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March 8, 2011

Firetide, Inc.
16795 Lark Ave. Suite 200
Los Gatos, CA 95032

Dear Steve Gu,

Enclosed is the EMC Wireless test report for compliance testing of the Firetide, Inc., Firetide Indoor MIMO Access Points, Model 5100 as tested to the requirements of Title 47 of the CFR, Ch. 1 (10-1-06 ed.), Part 15, Subpart B, ICES-003, Issue 4 February 2004 for a Class A Digital Device, and FCC Part 15.407 and Industry Canada RSS-210, Annex 9, Issue 7, June 2007 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: (\Firetide, Inc.\EMCS82555A-FCC407 Rev. 1 UNII 2)

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Electromagnetic Compatibility Criteria
Test Report

for the

Firetide, Inc.
Firetide Indoor MIMO Access Points, Model 5100

Tested under
the FCC Certification Rules
contained in
Title 47 of the CFR, Parts 15 Subpart B & ICES-003
for Class A Digital Devices
&
FCC Part 15.407 & RSS-210, Annex 9
for Intentional Radiators

MET Report: EMCS82555A-FCC407 Rev. 1 UNII 2

March 8, 2011

Prepared For:

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Prepared By:
MET Laboratories, Inc.
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Baltimore, MD 21230

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&
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for Intentional Radiators

Minh Ly, Project Engineer
Electromagnetic Compatibility Lab

Jennifer Warnell
Documentation Department

Engineering Statement: The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them. It is further stated that upon the basis of the measurements made, the equipment tested is capable of operation in accordance with the requirements of FCC Rules Parts 15B, Part 15.407 and Industry Canada standards ICES-003, Issue 4 February 2004, RSS-210 Annex 9 under normal use and maintenance.

Shawn McMillen, Wireless Manager
Electromagnetic Compatibility Lab

Report Status Sheet

Revision	Report Date	Reason for Revision
∅	February 14, 2011	Initial Issue.
1	March 8, 2011	Revised per 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
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 Firetide, Inc. Firetide Indoor MIMO Access Points, Model 5100, with the requirements of FCC Part 15, §15.407 and Industry Canada RSS-210 Annex 9. 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 Firetide Indoor MIMO Access Points, Model 5100. Firetide, Inc. should retain a copy of this document which should be kept on file for at least two years after the manufacturing of the Firetide Indoor MIMO Access Points, Model 5100, has been **permanently** discontinued.

B. Executive Summary

The following tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with FCC Part 15, §15.407 and Industry Canada RSS-210, Annex 9, in accordance with Firetide, Inc., quote number 2747. All tests were conducted using measurement procedure ANSI C63.4-2003.

FCC Reference	Industry Canada Reference	Description	Results
47 CFR Part 15.107 (a)	ICES-003 Issue 4 February 2004	Conducted Emission Limits for a Class A Digital Device	Compliant
47 CFR Part 15.109 (a)	ICES-003 Issue 4 February 2004	Radiated Emission Limits for a Class A Digital Device	Compliant
15.203	RSS-GEN 7.1.4	Antenna Requirements	Compliant
15.207	RSS-GEN 7.2.2; RSS-210 2.2	AC Conducted Emissions 150KHz – 30MHz	Compliant
15.403 (i)	A8.2	26dB Occupied Bandwidth	Compliant
15.407 (a)(3)	A9.2(3)	Conducted Transmitter Output Power	Compliant
15.407 (a)(3)	A9.2(3)	Power Spectral Density	Compliant
15.407 (a)(6)	N/A	Peak Excursion	Compliant
15.407 (b)(4), (6)	A9.3(4)	Undesirable Emissions (15.205/15.209 - General Field Strength Limits (Restricted Bands and Radiated Emission Limits)	Compliant
15.407(f)	RSS-GEN	RF Exposure	Compliant
15.407(g)	2.1	Frequency Stability	Compliant
N/A	RSS-Gen(4.8)	Receiver Spurious Emissions	Compliant

Table 1. Executive Summary of EMC Part 15.407 & RSS-210 Annex 9 ComplianceTesting

II. Equipment Configuration

A. Overview

MET Laboratories, Inc. was contracted by Firetide, Inc. to perform testing on the Firetide Indoor MIMO Access Points, Model 5100, under Firetide, Inc.' quote number 9FIR2707R3.

This document describes the test setups, test methods, required test equipment, and the test limit criteria used to perform compliance testing of the Firetide, Inc. Firetide Indoor MIMO Access Points, Model 5100.

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

Model(s) Tested:	Firetide Indoor MIMO Access Points, Model 5100	
Model(s) Covered:	Firetide Indoor MIMO Access Points, Model 5100	
EUT Specifications:	Primary Power: 120 VAC, 60 Hz	
	FCC ID: REP-5100-1 IC ID: 4988A-5100	
	Type of Modulations:	OFDM
	Emission Designators:	D7D
	Frequency Range:	5.25 – 5.35 GHz 5.47 – 5.725 GHz
	Equipment Code:	NII
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:	Minh Ly	
Report Date(s):	March 8, 2011	

Table 2. EUT Summary

B. References

RSS-210, Issue 7, June 2007	Low-power License-exempt Radiocommunications Devices (All Frequency Bands): Category I Equipment
CFR 47, Part 15, Subpart E	Unlicensed National Information Infrastructure Devices (UNII)
ANSI C63.4:2003	Methods and Measurements of Radio-Noise Emissions from Low-Voltage Electrical And Electronic Equipment in the Range of 9 kHz to 40 GHz
ANSI/NCSL Z540-1-1994	Calibration Laboratories and Measuring and Test Equipment - General Requirements
ANSI/ISO/IEC 17025:2000	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 radio testing was performed at MET Laboratories, Inc., 3162 Belick Street, Santa Clara, CA 95054. All digital testing was preformed at MET Laboratories, Inc., 3162 Belick Street, Santa Clara, CA 95054. 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 10 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 Firetide, Inc. Indoor MIMO Access Points, Model 5100, Equipment Under Test (EUT), utiliizies Wistron DNMA-83 mini PCI radios.

Photograph 1. Front View of EUT

Photograph 2. Rear View of EUT

E. Equipment Configuration

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

Ref. ID	Name / Description	Model Number	Part Number	Serial Number	Rev. #
A	Firetide Indoor AP	5100	5100	W4P071034500416	1
B	AC/DC Power Adapter	FSP040-DGAA5	9NA0402400	H00000043	NA
C	PoE Injector (PhiHong)	PoE30U-560	PoE30U-560	P71300181A1	NA

Table 4. Equipment Configuration

F. Support Equipment

Ref. ID	Name / Description	Manufacturer	Model Number	Customer Supplied Calibration Data
D	Laptop computer	Dell	vostro 1000	N/A

Table 5. Support Equipment

G. Ports and Cabling Information

Ref. ID	Port name on EUT	Cable Description or reason for no cable	Qty.	Length (m)	Shielded (Y/N)	Termination Box ID & Port Name
1	DC Power	DC power input from SELV	1	1	N	N/A
2	Ethernet	IP connection to host computer	1	10	N	N/A

Table 6. Ports and Cabling Information

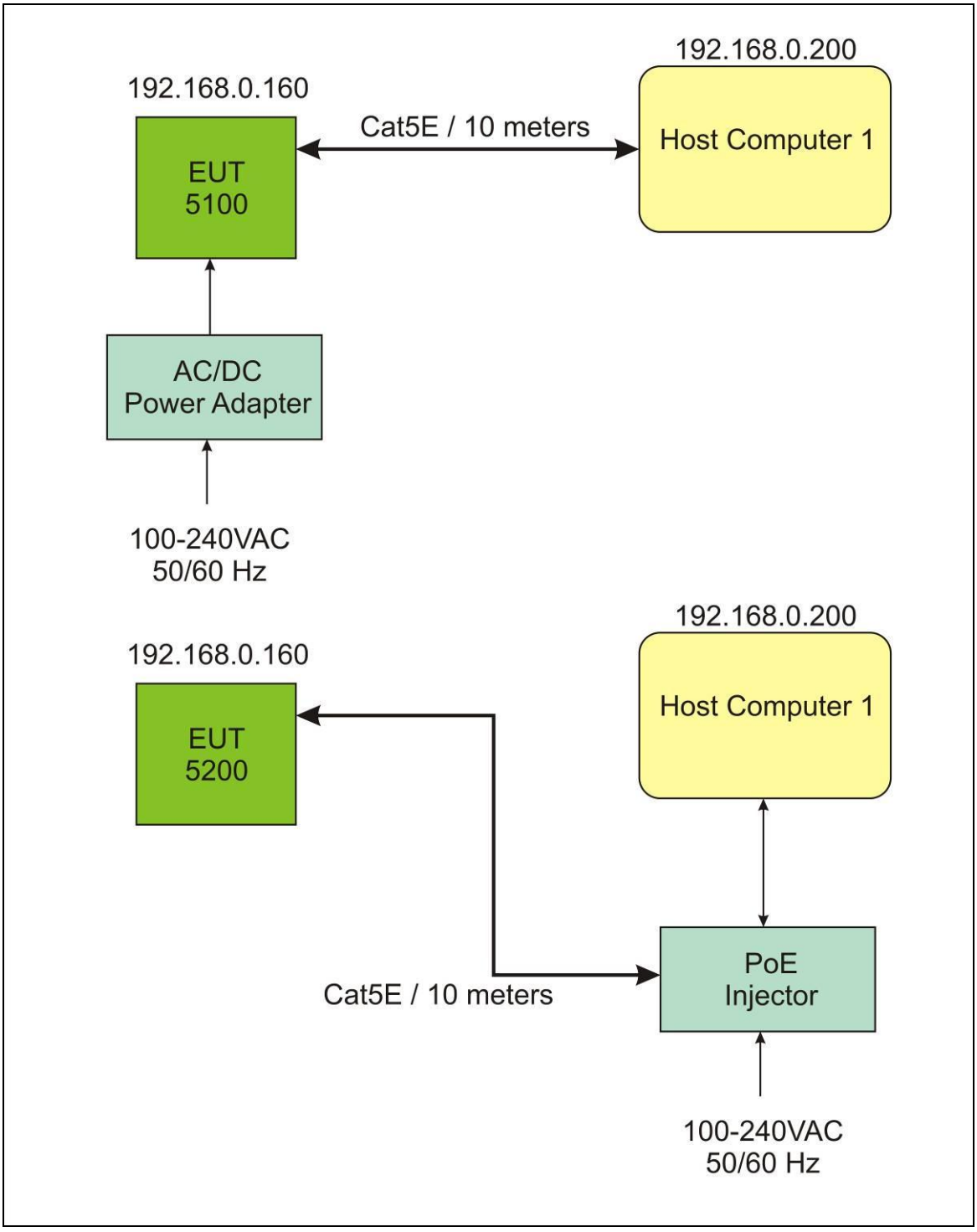


Figure 1. Setup Block Diagram

H. Mode of Operation

Operation can be monitored using by pinging the EUT or running ART.

I. Method of Monitoring

IP connectivity is maintained with the EUT. If IP connectivity is lost, EUT connectivity shall be re-established upon power up or re-boot.

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 Firetide, Inc. upon completion of testing.

III. Electromagnetic Compatibility Criteria for Unintentional Radiators

Electromagnetic Compatibility Criteria

§ 15.107 Conducted Emissions Limits

Test Requirement(s):

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

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

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

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

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

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

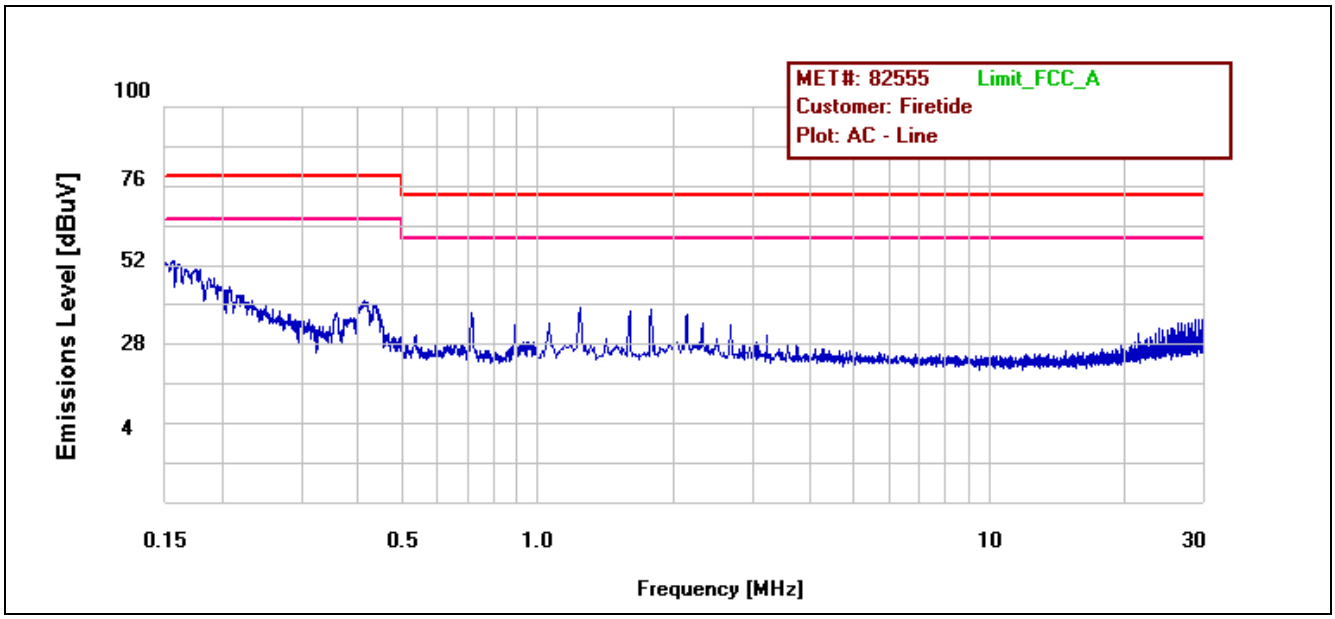
Test Engineer(s): Kenshi Chung

Test Date(s): 08/17/10

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

Line	Freq (MHz)	QP Amplitude	QP Limit	Delta	Pass	Average Amplitude	Average Limit	Delta	Pass	Notes
AC - Line	0.1550	47.91	79	-31.09	Pass	28.07	66	-37.93	Pass	Measured Emissions were below applicable limits
AC - Line	0.4162	38.65	79	-40.35	Pass	29.87	66	-36.13	Pass	Measured Emissions were below applicable limits
AC - Line	0.710	36.25	73	-36.75	Pass	30.74	60	-29.26	Pass	Measured Emissions were below applicable limits
AC - Line	1.243	38.08	73	-34.92	Pass	32.55	60	-27.45	Pass	Measured Emissions were below applicable limits
AC - Line	1.775	36.4	73	-36.6	Pass	30.85	60	-29.15	Pass	Measured Emissions were below applicable limits
AC - Line	28.85	22.9	73	-50.1	Pass	14.92	60	-45.08	Pass	Measured Emissions were below applicable limits

Table 8. Conducted Emissions - Voltage, AC Power, Phase Line (120 VAC, 60 Hz), FSP040-DGAA5

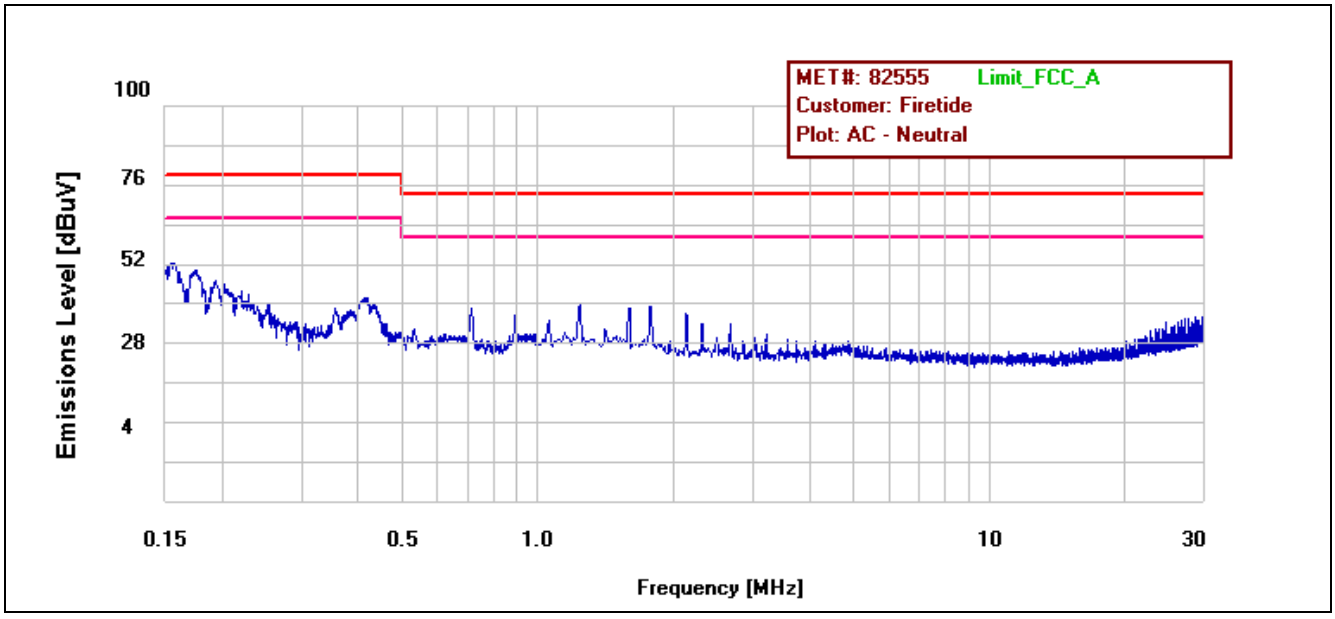


Plot 1. Conducted Emission, Phase Line Plot, FSP040-DGAA5

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

Line	Freq (MHz)	QP Amplitude	QP Limit	Delta	Pass	Average Amplitude	Average Limit	Delta	Pass	Notes
AC - Neutral	0.1503	48.23	79	-30.77	Pass	33.29	66	-32.71	Pass	Measured Emissions were below applicable limits
AC - Neutral	0.4167	40.44	79	-38.56	Pass	36.21	66	-29.79	Pass	Measured Emissions were below applicable limits
AC - Neutral	0.708	37.25	73	-35.75	Pass	35.74	60	-24.26	Pass	Measured Emissions were below applicable limits
AC - Neutral	1.241	39.23	73	-33.77	Pass	38.1	60	-21.9	Pass	Measured Emissions were below applicable limits
AC - Neutral	1.772	35.97	73	-37.03	Pass	34.35	60	-25.65	Pass	Measured Emissions were below applicable limits
AC - Neutral	29.325	25.22	73	-47.78	Pass	18.79	60	-41.21	Pass	Measured Emissions were below applicable limits

Table 9. Conducted Emissions - Voltage, AC Power, Neutral Line (120 VAC, 60 Hz), FSP040-DGAA5

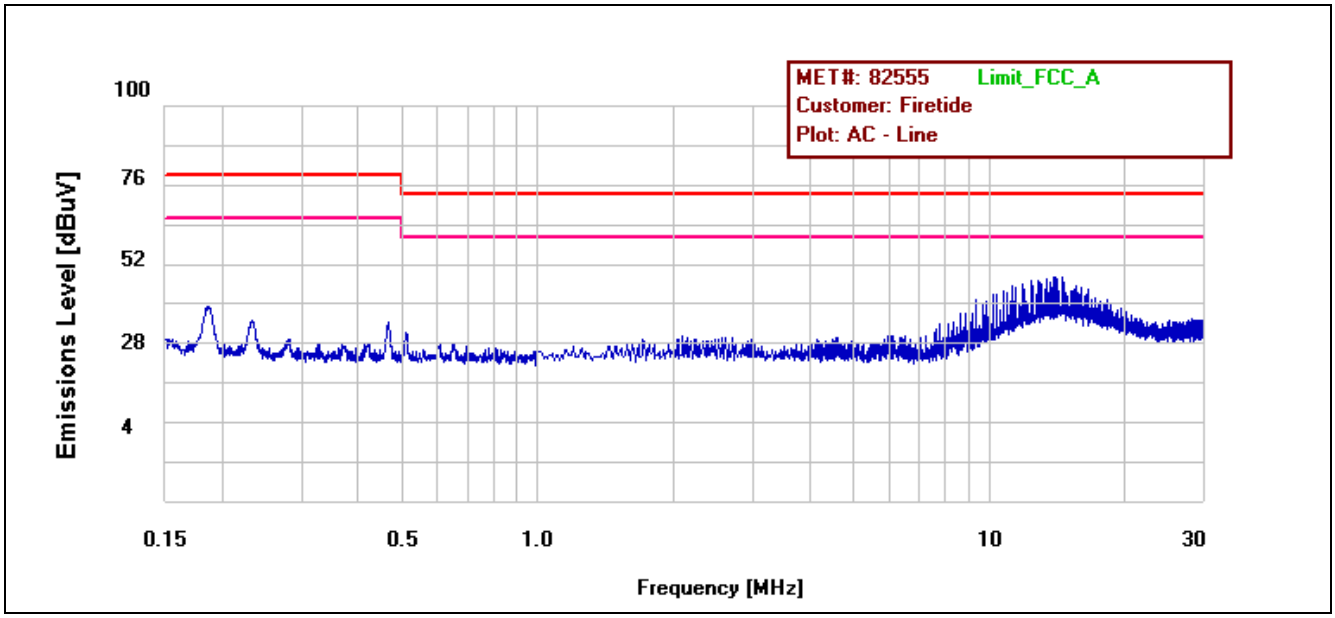


Plot 2. Conducted Emission, Neutral Line Plot, FSP040-DGAA5

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

Line	Freq (MHz)	QP Amplitude	QP Limit	Delta	Pass	Average Amplitude	Average Limit	Delta	Pass	Notes
AC - Line	0.1867	38.09	79	-40.91	Pass	33.08	66	-32.92	Pass	Measured Emissions were below applicable limits
AC - Line	0.2360	32.25	79	-46.75	Pass	26.9	66	-39.1	Pass	Measured Emissions were below applicable limits
AC - Line	1.497	26.01	73	-46.99	Pass	20.09	60	-39.91	Pass	Measured Emissions were below applicable limits
AC - Line	4.592	26.87	73	-46.13	Pass	20.41	60	-39.59	Pass	Measured Emissions were below applicable limits
AC - Line	14.450	46.87	73	-26.13	Pass	40.56	60	-19.44	Pass	Measured Emissions were below applicable limits

Table 10. Conducted Emissions - Voltage, AC Power, Phase Line (120 VAC, 60 Hz), PoE30U-560

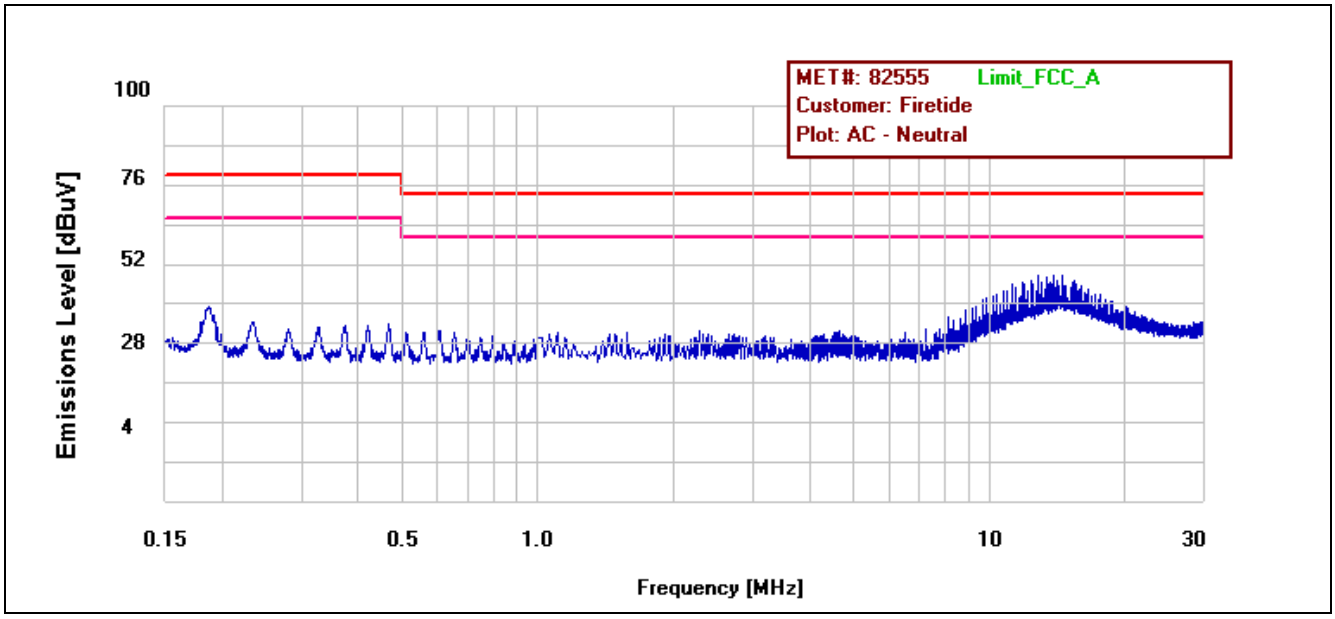


Plot 3. Conducted Emission, Phase Line Plot, PoE30U-560

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

Line	Freq (MHz)	QP Amplitude	QP Limit	Delta	Pass	Average Amplitude	Average Limit	Delta	Pass	Notes
AC - Neutral	0.1886	37.58	79	-41.42	Pass	36.53	66	-29.47	Pass	Measured Emissions were below applicable limits
AC - Neutral	0.2352	32.94	79	-46.06	Pass	31.3	66	-34.7	Pass	Measured Emissions were below applicable limits
AC - Neutral	1.0325	28.79	73	-44.21	Pass	25.82	60	-34.18	Pass	Measured Emissions were below applicable limits
AC - Neutral	4.603	29.56	73	-43.44	Pass	27.05	60	-32.95	Pass	Measured Emissions were below applicable limits
AC - Neutral	13.90	35.4	73	-37.6	Pass	29.24	60	-30.76	Pass	Measured Emissions were below applicable limits

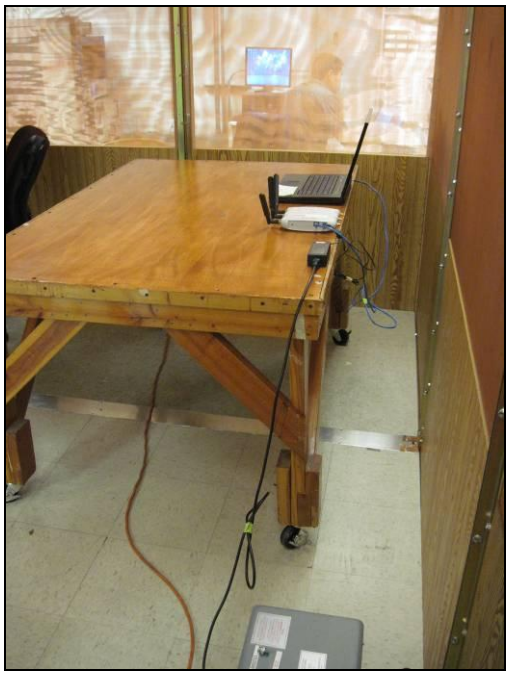
Table 11. Conducted Emissions - Voltage, AC Power, Neutral Line (120 VAC, 60 Hz), PoE30U-560



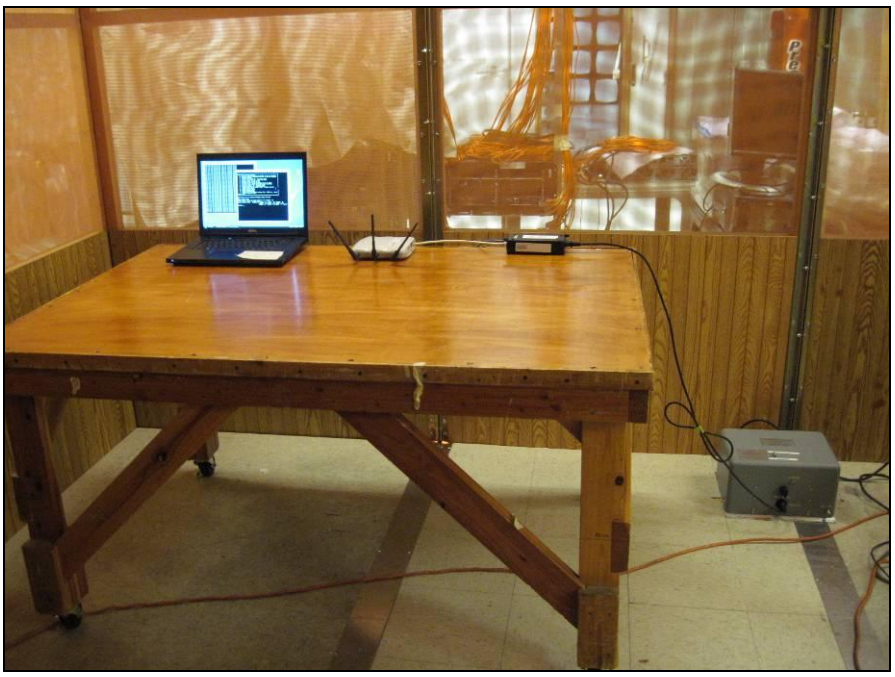
Plot 4. Conducted Emission, Neutral Line Plot, PoE30U-560

Conducted Emission Limits Test Setup

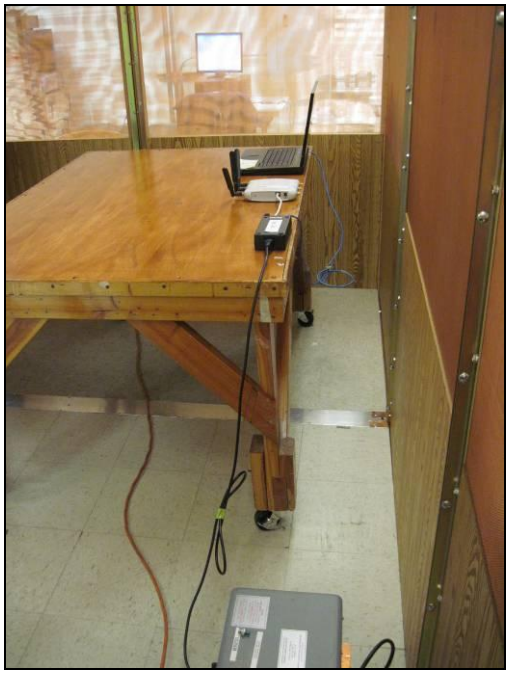
Photograph 3. Conducted Emissions, Test Setup 1, FSP040-DGAA5



Photograph 4. Conducted Emissions, Test Setup 2, FSP040-DGAA5



Photograph 5. Conducted Emissions, Test Setup 1, PoE30U-560



Photograph 6. Conducted Emissions, Test Setup 2, PoE30U-560

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 12.

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 12.

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 12. 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 3m 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 A requirement(s) of this section. Measured emissions were below applicable limits.

Test Engineer(s): Kenshi Chung and Anderson Soungpanya

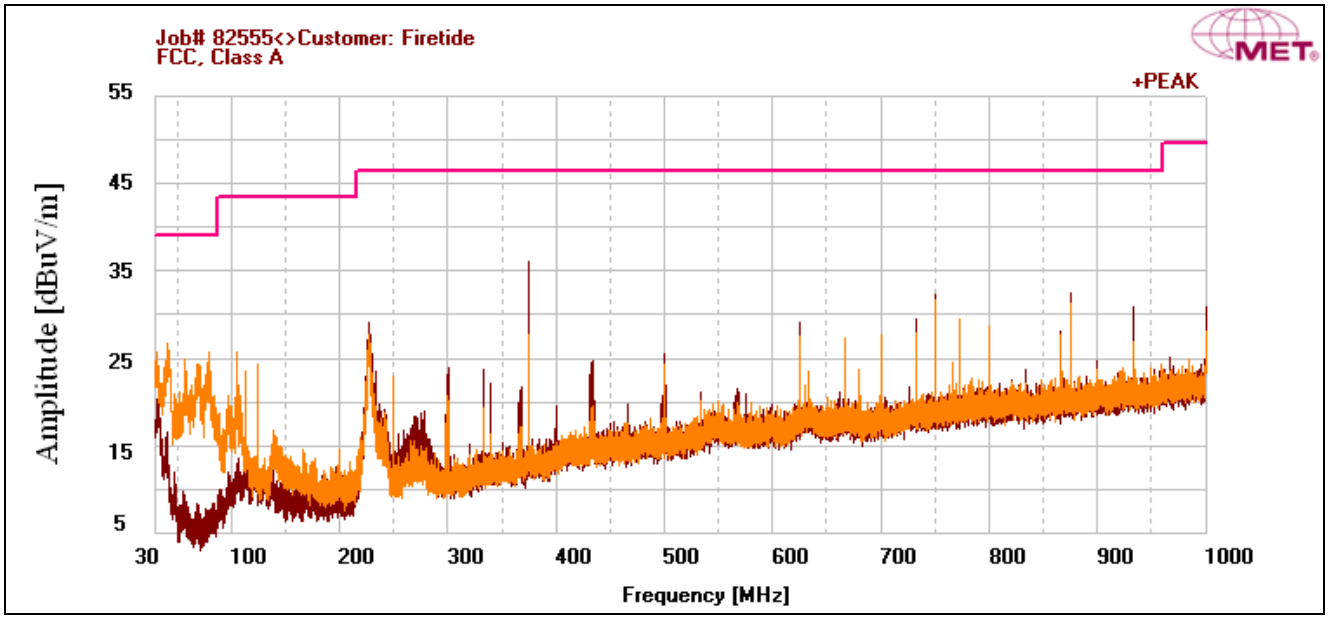
Test Date(s): 08/13/10 and 08/16/10

Radiated Emissions Limits Test Results, Class A

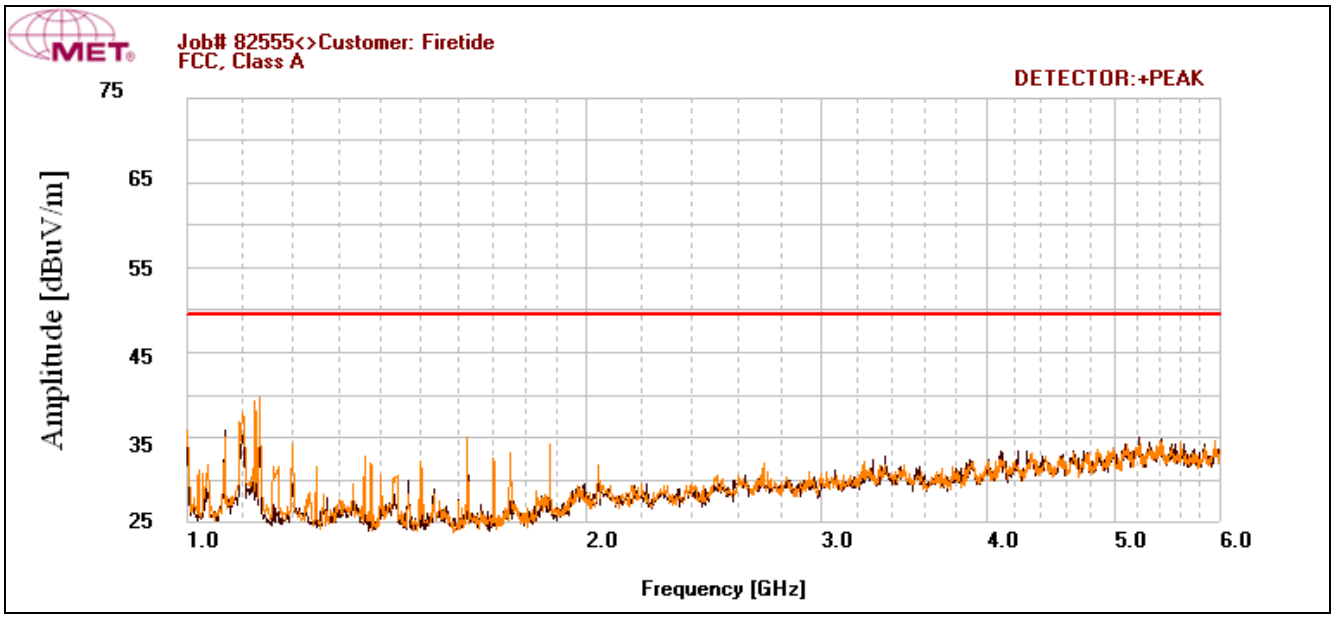
Frequency (MHz)	Antenna Polarity	EUT Azimuth (Degrees)	Antenna Height (cm)	Uncorrected Amplitude (dBuV)	ACF (dB/m)	Pre Amp Gain (dB)	CBL (dB)	DCF (dB)	Corrected Amplitude (dBuV)	Limit (dBuV)	Margin (dB)
374.998	H	179	293	53.309	15.2	40	3.198	0	31.707	46.4	-14.693
625.008	H	19	138	48.63	19.201	40	4.192	0	32.023	46.4	-14.377
749.972	H	290	115	50.359	19.301	40	4.561	0	34.221	46.4	-12.179
749.969	V	225	206	42.982	19.301	40	4.561	0	26.844	46.4	-19.556
749.972	V	82	271	45.349	19.301	40	4.561	0	29.211	46.4	-17.189
799.958	V	264	187	40.421	19.999	40	4.755	0	25.175	46.4	-21.225
225.802	V	51	100	51.718	9.848	40	2.381	0	23.947	46.4	-22.453
42.302	V	170	374	50.364	11.579	40	1.002	0	22.945	39	-16.055
226.24	H	0	400	56.209	9.874	40	2.371	0	28.454	46.4	-17.946
1133.4	V	18.40	108.9	74.71	24.791	51.978	0	-10.46	37.063	49.5	-12.437

Table 13. Radiated Emissions Limits, Test Results, FSP040-DGAA5, FCC Limits

Note: The EUT was tested at 3 m.



Plot 5. Radiated Emissions, 30 MHz - 1 GHz, FSP040-DGAA5, FCC Limits



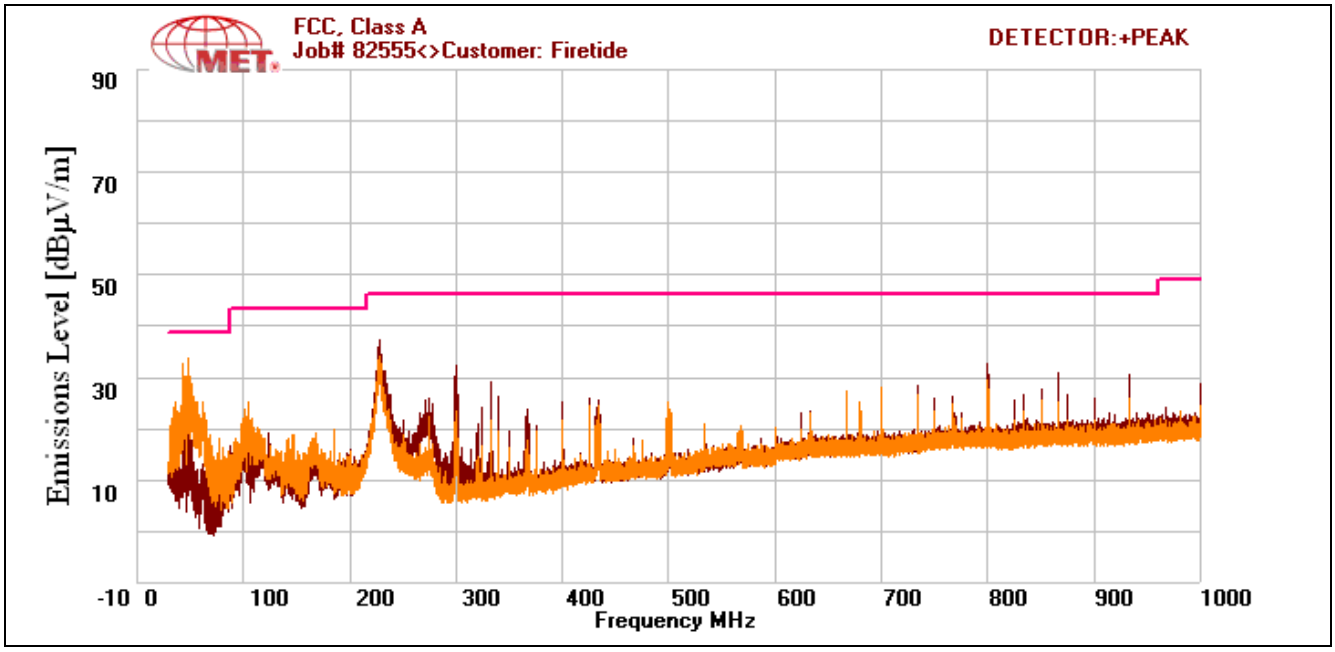
Plot 6. Radiated Emissions, Above 1 GHz, FSP040-DGAA5, FCC Limits

Radiated Emissions Limits Test Results, Class A

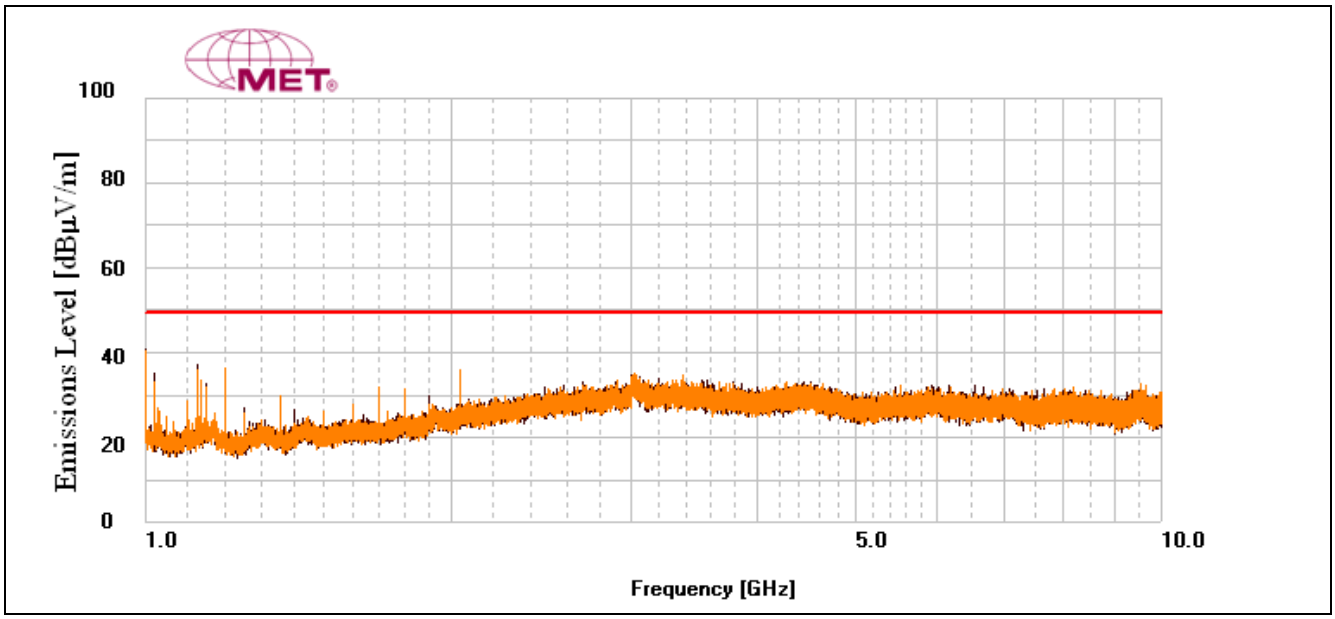
Frequency (MHz)	Antenna Polarity	EUT Azimuth (Degrees)	Antenna Height (cm)	Uncorrected Amplitude (dBuV)	ACF (dB/m)	Pre Amp Gain (dB)	CBL (dB)	DCF (dB)	Corrected Amplitude (dBuV)	Limit (dBuV)	Margin (dB)
47.78	V	0	100	34.15	8.444	0	1.757	-10.46	33.891	39	-5.109
227.39	V	322	100	17.21	11.296	0	3.817	-10.46	21.863	46.4	-24.537
228.2	H	0	100	30.37	11.056	0	3.814	-10.46	34.78	46.4	-11.62
300	H	322	100	25.65	13.9	0	3.57	-10.46	32.66	46.4	-13.74
333.33	H	164	100	20.86	14.767	0	3.763	-10.46	28.93	46.4	-17.47
800	H	330	100	19.91	20.9	0	6.23	-10.46	26.164	54	-27.836
1125	V	360	100	78.15	27.485	76.893	7.882	-10.46	28.626	54	-25.374
1000	H	0	100	81.6	27.216	77.23	7.5	-10.46	23.614	54	-30.386
1125	H	0	100	75.6	27.485	76.893	7.882	-10.46	26.164	54	-27.836

Table 14. Radiated Emissions Limits, Test Results, PoE30U-560, FCC Limits

Note: The EUT was tested at 3 m.



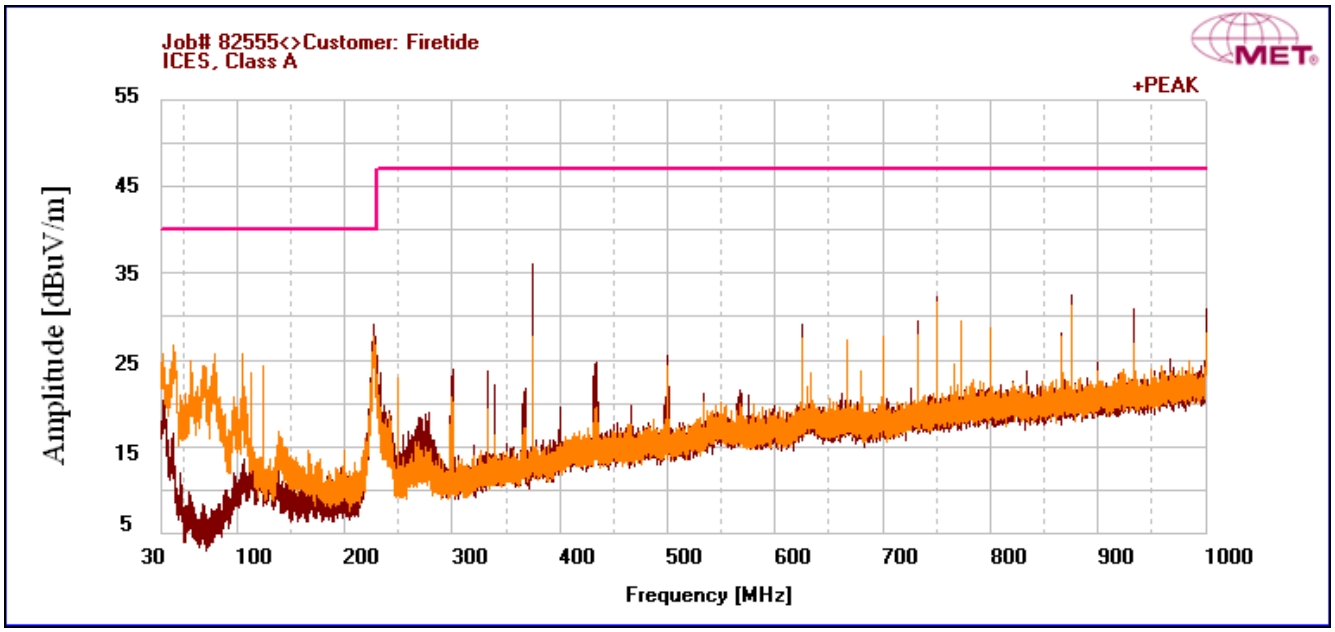
Plot 7. Radiated Emissions, 30 MHz – 1 GHz, PoE30U-560, FCC Limits



Plot 8. Radiated Emissions, 1 GHz – 10 GHz, PoE30U-560, FCC Limits

Frequency (MHz)	Antenna Polarity	EUT Azimuth (Degrees)	Antenna Height (cm)	Uncorrected Amplitude (dBuV)	ACF (dB/m)	Pre Amp Gain (dB)	CBL (dB)	DCF (dB)	Corrected Amplitude (dBuV/m)	Limit (dBuV/m)	Margin (dB)
374.998	H	179	293	53.309	15.2	40	3.198	0	31.707	47	-15.293
625.008	H	19	138	48.63	19.201	40	4.192	0	32.023	47	-14.977
749.972	H	290	115	50.359	19.301	40	4.561	0	34.221	47	-12.779
749.969	V	225	206	42.982	19.301	40	4.561	0	26.844	47	-20.156
749.972	V	82	271	45.349	19.301	40	4.561	0	29.211	47	-17.789
799.958	V	264	187	40.421	19.999	40	4.755	0	25.175	47	-21.825
225.802	V	51	100	51.718	9.848	40	2.381	0	23.947	40	-16.053
42.302	V	170	374	50.364	11.579	40	1.002	0	22.945	40	-17.055
226.24	H	0	400	56.209	9.874	40	2.371	0	28.454	40	-11.546

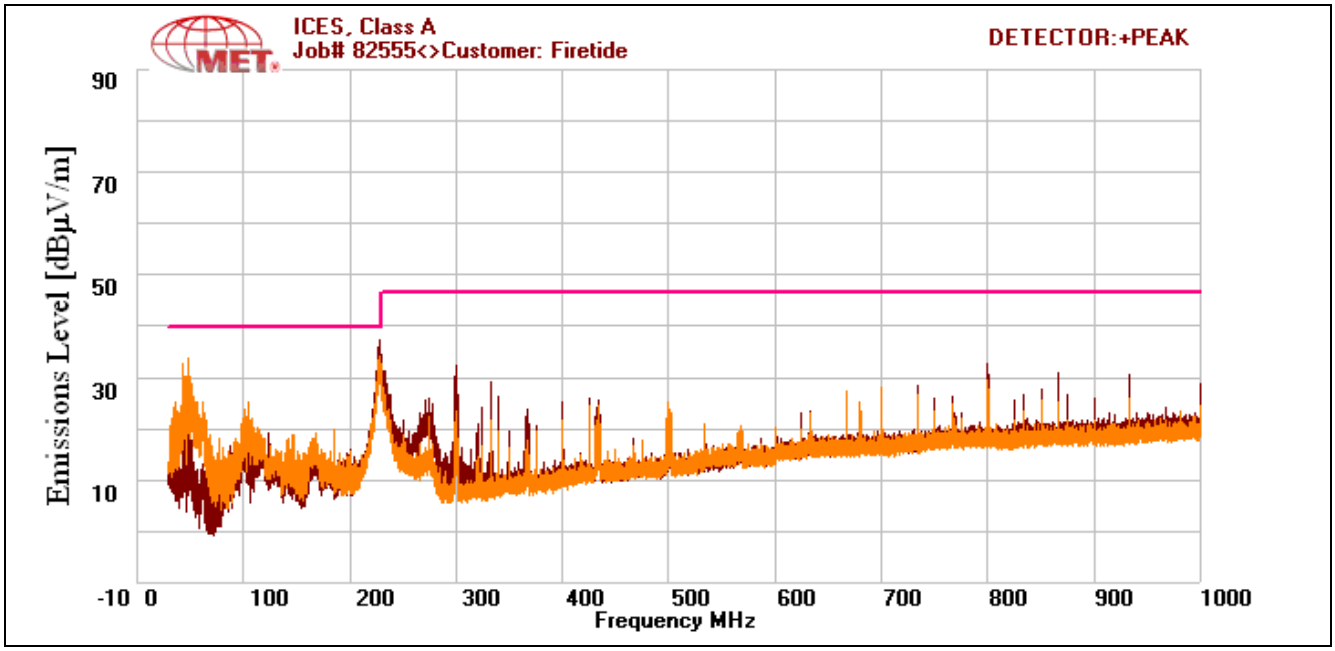
Table 15. Radiated Emissions Limits, Test Results, FSP040-DGAA5, ICES-003 Limits



Plot 9. Radiated Emissions Limits, FSP040-DGAA5, ICES-003 Limits

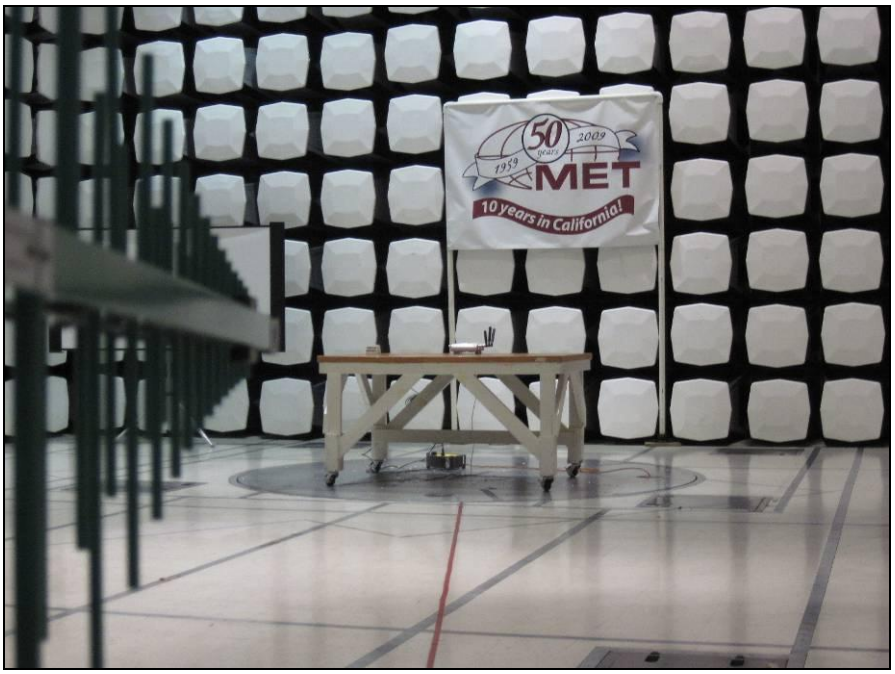
Frequency (MHz)	Antenna Polarity	EUT Azimuth (Degrees)	Antenna Height (cm)	Uncorrected Amplitude (dBuV)	ACF (dB/m)	Pre Amp Gain (dB)	CBL (dB)	DCF (dB)	Corrected Amplitude (dBuV/m)	Limit (dBuV/m)	Margin (dB)
47.78	V	0	100	34.15	8.444	0	1.757	-10.46	33.891	40	-6.109
227.39	V	322	100	17.21	11.296	0	3.817	-10.46	21.863	40	-18.137
228.2	H	0	100	30.37	11.056	0	3.814	-10.46	34.78	40	-5.22
300	H	322	100	25.65	13.9	0	3.57	-10.46	32.66	47	-14.34
333.33	H	164	100	20.86	14.767	0	3.763	-10.46	28.93	47	-18.07
800	H	330	100	19.91	20.9	0	6.23	-10.46	36.58	47	-10.42

Table 16. Radiated Emissions Limits, Test Results, PoE30U-560, ICES-003 Limits



Plot 10. Radiated Emissions Limits, PoE30U-560, ICES-003 Limits

Radiated Emission Limits Test Setup



Photograph 7. Radiated Emission, Test Setup, 30 MHz – 1 GHz

Photograph 8. Radiated Emission, Test Setup, Above 1 GHz

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

Gain/Type	Manufacturer
3dBi Omni (5GHz)	Master Wave Technology CO., LTD

Test Engineer(s): Anderson Soungpanya

Test Date(s): 08/25/10

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.207 Conducted Emissions Limits

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

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

Table 17. Conducted Limits for Intentional Radiators from FCC Part 15 § 15.207(a)

Test Procedure: The EUT was placed on a non-metallic table, 80 cm above the ground plane inside a semi-anechoic chamber. 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 C63.4-1992 "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.

Test Results: The EUT was compliant with the Class A requirement(s) of this section. Pre-scans revealed that emissions profiles and amplitudes of emissions were similar when the EUT was transmitting on low, mid and high channels. Therefore, final measurements were taken when the EUT was transmitting on high channel (i.e. 5805 MHz)

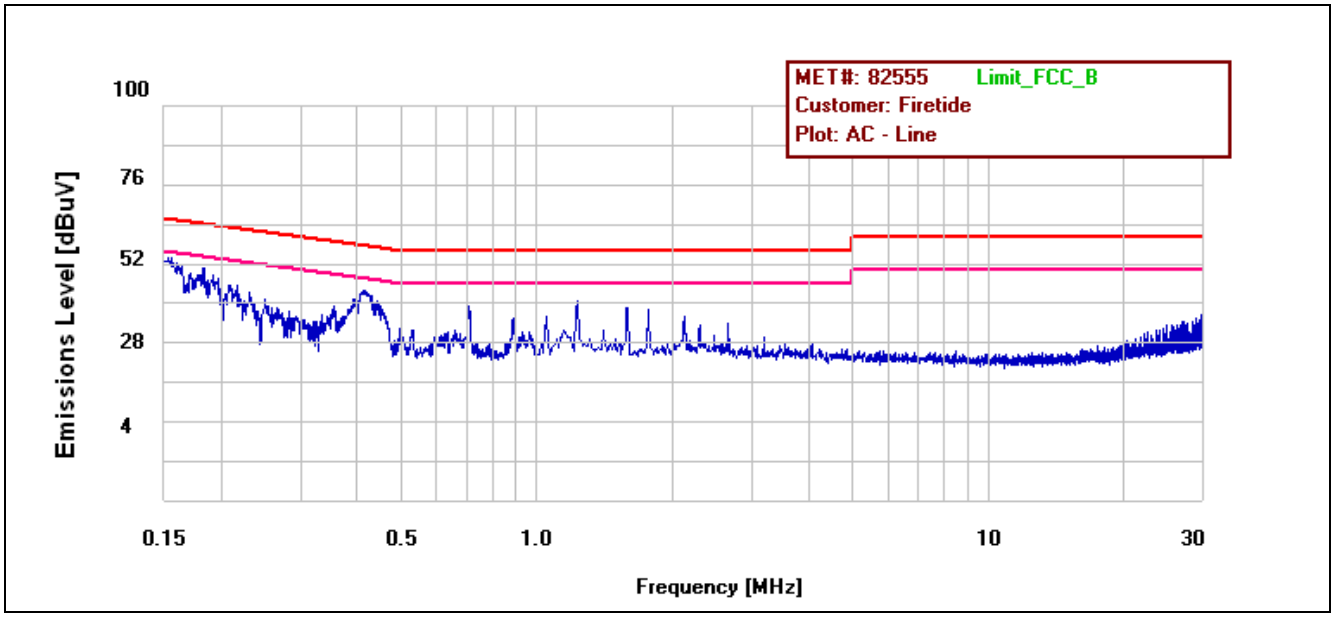
Test Engineer(s): Kenshi Chung

Test Date(s): 08/17/10

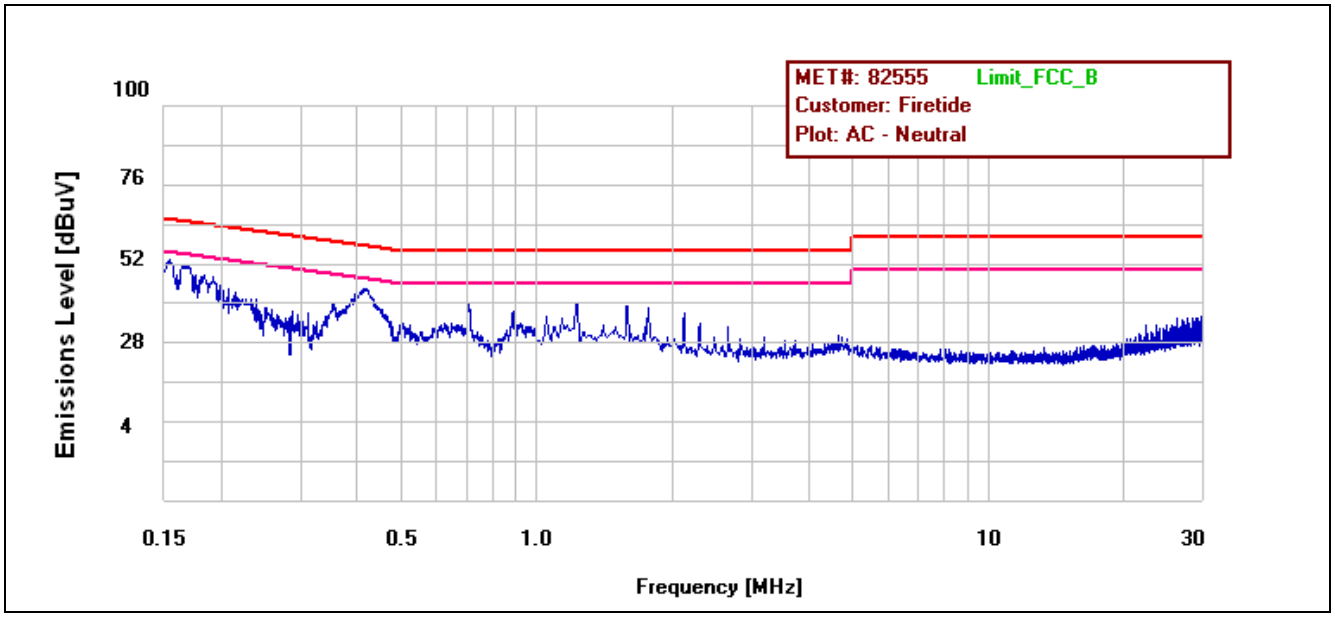
Conducted Emissions - Voltage, AC Power, (120V/60Hz)

Line	Freq (MHz)	QP Amplitude	QP Limit	Delta	Pass	Average Amplitude	Average Limit	Delta	Pass	Notes
AC - Line	0.1526	50.26	65.858	-15.598	Pass	33.76	55.858	-22.098	Pass	Measured Emissions were below applicable limits
AC - Line	0.4142	40.87	57.587	-16.717	Pass	27.83	47.587	-19.757	Pass	Measured Emissions were below applicable limits
AC - Line	0.7064	36.91	56	-19.09	Pass	31.3	46	-14.7	Pass	Measured Emissions were below applicable limits
AC - Line	1.235	39.08	56	-16.92	Pass	33.55	46	-12.45	Pass	Measured Emissions were below applicable limits
AC - Line	1.590	36.18	56	-19.82	Pass	30.46	46	-15.54	Pass	Measured Emissions were below applicable limits
AC - Line	29.575	23.21	60	-36.79	Pass	15.28	50	-34.72	Pass	Measured Emissions were below applicable limits
AC - Neutral	0.1533	50.13	65.82	-15.69	Pass	36.08	55.82	-19.74	Pass	Measured Emissions were below applicable limits
AC - Neutral	0.4156	42.9	57.559	-14.659	Pass	33.97	47.559	-13.589	Pass	Measured Emissions were below applicable limits
AC - Neutral	0.7057	38.03	56	-17.97	Pass	36.29	46	-9.71	Pass	Measured Emissions were below applicable limits
AC - Neutral	1.235	39.85	56	-16.15	Pass	38.55	46	-7.45	Pass	Measured Emissions were below applicable limits
AC - Neutral	1.587	38.25	56	-17.75	Pass	36.95	46	-9.05	Pass	Measured Emissions were below applicable limits
AC - Neutral	29.05	25.47	60	-34.53	Pass	19.12	50	-30.88	Pass	Measured Emissions were below applicable limits

Table 18. Conducted Emissions - Voltage, AC Power, FSP040-DGAA5



Plot 11. Conducted Emission, Phase Line Plot, FSP040-DGAA5

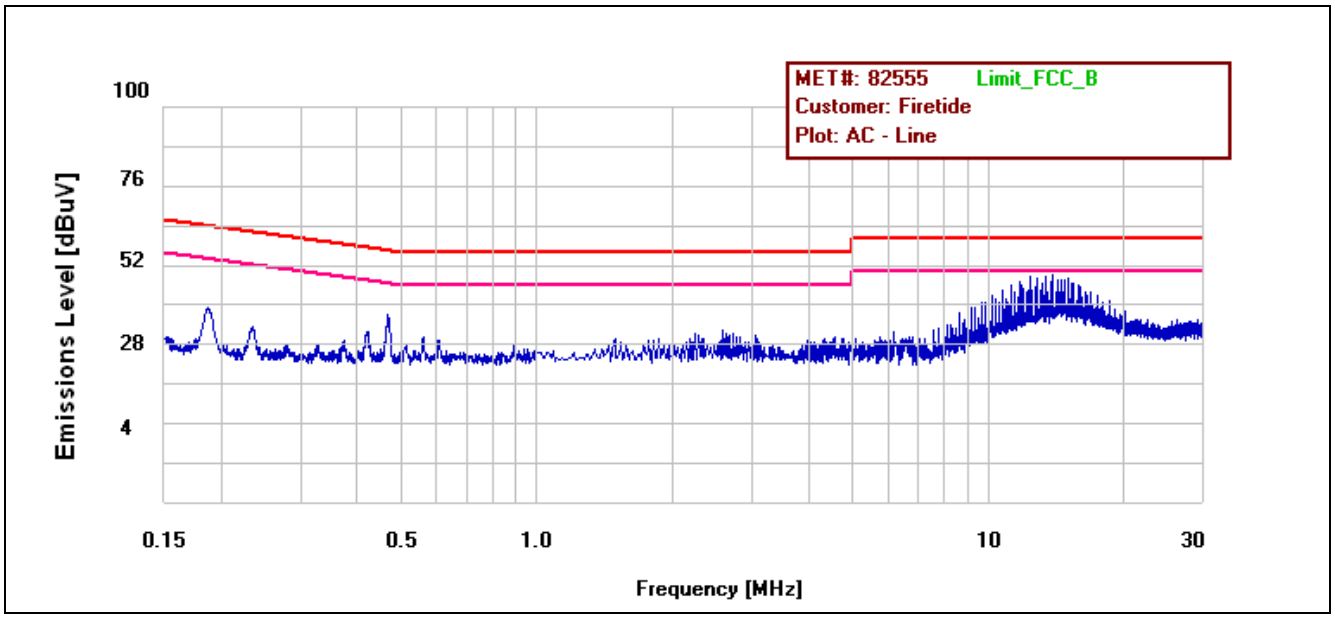


Plot 12. Conducted Emission, Neutral Line Plot, FSP040-DGAA5

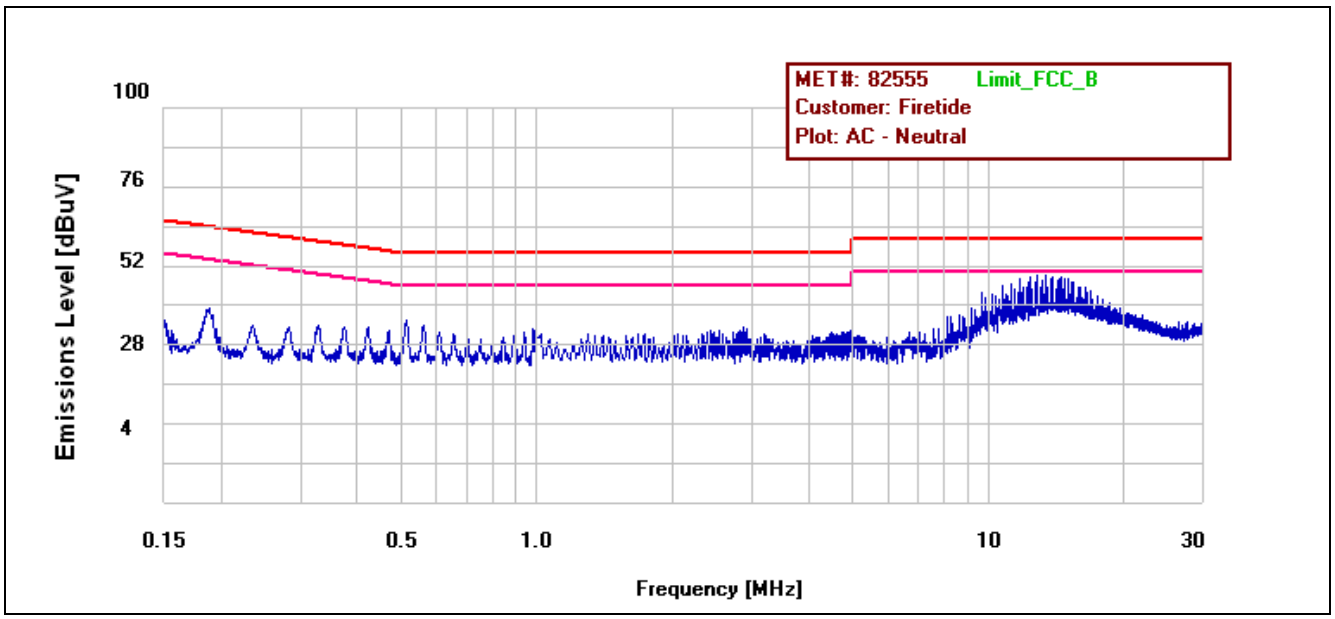
Conducted Emissions - Voltage, AC Power, (120V/60Hz)

