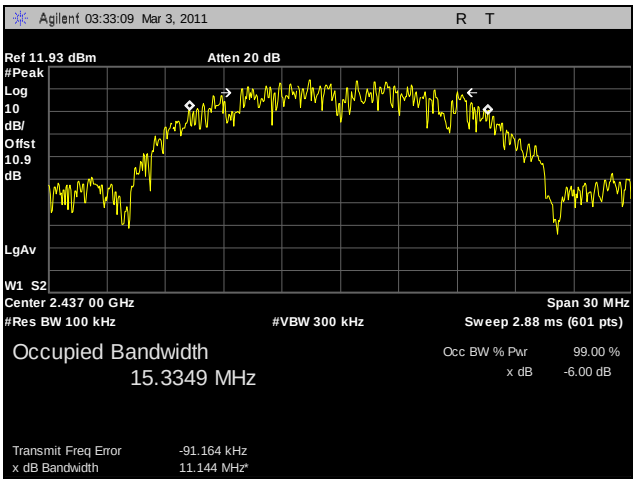
Plot 17. 6dB Occupied Bandwidth, Low Channel, 802.11g 40 MHz, 2.4 GHz, B



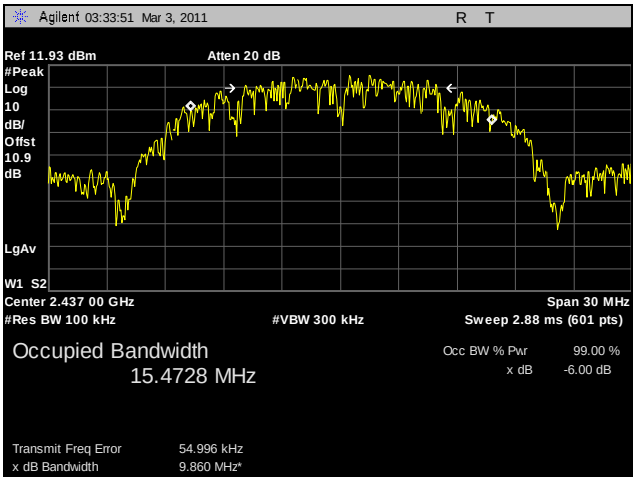
Plot 18. 6dB Occupied Bandwidth, Low Channel, 802.11g 40 MHz, 2.4 GHz, C



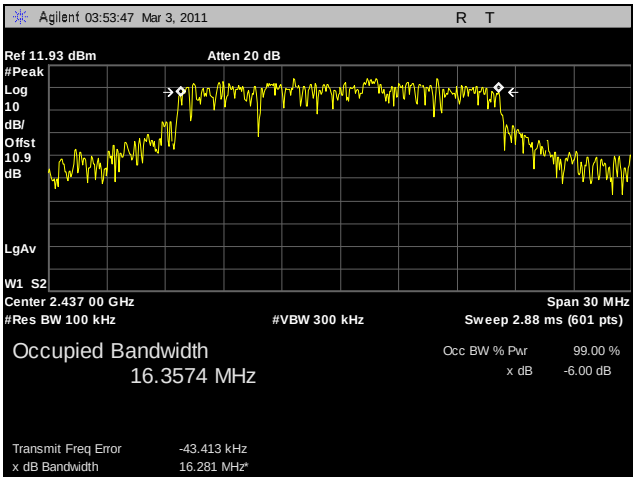
Plot 19. 6dB Occupied Bandwidth, Mid Channel, 802.11b, 2.4 GHz, A



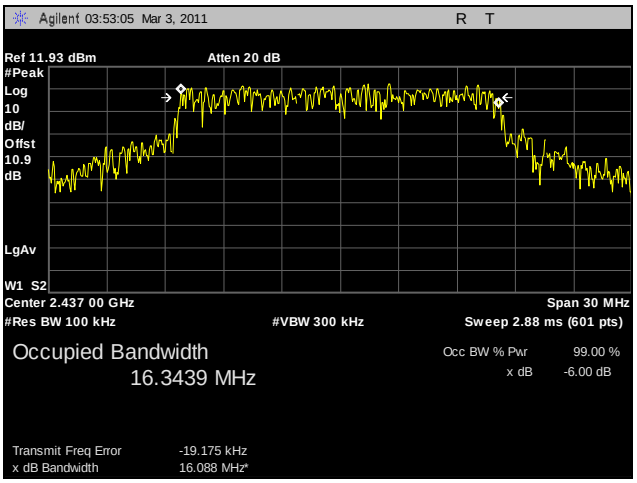
Plot 20. 6dB Occupied Bandwidth, Mid Channel, 802.11b, 2.4 GHz, B



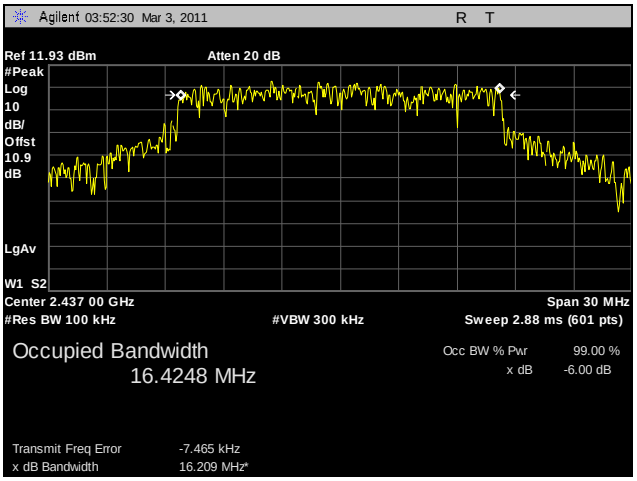
Plot 21. 6dB Occupied Bandwidth, Mid Channel, 802.11b, 2.4 GHz, C



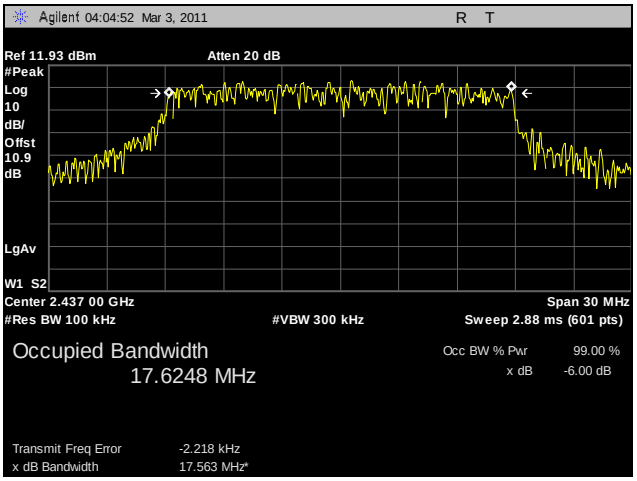
Plot 22. 6dB Occupied Bandwidth, Mid Channel, 802.11g, 2.4 GHz, A



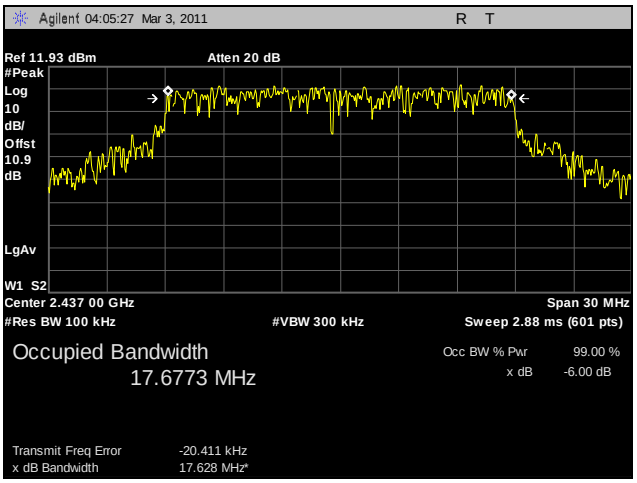
Plot 23. 6dB Occupied Bandwidth, Mid Channel, 802.11g, 2.4 GHz, B



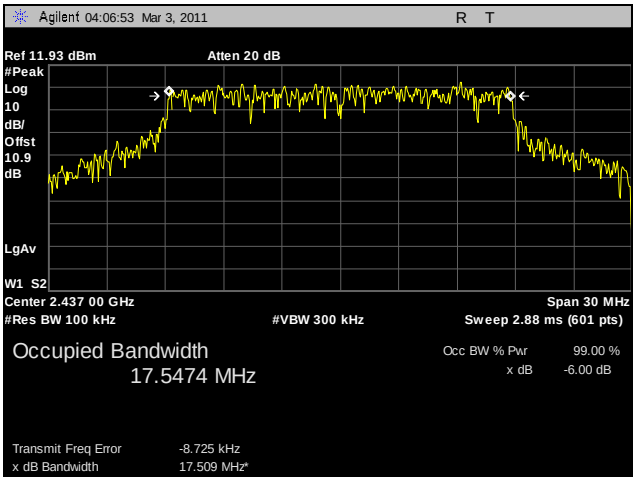
Plot 24. 6dB Occupied Bandwidth, Mid Channel, 802.11g, 2.4 GHz, C



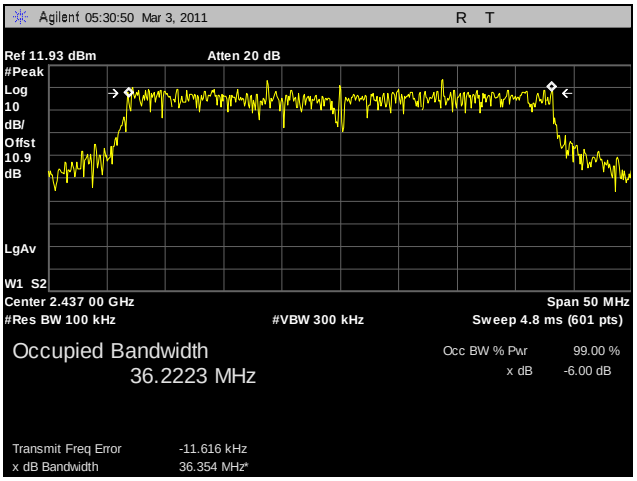
Plot 25. 6dB Occupied Bandwidth, Mid Channel, 802.11g 20 MHz, 2.4 GHz, A



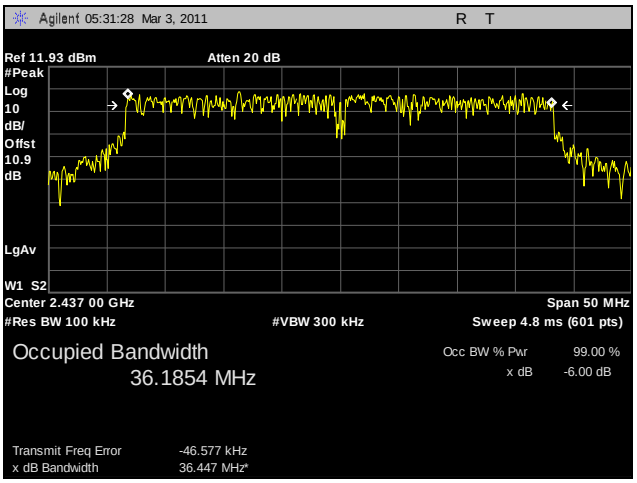
Plot 26. 6dB Occupied Bandwidth, Mid Channel, 802.11g 20 MHz, 2.4 GHz, B



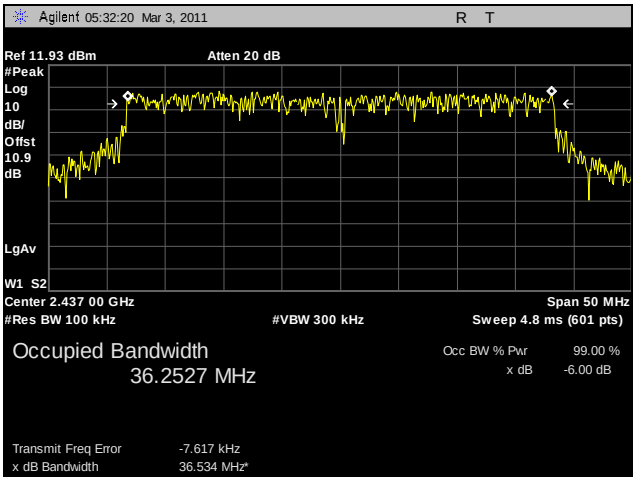
Plot 27. 6dB Occupied Bandwidth, Mid Channel, 802.11g 20 MHz, 2.4 GHz, C



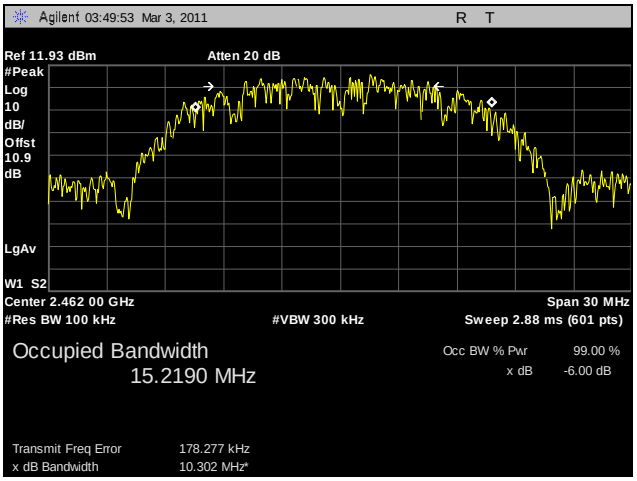
Plot 28. 6dB Occupied Bandwidth, Mid Channel, 802.11g 40 MHz, 2.4 GHz, A



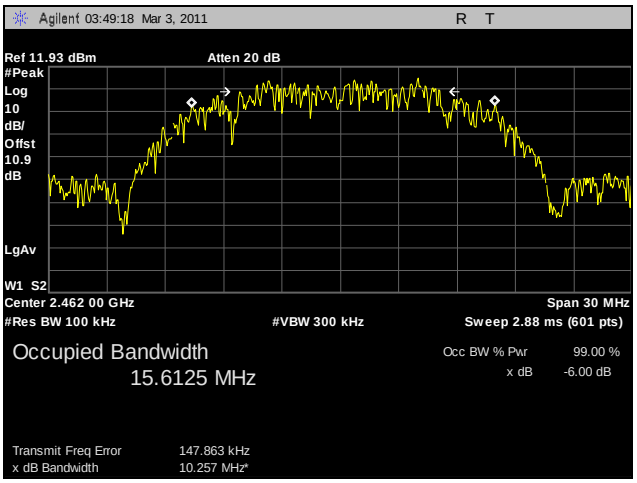
Plot 29. 6dB Occupied Bandwidth, Mid Channel, 802.11g 40 MHz, 2.4 GHz, B



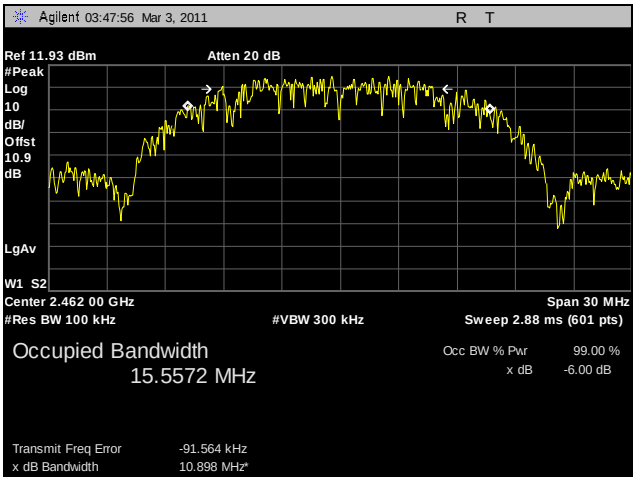
Plot 30. 6dB Occupied Bandwidth, Mid Channel, 802.11g 40 MHz, 2.4 GHz, C



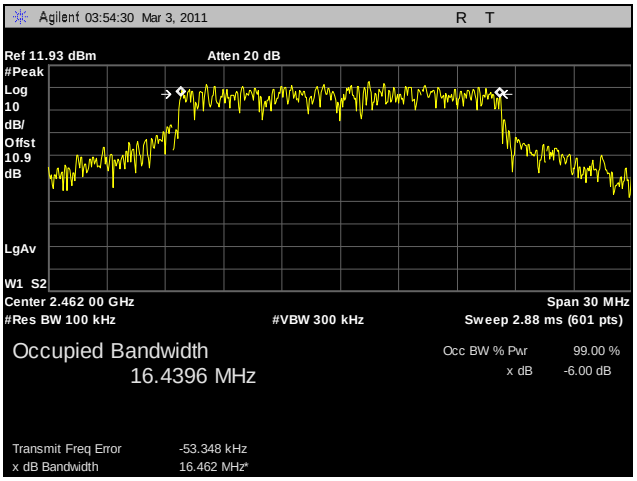
Plot 31. 6dB Occupied Bandwidth, High Channel, 802.11b, 2.4 GHz, A



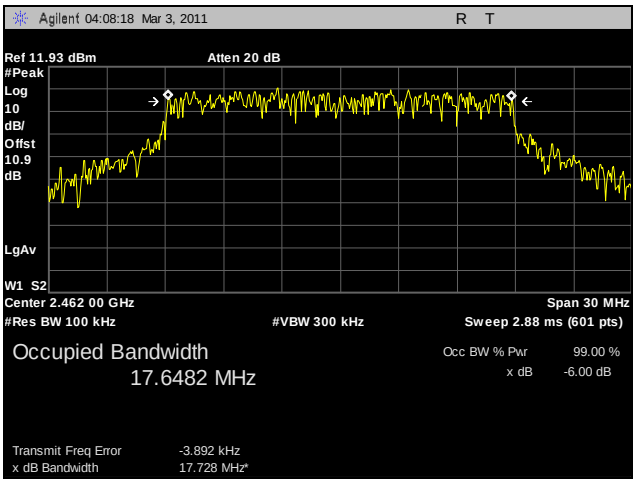
Plot 32. 6dB Occupied Bandwidth, High Channel, 802.11b, 2.4 GHz, B



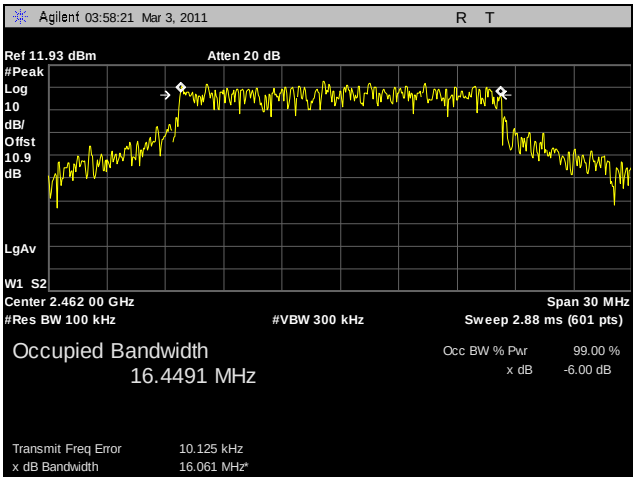
Plot 33. 6dB Occupied Bandwidth, High Channel, 802.11b, 2.4 GHz, C



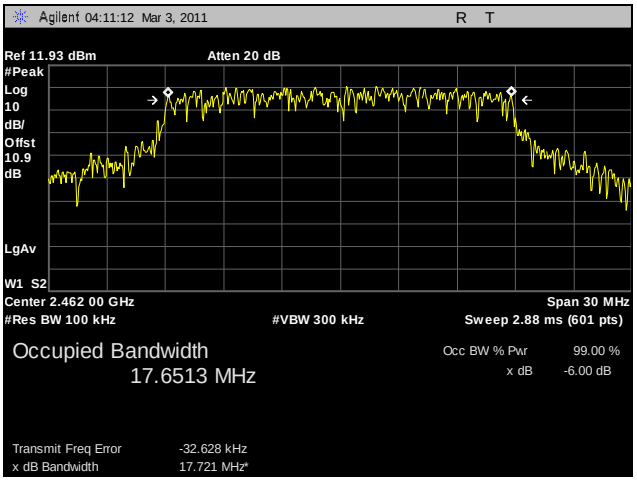
Plot 34. 6dB Occupied Bandwidth, High Channel, 802.11g, 2.4 GHz, A



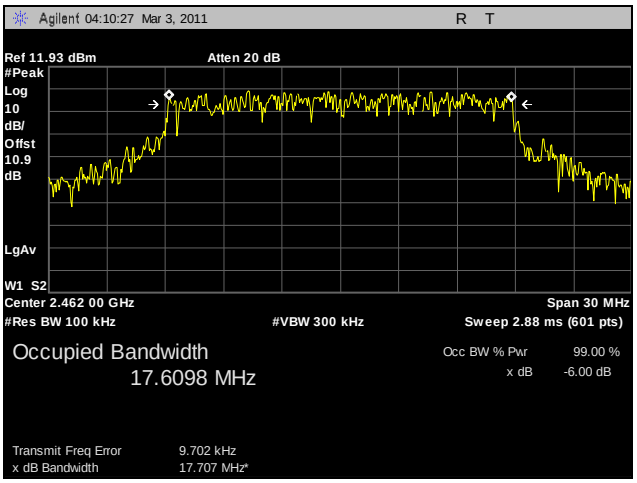
Plot 35. 6dB Occupied Bandwidth, High Channel, 802.11g, 2.4 GHz, B



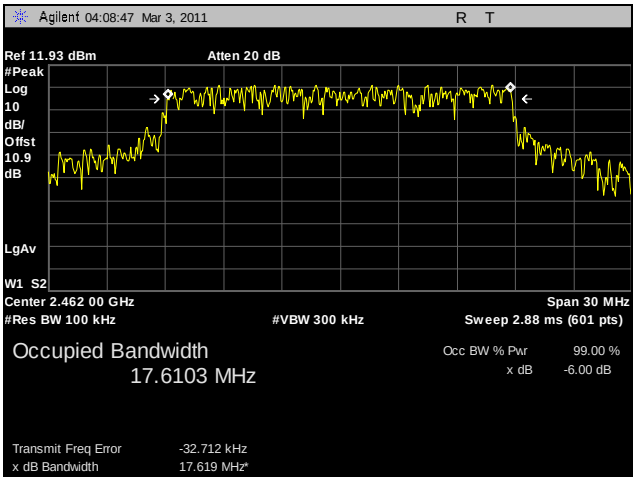
Plot 36. 6dB Occupied Bandwidth, High Channel, 802.11g, 2.4 GHz, C



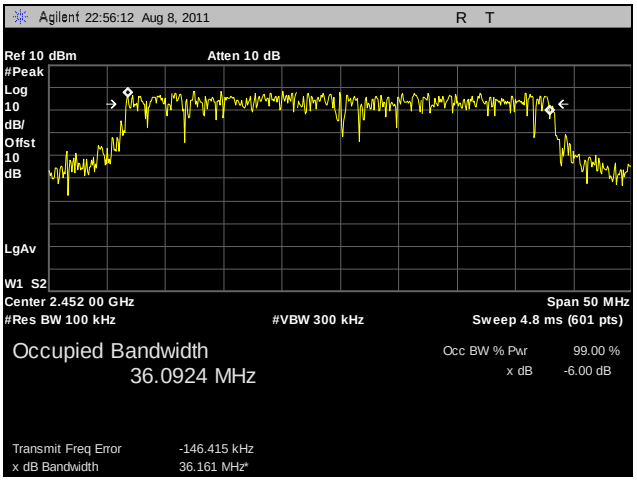
Plot 37. 6dB Occupied Bandwidth, High Channel, 802.11g 20 MHz, 2.4 GHz, A



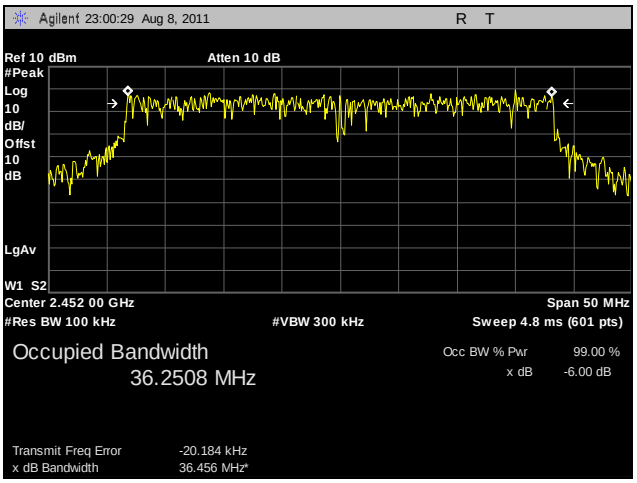
Plot 38. 6dB Occupied Bandwidth, High Channel, 802.11g 20 MHz, 2.4 GHz, B



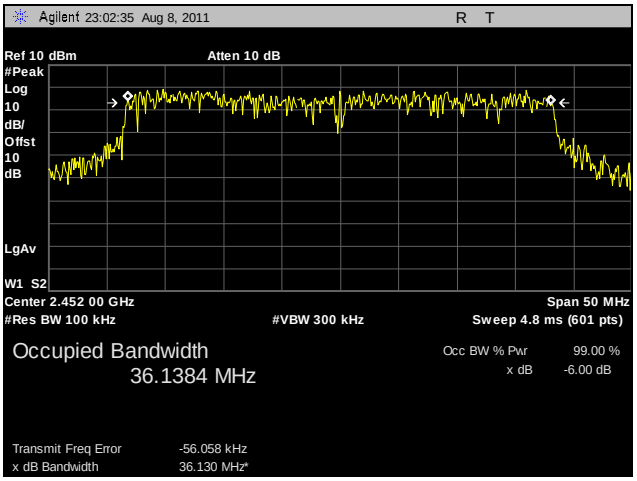
Plot 39. 6dB Occupied Bandwidth, High Channel, 802.11g 20 MHz, 2.4 GHz, C



Plot 40. 6dB Occupied Bandwidth, High Channel, 802.11g 40 MHz, 2.4 GHz, A

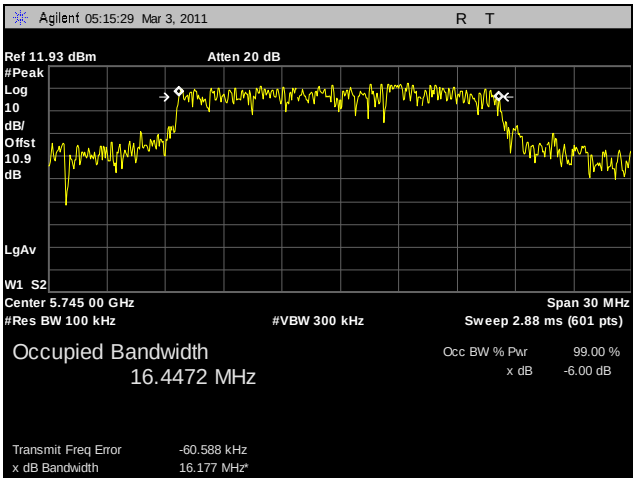


Plot 41. 6dB Occupied Bandwidth, High Channel, 802.11g 40 MHz, 2.4 GHz, B

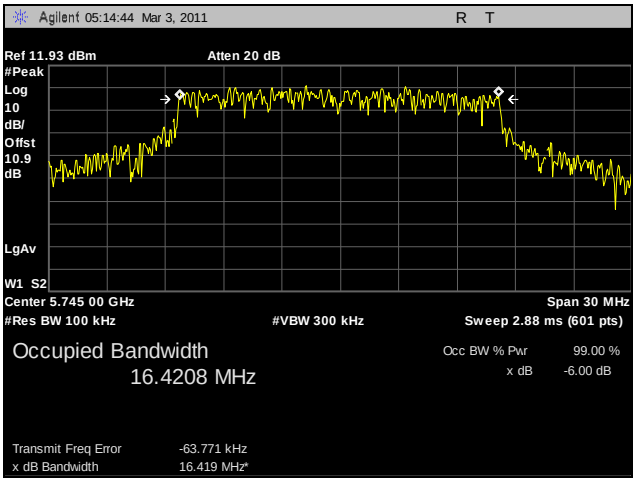


Plot 42. 6dB Occupied Bandwidth, High Channel, 802.11g 40 MHz, 2.4 GHz, C

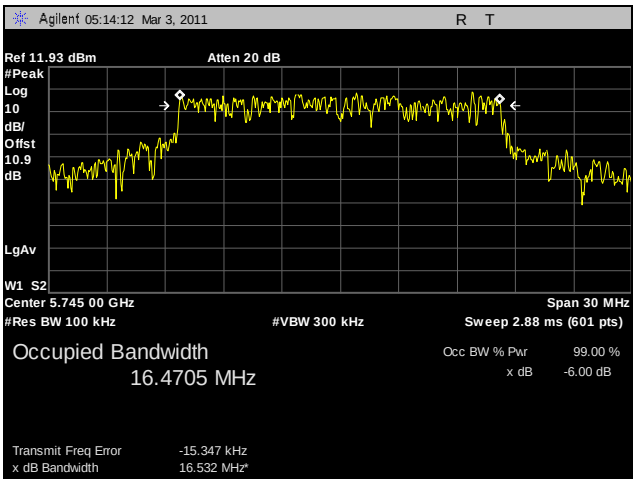
6 dB Occupied Bandwidth Test Results, 5.8 GHz



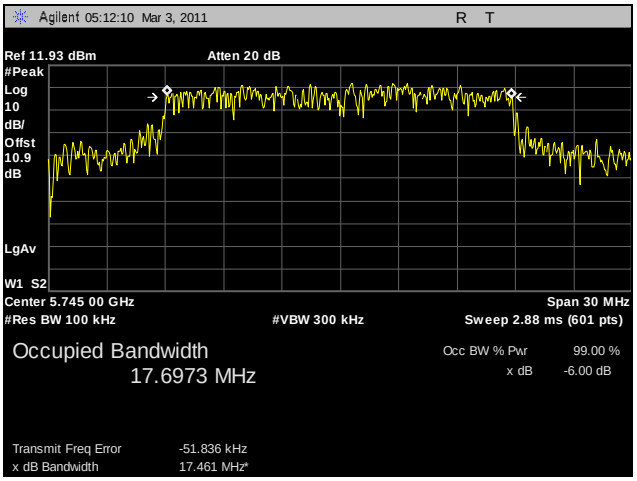
Plot 43. 6dB Occupied Bandwidth, Low Channel, 802.11a, 5.8 GHz, A



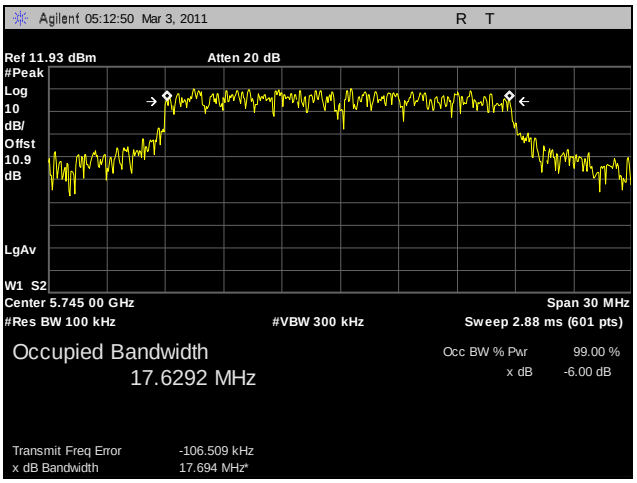
Plot 44. 6dB Occupied Bandwidth, Low Channel, 802.11a, 5.8 GHz, B



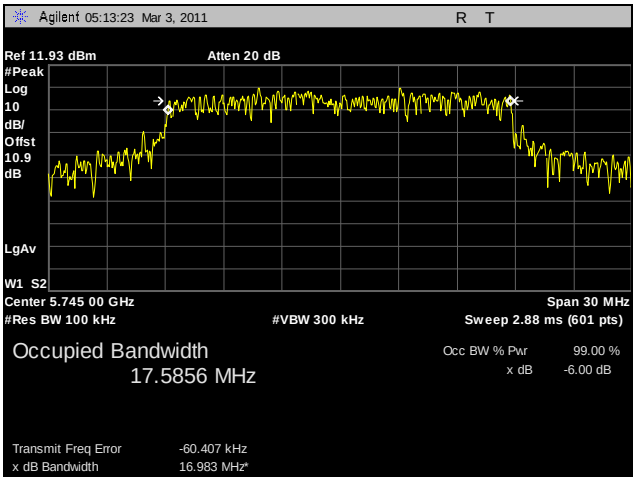
Plot 45. 6dB Occupied Bandwidth, Low Channel, 802.11a, 5.8 GHz, C



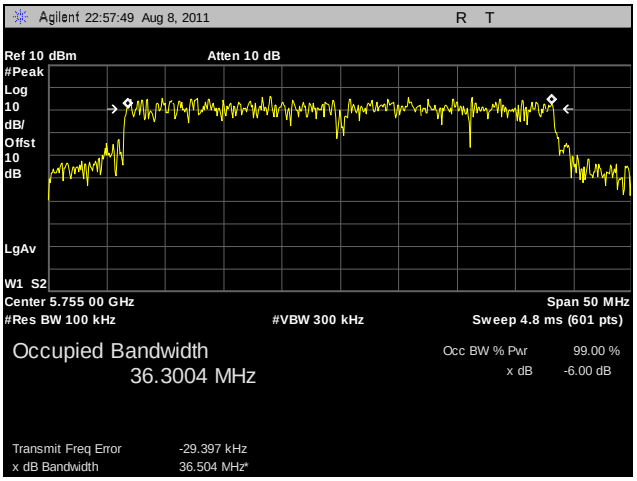
Plot 46. 6dB Occupied Bandwidth, Low Channel, 802.11n 20 MHz, 5.8 GHz, A



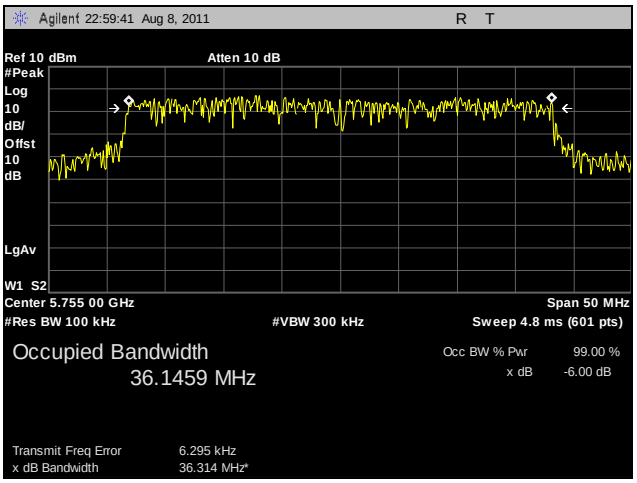
Plot 47. 6dB Occupied Bandwidth, Low Channel, 802.11n 20 MHz, 5.8 GHz, B



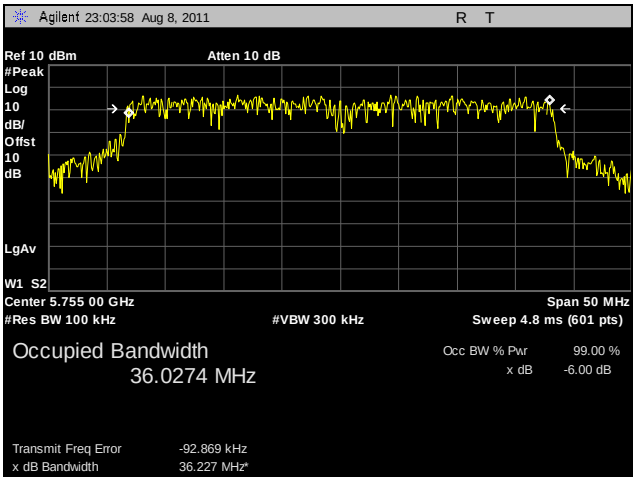
Plot 48. 6dB Occupied Bandwidth, Low Channel, 802.11n 20 MHz, 5.8 GHz, C



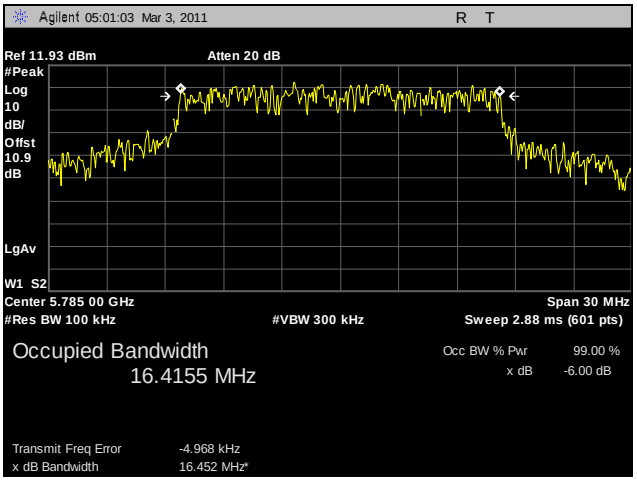
Plot 49. 6dB Occupied Bandwidth, Low Channel, 802.11n 40 MHz, 5.8 GHz, A



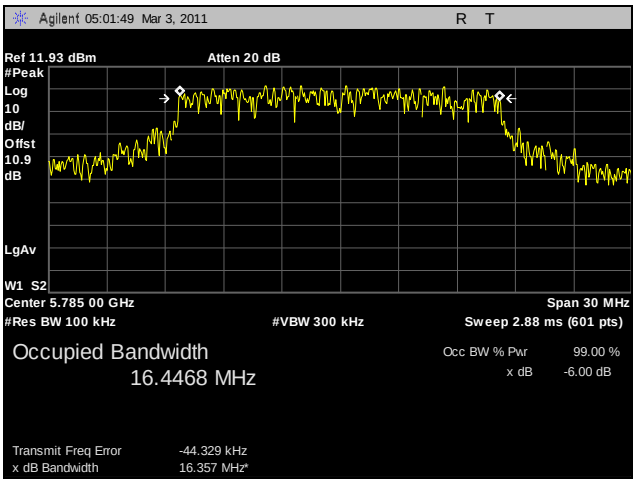
Plot 50. 6dB Occupied Bandwidth, Low Channel, 802.11n 40 MHz, 5.8 GHz, B



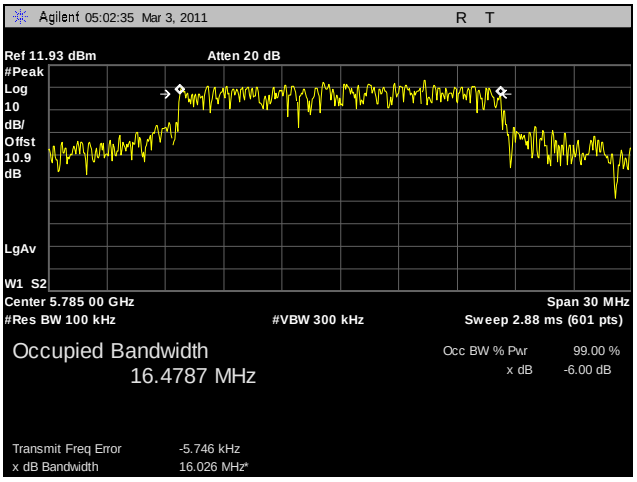
Plot 51. 6dB Occupied Bandwidth, Low Channel, 802.11n 40 MHz, 5.8 GHz, C



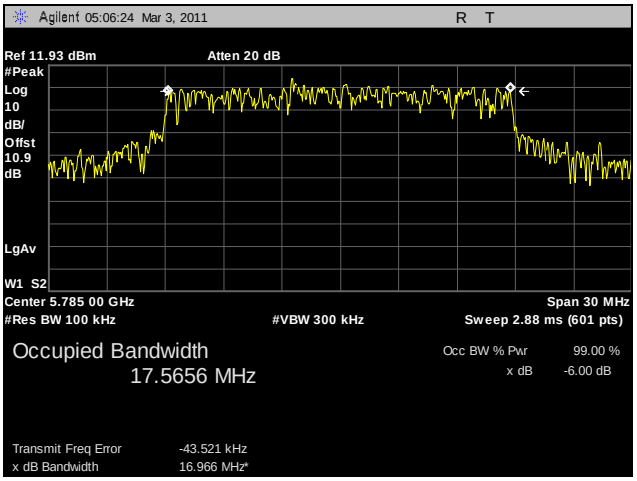
Plot 52. 6dB Occupied Bandwidth, Mid Channel, 802.11a, 5.8 GHz, A



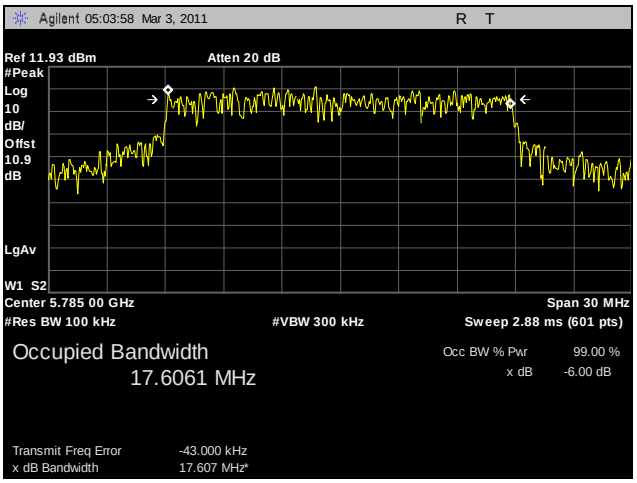
Plot 53. 6dB Occupied Bandwidth, Mid Channel, 802.11a, 5.8 GHz, B



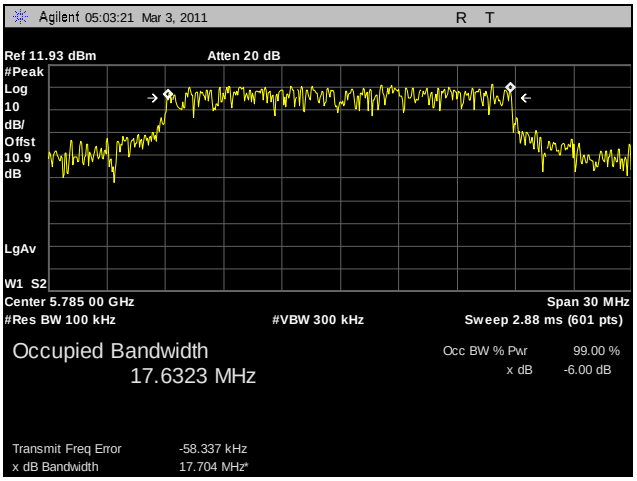
Plot 54. 6dB Occupied Bandwidth, Mid Channel, 802.11a, 5.8 GHz, C



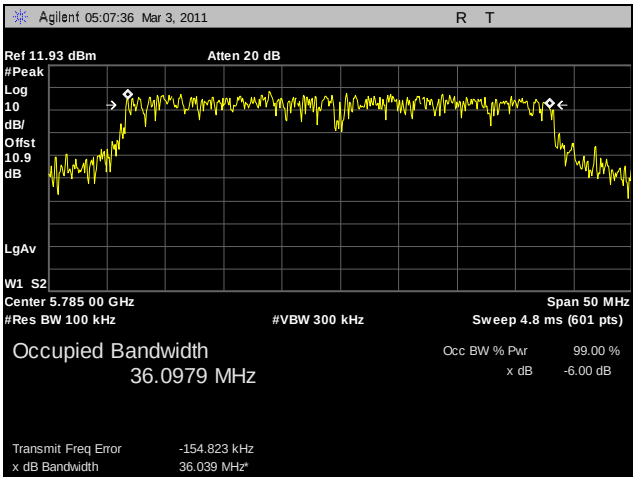
Plot 55. 6dB Occupied Bandwidth, Mid Channel, 802.11n 20 MHz, 5.8 GHz, A



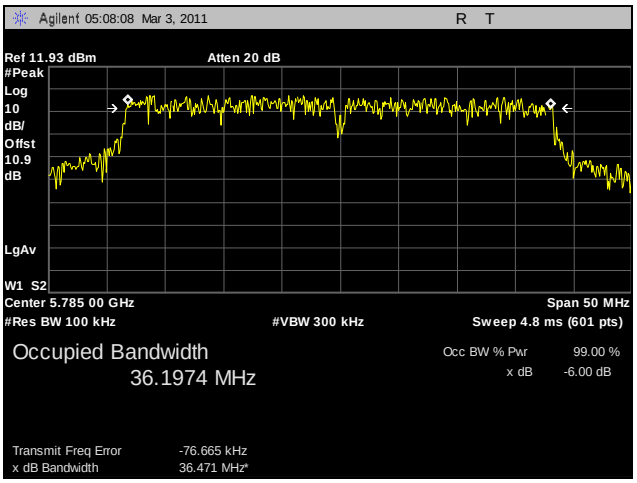
Plot 56. 6dB Occupied Bandwidth, Mid Channel, 802.11n 20 MHz, 5.8 GHz, B



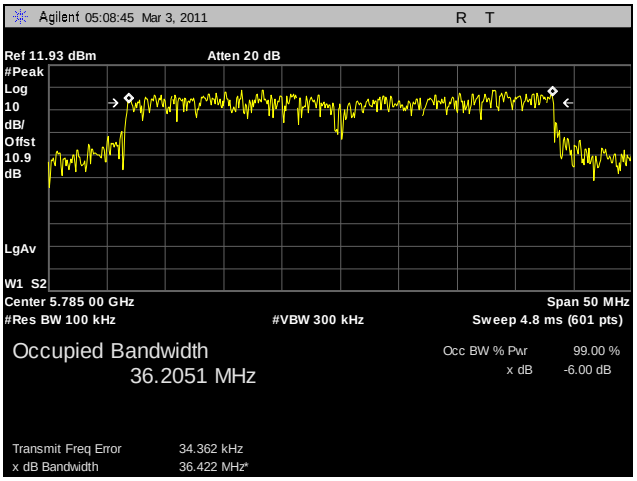
Plot 57. 6dB Occupied Bandwidth, Mid Channel, 802.11n 20 MHz, 5.8 GHz, C



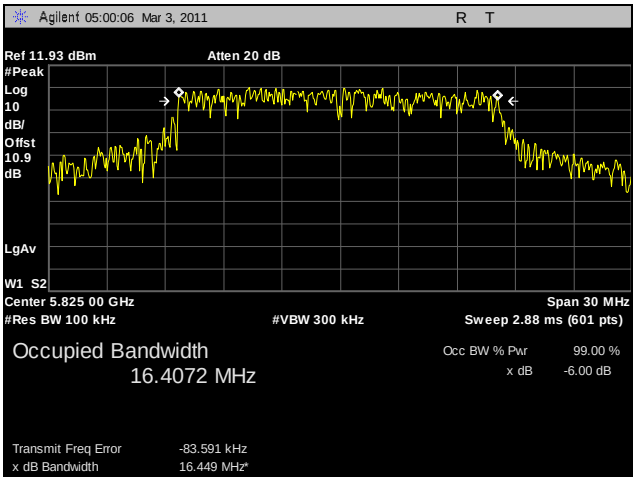
Plot 58. 6dB Occupied Bandwidth, Mid Channel, 802.11n 40 MHz, 5.8 GHz, A



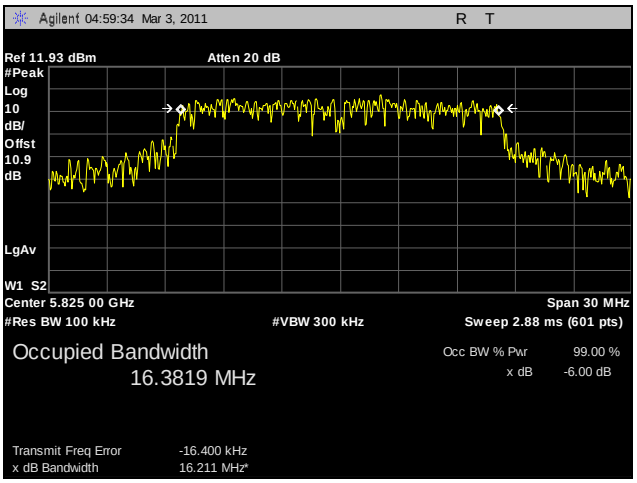
Plot 59. 6dB Occupied Bandwidth, Mid Channel, 802.11n 40 MHz, 5.8 GHz, B



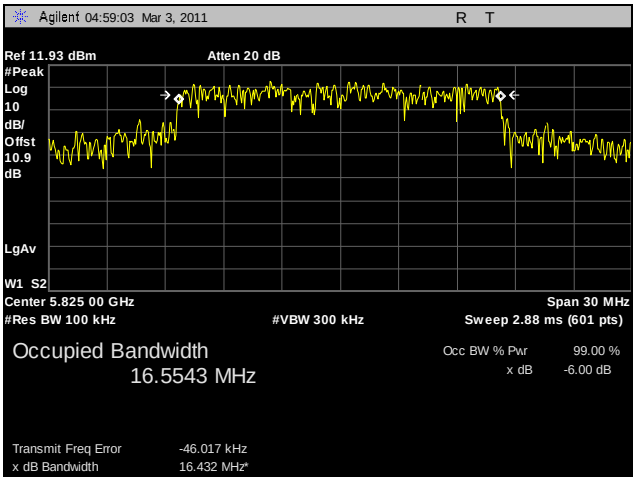
Plot 60. 6dB Occupied Bandwidth, Mid Channel, 802.11n 40 MHz, 5.8 GHz, C



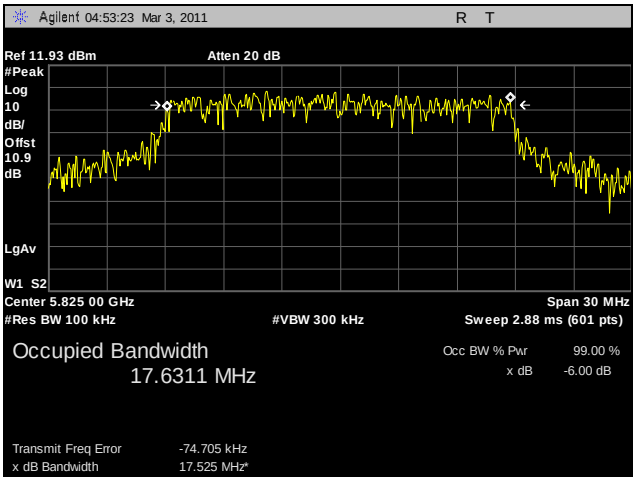
Plot 61. 6dB Occupied Bandwidth, High Channel, 802.11a, 5.8 GHz, A



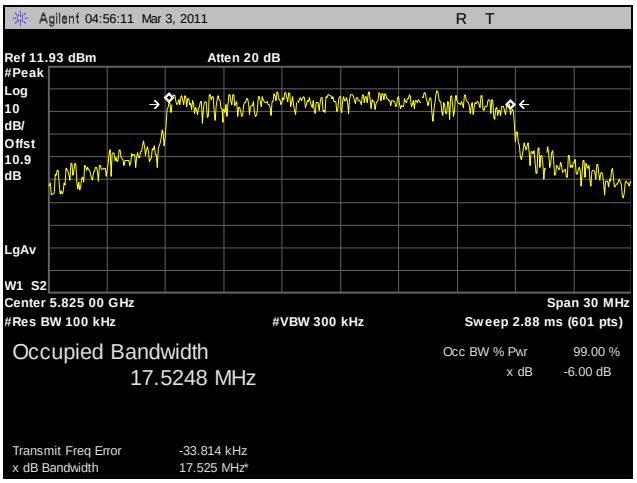
Plot 62. 6dB Occupied Bandwidth, High Channel, 802.11a, 5.8 GHz, B



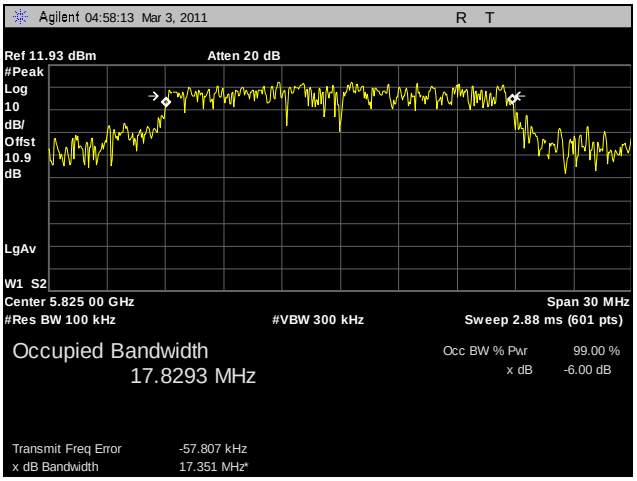
Plot 63. 6dB Occupied Bandwidth, High Channel, 802.11a, 5.8 GHz, C



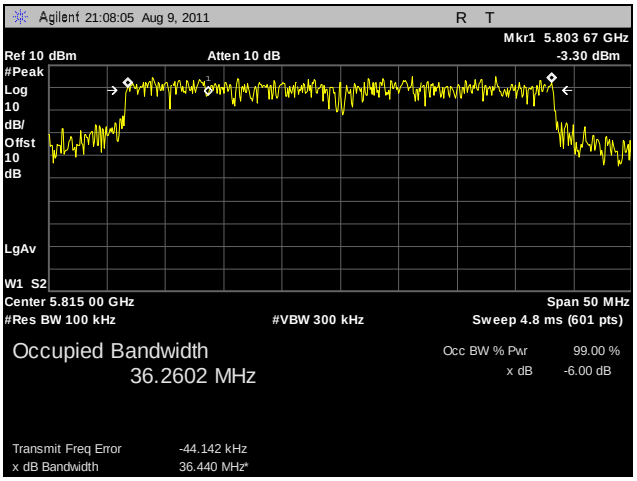
Plot 64. 6dB Occupied Bandwidth, High Channel, 802.11n 20 MHz, 5.8 GHz, A



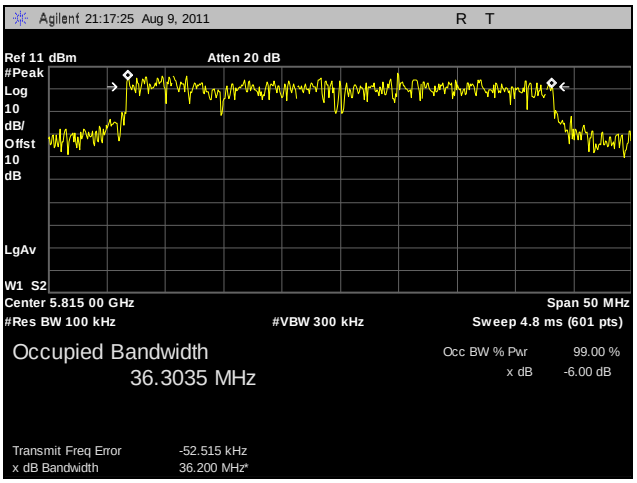
Plot 65. 6dB Occupied Bandwidth, High Channel, 802.11n 20 MHz, 5.8 GHz, B



