MET Laboratories, Inc. *Safety Certification - EMI - Telecom Environmental Simulation*
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October 15, 2014

ARRIS Group, Inc.
3871 Lakefield Drive, Suite 300
Suwanee, GA 30024

Dear Alan Hoover,

Enclosed is the EMC Wireless test report for compliance testing of the ARRIS Group, Inc., SBG6400 as tested to the requirements of Title 47 of the CFR, Ch. 1 (10-1-06 ed.), Part 15, Subpart B and ICES-003, Issue 5 August 2012 for a Class B Digital Device, and FCC Part 15 Subpart C and RSS-210, Issue 8, Dec. 2010 for Intentional Radiators.

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

Sincerely yours,
MET LABORATORIES, INC.

Jennifer Warnell
Documentation Department

Reference: (\ARRIS Group, Inc.\EMC42657-FCC247 Rev. 2)

Electromagnetic Compatibility Criteria
Test Report

for the

ARRIS Group, Inc.
SBG6400

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: EMC42657-FCC247 Rev. 2

October 15, 2014

Prepared For:

ARRIS Group, Inc.
3871 Lakefield Drive, Suite 300
Suwanee, GA 30024

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

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&
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for Intentional Radiators

Surinder Singh, 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 5 August 2012, 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
∅	September 4, 2014	Initial Issue.
1	October 1, 2014	Revised to reflect retested 15B test data.
2	October 15, 2014	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 ARRIS Group, Inc. SBG6400, 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 SBG6400. ARRIS Group, Inc. should retain a copy of this document which should be kept on file for at least two years after the manufacturing of the SBG6400, 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 ARRIS Group, Inc., purchase order number 0008077232. 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; RSS-GEN Issue 3: 2010	Description	Compliance
47 CFR Part 15.107 (a)	ICES-003 Issue 5 August 2012	Conducted Emission Limits for a Class B Digital Device	Compliant
47 CFR Part 15.109 (a)	ICES-003 Issue 5 August 2012	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-GEN (7.2.4)	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(A8.2)	Peak Power Spectral Density	Compliant
Title 47 of the CFR, Part 15 §15.247(i)	RSS-Gen(5.6)	Maximum Permissible Exposure (MPE)	Compliant

Table 1. Executive Summary of EMC Part 15.247 ComplianceTesting

II. Equipment Configuration

A. Overview

MET Laboratories, Inc. was contracted by ARRIS Group, Inc. to perform testing on the SBG6400, under ARRIS Group, Inc.'s purchase order number 0008077232.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the ARRIS Group, Inc., SBG6400.

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

Model(s) Tested:	SBG6400	
Model(s) Covered:	SBG6400	
EUT Specifications:	Primary Power: 120 VAC, 60 Hz	
	FCC ID: UIDSBG6400 IC: 6670A-SBG6400	
	Type of Modulations:	CCK, OFDM, MCS
	Equipment Code:	DTS
	Peak RF Output Power:	29.72dBm
	EUT Frequency Ranges:	2412-2462 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:	Surinder Singh	
Report Date(s):	October 15, 2014	

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
CFR 47, Part 15, Subpart B	Electromagnetic Compatibility: Criteria for Radio Frequency Devices
RSS-210, Issue 8, Dec. 2010	Low-power Licence-exempt Radiocommunications Devices (All Frequency Bands): Category I Equipment
RSS-GEN, Issue 3, Dec. 2010	General Requirements and Information for the Certification of Radio Apparatus
ICES-003, Issue 5 August 2012	Information Technology Equipment (ITE) — Limits and methods of measurement
ANSI C63.4:2003	Methods and Measurements of Radio-Noise Emissions from Low-Voltage Electrical And Electronic Equipment in the Range of 9 kHz to 40 GHz
ISO/IEC 17025:2005	General Requirements for the Competence of Testing and Calibration Laboratories
ANSI C63.10-2009	American National Standard for Testing Unlicensed Wireless Devices

Table 3. References

C. Test Site

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

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

D. Description of Test Sample

The ARRIS Group, Inc. SBG6400, Equipment Under Test (EUT), is an indoor2.4 indoor data gateway.

Photograph 1. ARRIS Group, Inc. SBG6400

E. Equipment Configuration

Ref. ID	Name / Description	Model Number	Part Number	Serial Number
1.	Gateway Router	SBG6400	59538400200	402183415700053500000002
2.	Gateway Router	SBG6400	59538400200	402183415700041200000002
3.	Gateway Router	SBG6400	59538400200	40218341570005700000002
4.	Gateway Router	SBG6400	59538400200	402183415700095500000002

Table 4. Equipment Configuration

F. Support Equipment

Ref. ID	Name / Description	Manufacturer	Model Number
NA	Laptop	Dell	Vostro
NA	Laptop Mouse	Logitech	NA
NA	RF Cable	NA	NA
NA	Ethernet cable	NA	NA
NA	12 Vdc PS	Asian Power Devices	WA-24I12FU
NA	CMTS	ARRIS C4	NA

Table 5. Support Equipment

G. Ports and Cabling Information

Ref. ID	Port Name on EUT	Cable Description	Qty.	Length (m)	Shielded (Y/N)	Termination Point
1	RF	RG6 Coax	1	8	Yes	CMTS Diplexer
2	DC	12Vdc, 22 AWG x 2C	1	2	No	AC/DC power supply
3	Ethernet	Cat 5E 24AWG/4P	1	2	No	Laptop Ethernet Port

Table 6. Ports and Cabling Information

H. Mode of Operation

The provided test tool configures the SBG6400 for operation at each required test mode.

I. Method of Monitoring EUT Operation

The measured emission value is over the specified FCC/IC limits.

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 ARRIS Group, 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.

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.				

Table 7. Conducted Limits for Radio Frequency Devices calculated from FCC Part 15 Subsections 15.107(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, test conditions, and test procedures of ANSI C63.4 were used. The EUT was powered through a 50Ω/50µH LISN. An EMI receiver, connected to the measurement port of the LISN, scanned the frequency range from 150 kHz to 30 MHz in order to find the peak conducted emissions. All peak emissions within 6 dB of the limit were re-measured using a quasi-peak and/or average detector as appropriate.

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

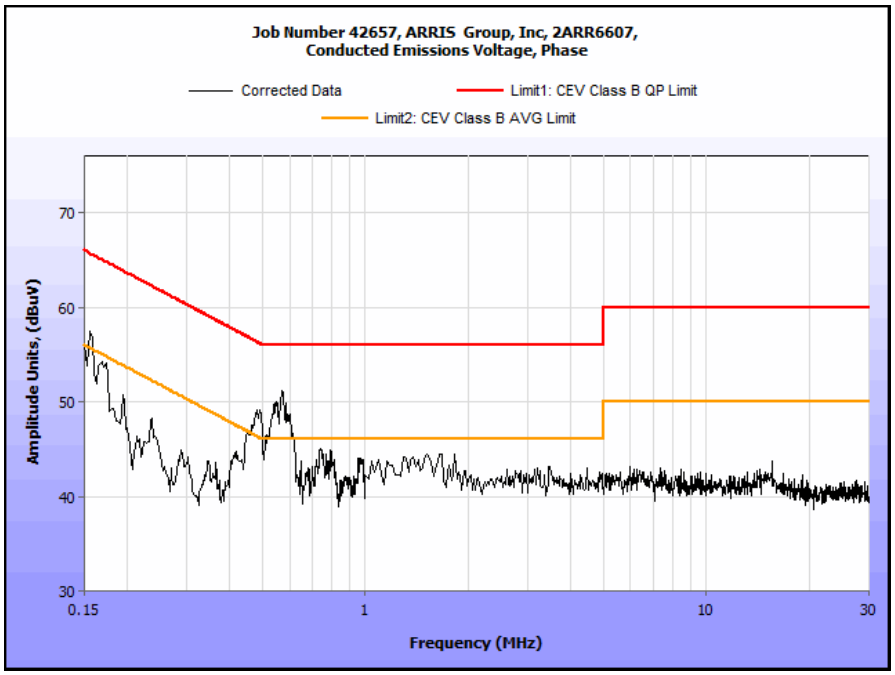
Test Engineer(s): Surinder Singh

Test Date(s): 09/21/14

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

Frequency (MHz)	Uncorrected Meter Reading (dBµV) QP	Cable Loss (dB)	Corrected Measurement (dBµV) QP	Limit (dBµV) QP	Margin (dB) QP	Uncorrected Meter Reading (dBµV) Avg.	Cable Loss (dB)	Corrected Measurement (dBµV) AVG	Limit (dBµV) AVG	Margin (dB) AVG
0.16	43.16	0	43.16	65.46	-22.3	36.57	0	36.57	55.46	-18.89
0.538	52.48	0	52.48	56	-3.52	42.23	0	42.23	46	-3.77
0.782	50.97	0	50.97	56	-5.03	40.22	0	40.22	46	-5.78
1.6	40.01	0	40.01	56	-15.99	31.23	0	31.23	46	-14.77
2.51	40.01	0	40.01	56	-15.99	31.23	0	31.23	46	-14.77
16.92	24.48	0	24.48	60	-35.52	9.26	0	9.26	50	-40.74

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

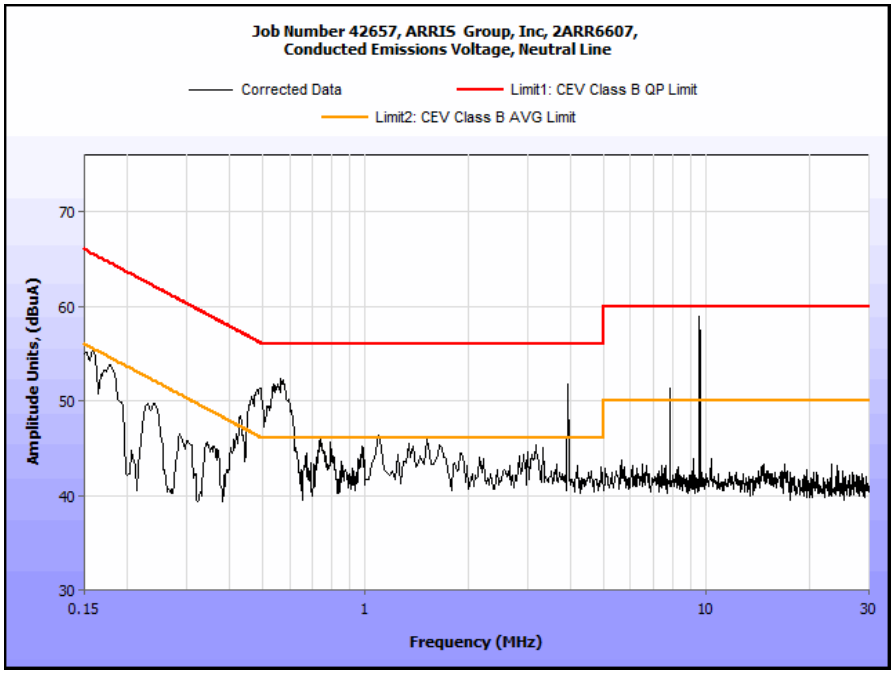


Plot 1. Conducted Emissions, Phase Line Plot

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

Frequency (MHz)	Uncorrected Meter Reading (dBµV) QP	Cable Loss (dB)	Corrected Measurement (dBµV) QP	Limit (dBµV) QP	Margin (dB) QP	Uncorrected Meter Reading (dBµV) Avg.	Cable Loss (dB)	Corrected Measurement (dBµV) AVG	Limit (dBµV) AVG	Margin (dB) AVG
0.2	45.63	0	45.63	63.61	-17.98	34.12	0	34.12	53.61	-19.49
0.529	51.22	0	51.22	56	-4.78	41.56	0	41.56	46	-4.44
1.06	48.46	0	48.46	56	-7.54	37.29	0	37.29	46	-8.71
1.52	38.39	0	38.39	56	-17.61	28.52	0	28.52	46	-17.48
3.42	39.22	0	39.22	56	-16.78	23.94	0	23.94	46	-22.06
17.2	25.17	0	25.17	60	-34.83	11.16	0	11.16	50	-38.84

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



Plot 2. Conducted Emissions, Neutral Line Plot

Conducted Emission Limits Test Setup

Photograph 2. Conducted Emissions, Test Setup

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): Surinder Singh

Test Date(s): 08/19/14

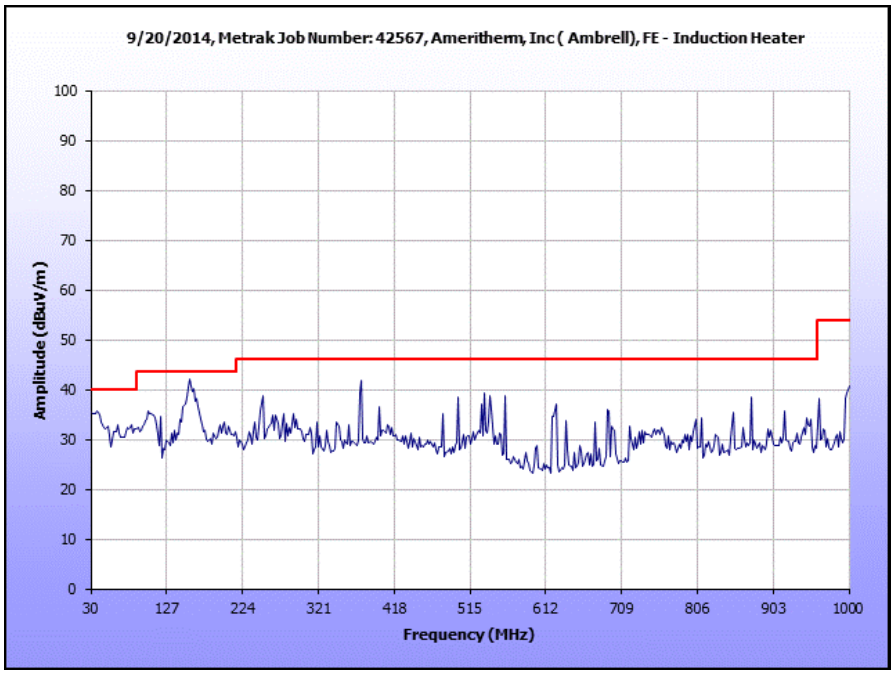
Radiated Emissions Limits Test Results, Class B

Frequency (MHz)	EUT Azimuth (Degrees)	Antenna Polarity (H/V)	Antenna HEIGHT (m)	Uncorrected Amplitude (dBµV)	Antenna Correction Factor (dB) (+)	Cable Loss (dB) (+)	Distance Correction Factor (dB) (-)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
38.566132	318	H	1.50	11.56	15.20	0.58	0.00	27.34	40.00	-12.66
38.566132	181	V	1.27	19.24	15.20	0.58	0.00	35.02	40.00	-4.98
154.92485	101	H	2.30	11.74	12.91	1.04	0.00	25.69	43.50	-17.81
154.92485	120	V	1.02	17.99	12.91	1.04	0.00	31.94	43.50	-11.56
248.98323	299	H	1.74	24.33	12.12	1.33	0.00	37.78	46.00	-8.22
248.98323	185	V	1.02	23.16	12.12	1.33	0.00	36.61	46.00	-9.39
533.21242	68	H	1.13	13.50	18.60	1.95	0.00	34.05	46.00	-11.95
533.21242	289	V	1.02	16.73	18.60	1.95	0.00	37.28	46.00	-8.72
623.28467	354	H	1.98	9.30	19.87	2.13	0.00	31.30	46.00	-14.70
623.28467	104	V	1.01	15.09	19.87	2.13	0.00	37.09	46.00	-8.91
774.95779	324	H	1.92	12.46	21.50	2.37	0.00	36.33	46.00	-9.67
774.95779	129	V	1.36	12.73	21.50	2.37	0.00	36.60	46.00	-9.40

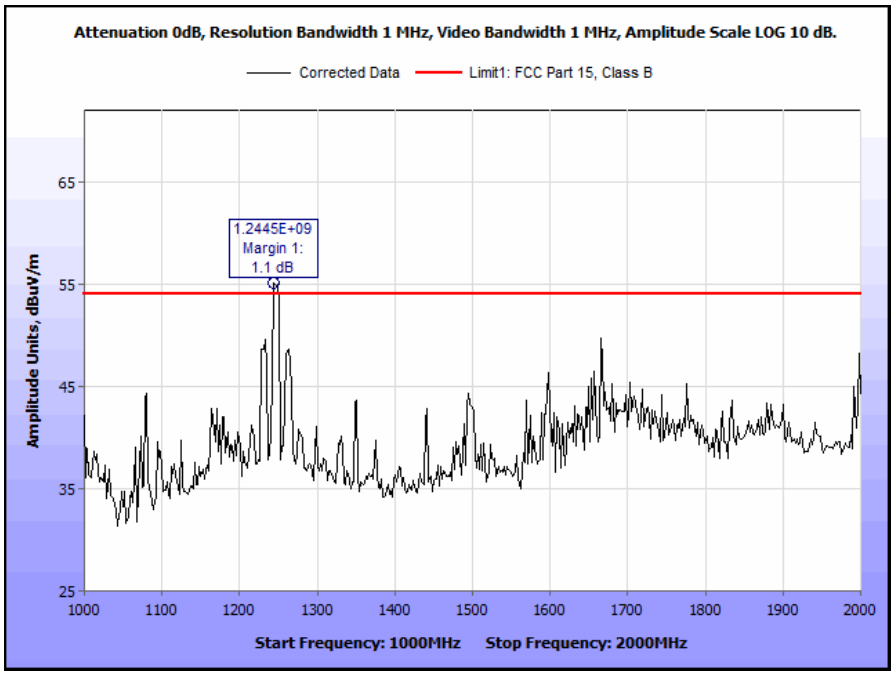
Table 11. Radiated Emissions Limits, Test Results, 30 MHz – 1 GHz

Frequency (MHz)	EUT Azimuth (Degrees)	Antenna Polarity (H/V)	Antenna HEIGHT (m)	Uncorrected Amplitude (dBµV)	Antenna Correction Factor (dB) (+)	Cable Loss (dB) (+)	Distance Correction Factor (dB) (-)	Corrected Amplitude (dBµV/m)	Limit (dBµV/m)	Margin (dB)
1.0802	195	H	235	24.82	-0.37	0.00	0	24.45	54	-29.55
1.0802	345	V	142.43	24.49	-0.62	0.00	0	23.87	54	-30.13
1.24474	340	H	138.73	23.9	-1.21	0.00	0	22.69	54	-31.31
1.24474	220	V	190.34	19.48	-1.43	0.00	0	18.05	54	-35.95
1.3507	188	H	136.82	19.26	-0.67	0.00	0	18.59	54	-35.41
1.3507	316	V	125.96	22.16	-0.83	0.00	0	21.33	54	-32.67
1.497	244	H	213.26	14.82	-0.19	0.00	0	14.63	54	-39.37
1.497	104	V	112.36	17.84	-0.18	0.00	0	17.66	54	-36.34
1.6713	360	H	101.91	17.26	0.33	0.00	0	17.59	54	-36.41
1.6713	112	V	163.45	14.52	0.33	0.00	0	14.85	54	-39.15
1.996	28	H	134.56	18.21	2.03	0.00	0	20.24	54	-33.76
1.996	309	V	116.46	19.55	1.92	0.00	0	21.47	54	-32.53

Table 12. Radiated Emissions Limits, Test Results, 1 GHz – 2 GHz

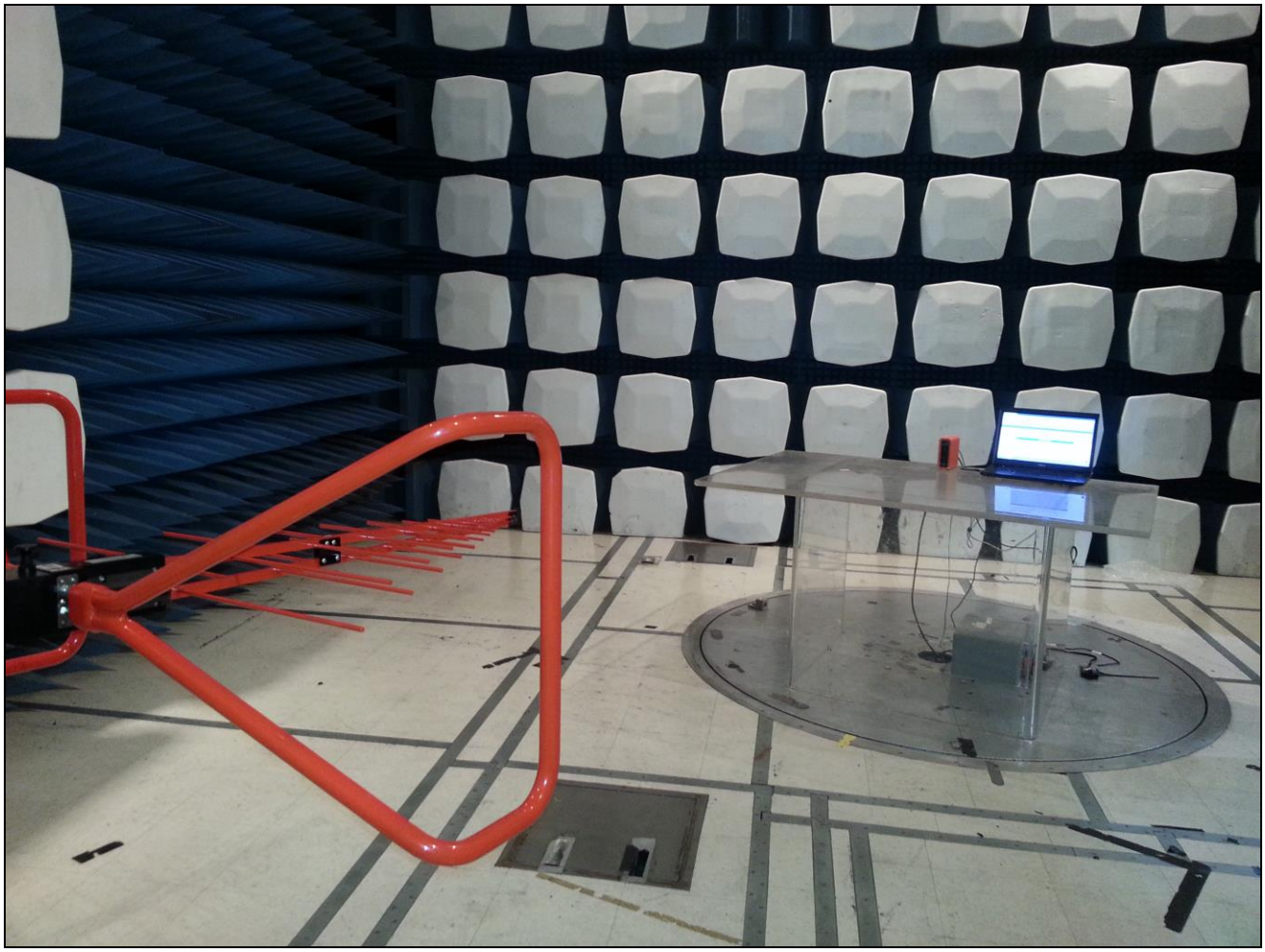


Plot 3. Radiated Emissions, Pre-Scan, 30 MHz - 1 GHz



Plot 4. Radiated Emissions, Pre-Scan, 1 GHz – 2 GHz

Radiated Emissions Limits Test Setup



Photograph 3. Radiated Emissions, Test Setup

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 integral antenna.

Test Engineer(s): Surinder Singh

Test Date(s): 02/12/14

Antennas	Peak Gain (over 2.4 GHz band)
Chain A0	1.66
Chain A1	3.35
2Tx Composite	5.56

The 2Tx Composite gain was calculated based upon the formula given in KDB 662911 D01 Multiple Transmitter Output v02r01 for antenna gains that are not equal and each transmit antenna is driven by only one spatial stream.

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 Σ 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.

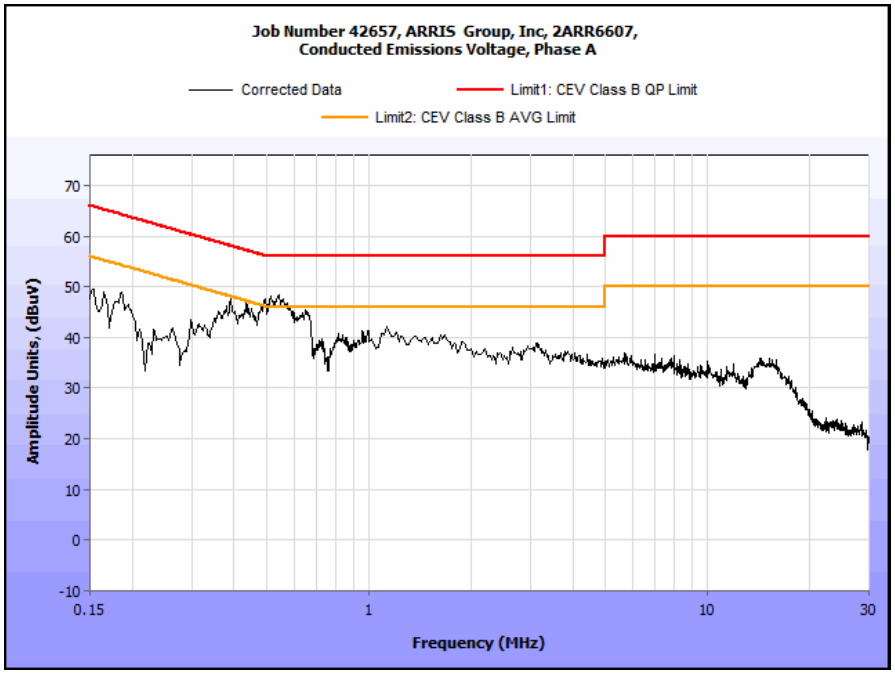
Test Engineer(s): Surinder Singh

Test Date(s): 08/06/14

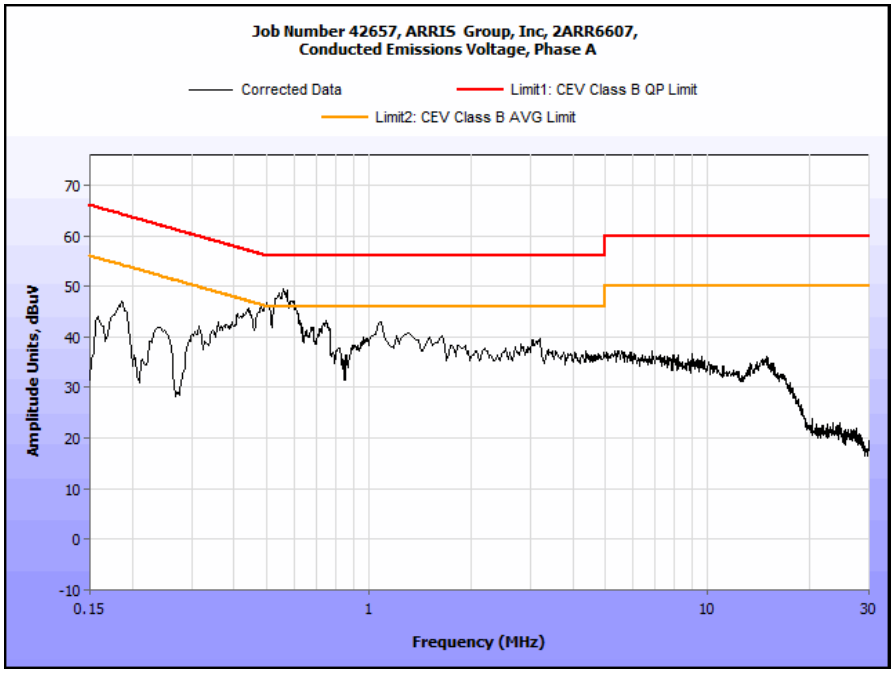
15.207(a) Conducted Emissions Test Results

Frequency (MHz)	Uncorrected Meter Reading (dBµV) QP	Cable Loss (dB)	Corrected Measurement (dBµV) QP	Limit (dBµV) QP	Margin (dB) QP	Uncorrected Meter Reading (dBµV) Avg.	Cable Loss (dB)	Corrected Measurement (dBµV) AVG	Limit (dBµV) AVG	Margin (dB) AVG
0.1502	36.92	0	36.92	65.99	-29.07	26.5	0	26.5	55.99	-29.49
0.494	42.82	0	42.82	56.1	-13.28	34.92	0	34.92	46.1	-11.18
0.5446	44.25	0	44.25	56	-11.75	36.09	0	36.09	46	-9.91
1.38	36.4	0	36.4	56	-19.6	25.19	0	25.19	46	-20.81
14.05	31.58	0	31.58	60	-28.42	23.64	0	23.64	50	-26.36
23.09	16.71	0	16.71	60	-43.29	9.75	0	9.75	50	-40.25

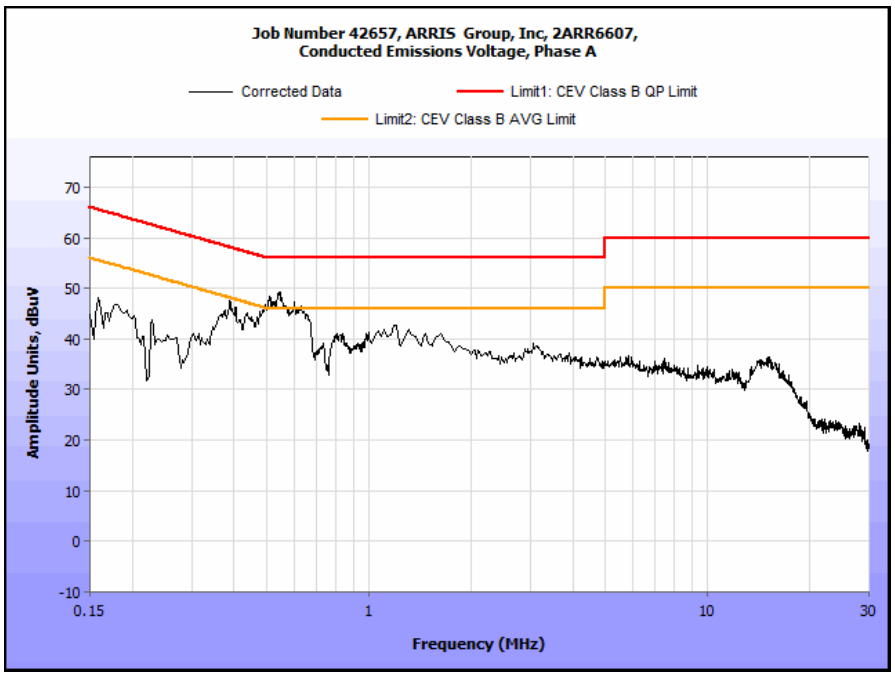
Table 14. Conducted Emissions, 15.207(a), Phase Line, Test Results



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



Plot 6. Conducted Emissions, 15.207(a), Phase Line, Mid Channel

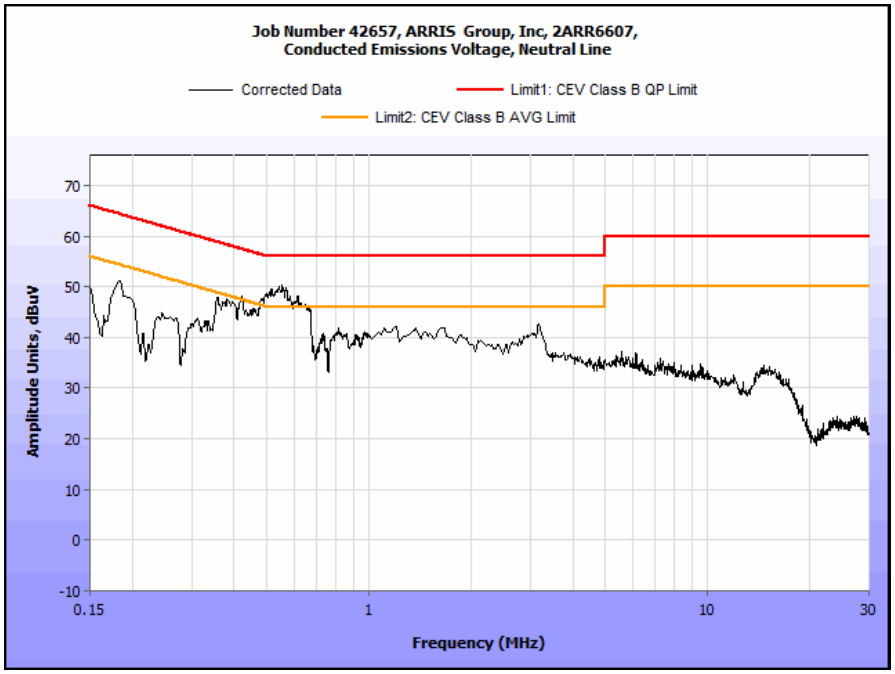


Plot 7. Conducted Emissions, 15.207(a), Phase Line, High Channel

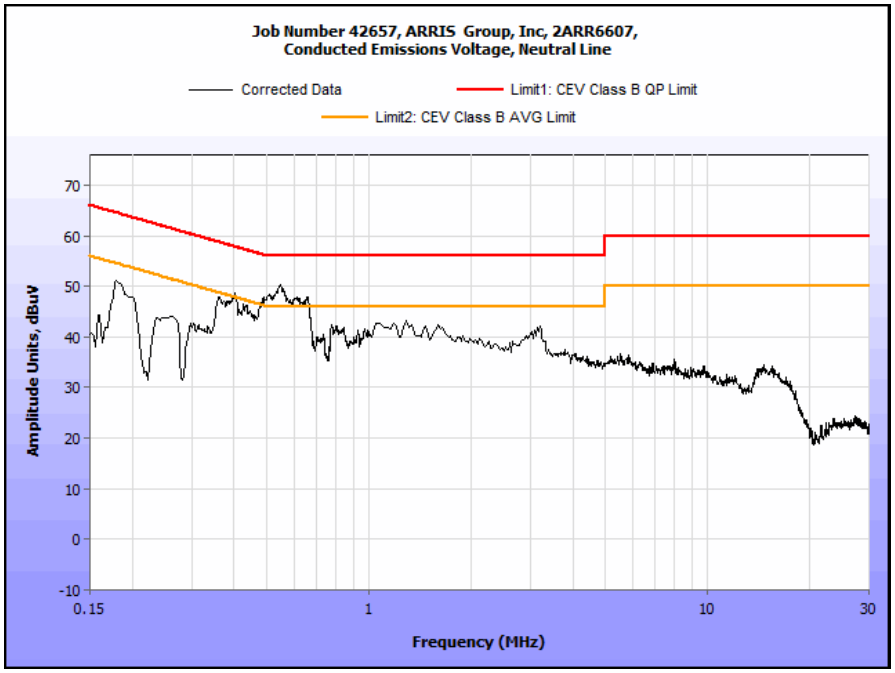
15.207(a) Conducted Emissions Test Results

