



FCC PART 15.407
IC RSS-210, ISSUE 8, DEC 2010
TEST AND MEASUREMENT REPORT

For

NVIDIA Corporation

2701 San Tomas Expressway,
Santa Clara, CA 95050, USA

FCC ID: VOB-NB099HA
IC: 7361A-NB099HA

Report Type: Original Report	Product Type: Wi-Fi and BT Combo Module
Test Engineers: Lionel Lara	
Report Number: R1111165-407	
Report Date: 2011-12-30	
Reviewed By: Victor Zhang RF/EMC Lead	
Prepared By: (84) Bay Area Compliance Laboratories Corp. 1274 Anvilwood Ave., Sunnyvale, CA 94089, USA Tel: (408) 732-9162 Fax: (408) 732-9164	

Note: This test report is prepared for the customer shown above and for the device described herein. It may not be duplicated or used in part without prior written consent from Bay Area Compliance Laboratories Corp. This report **must not** be used by the customer to claim product certification, approval, or endorsement by NVLAP*, NIST, or any agency of the Federal Government.

* This report may contain data that are not covered by the NVLAP accreditation and are marked with an asterisk "*" 8000

TABLE OF CONTENTS

1	GENERAL DESCRIPTION.....	6
1.1	PRODUCT DESCRIPTION FOR EQUIPMENT UNDER TEST (EUT)	6
1.2	MECHANICAL DESCRIPTION OF EUT	6
1.3	OBJECTIVE.....	6
1.4	RELATED SUBMITTAL(S)/GRANT(S)	6
1.5	TEST METHODOLOGY	6
1.6	MEASUREMENT UNCERTAINTY	6
1.7	TEST FACILITY	7
2	EUT TEST CONFIGURATION.....	8
2.1	JUSTIFICATION	8
2.2	EUT EXERCISE SOFTWARE.....	8
2.3	SPECIAL ACCESSORIES	8
2.4	EQUIPMENT MODIFICATIONS	8
2.5	LOCAL SUPPORT EQUIPMENT	8
2.6	POWER SUPPLY AND LINE FILTERS.....	8
2.7	INTERFACE PORTS AND CABLING	9
2.8	INTERNAL PARTS LIST AND DETAILS.....	9
3	SUMMARY OF TEST RESULTS.....	10
4	FCC §15.407(F), §2.1091 & IC RSS-102 - RF EXPOSURE	11
4.1	APPLICABLE STANDARD	11
4.2	MPE PREDICTION	12
4.3	MPE RESULTS	12
5	FCC §15.207 & IC RSS-GEN §7.2.2 - CONDUCTED EMISSIONS.....	13
5.1	APPLICABLE STANDARDS	13
5.2	TEST SETUP	13
5.3	TEST PROCEDURE	13
5.4	TEST SETUP BLOCK DIAGRAM.....	14
5.5	CORRECTED AMPLITUDE & MARGIN CALCULATION	14
5.6	TEST EQUIPMENT LIST AND DETAILS	15
5.7	TEST ENVIRONMENTAL CONDITIONS.....	15
5.8	SUMMARY OF TEST RESULTS.....	15
5.9	CONDUCTED EMISSIONS TEST PLOTS AND DATA	16
6	FCC §15.209 (A), §15.407(B) & IC RSS-210 §A9.2 – SPURIOUS RADIATED EMISSIONS.....	22
6.1	APPLICABLE STANDARD	22
6.2	EUT SETUP.....	23
6.3	TEST PROCEDURE	23
6.4	CORRECTED AMPLITUDE & MARGIN CALCULATION	24
6.5	TEST EQUIPMENT LIST AND DETAILS	24
6.6	TEST ENVIRONMENTAL CONDITIONS.....	24
6.7	SUMMARY OF TEST RESULTS.....	25
6.8	RADIATED EMISSIONS TEST RESULT DATA:.....	26
7	FCC §15.407(A) & IC RSS-210 §A9.2 – 26 DB AND 99% EMISSION BANDWIDTH.....	50
7.1	APPLICABLE STANDARD	50
7.2	MEASUREMENT PROCEDURE	50
7.3	TEST EQUIPMENT LIST AND DETAILS	50