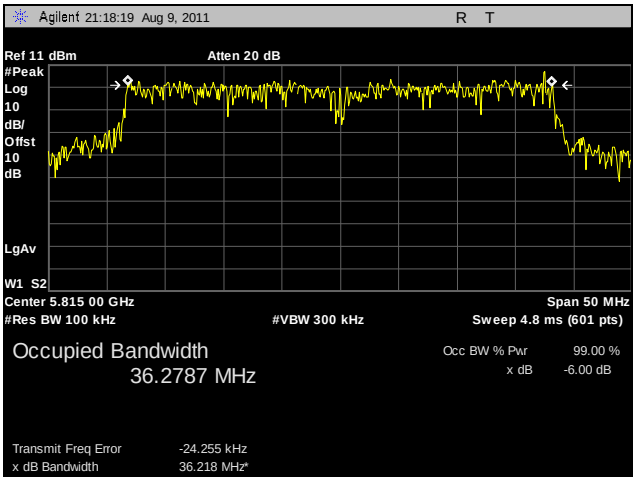
Plot 66. 6dB Occupied Bandwidth, High Channel, 802.11n 20 MHz, 5.8 GHz, C



Plot 67. 6dB Occupied Bandwidth, High Channel, 802.11n 40 MHz, 5.8 GHz, A

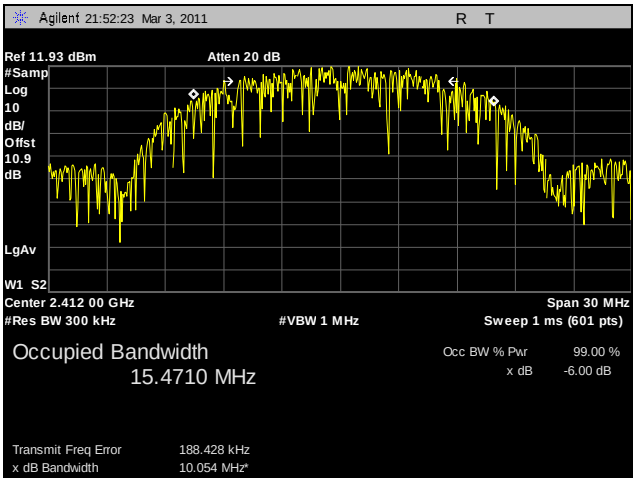


Plot 68. 6dB Occupied Bandwidth, High Channel, 802.11n 40 MHz, 5.8 GHz, B

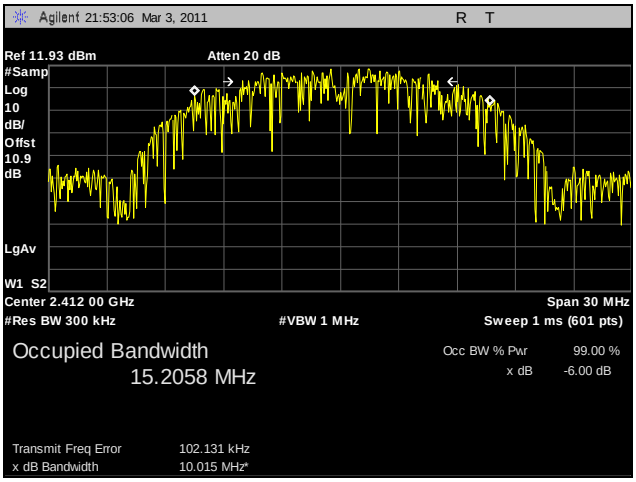


Plot 69. 6dB Occupied Bandwidth, High Channel, 802.11n 40 MHz, 5.8 GHz, C

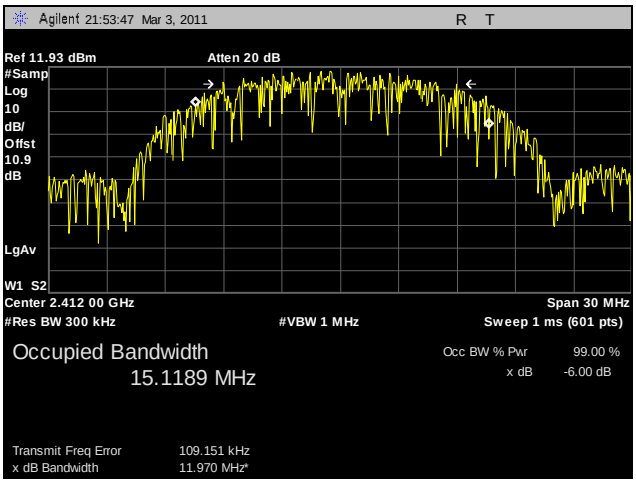
99% Occupied Bandwidth Test Results, 2.4 GHz



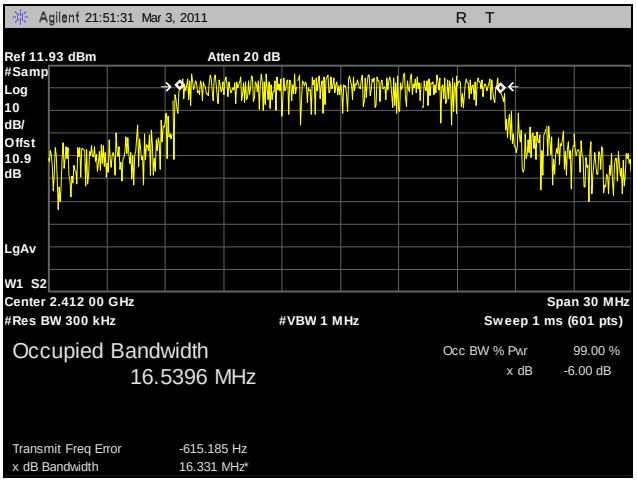
Plot 70. 99% Occupied Bandwidth, Low Channel, 802.11b, 2.4 GHz, A



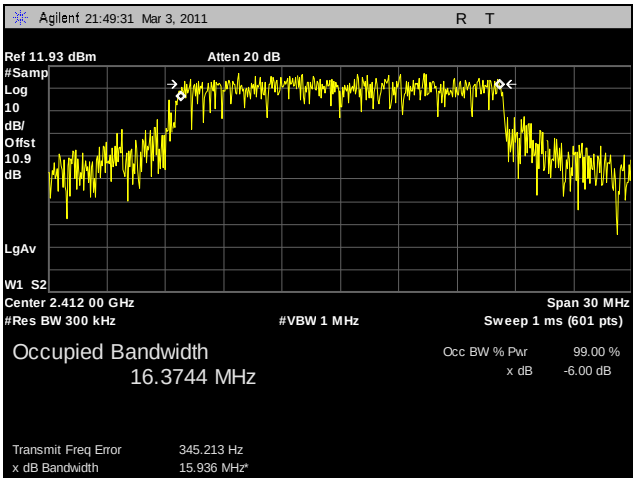
Plot 71. 99% Occupied Bandwidth, Low Channel, 802.11b, 2.4 GHz, B



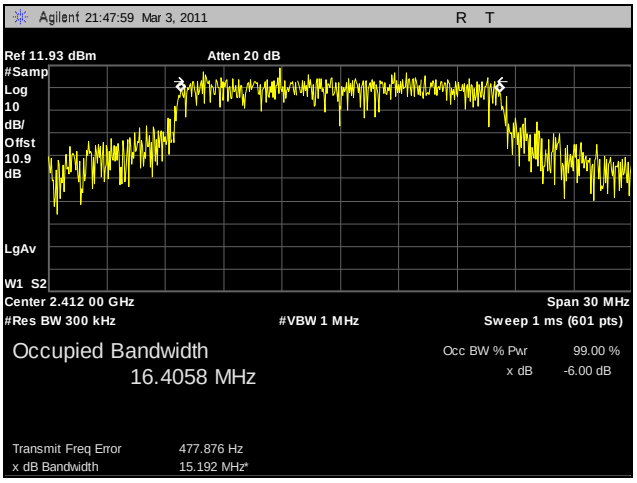
Plot 72. 99% Occupied Bandwidth, Low Channel, 802.11b, 2.4 GHz, C



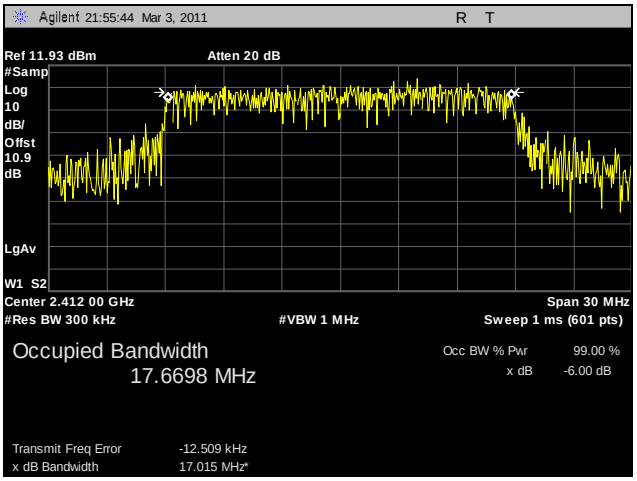
Plot 73. 99% Occupied Bandwidth, Low Channel, 802.11g, 2.4 GHz, A



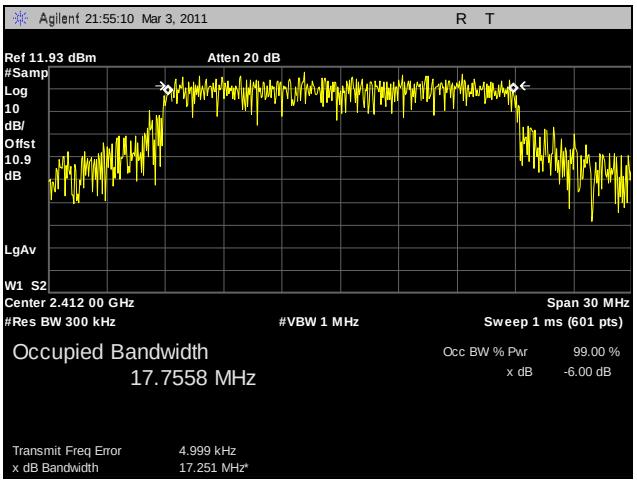
Plot 74. 99% Occupied Bandwidth, Low Channel, 802.11g, 2.4 GHz, B



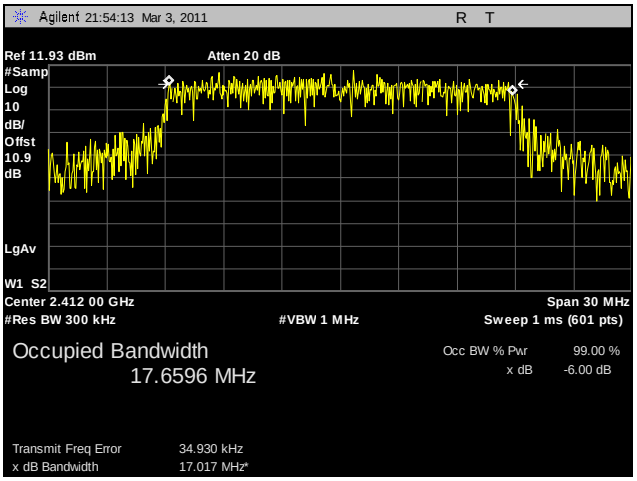
Plot 75. 99% Occupied Bandwidth, Low Channel, 802.11g, 2.4 GHz, C



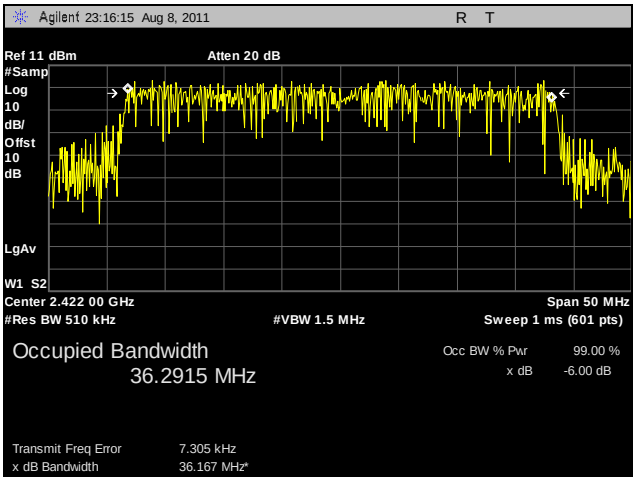
Plot 76. 99% Occupied Bandwidth, Low Channel, 802.11g 20 MHz, 2.4 GHz, A



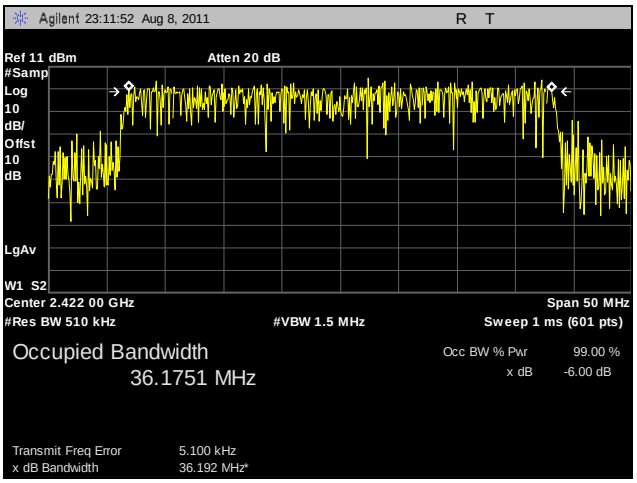
Plot 77. 99% Occupied Bandwidth, Low Channel, 802.11g 20 MHz, 2.4 GHz, B



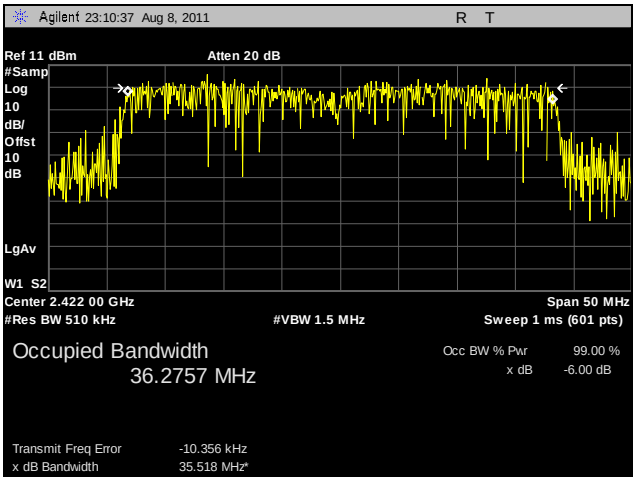
Plot 78. 99% Occupied Bandwidth, Low Channel, 802.11g 20 MHz, 2.4 GHz, C



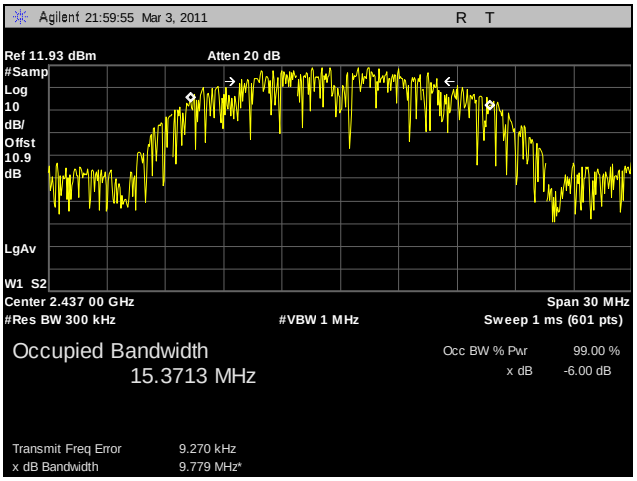
Plot 79. 99% Occupied Bandwidth, Low Channel, 802.11g 40 MHz, 2.4 GHz, A



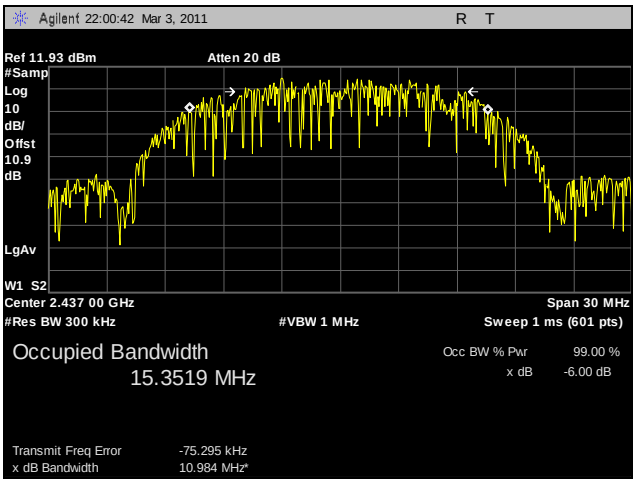
Plot 80. 99% Occupied Bandwidth, Low Channel, 802.11g 40 MHz, 2.4 GHz, B



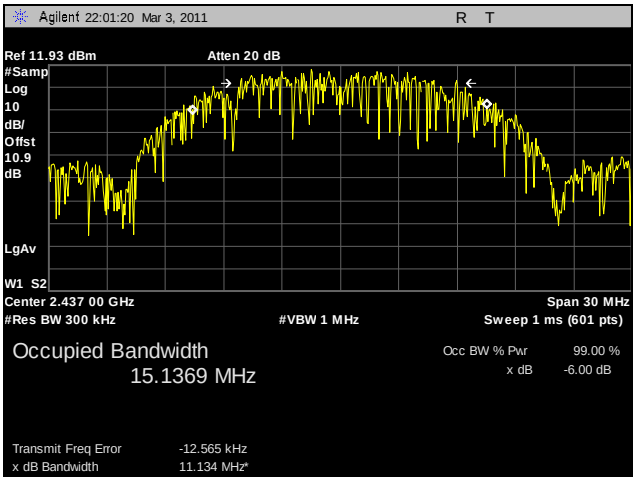
Plot 81. 99% Occupied Bandwidth, Low Channel, 802.11g 40 MHz, 2.4 GHz, C



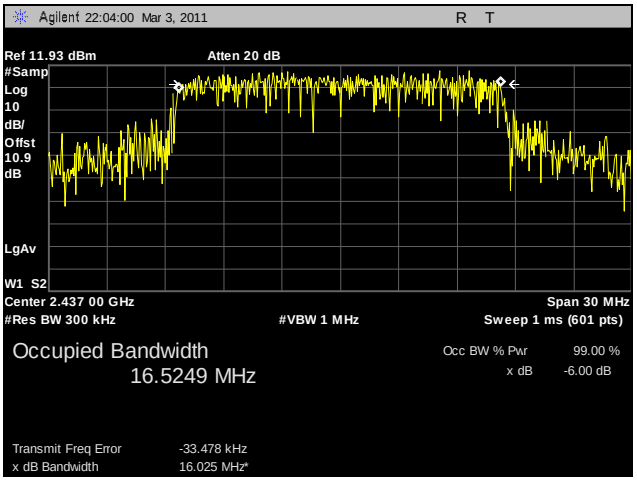
Plot 82. 99% Occupied Bandwidth, Mid Channel, 802.11b, 2.4 GHz, A



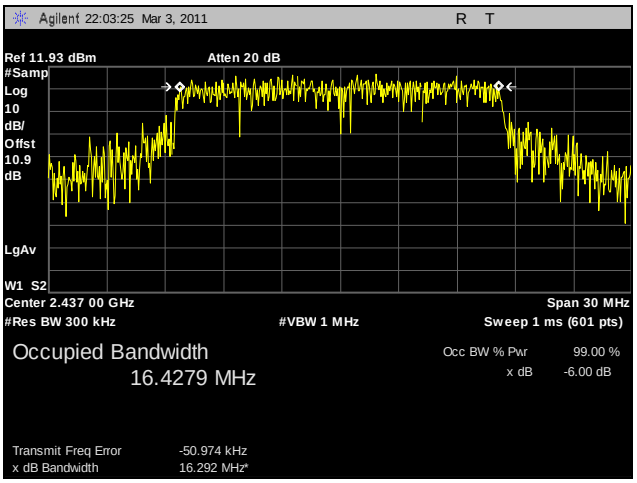
Plot 83. 99% Occupied Bandwidth, Mid Channel, 802.11b, 2.4 GHz, B



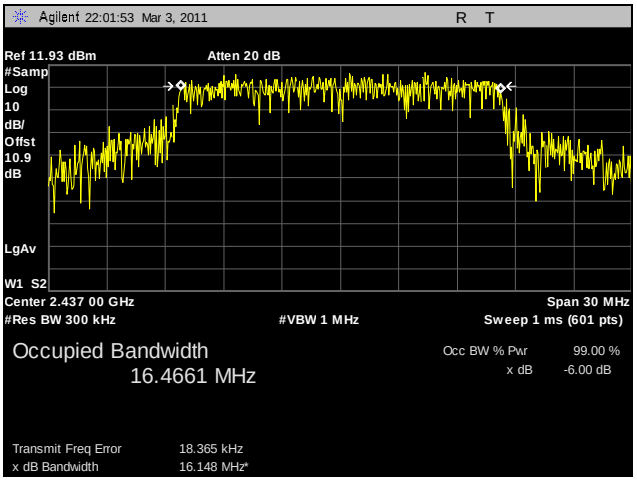
Plot 84. 99% Occupied Bandwidth, Mid Channel, 802.11b, 2.4 GHz, C



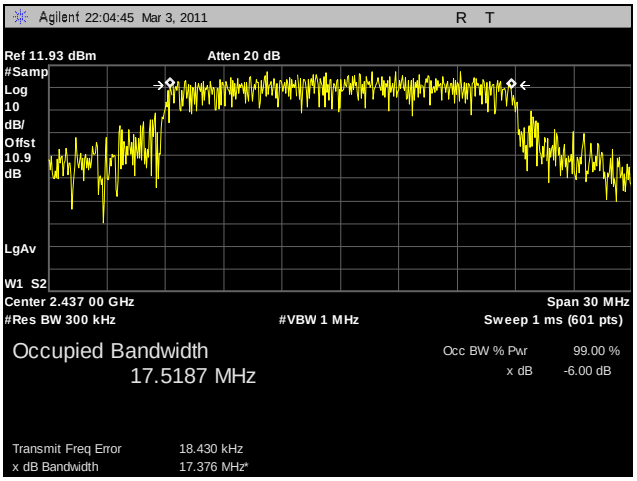
Plot 85. 99% Occupied Bandwidth, Mid Channel, 802.11g, 2.4 GHz, A



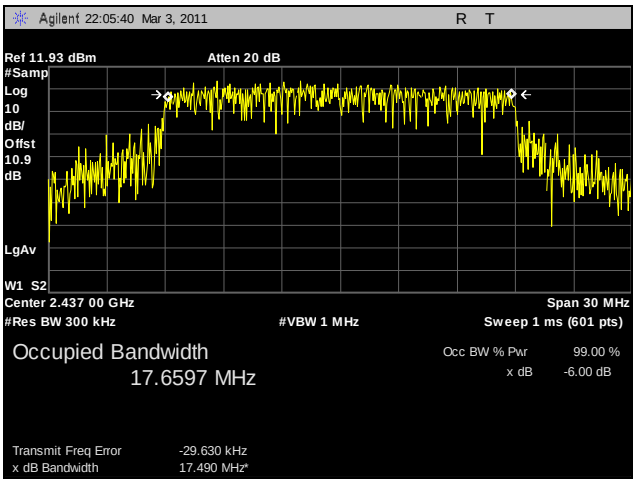
Plot 86. 99% Occupied Bandwidth, Mid Channel, 802.11g, 2.4 GHz, B



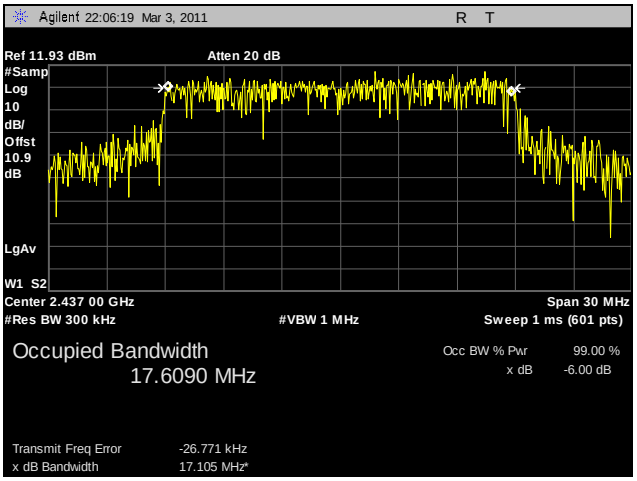
Plot 87. 99% Occupied Bandwidth, Mid Channel, 802.11g, 2.4 GHz, C



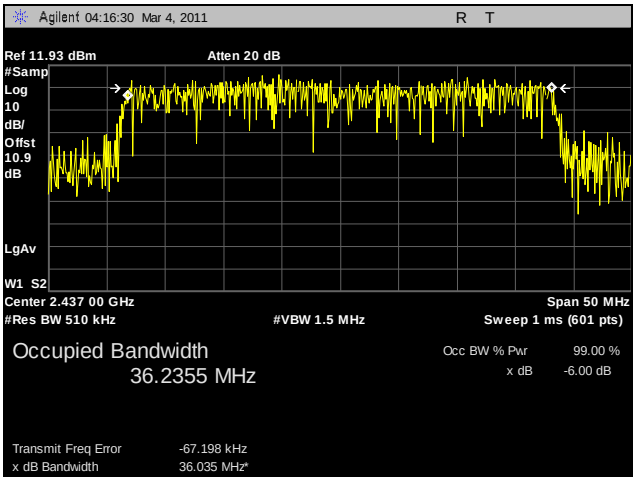
Plot 88. 99% Occupied Bandwidth, Mid Channel, 802.11g 20 MHz, 2.4 GHz, A



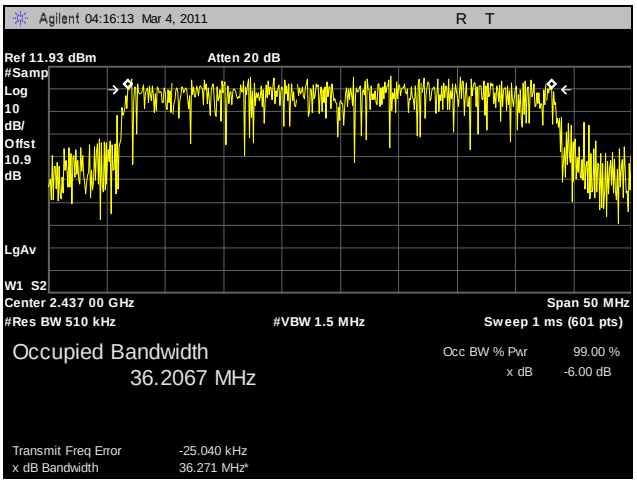
Plot 89. 99% Occupied Bandwidth, Mid Channel, 802.11g 20 MHz, 2.4 GHz, B



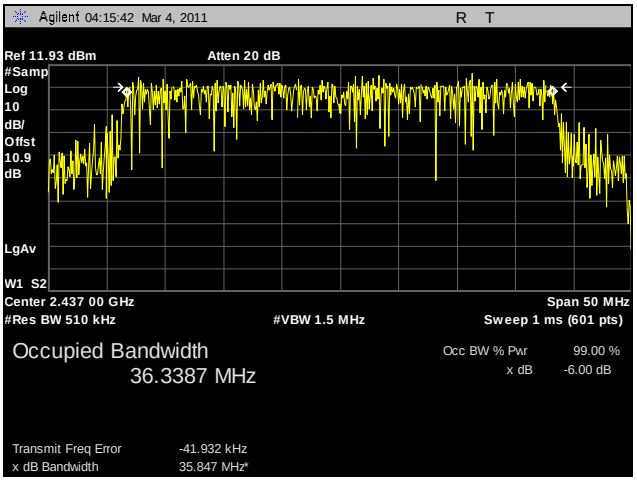
Plot 90. 99% Occupied Bandwidth, Mid Channel, 802.11g 20 MHz, 2.4 GHz, C



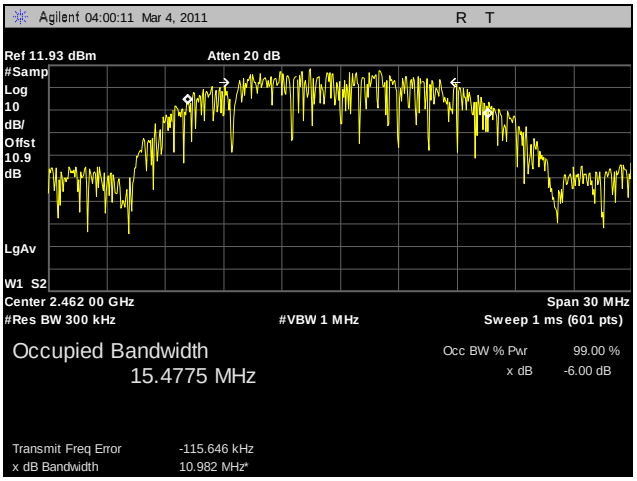
Plot 91. 99% Occupied Bandwidth, Mid Channel, 802.11g 40 MHz, 2.4 GHz, A



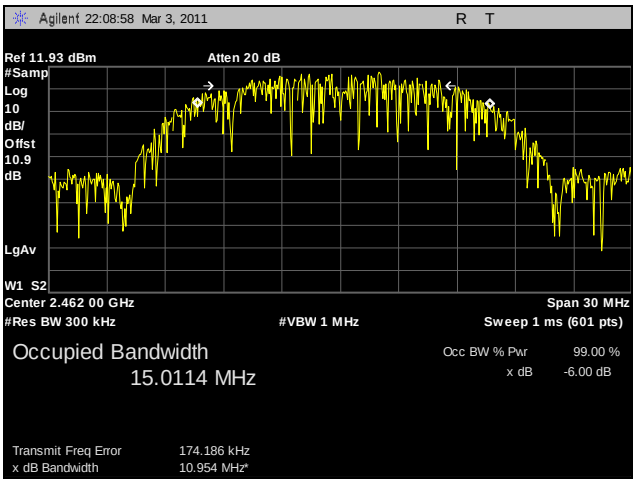
Plot 92. 99% Occupied Bandwidth, Mid Channel, 802.11g 40 MHz, 2.4 GHz, B



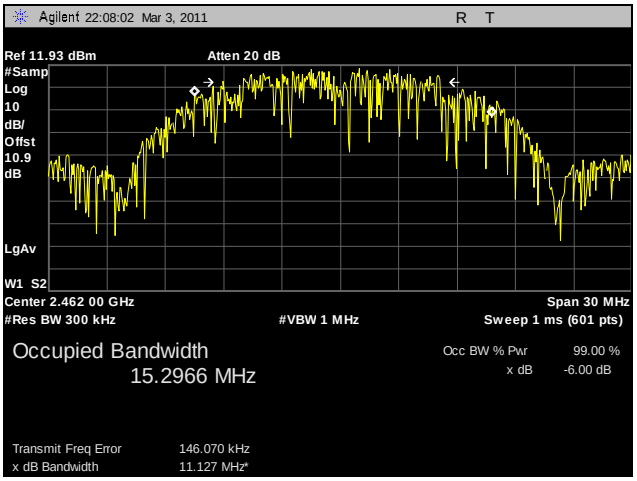
Plot 93. 99% Occupied Bandwidth, Mid Channel, 802.11g 40 MHz, 2.4 GHz, C



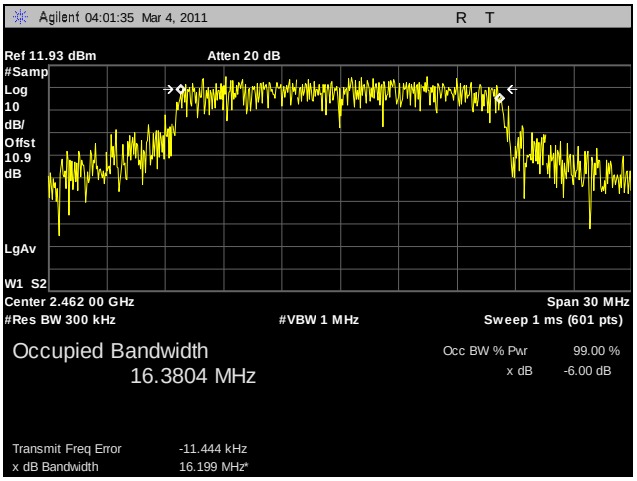
Plot 94. 99% Occupied Bandwidth, High Channel, 802.11b, 2.4 GHz, A



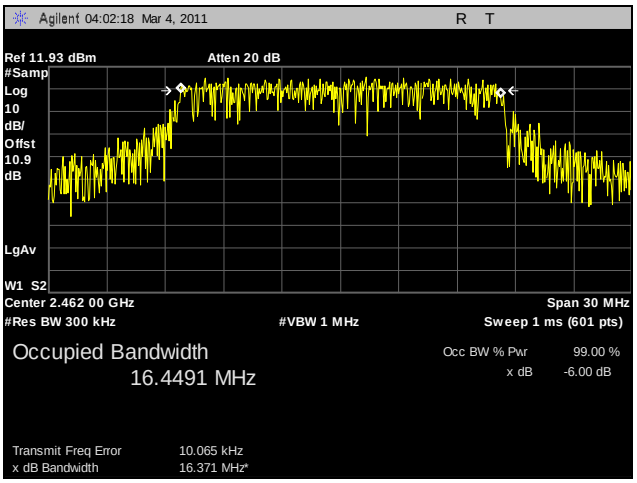
Plot 95. 99% Occupied Bandwidth, High Channel, 802.11b, 2.4 GHz, B



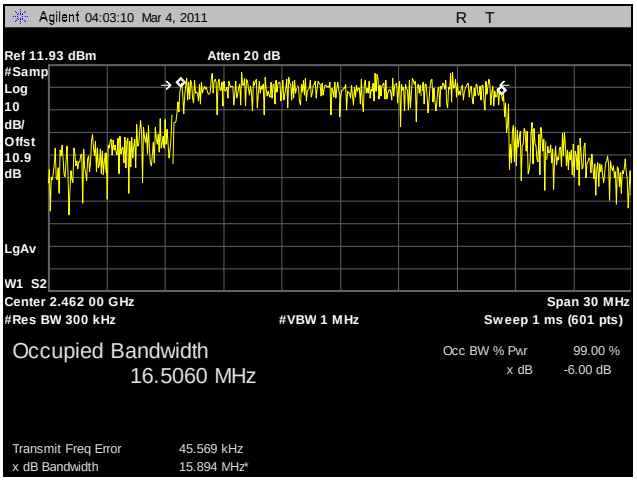
Plot 96. 99% Occupied Bandwidth, High Channel, 802.11b, 2.4 GHz, C



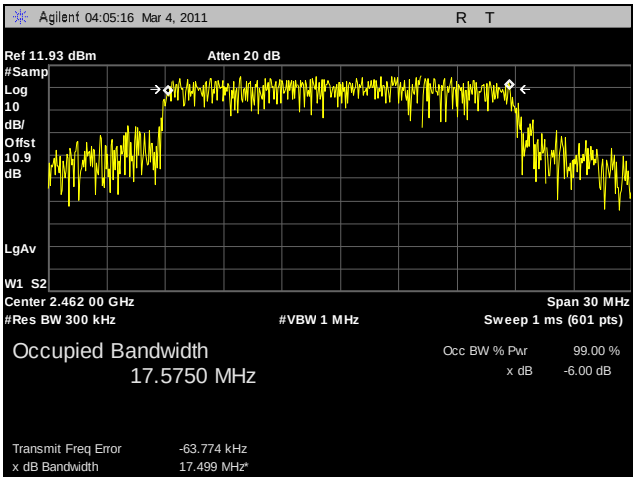
Plot 97. 99% Occupied Bandwidth, High Channel, 802.11g, 2.4 GHz, A



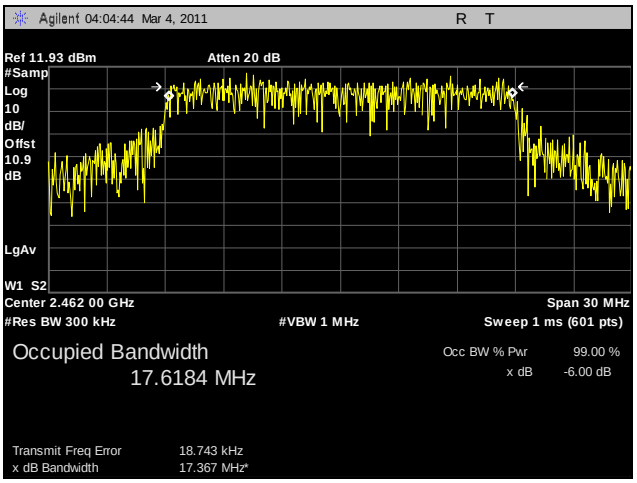
Plot 98. 99% Occupied Bandwidth, High Channel, 802.11g, 2.4 GHz, B



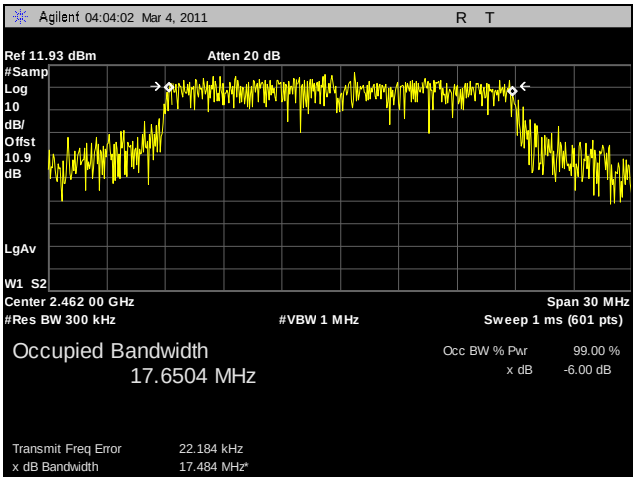
Plot 99. 99% Occupied Bandwidth, High Channel, 802.11g, 2.4 GHz, C



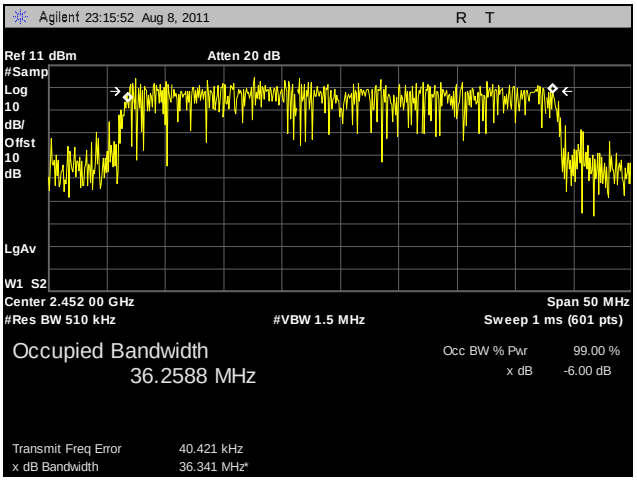
Plot 100. 99% Occupied Bandwidth, High Channel, 802.11g 20 MHz, 2.4 GHz, A



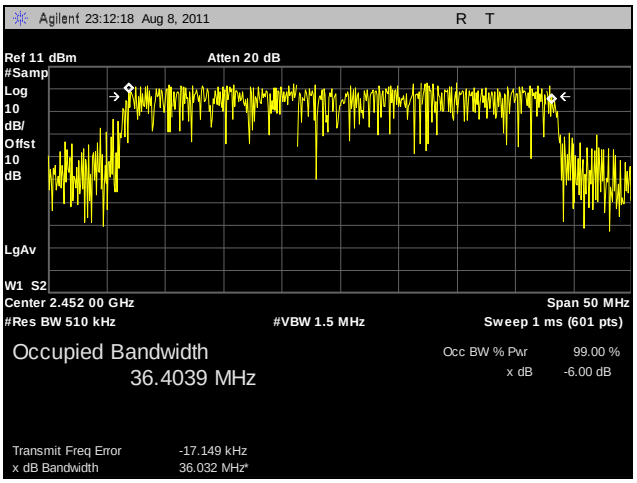
Plot 101. 99% Occupied Bandwidth, High Channel, 802.11g 20 MHz, 2.4 GHz, B



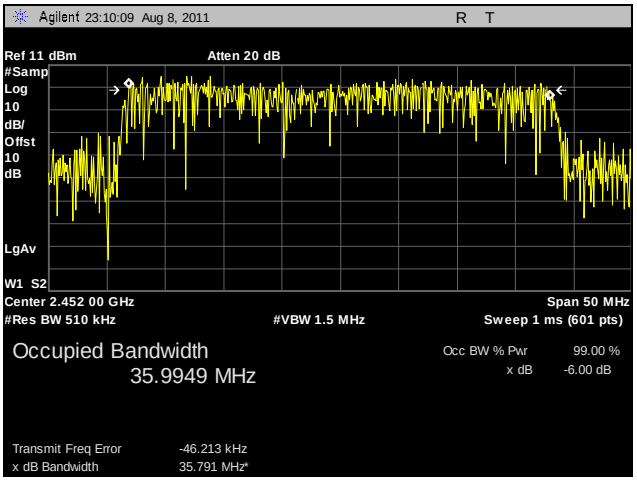
Plot 102. 99% Occupied Bandwidth, High Channel, 802.11g 20 MHz, 2.4 GHz, C



Plot 103. 99% Occupied Bandwidth, High Channel, 802.11g 40 MHz, 2.4 GHz, A

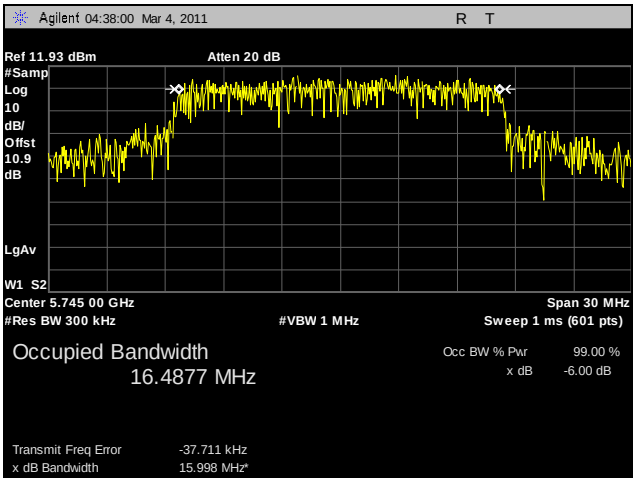


Plot 104. 99% Occupied Bandwidth, High Channel, 802.11g 40 MHz, 2.4 GHz, B

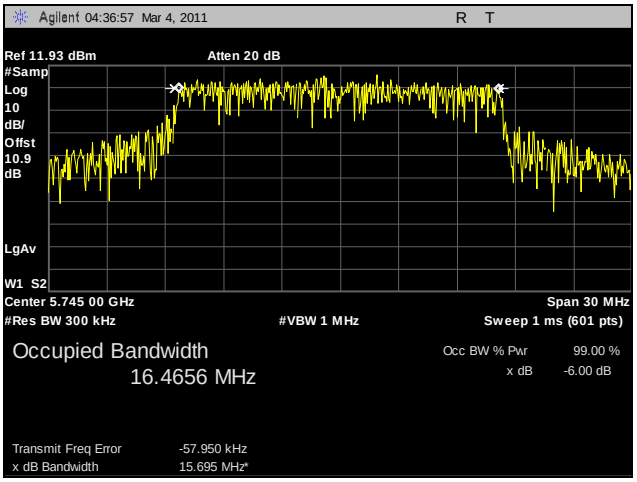


Plot 105. 99% Occupied Bandwidth, High Channel, 802.11g 40 MHz, 2.4 GHz, C

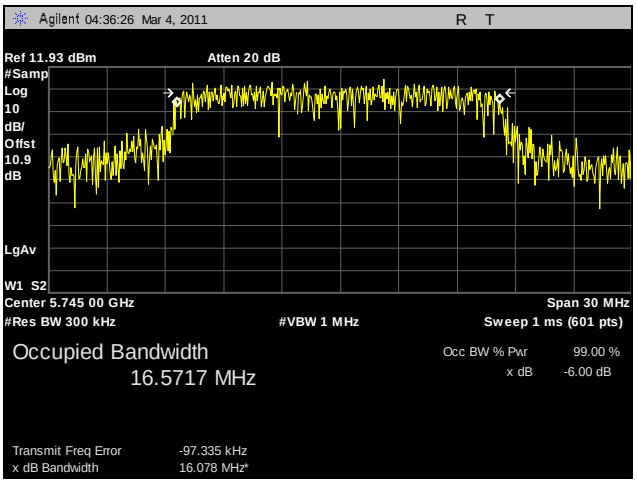
99% Occupied Bandwidth Test Results, 5.8 GHz



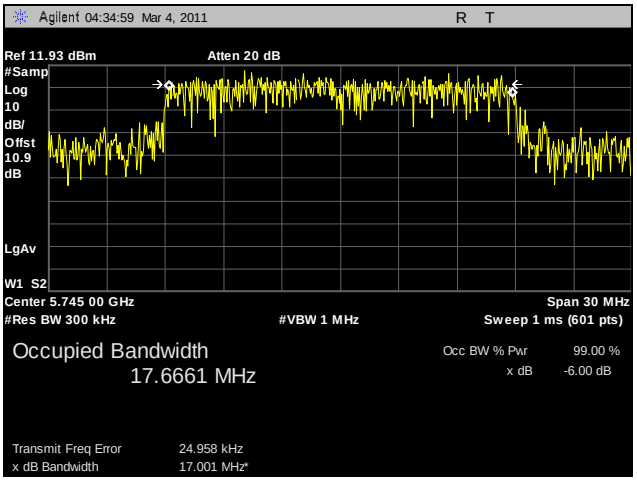
Plot 106. 99% Occupied Bandwidth, Low Channel, 802.11a, 5.8 GHz, A



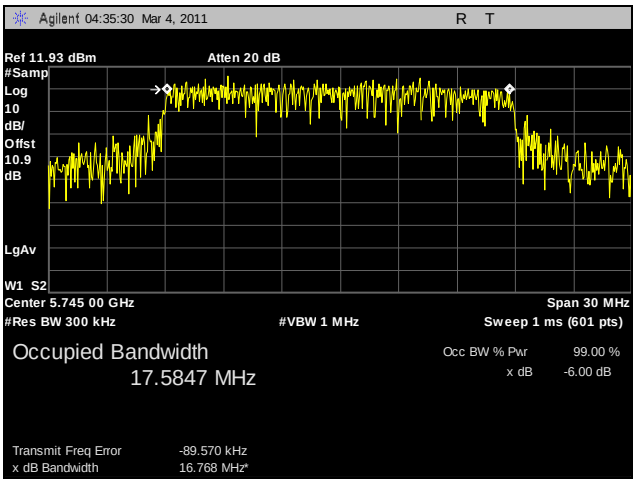
Plot 107. 99% Occupied Bandwidth, Low Channel, 802.11a, 5.8 GHz, B



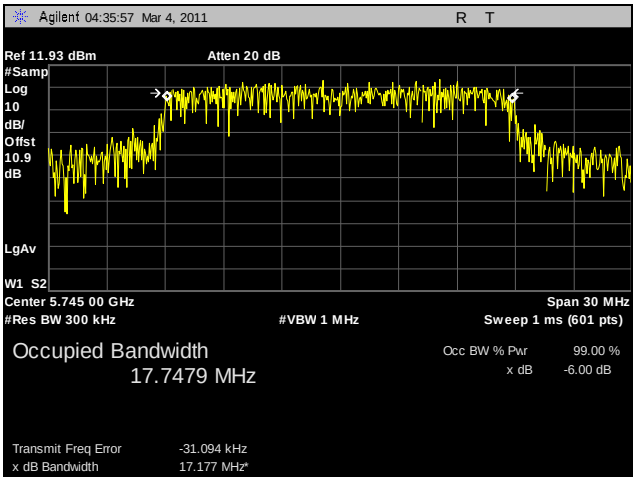
Plot 108. 99% Occupied Bandwidth, Low Channel, 802.11a, 5.8 GHz, C



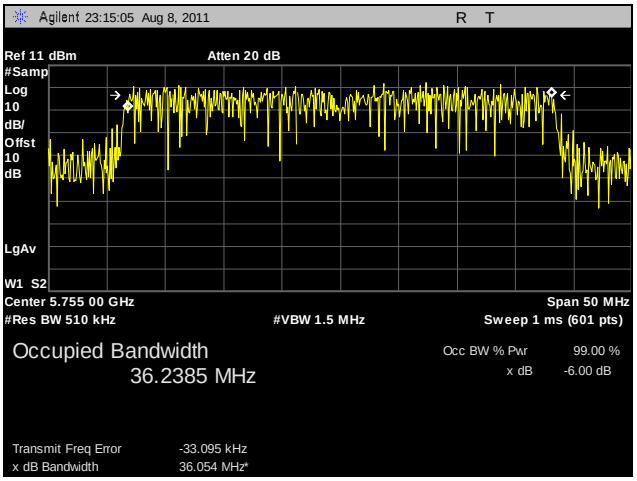
Plot 109. 99% Occupied Bandwidth, Low Channel, 802.11n 20 MHz, 5.8 GHz, A



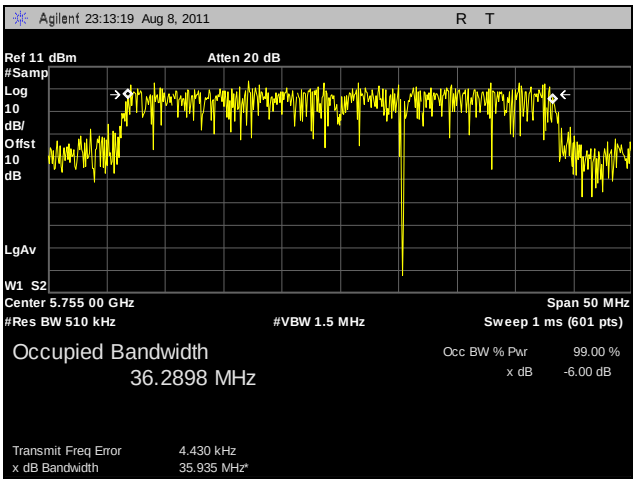
Plot 110. 99% Occupied Bandwidth, Low Channel, 802.11n 20 MHz, 5.8 GHz, B



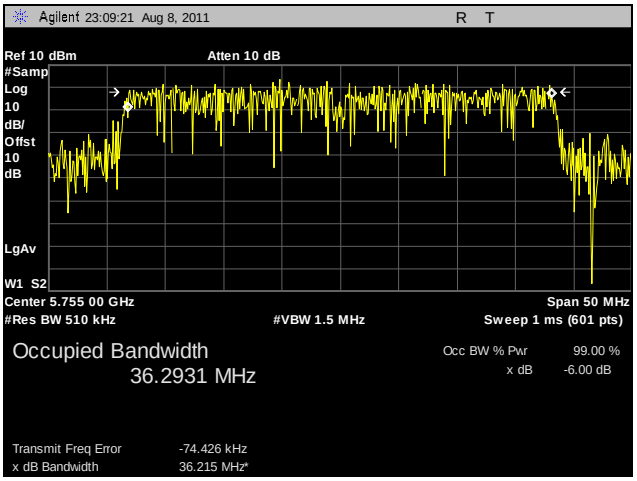
Plot 111. 99% Occupied Bandwidth, Low Channel, 802.11n 20 MHz, 5.8 GHz, C



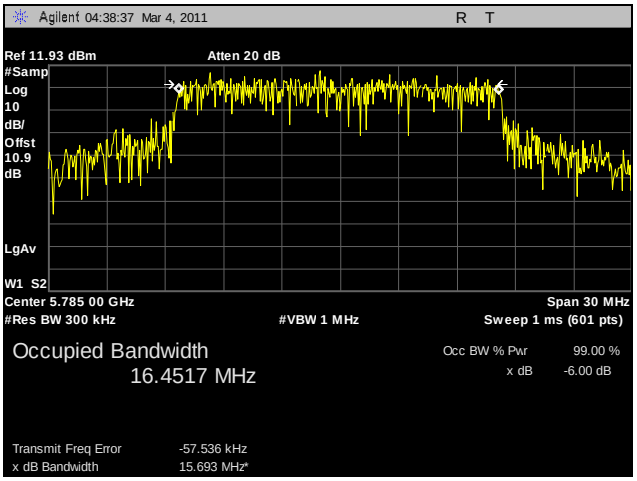
Plot 112. 99% Occupied Bandwidth, Low Channel, 802.11n 40 MHz, 5.8 GHz, A



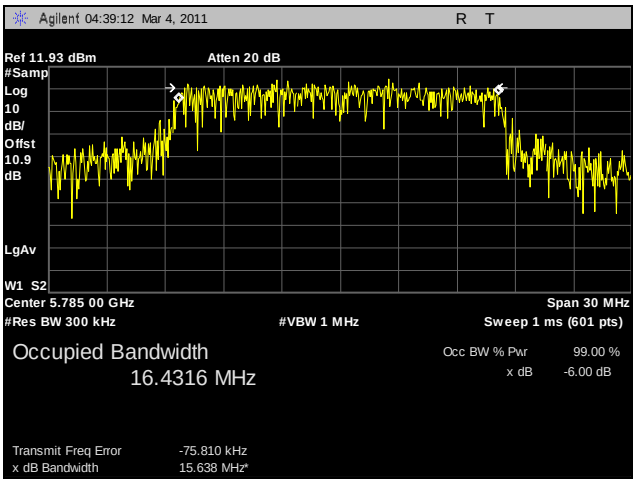
Plot 113. 99% Occupied Bandwidth, Low Channel, 802.11n 40 MHz, 5.8 GHz, B



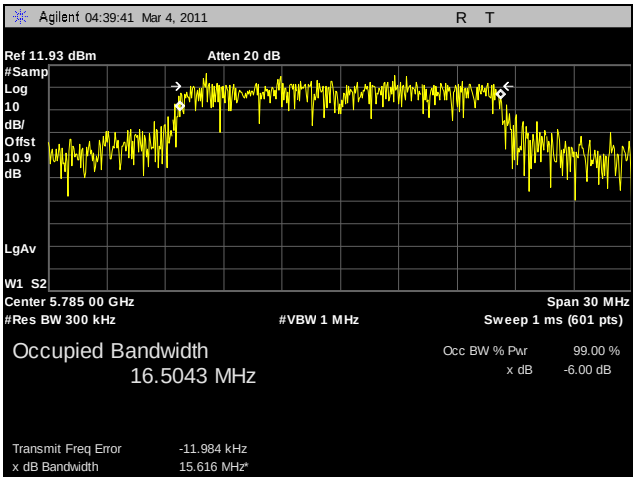
Plot 114. 99% Occupied Bandwidth, Low Channel, 802.11n 40 MHz, 5.8 GHz, C



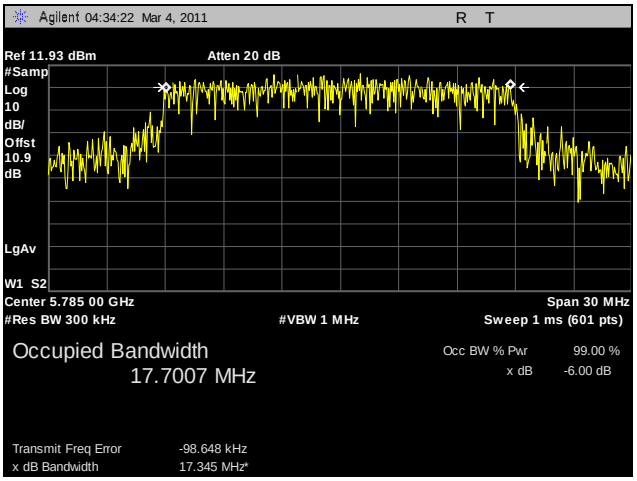
Plot 115. 99% Occupied Bandwidth, Mid Channel, 802.11a, 5.8 GHz, A