Line	Freq (MHz)	QP Amplitude	QP Limit	Delta	Pass	Average Amplitude	Average Limit	Delta	Pass	Notes
AC - Line	0.1873	37.94	64.161	-26.221	Pass	32.68	54.161	-21.481	Pass	Measured Emissions were below applicable limits
AC - Line	0.2352	31.32	62.274	-30.954	Pass	25.43	52.274	-26.844	Pass	Measured Emissions were below applicable limits
AC - Line	0.4967	34.23	56.057	-21.827	Pass	28.31	46.057	-17.747	Pass	Measured Emissions were below applicable limits
AC - Line	2.390	30.15	56	-25.85	Pass	21.78	46	-24.22	Pass	Measured Emissions were below applicable limits
AC - Line	13.900	45.8	60	-14.2	Pass	39.32	50	-10.68	Pass	Measured Emissions were below applicable limits
AC - Line	0.1897	36.79	64.055	-27.265	Pass	35.64	54.055	-18.415	Pass	Measured Emissions were below applicable limits
AC - Neutral	0.1897	36.79	64.055	-27.265	Pass	35.64	54.055	-18.415	Pass	Measured Emissions were below applicable limits
AC - Neutral	0.4215	30.65	57.442	-26.792	Pass	28.48	47.442	-18.962	Pass	Measured Emissions were below applicable limits
AC - Neutral	1.035	30.66	56	-25.34	Pass	27.75	46	-18.25	Pass	Measured Emissions were below applicable limits
AC - Neutral	2.817	30.45	56	-25.55	Pass	26.08	46	-19.92	Pass	Measured Emissions were below applicable limits
AC - Neutral	12.825	35.06	60	-24.94	Pass	29.15	50	-20.85	Pass	Measured Emissions were below applicable limits

Table 19. Conducted Emissions - Voltage, AC Power, PoE30U-560



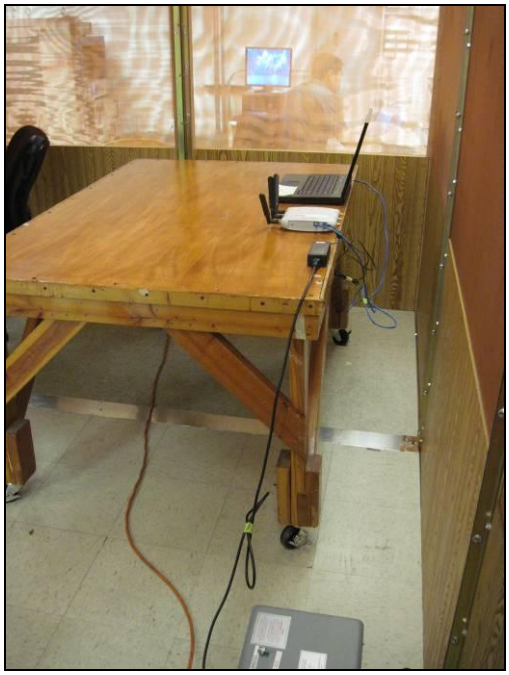
Plot 13. Conducted Emission, Phase Line Plot, PoE30U-560



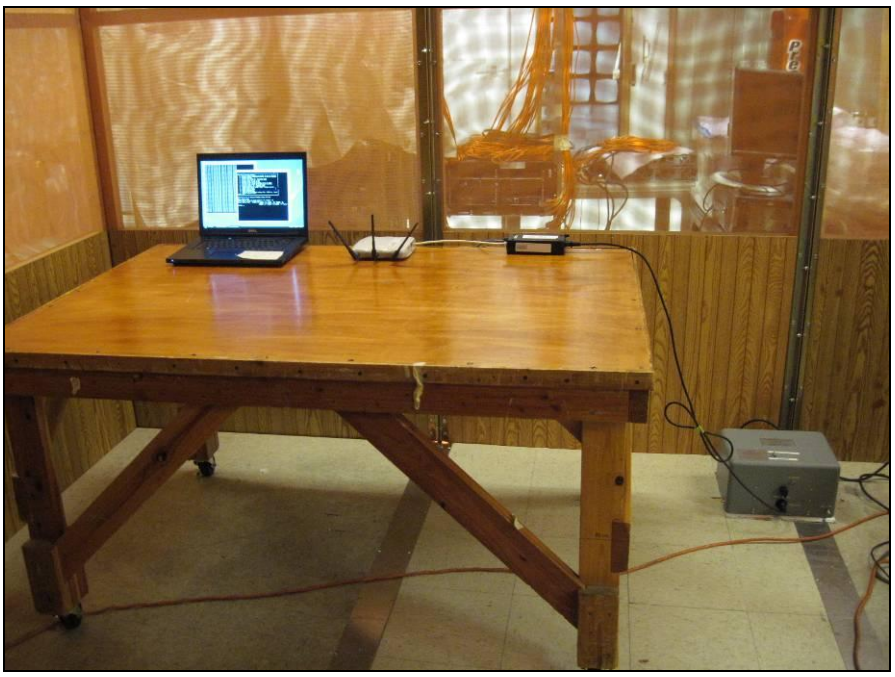
Plot 14. Conducted Emission, Neutral Line Plot, PoE30U-560

Conducted Emission Limits Test Setup

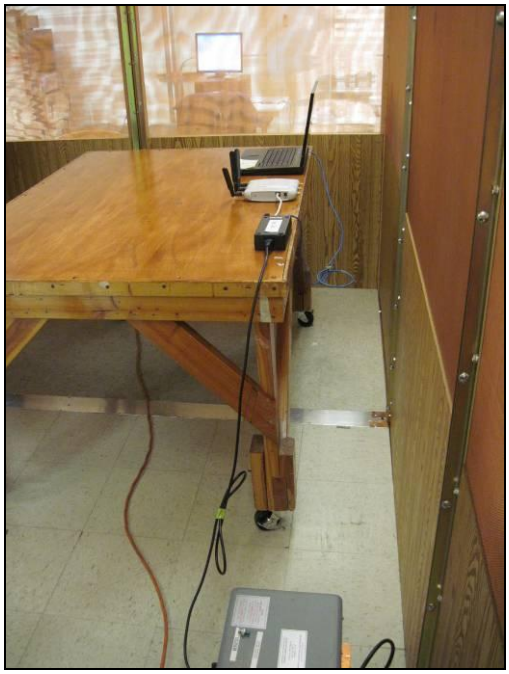
Photograph 9. Conducted Emissions, Test Setup 1, FSP040-DGAA5



Photograph 10. Conducted Emissions, Test Setup 2, FSP040-DGAA5



Photograph 11. Conducted Emissions, Test Setup 1, PoE30U-560



Photograph 12. Conducted Emissions, Test Setup 2, PoE30U-560

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15. 403(c) 26dB Bandwidth

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

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

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

Test Engineer(s): Anderson Soungpanya

Test Date(s): 08/25/10

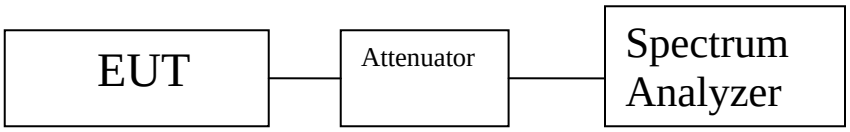


Figure 2. Occupied Bandwidth, Test Setup

Mode	Frequency (MHz)	26 dB Bandwidth (MHz)
802.11a	5260	21.467
	5300	23.774
	5320	26.489
	5500	22.037
	5580	18.381
	5700	19.783
802.11n 20 MHz	5260	19.944
	5300	23.512
	5320	19.872
	5500	19.558
	5580	19.497
	5700	20.306
802.11n 40 MHz	5270	40.429
	5310	41.162
	5510	41.855
	5670	40.773

Table 20. 26 dB Occupied Bandwidth, Test Results, Port 1

Mode	Frequency (MHz)	99% Bandwidth (MHz)
802.11a	5260	16.5156
	5300	16.5124
	5320	16.4362
	5500	16.5685
	5580	17.650
	5700	16.4145
802.11n 20 MHz	5260	17.6145
	5300	17.7411
	5320	17.5949
	5500	17.4754
	5580	17.7502
	5700	17.6335
802.11n 40 MHz	5270	36.6609
	5310	36.8046
	5510	36.4368
	5670	36.3084

Table 21. 99% Occupied Bandwidth, Test Results, Port 1

Mode	Frequency (MHz)	26 dB Bandwidth (MHz)
802.11n 20 MHz	5260	19.747
	5300	18.312
	5320	21.607
	5500	18.580
	5580	19.886
	5700	19.988
802.11n 40 MHz	5270	41.252
	5310	41.437
	5510	40.708
	5670	40.969

Table 22. 26 dB Occupied Bandwidth, Test Results, Port 2

Mode	Frequency (MHz)	99% Bandwidth (MHz)
802.11n 20 MHz	5260	17.5641
	5300	16.3777
	5320	16.3972
	5500	16.3955
	5580	17.6307
	5700	17.6223
802.11n 40 MHz	5270	36.5253
	5310	36.4448
	5510	36.3317
	5670	36.6579

Table 23. 99% Occupied Bandwidth, Test Results, Port 2

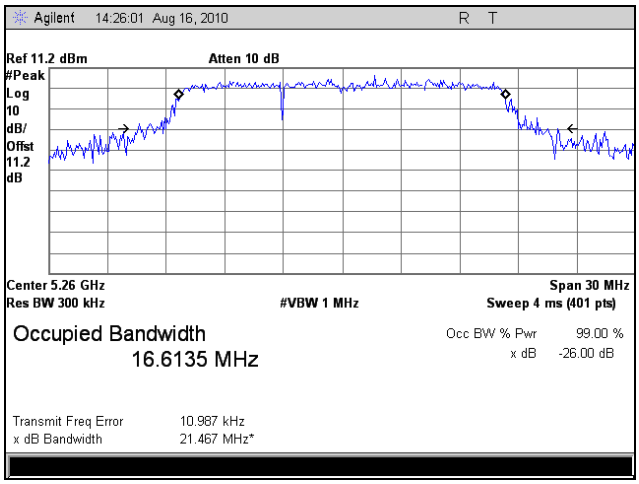
Mode	Frequency (MHz)	26 dB Bandwidth (MHz)
802.11n 20 MHz	5260	18.790
	5300	18.995
	5320	18.548
	5500	18.503
	5580	17.661
	5700	18.907
802.11n 40 MHz	5270	41.628
	5310	42.063
	5510	41.660
	5670	41.712

Table 24. 26 dB Occupied Bandwidth, Test Results, Port 3

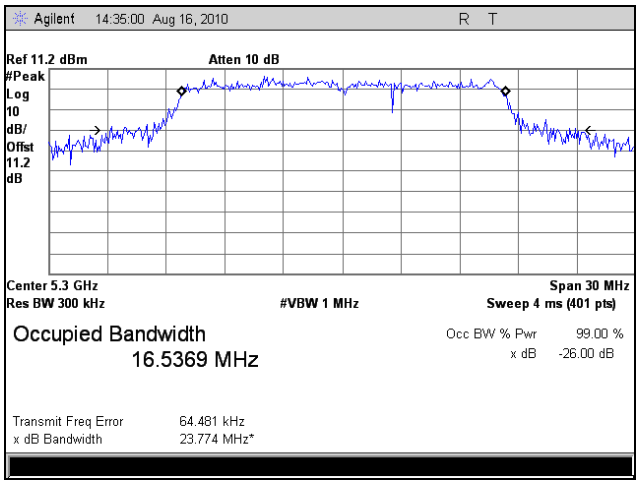
Mode	Frequency (MHz)	99% Bandwidth (MHz)
802.11n 20 MHz	5260	16.3297
	5300	16.4625
	5320	16.3233
	5500	16.3689
	5580	17.5428
	5700	16.4563
802.11n 40 MHz	5270	36.8606
	5310	36.5654
	5510	36.4592
	5670	36.5608

Table 25. 99% Occupied Bandwidth, Test Results, Port 3

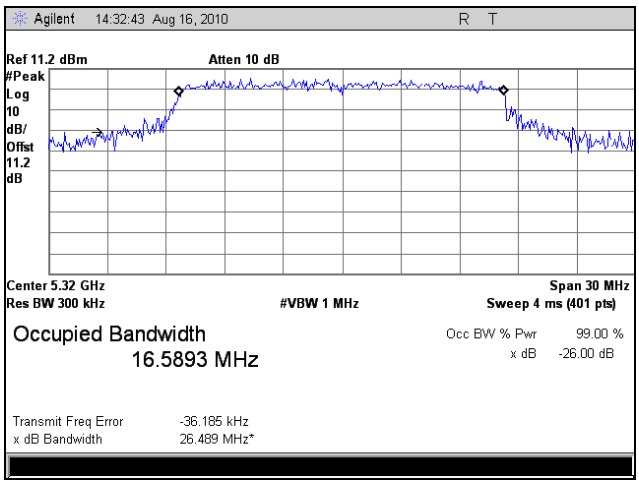
26 dB Occupied Bandwidth Test Results, 802.11a, Port 1



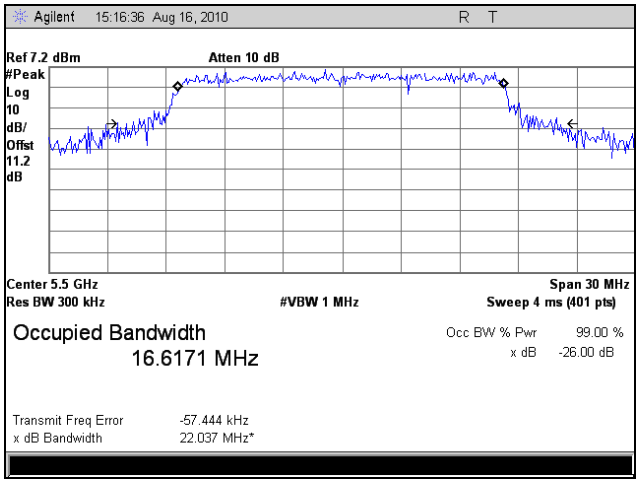
Plot 15. 26 dB Occupied Bandwidth, 802.11a, 5260 MHz, Port 1



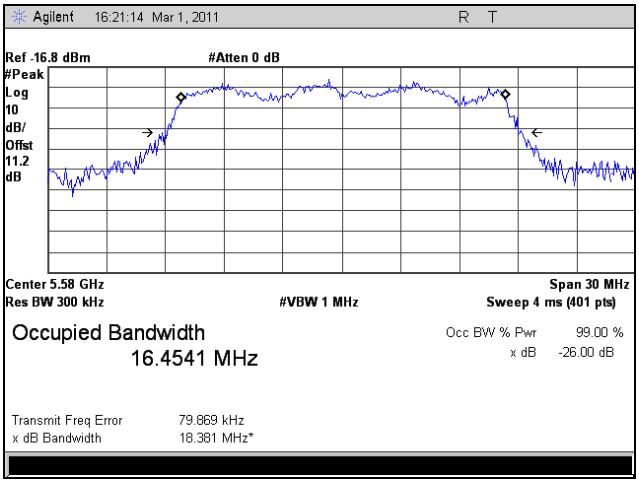
Plot 16. 26 dB Occupied Bandwidth, 802.11a, 5300 MHz, Port 1



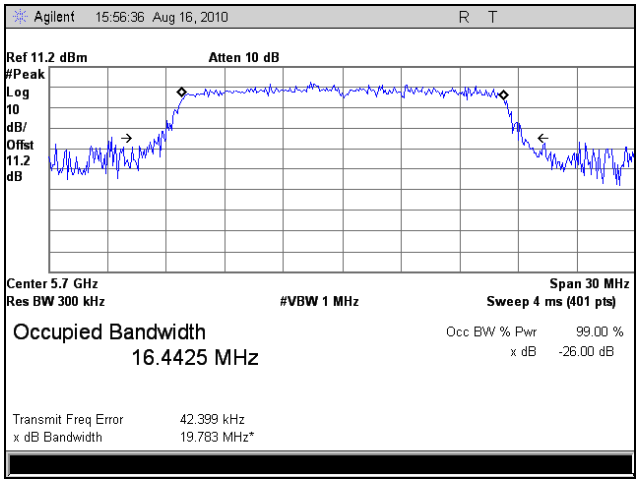
Plot 17. 26 dB Occupied Bandwidth, 802.11a, 5320 MHz, Port 1



Plot 18. 26 dB Occupied Bandwidth, 802.11a, 5500 MHz, Port 1

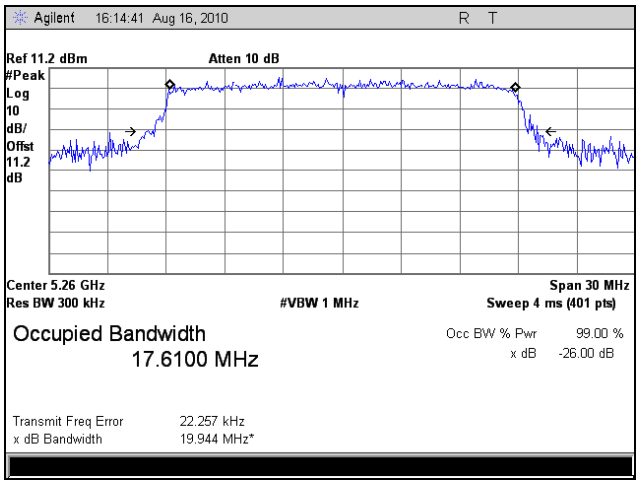


Plot 19. 26 dB Occupied Bandwidth, 802.11a, 5580 MHz, Port 1

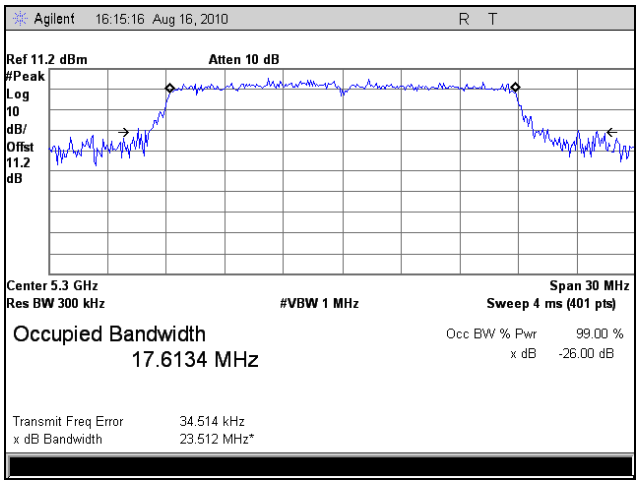


Plot 20. 26 dB Occupied Bandwidth, 802.11a, 5700 MHz, Port 1

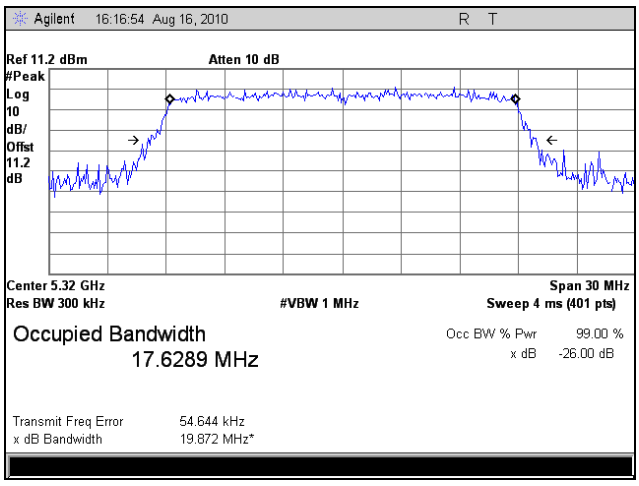
26 dB Occupied Bandwidth Test Results, 802.11n 20 MHz, Port 1



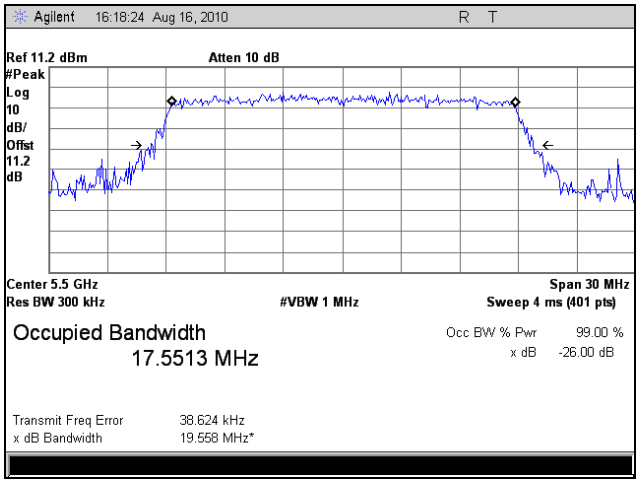
Plot 21. 26 dB Occupied Bandwidth, 802.11n 20 MHz, 5260 MHz, Port 1



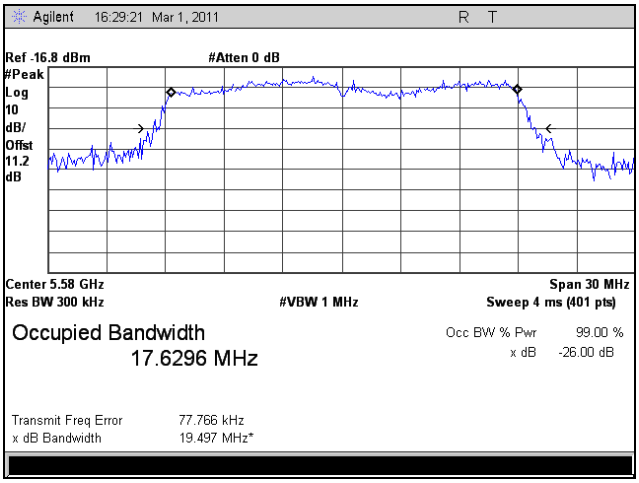
Plot 22. 26 dB Occupied Bandwidth, 802.11n 20 MHz, 5300 MHz, Port 1



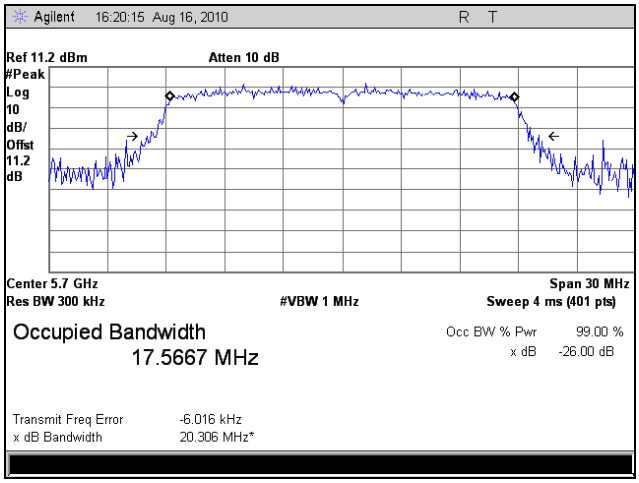
Plot 23. 26 dB Occupied Bandwidth, 802.11n 20 MHz, 5320 MHz, Port 1



Plot 24. 26 dB Occupied Bandwidth, 802.11n 20 MHz, 5500 MHz, Port 1

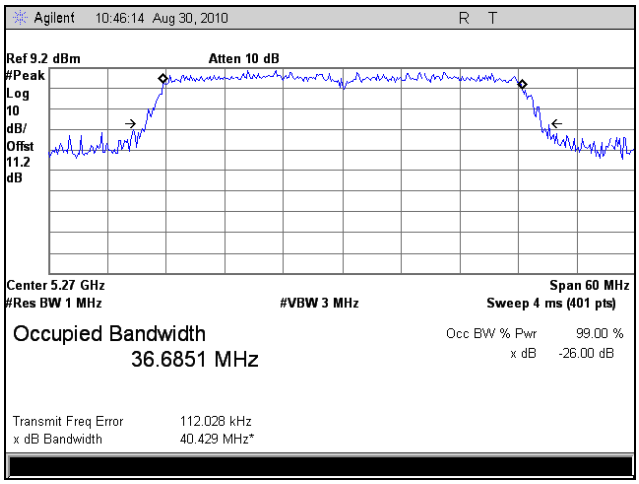


Plot 25. 26 dB Occupied Bandwidth, 802.11n 20 MHz, 5580 MHz, Port 1

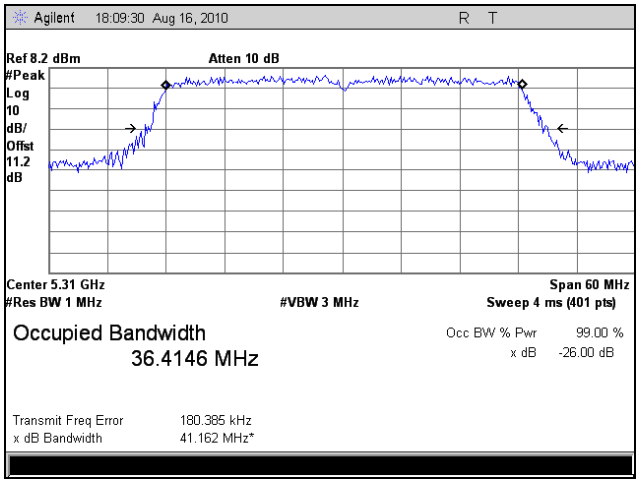


Plot 26. 26 dB Occupied Bandwidth, 802.11n 20 MHz, 5700 MHz, Port 1

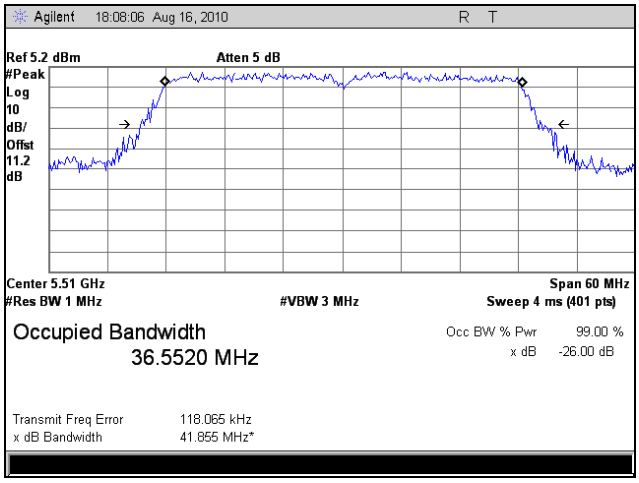
26 dB Occupied Bandwidth Test Results, 802.11n 40 MHz, Port 1



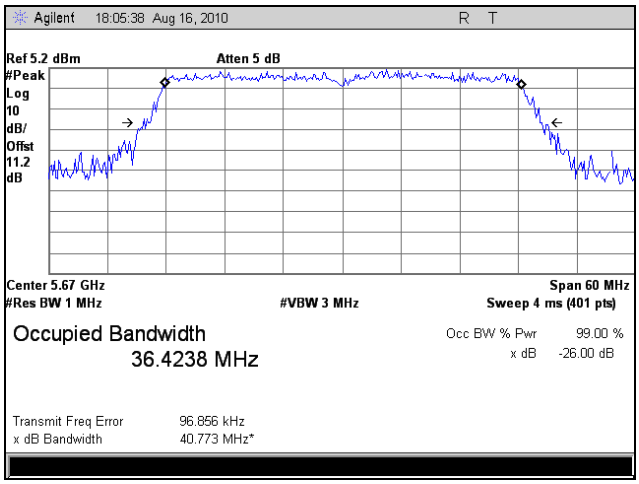
Plot 27. 26 dB Occupied Bandwidth, 802.11n 40 MHz, 5270 MHz, Port 1



Plot 28. 26 dB Occupied Bandwidth, 802.11n 40 MHz, 5310 MHz, Port 1

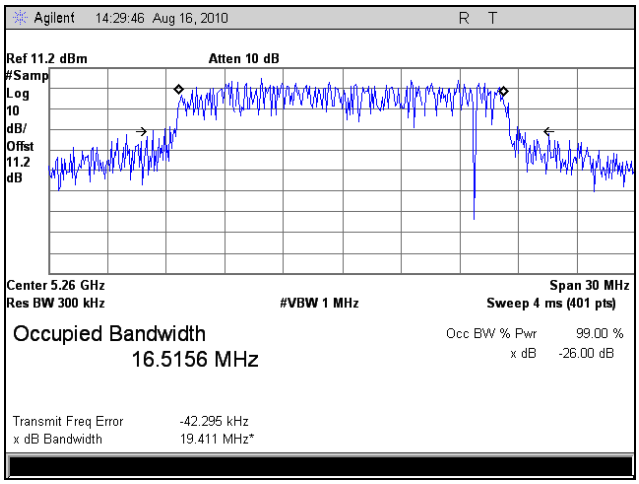


Plot 29. 26 dB Occupied Bandwidth, 802.11n 40 MHz, 5510 MHz, Port 1

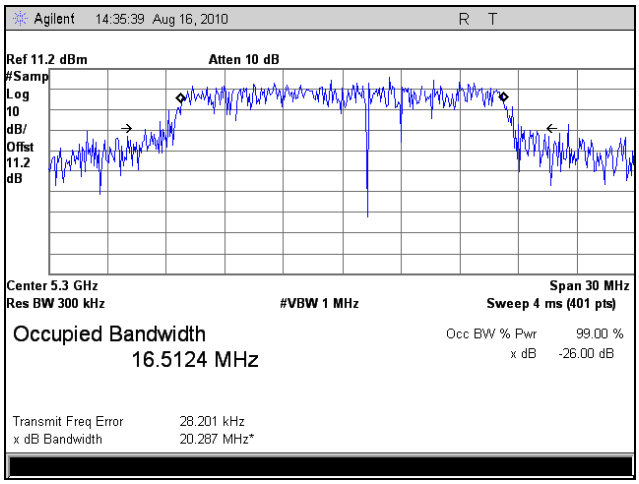


Plot 30. 26 dB Occupied Bandwidth, 802.11n 40 MHz, 5670 MHz, Port 1

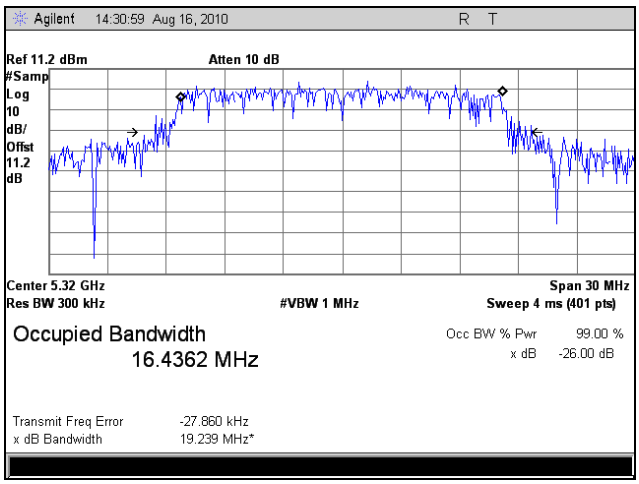
99% Occupied Bandwidth Test Results, 802.11a, Port 1



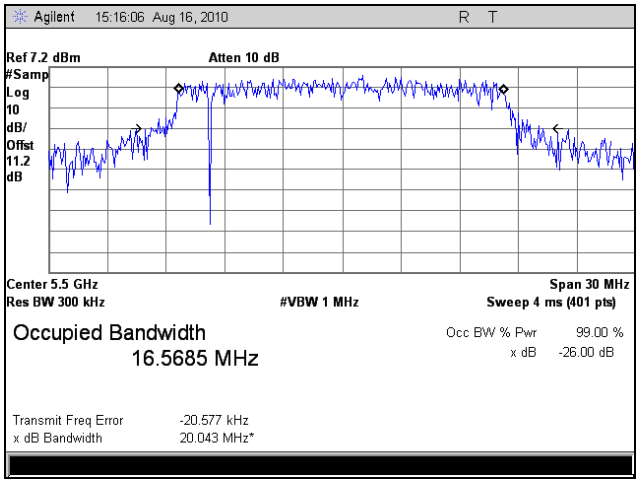
Plot 31. 99% Occupied Bandwidth, 802.11a, 5260 MHz, Port 1



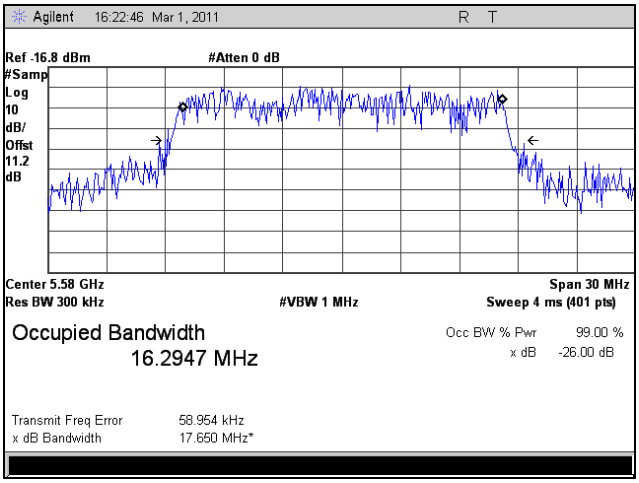
Plot 32. 99% Occupied Bandwidth, 802.11a, 5300 MHz, Port 1



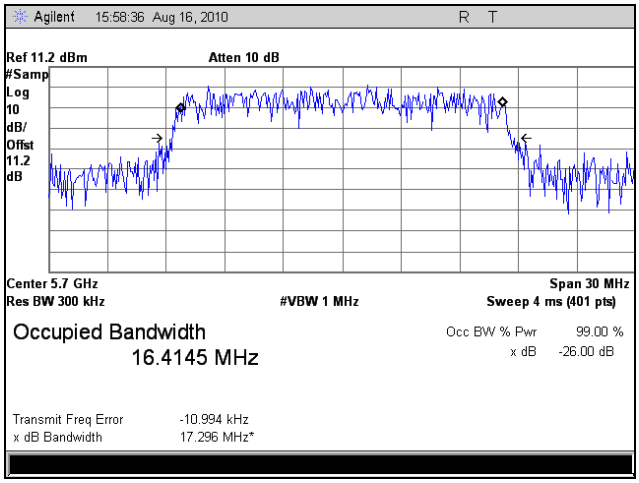
Plot 33. 99% Occupied Bandwidth, 802.11a, 5320 MHz, Port 1



Plot 34. 99% Occupied Bandwidth, 802.11a, 5500 MHz, Port 1

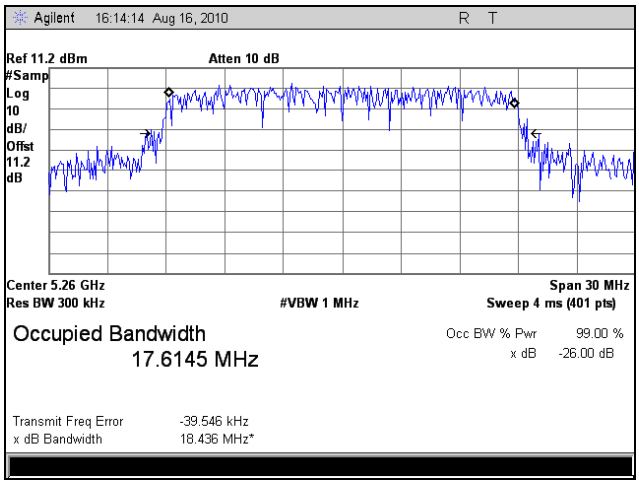


Plot 35. 99% Occupied Bandwidth, 802.11a, 5580 MHz, Port 1

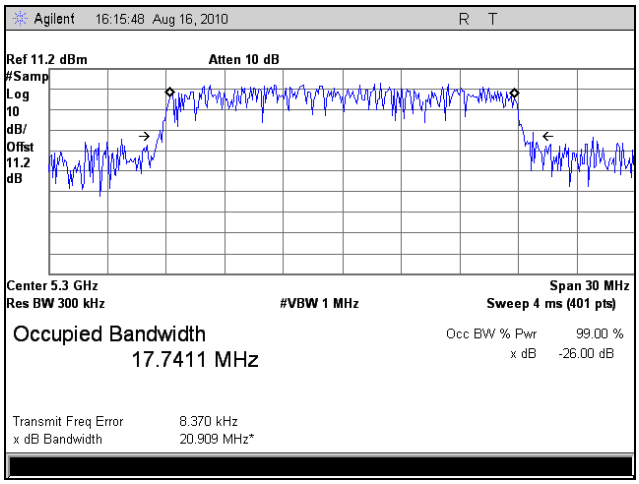


Plot 36. 99% Occupied Bandwidth, 802.11a, 5700 MHz, Port 1

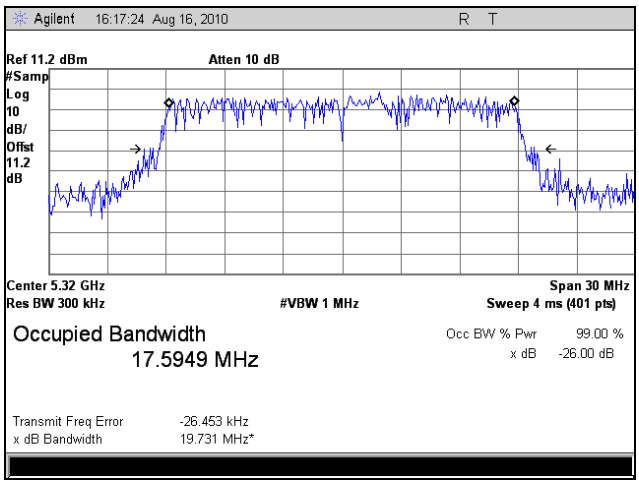
99% Occupied Bandwidth Test Results, 802.11n 20 MHz, Port 1



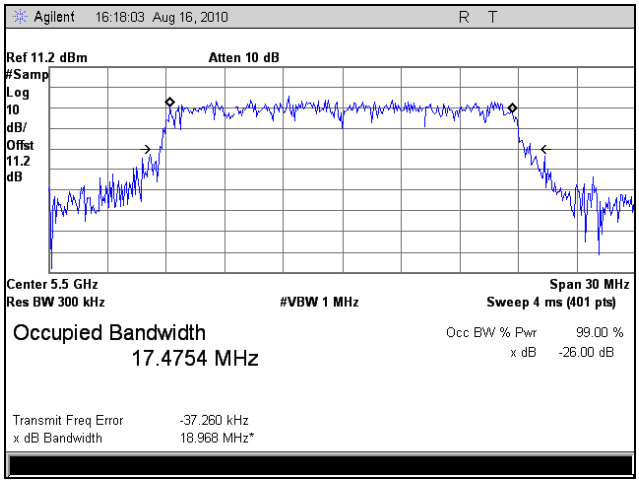
Plot 37. 99% Occupied Bandwidth, 802.11n 20 MHz, 5260 MHz, Port 1



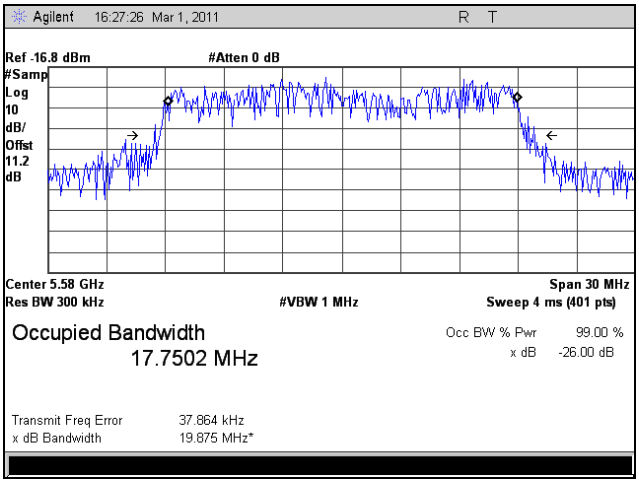
Plot 38. 99% Occupied Bandwidth, 802.11n 20 MHz, 5300 MHz, Port 1



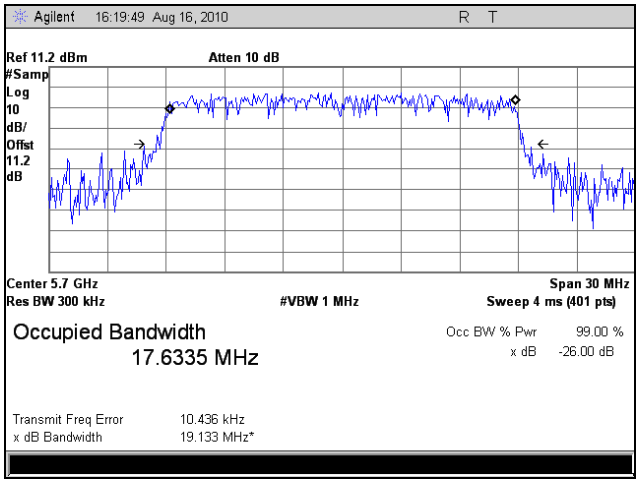
Plot 39. 99% Occupied Bandwidth, 802.11n 20 MHz, 5320 MHz, Port 1



Plot 40. 99% Occupied Bandwidth, 802.11n 20 MHz, 5500 MHz, Port 1

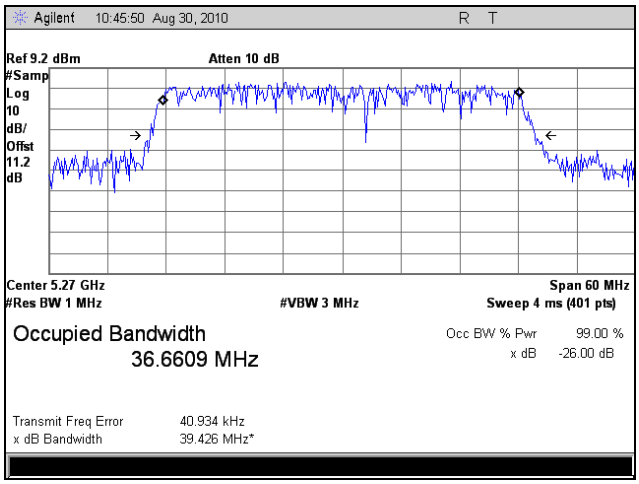


Plot 41. 99% Occupied Bandwidth, 802.11n 20 MHz, 5580 MHz, Port 1

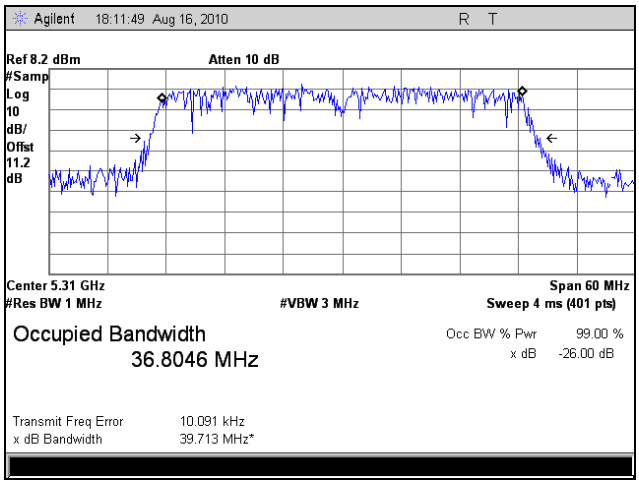


Plot 42. 99% Occupied Bandwidth, 802.11n 20 MHz, 5700 MHz, Port 1

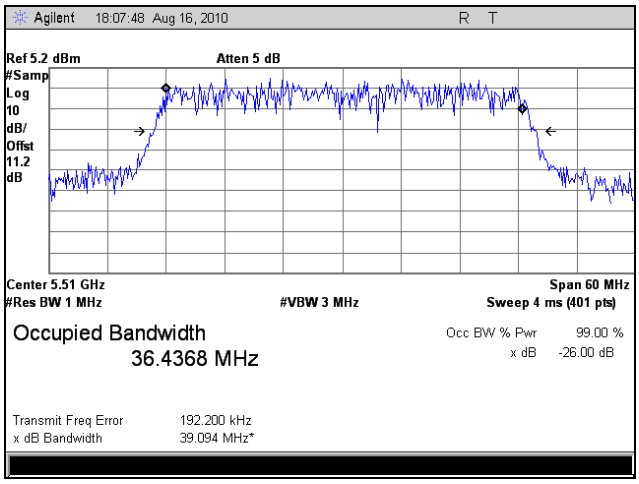
99% Occupied Bandwidth Test Results, 802.11n 40 MHz, Port 1



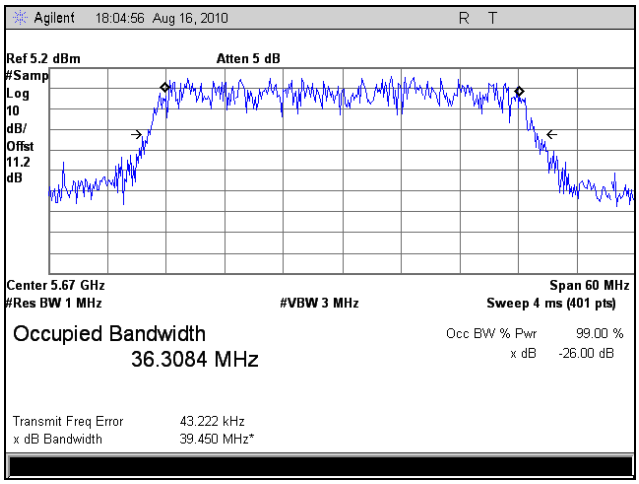
Plot 43. 99% Occupied Bandwidth, 802.11n 40 MHz, 5270 MHz, Port 1



Plot 44. 99% Occupied Bandwidth, 802.11n 40 MHz, 5310 MHz, Port 1

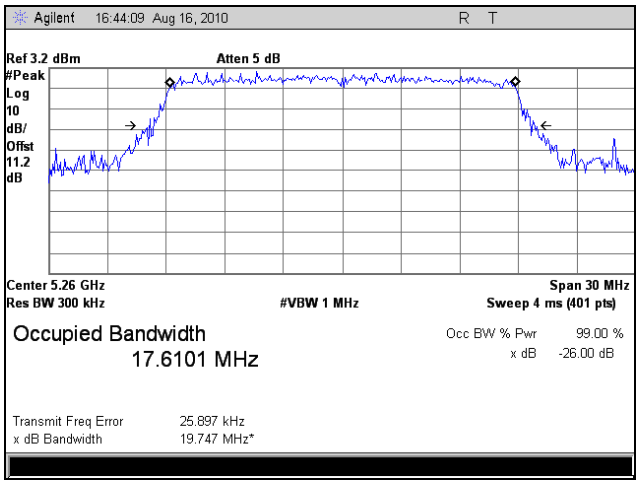


Plot 45. 99% Occupied Bandwidth, 802.11n 40 MHz, 5510 MHz, Port 1

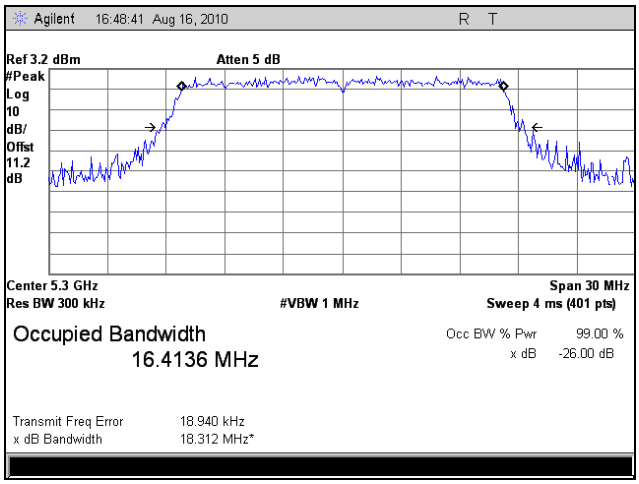


Plot 46. 99% Occupied Bandwidth, 802.11n 40 MHz, 5670 MHz, Port 1

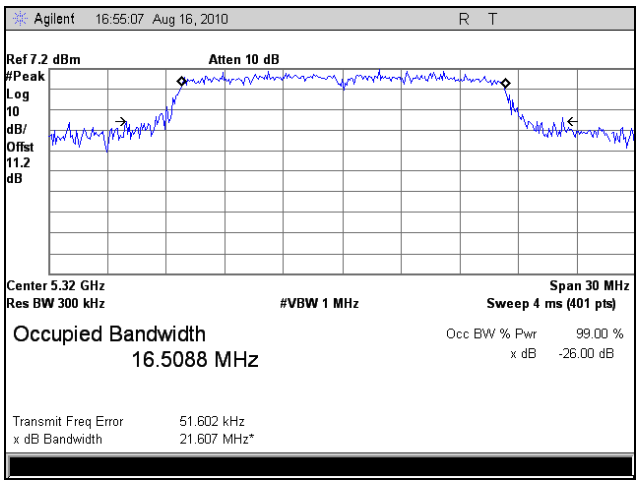
26 dB Occupied Bandwidth Test Results, 802.11n 20 MHz, Port 2



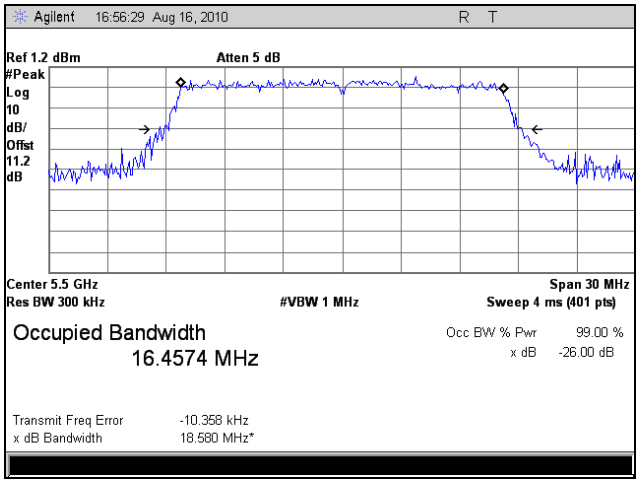
Plot 47. 26 dB Occupied Bandwidth, 802.11n 20 MHz, 5260 MHz, Port 2



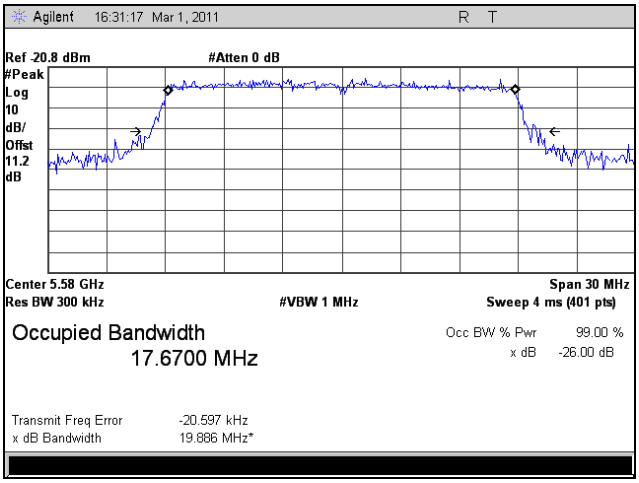
Plot 48. 26 dB Occupied Bandwidth, 802.11n 20 MHz, 5300 MHz, Port 2



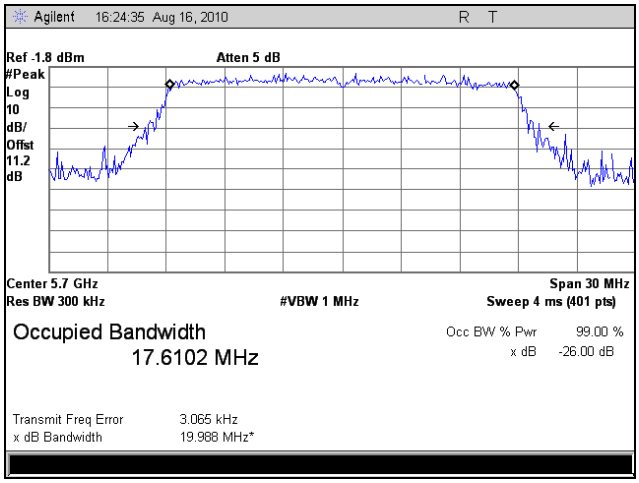
Plot 49. 26 dB Occupied Bandwidth, 802.11n 20 MHz, 5320 MHz, Port 2



Plot 50. 26 dB Occupied Bandwidth, 802.11n 20 MHz, 5500 MHz, Port 2

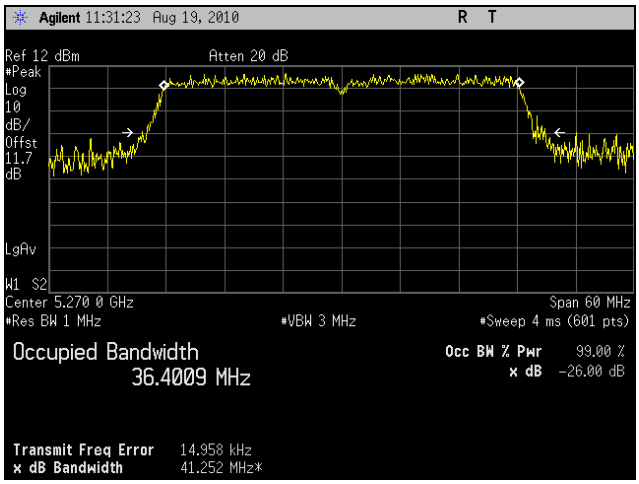


Plot 51. 26 dB Occupied Bandwidth, 802.11n 20 MHz, 5580 MHz, Port 2

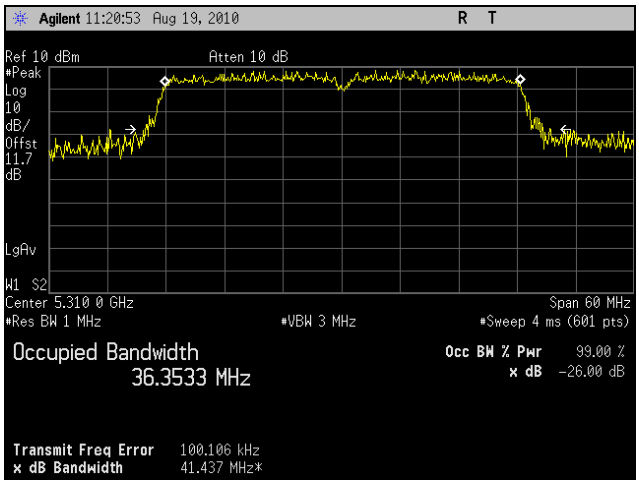


Plot 52. 26 dB Occupied Bandwidth, 802.11n 20 MHz, 5700 MHz, Port 2

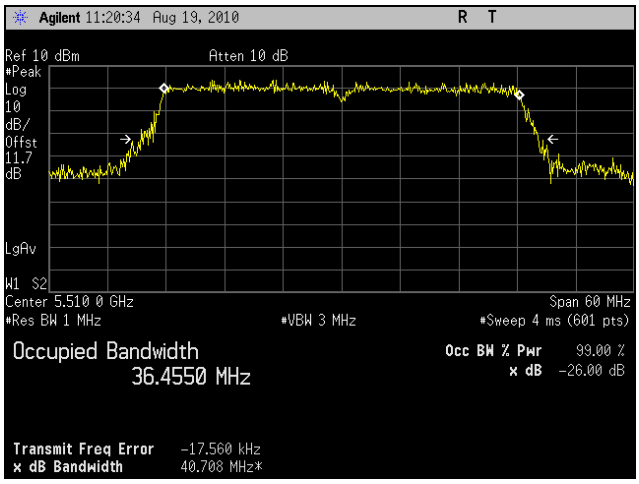
26 dB Occupied Bandwidth Test Results, 802.11n 40 MHz, Port 2



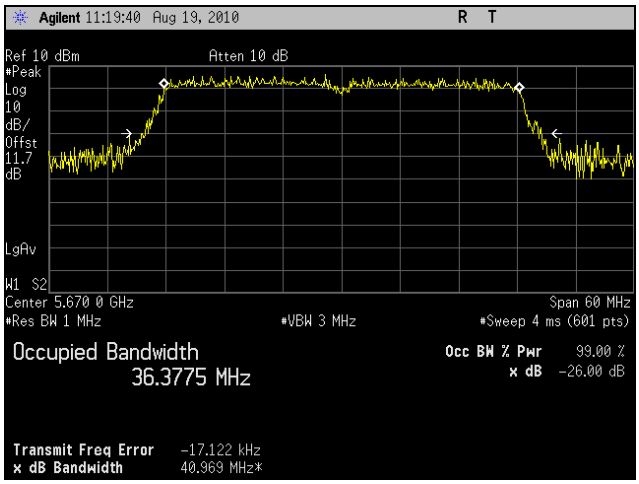
Plot 53. 26 dB Occupied Bandwidth, 802.11n 40 MHz, 5270 MHz, Port 2



Plot 54. 26 dB Occupied Bandwidth, 802.11n 40 MHz, 5310 MHz, Port 2

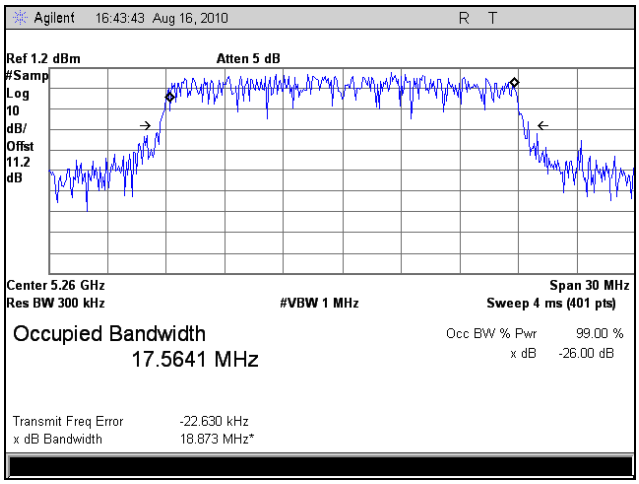


Plot 55. 26 dB Occupied Bandwidth, 802.11n 40 MHz, 5510 MHz, Port 2

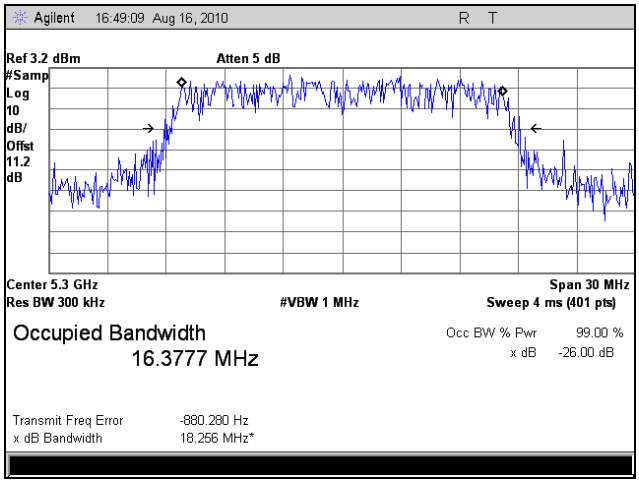


Plot 56. 26 dB Occupied Bandwidth, 802.11n 40 MHz, 5670 MHz, Port 2

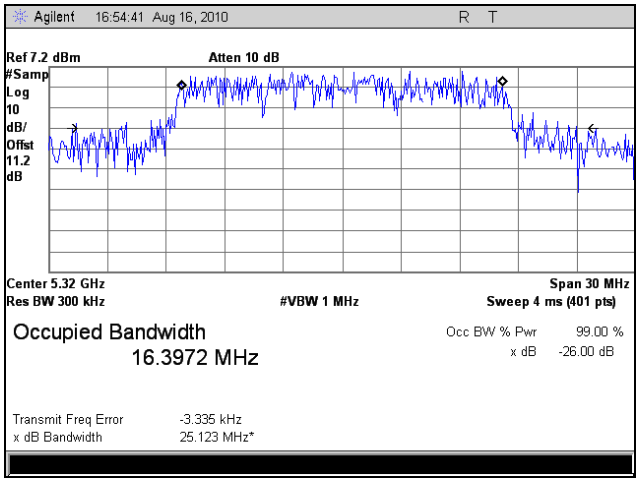
99% Occupied Bandwidth Test Results, 802.11n 20 MHz, Port 2



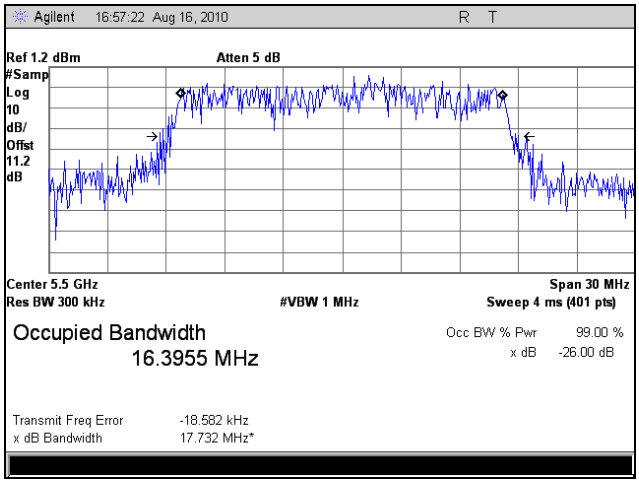
Plot 57. 99% Occupied Bandwidth, 802.11n 20 MHz, 5260 MHz, Port 2



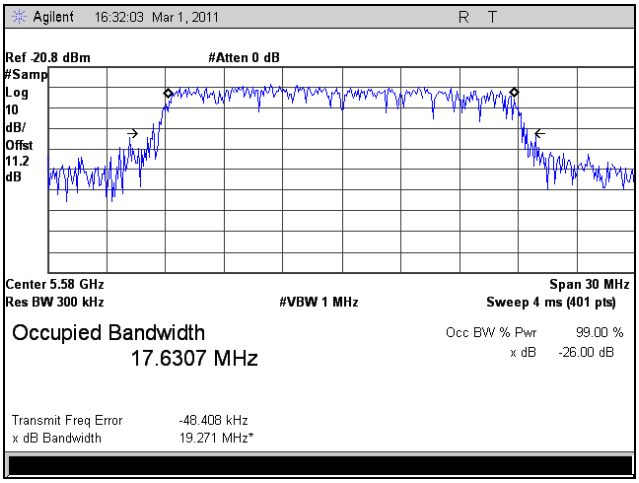
Plot 58. 99% Occupied Bandwidth, 802.11n 20 MHz, 5300 MHz, Port 2



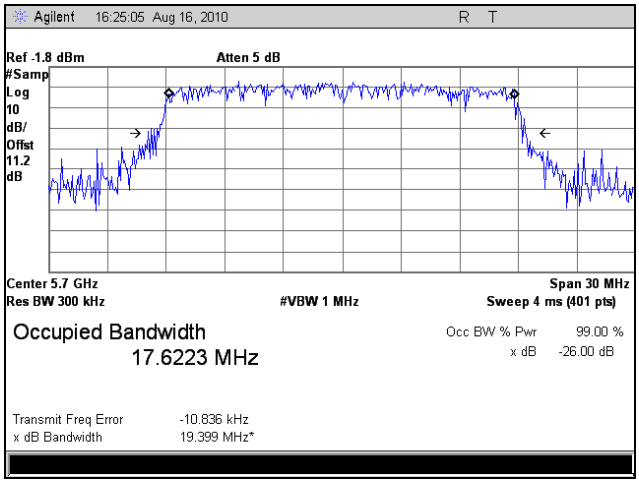
Plot 59. 99% Occupied Bandwidth, 802.11n 20 MHz, 5320 MHz, Port 2