7.4 TEST ENVIRONMENTAL CONDITIONS 50

7.5 TEST RESULTS 51

8 FCC §407(A) & IC RSS-210 §A9.2 - PEAK OUTPUT POWER 65

8.1 APPLICABLE STANDARD 65

8.2 TEST PROCEDURE 65

8.3 TEST EQUIPMENT LIST AND DETAILS 65

8.4 TEST ENVIRONMENTAL CONDITIONS 65

8.5 TEST RESULTS 66

9 FCC §15.407(B) & IC RSS-210 §A9.2 – OUT OF BAND EMISSIONS 67

9.1 APPLICABLE STANDARD 67

9.2 TEST PROCEDURE 67

9.3 TEST EQUIPMENT LIST AND DETAILS 67

9.4 TEST ENVIRONMENTAL CONDITIONS 67

9.5 TEST RESULTS 68

10 FCC §15.407(A) & IC RSS-210 §A9.2 - POWER SPECTRAL DENSITY 74

10.1 APPLICABLE STANDARD 74

10.2 TEST PROCEDURE 74

10.3 TEST EQUIPMENT LIST AND DETAILS 74

10.4 TEST ENVIRONMENTAL CONDITIONS 74

10.5 TEST RESULTS 75

11 FCC §15.407(A)(6) – PEAK EXCURSION RATIO 88

11.1 APPLICABLE STANDARD 88

11.2 TEST PROCEDURE 88

11.3 TEST EQUIPMENT LIST AND DETAILS 88

11.4 TEST ENVIRONMENTAL CONDITIONS 88

11.5 TEST RESULTS 89

12 IC RSS-210 §2.6 & RSS-GEN §6 - RECEIVER SPURIOUS RADIATED EMISSIONS 90

12.1 APPLICABLE STANDARD 90

12.2 EUT SETUP 91

12.3 TEST PROCEDURE 91

12.4 CORRECTED AMPLITUDE & MARGIN CALCULATION 91

12.5 TEST EQUIPMENT LISTS AND DETAILS 92

12.6 TEST ENVIRONMENTAL CONDITIONS 92

12.7 SUMMARY OF TEST RESULTS 92

13 FCC §15.407(B) & IC RSS-210 §A9.2 - SPURIOUS EMISSIONS AT ANTENNA TERMINALS 102

13.1 APPLICABLE STANDARD 102

13.2 MEASUREMENT PROCEDURE 102

13.3 TEST EQUIPMENT LIST AND DETAILS 102

13.4 TEST ENVIRONMENTAL CONDITIONS 102

13.5 TEST RESULTS 102

14 FCC §15.407(H) & IC RSS-210 §A9.3 - DYNAMIC FREQUENCY SELECTION (DFS) 121

14.1 DFS REQUIREMENT 121

14.2 DFS MEASUREMENT SYSTEM 124

14.3 SYSTEM BLOCK DIAGRAM 124

14.4 RADIATED METHOD 126

14.5 TEST PROCEDURE 126

14.6 SUMMARY 127

14.7 DESCRIPTION OF EUT 127

14.8 TEST EQUIPMENT LIST AND DETAILS 128

14.9 TEST ENVIRONMENTAL CONDITIONS 128

14.10 RADAR WAVEFORM CALIBRATION 129

14.11 CHANNEL MOVE TIME AND CHANNEL CLOSING TRANSMISSION TIME..... 137

15 EXHIBIT A - FCC & IC EQUIPMENT LABELING REQUIREMENTS..... 146

15.1 FCC ID LABEL REQUIREMENTS 146

15.2 IC LABEL REQUIREMENTS..... 146

15.3 FCC ID & IC LABEL CONTENTS AND LOCATION..... 147

16 EXHIBIT A - TEST SETUP PHOTOGRAPHS 148

16.1 RADIATED EMISSION FRONT VIEW 148

16.2 RADIATED EMISSION BELOW 1 GHZ REAR VIEW 148

16.3 RADIATED EMISSION ABOVE 1 GHZ REAR VIEW..... 149

16.4 AC LINE CONDUCTED EMISSION FRONT VIEW..... 149

16.5 AC LINE CONDUCTED EMISSION SIDE VIEW 150

16.6 DFS TEST SETUP VIEW 150

17 EXHIBIT B - EUT PHOTOGRAPHS..... 151

17.1 EUT- FRONT SIDE VIEW..... 151

17.2 EUT- BACK SIDE VIEW 151

17.3 EUT- FRONT SIDE VIEW (WITHOUT SHIELDING) 152

17.4 SUPPORTING SYSTEM VIEW 152

17.5 SUPPORTING SYSTEM POWER SUPPLY VIEW 153

17.6 ANTENNAS VIEW..... 153

DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	R1111165-407	Original Report	2011-12-30