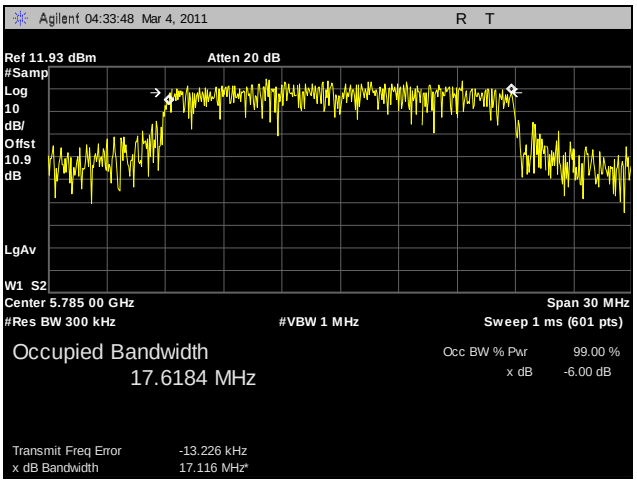
Plot 116. 99% Occupied Bandwidth, Mid Channel, 802.11a, 5.8 GHz, B



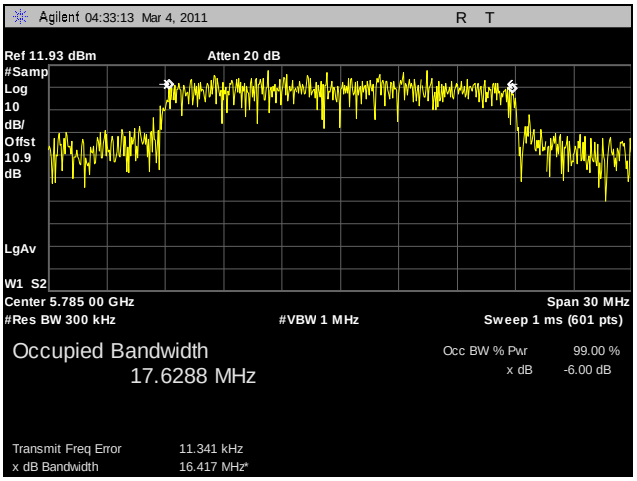
Plot 117. 99% Occupied Bandwidth, Mid Channel, 802.11a, 5.8 GHz, C



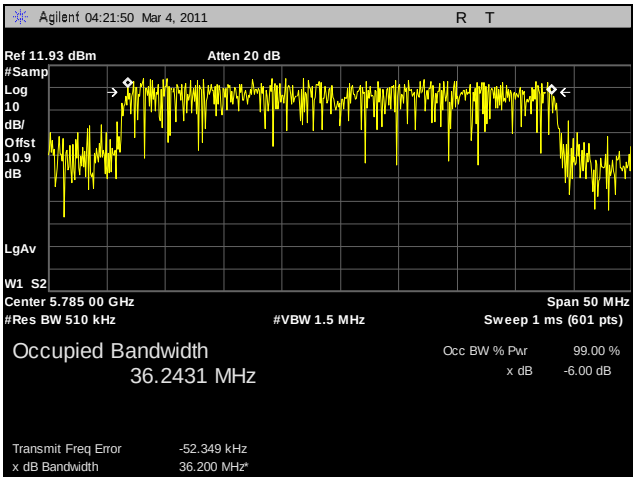
Plot 118. 99% Occupied Bandwidth, Mid Channel, 802.11n 20 MHz, 5.8 GHz, A



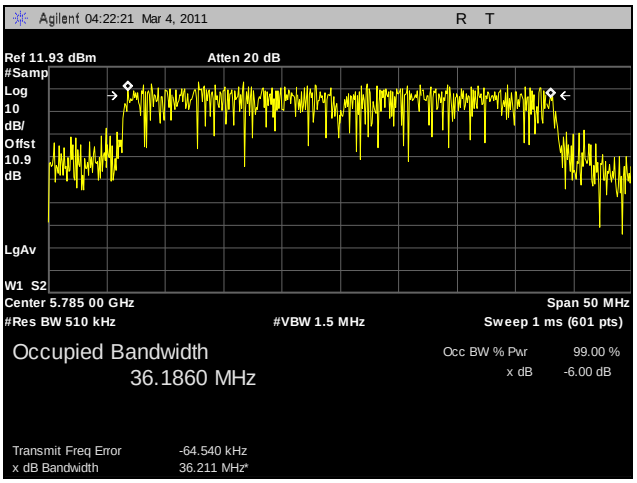
Plot 119. 99% Occupied Bandwidth, Mid Channel, 802.11n 20 MHz, 5.8 GHz, B



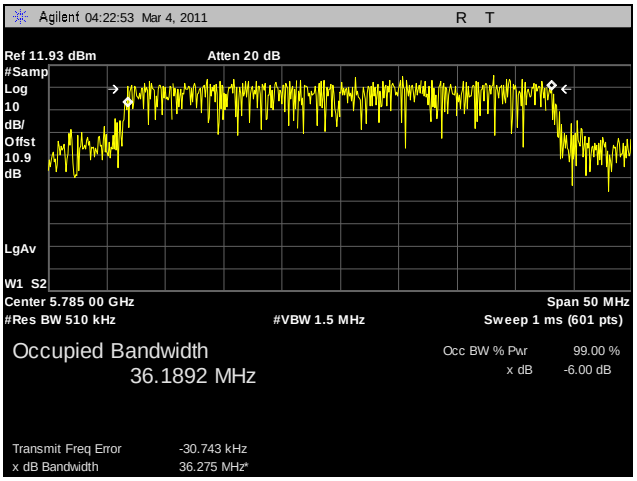
Plot 120. 99% Occupied Bandwidth, Mid Channel, 802.11n 20 MHz, 5.8 GHz, C



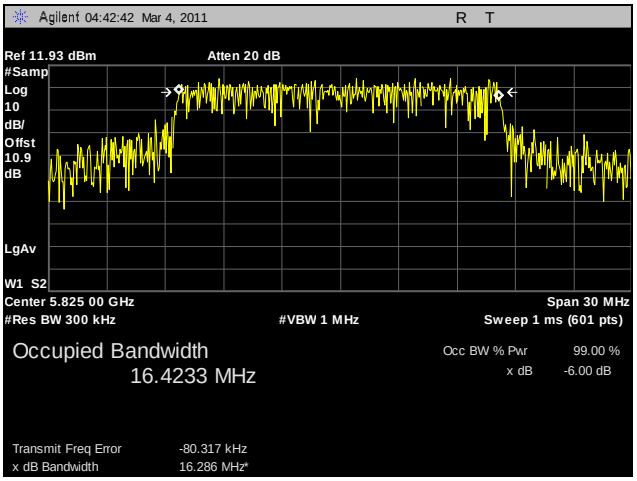
Plot 121. 99% Occupied Bandwidth, Mid Channel, 802.11n 40 MHz, 5.8 GHz, A



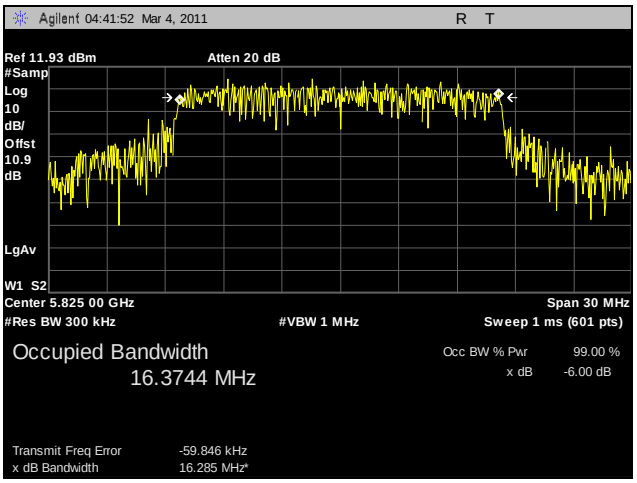
Plot 122. 99% Occupied Bandwidth, Mid Channel, 802.11n 40 MHz, 5.8 GHz, B



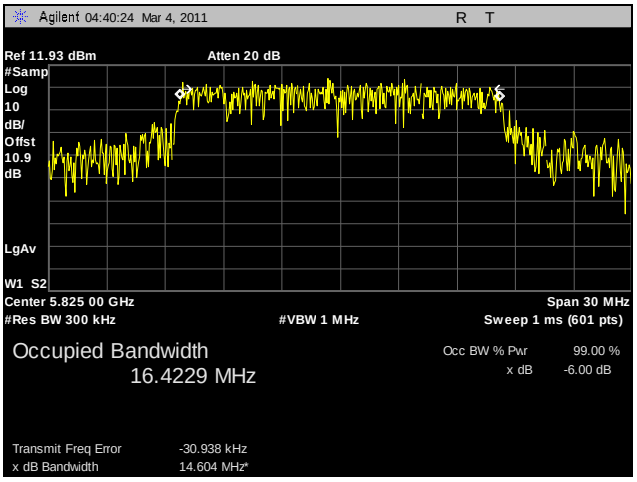
Plot 123. 99% Occupied Bandwidth, Mid Channel, 802.11n 40 MHz, 5.8 GHz, C



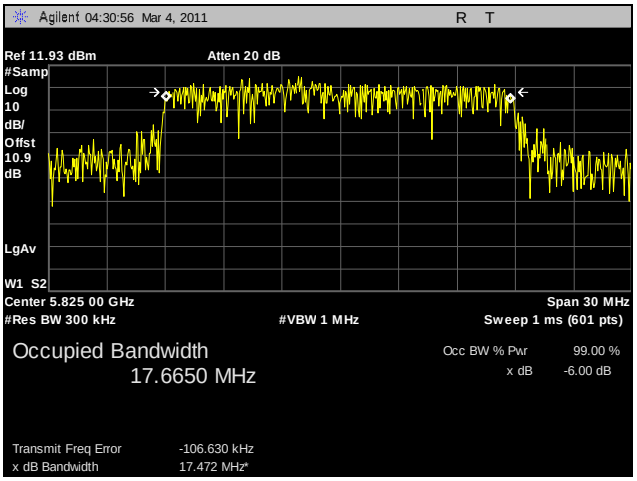
Plot 124. 99% Occupied Bandwidth, High Channel, 802.11a, 5.8 GHz, A



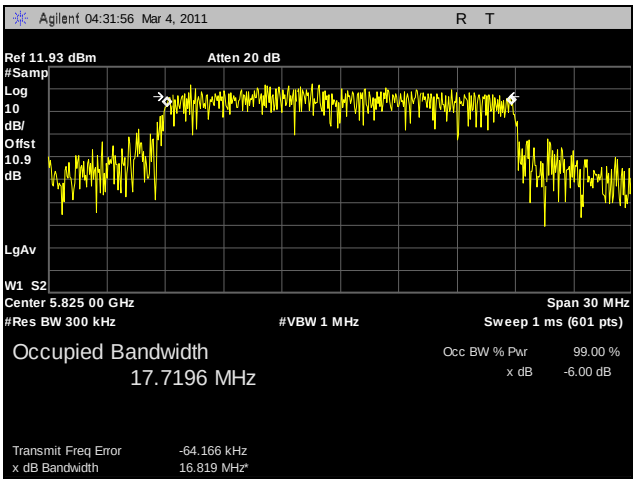
Plot 125. 99% Occupied Bandwidth, High Channel, 802.11a, 5.8 GHz, B



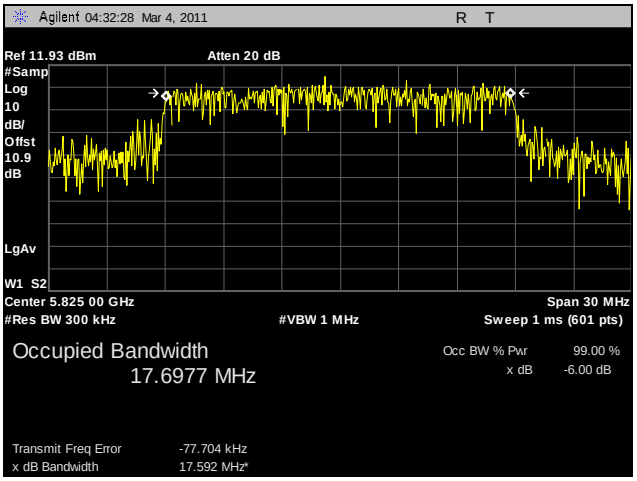
Plot 126. 99% Occupied Bandwidth, High Channel, 802.11a, 5.8 GHz, C



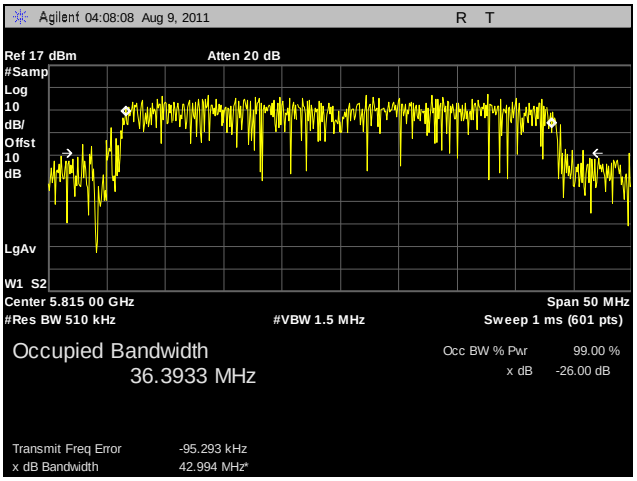
Plot 127. 99% Occupied Bandwidth, High Channel, 802.11n 20 MHz, 5.8 GHz, A



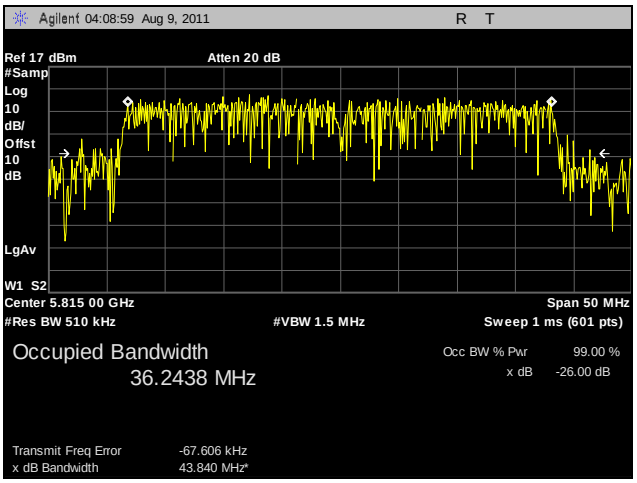
Plot 128. 99% Occupied Bandwidth, High Channel, 802.11n 20 MHz, 5.8 GHz, B



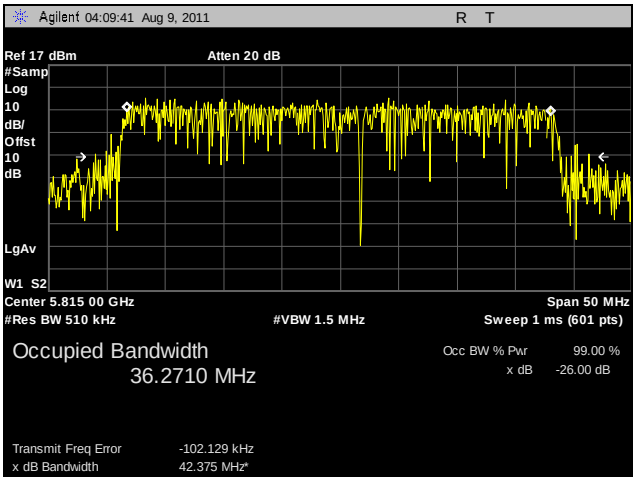
Plot 129. 99% Occupied Bandwidth, High Channel, 802.11n 20 MHz, 5.8 GHz, C



Plot 130. 99% Occupied Bandwidth, High Channel, 802.11n 40 MHz, 5.8 GHz, A



Plot 131. 99% Occupied Bandwidth, High Channel, 802.11n 40 MHz, 5.8 GHz, B



Plot 132. 99% Occupied Bandwidth, High Channel, 802.11n 40 MHz, 5.8 GHz, C

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.247(b) Peak Power Output

Test Requirements: **§15.247(b):** The maximum peak output power of the intentional radiator shall not exceed the following:

Digital Transmission Systems (MHz)	Output Limit (Watts)
902-928	1.000
2400–2483.5	1.000
5725– 5850	1.000

Table 20. Output Power Requirements from §15.247(b)

§15.247(c): if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in the Table 20, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Systems operating in the 2400 – 2483.5 MHz band and using a point to point application may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

Systems operating in the 5725 – 5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter peak output power.

Fixed, point-to-point operation excludes the use of point-to-multipoint systems, Omni-directional applications, and multiple co-located intentional radiators transmitting the same information. The operator of the spread spectrum intentional radiator or, if the equipment is professionally installed, the installer is responsible for ensuring that the system is used exclusively for fixed, point-to-point operations. The instruction manual furnished with the intentional radiator shall contain language in the installation instructions informing the operator and the installer of this responsibility.

Test Procedure: The transmitter was connected to a calibrated spectrum analyzer. The EUT was measured at the low, mid and high channels of each band at the maximum power level.

Test Results: The EUT was compliant with the Peak Power Output limits of **§15.247(b)**.

Test Engineer(s): Ben Taylor

Test Date(s): 05/25/12

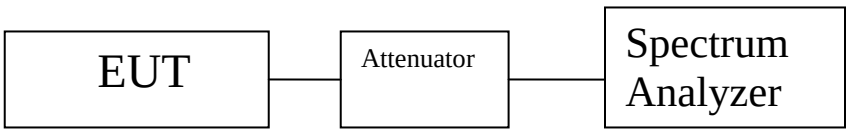


Figure 3. Peak Power Output Test Setup

Peak Power Output Test Results

Frequency (MHz)	Mode/Modulation Type	Port 0 Conducted Power (dBm)	Port 2 Conducted Power (dBm)	Port 1 Conducted Power (dBm)	Summed Conducted Power (dBm)	Antenna Array Gain (dBi)	Maximum Conducted Power (dBm)	Margin (dB)
2412	802.11b	17.60	17.11	18.02	22.36	8.97	27.03	-4.67
2437	802.11b	17.30	19.02	18.91	23.25	8.97	27.03	-3.78
2462	802.11b	16.98	20.31	16.99	23.17	8.97	27.03	-3.86
2412	802.11g	15.58	16.24	17.88	21.45	8.97	27.03	-5.58
2437	802.11g	14.89	16.31	16.77	20.83	8.97	27.03	-6.20
2462	802.11g	16.31	18.02	17.01	21.94	8.97	27.03	-5.09
2412	802.11g HT20	15.21	16.02	17.02	20.92	8.97	27.03	-6.11
2437	802.11g HT20	13.52	15.45	15.31	19.62	8.97	27.03	-7.41
2462	802.11g HT20	13.48	19.89	17.01	22.30	8.97	27.03	-4.72
2422	802.11g HT40	15.05	16.02	16.01	20.49	8.97	27.03	-6.54
2437	802.11g HT40	14.09	15.03	14.98	19.49	8.97	27.03	-7.54
2452	802.11g HT40	14.01	16.03	14.96	19.85	8.97	27.03	-7.18

Table 21. Peak Power Output, Test Results, 2.4 GHz

Frequency (MHz)	Mode/Modulation Type	Port 0 Conducted Power (dBm)	Port 2 Conducted Power (dBm)	Port 1 Conducted Power (dBm)	Summed Conducted Power (dBm)	Antenna Array Gain (dBi)	Maximum Conducted Power (dBm)	Margin (dB)
5745	802.11a	16.66	19.02	18.83	23.06	8.34	27.66	-4.59
5785	802.11a	15.12	17.93	18.02	21.99	8.34	27.66	-5.67
5825	802.11a	16.84	16.01	16.22	21.14	8.34	27.66	-6.52
5745	802.11n HT20	17.46	19.43	20	23.86	8.34	27.66	-3.80
5785	802.11n HT20	14.42	17.24	17.11	21.21	8.34	27.66	-6.45
5825	802.11n HT20	17.21	16.03	16.41	21.35	8.34	27.66	-6.31
5755	802.11n HT40	13.91	16.19	16.5	20.45	8.34	27.66	-7.21
5785	802.11n HT40	15.64	17.4	18.1	21.94	8.34	27.66	-5.72
5815	802.11n HT40	17.51	15.21	16.31	21.22	8.34	27.66	-6.44

Table 22. Peak Power Output, Test Results, 5.8 GHz

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.247(d) Radiated Spurious Emissions Requirements and Band Edge

Test Requirements: **§15.247(d); §15.205:** Emissions outside the frequency band.

§15.247(d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement. Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a).

§15.205(a): Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090–0.110----------	16.42–16.423	399.9–410	4.5–5.15
[1] 0.495–0.505----------	16.69475–16.69525	608–614	5.35–5.46
2.1735–2.1905----------	16.80425–16.80475	960–1240	7.25–7.75
4.125–4.128----------	25.5–25.67	1300–1427	8.025–8.5
4.17725–4.17775----------	37.5–38.25	1435–1626.5	9.0–9.2
4.20725–4.20775----------	73–74.6	1645.5–1646.5	9.3–9.5
6.215–6.218----------	74.8–75.2	1660–1710	10.6–12.7
6.26775–6.26825----------	108–121.94	1718.8–1722.2	13.25–13.4
6.31175–6.31225----------	123–138	2200–2300	14.47–14.5
8.291–8.294----------	149.9–150.05	2310–2390	15.35–16.2
8.362–8.366----------	156.52475–156.52525	2483.5–2500	17.7–21.4
8.37625–8.38675----------	156.7–156.9	2655–2900	22.01–23.12
8.41425–8.41475----------	162.0125–167.17	3260–3267	23.6–24.0
12.29–12.293----------	167.72–173.2	3332–3339	31.2–31.8
12.51975–12.52025----------	240–285	3345.8–3358 36.	43–36.5
12.57675–12.57725----------	322–335.4	3600–4400	([2])

Table 23. Restricted Bands of Operation

[1] Until February 1, 1999, this restricted band shall be 0.490 – 0.510 MHz.
[2] Above 38.6

Test Requirement(s): **§ 15.209 (a):** Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in Table 24.

Frequency (MHz)	§ 15.209(a),Radiated Emission Limits (dBµV) @ 3m
30 - 88	40.00
88 - 216	43.50
216 - 960	46.00
Above 960	54.00

Table 24. Radiated Emissions Limits Calculated from FCC Part 15, § 15.209 (a)

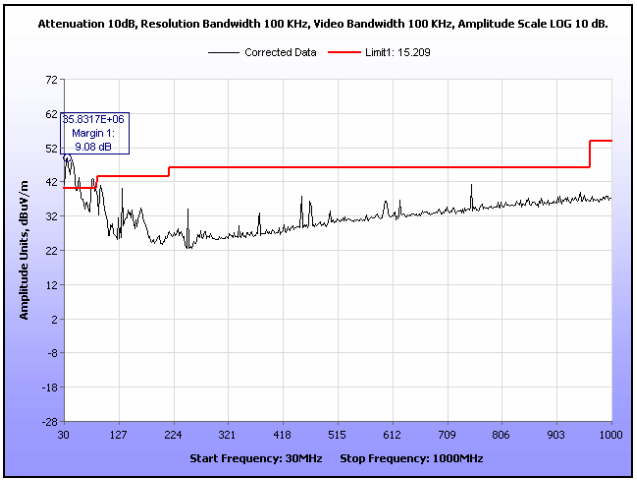
Test Procedures: The transmitter was turned on. Measurements were performed of the low, mid and high Channels. The EUT was rotated orthogonally through all three axes. Plots shown are corrected for both antenna correction factor and distance and compared to a 3 m limit line. Only noise floor was measured above 18 GHz.

Test Results: The EUT was completed with the Radiated Spurious Emission limits of **§ 15.247(d)**.

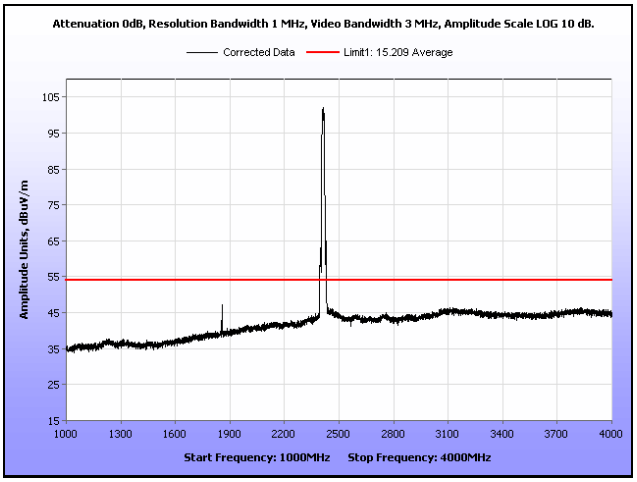
Test Engineer(s): Ben Taylor

Test Date(s): 05/23/12

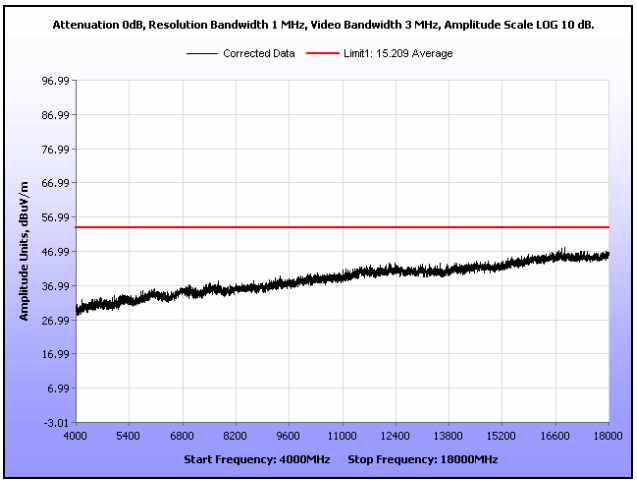
Radiated Spurious Emissions Test Results, 802.11b, 2.4 GHz



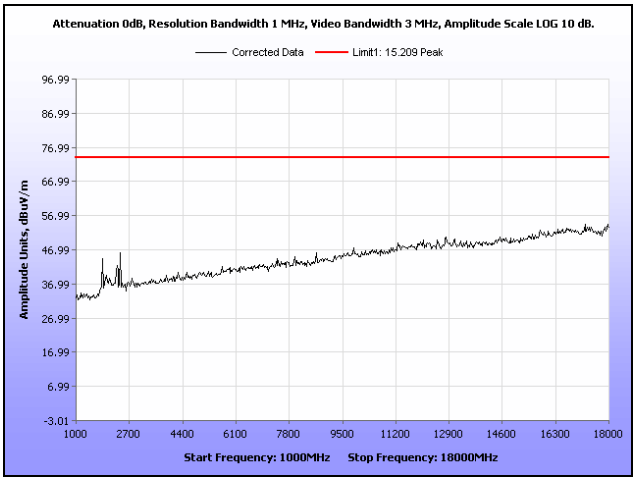
Plot 133. Radiated Spurious Emissions, 802.11b, Low Channel, 30 MHz – 1 GHz, 2.4 GHz



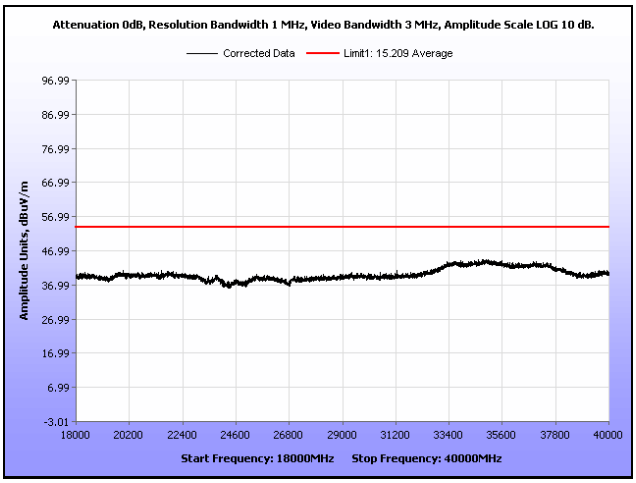
Plot 134. Radiated Spurious Emissions, 802.11b, Low Channel, 1 GHz – 4 GHz, 2.4 GHz



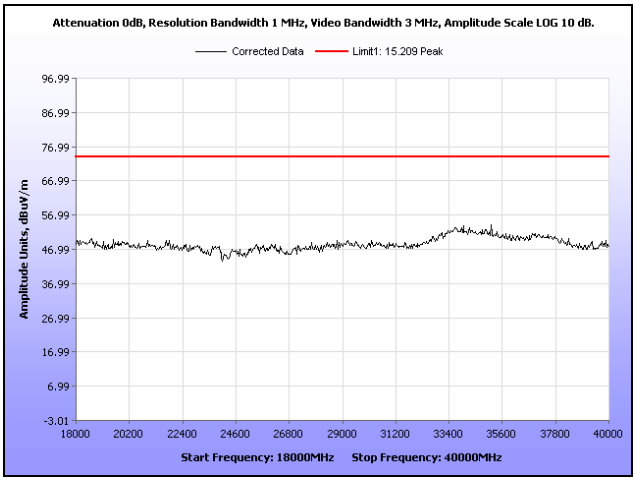
Plot 135. Radiated Spurious Emissions, 802.11b, Low Channel, 4 GHz – 18 GHz, Average, 2.4 GHz



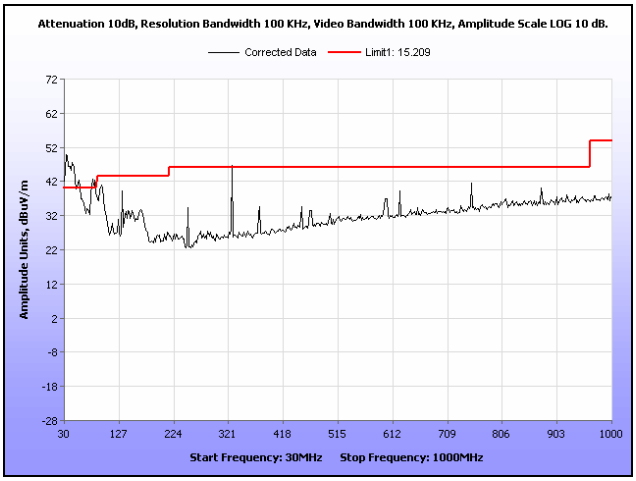
Plot 136. Radiated Spurious Emissions, 802.11b, Low Channel, 1 GHz – 18 GHz, Peak, 2.4 GHz



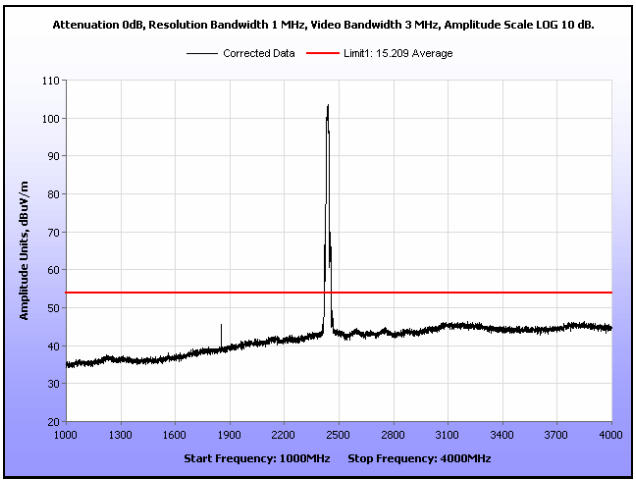
Plot 137. Radiated Spurious Emissions, 802.11b, Low Channel, 18 GHz – 40 GHz, Average, 2.4 GHz



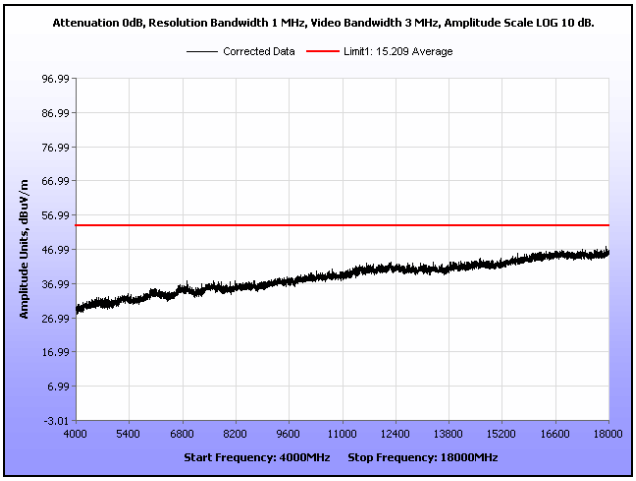
Plot 138. Radiated Spurious Emissions, 802.11b, Low Channel, 18 GHz – 40 GHz, Peak, 2.4 GHz



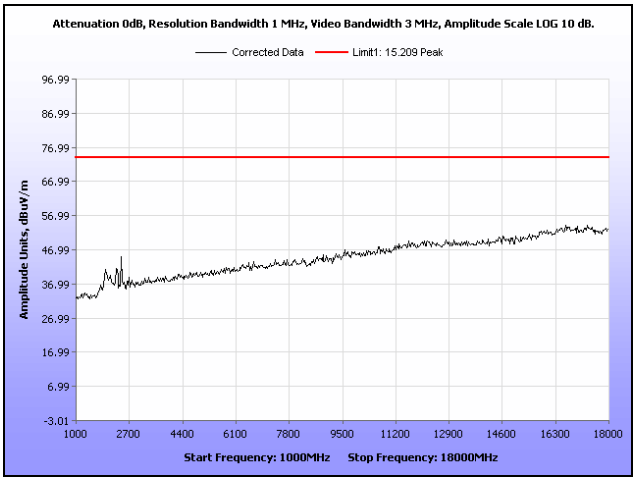
Plot 139. Radiated Spurious Emissions, 802.11b, Mid Channel, 30 MHz – 1 GHz, 2.4 GHz



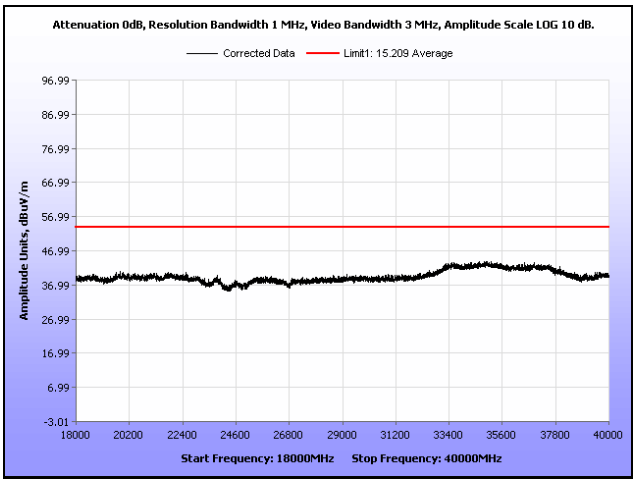
Plot 140. Radiated Spurious Emissions, 802.11b, Mid Channel, 1 GHz – 4 GHz, 2.4 GHz



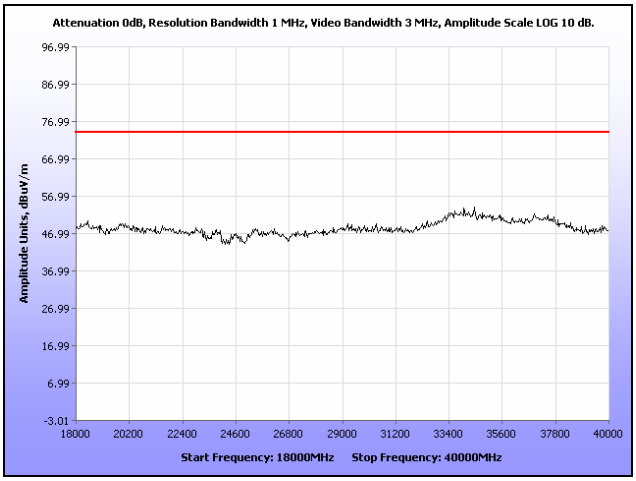
Plot 141. Radiated Spurious Emissions, 802.11b, Mid Channel, 4 GHz – 18 GHz, Average, 2.4 GHz



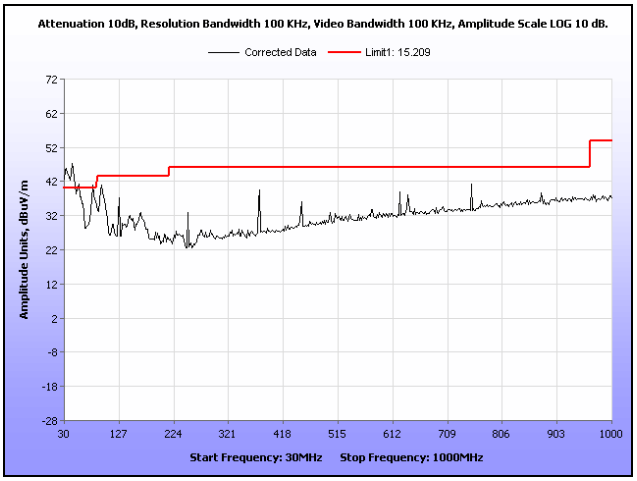
Plot 142. Radiated Spurious Emissions, 802.11b, Mid Channel, 1 GHz – 18 GHz, Peak, 2.4 GHz



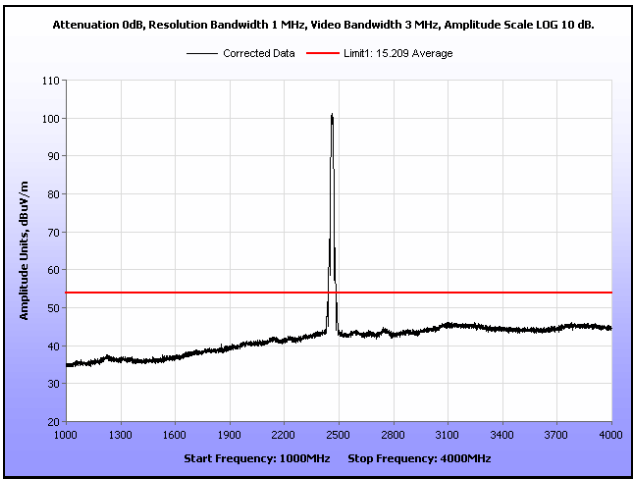
Plot 143. Radiated Spurious Emissions, 802.11b, Mid Channel, 18 GHz – 40 GHz, Average, 2.4 GHz



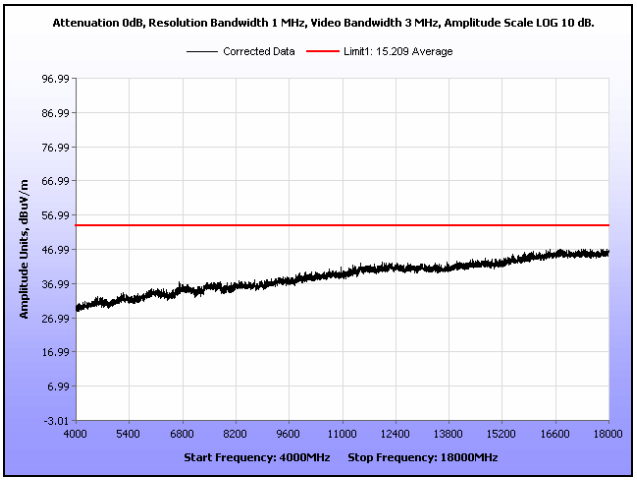
Plot 144. Radiated Spurious Emissions, 802.11b, Mid Channel, 18 GHz – 40 GHz, Peak, 2.4 GHz



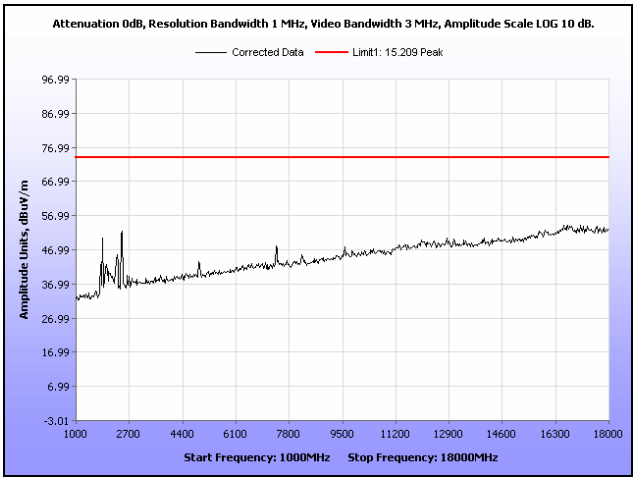
Plot 145. Radiated Spurious Emissions, 802.11b, High Channel, 30 MHz – 1 GHz, 2.4 GHz



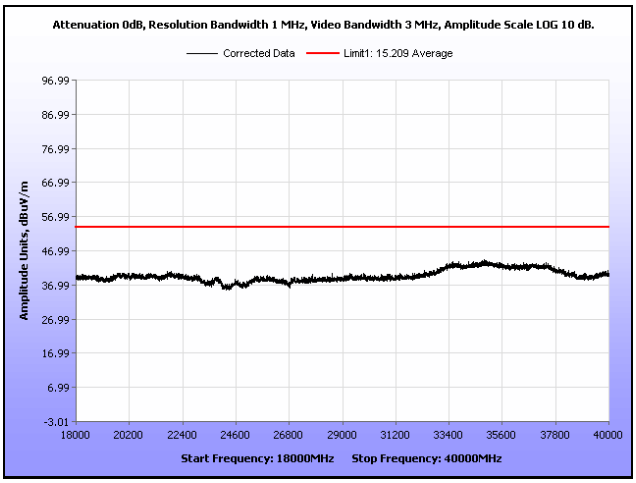
Plot 146. Radiated Spurious Emissions, 802.11b, High Channel, 1 GHz – 4 GHz, 2.4 GHz



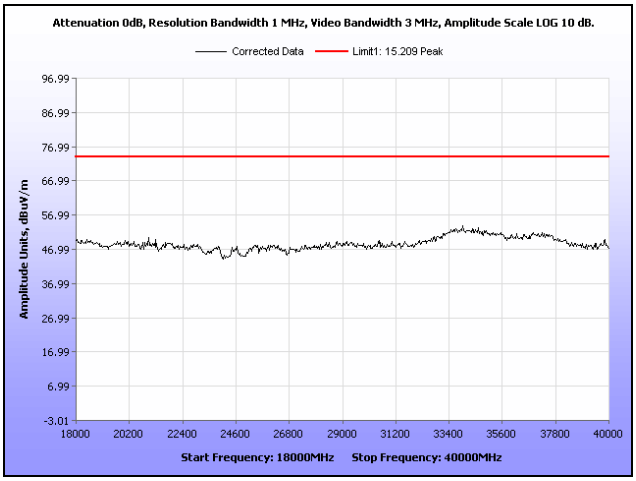
Plot 147. Radiated Spurious Emissions, 802.11b, High Channel, 4 GHz – 18 GHz, Average, 2.4 GHz



Plot 148. Radiated Spurious Emissions, 802.11b, High Channel, 1 GHz – 18 GHz, Peak, 2.4 GHz

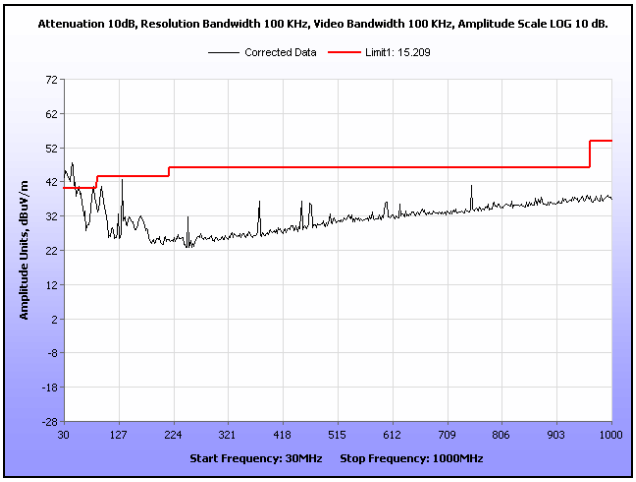


Plot 149. Radiated Spurious Emissions, 802.11b, High Channel, 18 GHz – 40 GHz, Average, 2.4 GHz

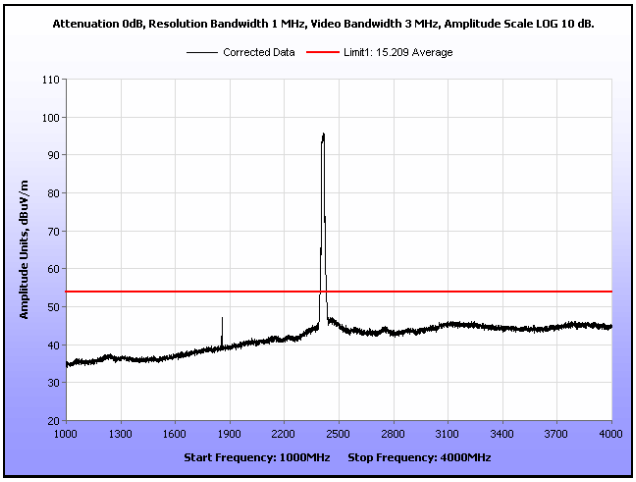


Plot 150. Radiated Spurious Emissions, 802.11b, High Channel, 18 GHz – 40 GHz, Peak, 2.4 GHz

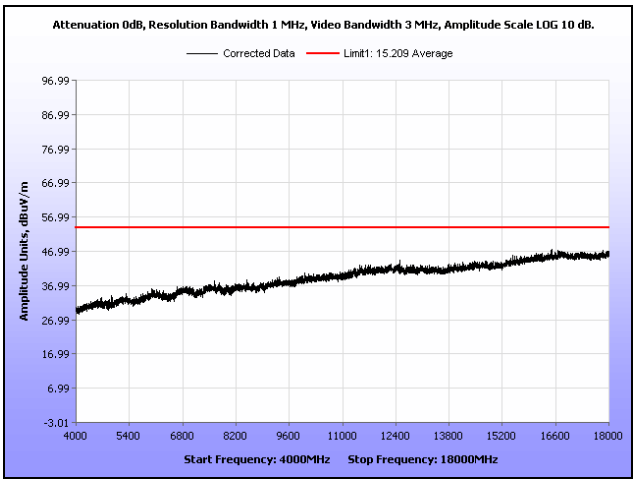
Radiated Spurious Emissions Test Results, 802.11g, 2.4 GHz



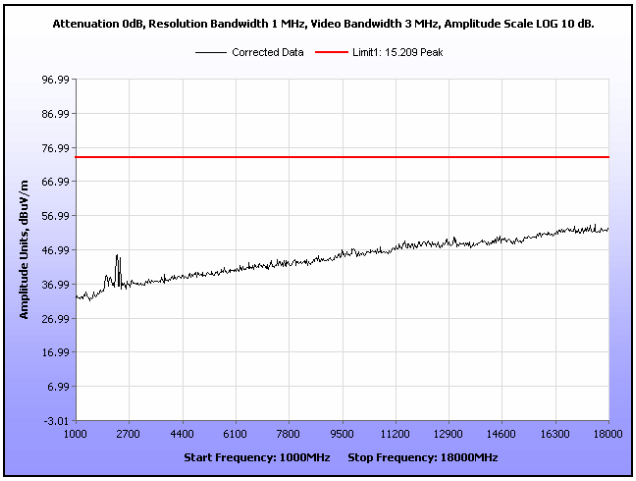
Plot 151. Radiated Spurious Emissions, 802.11g, Low Channel, 30 MHz – 1 GHz, 2.4 GHz



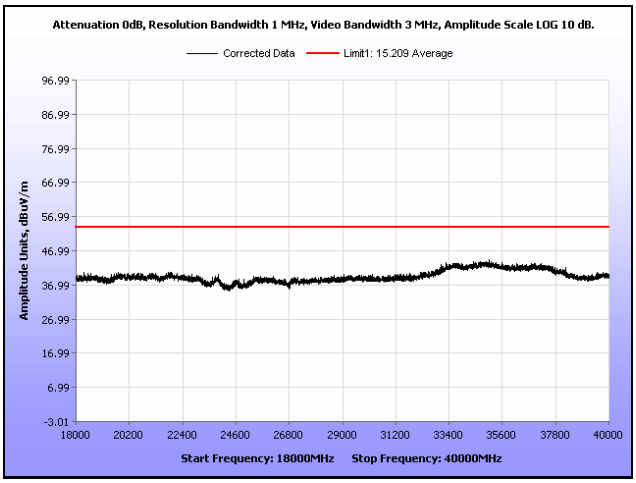
Plot 152. Radiated Spurious Emissions, 802.11g, Low Channel, 1 GHz – 4 GHz, 2.4 GHz



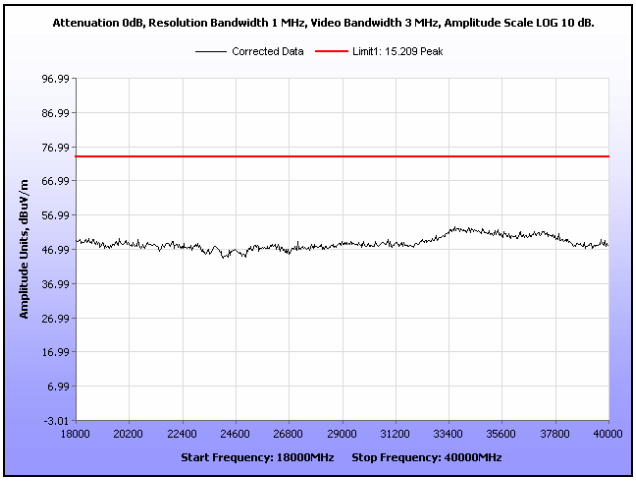
Plot 153. Radiated Spurious Emissions, 802.11g, Low Channel, 4 GHz – 18 GHz, Average, 2.4 GHz



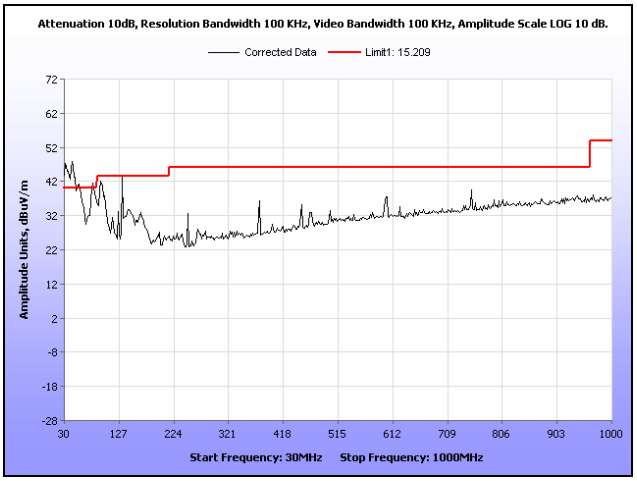
Plot 154. Radiated Spurious Emissions, 802.11g, Low Channel, 1 GHz – 18 GHz, Peak, 2.4 GHz



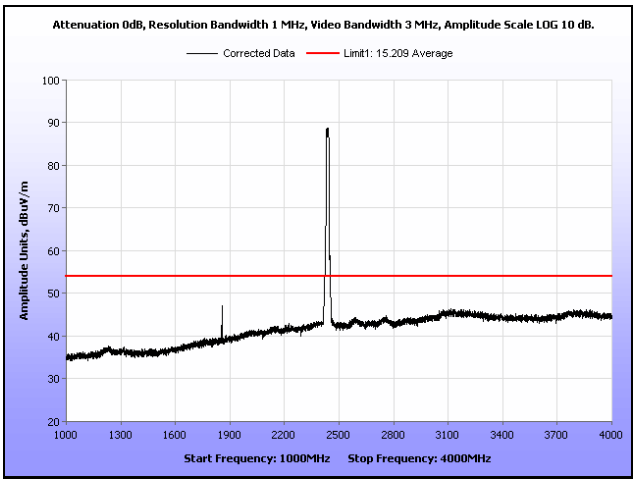
Plot 155. Radiated Spurious Emissions, 802.11g, Low Channel, 18 GHz – 40 GHz, Average, 2.4 GHz



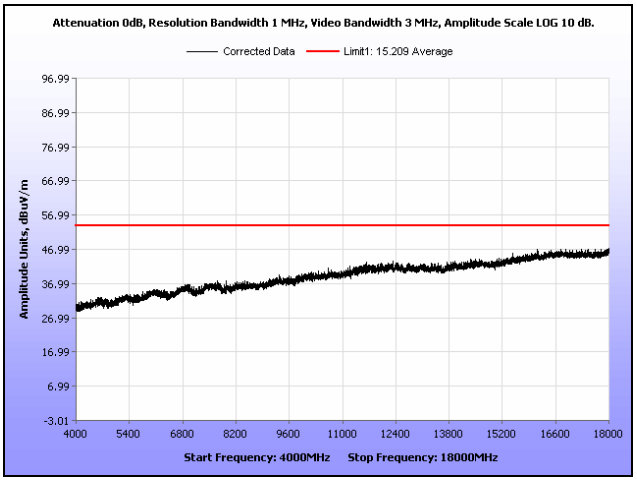
Plot 156. Radiated Spurious Emissions, 802.11g, Low Channel, 18 GHz – 40 GHz, Peak, 2.4 GHz



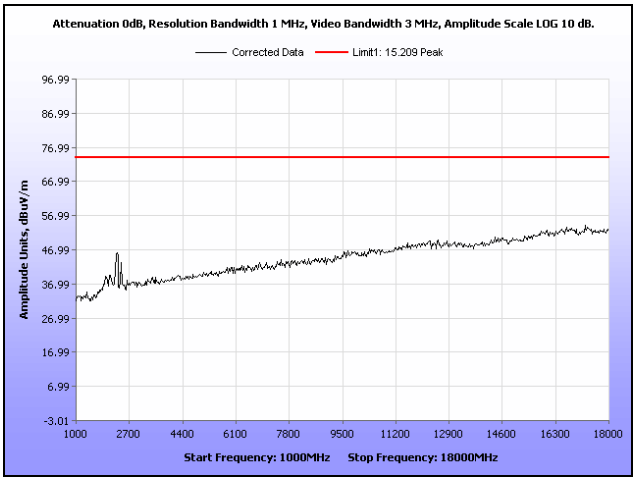
Plot 157. Radiated Spurious Emissions, 802.11g, Mid Channel, 30 MHz – 1 GHz, 2.4 GHz