Plot 60. 99% Occupied Bandwidth, 802.11n 20 MHz, 5500 MHz, Port 2

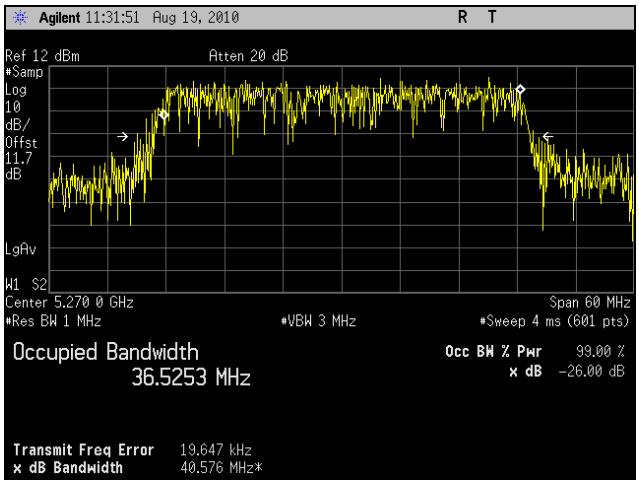


Plot 61. 99% Occupied Bandwidth, 802.11n 20 MHz, 5580 MHz, Port 2

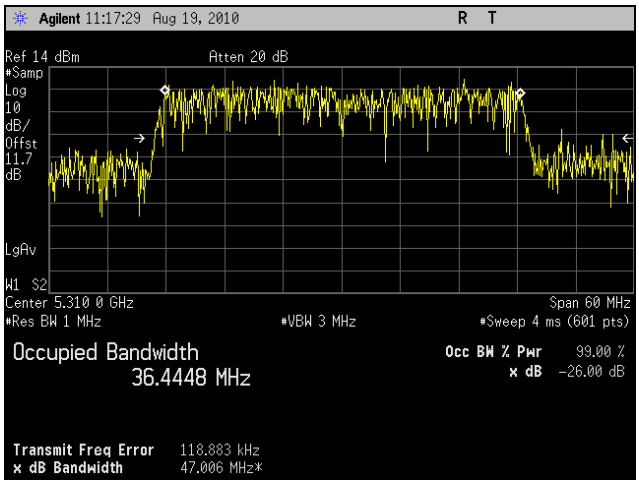


Plot 62. 99% Occupied Bandwidth, 802.11n 20 MHz, 5700 MHz, Port 2

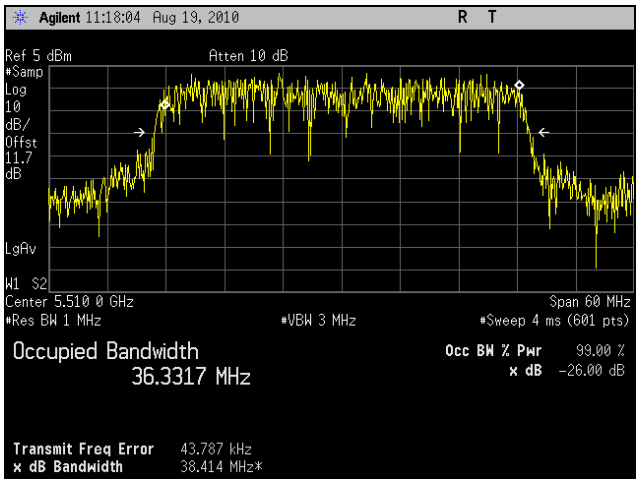
99% Occupied Bandwidth Test Results, 802.11n 40 MHz, Port 2



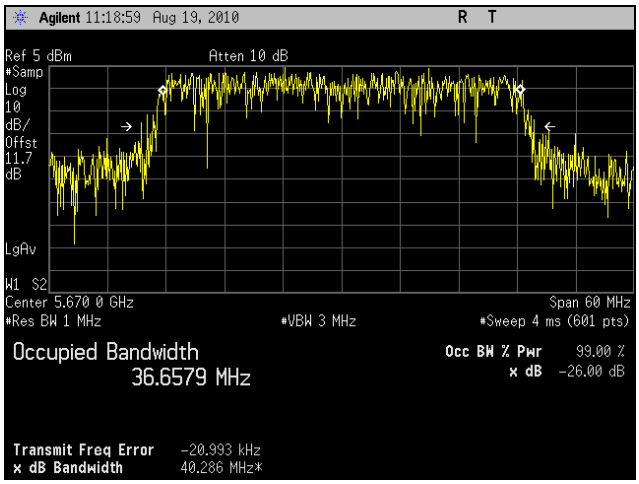
Plot 63. 99% Occupied Bandwidth, 802.11n 40 MHz, 5270 MHz, Port 2



Plot 64. 99% Occupied Bandwidth, 802.11n 40 MHz, 5310 MHz, Port 2

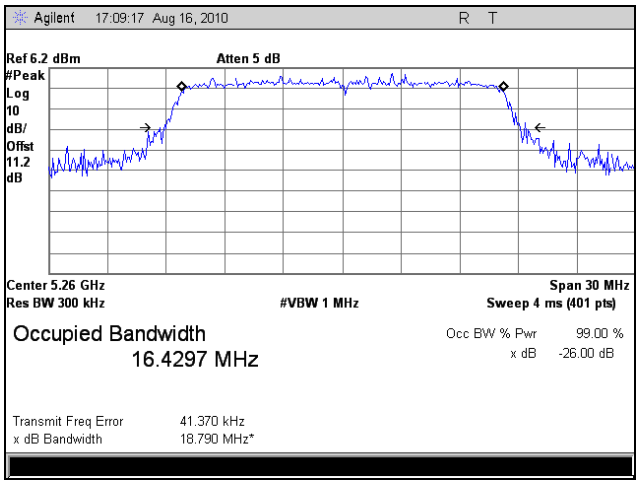


Plot 65. 99% Occupied Bandwidth, 802.11n 40 MHz, 5510 MHz, Port 2

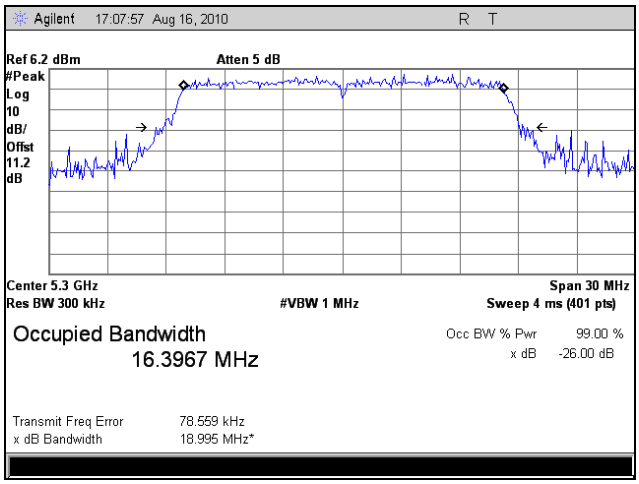


Plot 66. 99% Occupied Bandwidth, 802.11n 40 MHz, 5670 MHz, Port 2

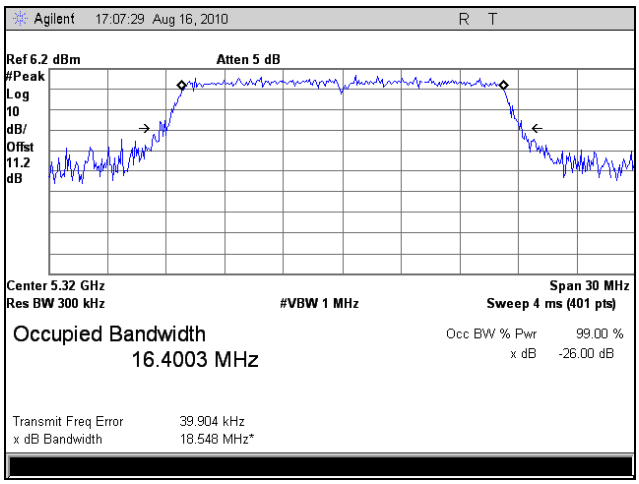
26 dB Occupied Bandwidth Test Results, 802.11n 20 MHz, Port 3



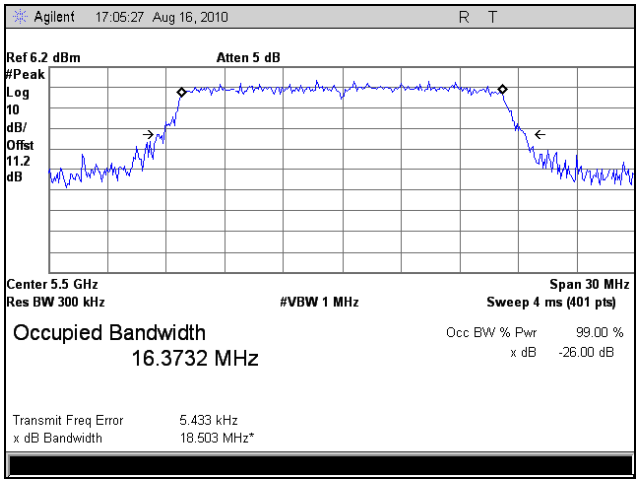
Plot 67. 26 dB Occupied Bandwidth, 802.11n 20 MHz, 5260 MHz, Port 3



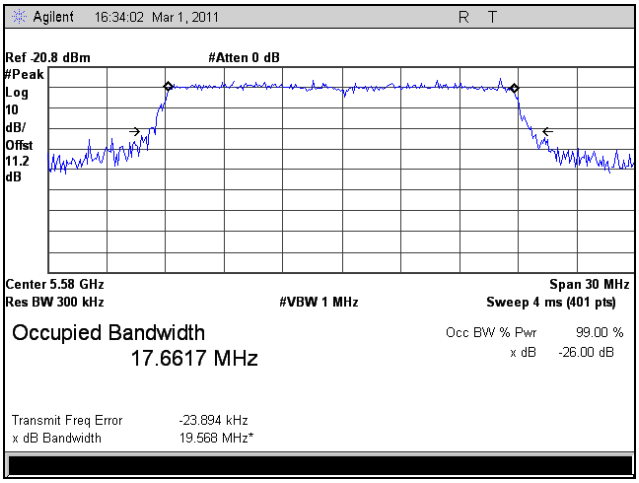
Plot 68. 26 dB Occupied Bandwidth, 802.11n 20 MHz, 5300 MHz, Port 3



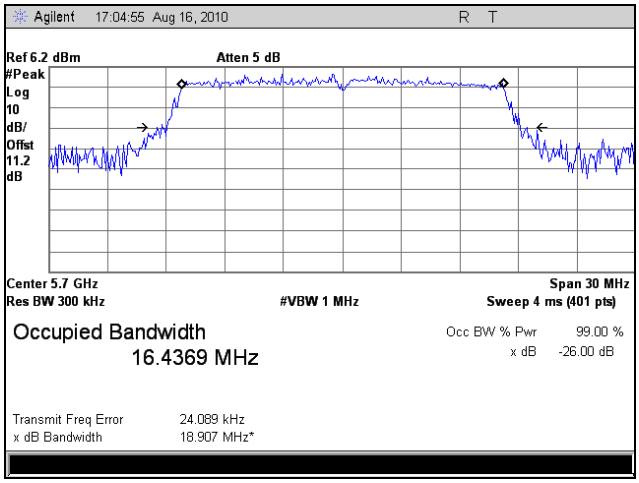
Plot 69. 26 dB Occupied Bandwidth, 802.11n 20 MHz, 5320 MHz, Port 3



Plot 70. 26 dB Occupied Bandwidth, 802.11n 20 MHz, 5500 MHz, Port 3

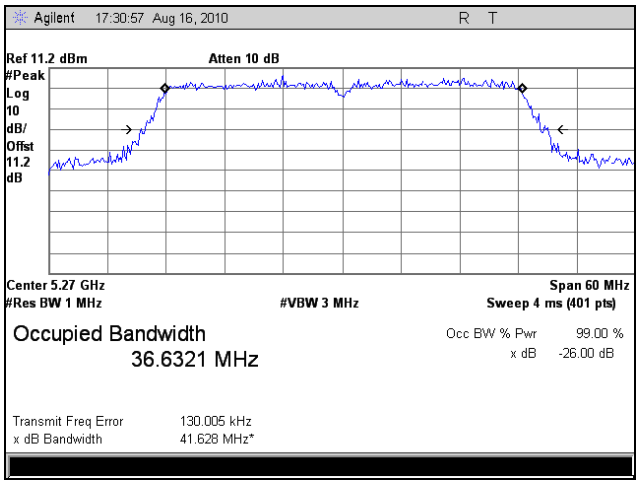


Plot 71. 26 dB Occupied Bandwidth, 802.11n 20 MHz, 5580 MHz, Port 3

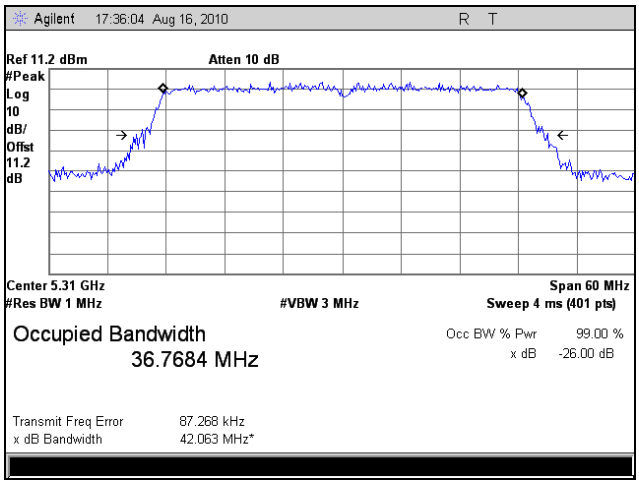


Plot 72. 26 dB Occupied Bandwidth, 802.11n 20 MHz, 5700 MHz, Port 3

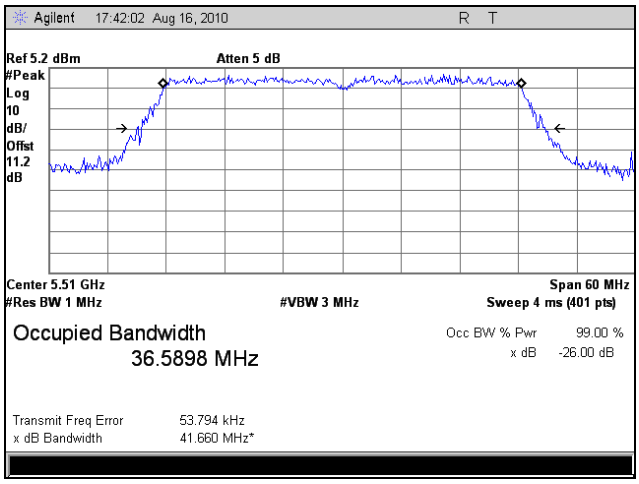
26 dB Occupied Bandwidth Test Results, 802.11n 40 MHz, Port 3



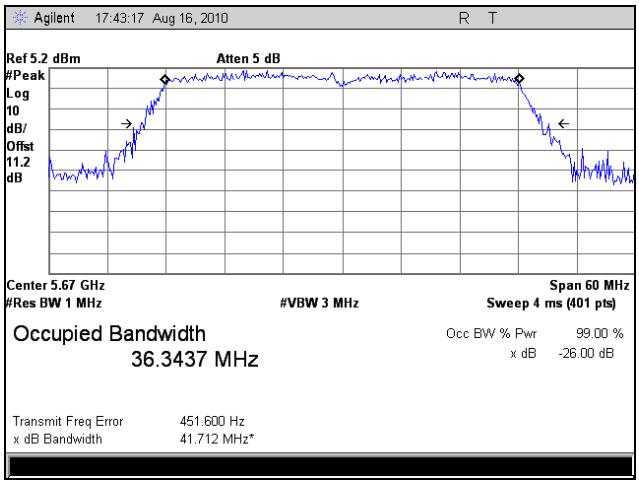
Plot 73. 26 dB Occupied Bandwidth, 802.11n 40 MHz, 5270 MHz, Port 3



Plot 74. 26 dB Occupied Bandwidth, 802.11n 40 MHz, 5310 MHz, Port 3

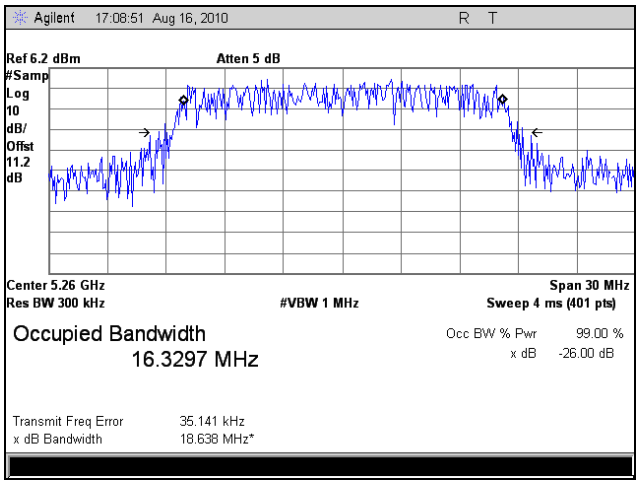


Plot 75. 26 dB Occupied Bandwidth, 802.11n 40 MHz, 5510 MHz, Port 3

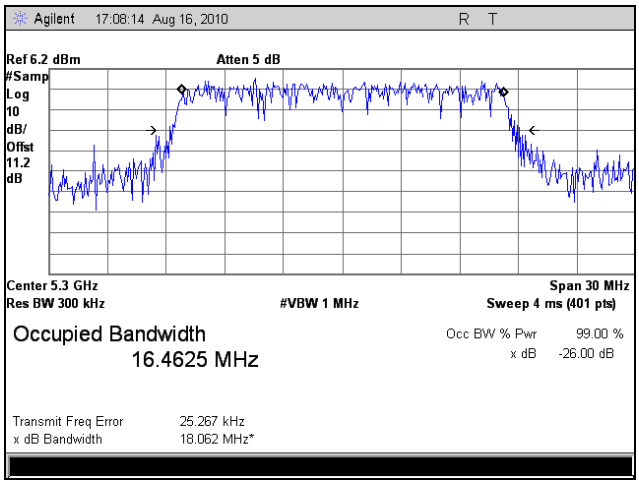


Plot 76. 26 dB Occupied Bandwidth, 802.11n 40 MHz, 5670 MHz, Port 3

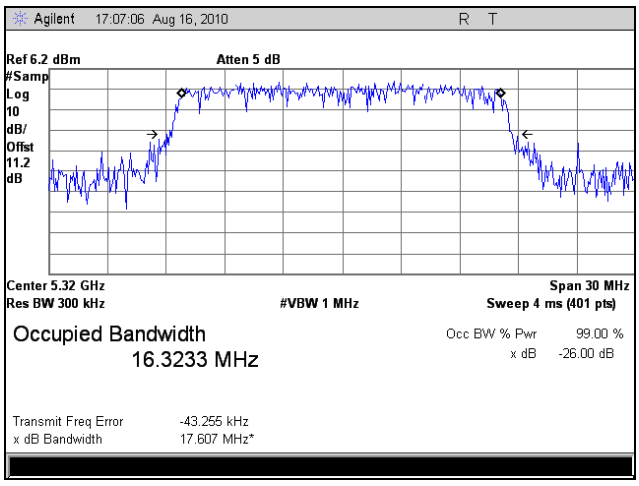
99% Occupied Bandwidth Test Results, 802.11n 20 MHz, Port 3



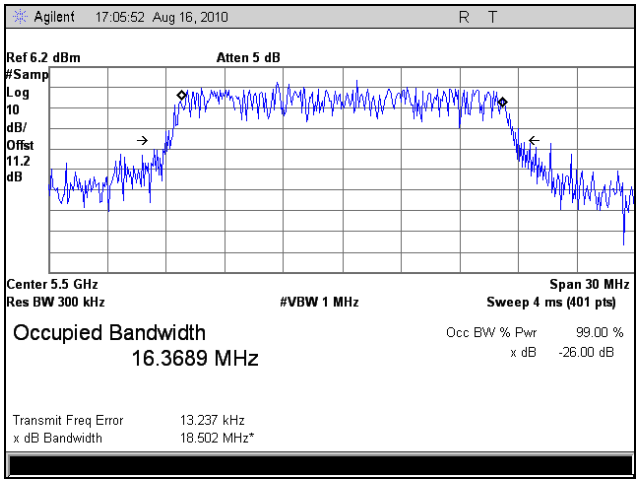
Plot 77. 99% Occupied Bandwidth, 802.11n 20 MHz, 5260 MHz, Port 3



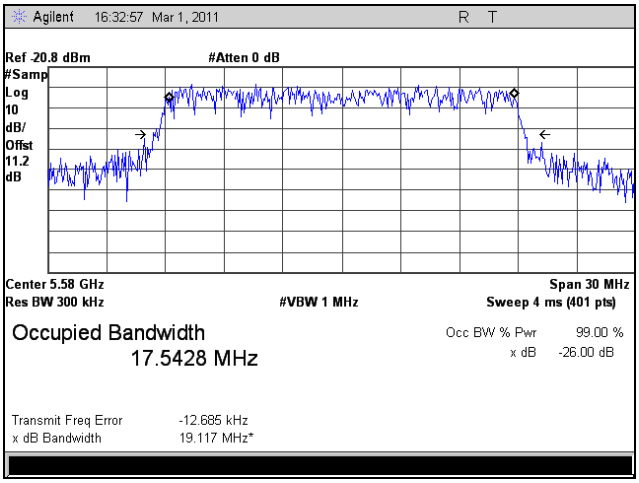
Plot 78. 99% Occupied Bandwidth, 802.11n 20 MHz, 5300 MHz, Port 3



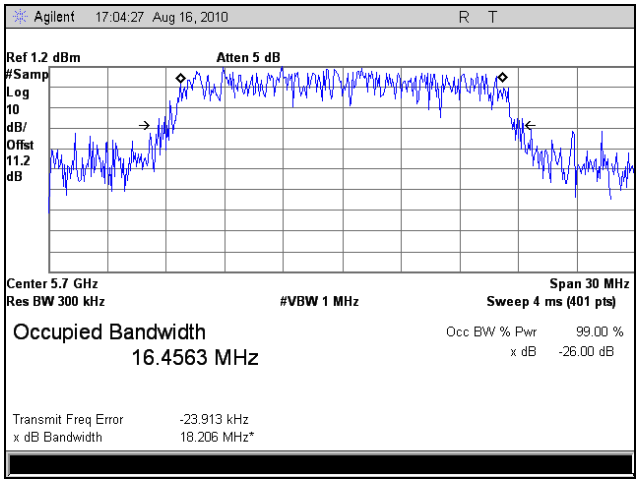
Plot 79. 99% Occupied Bandwidth, 802.11n 20 MHz, 5320 MHz, Port 3



Plot 80. 99% Occupied Bandwidth, 802.11n 20 MHz, 5500 MHz, Port 3

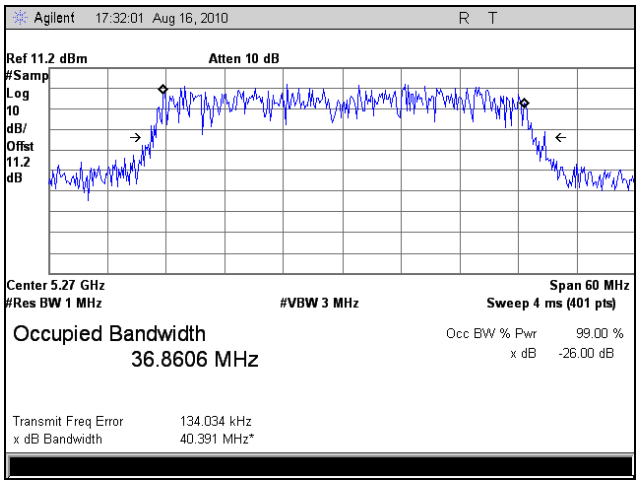


Plot 81. 99% Occupied Bandwidth, 802.11n 20 MHz, 5580 MHz, Port 3

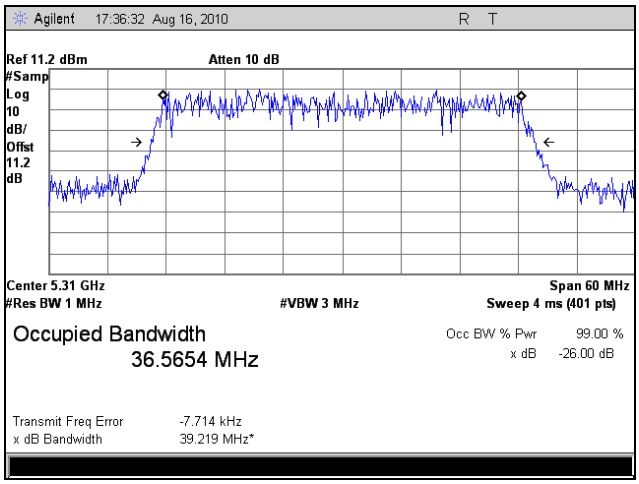


Plot 82. 99% Occupied Bandwidth, 802.11n 20 MHz, 5700 MHz, Port 3

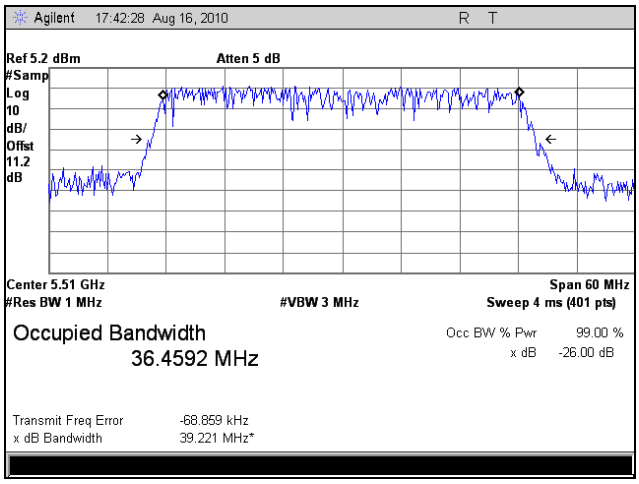
99% Occupied Bandwidth Test Results, 802.11n 40 MHz, Port 3



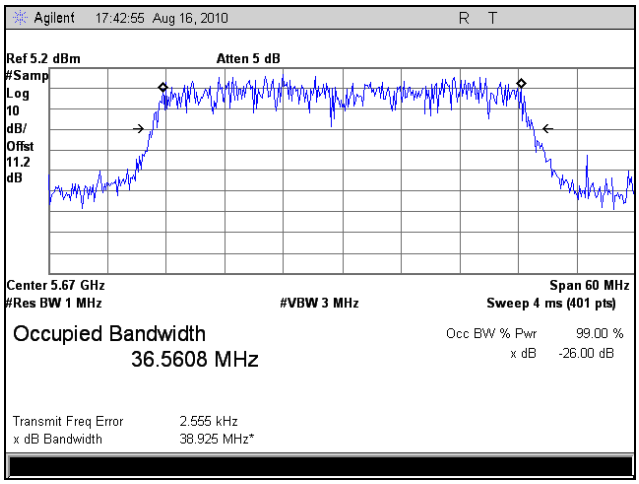
Plot 83. 99% Occupied Bandwidth, 802.11n 40 MHz, 5270 MHz, Port 3



Plot 84. 99% Occupied Bandwidth, 802.11n 40 MHz, 5310 MHz, Port 3



Plot 85. 99% Occupied Bandwidth, 802.11n 40 MHz, 5510 MHz, Port 3



Plot 86. 99% Occupied Bandwidth, 802.11n 40 MHz, 5670 MHz, Port 3

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15. 407(a)(3) RF Power Output

Test Requirements: **§15.407(a) (3):** The maximum output power of the intentional radiator shall not exceed the following:

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

Table 26. Output Power Requirements from §15.407

§15.407(a) (3): For the band 5.725–5.825 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 1 W or 17 dBm + 10 log B, where B is the 26-dB emission bandwidth in MHz.

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

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

Test Engineer(s): Anderson Soungpanya

Test Date(s): 08/31/10

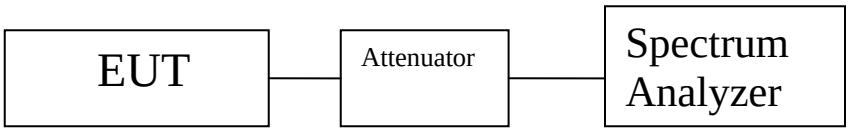


Figure 3. Power Output Test Setup

Mode	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (mW)
802.11a	5260	14.14	25.94
	5300	14.39	27.48
	5320	15.48	35.32
	5500	14.36	27.29
	5580	13.92	24.72
	5700	15.01	31.70
802.11n 20MH	5260	15.10	32.36
	5300	15.11	32.43
	5320	12.43	17.50
	5500	15.36	34.36
	5580	11.70	14.82
	5700	14.44	27.80
802.11n 40 MHz	5270	14.57	28.64
	5310	13.47	22.23
	5510	14.57	28.64
	5670	14.57	28.64

Table 27. RF Power Output, Test Results, Port 1

Mode	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (mW)
802.11n 20MH	5260	11.51	14.16
	5300	12.84	19.23
	5320	10.60	11.48
	5500	14.88	30.76
	5580	13.98	25.06
	5700	16.16	41.30
802.11n 40 MHz	5270	10.17	10.40
	5310	6.46	4.43
	5510	9.48	8.87
	5670	12.27	16.87

Table 28. RF Power Output, Test Results, Port 2

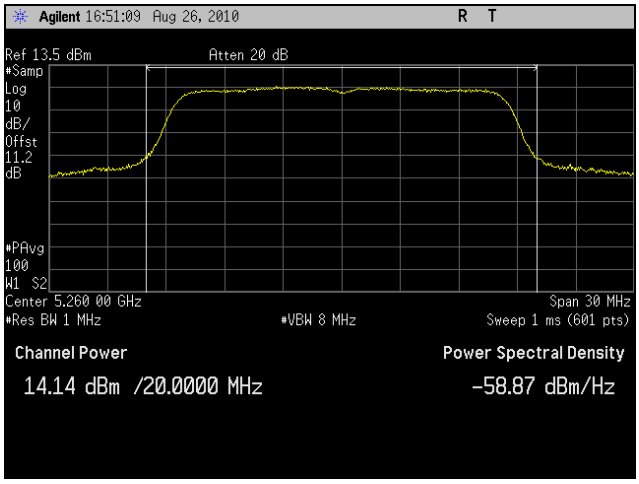
Mode	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (mW)
802.11n 20MHz	5260	12.27	16.87
	5300	12.99	19.91
	5320	9.20	8.32
	5500	11.03	12.68
	5580	14.04	25.41
	5700	11.90	15.49
802.11n 40 MHz	5270	11.92	15.56
	5310	6.61	4.58
	5510	9.00	7.94
	5670	10.48	11.17

Table 29. RF Power Output, Test Results, Port 3

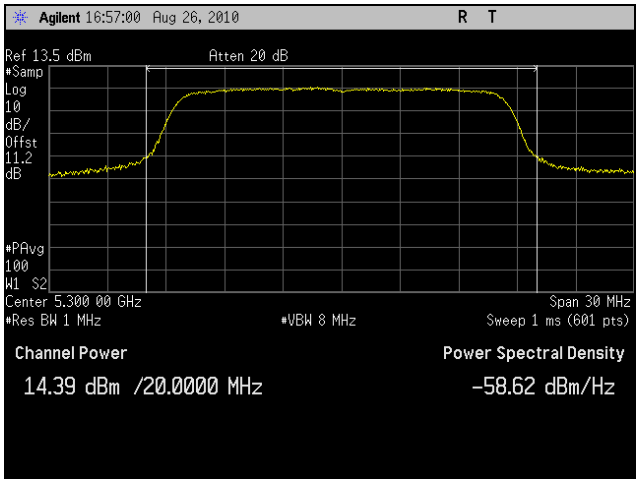
Mode	Frequency (MHz)	Conducted Power (dBm)	Conducted Power (mW)
802.11n 20MH	5260	18.01	63.38
	5300	18.54	71.57
	5320	15.71	37.29
	5500	18.90	77.79
	5580	18.14	65.14
	5700	19.29	84.97
802.11n 40 MHz	5270	16.73	47.14
	5310	14.16	26.06
	5510	14.47	28.03
	5670	15.96	39.48

Table 30. RF Power Output, Test Results, Combined

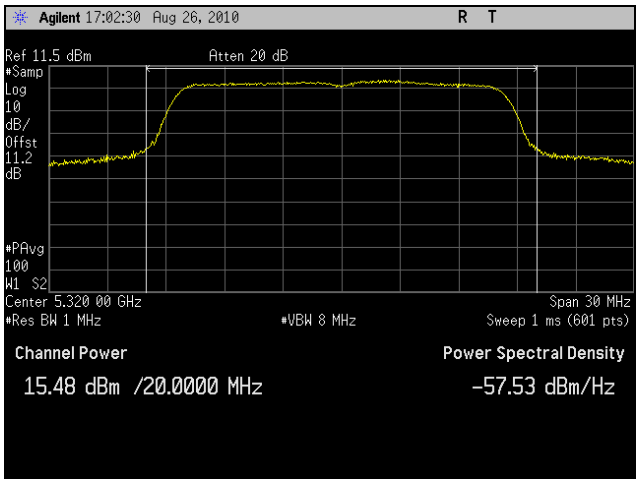
RF Output Power Test Results, 802.11a, Port 1



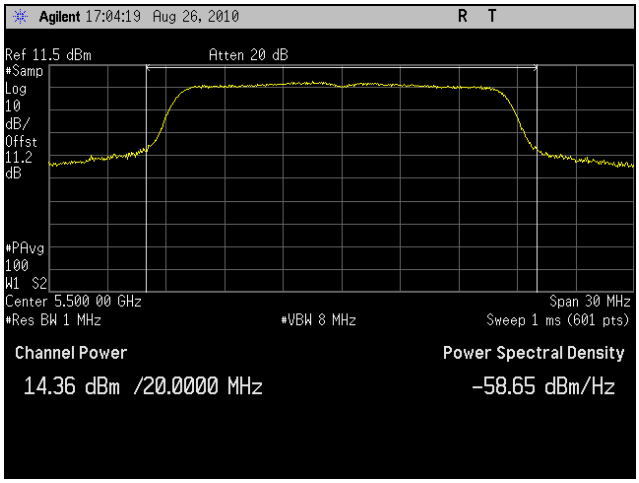
Plot 87. RF Power Output, 802.11a, 5260 MHz, Port 1



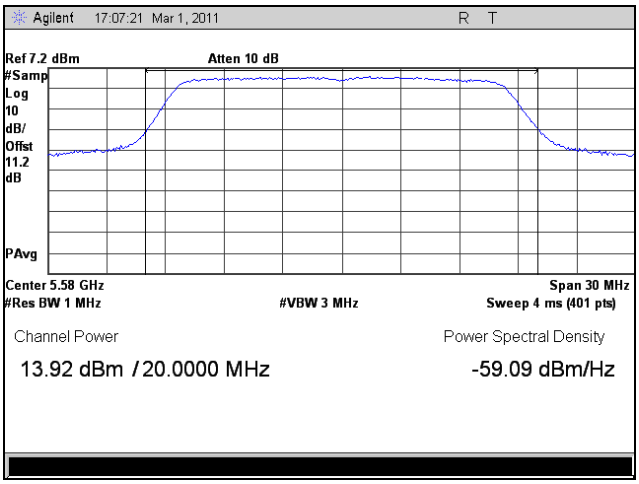
Plot 88. RF Power Output, 802.11a, 5300 MHz, Port 1



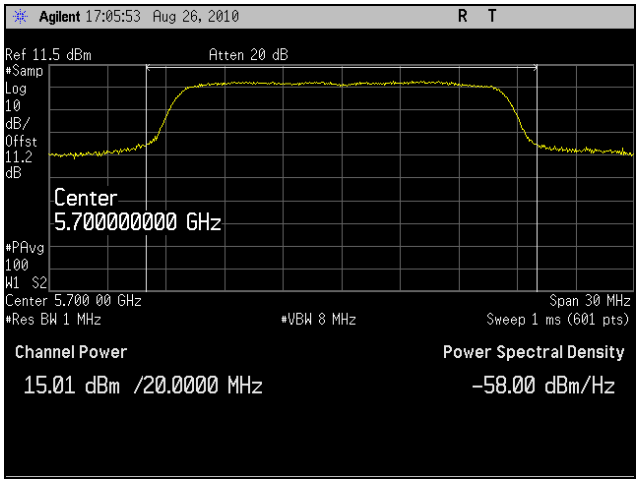
Plot 89. RF Power Output, 802.11a, 5320 MHz, Port 1



Plot 90. RF Power Output, 802.11a, 5500 MHz, Port 1

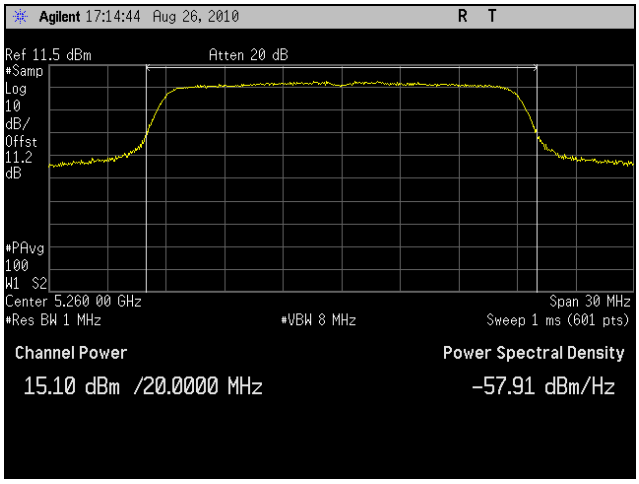


Plot 91. RF Power Output, 802.11a, 5580 MHz, Port 1

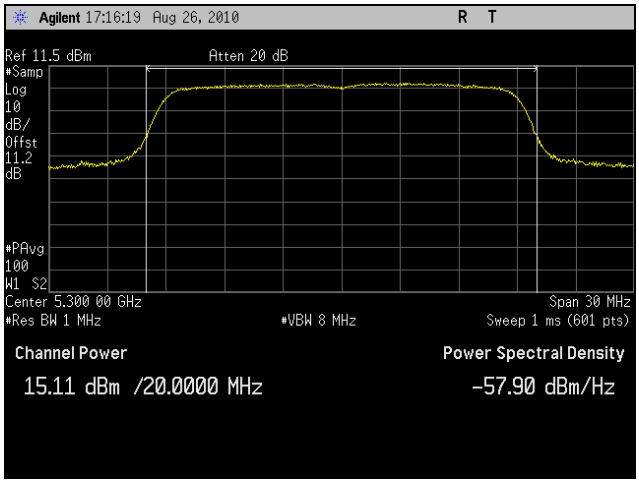


Plot 92. RF Power Output, 802.11a, 5700 MHz, Port 1

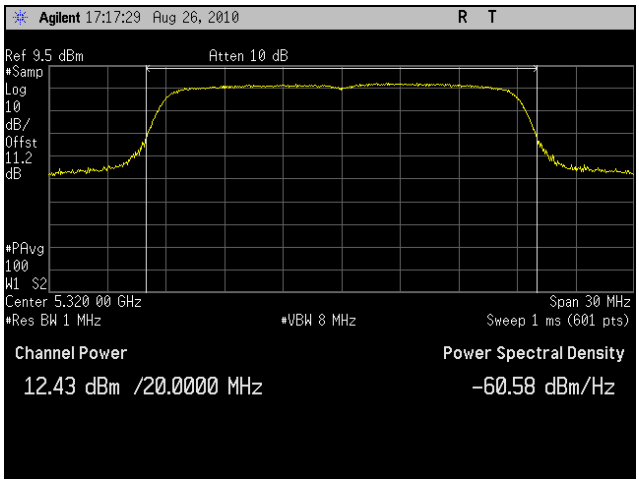
RF Output Power Test Results, 802.11n 20 MHz, Port 1



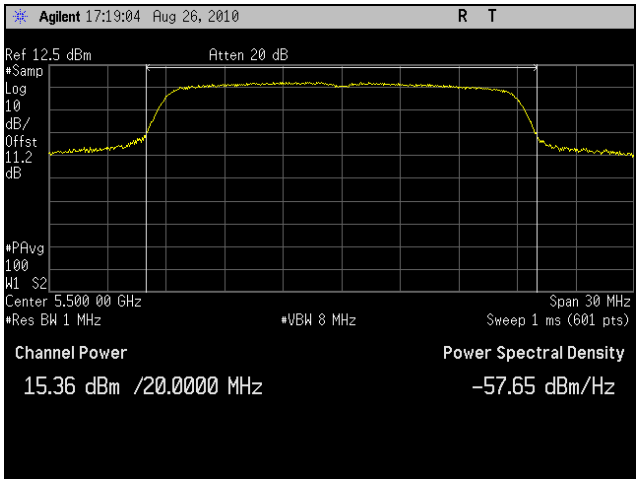
Plot 93. RF Power Output, 802.11n 20 MHz, 5260 MHz, Port 1



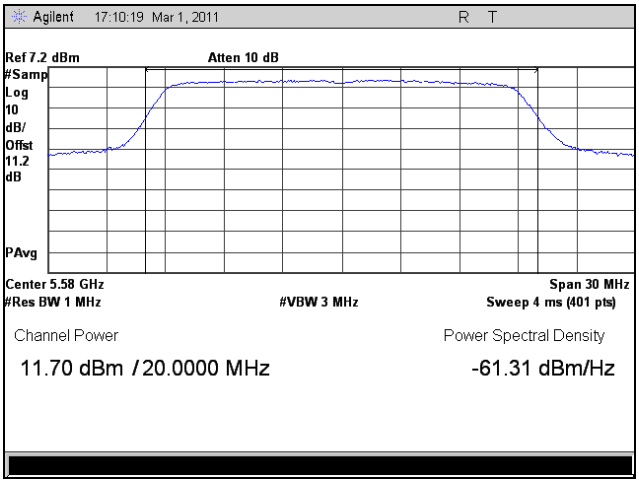
Plot 94. RF Power Output, 802.11n 20 MHz, 5300 MHz, Port 1



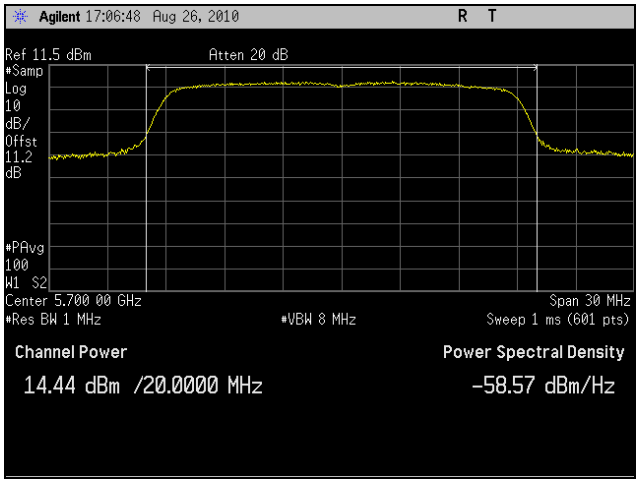
Plot 95. RF Power Output, 802.11n 20 MHz, 5320 MHz, Port 1



Plot 96. RF Power Output, 802.11n 20 MHz, 5500 MHz, Port 1

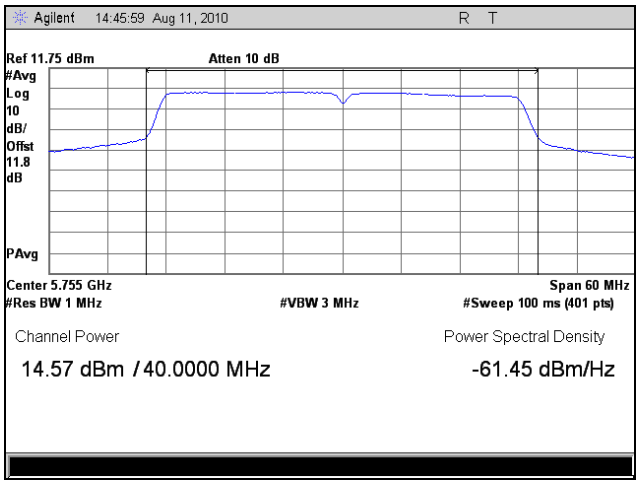


Plot 97. RF Power Output, 802.11n 20 MHz, 5580 MHz, Port 1

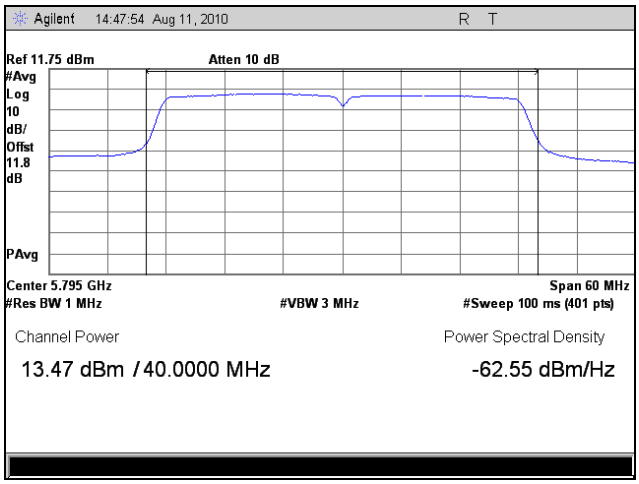


Plot 98. RF Power Output, 802.11n 20 MHz, 5700 MHz, Port 1

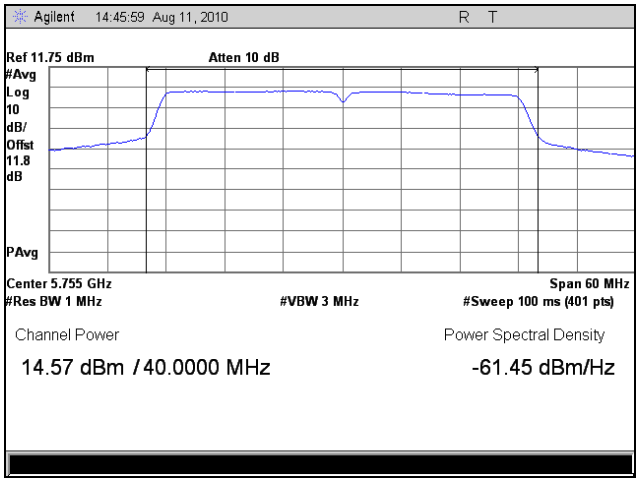
RF Output Power Test Results, 802.11n 40 MHz, Port 1



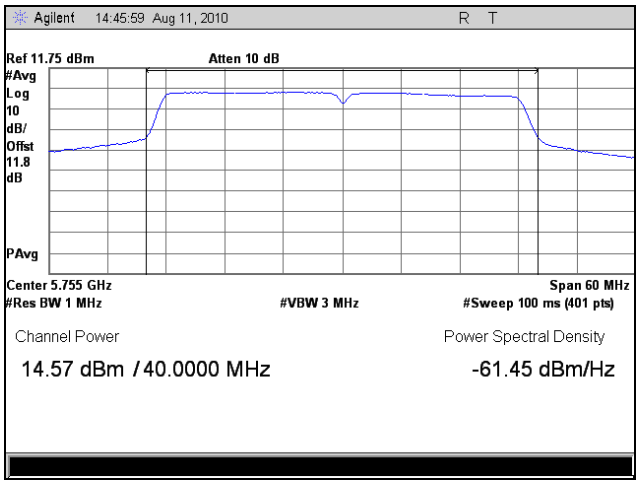
Plot 99. RF Power Output, 802.11n 40 MHz, 5270 MHz, Port 1



Plot 100. RF Power Output, 802.11n 40 MHz, 5310 MHz, Port 1

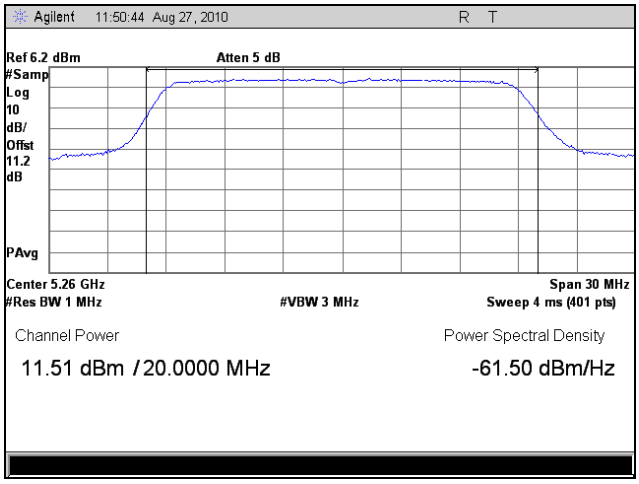


Plot 101. RF Power Output, 802.11n 40 MHz, 5510 MHz, Port 1

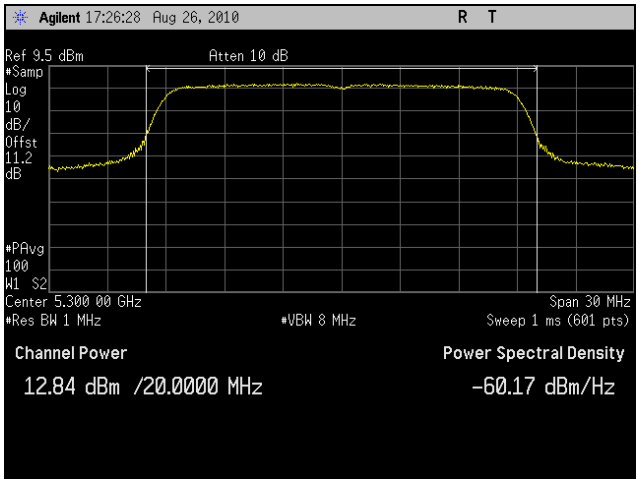


Plot 102. RF Power Output, 802.11n 40 MHz, 5670 MHz, Port 1

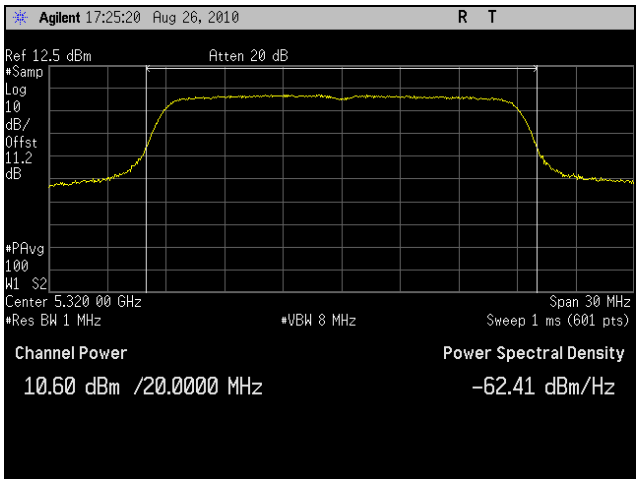
RF Output Power Test Results, 802.11n 20 MHz, Port 2



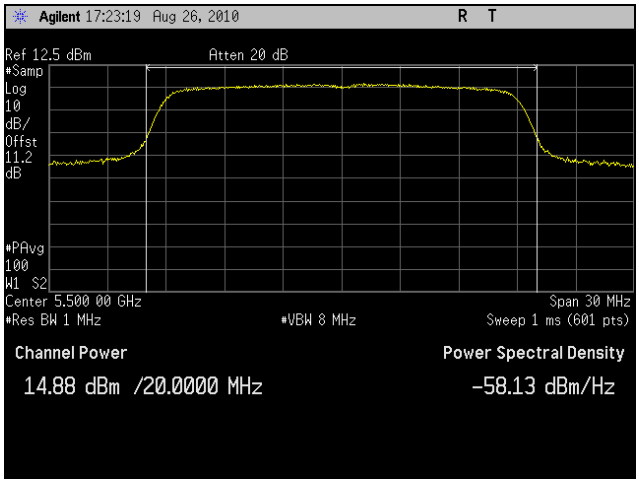
Plot 103. RF Power Output, 802.11n 20 MHz, 5260 MHz, Port 2



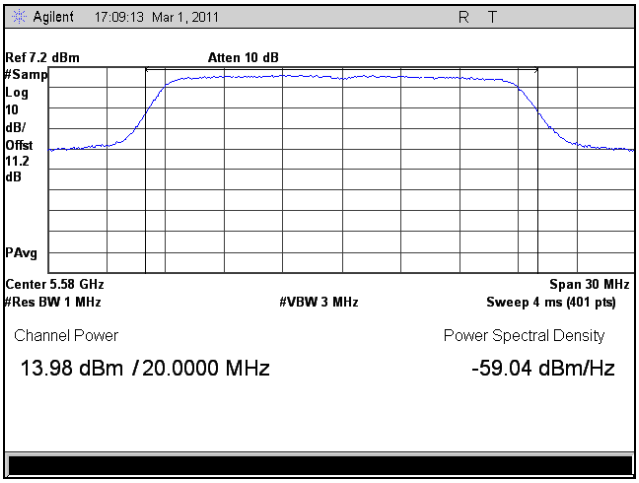
Plot 104. RF Power Output, 802.11n 20 MHz, 5300 MHz, Port 2



Plot 105. RF Power Output, 802.11n 20 MHz, 5320 MHz, Port 2



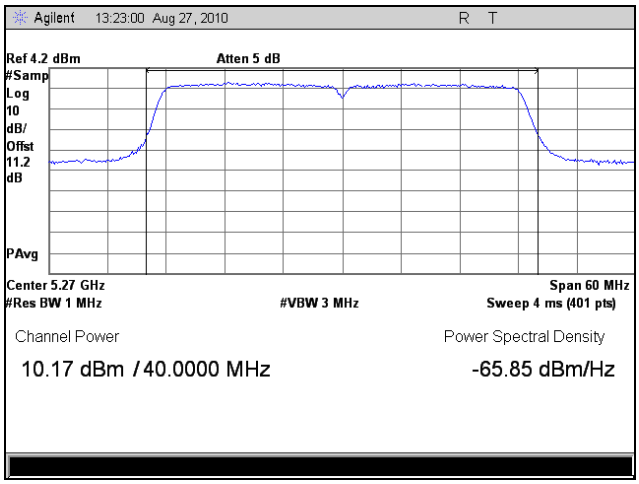
Plot 106. RF Power Output, 802.11n 20 MHz, 5500 MHz, Port 2



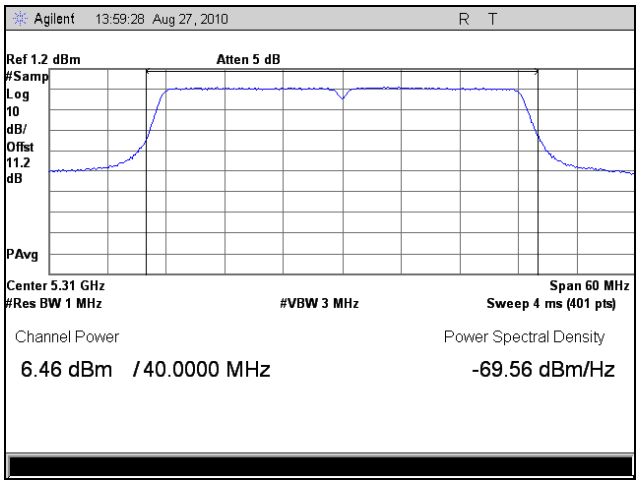
Plot 107. RF Power Output, 802.11n 20 MHz, 5580 MHz, Port 2

Plot 108. RF Power Output, 802.11n 20 MHz, 5700 MHz, Port 2

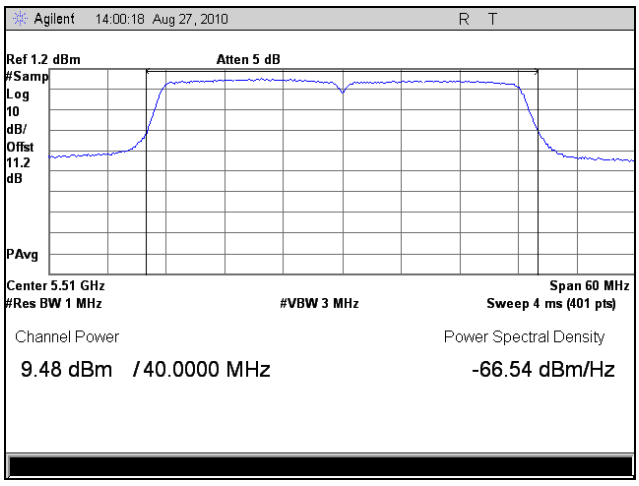
RF Output Power Test Results, 802.11n 40 MHz, Port 2



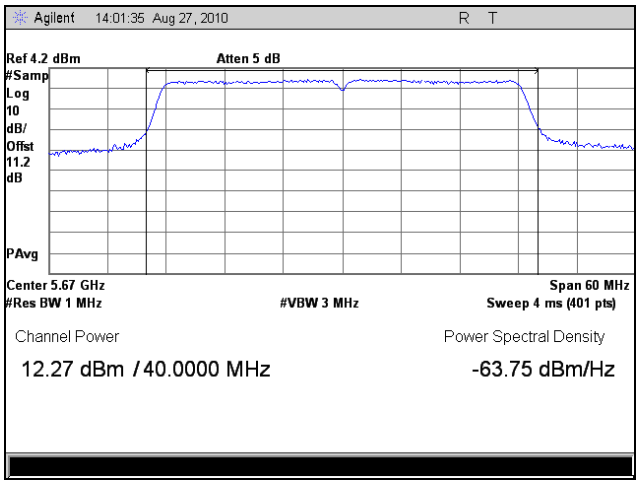
Plot 109. RF Power Output, 802.11n 40 MHz, 5270 MHz, Port 2



Plot 110. RF Power Output, 802.11n 40 MHz, 5310 MHz, Port 2

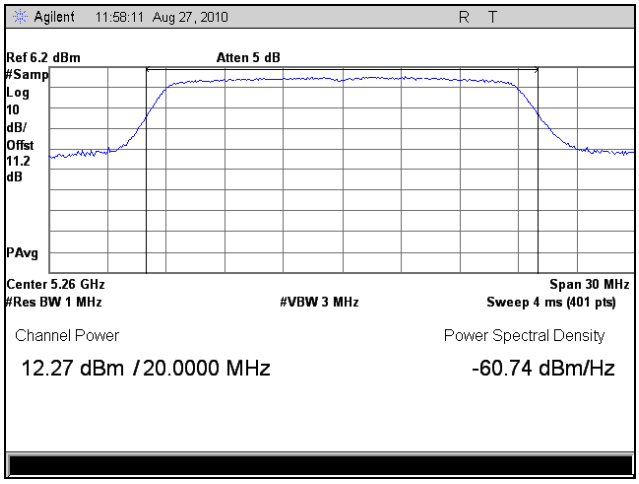


Plot 111. RF Power Output, 802.11n 40 MHz, 5510 MHz, Port 2

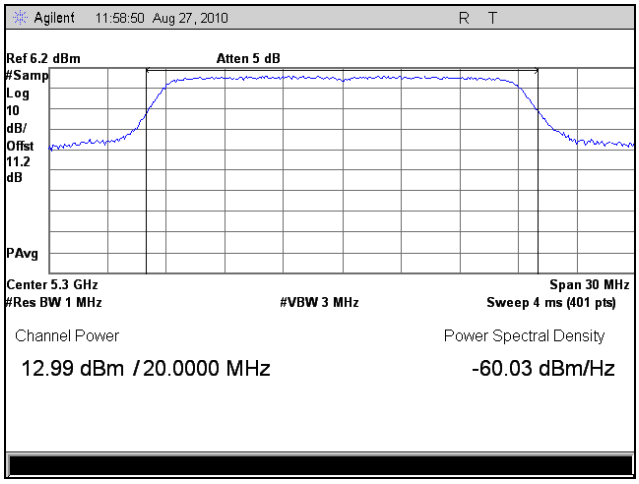


Plot 112. RF Power Output, 802.11n 40 MHz, 5670 MHz, Port 2

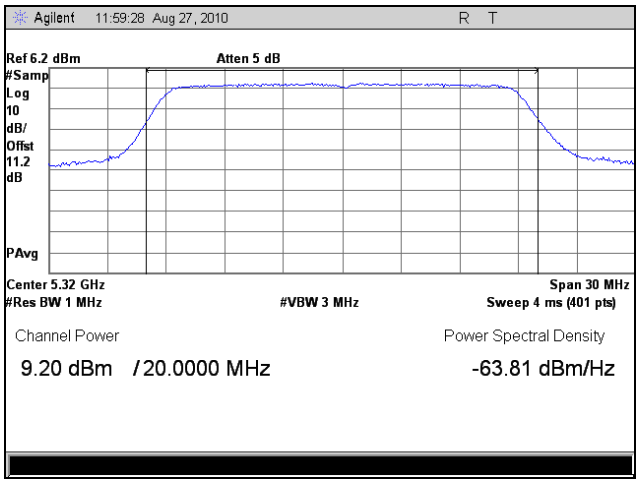
RF Output Power Test Results, 802.11n 20 MHz, Port 3



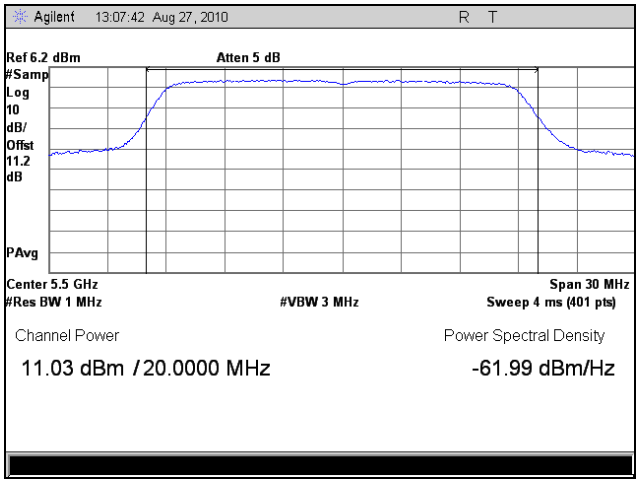
Plot 113. RF Power Output, 802.11n 20 MHz, 5260 MHz, Port 3



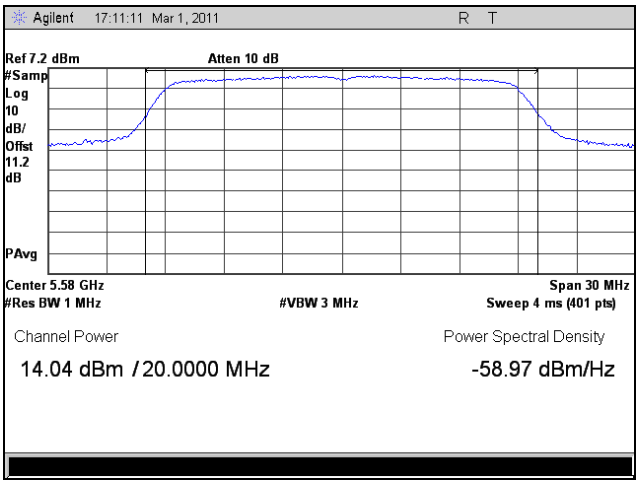
Plot 114. RF Power Output, 802.11n 20 MHz, 5300 MHz, Port 3



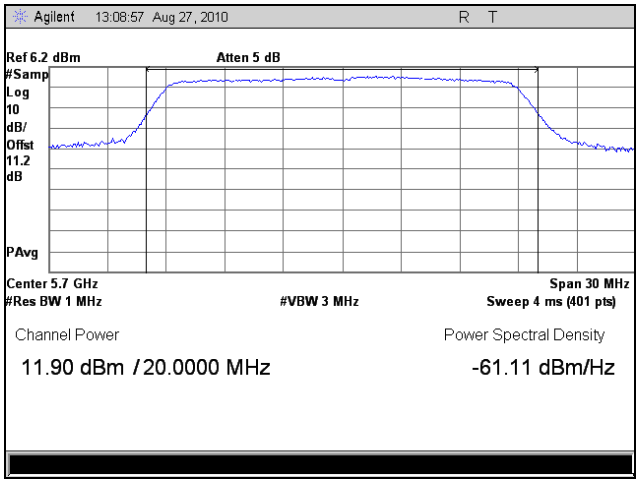
Plot 115. RF Power Output, 802.11n 20 MHz, 5320 MHz, Port 3



Plot 116. RF Power Output, 802.11n 20 MHz, 5500 MHz, Port 3

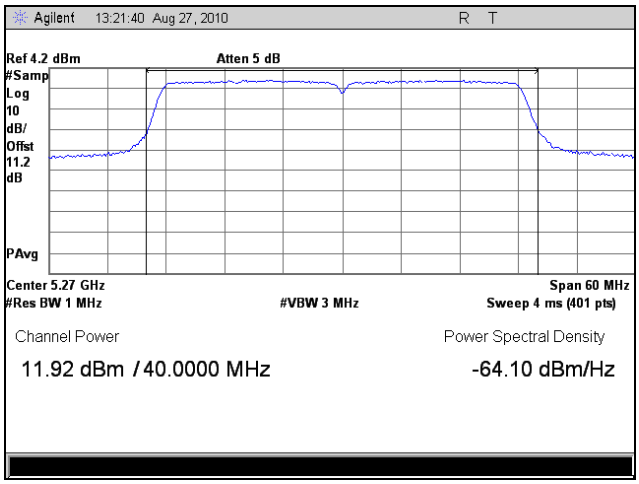


Plot 117. RF Power Output, 802.11n 20 MHz, 5580 MHz, Port 3

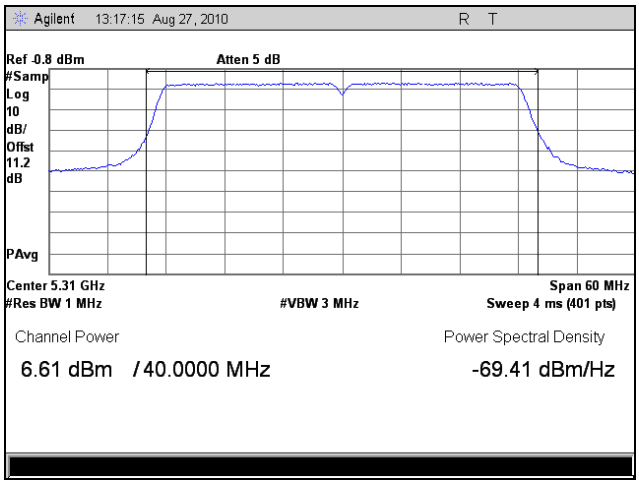


Plot 118. RF Power Output, 802.11n 20 MHz, 5700 MHz, Port 3

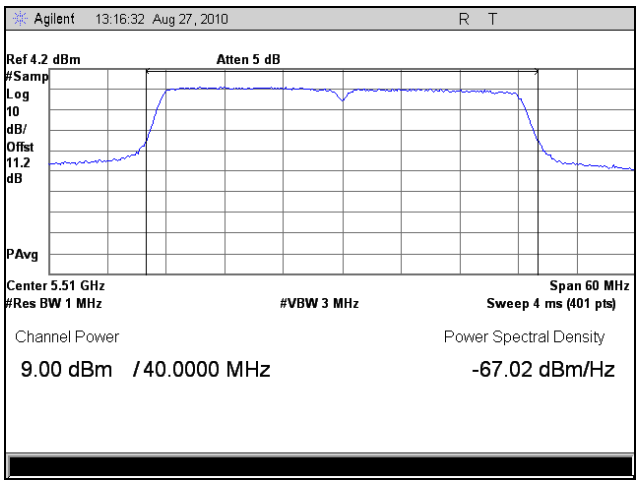
RF Output Power Test Results, 802.11n 40 MHz, Port 3



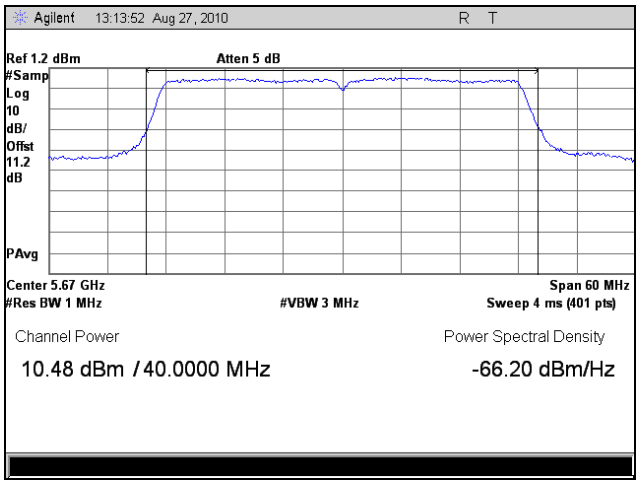
Plot 119. RF Power Output, 802.11n 40 MHz, 5270 MHz, Port 3



Plot 120. RF Power Output, 802.11n 40 MHz, 5310 MHz, Port 3



Plot 121. RF Power Output, 802.11n 40 MHz, 5510 MHz, Port 3



Plot 122. RF Power Output, 802.11n 40 MHz, 5670 MHz, Port 3

§ 15.407(f) RF Exposure

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

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

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

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

where, S = Power Density mW/m^2
P = Power (mW)
R = Distance to the center of radiation of the antenna
G = Maximum antenna gain

Maximum antenna gain for EUT = 3 dBi

MPE Limit Calculation: EUT's operating frequency is 5250-5350MHz and 5470-5725MHz;. Highest conducted power = 19.29dBm. Therefore, **Limit for Uncontrolled exposure: 1 mW/cm^2 or 10 W/m^2.**

$S = (84.91*1.99 / 4*3.14*20.0^2) = (168.43 / 5024) =$ **0.033mW/cm^2**@ 20cm separation

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.407(a)(3) Peak Power Spectral Density

Test Requirements: **§ 15.407(a)(1), (a)(2):** For digitally modulated systems, the conducted peak power spectral density from the intentional radiator to the antenna shall not be greater than 4dBm/MHz in the frequency band 5.15-5.25 GHz and 11dBm/MHz in the frequency band 5.25-5.35GHz.