Frequency (MHz)	Uncorrected Meter Reading (dBµV) QP	Cable Loss (dB)	Corrected Measurement (dBµV) QP	Limit (dBµV) QP	Margin (dB) QP	Uncorrected Meter Reading (dBµV) Avg.	Cable Loss (dB)	Corrected Measurement (dBµV) AVG	Limit (dBµV) AVG	Margin (dB) AVG
0.175	46.46	0	46.46	64.72	-18.26	35.98	0	35.98	54.72	-18.74
0.475	43.8	0	43.8	56.43	-12.63	36.53	0	36.53	46.43	-9.9
0.5662	46.09	0	46.09	56	-9.91	36.76	0	36.76	46	-9.24
1.067	37.93	0	37.93	56	-18.07	29.66	0	29.66	46	-16.34
15.38	27.77	0	27.77	60	-32.23	22.59	0	22.59	50	-27.41
24.87	17.01	0	17.01	60	-42.99	10.89	0	10.89	50	-39.11

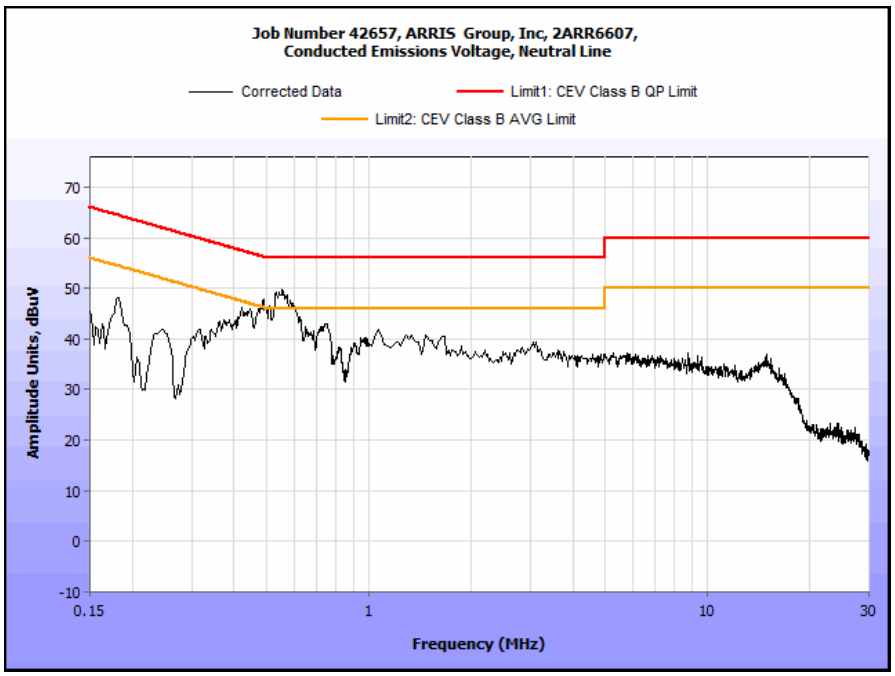
Table 15. Conducted Emissions, 15.207(a), Neutral Line, Test Results



Plot 8. Conducted Emissions, 15.207(a), Neutral Line, Low Channel

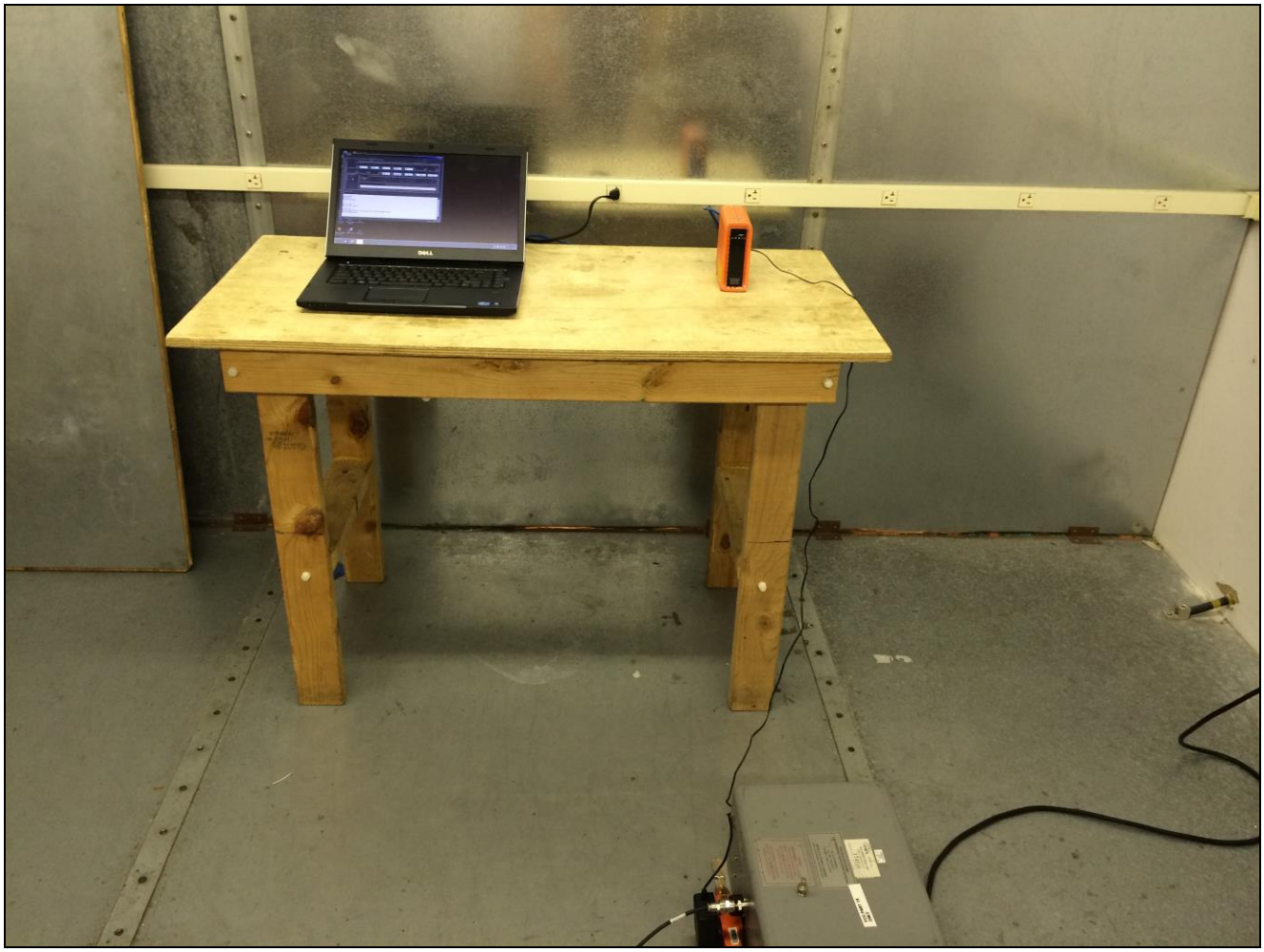


Plot 9. Conducted Emissions, 15.207(a), Neutral Line, Mid Channel



Plot 10. Conducted Emissions, 15.207(a), Neutral Line, High Channel

15.207(a) Conducted Emissions Test Setup Photo



Photograph 4. Conducted Emissions, 15.207(a), Test Setup

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): Surinder Singh

Test Date(s): 02/08/14

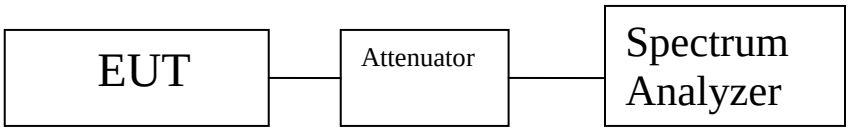


Figure 1. Block Diagram, Occupied Bandwidth Test Setup

Occupied Bandwidth Test Results

Occupied Bandwidth		
Carrier Channel	**Frequency (MHz)**	**Measured 6 dB Bandwidth (MHz)**
Channel 1	2412	9.034
Channel 6	2437	9.572
Channel 11	2462	8.618

Table 16. 6 dB Occupied Bandwidth, Test Results, 802.11b, Ant. 0

Occupied Bandwidth		
Carrier Channel	**Frequency (MHz)**	**Measured 6 dB Bandwidth (MHz)**
Channel 1	2412	9.041
Channel 6	2437	9.580
Channel 11	2462	9.079

Table 17. 6 dB Occupied Bandwidth, Test Results, 802.11b, Ant. 1

Occupied Bandwidth		
Carrier Channel	**Frequency (MHz)**	**Measured 6 dB Bandwidth (MHz)**
Channel 1	2412	15.743
Channel 6	2437	15.098
Channel 11	2462	14.676

Table 18. 6 dB Occupied Bandwidth, Test Results, 802.11g, Ant. 0

Occupied Bandwidth		
Carrier Channel	**Frequency (MHz)**	**Measured 6 dB Bandwidth (MHz)**
Channel 1	2412	16.165
Channel 6	2437	15.141
Channel 11	2462	15.086

Table 19. 6 dB Occupied Bandwidth, Test Results, 802.11g, Ant. 1

Occupied Bandwidth		
Carrier Channel	**Frequency (MHz)**	**Measured 6 dB Bandwidth (MHz)**
Channel 1	2412	15.914
Channel 6	2437	15.951
Channel 11	2462	15.073

Table 20. 6 dB Occupied Bandwidth, Test Results, 802.11n 20 MHz, Ant. 0

Occupied Bandwidth		
Carrier Channel	**Frequency (MHz)**	**Measured 6 dB Bandwidth (MHz)**
Channel 1	2412	15.091
Channel 6	2437	15.173
Channel 11	2462	15.117

Table 21. 6 dB Occupied Bandwidth, Test Results, 802.11n 20 MHz, Ant. 1

Occupied Bandwidth		
Carrier Channel	**Frequency (MHz)**	**Measured 6 dB Bandwidth (MHz)**
Channel 1	2422	35.116
Channel 6	2437	35.683
Channel 11	2452	35.756

Table 22. 6 dB Occupied Bandwidth, Test Results, 802.11n 40 MHz, Ant. 0

Occupied Bandwidth		
Carrier Channel	**Frequency (MHz)**	**Measured 6 dB Bandwidth (MHz)**
Channel 1	2422	35.670
Channel 6	2437	35.701
Channel 11	2452	35.763

Table 23. 6 dB Occupied Bandwidth, Test Results, 802.11n 40 MHz, Ant. 1

Occupied Bandwidth		
Carrier Channel	**Frequency (MHz)**	**Measured 99% Bandwidth (MHz)**
Channel 1	2412	13.9998
Channel 6	2437	15.2355
Channel 11	2462	13.7568

Table 24. 99% Occupied Bandwidth, Test Results, 802.11b, Ant. 0

Occupied Bandwidth		
Carrier Channel	**Frequency (MHz)**	**Measured 99% Bandwidth (MHz)**
Channel 1	2412	14.0544
Channel 6	2437	15.5978
Channel 11	2462	13.5731

Table 25. 99% Occupied Bandwidth, Test Results, 802.11b, Ant. 1

Occupied Bandwidth		
Carrier Channel	**Frequency (MHz)**	**Measured 99% Bandwidth (MHz)**
Channel 1	2412	18.3315
Channel 6	2437	19.6900
Channel 11	2462	18.2870

Table 26. 99% Occupied Bandwidth, Test Results, 802.11g, Ant. 0

Occupied Bandwidth		
Carrier Channel	**Frequency (MHz)**	**Measured 99% Bandwidth (MHz)**
Channel 1	2412	18.7429
Channel 6	2437	19.5906
Channel 11	2462	18.9699

Table 27. 99% Occupied Bandwidth, Test Results, 802.11g, Ant. 1

Occupied Bandwidth		
Carrier Channel	**Frequency (MHz)**	**Measured 99% Bandwidth (MHz)**
Channel 1	2412	18.6882
Channel 6	2437	19.3818
Channel 11	2462	18.4341

Table 28. 99% Occupied Bandwidth, Test Results, 802.11n 20 MHz, Ant. 0

Occupied Bandwidth		
Carrier Channel	**Frequency (MHz)**	**Measured 99% Bandwidth (MHz)**
Channel 1	2412	18.5542
Channel 6	2437	19.3620
Channel 11	2462	19.0987

Table 29. 99% Occupied Bandwidth, Test Results, 802.11n 20 MHz, Ant. 1

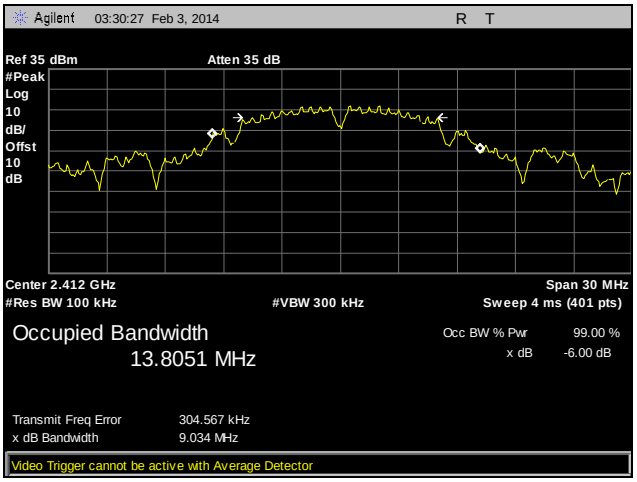
Occupied Bandwidth		
Carrier Channel	**Frequency (MHz)**	**Measured 99% Bandwidth (MHz)**
Channel 1	2422	38.1003
Channel 6	2437	38.9352
Channel 11	2452	39.6940

Table 30. 99% Occupied Bandwidth, Test Results, 802.11n 40 MHz, Ant. 0

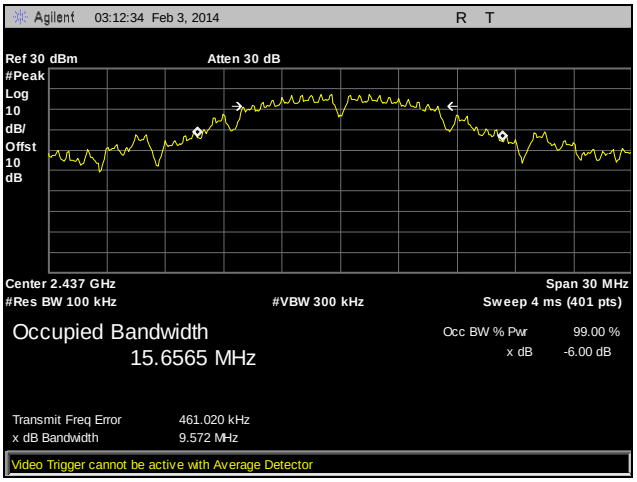
Occupied Bandwidth		
Carrier Channel	**Frequency (MHz)**	**Measured 99% Bandwidth (MHz)**
Channel 1	2422	37.5220
Channel 6	2437	37.0964
Channel 11	2452	39.6698

Table 31. 99% Occupied Bandwidth, Test Results, 802.11n 40 MHz, Ant. 1

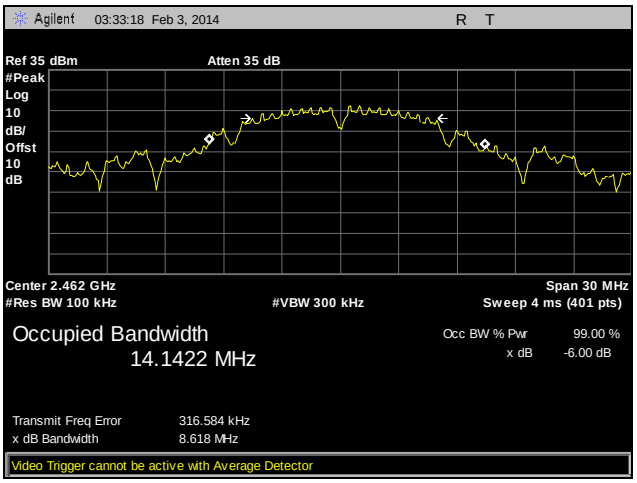
6 dB Occupied Bandwidth Test Results, 802.11b



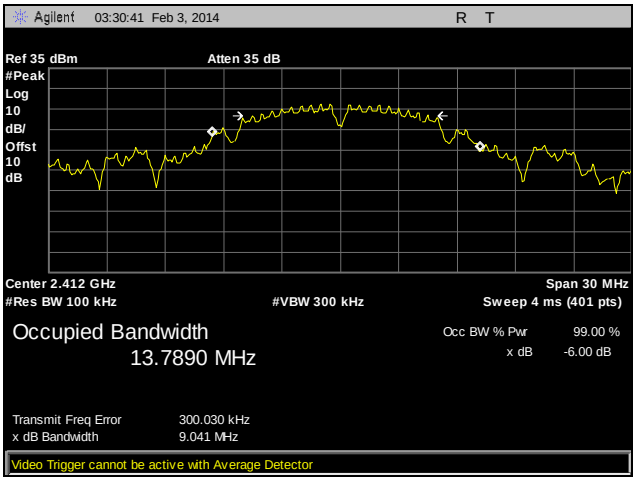
Plot 11. 6 dB Occupied Bandwidth, Channel 1, 802.11b, Ant. 0



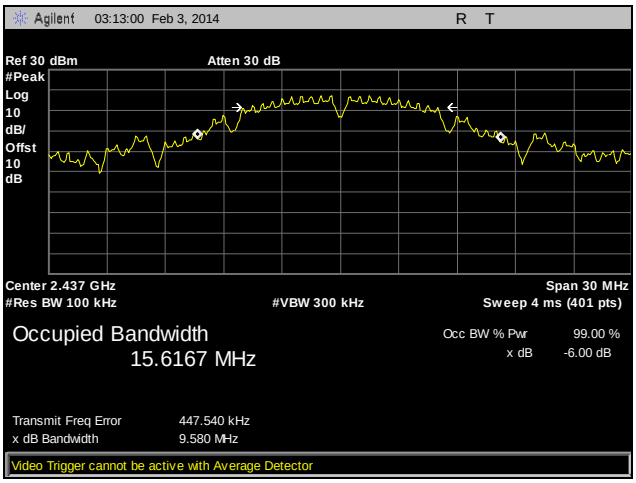
Plot 12. 6 dB Occupied Bandwidth, Channel 6, 802.11b, Ant. 0



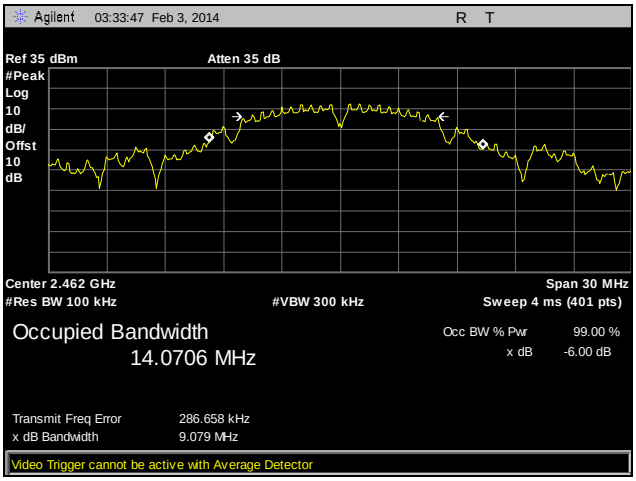
Plot 13. 6 dB Occupied Bandwidth, Channel 11, 802.11b, Ant. 0



Plot 14. 6 dB Occupied Bandwidth, Channel 1, 802.11b, Ant. 1

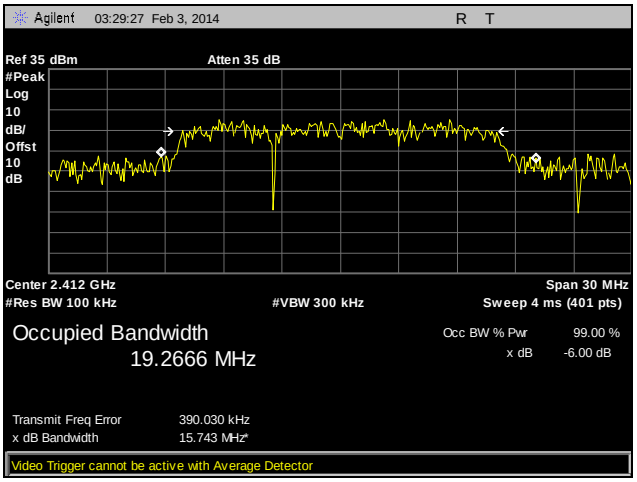


Plot 15. 6 dB Occupied Bandwidth, Channel 6, 802.11b, Ant. 1

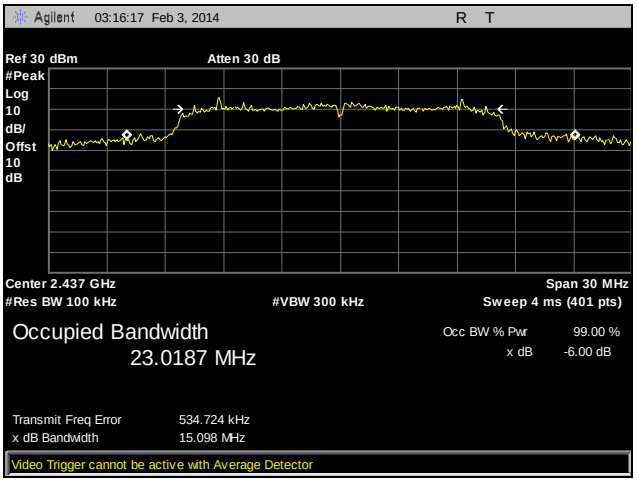


Plot 16. 6 dB Occupied Bandwidth, Channel 11, 802.11b, Ant. 1

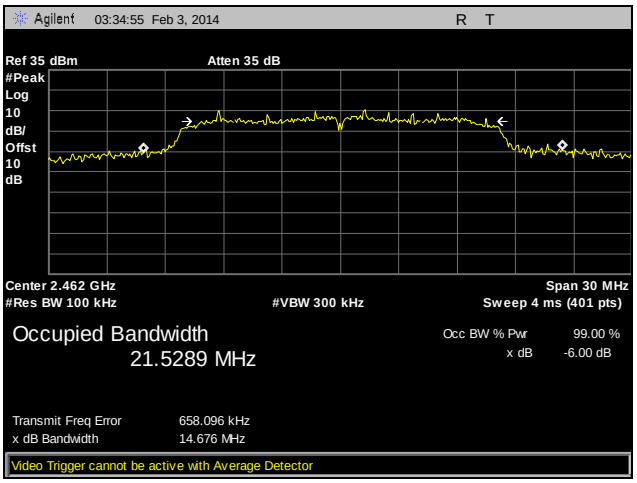
6 dB Occupied Bandwidth Test Results, 802.11g



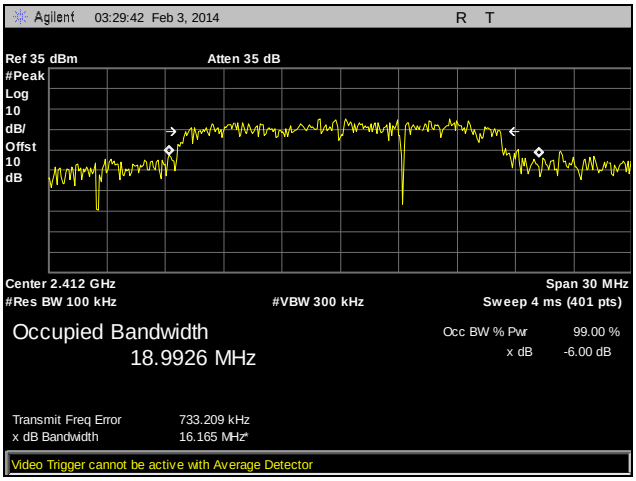
Plot 17. 6 dB Occupied Bandwidth, Channel 1, 802.11g, Ant. 0



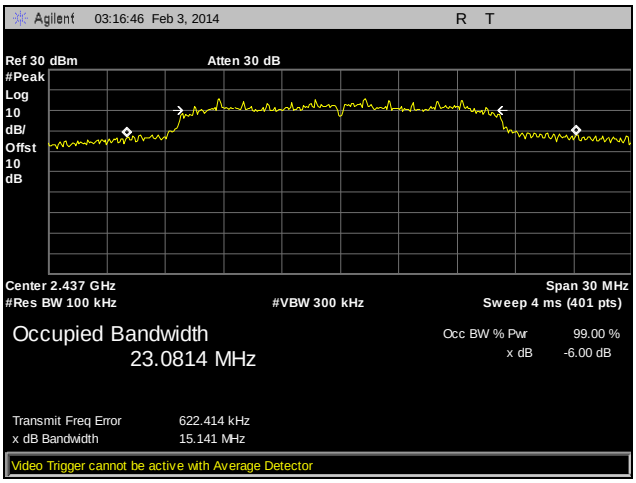
Plot 18. 6 dB Occupied Bandwidth, Channel 6, 802.11g, Ant. 0



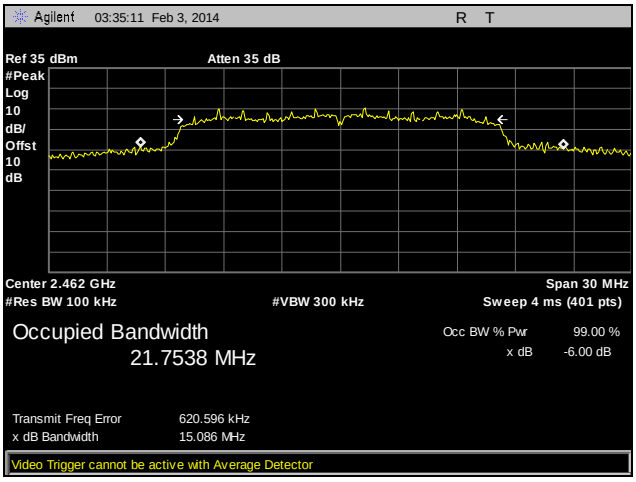
Plot 19. 6 dB Occupied Bandwidth, Channel 11, 802.11g, Ant. 0



Plot 20. 6 dB Occupied Bandwidth, Channel 1, 802.11g, Ant. 1

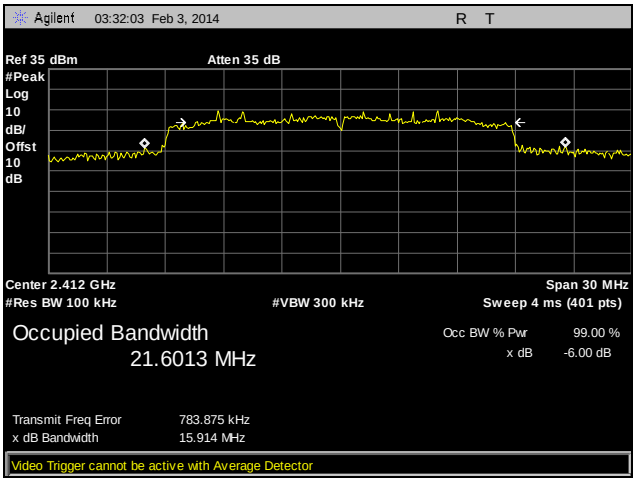


Plot 21. 6 dB Occupied Bandwidth, Channel 6, 802.11g, Ant. 1

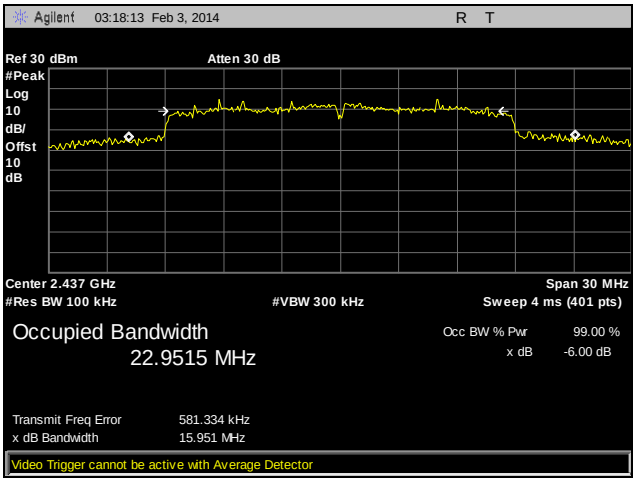


Plot 22. 6 dB Occupied Bandwidth, Channel 11, 802.11g, Ant. 1

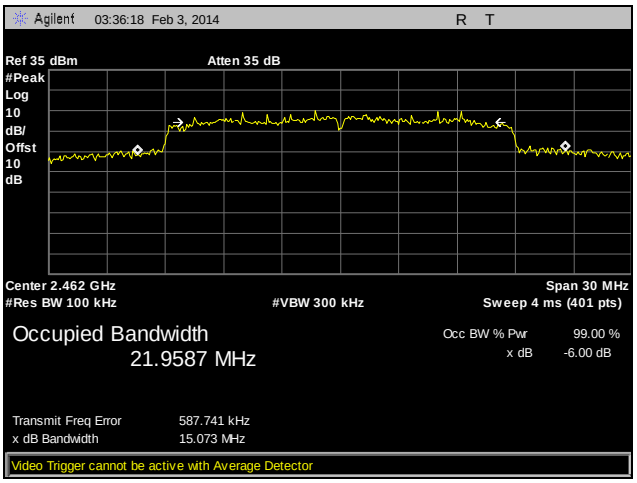
6 dB Occupied Bandwidth Test Results, 802.11n 20 MHz



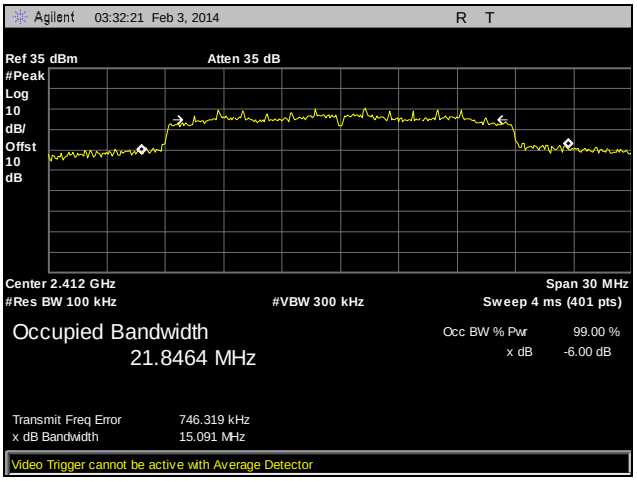
Plot 23. 6 dB Occupied Bandwidth, Channel 1, 802.11n 20 MHz, Ant. 0



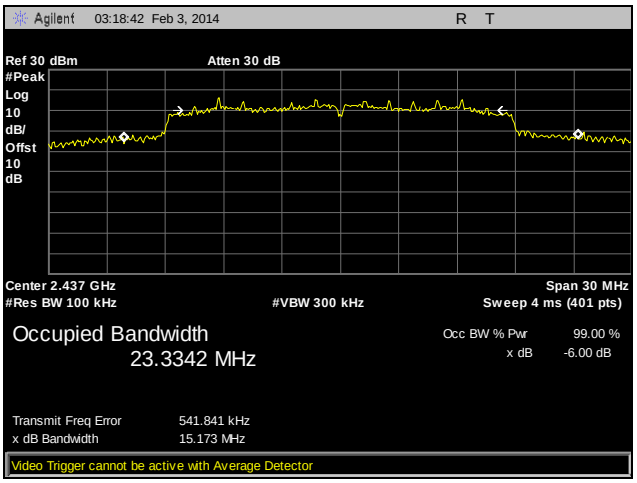
Plot 24. 6 dB Occupied Bandwidth, Channel 6, 802.11n 20 MHz, Ant. 0



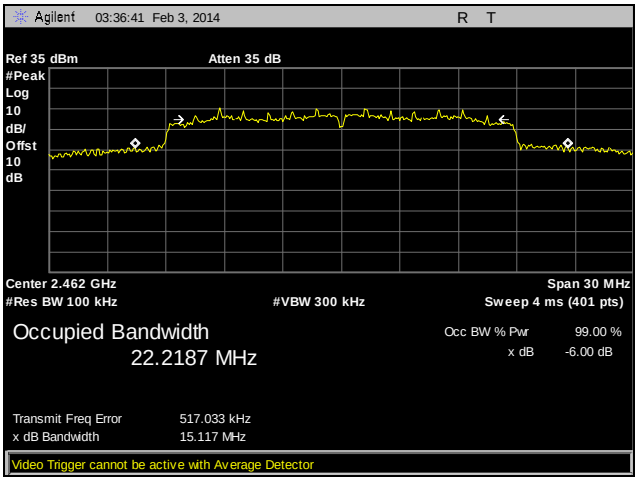
Plot 25. 6 dB Occupied Bandwidth, Channel 11, 802.11n 20 MHz, Ant. 0