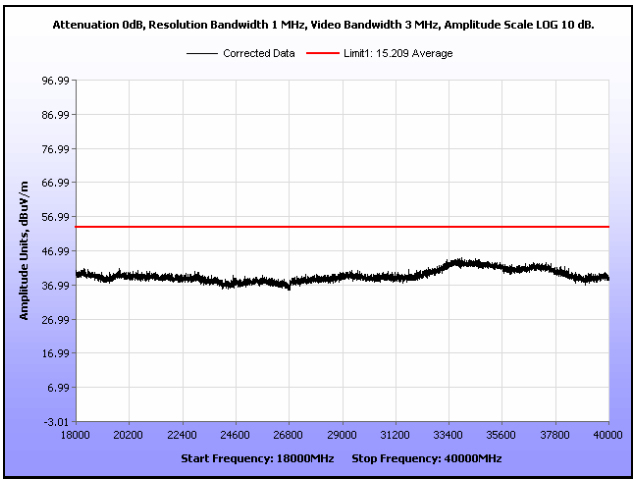
Plot 158. Radiated Spurious Emissions, 802.11g, Mid Channel, 1 GHz – 4 GHz, 2. 4 GHz



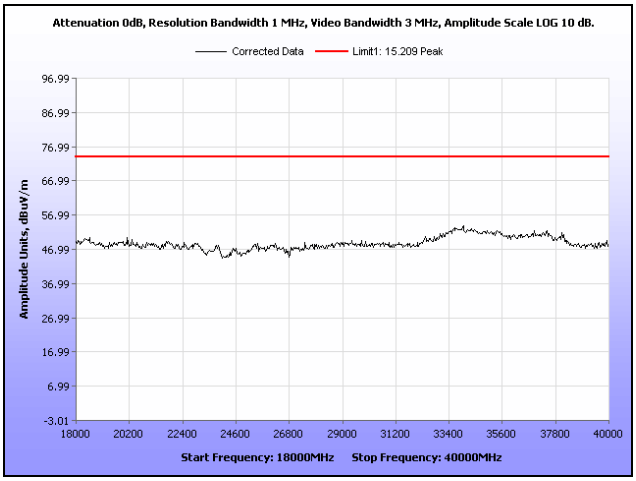
Plot 159. Radiated Spurious Emissions, 802.11g, Mid Channel, 4 GHz – 18 GHz, Average, 2. 4 GHz



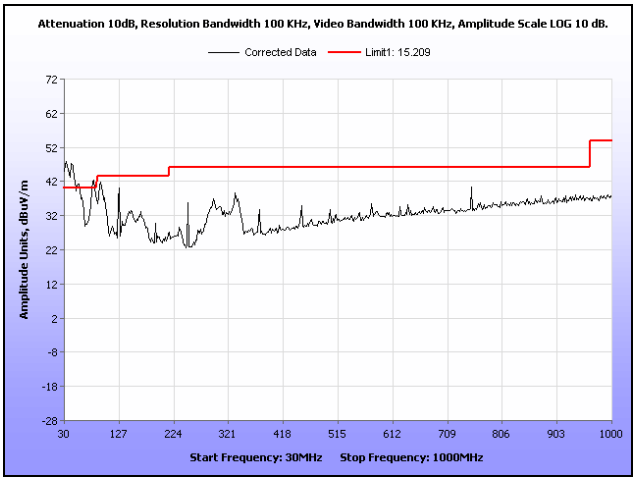
Plot 160. Radiated Spurious Emissions, 802.11g, Mid Channel, 1 GHz – 18 GHz, Peak, 2. 4 GHz



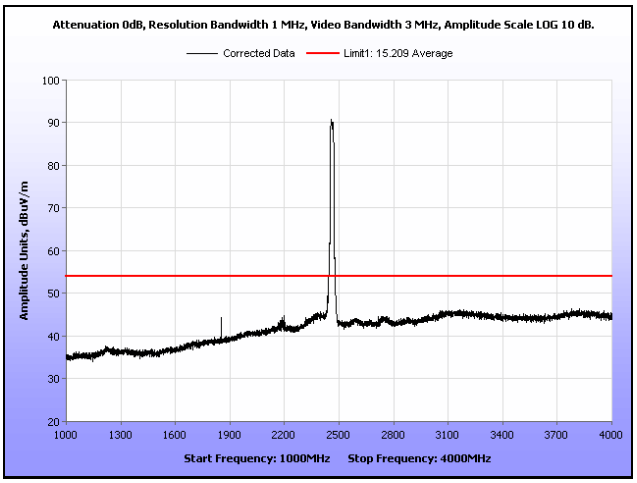
Plot 161. Radiated Spurious Emissions, 802.11g, Mid Channel, 18 GHz – 40 GHz, Average, 2. 4 GHz



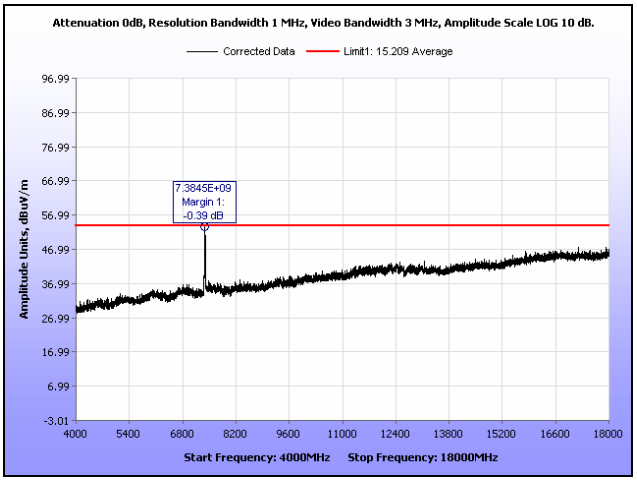
Plot 162. Radiated Spurious Emissions, 802.11g, Mid Channel, 18 GHz – 40 GHz, Peak, 2. 4 GHz



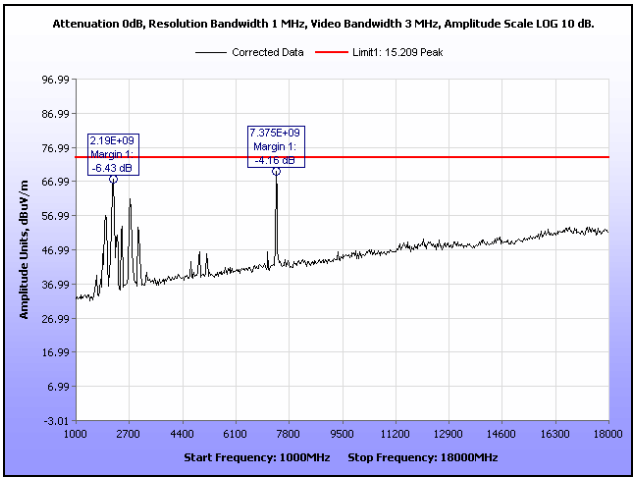
Plot 163. Radiated Spurious Emissions, 802.11g, High Channel, 30 MHz – 1 GHz, 2.4 GHz



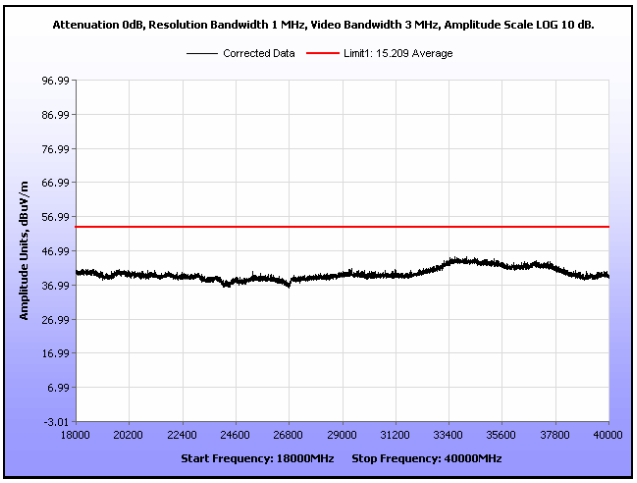
Plot 164. Radiated Spurious Emissions, 802.11g, High Channel, 1 GHz – 4 GHz, 2.4 GHz



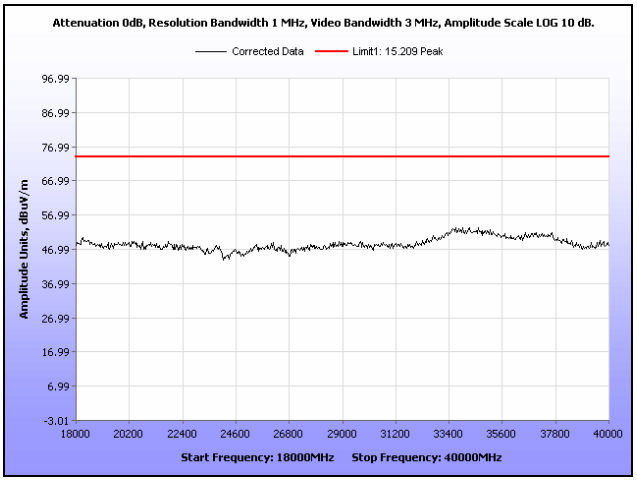
Plot 165. Radiated Spurious Emissions, 802.11g, High Channel, 4 GHz – 18 GHz, Average, 2.4 GHz



Plot 166. Radiated Spurious Emissions, 802.11g, High Channel, 1 GHz – 18 GHz, Peak, 2.4 GHz

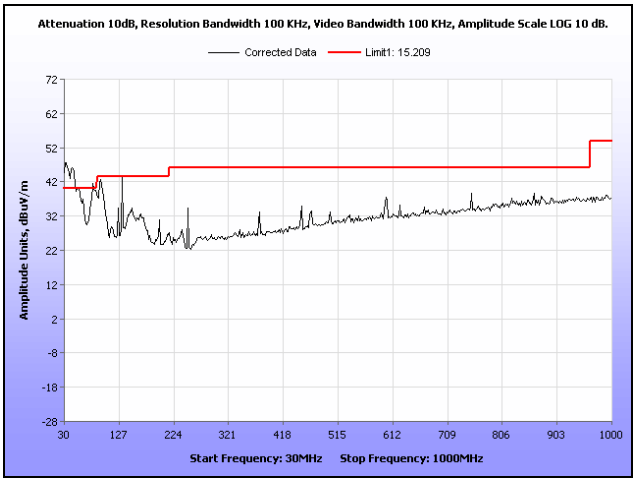


Plot 167. Radiated Spurious Emissions, 802.11g, High Channel, 18 GHz – 40 GHz, Average, 2.4 GHz

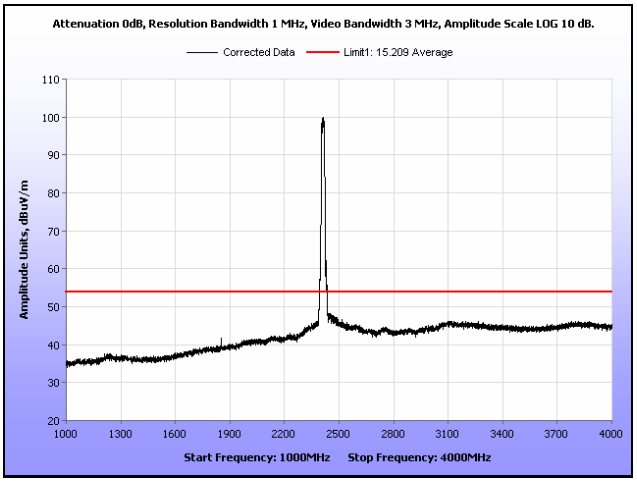


Plot 168. Radiated Spurious Emissions, 802.11g, High Channel, 18 GHz – 40 GHz, Peak, 2.4 GHz

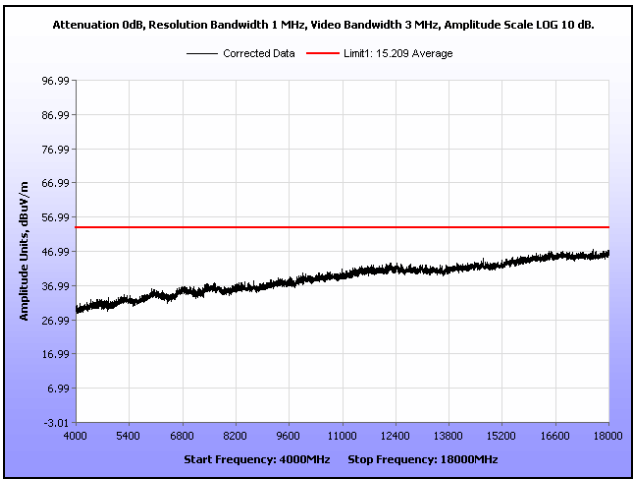
Radiated Spurious Emissions Test Results, 802.11g 20 MHz, 2.4 GHz



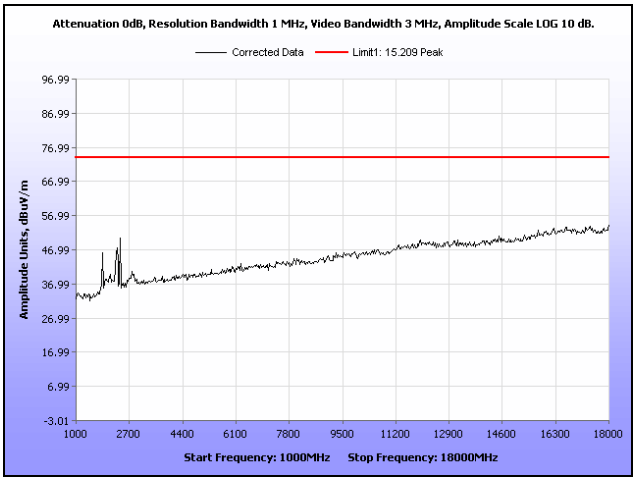
Plot 169. Radiated Spurious Emissions, 802.11g 20 MHz, Low Channel, 30 MHz – 1 GHz, 2.4 GHz



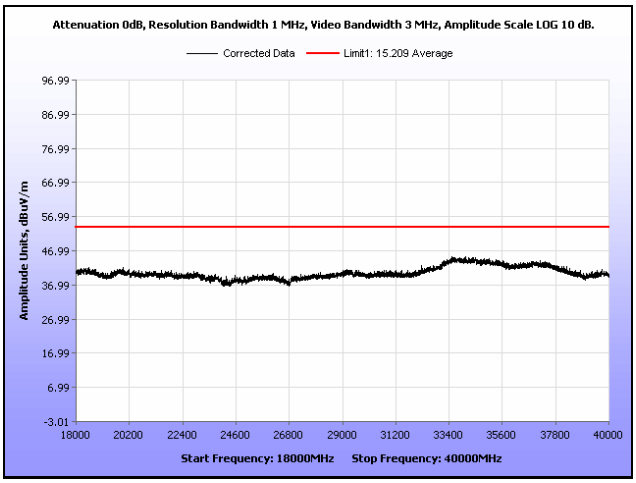
Plot 170. Radiated Spurious Emissions, 802.11g 20 MHz, Low Channel, 1 GHz – 4 GHz, 2.4 GHz



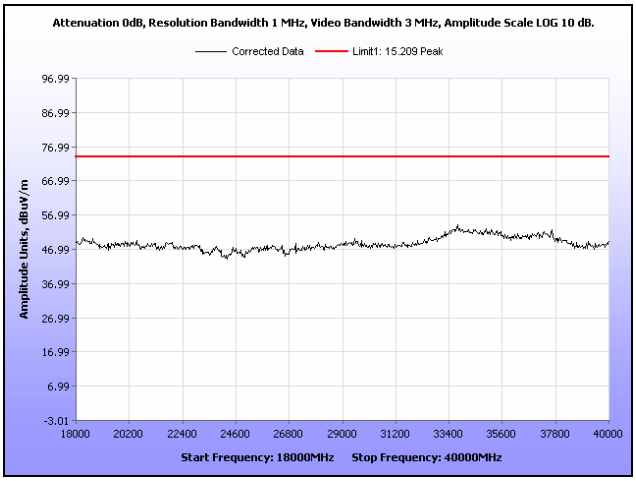
Plot 171. Radiated Spurious Emissions, 802.11g 20 MHz, Low Channel, 4 GHz – 18 GHz, Average, 2.4 GHz



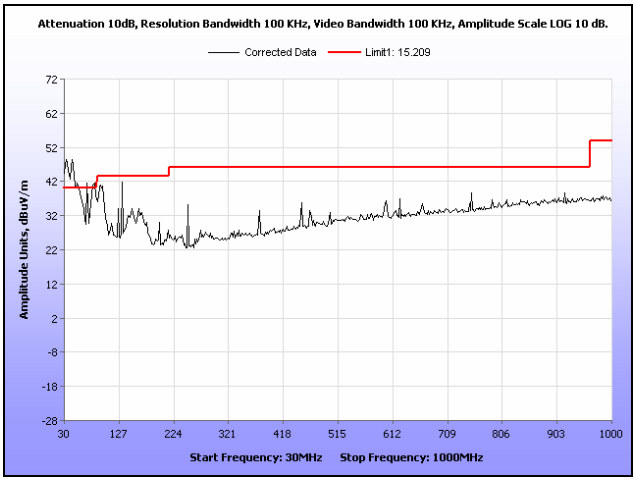
Plot 172. Radiated Spurious Emissions, 802.11g 20 MHz, Low Channel, 1 GHz – 18 GHz, Peak, 2.4 GHz



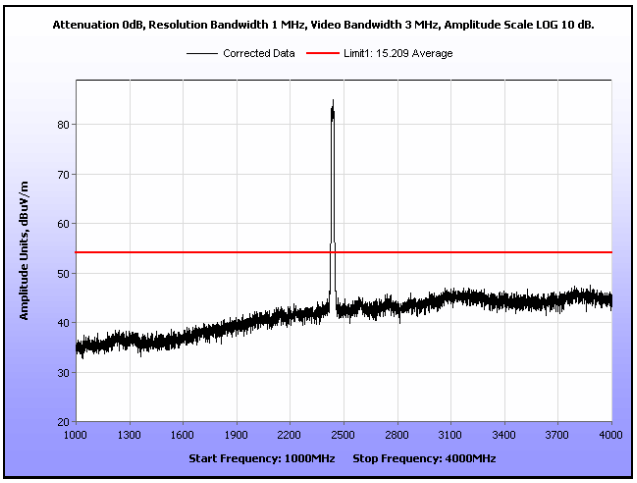
Plot 173. Radiated Spurious Emissions, 802.11g 20 MHz, Low Channel, 18 GHz – 40 GHz, Average, 2.4 GHz



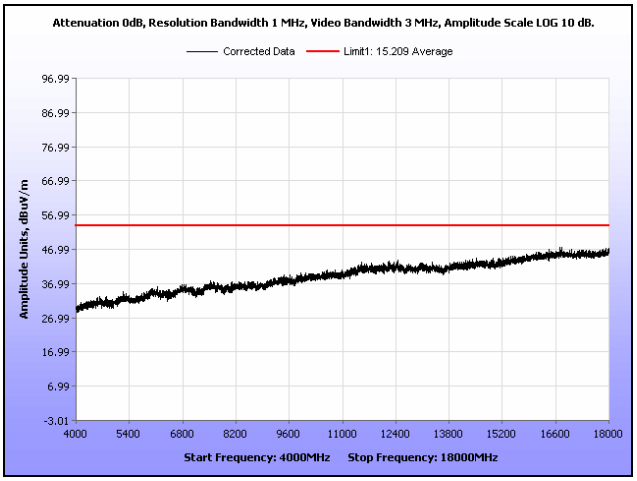
Plot 174. Radiated Spurious Emissions, 802.11g 20 MHz, Low Channel, 18 GHz – 40 GHz, Peak, 2.4 GHz



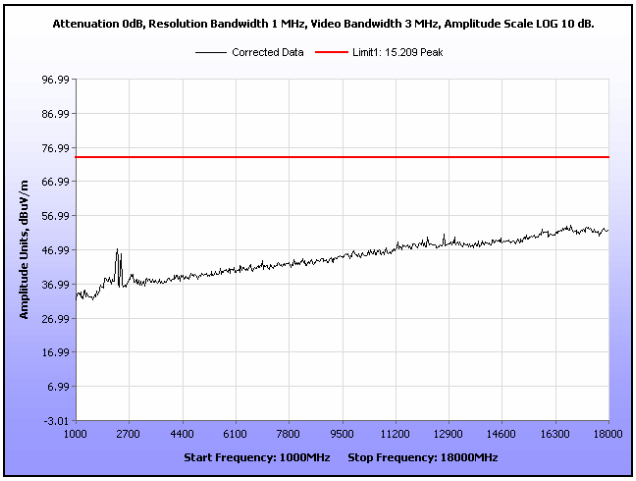
Plot 175. Radiated Spurious Emissions, 802.11g 20 MHz, Mid Channel, 30 MHz – 1 GHz, 2.4 GHz



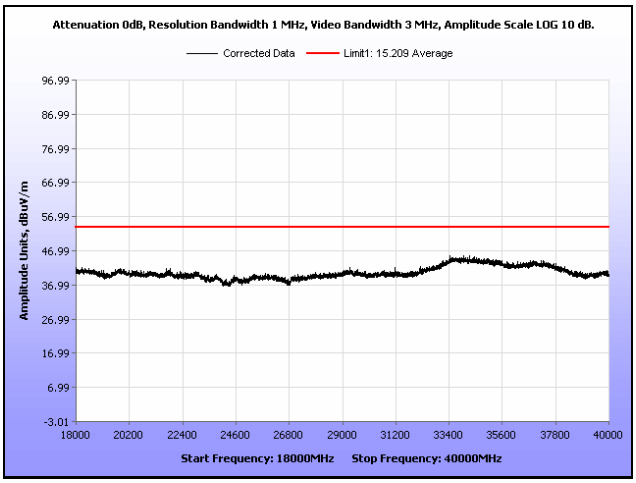
Plot 176. Radiated Spurious Emissions, 802.11g 20 MHz, Mid Channel, 1 GHz – 4 GHz, 2.4 GHz



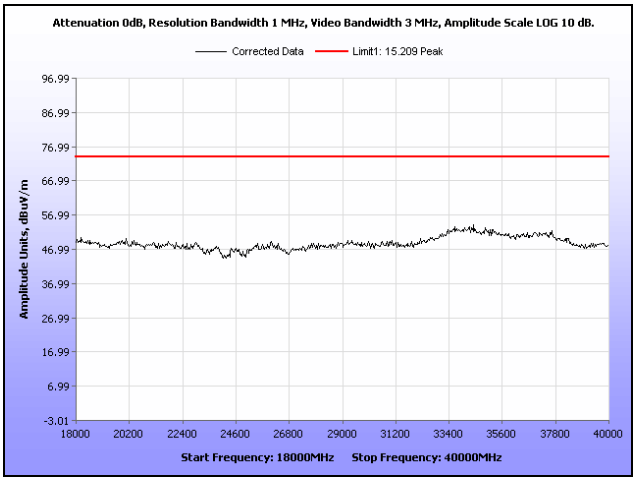
Plot 177. Radiated Spurious Emissions, 802.11g 20 MHz, Mid Channel, 4 GHz – 18 GHz, Average, 2.4 GHz



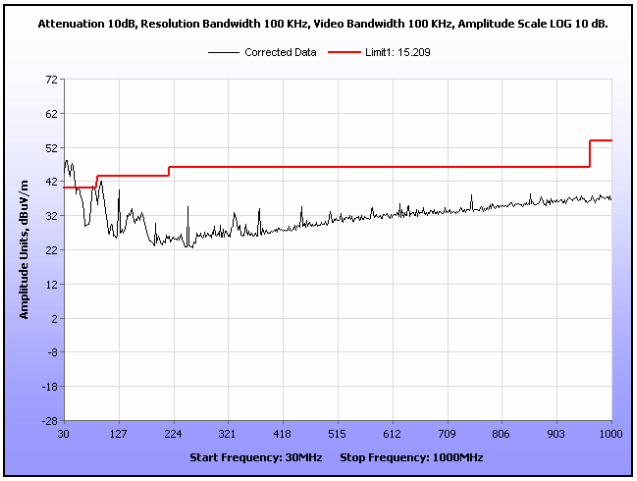
Plot 178. Radiated Spurious Emissions, 802.11g 20 MHz, Mid Channel, 1 GHz – 18 GHz, Peak, 2.4 GHz



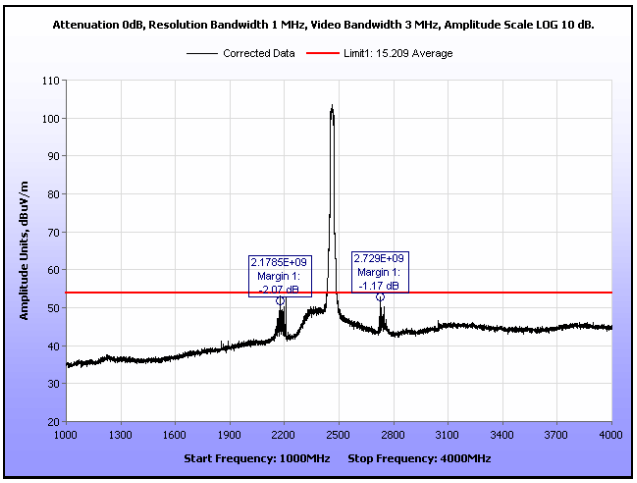
Plot 179. Radiated Spurious Emissions, 802.11g 20 MHz, Mid Channel, 18 GHz – 40 GHz, Average, 2.4 GHz



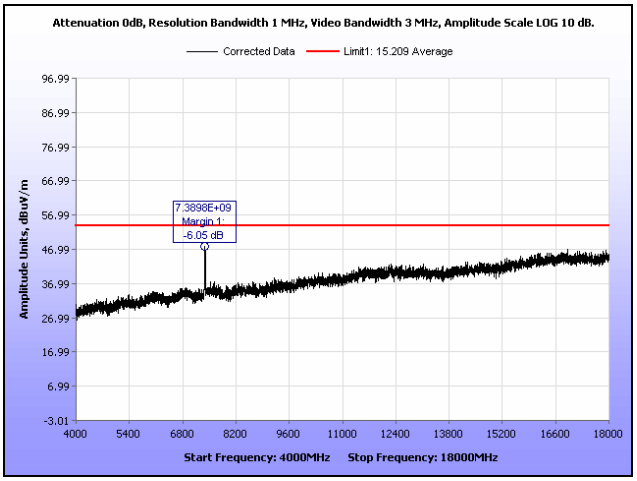
Plot 180. Radiated Spurious Emissions, 802.11g 20 MHz, Mid Channel, 18 GHz – 40 GHz, Peak, 2.4 GHz



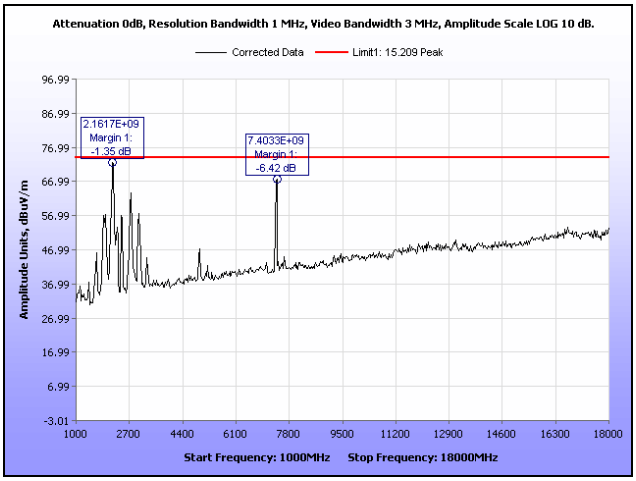
Plot 181. Radiated Spurious Emissions, 802.11g 20 MHz, High Channel, 30 MHz – 1 GHz, 2.4 GHz



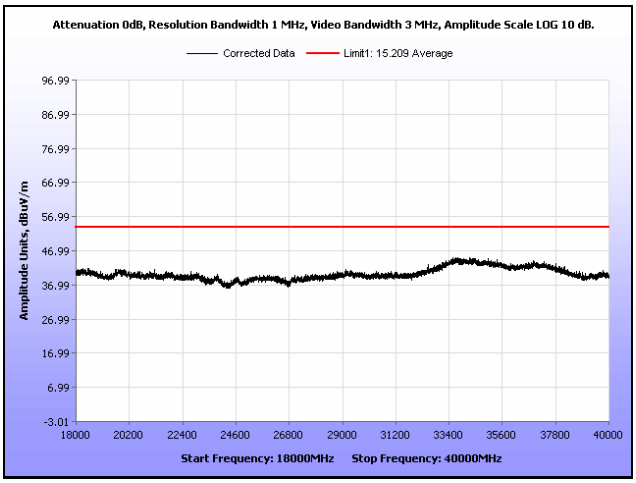
Plot 182. Radiated Spurious Emissions, 802.11g 20 MHz, High Channel, 1 GHz – 4 GHz, 2.4 GHz



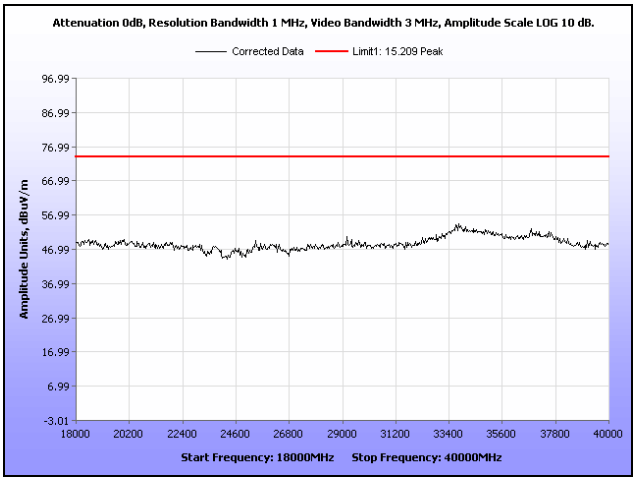
Plot 183. Radiated Spurious Emissions, 802.11g 20 MHz, High Channel, 4 GHz – 18 GHz, Average, 2.4 GHz



Plot 184. Radiated Spurious Emissions, 802.11g 20 MHz, High Channel, 1 GHz – 18 GHz, Peak, 2.4 GHz

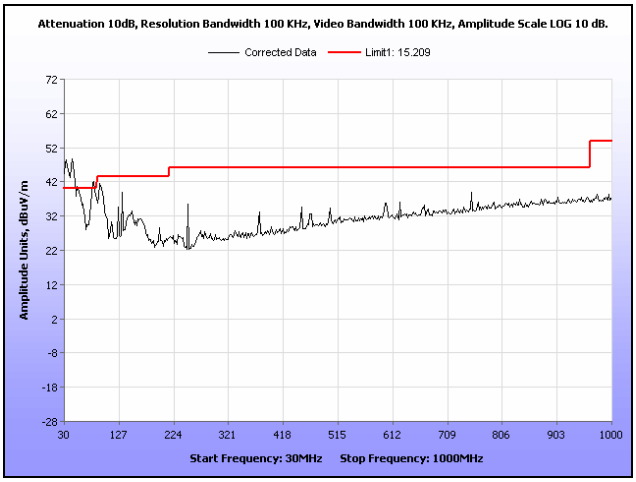


Plot 185. Radiated Spurious Emissions, 802.11n 20 MHz, High Channel, 18 GHz – 40 GHz, Average, 2.4 GHz

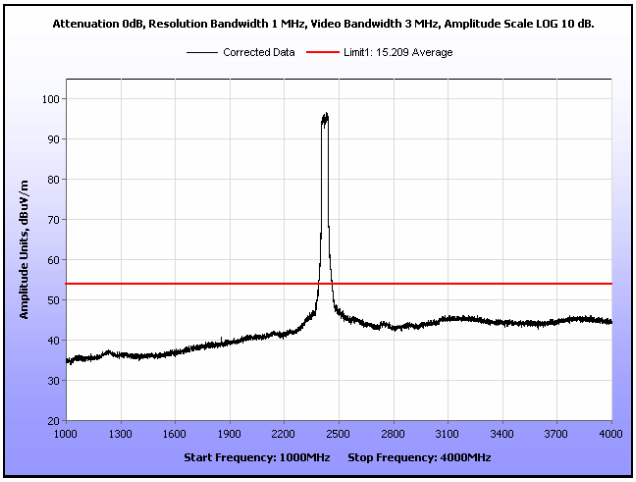


Plot 186. Radiated Spurious Emissions, 802.11n 20 MHz, High Channel, 18 GHz – 40 GHz, Peak, 2.4 GHz

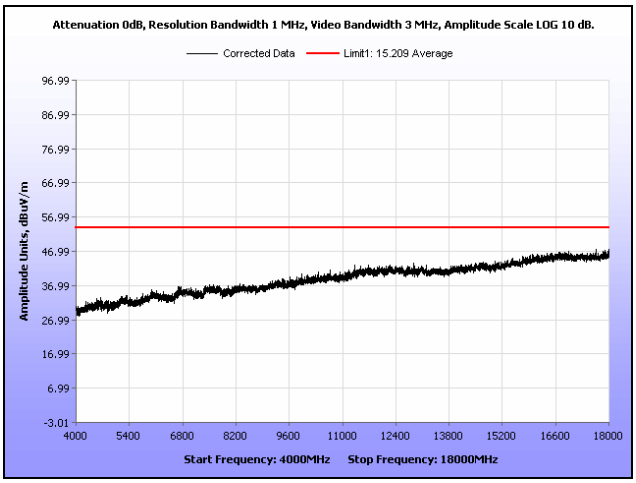
Radiated Spurious Emissions Test Results, 802.11g 40 MHz, 2.4 GHz



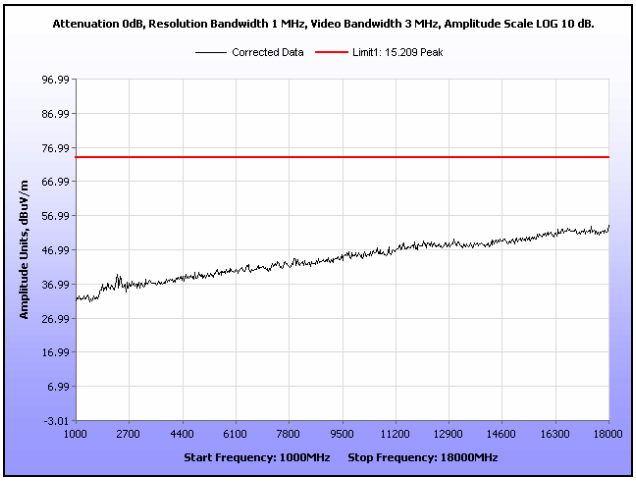
Plot 187. Radiated Spurious Emissions, 802.11g 40 MHz, Low Channel, 30 MHz – 1 GHz, 2.4 GHz



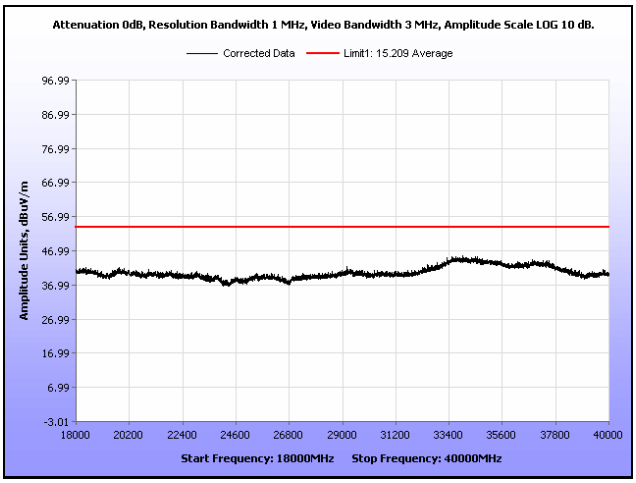
Plot 188. Radiated Spurious Emissions, 802.11g 40 MHz, Low Channel, 1 GHz – 4 GHz, 2.4 GHz



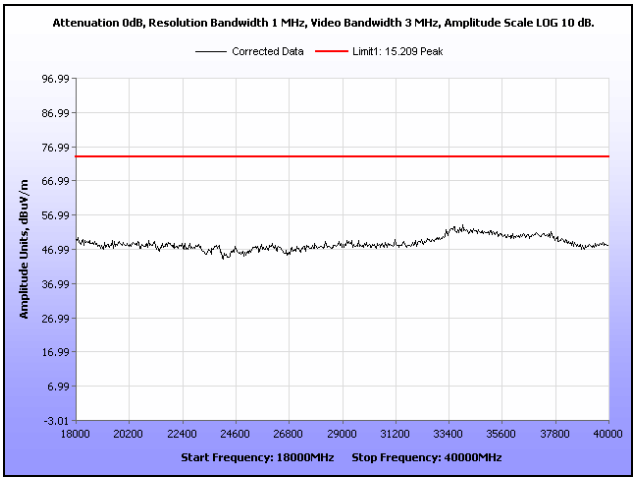
Plot 189. Radiated Spurious Emissions, 802.11g 40 MHz, Low Channel, 4 GHz – 18 GHz, Average, 2.4 GHz



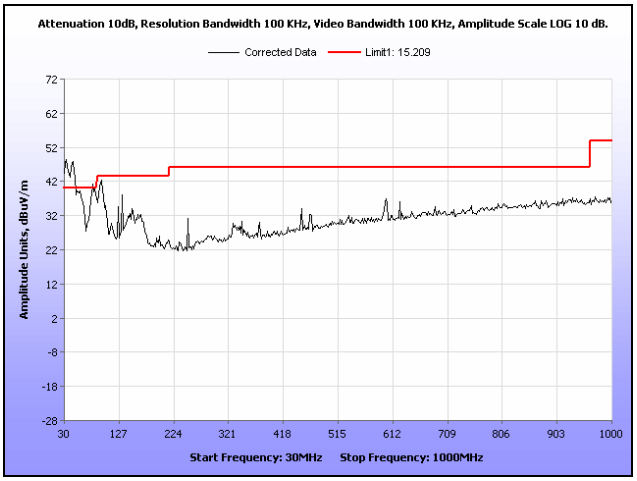
Plot 190. Radiated Spurious Emissions, 802.11g 40 MHz, Low Channel, 1 GHz – 18 GHz, Peak, 2.4 GHz



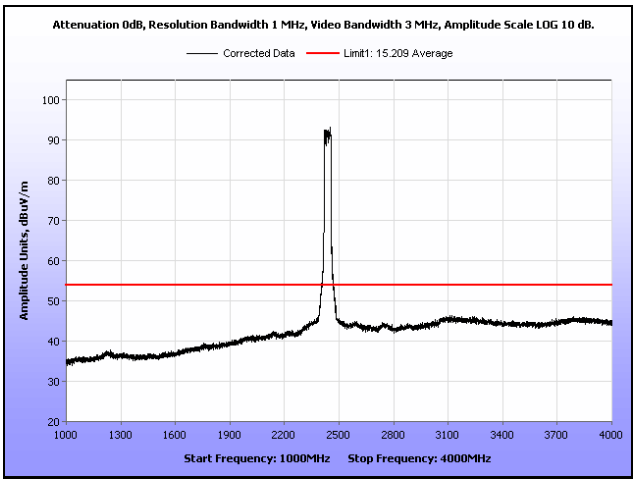
Plot 191. Radiated Spurious Emissions, 802.11g 40 MHz, Low Channel, 18 GHz – 40 GHz, Average, 2.4 GHz



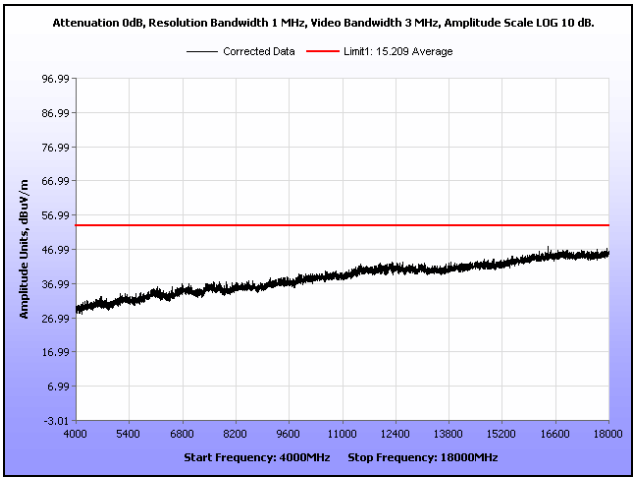
Plot 192. Radiated Spurious Emissions, 802.11g 40 MHz, Low Channel, 18 GHz – 40 GHz, Peak, 2.4 GHz



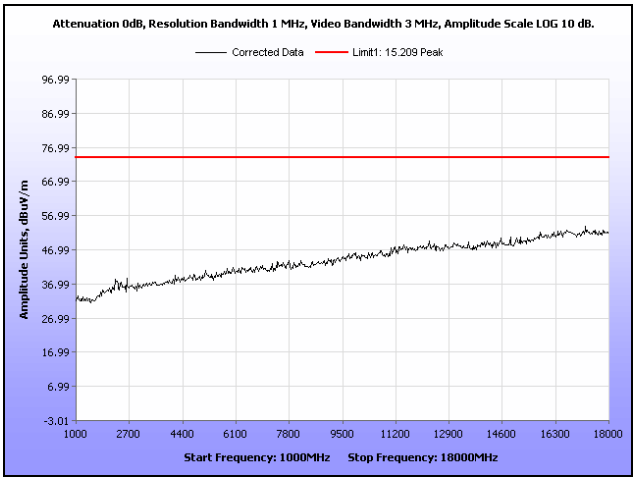
Plot 193. Radiated Spurious Emissions, 802.11g 40 MHz, Mid Channel, 30 MHz – 1 GHz, 2.4 GHz



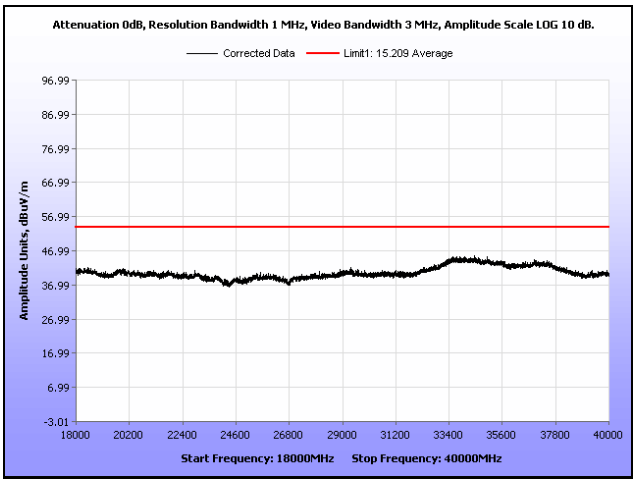
Plot 194. Radiated Spurious Emissions, 802.11g 40 MHz, Mid Channel, 1 GHz – 4 GHz, 2.4 GHz



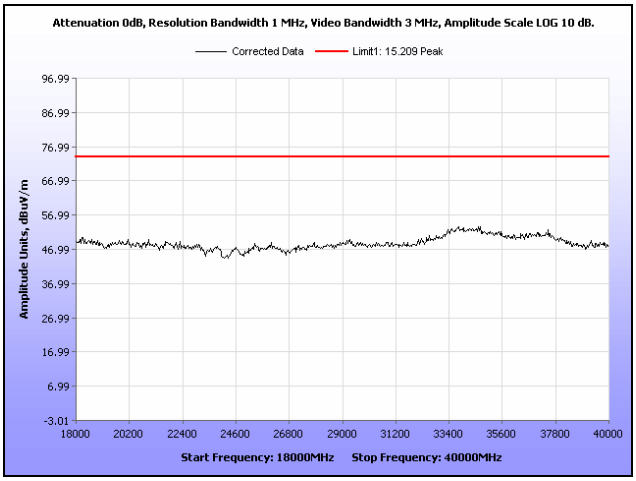
Plot 195. Radiated Spurious Emissions, 802.11g 40 MHz, Mid Channel, 4 GHz – 18 GHz, Average, 2.4 GHz



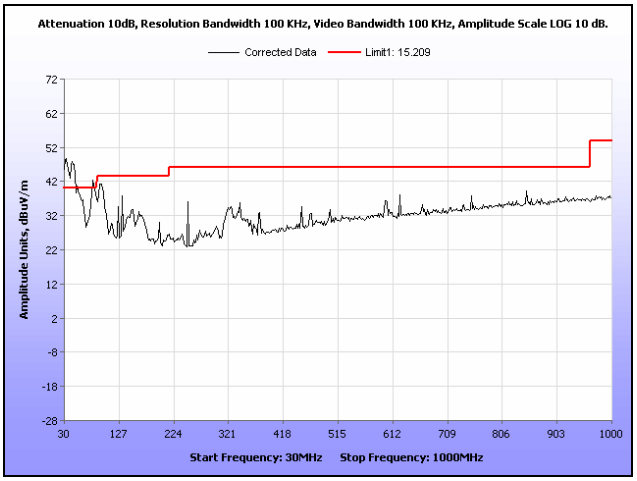
Plot 196. Radiated Spurious Emissions, 802.11g 40 MHz, Mid Channel, 1 GHz – 18 GHz, Peak, 2.4 GHz



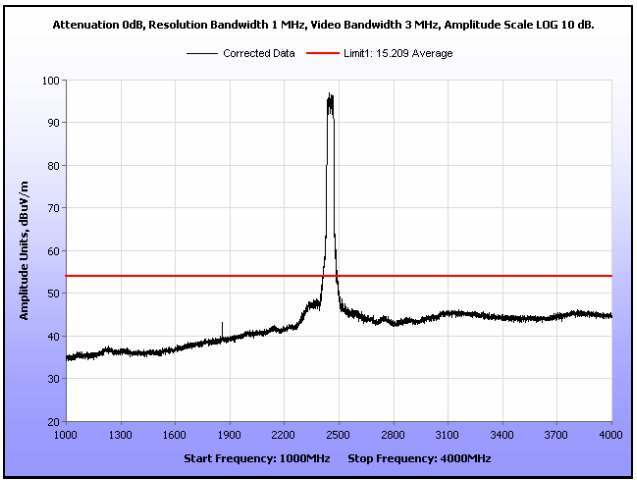
Plot 197. Radiated Spurious Emissions, 802.11g 40 MHz, Mid Channel, 18 GHz – 40 GHz, Average, 2.4 GHz



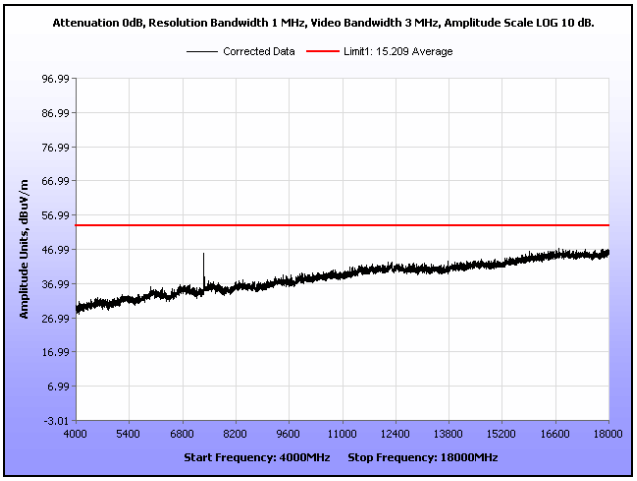
Plot 198. Radiated Spurious Emissions, 802.11g 40 MHz, Mid Channel, 18 GHz – 40 GHz, Peak, 2.4 GHz



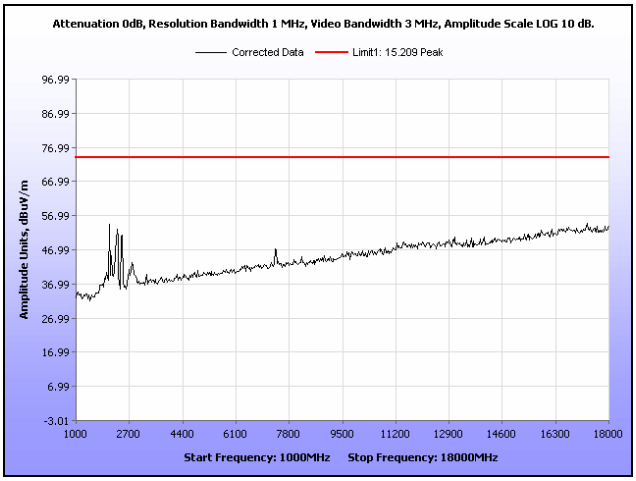
Plot 199. Radiated Spurious Emissions, 802.11g 40 MHz, High Channel, 30 MHz – 1 GHz, 2.4 GHz



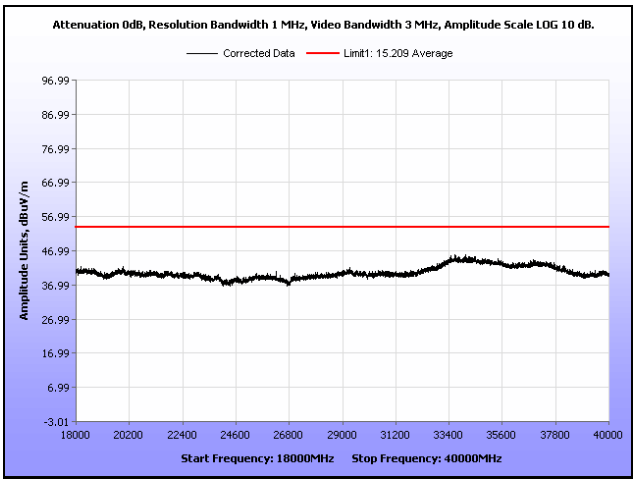
Plot 200. Radiated Spurious Emissions, 802.11g 40 MHz, High Channel, 1 GHz – 4 GHz, 2. 4 GHz



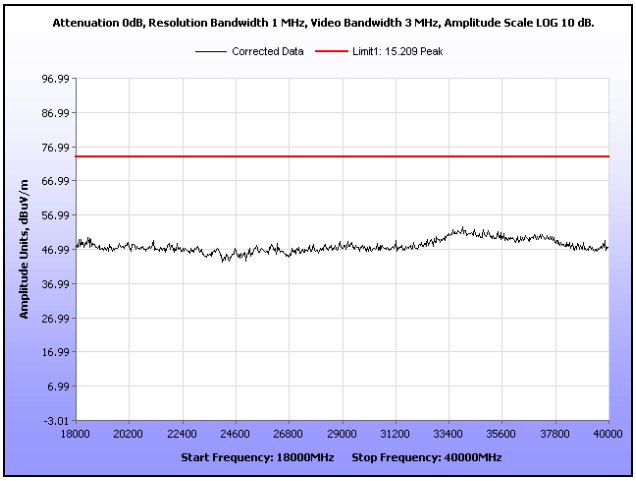
Plot 201. Radiated Spurious Emissions, 802.11g 40 MHz, High Channel, 4 GHz – 18 GHz, Average, 2. 4 GHz



Plot 202. Radiated Spurious Emissions, 802.11g 40 MHz, High Channel, 4 GHz – 18 GHz, Peak, 2. 4 GHz

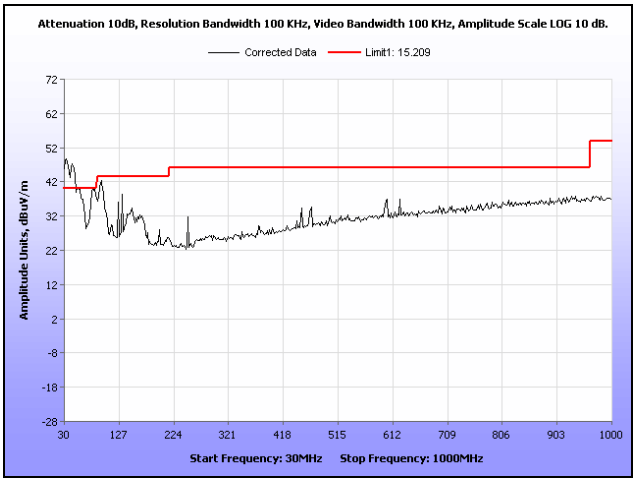


Plot 203. Radiated Spurious Emissions, 802.11g 40 MHz, High Channel, 18 GHz – 40 GHz, Average, 2. 4 GHz

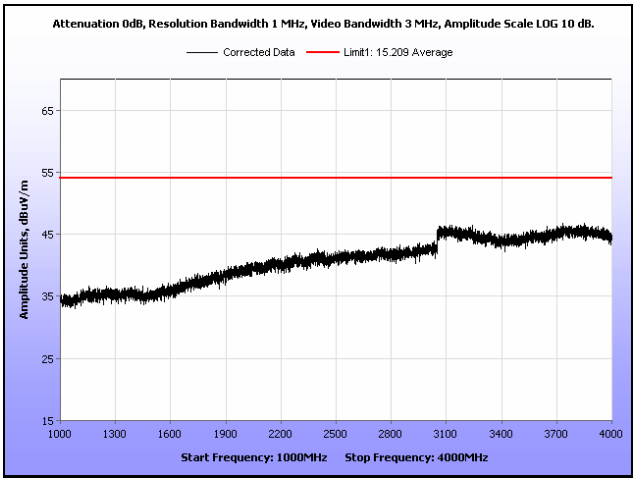


Plot 204. Radiated Spurious Emissions, 802.11g 40 MHz, High Channel, 18 GHz – 40 GHz, Peak, 2. 4 GHz

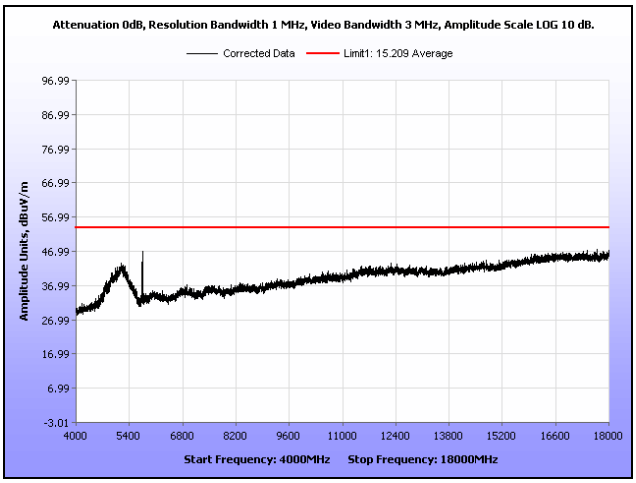
Radiated Spurious Emissions Test Results, 802.11a, 5.8 GHz



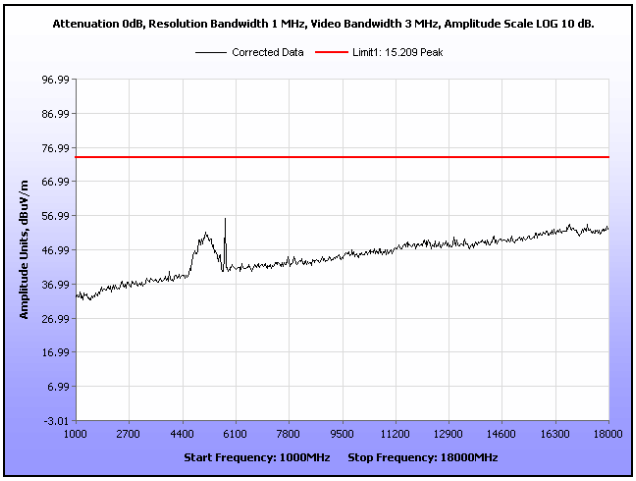
Plot 205. Radiated Spurious Emissions, 802.11a, Low Channel, 30 MHz – 1 GHz, 5.8 GHz