Test Procedure: The transmitter was connected directly to a Spectrum Analyzer through an attenuator. The power level was set to the maximum level on the EUT. The RBW was set to 1MHz and the VBW was set to 3MHz. The method of measurement #2 from the FCC Public Notice DA 02-2138 was used. A combiner was used to measure spectral density in MIMO mode.

Test Results: Equipment was compliant with the peak power spectral density limits of **§ 15.407 (a)(2).** The peak power spectral density was determined from plots on the following page(s).

Test Engineer(s): Anderson Soungpanya

Test Date(s): 08/31/10

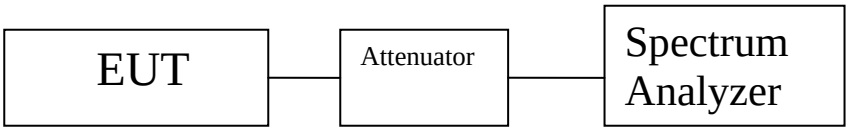


Figure 4. Power Spectral Density Test Setup

Mode	Frequency (MHz)	PSD (dBm)
802.11a	5260	7.204
	5300	8.157
	5320	6.643
	5500	5.456
	5580	1.590
	5700	5.861
802.11n 20 MHz	5260	5.728
	5300	5.864
	5320	3.361
	5500	4.510
	5580	2.052
	5700	4.314
802.11n 40 MHz	5270	0.793
	5310	-6.440
	5510	-2.548
	5670	-1.419

Table 31. Power Spectral Density, Test Results, Port 1

Mode	Frequency (MHz)	PSD (dBm)
802.11n 20 MHz	5260	2.263
	5300	1.339
	5320	-0.927
	5500	3.598
	5580	1.935
	5700	5.518
802.11n 40 MHz	5270	-1.926
	5310	-7.202
	5510	-1.833
	5670	-0.675

Table 32. Power Spectral Density, Test Results, Port 2

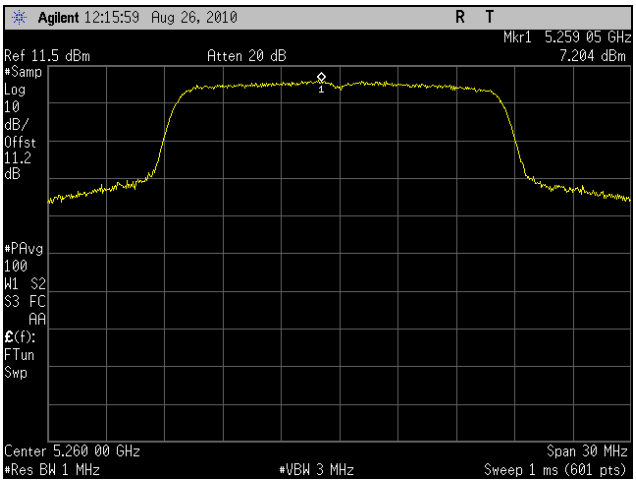
Mode	Frequency (MHz)	PSD (dBm)
802.11n 20 MHz	5260	3.211
	5300	2.869
	5320	0.306
	5500	3.326
	5580	-0.439
	5700	1.558
802.11n 40 MHz	5270	-1.971
	5310	-6.854
	5510	-3.482
	5670	-3.009

Table 33. Power Spectral Density, Test Results, Port 3

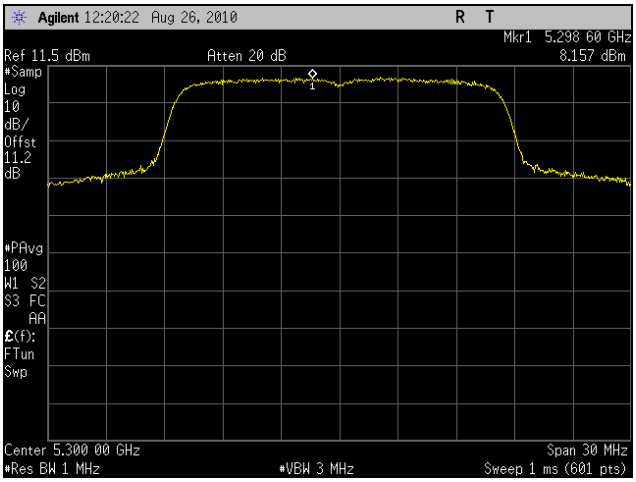
Mode	Frequency (MHz)	PSD (dBm)
802.11n 20 MHz	5260	8.471
	5300	9.568
	5320	4.598
	5500	9.445
	5580	5.823
	5700	9.121
802.11n 40 MHz	5270	-1.222
	5310	0.118
	5510	6.303
	5670	5.545

Table 34. Power Spectral Density, Test Results, Combined Ports

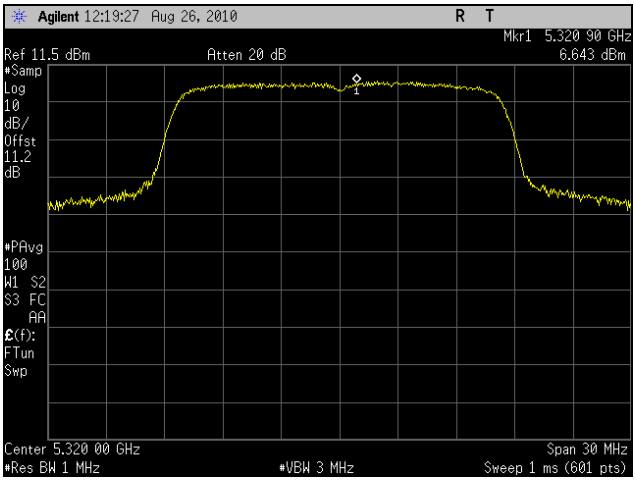
Power Spectral Density Test Results, 802.11a, Port 1



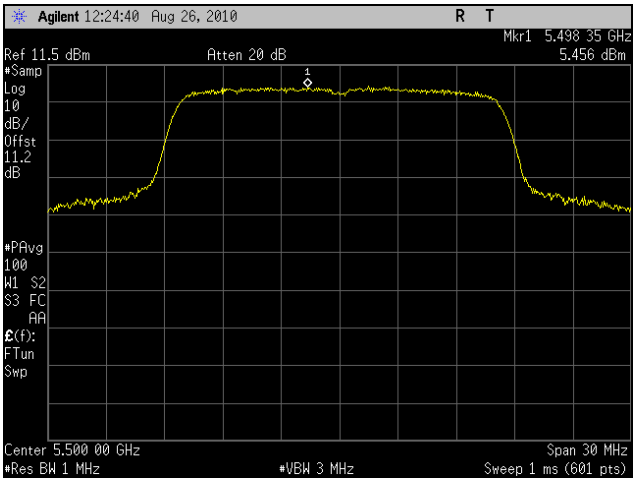
Plot 123. Power Spectral Density, 802.11a, 5260 MHz, Port 1



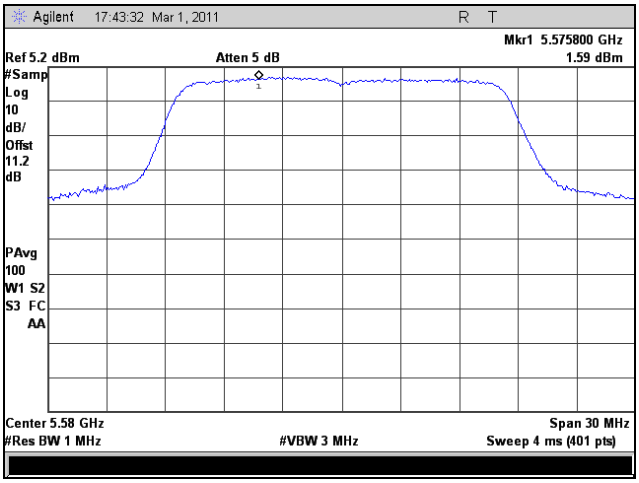
Plot 124. Power Spectral Density, 802.11a, 5300 MHz, Port 1



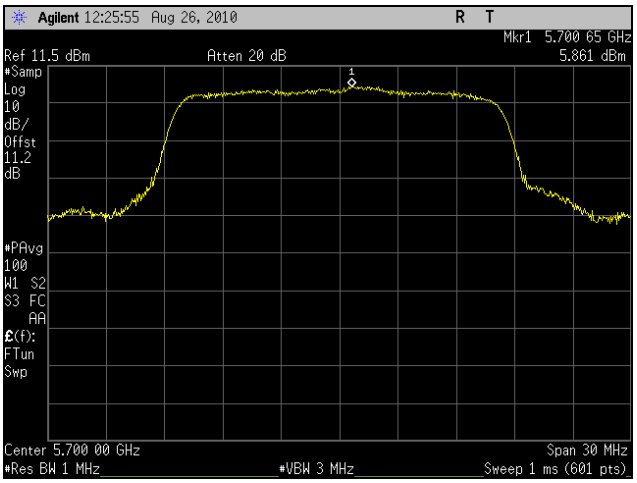
Plot 125. Power Spectral Density, 802.11a, 5320 MHz, Port 1



Plot 126. Power Spectral Density, 802.11a, 5500 MHz, Port 1

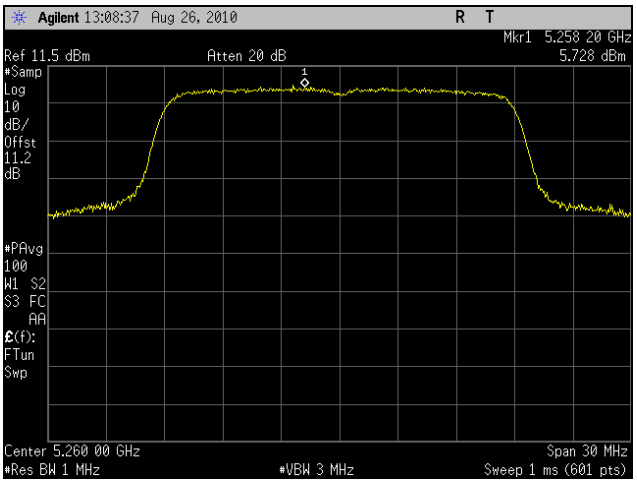


Plot 127. Power Spectral Density, 802.11a, 5580 MHz, Port 1

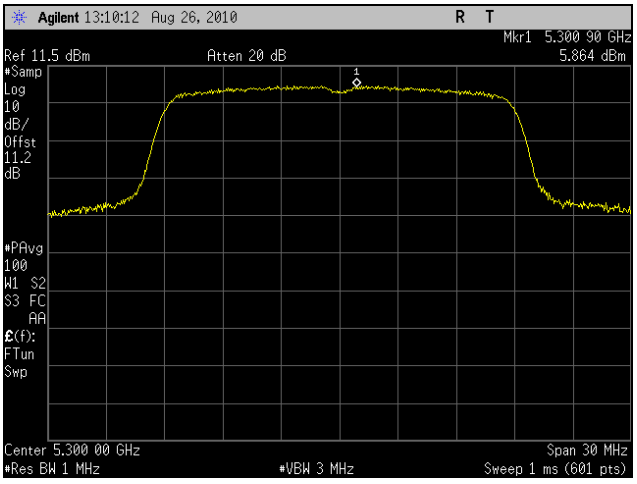


Plot 128. Power Spectral Density, 802.11a, 5700 MHz, Port 1

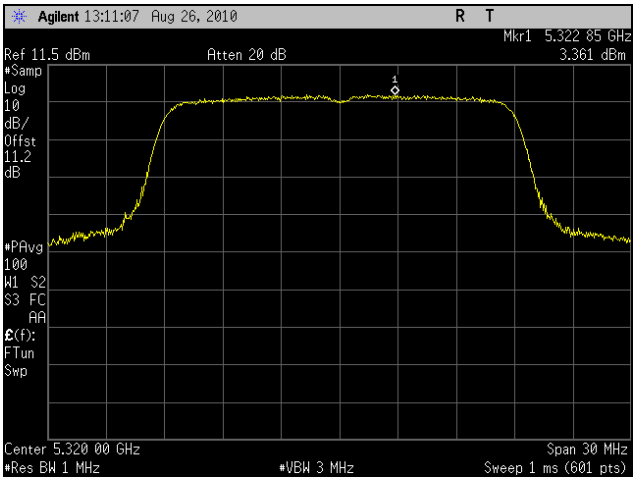
Power Spectral Density Test Results, 802.11n 20 MHz, Port 1



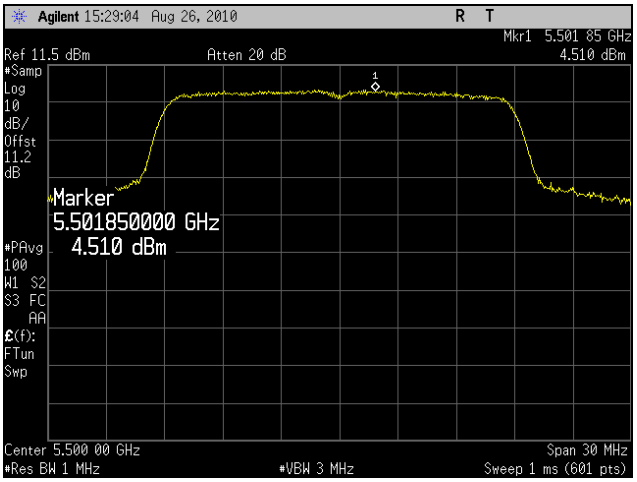
Plot 129. Power Spectral Density, 802.11n 20 MHz, 5260 MHz, Port 1



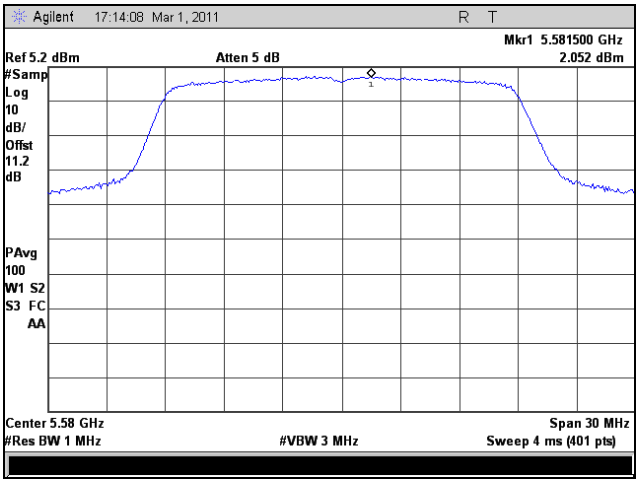
Plot 130. Power Spectral Density, 802.11n 20 MHz, 5300 MHz, Port 1



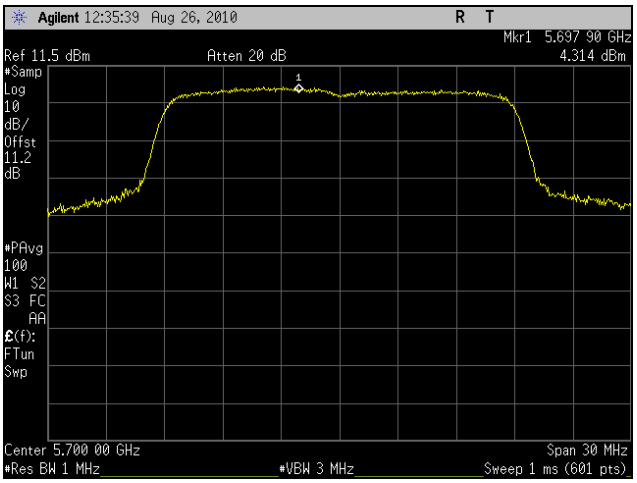
Plot 131. Power Spectral Density, 802.11n 20 MHz, 5320 MHz, Port 1



Plot 132. Power Spectral Density, 802.11n 20 MHz, 5500 MHz, Port 1

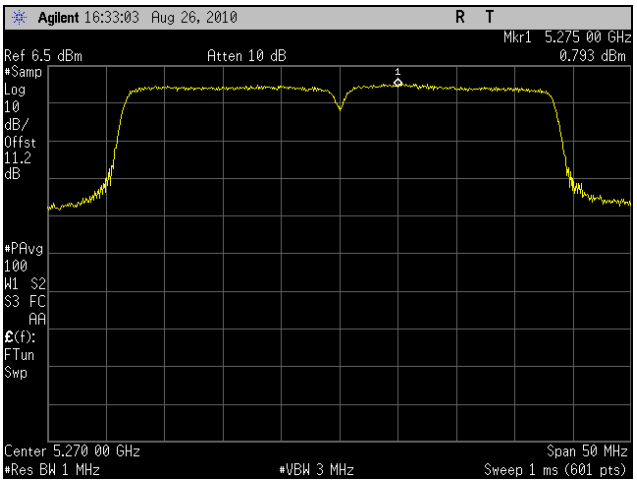


Plot 133. Power Spectral Density, 802.11n 20 MHz, 5580 MHz, Port 1

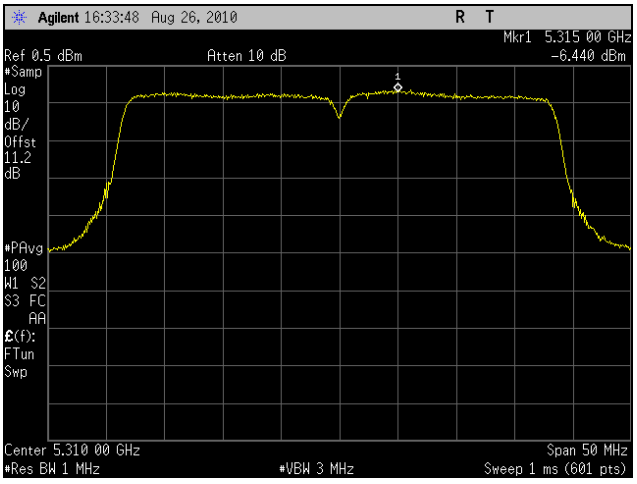


Plot 134. Power Spectral Density, 802.11n 20 MHz, 5700 MHz, Port 1

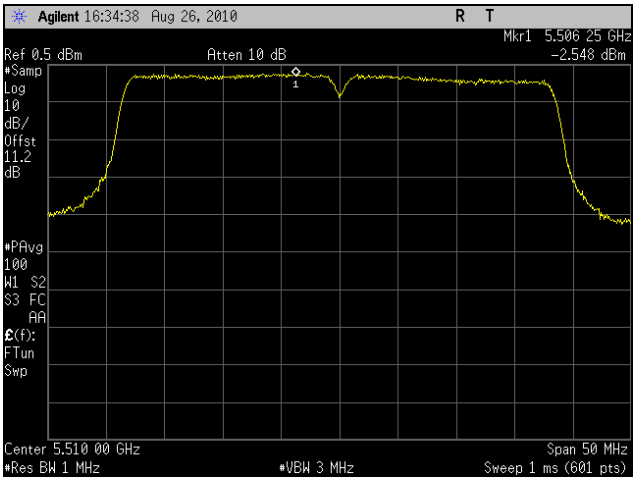
Power Spectral Density Test Results, 802.11n 40 MHz, Port 1



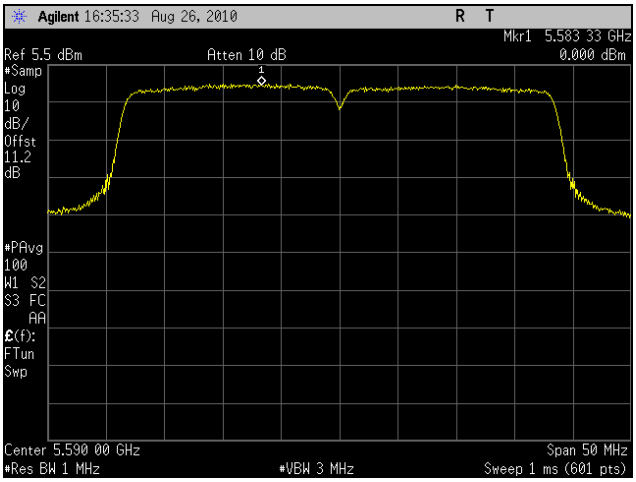
Plot 135. Power Spectral Density, 802.11n 40 MHz, 5270 MHz, Port 1



Plot 136. Power Spectral Density, 802.11n 40 MHz, 5310 MHz, Port 1

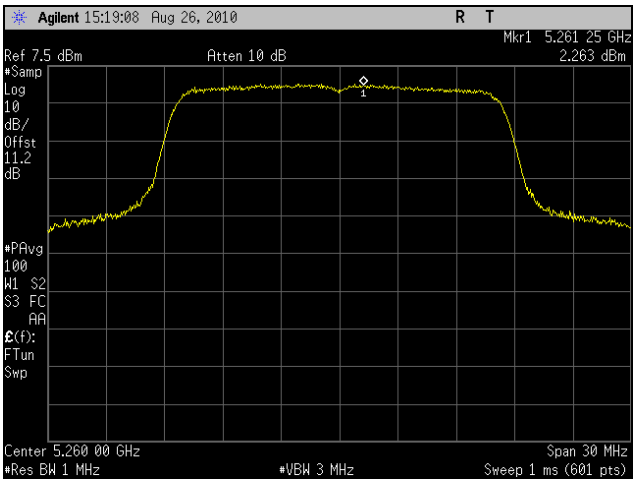


Plot 137. Power Spectral Density, 802.11n 40 MHz, 5510 MHz, Port 1

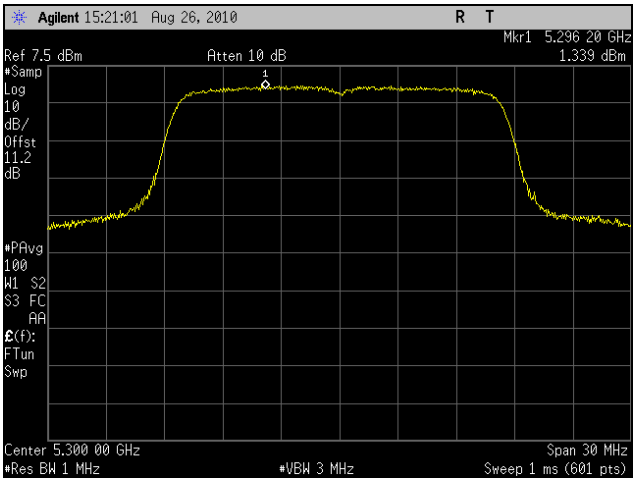


Plot 138. Power Spectral Density, 802.11n 40 MHz, 5670 MHz, Port 1

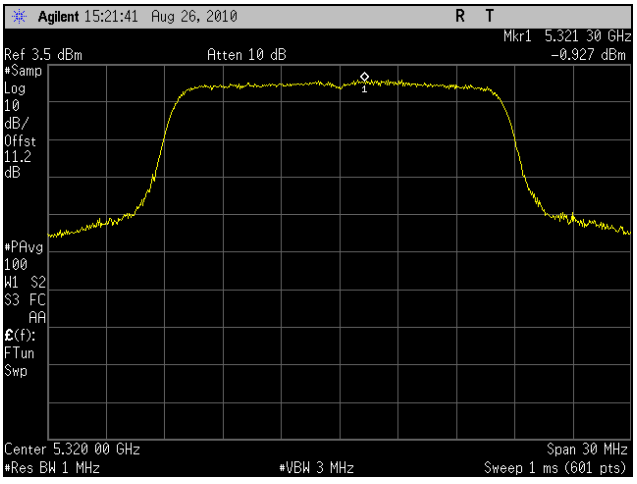
Power Spectral Density Test Results, 802.11n 20 MHz, Port 2



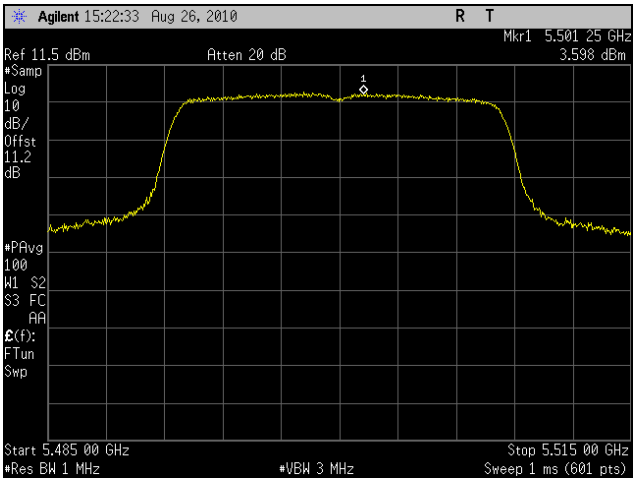
Plot 139. Power Spectral Density, 802.11n 20 MHz, 5260 MHz, Port 2



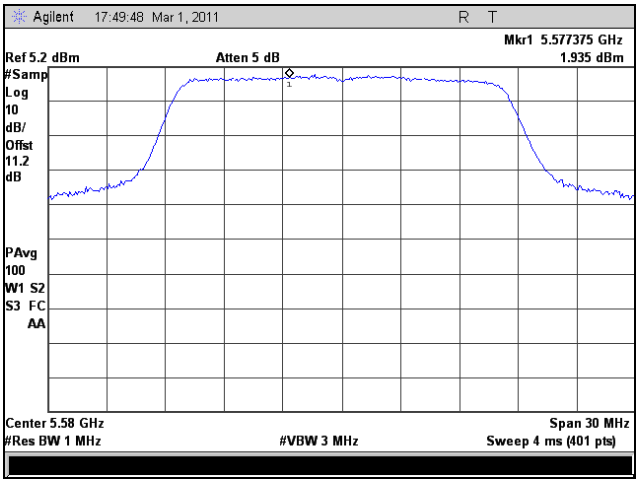
Plot 140. Power Spectral Density, 802.11n 20 MHz, 5300 MHz, Port 2



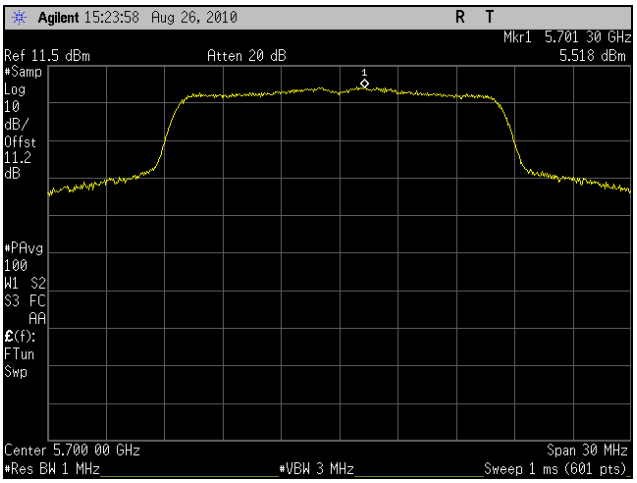
Plot 141. Power Spectral Density, 802.11n 20 MHz, 5320 MHz, Port 2



Plot 142. Power Spectral Density, 802.11n 20 MHz, 5500 MHz, Port 2

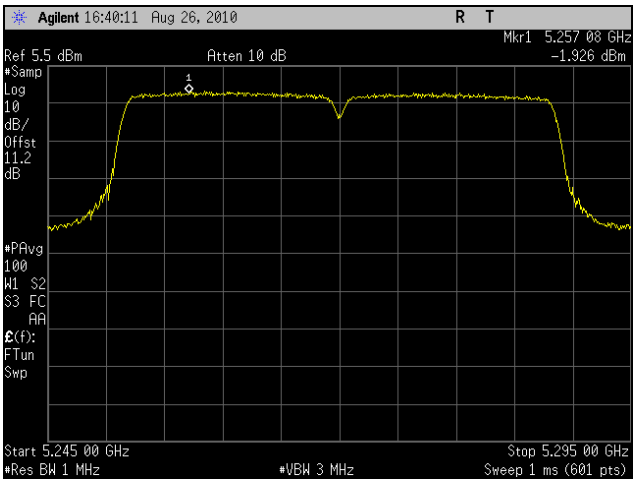


Plot 143. Power Spectral Density, 802.11n 20 MHz, 5580 MHz, Port 2

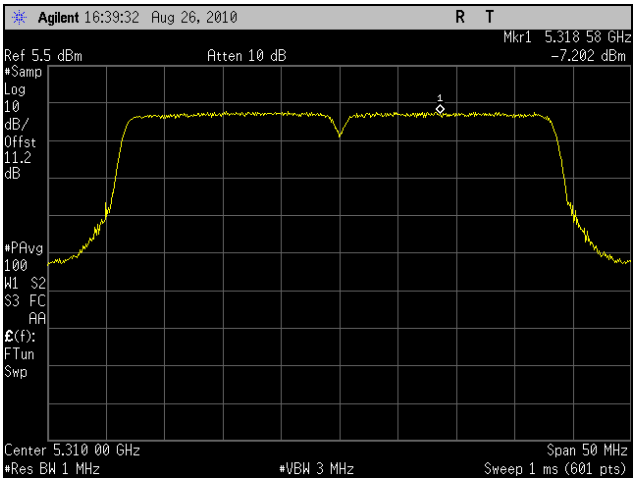


Plot 144. Power Spectral Density, 802.11n 20 MHz, 5700 MHz, Port 2

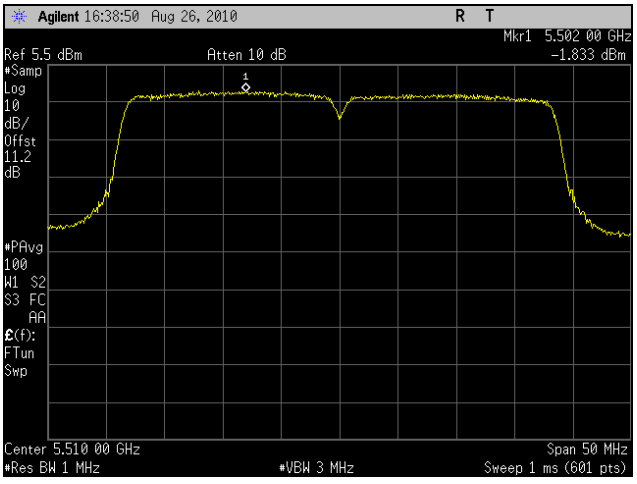
Power Spectral Density Test Results, 802.11n 40 MHz, Port 2



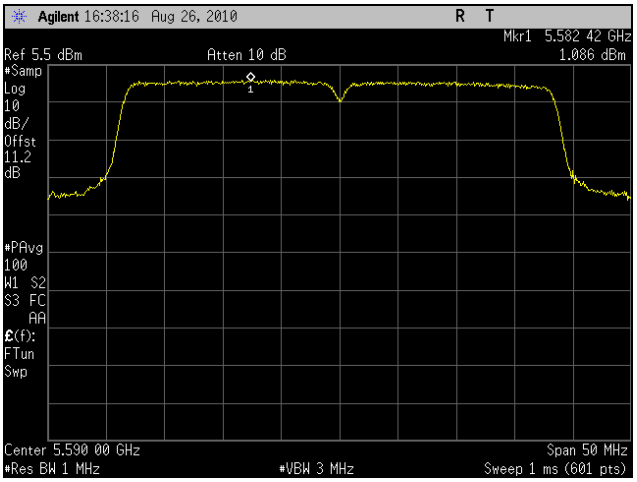
Plot 145. Power Spectral Density, 802.11n 40 MHz, 5270 MHz, Port 2



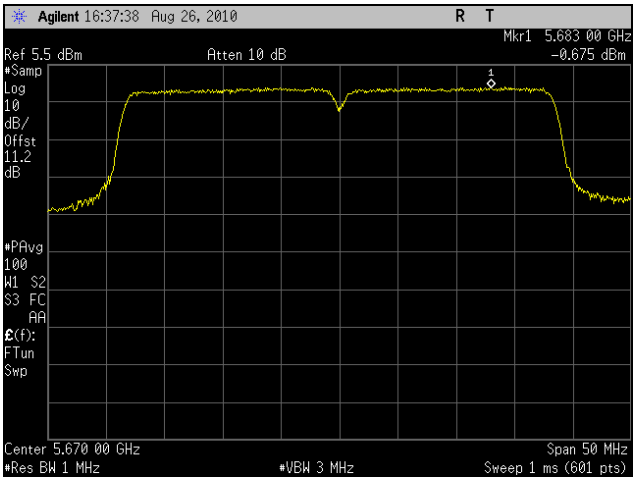
Plot 146. Power Spectral Density, 802.11n 40 MHz, 5310 MHz, Port 2



Plot 147. Power Spectral Density, 802.11n 40 MHz, 5510 MHz, Port 2

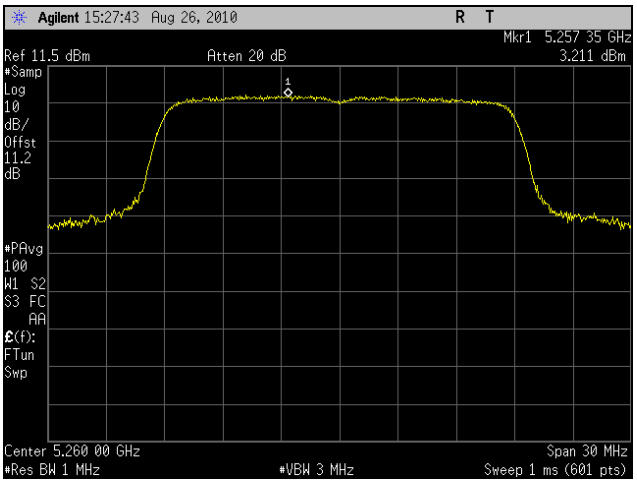


Plot 148. Power Spectral Density, 802.11n 40 MHz, 5590 MHz, Port 2

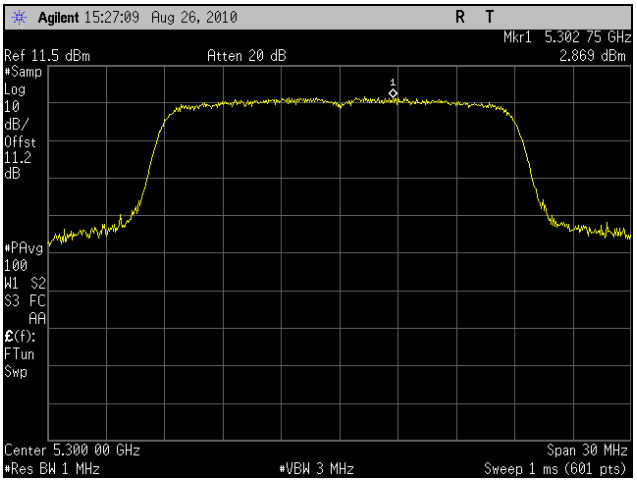


Plot 149. Power Spectral Density, 802.11n 40 MHz, 5670 MHz, Port 2

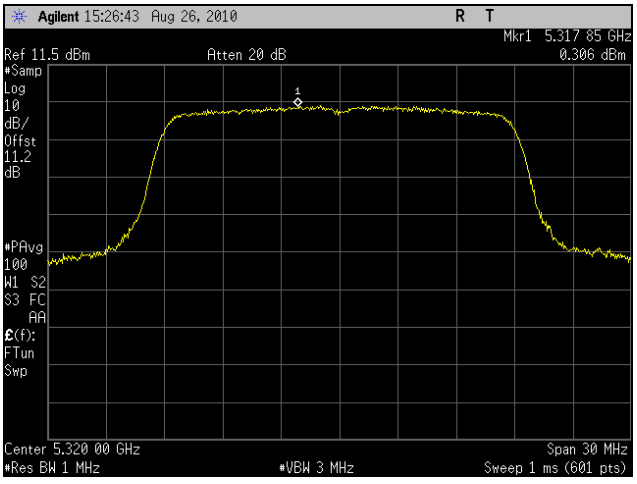
Power Spectral Density Test Results, 802.11n 20 MHz, Port 3



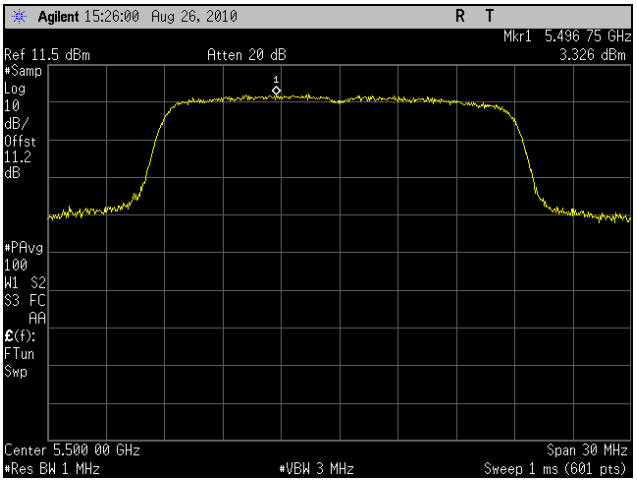
Plot 150. Power Spectral Density, 802.11n 20 MHz, 5260 MHz, Port 3



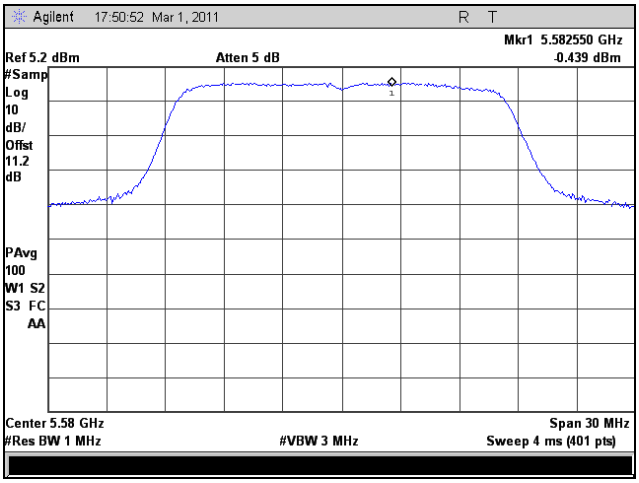
Plot 151. Power Spectral Density, 802.11n 20 MHz, 5300 MHz, Port 3



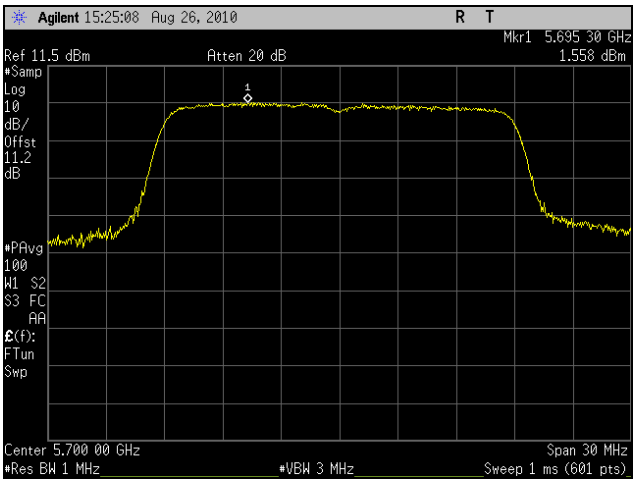
Plot 152. Power Spectral Density, 802.11n 20 MHz, 5320 MHz, Port 3



Plot 153. Power Spectral Density, 802.11n 20 MHz, 5500 MHz, Port 3

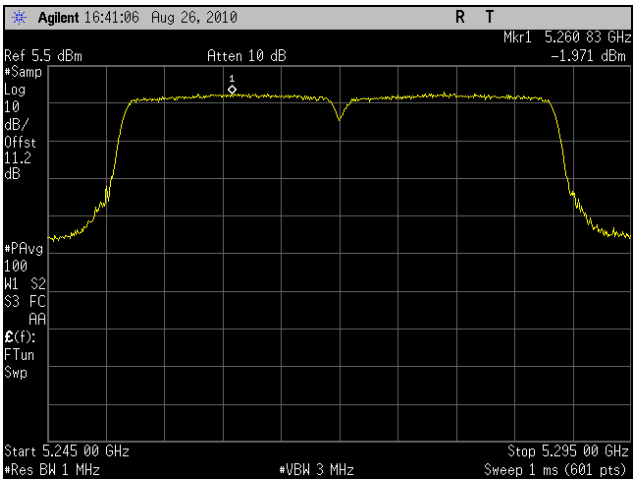


Plot 154. Power Spectral Density, 802.11n 20 MHz, 5580 MHz, Port 3

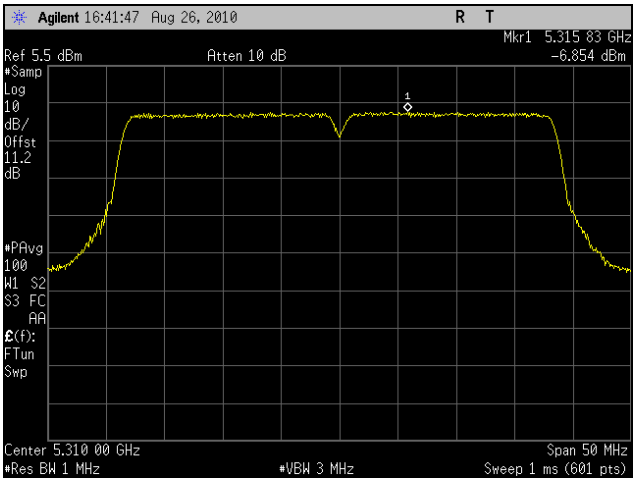


Plot 155. Power Spectral Density, 802.11n 20 MHz, 5700 MHz, Port 3

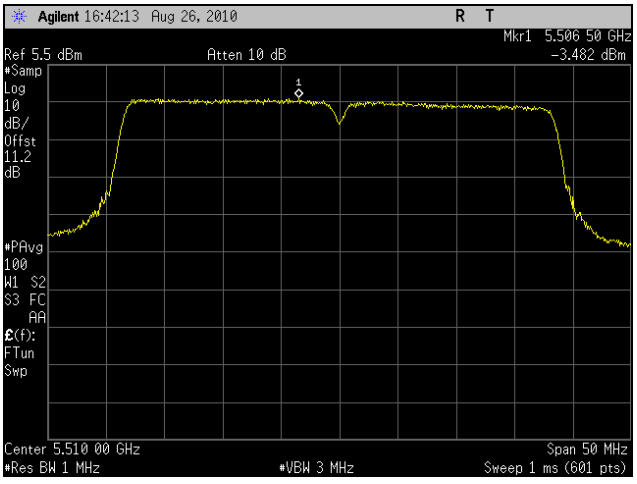
Power Spectral Density Test Results, 802.11n 40 MHz, Port 3



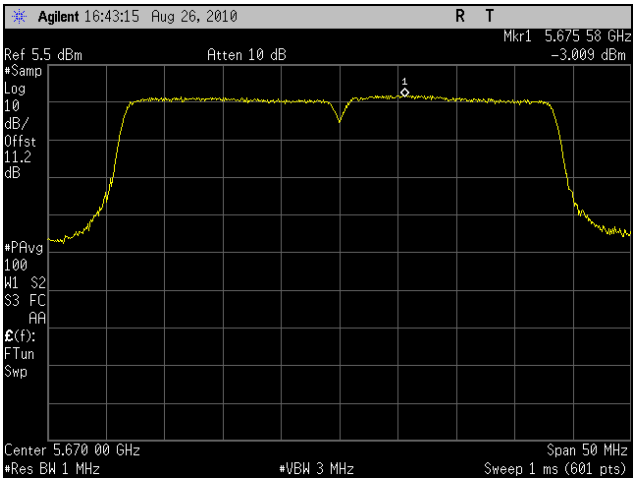
Plot 156. Power Spectral Density, 802.11n 40 MHz, 5270 MHz, Port 3



Plot 157. Power Spectral Density, 802.11n 40 MHz, 5310 MHz, Port 3

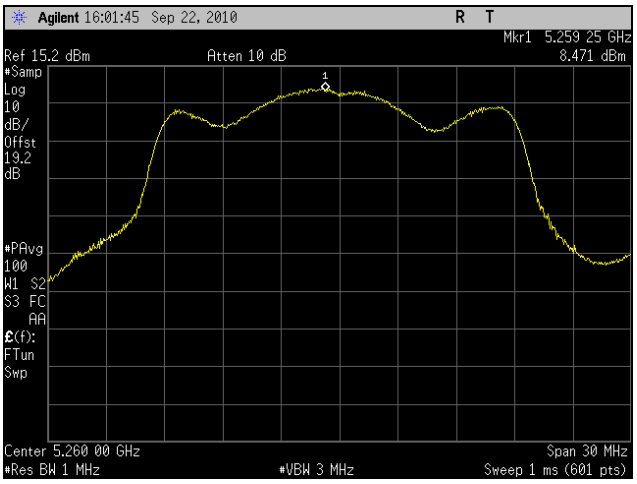


Plot 158. Power Spectral Density, 802.11n 40 MHz, 5510 MHz, Port 3

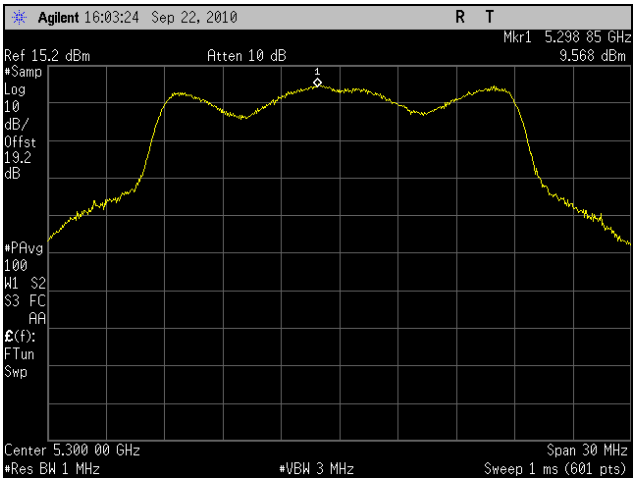


Plot 159. Power Spectral Density, 802.11n 40 MHz, 5670 MHz, Port 3

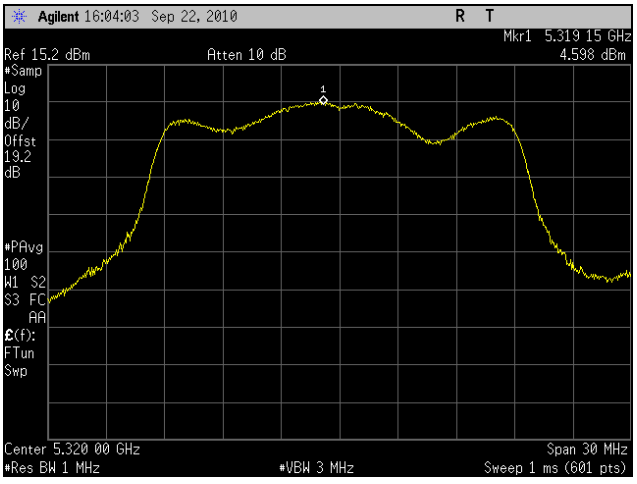
Power Spectral Density Test Results, 802.11n 20 MHz, Combined Ports



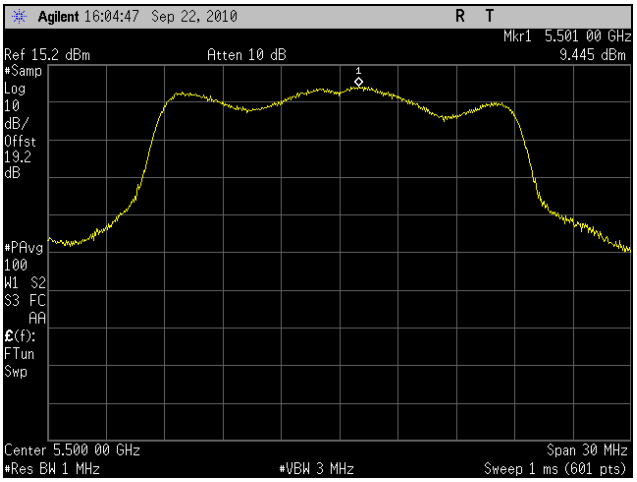
Plot 160. Power Spectral Density, 802.11n 20 MHz, 5260 MHz, Combined Ports



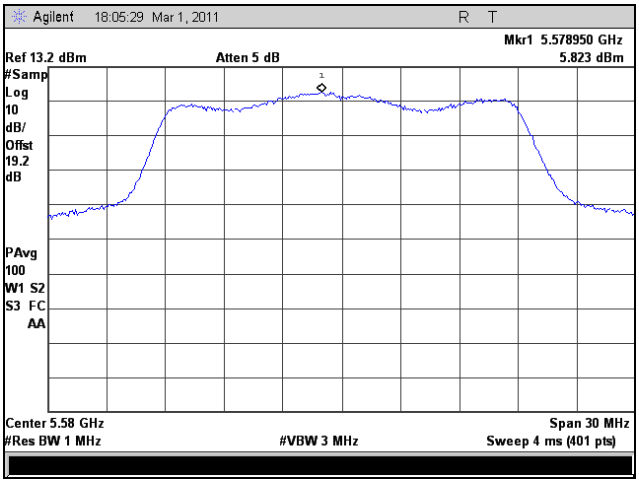
Plot 161. Power Spectral Density, 802.11n 20 MHz, 5300 MHz, Combined Ports



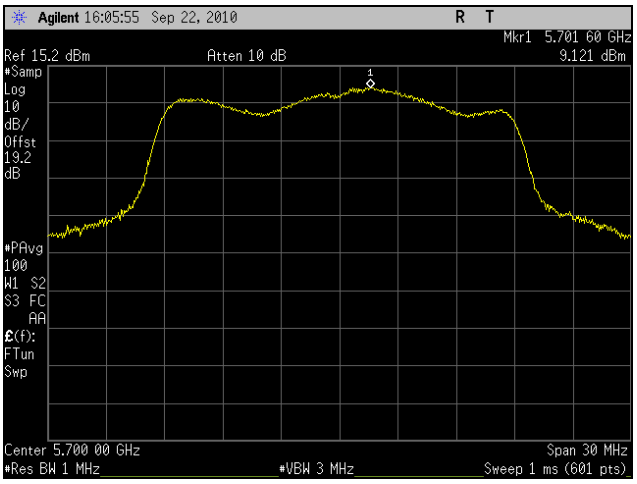
Plot 162. Power Spectral Density, 802.11n 20 MHz, 5320 MHz, Combined Ports



Plot 163. Power Spectral Density, 802.11n 20 MHz, 5500 MHz, Combined Ports

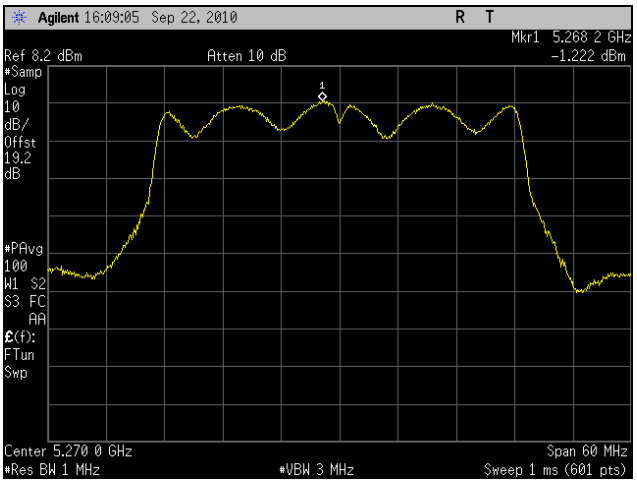


Plot 164. Power Spectral Density, 802.11n 20 MHz, 5580 MHz, Combined Ports

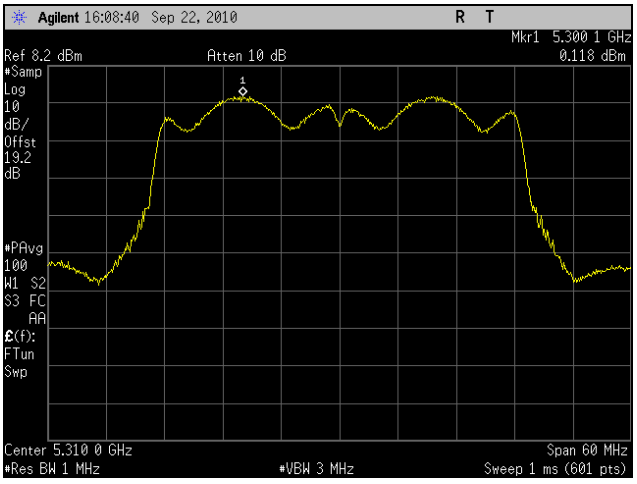


Plot 165. Power Spectral Density, 802.11n 20 MHz, 5700 MHz, Combined Ports

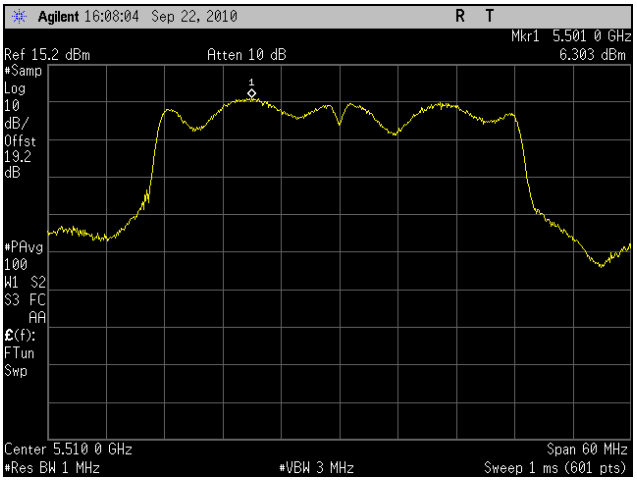
Power Spectral Density Test Results, 802.11n 40 MHz, Combined Ports



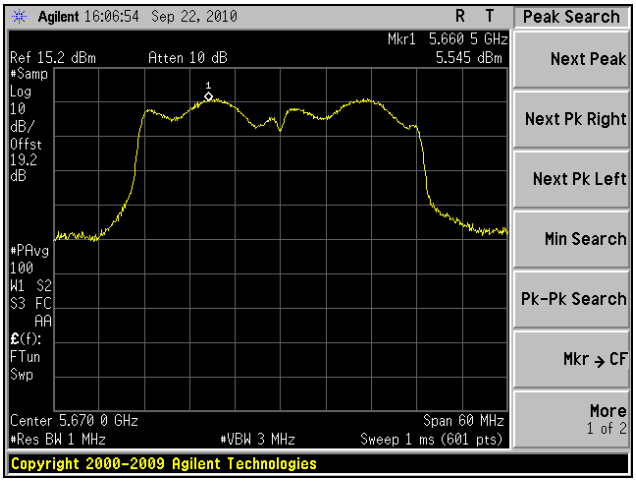
Plot 166. Power Spectral Density, 802.11n 40 MHz, 5270 MHz, Combined Ports



Plot 167. Power Spectral Density, 802.11n 40 MHz, 5310 MHz, Combined Ports



Plot 168. Power Spectral Density, 802.11n 40 MHz, 5510 MHz, Combined Ports



Plot 169. Power Spectral Density, 802.11n 40 MHz, 5670 MHz, Combined Ports

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.407(a)(6) Peak Excursion Ratio

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

Test Procedure: The EUT was connected directly to the spectrum analyzer through cabling and attenuation. The 1st trace on the spectrum analyzer was set to RBW=1MHz, VBW=3MHz. The peak detector mode was used and the trace max held. The 2nd trace on the spectrum analyzer was set according to measurement method #1 from the FCC Public Notice DA 02-2138 for making conducted power measurements.