1 General Description

1.1 Product Description for Equipment Under Test (EUT)

This test and measurement report was prepared on behalf of *NVIDIA Corporation* and their product, *model: NB099H, FCC ID: VOB-NB099HA, IC: 7361A-NB099HA* or the “EUT” as referred to this report. The EUT is Bluetooth and 802.11a/b/g/n Wi-Fi combo module.

1.2 Mechanical Description of EUT

The EUT measures approximately 30 mm (**L**) x 27 mm (**W**) x 3 mm (**H**) and weighs approximately 3.5 g.

The data gathered are from a typical production sample provided by the manufacturer with serial 112566 provide by the manufacture.

1.3 Objective

This report is prepared on behalf of *NVIDIA Corporation*, in accordance with Part 2, Subpart J, and Part 15, Subparts B, C and E of the Federal Communication Commissions rules and IC RSS-210 Issue 8, Dec 2010.

The objective is to determine compliance with FCC Part 15.407 and IC RSS-210 rules for Output Power, 26 dB Emission Bandwidth, Power Spectral Density, Conducted and Radiated Spurious Emissions and DFS.

1.4 Related Submittal(s)/Grant(s)

FCC Part 15.247, IC RSS-210 DTS, DSS submissions with FCC ID: VOB-NB099HA, IC: 7361-NB099HA.

1.5 Test Methodology

FCC Part 2, Part 15.407 and RSS-210, Issue 8, Dec 2010, ANSI C63.4-2003 American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

1.6 Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in the field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on CISPR16-4-2:2003, The Treatment of Uncertainty in EMC Measurements, the values ranging from ± 2.0 dB for Conducted Emissions tests and ± 4.0 dB for Radiated Emissions tests are the most accurate estimates pertaining to uncertainty of EMC measurements at BAACL Corp.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

1.7 Test Facility

The test site used by BACL Corp. to collect radiated and conducted emissions measurement data is located at its facility in Sunnyvale, California, USA.

The test site at BACL Corp. has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997, and Article 8 of the VCCI regulations on December 25, 1997. The test site also complies with the test methods and procedures set forth in CISPR 22:2005 + A1:2005 + A2:2006 §10.4 for measurements below 1 GHz and §10.6 for measurements above 1 GHz. The facility also complies with the test methods and procedures set forth in ANSI C63.4-2003 & TIA/EIA-603.

The Federal Communications Commission and Voluntary Control Council for Interference have the reports on file and they are listed under FCC registration number: 90464 and VCCI Registration No.: R-3729, C-4176, G-469, and T-1206. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL Corp. is a National Institute of Standards and Technology (NIST) accredited laboratory under the National Voluntary Laboratory Accredited Program (Lab Code 200167-0). The current scope of accreditations can be found at <http://ts.nist.gov/Standards/scopes/2001670.htm>

2 EUT Test Configuration

2.1 Justification

The EUT was configured for testing according to ANSI C63.4-2003.

The EUT was tested in a testing mode to represent worst-case results during the final qualification test.

The worst-case data rates are determined to be as follows for each mode based upon investigation by measuring the average power, peak power and PPSD across all data rates bandwidths, and modulations.

2.2 EUT Exercise Software

The software is provided by customer. The EUT exercise program used during radiated testing was designed to exercise the system components.

The EUT had been tested with the following data rate settings (worst case):

Radio Mode	Bandwidth (MHz)	Frequency/Data rate		
		Low CH (MHz/Mbps)	Mid CH (MHz/Mbps)	High CH (MHz)
802.11a	20	5180, 5260, 5500/6	5200, 5280, 5580/6	5240, 5320, 5700/6
802.11n HT20	20	5180, 5260, 5500/6.5	5200, 5280, 5580/6.5	5240, 5320, 5700/6.5

2.3 Special Accessories

N/A.