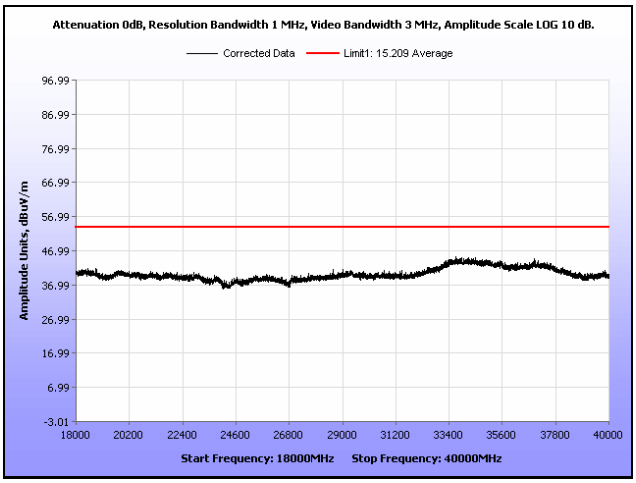
Plot 206. Radiated Spurious Emissions, 802.11a, Low Channel, 1 GHz – 4 GHz, 5.8 GHz



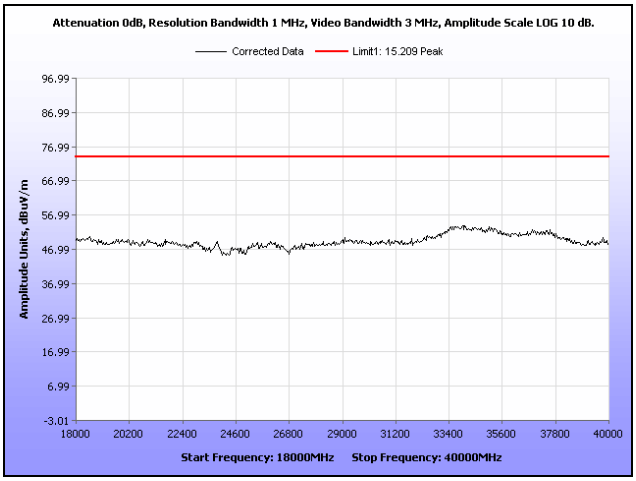
Plot 207. Radiated Spurious Emissions, 802.11a, Low Channel, 4 GHz – 18 GHz, Average, 5.8 GHz



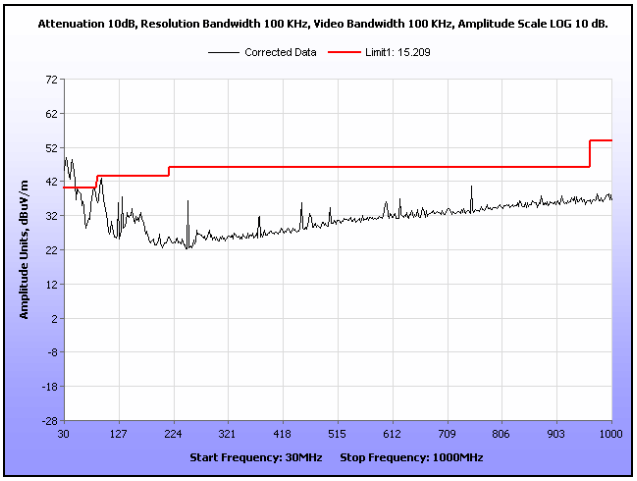
Plot 208. Radiated Spurious Emissions, 802.11a, Low Channel, 1 GHz – 18 GHz, Peak, 5.8 GHz



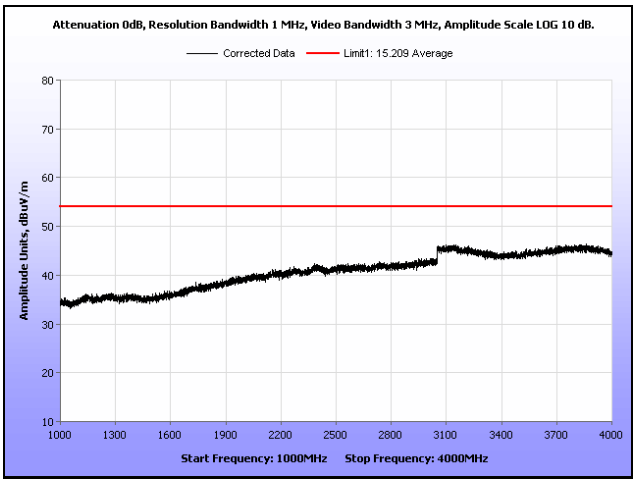
Plot 209. Radiated Spurious Emissions, 802.11a, Low Channel, 18 GHz – 40 GHz, Average, 5.8 GHz



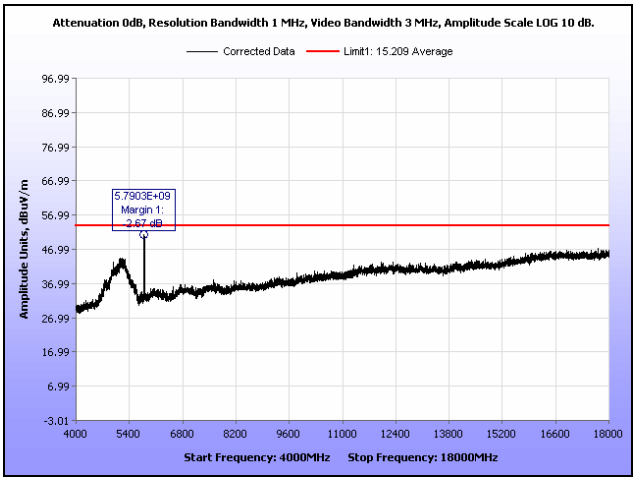
Plot 210. Radiated Spurious Emissions, 802.11a, Low Channel, 18 GHz – 40 GHz, Peak, 5.8 GHz



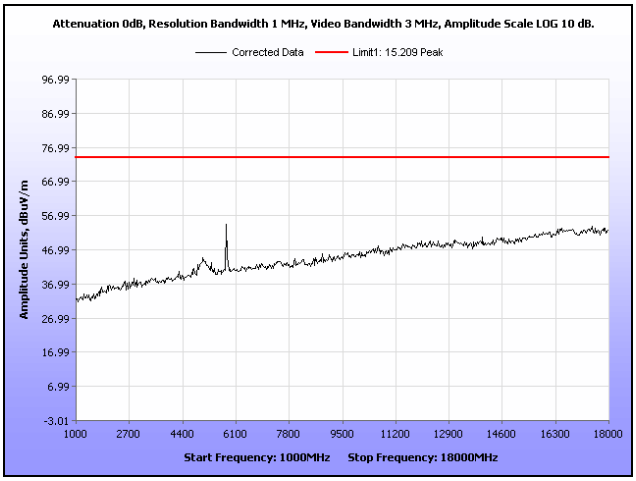
Plot 211. Radiated Spurious Emissions, 802.11a, Mid Channel, 30 MHz – 1 GHz, 5.8 GHz



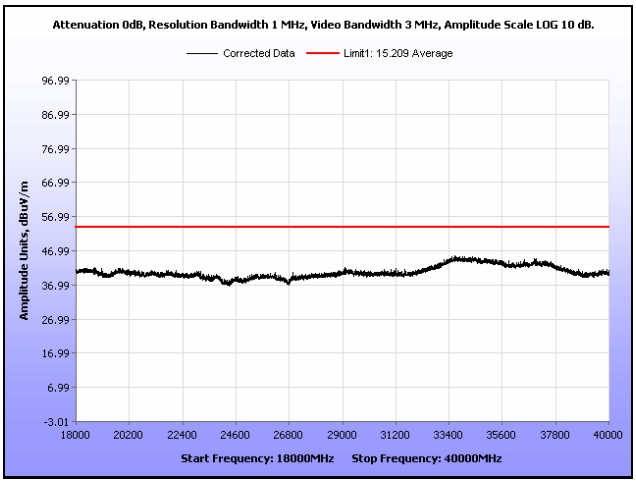
Plot 212. Radiated Spurious Emissions, 802.11a, Mid Channel, 1 GHz – 4 GHz, 5.8 GHz



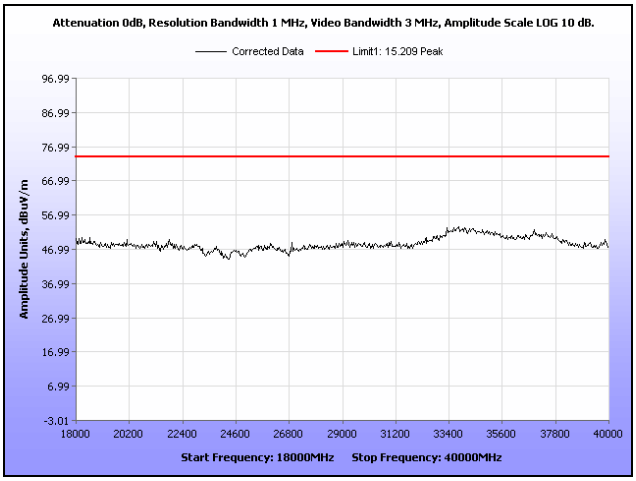
Plot 213. Radiated Spurious Emissions, 802.11a, Mid Channel, 4 GHz – 18 GHz, Average, 5.8 GHz



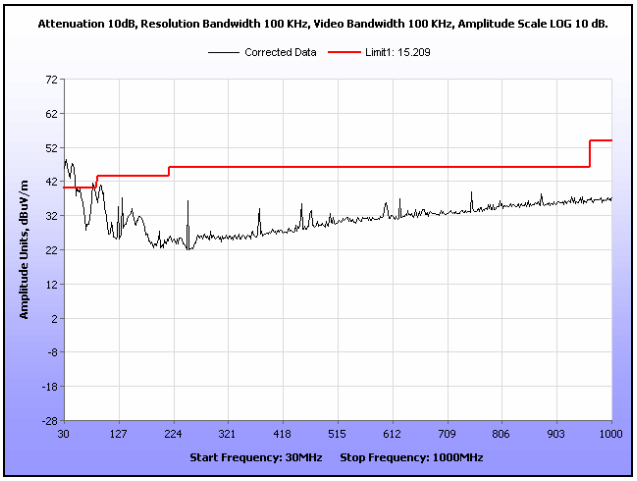
Plot 214. Radiated Spurious Emissions, 802.11a, Mid Channel, 1 GHz – 18 GHz, Peak, 5.8 GHz



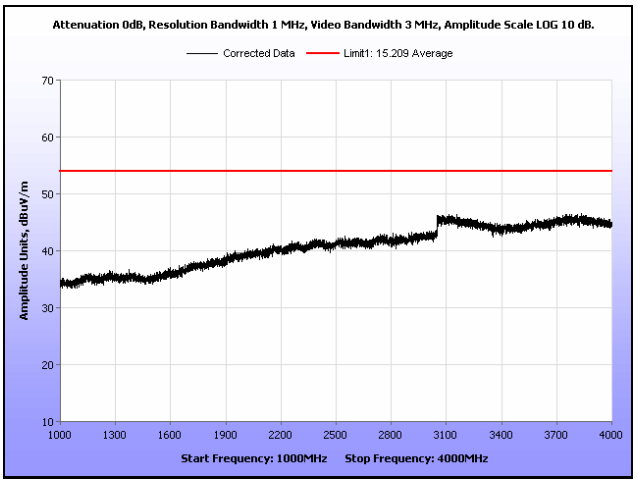
Plot 215. Radiated Spurious Emissions, 802.11a, Mid Channel, 18 GHz – 40 GHz, Average, 5.8 GHz



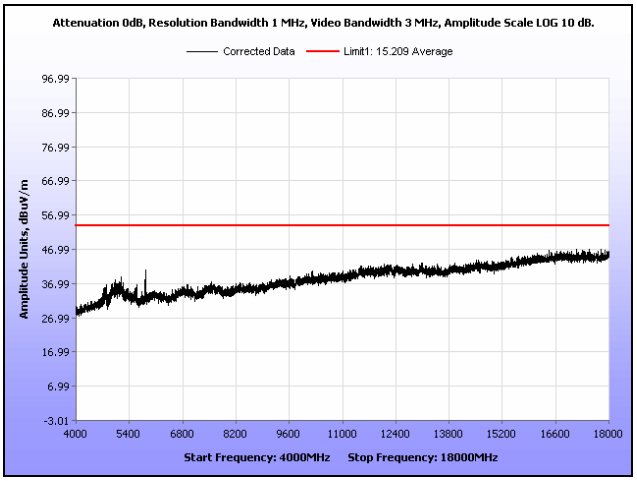
Plot 216. Radiated Spurious Emissions, 802.11a, Mid Channel, 18 GHz – 40 GHz, Peak, 5.8 GHz



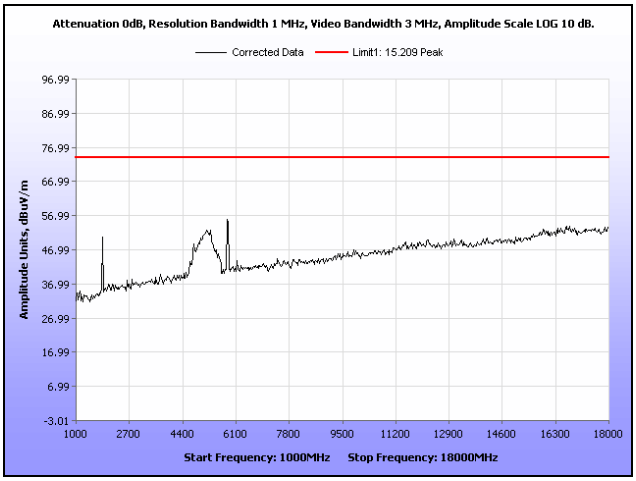
Plot 217. Radiated Spurious Emissions, 802.11a, High Channel, 30 MHz – 1 GHz, 5.8 GHz



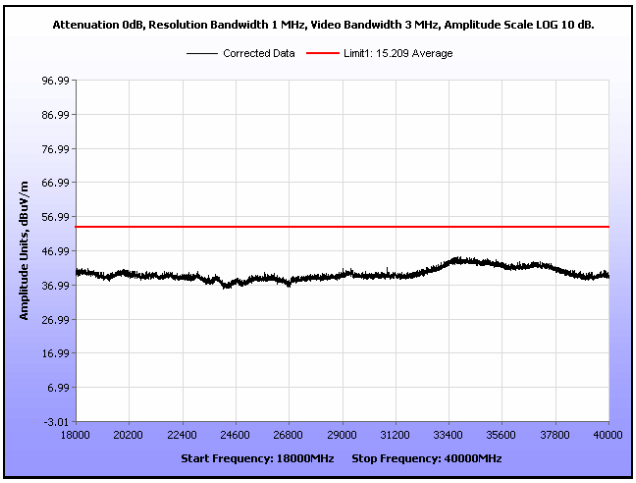
Plot 218. Radiated Spurious Emissions, 802.11a, High Channel, 1 GHz – 4 GHz, 5.8 GHz



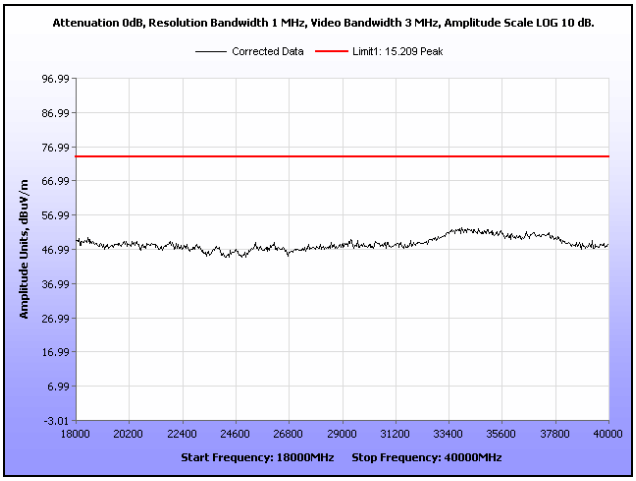
Plot 219. Radiated Spurious Emissions, 802.11a, High Channel, 4 GHz – 18 GHz, Average, 5.8 GHz



Plot 220. Radiated Spurious Emissions, 802.11a, High Channel, 1 GHz – 18 GHz, Peak, 5.8 GHz

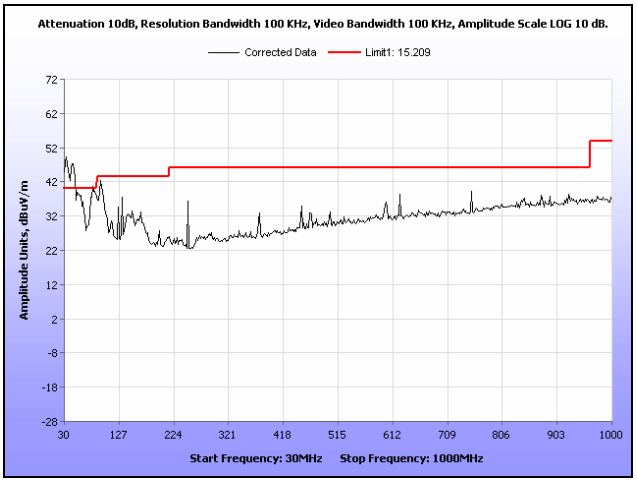


Plot 221. Radiated Spurious Emissions, 802.11a, High Channel, 18 GHz – 40 GHz, Average, 5.8 GHz

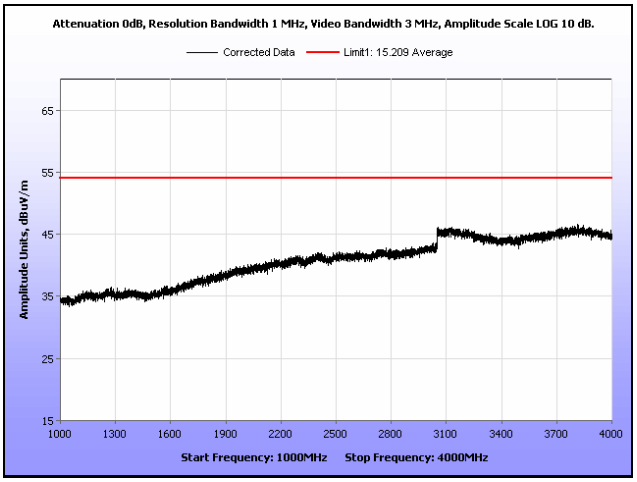


Plot 222. Radiated Spurious Emissions, 802.11a, High Channel, 18 GHz – 40 GHz, Peak, 5.8 GHz

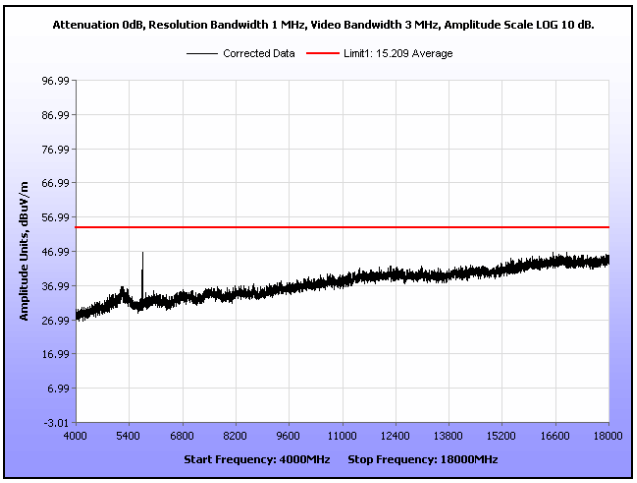
Radiated Spurious Emissions Test Results, 802.11n 20 MHz, 5.8 GHz



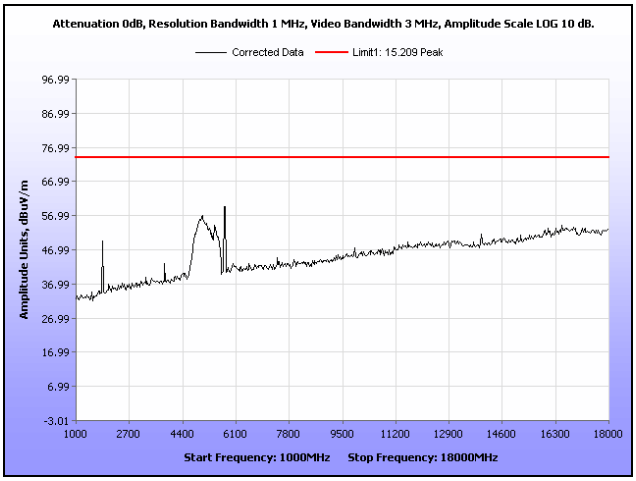
Plot 223. Radiated Spurious Emissions, 802.11n 20 MHz, Low Channel, 30 MHz – 1 GHz, 5.8 GHz



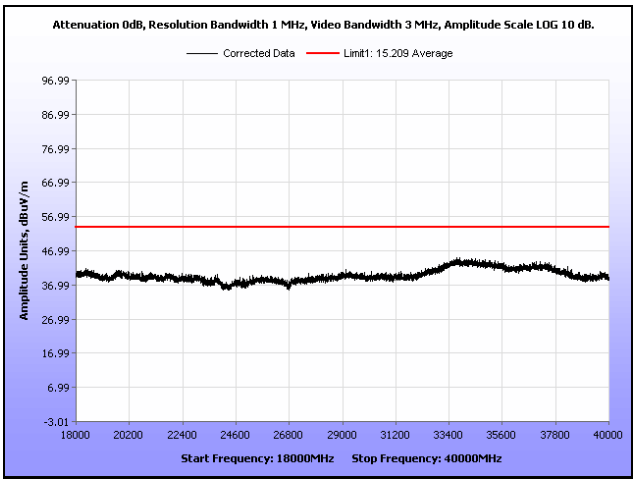
Plot 224. Radiated Spurious Emissions, 802.11n 20 MHz, Low Channel, 1 GHz – 4 GHz, 5.8 GHz



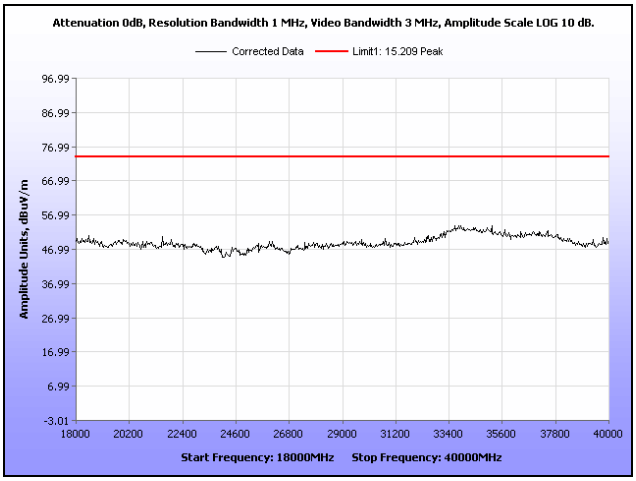
Plot 225. Radiated Spurious Emissions, 802.11n 20 MHz, Low Channel, 4 GHz – 18 GHz, Average, 5.8 GHz



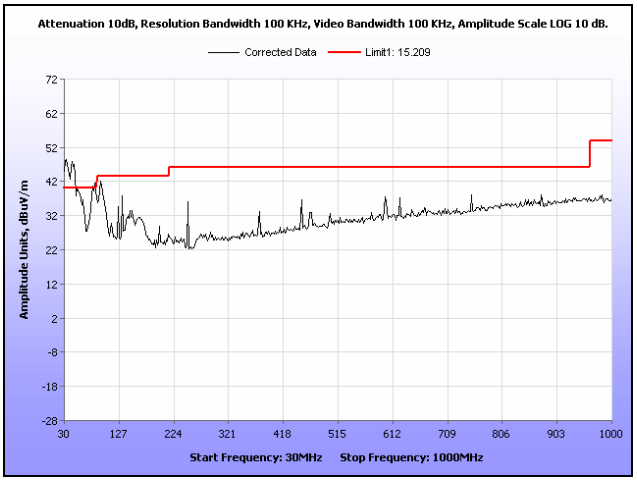
Plot 226. Radiated Spurious Emissions, 802.11n 20 MHz, Low Channel, 1 GHz – 18 GHz, Peak, 5.8 GHz



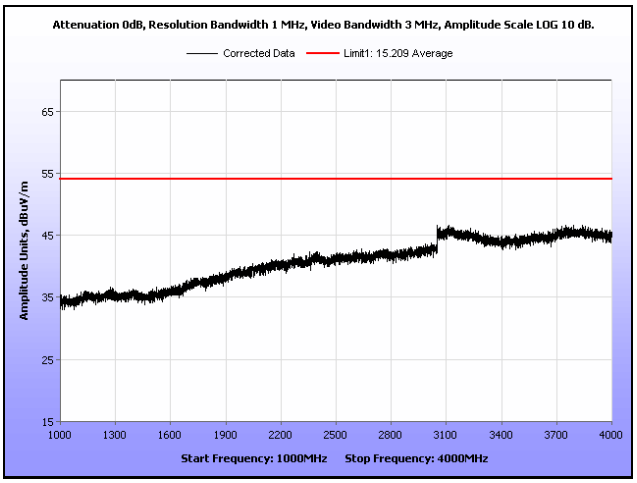
Plot 227. Radiated Spurious Emissions, 802.11n 20 MHz, Low Channel, 18 GHz – 40 GHz, Average, 5.8 GHz



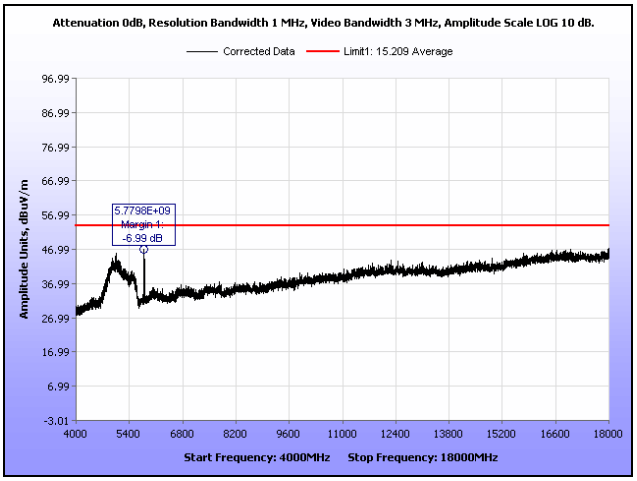
Plot 228. Radiated Spurious Emissions, 802.11n 20 MHz, Low Channel, 18 GHz – 40 GHz, Peak, 5.8 GHz



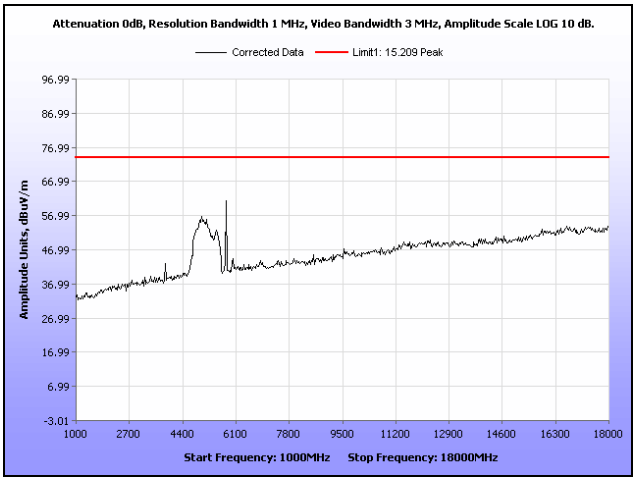
Plot 229. Radiated Spurious Emissions, 802.11n 20 MHz, Mid Channel, 30 MHz – 1 GHz, 5.8 GHz



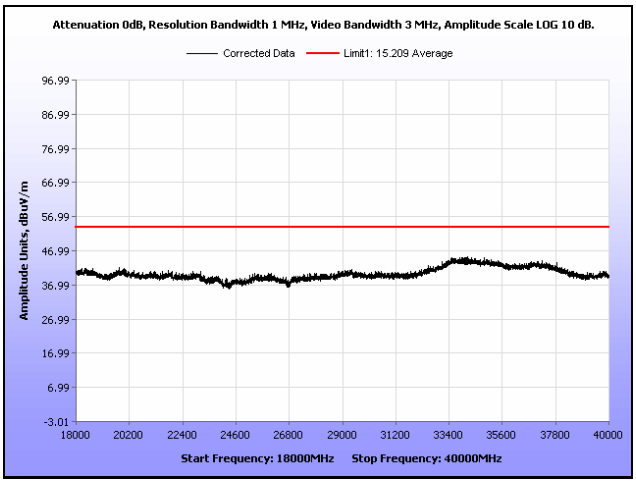
Plot 230. Radiated Spurious Emissions, 802.11n 20 MHz, Mid Channel, 1 GHz – 4 GHz, 5.8 GHz



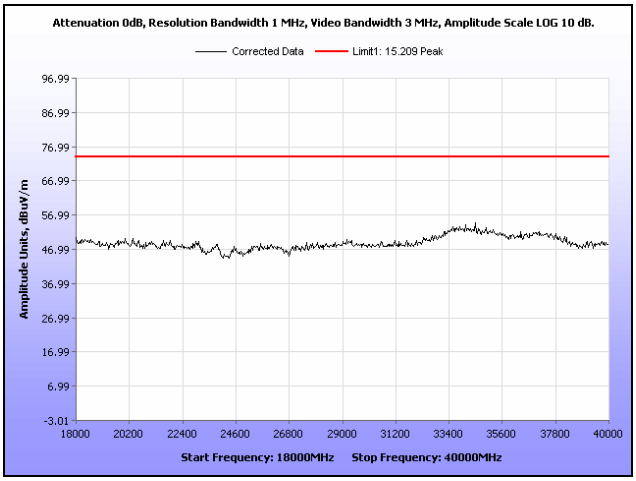
Plot 231. Radiated Spurious Emissions, 802.11n 20 MHz, Mid Channel, 4 GHz – 18 GHz, Average, 5.8 GHz



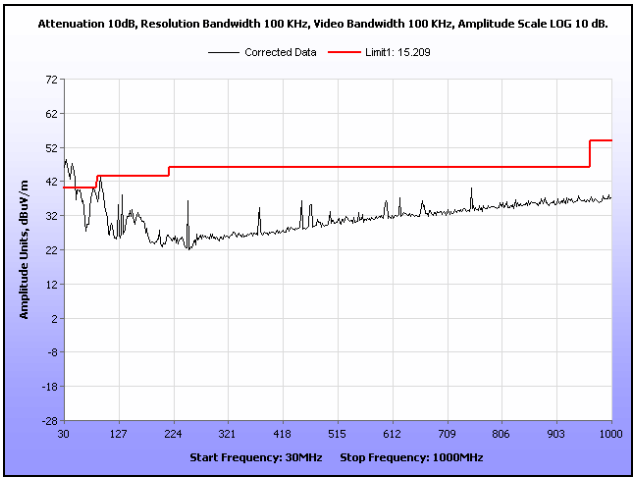
Plot 232. Radiated Spurious Emissions, 802.11n 20 MHz, Mid Channel, 1 GHz – 18 GHz, Peak, 5.8 GHz



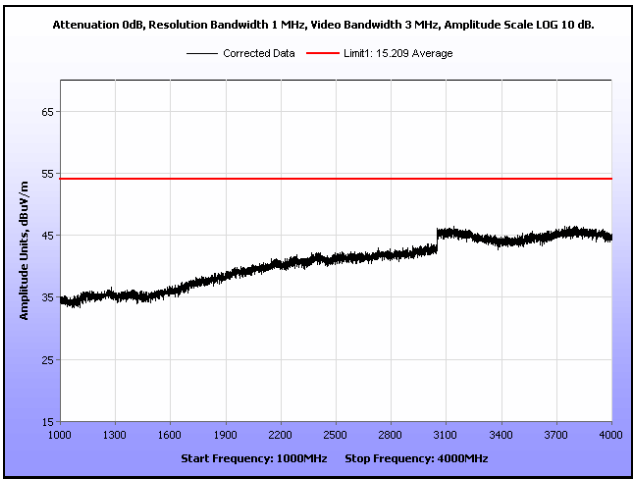
Plot 233. Radiated Spurious Emissions, 802.11n 20 MHz, Mid Channel, 18 GHz – 40 GHz, Average, 5.8 GHz



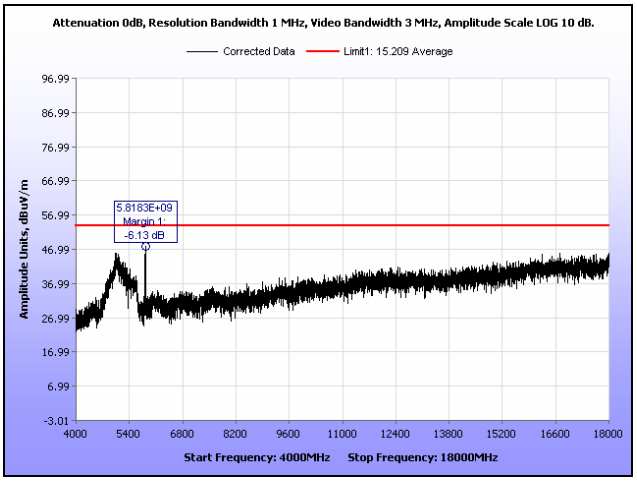
Plot 234. Radiated Spurious Emissions, 802.11n 20 MHz, Mid Channel, 18 GHz – 40 GHz, Peak, 5.8 GHz



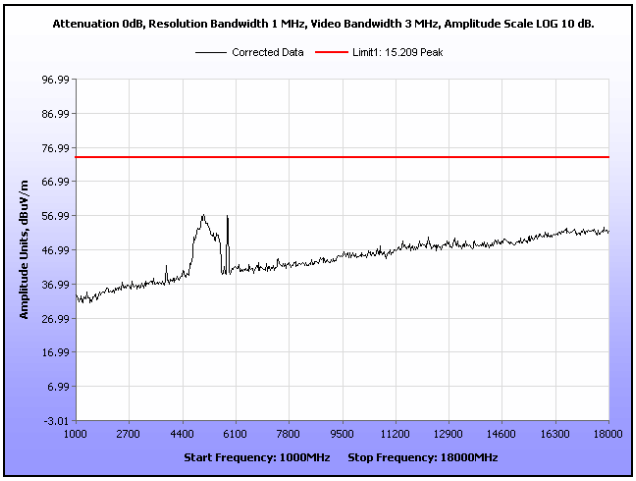
Plot 235. Radiated Spurious Emissions, 802.11n 20 MHz, High Channel, 30 MHz – 1 GHz, 5.8 GHz



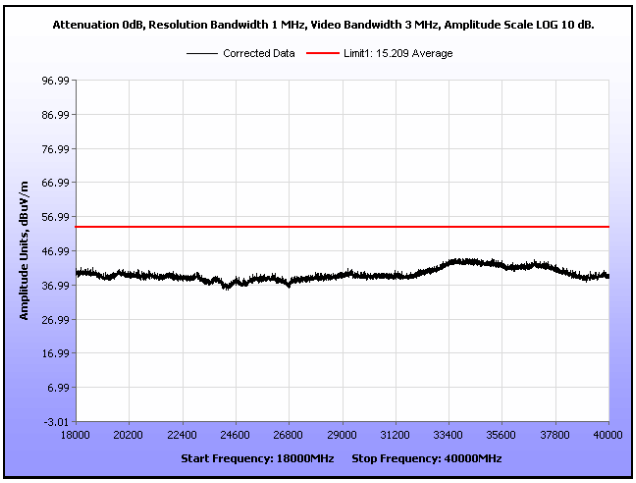
Plot 236. Radiated Spurious Emissions, 802.11n 20 MHz, High Channel, 1 GHz – 4 GHz, 5.8 GHz



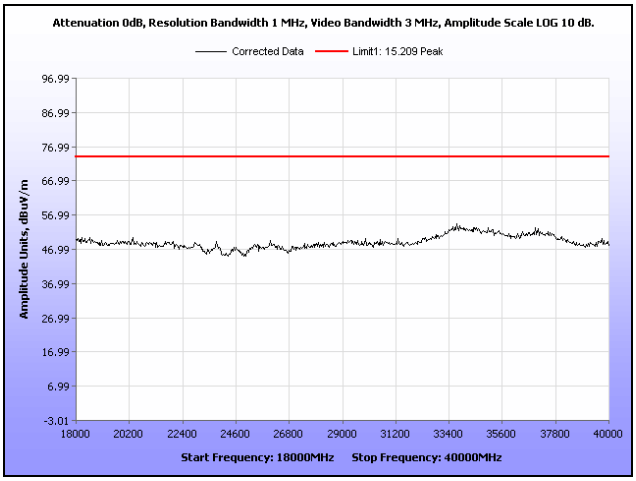
Plot 237. Radiated Spurious Emissions, 802.11n 20 MHz, High Channel, 4 GHz – 18 GHz, Average, 5.8 GHz



Plot 238. Radiated Spurious Emissions, 802.11n 20 MHz, High Channel, 1 GHz – 18 GHz, Peak, 5.8 GHz

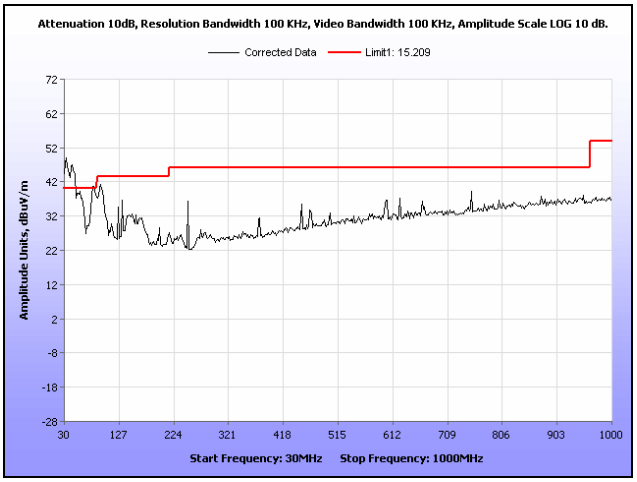


Plot 239. Radiated Spurious Emissions, 802.11n 20 MHz, High Channel, 18 GHz – 40 GHz, Average, 5.8 GHz

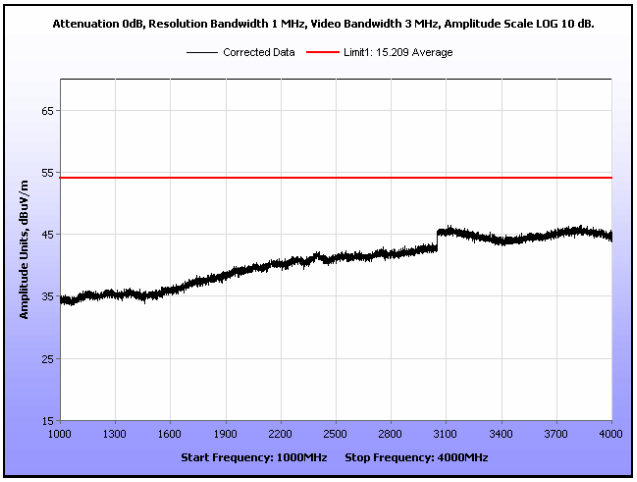


Plot 240. Radiated Spurious Emissions, 802.11n 20 MHz, High Channel, 18 GHz – 40 GHz, Peak, 5.8 GHz

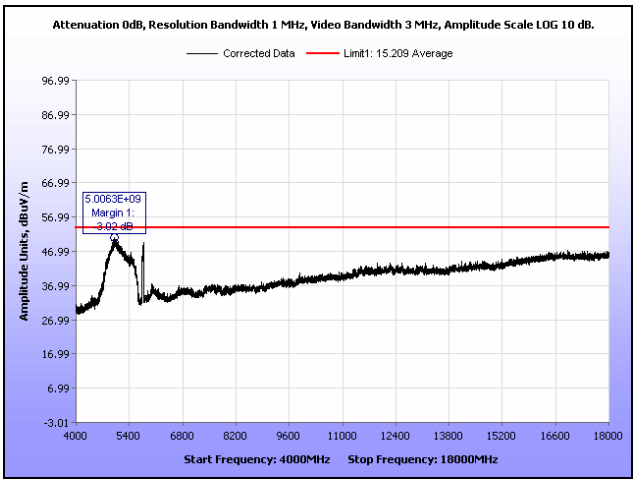
Radiated Spurious Emissions Test Results, 802.11n 40 MHz, 5.8 GHz



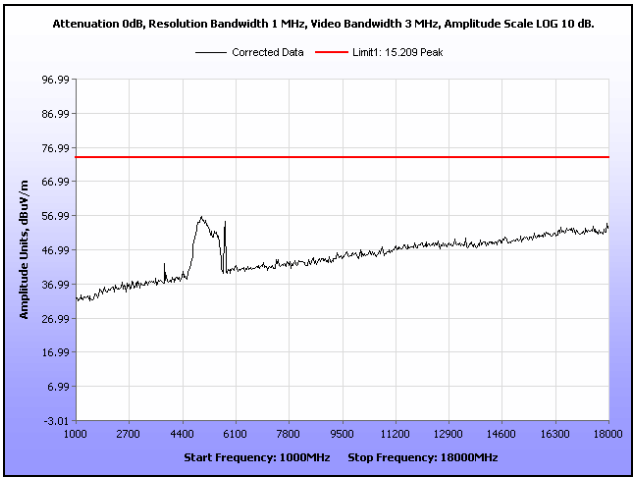
Plot 241. Radiated Spurious Emissions, 802.11n 40 MHz, Low Channel, 30 MHz – 1 GHz, 5.8 GHz



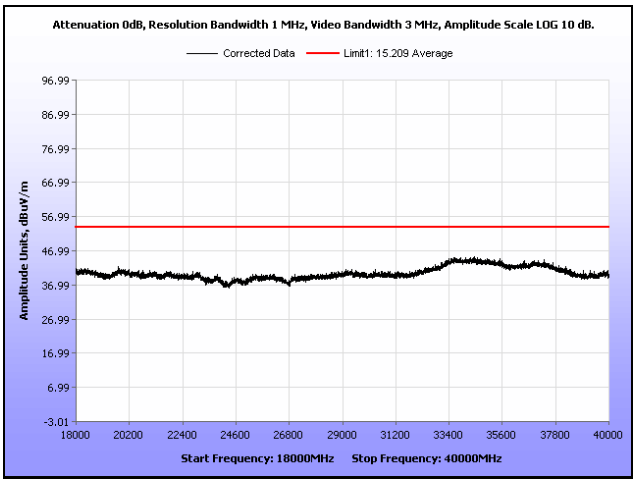
Plot 242. Radiated Spurious Emissions, 802.11n 40 MHz, Low Channel, 1 GHz – 4 GHz, 5.8 GHz



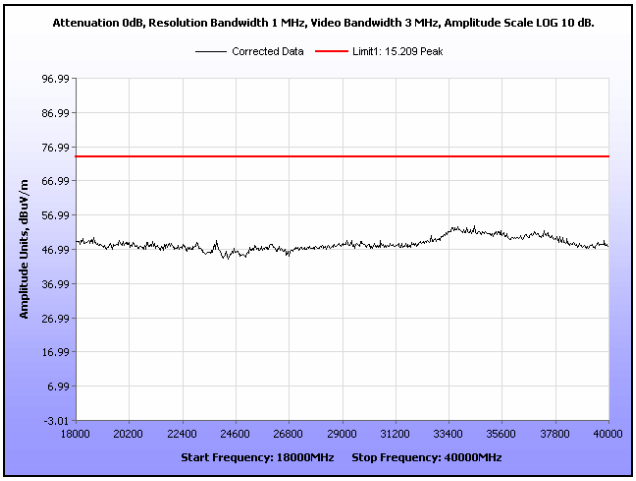
Plot 243. Radiated Spurious Emissions, 802.11n 40 MHz, Low Channel, 4 GHz – 18 GHz, Average, 5.8 GHz



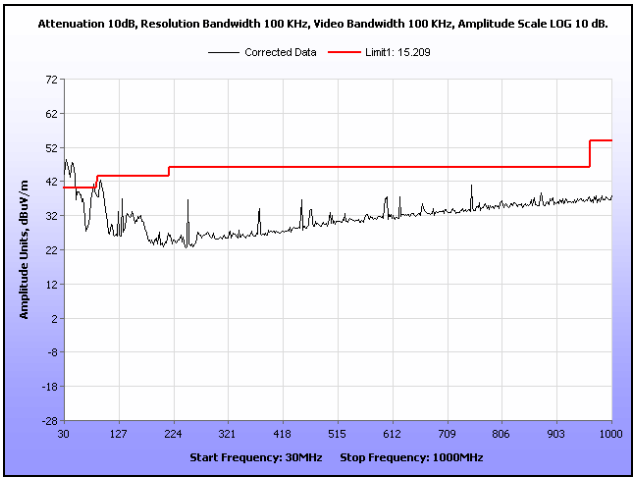
Plot 244. Radiated Spurious Emissions, 802.11n 40 MHz, Low Channel, 1 GHz – 18 GHz, Peak, 5.8 GHz



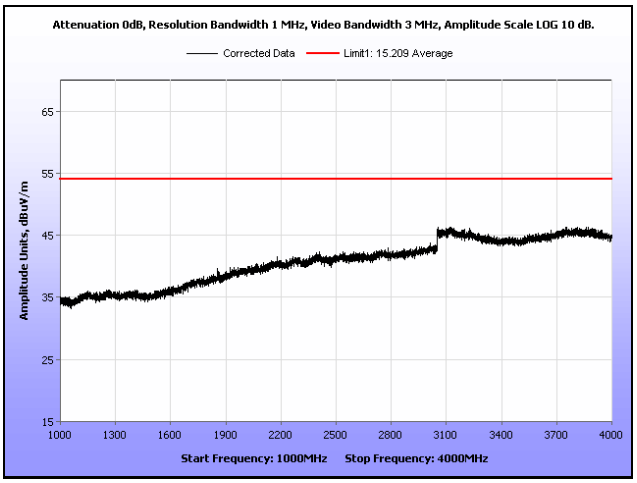
Plot 245. Radiated Spurious Emissions, 802.11n 40 MHz, Low Channel, 18 GHz – 40 GHz, Average, 5.8 GHz



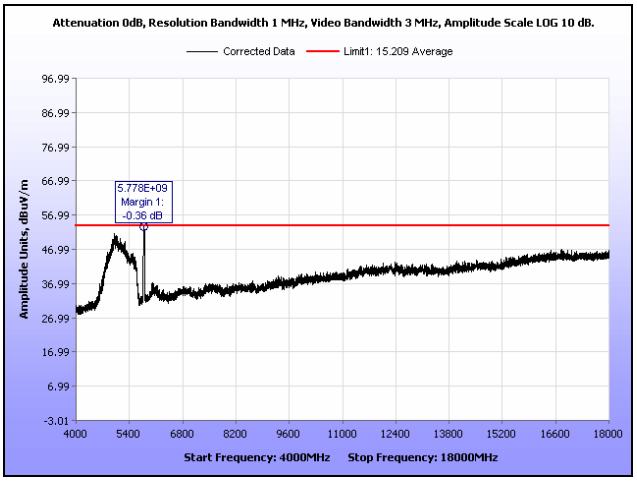
Plot 246. Radiated Spurious Emissions, 802.11n 40 MHz, Low Channel, 18 GHz – 40 GHz, Peak, 5.8 GHz



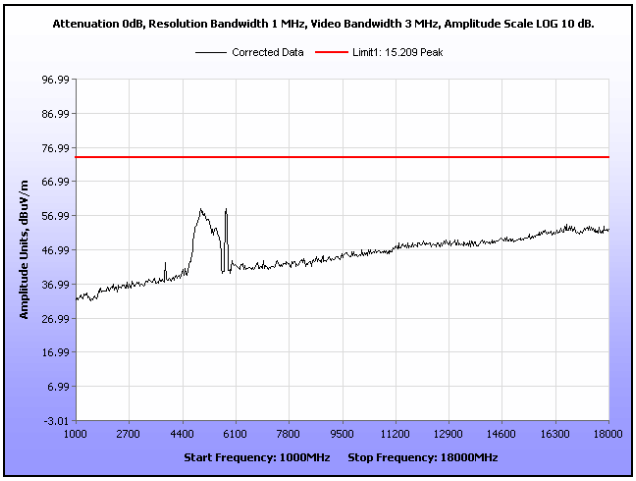
Plot 247. Radiated Spurious Emissions, 802.11n 40 MHz, Mid Channel, 30 MHz – 1 GHz, 5.8 GHz



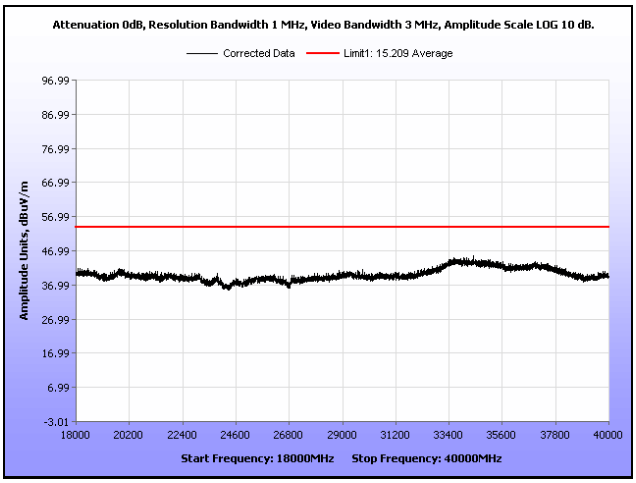
Plot 248. Radiated Spurious Emissions, 802.11n 40 MHz, Mid Channel, 1 GHz – 4 GHz, 5.8 GHz



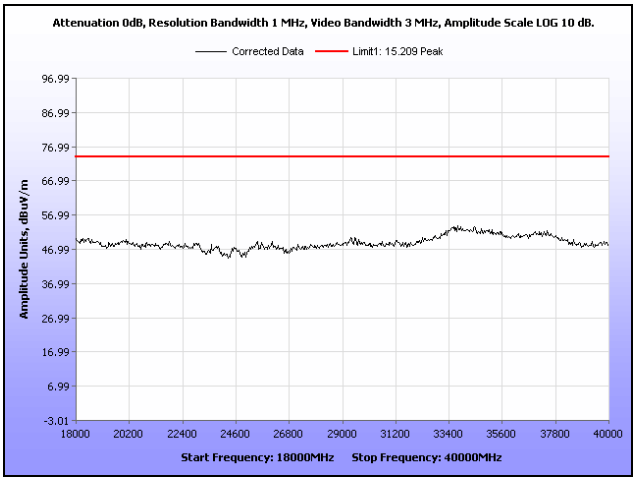
Plot 249. Radiated Spurious Emissions, 802.11n 40 MHz, Mid Channel, 4 GHz – 18 GHz, Average, 5.8 GHz



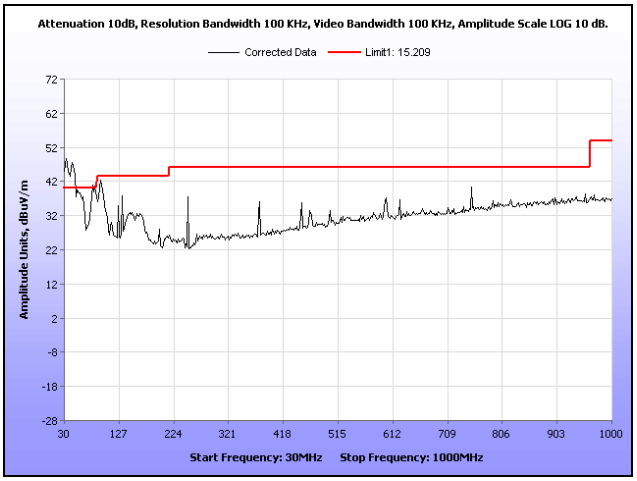
Plot 250. Radiated Spurious Emissions, 802.11n 40 MHz, Mid Channel, 1 GHz – 18 GHz, Peak, 5.8 GHz



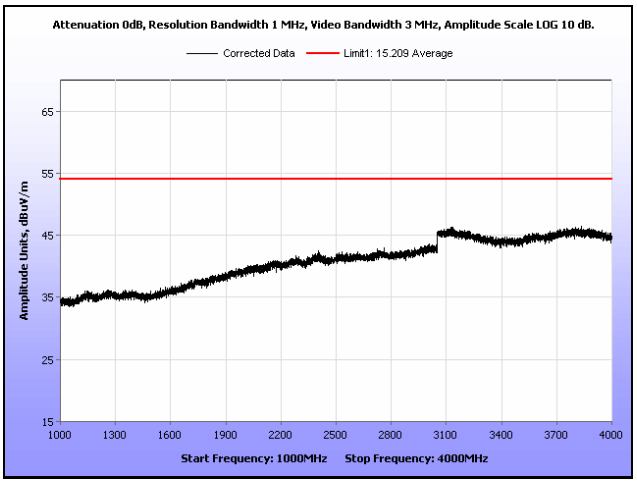
Plot 251. Radiated Spurious Emissions, 802.11n 40 MHz, Mid Channel, 18 GHz – 40 GHz, Average, 5.8 GHz



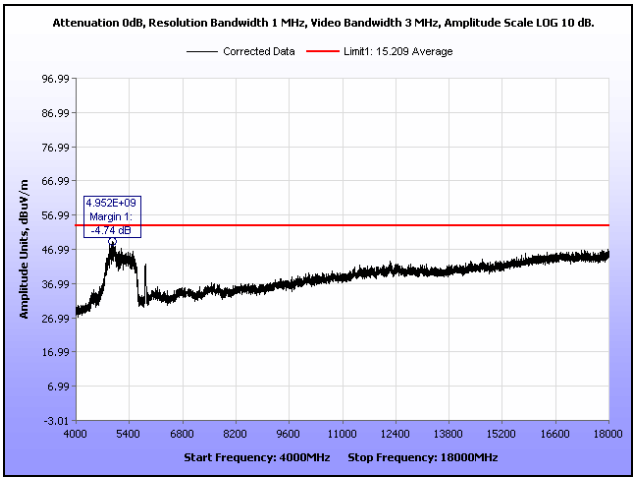
Plot 252. Radiated Spurious Emissions, 802.11n 40 MHz, Mid Channel, 18 GHz – 40 GHz, Peak, 5.8 GHz



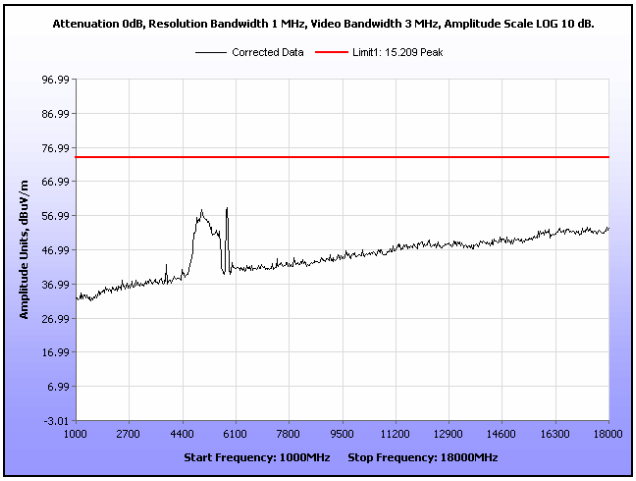
Plot 253. Radiated Spurious Emissions, 802.11n 40 MHz, High Channel, 30 MHz – 1 GHz, 5.8 GHz



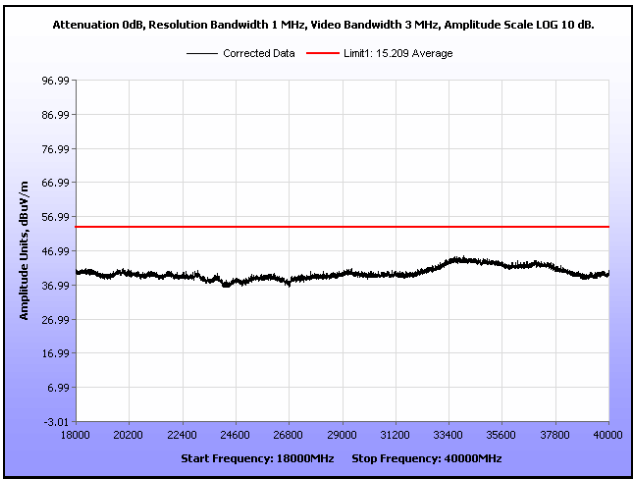
Plot 254. Radiated Spurious Emissions, 802.11n 40 MHz, High Channel, 1 GHz – 4 GHz, 2. 4 GHz



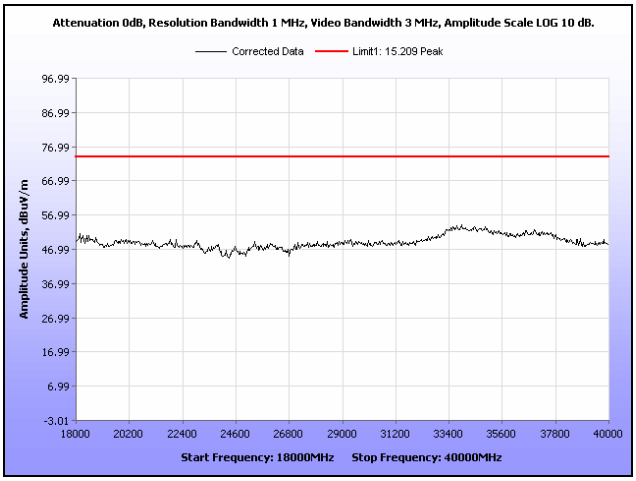
Plot 255. Radiated Spurious Emissions, 802.11n 40 MHz, High Channel, 4 GHz – 18 GHz, Average, 2. 4 GHz



Plot 256. Radiated Spurious Emissions, 802.11n 40 MHz, High Channel, 4 GHz – 18 GHz, Peak, 2. 4 GHz



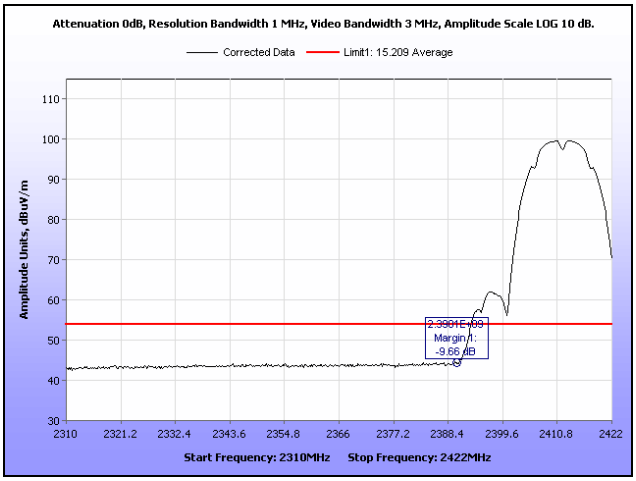
Plot 257. Radiated Spurious Emissions, 802.11n 40 MHz, High Channel, 18 GHz – 40 GHz, Average, 2. 4 GHz



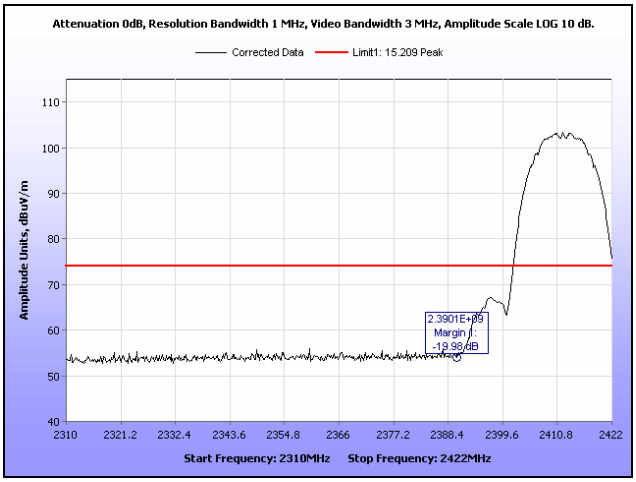
Plot 258. Radiated Spurious Emissions, 802.11n 40 MHz, High Channel, 18 GHz – 40 GHz, Peak, 2. 4 GHz

Radiated Band Edge Measurements

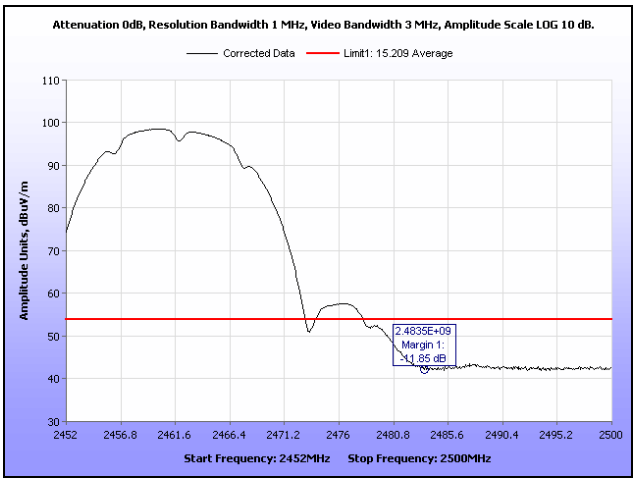
Test Procedures: The transmitter was turned on. Measurements were performed of the low, mid and high Channels. The EUT was rotated orthogonally through all three axes. Plots shown are corrected for both antenna correction factor and distance and compared to a 3 m limit line.