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

Test Engineer(s): Anderson Soungpanya

Test Date(s): 08/31/10

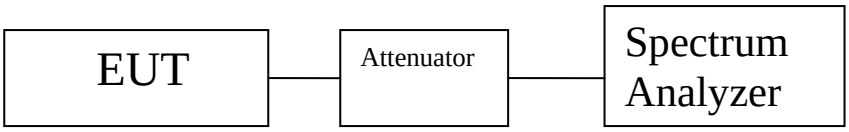
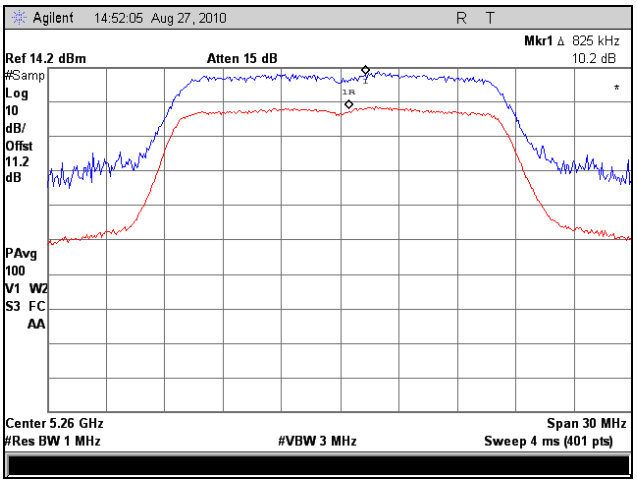
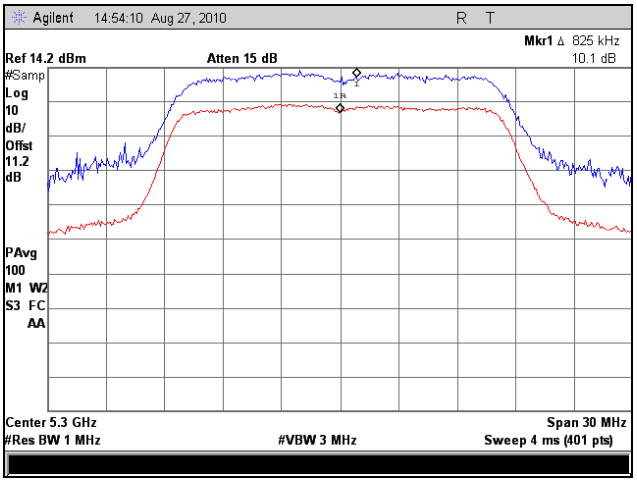


Figure 5. Peak Excursion Ration Test Setup

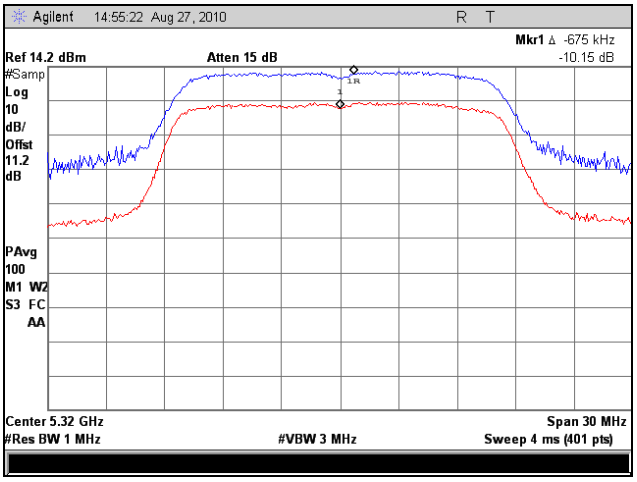
Peak Excursion Test Results, 802.11a, Port 1



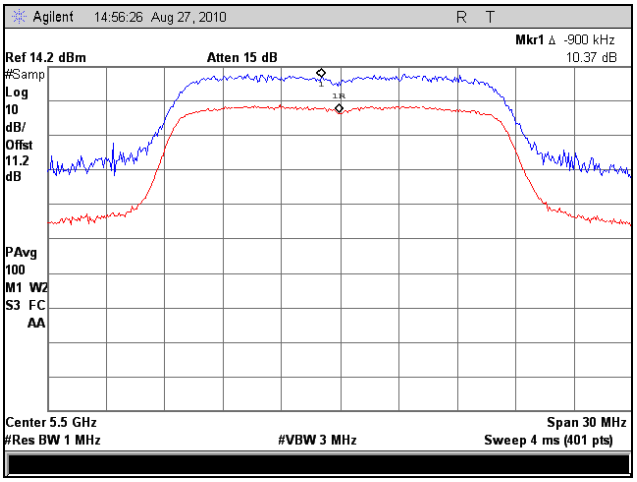
Plot 170. Peak Excursion Ratio, 802.11a, 5260 MHz, Port 1



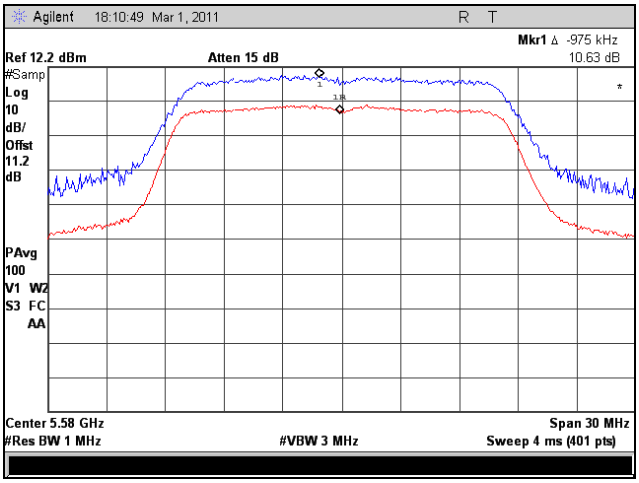
Plot 171. Peak Excursion Ratio, 802.11a, 5300 MHz, Port 1



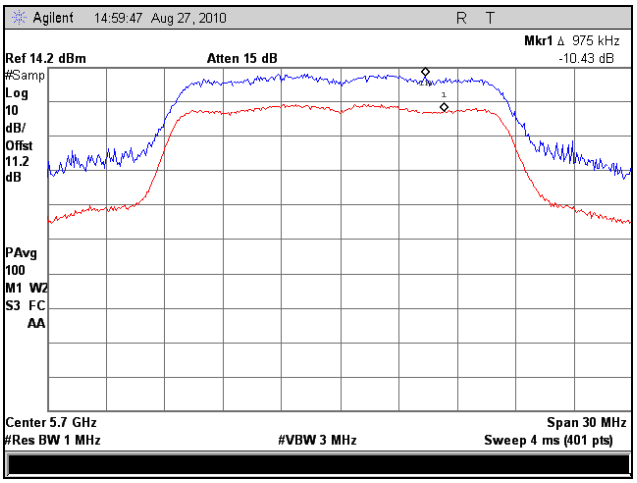
Plot 172. Peak Excursion Ratio, 802.11a, 5320 MHz, Port 1



Plot 173. Peak Excursion Ratio, 802.11a, 5500 MHz, Port 1

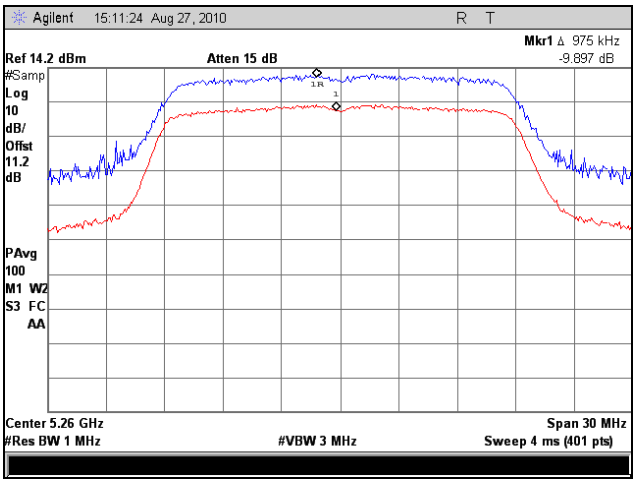


Plot 174. Peak Excursion Ratio, 802.11a, 5580 MHz, Port 1

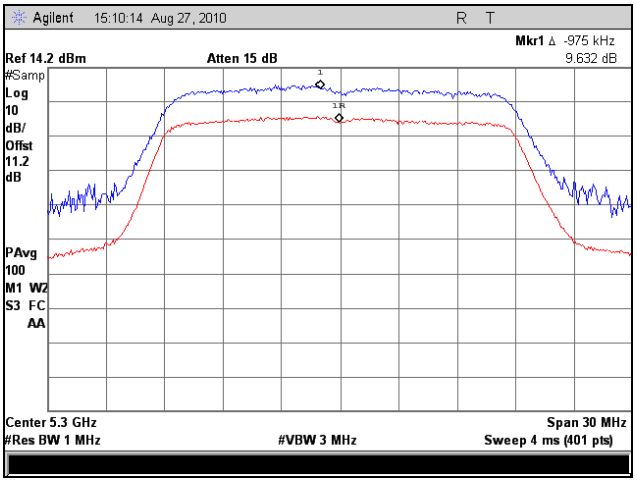


Plot 175. Peak Excursion Ratio, 802.11a, 5700 MHz, Port 1

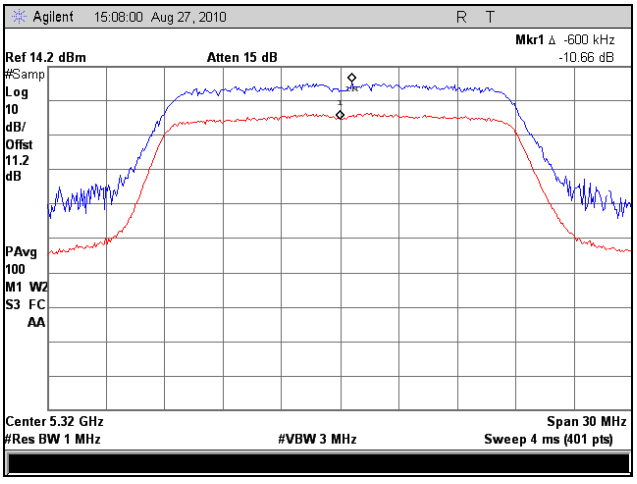
Peak Excursion Test Results, 802.11n 20 MHz, Port 1



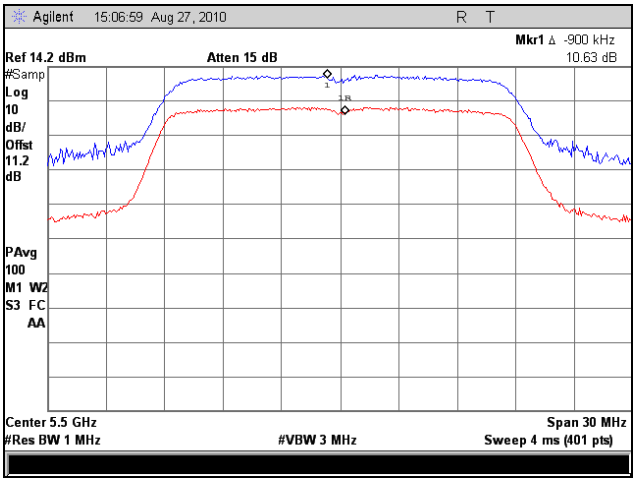
Plot 176. Peak Excursion Ratio, 802.11n 20 MHz, 5260 MHz, Port 1



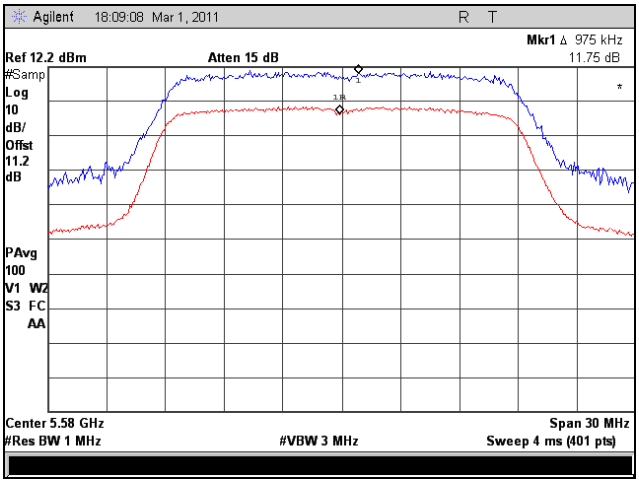
Plot 177. Peak Excursion Ratio, 802.11n 20 MHz, 5300 MHz, Port 1



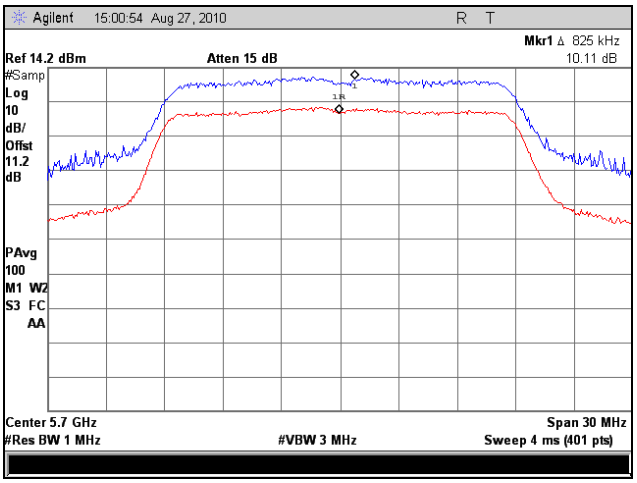
Plot 178. Peak Excursion Ratio, 802.11n 20 MHz, 5320 MHz, Port 1



Plot 179. Peak Excursion Ratio, 802.11n 20 MHz, 5500 MHz, Port 1

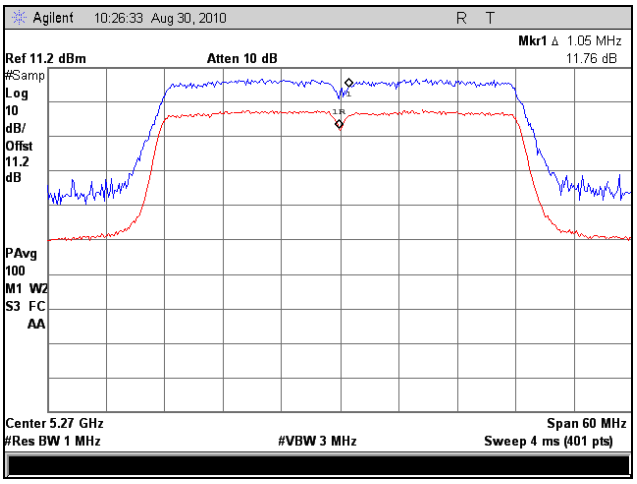


Plot 180. Peak Excursion Ratio, 802.11n 20 MHz, 5580 MHz, Port 1

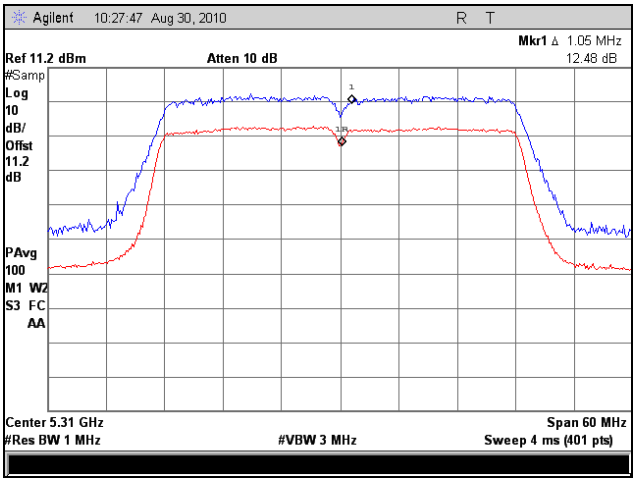


Plot 181. Peak Excursion Ratio, 802.11n 20 MHz, 5700 MHz, Port 1

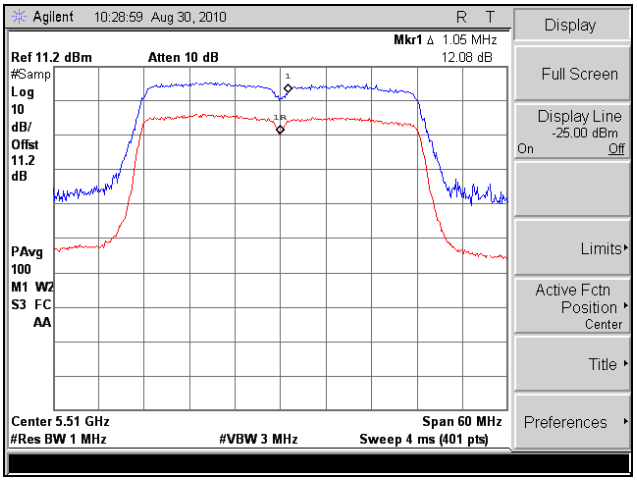
Peak Excursion Test Results, 802.11n 40 MHz, Port 1



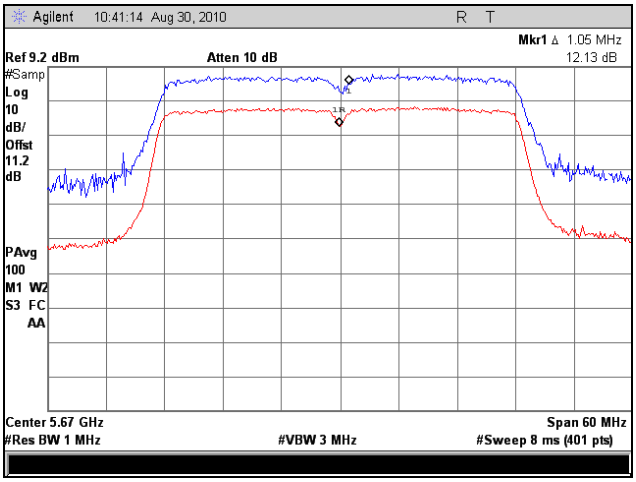
Plot 182. Peak Excursion Ratio, 802.11n 40 MHz, 5270 MHz, Port 1



Plot 183. Peak Excursion Ratio, 802.11n 40 MHz, 5310 MHz, Port 1

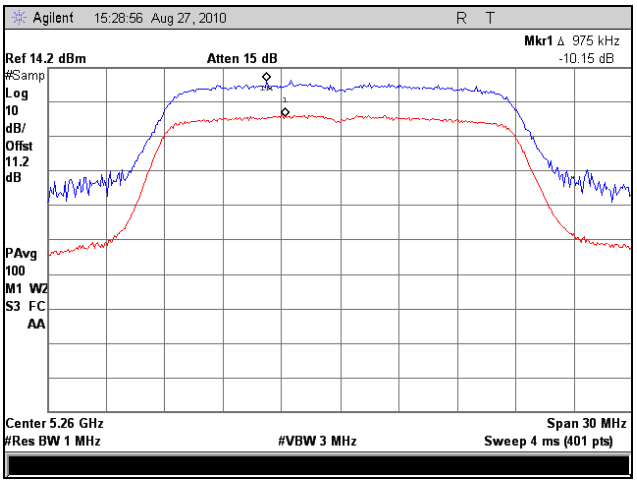


Plot 184. Peak Excursion Ratio, 802.11n 40 MHz, 5510 MHz, Port 1

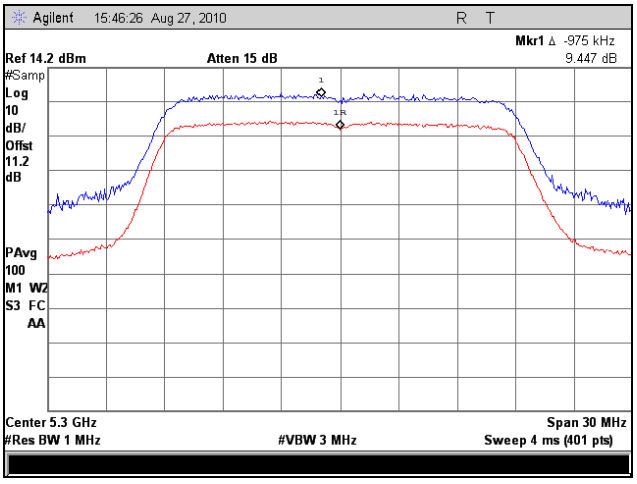


Plot 185. Peak Excursion Ratio, 802.11n 40 MHz, 5670 MHz, Port 1

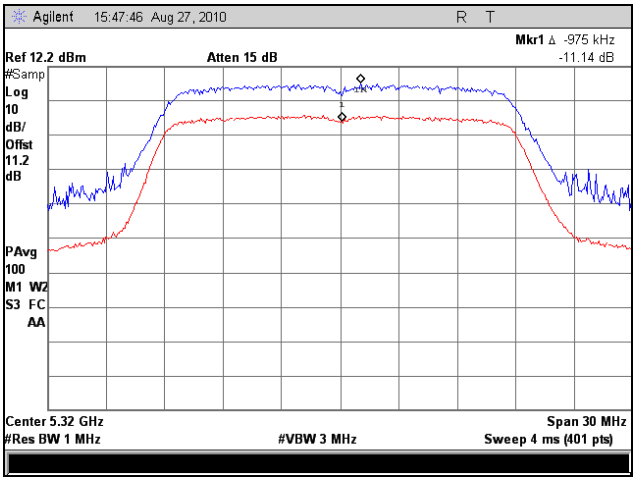
Peak Excursion Test Results, 802.11n 20 MHz, Port 2



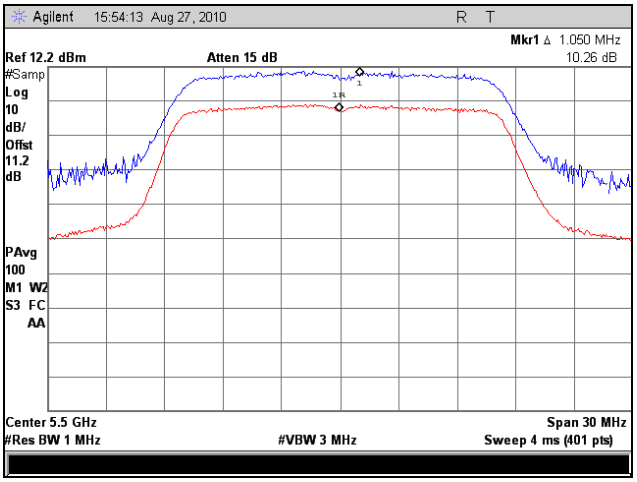
Plot 186. Peak Excursion Ratio, 802.11n 20 MHz, 5260 MHz, Port 2



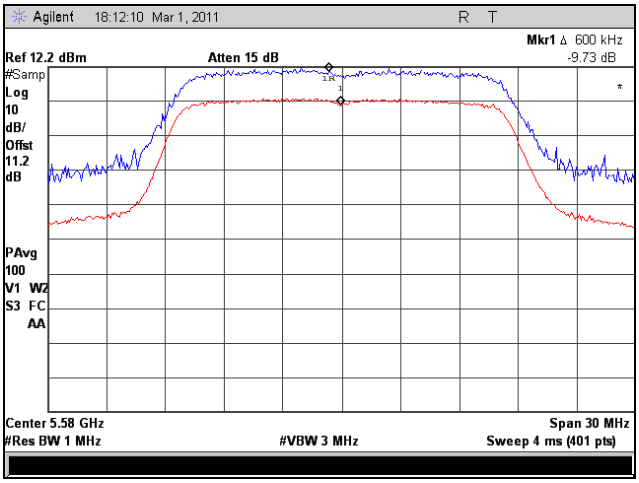
Plot 187. Peak Excursion Ratio, 802.11n 20 MHz, 5300 MHz, Port 2



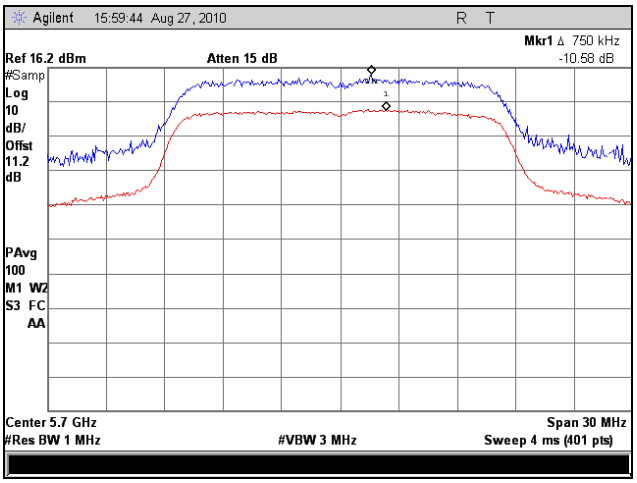
Plot 188. Peak Excursion Ratio, 802.11n 20 MHz, 5320 MHz, Port 2



Plot 189. Peak Excursion Ratio, 802.11n 20 MHz, 5500 MHz, Port 2

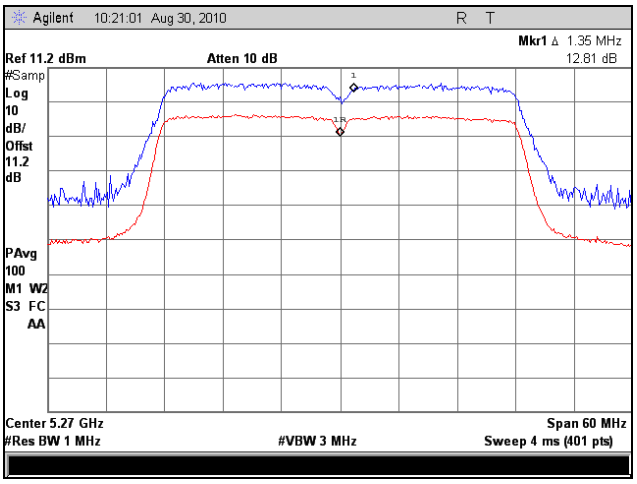


Plot 190. Peak Excursion Ratio, 802.11n 20 MHz, 5580 MHz, Port 2

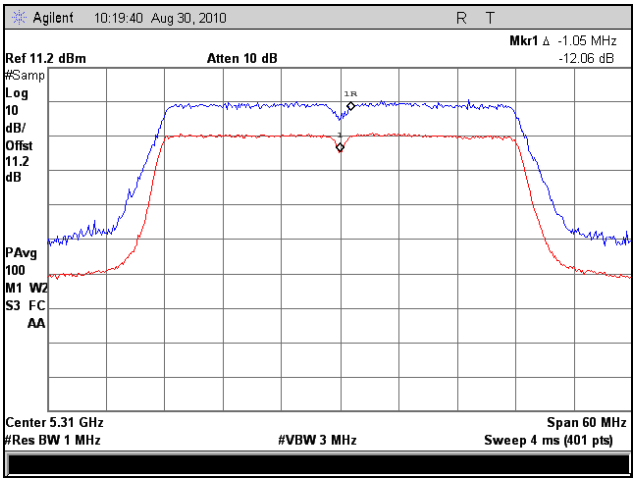


Plot 191. Peak Excursion Ratio, 802.11n 20 MHz, 5700 MHz, Port 2

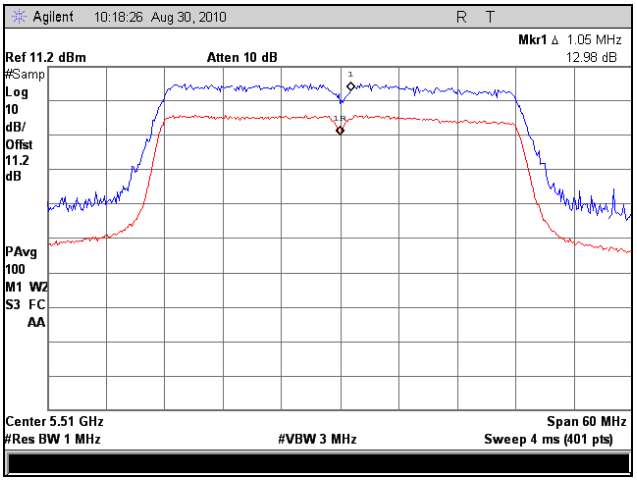
Peak Excursion Test Results, 802.11n 40 MHz, Port 2



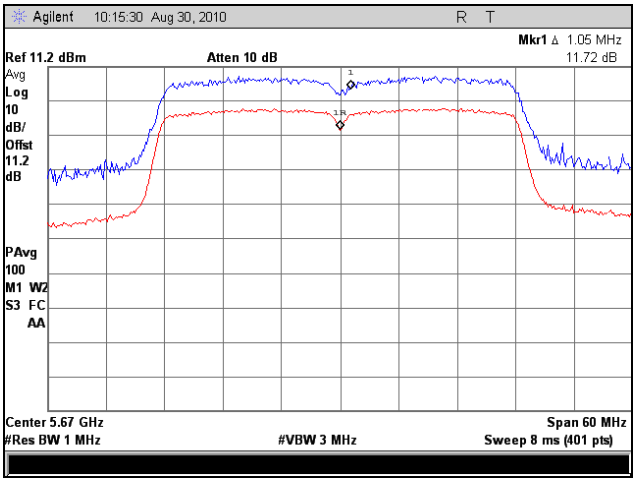
Plot 192. Peak Excursion Ratio, 802.11n 40 MHz, 5270 MHz, Port 2



Plot 193. Peak Excursion Ratio, 802.11n 40 MHz, 5310 MHz, Port 2

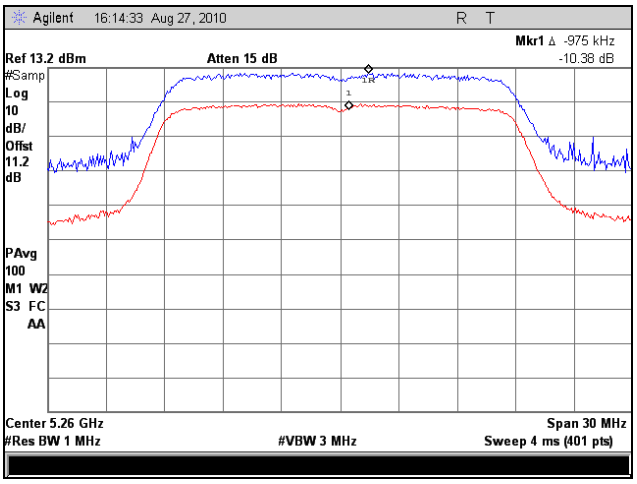


Plot 194. Peak Excursion Ratio, 802.11n 40 MHz, 5510 MHz, Port 2

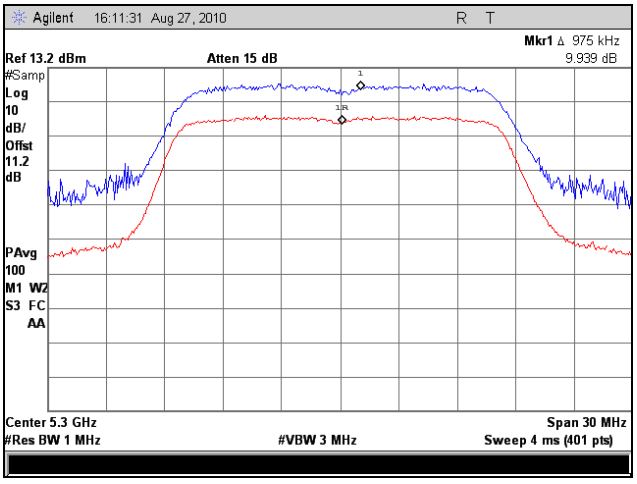


Plot 195. Peak Excursion Ratio, 802.11n 40 MHz, 5670 MHz, Port 2

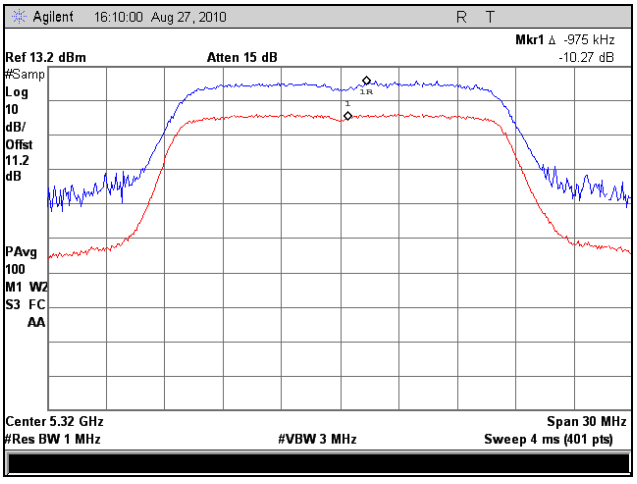
Peak Excursion Test Results, 802.11n 20 MHz, Port 3



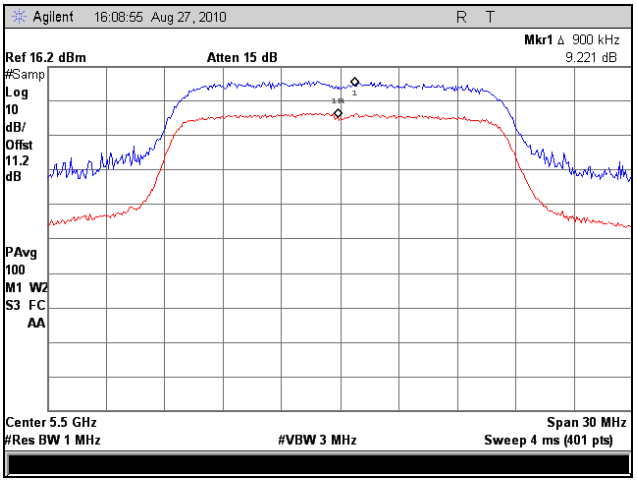
Plot 196. Peak Excursion Ratio, 802.11n 20 MHz, 5260 MHz, Port 3



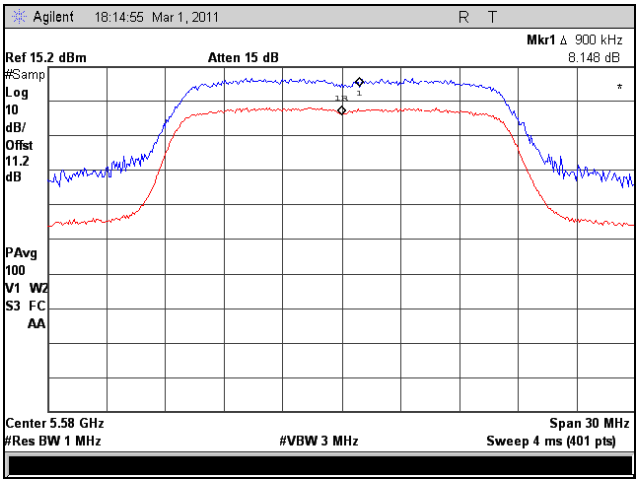
Plot 197. Peak Excursion Ratio, 802.11n 20 MHz, 5300 MHz, Port 3



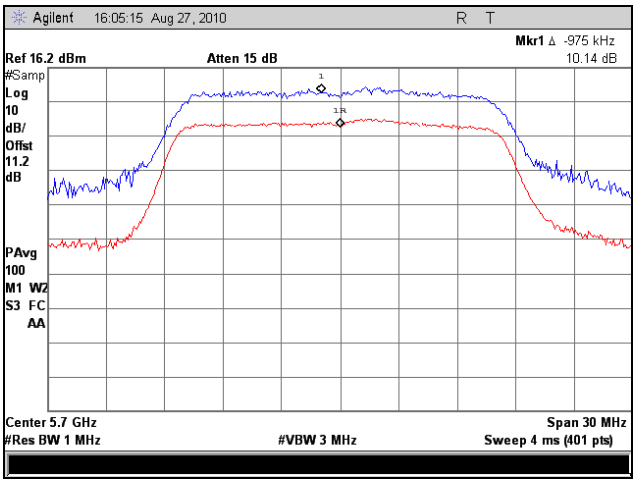
Plot 198. Peak Excursion Ratio, 802.11n 20 MHz, 5320 MHz, Port 3



Plot 199. Peak Excursion Ratio, 802.11n 20 MHz, 5500 MHz, Port 3

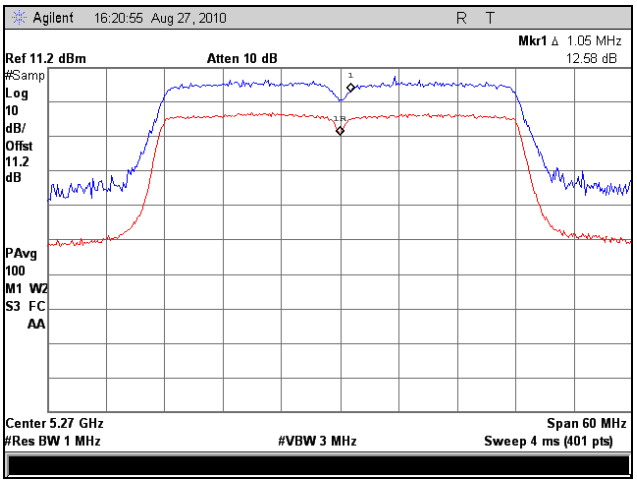


Plot 200. Peak Excursion Ratio, 802.11n 20 MHz, 5580 MHz, Port 3

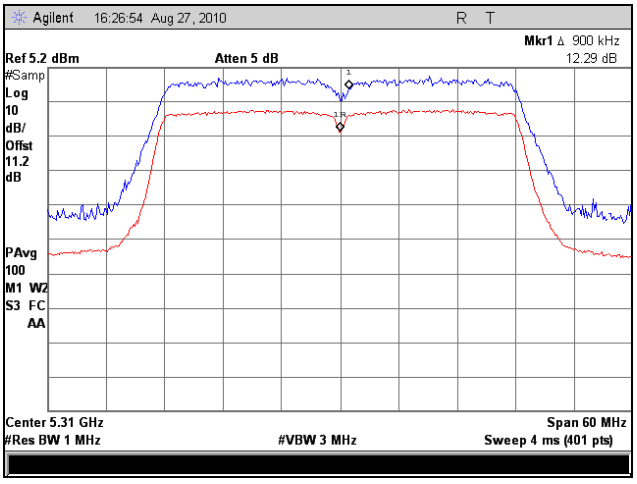


Plot 201. Peak Excursion Ratio, 802.11n 20 MHz, 5700 MHz, Port 3

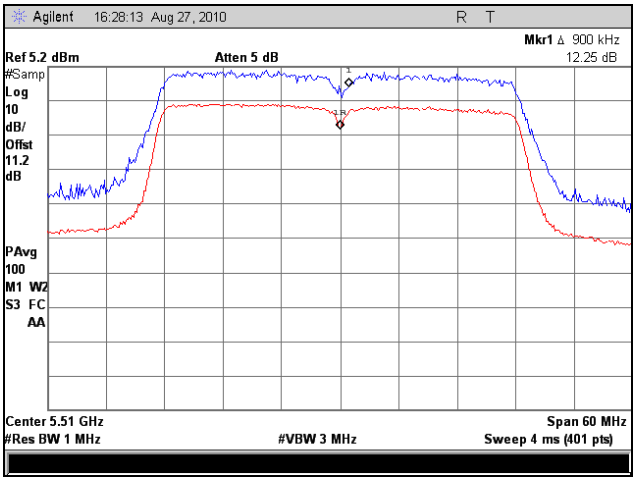
Peak Excursion Test Results, 802.11n 40 MHz, Port 3



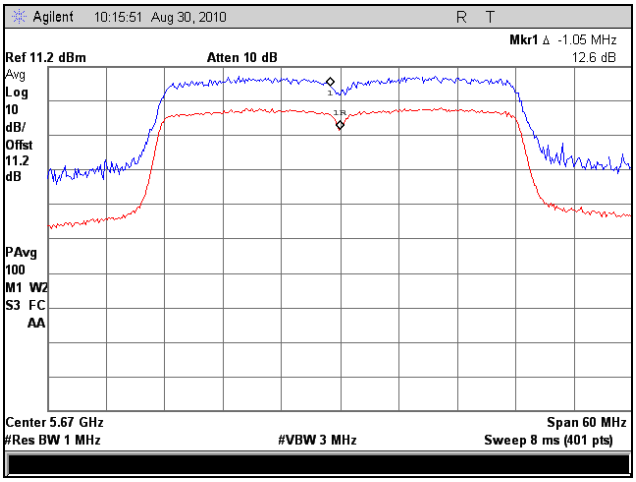
Plot 202. Peak Excursion Ratio, 802.11n 40 MHz, 5270 MHz, Port 3



Plot 203. Peak Excursion Ratio, 802.11n 40 MHz, 5310 MHz, Port 3



Plot 204. Peak Excursion Ratio, 802.11n 40 MHz, 5510 MHz, Port 3



Plot 205. Peak Excursion Ratio, 802.11n 40 MHz, 5670 MHz, Port 3

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.407(b) Undesirable Emissions

Test Requirements: **§ 15.407(b)(4), (b)(6), (b)(7), §15.205:** Emissions outside the frequency band.

§ 15.407(b)(4): For transmitters operating in the 5.725–5.825 GHz band: all emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an EIRP of –17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an EIRP of –27 dBm/MHz.

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

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

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

For frequencies from 30 MHz to 1 GHz, measurements were made using a quasi-peak detector with a 120 kHz bandwidth. Only noise floor was measured above 18GHz.

For measurements above 1 GHz, measurements were made with a Peak detector with 1 MHz resolution bandwidth. Where the spurious emissions fell into a restricted band, measurements were also made with an average detector to make sure they complied with 15.209 limits. Emissions were explored up to 40 GHz.
The equation, **EIRP= E + 20 log D – 104.8** was used to convert an EIRP limit to a field strength limit.
E = field strength (dBuV/m)
D = Reference measurement distance (m)

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

Test Engineer(s): Anderson Soungpanya

Test Date(s): 08/25/10

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.407(b)(4): Harmonic and Spurious Emissions Requirements – Radiated

Freq. (GHz)	Antenna Polarity (H/V)	Raw Amp. @ 3 m (dBuV/m)	P. Amp (dB)	Ant. Cor. Factor (dB/m)	Cable Loss (dB)	EUT Field Strength Final Amp. (dBuV/m)	Limit Detector Peak / Avg. (Peak) / (Avg.)	Limit @ 3 m (dBuV/m)	Delta (dB)
10.52	H	42.96	34.79	37.59	7.88	53.65	Peak	74	-20.35
10.52	H	30.85	34.79	37.59	7.88	41.54	Avg.	54	-12.46
15.78	H	44.95	35.26	40.61	10.19	60.49	Peak	74	-13.51
15.78	H	32.01	35.26	40.61	10.19	47.55	Avg.	54	-6.45

Table 35. Radiated Spurs, Test Results, 802.11a, 5.26 GHz, 9 dBi Omni Antenna

Note: All other emissions were measured at the noise floor of the spectrum analyzer.

Freq. (GHz)	Antenna Polarity (H/V)	Raw Amp. @ 3 m (dBuV/m)	P. Amp (dB)	Ant. Cor. Factor (dB/m)	Cable Loss (dB)	EUT Field Strength Final Amp. (dBuV/m)	Limit Detector Peak / Avg. (Peak) / (Avg.)	Limit @ 3 m (dBuV/m)	Delta (dB)
10.64	H	42.82	34.74	37.64	7.86	53.58	Peak	74	-20.42
10.64	H	31.15	34.74	37.64	7.86	41.91	Avg.	54	-12.09
15.96	H	44.27	35.04	40.71	10.38	60.32	Peak	74	-13.68
15.96	H	32.04	35.04	40.71	10.38	48.09	Avg.	54	-5.91

Table 36. Radiated Spurs, Test Results, 802.11a, 5.32 GHz, 9 dBi Omni Antenna

Note: All other emissions were measured at the noise floor of the spectrum analyzer.

Freq. (GHz)	Antenna Polarity (H/V)	Raw Amp. @ 3 m (dBuV/m)	P. Amp (dB)	Ant. Cor. Factor (dB/m)	Cable Loss (dB)	EUT Field Strength Final Amp. (dBuV/m)	Limit Detector Peak / Avg. (Peak) / (Avg.)	Limit @ 3 m (dBuV/m)	Delta (dB)
11	H	42.66	34.71	37.73	7.79	53.47	Peak	74	-20.53
11	H	30.69	34.71	37.73	7.79	41.50	Avg.	54	-12.50
16.5	H	43.15	34.27	40.99	10.68	60.55	Peak	74	-13.45
16.5	H	32.02	34.27	40.99	10.68	49.42	Avg.	54	-4.58

Table 37. Radiated Spurs, Test Results, 802.11a, 5.5 GHz, 9 dBi Omni Antenna

Note: All other emissions were measured at the noise floor of the spectrum analyzer.

Freq. (GHz)	Antenna Polarity (H/V)	Raw Amp. @ 3 m (dBuV/m)	P. Amp (dB)	Ant. Cor. Factor (dB/m)	Cable Loss (dB)	EUT Field Strength Final Amp. (dBuV/m)	Limit Detector Peak / Avg. (Peak) / (Avg.)	Limit @ 3 m (dBuV/m)	Delta (dB)
11.16	H	43.31	34.71	37.87	7.85	53.22	Peak	74	-20.78
11.16	H	30.36	34.71	37.87	7.85	42.13	Avg.	54	-11.87
16.74	H	43.32	34.20	40.78	10.59	59.31	Peak	74	-14.69
16.74	H	31.71	34.20	40.78	10.59	47.46	Avg.	54	-6.54

Table 38. Radiated Spurs, Test Results, 802.11a, 5.580 GHz, 9 dBi Omni Antenna

Note: All other emissions were measured at the noise floor of the spectrum analyzer.

Freq. (GHz)	Antenna Polarity (H/V)	Raw Amp. @ 3 m (dBuV/m)	P. Amp (dB)	Ant. Cor. Factor (dB/m)	Cable Loss (dB)	EUT Field Strength Final Amp. (dBuV/m)	Limit Detector Peak / Avg. (Peak) / (Avg.)	Limit @ 3 m (dBuV/m)	Delta (dB)
11.4	H	43.27	34.69	38.06	7.99	54.63	Peak	74	-19.37
11.4	H	30.74	34.69	38.06	7.99	42.10	Avg.	54	-11.90
17.1	H	42.15	34.14	40.73	10.51	59.25	Peak	74	-14.75
17.1	H	30.57	34.14	40.73	10.51	47.67	Avg.	54	-6.33

Table 39. Radiated Spurs, Test Results, 802.11a, 5.7 GHz, 9 dBi Omni Antenna

Note: All other emissions were measured at the noise floor of the spectrum analyzer.

Freq. (GHz)	Antenna Polarity (H/V)	Raw Amp. @ 3 m (dBuV/m) (dBuV/m)	P. Amp (dB)	Ant. Cor. Factor (dB/m)	Cable Loss (dB)	EUT Field Strength Final Amp. (dBuV/m)	Limit Detector Peak / Avg. (Peak) / (Avg.)	Limit @ 3 m (dBuV/m)	Delta (dB)
10.52	H	43.64	34.79	37.59	7.88	54.33	Peak	74	-19.67
10.52	H	31.7	34.79	37.59	7.88	42.39	Avg.	54	-11.61
15.78	H	44.74	35.26	40.61	10.19	60.28	Peak	74	-13.72
15.78	H	32.19	35.26	40.61	10.19	47.73	Avg.	54	-6.27

Table 40. Radiated Spurs, Test Results, 802.11n 20 MHz, 5.26 GHz, 9 dBi Omni Antenna

Note: All other emissions were measured at the noise floor of the spectrum analyzer.

Freq. (GHz)	Antenna Polarity (H/V)	Raw Amp. @ 3 m (dBuV/m)	P. Amp (dB)	Ant. Cor. Factor (dB/m)	Cable Loss (dB)	EUT Field Strength Final Amp. (dBuV/m)	Limit Detector Peak / Avg. (Peak) / (Avg.)	Limit @ 3 m (dBuV/m)	Delta (dB)
10.64	H	43.82	34.74	37.64	7.86	54.58	Peak	74	-19.42
10.64	H	31.23	34.74	37.64	7.86	41.99	Avg.	54	-12.01
15.96	H	44.58	35.04	40.71	10.38	60.63	Peak	74	-13.37
15.96	H	32.31	35.04	40.71	10.38	48.36	Avg.	54	-5.64

Table 41. Radiated Spurs, Test Results, 802.11n 20 MHz, 5.32 GHz, 9 dBi Omni Antenna

Note: All other emissions were measured at the noise floor of the spectrum analyzer.

Freq. (GHz)	Antenna Polarity (H/V)	Raw Amp. @ 3 m (dBuV/m)	P. Amp (dB)	Ant. Cor. Factor (dB/m)	Cable Loss (dB)	EUT Field Strength Final Amp. (dBuV/m)	Limit Detector Peak / Avg. (Peak) / (Avg.)	Limit @ 3 m (dBuV/m)	Delta (dB)
11	H	43.23	34.71	37.73	7.79	54.04	Peak	74	-19.96
11	H	31.82	34.71	37.73	7.79	42.63	Avg.	54	-11.37
16.5	H	45.44	34.27	40.99	10.68	62.84	Peak	74	-11.16
16.5	H	31.79	34.27	40.99	10.68	49.19	Avg.	54	-4.81

Table 42. Radiated Spurs, Test Results, 802.11n 20 MHz, 5.5 GHz, 9 dBi Omni Antenna

Note: All other emissions were measured at the noise floor of the spectrum analyzer.

Freq. (GHz)	Antenna Polarity (H/V)	Raw Amp. @ 3 m (dBuV/m)	P. Amp (dB)	Ant. Cor. Factor (dB/m)	Cable Loss (dB)	EUT Field Strength Final Amp. (dBuV/m)	Limit Detector Peak / Avg. (Peak) / (Avg.)	Limit @ 3 m (dBuV/m)	Delta (dB)
11.16	H	43.91	34.71	37.87	7.85	53.19	Peak	74	-20.81
11.16	H	30.56	34.71	37.87	7.85	42.11	Avg.	54	-11.89
16.74	H	44.23	34.20	40.78	10.59	60.07	Peak	74	-13.93
16.74	H	31.97	34.20	40.78	10.59	48.97	Avg.	54	-5.03

Table 43. Radiated Spurs, Test Results, 802.11n 20 MHz, 5.580 GHz, 9 dBi Omni Antenna

Note: All other emissions were measured at the noise floor of the spectrum analyzer.

Freq. (GHz)	Antenna Polarity (H/V)	Raw Amp. @ 3 m (dBuV/m)	P. Amp (dB)	Ant. Cor. Factor (dB/m)	Cable Loss (dB)	EUT Field Strength Final Amp. (dBuV/m)	Limit Detector Peak / Avg. (Peak) / (Avg.)	Limit @ 3 m (dBuV/m)	Delta (dB)
11.4	H	43.6	34.69	38.06	7.99	54.96	Peak	74	-19.04
11.4	H	30.78	34.69	38.06	7.99	42.14	Avg.	54	-11.86
17.1	H	43.47	34.14	40.73	10.51	60.57	Peak	74	-13.43
17.1	H	31.23	34.14	40.73	10.51	48.33	Avg.	54	-5.67

Table 44. Radiated Spurs, Test Results, 802.11n 20 MHz, 5.7 GHz, 9 dBi Omni Antenna

Note: All other emissions were measured at the noise floor of the spectrum analyzer.

Freq. (GHz)	Antenna Polarity (H/V)	Raw Amp. @ 3 m (dBuV/m)	P. Amp (dB)	Ant. Cor. Factor (dB/m)	Cable Loss (dB)	EUT Field Strength Final Amp. (dBuV/m)	Limit Detector Peak / Avg. (Peak) / (Avg.)	Limit @ 3 m (dBuV/m)	Delta (dB)
10.54	H	43.79	34.78	37.60	7.88	54.49	Peak	74	-19.51
10.54	H	30.79	34.78	37.60	7.88	41.49	Avg.	54	-12.51
15.81	H	44.42	35.23	40.63	10.23	60.05	Peak	74	-13.95
15.81	H	32.45	35.23	40.63	10.23	48.08	Avg.	54	-5.92

Table 45. Radiated Spurs, Test Results, 802.11n 40 MHz, 5.27 GHz, 9 dBi Omni Antenna

Note: All other emissions were measured at the noise floor of the spectrum analyzer.

Freq. (GHz)	Antenna Polarity (H/V)	Raw Amp. @ 3 m (dBuV/m)	P. Amp (dB)	Ant. Cor. Factor (dB/m)	Cable Loss (dB)	EUT Field Strength Final Amp. (dBuV/m)	Limit Detector Peak / Avg. (Peak) / (Avg.)	Limit @ 3 m (dBuV/m)	Delta (dB)
10.62	H	44.24	34.75	37.63	7.87	54.99	Peak	74	-19.01
10.62	H	30.93	34.75	37.63	7.87	41.68	Avg.	54	-12.32
15.93	H	43.8	35.07	40.69	10.35	59.77	Peak	74	-14.23
15.93	H	31.88	35.07	40.69	10.35	47.85	Avg.	54	-6.15

Table 46. Radiated Spurs, Test Results, 802.11n 40 MHz, 5.31 GHz, 9 dBi Omni Antenna

Note: All other emissions were measured at the noise floor of the spectrum analyzer.

Freq. (GHz)	Antenna Polarity (H/V)	Raw Amp. @ 3 m (dBuV/m)	P. Amp (dB)	Ant. Cor. Factor (dB/m)	Cable Loss (dB)	EUT Field Strength Final Amp. (dBuV/m)	Limit Detector Peak / Avg. (Peak) / (Avg.)	Limit @ 3 m (dBuV/m)	Delta (dB)
11.02	H	42.7	34.71	37.74	7.79	53.53	Peak	74	-20.47
11.02	H	30.71	34.71	37.74	7.79	41.54	Avg.	54	-12.46
16.53	H	43.59	34.20	40.99	10.68	61.06	Peak	74	-12.94
16.53	H	31.55	34.20	40.99	10.68	49.02	Avg.	54	-4.98

Table 47. Radiated Spurs, Test Results, 802.11n 40 MHz, 5.51 GHz, 9 dBi Omni Antenna

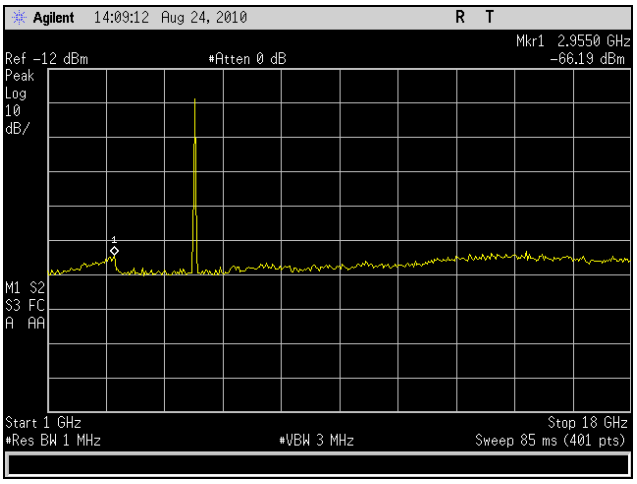
Note: All other emissions were measured at the noise floor of the spectrum analyzer.

Freq. (GHz)	Antenna Polarity (H/V)	Raw Amp. @ 3 m (dBuV/m)	P. Amp (dB)	Ant. Cor. Factor (dB/m)	Cable Loss (dB)	EUT Field Strength Final Amp. (dBuV/m)	Limit Detector Peak / Avg. (Peak) / (Avg.)	Limit @ 3 m (dBuV/m)	Delta (dB)
11.34	H	43.46	34.70	38.00	7.93	54.70	Peak	74	-19.30
11.34	H	30.58	34.70	38.00	7.93	41.82	Avg.	54	-12.18
17.01	H	43.04	34.26	40.68	10.52	59.98	Peak	74	-14.02
17.01	H	31.04	34.26	40.68	10.52	47.98	Avg.	54	-6.02

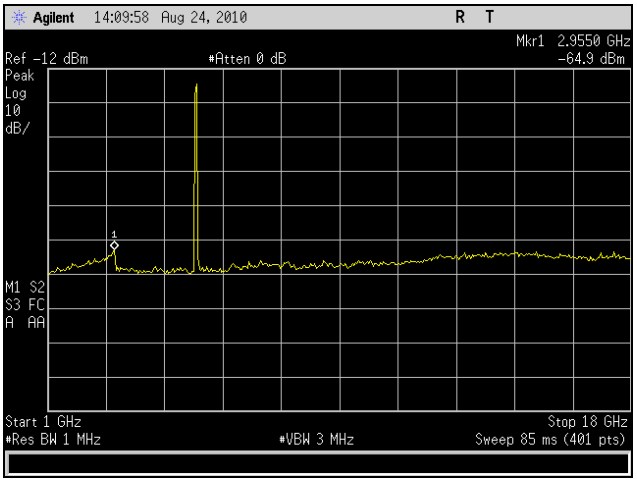
Table 48. Radiated Spurs, Test Results, 802.11n 40 MHz, 5.67 GHz, 9 dBi Omni Antenna

Note: All other emissions were measured at the noise floor of the spectrum analyzer.

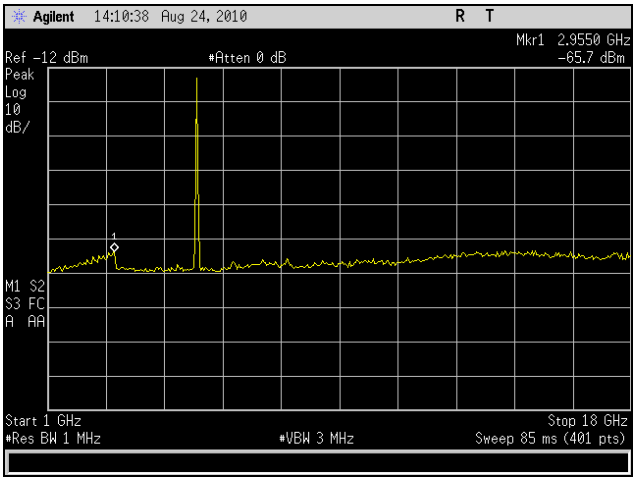
Radiated Spurious Emissions Test Results, 802.11a



Plot 206. Radiated Spurs, 1 GHz – 18 GHz, 802.11a, 5260 MHz, 9 dBi Omni Antenna

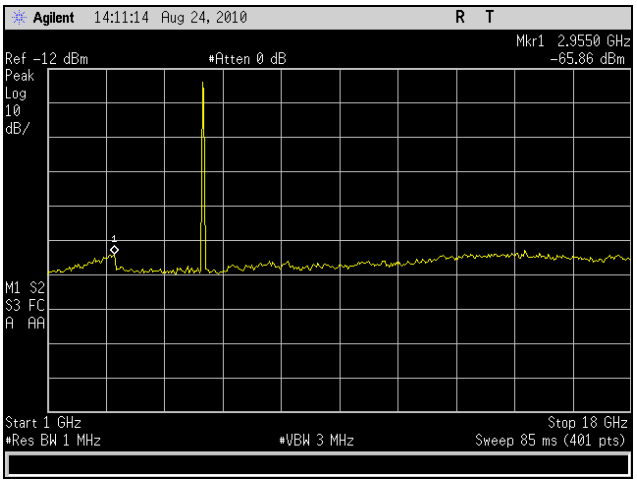


Plot 207. Radiated Spurs, 1 GHz – 18 GHz, 802.11a, 5300 MHz, 9 dBi Omni Antenna

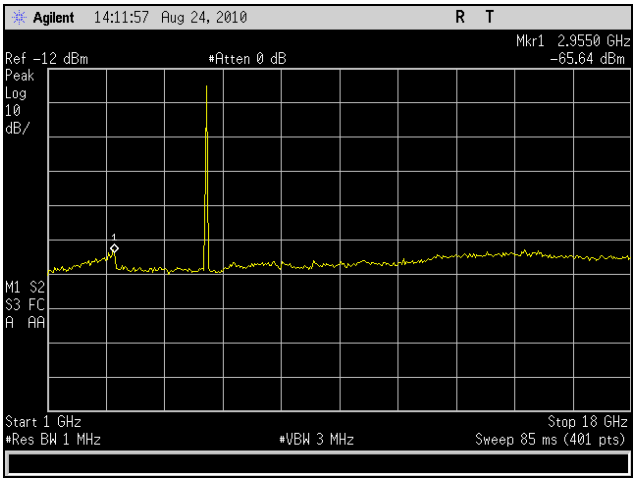


Plot 208. Radiated Spurs, 1 GHz – 18 GHz, 802.11a, 5320 MHz, 9 dBi Omni Antenna

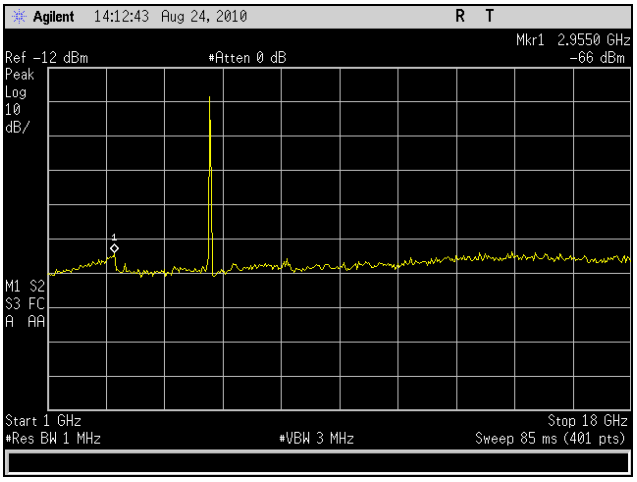
Radiated Spurious Emissions Test Results, 802.11a



Plot 209. Radiated Spurs, 1 GHz – 18 GHz, 802.11a, 5500 MHz, 9 dBi Omni Antenna

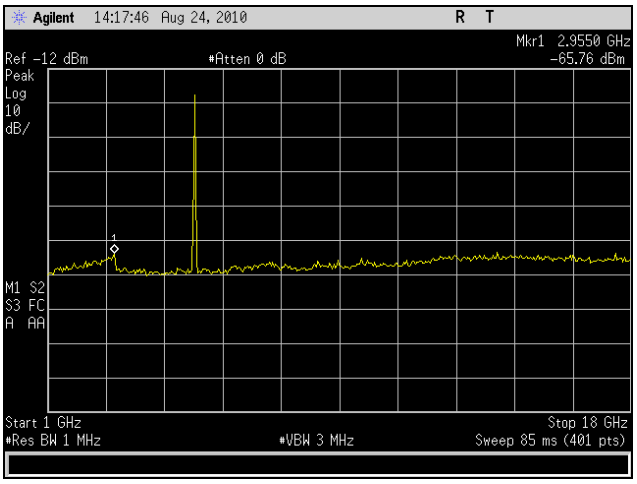


Plot 210. Radiated Spurs, 1 GHz – 18 GHz, 802.11a, 5580 MHz, 9 dBi Omni Antenna

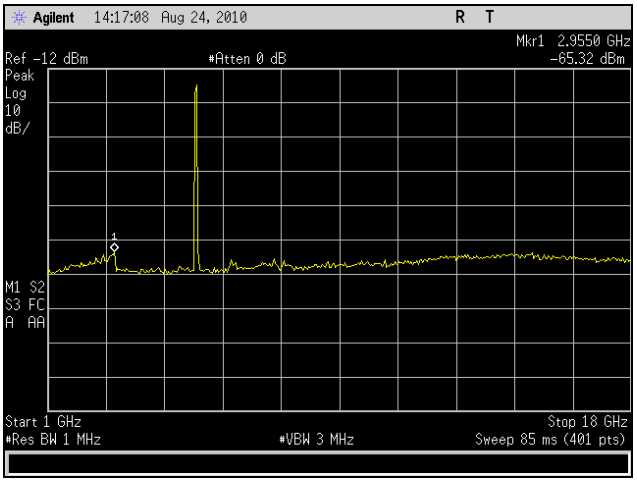


Plot 211. Radiated Spurs, 1 GHz – 18 GHz, 802.11a, 5700 MHz, 9 dBi Omni Antenna

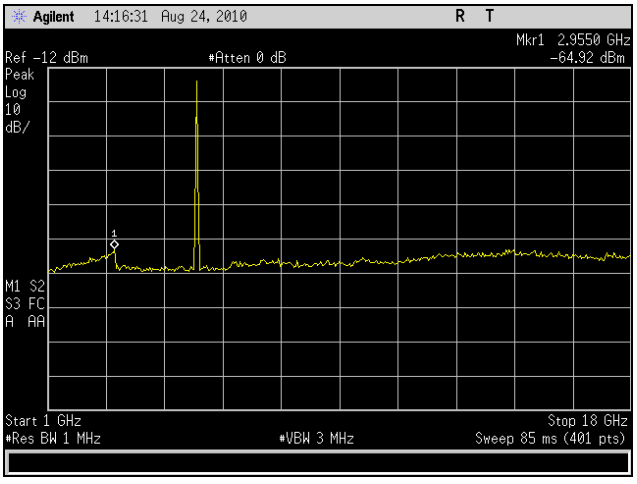
Radiated Spurious Emissions Test Results, 802.11n 20 MHz



Plot 212. Radiated Spurs, 1 GHz – 18 GHz, 802.11n 20 MHz, 5260 MHz, 9 dBi Omni Antenna

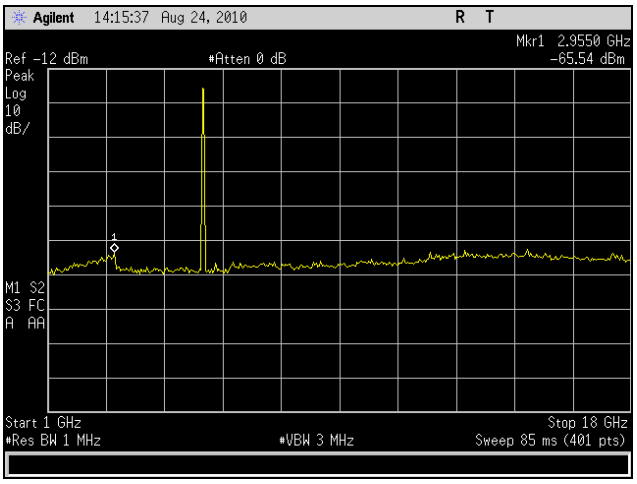


Plot 213. Radiated Spurs, 1 GHz – 18 GHz, 802.11n 20 MHz, 5300 MHz, 9 dBi Omni Antenna

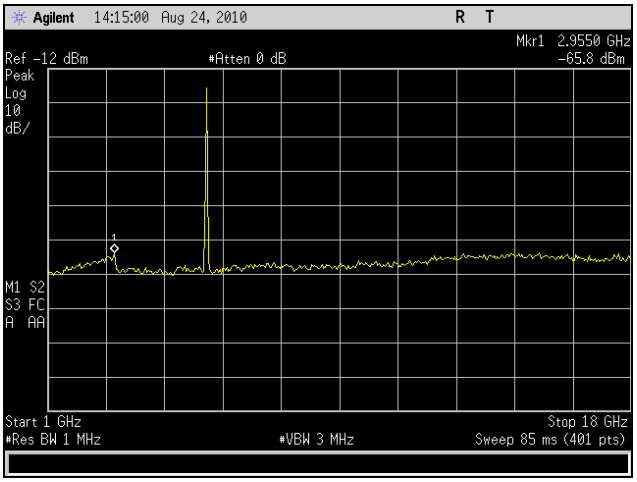


Plot 214. Radiated Spurs, 1 GHz – 18 GHz, 802.11n 20 MHz, 5320 MHz, 9 dBi Omni Antenna

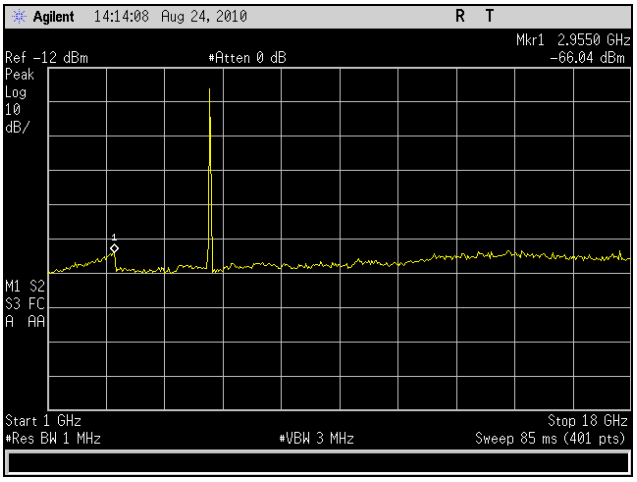
Radiated Spurious Emissions Test Results, 802.11n 20 MHz



Plot 215. Radiated Spurs, 1 GHz – 18 GHz, 802.11n 20 MHz, 5500 MHz, 9 dBi Omni Antenna

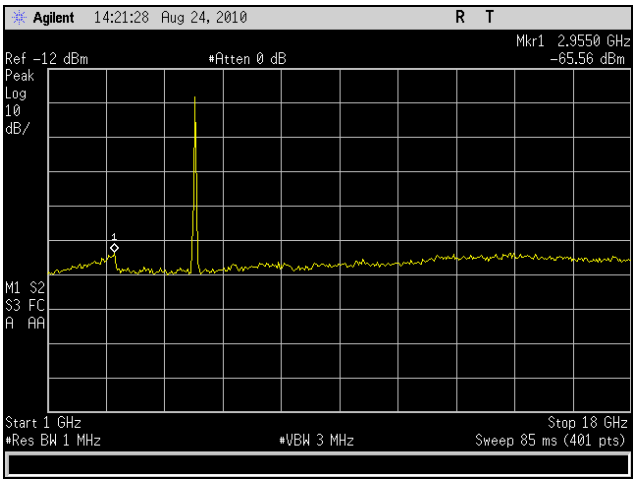


Plot 216. Radiated Spurs, 1 GHz – 18 GHz, 802.11n 20 MHz, 5580 MHz, 9 dBi Omni Antenna

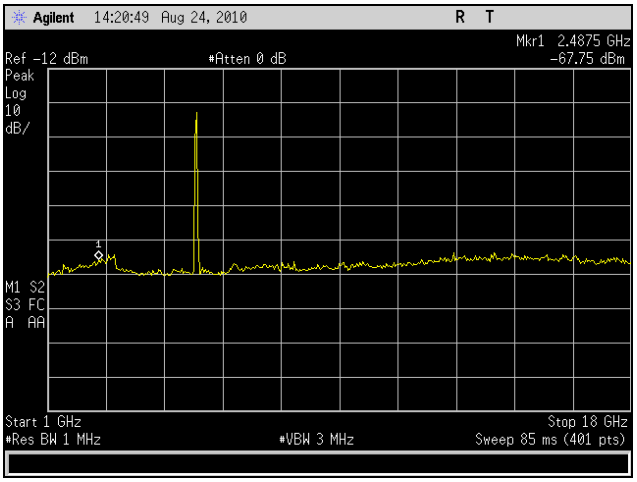


Plot 217. Radiated Spurs, 1 GHz – 18 GHz, 802.11n 20 MHz, 5700 MHz, 9 dBi Omni Antenna

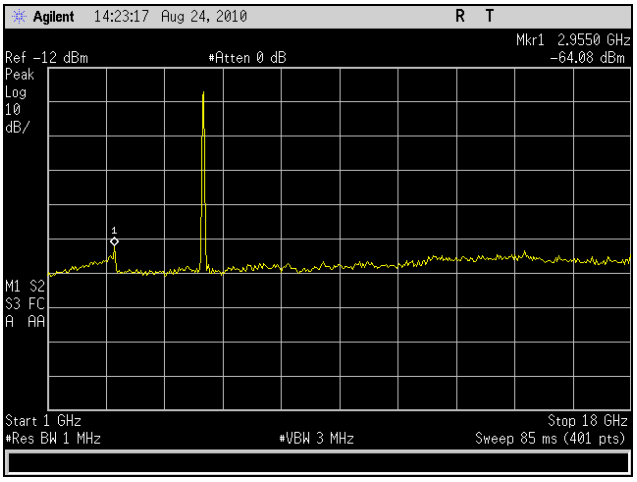
Radiated Spurious Emissions Test Results, 802.11n 40 MHz



Plot 218. Radiated Spurs, 1 GHz – 18 GHz, 802.11n 40 MHz, 5270 MHz, 9 dBi Omni Antenna

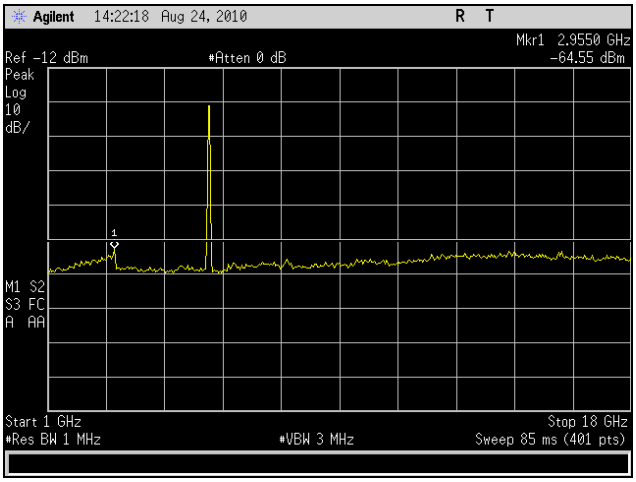


Plot 219. Radiated Spurs, 1 GHz – 18 GHz, 802.11n 40 MHz, 5310 MHz, 9 dBi Omni Antenna



Plot 220. Radiated Spurs, 1 GHz – 18 GHz, 802.11n 40 MHz, 5510 MHz, 9 dBi Omni Antenna

Radiated Spurious Emissions Test Results, 802.11n 40 MHz



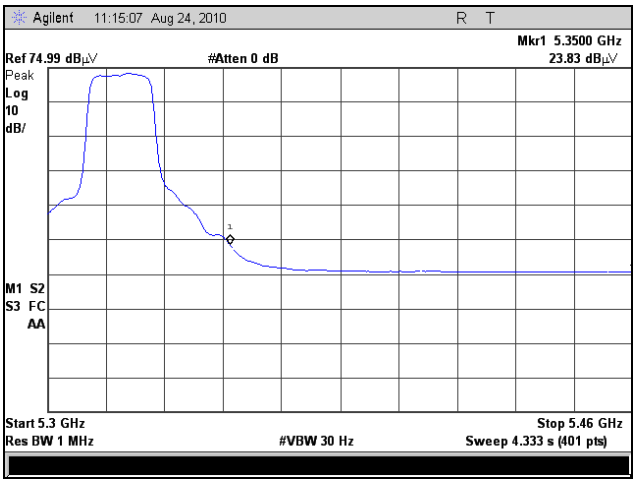
Plot 221. Radiated Spurs, 1 GHz – 18 GHz, 802.11n 40 MHz, 5670 MHz, 9 dBi Omni Antenna

§15.407 (b)(3) Radiated Band Edge

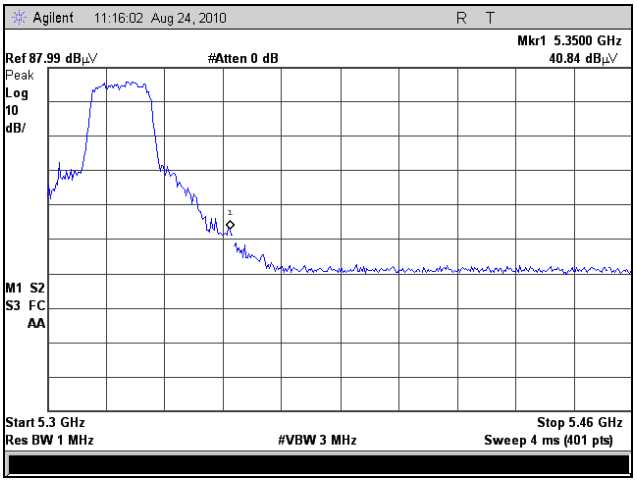
Restricted Band (3dBi Omni)									
	Restricted Band Freq.	**Uncorrected Peak (dBuV)**	**Cable Loss**	**ACF**	**DCF**	**Corrected**	**Limit (dBuV/m)**	**Margin**	
802.11a	5350 MHz	40.84	3.99	34.32	9.54	69.61	74	-4.39	Peak
	5350 MHz	23.83	3.99	34.32	9.54	52.6	54	-1.4	Average
	5460 MHz	28	4.03	34.45	9.54	56.94	74	-17.06	Peak
	5460 MHz	16.21	4.03	34.45	9.54	45.14	54	-8.85	Average
HT20	5350 MHz	42.32	3.99	34.32	9.54	71.09	74	-2.91	Peak
	5350 MHz	22.81	3.99	34.32	9.54	51.58	54	-2.42	Average
	5460 MHz	39.04	4.03	34.45	9.54	67.98	74	-6.02	Peak
	5460 MHz	21.2	4.03	34.45	9.54	50.14	54	-3.86	Average
HT40	5350 MHz	43.7	3.99	34.32	9.54	72.47	74	-1.53	Peak
	5350 MHz	24.35	3.99	34.32	9.54	53.12	54	-0.88	Average
	5460 MHz	42.6	4.03	34.45	9.54	71.54	74	-2.46	Peak
	5460 MHz	24.59	4.03	34.45	9.54	53.53	54	-0.47	Average