2.4 Equipment Modifications

No modifications were made to the EUT.

2.5 Local Support Equipment

Manufacturer	Description	Model No.	Serial No.
DELL	Laptop	Latitude D600	CX-0X2034-48643-3A6-8307
NVIDIA	Tablet PC Host	E1290	0412911036188

2.6 Power Supply and Line Filters

Manufacturer	Description	Model	Serial Number
FSP Group Inc.	AC/DC Adapter	FSP025-DGAA1	H1191003035

2.7 Interface Ports and Cabling

Cable Description	Length (m)	From	To
RF Cable	< 1	EUT	Spectrum Analyzer

2.8 Internal Parts List and Details

Manufacturers	Descriptions	Models	Serial Numbers
AzureWave	PCB Board	2099HV02	112566

3 Summary of Test Results

FCC & IC Rules	Description of Test	Results
FCC §15.407(f), §2.1091 IC RSS-102	RF Exposure	Compliant
FCC §15.207 IC RSS-Gen §7.2.2	Conducted Emissions	Compliant
FCC §15.209(a), §15.407(b) IC RSS-210 §A9.2	Spurious Radiated Emissions	Compliant
FCC §15.407(a) IC RSS-210 §A9.2	26 dB and 99% Emission Bandwidth	Compliant
FCC §407(a) IC RSS-210 §A9.2	Peak Output Power Measurement	Compliant
FCC §2.1051, §15.407(b) IC RSS-210 §A9.3	Band Edges	Compliant
FCC §15.407(a)(1), (a)(2) IC RSS-5210 §A9.2	Power Spectral Density	Compliant
IC RSS-210 §2.6 & RSS-Gen §6	Receiver Spurious Radiated Emissions	Compliant
FCC §15.407(h) IC RSS-210 §A9.3	DFS	Compliant
FCC §2.1051, §15.407(b) IC RSS-210 §A9.2	Spurious Emissions at Antenna Terminals	Compliant

4 FCC §15.407(f), §2.1091 & IC RSS-102 - RF Exposure

4.1 Applicable Standard

According to FCC §15.407(f) and §1.1307(b)(1), 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 level in excess of the Commission's guidelines.

Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (V/m)	Magnetic Field Strength (A/m)	Power Density (mW/cm ²)	Averaging Time (minutes)
Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	* (100)	30
1.34-30	824/f	2.19/f	* (180/f ²)	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	f/1500	30
1500-100,000	/	/	1.0	30

f = frequency in MHz

* = Plane-wave equivalent power density

Before equipment certification is granted, the procedure of IC RSS-102 must be followed concerning the exposure of humans to RF fields.

According to IC RSS-102 Issue 2 section 4.1, RF limits used for general public will be applied to the EUT.

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m ²)	Time Averaging (minutes)
0.003 - 1	280	2.19	-	6
1 - 10	280 / f	2.19 / f	-	6
10 - 30	28	2.19 / f	-	6
30 - 300	28	0.073	2*	6
300 - 1 500	1.585 f ^{0.5}	0.0042 f ^{0.5}	f / 150	6
1 500 - 15 000	61.4	0.163	10	6
15 000 - 150 000	61.4	0.163	10	616000 / f ^{1.2}
150 000- 300 000	0.158 f ^{0.5}	4.21 x 10 ⁻⁴ f ^{0.5}	6.67 x 10 ⁻⁵ f	616000 / f ^{1.2}

Note: f is frequency in MHz

* = Power density limit is applicable at frequencies greater than 100 MHz

4.2 MPE Prediction

Predication of MPE limit at a given distance, Equation from OET Bulletin 65, Edition 97-01

$$S = PG/4\pi R^2$$

Where: S = power density

P = power input to antenna

G = power gain of the antenna in the direction of interest relative to an isotropic radiator