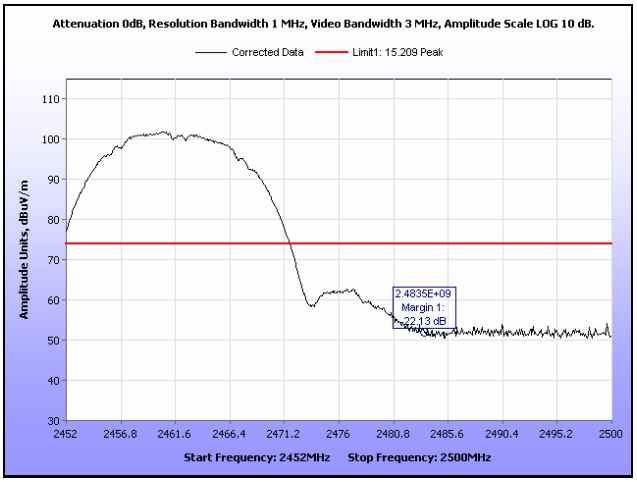
Plot 259. Radiated Restricted Band Edge, 802.11b, Low Channel, Average



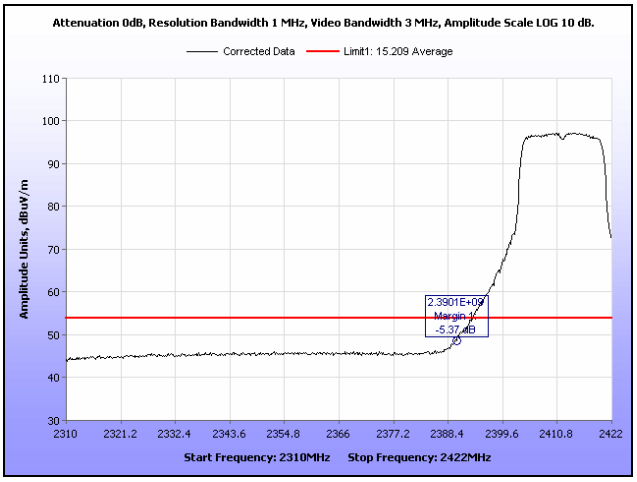
Plot 260. Radiated Restricted Band Edge, 802.11b, Low Channel, Peak



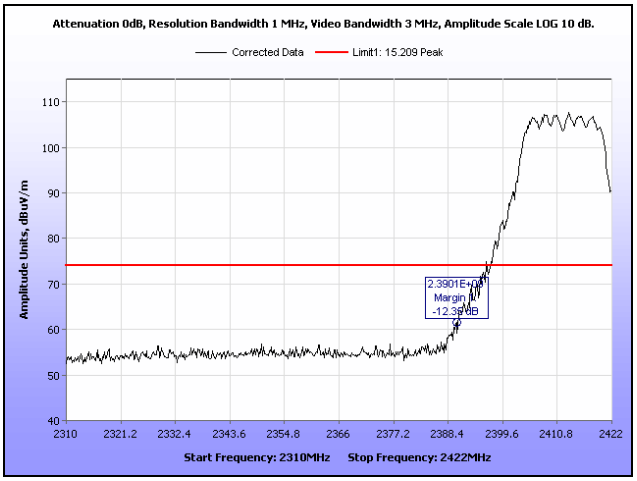
Plot 261. Radiated Restricted Band Edge, 802.11b, High Channel, Average



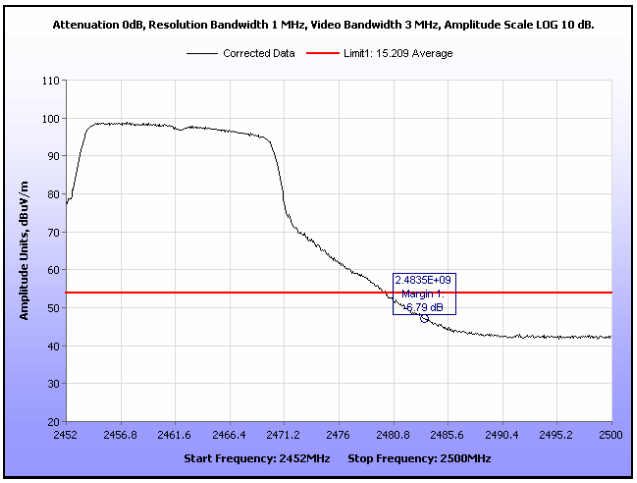
Plot 262. Radiated Restricted Band Edge, 802.11b, High Channel, Peak



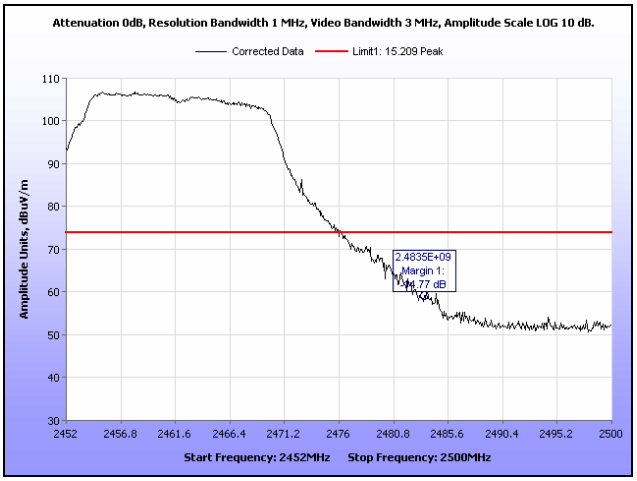
Plot 263. Radiated Restricted Band Edge, 802.11g, Low Channel, Average



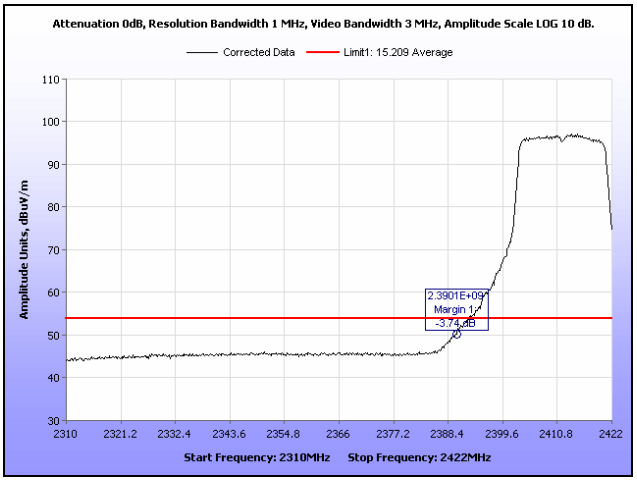
Plot 264. Radiated Restricted Band Edge, 802.11g, Low Channel, Peak



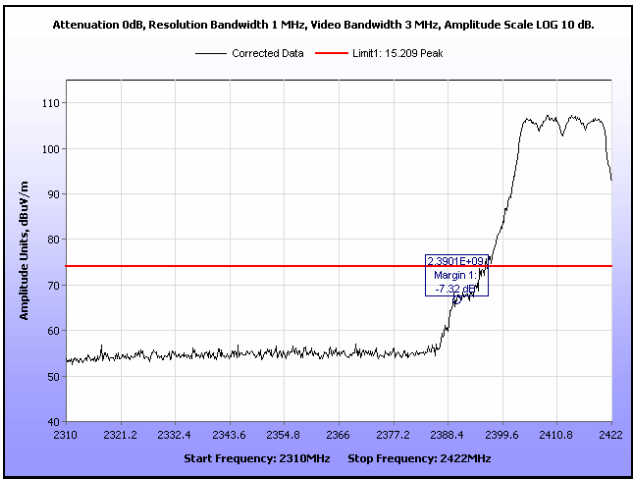
Plot 265. Radiated Restricted Band Edge, 802.11g, High Channel, Average



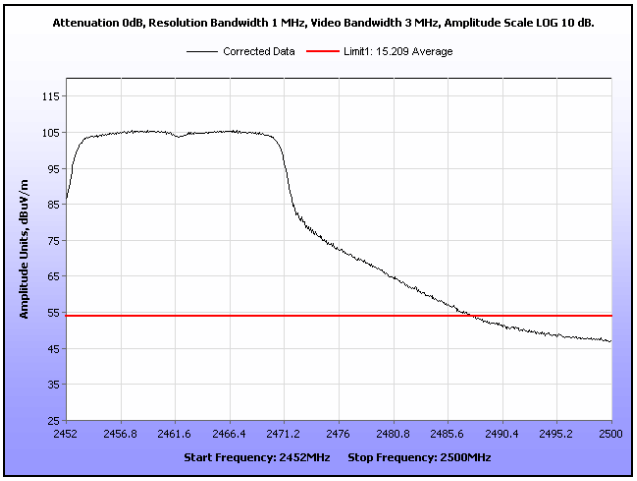
Plot 266. Radiated Restricted Band Edge, 802.11g, High Channel, Peak



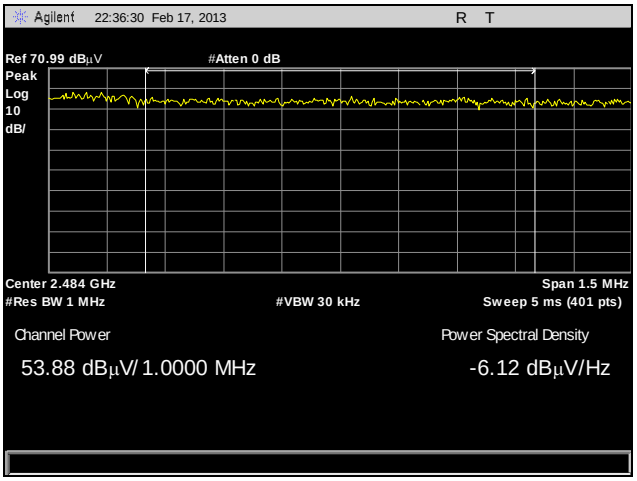
Plot 267. Radiated Restricted Band Edge, 802.11g 20 MHz, Low Channel, Average



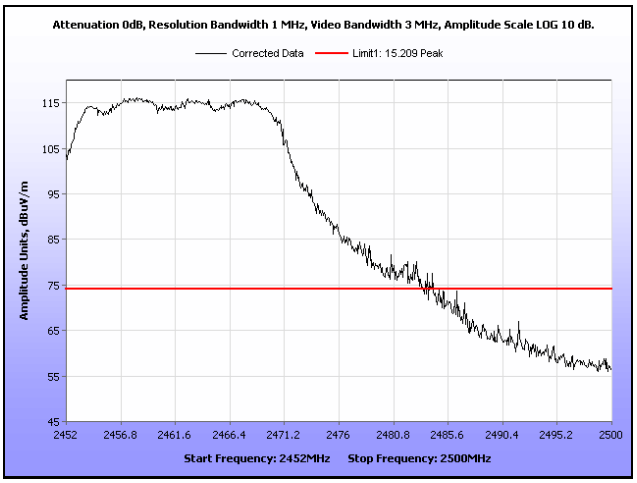
Plot 268. Radiated Restricted Band Edge, 802.11g 20 MHz, Low Channel, Peak



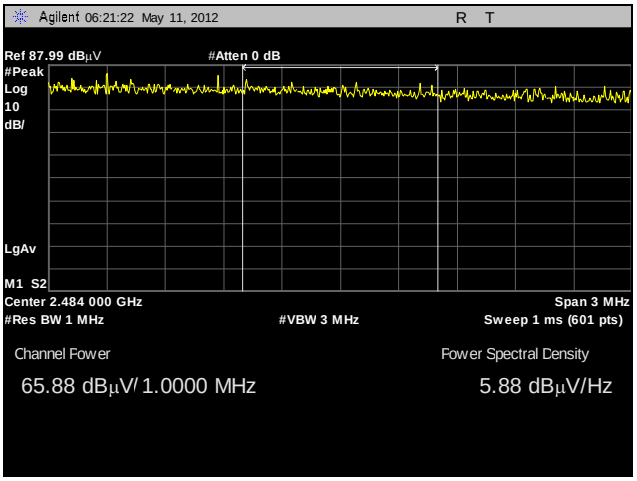
Plot 269. Radiated Restricted Band Edge, 802.11g 20 MHz, High Channel, Average



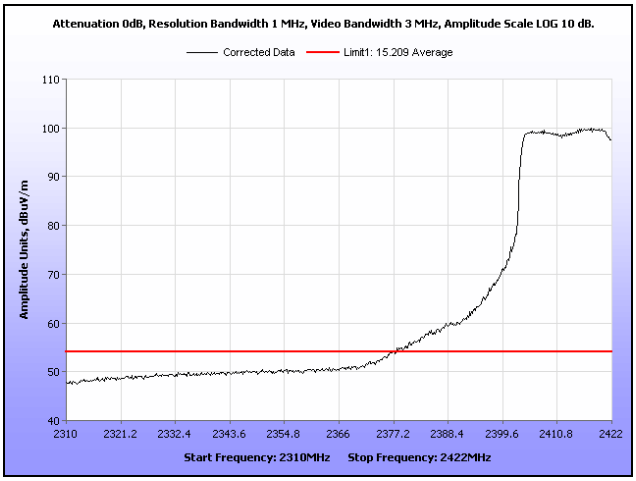
Plot 270. Radiated Restricted Band Edge, 802.11g 20 MHz, High Channel, 1 MHz Integration, Average



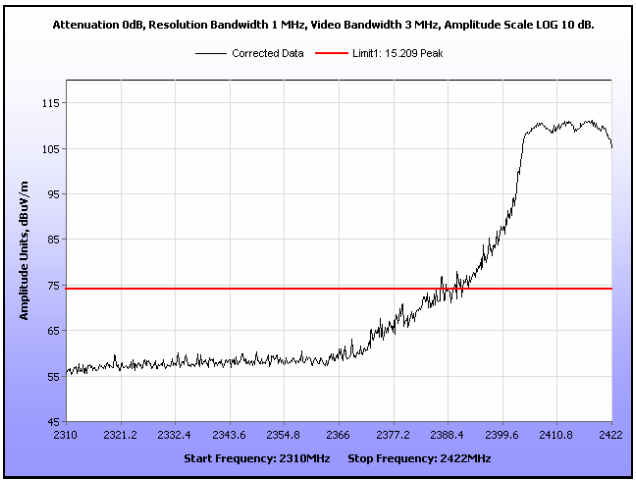
Plot 271. Radiated Restricted Band Edge, 802.11g 20 MHz, High Channel, Peak



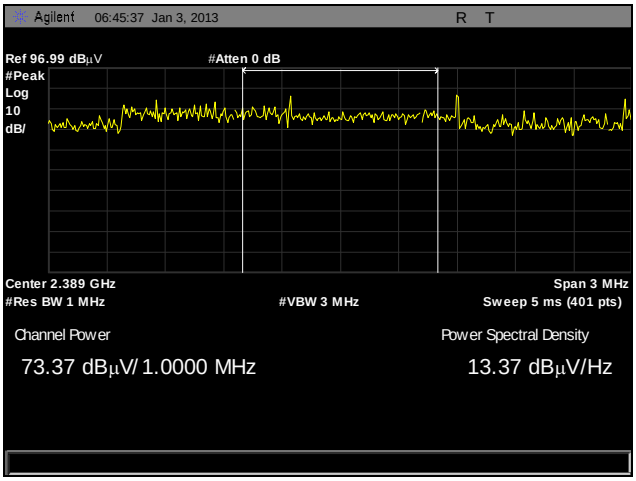
Plot 272. Radiated Restricted Band Edge, 802.11g 20 MHz, High Channel, 1 MHz Integration, Peak



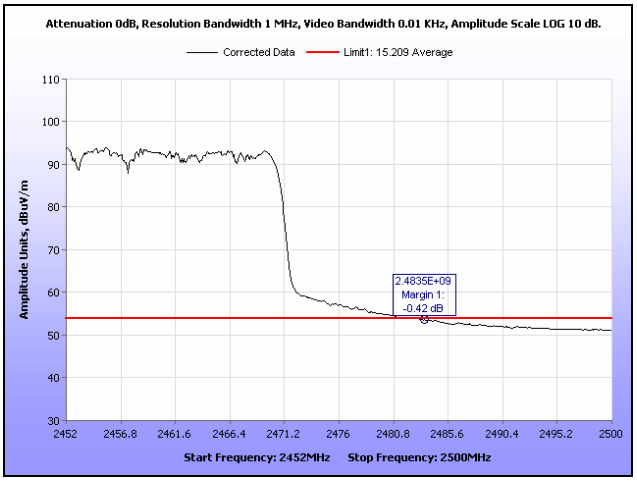
Plot 273. Radiated Restricted Band Edge, 802.11g 40 MHz, Low Channel, Average



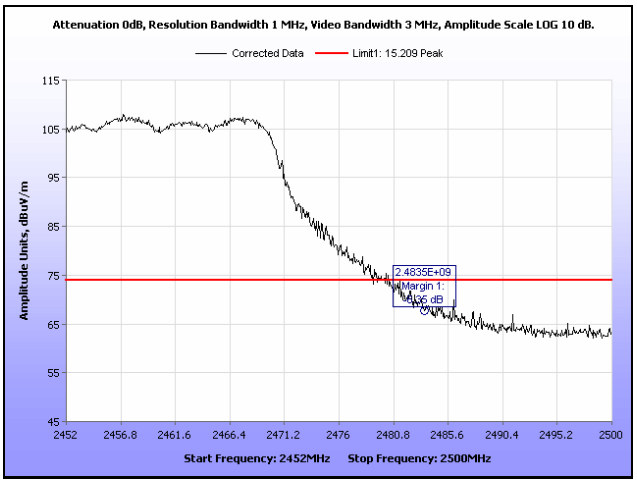
Plot 274. Radiated Restricted Band Edge, 802.11g 40 MHz, Low Channel, Peak



Plot 275. Radiated Restricted Band Edge, 802.11g 40 MHz, Low Channel, 1 MHz Integration, Peak



Plot 276. Radiated Restricted Band Edge, 802.11g (40 MHz), High Channel, Average



Plot 277. Radiated Restricted Band Edge, 802.11g (40 MHz), High Channel, Peak

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.247(d) RF Conducted Spurious Emissions Requirements and Band Edge

Test Requirement: **15.247(d)** In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at leas 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

Test Procedure: For intentional radiators with a digital device portion which operates below 10 GHz, the spectrum was investigated as per §15.33(a)(1) and §15.33(a)(4); i.e., the lowest RF signal generated or used in the device up to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower.

Since the EUT had an integral antenna, conducted measurements could not be performed. Measurements needed to be taken radiated. An antenna was located 3 m away from the EUT and plots were taken. The EUT was rotated through all three orthogonal axes. The plots were corrected for both antenna correction factor and cable lost.

See following pages for detailed test results with RF Conducted Spurious Emissions.

Test Results: The EUT was compliant with the Conducted Spurious Emission limits of **§15.247(d)**.

Test Engineer(s): Jeff Pratt

Test Date(s): 03/07/11

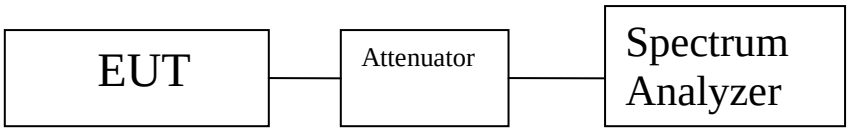
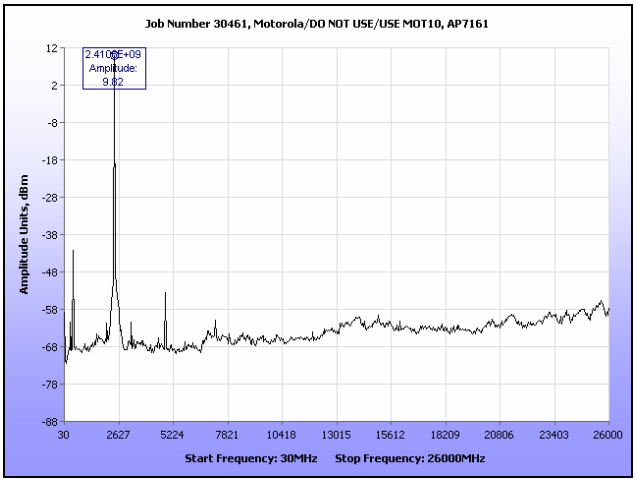
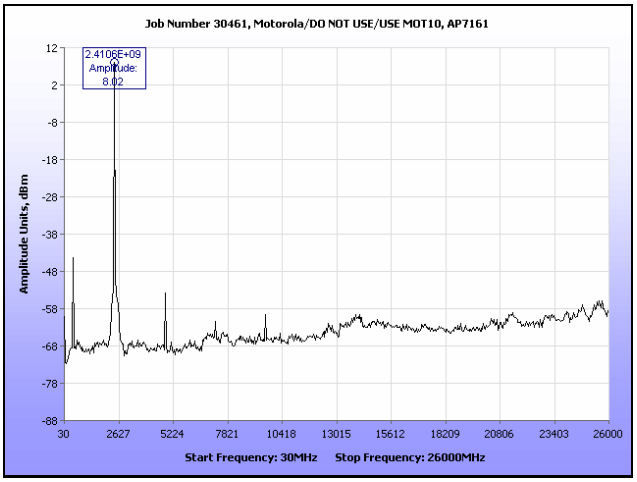


Figure 4. Block Diagram, Conducted Spurious Emissions Test Setup

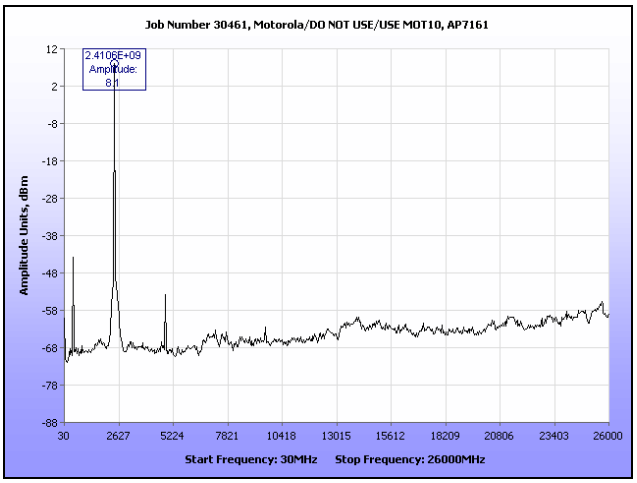
Conducted Spurious Emissions Test Results, 2.4 GHz



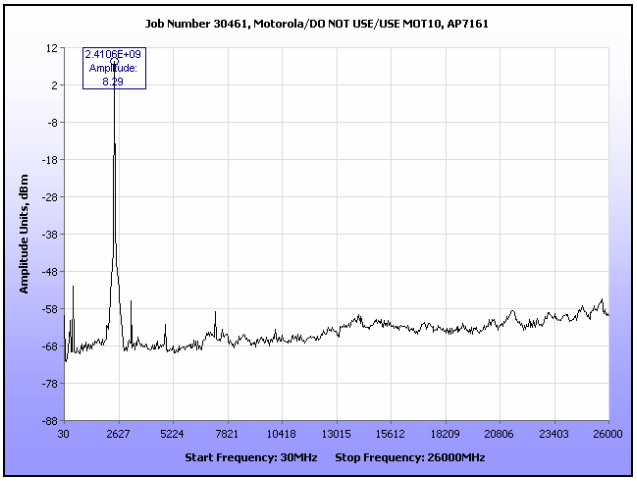
Plot 278. Conducted Spurious Emissions, Low Channel, 802.11b, A



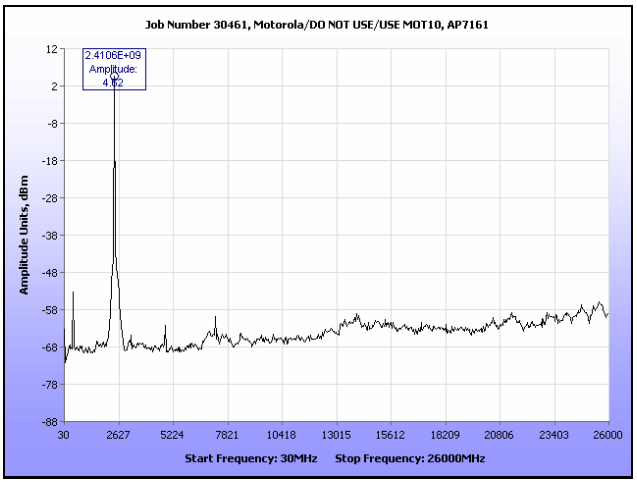
Plot 279. Conducted Spurious Emissions, Low Channel, 802.11b, B



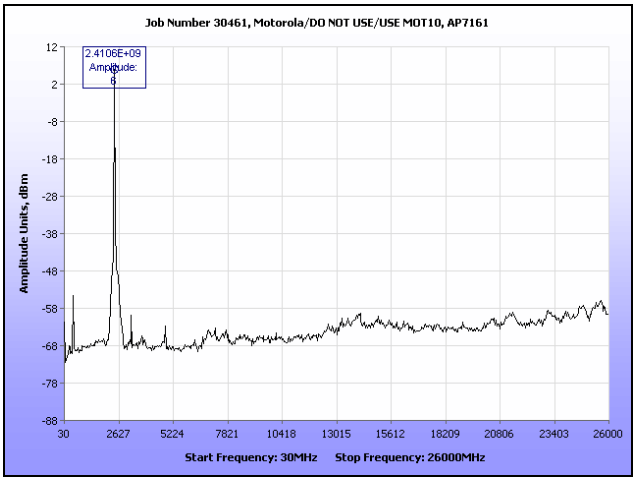
Plot 280. Conducted Spurious Emissions, Low Channel, 802.11b, C



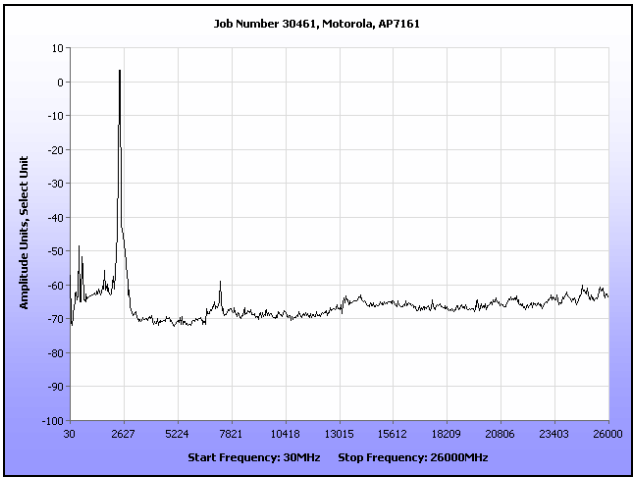
Plot 281. Conducted Spurious Emissions, Low Channel, 802.11g 20 MHz, A



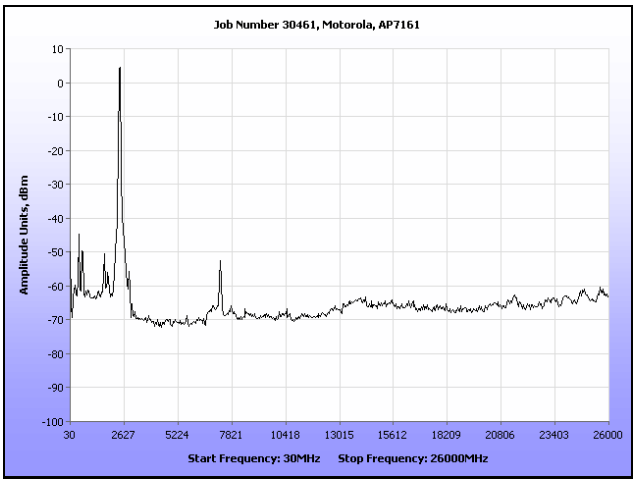
Plot 282. Conducted Spurious Emissions, Low Channel, 802.11g 20 MHz, B



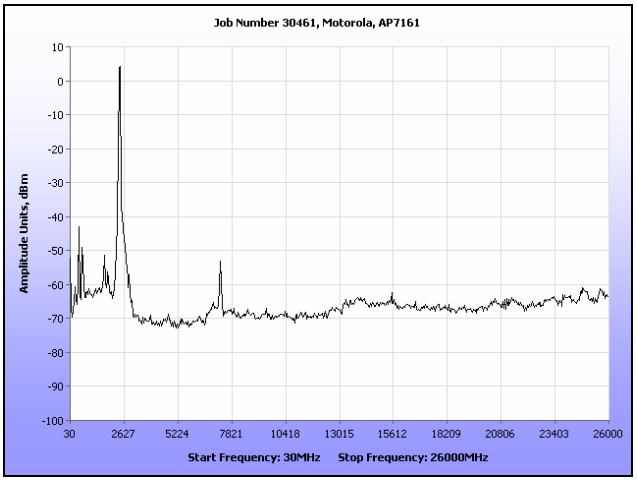
Plot 283. Conducted Spurious Emissions, Low Channel, 802.11g 20 MHz, C



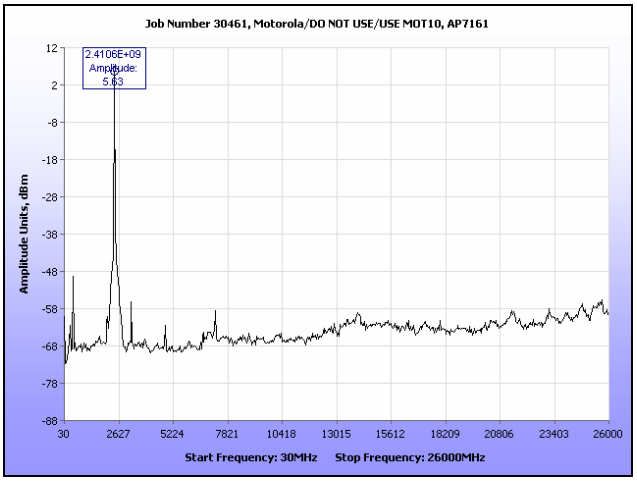
Plot 284. Conducted Spurious Emissions, Low Channel, 802.11g 40 MHz, A



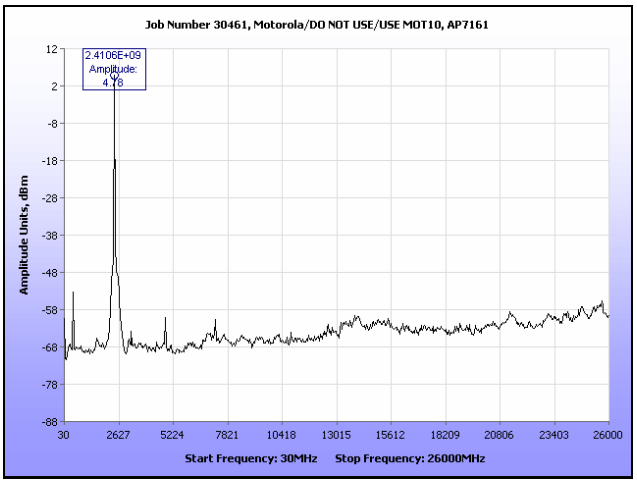
Plot 285. Conducted Spurious Emissions, Low Channel, 802.11g 40 MHz, B



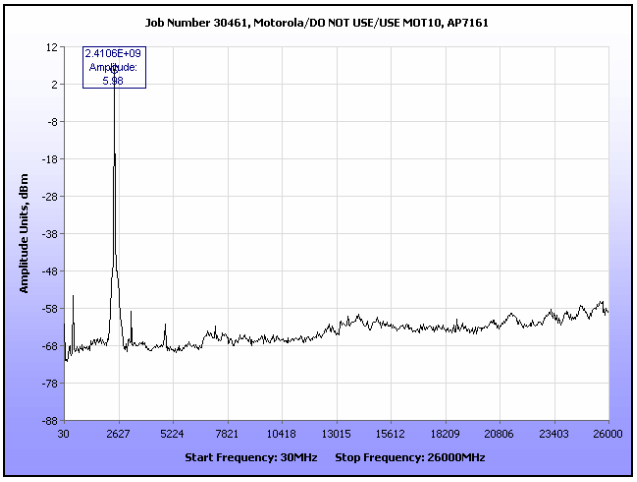
Plot 286. Conducted Spurious Emissions, Low Channel, 802.11g 40 MHz, C



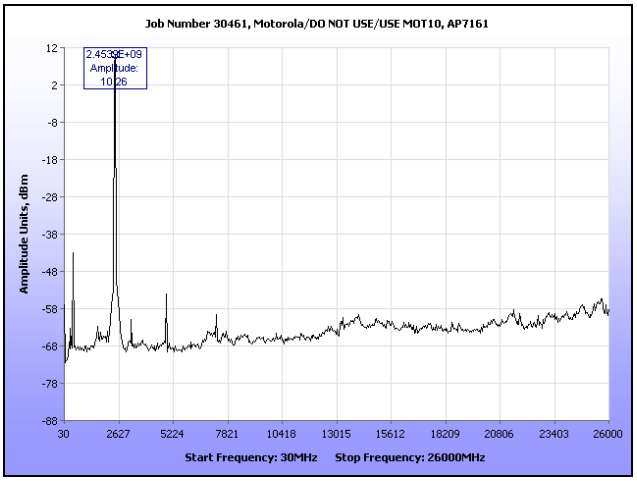
Plot 287. Conducted Spurious Emissions, Low Channel, 802.11g, A



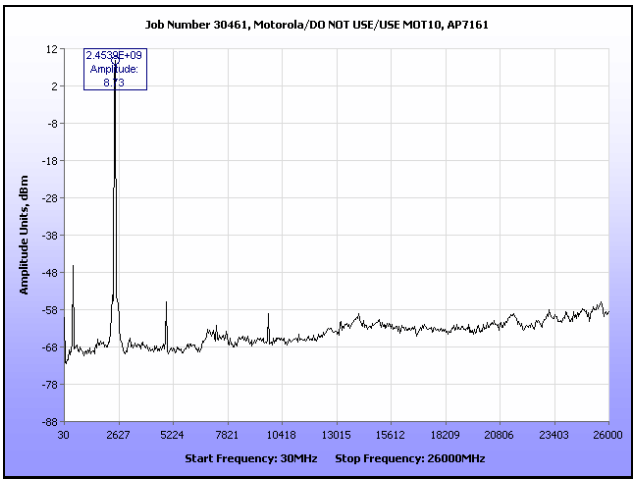
Plot 288. Conducted Spurious Emissions, Low Channel, 802.11g, B



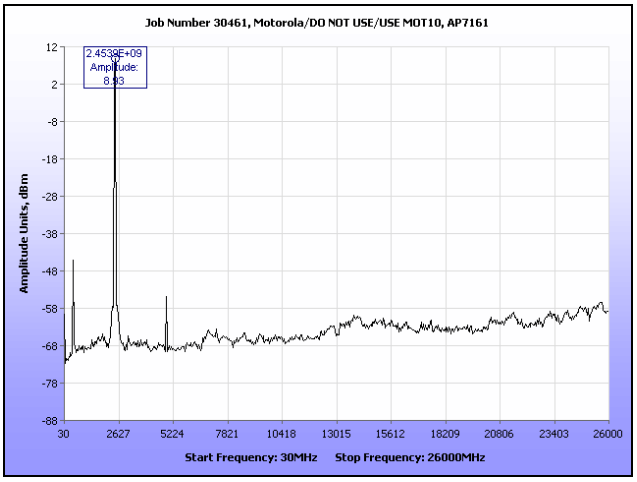
Plot 289. Conducted Spurious Emissions, Low Channel, 802.11g, C



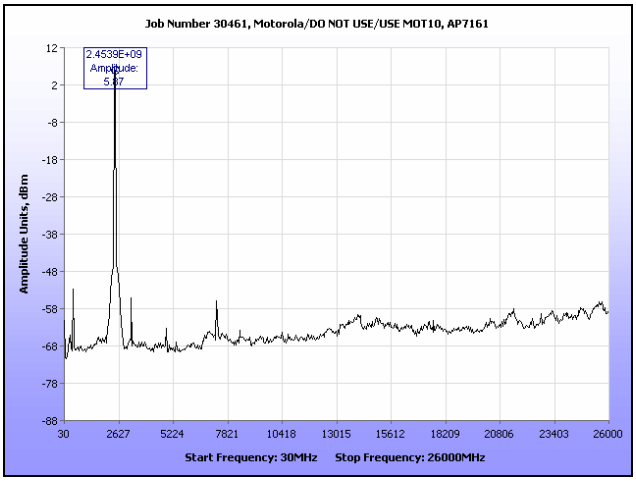
Plot 290. Conducted Spurious Emissions, Mid Channel, 802.11b, A



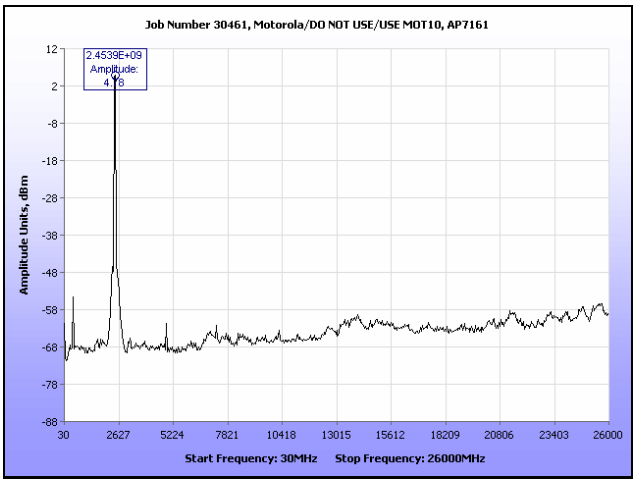
Plot 291. Conducted Spurious Emissions, Mid Channel, 802.11b, B



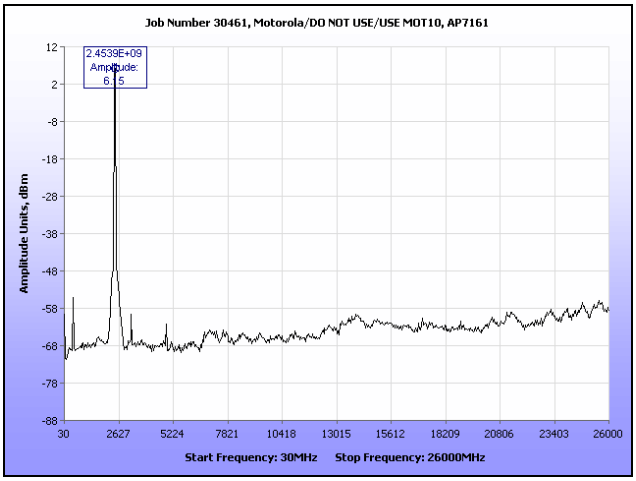
Plot 292. Conducted Spurious Emissions, Mid Channel, 802.11b, C



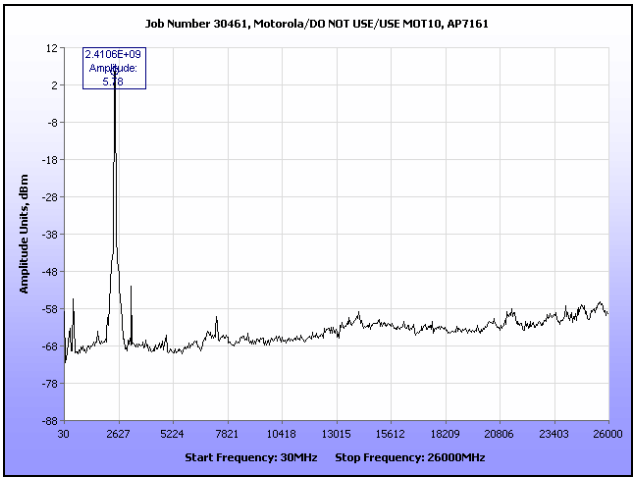
Plot 293. Conducted Spurious Emissions, Mid Channel, 802.11g 20 MHz, A



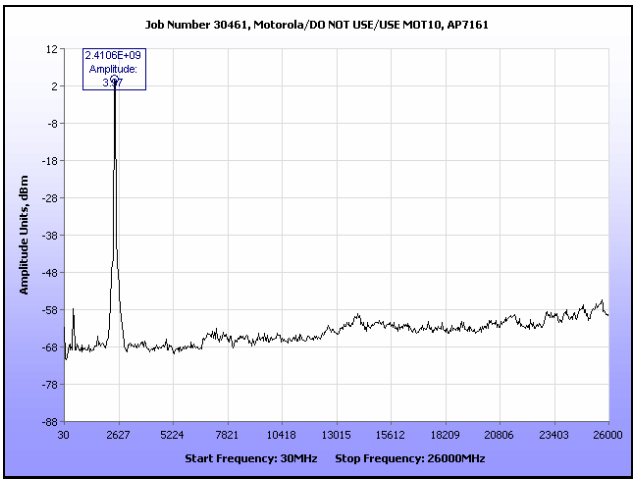
Plot 294. Conducted Spurious Emissions, Mid Channel, 802.11g 20 MHz, B



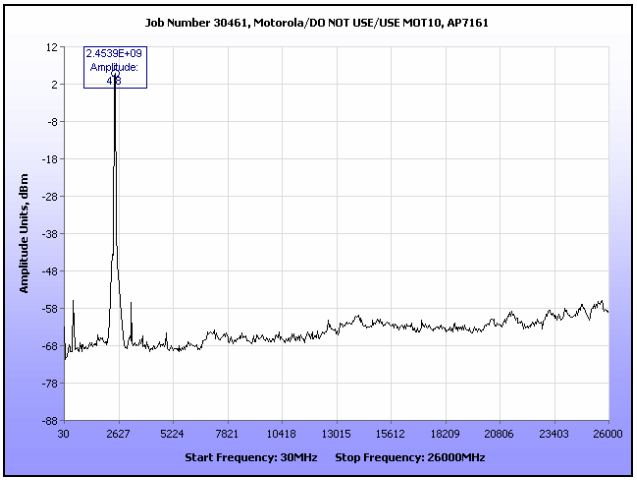
Plot 295. Conducted Spurious Emissions, Mid Channel, 802.11g 20 MHz, C



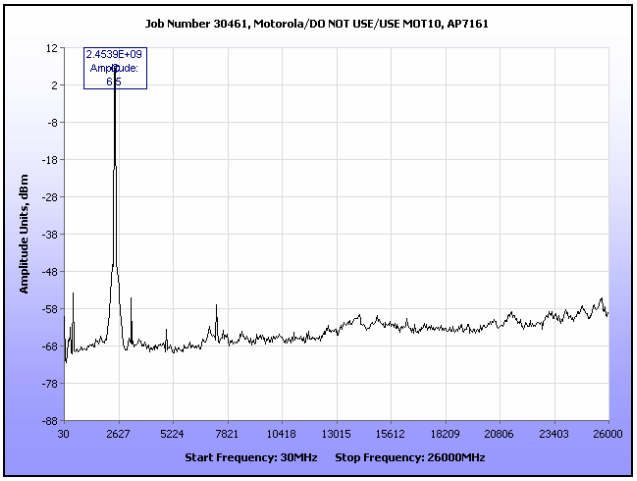
Plot 296. Conducted Spurious Emissions, Mid Channel, 802.11g 40 MHz, A



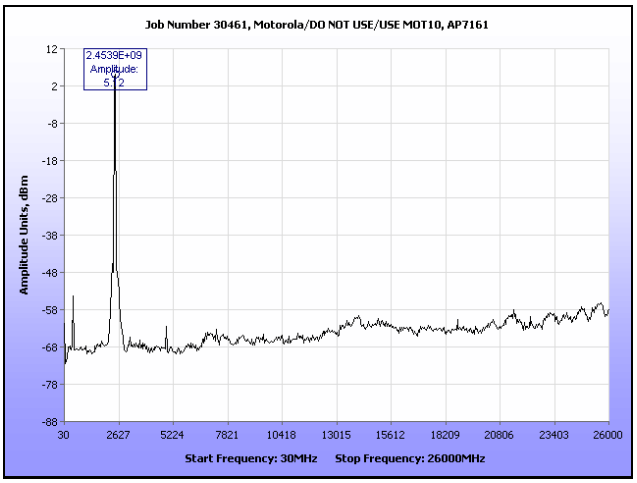
Plot 297. Conducted Spurious Emissions, Mid Channel, 802.11g 40 MHz, B



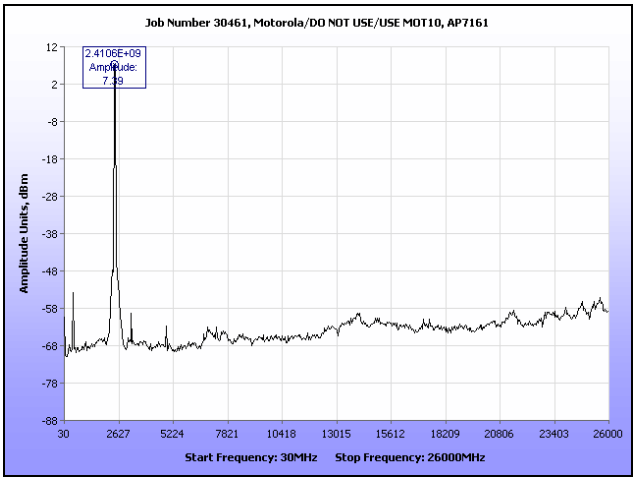
Plot 298. Conducted Spurious Emissions, Mid Channel, 802.11g 40 MHz, C



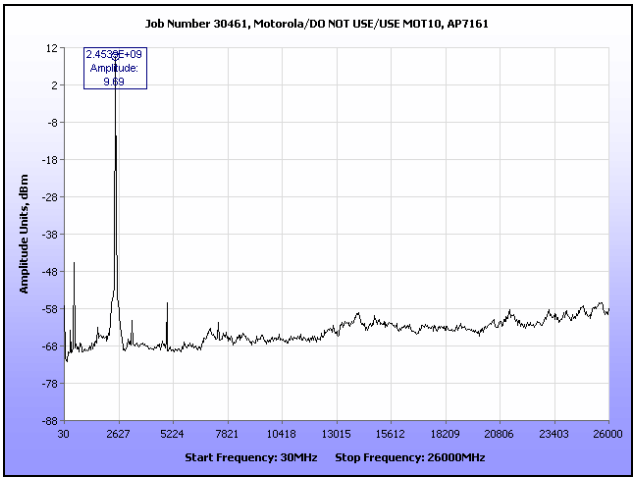
Plot 299. Conducted Spurious Emissions, Mid Channel, 802.11g, A



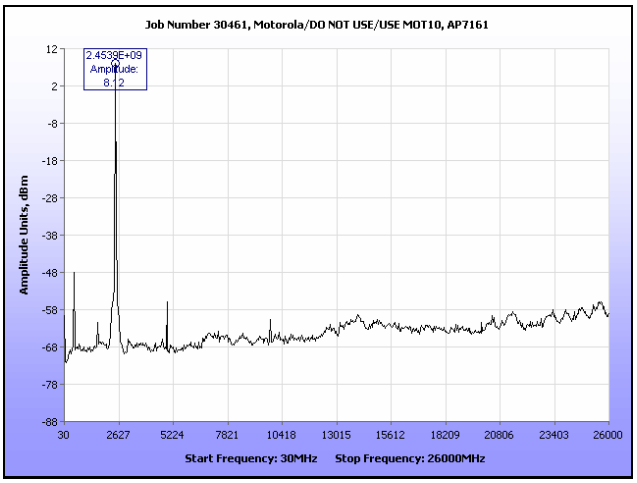
Plot 300. Conducted Spurious Emissions, Mid Channel, 802.11g, B



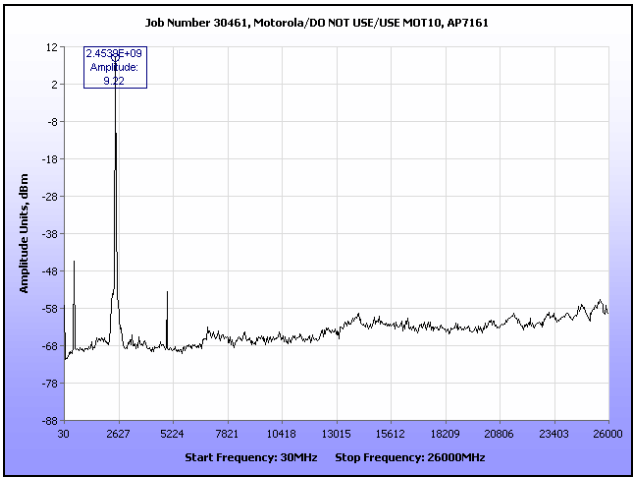
Plot 301. Conducted Spurious Emissions, Mid Channel, 802.11g, C



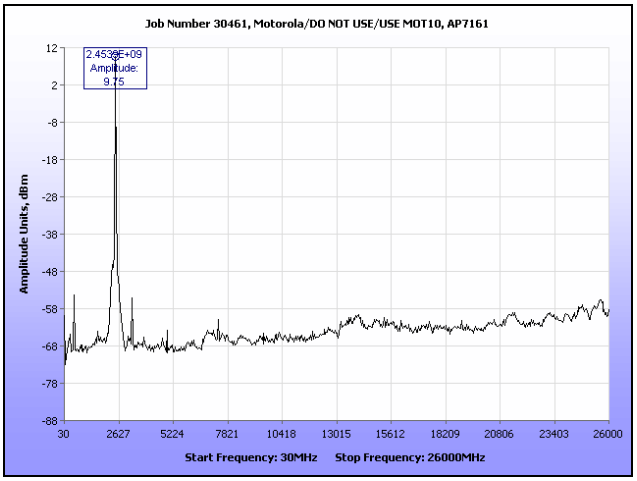
Plot 302. Conducted Spurious Emissions, High Channel, 802.11b, A