Plot 26. 6 dB Occupied Bandwidth, Channel 1, 802.11n 20 MHz, Ant. 1

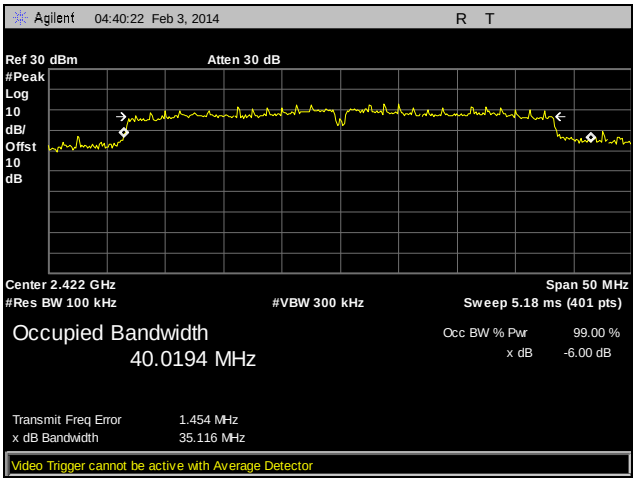


Plot 27. 6 dB Occupied Bandwidth, Channel 6, 802.11n 20 MHz, Ant. 1

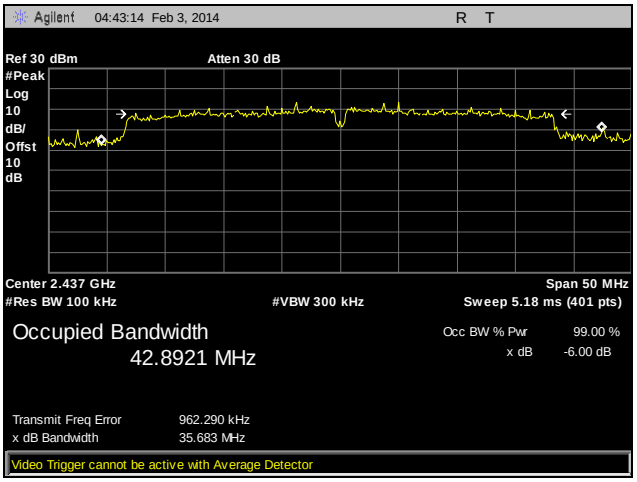


Plot 28. 6 dB Occupied Bandwidth, Channel 11, 802.11n 20 MHz, Ant. 1

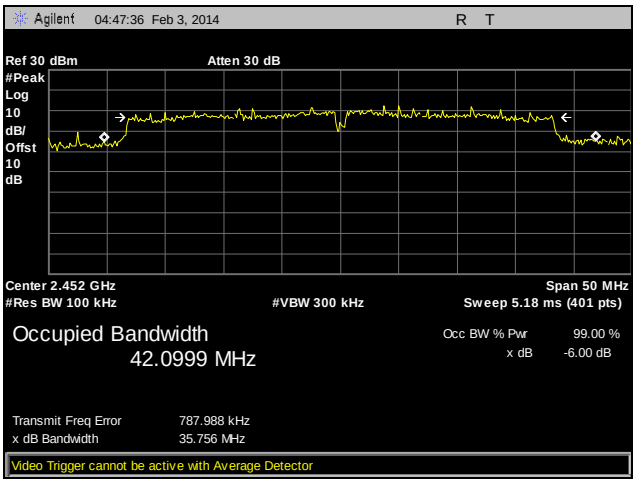
6 dB Occupied Bandwidth Test Results, 802.11n 40 MHz



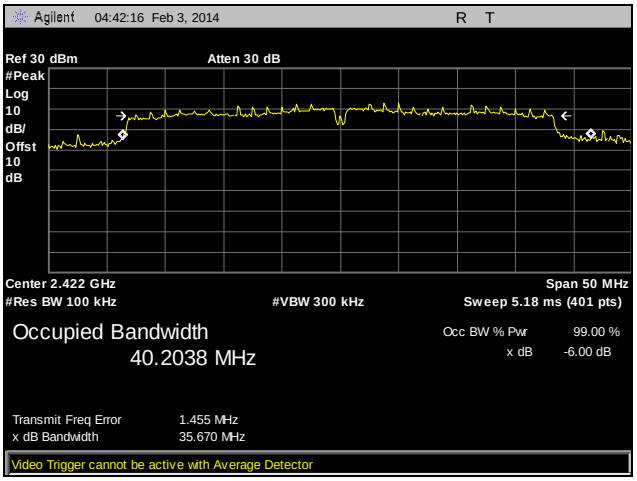
Plot 29. 6 dB Occupied Bandwidth, Channel 1, 802.11n 40 MHz, Ant. 0



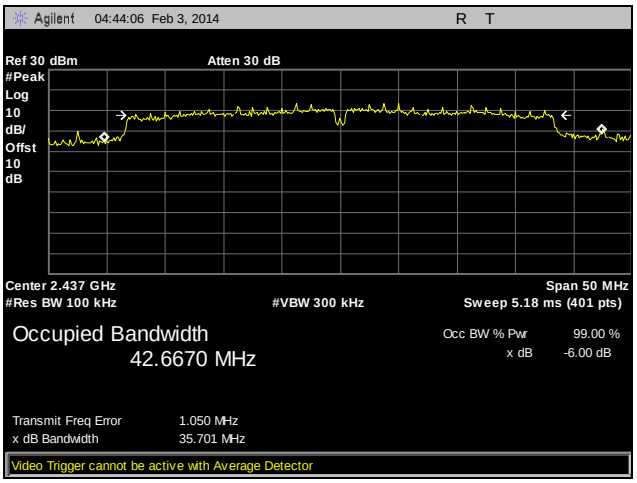
Plot 30. 6 dB Occupied Bandwidth, Channel 6, 802.11n 40 MHz, Ant. 0



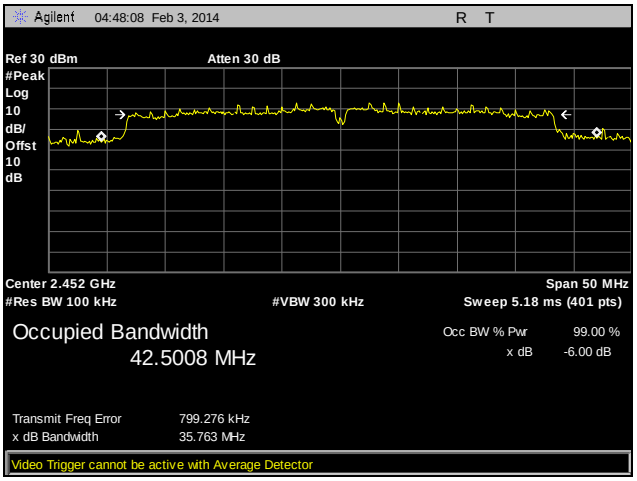
Plot 31. 6 dB Occupied Bandwidth, Channel 11, 802.11n 40 MHz, Ant. 0



Plot 32. 6 dB Occupied Bandwidth, Channel 1, 802.11n 40 MHz, Ant. 1

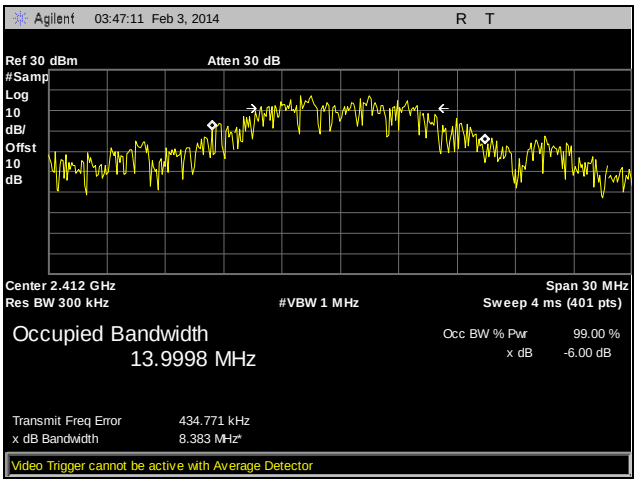


Plot 33. 6 dB Occupied Bandwidth, Channel 6, 802.11n 40 MHz, Ant. 1

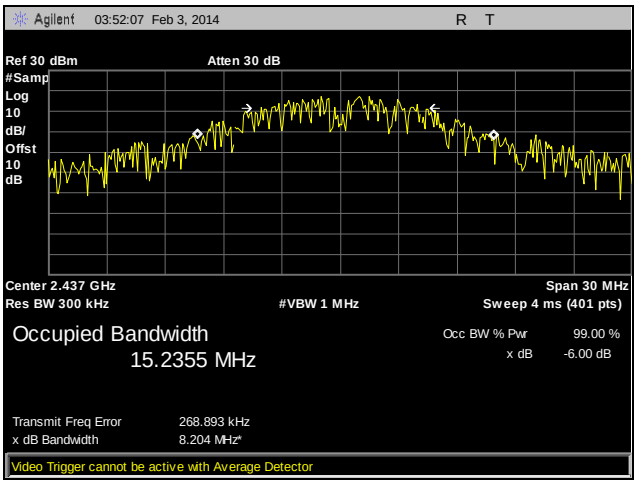


Plot 34. 6 dB Occupied Bandwidth, Channel 11, 802.11n 40 MHz, Ant. 1

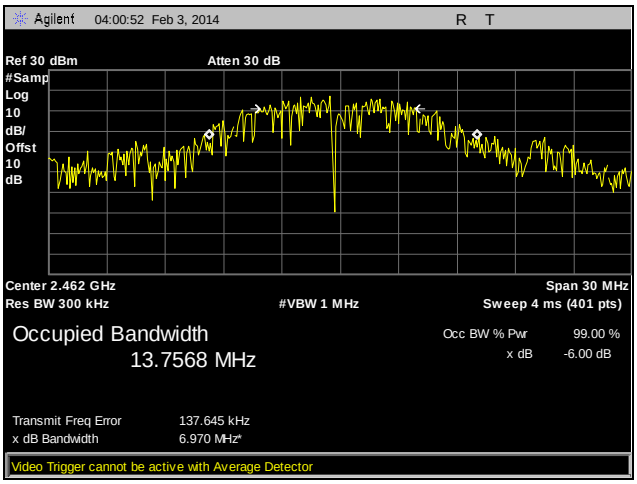
99% Occupied Bandwidth Test Results, 802.11b



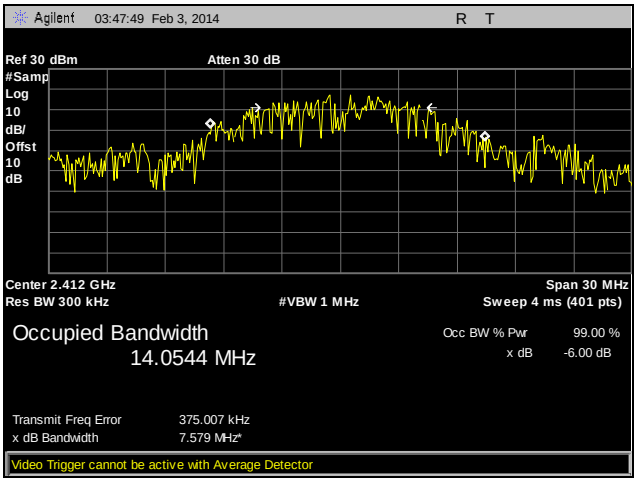
Plot 35. 99% Occupied Bandwidth, Channel 1, 802.11b, Ant. 0



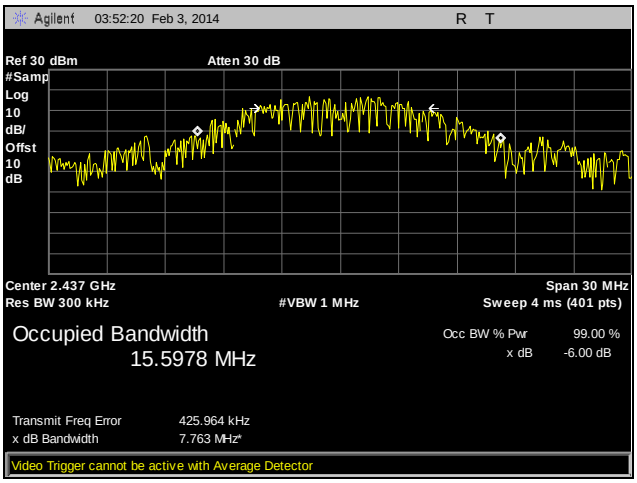
Plot 36. 99% Occupied Bandwidth, Channel 6, 802.11b, Ant. 0



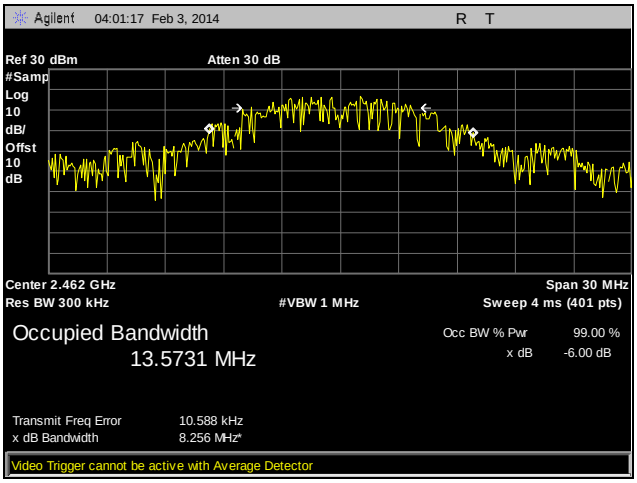
Plot 37. 99% Occupied Bandwidth, Channel 11, 802.11b, Ant. 0



Plot 38. 99% Occupied Bandwidth, Channel 1, 802.11b, Ant. 1

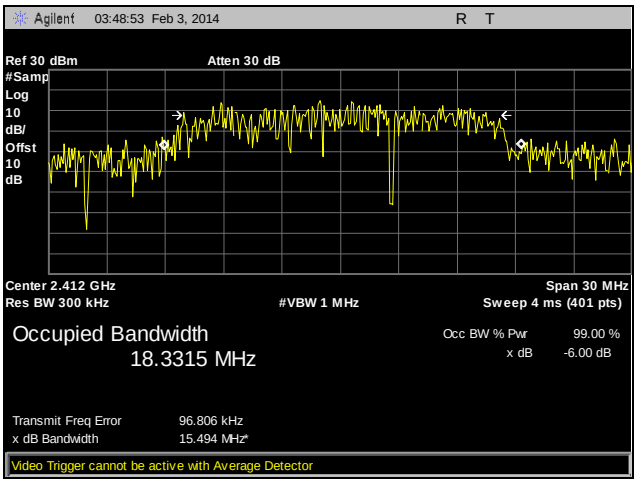


Plot 39. 99% Occupied Bandwidth, Channel 6, 802.11b, Ant. 1

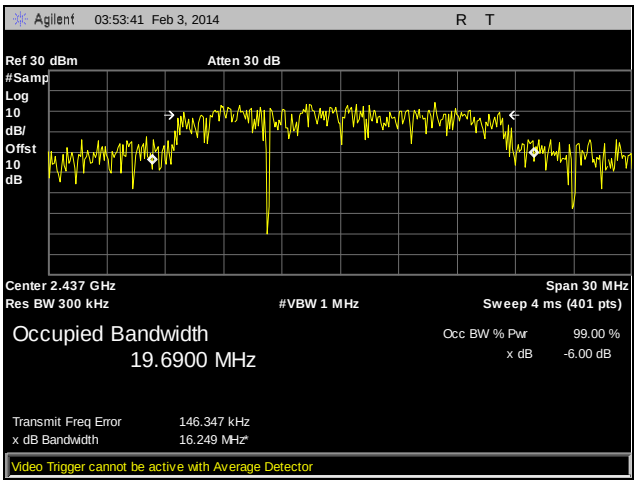


Plot 40. 99% Occupied Bandwidth, Channel 11, 802.11b, Ant. 1

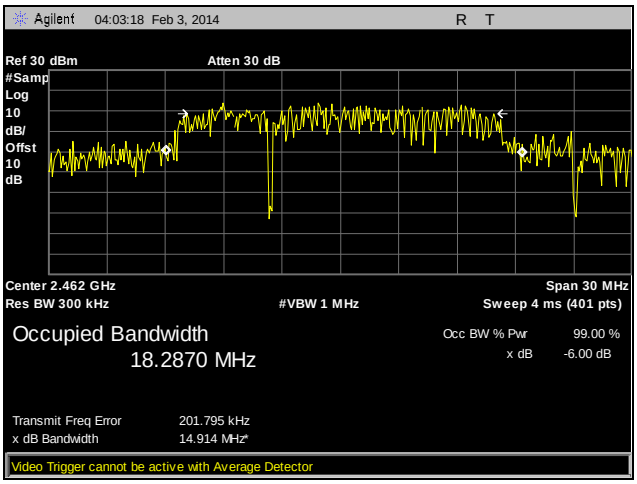
99% Occupied Bandwidth Test Results, 802.11g



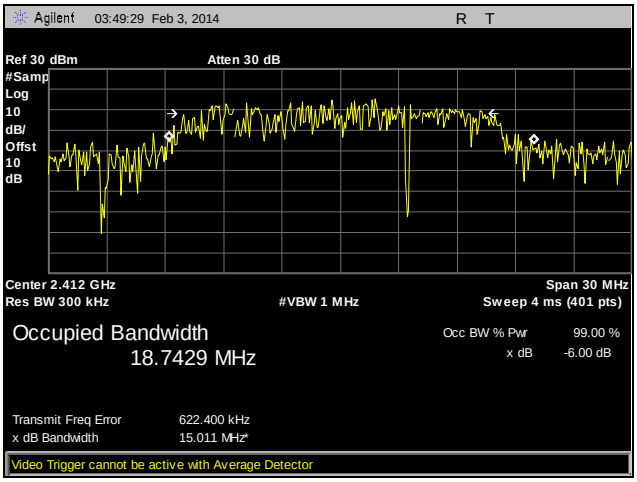
Plot 41. 99% Occupied Bandwidth, Channel 1, 802.11g, Ant. 0



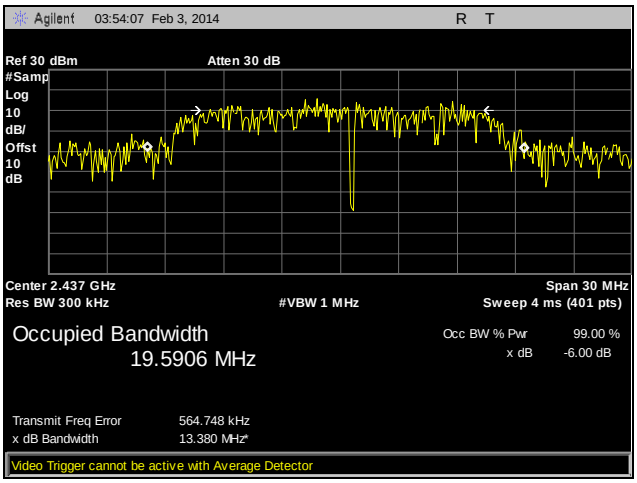
Plot 42. 99% Occupied Bandwidth, Channel 6, 802.11g, Ant. 0



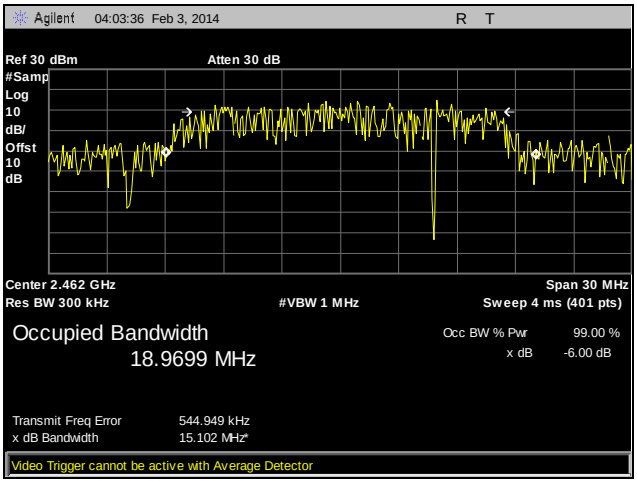
Plot 43. 99% Occupied Bandwidth, Channel 11, 802.11g, Ant. 0



Plot 44. 99% Occupied Bandwidth, Channel 1, 802.11g, Ant. 1

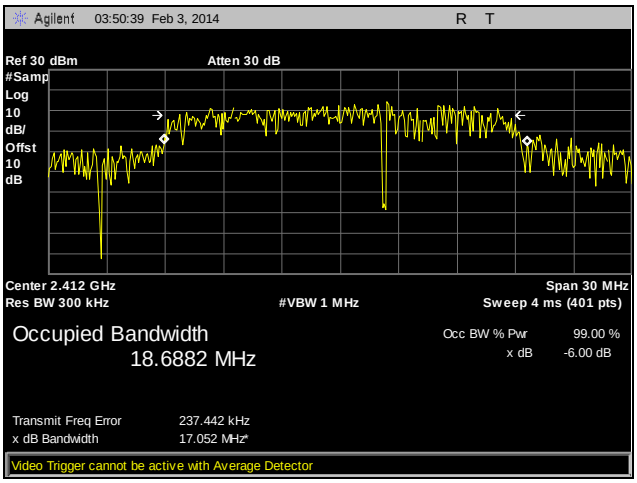


Plot 45. 99% Occupied Bandwidth, Channel 6, 802.11g, Ant. 1

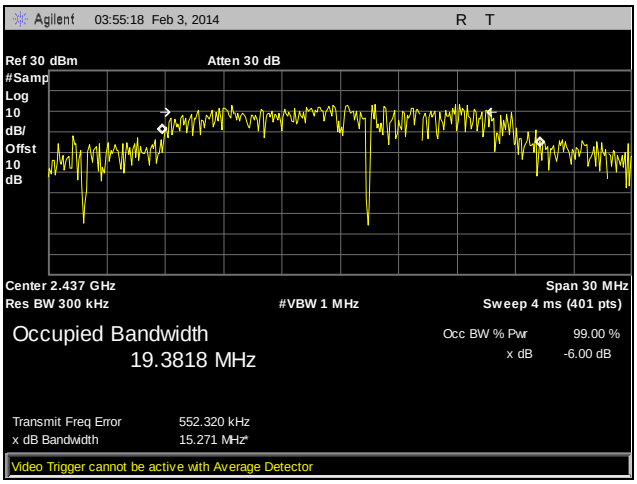


Plot 46. 99% Occupied Bandwidth, Channel 11, 802.11g, Ant. 1

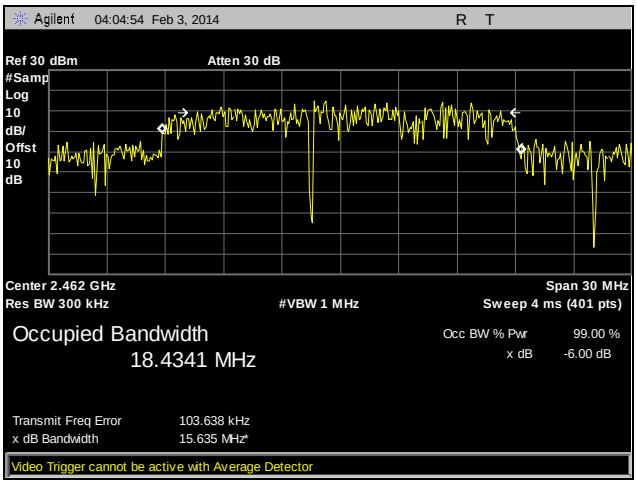
99% Occupied Bandwidth Test Results, 802.11n 20 MHz



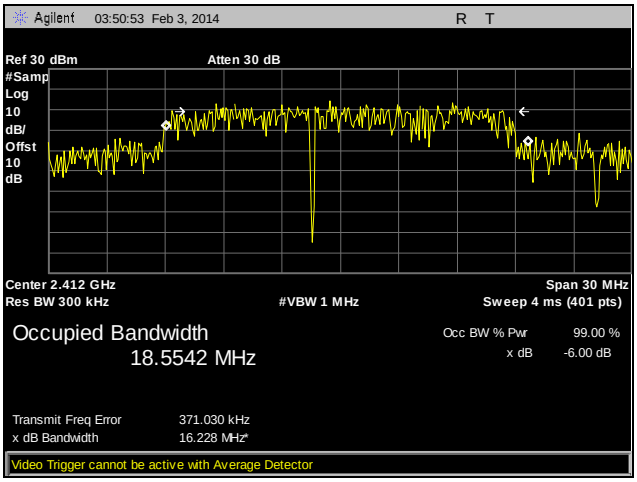
Plot 47. 99% Occupied Bandwidth, Channel 1, 802.11n 20 MHz, Ant. 0



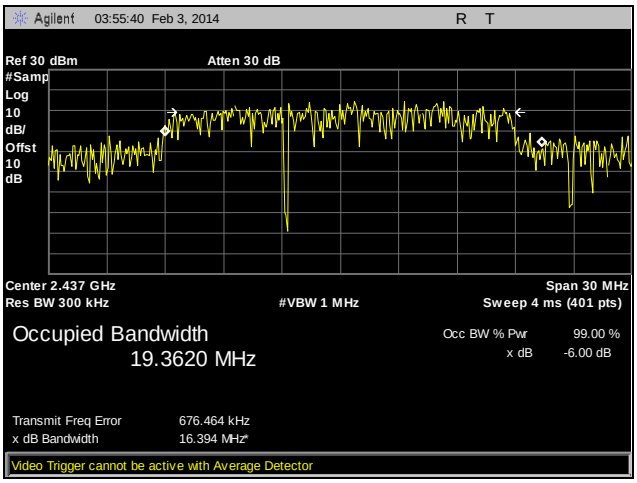
Plot 48. 99% Occupied Bandwidth, Channel 6, 802.11n 20 MHz, Ant. 0



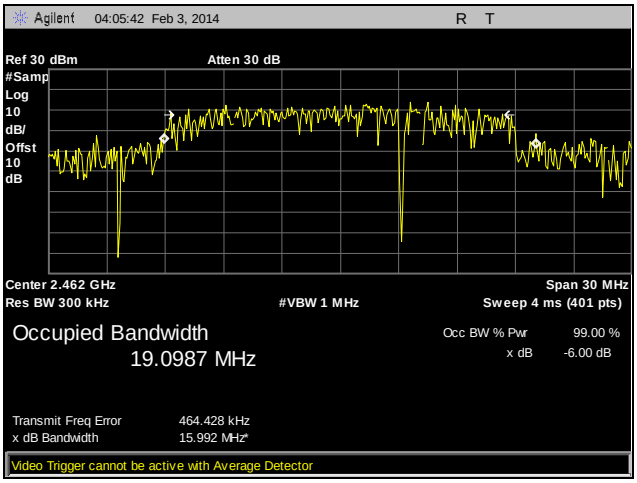
Plot 49. 99% Occupied Bandwidth, Channel 11, 802.11n 20 MHz, Ant. 0



Plot 50. 99% Occupied Bandwidth, Channel 1, 802.11n 20 MHz, Ant. 1

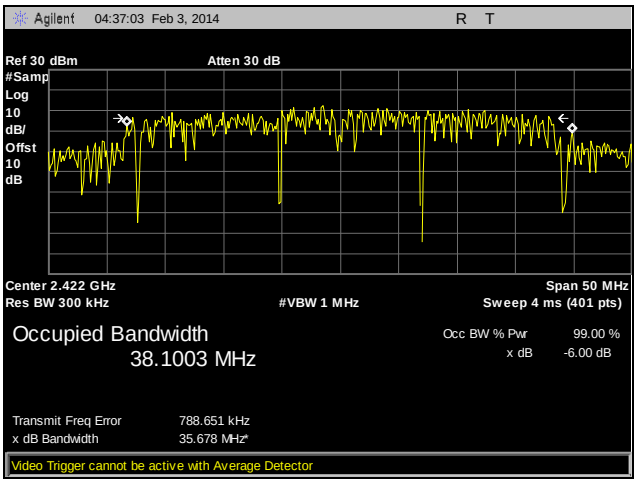


Plot 51. 99% Occupied Bandwidth, Channel 6, 802.11n 20 MHz, Ant. 1

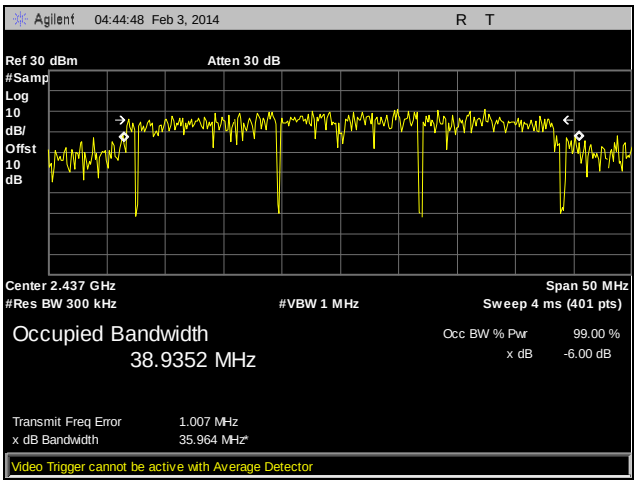


Plot 52. 99% Occupied Bandwidth, Channel 11, 802.11n 20 MHz, Ant. 1

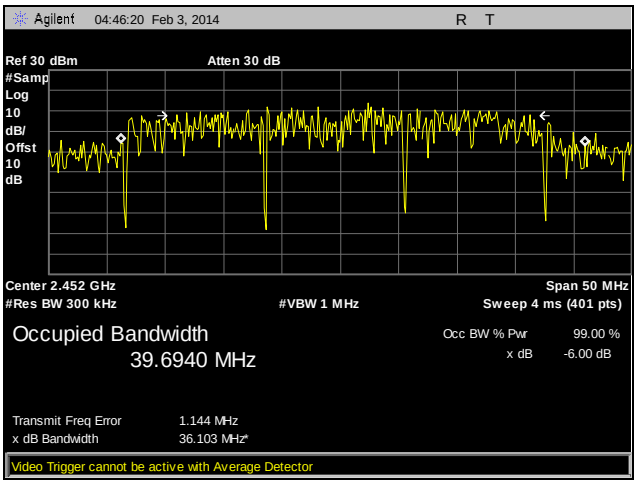
99% Occupied Bandwidth Test Results, 802.11n 40 MHz



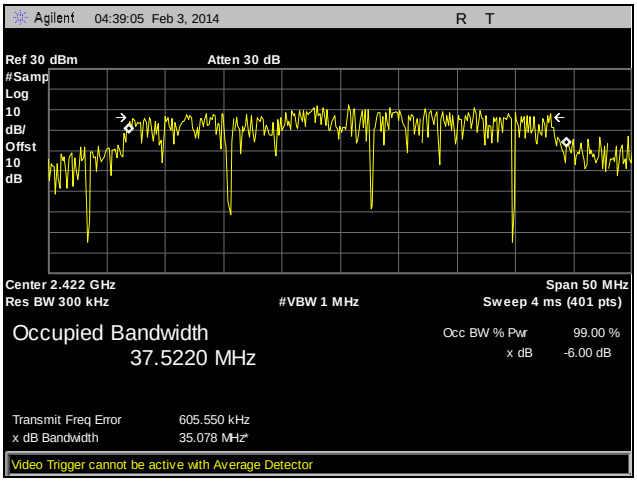
Plot 53. 99% Occupied Bandwidth, Channel 1, 802.11n 40 MHz, Ant. 0



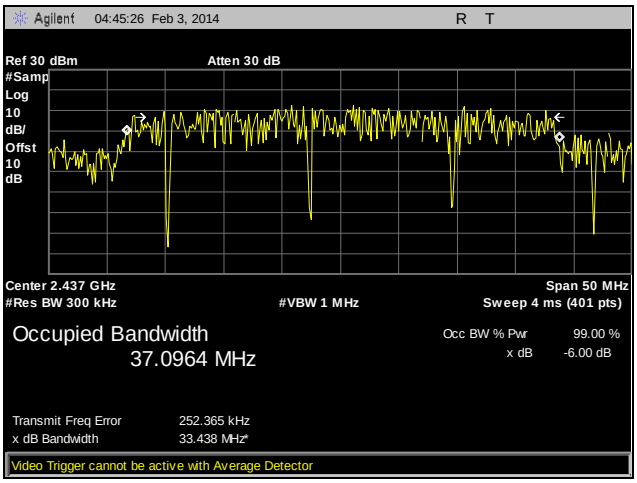
Plot 54. 99% Occupied Bandwidth, Channel 6, 802.11n 40 MHz, Ant. 0



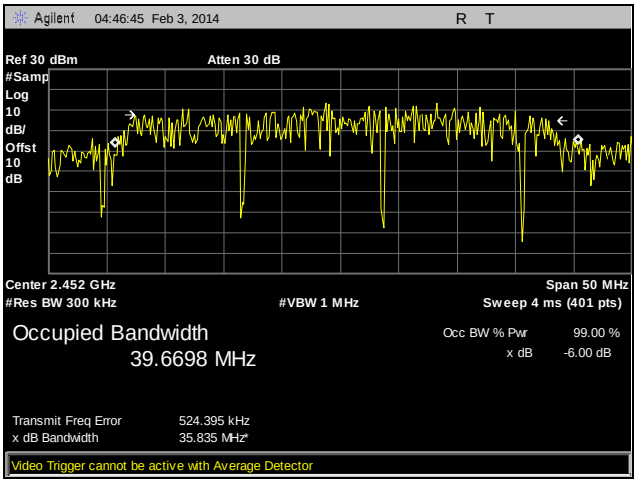
Plot 55. 99% Occupied Bandwidth, Channel 11, 802.11n 40 MHz, Ant. 0



Plot 56. 99% Occupied Bandwidth, Channel 1, 802.11n 40 MHz, Ant. 1



Plot 57. 99% Occupied Bandwidth, Channel 6, 802.11n 40 MHz, Ant. 1



Plot 58. 99% Occupied Bandwidth, Channel 11, 802.11n 40 MHz, Ant. 1

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 32. Output Power Requirements from §15.247(b)

§15.247(b)(4): The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

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): Surinder Singh

Test Date(s): 02/08/14

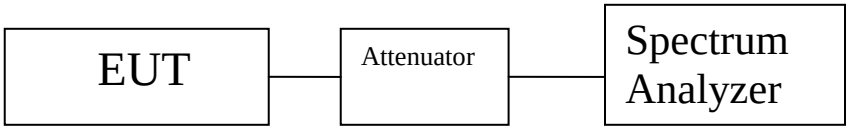


Figure 2. Peak Power Output Test Setup

Peak Power Output Test Results

Peak Conducted Output Power		
Carrier Channel	**Frequency (MHz)**	**Measured Peak Output Power dBm**
Channel 1	2412	24.22
Channel 2	2417	26.24
Channel 3	2422	28.01
Channel 4	2427	29.15
Channel 5	2432	29.40
Channel 6	2437	29.29
Channel 7	2442	29.52
Channel 8	2447	29.43
Channel 9	2452	28.14
Channel 10	2457	26.54
Channel 11	2462	24.62

Table 33. Peak Power Output, Test Results, 802.11b (legacy), Ant. 0

Peak Conducted Output Power		
Carrier Channel	**Frequency (MHz)**	**Measured Peak Output Power dBm**
Channel 1	2412	24.35
Channel 2	2417	26.58
Channel 3	2422	27.25
Channel 4	2427	28.31
Channel 5	2432	29.57
Channel 6	2437	29.58
Channel 7	2442	29.27
Channel 8	2447	28.14
Channel 9	2452	27.00
Channel 10	2457	26.09
Channel 11	2462	24.75