Table 49. Radiated Band Edge, Test Results

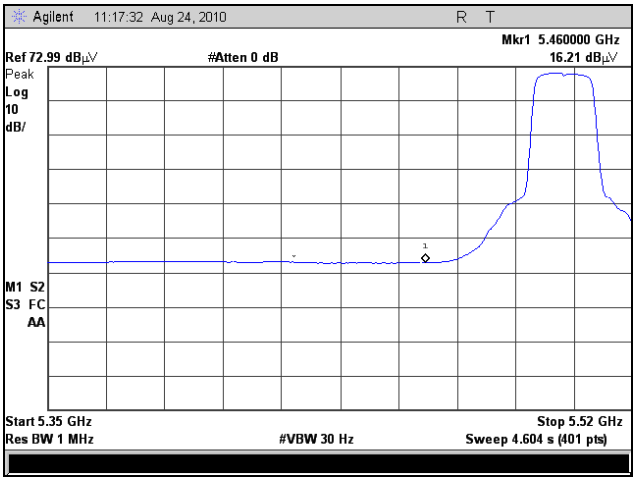
Radiated Band Edge Test Results, 802.11a



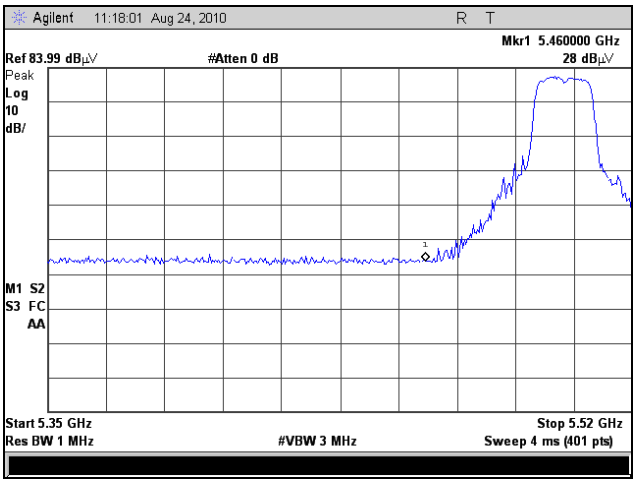
Plot 222. Radiated Band Edge, 802.11a, 5350 MHz, Average, 3 dBi Omni Antenna



Plot 223. Radiated Band Edge, 802.11a, 5350 MHz, Peak, 3 dBi Omni Antenna

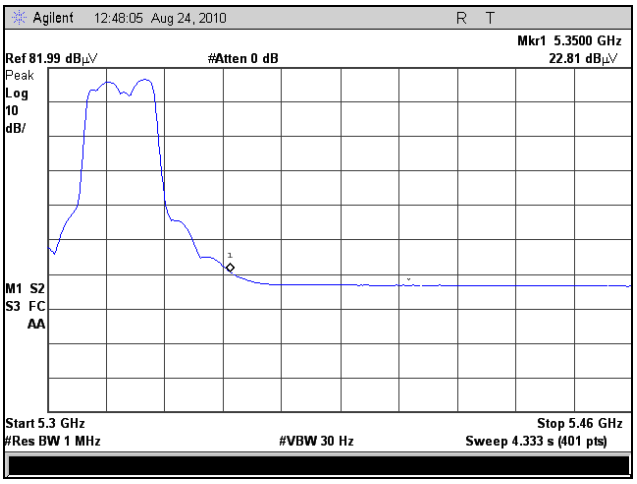


Plot 224. Radiated Band Edge, 802.11n 20 MHz, 5460 MHz, Average, 3 dBi Omni Antenna

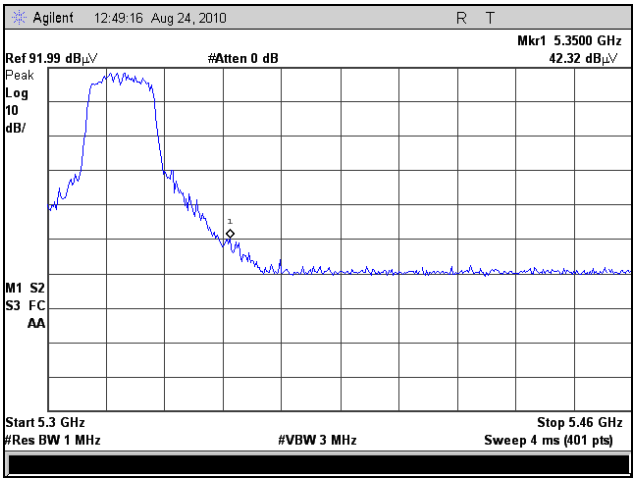


Plot 225. Radiated Band Edge, 802.11n 20 MHz, 5460 MHz, Peak, 3 dBi Omni Antenna

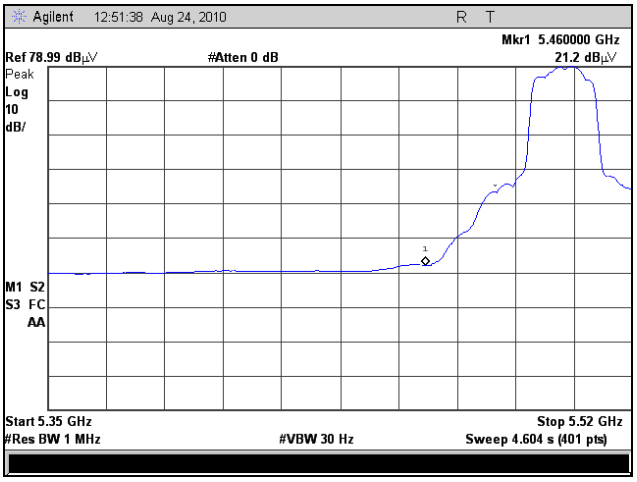
Radiated Band Edge Test Results, 802.11n 20 MHz



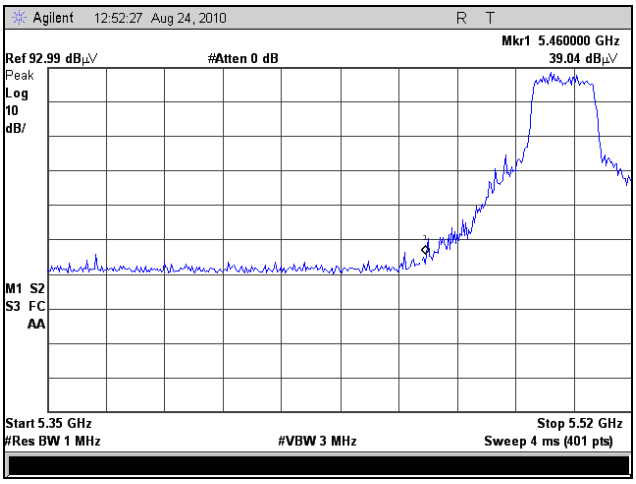
Plot 226. Radiated Band Edge, 802.11n 20 MHz, 5350 MHz, Average, 3 dBi Omni Antenna



Plot 227. Radiated Band Edge, 802.11n 20 MHz, 5350 MHz, Peak, 3 dBi Omni Antenna

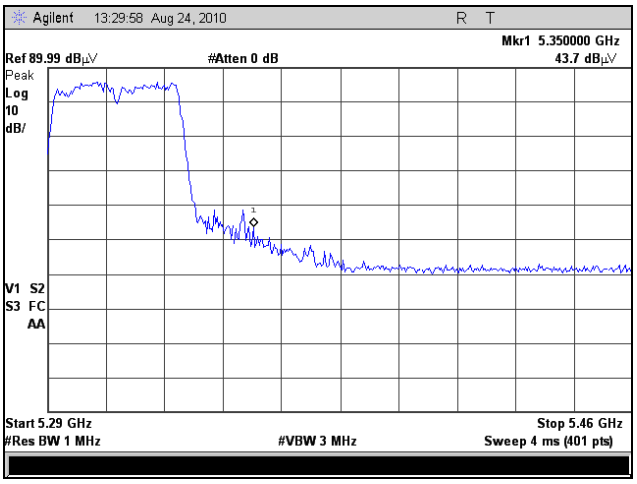


Plot 228. Radiated Band Edge, 802.11n 20 MHz, 5460 MHz, Average, 3 dBi Omni Antenna

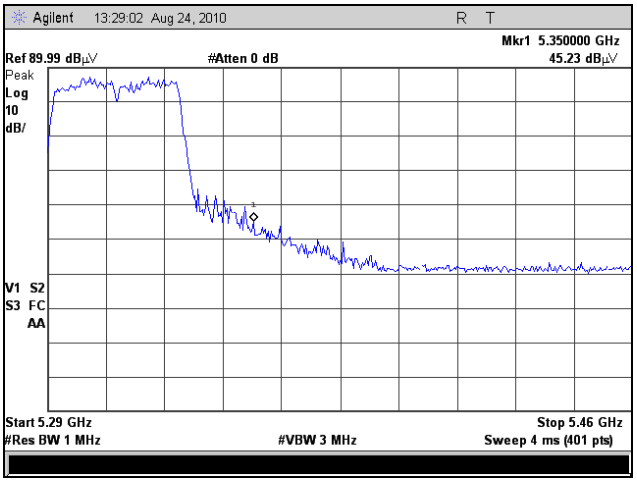


Plot 229. Radiated Band Edge, 802.11n 20 MHz, 5460 MHz, Peak, 3 dBi Omni Antenna

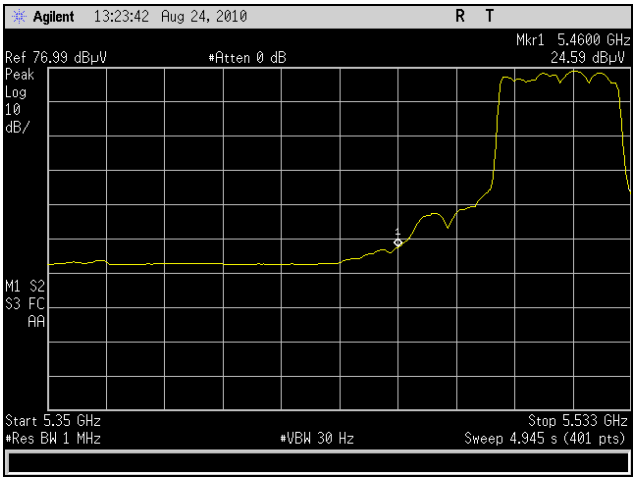
Radiated Band Edge Test Results, 802.11n 40 MHz



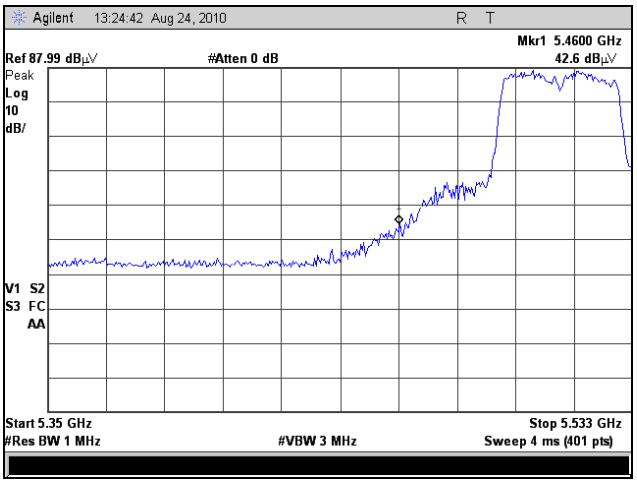
Plot 230. Radiated Band Edge, 802.11n 40 MHz, 5350 MHz, Average, 3 dBi Omni Antenna



Plot 231. Radiated Band Edge, 802.11n 40 MHz, 5350 MHz, Peak, 3 dBi Omni Antenna



Plot 232. Radiated Band Edge, 802.11n 40 MHz, 5460 MHz, Average, 3 dBi Omni Antenna

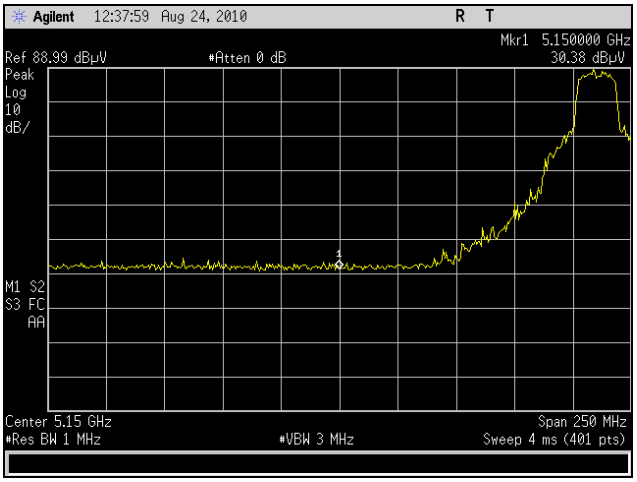


Plot 233. Radiated Band Edge, 802.11n 40 MHz, 5460 MHz, Peak, 3 dBi Omni Antenna

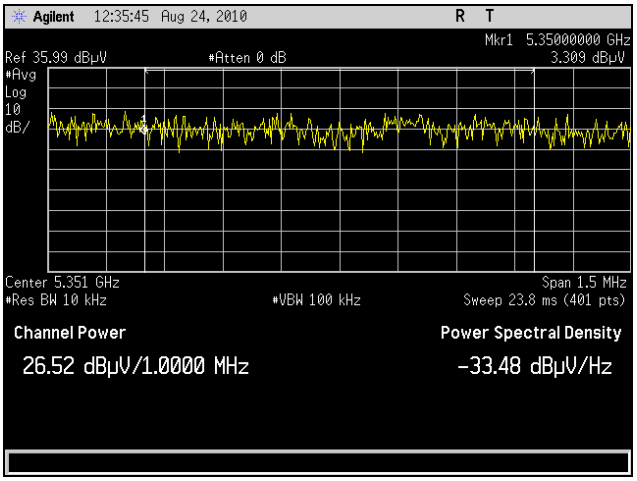
EIRP (3dBi Omni)

EIRP (3dBi Omni)								
	Restricted Band Freq.	**Uncorrected Peak (dBuV)**	**Cable Loss**	**ACF**	**DCF**	**Corrected**	**Limit (dBuV/m)**	**Margin**
802.11a	5150 MHz	30.38	3.91	34.08	9.54	58.83	68.23	-9.4
	5350 MHz	26.52	3.99	34.32	9.54	55.29	68.23	-12.94
	5470 MHz	34.3	4.04	34.47	9.54	63.27	68.23	-4.96
	5725 MHz	32.01	4.14	34.77	9.54	61.38	68.23	-6.85
HT20	5150 MHz	35.2	3.91	34.08	9.54	63.65	68.23	-4.58
	5350 MHz	24.38	3.99	34.32	9.54	53.15	68.23	-15.08
	5470 MHz	20.54	4.04	34.47	9.54	49.51	68.23	-18.72
	5725 MHz	29.09	4.14	34.77	9.54	58.46	68.23	-9.77
HT40	5150 MHz	34.8	3.91	34.08	9.54	63.25	68.23	-4.98
	5350 MHz	28.41	3.99	34.32	9.54	57.18	68.23	-11.05
	5470 MHz	19.68	4.04	34.47	9.54	48.65	68.23	-19.58
	5725 MHz	27.8	4.14	34.77	9.54	57.17	68.23	-11.06

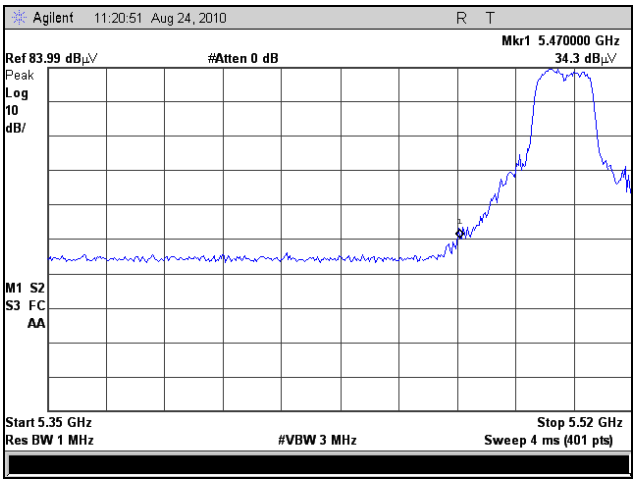
802.11a



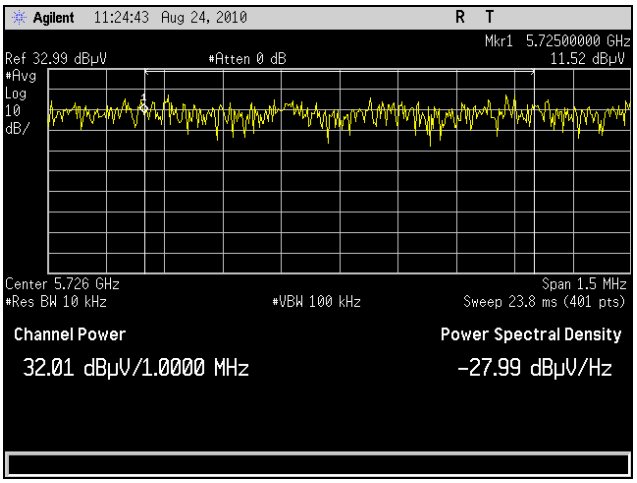
Plot 234. EIRP, 802.11a, 5150 MHz, Peak



Plot 235. EIRP, 802.11a, 5350 MHz, Peak

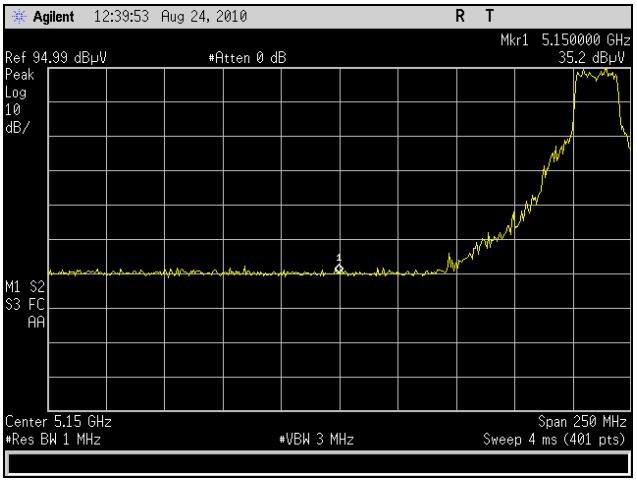


Plot 236. EIRP, 802.11a, 5470 MHz, Peak

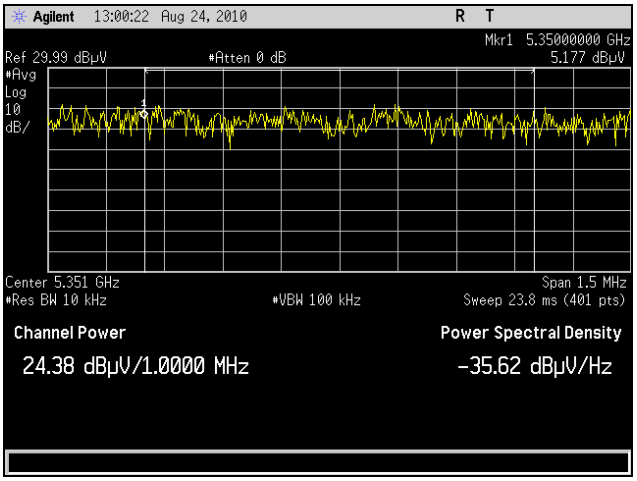


Plot 237. EIRP, 802.11a, 5725 MHz, Peak

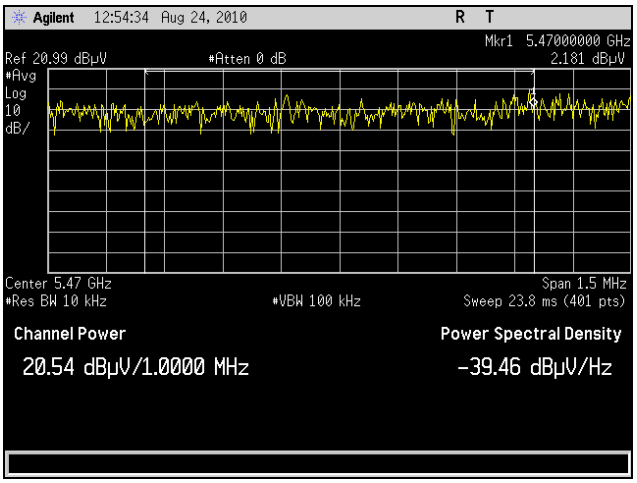
802.11n 20 MHz



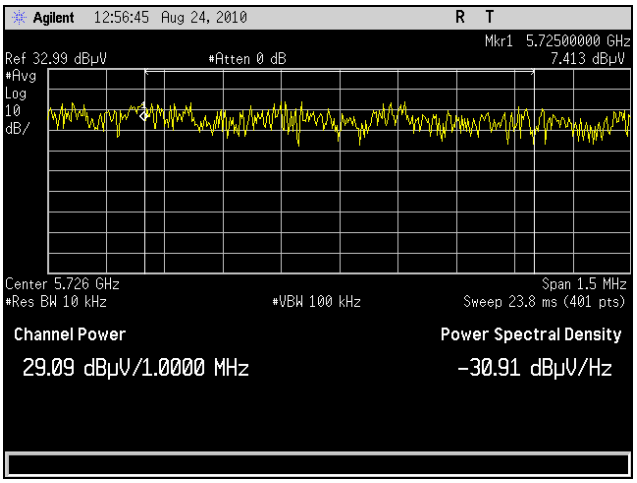
Plot 238. EIRP, 802.11n 20 MHz, 5150 MHz, Peak



Plot 239. EIRP, 802.11n 20 MHz, 5350 MHz, Peak

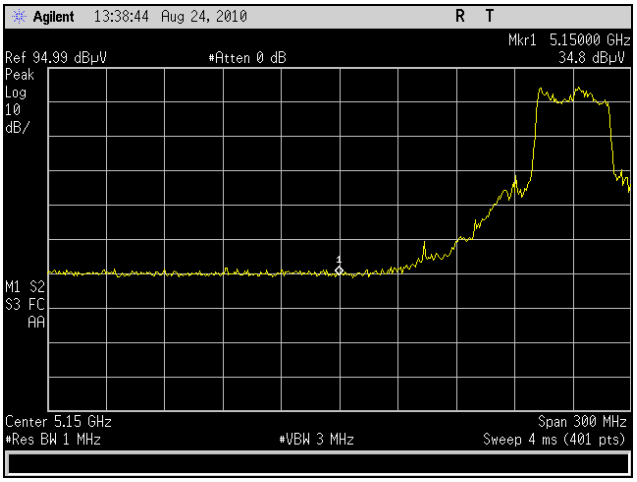


Plot 240. EIRP, 802.11n 20 MHz, 5470 MHz, Peak

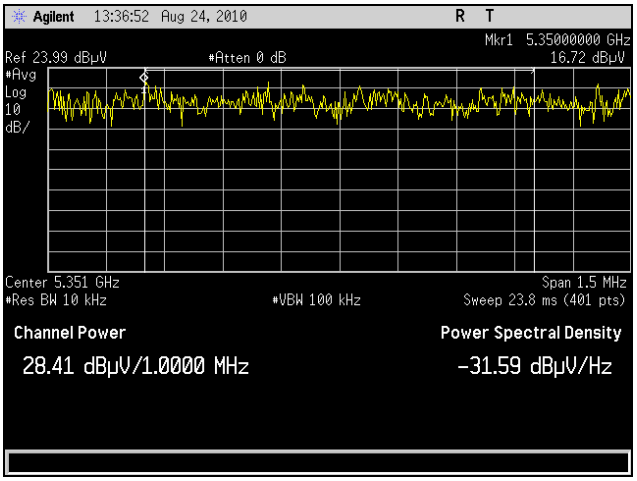


Plot 241. EIRP, 802.11n 20 MHz, 5725 MHz, Peak

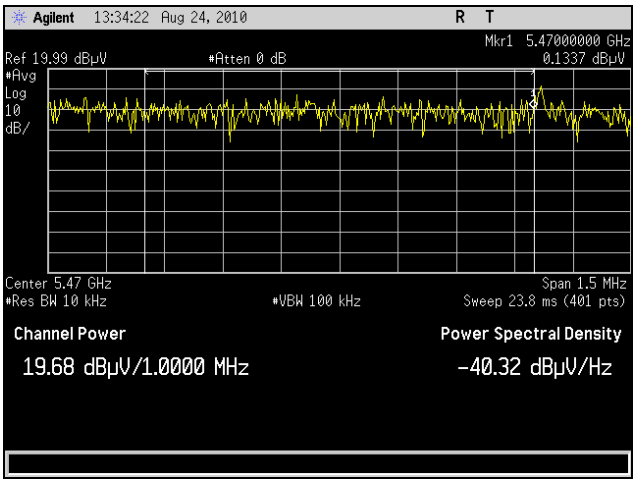
802.11n 40 MHz



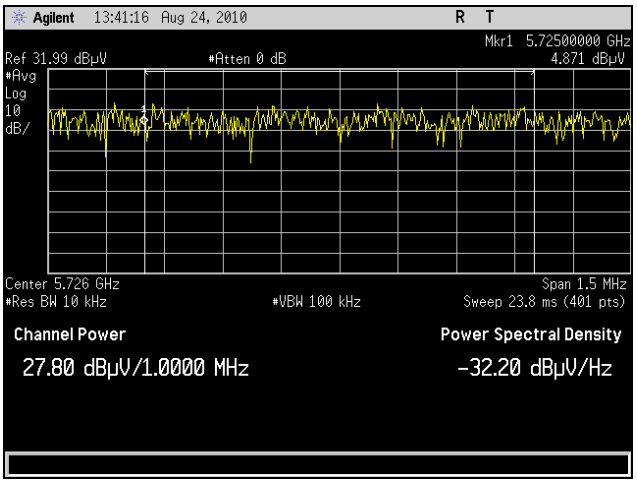
Plot 242. EIRP, 802.11n 40 MHz, 5150 MHz, Peak



Plot 243. EIRP, 802.11n 40 MHz, 5350 MHz, Peak



Plot 244. EIRP, 802.11n 40 MHz, 5470 MHz, Peak



Plot 245. EIRP, 802.11n 40 MHz, 5725 MHz, Peak

Electromagnetic Compatibility Criteria for Intentional Radiators

§ 15.407(g) Frequency Stability

Test Requirements: **§ 15.407(g):** Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

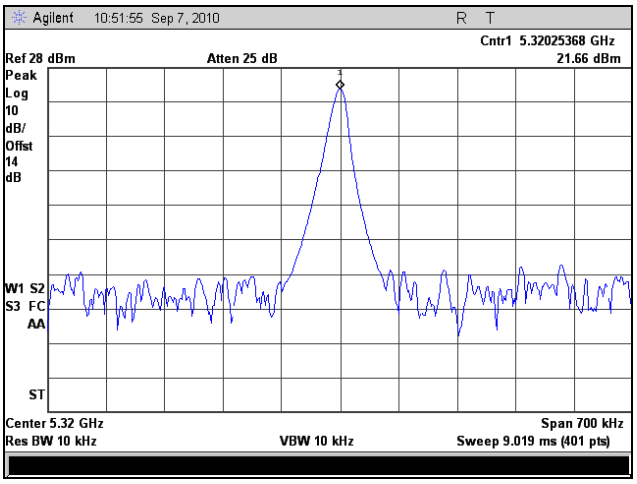
Test Procedure: The EUT was connected directly to a spectrum analyzer through a attenuator. The resolution band width of the spectrum analyzer was set to 100 KHz. A delta marker was used to verify that the carrier's peak to band edge remained at least 20dBc.

Test Results: The EUT was compliant with the requirements of **§15.407(g)**.

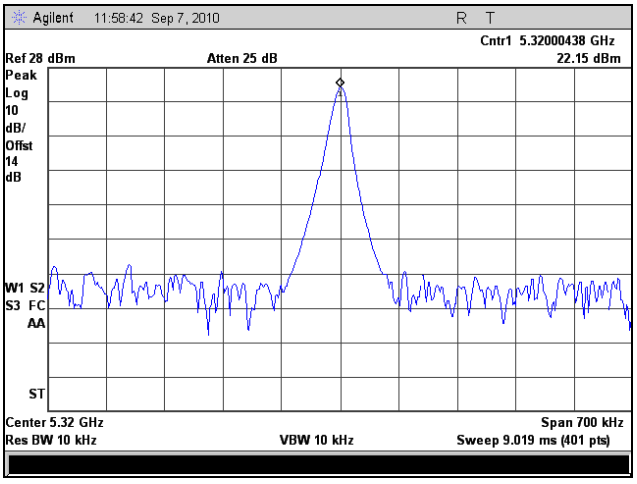
Test Engineer(s): Minh Ly

Test Date(s): 09/16/10

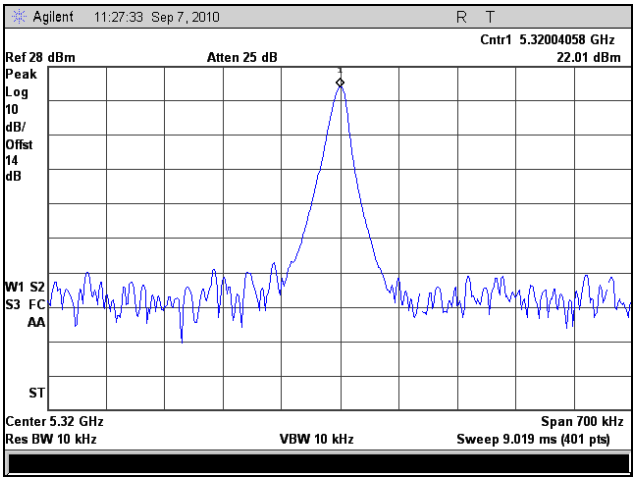
Frequency Stability Test Results



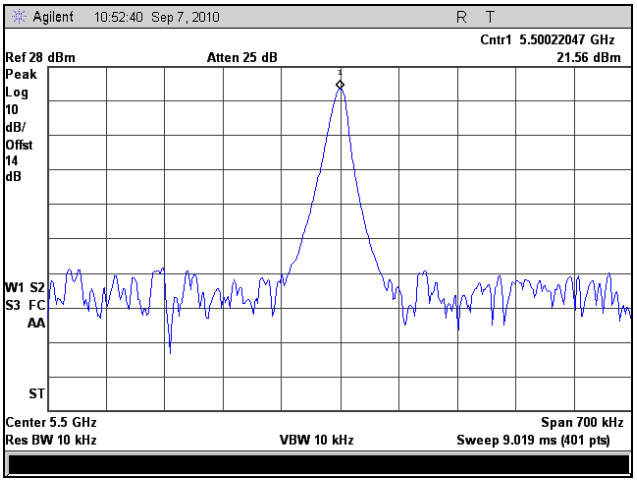
Plot 246. Frequency Stability, Port 1, 5320 MHz, 20°C



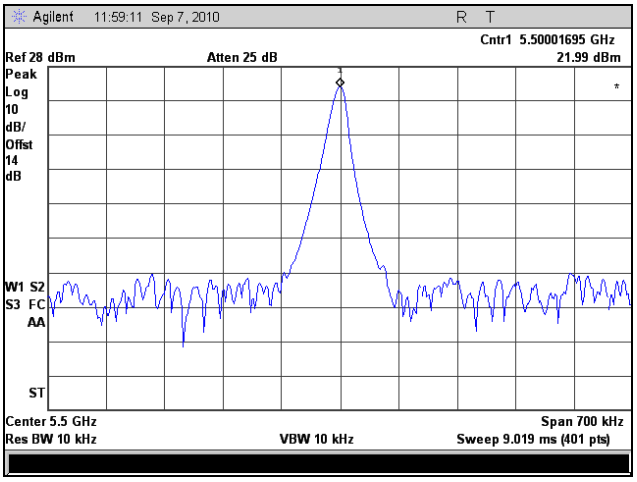
Plot 247. Frequency Stability, Port 1, 5320 MHz, 60°C



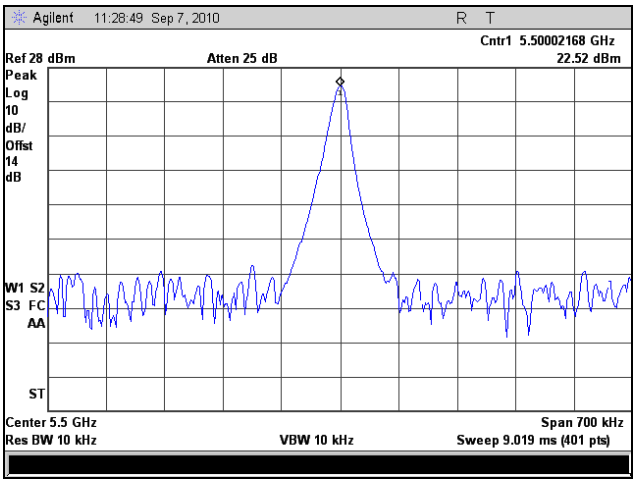
Plot 248. Frequency Stability, Port 1, 5320 MHz, -40°C



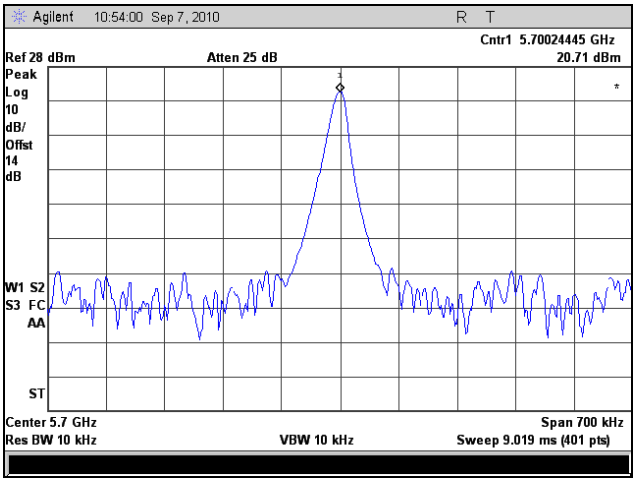
Plot 249. Frequency Stability, Port 1, 5500 MHz, 20°C



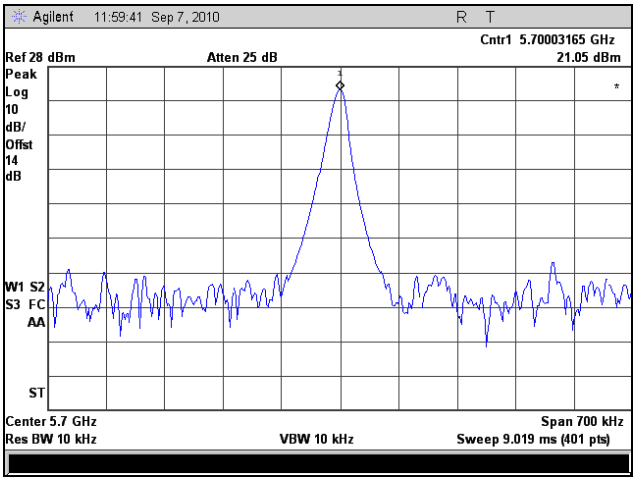
Plot 250. Frequency Stability, Port 1, 5500 MHz, 60°C



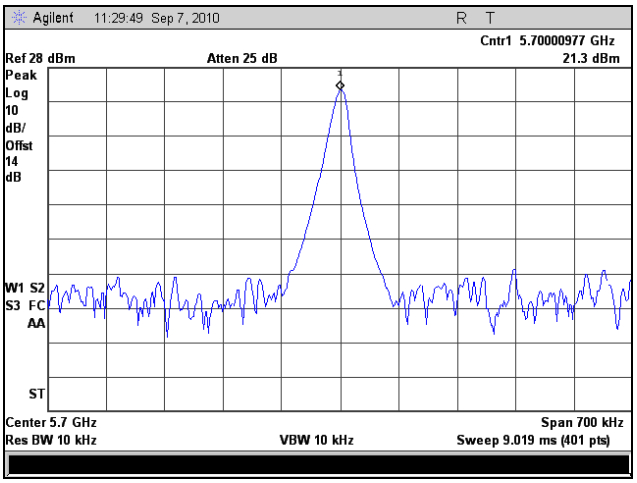
Plot 251. Frequency Stability, Port 1, 5500 MHz, -40°C



Plot 252. Frequency Stability, Port 1, 5700 MHz, 20°C



Plot 253. Frequency Stability, Port 1, 5700 MHz, 60°C



Plot 254. Frequency Stability, Port 1, 5700 MHz, -40°C

Electromagnetic Compatibility Criteria for Intentional Radiators

RSS-GEN Receiver Spurious

Test Requirement: If the device has a detachable antenna of known antenna impedance, then the antenna conducted method is permitted in lieu of a radiated measurement.

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

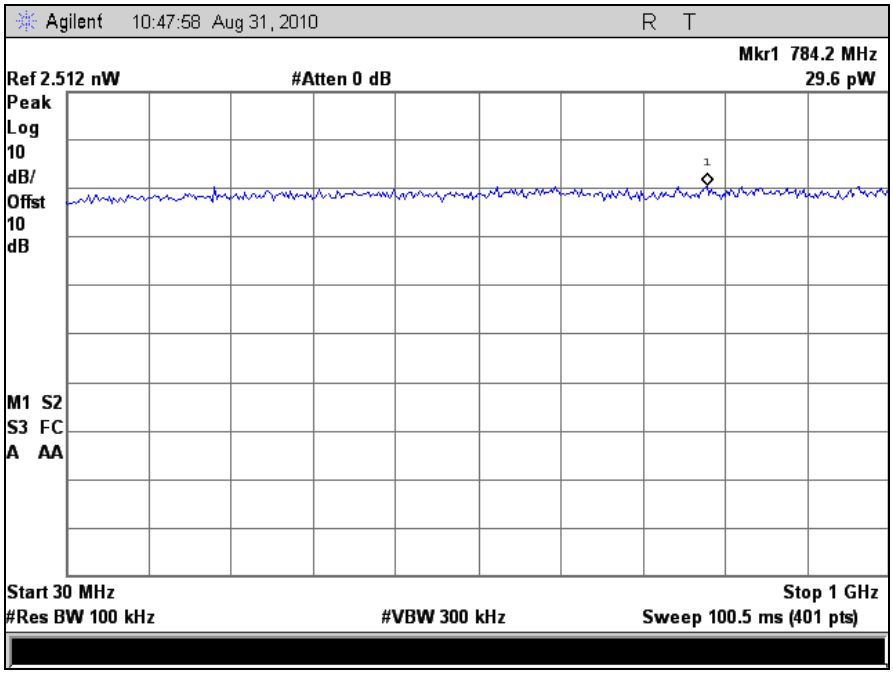
Test Procedure: The EUT was directly connected to a spectrum analyzer. Testing was performed when the EUT was receiving. Testing was performed conducted.

Results: The EUT as tested is compliant with the requirements of RSS-GEN.

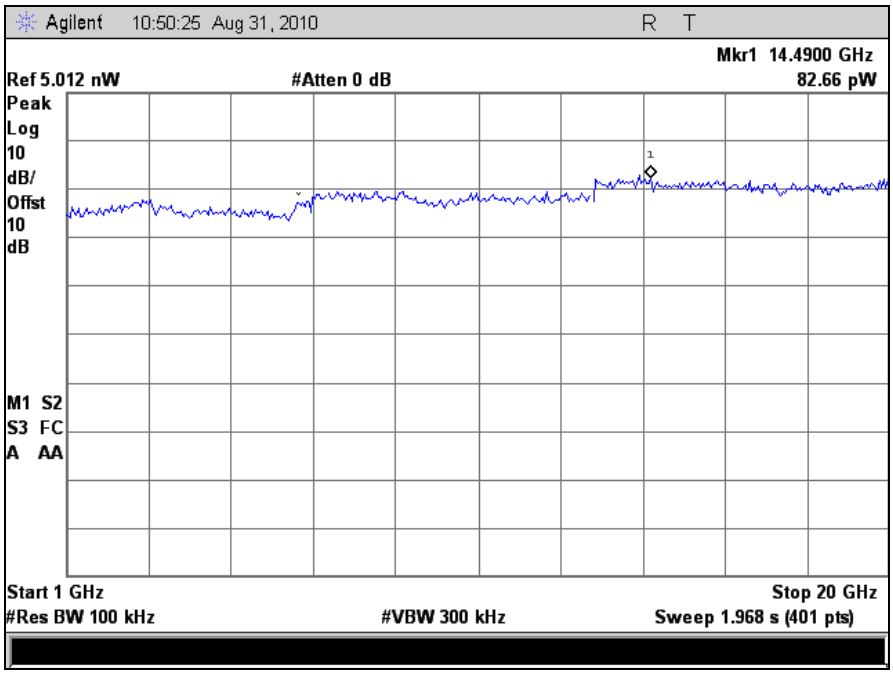
Test Engineer(s): Minh Ly

Test Date(s): 08/31/10

Receiver Spurious Emissions Test Results



Plot 255. Receiver Spurious Emission, 30MHz – 1 GHz



Plot 256. Receiver Spurious Emission, 1 GHz – 20 GHz

III. DFS Requirements and Radar Waveform Description & Calibration

A. DFS Requirements

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Client With Radar Detection
Non-Occupancy Period	Yes	Not required	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
Uniform Spreading	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

Table 50. Applicability of DFS Requirements Prior to Use of a Channel

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Client With Radar Detection
DFS Detection Threshold	Yes	Not required	Yes
Channel Closing Transmission Time	Yes	Yes	Yes
Channel Move Time	Yes	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required	Yes

Table 51. Applicability of DFS Requirements During Normal Operation

Maximum Transmit Power	Value
≥ 200 milliwatt	-64 dBm
< 200 milliwatt	-62 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.	

Table 52. DFS Detection Thresholds for Master or Client Devices Incorporating DFS

Parameter	Value
Non-occupancy period	*Minimum 30 minutes*
Channel Availability Check Time	*60 seconds*
Channel Move Time	*10 seconds See Note 1*
Channel Closing Transmission Time	*200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2*
U-NII Detection Bandwidth	*Minimum 80% of the 99% power bandwidth. See Note 3.*

Note 1: The instant that the Channel Move Time and the Channel Closing Transmission Time begins is as follows:
- **For the Short pulse radar Test Signals this instant is the end of the Burst.**
- **For the Frequency Hopping radar Test Signal, this instant is the end of the last radar *Burst* generated.**
- **For the Long Pulse radar Test Signal this instant is the end of the 12 second period defining the radar transmission.**

Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required facilitating Channel changes (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

Note 3: During the U-NII Detection Bandwidth detection test, radar type 1 is used and for each frequency step the minimum percentage of detection is 90%. Measurements are performed with no data traffic.

Table 53. DFS Response Requirement Values

B. Radar Test Waveforms

This section provides the parameters for required test waveforms, minimum percentage of successful detections, and the minimum number of trials that must be used for determining DFS conformance. Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of specific test waveforms.

Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (µsec)	PRI (µsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Trials
1	1	1428	18	60%	30
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120

A minimum of 30 unique waveforms are required for each of the short pulse radar types 2 through 4. For short pulse radar type 1, the same waveform is used a minimum of 30 times. If more than 30 waveforms are used for short pulse radar types 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms. The aggregate is the average of the percentage of successful detections of short pulse radar types 1-4.

Long Pulse Radar Test Waveform

Radar Type	Pulse Width (µsec)	Chirp Width (MHz)	PRI (µsec)	Number of Pulses per Bursts	Number of Bursts	Minimum Percentage of Successful Detection	Minimum Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

The parameters for this waveform are randomly chosen. Thirty unique waveforms are required for the Long Pulse radar test signal. If more than 30 waveforms are used for the Long Pulse radar test signal, then each additional waveform must also be unique and not repeated from the previous waveforms.

Each waveform is defined as follows:

1) The transmission period for the Long Pulse Radar test signal is 12 seconds.
2) There are a total of 8 to 20 Bursts in the 12 second period, with the number of Bursts being randomly chosen. This number is Burst_Count.
3) Each Burst consists of 1 to 3 pulses, with the number of pulses being randomly chosen. Each Burst within the 12 second sequence may have a different number of pulses.
4) The pulse width is between 50 and 100 microseconds, with the pulse width being randomly chosen. Each pulse within a Burst will have the same pulse width. Pulses in different Bursts may have different pulse widths.
5) Each pulse has a linear FM chirp between 5 and 20 MHz, with the chirp width being randomly chosen. Each pulse within a Burst will have the same chirp width. Pulses in different Bursts may have different chirp widths. The chirp is centered on the pulse. For example, with radar frequency of 5300 MHz and a 20 MHz chirped signal, the chirp starts at 5290 MHz and ends at 5310 MHz.
6) If more than one pulse is present in a Burst, the time between the pulses will be between 1000 and 2000 microseconds, with the time being randomly chosen. If three pulses are present in a Burst, the time between the first and second pulses is chosen independently of the time between the second and third pulses.
7) The 12 second transmission period is divided into even intervals. The number of intervals is equal to Burst_Count. Each interval is of length (12,000,000 / Burst_Count) microseconds. Each interval contains one Burst. The start time for the Burst, relative to the beginning of the interval, is between 1 and [(12,000,000 / Burst_Count) – (Total Burst Length) + (One Random PRI Interval)] microseconds, with the start time being randomly chosen. The step interval for the start time is 1 microsecond. The start time for each Burst is chosen independently.

A representative example of a Long Pulse radar test waveform:

1) The total test signal length is 12 seconds.
2) 8 Bursts are randomly generated for the Burst_Count.
3) Burst 1 has 2 randomly generated pulses.
4) The pulse width (for both pulses) is randomly selected to be 75 microseconds.
5) The PRI is randomly selected to be at 1213 microseconds.
6) Bursts 2 through 8 are generated using steps 3 – 5.
7) Each Burst is contained in even intervals of 1,500,000 microseconds. The starting location for Pulse 1, Burst 1 is randomly generated (1 to 1,500,000 minus the total Burst 1 length + 1 random PRI interval) at the 325,001 microsecond step. Bursts 2 through 8 randomly fall in successive 1,500,000 microsecond intervals (i.e. Burst 2 falls in the 1,500,001 – 3,000,000 microsecond range).

Graphical Representation of a Long Pulse radar Test Waveform

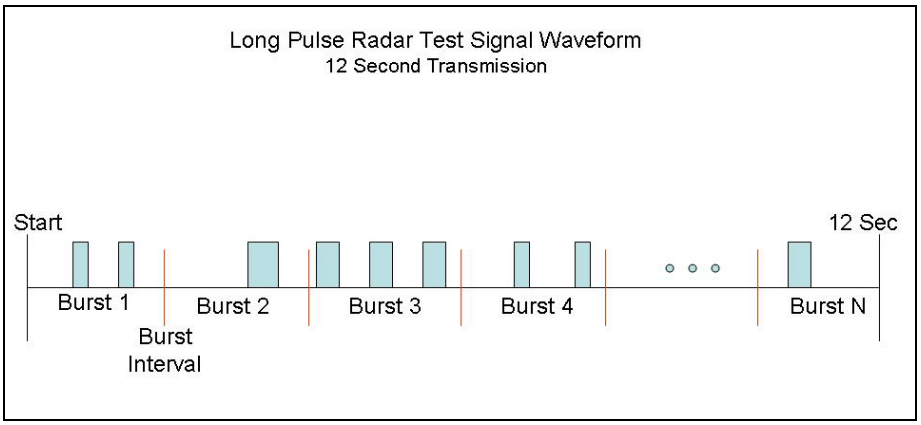


Figure 6. Long Pulse Radar Test Signal Waveform

Frequency Hopping Radar Test Waveform

Radar Type	Pulse Width (µsec)	PRI (µsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Trials
6	1	333	9	.333	300	70%	30

For the Frequency Hopping Radar Type, the same *Burst* parameters are used for each waveform. The hopping sequence is different for each waveform and a 100-length segment is selected1 from the hopping sequence defined by the following algorithm:

The first frequency in a hopping sequence is selected randomly from the group of 475 integer frequencies from 5250 – 5724 MHz. Next, the frequency that was just chosen is removed from the group and a frequency is randomly selected from the remaining 474 frequencies in the group. This process continues until all 475 frequencies are chosen for the set. For selection of a random frequency, the frequencies remaining within the group are always treated as equally likely.

C. Radar Waveform Calibration

The following equipment setup was used to calibrate the radiated Radar Waveform. A spectrum analyzer was used to establish the test signal level for each radar type. During this process there were no transmissions by either the Master or Client Device. The spectrum analyzer was switched to the zero span (Time Domain) mode at the frequency of the Radar Waveform generator. Peak detection was utilized. The spectrum analyzer's resolution bandwidth (RBW) was set to 3 MHz and the video bandwidth (VBW) was set to 3 MHz. The calibration setup is diagrammed in Figure 7, and the radar test signal generator is shown in Photograph 13.

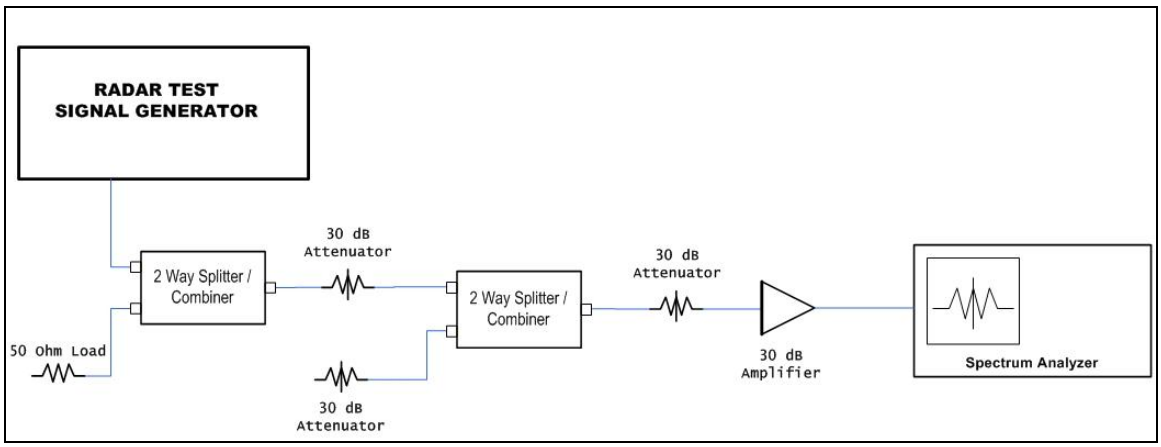
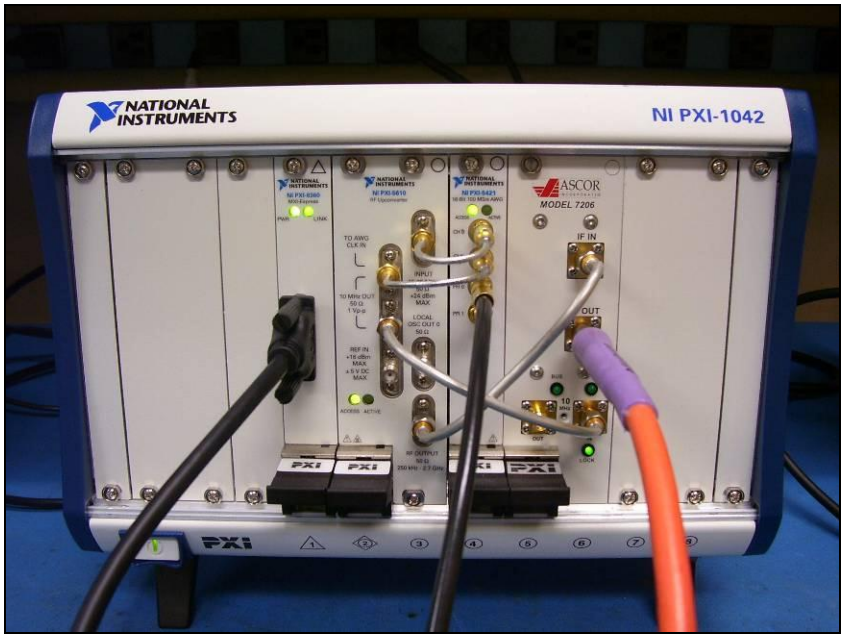
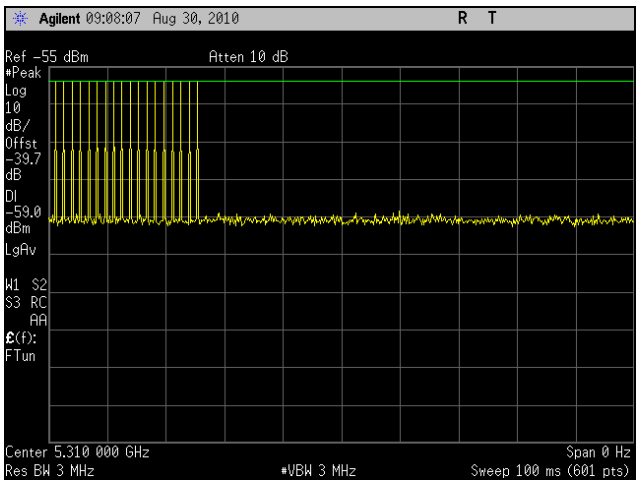


Figure 7. Calibration Test Setup

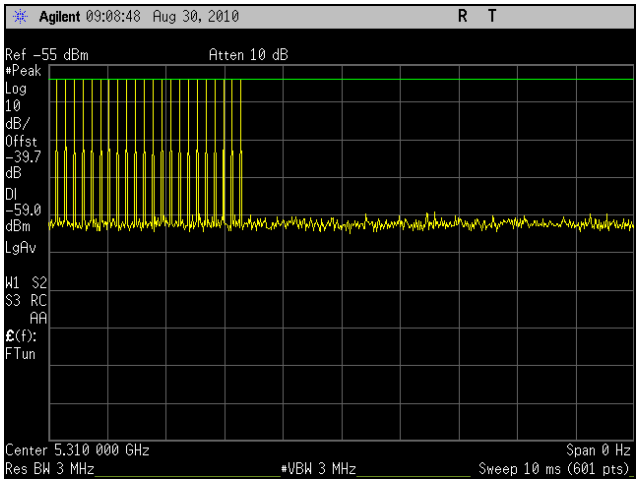


Photograph 13. DFS Radar Test Signal Generator

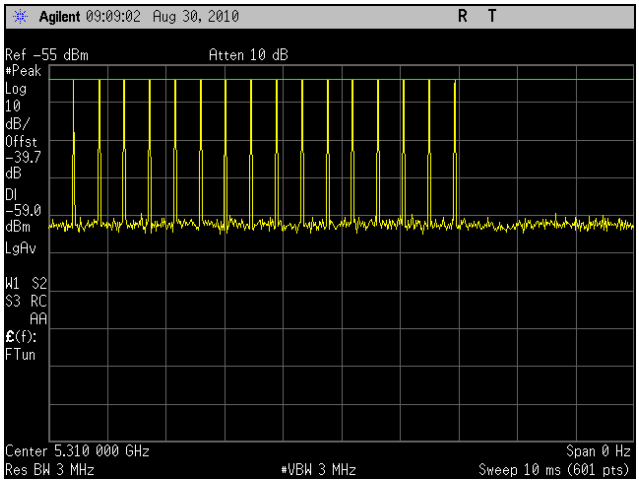
Radar Calibration



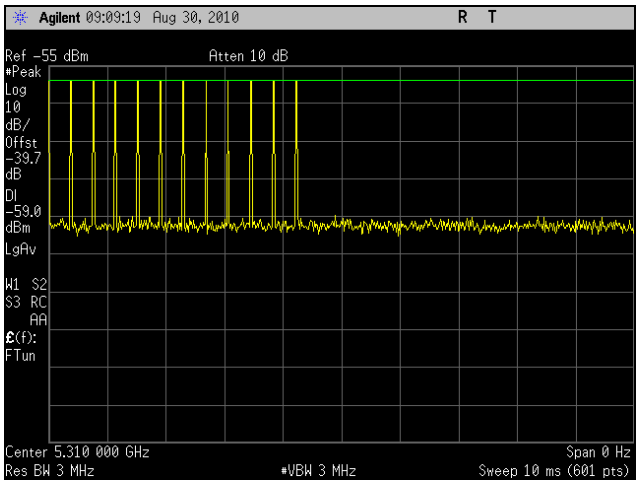
Plot 257. Bin 1 Radar Calibration, 5310 MHz



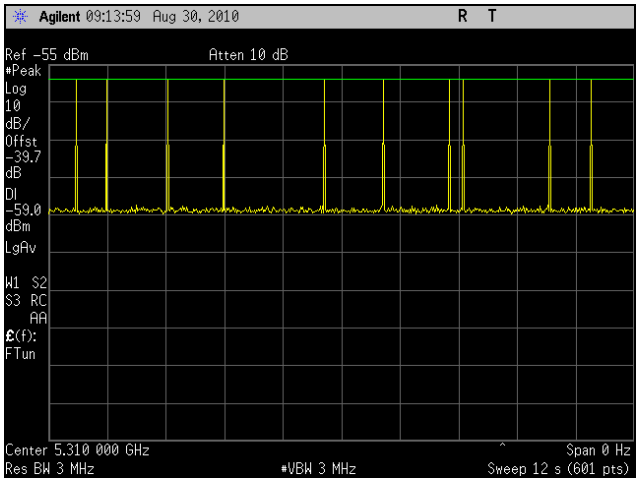
Plot 258. Bin 2 Radar Calibration, 5310 MHz



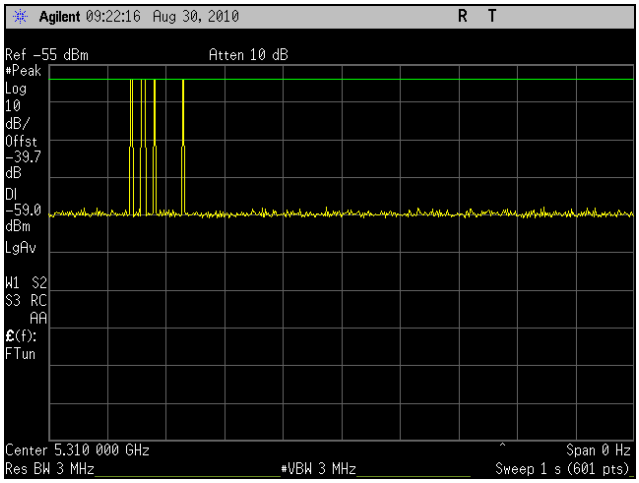
Plot 259. Bin 3 Radar Calibration, 5310 MHz



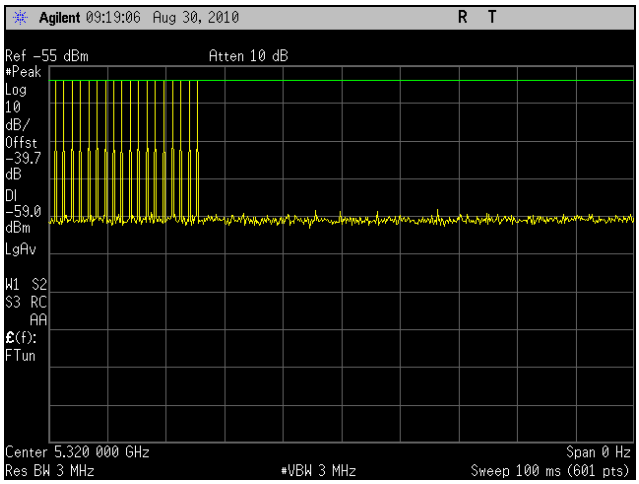
Plot 260. Bin 4 Radar Calibration, 5310 MHz



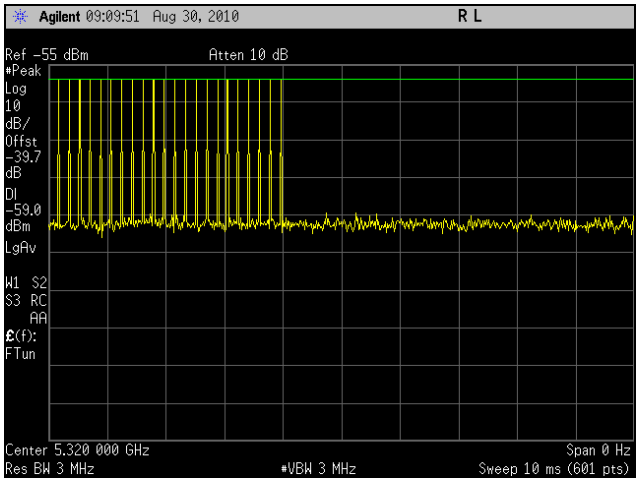
Plot 261. Bin 5 Radar Calibration, 5310 MHz



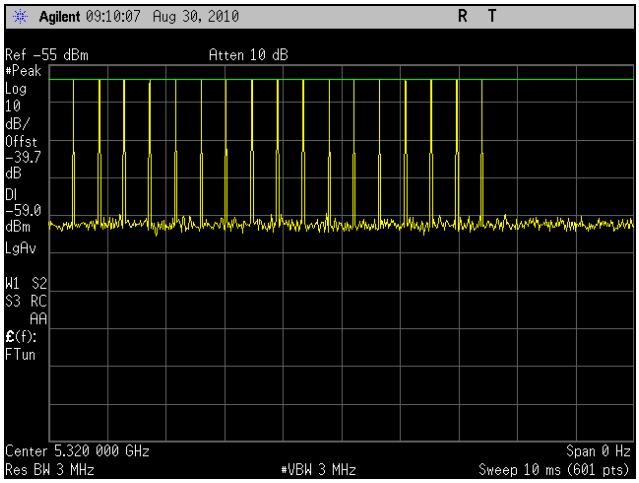
Plot 262. Bin 6 Radar Calibration, 5310 MHz



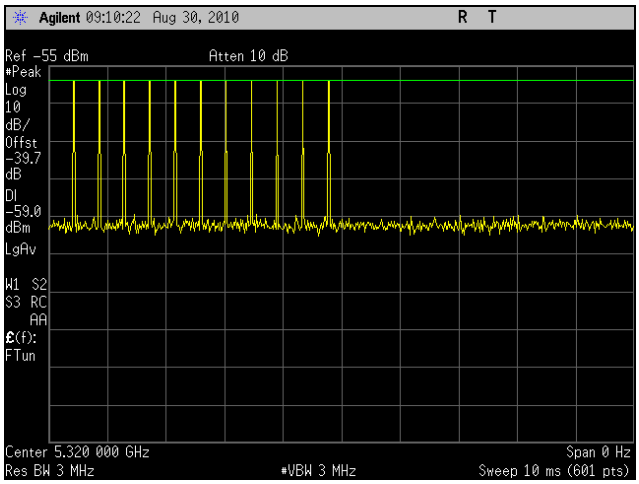
Plot 263. Bin 1 Radar Calibration, 5320 MHz



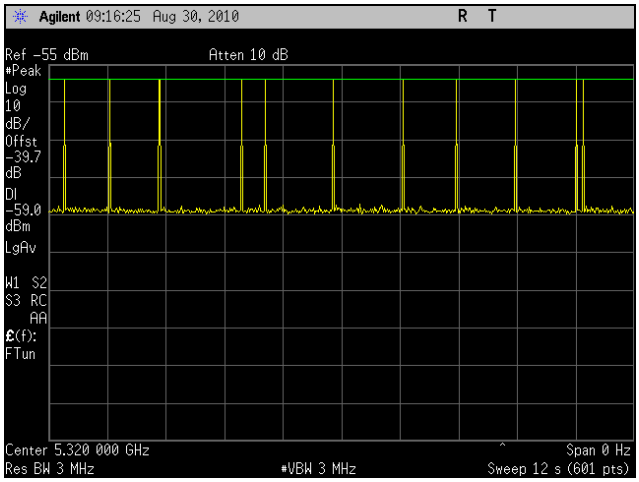
Plot 264. Bin 2 Radar Calibration, 5320 MHz



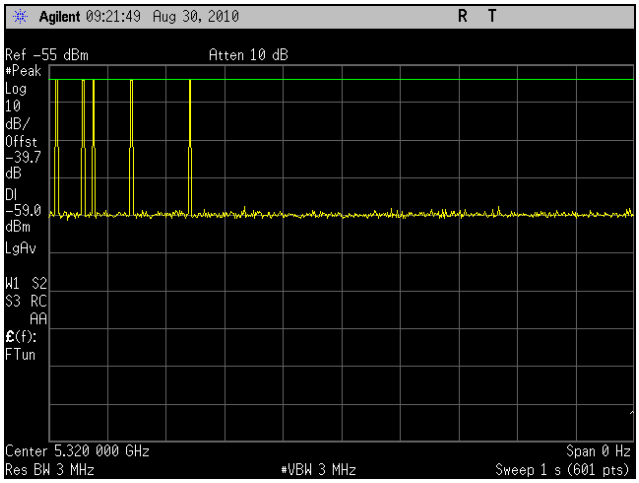
Plot 265. Bin 3 Radar Calibration, 5320 MHz



Plot 266. Bin 4 Radar Calibration, 5320 MHz



Plot 267. Bin 5 Radar Calibration, 5320 MHz



Plot 268. Bin 6 Radar Calibration, 5320 MHz

V. DFS Test Procedure and Test Results

DFS Test Setup

A. DFS Test Setup

The 5600 – 5650 MHz bands were disabled.

1. A spectrum analyzer is used as a monitor to verify that the Unit Under Test (UUT) has vacated the Channel within the Channel Closing Transmission Time and Channel Move Time, and does not transmit on a Channel during the Non-Occupancy Period after the detection and subsequent Channel move. It is also used to monitor UUT transmissions during the Channel Availability Check Time.
2. The test setup, which consists of test equipment and equipment under test (EUT), is and pictured in Figure 8. Test Setup Diagram.