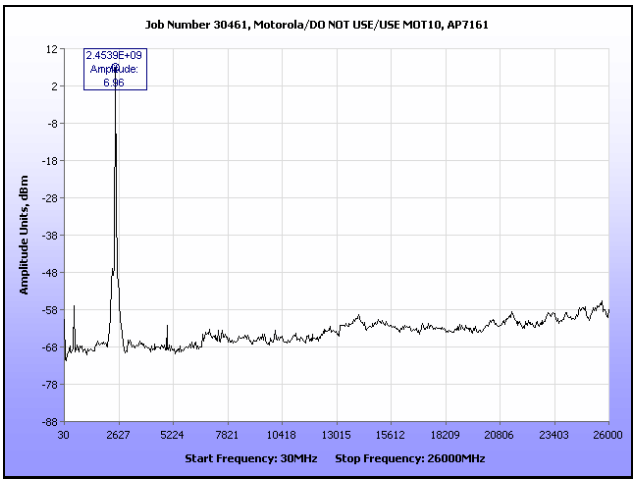
Plot 303. Conducted Spurious Emissions, High Channel, 802.11b, B



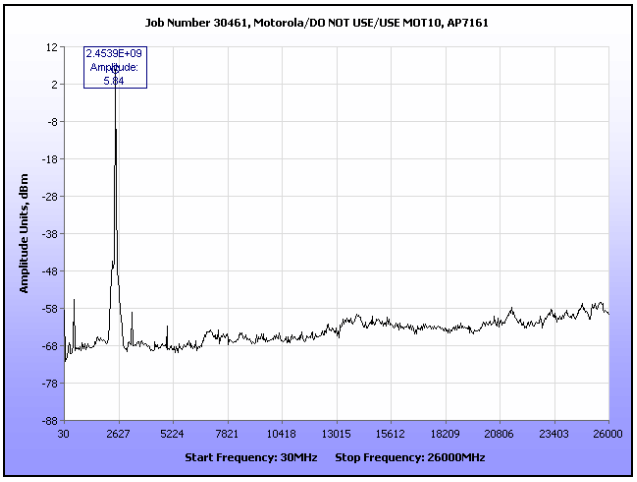
Plot 304. Conducted Spurious Emissions, High Channel, 802.11b, C



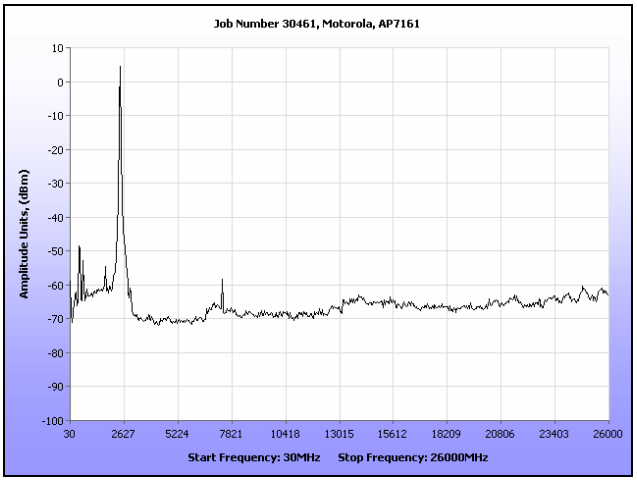
Plot 305. Conducted Spurious Emissions, High Channel, 802.11g 20 MHz, A



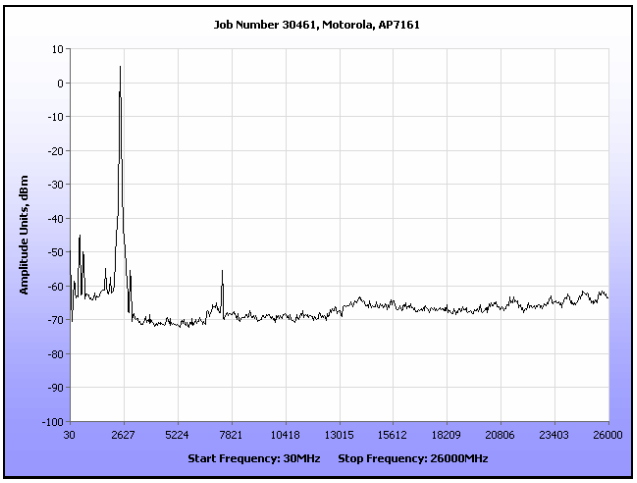
Plot 306. Conducted Spurious Emissions, High Channel, 802.11g 20 MHz, B



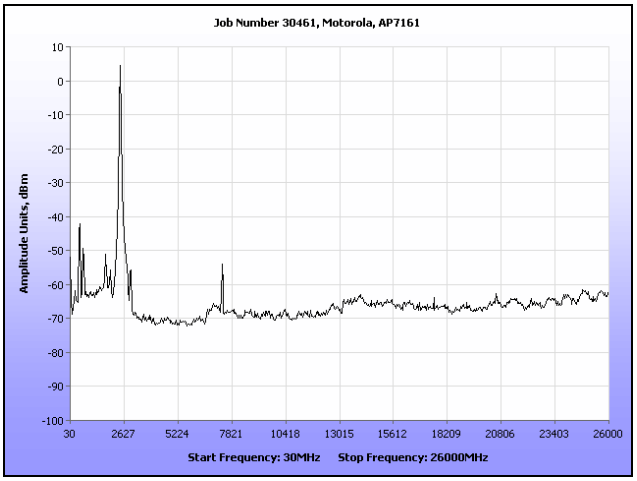
Plot 307. Conducted Spurious Emissions, High Channel, 802.11g 20 MHz, C



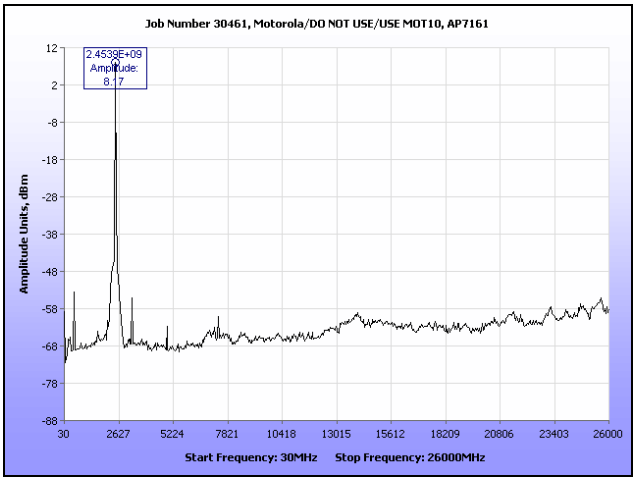
Plot 308. Conducted Spurious Emissions, High Channel, 802.11g 40 MHz, A



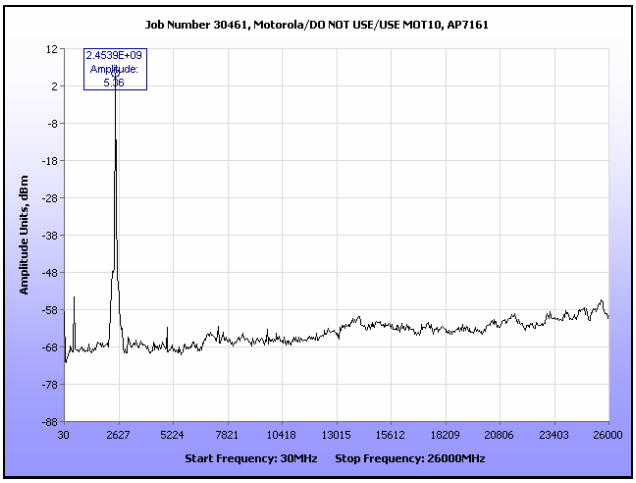
Plot 309. Conducted Spurious Emissions, High Channel, 802.11g 40 MHz, B



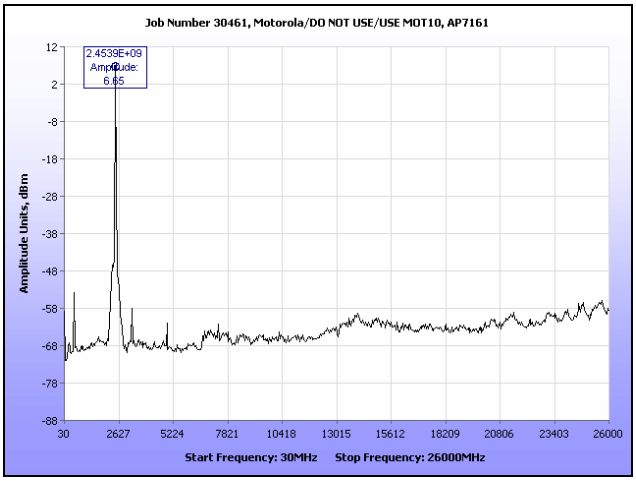
Plot 310. Conducted Spurious Emissions, High Channel, 802.11g 40 MHz, C



Plot 311. Conducted Spurious Emissions, High Channel, 802.11g, A

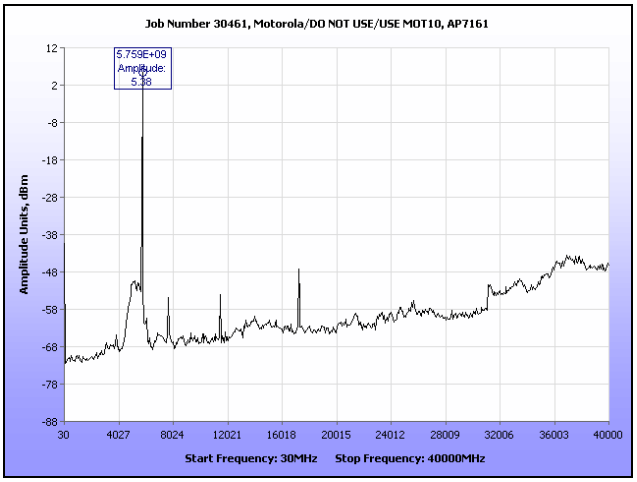


Plot 312. Conducted Spurious Emissions, High Channel, 802.11g, B

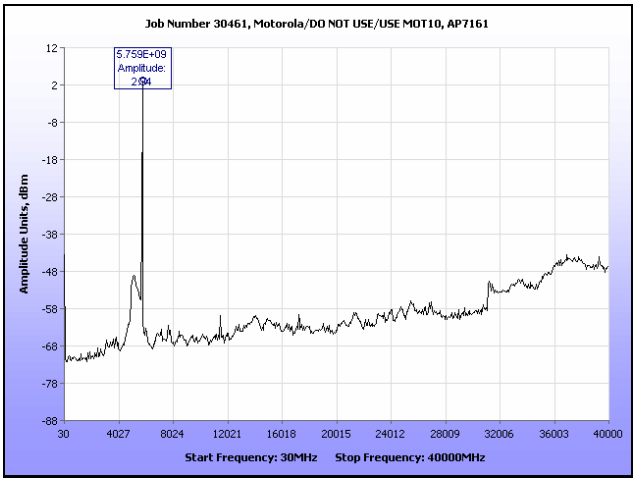


Plot 313. Conducted Spurious Emissions, High Channel, 802.11g, C

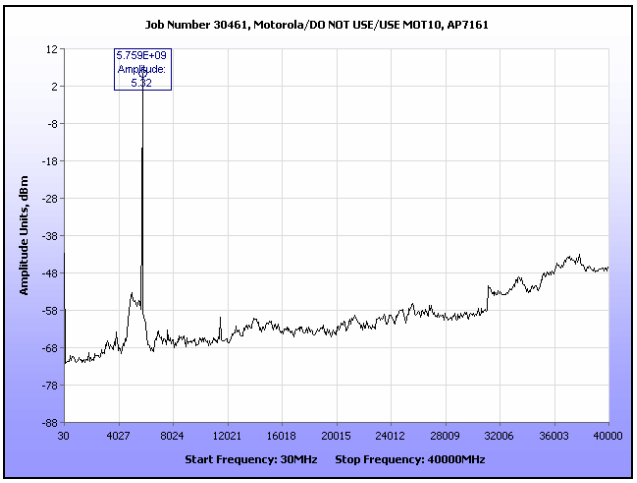
Conducted Spurious Emissions Test Results, 5.8 GHz



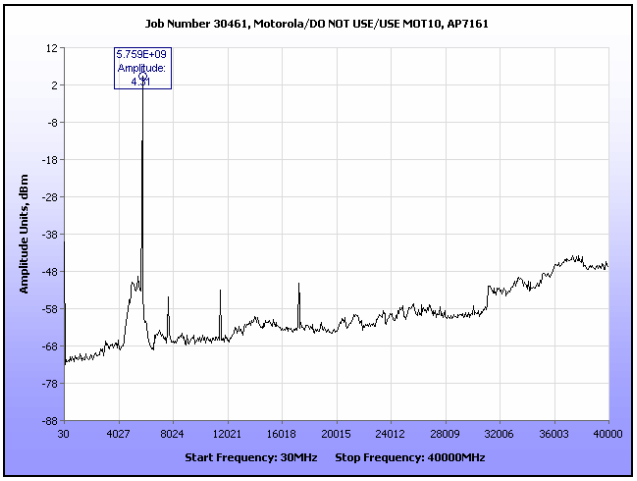
Plot 314. Conducted Spurious Emissions, Low Channel, 802.11a, A



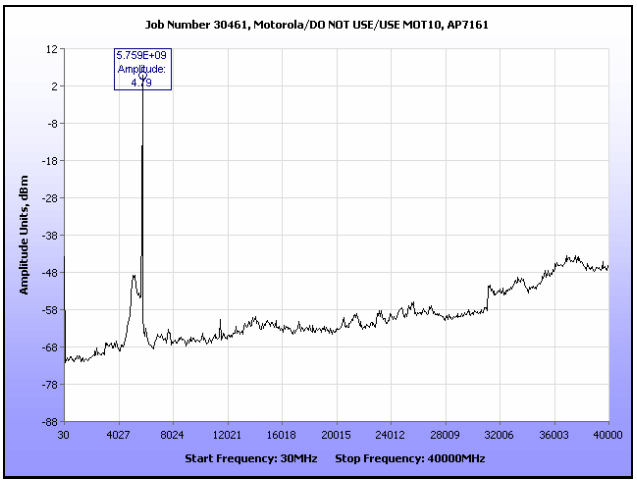
Plot 315. Conducted Spurious Emissions, Low Channel, 802.11a, B



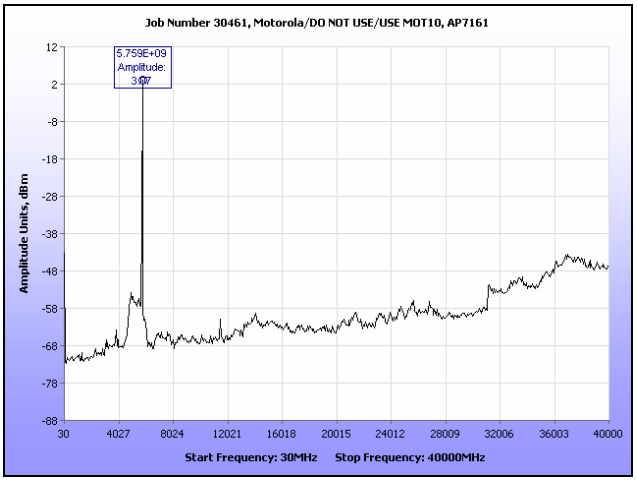
Plot 316. Conducted Spurious Emissions, Low Channel, 802.11a, C



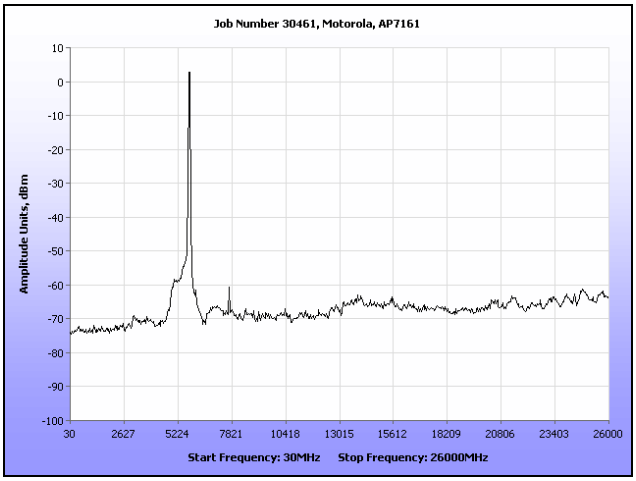
Plot 317. Conducted Spurious Emissions, Low Channel, 802.11n 20 MHz, A



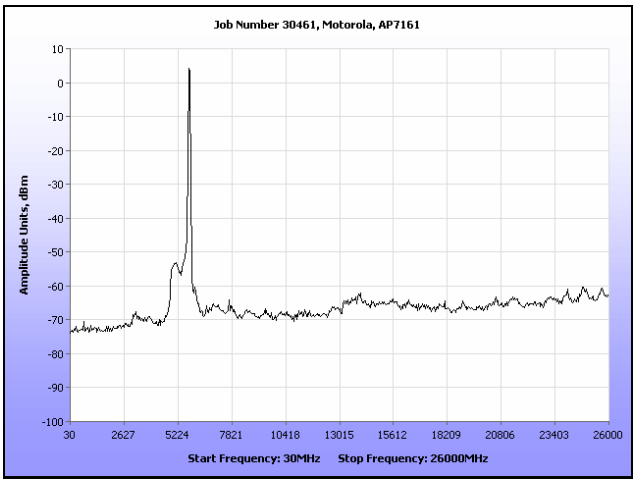
Plot 318. Conducted Spurious Emissions, Low Channel, 802.11n 20 MHz, B



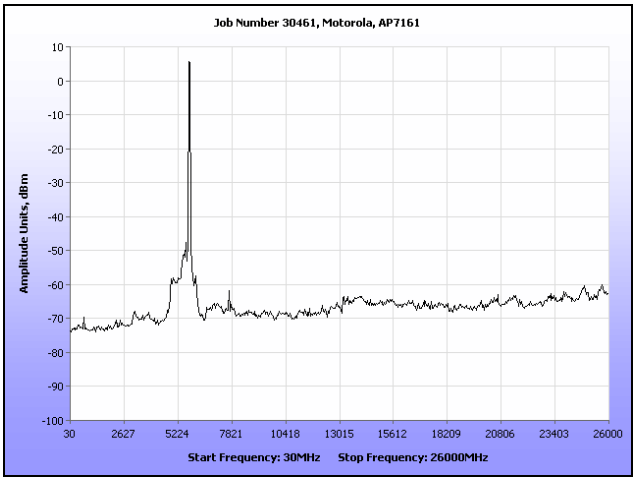
Plot 319. Conducted Spurious Emissions, Low Channel, 802.11n 20 MHz, C



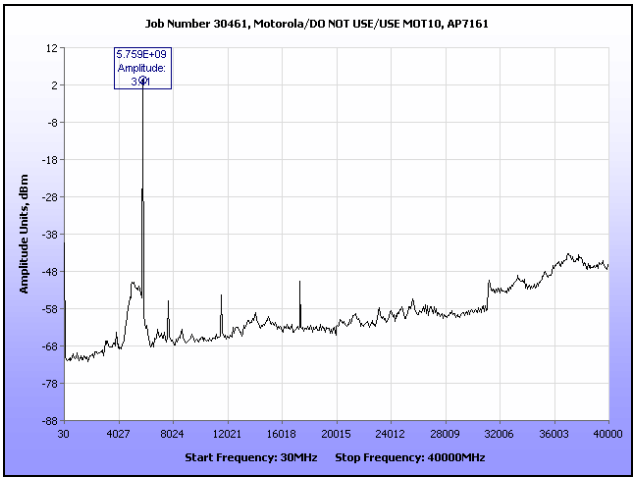
Plot 320. Conducted Spurious Emissions, Low Channel, 802.11n 40 MHz, A



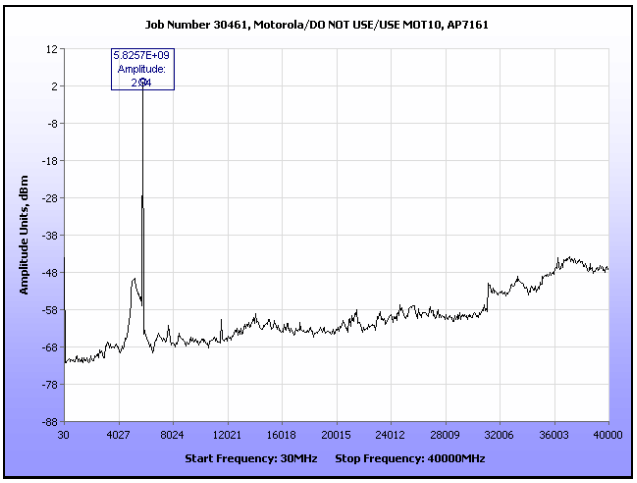
Plot 321. Conducted Spurious Emissions, Low Channel, 802.11n 40 MHz, B



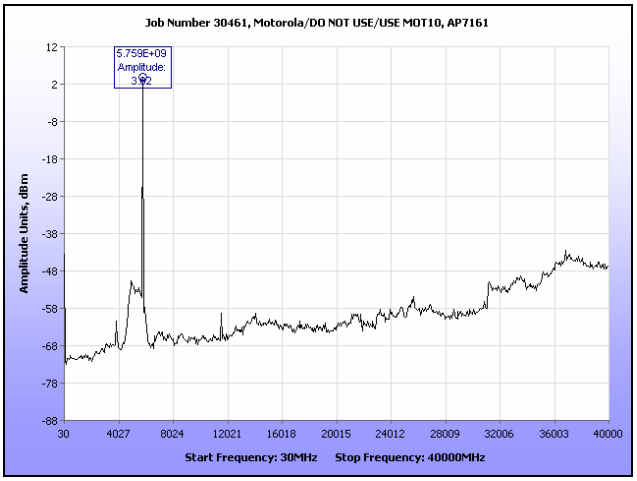
Plot 322. Conducted Spurious Emissions, Low Channel, 802.11n 40 MHz, C



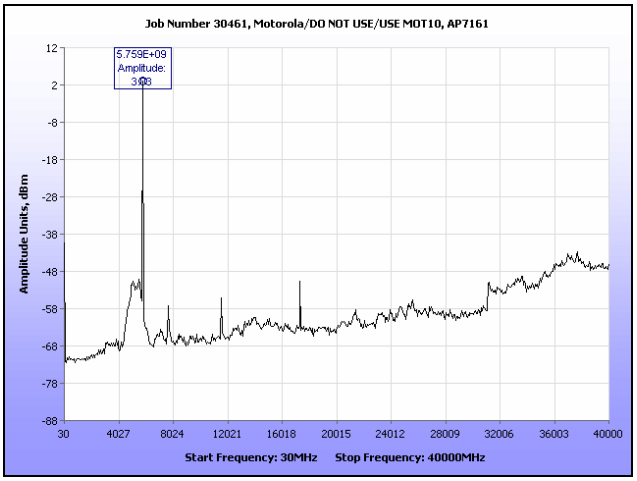
Plot 323. Conducted Spurious Emissions, Mid Channel, 802.11a, A



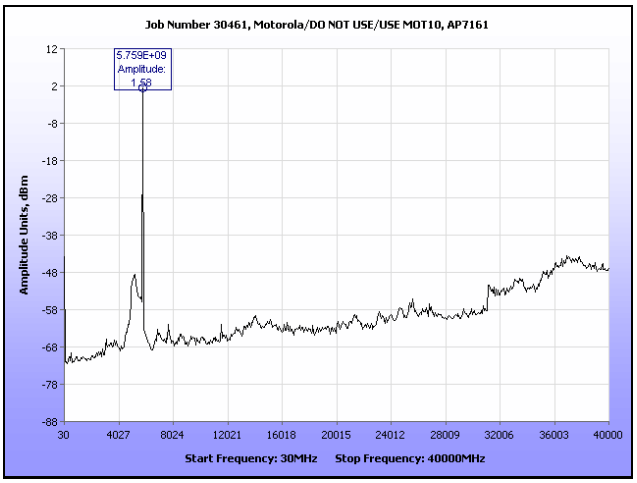
Plot 324. Conducted Spurious Emissions, Mid Channel, 802.11a, B



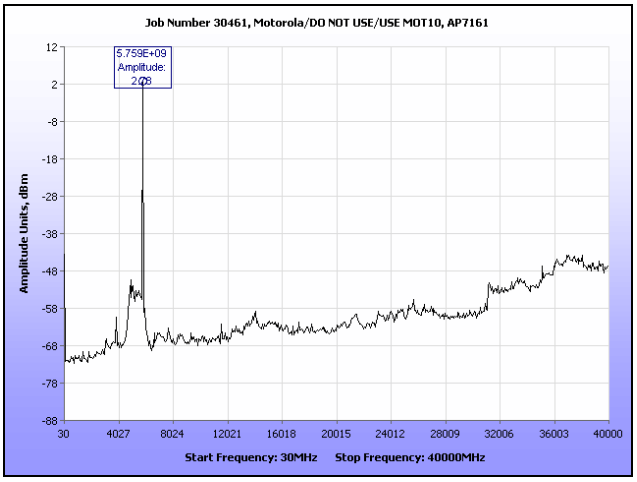
Plot 325. Conducted Spurious Emissions, Mid Channel, 802.11a, C



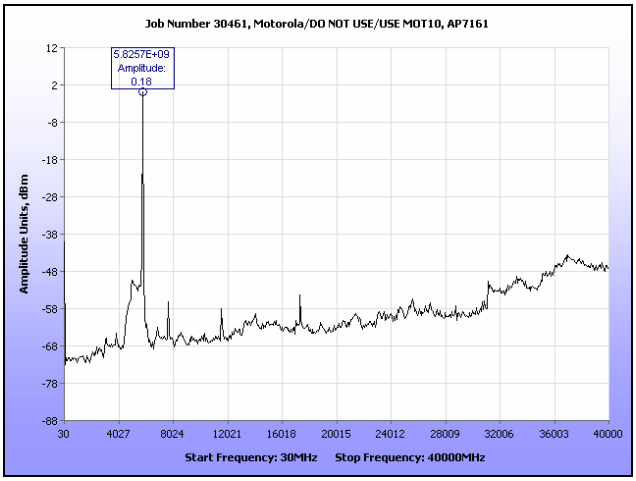
Plot 326. Conducted Spurious Emissions, Mid Channel, 802.11n 20 MHz, A



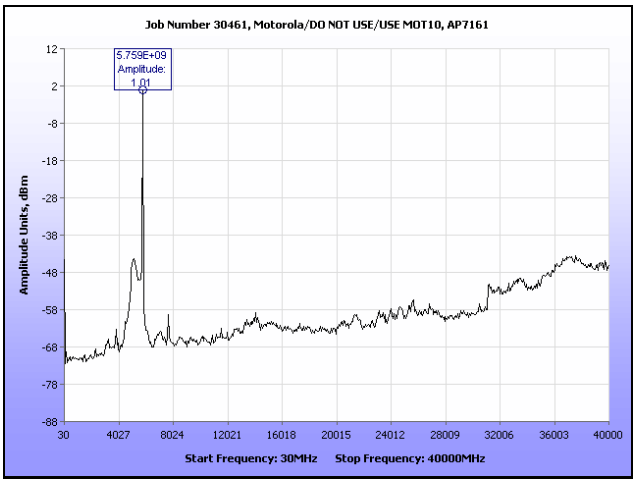
Plot 327. Conducted Spurious Emissions, Mid Channel, 802.11n 20 MHz, B



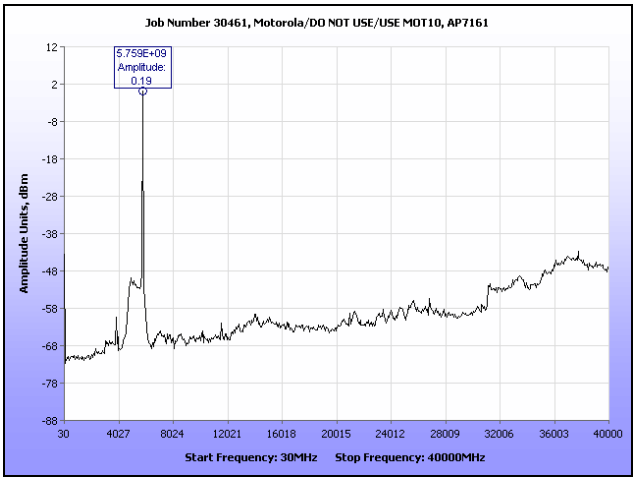
Plot 328. Conducted Spurious Emissions, Mid Channel, 802.11n 20 MHz, C



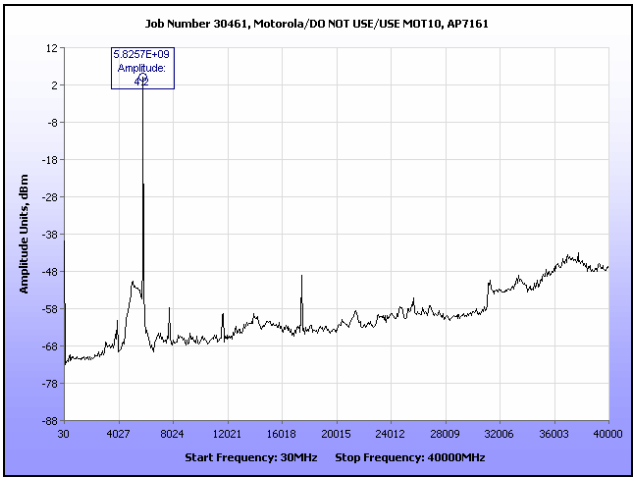
Plot 329. Conducted Spurious Emissions, Mid Channel, 802.11n 40 MHz, A



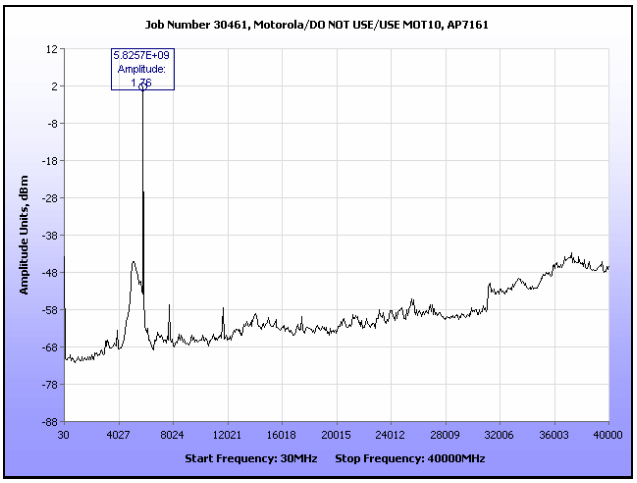
Plot 330. Conducted Spurious Emissions, Mid Channel, 802.11n 40 MHz, B



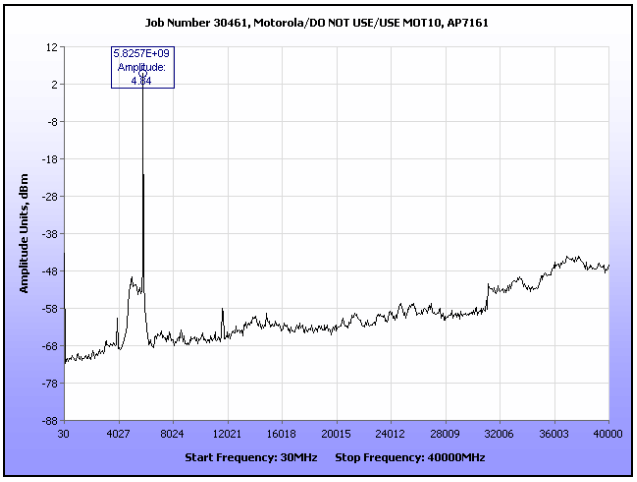
Plot 331. Conducted Spurious Emissions, Mid Channel, 802.11n 40 MHz, C



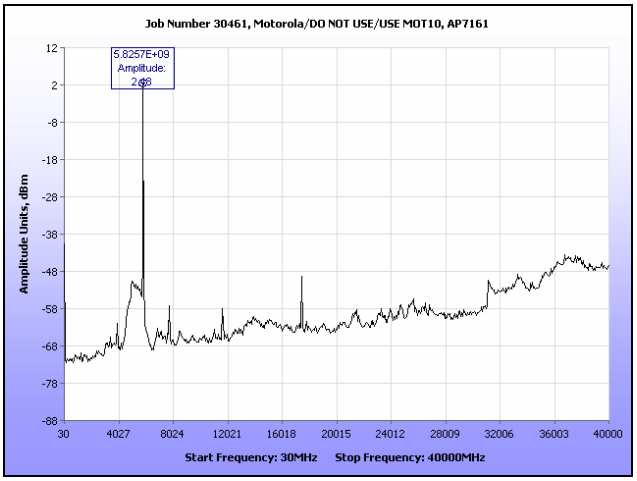
Plot 332. Conducted Spurious Emissions, High Channel, 802.11a, A



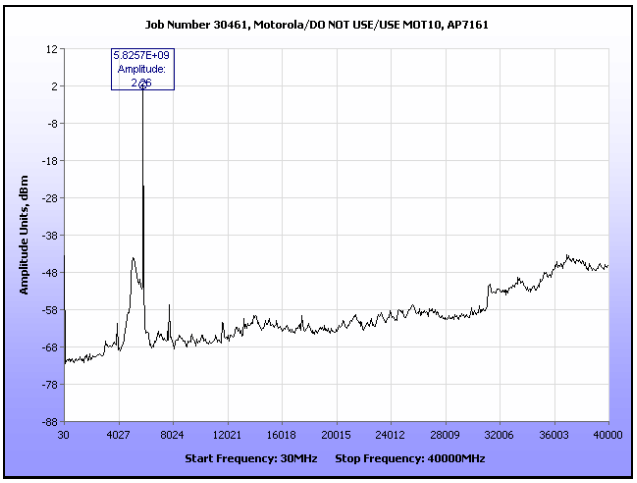
Plot 333. Conducted Spurious Emissions, High Channel, 802.11a, B



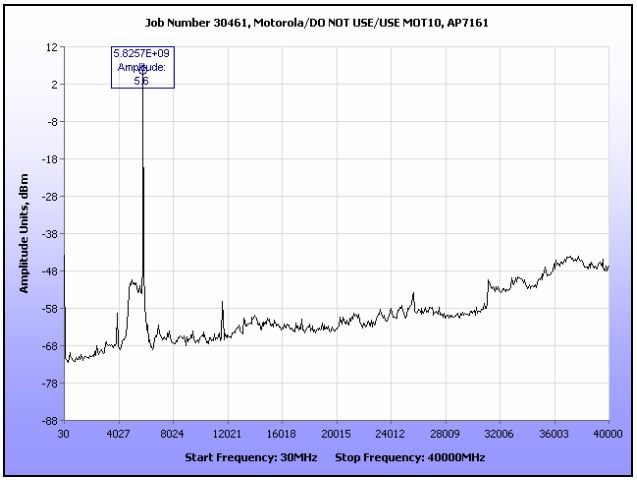
Plot 334. Conducted Spurious Emissions, High Channel, 802.11a, C



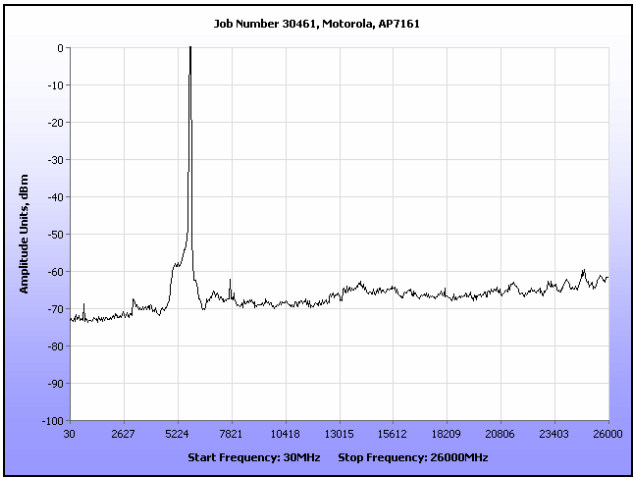
Plot 335. Conducted Spurious Emissions, High Channel, 802.11n 20 MHz, A



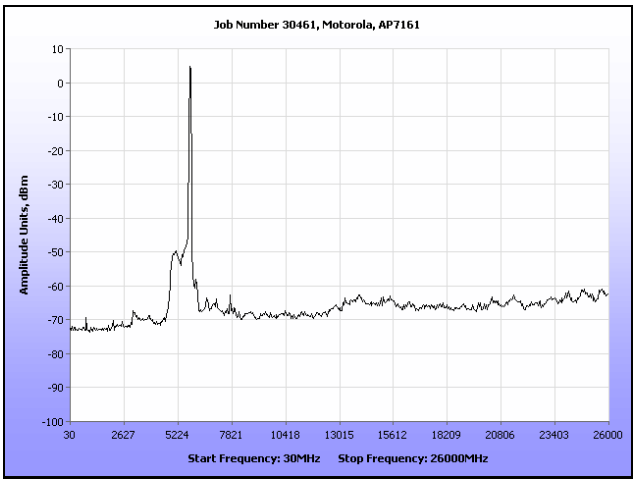
Plot 336. Conducted Spurious Emissions, High Channel, 802.11n 20 MHz, B



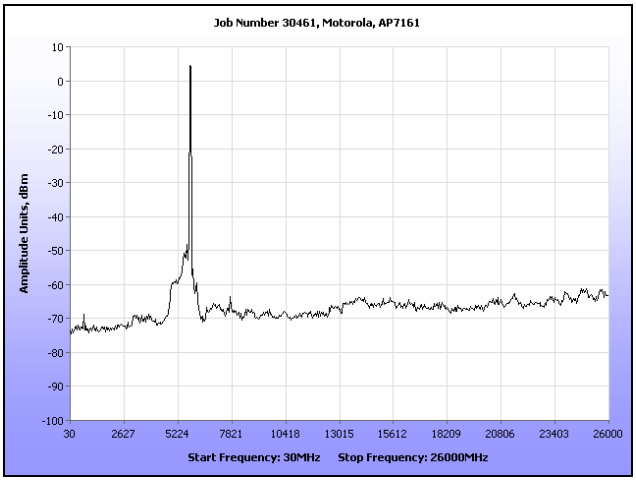
Plot 337. Conducted Spurious Emissions, High Channel, 802.11n 20 MHz, C



Plot 338. Conducted Spurious Emissions, High Channel, 802.11n 40 MHz, A

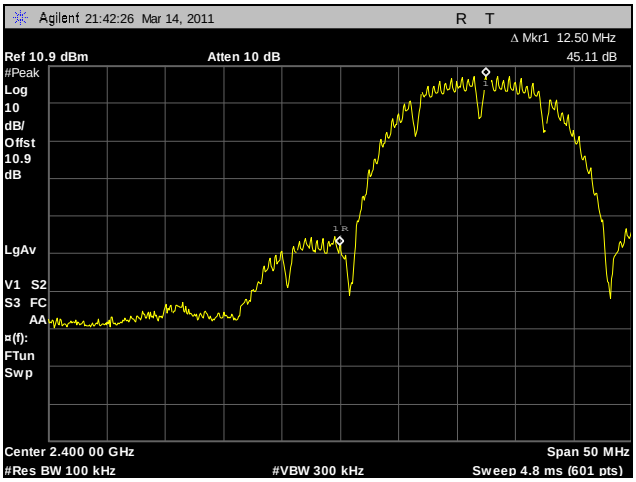


Plot 339. Conducted Spurious Emissions, High Channel, 802.11n 40 MHz, B

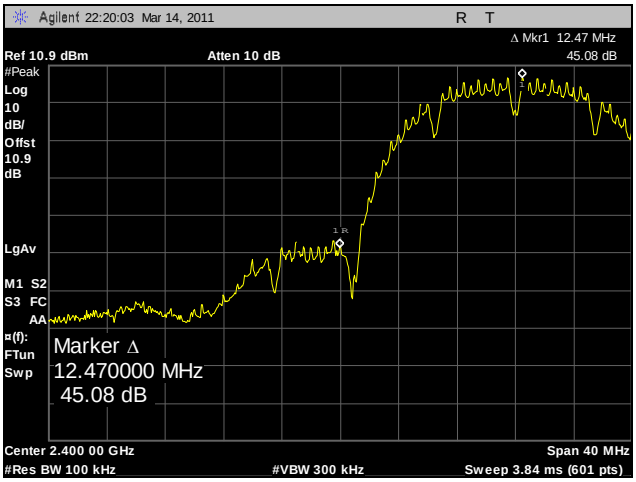


Plot 340. Conducted Spurious Emissions, High Channel, 802.11n 40 MHz, C

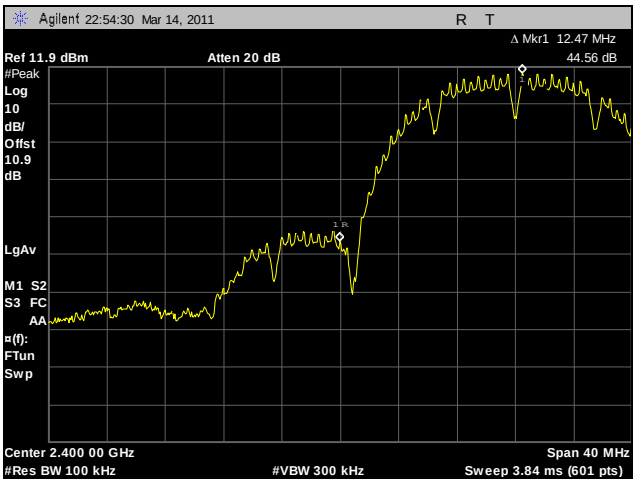
Conducted Band Edge Test Results. 2.4 GHz



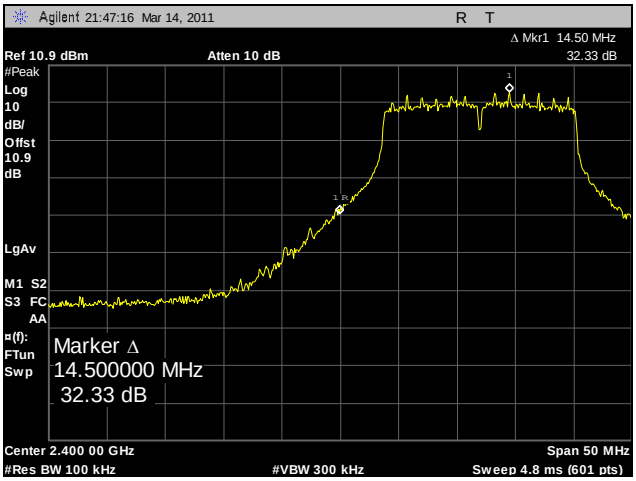
Plot 341. Conducted Band Edge, Low Channel, 802.11b, Port A



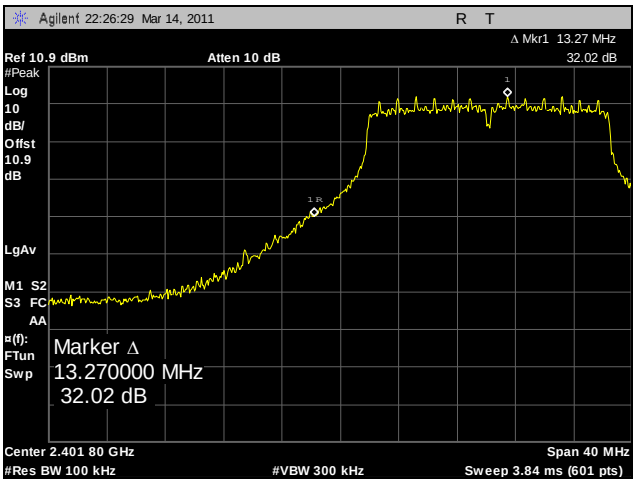
Plot 342. Conducted Band Edge, Low Channel, 802.11b, Port B



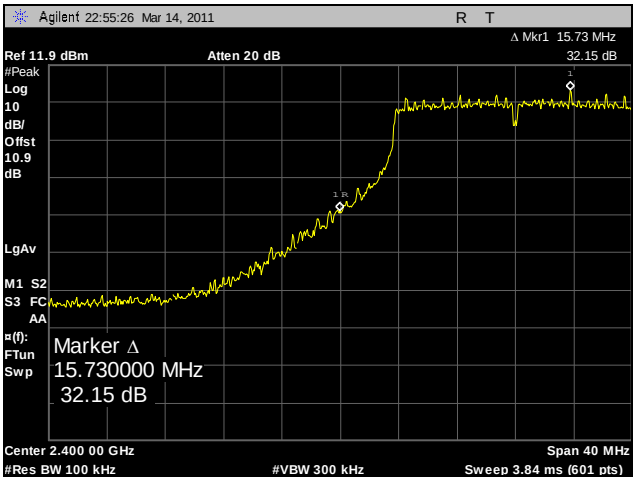
Plot 343. Conducted Band Edge, Low Channel, 802.11b, Port C



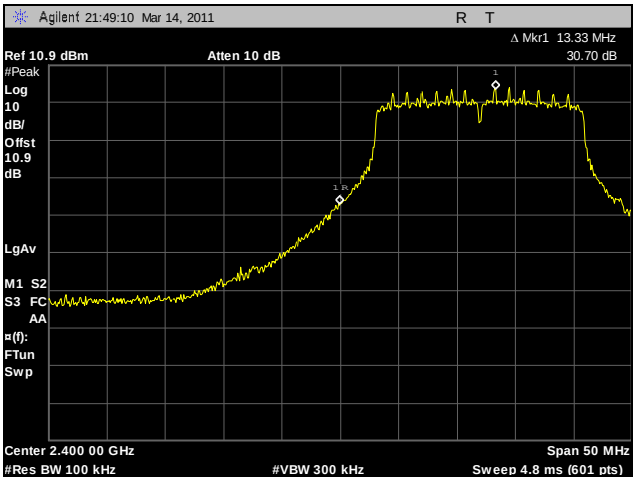
Plot 344. Conducted Band Edge, Low Channel, 802.11g, Port A



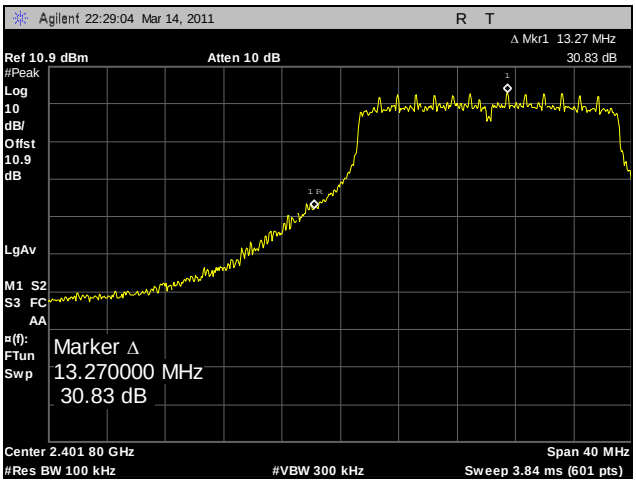
Plot 345. Conducted Band Edge, Low Channel, 802.11g, Port B



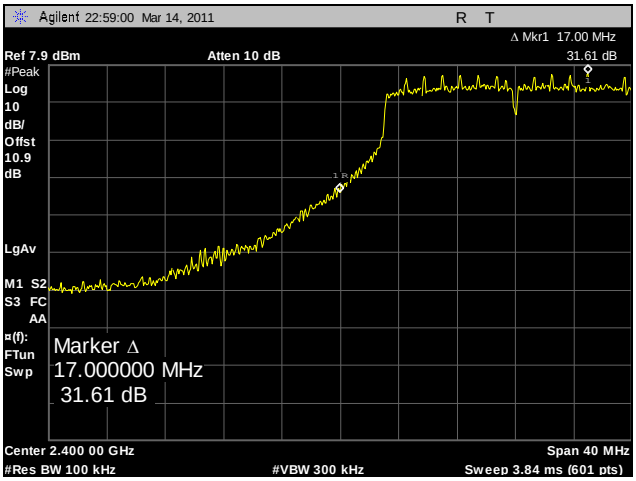
Plot 346. Conducted Band Edge, Low Channel, 802.11g, Port C



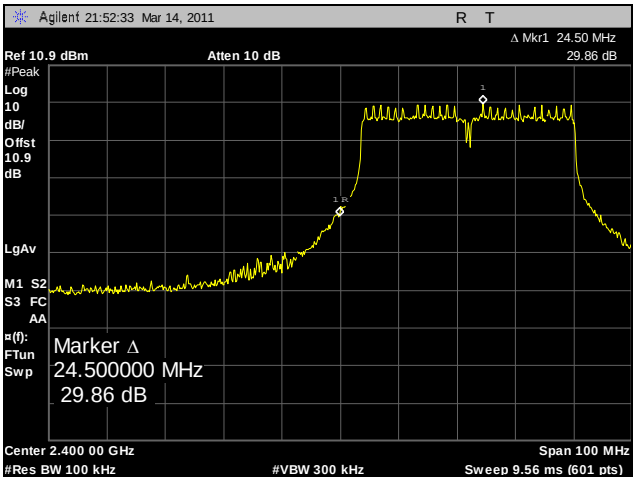
Plot 347. Conducted Band Edge, Low Channel, 802.11g 20 MHZ, Port A



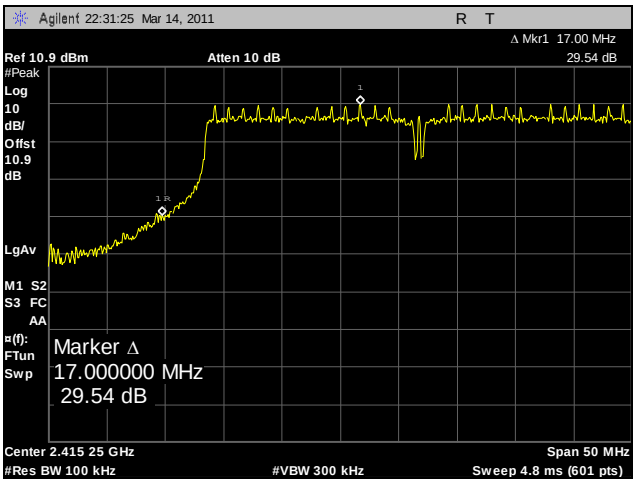
Plot 348. Conducted Band Edge, Low Channel, 802.11g 20 MHZ, Port B



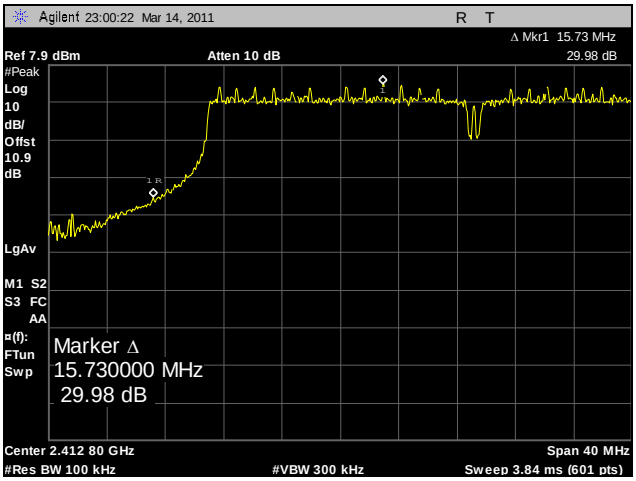
Plot 349. Conducted Band Edge, Low Channel, 802.11g 20 MHZ, Port C



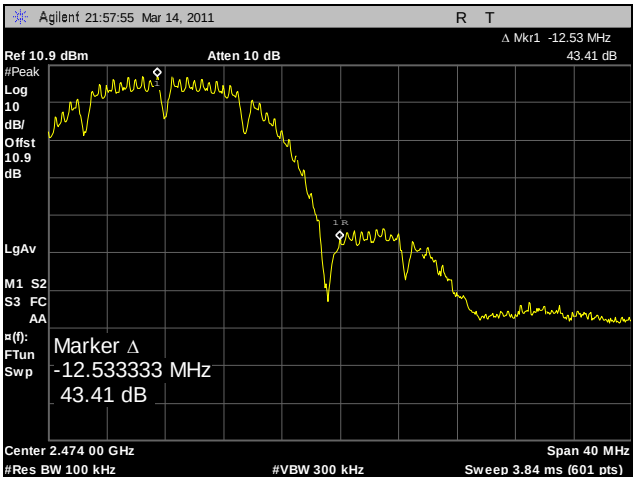
Plot 350. Conducted Band Edge, Low Channel, 802.11g 40 MHZ, Port A



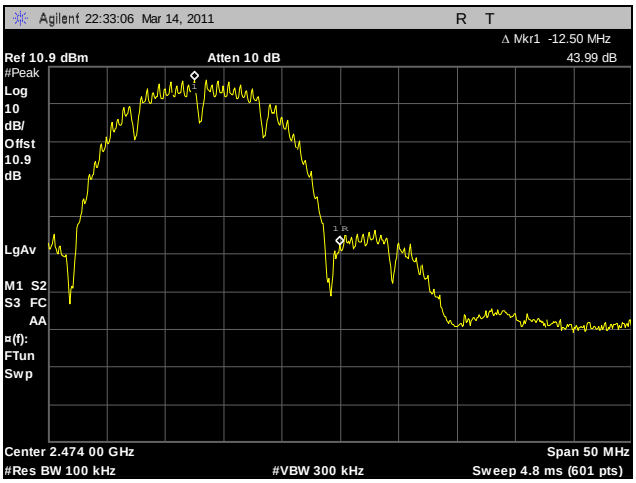
Plot 351. Conducted Band Edge, Low Channel, 802.11g 40 MHZ, Port B



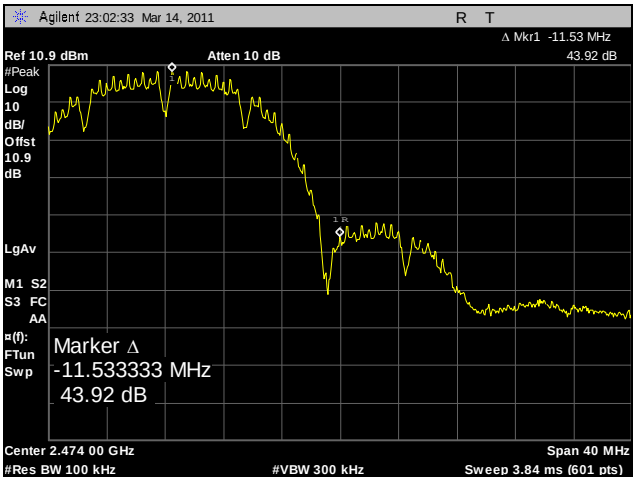
Plot 352. Conducted Band Edge, Low Channel, 802.11g 40 MHZ, Port C