Table 34. Peak Power Output, Test Results, 802.11b(legacy), Ant. 1

Peak Conducted Output Power		
Carrier Channel	**Frequency (MHz)**	**Measured Peak Output Power dBm**
Channel 1	2412	23.22
Channel 2	2417	24.72
Channel 3	2422	26.19
Channel 4	2427	27.14
Channel 5	2432	28.08
Channel 6	2437	29.45
Channel 7	2442	29.72
Channel 8	2447	28.35
Channel 9	2452	27.28
Channel 10	2457	25.56
Channel 11	2462	23.49

Table 35. Peak Power Output, Test Results, 802.11g(legacy), Ant. 0

Peak Conducted Output Power		
Carrier Channel	**Frequency (MHz)**	**Measured Peak Output Power dBm**
Channel 1	2412	23.60
Channel 2	2417	24.28
Channel 3	2422	25.55
Channel 4	2427	26.48
Channel 5	2432	27.75
Channel 6	2437	28.64
Channel 7	2442	28.67
Channel 8	2447	27.52
Channel 9	2452	25.69
Channel 10	2457	24.36
Channel 11	2462	23.98

Table 36. Peak Power Output, Test Results, 802.11g(legacy), Ant. 1

Peak Conducted Output Power		
Carrier Channel	**Frequency (MHz)**	**Measured Peak Output Power dBm**
Channel 1	2412	23.28
Channel 2	2417	24.73
Channel 3	2422	25.42
Channel 4	2427	26.56
Channel 5	2432	27.20
Channel 6	2437	29.45
Channel 7	2442	28.49
Channel 8	2447	27.39
Channel 9	2452	25.95
Channel 10	2457	24.36
Channel 11	2462	22.96

Table 37. Peak Power Output, Test Results, 802.11n 20 MHz(legacy), Ant. 0

Peak Conducted Output Power		
Carrier Channel	**Frequency (MHz)**	**Measured Peak Output Power dBm**
Channel 1	2412	22.59
Channel 2	2417	24.45
Channel 3	2422	25.17
Channel 4	2427	25.99
Channel 5	2432	27.76
Channel 6	2437	28.77
Channel 7	2442	28.59
Channel 8	2447	27.14
Channel 9	2452	25.75
Channel 10	2457	23.96
Channel 11	2462	22.46

Table 38. Peak Power Output, Test Results, 802.11n 20 MHz(legacy), Ant. 1

Peak Conducted Output Power		
Carrier Channel	Frequency (MHz)	Measured Peak Output Power dBm
Channel 1	2422	20.69
Channel 2	2427	20.43
Channel 3	2432	22.50
Channel 4	2437	23.92
Channel 5	2442	23.97
Channel 6	2447	22.84
Channel 7	2452	21.84
Channel 8	2457	20.78
Channel 9	2462	15.51

Table 39. Peak Power Output, Test Results, 802.11n 40 MHz(legacy), Ant. 0

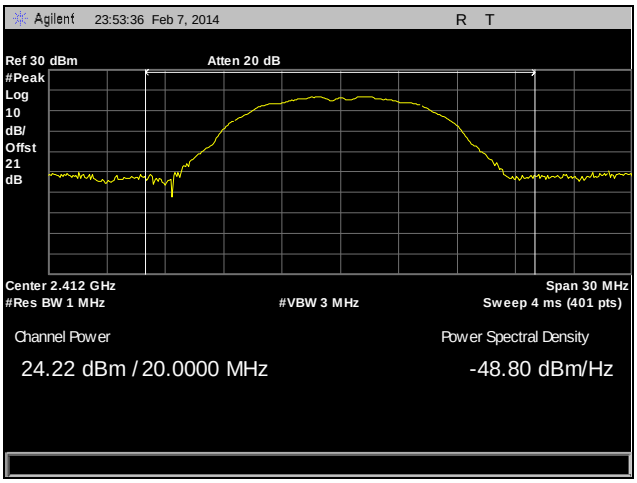
Peak Conducted Output Power		
Carrier Channel	Frequency (MHz)	Measured Peak Output Power dBm
Channel 1	2422	19.29
Channel 2	2427	19.21
Channel 3	2432	20.78
Channel 4	2437	23.04
Channel 5	2442	21.68
Channel 6	2447	20.35
Channel 7	2452	20.46
Channel 8	2457	19.18
Channel 9	2462	13.40

Table 40. Peak Power Output, Test Results, 802.11n 40 MHz(legacy), Ant. 1

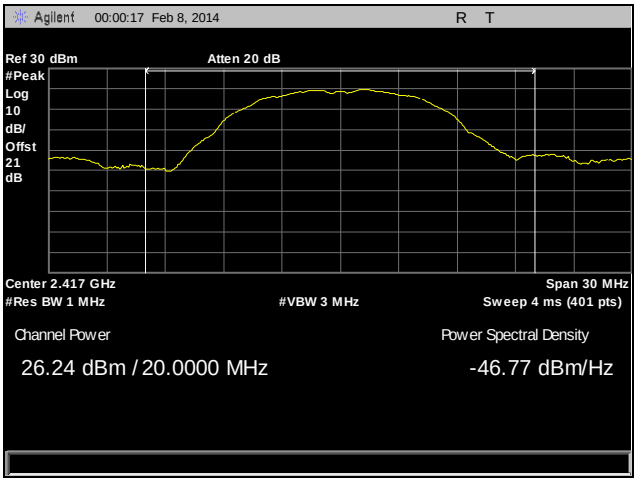
Peak Conducted Output Power				
Carrier Channel	Frequency (MHz)	Measured Peak Output Power (dBm)	Measured Peak Output Power (dBm)	Total Power (dBm)
Channel 1	2422	19.79	20.27	23.04
Channel 2	2427	20.09	19.91	23.01
Channel 3	2432	20.57	20.77	23.68
Channel 4	2437	21.27	21.06	24.17
Channel 5	2442	20.4	20.84	23.63
Channel 6	2447	19.37	19.69	22.54
Channel 7	2452	19.3	19.5	22.41
Channel 8	2457	18.61	18.83	21.73
Channel 9	2462	12.88	13.27	16.08

Table 41. Peak Power Output, Test Results, 802.11n 40 MHz MIMO

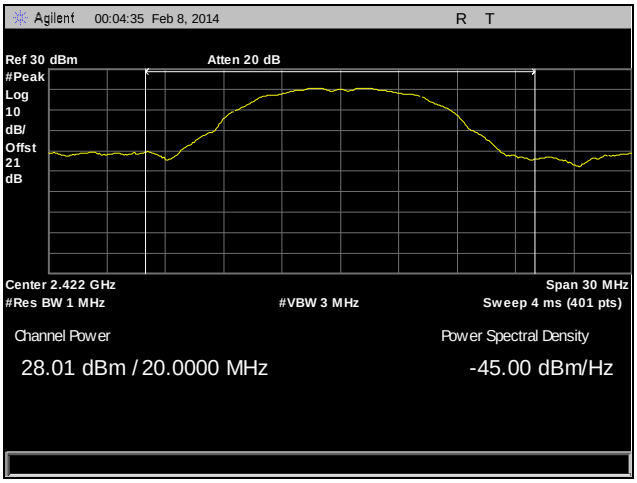
Peak Power Output Test Results, 802.11b



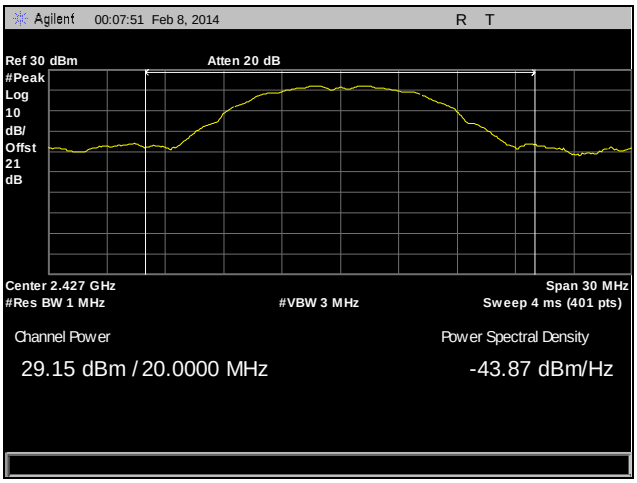
Plot 59. Peak Power Output, Channel 1, 802.11b, Ant. 0



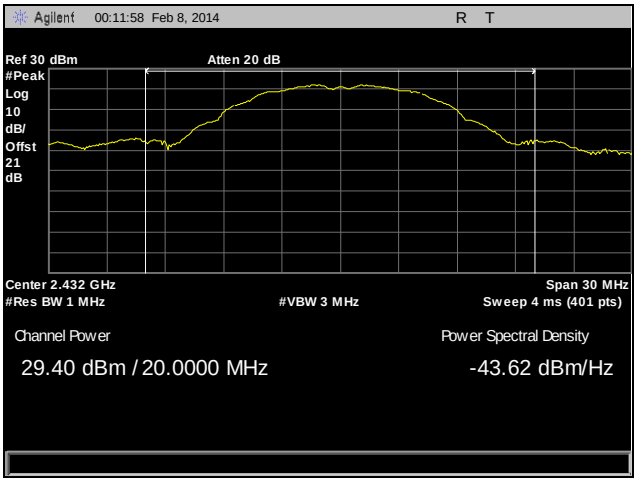
Plot 60. Peak Power Output, Channel 2, 802.11b, Ant. 0



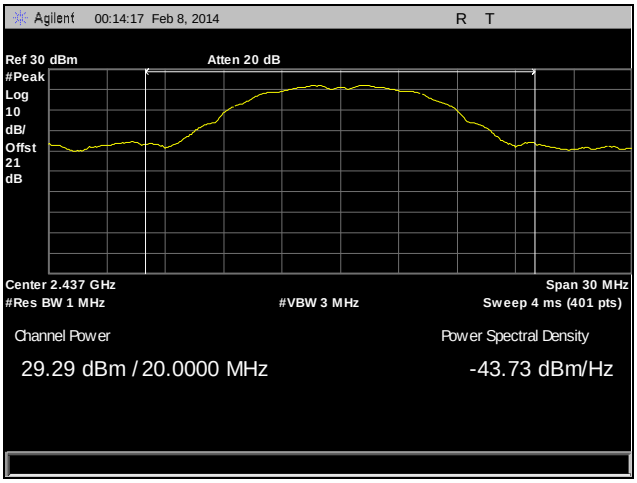
Plot 61. Peak Power Output, Channel 3, 802.11b, Ant. 0



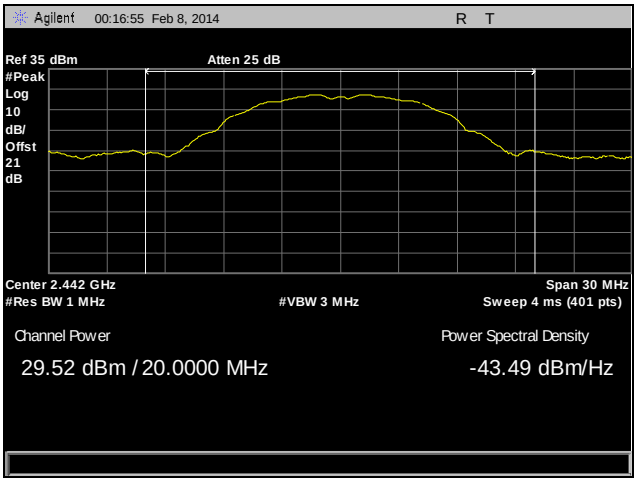
Plot 62. Peak Power Output, Channel 4, 802.11b, Ant. 0



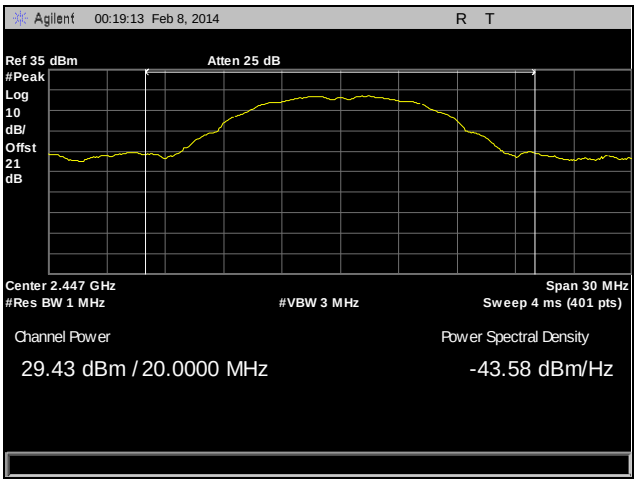
Plot 63. Peak Power Output, Channel 5, 802.11b, Ant. 0



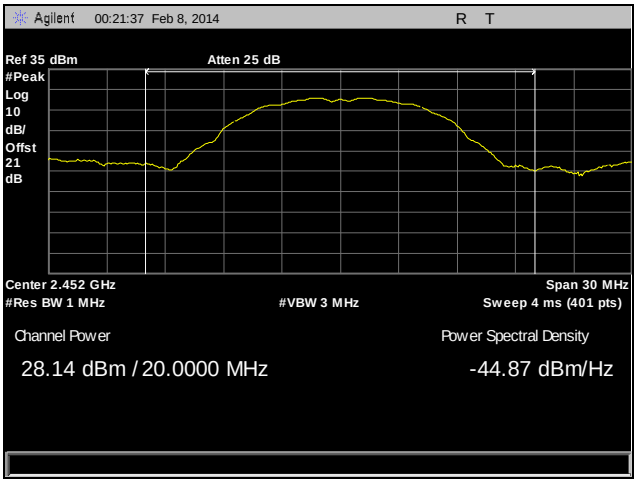
Plot 64. Peak Power Output, Channel 6, 802.11b, Ant. 0



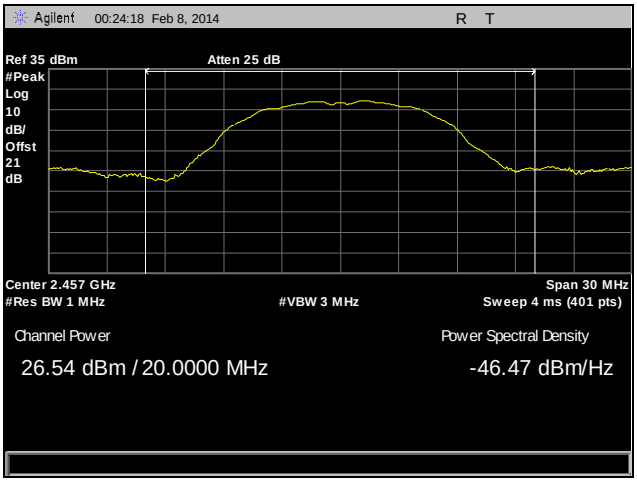
Plot 65. Peak Power Output, Channel 7, 802.11b, Ant. 0



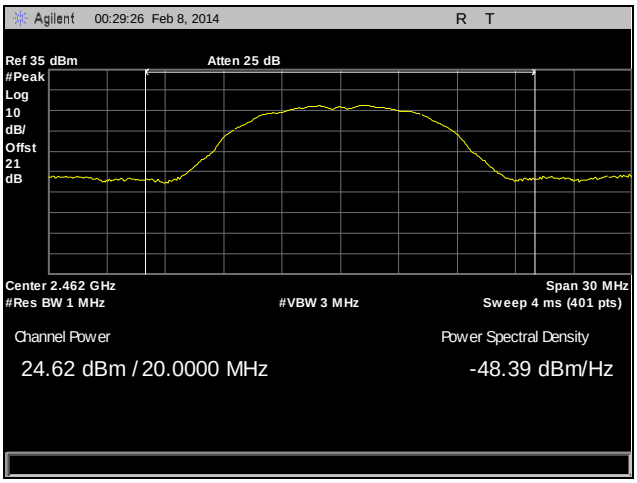
Plot 66. Peak Power Output, Channel 8, 802.11b, Ant. 0



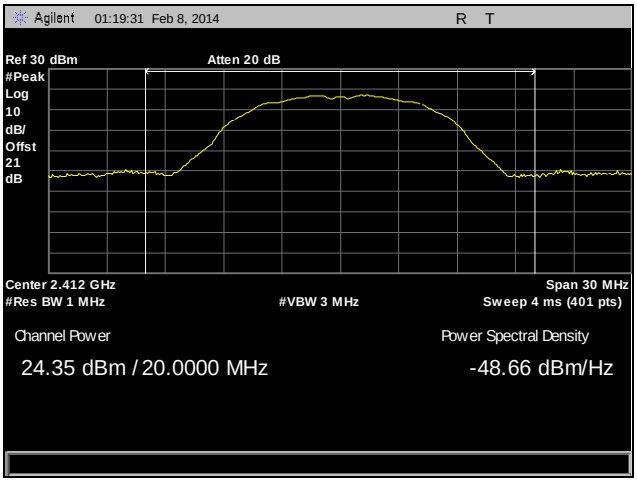
Plot 67. Peak Power Output, Channel 9, 802.11b, Ant. 0



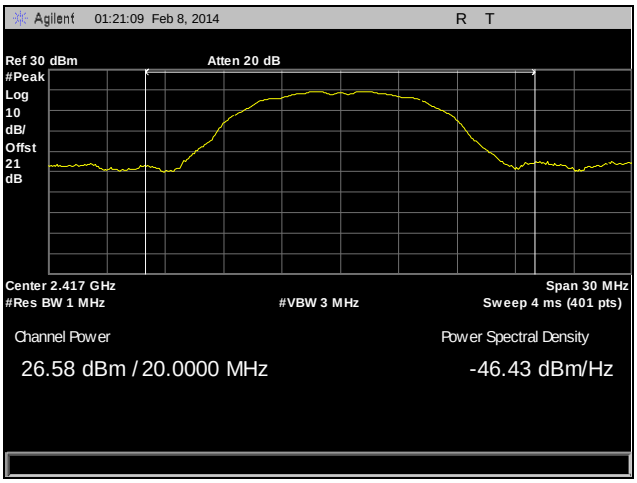
Plot 68. Peak Power Output, Channel 10, 802.11b, Ant. 0



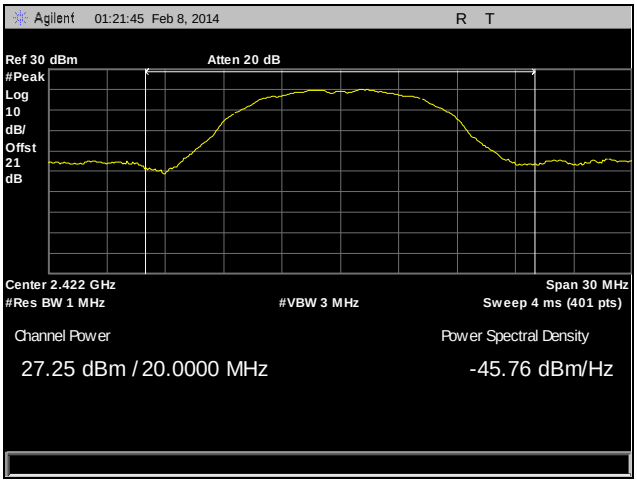
Plot 69. Peak Power Output, Channel 11, 802.11b, Ant. 0



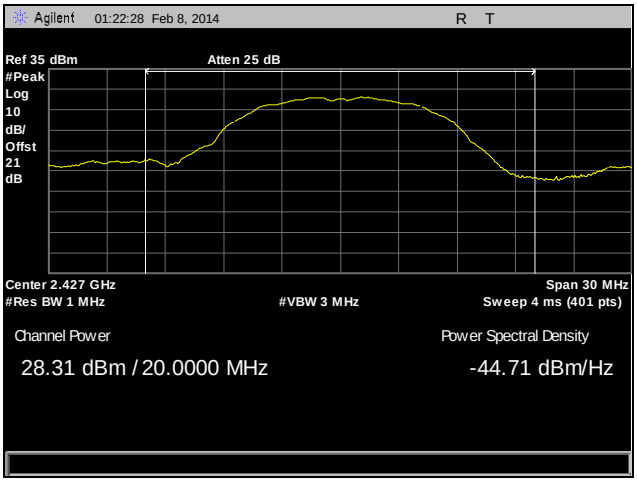
Plot 70. Peak Power Output, Channel 1, 802.11b, Ant. 1



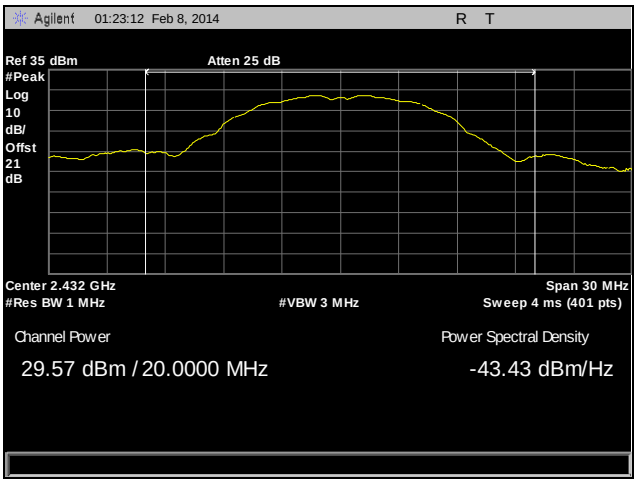
Plot 71. Peak Power Output, Channel 2, 802.11b, Ant. 1



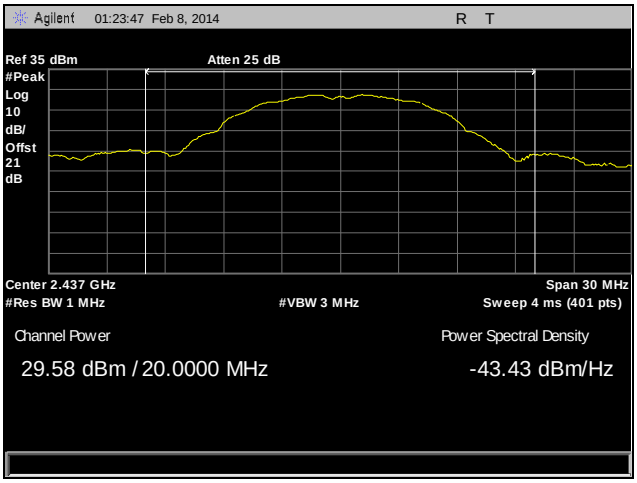
Plot 72. Peak Power Output, Channel 3, 802.11b, Ant. 1



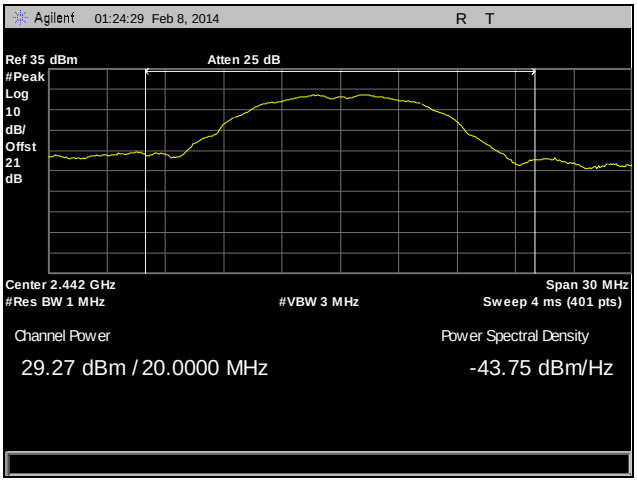
Plot 73. Peak Power Output, Channel 4, 802.11b, Ant. 1



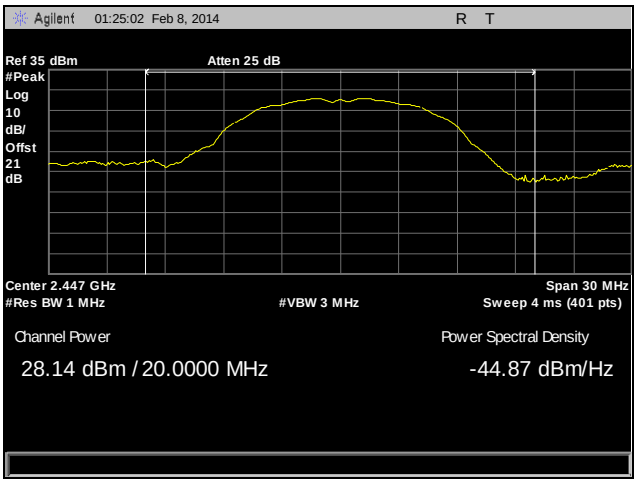
Plot 74. Peak Power Output, Channel 5, 802.11b, Ant. 1



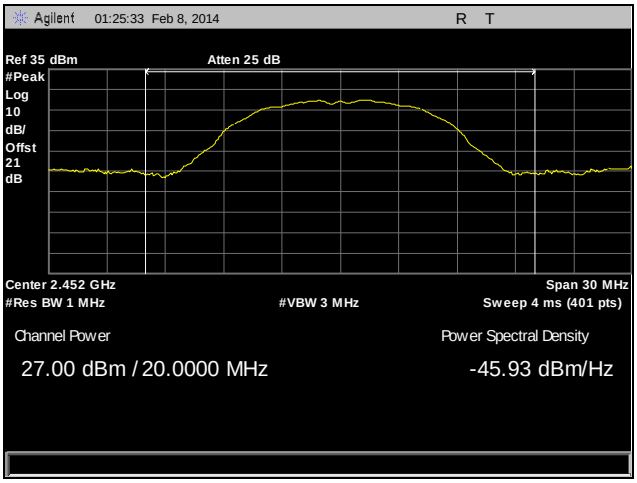
Plot 75. Peak Power Output, Channel 6, 802.11b, Ant. 1



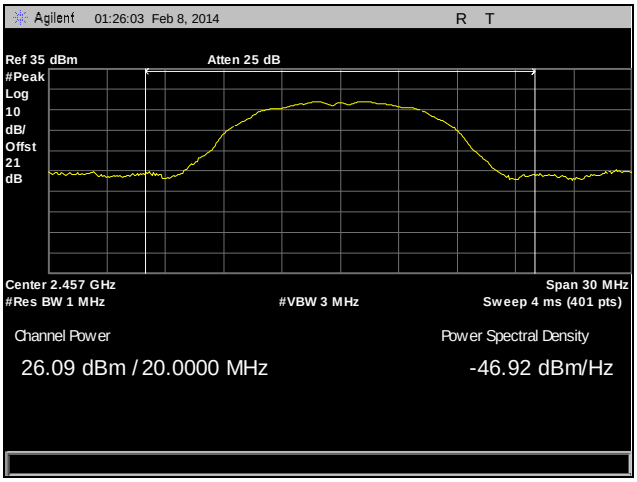
Plot 76. Peak Power Output, Channel 7, 802.11b, Ant. 1



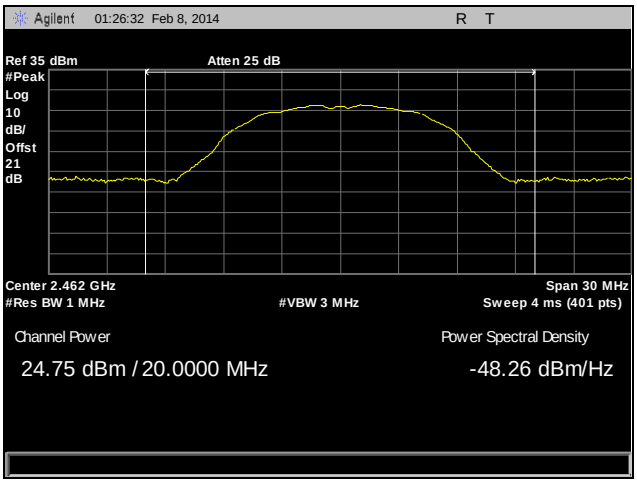
Plot 77. Peak Power Output, Channel 8, 802.11b, Ant. 1



Plot 78. Peak Power Output, Channel 9, 802.11b, Ant. 1

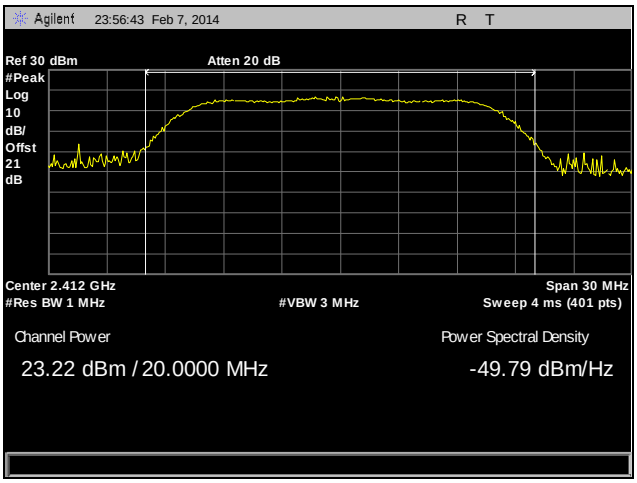


Plot 79. Peak Power Output, Channel 10, 802.11b, Ant. 1

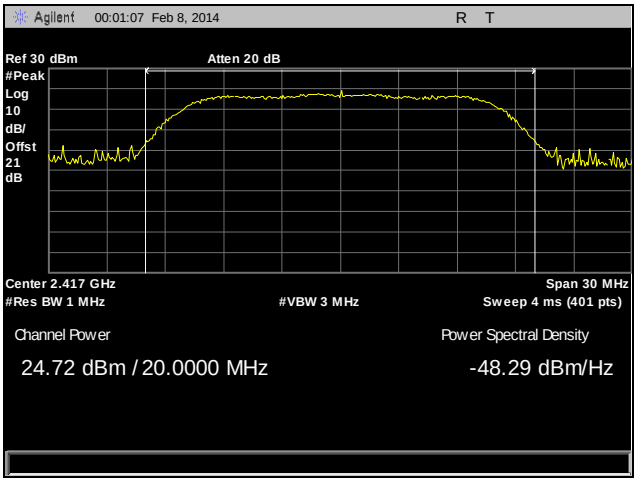


Plot 80. Peak Power Output, Channel 11, 802.11b, Ant. 1

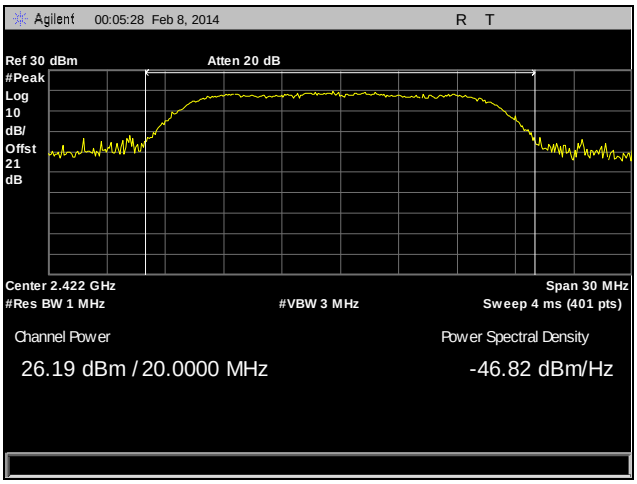
Peak Power Output Test Results, 802.11g



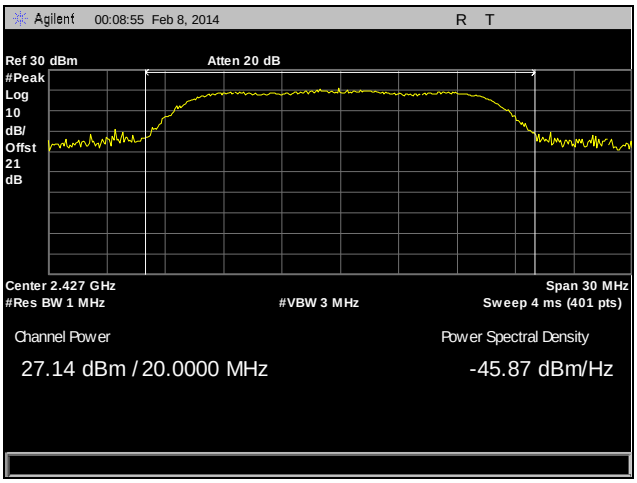
Plot 81. Peak Power Output, Channel 1, 802.11g, Ant. 0



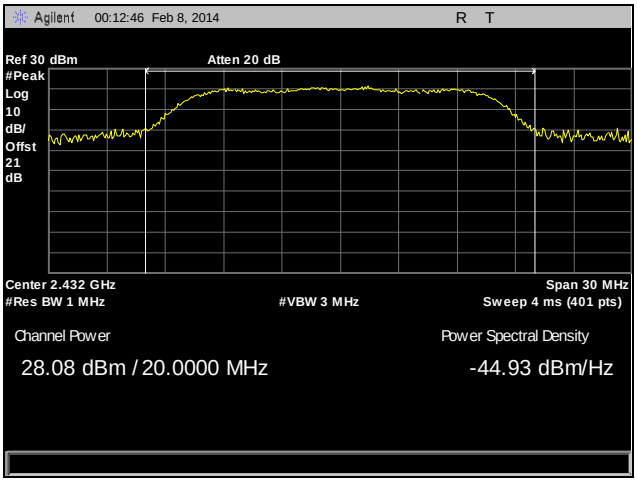
Plot 82. Peak Power Output, Channel 2, 802.11g, Ant. 0



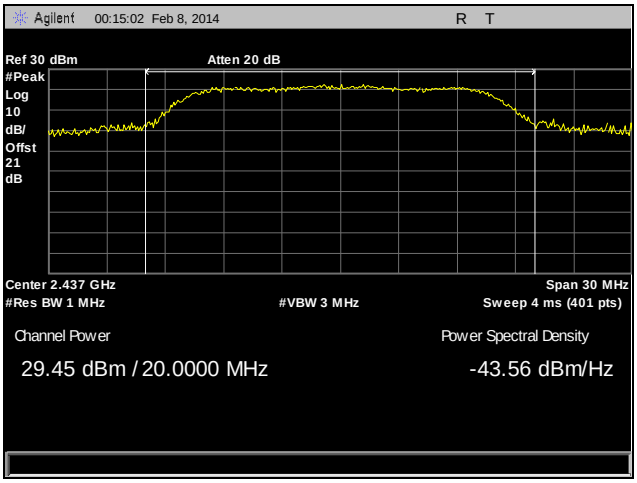
Plot 83. Peak Power Output, Channel 3, 802.11g, Ant. 0