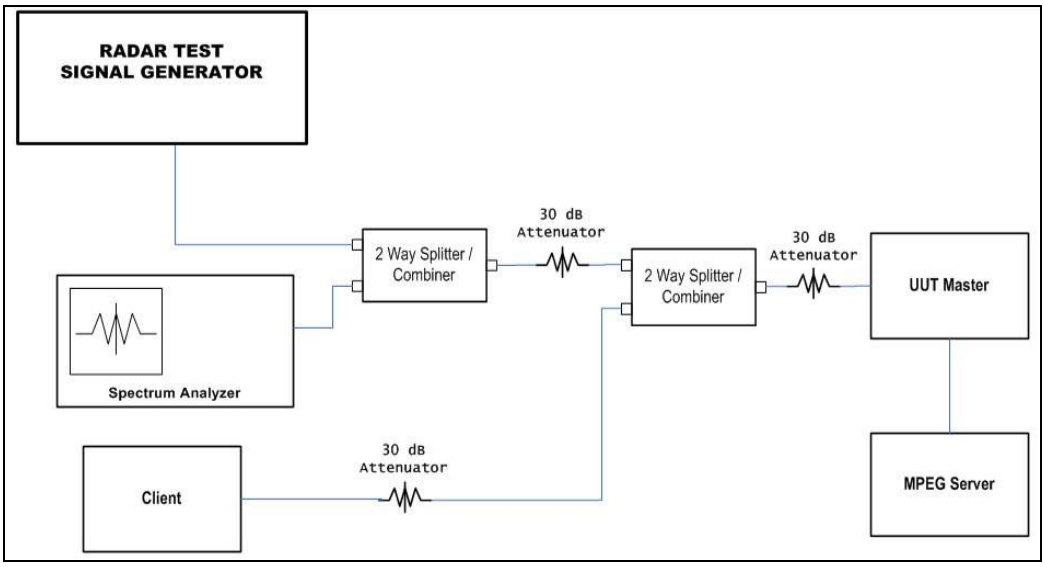


Figure 8. Test Setup Diagram

B. Description of Master Device

1. Operating Frequency Range – 5250-5725 MHz
2. Modes of Operation – 802.11a/802.11n
3. Highest and Lowest EIRP – Highest: 22.29 dBm; Lowest: 9.46 dBm
4. List all antennas and associated gains –

Gain/Type	Model	Manufacturer
3dBi Omni (5GHz)	98144PRX003	Master Wave Tech
9dBi Omni	MA-W055-MIMONHFT9	MARS ANTENNAS & RF Systems LTD
16dBi Sector	MA-WD55-MIMOFT16	MARS ANTENNAS & RF Systems LTD
19dBi Panel	MA-WA55-MIMO	MARS ANTENNAS & RF Systems LTD

5. List output power ranges – 6.46dBm – 19.29 dBm
6. List antenna impedance – 50 ohms
7. Antenna gain verification - Use antenna data sheet
8. State test file that is transmitted – 6 and ½ Magic Hours
9. Time for master to complete its power-on-cycle – 105 seconds

UNII Detection Bandwidth

Test Requirement(s): **§ 15.407** A minimum 80% of the UNII 99% transmission power bandwidth is required.

Test Procedure: All UNII channels for this device have identical channel bandwidths.

A single burst of the short pulse radar type 1 is produced at 5320 and 5310 MHz, at the -59dBm test level. The UUT is set up as a standalone device (no associated client, and no data traffic).

A single radar burst is generated for a minimum of 10 trials, and the response of the UUT is recorded. The UUT must detect the radar waveform 90% or more of the time.

The radar frequency is increased in 1 MHz steps, repeating the above test sequence, until the detection rate falls below 90%. The highest frequency at which detection is greater than or equal to 90% is denoted F_H.

The radar frequency is decreased in 1 MHz steps, repeating the above test sequence, until the detection rate falls below 90%. The lowest frequency at which detection is greater than or equal to 90% is denoted F_L.

The U-NII Detection Bandwidth is calculated as follows:

$$\text{U-NII Detection Bandwidth} = F_H - F_L$$

Test Engineer: Anderson Soungpanya

Test Date: 09/10/10

EUT Frequency- 5320MHz 20MHz BW											
	DFS Detection Trials (1=Detection, 0= No Detection)										
Radar Frequency (MHz)	1	2	3	4	5	6	7	8	9	10	Detection Rate (%)
5309	0	0	0	0	1	0	1	0	0	0	20
5310 (fL)	1	1	1	0	1	1	1	1	1	1	90
5311	1	1	1	0	1	1	1	1	1	1	90
5312	1	1	1	1	1	0	1	1	1	1	90
5313	1	1	1	1	0	1	1	1	1	1	90
5314	1	1	1	1	1	1	1	1	1	1	100
5315	1	1	1	1	1	1	1	1	1	1	100
5316	1	1	1	1	1	1	1	1	1	1	100
5317	1	1	0	1	1	1	1	1	1	1	90
5318	1	1	1	1	1	1	1	1	1	1	100
5319	1	1	1	1	1	1	1	1	1	1	100
5320	1	1	1	1	1	1	1	1	1	1	100
5321	1	1	1	1	1	1	1	1	1	1	100
5322	1	1	1	1	0	1	1	1	1	1	90
5323	1	1	1	1	1	1	1	1	1	1	100
5324	1	1	1	1	1	1	1	1	1	1	100
5325	1	1	1	1	1	1	1	1	1	1	100
5326	1	1	1	1	1	1	1	1	1	1	100
5327	1	1	1	1	1	1	1	1	1	1	100
5328	1	1	1	1	1	0	1	1	1	1	90
5329	1	1	1	1	1	1	1	1	1	1	100
5330 (fH)	1	1	1	1	1	1	1	1	0	1	90
5331	1	0	0	0	0	1	0	0	0	0	20
Overall Detection Percentage											96.12 %
Detection Bandwidth = f_h - f_l = 5330MHz-5310MHz = 20MHz											
EUT 99% Bandwidth = 17.62 MHz											
OBW* 80% = 17.62*80% = 14.09 MHz < 20MHz											

Table 54. UNII Detection Bandwidth, Test Results, 5320 MHz, 802.11 20 MHz

EUT Frequency- 5310MHz 40MHz BW											
	DFS Detection Trials (1=Detection, 0= No Detection)										
Radar Frequency (MHz)	1	2	3	4	5	6	7	8	9	10	Detection Rate (%)
5289	1	0	0	0	0	0	1	0	1	0	30
5290 (fL)	1	1	1	1	1	1	1	1	1	0	90
5291	1	1	1	1	1	1	1	1	1	1	100
5292	1	1	0	1	1	1	1	1	1	1	90
5293	1	1	1	1	0	1	1	1	1	1	90
5294	1	1	1	1	1	1	1	1	1	1	100
5295	1	1	1	1	1	1	1	1	1	1	100
5296	1	1	1	1	1	1	1	1	1	1	100
5297	1	1	1	1	1	1	1	1	1	1	100
5298	1	1	1	1	1	1	1	1	1	1	100
5299	1	1	1	1	1	1	1	1	1	1	100
5300	1	0	1	1	1	1	1	1	1	1	90
5301	1	1	1	1	1	1	1	1	1	1	100
5302	1	1	1	1	1	1	1	0	1	1	90
5303	1	1	1	1	1	1	1	1	1	1	100
5304	1	1	1	1	1	1	1	1	1	1	100
5305	1	1	1	1	1	1	1	1	1	1	100
5306	1	1	1	1	1	1	1	1	1	1	100
5307	1	1	1	1	1	1	1	1	1	1	100
5308	1	1	1	1	1	1	1	1	1	1	100
5309	1	1	1	1	1	1	1	1	1	1	100
5310 (fC)	1	1	1	1	1	1	1	1	1	1	100
5311	1	1	1	1	1	1	1	1	1	1	100
5312	1	1	1	1	1	1	1	1	1	1	100
5313	1	1	1	1	0	1	1	1	1	1	90
5314	1	1	1	1	1	1	1	1	1	1	100
5315	1	1	1	1	1	1	1	1	1	1	100
5316	1	1	1	1	1	1	1	1	1	1	100
5317	1	1	0	1	1	1	1	1	1	1	90
5318	1	1	1	1	1	1	1	1	1	1	100
5319	1	1	1	1	1	1	1	1	1	1	100
5320	1	1	1	1	1	1	1	1	0	1	90
5321	1	1	1	1	1	1	1	1	1	1	100
5322	1	1	1	1	1	1	1	1	1	1	100
5323	1	1	1	1	1	1	1	1	1	1	100
5324	1	1	1	1	1	1	1	1	1	1	100
5325	1	1	1	1	1	1	1	1	1	1	100
5326	1	1	1	1	1	1	1	1	1	1	100
5327	1	1	0	1	1	1	1	1	1	1	90
5328	1	1	1	1	1	1	1	0	1	1	90
5329	1	1	1	1	1	1	1	1	1	1	100
5330 (fH)	1	1	1	1	1	1	1	1	1	1	100
5331	0	0	1	0	0	0	1	0	0	0	20
Overall Detection Percentage											97.56%
Detection Bandwidth = f_h - f_l = 5616MHz-5564MHz = 40MHz											
EUT 99% Bandwidth = 36.41											
OBW* 80% = 36.55 * 80% = 29.13MHz < 40MHz											

Table 55. UNII Detection Bandwidth, Test Results, 5310 MHz, 802.11 40 MHz

In-Service Monitoring for Channel Move Time, Channel Closing Transmission Time, and Non-Occupancy Period

Test Requirements: **§ 15.407** (Refer to DFS Response Requirement Values table in section III-A of this report.) The UUT shall continuously monitor for radar transmissions in the operating test channel. When a radar burst occurs in the test channel, it has 10 seconds to move to another channel. This 10 second window is termed Channel Move Time (CMT).

When a radar burst occurs, the UUT has 200 milliseconds, plus an aggregate of 60 milliseconds, to cease transmission in the operating test channel. This 200 ms + 60 ms requirement is termed Channel Closing Transmission Time (CCT).

After radar burst and subsequent move to another channel, the UUT shall not resume transmission, on the channel it moved from, for a period of 30 minutes. This requirement is termed Non-Occupancy Period (NOP).

Test Procedure: These tests define how the following DFS parameters are verified during In-Service Monitoring: Channel Closing Transmission Time, Channel Move Time, and Non-Occupancy Period.

The steps below define the procedure to determine the above mentioned parameters when a radar Burst with a level equal to the DFS Detection Threshold + 1dB (-59dBm) is generated on the Operating Channel of the U-NII device.

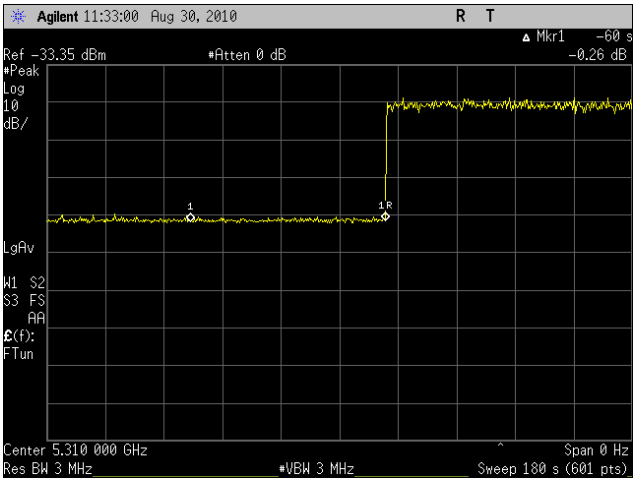
A U-NII device operating as a Client Device will associate with the UUT (Master) at 5320 & 5310 MHz. Stream the MPEG test file from the Master Device to the Client Device on the selected Channel for the entire period of the test.

At time T0 the Radar Waveform generator sends a Burst of pulses for each of the radar types at -59dBm.

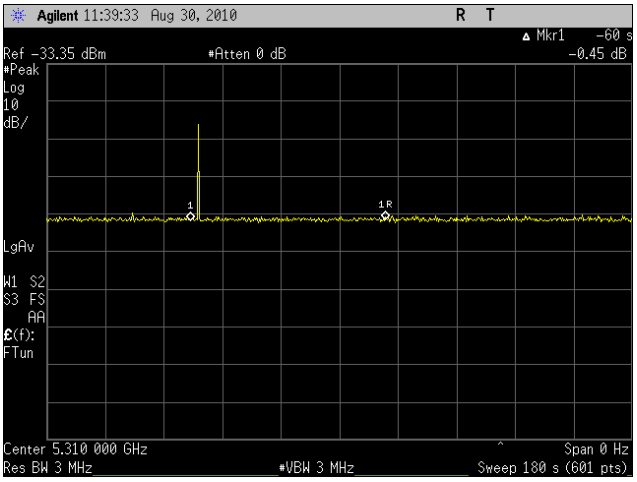
Observe the transmissions of the UUT at the end of the radar Burst on the Operating Channel for duration greater than 10 seconds. Measure and record the transmissions from the UUT during the observation time (Channel Move Time). Compare the Channel Move Time and Channel Closing Transmission Time results to the limits defined in the *DFS Response Requirement Values table*.

Test Engineer: Anderson Soungpanya

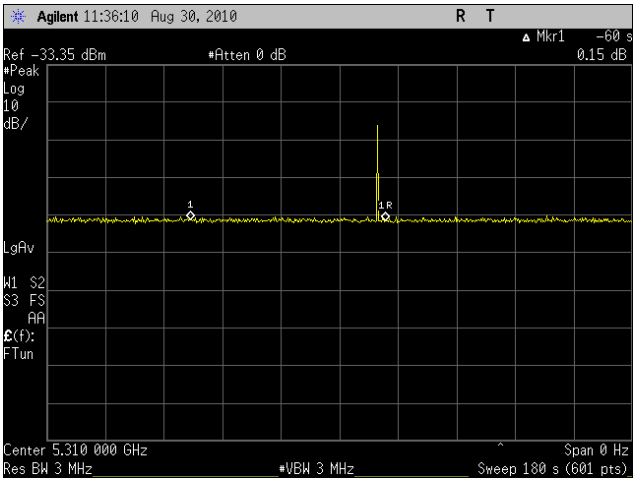
Test Date: 09/10/10



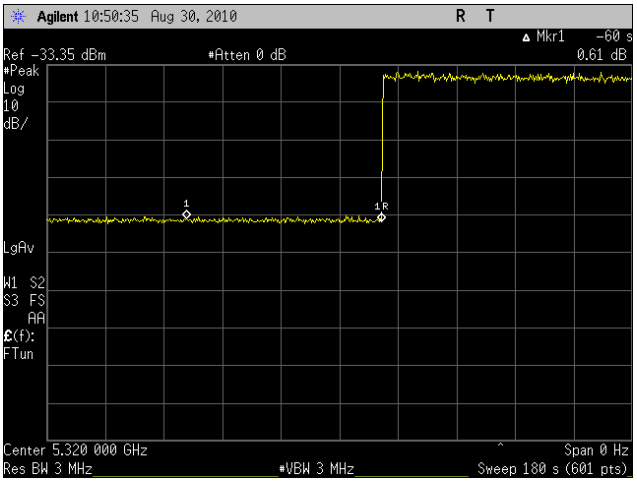
Plot 269. Channel Availability Check Time (CACT), Boot-Up Time, 5310 MHz



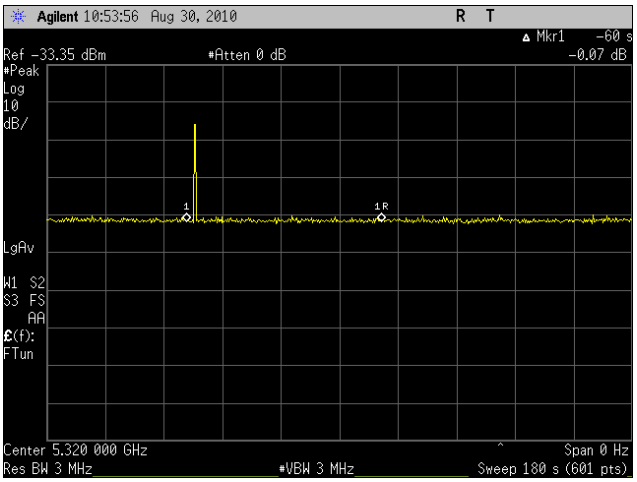
Plot 270. Channel Availability Check Time (CACT), Burst at Beginning, 5310 MHz



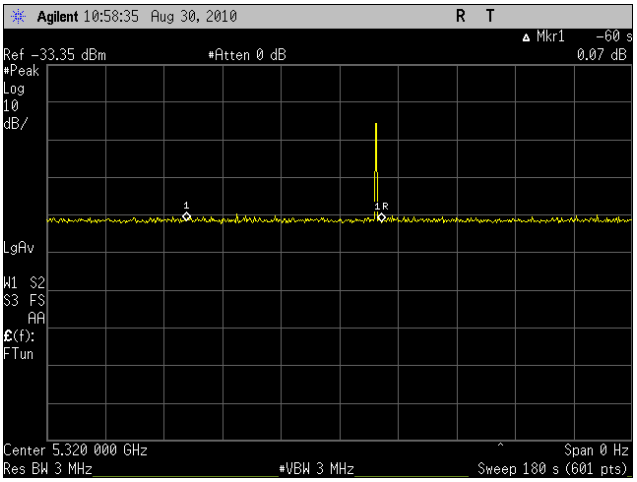
Plot 271. Channel Availability Check Time (CACT), Burst at End, 5310 MHz



Plot 272. Channel Availability Check Time (CACT), Boot-Up Time, 5320 MHz



Plot 273. Channel Availability Check Time (CACT), Burst at Beginning, 5320 MHz



Plot 274. Channel Availability Check Time (CACT), Burst at End, 5320 MHz

Radar Type	Trial #	Pulses per Burst	Pulse Width (µsec)	PRI (µsec)	Detection
					1 = Yes, 0 = No
1	1	18	1	1428	1
	2	18	1	1428	1
	3	18	1	1428	1
	4	18	1	1428	1
	5	18	1	1428	1
	6	18	1	1428	1
	7	18	1	1428	1
	8	18	1	1428	1
	9	18	1	1428	1
	10	18	1	1428	1
	11	18	1	1428	1
	12	18	1	1428	1
	13	18	1	1428	1
	14	18	1	1428	1
	15	18	1	1428	1
	16	18	1	1428	1
	17	18	1	1428	1
	18	18	1	1428	1
	19	18	1	1428	1
	20	18	1	1428	1
	21	18	1	1428	1
	22	18	1	1428	1
	23	18	1	1428	0
	24	18	1	1428	1
	25	18	1	1428	1
	26	18	1	1428	1
	27	18	1	1428	1
	28	18	1	1428	1
	29	18	1	1428	1
	30	18	1	1428	1
	Detection Percentage				96.7% (> 60%)

Table 56. Radar Type 1, 5320MHz 802.11n 20 MHz

Radar Type	Trial #	Pulses per Burst	Pulse Width (µsec)	PRI (µsec)	Detection
					1 = Yes, 0 = No
1	1	18	1	1428	1
	2	18	1	1428	1
	3	18	1	1428	0
	4	18	1	1428	1
	5	18	1	1428	1
	6	18	1	1428	1
	7	18	1	1428	1
	8	18	1	1428	1
	9	18	1	1428	1
	10	18	1	1428	1
	11	18	1	1428	1
	12	18	1	1428	0
	13	18	1	1428	1
	14	18	1	1428	1
	15	18	1	1428	1
	16	18	1	1428	1
	17	18	1	1428	1
	18	18	1	1428	0
	19	18	1	1428	1
	20	18	1	1428	1
	21	18	1	1428	1
	22	18	1	1428	1
	23	18	1	1428	1
	24	18	1	1428	1
	25	18	1	1428	1
	26	18	1	1428	1
	27	18	1	1428	1
	28	18	1	1428	1
	29	18	1	1428	1
	30	18	1	1428	1
	Detection Percentage				90% (> 60%)

Table 57. Radar Type 1, 5310MHz 802.11n 40 MHz

Radar Type	Trial #	Pulse Width 1 to 5 µsec	PRI 150 to 230 µsec	Pulses per Burst 23 to 29	Detection 1 = Yes, 0 = No
2	1	1.3	162	27	1
	2	3.5	162	29	1
	3	2.5	185	27	1
	4	3.7	173	26	1
	5	1.3	217	26	1
	6	4.9	223	25	1
	7	4.4	226	26	1
	8	1.1	181	28	1
	9	2.8	204	25	1
	10	3.0	177	26	1
	11	3.2	186	23	1
	12	3.4	152	27	1
	13	3.8	182	24	1
	14	3.8	206	23	1
	15	4.8	230	28	1
	16	4.1	210	23	1
	17	4.8	190	29	1
	18	2.2	153	27	1
	19	1.1	176	25	1
	20	1.2	155	28	1
	21	4.5	203	28	1
	22	4.8	225	25	1
	23	1.8	204	24	1
	24	1.6	178	24	1
	25	1.2	181	29	1
	26	1.9	191	27	1
	27	3.2	188	27	1
	28	1.5	210	29	1
	29	4.3	183	27	1
	30	1.9	221	24	0
	Detection Percentage				**96.7 (> 60%)**

Table 58. Radar Type 2, 5320MHz 802.11n 20 MHz

Radar Type	Trial #	Pulse Width 1 to 5 µsec	PRI 150 to 230 µsec	Pulses per Burst 23 to 29	Detection 1 = Yes, 0 = No
2	1	4.5	214	23	1
	2	1.5	166	29	1
	3	2.7	220	26	1
	4	1.9	190	28	1
	5	3.3	186	29	1
	6	2.1	157	29	1
	7	2.6	153	28	1
	8	3.2	206	27	1
	9	3.2	181	29	1
	10	3.1	165	27	1
	11	1.9	191	24	1
	12	2.6	214	27	1
	13	3.8	203	29	0
	14	4.4	191	27	1
	15	3.8	224	26	1
	16	1.7	219	29	1
	17	3.9	169	27	1
	18	3.4	204	28	1
	19	1.7	197	23	1
	20	1.0	190	26	1
	21	2.3	190	25	1
	22	1.7	192	23	1
	23	2.2	203	24	1
	24	2.9	193	29	1
	25	1.7	198	27	1
	26	2.2	211	24	1
	27	3.6	158	26	1
	28	1.5	190	29	1
	29	1.8	159	26	1
	30	1.5	167	28	1
	Detection Percentage				**96.7% (> 60%)**

Table 59. Radar Type 2, 5310MHz 802.11n 40 MHz

Radar Type	Trial #	Pulse Width 6 to 10 µsec	PRI 200 to 500 µsec	Pulses per Burst 16 to 18	Detection 1 = Yes, 0 = No
3	1	9.5	425	17	1
	2	8.2	336	16	1
	3	7.9	262	17	1
	4	5.8	312	17	1
	5	9.3	331	17	1
	6	6.1	432	18	1
	7	10	305	17	1
	8	6.2	394	16	1
	9	9.9	494	16	1
	10	7.5	426	16	1
	11	9.2	441	16	1
	12	7.3	380	18	1
	13	7.0	371	18	1
	14	8.5	396	17	1
	15	7.3	428	18	1
	16	9.1	383	16	1
	17	7.4	380	17	1
	18	8.1	253	16	1
	19	5.2	463	16	1
	20	7.5	382	18	1
	21	7.6	437	16	1
	22	6.7	410	16	1
	23	8.3	361	18	1
	24	8.1	442	17	1
	25	8.7	259	18	1
	26	5.8	254	18	1
	27	9.4	356	18	1
	28	9.6	451	18	1
	29	8.4	293	16	1
	30	7.2	372	18	1
	Detection Percentage				**100% (> 60%)**

Table 60. Radar Type 3, 5320MHz 802.11n 20 MHz

Radar Type	Trial #	Pulse Width 6 to 10 µsec	PRI 200 to 500 µsec	Pulses per Burst 16 to 18	Detection 1 = Yes, 0 = No
3	1	7.1	323	16	1
	2	8.7	403	17	1
	3	8.9	291	17	1
	4	9.5	367	18	1
	5	7.7	448	16	1
	6	5.1	434	18	1
	7	8.1	452	16	1
	8	9.5	373	17	1
	9	7.6	348	18	1
	10	9.6	334	17	1
	11	5.0	310	17	0
	12	8.8	308	17	1
	13	9.4	259	17	0
	14	9.4	415	16	0
	15	9.4	403	16	1
	16	6.5	373	18	1
	17	9.0	456	16	0
	18	8.8	346	18	1
	19	7.5	299	18	1
	20	7.2	283	18	1
	21	8.7	478	18	1
	22	5.8	327	18	1
	23	7.9	460	16	1
	24	7.3	429	18	1
	25	9.6	347	18	1
	26	5.7	351	18	1
	27	9.0	300	17	0
	28	5.0	342	16	1
	29	7.5	298	16	1
	30	5.9	485	16	1
	Detection Percentage				83.3%(> 60%)

Table 61. Radar Type 3, 5310MHz 802.11 40 MHz

Radar Type	Trial #	Pulse Width 11 to 20 µsec	PRI 200 to 500 µsec	Pulses per Burst 12 to 16	Detection 1 = Yes, 0 = No
4	1	12.4	438	12	1
	2	13.3	427	12	1
	3	19.3	346	16	1
	4	13.4	335	16	1
	5	10.1	467	13	1
	6	18.6	362	15	1
	7	16.8	375	12	1
	8	16.8	275	15	1
	9	17.8	318	16	1
	10	15.5	484	14	1
	11	12.8	460	15	1
	12	11.9	413	16	1
	13	14.7	277	16	1
	14	16.8	391	12	1
	15	19.3	388	13	1
	16	14.3	314	15	1
	17	18.2	476	12	1
	18	18.5	356	13	1
	19	10.5	256	15	1
	20	10.8	399	16	1
	21	14.1	298	14	1
	22	15.9	358	16	1
	23	15.2	285	16	1
	24	16.9	295	14	1
	25	15.7	442	16	1
	26	15.8	374	14	1
	27	17.0	471	13	1
	28	13.6	309	16	1
	29	19.0	386	12	1
	30	19.3	304	12	1
	Detection Percentage				100% (> 60%)

Table 62. Radar Type 4, 5320MHz 802.11n 20 MHz

Radar Type	Trial #	Pulse Width 11 to 20 µsec	PRI 200 to 500 µsec	Pulses per Burst 12 to 16	Detection 1 = Yes, 0 = No
4	1	17.2	472	15	1
	2	13.9	410	14	1
	3	10.3	401	13	1
	4	13.3	438	12	0
	5	14.9	345	12	0
	6	16.2	420	15	1
	7	10.3	300	12	1
	8	10.8	348	14	0
	9	11.4	396	13	1
	10	11.5	486	16	1
	11	19.2	359	14	1
	12	10.9	495	13	1
	13	19.6	262	12	1
	14	19.8	321	15	1
	15	15.8	391	14	0
	16	10.5	482	12	1
	17	16.2	426	14	1
	18	16.1	400	16	0
	19	15.7	385	15	0
	20	14.1	351	16	0
	21	16.6	419	16	1
	22	19.6	428	14	0
	23	19.1	479	16	0
	24	18.9	395	13	1
	25	19.9	331	16	0
	26	12.1	432	13	1
	27	12.3	426	13	0
	28	19.2	391	15	1
	29	10.8	255	15	1
	30	15.2	462	14	1
	Detection Percentage				63.3% (> 60%)

Table 63. Radar Type 4, 5310MHz 802.11n 40 MHz

Radar Type	Trial #	See Appendix A	Detection
			1 = Yes, 0 = No
5	1	bin5-trial 1	0
	2	bin5-trial 2	1
	3	bin5-trial 3	1
	4	bin5-trial 4	1
	5	bin5-trial 5	1
	6	bin5-trial 6	1
	7	bin5-trial 7	1
	8	bin5-trial 8	1
	9	bin5-trial 9	1
	10	bin5-trial 10	1
	11	bin5-trial 11	1
	12	bin5-trial 12	1
	13	bin5-trial 13	1
	14	bin5-trial 14	1
	15	bin5-trial 15	1
	16	bin5-trial 16	1
	17	bin5-trial 17	1
	18	bin5-trial 18	1
	19	bin5-trial 19	1
	20	bin5-trial 20	1
	21	bin5-trial 21	1
	22	bin5-trial 22	1
	23	bin5-trial 23	1
	24	bin5-trial 24	1
	25	bin5-trial 25	1
	26	bin5-trial 26	1
	27	bin5-trial 27	1
	28	bin5-trial 28	1
	29	bin5-trial 29	1
	30	bin5-trial 30	1
	Detection Percentage		**96.7% (> 60%)**

Table 64. Radar Type 5, 5320MHz 802.11n 20 MHz

Radar Type	Trial #	See Appendix B	Detection
			1 = Yes, 0 = No
5	1	bin5-trial 1	1
	2	bin5-trial 2	1
	3	bin5-trial 3	1
	4	bin5-trial 4	1
	5	bin5-trial 5	1
	6	bin5-trial 6	1
	7	bin5-trial 7	1
	8	bin5-trial 8	1
	9	bin5-trial 9	1
	10	bin5-trial 10	1
	11	bin5-trial 11	1
	12	bin5-trial 12	1
	13	bin5-trial 13	1
	14	bin5-trial 14	1
	15	bin5-trial 15	1
	16	bin5-trial 16	1
	17	bin5-trial 17	1
	18	bin5-trial 18	1
	19	bin5-trial 19	1
	20	bin5-trial 20	1
	21	bin5-trial 21	1
	22	bin5-trial 22	1
	23	bin5-trial 23	0
	24	bin5-trial 24	1
	25	bin5-trial 25	1
	26	bin5-trial 26	1
	27	bin5-trial 27	0
	28	bin5-trial 28	1
	29	bin5-trial 29	1
	30	bin5-trial 30	1
	Detection Percentage		**93.3 (> 60%)**

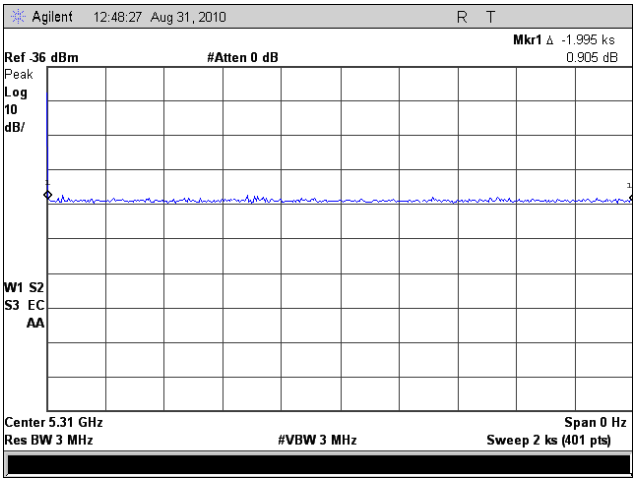
Table 65. Radar Type 5, 5310MHz 802.11n 40 MHz

Radar Type	Trial #	Frequency (MHz)	Pulses/Hop	Pulse Width (µsec)	PRI (µsec)	Detection
						1 = Yes, 0 = No
6	1	5500	9	1	333	1
	2	5500	9	1	333	1
	3	5500	9	1	333	1
	4	5500	9	1	333	1
	5	5500	9	1	333	1
	6	5500	9	1	333	1
	7	5500	9	1	333	1
	8	5500	9	1	333	1
	9	5500	9	1	333	1
	10	5500	9	1	333	1
	11	5500	9	1	333	1
	12	5500	9	1	333	1
	13	5500	9	1	333	1
	14	5500	9	1	333	1
	15	5500	9	1	333	1
	16	5500	9	1	333	1
	17	5500	9	1	333	1
	18	5500	9	1	333	1
	19	5500	9	1	333	1
	20	5500	9	1	333	1
	21	5500	9	1	333	1
	22	5500	9	1	333	1
	23	5500	9	1	333	1
	24	5500	9	1	333	1
	25	5500	9	1	333	1
	26	5500	9	1	333	1
	27	5500	9	1	333	1
	28	5500	9	1	333	1
	29	5500	9	1	333	1
	30	5500	9	1	333	1
	Detection Percentage					100% (> 60%)

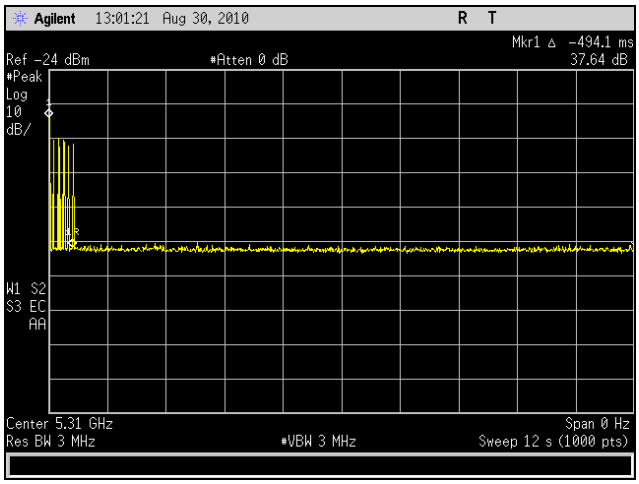
Table 66. Radar Type 6, 5320MHz 802.11n 20 MHz

Radar Type	Trial #	Frequency (MHz)	Pulses/Hop	Pulse Width (µsec)	PRI (µsec)	Detection
						1 = Yes, 0 = No
6	1	5500	9	1	333	1
	2	5500	9	1	333	1
	3	5500	9	1	333	1
	4	5500	9	1	333	1
	5	5500	9	1	333	1
	6	5500	9	1	333	1
	7	5500	9	1	333	1
	8	5500	9	1	333	1
	9	5500	9	1	333	1
	10	5500	9	1	333	1
	11	5500	9	1	333	1
	12	5500	9	1	333	1
	13	5500	9	1	333	1
	14	5500	9	1	333	1
	15	5500	9	1	333	1
	16	5500	9	1	333	1
	17	5500	9	1	333	1
	18	5500	9	1	333	1
	19	5500	9	1	333	1
	20	5500	9	1	333	1
	21	5500	9	1	333	1
	22	5500	9	1	333	1
	23	5500	9	1	333	1
	24	5500	9	1	333	1
	25	5500	9	1	333	1
	26	5500	9	1	333	1
	27	5500	9	1	333	1
	28	5500	9	1	333	1
	29	5500	9	1	333	1
	30	5500	9	1	333	1
	Detection Percentage					100% (> 60%)

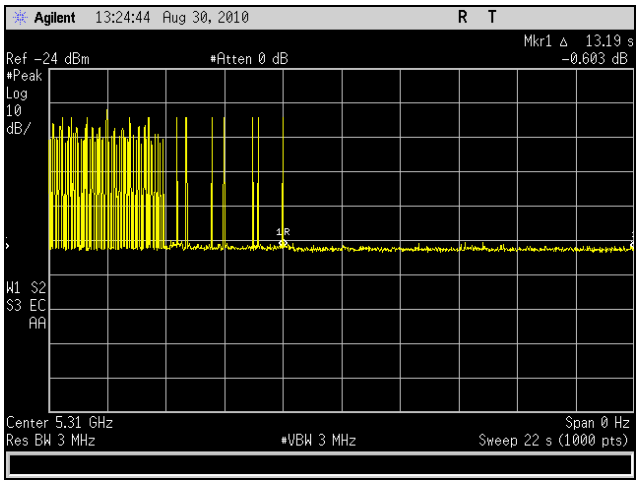
Table 67. Radar Type 6, 5310MHz 802.11n 40 MHz



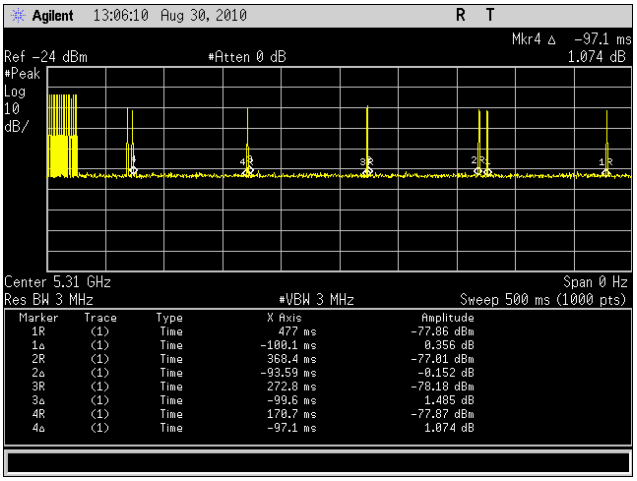
Plot 275. Unoccupancy Time, 30 min., 5310 MHz



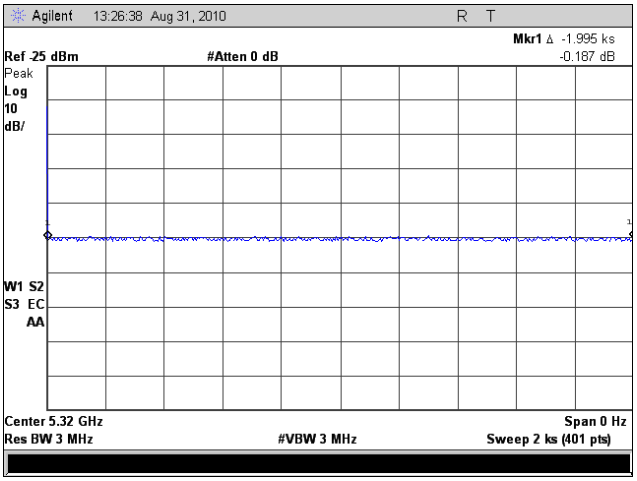
Plot 276. Channel Close Time, 12 sec., 5310 MHz



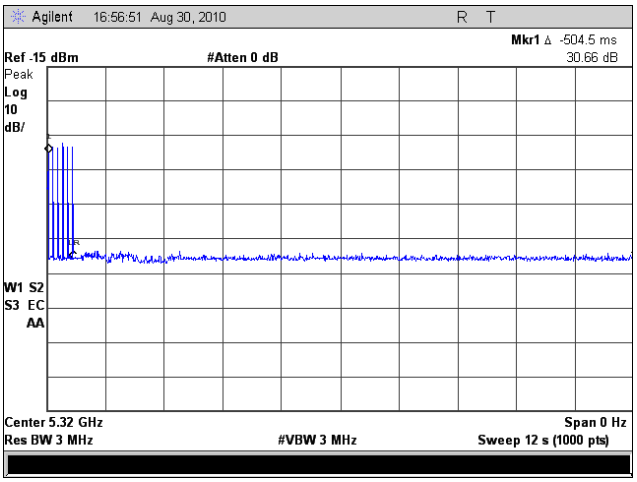
Plot 277. Channel Close Time, 22 sec., 5310 MHz



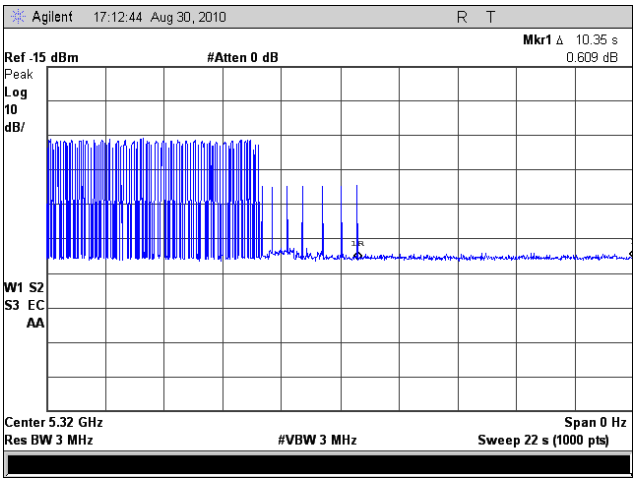
Plot 278. Channel Move Time, 500msec, 5310 MHz



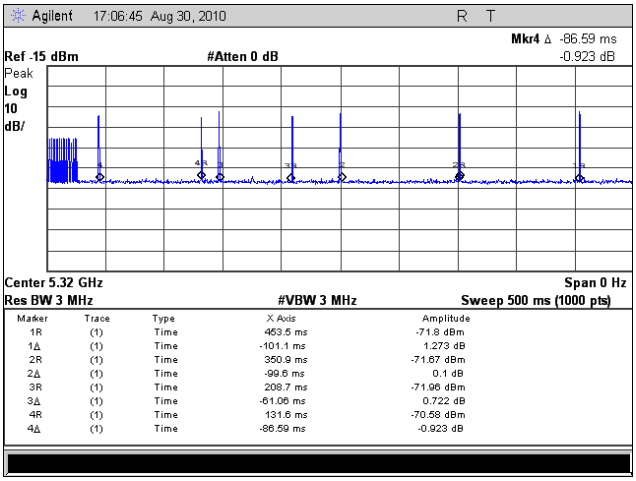
Plot 279. Unoccupancy Time, 30 min., 5320 MHz



Plot 280. Channel Close Time, 12 sec., 5320 MHz



Plot 281. Channel Close Time, 22 sec., 5320 MHz



Plot 282. Channel Move Time, 500msce, 5320 MHz

IV. Test Equipment

Test Equipment

Calibrated test equipment utilized during testing was maintained in a current state of calibration per the requirements of ANSI/NCSL Z540-1-1994 and ANSI/ISO/IEC 17025:2000.

MET Asset #	Equipment	Manufacturer	Model	Last Cal Date	Cal Due Date
1S2501	EMI RECEIVER	ROHDE&SCHWARZ	ESU40	06/03/2010	06/03/2011
1S2484	BILOG ANTENNA	TESEQ	CBL6112D	1/27/2009	1/27/2011
1S2399	TURNTABLE CONTROLLER	SUNOL SCIENCE	SC99V	NOT REQUIRED	
1S2522	DIGITAL THERMO/HYGROMETER	CONTROL COMPANY	11-661-7D	11/11/2009	11/11/2010
1S2482	5M CHAMBER	PANASHIELD	N/A	10/16/2009	10/16/2010
1S2603	DOUBLE RIDGED WAVEGUIDE HORN	ETS-LINGREN	3117	04/09/2009	04/09/2011
1S2121	PRE-AMPLIFIER	HEWLETT PACKARD	8449B	SEE NOTE	
N/A	HIGH PASS FILTER	MICRO-TRONICS	HPM13146	SEE NOTE	
1S2430	WIDEBAND POWER METER	ANRITSU COMPANY	ML2488A	05/26/2009	06/26/2010
1S2432	WIDEBAND POWER SENSOR	ANRITSU COMPANY	MA2491A	05/26/2009	06/26/2010
1S2034	COUPLER, DIRECTIONAL 1-20 GHZ	KRYTAR	101020020	SEE NOTE	
1S2583	SPECTRUM ANALYZER	AGILENT	E4447A	01/26/2010	01/26/2011
1S2460	ANALYZER, SPECTRUM 9 KHZ-40GHZ	AGILENT	E4407B	07/13/2010	07/213/2011
1S2229	TEMPERATURE CHAMBER	TENNY ENGINEERING	T63C	02/19/2010	02/19/2011
1S2128	HARMONIC MIXER	HEWLETT PACKARD	11970A	11/22/2008	11/22/2010
1S2129	HARMONIC MIXER	HEWLETT PACKARD	11970K	11/22/2008	11/22/2010

Table 68. Test Equipment List

Note: Functionally tested equipment is verified using calibrated instrumentation at the time of testing.

MET Asset	Equipment	Manufacturer	Last Cal Date	Cal Due Date
1S2243	NI PXI-1042 8-SLOT 3U CHASSIS	NATIONAL INSTRUMENTS	SEE NOTE	
1S2602	NI PXI-5421 16-BIT 100MS/S ARBITRARY WAVEFORM GENERATOR	NATIONAL INSTRUMENTS	SEE NOTE	
1S2278	NI PXI-5610 2.7 GHZ RF UPCONVERTER	NATIONAL INSTRUMENTS	SEE NOTE	
1S2069	UPCONVERTER, 7206 PXI 4.9 TO 6GHZ	ASCOR	SEE NOTE	
N/A	SPLITTER/COMBINER, ZFSC-2-9G (QTY 2)	MINI-CIRCUITS	SEE NOTE	
N/A	30DB ATTENUATOR, BW-S30W2 (QTY 2)	PASTERNAK	SEE NOTE	
N/A	10DB ATTENUATOR, BW-S10W2 (QTY 2)	PASTERNAK	SEE NOTE	
1S2523	PRE-AMPLIFIER, 8449B	AGILENT	SEE NOTE	
1S2583	SPECTRUM ANALYZER, E447A	AGILENT	01/26/2010	01/26/2011
1S2460	SPECTRUM ANALYZER, E4407B	AGILENT	07/13/2010	07/13/2011

Table 69. DFS Equipment List

Note: Functionally verified test equipment is verified using calibrated instrumentation at the time of testing.

V. Certification & User's Manual Information

Certification & User's Manual Information

A. Certification Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 2, Subpart I — Marketing of Radio frequency devices:

§ 2.801 Radio-frequency device defined.

As used in this part, a radio-frequency device is any device which in its operation is capable of Emitting radio-frequency energy by radiation, conduction, or other means. Radio- frequency devices include, but are not limited to:

(a) The various types of radio communication transmitting devices described throughout this chapter.

(b) The incidental, unintentional and intentional radiators defined in Part 15 of this chapter.

(c) The industrial, scientific, and medical equipment described in Part 18 of this chapter.

(d) Any part or component thereof which in use emits radio-frequency energy by radiation, conduction, or other means.

§ 2.803 Marketing of radio frequency devices prior to equipment authorization.

(a) Except as provided elsewhere in this chapter, no person shall sell or lease, or offer for sale or lease (including advertising for sale or lease), or import, ship or distribute for the purpose of selling or leasing or offering for sale or lease, any radio frequency device unless:

(1) In the case of a device subject to certification, such device has been authorized by the Commission in accordance with the rules in this chapter and is properly identified and labeled as required by §2.925 and other relevant sections in this chapter; or

(2) In the case of a device that is not required to have a grant of equipment authorization issued by the Commission, but which must comply with the specified technical standards prior to use, such device also complies with all applicable administrative (including verification of the equipment or authorization under a Declaration of Conformity, where required), technical, labeling and identification requirements specified in this chapter.

(d) Notwithstanding the provisions of paragraph (a) of this section, the offer for sale solely to business, commercial, industrial, scientific or medical users (but not an offer for sale to other parties or to end users located in a residential environment) of a radio frequency device that is in the conceptual, developmental, design or pre-production stage is permitted prior to equipment authorization or, for devices not subject to the equipment authorization requirements, prior to a determination of compliance with the applicable technical requirements *provided* that the prospective buyer is advised in writing at the time of the offer for sale that the equipment is subject to the FCC rules and that the equipment will comply with the appropriate rules before delivery to the buyer or to centers of distribution.

(e)(1) Notwithstanding the provisions of paragraph (a) of this section, prior to equipment authorization or determination of compliance with the applicable technical requirements any radio frequency device may be operated, but not marketed, for the following purposes and under the following conditions:

(i) Compliance testing;

(ii) Demonstrations at a trade show provided the notice contained in paragraph (c) of this section is displayed in a conspicuous location on, or immediately adjacent to, the device;

(iii) Demonstrations at an exhibition conducted at a business, commercial, industrial, scientific or medical location, but excluding locations in a residential environment, provided the notice contained in paragraphs (c) or (d) of this section, as appropriate, is displayed in a conspicuous location on, or immediately adjacent to, the device;

(iv) Evaluation of product performance and determination of customer acceptability, provided such operation takes place at the manufacturer's facilities during developmental, design or pre-production states; or

(v) Evaluation of product performance and determination of customer acceptability where customer acceptability of a radio frequency device cannot be determined at the manufacturer's facilities because of size or unique capability of the device, provided the device is operated at a business, commercial, industrial, scientific or medical user's site, but not at a residential site, during the development, design or pre-production stages.

(e)(2) For the purpose of paragraphs (e)(1)(iv) and (e)(1)(v) of this section, the term *manufacturer's facilities* includes the facilities of the party responsible for compliance with the regulations and the manufacturer's premises, as well as the facilities of other entities working under the authorization of the responsible party in connection with the development and manufacture, but not the marketing, of the equipment.

(f) For radio frequency devices subject to verification and sold solely to business, commercial, industrial, scientific and medical users (excluding products sold to other parties or for operation in a residential environment), parties responsible for verification of the devices shall have the option of ensuring compliance with the applicable technical specifications of this chapter at each end user's location after installation, provided that the purchase or lease agreement includes a proviso that such a determination of compliance be made and is the responsibility of the party responsible for verification of the equipment.

Certification & User's Manual Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 2, Subpart J — Equipment Authorization Procedures:

§ 2.901 Basis and Purpose

(a) In order to carry out its responsibilities under the Communications Act and the various treaties and international regulations, and in order to promote efficient use of the radio spectrum, the Commission has developed technical standards for radio frequency equipment and parts or components thereof. The technical standards applicable to individual types of equipment are found in that part of the rules governing the service wherein the equipment is to be operated.[1] *In addition to the technical standards provided, the rules governing the service may require that such equipment be verified by the manufacturer or importer*, be authorized under a Declaration of Conformity, or receive an equipment authorization from the Commission by one of the following procedures: certification or registration.

(b) The following sections describe the verification procedure, the procedure for a Declaration of Conformity, and the procedures to be followed in obtaining certification from the Commission and the conditions attendant to such a grant.

§ 2.907 Certification.

(a) Certification is an equipment authorization issued by the Commission, based on representation and test data submitted by the applicant.

(b) Certification attaches to all units subsequently marketed by the grantee which are identical (see Section 2.908) to the sample tested except for permissive changes or other variations authorized by the Commission pursuant to Section 2.1043.

[1] In this case, the equipment is subject to the rules of Part 15. More specifically, the equipment falls under Subpart B (of Part 15), which deals with unintentional radiators.

Certification & User's Manual Information

§ 2.948 Description of measurement facilities.

(a) Each party making measurements of equipment that is subject to an equipment authorization under Part 15 or Part 18 of this chapter, regardless of whether the measurements are filed with the Commission or kept on file by the party responsible for compliance of equipment marketed within the U.S. or its possessions, shall compile a description of the measurement facilities employed.

(1) If the measured equipment is subject to the verification procedure, the description of the measurement facilities shall be retained by the party responsible for verification of the equipment.

(i) If the equipment is verified through measurements performed by an independent laboratory, it is acceptable for the party responsible for verification of the equipment to rely upon the description of the measurement facilities retained by or placed on file with the Commission by that laboratory. In this situation, the party responsible for the verification of the equipment is not required to retain a duplicate copy of the description of the measurement facilities.

(ii) If the equipment is verified based on measurements performed at the installation site of the equipment, no specific site calibration data is required. It is acceptable to retain the description of the measurement facilities at the site at which the measurements were performed.

(2) If the equipment is to be authorized by the Commission under the certification procedure, the description of the measurement facilities shall be filed with the Commission's Laboratory in Columbia, Maryland. The data describing the measurement facilities need only be filed once but must be updated as changes are made to the measurement facilities or as otherwise described in this section. At least every three years, the organization responsible for filing the data with the Commission shall certify that the data on file is current.

Certification & User's Manual Information

Label and User's Manual Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 15, Subpart A — General:

§ 15.19 Labeling requirements.

(a) In addition to the requirements in Part 2 of this chapter, a device subject to certification or verification shall be labeled as follows:

(1) Receivers associated with the operation of a licensed radio service, e.g., FM broadcast under Part 73 of this chapter, land mobile operation under Part 90, etc., shall bear the following statement in a conspicuous location on the device:

This device complies with Part 15 of the FCC Rules. Operation is subject to the condition that this device does not cause harmful interference.

(2) A stand-alone cable input selector switch, shall bear the following statement in a conspicuous location on the device:

This device is verified to comply with Part 15 of the FCC Rules for use with cable television service.

(3) All other devices shall bear the following statement in a conspicuous location on the device:

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

(4) Where a device is constructed in two or more sections connected by wires and marketed together, the statement specified under paragraph (a) of this section is required to be affixed only to the main control unit.

(5) When the device is so small or for such use that it is not practicable to place the statement specified under paragraph (a) of this section on it, the information required by this paragraph shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user or, alternatively, shall be placed on the container in which the device is marketed. However, the FCC identifier or the unique identifier, as appropriate, must be displayed on the device.

§ 15.21 Information to user.

The users manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

Verification & User's Manual Information

The following is extracted from Title 47 of the Code of Federal Regulations, Part 15, Subpart B — Unintentional Radiators:

§ 15.105 Information to the user.

(a) For a Class A digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at own expense.

(b) For a Class B digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

– Reorient or relocate the receiving antenna.

– Increase the separation between the equipment and receiver.

– Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

– Consult the dealer or an experienced radio/TV technician for help.

VI. Appendix A

Bin 5 Pulses 5310MHz

Waveform Num = 1
Num of Bursts = 16
Burst Interval (us) = 750000.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
1	53109	3	13.0	53	1126	1529	1554	53109	0	749999
2	882246	3	7.0	69	1215	1950	1753	939564	750000	1499999
3	798866	2	7.0	53	1322	1808	0	1743348	1500000	2249999
4	1119507	2	12.0	53	1011	1146	0	2865985	2250000	2999999
5	717450	3	20.0	53	1446	1725	1837	3585592	3000000	3749999
6	738356	1	7.0	92	1765	0	0	4328956	3750000	4499999
7	410922	1	14.0	75	1263	0	0	4741643	4500000	5249999
8	685815	1	12.0	69	1835	0	0	5428721	5250000	5999999
9	946056	2	15.0	55	1901	1875	0	6376612	6000000	6749999
10	692290	2	9.0	57	1746	1308	0	7072678	6750000	7499999
11	536734	1	9.0	68	1625	0	0	7612466	7500000	8249999
12	940821	1	17.0	100	1602	0	0	8554912	8250000	8999999
13	569921	2	14.0	96	1345	1091	0	9126435	9000000	9749999
14	1047861	3	9.0	75	1527	1091	1835	10176732	9750000	10499999
15	473022	2	6.0	61	1555	1904	0	10654207	10500000	11249999
16	1178403	1	20.0	74	1665	0	0	11836069	11250000	11999999

Total number of pulses in waveform = 30

♀

Waveform Num = 2
Num of Bursts = 8
Burst Interval (us) = 1500000.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
1	1080505	1	19.0	62	1506	0	0	1080505	0	1499999
2	1160599	3	16.0	82	1805	1289	1416	2242610	1500000	2999999
3	1861755	1	20.0	90	1611	0	0	4108875	3000000	4499999
4	1831977	2	10.0	99	1581	1356	0	5942463	4500000	5999999
5	735723	3	12.0	61	1721	1523	1238	6681123	6000000	7499999
6	954544	2	15.0	79	1251	1041	0	7640149	7500000	8999999
7	2279951	3	19.0	67	1592	1209	1772	9922392	9000000	10499999
8	970042	3	12.0	55	1393	1262	1634	10897007	10500000	11999999

Total number of pulses in waveform = 18

♀

Waveform Num = 3
Num of Bursts = 12
Burst Interval (us) = 1000000.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
1	56813	2	19.0	84	1982	1807	0	56813	0	999999
2	1216854	3	20.0	85	1294	1430	1344	1277456	1000000	1999999
3	1061562	1	20.0	51	1800	0	0	2343086	2000000	2999999
4	1549808	3	17.0	58	1158	1792	1696	3894694	3000000	3999999
5	1037895	3	6.0	99	1547	1692	1159	4937235	4000000	4999999
6	869347	1	14.0	67	1276	0	0	5810980	5000000	5999999
7	322801	2	18.0	58	1513	1103	0	6135057	6000000	6999999
8	1067222	1	15.0	79	1982	0	0	7204895	7000000	7999999

1787279
9 2 13.0 100 1386 1509 0 8994156
8000000 8999999
538670
10 3 18.0 51 1343 1735 1018 9535721
9000000 9999999
869735
11 2 12.0 79 1267 1204 0 10409552
10000000 10999999
1002387
12 1 18.0 58 1852 0 0 11414410
11000000 11999999
Total number of pulses in waveform = 24
♀
Waveform Num = 4
Num of Bursts = 10
Burst Interval (us) = 1200000.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	237091									
1		3	11.0	69	1622	1324	1632	237091	0	1199999
	1437499									
2		3	16.0	94	1334	1572	1988	1679168		
1200000	2399999									
	1299211									
3		3	20.0	78	1136	1723	1530	2983273		
2400000	3599999									
	1758276									
4		3	10.0	83	1441	1917	1432	4745938		
3600000	4799999									
	623470									
5		3	15.0	50	1255	1295	1500	5374198		
4800000	5999999									
	1046601									
6		2	11.0	84	1761	1092	0	6424849		
6000000	7199999									
	1692215									
7		1	9.0	63	1068	0	0	8119917		
7200000	8399999									
	667887									
8		3	14.0	67	1233	1879	1911	8788872		
8400000	9599999									
	1313711									
9		3	12.0	77	1498	1671	1326	10107606		
9600000	10799999									
	968154									
10		2	16.0	51	1540	1924	0	11080255		
10800000	11999999									

Total number of pulses in waveform = 26
♀
Waveform Num = 5
Num of Bursts = 14
Burst Interval (us) = 857143.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	630892									

Bin 5 Pulses 5310MHz

1	2	8.0	74	1624	1140	0	630892	0	857142
404688									
2	1	9.0	54	1939	0	0	1038344	857143	1714285
1523547									
3	2	5.0	70	1719	1099	0	2563830	1714286	2571428
96439									
4	1	20.0	52	1307	0	0	2663087	2571429	3428571
1340368									
5	1	13.0	56	1150	0	0	4004762	3428572	4285714
327766									
6	3	17.0	82	1927	1768	1934	4333678	4285715	5142857
1129200									
7	3	17.0	69	1716	1042	1516	5468507	5142858	6000000
1213063									
8	2	16.0	84	1964	1329	0	6685844	6000001	6857143
357885									
9	2	8.0	95	1092	1676	0	7047022	6857144	7714286
1140987									
10	1	7.0	56	1693	0	0	8190777	7714287	8571429
571193									
11	3	13.0	59	1677	1180	1153	8763663	8571430	9428572
1272887									
12	1	15.0	87	1187	0	0	10040560	9428573	10285715
965893									
13	1	9.0	80	1198	0	0	11007640	10285716	11142858
896196									
14	3	10.0	50	1004	1740	1115	11905034	11142859	12000001

Total number of pulses in waveform = 26

♀

Waveform Num = 6
Num of Bursts = 20
Burst Interval (us) = 600000.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)		Start Burst Interval(us)	End Burst Interval(us)
1	526391	3	12.0	60	1751	1788	1709	526391	0	599999	309244
2	600000	3	11.0	52	1228	1189	1334	840883	1199999	368071	
3	1200000	1	12.0	96	1427	0	0	1212705	1799999	990034	
4	1800000	3	19.0	52	1189	1906	1176	2204166	2399999		

331196

5	1	18.0	76	1131	0	0	2539633	
2400000	2999999							
	592626							
6	1	10.0	71	1480	0	0	3133390	
3000000	3599999							
	573419							
7	1	18.0	93	1950	0	0	3708289	
3600000	4199999							
	593438							
8	1	18.0	54	1916	0	0	4303677	
4200000	4799999							
	709399							
9	3	9.0	56	1844	1344	1333	5014992	
4800000	5399999							
	387515							
10	1	5.0	65	1505	0	0	5407028	
5400000	5999999							
	1139988							
11	3	6.0	91	1194	1197	1181	6548521	
6000000	6599999							
	148849							
12	1	18.0	57	1986	0	0	6700942	
6600000	7199999							
	522808							
13	2	7.0	81	1869	1976	0	7225736	
7200000	7799999							
	842016							
14	1	20.0	59	1903	0	0	8071597	
7800000	8399999							
	390399							
15	1	5.0	84	1599	0	0	8463899	
8400000	8999999							
	646240							
16	2	8.0	53	1280	1046	0	9111738	
9000000	9599999							
	645893							
17	1	19.0	96	1035	0	0	9759957	
9600000	10199999							
	1000952							
18	3	18.0	80	1285	1778	1010	10761944	
10200000	10799999							
	42869							
19	3	10.0	98	1569	1329	1702	10808886	
10800000	11399999							
	967519							
20	2	12.0	78	1952	1618	0	11781005	
11400000	11999999							

Total number of pulses in waveform = 37

♀

Waveform Num = 7
Num of Bursts = 12
Burst Interval (us) = 1000000.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	538762									
1		3	6.0	94	1601	1576	1285	538762	0	999999
	850506									
2		1	10.0	70	1936	0	0	1393730		

1000000 1999999
712557
3 2 8.0 68 1751 1324 0 2108223
2000000 2999999
1060439
4 1 8.0 75 1009 0 0 3171737
3000000 3999999
1200325
5 3 20.0 95 1930 1062 1480 4373071
4000000 4999999
862388
6 2 7.0 82 1210 1966 0 5239931
5000000 5999999
1514224
7 3 18.0 95 1423 1207 1180 6757331
6000000 6999999
729393
8 3 20.0 50 1740 1781 1462 7490534
7000000 7999999
1059562
9 1 11.0 90 1199 0 0 8555079
8000000 8999999
1202880
10 1 11.0 99 1531 0 0 9759158
9000000 9999999
885013
11 2 17.0 88 1545 1615 0 10645702
10000000 10999999
903178
12 1 10.0 66 1795 0 0 11552040
11000000 11999999
Total number of pulses in waveform = 23
♀
Waveform Num = 8
Num of Bursts = 9
Burst Interval (us) = 1333333.0

Burst # Off Time (us) # Pulses Chirp (MHz) PW (us) Pulse 1 Pri(us) Pulse 2 Pri(us) Pulse 3 Pri(us) Start Loc (us) Start Burst Interval(us) End Burst Interval(us)
642878
1 1 15.0 90 1252 0 0 642878 0
1333332
1715454
2 3 16.0 98 1049 1370 1164 2359584
1333333 2666665
432313
3 3 12.0 50 1110 1748 1725 2795480
2666666 3999998
2275193
4 3 12.0 56 1747 1291 1737 5075256
3999999 5333331
1520544
5 3 14.0 54 1843 1910 1511 6600575
5333332 6666664
301063
6 2 6.0 73 1331 1490 0 6906902
6666665 7999997
2398385
7 1 20.0 89 1931 0 0 9308108
7999998 9333330
1101784

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8	3	8.0	59	1914	1090	1364	10411823	9333331
10666663	1031294							
9	1	10.0	52	1568	0	0	11447485	10666664
11999996								

Total number of pulses in waveform = 20

♀

Waveform Num = 9
Num of Bursts = 19
Burst Interval (us) = 631579.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
1		2	18.0	58	1927	1385	0	299142	0	299142
631578	839897									
2		1	15.0	88	1848	0	0	1142351	631579	1263157
317698										
3		3	17.0	87	1468	1720	1216	1461897	1263158	1894736
1020506										
4		1	10.0	55	1301	0	0	2486807	1894737	2526315
514074										
5		2	16.0	73	1330	1075	0	3002182	2526316	3157894
355183										
6		1	8.0	99	1640	0	0	3359770	3157895	3789473
1027701										
7		3	5.0	62	1296	1943	1361	4389111	3789474	4421052
124411										
8		2	20.0	100	1142	1414	0	4518122	4421053	5052631
729034										
9		3	15.0	87	1643	1318	1466	5249712	5052632	5684210
632871										
10		3	7.0	51	1019	1385	1329	5887010	5684211	6315789
701325										
11		2	15.0	58	1548	1866	0	6592068	6315790	6947368
490388										
12		2	7.0	75	1354	1056	0	7085870	6947369	7578947
616655										
13		1	20.0	69	1802	0	0	7704935	7578948	8210526
532984										
14		2	5.0	92	1532	1258	0	8239721	8210527	8842105
1010487										
15		1	20.0	72	1842	0	0	9252998	8842106	9473684
718065										
16		3	17.0	54	1079	1348	1933	9972905	9473685	10105263

345695
17 3 9.0 65 1665 1745 1662 10322960
10105264 10736842
850629
18 1 17.0 66 1545 0 0 11178661
10736843 11368421
536454
19 1 5.0 64 1394 0 0 11716660
11368422 12000000
Total number of pulses in waveform = 37
♀
Waveform Num = 10
Num of Bursts = 11
Burst Interval (us) = 1090909.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	730166									
1		2	10.0	72	1923	1653	0	730166	0	1090908
	432442									
2		2	7.0	71	1524	1442	0	1166184	1090909	2181817
	1167049									
3		3	18.0	92	1414	1866	1627	2336199	2181818	3272726
	1370756									
4		2	9.0	79	1377	1924	0	3711862	3272727	4363635
	1397148									
5		1	8.0	89	1245	0	0	5112311	4363636	5454544
	457675									
6		1	20.0	96	1764	0	0	5571231	5454545	6545453
	1145742									
7		2	16.0	90	1064	1052	0	6718737	6545454	7636362
	1468720									
8		2	6.0	50	1698	1944	0	8189573	7636363	8727271
	1191180									
9		3	8.0	100	1378	1946	1511	9384395	8727272	9818180
	670279									
10		2	19.0	56	1425	1110	0	10059509	9818181	10909089
	1669710									
11		2	10.0	100	1020	1067	0	11731754	10909090	11999998

Total number of pulses in waveform = 22
♀
Waveform Num = 11
Num of Bursts = 10
Burst Interval (us) = 1200000.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	301860									

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1	2	7.0	74	1117	1622	0	301860	0
1199999								
2011024								
2	3	8.0	91	1348	1467	1273	2315623	
1200000	2399999							
1111848								
3	2	5.0	60	1350	1086	0	3431559	
2400000	3599999							
870842								
4	3	14.0	51	1413	1286	1952	4304837	
3600000	4799999							
744944								
5	3	14.0	63	1831	1845	1477	5054432	
4800000	5999999							
1489363								
6	2	9.0	86	1188	1305	0	6548948	
6000000	7199999							
1838656								
7	3	16.0	84	1346	1825	1035	8390097	
7200000	8399999							
199649								
8	2	15.0	59	1780	1773	0	8593952	
8400000	9599999							
1227042								
9	1	6.0	95	1988	0	0	9824547	
9600000	10799999							
1664904								
10	1	6.0	86	1962	0	0	11491439	
10800000	11999999							

Total number of pulses in waveform = 22

♀

Waveform Num = 12
Num of Bursts = 12
Burst Interval (us) = 1000000.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	
Start Burst Interval(us)		End Burst Interval(us)							
610071									
1	3	16.0	85	1853	1500	1359	610071	0	
999999									
879750									
2	1	17.0	58	1435	0	0	1494533		
1000000	1999999								
581228									
3	3	15.0	91	1939	1580	1129	2077196		
2000000	2999999								
1012839									
4	3	13.0	87	1164	1800	1874	3094683		
3000000	3999999								
1208986									
5	3	13.0	84	1957	1128	1537	4308507		
4000000	4999999								
1653018									
6	1	20.0	92	1848	0	0	5966147		
5000000	5999999								
326689									
7	1	5.0	59	1592	0	0	6294684		
6000000	6999999								
1250455									
8	2	5.0	52	1393	1195	0	7546731		
7000000	7999999								

809163
9 3 13.0 51 1070 1100 1428 8358482
8000000 8999999
1560192
10 2 14.0 73 1682 1781 0 9922272
9000000 9999999
682804
11 3 7.0 74 1660 1370 1091 10608539
10000000 10999999
1255270
12 2 6.0 97 1901 1480 0 11867930
11000000 11999999
Total number of pulses in waveform = 27
♀
Waveform Num = 13
Num of Bursts = 13
Burst Interval (us) = 923077.0