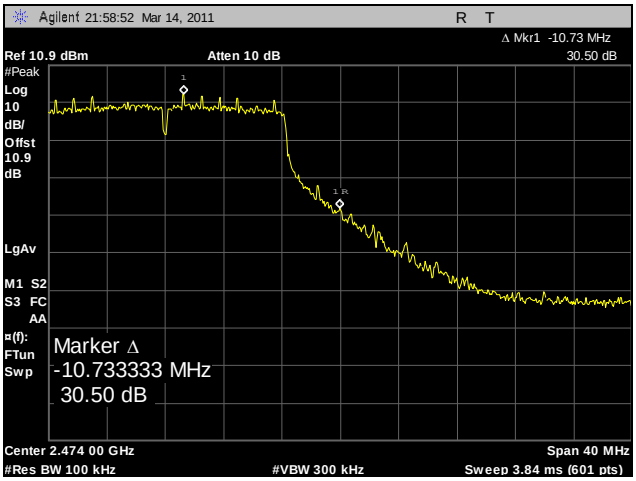
Plot 353. Conducted Band Edge, High Channel, 802.11b, Port A



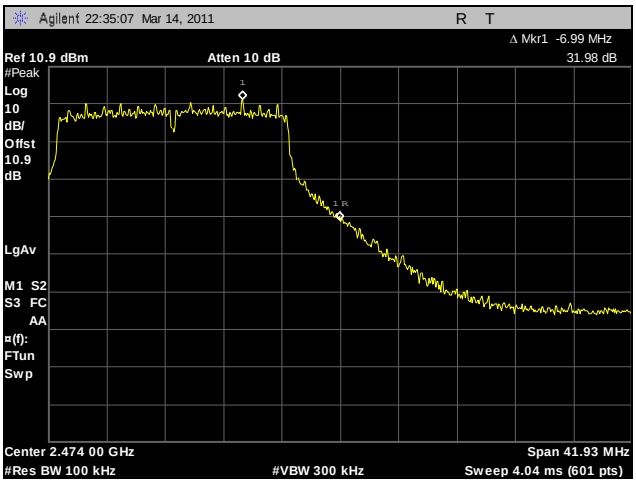
Plot 354. Conducted Band Edge, High Channel, 802.11g, Port B



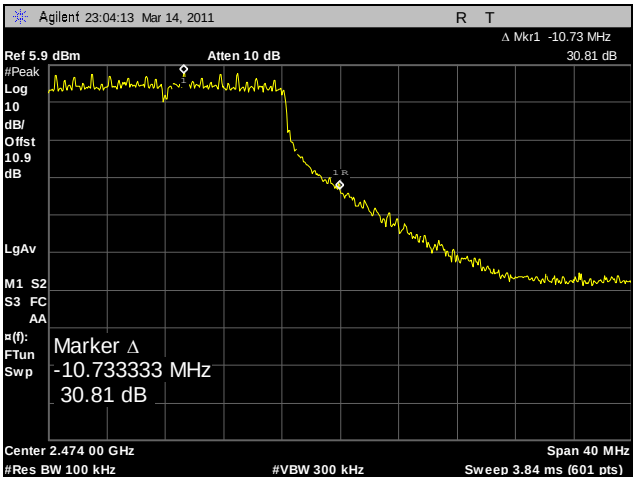
Plot 355. Conducted Band Edge, High Channel, 802.11b, Port C



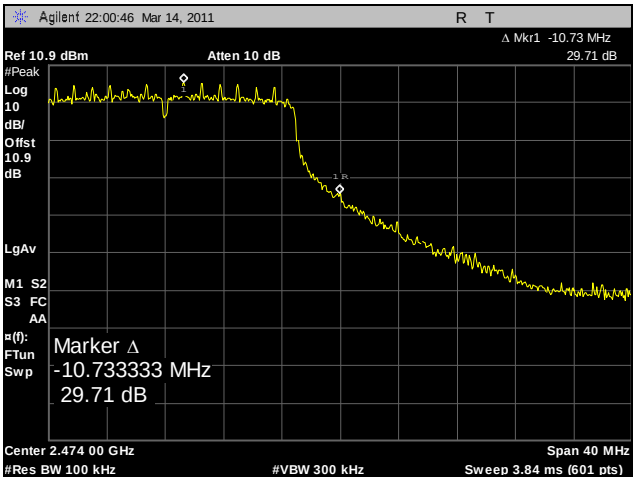
Plot 356. Conducted Band Edge, High Channel, 802.11g, Port A



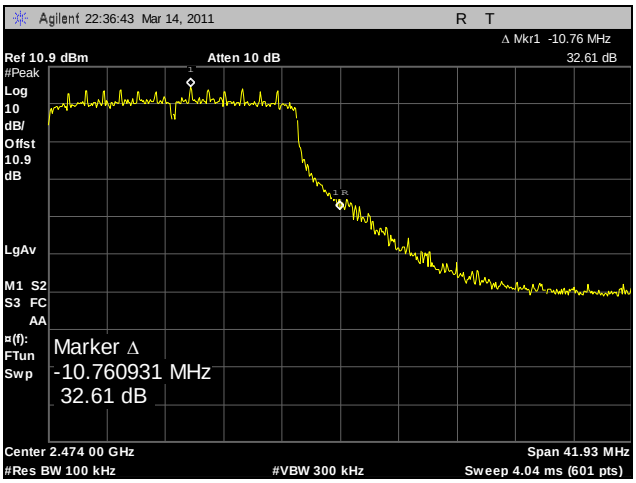
Plot 357. Conducted Band Edge, High Channel, 802.11g, Port B



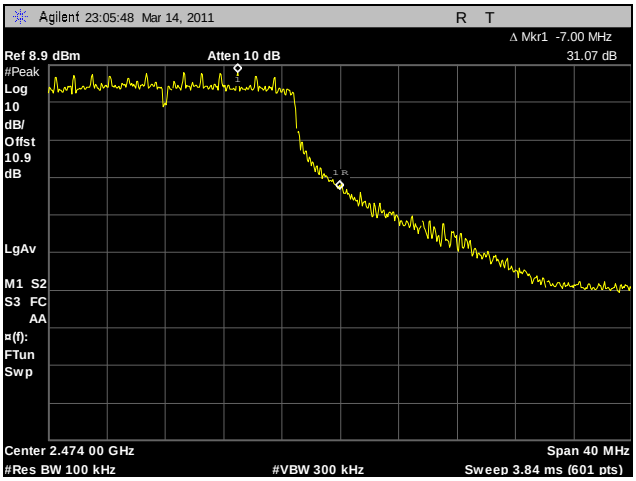
Plot 358. Conducted Band Edge, High Channel, 802.11g, Port C



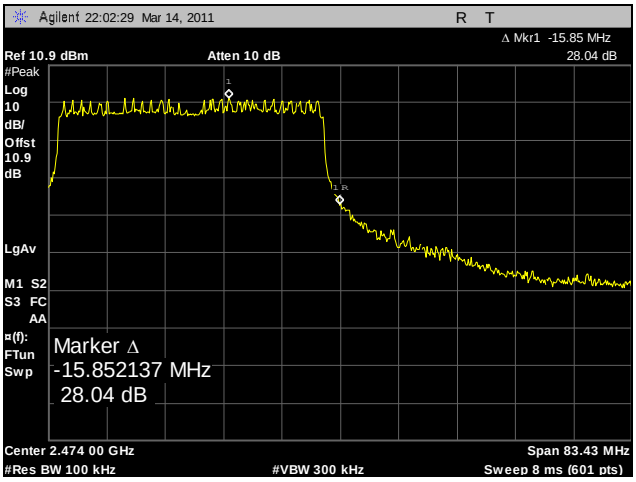
Plot 359. Conducted Band Edge, High Channel, 802.11g 20 MHZ, Port A



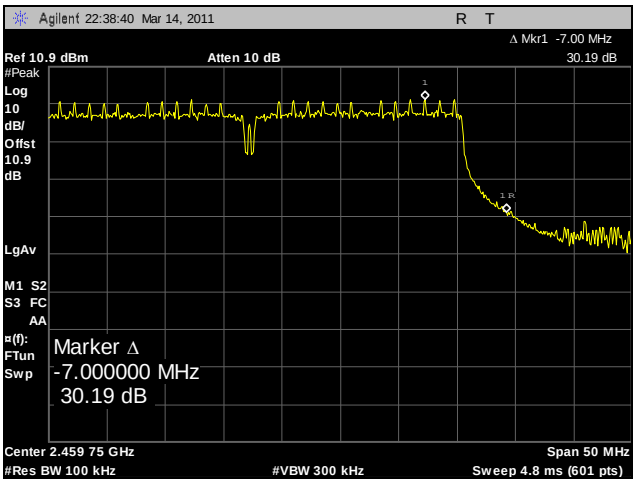
Plot 360. Conducted Band Edge, High Channel, 802.11g 20 MHZ, Port B



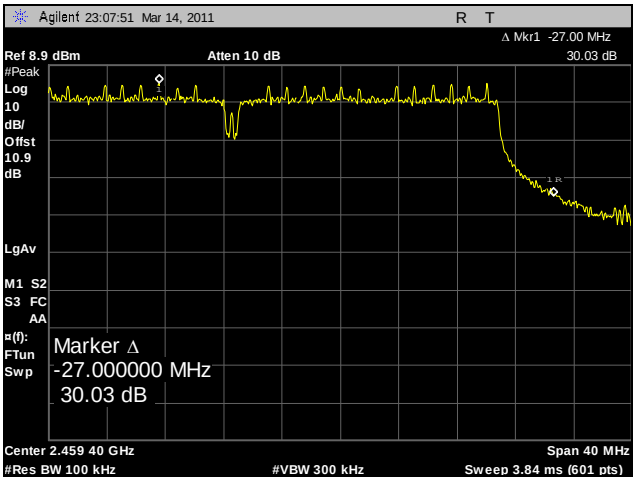
Plot 361. Conducted Band Edge, High Channel, 802.11g 20 MHZ, Port C



Plot 362. Conducted Band Edge, High Channel, 802.11g 40 MHZ, Port A

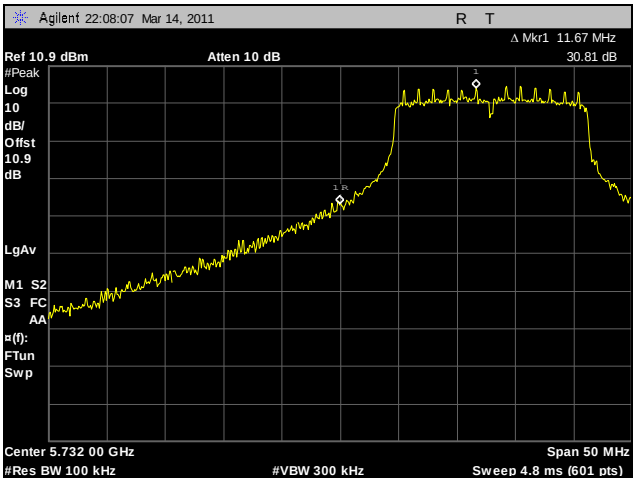


Plot 363. Conducted Band Edge, High Channel, 802.11g 40 MHZ, Port B

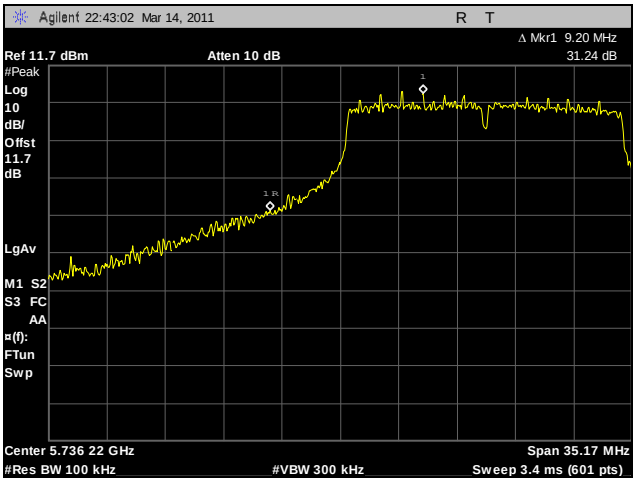


Plot 364. Conducted Band Edge, High Channel, 802.11g 40 MHZ, Port C

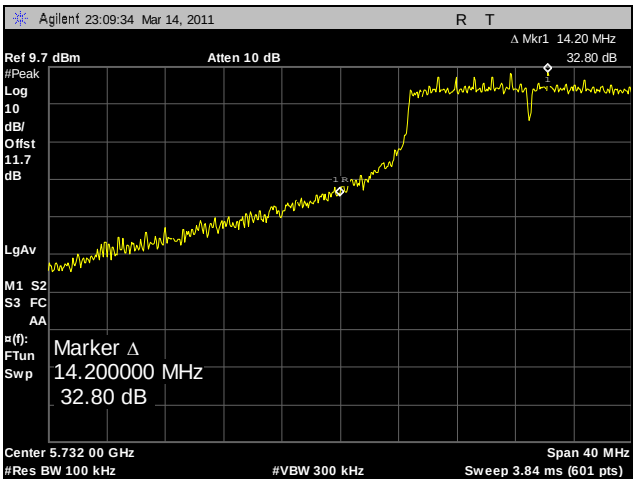
Conducted Band Edge Test Results. 5.8 GHz



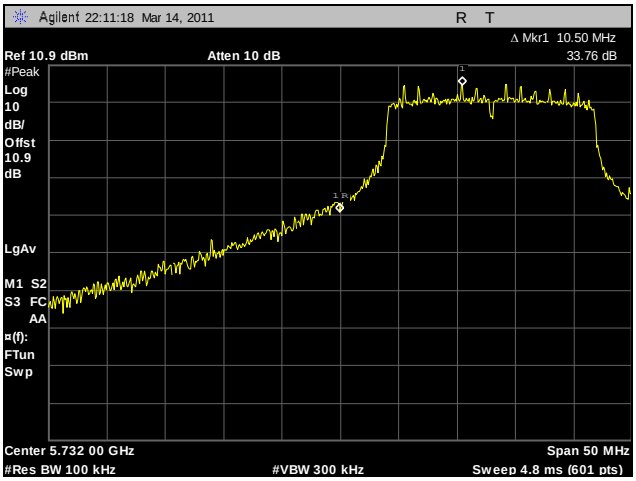
Plot 365. Conducted Band Edge, Low Channel, 802.11a, Port A



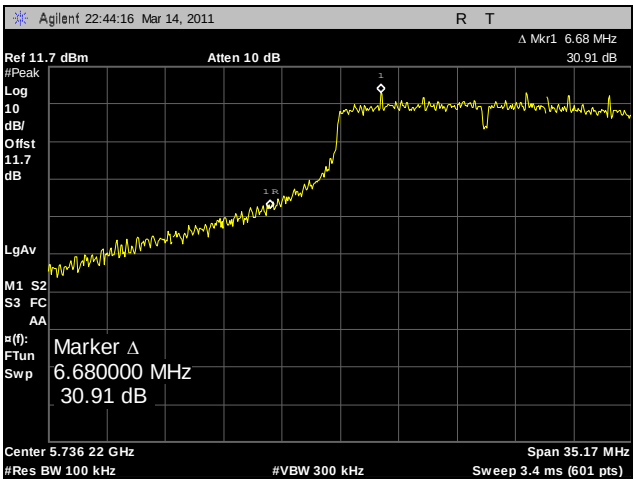
Plot 366. Conducted Band Edge, Low Channel, 802.11a, Port B



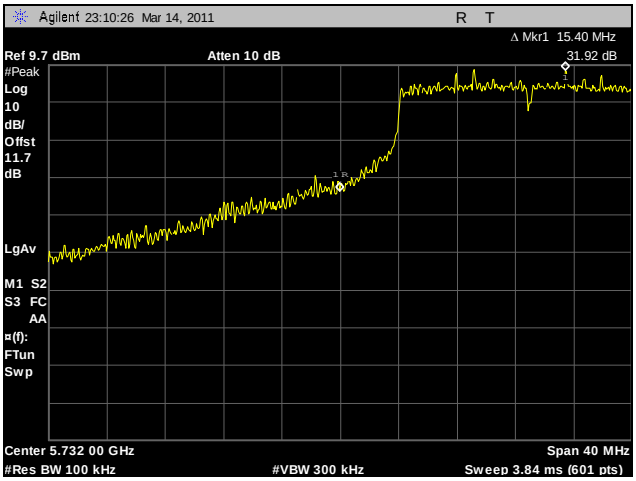
Plot 367. Conducted Band Edge, Low Channel, 802.11a, Port C



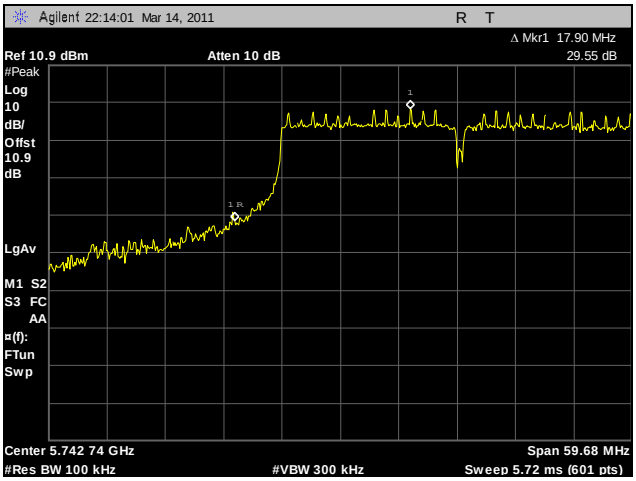
Plot 368. Conducted Band Edge, Low Channel, 802.11g 20 MHZ, Port A



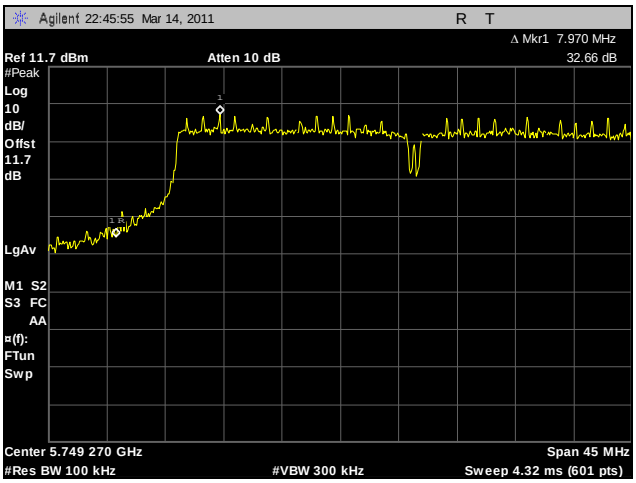
Plot 369. Conducted Band Edge, Low Channel, 802.11g 20 MHZ, Port B



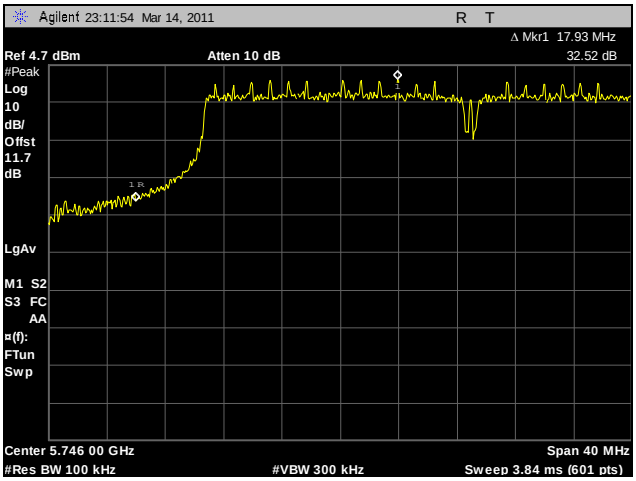
Plot 370. Conducted Band Edge, Low Channel, 802.11g 20 MHZ, Port C



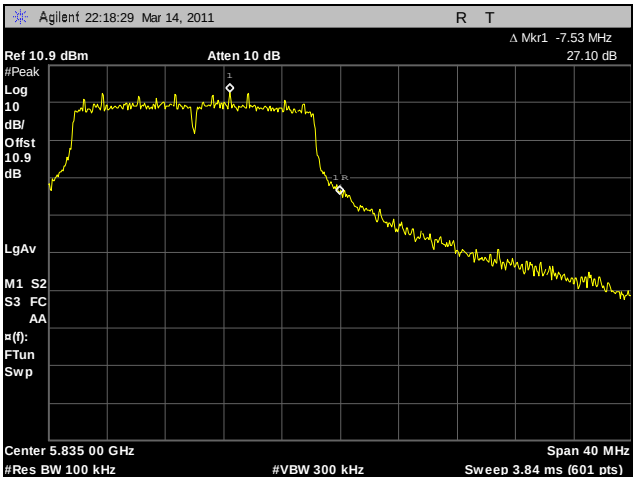
Plot 371. Conducted Band Edge, Low Channel, 802.11g 40 MHZ, Port A



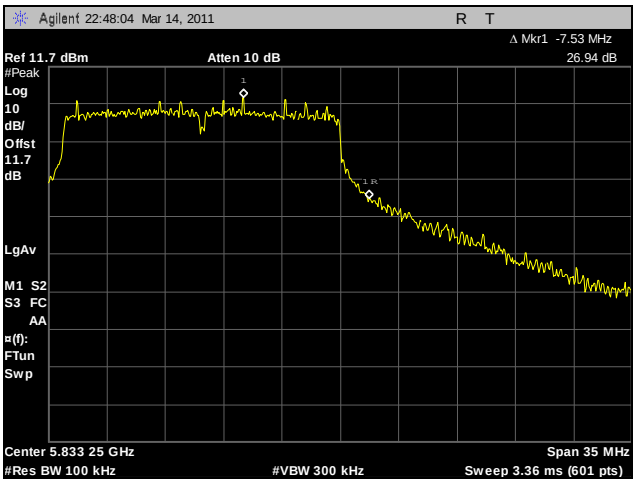
Plot 372. Conducted Band Edge, Low Channel, 802.11g 40 MHZ, Port B



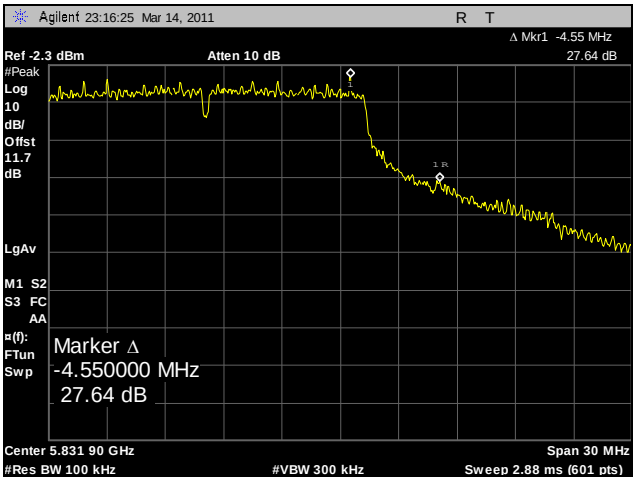
Plot 373. Conducted Band Edge, Low Channel, 802.11g 40 MHZ, Port C



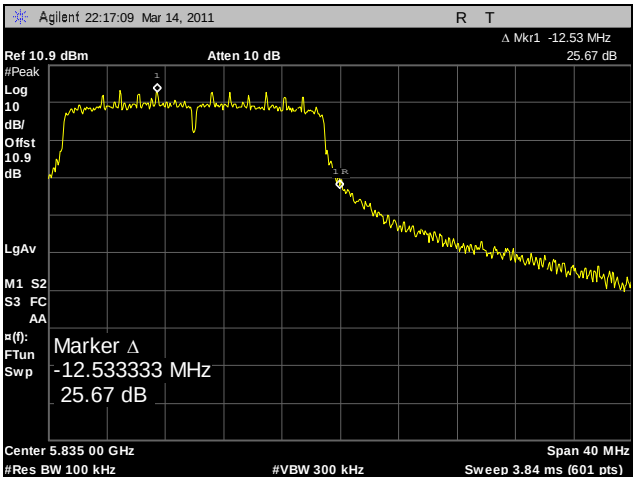
Plot 374. Conducted Band Edge, High Channel, 802.11a, Port A



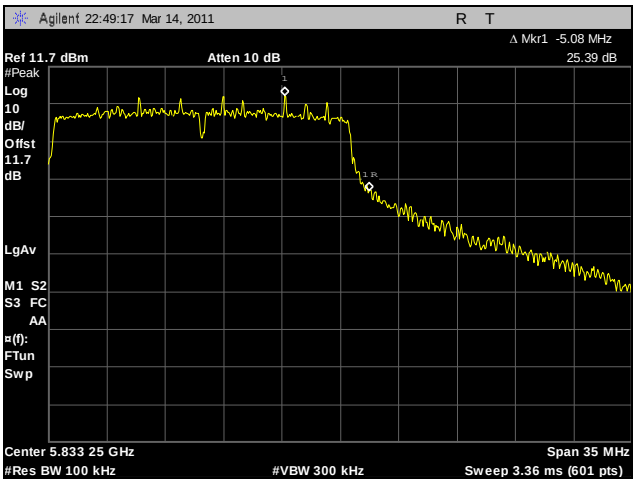
Plot 375. Conducted Band Edge, High Channel, 802.11a, Port B



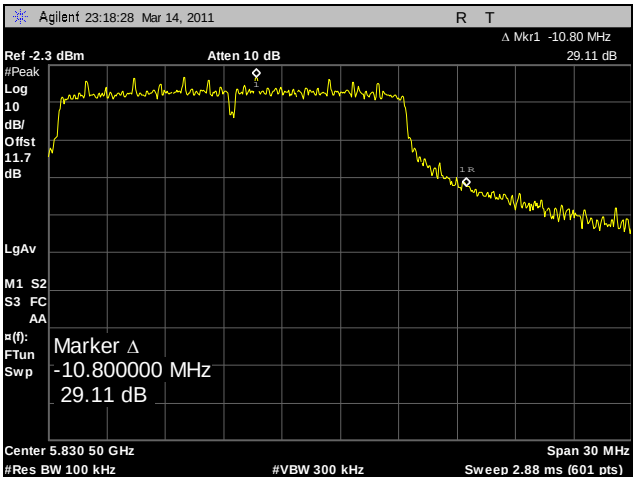
Plot 376. Conducted Band Edge, High Channel, 802.11a, Port C



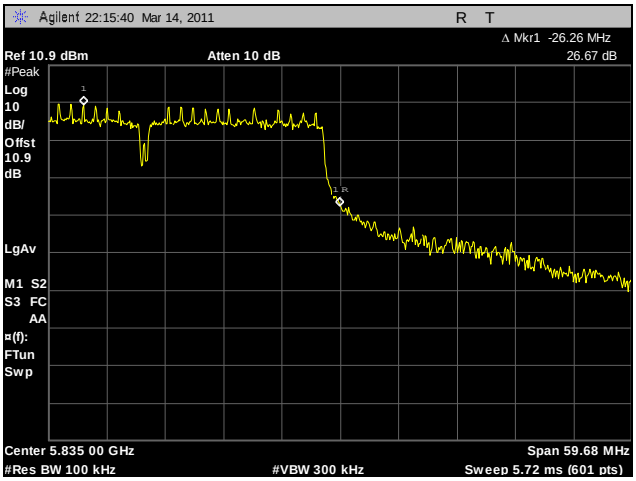
Plot 377. Conducted Band Edge, High Channel, 802.11g 20 MHZ, Port A



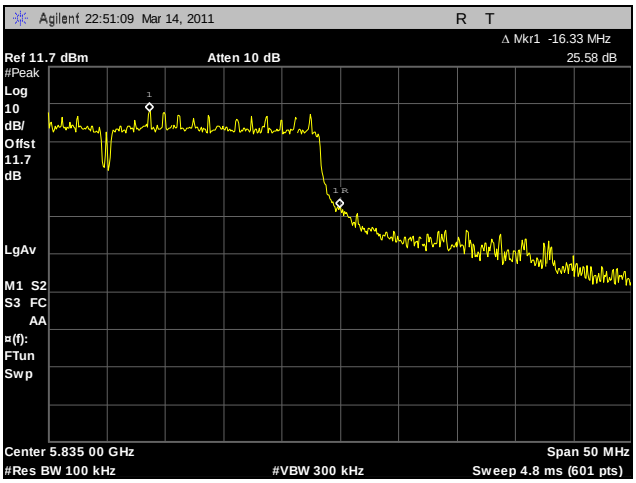
Plot 378. Conducted Band Edge, High Channel, 802.11g 20 MHZ, Port B



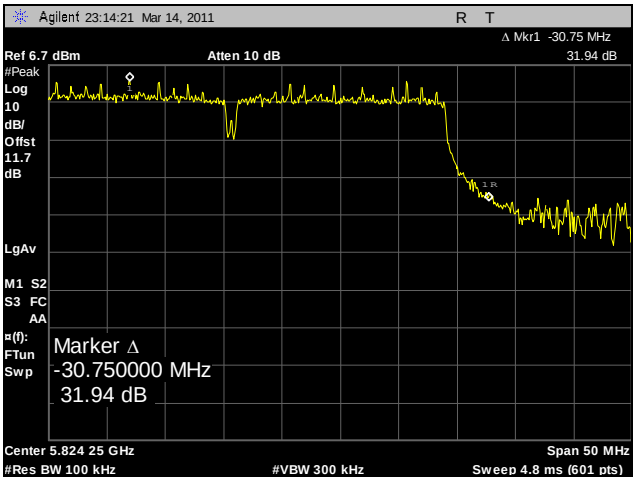
Plot 379. Conducted Band Edge, High Channel, 802.11g 20 MHZ, Port C



Plot 380. Conducted Band Edge, High Channel, 802.11g 40 MHZ, Port A



Plot 381. Conducted Band Edge, High Channel, 802.11g 40 MHZ, Port B



Plot 382. Conducted Band Edge, High Channel, 802.11g 40 MHZ, Port C

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.247(e) Peak Power Spectral Density

Test Requirements: **§15.247(e):** For digitally modulated systems, the peak power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3 kHz band during any time interval of continuous transmission.

Test Procedure: The transmitter was connected directly to a Spectrum Analyzer through an attenuator. The power level was set to the maximum level throughout each of the 100 sweeps of power averaging. The RBW was set to 3 kHz and a VBW set to 9 kHz or greater. The spectrum analyzer was set to an auto sweep time and a peak detector was used. Measurements were carried out at the low, mid and high channels.

Test Results: The EUT was compliant with the peak power spectral density limits of **§ 15.247 (e)**.

The peak power spectral density was determined from plots on the following page(s).

Test Engineer: Jeff Pratt and Dan Youngcourt

Test Date: 03/07/11

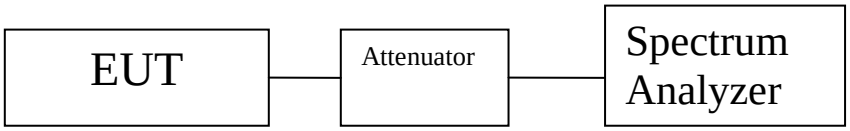


Figure 5. Block Diagram, Peak Power Spectral Density Test Setup

Peak Power Spectral Density Test Results

Frequency (MHz)	Mode/Modulation Type	Maximum Allowable Spectral Density w/ 8.97dBi gain (dBm)	Port A Spectral Density (dBm)	Port B Spectral Density (dBm)	Port C Spectral Density (dBm)	Summed Spectral Density (dBm)	Port A Spectral Density (mW)	Port B Spectral Density (mW)	Port C Spectral Density (mW)	Summed Spectral Density (mW)
2412	802.11b	5.03	-5.49	-6.69	-8.09	-1.864	0.282	0.214	0.155	0.652
2437	802.11b	5.03	-4.09	-6.37	-6.12	-0.630	0.390	0.231	0.244	0.865
2462	802.11b	5.03	-6.21	-6.13	-5.41	-1.130	0.239	0.244	0.288	0.771
2412	802.11g	5.03	-3.61	-5.24	-8.45	-0.567	0.436	0.299	0.143	0.878
2437	802.11g	5.03	-6.51	-3.53	-9.95	-1.146	0.223	0.444	0.101	0.768
2462	802.11g	5.03	-3.43	-5.45	-5.99	-0.040	0.454	0.285	0.252	0.991
2412	802.11g HT20	5.03	-8.56	-5.43	-9.66	-2.726	0.139	0.286	0.108	0.534
2437	802.11g HT20	5.03	-6.61	-3.75	-10.55	-1.378	0.218	0.422	0.088	0.728
2462	802.11g HT20	5.03	-5.63	-7.77	-4.56	-1.021	0.274	0.167	0.350	0.791
2422	802.11g HT40	5.03	-5.35	-9.32	-14.47	-3.522	0.292	0.117	0.036	0.444
2437	802.11g HT40	5.03	-3.52	-6.09	-14.9	-1.408	0.445	0.246	0.032	0.723
2452	802.11g HT40	5.03	-3.57	-10.81	-14.22	-2.515	0.440	0.083	0.038	0.560

Table 25. Peak Power Spectral Density, Test Results, 2.4 GHz

Frequency (MHz)	Mode / Modulation Type	Maximum Spectral Density w/ 12.27dBi gain (dBm / MHz)	Port A Spectral Density (dBm / MHz)	Port B Spectral Density (dBm / MHz)	Port C Spectral Density (dBm / MHz)	Summed Spectral Density (mW / MHz)	Summed Spectral Density (dBm / MHz)	Relative Margin (dB)	Port A SD (mW / MHz)	Port B SD (mW / MHz)	Port C SD (mW / MHz)
5745	802.11a	1.73	-8.65	-11.74	-12.61	0.25827447	-5.8791852	-7.6091852	0.13645831	0.06698846	0.0548277
5785	802.11a	1.73	-10.89	-12.36	-12.4	0.19709086	-7.0533351	-8.7833351	0.08147043	0.05807644	0.05754399
5825	802.11a	1.73	-11.27	-5.91	-9.04	0.45583163	-3.4119554	-5.1419554	0.07464488	0.2564484	0.12473835
5745	802.11n HT20	1.73	-8.08	-12.48	-10.88	0.2937485	-5.3202435	-7.0502435	0.15559656	0.0564937	0.08165824
5785	802.11n HT20	1.73	-7.22	-10.2	-3.6	0.72168568	-1.4165191	-3.1465191	0.18967059	0.09549926	0.43651583
5825	802.11n HT20	1.73	-9.89	-5.67	-8.4	0.51812833	-2.8556266	-4.5856266	0.10256519	0.27101916	0.14454398
5755	802.11n HT40	1.73	-11.26	-9.88	-10.37	0.26945184	-5.6951885	-7.4251885	0.07481695	0.10280163	0.09183326
5785	802.11n HT40	1.73	-11.93	-9.07	-3.34	0.65144754	-1.8612055	-3.5912055	0.06412096	0.12387966	0.46344692
5815	802.11n HT40	1.73	-8.92	-7.38	-10.79	0.3944112	-4.0405076	-5.7705076	0.12823306	0.18281002	0.08336812

Table 26. Peak Power Spectral Density, Test Results, 5.8 GHz

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.247(i) Maximum Permissible Exposure

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

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

MPE Limit Calculation: EUT's operating frequencies @ 2400-2483.5 MHz; highest conducted power = *23.25dBm* (peak) therefore, **Limit for Uncontrolled exposure: 1 mW/cm^2 or 10 W/m^2**

Gain of Antenna Elements @ 2.4GHz= 4.2 dBi
# of Antenna Elements = 3
EUT maximum antenna gain = 4.2dBi + 10*log(3)dBi = *8.97 dBi.*

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

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

where, S = Power Density (1 mW/cm^2)
P = Power Input to antenna (211.35mW)
G = Antenna Gain (7.88 numeric)

$R = (211.35*7.88/ 4*3.14*1.0)^{1/2} = (1665.438/12.56)^{1/2} = 11.52$ cm

MPE Limit Calculation: EUT's operating frequencies @ 5725-5850 MHz; highest conducted power = 23.86*dBm* (peak) therefore, **Limit for Uncontrolled exposure: 1 mW/cm^2 or 10 W/m^2**

Gain of Antenna Elements @ 5.8GHz = 7.5 dBi
off Antenna Elements = 3;
EUT maximum antenna gain = 7.5dBi + 10*log(3)dBi = *12.27 dBi.*

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

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

where, S = Power Density (1 mW/cm^2)
P = Power Input to antenna (243.22mW)
G = Antenna Gain (16.87 numeric)

$R = (243.22*16.87/ 4*3.14*1.0)^{1/2} = (4103.12/12.56)^{1/2} = 18.07$ cm

Electromagnetic Compatibility Criteria for Intentional Radiators

RSS-GEN Receiver Spurious Emissions Requirements

Test Requirements: The following receiver spurious emission limits shall be complied with:

(a) If a radiated measurement is made, all spurious emissions shall comply with the limits of Table 27.

Spurious Frequency (MHz)	Field Strength (microvolt/m at 3 metres)
30 – 88	100
88 – 216	150
216 – 960	200
Above 960	500

Table 27. Spurious Emission Limits for Receivers

(b) If a conducted measurement is made, no spurious output signals appearing at the antenna terminals shall exceed 2 nanowatts per any 4 kHz spurious frequency in the band 30-1000 MHz, or 5 nanowatts above 1 GHz.

Test Procedures: The EUT was programmed for receive mode only. Conducted measurements were taken at the antenna port of the EUT. 100 kHz resolution bandwidth was used from 30 MHz - 1 GHz and 300 kHz resolution was used for measurements done above 1 GHz. All plots are corrected for cable loss.

Test Results: Equipment is compliant with the Receiver Spurious Emissions Requirements of RSS-GEN.

Test Engineer(s): Jeff Pratt

Test Date(s): 03/07/11

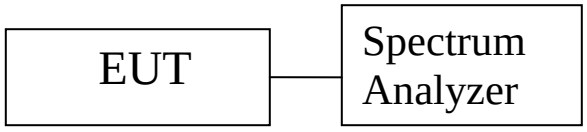
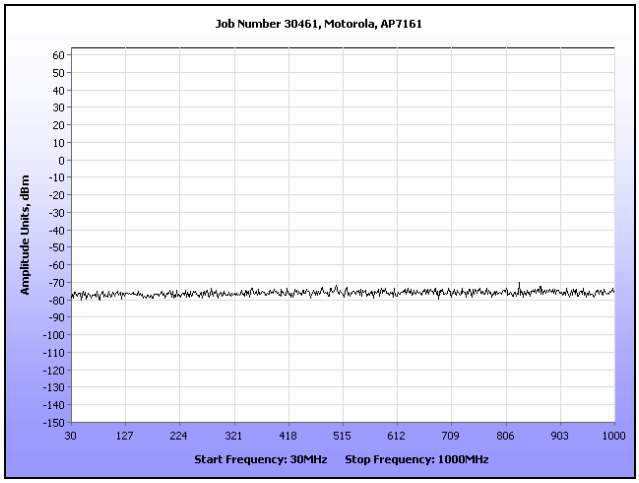
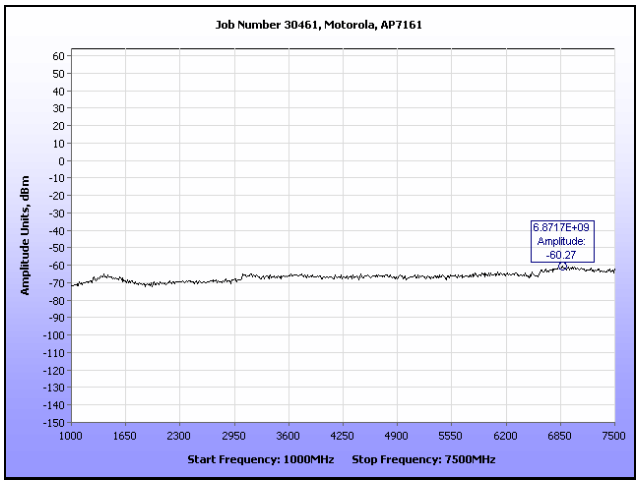


Figure 6. Block Diagram, Conducted Receiver Spurious Emissions Test Setup

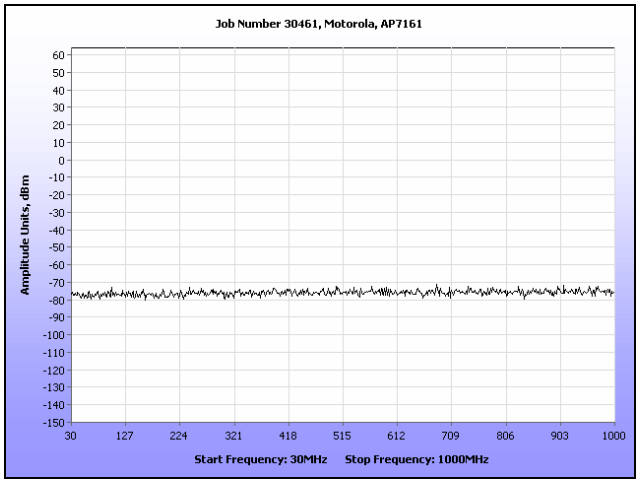
Conducted Receiver Spurious Emissions, 2.4 GHz



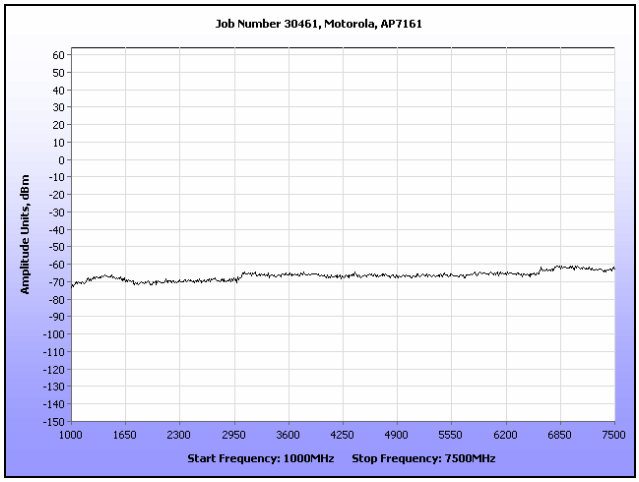
Plot 383. Receiver Spurious Emission, Port A, 30 MHz – 1 GHz



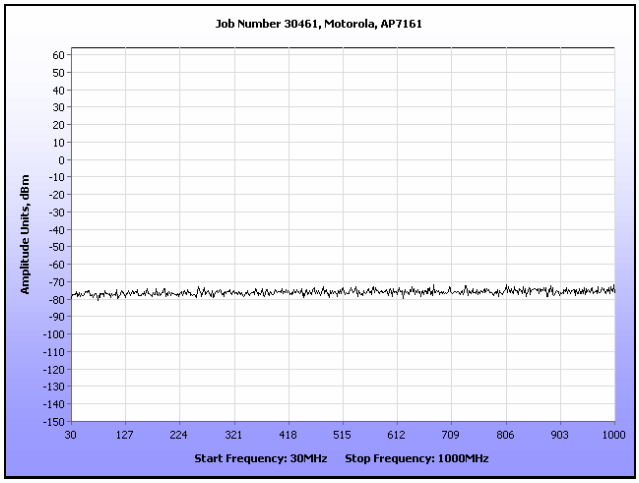
Plot 384. Receiver Spurious Emission, Port A, 1 GHz - 7.5 GHz



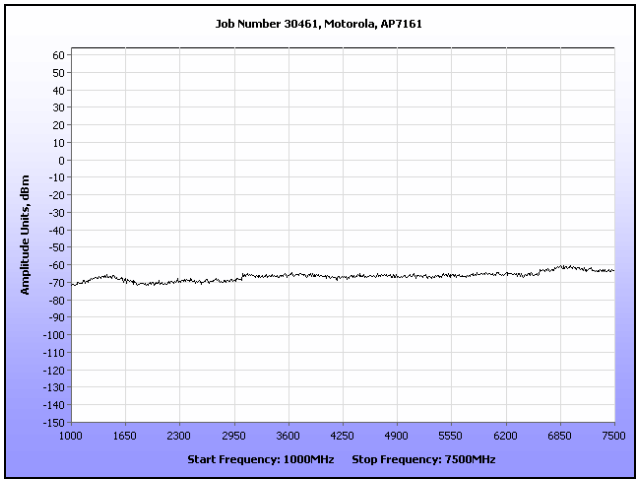
Plot 385. Receiver Spurious Emission, Port B, 30 MHz – 1 GHz



Plot 386. Receiver Spurious Emission, Port B, 1 GHz - 7.5 GHz

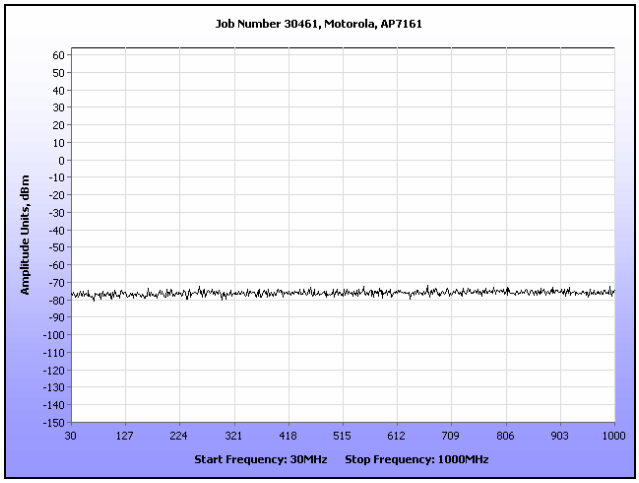


Plot 387. Receiver Spurious Emission, Port C, 30 MHz – 1 GHz

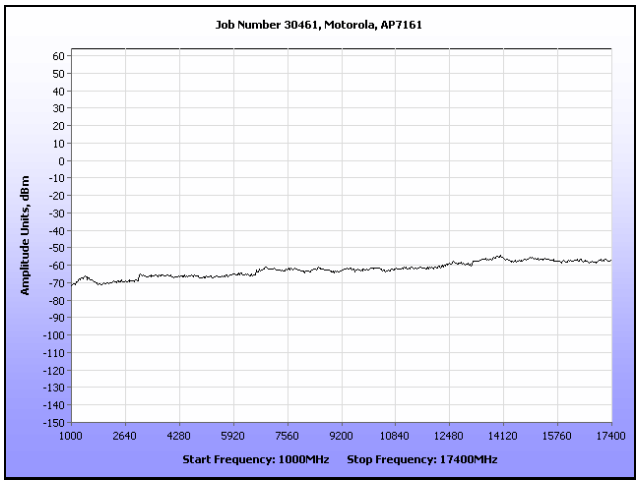


Plot 388. Receiver Spurious Emission, Port C, 1 - 7.5 GHz

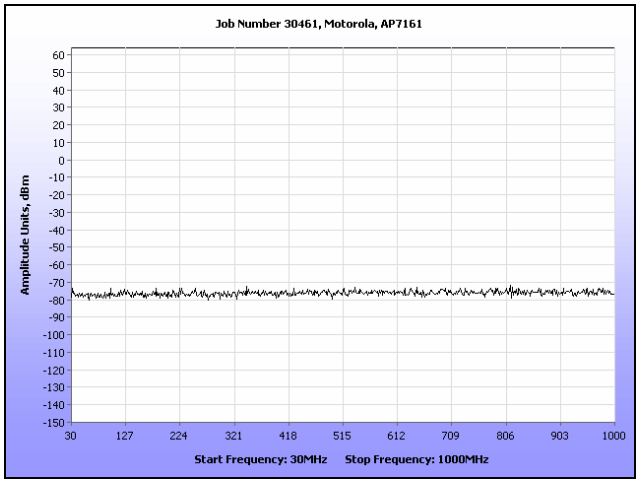
Conducted Receiver Spurious Emissions, 5.8 GHz



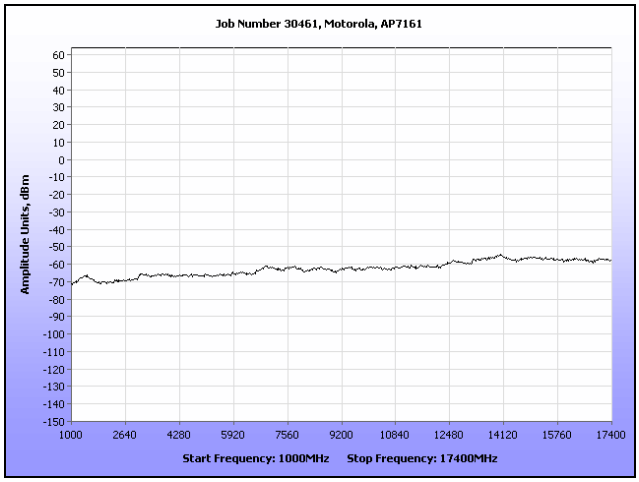
Plot 389. Receiver Spurious Emission, Port A, 30 MHz – 1 GHz



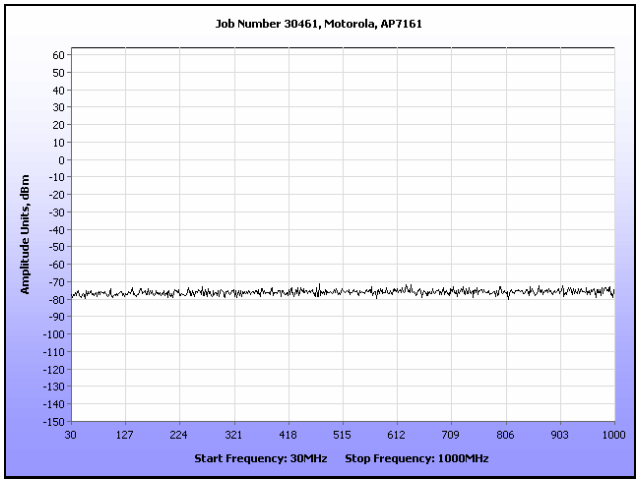
Plot 390. Receiver Spurious Emission, Port A, 1 GHz - 17.4 GHz



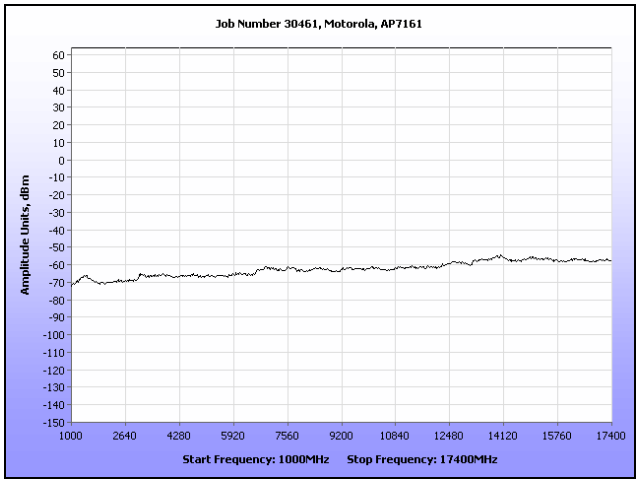
Plot 391. Receiver Spurious Emission, Port B, 30 MHz – 1 GHz



Plot 392. Receiver Spurious Emission, Port B, 1 GHz - 17.4 GHz



Plot 393. Receiver Spurious Emission, Port C, 30 MHz – 1 GHz



Plot 394. Receiver Spurious Emission, Port C, 1 GHz - 17.4 GHz

IV. Test Equipment

Test Equipment

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ISO/IEC 17025:2005.

MET Asset #	Equipment	Manufacturer	Model	Last Cal Date	Cal Due Date
1T4612	SPECTRUM ANALYZER	AGILENT	E4407B	9/27/2010	9/27/2011
1T4149	HIGH-FREQUENCY ANECHOIC CHAMBER	RAY-PROOF	81	SEE NOTE	
1T2511	ANTENNA; HORN	EMCO	3115	8/31/2010	8/31/2011
1T2511	ANTENNA; HORN	EMCO	3115	09/22/2011	03/22/2013
1T4621	ESA-E SERIES SPECTRUM ANALYZER	AGILENT	E4402B	05/10/2010	05/10/2011
1T4502	COMB GENERATOR	COM-POWER	CGC-255	10/06/2010	10/06/2011
1T4502	COMB GENERATOR	COM-POWER	CGC-255	08/21/2012	02/21/2014
1T4565	LISN (24 AMP)	SOLAR ELECTRONICS	9252-50-R-24-BNC	10/28/2010	10/28/2011
1T4565	LISN (24 AMP)	SOLAR ELECTRONICS	9252-50-R-24-BNC	12/15/2011	12/15/2012
1T4633	THERMO/HYGRO/BAROMETER	CONTROL COMPANY	02-401	03/11/2010	03/11/2012
1T4771	SPECTRUM ANALYZER	AGILENT TECHNOLOGIES	E4446A	06/25/2011	06/25/2012
1T4773	THERMO/HYGROMETER	CONTROL COMPANY	4040	05/21/2010	05/21/2012
1S2200	MULTI-DEVICE CONTROLLER	EMCO	2090	SEE NOTE	
1T4214	SHIELD ROOM #4	UNIVERSAL SHIELD INC	N/A	N/A	
1T4409	EMI RECEIVER	ROHDE & SCHWARZ	ESIB7	05/25/2010	05/25/2011
1T4409	EMI RECEIVER	ROHDE & SCHWARZ	ESIB7	07/16/2012	07/16/2013
1T4627	THERMO/HYGROMETER	CONTROL COMPANY	S6-627-9	10/09/2009	10/09/2011
1T4751	ANTENNA - BILOG	SUNOL SCIENCES	JB6	11/03/2010	11/03/2011
1T4751	ANTENNA - BILOG	SUNOL SCIENCES	JB6	12/07/2011	12/07/2012

Table 28. 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

1. 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.

ICES-003 Procedural & Labeling Requirements

From the Industry Canada Electromagnetic Compatibility Advisory Bulletin entitled, "Implementation and Interpretation of the Interference-Causing Equipment Standard for Digital Apparatus, ICES-003" (EMCAB-3, Issue 2, July 1995):

> "At present, CISPR 22: 2002 and ICES technical requirements are essentially equivalent. Therefore, if you have CISPR 22: 2002 approval by meeting CISPR Publication 22, the only additional requirements are: to attach a note to the report of the test results for compliance, indicating that these results are deemed satisfactory evidence of compliance with ICES-003 of the Canadian Interference-Causing Equipment Regulations; to maintain these records on file for the requisite five year period; and to provide the device with a notice of compliance in accordance with ICES-003."

Procedural Requirements:

According to Industry Canada's Interference Causing Equipment Standard for Digital Apparatus ICES-003 Issue 4, February 2004:

Section 6.1: A record of the measurements and results, showing the date that the measurements were completed, shall be retained by the manufacturer or importer for a period of at least five years from the date shown in the record and made available for examination on the request of the Minister.

Section 6.2: A written notice indicating compliance must accompany each unit of digital apparatus to the end user. The notice shall be in the form of a label that is affixed to the apparatus. Where because of insufficient space or other constraints it is not feasible to affix a label to the apparatus, the notice may be in the form of a statement in the user's manual.

Labeling Requirements:

The suggested text for the notice, in English and in French, is provided below, from the Annex of ICES-003:

> This Class [2] digital apparatus complies with Canadian ICES-003.
>
> Cet appareil numérique de la classe [1] est conforme à la norme NMB-003 du Canada.

[2] Insert either A or B but not both as appropriate for the equipment requirements.

End of Report