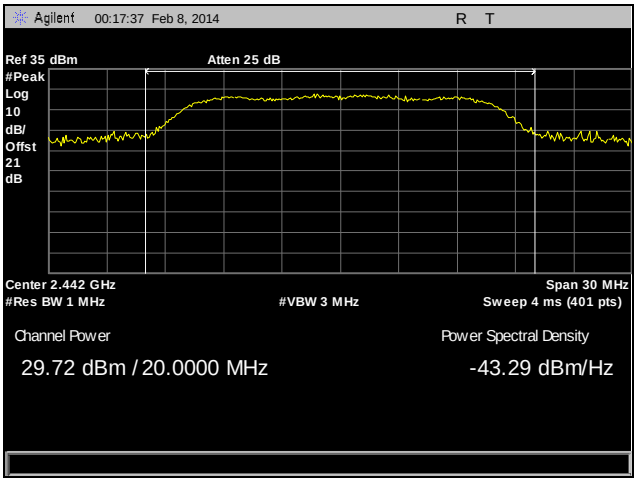
Plot 84. Peak Power Output, Channel 4, 802.11g, Ant. 0



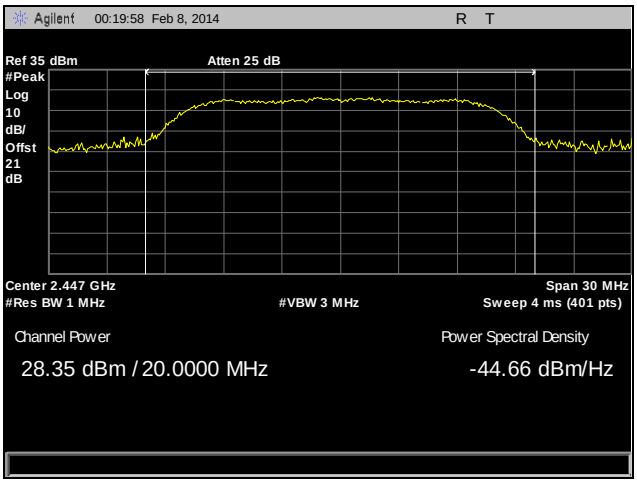
Plot 85. Peak Power Output, Channel 5, 802.11g, Ant. 0



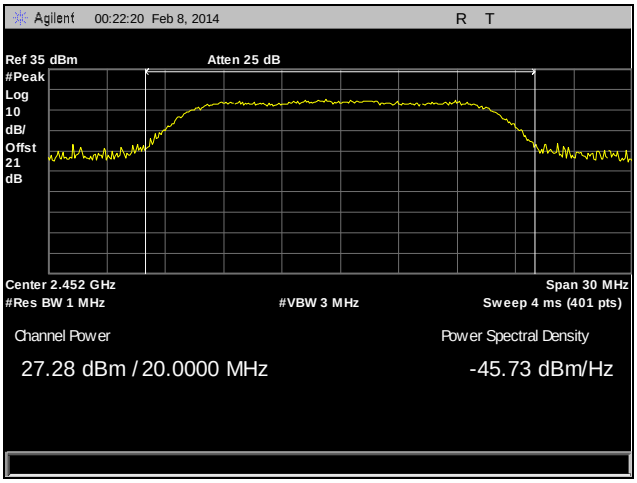
Plot 86. Peak Power Output, Channel 6, 802.11g, Ant. 0



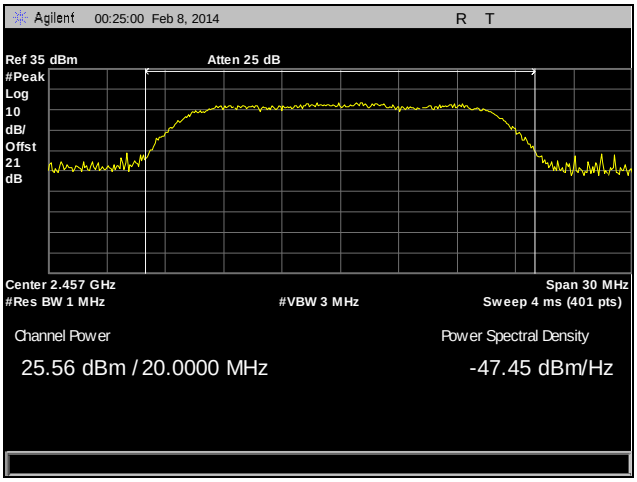
Plot 87. Peak Power Output, Channel 7, 802.11g, Ant. 0



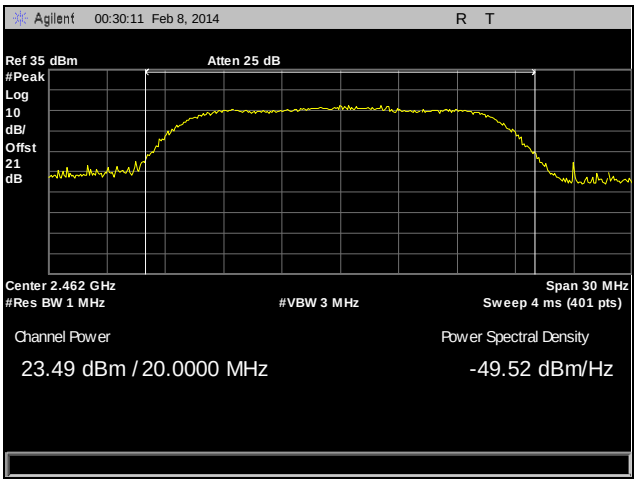
Plot 88. Peak Power Output, Channel 8, 802.11g, Ant. 0



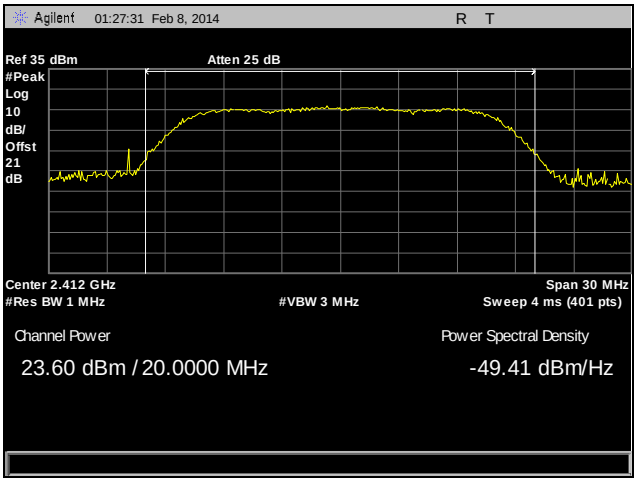
Plot 89. Peak Power Output, Channel 9, 802.11g, Ant. 0



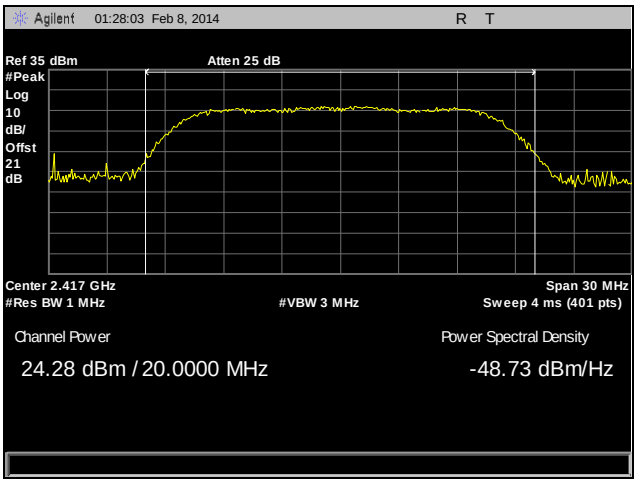
Plot 90. Peak Power Output, Channel 10, 802.11g, Ant. 0



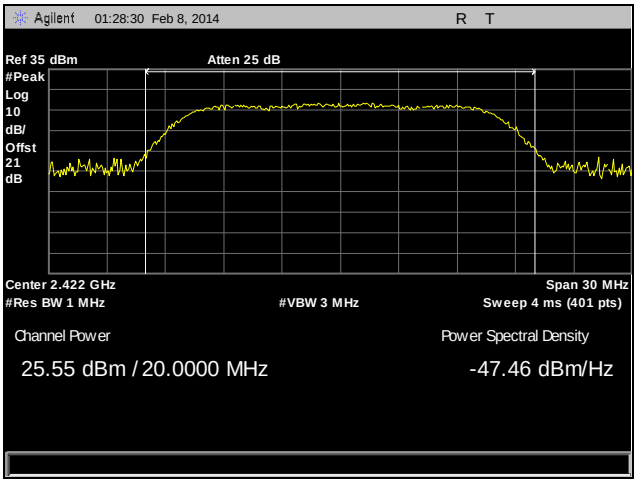
Plot 91. Peak Power Output, Channel 11, 802.11g, Ant. 0



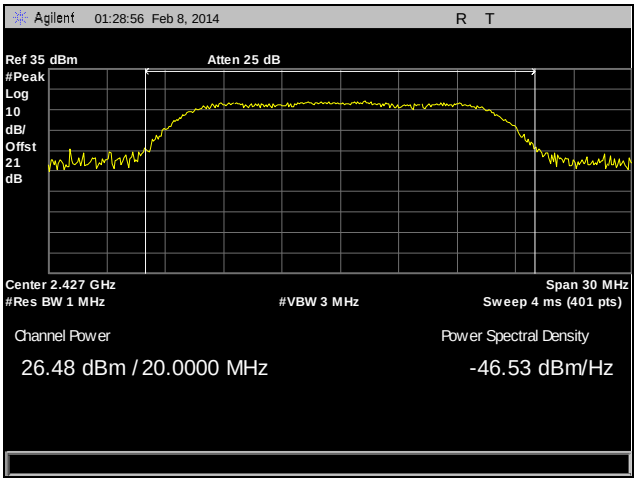
Plot 92. Peak Power Output, Channel 1, 802.11g, Ant. 1



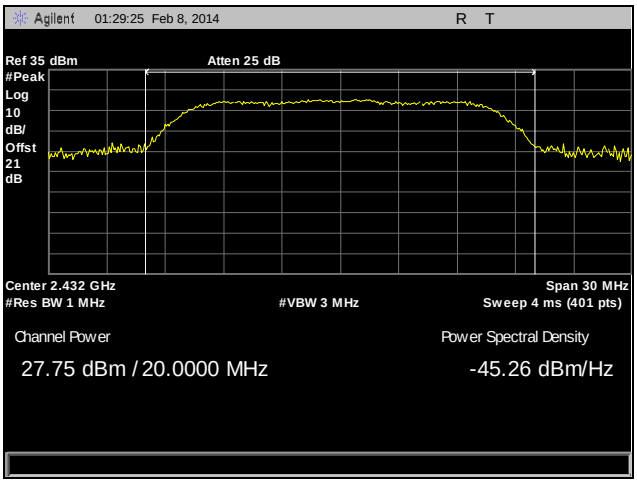
Plot 93. Peak Power Output, Channel 2, 802.11g, Ant. 1



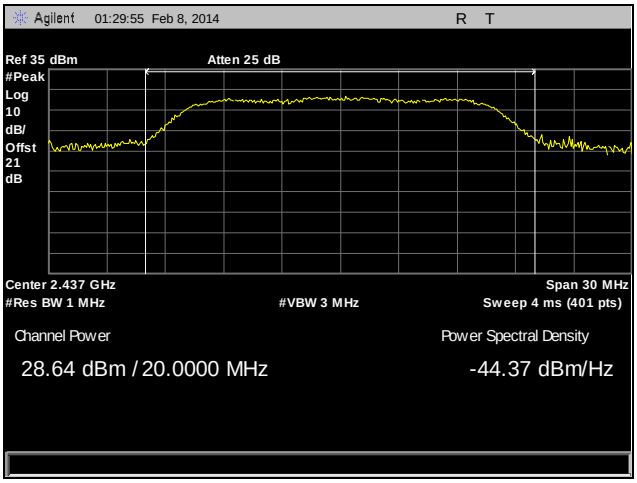
Plot 94. Peak Power Output, Channel 3, 802.11g, Ant. 1



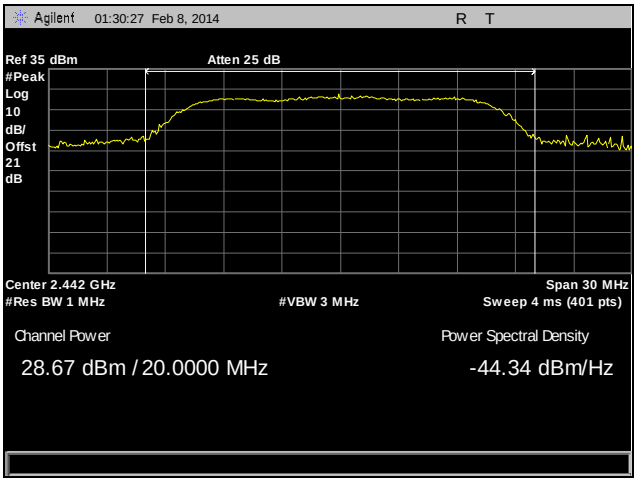
Plot 95. Peak Power Output, Channel 4, 802.11g, Ant. 1



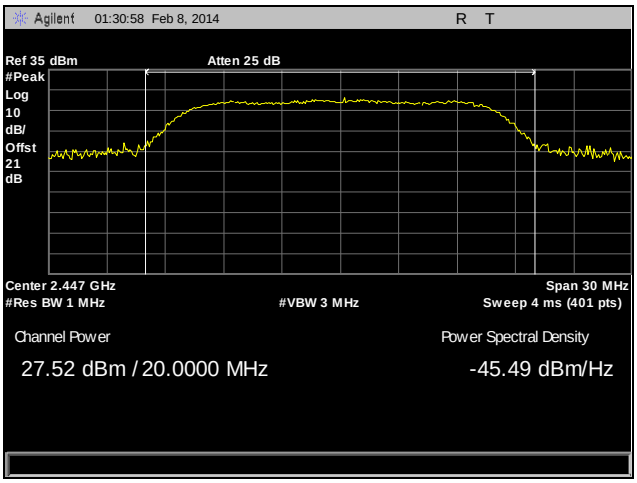
Plot 96. Peak Power Output, Channel 5, 802.11g, Ant. 1



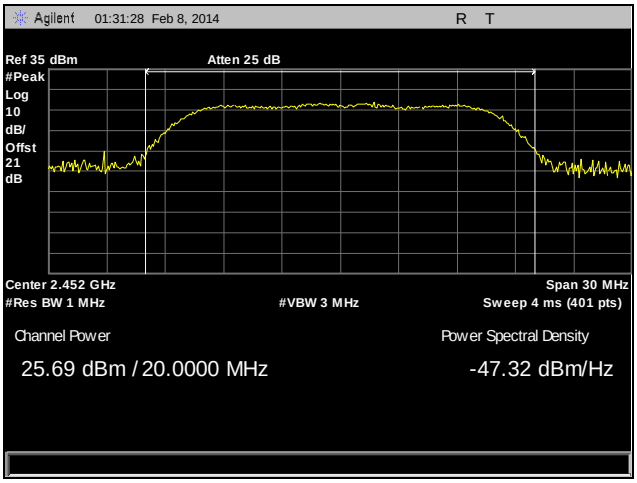
Plot 97. Peak Power Output, Channel 6, 802.11g, Ant. 1



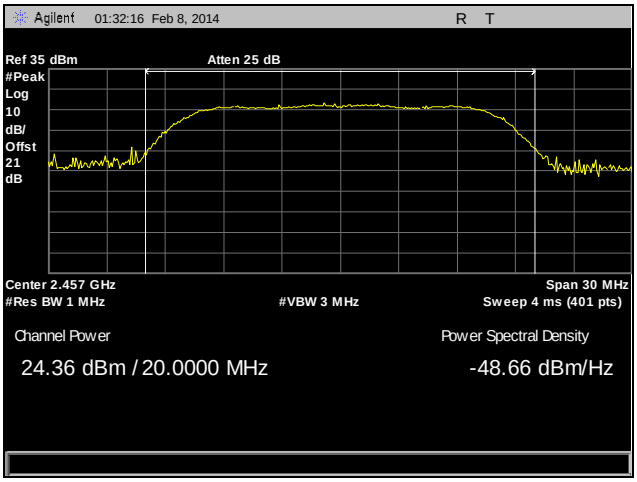
Plot 98. Peak Power Output, Channel 7, 802.11g, Ant. 1



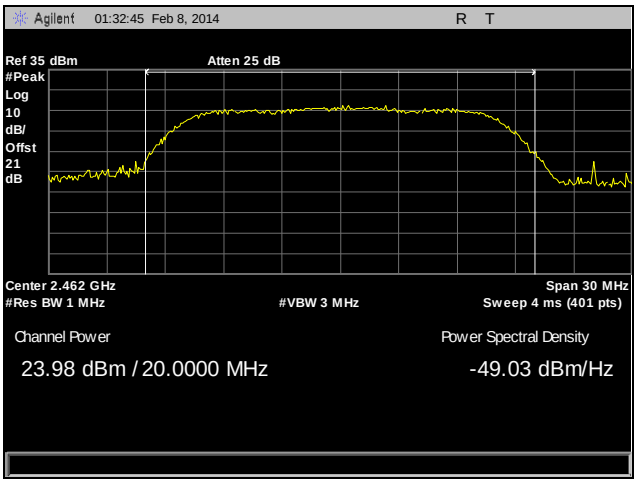
Plot 99. Peak Power Output, Channel 8, 802.11g, Ant. 1



Plot 100. Peak Power Output, Channel 9, 802.11g, Ant. 1

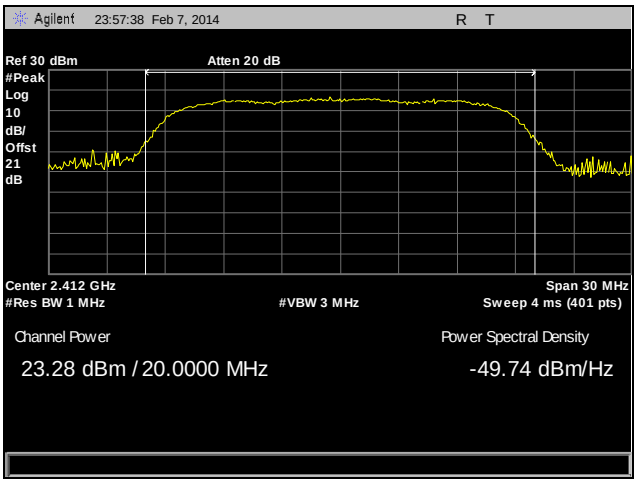


Plot 101. Peak Power Output, Channel 10, 802.11g, Ant. 1

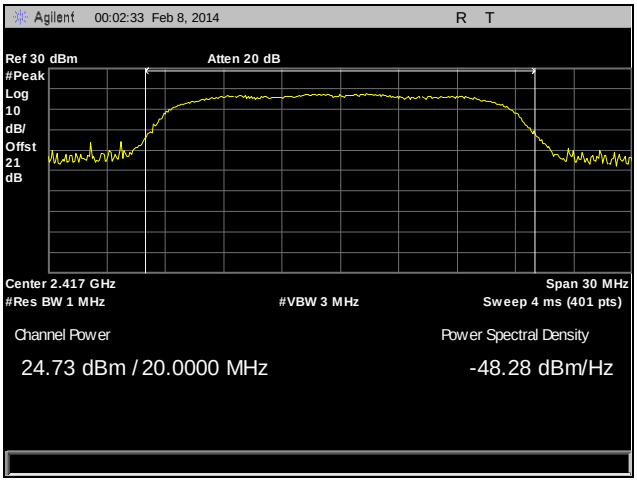


Plot 102. Peak Power Output, Channel 11, 802.11g, Ant. 1

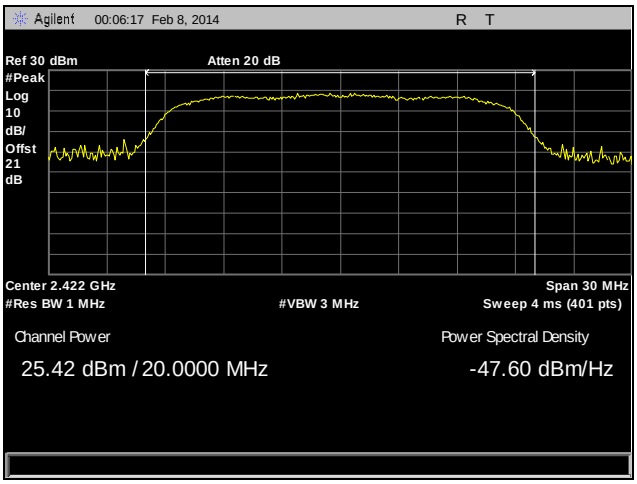
Peak Power Output Test Results, 802.11n 20 MHz



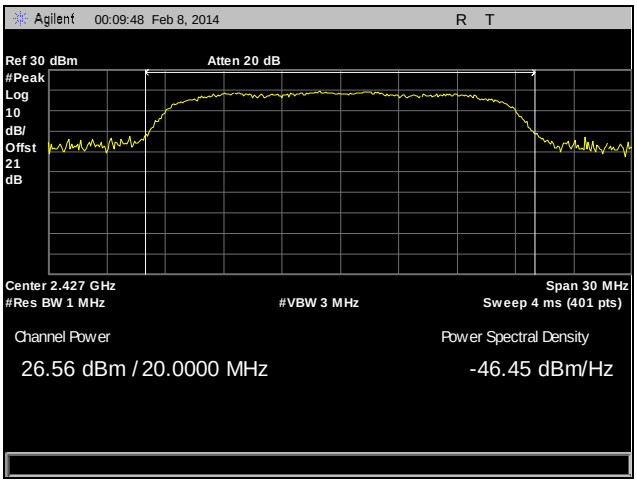
Plot 103. Peak Power Output, Channel 1, 802.11n 20 MHz, Ant. 0



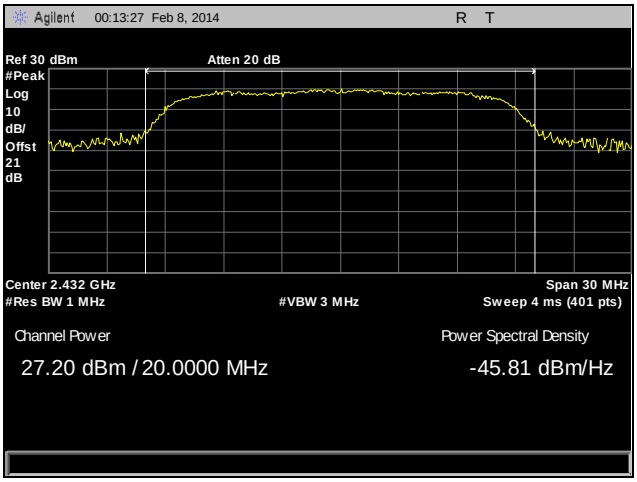
Plot 104. Peak Power Output, Channel 2, 802.11n 20 MHz, Ant. 0



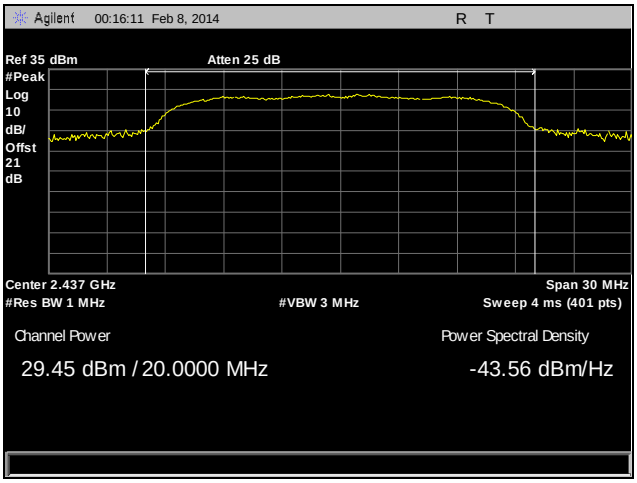
Plot 105. Peak Power Output, Channel 3, 802.11n 20 MHz, Ant. 0



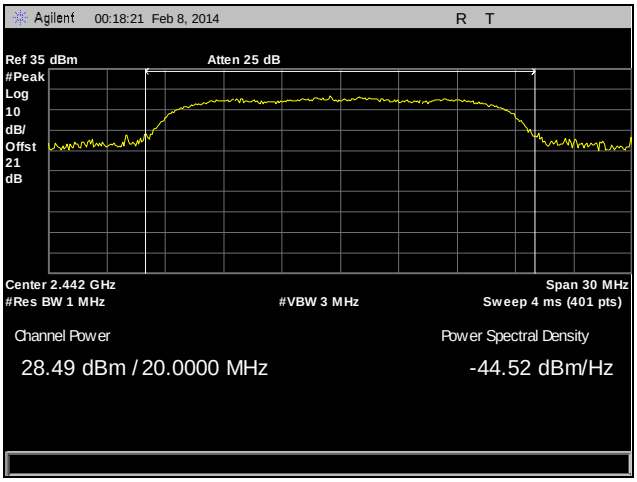
Plot 106. Peak Power Output, Channel 4, 802.11n 20 MHz, Ant. 0



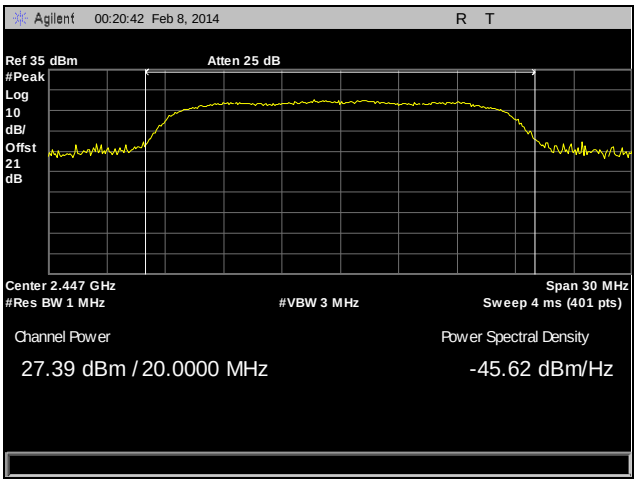
Plot 107. Peak Power Output, Channel 5, 802.11n 20 MHz, Ant. 0



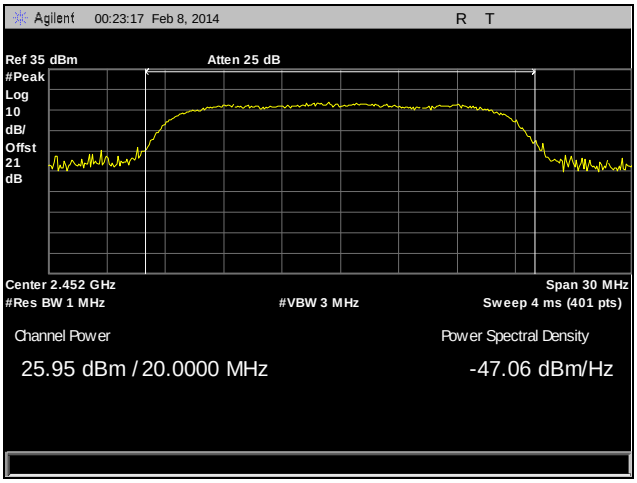
Plot 108. Peak Power Output, Channel 6, 802.11n 20 MHz, Ant. 0



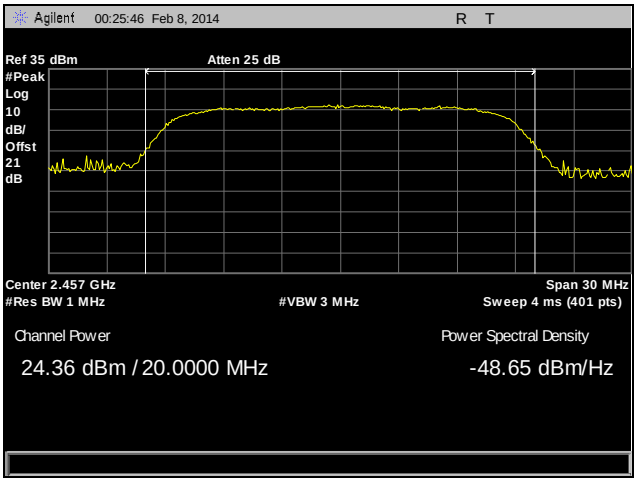
Plot 109. Peak Power Output, Channel 7, 802.11n 20 MHz, Ant. 0



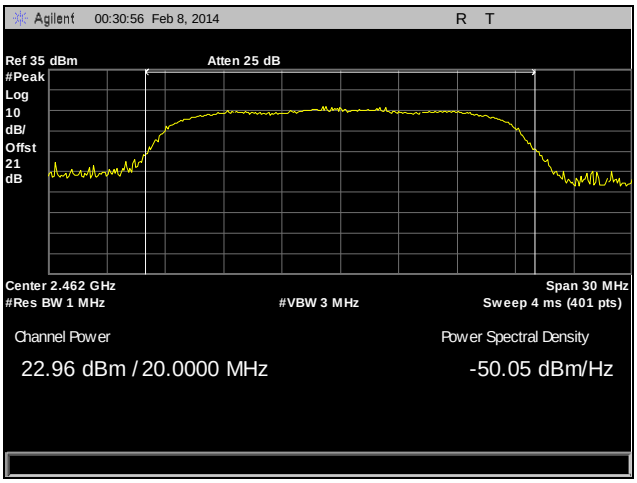
Plot 110. Peak Power Output, Channel 8, 802.11n 20 MHz, Ant. 0



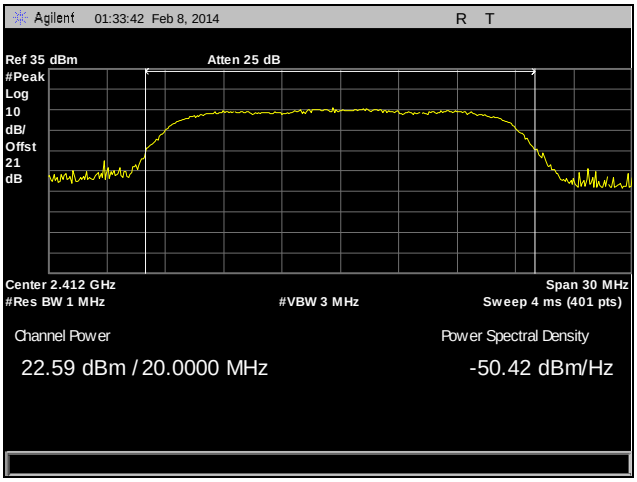
Plot 111. Peak Power Output, Channel 9, 802.11n 20 MHz, Ant. 0



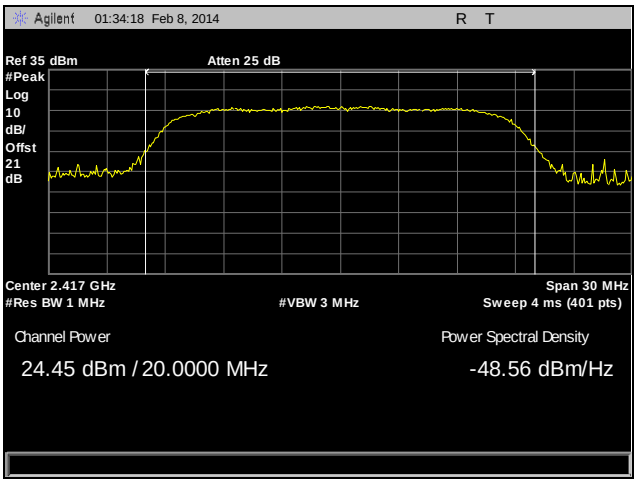
Plot 112. Peak Power Output, Channel 10, 802.11n 20 MHz, Ant. 0



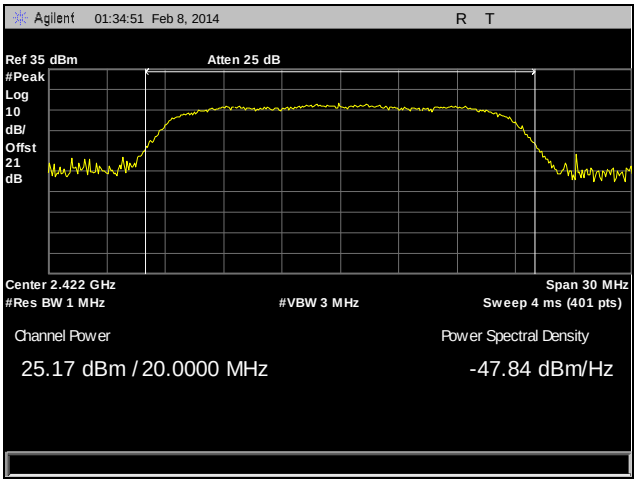
Plot 113. Peak Power Output, Channel 11, 802.11n 20 MHz, Ant. 0



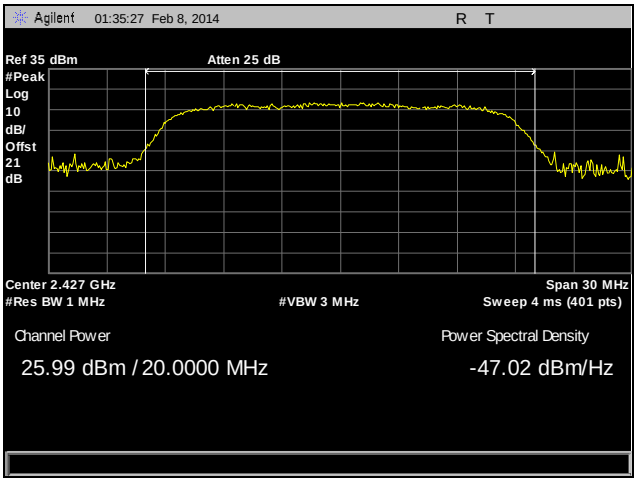
Plot 114. Peak Power Output, Channel 1, 802.11n 20 MHz, Ant. 1