Burst # | Off Time (us) | # Pulses | Chirp (MHz) | PW (us) | Pulse 1 Pri(us) | Pulse 2 Pri(us) | Pulse 3 Pri(us) | Start Loc (us) | Start Burst Interval(us) | End Burst Interval(us)

671433
1 3 10.0 65 1521 1587 1099 671433 0
923076
825530
2 2 14.0 93 1729 1817 0 1501170
923077 1846153
1166104
3 2 12.0 98 1940 1941 0 2670820
1846154 2769230
889957
4 2 7.0 97 1511 1552 0 3564658
2769231 3692307
932064
5 2 14.0 55 1737 1216 0 4499785
3692308 4615384
662720
6 3 6.0 53 1592 1161 1734 5165458
4615385 5538461
1019740
7 2 6.0 56 1939 1719 0 6189685
5538462 6461538
1107774
8 2 11.0 58 1071 1563 0 7301117
6461539 7384615
756732
9 1 11.0 72 1858 0 0 8060483
7384616 8307692
248856
10 1 10.0 80 1920 0 0 8311197
8307693 9230769
1691100
11 3 12.0 51 1547 1721 1779 10004217
9230770 10153846
799424
12 1 12.0 76 1675 0 0 10808688
10153847 11076923
1111742
13 1 6.0 99 1888 0 0 11922105
11076924 12000000
Total number of pulses in waveform = 25
♀

Waveform Num = 14
Num of Bursts = 11
Burst Interval (us) = 1090909.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
1	258942	2	13.0	82	1630	1965	0	258942	0	1090908
2	1004279	1	13.0	87	1300	0	0	1266816	1090909	2181817
3	1207825	2	19.0	54	1625	1017	0	2475941	2181818	3272726
4	998625	2	14.0	93	1432	1141	0	3477208	3272727	4363635
5	1831365	2	20.0	82	1509	1637	0	5311146	4363636	5454544
6	707938	1	14.0	74	1135	0	0	6022230	5454545	6545453
7	1202400	2	10.0	72	1317	1449	0	7225765	6545454	7636362
8	1062280	3	8.0	86	1746	1669	1029	8290811	7636363	8727271
9	1169367	3	7.0	56	1798	1412	1399	9464622	8727272	9818180
10	923508	1	15.0	69	1125	0	0	10392739	9818181	10909089
11	891766	3	10.0	79	1487	1987	1544	11285630	10909090	11999998

Total number of pulses in waveform = 22

♀

Waveform Num = 15
Num of Bursts = 10
Burst Interval (us) = 1200000.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
1	279150	1	7.0	69	1632	0	0	279150	0	1199999
2	2050107	1	13.0	65	1510	0	0	2330889	1200000	2399999
3	925283	2	19.0	81	1824	1431	0	3257682	2400000	3599999
4	1403684	3	7.0	70	1505	1464	1218	4664621	3600000	4799999

1051820
5 3 19.0 61 1076 1559 1803 5720628
4800000 5999999
468477
6 2 9.0 79 1259 1868 0 6193543
6000000 7199999
1028966
7 1 18.0 59 1512 0 0 7225636
7200000 8399999
1252828
8 1 17.0 83 1953 0 0 8479976
8400000 9599999
2028978
9 3 13.0 89 1992 1191 1081 10510907
9600000 10799999
817535
10 2 13.0 51 1941 1525 0 11332706
10800000 11999999
Total number of pulses in waveform = 19

♀

Waveform Num = 16
Num of Bursts = 9
Burst Interval (us) = 1333333.0

Burst # | Off Time (us) | # Pulses | Chirp (MHz) | PW (us) | Pulse 1 Pri(us) | Pulse 2 Pri(us) | Pulse 3 Pri(us) | Start Loc (us) | Start Burst Interval(us) | End Burst Interval(us)

44252
1 1 7.0 50 1934 0 0 44252 0
1333332
2444155
2 1 15.0 51 1265 0 0 2490341
1333333 2666665
817969
3 3 20.0 64 1429 1124 1069 3309575
2666666 3999998
1633845
4 2 19.0 59 1557 1081 0 4947042
3999999 5333331
1554618
5 3 16.0 56 1566 1783 1021 6504298
5333332 6666664
602748
6 2 7.0 93 1230 1508 0 7111416
6666665 7999997
2146965
7 3 15.0 73 1199 1876 1641 9261119
7999998 9333330
929047
8 3 17.0 64 1354 1316 1690 10194882
9333331 10666663
1749836
9 2 12.0 67 1570 1227 0 11949078
10666664 11999996
Total number of pulses in waveform = 20

♀

Waveform Num = 17
Num of Bursts = 17
Burst Interval (us) = 705882.0

Burst # | Off Time (us) | # Pulses | Chirp (MHz) | PW (us) | Pulse 1 Pri(us) | Pulse 2 Pri(us) | Pulse 3 Pri(us) | Start Loc (us) | Start Burst | End Burst

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#	Burst Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
1		2	7.0	94	1784	1271	0	259516	0	705881
	259516									
2		3	13.0	73	1624	1413	1088	1321018	705882	1411763
	554266									
3		1	14.0	66	1049	0	0	1879409	1411764	2117645
	726647									
4		3	16.0	85	1965	1632	1174	2607105	2117646	2823527
	331450									
5		1	17.0	75	1880	0	0	2943326	2823528	3529409
	610608									
6		1	13.0	73	1900	0	0	3555814	3529410	4235291
	1092352									
7		2	14.0	100	1879	1314	0	4650066	4235292	4941173
	406902									
8		1	14.0	75	1550	0	0	5060161	4941174	5647055
	1080703									
9		1	6.0	53	1058	0	0	6142414	5647056	6352937
	270352									
10		3	9.0	81	1574	1946	1253	6413824	6352938	7058819
	984156									
11		3	19.0	59	1722	1820	1218	7402753	7058820	7764701
	448903									
12		3	10.0	85	1823	1338	1033	7856416	7764702	8470583
	1001979									
13		3	20.0	99	1148	1409	1271	8862589	8470584	9176465
	909807									
14		1	10.0	80	1473	0	0	9776224	9176466	9882347
	423790									
15		3	12.0	88	1029	1311	1664	10201487	9882348	10588229
	579845									
16		2	10.0	64	1700	1698	0	10785336	10588230	11294111
	646226									
17		2	18.0	53	1653	1844	0	11434960	11294112	11999993

Total number of pulses in waveform = 35

♀

Waveform Num = 18
Num of Bursts = 20
Burst Interval (us) = 600000.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)

314642								
1	1	17.0	61	1538	0	0	314642	0
599999								
387028								
2	3	14.0	70	1207	1058	1153	703208	
600000	1199999							
817544								
3	3	18.0	57	1131	1285	1162	1524170	
1200000	1799999							
448355								
4	3	18.0	63	1086	1778	1933	1976103	
1800000	2399999							
529067								
5	3	13.0	71	1031	1293	1126	2509967	
2400000	2999999							
563122								
6	1	16.0	71	1563	0	0	3076539	
3000000	3599999							
852659								
7	2	11.0	95	1977	1229	0	3930761	
3600000	4199999							
307269								
8	2	12.0	83	1383	1490	0	4241236	
4200000	4799999							
863671								
9	3	16.0	89	1479	1135	1476	5107780	
4800000	5399999							
510417								
10	1	13.0	63	1052	0	0	5622287	
5400000	5999999							
897745								
11	2	18.0	75	1802	1527	0	6521084	
6000000	6599999							
467168								
12	1	16.0	90	1455	0	0	6991581	
6600000	7199999							
356263								
13	1	13.0	69	1455	0	0	7349299	
7200000	7799999							
686116								
14	2	14.0	95	1539	1185	0	8036870	
7800000	8399999							
630455								
15	3	14.0	90	1330	1971	1692	8670049	
8400000	8999999							
664534								
16	2	13.0	90	1534	1265	0	9339576	
9000000	9599999							
262723								
17	1	8.0	78	1887	0	0	9605098	
9600000	10199999							
1100359								
18	1	6.0	95	1704	0	0	10707344	
10200000	10799999							
369929								
19	3	13.0	98	1782	1145	1789	11078977	
10800000	11399999							
334205								
20	3	8.0	89	1037	1314	1846	11417898	
11400000	11999999							

Total number of pulses in waveform = 41

♀

Waveform Num = 19

Num of Bursts = 9
Burst Interval (us) = 1333333.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
1	824665	1	16.0	78	1331	0	0	824665	0	1333332
2	1134466	3	17.0	52	1207	1125	1461	1960462	1333333	2666665
3	1090006	3	18.0	89	1552	1921	1876	3054261	2666666	3999998
4	2154560	2	6.0	69	1360	1122	0	5214170	3999999	5333331
5	1191913	3	9.0	68	1078	1212	1907	6408565	5333332	6666664
6	411566	2	14.0	72	1641	1645	0	6824328	6666665	7999997
7	1806792	1	15.0	66	1417	0	0	8634406	7999998	9333330
8	1561478	1	13.0	65	1827	0	0	10197301	9333331	10666663
9	1618978	1	17.0	83	1773	0	0	11818106	10666664	11999996

Total number of pulses in waveform = 17

♀

Waveform Num = 20
Num of Bursts = 8
Burst Interval (us) = 1500000.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
1	775344	3	14.0	71	1457	1152	1366	775344	0	1499999
2	1255795	2	6.0	62	1661	1670	0	2035114	1500000	2999999
3	1323125	2	14.0	59	1209	1971	0	3361570	3000000	4499999
4	2361028	2	12.0	85	1944	1060	0	5725778	4500000	5999999
5	602577	3	20.0	57	1189	1220	1534	6331359	6000000	7499999
6	1708813	1	11.0	78	1624	0	0	8044115	7500000	8999999
	1270950									

7	1	17.0	82	1835	0	0	9316689	
9000000	10499999							
	2284099							
8	2	15.0	69	1223	1443	0	11602623	
10500000	11999999							

Total number of pulses in waveform = 16

♀

Waveform Num = 21
Num of Bursts = 12
Burst Interval (us) = 1000000.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	439995									
1		1	15.0	72	1807	0	0	439995	0	
	999999									
	1468466									
2		3	14.0	68	1419	1189	1962	1910268		
1000000	1999999									
	788745									
3		2	20.0	50	1578	1386	0	2703583		
2000000	2999999									
	488417									
4		1	5.0	81	1238	0	0	3194964		
3000000	3999999									
	1143923									
5		3	6.0	67	1832	1643	1284	4340125		
4000000	4999999									
	1521839									
6		1	17.0	54	1380	0	0	5866723		
5000000	5999999									
	418694									
7		1	15.0	86	1644	0	0	6286797		
6000000	6999999									
	1367965									
8		3	11.0	72	1421	1451	1431	7656406		
7000000	7999999									
	1204365									
9		3	20.0	86	1555	1233	1218	8865074		
8000000	8999999									
	666943									
10		2	13.0	99	1244	1156	0	9536023		
9000000	9999999									
	1367641									
11		1	17.0	65	1262	0	0	10906064		
10000000	10999999									
	1012024									
12		1	11.0	65	1699	0	0	11919350		
11000000	11999999									

Total number of pulses in waveform = 22

♀

Waveform Num = 22
Num of Bursts = 16
Burst Interval (us) = 750000.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	633284									
1		2	18.0	92	1938	1969	0	633284	0	

749999
203813
2 1 6.0 55 1895 0 0 841004
750000 1499999
818746
3 2 9.0 88 1638 1546 0 1661645
1500000 2249999
1102304
4 1 20.0 95 1744 0 0 2767133
2250000 2999999
487555
5 2 14.0 76 1051 1883 0 3256432
3000000 3749999
1090009
6 1 18.0 54 1217 0 0 4349375
3750000 4499999
707112
7 2 19.0 64 1749 1543 0 5057704
4500000 5249999
621040
8 1 10.0 86 1173 0 0 5682036
5250000 5999999
448837
9 2 8.0 87 1594 1777 0 6132046
6000000 6749999
1188975
10 1 12.0 74 1024 0 0 7324392
6750000 7499999
318953
11 2 17.0 54 1508 1196 0 7644369
7500000 8249999
1266178
12 2 13.0 68 1332 1088 0 8913251
8250000 8999999
767541
13 2 18.0 83 1600 1516 0 9683212
9000000 9749999
283860
14 2 6.0 82 1352 1918 0 9970188
9750000 10499999
1220204
15 3 20.0 51 1782 1201 1760 11193662
10500000 11249999
602851
16 3 11.0 79 1610 1654 1364 11801256
11250000 11999999
Total number of pulses in waveform = 29
♀
Waveform Num = 23
Num of Bursts = 11
Burst Interval (us) = 1090909.0

Burst # Off Time (us) # Pulses Chirp (MHz) PW (us) Pulse 1 Pri(us) Pulse 2 Pri(us) Pulse 3 Pri(us) Start Loc (us) Start Burst Interval(us) End Burst Interval(us)
493022
1 3 10.0 54 1233 1850 1347 493022 0
1090908
1111187
2 3 9.0 60 1120 1023 1818 1608639
1090909 2181817
1020223

3	1	7.0	100	1677	0	0	2632823	2181818
3272726	1421988							
4	3	19.0	64	1317	1208	1408	4056488	3272727
4363635	320887							
5	2	9.0	75	1325	1267	0	4381308	4363636
5454544	2141036							
6	2	5.0	88	1597	1200	0	6524936	5454545
6545453	1011287							
7	3	18.0	79	1252	1161	1275	7539020	6545454
7636362	516240							
8	3	19.0	50	1816	1277	1470	8058948	7636363
8727271	1721944							
9	1	19.0	78	1024	0	0	9785455	8727272
9818180	859523							
10	1	14.0	86	1964	0	0	10646002	9818181
10909089	358998							
11	3	5.0	97	1117	1018	1221	11006964	10909090
11999998								

Total number of pulses in waveform = 25

♀

Waveform Num = 24
Num of Bursts = 9
Burst Interval (us) = 1333333.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
1	208762	2	16.0	67	1072	1509	0	208762	0	1333332
1533602										
2	1522986	2	17.0	92	1734	1430	0	1744945	1333333	2666665
3	830220	2	6.0	51	1430	1004	0	3271095	2666666	3999998
4	2123001	3	6.0	89	1369	1229	1414	4103749	3999999	5333331
5	1460435	1	18.0	59	1301	0	0	6230762	5333332	6666664
6	1076385	1	20.0	99	1125	0	0	7692498	6666665	7999997
7	1517152	3	7.0	78	1352	1843	1430	8770008	7999998	9333330
8	434489	2	18.0	67	1922	1313	0	10291785	9333331	10666663
9		2	12.0	50	1713	1484	0	10729509	10666664	11999996

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Total number of pulses in waveform = 18

♀

Waveform Num = 25
Num of Bursts = 19
Burst Interval (us) = 631579.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
1	165234	1	12.0	61	1770	0	0	165234	0	631578
2	1024652	3	20.0	62	1733	1856	1630	1191656	631579	1263157
3	658008	2	11.0	60	1490	1040	0	1854883	1263158	1894736
4	120427	2	10.0	100	1208	1670	0	1977840	1894737	2526315
5	1112209	3	10.0	71	1135	1892	1779	3092927	2526316	3157894
6	557657	3	11.0	57	1338	1862	1017	3655390	3157895	3789473
7	440002	1	10.0	69	1493	0	0	4099609	3789474	4421052
8	379278	3	11.0	80	1580	1509	1655	4480380	4421053	5052631
9	611674	1	18.0	53	1130	0	0	5096798	5052632	5684210
10	873330	1	18.0	61	1516	0	0	5971258	5684211	6315789
11	700900	2	19.0	75	1589	1375	0	6673674	6315790	6947368
12	788796	3	17.0	56	1693	1969	1625	7465434	6947369	7578947
13	238525	2	5.0	90	1381	1781	0	7709246	7578948	8210526
14	843491	3	5.0	95	1603	1405	1991	8555899	8210527	8842105
15	475231	2	7.0	99	1962	1767	0	9036129	8842106	9473684
16	898097	1	14.0	88	1085	0	0	9937955	9473685	10105263
17	196654	3	17.0	74	1873	1951	1817	10135694	10105264	10736842
18	1174154	3	14.0	56	1053	1073	1197	11315489		

10736843 11368421
178604
19 3 15.0 54 1691 1803 1561 11497416
11368422 12000000
Total number of pulses in waveform = 42
♀
Waveform Num = 26
Num of Bursts = 18
Burst Interval (us) = 666667.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	226620									
1		3	7.0	59	1497	1766	1857	226620	0	
	666666									
	830702									
2		2	13.0	61	1491	1746	0	1062442		
666667		1333333								
	767273									
3		2	5.0	72	1723	1374	0	1832952		
1333334		2000000								
	279297									
4		3	11.0	55	1849	1164	1567	2115346		
2000001		2666667								
	742268									
5		1	19.0	64	1197	0	0	2862194		
2666668		3333334								
	745474									
6		1	20.0	75	1707	0	0	3608865		
3333335		4000001								
	529880									
7		2	14.0	71	1811	1930	0	4140452		
4000002		4666668								
	1028929									
8		3	16.0	56	1029	1513	1770	5173122		
4666669		5333335								
	263060									
9		3	7.0	98	1777	1037	1300	5440494		
5333336		6000002								
	1117864									
10		3	14.0	81	1401	1968	1319	6562472		
6000003		6666669								
	244279									
11		1	15.0	97	1987	0	0	6811439		
6666670		7333336								
	950953									
12		3	13.0	54	1202	1528	1714	7764379		
7333337		8000003								
	788276									
13		2	7.0	76	1505	1354	0	8557099		
8000004		8666670								
	577191									
14		1	14.0	65	1063	0	0	9137149		
8666671		9333337								
	701064									
15		3	18.0	97	1700	1799	1356	9839276		
9333338		10000004								
	334897									
16		2	17.0	97	1499	1937	0	10179028		
10000005		10666671								
	519290									

17 3 11.0 85 1106 1279 1481 10701754
10666672 11333338
1149389
18 2 15.0 50 1532 1089 0 11855009
11333339 12000005
Total number of pulses in waveform = 40
♀
Waveform Num = 27
Num of Bursts = 12
Burst Interval (us) = 1000000.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	311110									
1		1	12.0	65	1811	0	0	311110	0	
	999999									
	1203791									
2		3	20.0	61	1087	1555	1669	1516712		
1000000	1999999									
	1131788									
3		3	12.0	61	1014	1372	1472	2652811		
2000000	2999999									
	1060054									
4		1	14.0	99	1726	0	0	3716723		
3000000	3999999									
	1228316									
5		3	12.0	84	1924	1035	1829	4946765		
4000000	4999999									
	858545									
6		3	5.0	76	1313	1521	1218	5810098		
5000000	5999999									
	781437									
7		1	17.0	95	1642	0	0	6595587		
6000000	6999999									
	1383019									
8		2	20.0	60	1155	1834	0	7980248		
7000000	7999999									
	20710									
9		1	18.0	54	1329	0	0	8003947		
8000000	8999999									
	1892606									
10		3	12.0	93	1289	1351	1746	9897882		
9000000	9999999									
	1078200									
11		1	20.0	89	1327	0	0	10980468		
10000000	10999999									
	246311									
12		1	13.0	84	1853	0	0	11228106		
11000000	11999999									

Total number of pulses in waveform = 23
♀
Waveform Num = 28
Num of Bursts = 10
Burst Interval (us) = 1200000.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	241728									
1		2	20.0	59	1401	1938	0	241728	0	

1199999
1352939
2 3 10.0 76 1662 1840 1677 1598006
1200000 2399999
818882
3 2 12.0 63 1873 1480 0 2422067
2400000 3599999
1886174
4 2 5.0 79 1294 1925 0 4311594
3600000 4799999
1371133
5 2 8.0 100 1899 1137 0 5685946
4800000 5999999
343177
6 1 20.0 92 1660 0 0 6032159
6000000 7199999
1318103
7 3 11.0 81 1265 1424 1667 7351922
7200000 8399999
1057104
8 1 9.0 88 1861 0 0 8413382
8400000 9599999
1408919
9 1 7.0 95 1576 0 0 9824162
9600000 10799999
1016647
10 1 11.0 59 1474 0 0 10842385
10800000 11999999
Total number of pulses in waveform = 18
♀
Waveform Num = 29
Num of Bursts = 14
Burst Interval (us) = 857143.0

Burst # Off Time (us) # Pulses Chirp (MHz) PW (us) Pulse 1 Pri(us) Pulse 2 Pri(us) Pulse 3 Pri(us) Start Loc (us) Start Burst Interval(us) End Burst Interval(us)
105920
1 1 9.0 59 1864 0 0 105920 0
857142
1410008
2 3 14.0 51 1927 1949 1531 1517792
857143 1714285
731461
3 2 14.0 57 1856 1721 0 2254660
1714286 2571428
624460
4 3 6.0 85 1133 1341 1975 2882697
2571429 3428571
583205
5 3 8.0 100 1509 1396 1222 3470351
3428572 4285714
1218433
6 3 10.0 64 1908 1885 1728 4692911
4285715 5142857
854791
7 3 16.0 64 1327 1089 1191 5553223
5142858 6000000
1264915
8 1 12.0 96 1390 0 0 6821745
6000001 6857143
744087

9	2	11.0	52	1686	1251	0	7567222	6857144
7714286	348252							
10	1	8.0	94	1325	0	0	7918411	7714287
8571429	914252							
11	3	16.0	65	1723	1841	1504	8833988	8571430
9428572	660763							
12	3	6.0	71	1678	1023	1569	9499819	9428573
10285715	1540502							
13	3	20.0	93	1255	1447	1100	11044591	10285716
11142858	800697							
14	3	17.0	85	1124	1616	1992	11849090	11142859
12000001								

Total number of pulses in waveform = 34

♀

Waveform Num = 30
Num of Bursts = 14
Burst Interval (us) = 857143.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
1	3	19.0	55	1016	1069	1951	697970	0	697970	857142
2	3	14.0	88	1328	1811	1793	1552259	857143	1714285	850253
3	2	14.0	83	1779	1139	0	1853513	1714286	2571428	1330534
4	1	16.0	60	1919	0	0	3186965	2571429	3428571	1083694
5	1	15.0	50	1550	0	0	4272578	3428572	4285714	423393
6	1	6.0	70	1119	0	0	4697521	4285715	5142857	529323
7	3	8.0	98	1035	1238	1874	5227963	5142858	6000000	1397105
8	2	10.0	83	1850	1184	0	6629215	6000001	6857143	606222
9	2	20.0	60	1326	1798	0	7238471	6857144	7714286	784014
10	2	19.0	75	1707	1114	0	8025609	7714287	8571429	1057453
11	1	12.0	72	1043	0	0	9085883	8571430	9428572	556392
12	1	7.0	83	1989	0	0	9643318	9428573	10285715	

Bin 5 Pulses 5310MHz

```
       1078568
13                2        17.0     74      1091      1569      0          10723875
10285716      11142858
       1156760
14                1        5.0      83      1023      0         0          11883295
11142859      12000001
Total number of pulses in waveform =  25
 ♀
```

VII. Appendix B

Waveform Num = 1
Num of Bursts = 14
Burst Interval (us) = 857143.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
1	684343	1	16.0	53	1706	0	0	684343	0	857142
2	528030	3	5.0	76	1417	1196	1203	1214079	857143	1714285
3	1089836	2	17.0	82	1626	1483	0	2307731	1714286	2571428
4	825553	1	11.0	82	1872	0	0	3136393	2571429	3428571
5	1023804	1	6.0	77	1460	0	0	4162069	3428572	4285714
6	827191	2	15.0	68	1666	1092	0	4990720	4285715	5142857
7	182490	3	19.0	94	1428	1684	1283	5175968	5142858	6000000
8	1048976	3	11.0	60	1475	1622	1155	6229339	6000001	6857143
9	1238539	3	19.0	82	1175	1446	1901	7472130	6857144	7714286
10	276087	2	14.0	67	1517	1332	0	7752739	7714287	8571429
11	1599137	1	13.0	72	1071	0	0	9354725	8571430	9428572
12	871564	2	20.0	53	1596	1389	0	10227360	9428573	10285715
13	474736	1	17.0	68	1358	0	0	10705081	10285716	11142858
14	506365	1	11.0	62	1990	0	0	11212804	11142859	12000001

Total number of pulses in waveform = 26

♀

Waveform Num = 2
Num of Bursts = 17
Burst Interval (us) = 705882.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	215057									

Bin 5 pulses 5320

1	3	6.0	69	1104	1248	1246	215057	0
705881								
504819								
2	1	8.0	81	1541	0	0	723474	
705882	1411763							
716901								
3	3	12.0	51	1425	1693	1198	1441916	
1411764	2117645							
787503								
4	2	18.0	81	1482	1816	0	2233735	
2117646	2823527							
1234751								
5	1	10.0	72	1718	0	0	3471784	
2823528	3529409							
297604								
6	3	11.0	98	1256	1486	1989	3771106	
3529410	4235291							
909795								
7	2	10.0	87	1604	1592	0	4685632	
4235292	4941173							
347396								
8	3	14.0	70	1526	1874	1266	5036224	
4941174	5647055							
999301								
9	3	10.0	64	1336	1137	1507	6040191	
5647056	6352937							
690951								
10	2	7.0	57	1537	1624	0	6735122	
6352938	7058819							
671480								
11	1	15.0	93	1782	0	0	7409763	
7058820	7764701							
889154								
12	1	13.0	76	1559	0	0	8300699	
7764702	8470583							
330493								
13	2	16.0	93	1674	1251	0	8632751	
8470584	9176465							
712333								
14	3	15.0	96	1643	1594	1032	9348009	
9176466	9882347							
929670								
15	3	13.0	78	1997	1101	1137	10281948	
9882348	10588229							
716837								
16	1	12.0	78	1153	0	0	11003020	
10588230	11294111							
817245								
17	2	5.0	74	1744	1406	0	11821418	
11294112	11999993							

Total number of pulses in waveform = 36

♀

Waveform Num = 3
Num of Bursts = 14
Burst Interval (us) = 857143.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
1	253651	2	12.0	93	1388	1887	0	253651	0	857142

669578
2 1 8.0 95 1543 0 0 926504
857143 1714285
1519733
3 3 19.0 58 1106 1300 1618 2447780
1714286 2571428
528983
4 3 17.0 95 1892 1975 1225 2980787
2571429 3428571
861146
5 2 13.0 69 1231 1864 0 3847025
3428572 4285714
671163
6 3 5.0 75 1506 1413 1826 4521283
4285715 5142857
778365
7 3 12.0 52 1756 1635 1027 5304393
5142858 6000000
1279456
8 1 6.0 86 1901 0 0 6588267
6000001 6857143
473850
9 3 5.0 79 1238 1916 1655 7064018
6857144 7714286
1143022
10 2 9.0 96 1631 1529 0 8211849
7714287 8571429
960259
11 3 9.0 59 1196 1690 1309 9175268
8571430 9428572
780374
12 2 17.0 84 1547 1696 0 9959837
9428573 10285715
970648
13 3 10.0 55 1115 1229 1052 10933728
10285716 11142858
864300
14 2 8.0 73 1699 1009 0 11801424
11142859 12000001
Total number of pulses in waveform = 33
♀
Waveform Num = 4
Num of Bursts = 17
Burst Interval (us) = 705882.0

Burst # Off Time (us) # Pulses Chirp (MHz) PW (us) Pulse 1 Pri(us) Pulse 2 Pri(us) Pulse 3 Pri(us) Start Loc (us) Start Burst Interval(us) End Burst Interval(us)
551734
1 3 18.0 55 1720 1578 1105 551734 0
705881
184045
2 3 7.0 61 1005 1083 1796 740182
705882 1411763
1255938
3 3 20.0 94 1625 1263 1238 2000004
1411764 2117645
241492
4 1 20.0 69 1880 0 0 2245622
2117646 2823527
1219322
5 1 7.0 94 1744 0 0 3466824

2823528 3529409
605796
6 2 20.0 66 1516 1063 0 4074364
3529410 4235291
595436
7 1 5.0 66 1891 0 0 4672379
4235292 4941173
804869
8 3 19.0 82 1007 1907 1302 5479139
4941174 5647055
829473
9 3 16.0 98 1616 1687 1849 6312828
5647056 6352937
573566
10 3 10.0 71 1564 1043 1850 6891546
6352938 7058819
757615
11 1 17.0 92 1243 0 0 7653618
7058820 7764701
133126
12 1 16.0 95 1084 0 0 7787987
7764702 8470583
711983
13 1 8.0 95 1026 0 0 8501054
8470584 9176465
808067
14 1 17.0 70 1933 0 0 9310147
9176466 9882347
1058105
15 1 16.0 81 1426 0 0 10370185
9882348 10588229
469701
16 1 12.0 63 1493 0 0 10841312
10588230 11294111
668921
17 2 9.0 50 1049 1169 0 11511726
11294112 11999993
Total number of pulses in waveform = 31
♀
Waveform Num = 5
Num of Bursts = 16
Burst Interval (us) = 750000.0

Burst # Off Time (us) # End Burst Pulses Chirp (MHz) PW (us) Pulse 1 Pri(us) Pulse 2 Pri(us) Pulse 3 Pri(us) Start Loc (us) Start Burst Interval(us) End Burst Interval(us)
291041
1 1 8.0 91 1347 0 0 291041 0
749999
645478
2 2 11.0 89 1150 1569 0 937866
750000 1499999
1294942
3 3 10.0 95 1055 1109 1056 2235527
1500000 2249999
290825
4 1 9.0 74 1847 0 0 2529572
2250000 2999999
778899
5 3 8.0 67 1263 1752 1616 3310318
3000000 3749999
930359

Bin 5 pulses 5320

6	2	16.0	57	1034	1802	0	4245308	3750000	4499999	425656
7	1	6.0	88	1717	0	0	4673800	4500000	5249999	712804
8	2	14.0	89	1181	1553	0	5388321	5250000	5999999	1078813
9	2	20.0	81	1998	1330	0	6469868	6000000	6749999	462992
10	3	20.0	82	1861	1384	1429	6936188	6750000	7499999	628628
11	3	9.0	99	1239	1663	1341	7569490	7500000	8249999	1388311
12	2	20.0	79	1647	1002	0	8962044	8250000	8999999	424049
13	1	15.0	96	1934	0	0	9388742	9000000	9749999	703816
14	3	17.0	83	1029	1618	1105	10094492	9750000	10499999	629744
15	3	12.0	100	1471	1872	1743	10727988	10500000	11249999	582349
16	2	16.0	96	1321	1791	0	11315423	11250000	11999999	

Total number of pulses in waveform = 34

♀

Waveform Num = 6
Num of Bursts = 13
Burst Interval (us) = 923077.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)	
1		2	12.0	57	1049	1803	0	572369	0	923076	692115
2		1	20.0	80	1604	0	0	1267336	923077	1846153	694226
3		1	18.0	97	1946	0	0	1963166	1846154	2769230	1535471
4		1	7.0	77	1567	0	0	3500583	2769231	3692307	722315
5		3	11.0	95	1190	1524	1979	4224465	3692308	4615384	809132
6		3	5.0	96	1079	1014	1458	5038290	4615385	5538461	503222
7		1	13.0	55	1423	0	0	5545063	5538462	6461538	

1461053
8 1 8.0 66 1715 0 0 7007539
6461539 7384615
1026796
9 3 17.0 61 1685 1822 1962 8036050
7384616 8307692
798286
10 3 18.0 81 1189 1882 1241 8839805
8307693 9230769
585732
11 1 10.0 57 1323 0 0 9429849
9230770 10153846
1375883
12 2 10.0 94 1055 1827 0 10807055
10153847 11076923
659405
13 2 9.0 76 1313 1068 0 11469342
11076924 12000000
Total number of pulses in waveform = 24
♀
Waveform Num = 7
Num of Bursts = 18
Burst Interval (us) = 666667.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	282951									
1		2	15.0	71	1697	1140	0	282951	0	
	666666									
	728295									
2		2	9.0	83	1850	1512	0	1014083		
666667	1333333									
	387586									
3		3	15.0	94	1561	1550	1378	1405031		
1333334	2000000									
	831801									
4		2	6.0	72	1214	1177	0	2241321		
2000001	2666667									
	434519									
5		1	13.0	77	1868	0	0	2678231		
2666668	3333334									
	1162526									
6		1	13.0	83	1579	0	0	3842625		
3333335	4000001									
	319924									
7		2	13.0	64	1480	1300	0	4164128		
4000002	4666668									
	1130585									
8		1	11.0	52	1243	0	0	5297493		
4666669	5333335									
	93801									
9		1	10.0	61	1470	0	0	5392537		
5333336	6000002									
	711197									
10		2	19.0	61	1566	1365	0	6105204		
6000003	6666669									
	1090239									
11		2	10.0	82	1937	1766	0	7198374		
6666670	7333336									
	188758									
12		1	12.0	90	1139	0	0	7390835		

7333337 8000003
898578
13 3 5.0 71 1700 1611 1403 8290552
8000004 8666670
581998
14 1 5.0 79 1306 0 0 8877264
8666671 9333337
622046
15 3 12.0 54 1335 1469 1086 9500616
9333338 10000004
681741
16 3 15.0 61 1743 1820 1708 10186247
10000005 10666671
543760
17 3 11.0 71 1736 1947 1856 10735278
10666672 11333338
1040605
18 3 13.0 77 1545 1631 1553 11781422
11333339 12000005
Total number of pulses in waveform = 36
♀
Waveform Num = 8
Num of Bursts = 18
Burst Interval (us) = 666667.0

Burst # | Off Time (us) | # Pulses | Chirp (MHz) | PW (us) | Pulse 1 Pri(us) | Pulse 2 Pri(us) | Pulse 3 Pri(us) | Start Loc (us) | Start Burst Interval(us) | End Burst Interval(us)

184008
1 3 11.0 74 1940 1489 1127 184008 0
666666
898362
2 2 5.0 97 1780 1930 0 1086926
666667 1333333
598301
3 3 5.0 61 1832 1355 1382 1688937
1333334 2000000
330345
4 1 14.0 51 1975 0 0 2023851
2000001 2666667
727204
5 1 7.0 95 1161 0 0 2753030
2666668 3333334
1144753
6 2 12.0 95 1339 1359 0 3898944
3333335 4000001
237271
7 1 7.0 90 1755 0 0 4138913
4000002 4666668
607990
8 1 6.0 93 1385 0 0 4748658
4666669 5333335
1017227
9 2 9.0 96 1129 1027 0 5767270
5333336 6000002
387979
10 3 5.0 67 1748 1373 1562 6157405
6000003 6666669
1095099
11 2 7.0 79 1841 1453 0 7257187
6666670 7333336
546560

Bin 5 pulses 5320

12	1	14.0	68	1222	0	0	7807041	7333337
8000003	700771							
13	2	20.0	54	1291	1198	0	8509034	8000004
8666670	269285							
14	2	10.0	82	1380	1203	0	8780808	8666671
9333337	1022179							
15	3	18.0	68	1500	1796	1962	9805570	9333338
10000004	358447							
16	2	10.0	89	1843	1571	0	10169275	10000005
10666671	891502							
17	1	20.0	80	1023	0	0	11064191	10666672
11333338	488900							
18	1	13.0	83	1218	0	0	11554114	11333339
12000005								

Total number of pulses in waveform = 33

♀

Waveform Num = 9
Num of Bursts = 18
Burst Interval (us) = 666667.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	
Start Burst Interval(us)	End Burst Interval(us)								
1	566460	3	7.0	68	1089	1665	1233	566460	0
666666	736667								
2	3	13.0	82	1370	1430	1175	1307114	666667	1333333
344235									
3	3	20.0	58	1795	1892	1721	1655324	1333334	2000000
891532									
4	3	16.0	88	1755	1166	1913	2552264	2000001	2666667
673584									
5	3	9.0	98	1483	1221	1833	3230682	2666668	3333334
534676									
6	1	10.0	76	1346	0	0	3769895	3333335	4000001
616286									
7	2	15.0	57	1151	1660	0	4387527	4000002	4666668
465728									
8	1	16.0	87	1685	0	0	4856066	4666669	5333335
600663									
9	3	8.0	91	1405	1329	1212	5458414	5333336	6000002
1176854									
10	3	11.0	95	1043	1380	1315	6639214	6000003	6666669
524873									
11	2	13.0	98	1918	1005	0	7167825	6666670	7333336

693629
12 2 17.0 88 1504 1719 0 7864377
7333337 8000003
542662
13 3 7.0 77 1577 1541 1436 8410262
8000004 8666670
857876
14 3 8.0 73 1817 1383 1466 9272692
8666671 9333337
141017
15 1 11.0 95 1422 0 0 9418375
9333338 10000004
877515
16 2 19.0 76 1991 1597 0 10297312
10000005 10666671
919218
17 1 13.0 91 1549 0 0 11220118
10666672 11333338
414568
18 2 6.0 59 1572 1213 0 11636235
11333339 12000005
Total number of pulses in waveform = 41
♀
Waveform Num = 10
Num of Bursts = 8
Burst Interval (us) = 1500000.0

Burst # | Off Time (us) | # Pulses | Chirp (MHz) | PW (us) | Pulse 1 Pri(us) | Pulse 2 Pri(us) | Pulse 3 Pri(us) | Start Loc (us) | Start Burst Interval(us) | End Burst Interval(us)

1444988
1 2 6.0 68 1836 1604 0 1444988 0
1499999
970122
2 2 20.0 82 1488 1723 0 2418550
1500000 2999999
783428
3 2 13.0 93 1565 1178 0 3205189
3000000 4499999
1499808
4 3 13.0 61 1498 1943 1754 4707740
4500000 5999999
2450553
5 1 15.0 59 1137 0 0 7163488
6000000 7499999
1704960
6 3 5.0 64 1085 1691 1244 8869585
7500000 8999999
693399
7 2 7.0 85 1907 1129 0 9567004
9000000 10499999
1899215
8 3 8.0 68 1102 1516 1313 11469255
10500000 11999999
Total number of pulses in waveform = 18
♀
Waveform Num = 11
Num of Bursts = 13
Burst Interval (us) = 923077.0

Burst # | Off Time (us) | # Pulses | Chirp (MHz) | PW (us) | Pulse 1 Pri(us) | Pulse 2 Pri(us) | Pulse 3 Pri(us) | Start Loc (us) | Start Burst Interval(us) | End Burst Interval(us)

Bin 5 pulses 5320

#	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
1	253051	3	9.0	66	1358	1639	1145	253051	0	923076
2	818283	1	15.0	58	1546	0	0	1075476	923077	1846153
3	1315833	3	6.0	73	1345	1063	1682	2392855	1846154	2769230
4	566513	1	10.0	81	1782	0	0	2963458	2769231	3692307
5	1235926	3	9.0	79	1898	1620	1332	4201166	3692308	4615384
6	987629	3	9.0	65	1988	1919	1309	5193645	4615385	5538461
7	582220	2	19.0	85	1243	1266	0	5781081	5538462	6461538
8	1373411	2	12.0	97	1170	1422	0	7157001	6461539	7384615
9	1080734	3	11.0	59	1230	1269	1995	8240327	7384616	8307692
10	919206	2	5.0	87	1007	1049	0	9164027	8307693	9230769
11	369598	1	15.0	64	1499	0	0	9535681	9230770	10153846
12	1289597	3	9.0	76	1691	1571	1293	10826777	10153847	11076923
13	547059	2	14.0	88	1779	1097	0	11378391	11076924	12000000

Total number of pulses in waveform = 29

♀

Waveform Num = 12
Num of Bursts = 9
Burst Interval (us) = 1333333.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
1	1217643	3	14.0	77	1329	1890	1646	1217643	0	1333332
2	805879	1	14.0	71	1028	0	0	2028387	1333333	2666665
3	1007477	3	16.0	63	1593	1443	1086	3036892	2666666	3999998
4	2003160	1	9.0	82	1088	0	0	5044174	3999999	5333331

882240
5 2 14.0 62 1043 1954 0 5927502
5333332 6666664
782269
6 3 9.0 89 1762 1107 1600 6712768
6666665 7999997
2064162
7 1 12.0 70 1765 0 0 8781399
7999998 9333330
1761141
8 1 7.0 91 1464 0 0 10544305
9333331 10666663
243468
9 2 13.0 63 1848 1024 0 10789237
10666664 11999996
Total number of pulses in waveform = 17
♀
Waveform Num = 13
Num of Bursts = 18
Burst Interval (us) = 666667.0

Burst # Off Time (us) # Pulses Chirp (MHz) PW (us) Pulse 1 Pri(us) Pulse 2 Pri(us) Pulse 3 Pri(us) Start Loc (us) Start Burst Interval(us) End Burst Interval(us)
226803
1 1 17.0 70 1268 0 0 226803 0
666666
620290
2 3 16.0 67 1847 1742 1784 848361
666667 1333333
989129
3 3 5.0 71 1444 1076 1111 1842863
1333334 2000000
756738
4 3 19.0 62 1177 1975 1563 2603232
2000001 2666667
257674
5 2 10.0 79 1870 1179 0 2865621
2666668 3333334
681149
6 3 15.0 89 1935 1531 1336 3549819
3333335 4000001
962102
7 2 18.0 73 1608 1202 0 4516723
4000002 4666668
474227
8 3 12.0 50 1177 1212 1587 4993760
4666669 5333335
842422
9 2 15.0 71 1949 1934 0 5840158
5333336 6000002
433374
10 1 8.0 82 1349 0 0 6277415
6000003 6666669
941455
11 2 7.0 75 1840 1064 0 7220219
6666670 7333336
135631
12 1 18.0 77 1794 0 0 7358754
7333337 8000003
1205208
13 2 19.0 50 1678 1337 0 8565756

8000004 8666670
740069
14 2 19.0 65 1656 1537 0 9308840
8666671 9333337
678345
15 1 5.0 85 1476 0 0 9990378
9333338 10000004
491036
16 2 9.0 98 1175 1176 0 10482890
10000005 10666671
295581
17 1 9.0 75 1544 0 0 10780822
10666672 11333338
1058908
18 1 9.0 99 1372 0 0 11841274
11333339 12000005
Total number of pulses in waveform = 35
♀
Waveform Num = 14
Num of Bursts = 13
Burst Interval (us) = 923077.0

Burst # Off Time (us) # Pulses Chirp (MHz) PW (us) Pulse 1 Pri(us) Pulse 2 Pri(us) Pulse 3 Pri(us) Start Loc (us) Start Burst Interval(us) End Burst Interval(us)
180617
1 2 16.0 78 1779 1789 0 180617 0
923076
972881
2 1 13.0 61 1850 0 0 1157066
923077 1846153
1274137
3 1 9.0 97 1726 0 0 2433053
1846154 2769230
1051936
4 3 18.0 96 1040 1743 1393 3486715
2769231 3692307
710257
5 2 6.0 97 1167 1795 0 4201148
3692308 4615384
738089
6 3 6.0 62 1745 1468 1387 4942199
4615385 5538461
1032756
7 2 15.0 52 1107 1199 0 5979555
5538462 6461538
933277
8 2 18.0 53 1758 1155 0 6915138
6461539 7384615
1185416
9 3 16.0 73 1007 1246 1087 8103467
7384616 8307692
851692
10 1 7.0 94 1971 0 0 8958499
8307693 9230769
877724
11 3 12.0 56 1978 1738 1054 9838194
9230770 10153846
518028
12 3 19.0 63 1968 1817 1507 10360992
10153847 11076923
1530160

13 3 19.0 77 1911 1694 1762 11896444
11076924 12000000
Total number of pulses in waveform = 29
♀
Waveform Num = 15
Num of Bursts = 16
Burst Interval (us) = 750000.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
1	492444	3	11.0	68	1274	1659	1968	492444	0	749999
2	288565	2	5.0	51	1682	1024	0	785910	750000	1499999
3	991126	2	8.0	64	1323	1791	0	1779742	1500000	2249999
4	885884	3	10.0	56	1161	1378	1289	2668740	2250000	2999999
5	902603	2	9.0	79	1343	1098	0	3575171	3000000	3749999
6	804391	3	20.0	79	1499	1340	1030	4382003	3750000	4499999
7	542574	2	9.0	67	1595	1672	0	4928446	4500000	5249999
8	935287	1	18.0	98	1422	0	0	5867000	5250000	5999999
9	363028	1	13.0	85	1598	0	0	6231450	6000000	6749999
10	567763	3	8.0	50	1580	1411	2000	6800811	6750000	7499999
11	1350914	3	17.0	89	1157	1098	1161	8156716	7500000	8249999
12	407966	1	10.0	75	1978	0	0	8568098	8250000	8999999
13	981781	2	11.0	93	1044	1142	0	9551857	9000000	9749999
14	655490	1	18.0	85	1352	0	0	10209533	9750000	10499999
15	966670	2	12.0	99	1635	1329	0	11177555	10500000	11249999
16	122070	3	5.0	85	1447	1774	1361	11302589	11250000	11999999

Total number of pulses in waveform = 34
♀
Waveform Num = 16

Bin 5 pulses 5320

Num of Bursts = 20
Burst Interval (us) = 600000.0

Burst #	Off Time (us)	# Burst Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
1	193290	3	10.0	80	1407	1042	1624	193290	0	599999
2	447793	3	10.0	100	1425	1312	1425	645156	600000	1199999
3	962113	1	16.0	68	1604	0	0	1611431	1200000	1799999
4	699982	1	10.0	52	1578	0	0	2313017	1800000	2399999
5	266673	3	16.0	64	1577	1822	1032	2581268	2400000	2999999
6	614095	1	9.0	100	1036	0	0	3199794	3000000	3599999
7	921265	1	15.0	53	1648	0	0	4122095	3600000	4199999
8	106759	3	18.0	75	1847	1736	1892	4230502	4200000	4799999
9	1065377	1	14.0	68	1930	0	0	5301354	4800000	5399999
10	436322	3	20.0	95	1603	1380	1897	5739606	5400000	5999999
11	719222	3	19.0	100	1804	1270	1285	6463708	6000000	6599999
12	137211	1	20.0	92	1149	0	0	6605278	6600000	7199999
13	738161	2	18.0	87	1471	1966	0	7344588	7200000	7799999
14	675437	1	10.0	60	1195	0	0	8023462	7800000	8399999
15	517593	2	8.0	81	1150	1598	0	8542250	8400000	8999999
16	619632	1	15.0	91	1553	0	0	9164630	9000000	9599999
17	529054	2	15.0	63	1437	1173	0	9695237	9600000	10199999
18	520086	3	9.0	72	1311	1570	1006	10217933	10200000	10799999
19	1103522	1	6.0	97	1597	0	0	11325342		

10800000 11399999
243248
20 1 6.0 74 1043 0 0 11570187
11400000 11999999
Total number of pulses in waveform = 37
♀
Waveform Num = 17
Num of Bursts = 14
Burst Interval (us) = 857143.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
	195620									
1		1	17.0	98	1909	0	0	195620	0	857142
	740662									
2		2	14.0	90	1135	1384	0	938191	857143	1714285
	1468998									
3		2	17.0	55	1514	1958	0	2409708	1714286	2571428
	176606									
4		2	16.0	53	1451	1280	0	2589786	2571429	3428571
	1639817									
5		3	20.0	83	1741	1984	1664	4232334	3428572	4285714
	115536									
6		1	19.0	95	1982	0	0	4353259	4285715	5142857
	1231050									
7		1	12.0	77	1838	0	0	5586291	5142858	6000000
	929758									
8		2	20.0	64	1423	1206	0	6517887	6000001	6857143
	364711									
9		1	5.0	54	1832	0	0	6885227	6857144	7714286
	1217704									
10		1	8.0	57	1855	0	0	8104763	7714287	8571429
	776779									
11		2	16.0	52	1301	1740	0	8883397	8571430	9428572
	895653									
12		2	16.0	87	1625	1031	0	9782091	9428573	10285715
	844017									
13		2	7.0	89	1096	1994	0	10628764	10285716	11142858
	1065341									
14		3	20.0	53	1733	1993	1233	11697195	11142859	12000001

Total number of pulses in waveform = 25
♀
Waveform Num = 18
Num of Bursts = 13
Burst Interval (us) = 923077.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)

Bin 5 pulses 5320

Start Burst #	Off Time (us)	End Burst Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	
Interval(us)	Interval(us)								
1	78500	2	15.0	56	1431	1334	0	78500	0
	923076								
2	895440	3	15.0	62	1785	1064	1415	976705	
923077	1846153								
3	966004	3	19.0	85	1310	1333	1158	1946973	
1846154	2769230								
4	1340698	2	16.0	87	1331	1664	0	3291472	
2769231	3692307								
5	775635	3	6.0	97	1095	1827	1978	4070102	
3692308	4615384								
6	590495	3	19.0	56	1162	1645	1482	4665497	
4615385	5538461								
7	1077582	1	6.0	63	1469	0	0	5747368	
5538462	6461538								
8	888202	3	18.0	96	1846	1239	1779	6637039	
6461539	7384615								
9	801868	1	9.0	62	1747	0	0	7443771	
7384616	8307692								
10	913107	3	18.0	53	1814	1437	1889	8358625	
8307693	9230769								
11	1677450	1	8.0	58	1534	0	0	10041215	
9230770	10153846								
12	228176	2	15.0	83	1052	1752	0	10270925	
10153847	11076923								
13	1134413	2	8.0	57	1894	1391	0	11408142	
11076924	12000000								

Total number of pulses in waveform = 29

♀

Waveform Num = 19
Num of Bursts = 14
Burst Interval (us) = 857143.0

Burst #	Off Time (us)	End Burst Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	
Start Burst	End Burst								
Interval(us)	Interval(us)								
1	455454	3	20.0	73	1645	1175	1963	455454	0
	857142								
2	717419	2	18.0	95	1313	1244	0	1177656	
857143	1714285								
3	1043404	2	14.0	64	1269	1990	0	2223617	
1714286	2571428								
4	755765	1	10.0	90	1079	0	0	2982641	

2571429 3428571
683570
5 2 9.0 73 1712 1552 0 3667290
3428572 4285714
658913
6 3 5.0 80 1097 1792 1272 4329467
4285715 5142857
1274046
7 3 8.0 59 1649 1656 1505 5607674
5142858 6000000
716694
8 1 10.0 74 1059 0 0 6329178
6000001 6857143
601266
9 2 14.0 56 1583 1386 0 6931503
6857144 7714286
1138960
10 1 19.0 73 1336 0 0 8073432
7714287 8571429
1310940
11 1 9.0 75 1151 0 0 9385708
8571430 9428572
540634
12 1 19.0 71 1980 0 0 9927493
9428573 10285715
1029027
13 2 11.0 90 1919 1300 0 10958500
10285716 11142858
704342
14 3 8.0 91 1956 1626 1730 11666061
11142859 12000001
Total number of pulses in waveform = 27
♀
Waveform Num = 20
Num of Bursts = 17
Burst Interval (us) = 705882.0

Burst # Off Time (us) # Pulses Chirp (MHz) PW (us) Pulse 1 Pri(us) Pulse 2 Pri(us) Pulse 3 Pri(us) Start Loc (us) Start Burst Interval(us) End Burst Interval(us)
255547
1 3 10.0 55 1908 1257 1505 255547 0
705881
1095262
2 1 13.0 81 1163 0 0 1355479
705882 1411763
283744
3 3 13.0 99 1681 1585 1396 1640386
1411764 2117645
537867
4 2 10.0 62 1353 1050 0 2182915
2117646 2823527
1200949
5 2 6.0 74 1187 1303 0 3386267
2823528 3529409
270774
6 3 14.0 90 1401 1435 1130 3659531
3529410 4235291
823824
7 2 18.0 74 1991 1799 0 4487321
4235292 4941173
898992

Bin 5 pulses 5320

8	2	12.0	76	1112	1010	0	5390103	4941174
5647055	435830							
9	1	15.0	56	1454	0	0	5828055	5647056
6352937	740064							
10	1	5.0	99	1946	0	0	6569573	6352938
7058819	1124496							
11	1	11.0	92	1422	0	0	7696015	7058820
7764701	749517							
12	1	17.0	86	1904	0	0	8446954	7764702
8470583	248705							
13	2	7.0	81	1766	1759	0	8697563	8470584
9176465	549174							
14	1	14.0	50	1938	0	0	9250262	9176466
9882347	862689							
15	2	20.0	57	1131	1823	0	10114889	9882348
10588229	1060057							
16	1	17.0	97	1834	0	0	11177900	10588230
11294111	216521							
17	1	5.0	97	1580	0	0	11396255	11294112
11999993								

Total number of pulses in waveform = 29

♀

Waveform Num = 21
Num of Bursts = 17
Burst Interval (us) = 705882.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
1	265404	1	10.0	67	1152	0	0	265404	0	705881
793651										
2	2	11.0	97	1331	1742	0	1060207	705882	1411763	
874932										
3	1	15.0	59	1758	0	0	1938212	1411764	2117645	
630314										
4	1	19.0	68	1492	0	0	2570284	2117646	2823527	
766643										
5	2	15.0	62	1322	1654	0	3338419	2823528	3529409	
308139										
6	2	18.0	71	1131	1113	0	3649534	3529410	4235291	
820639										
7	1	18.0	100	1973	0	0	4472417	4235292	4941173	
831500										
8	3	14.0	79	1564	1175	1891	5305890	4941174	5647055	

990684
9 3 8.0 54 1288 1632 1579 6301204
5647056 6352937
563040
10 2 15.0 67 1232 1200 0 6868743
6352938 7058819
687489
11 1 13.0 57 1065 0 0 7558664
7058820 7764701
831772
12 2 12.0 98 1448 1772 0 8391501
7764702 8470583
657376
13 2 8.0 69 1340 1941 0 9052097
8470584 9176465
629440
14 2 14.0 73 1633 1640 0 9684818
9176466 9882347
711193
15 1 15.0 53 1995 0 0 10399284
9882348 10588229
422808
16 2 8.0 79 1435 1039 0 10824087
10588230 11294111
1125259
17 2 16.0 64 1688 1279 0 11951820
11294112 11999993
Total number of pulses in waveform = 30
♀
Waveform Num = 22
Num of Bursts = 15
Burst Interval (us) = 800000.0

Burst # Off Time (us) # Pulses Chirp (MHz) PW (us) Pulse 1 Pri(us) Pulse 2 Pri(us) Pulse 3 Pri(us) Start Loc (us) Start Burst Interval(us) End Burst Interval(us)
634716
1 2 18.0 80 1920 1620 0 634716 0
799999
953532
2 3 10.0 99 1332 1947 1271 1591788
800000 1599999
40442
3 1 14.0 74 1016 0 0 1636780
1600000 2399999
1316679
4 2 5.0 96 1520 1372 0 2954475
2400000 3199999
440063
5 3 17.0 66 1792 1210 1427 3397430
3200000 3999999
993587
6 2 11.0 99 1880 1010 0 4395446
4000000 4799999
644166
7 3 18.0 90 1090 1411 1692 5042502
4800000 5599999
978889
8 1 5.0 77 1021 0 0 6025584
5600000 6399999
554738
9 3 5.0 55 1933 1127 1105 6581343

6400000 7199999
1363418
10 1 20.0 63 1631 0 0 7948926
7200000 7999999
77214
11 3 5.0 95 1731 1358 1423 8027771
8000000 8799999
1475436
12 3 8.0 52 1152 1717 1071 9507719
8800000 9599999
585983
13 1 15.0 73 1439 0 0 10097642
9600000 10399999
794346
14 2 6.0 98 1080 1617 0 10893427
10400000 11199999
844537
15 2 10.0 53 1485 1725 0 11740661
11200000 11999999
Total number of pulses in waveform = 32
♀
Waveform Num = 23
Num of Bursts = 8
Burst Interval (us) = 1500000.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
1	611161	3	15.0	93	1591	1689	1217	611161	0	1499999
2	2114012	1	9.0	69	1009	0	0	2729670	1500000	2999999
3	1665833	1	12.0	59	1769	0	0	4396512	3000000	4499999
4	426006	1	18.0	71	1571	0	0	4824287	4500000	5999999
5	2607987	2	9.0	92	1467	1134	0	7433845	6000000	7499999
6	1270101	2	17.0	100	1659	1712	0	8706547	7500000	8999999
7	980057	3	6.0	66	1459	1354	1800	9689975	9000000	10499999
8	989874	1	7.0	56	1980	0	0	10684462	10500000	11999999

Total number of pulses in waveform = 14
♀
Waveform Num = 24
Num of Bursts = 17
Burst Interval (us) = 705882.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)

630325								
1	1	8.0	79	1774	0	0	630325	0
705881								
356187								
2	2	11.0	70	1499	1657	0	988286	
705882	1411763							
599397								
3	2	14.0	90	1749	1573	0	1590839	
1411764	2117645							
568956								
4	2	19.0	89	1843	1592	0	2163117	
2117646	2823527							
710492								
5	3	5.0	65	1087	1606	1120	2877044	
2823528	3529409							
885146								
6	2	18.0	79	1219	1965	0	3766003	
3529410	4235291							
961700								
7	1	8.0	63	1113	0	0	4730887	
4235292	4941173							
364946								
8	2	6.0	89	1470	1320	0	5096946	
4941174	5647055							
821695								
9	3	19.0	53	1635	1121	1173	5921431	
5647056	6352937							
974034								
10	2	13.0	63	1392	1138	0	6899394	
6352938	7058819							
178319								
11	2	7.0	57	1831	1799	0	7080243	
7058820	7764701							
873142								
12	2	17.0	80	1426	1266	0	7957015	
7764702	8470583							
1105290								
13	1	6.0	83	1258	0	0	9064997	
8470584	9176465							
729220								
14	1	10.0	97	1277	0	0	9795475	
9176466	9882347							
467197								
15	3	6.0	84	1781	1515	1076	10263949	
9882348	10588229							
693684								
16	1	10.0	76	1441	0	0	10962005	
10588230	11294111							
785482								
17	3	7.0	74	1364	1572	1037	11748928	
11294112	11999993							

Total number of pulses in waveform = 33

♀

Waveform Num = 25
Num of Bursts = 15
Burst Interval (us) = 800000.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
301980										
1		3	20.0	51	1221	1156	1523	301980	0	

```
          799999
       596396
2                3        19.0    74     1577     1508     1721      902276
800000        1599999
       1085242
3                3        19.0    68     1493     1592     1949      1992324
1600000       2399999
       1054079
4                1        8.0     54     1860     0        0         3051437
2400000       3199999
       634708
5                1        6.0     67     1330     0        0         3688005
3200000       3999999
       656485
6                2        17.0    91     1816     1959     0         4345820
4000000       4799999
       1078338
7                2        12.0    75     1148     1815     0         5427933
4800000       5599999
       330283
8                1        7.0     100    1891     0        0         5761179
5600000       6399999
       1030017
9                2        17.0    63     1629     1976     0         6793087
6400000       7199999
       932885
10               2        16.0    98     1744     1714     0         7729577
7200000       7999999
       498372
11               3        11.0    86     1302     1861     1030      8231407
8000000       8799999
       899188
12               3        9.0     55     1281     1353     1185      9134788
8800000       9599999
       1248292
13               3        19.0    79     1589     1742     1043      10386899
9600000       10399999
       770906
14               1        18.0    92     1393     0        0         11162179
10400000      11199999
       508167
15               3        12.0    70     1631     1277     1460      11671739
11200000      11999999
Total number of pulses in waveform =  33
♀
Waveform Num =   26
Num of Bursts =   9
Burst Interval (us) =  1333333.0

Burst  Off Time   #        Chirp   PW     Pulse 1  Pulse 2  Pulse 3   Start Loc
Start Burst   End Burst
#      (us)       Pulses   (MHz)   (us)   Pri(us)  Pri(us)  Pri(us)   (us)
Interval(us)  Interval(us)
       258409
1                2        7.0     59     1277     1257     0         258409     0
          1333332
       1290620
2                1        12.0    64     1993     0        0         1551563
1333333       2666665
       2423427
3                2        15.0    71     1762     1639     0         3976983
2666666       3999998
       414803
```

Bin 5 pulses 5320

4 2 10.0 65 1210 1322 0 4395187
3999999 5333331
1996127
5 3 11.0 67 1882 1805 1626 6393846
5333332 6666664
340272
6 1 20.0 54 1052 0 0 6739431
6666665 7999997
2071574
7 1 19.0 57 1259 0 0 8812057
7999998 9333330
1536514
8 2 19.0 62 1003 1195 0 10349830
9333331 10666663
847704
9 2 9.0 71 1587 1309 0 11199732
10666664 11999996
Total number of pulses in waveform = 16

♀

Waveform Num = 27
Num of Bursts = 9
Burst Interval (us) = 1333333.0

Burst # Off Time (us) # Pulses Chirp (MHz) PW (us) Pulse 1 Pri(us) Pulse 2 Pri(us) Pulse 3 Pri(us) Start Loc (us) Start Burst # End Burst Interval(us) End Burst Interval(us)

1020799
1 2 19.0 70 1278 1364 0 1020799 0
1333332
1277995
2 1 9.0 93 1894 0 0 2301436
1333333 2666665
1645743
3 3 6.0 91 1798 1987 1090 3949073
2666666 3999998
245169
4 1 15.0 55 1896 0 0 4199117
3999999 5333331
1421841
5 1 16.0 68 1876 0 0 5622854
5333332 6666664
2040636
6 3 20.0 80 1306 1309 1332 7665366
6666665 7999997
436970
7 1 19.0 75 1947 0 0 8106283
7999998 9333330
1761104
8 2 13.0 90 1419 1538 0 9869334
9333331 10666663
1377441
9 2 7.0 69 1366 1862 0 11249732
10666664 11999996
Total number of pulses in waveform = 16

♀

Waveform Num = 28
Num of Bursts = 15
Burst Interval (us) = 800000.0

Burst # Off Time (us) # Pulses Chirp (MHz) PW (us) Pulse 1 Pri(us) Pulse 2 Pri(us) Pulse 3 Pri(us) Start Loc (us) Start Burst # End Burst

Bin 5 pulses 5320

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
1		2	15.0	97	1015	1647	0	396513	0	396513
	799999									
2	578225	3	17.0	98	1364	1437	1792	977400	800000	1371238
	1599999									
3	1600000	3	14.0	69	1918	1127	1385	2353231	2399999	336839
4	2400000	2	8.0	61	1292	1473	0	2694500	3199999	869655
5	3200000	1	11.0	56	1471	0	0	3566920	3999999	1003255
6	4000000	3	12.0	60	1248	1634	1072	4571646	4799999	977735
7	4800000	2	8.0	67	1603	1037	0	5553335	5599999	661358
8	5600000	1	14.0	92	1804	0	0	6217333	6399999	752457
9	6400000	2	14.0	90	1065	1393	0	6971594	7199999	867855
10	7200000	3	19.0	69	1926	1902	1651	7841907	7999999	379114
11	8000000	1	19.0	73	1114	0	0	8226500	8799999	889345
12	8800000	1	6.0	69	1836	0	0	9116959	9599999	913358
13	9600000	3	17.0	56	1781	1579	1209	10032153	10399999	580922
14	10400000	2	16.0	86	1730	1828	0	10617644	11199999	680444
15	11200000	1	20.0	62	1107	0	0	11301646	11999999	

Total number of pulses in waveform = 30

♀

Waveform Num = 29
Num of Bursts = 19
Burst Interval (us) = 631579.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
1		1	15.0	71	1804	0	0	387094	0	387094
	631578									
2	363904	1	11.0	71	1486	0	0	752802	631579	1263157
	867288									

Bin 5 pulses 5320

3	3	6.0	67	1280	1819	1171	1621576	1263158
1894736	365515							
4	2	10.0	87	1797	1996	0	1991361	1894737
2526315	817463							
5	2	9.0	56	1537	1146	0	2812617	2526316
3157894	668501							
6	1	15.0	57	1840	0	0	3483801	3157895
3789473	636230							
7	3	14.0	62	1497	1998	1682	4121871	3789474
4421052	477894							
8	1	13.0	57	1550	0	0	4604942	4421053
5052631	871201							
9	1	15.0	59	1144	0	0	5477693	5052632
5684210	718473							
10	2	13.0	87	1458	1853	0	6197310	5684211
6315789	389563							
11	3	5.0	97	1268	1448	1110	6590184	6315790
6947368	593268							
12	1	6.0	85	1029	0	0	7187278	6947369
7578947	473624							
13	1	13.0	75	1067	0	0	7661931	7578948
8210526	676026							
14	1	7.0	59	1314	0	0	8339024	8210527
8842105	693512							
15	2	18.0	92	1968	1328	0	9033850	8842106
9473684	668287							
16	1	18.0	76	1566	0	0	9705433	9473685
10105263	648516							
17	3	15.0	77	1021	1753	1100	10355515	10105264
10736842	838789							
18	2	20.0	77	1554	1928	0	11198178	10736843
11368421	754754							
19	3	8.0	76	1271	1282	1707	11956414	11368422
12000000								

Total number of pulses in waveform = 34

♀

Waveform Num = 30
Num of Bursts = 19
Burst Interval (us) = 631579.0

Burst #	Off Time (us)	# Pulses	Chirp (MHz)	PW (us)	Pulse 1 Pri(us)	Pulse 2 Pri(us)	Pulse 3 Pri(us)	Start Loc (us)	Start Burst Interval(us)	End Burst Interval(us)
1	513184	1	20.0	84	1590	0	0	513184	0	631578

Bin 5 pulses 5320

	557715								
2		2	5.0	75	1522	1939	0	1072489	
631579	1263157								
	729824								
3		2	16.0	65	1091	1348	0	1805774	
1263158	1894736								
	600047								
4		1	9.0	91	1903	0	0	2408260	
1894737	2526315								
	246102								
5		2	20.0	80	1851	1778	0	2656265	
2526316	3157894								
	934664								
6		2	8.0	68	1044	1697	0	3594558	
3157895	3789473								
	684442								
7		3	20.0	55	1569	1122	1403	4281741	
3789474	4421052								
	725473								
8		1	5.0	54	1500	0	0	5011308	
4421053	5052631								
	159190								
9		1	7.0	58	1564	0	0	5171998	
5052632	5684210								
	1040690								
10		2	8.0	81	1926	1536	0	6214252	
5684211	6315789								
	596330								
11		1	5.0	61	1152	0	0	6814044	
6315790	6947368								
	325097								
12		1	10.0	69	1376	0	0	7140293	
6947369	7578947								
	972285								
13		3	18.0	61	1790	1292	1577	8113954	
7578948	8210526								
	433363								
14		1	12.0	78	1393	0	0	8551976	
8210527	8842105								
	654262								
15		3	5.0	68	1247	1912	1445	9207631	
8842106	9473684								
	776830								
16		3	5.0	95	1111	1405	1355	9989065	
9473685	10105263								
	577782								
17		2	12.0	52	1232	1644	0	10570718	
10105264	10736842								
	731923								
18		1	10.0	53	1219	0	0	11305517	
10736843	11368421								
	676665								
19		1	16.0	85	1837	0	0	11983401	
11368422	12000000								

Total number of pulses in waveform = 33

♀