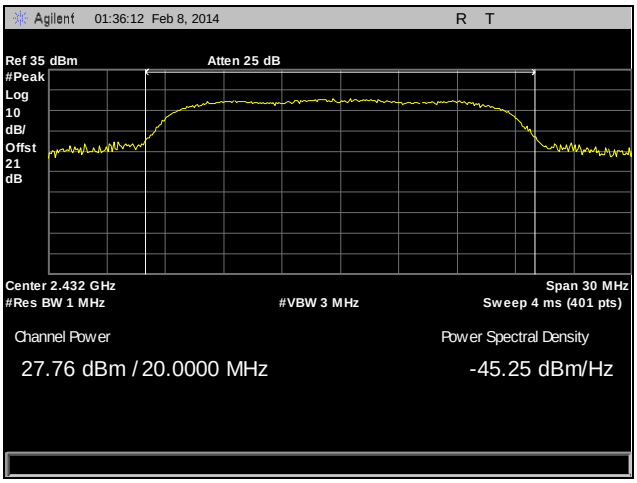
Plot 115. Peak Power Output, Channel 2, 802.11n 20 MHz, Ant. 1



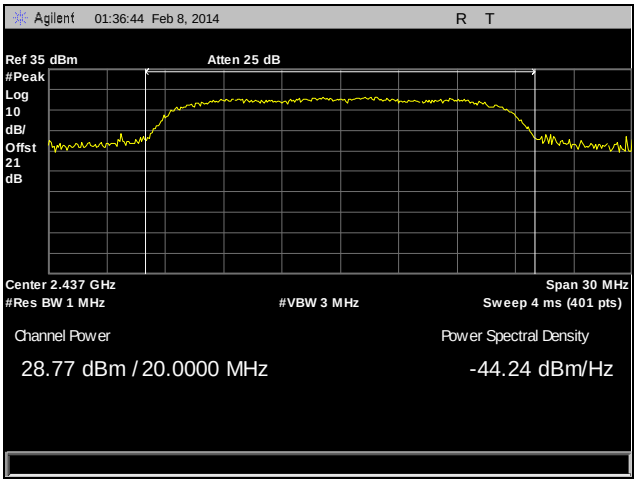
Plot 116. Peak Power Output, Channel 3, 802.11n 20 MHz, Ant. 1



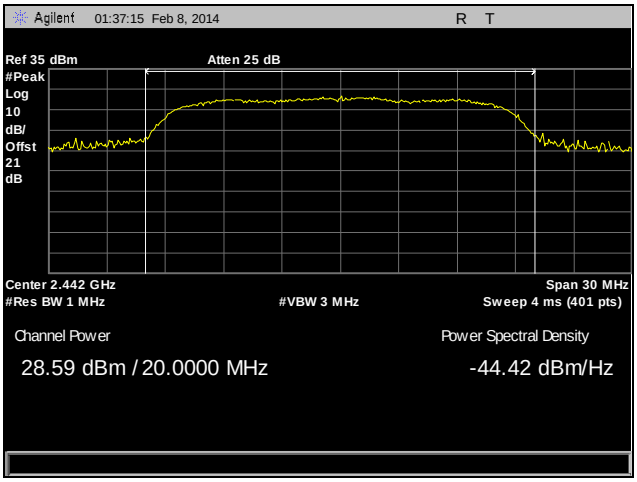
Plot 117. Peak Power Output, Channel 4, 802.11n 20 MHz, Ant. 1



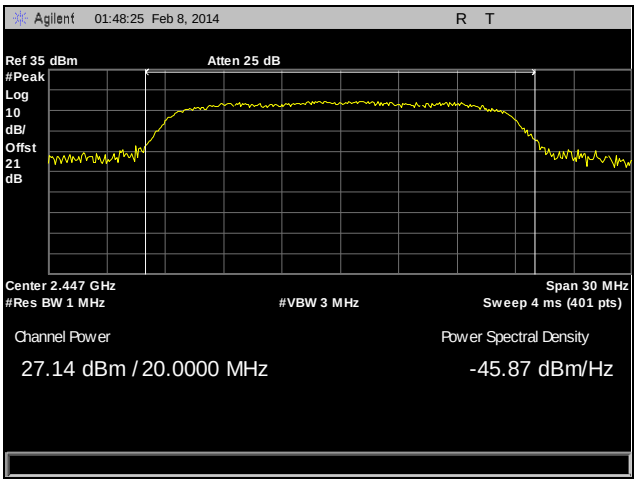
Plot 118. Peak Power Output, Channel 5, 802.11n 20 MHz, Ant. 1



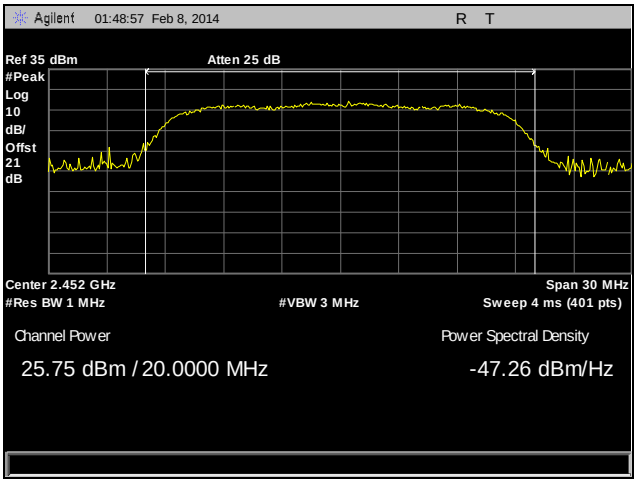
Plot 119. Peak Power Output, Channel 6, 802.11n 20 MHz, Ant. 1



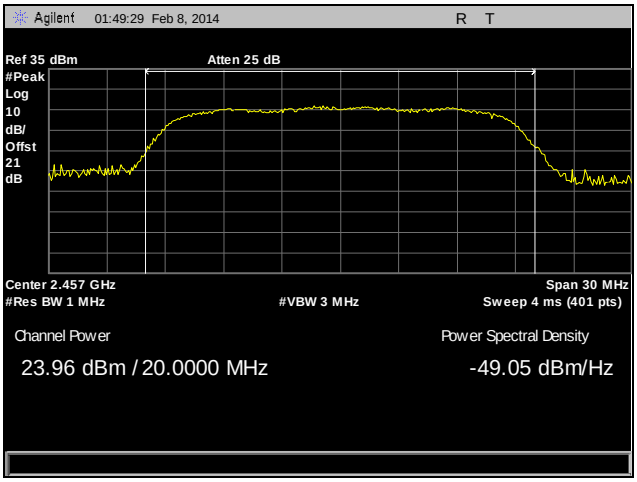
Plot 120. Peak Power Output, Channel 7, 802.11n 20 MHz, Ant. 1



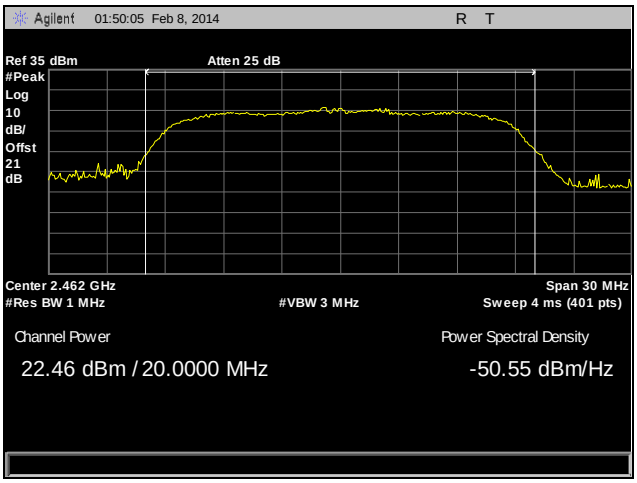
Plot 121. Peak Power Output, Channel 8, 802.11n 20 MHz, Ant. 1



Plot 122. Peak Power Output, Channel 9, 802.11n 20 MHz, Ant. 1

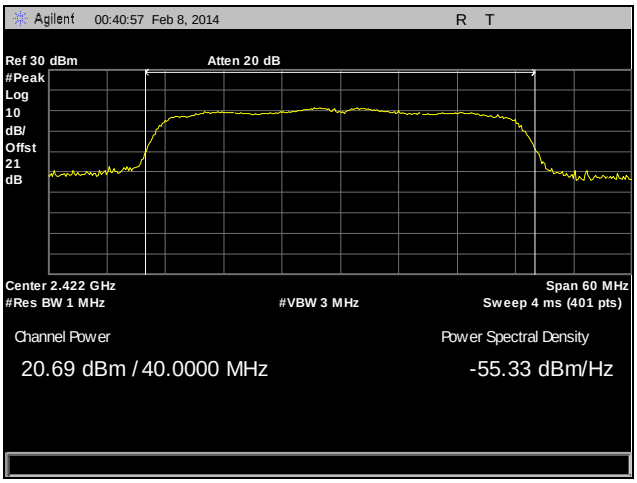


Plot 123. Peak Power Output, Channel 10, 802.11n 20 MHz, Ant. 1

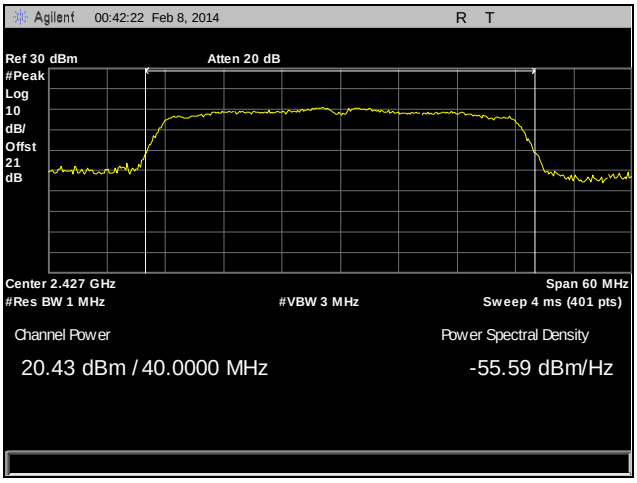


Plot 124. Peak Power Output, Channel 11, 802.11n 20 MHz, Ant. 1

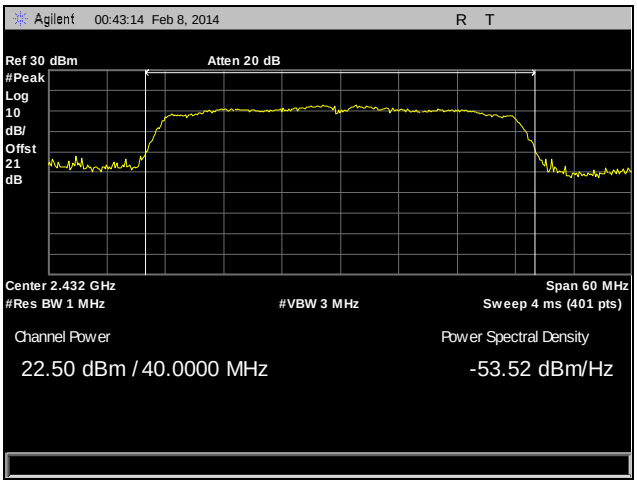
Peak Power Output Test Results, 802.11n 40 MHz



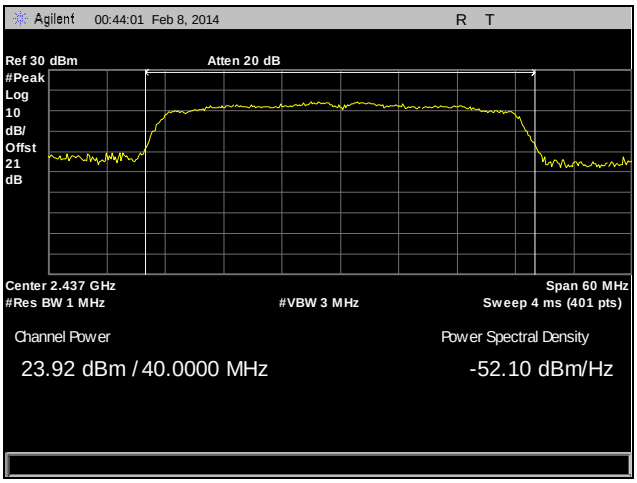
Plot 125. Peak Power Output, Channel 1, 802.11n 40 MHz, Ant. 0



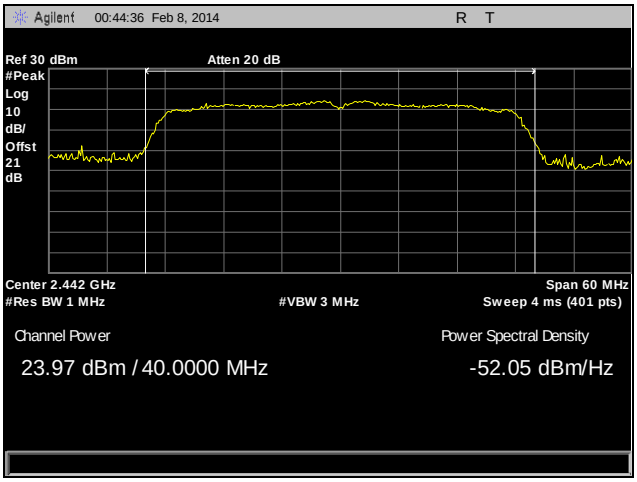
Plot 126. Peak Power Output, Channel 2, 802.11n 40 MHz, Ant. 0



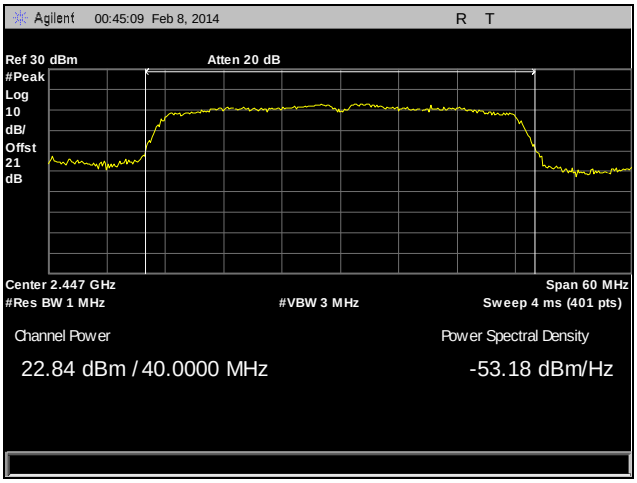
Plot 127. Peak Power Output, Channel 3, 802.11n 40 MHz, Ant. 0



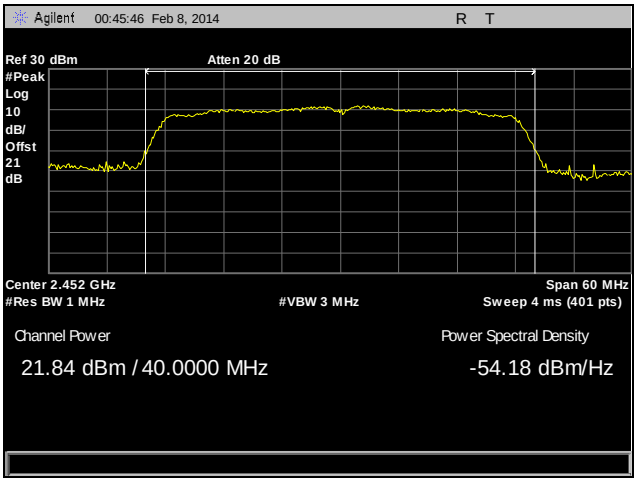
Plot 128. Peak Power Output, Channel 4, 802.11n 40 MHz, Ant. 0



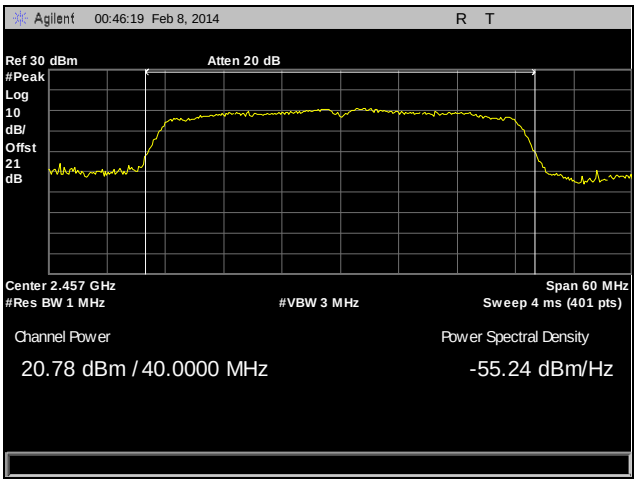
Plot 129. Peak Power Output, Channel 5, 802.11n 40 MHz, Ant. 0



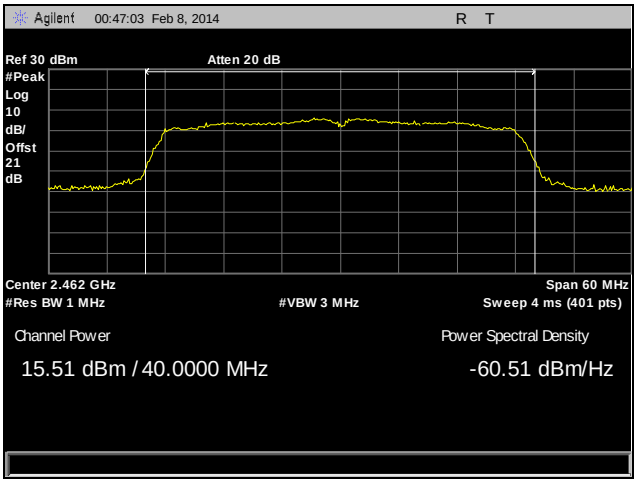
Plot 130. Peak Power Output, Channel 6, 802.11n 40 MHz, Ant. 0



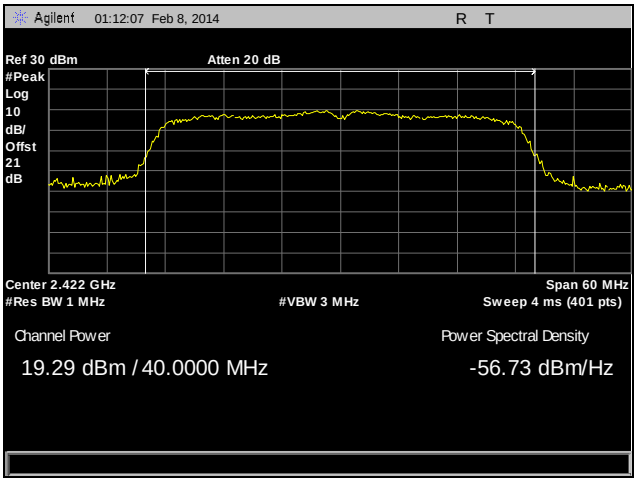
Plot 131. Peak Power Output, Channel 7, 802.11n 40 MHz, Ant. 0



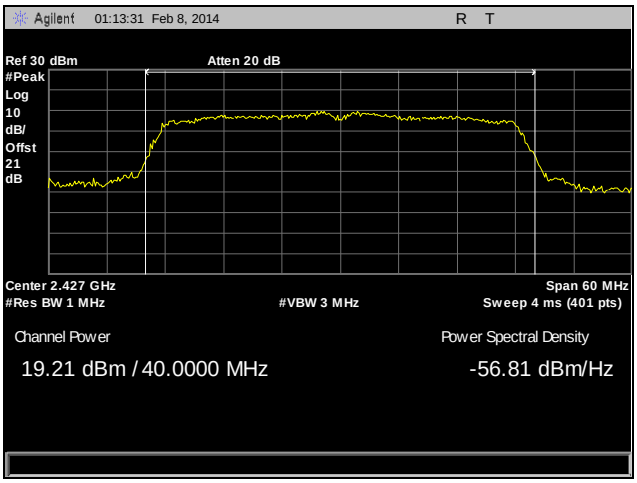
Plot 132. Peak Power Output, Channel 8, 802.11n 40 MHz, Ant. 0



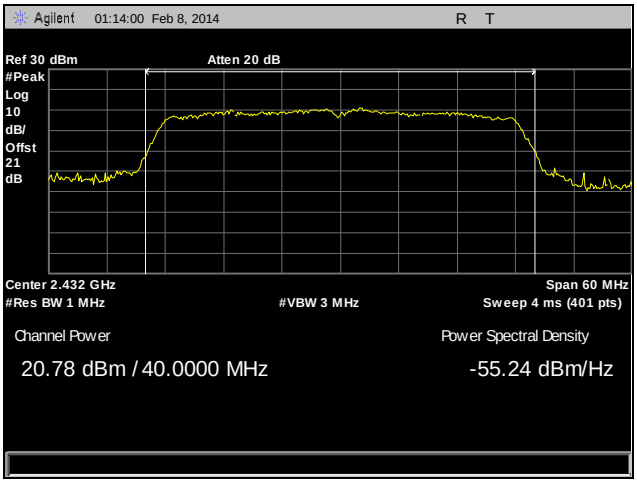
Plot 133. Peak Power Output, Channel 9, 802.11n 40 MHz, Ant. 0



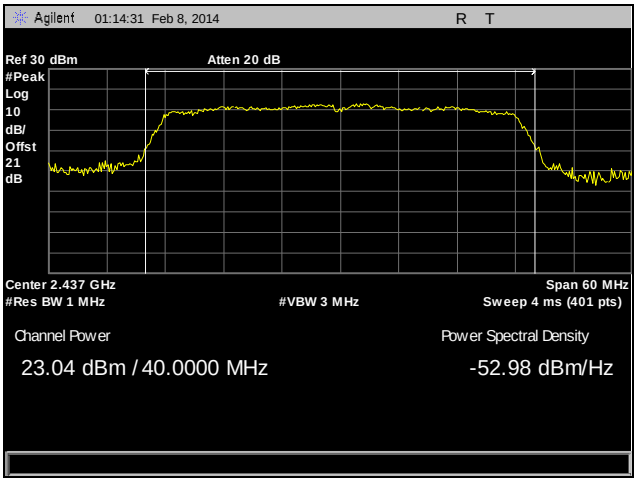
Plot 134. Peak Power Output, Channel 1, 802.11n 40 MHz, Ant. 1



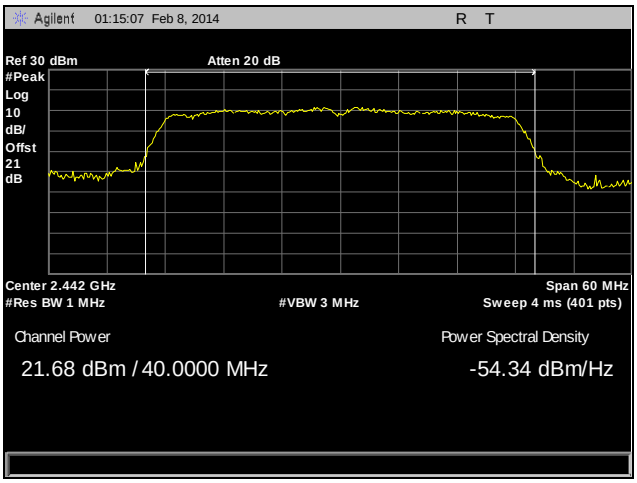
Plot 135. Peak Power Output, Channel 2, 802.11n 40 MHz, Ant. 1



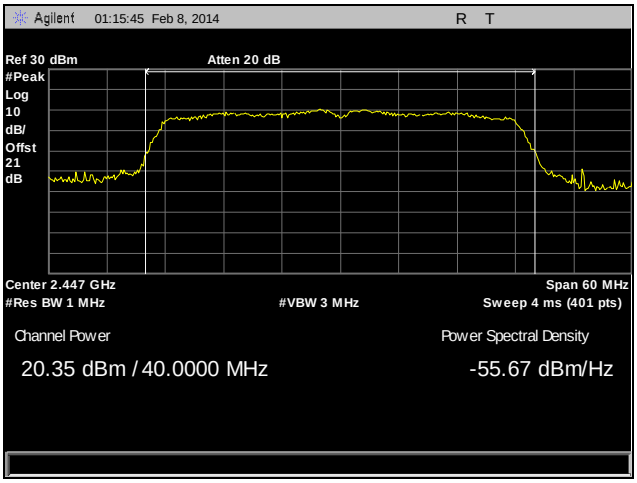
Plot 136. Peak Power Output, Channel 3, 802.11n 40 MHz, Ant. 1



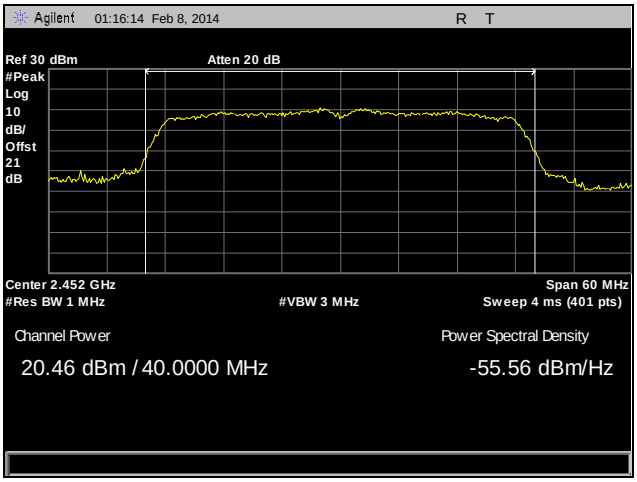
Plot 137. Peak Power Output, Channel 4, 802.11n 40 MHz, Ant. 1



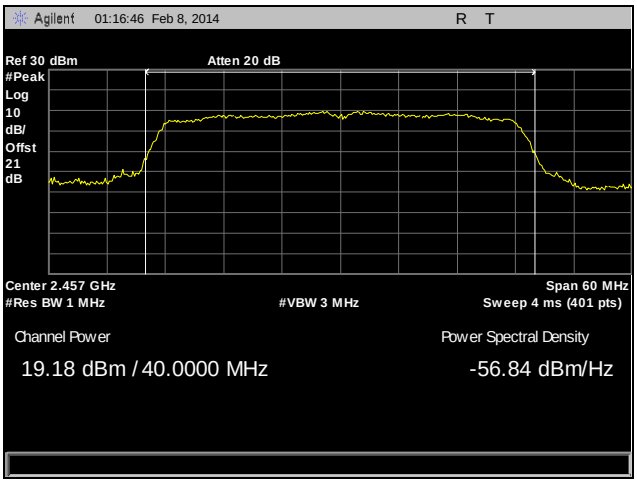
Plot 138. Peak Power Output, Channel 5, 802.11n 40 MHz, Ant. 1



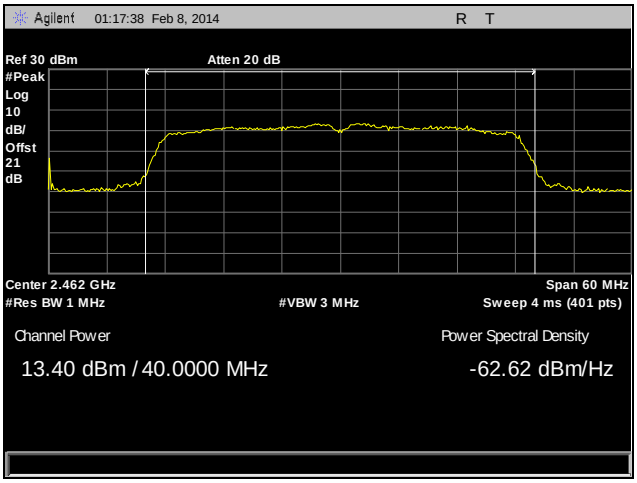
Plot 139. Peak Power Output, Channel 6, 802.11n 40 MHz, Ant. 1



Plot 140. Peak Power Output, Channel 7, 802.11n 40 MHz, Ant. 1

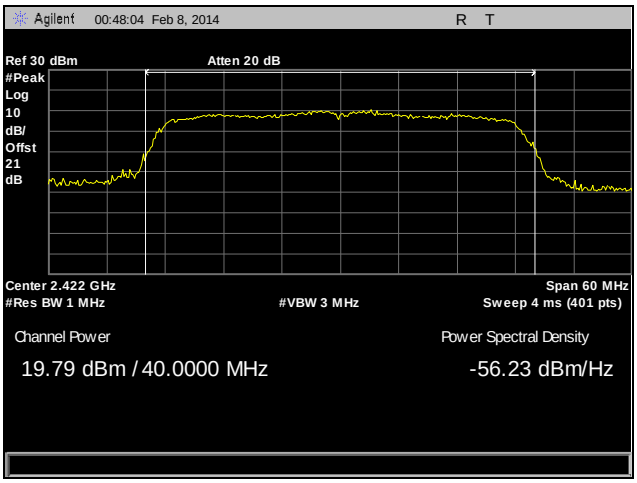


Plot 141. Peak Power Output, Channel 8, 802.11n 40 MHz, Ant. 1

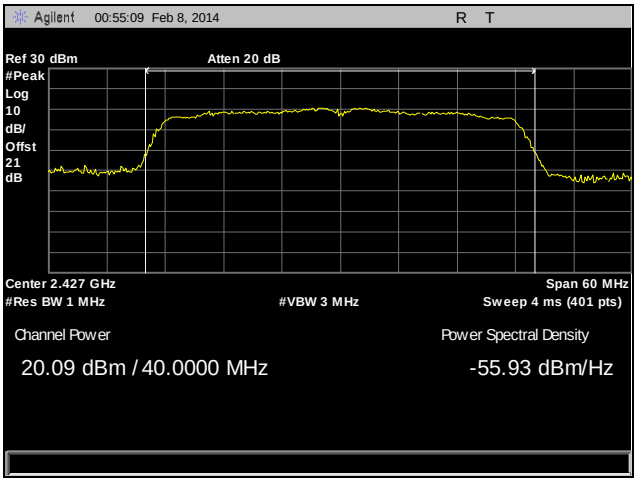


Plot 142. Peak Power Output, Channel 9, 802.11n 40 MHz, Ant. 1

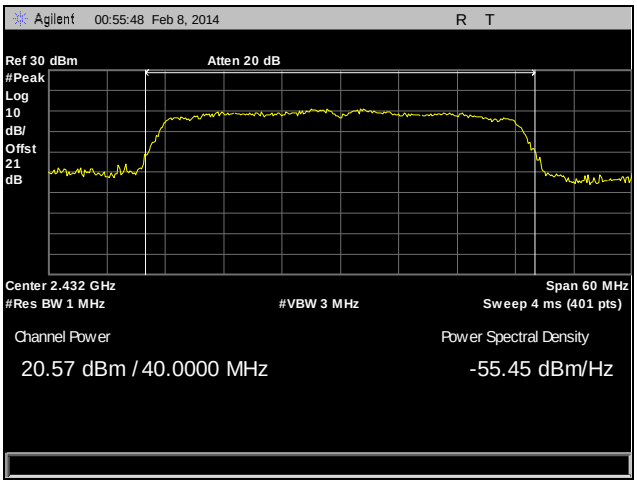
Peak Power Output Test Results, 802.11n 40 MHz, MIMO



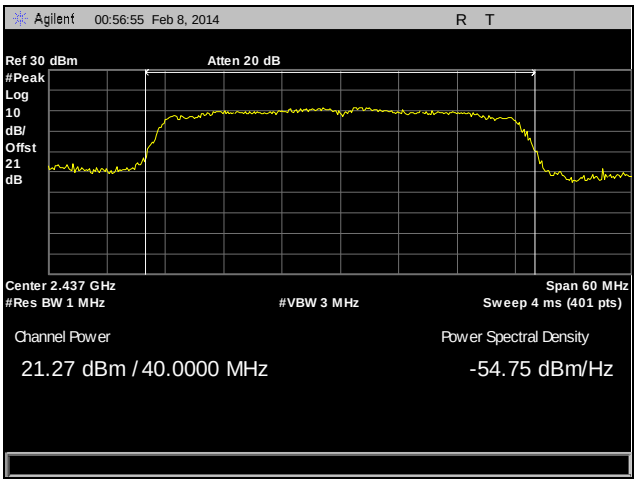
Plot 143. Peak Power Output, Channel 1, 802.11n 40 MHz, Ant. 0, MIMO



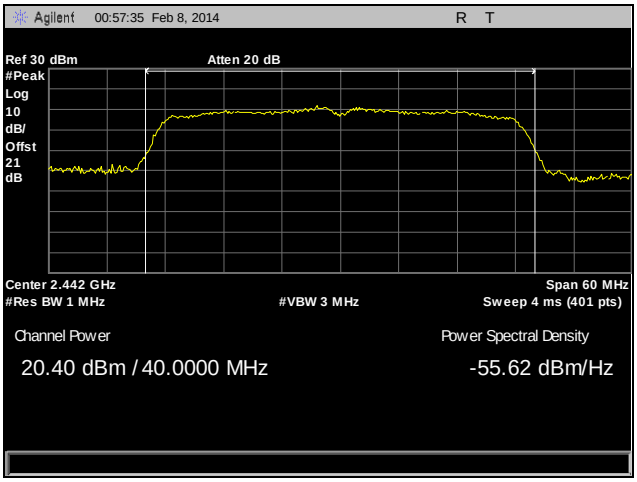
Plot 144. Peak Power Output, Channel 2, 802.11n 40 MHz, Ant. 0, MIMO



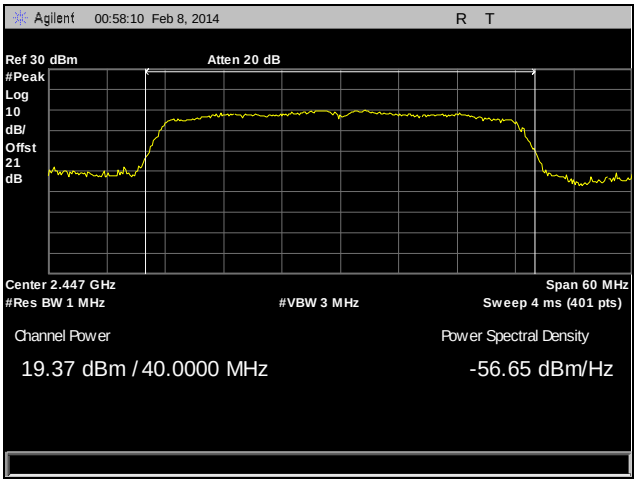
Plot 145. Peak Power Output, Channel 3, 802.11n 40 MHz, Ant. 0, MIMO



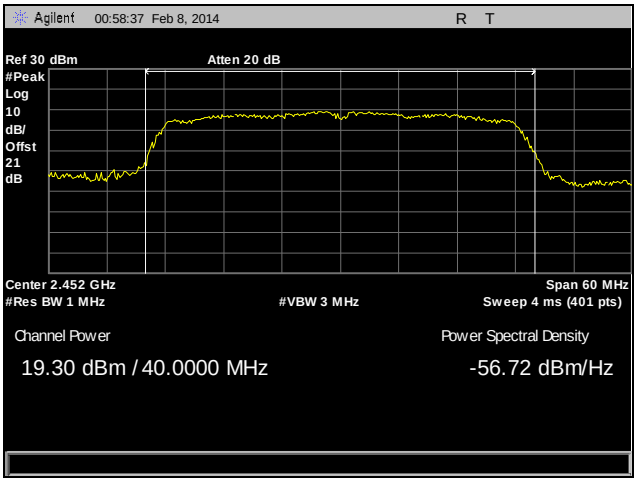
Plot 146. Peak Power Output, Channel 4, 802.11n 40 MHz, Ant. 0, MIMO



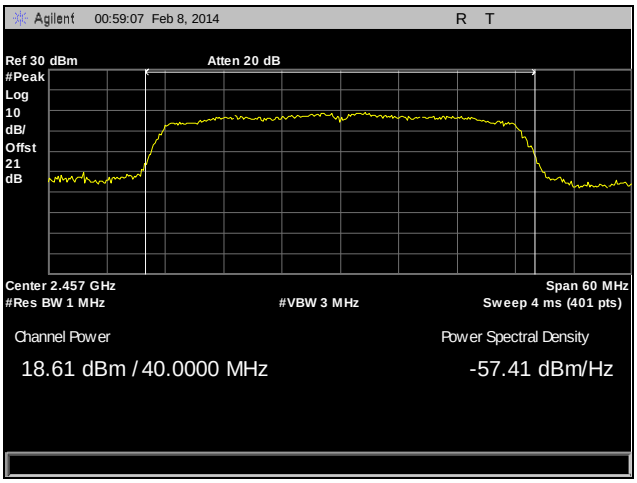
Plot 147. Peak Power Output, Channel 5, 802.11n 40 MHz, Ant. 0, MIMO



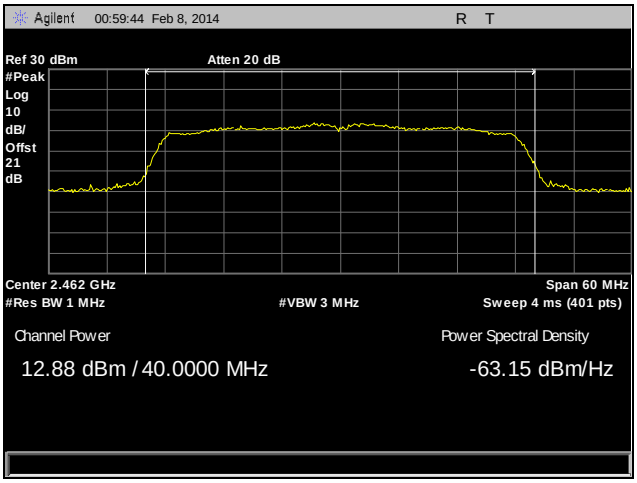
Plot 148. Peak Power Output, Channel 6, 802.11n 40 MHz, Ant. 0, MIMO



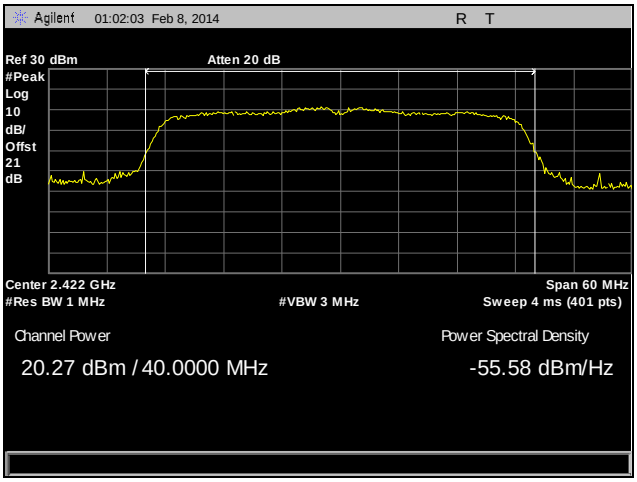
Plot 149. Peak Power Output, Channel 7, 802.11n 40 MHz, Ant. 0, MIMO



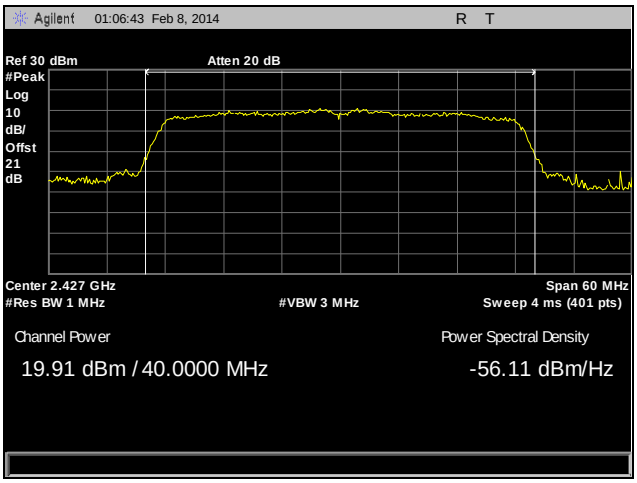
Plot 150. Peak Power Output, Channel 8, 802.11n 40 MHz, Ant. 0, MIMO



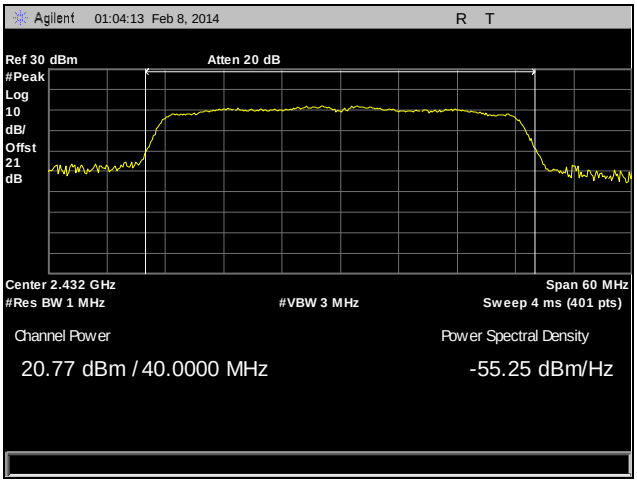
Plot 151. Peak Power Output, Channel 9, 802.11n 40 MHz, Ant. 0, MIMO



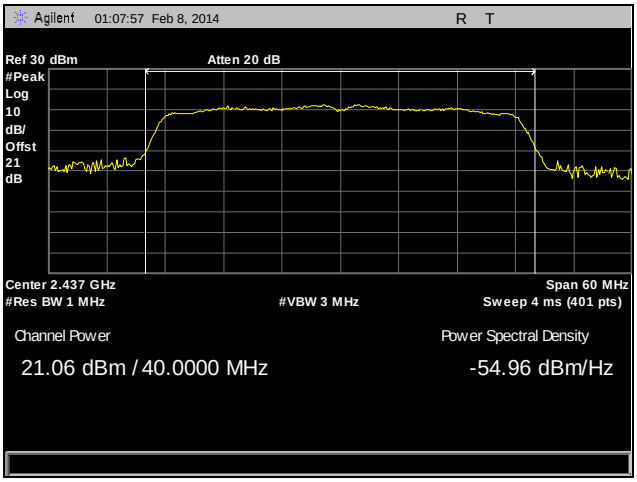
Plot 152. Peak Power Output, Channel 1, 802.11n 40 MHz, Ant. 1, MIMO



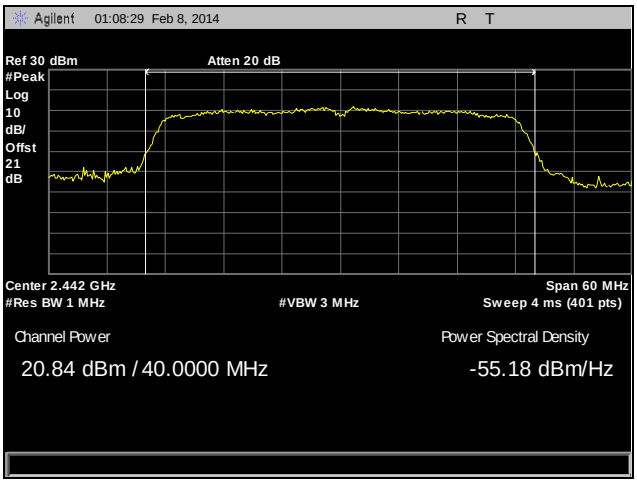
Plot 153. Peak Power Output, Channel 2, 802.11n 40 MHz, Ant. 1, MIMO



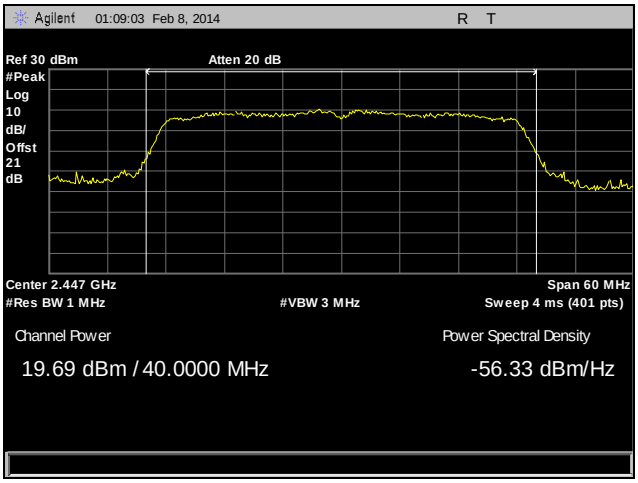
Plot 154. Peak Power Output, Channel 3, 802.11n 40 MHz, Ant. 1, MIMO



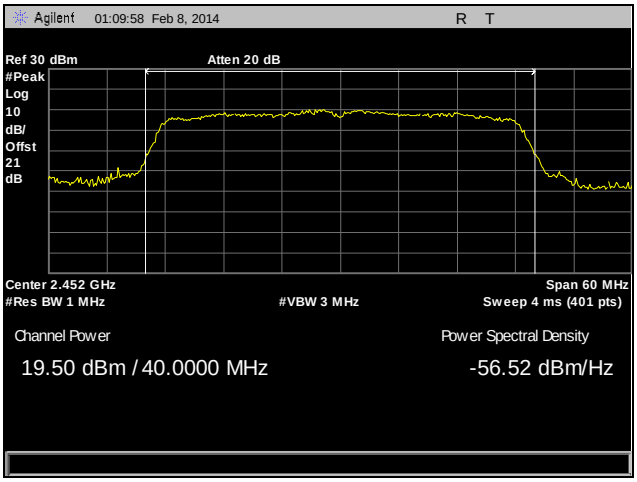
Plot 155. Peak Power Output, Channel 4, 802.11n 40 MHz, Ant. 1, MIMO



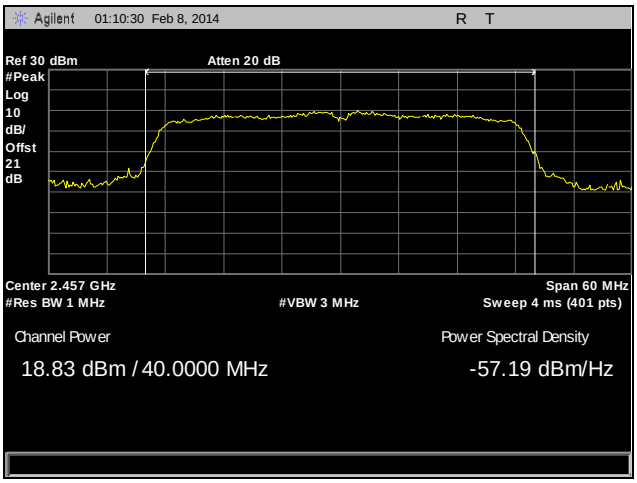
Plot 156. Peak Power Output, Channel 5, 802.11n 40 MHz, Ant. 1, MIMO



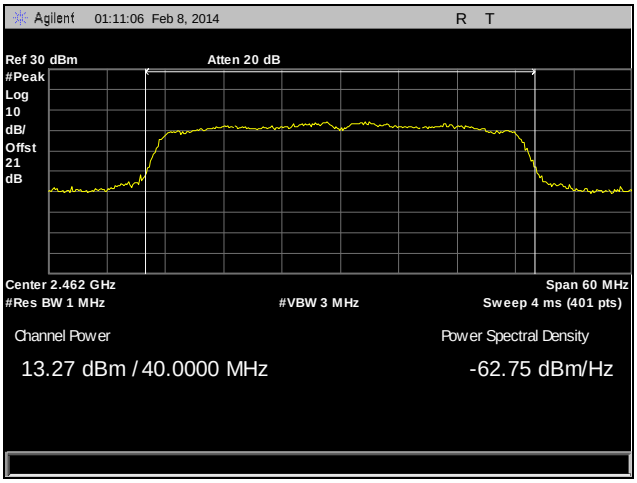
Plot 157. Peak Power Output, Channel 6, 802.11n 40 MHz, Ant. 1, MIMO



Plot 158. Peak Power Output, Channel 7, 802.11n 40 MHz, Ant. 1, MIMO



Plot 159. Peak Power Output, Channel 8, 802.11n 40 MHz, Ant. 1, MIMO



Plot 160. Peak Power Output, Channel 9, 802.11n 40 MHz, Ant. 1, MIMO

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 42. 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 43.

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

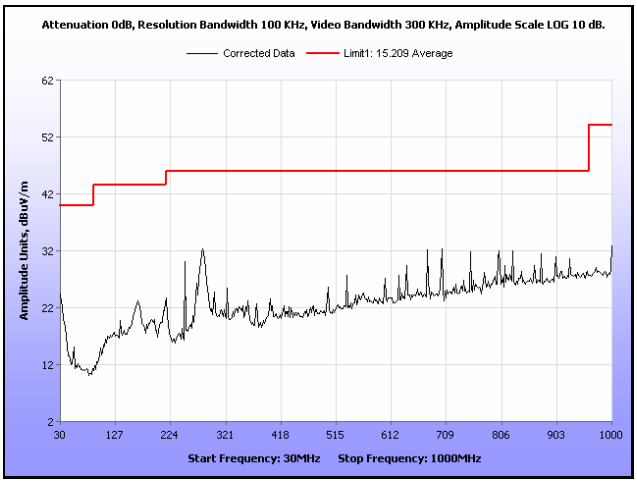
Test Procedures: The transmitter was turned on. Measurements were performed of the low, mid and high Channels. The EUT was rotated orthogonally through all three axes. Plots shown are corrected for both antenna correction factor and distance and compared to a 3 m limit line. Only noise floor was measured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

Test Results: The EUT was compliant with the Radiated Spurious Emission limits of **§ 15.247(d)**. Due to dual radio in the EUT (2.4GHz and 5GHz radio), in some of the radiated emission plots 5 GHz radio beacon was observed. Arris had no way of turning this off. This is not a spurious emission from the 2.4 GHz radio.

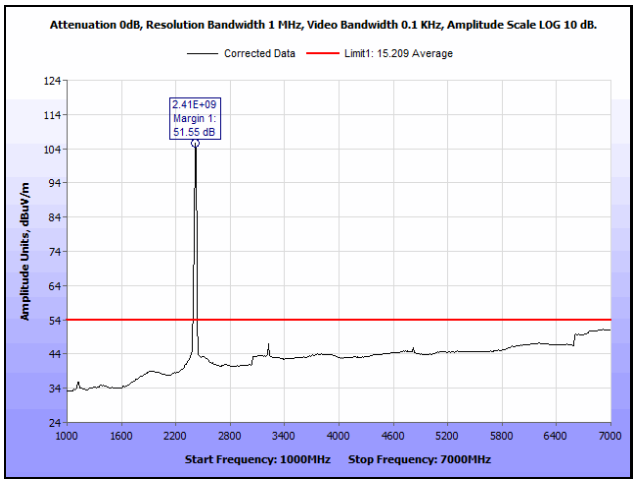
Test Engineer(s): Surinder Singh

Test Date(s): 02/06/14

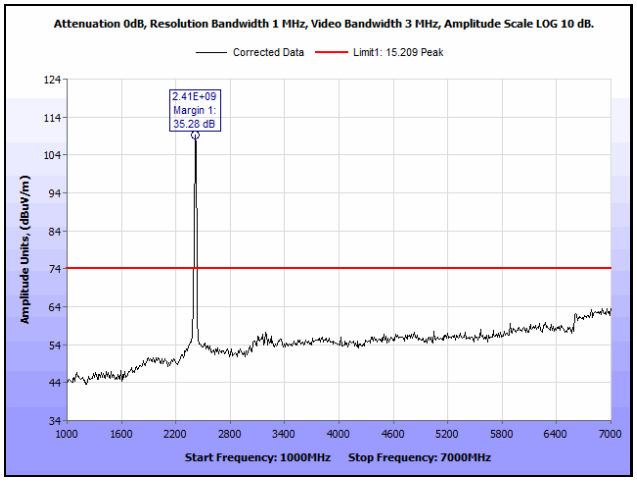
Radiated Spurious Emissions Test Results, 802.11b



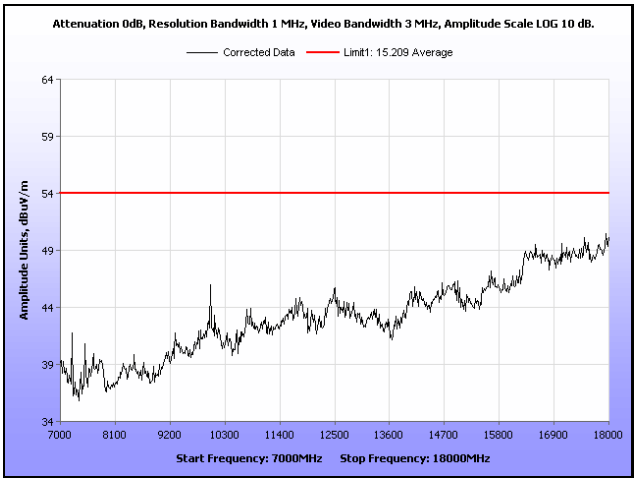
Plot 161. Radiated Spurious Emissions, Low Channel, 802.11b, Ant. 0, 30 MHz – 1 GHz



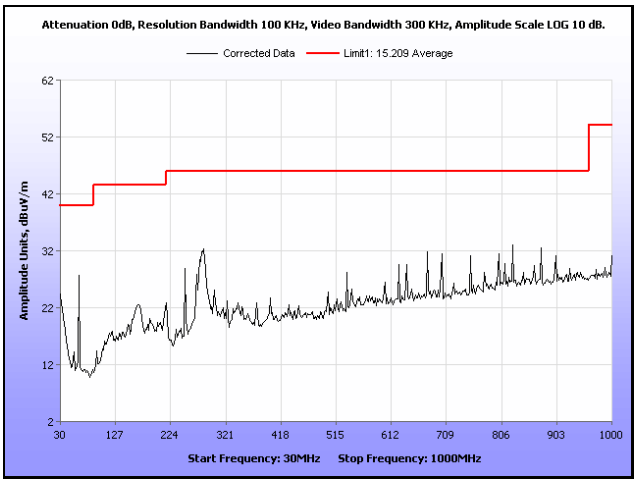
Plot 162. Radiated Spurious Emissions, Low Channel, 802.11b, Ant. 0, 1 GHz – 7 GHz, Average



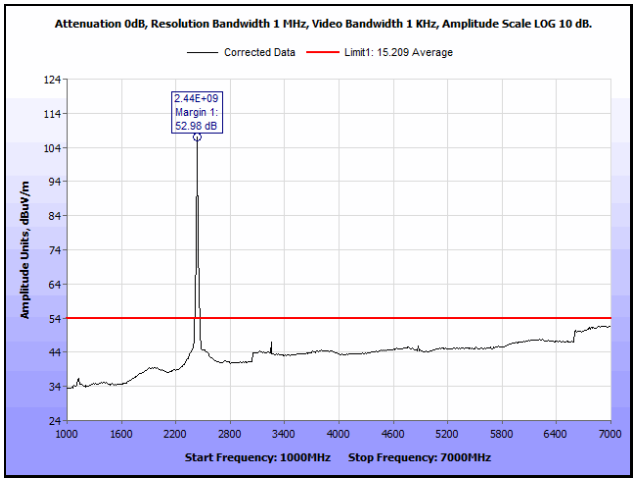
Plot 163. Radiated Spurious Emissions, Low Channel, 802.11b, Ant. 0, 1 GHz – 7 GHz, Peak



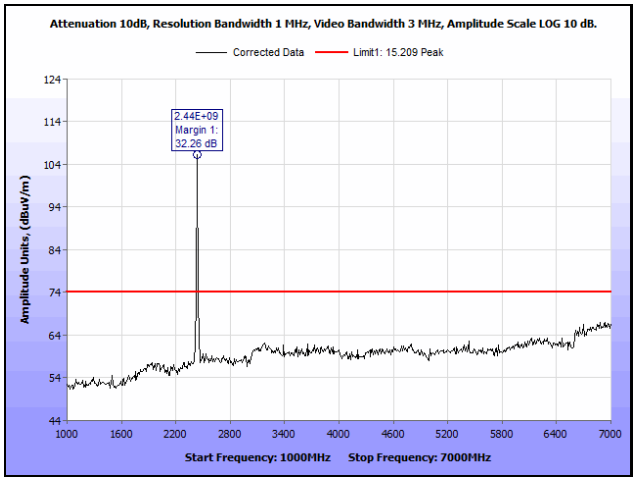
Plot 164. Radiated Spurious Emissions, Low Channel, 802.11b, Ant. 0, 7 GHz – 18 GHz



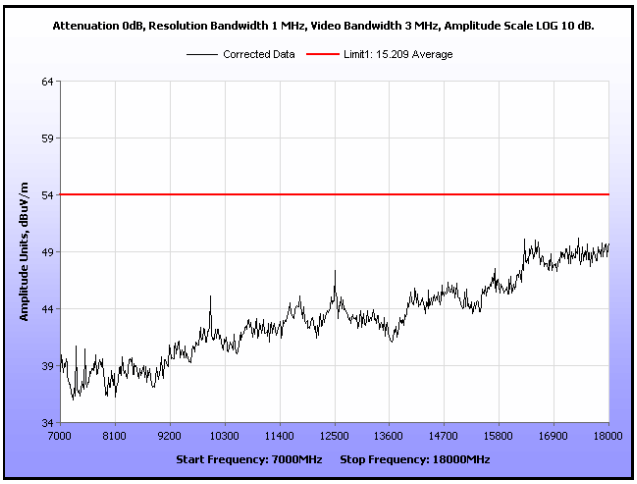
Plot 165. Radiated Spurious Emissions, Mid Channel, 802.11b, Ant. 0, 30 MHz – 1 GHz



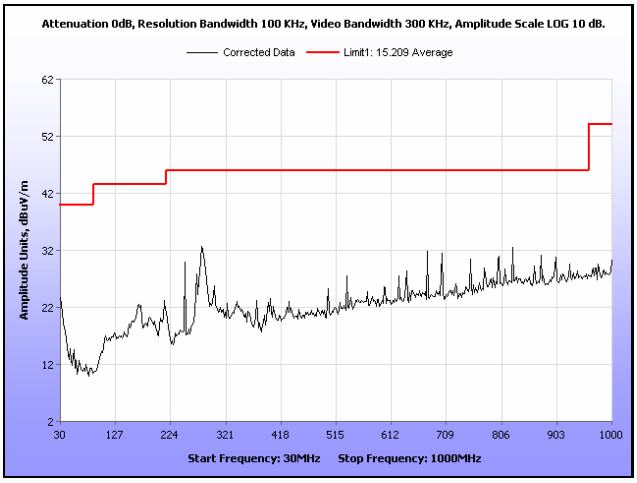
Plot 166. Radiated Spurious Emissions, Mid Channel, 802.11b, Ant. 0, 1 GHz – 7 GHz, Average



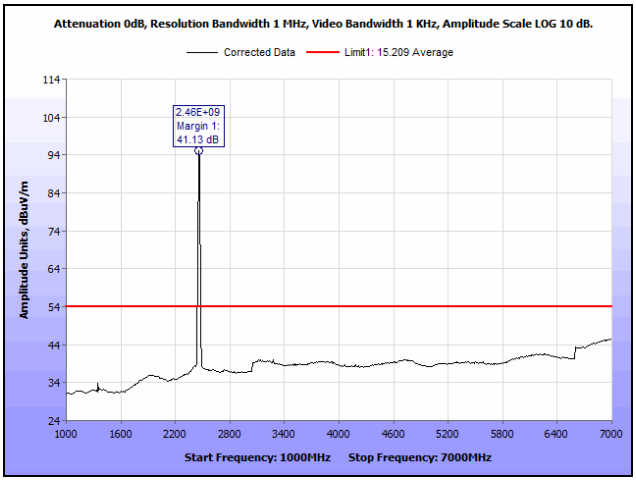
Plot 167. Radiated Spurious Emissions, Mid Channel, 802.11b, Ant. 0, 1 GHz – 7 GHz, Peak



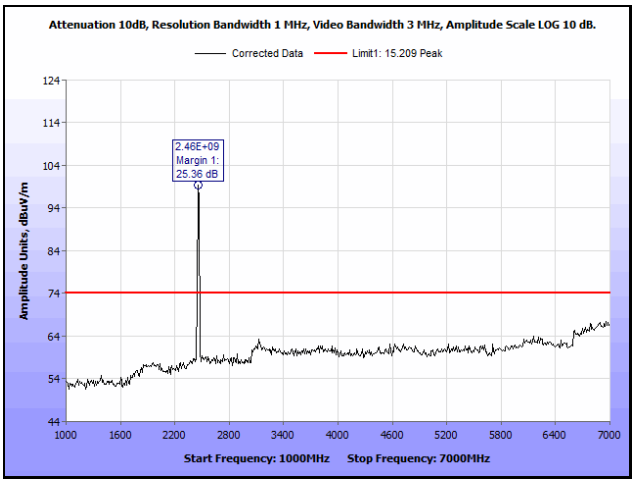
Plot 168. Radiated Spurious Emissions, Mid Channel, 802.11b, Ant. 0, 7 GHz – 18 GHz



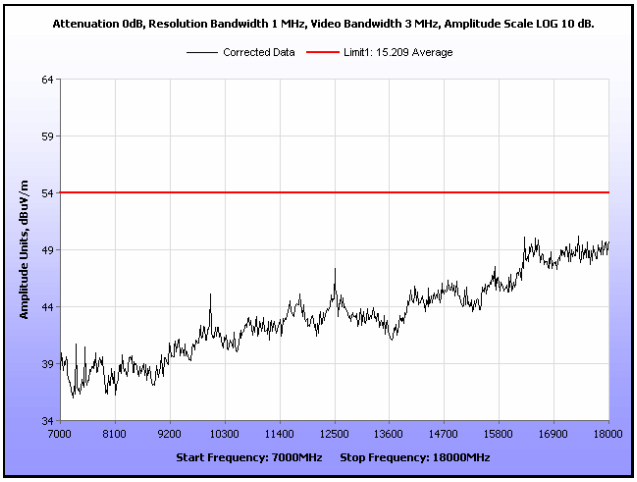
Plot 169. Radiated Spurious Emissions, High Channel, 802.11b, Ant. 0, 30 MHz – 1 GHz



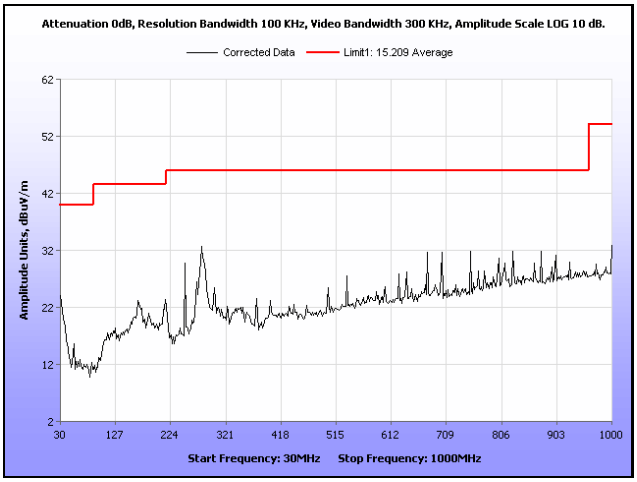
Plot 170. Radiated Spurious Emissions, High Channel, 802.11b, Ant. 0, 1 GHz – 7 GHz, Average



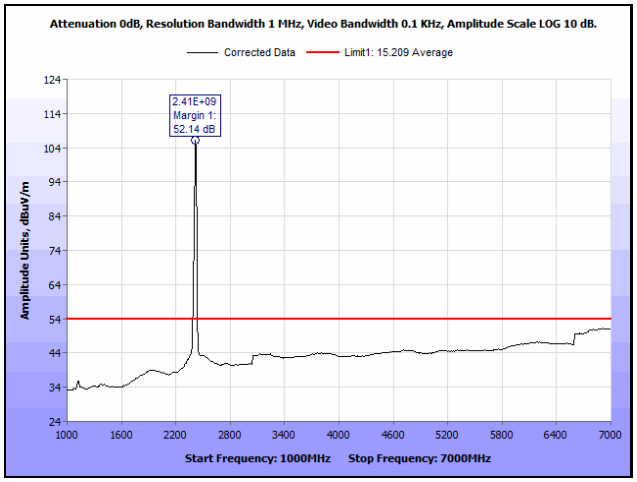
Plot 171. Radiated Spurious Emissions, High Channel, 802.11b, Ant. 0, 1 GHz – 7 GHz, Peak



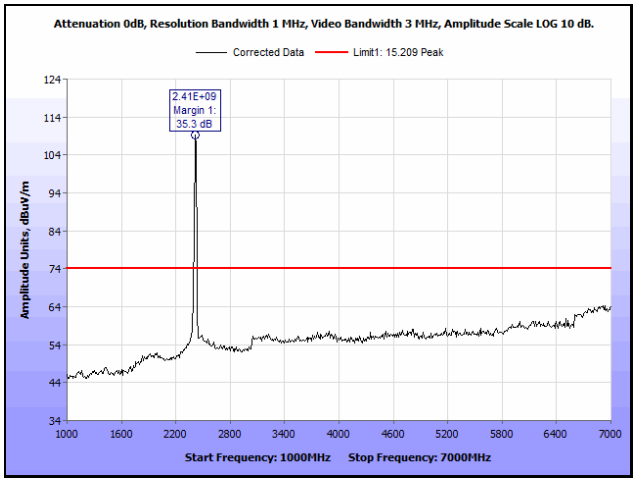
Plot 172. Radiated Spurious Emissions, High Channel, 802.11b, Ant. 0, 7 GHz – 18 GHz



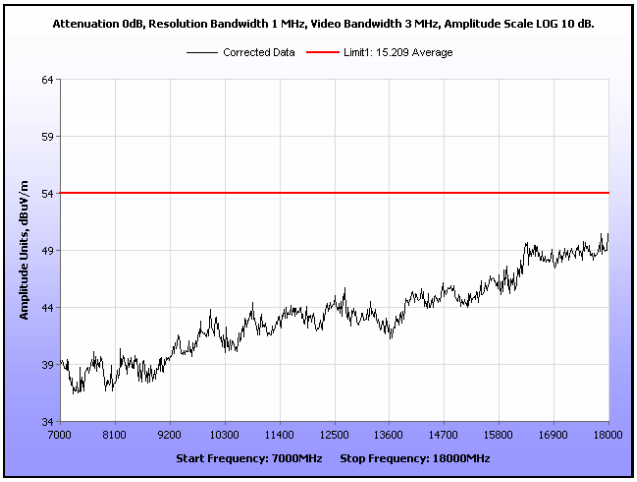
Plot 173. Radiated Spurious Emissions, Low Channel, 802.11b, Ant. 1, 30 MHz – 1 GHz



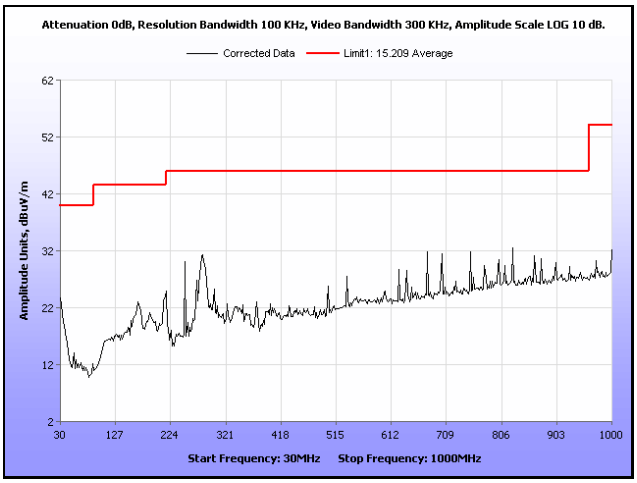
Plot 174. Radiated Spurious Emissions, Low Channel, 802.11b, Ant. 1, 1 GHz – 7 GHz, Average



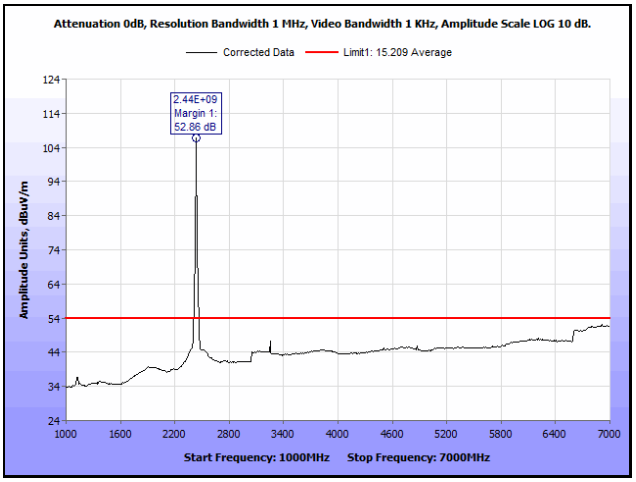
Plot 175. Radiated Spurious Emissions, Low Channel, 802.11b, Ant. 1, 1 GHz – 7 GHz, Peak



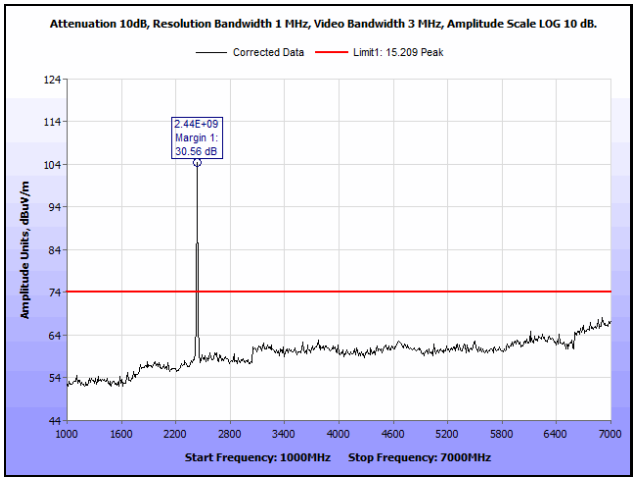
Plot 176. Radiated Spurious Emissions, Low Channel, 802.11b, Ant. 1, 7 GHz – 18 GHz



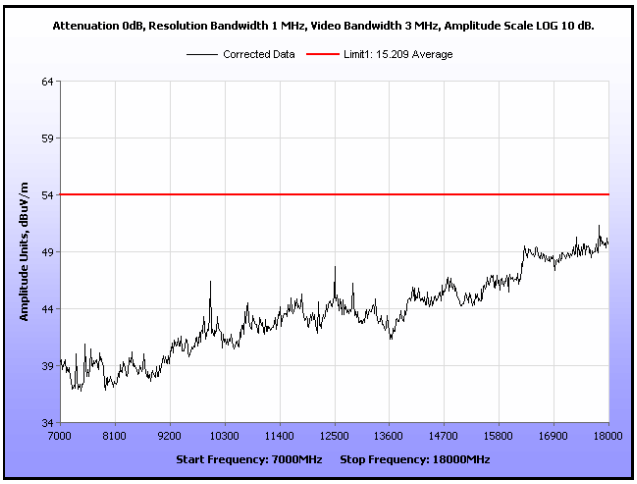
Plot 177. Radiated Spurious Emissions, Mid Channel, 802.11b, Ant. 1, 30 MHz – 1 GHz



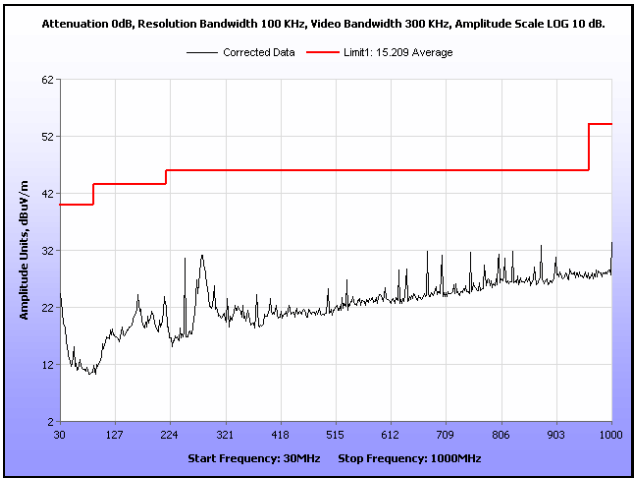
Plot 178. Radiated Spurious Emissions, Mid Channel, 802.11b, Ant. 1, 1 GHz – 7 GHz, Average



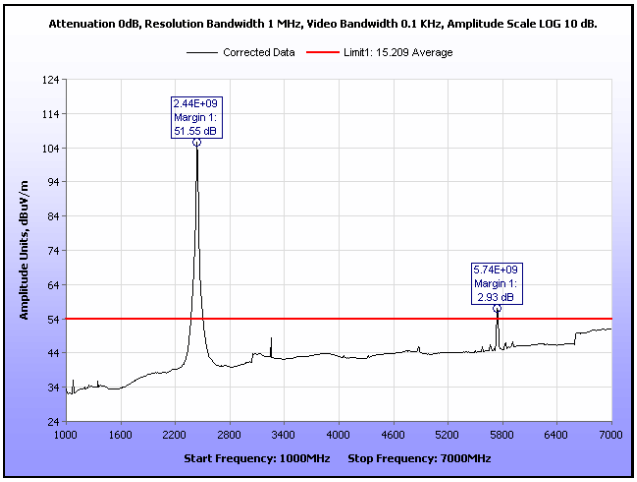
Plot 179. Radiated Spurious Emissions, Mid Channel, 802.11b, Ant. 1, 1 GHz – 7 GHz, Peak



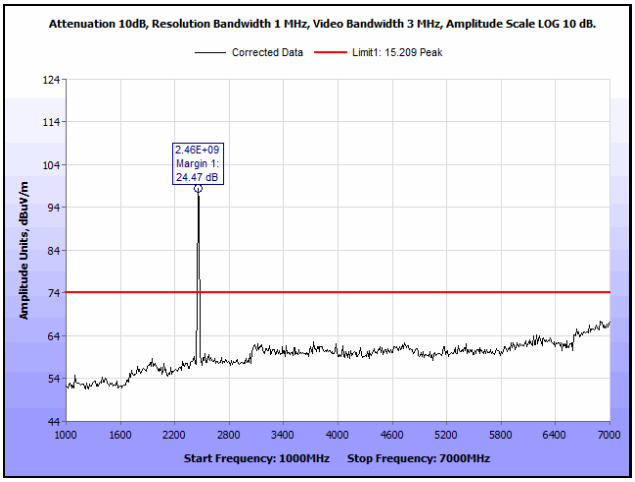
Plot 180. Radiated Spurious Emissions, Mid Channel, 802.11b, Ant. 1, 7 GHz – 18 GHz



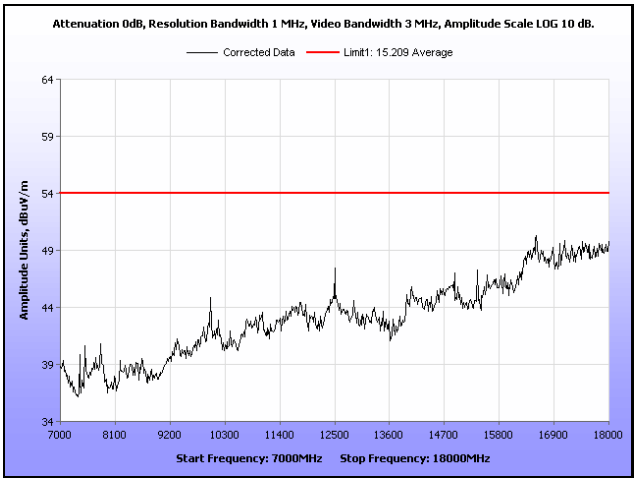
Plot 181. Radiated Spurious Emissions, High Channel, 802.11b, Ant. 1, 30 MHz – 1 GHz



Plot 182. Radiated Spurious Emissions, High Channel, 802.11b, Ant. 1, 1 GHz – 7 GHz, Average

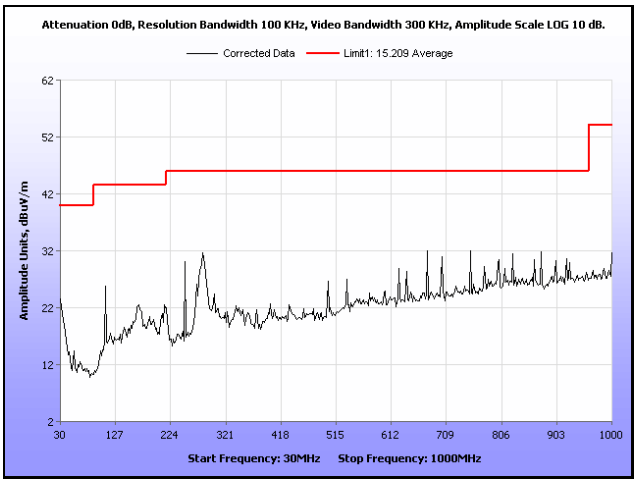


Plot 183. Radiated Spurious Emissions, High Channel, 802.11b, Ant. 1, 1 GHz – 7 GHz, Peak

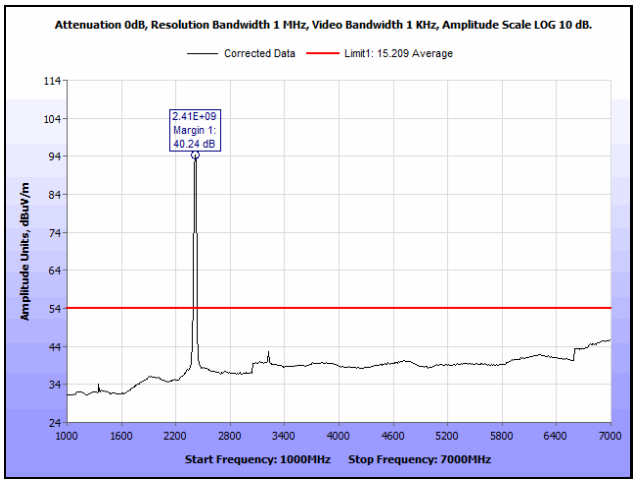


Plot 184. Radiated Spurious Emissions, High Channel, 802.11b, Ant. 1, 7 GHz – 18 GHz

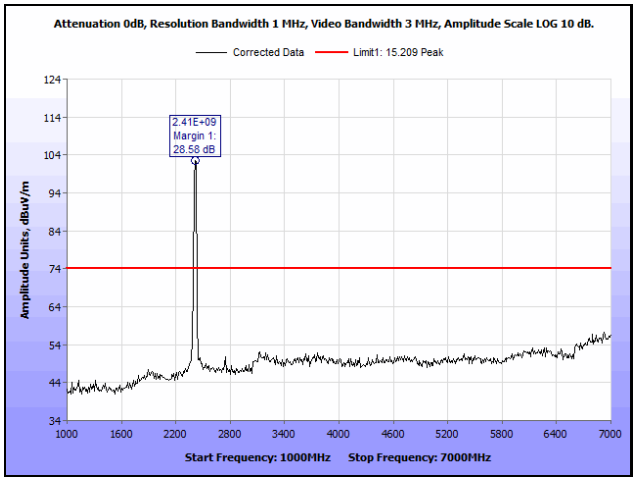
Radiated Spurious Emissions Test Results, 802.11g



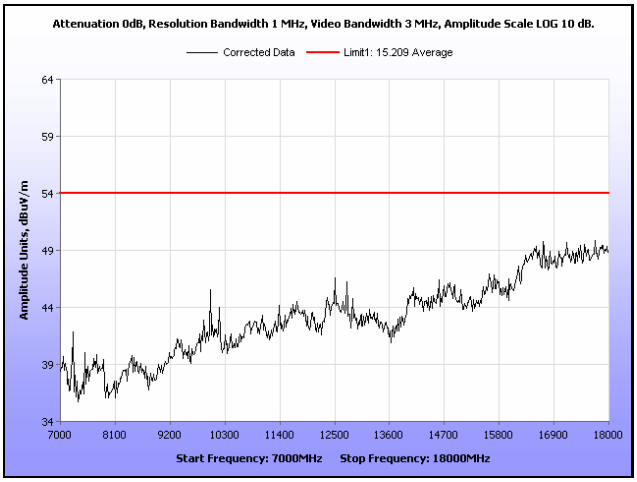
Plot 185. Radiated Spurious Emissions, Low Channel, 802.11g, Ant. 0, 30 MHz – 1 GHz



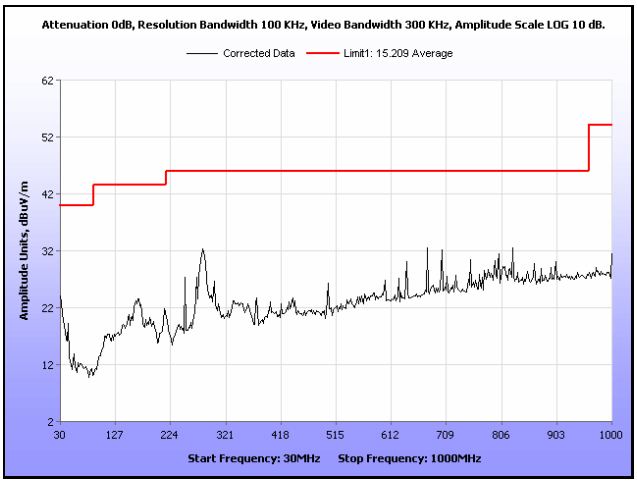
Plot 186. Radiated Spurious Emissions, Low Channel, 802.11g, Ant. 0, 1 GHz – 7 GHz, Average



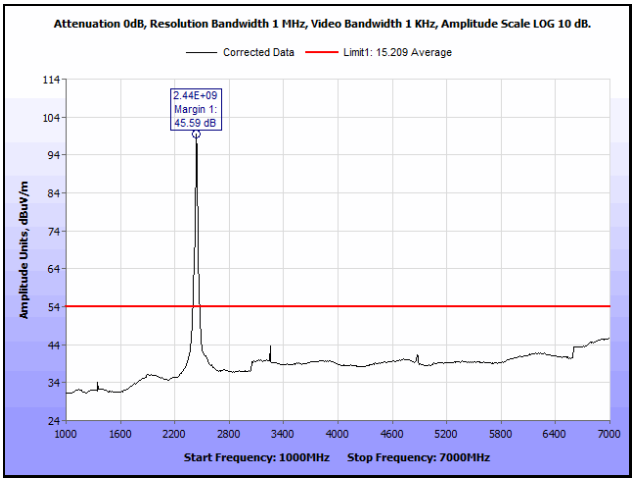
Plot 187. Radiated Spurious Emissions, Low Channel, 802.11g, Ant. 0, 1 GHz – 7 GHz, Peak



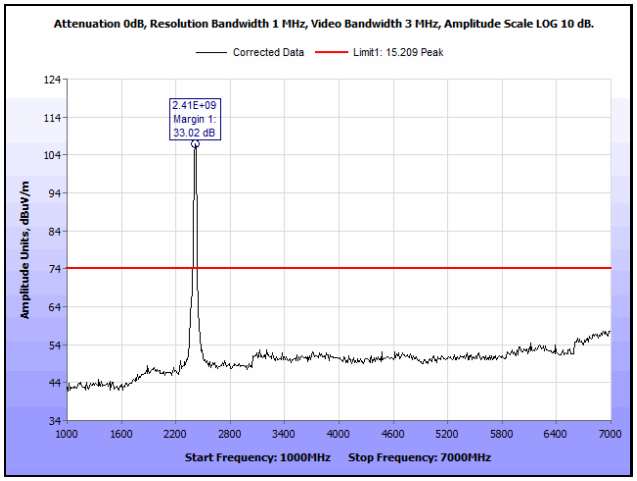
Plot 188. Radiated Spurious Emissions, Low Channel, 802.11g, Ant. 0, 7 GHz – 18 GHz



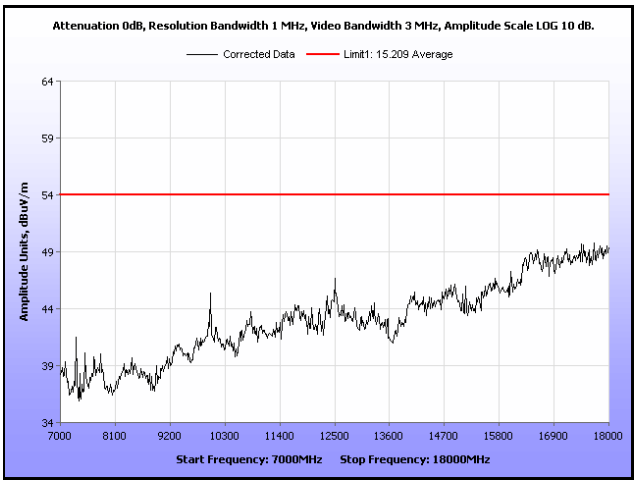
Plot 189. Radiated Spurious Emissions, Mid Channel, 802.11g, Ant. 0, 30 MHz – 1 GHz



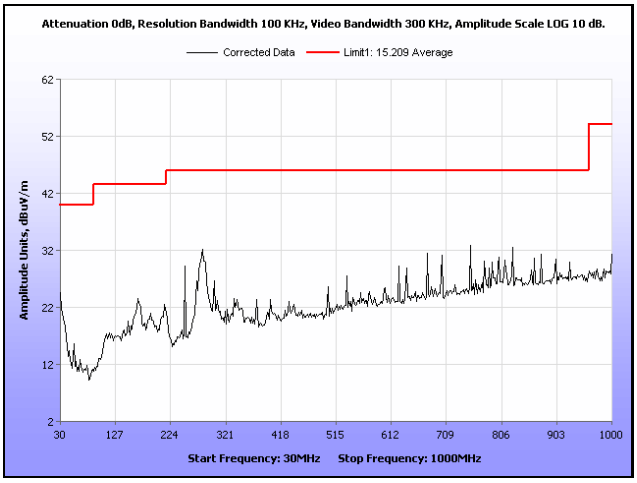
Plot 190. Radiated Spurious Emissions, Mid Channel, 802.11g, Ant. 0, 1 GHz – 7 GHz, Average



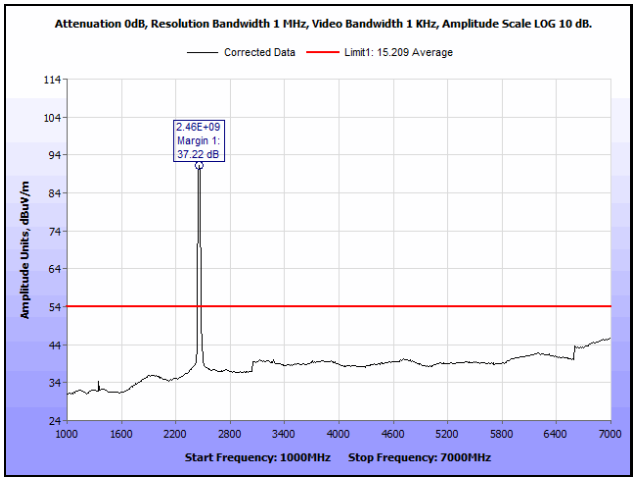
Plot 191. Radiated Spurious Emissions, Mid Channel, 802.11g, Ant. 0, 1 GHz – 7 GHz, Peak



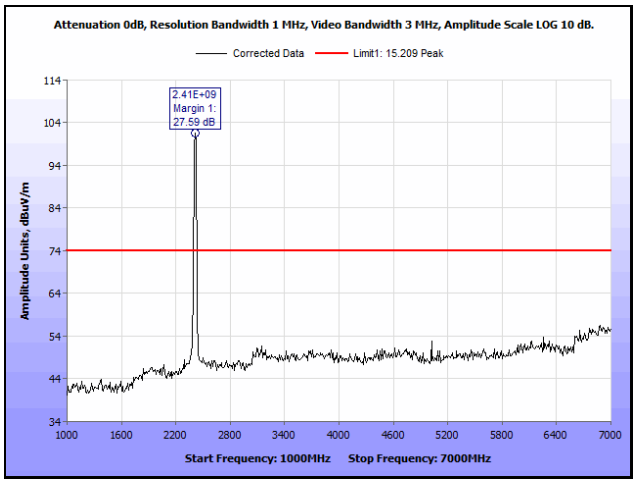
Plot 192. Radiated Spurious Emissions, Mid Channel, 802.11g, Ant. 0, 7 GHz – 18 GHz



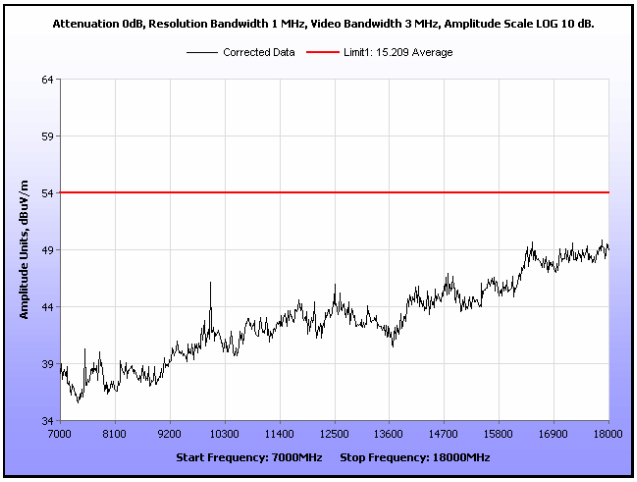
Plot 193. Radiated Spurious Emissions, High Channel, 802.11g, Ant. 0, 30 MHz – 1 GHz



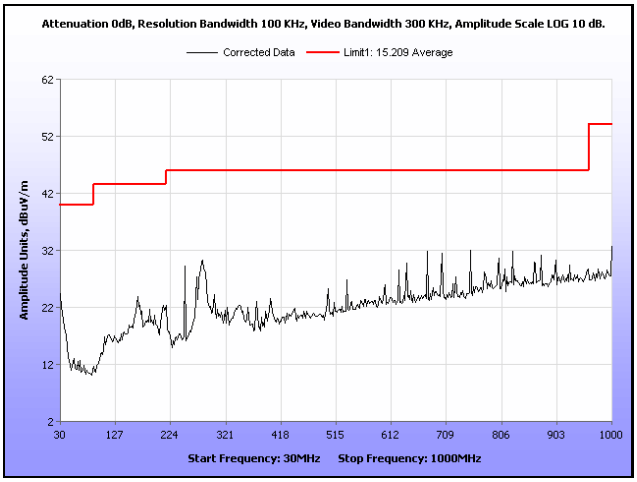
Plot 194. Radiated Spurious Emissions, High Channel, 802.11g, Ant. 0, 1 GHz – 7 GHz, Average



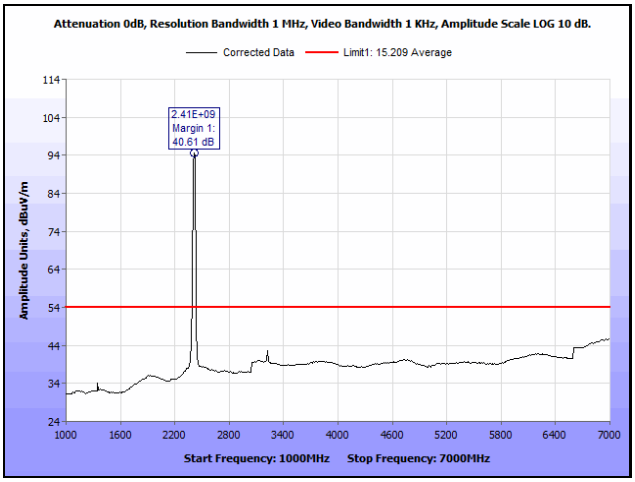
Plot 195. Radiated Spurious Emissions, High Channel, 802.11g, Ant. 0, 1 GHz – 7 GHz, Peak



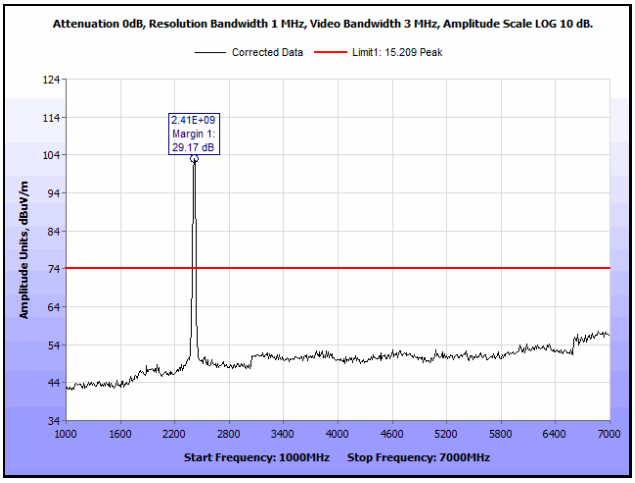
Plot 196. Radiated Spurious Emissions, High Channel, 802.11g, Ant. 0, 7 GHz – 18 GHz



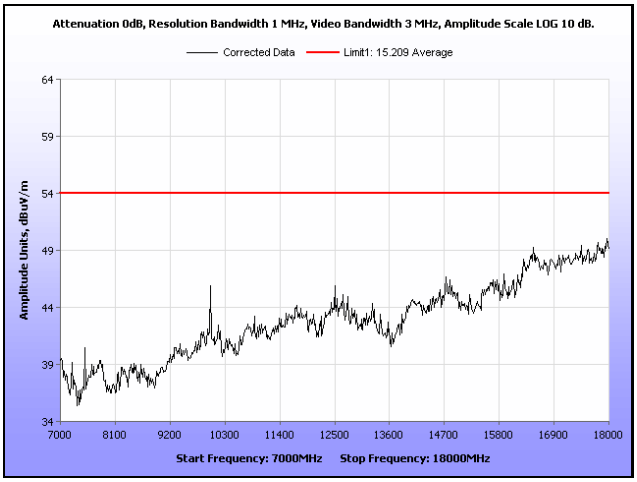
Plot 197. Radiated Spurious Emissions, Low Channel, 802.11g, Ant. 1, 30 MHz – 1 GHz



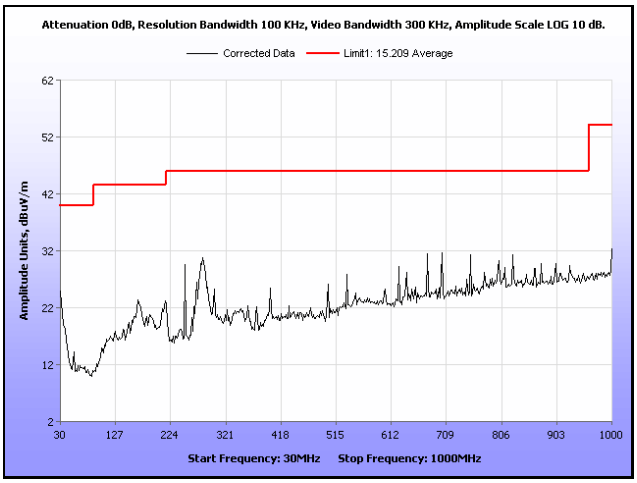
Plot 198. Radiated Spurious Emissions, Low Channel, 802.11g, Ant. 1, 1 GHz – 7 GHz, Average



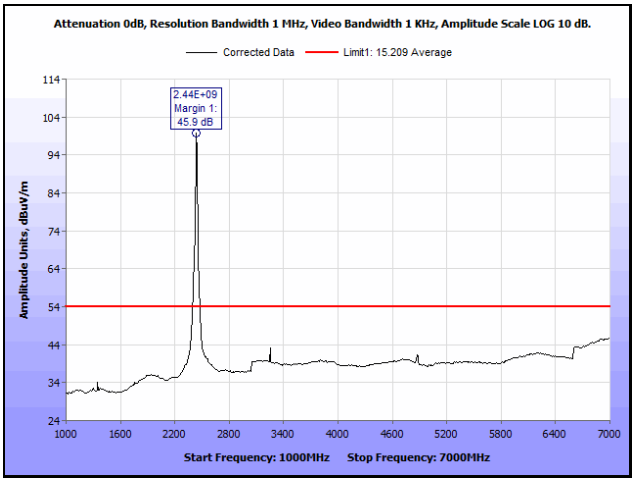
Plot 199. Radiated Spurious Emissions, Low Channel, 802.11g, Ant. 1, 1 GHz – 7 GHz, Peak



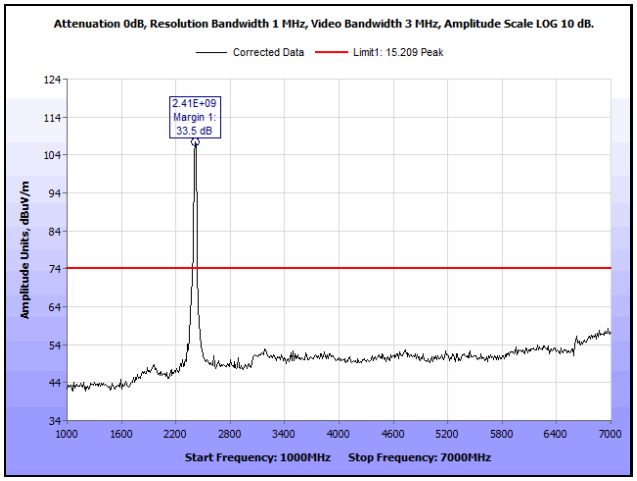
Plot 200. Radiated Spurious Emissions, Low Channel, 802.11g, Ant. 1, 7 GHz – 18 GHz



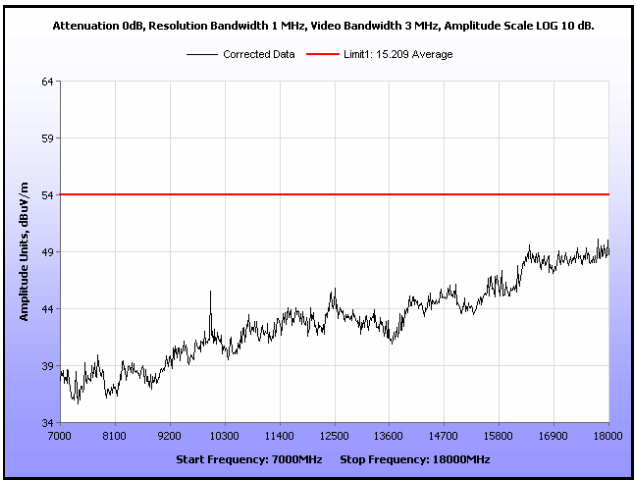
Plot 201. Radiated Spurious Emissions, Mid Channel, 802.11g, Ant. 1, 30 MHz – 1 GHz



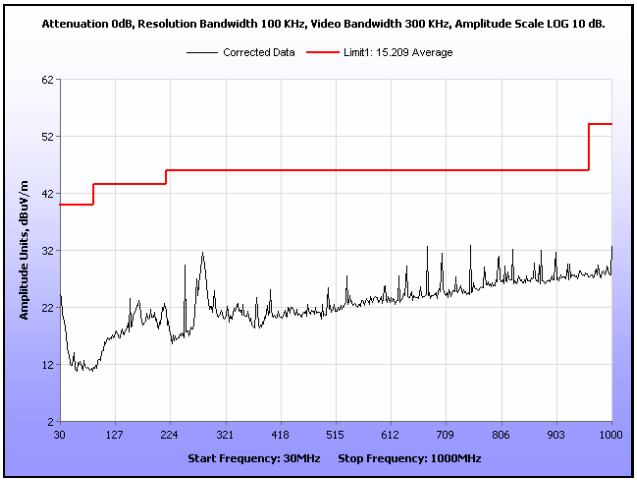
Plot 202. Radiated Spurious Emissions, Mid Channel, 802.11g, Ant. 1, 1 GHz – 7 GHz, Average



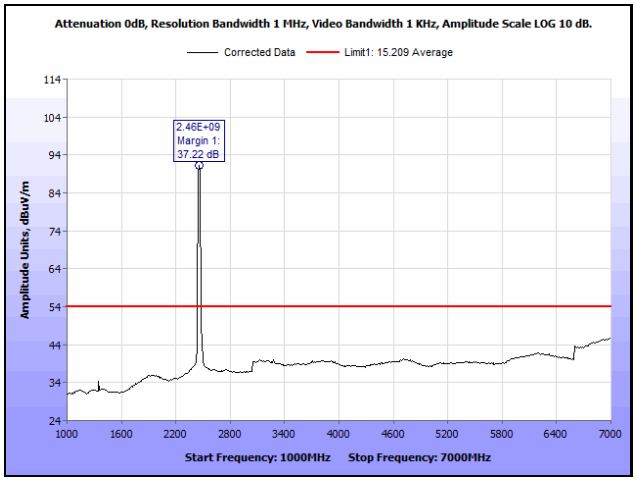
Plot 203. Radiated Spurious Emissions, Mid Channel, 802.11g, Ant. 1, 1 GHz – 7 GHz, Peak



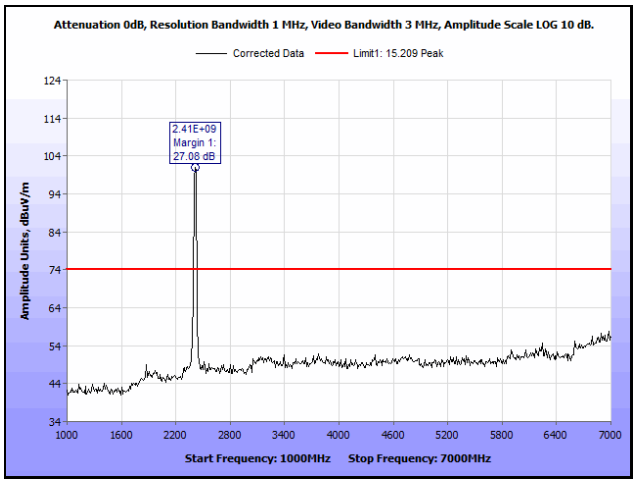
Plot 204. Radiated Spurious Emissions, Mid Channel, 802.11g, Ant. 1, 7 GHz – 18 GHz



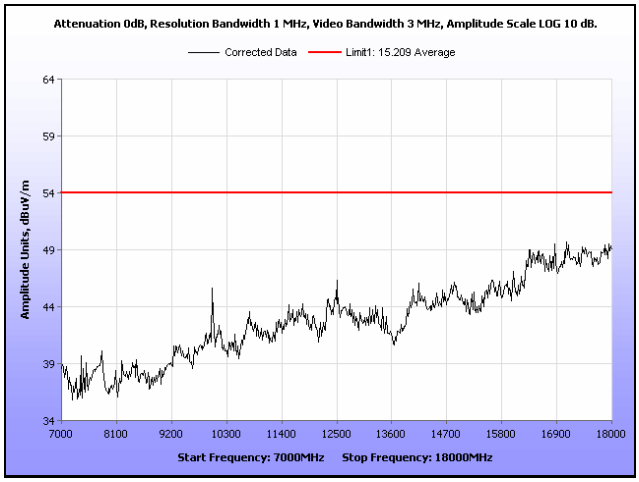
Plot 205. Radiated Spurious Emissions, High Channel, 802.11g, Ant. 1, 30 MHz – 1 GHz



Plot 206. Radiated Spurious Emissions, High Channel, 802.11g, Ant. 1, 1 GHz – 7 GHz, Average



Plot 207. Radiated Spurious Emissions, High Channel, 802.11g, Ant. 1, 1 GHz – 7 GHz, Peak



Plot 208. Radiated Spurious Emissions, High Channel, 802.11g, Ant. 1, 7 GHz – 18 GHz