R = distance to the center of radiation of the antenna

4.3 MPE Results

<u>Maximum peak output power at antenna input terminal (dBm):</u>	<u>11.68</u>
<u>Maximum peak output power at antenna input terminal (mW):</u>	<u>14.72</u>
<u>Prediction distance (cm):</u>	<u>20</u>
<u>Prediction frequency (MHz):</u>	<u>5260</u>
<u>Maximum Antenna Gain, typical (dBi):</u>	<u>5.5</u>
<u>Maximum Antenna Gain (numeric):</u>	<u>3.55</u>
<u>Power density of prediction frequency at 20.0 cm (mW/cm²):</u>	<u>0.01</u>
<u>Power density of prediction frequency at 20.0 cm (W/m²):</u>	<u>0.1</u>
<u>MPE limit for uncontrolled exposure at prediction frequency (mW/cm²):</u>	<u>1.0</u>
<u>MPE limit for uncontrolled exposure at prediction frequency (W/m²):</u>	<u>10</u>

The device is compliant with the requirement MPE limit for uncontrolled exposure.

5 FCC §15.207 & IC RSS-Gen §7.2.2 - Conducted Emissions

5.1 Applicable Standards

As per FCC §15.207 and IC RSS-Gen §7.2.2 Conducted limits:

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 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/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 of Emission (MHz)	Conducted Limit (dBuV)	
	Quasi-peak	Average
0.15-0.5	66 to 56 Note 1	56 to 46 Note 1
0.5-5	56	46
5-30	60	50

Note 1 Decreases with the logarithm of the frequency.

5.2 Test Setup

The measurement was performed at shield room, using the setup per ANSI C63.4-2003 measurement procedure. The specification used was FCC §15.207 and IC RSS-Gen §7.2.2 limits.

External I/O cables were draped along the edge of the test table and bundle when necessary.

The AC/DC power adapter of the EUT was connected with LISN-1 which provided 120 V / 60 Hz AC power.

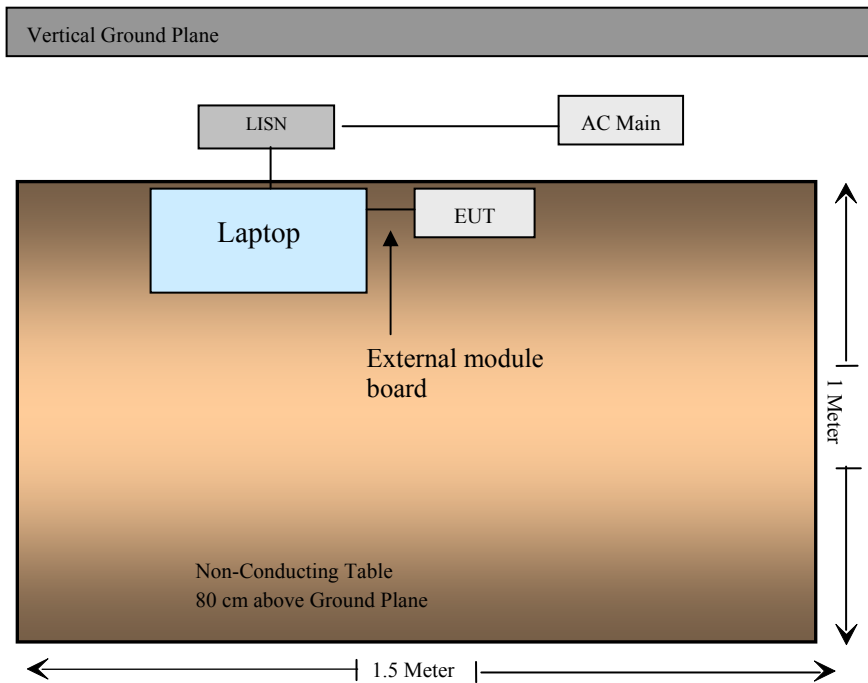
5.3 Test Procedure

During the conducted emissions test, the power cord of the EUT host system was connected to the mains outlet of the LISN-2.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All data was recorded in the peak detection mode, quasi-peak and average. Quasi-Peak readings are distinguished with a "QP." Average readings are distinguished with an "Ave".

5.4 Test Setup Block Diagram



5.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude (CA) is calculated by adding the Cable Loss (CL), the Attenuator Factor (Atten) to indicated Amplitude (Ai) reading. The basic equation is as follows:

$$CA = Ai + CL + Atten$$

For example, a corrected amplitude of 46.2 dBuV = Indicated Reading (32.5 dBuV) + Cable Loss (3.7 dB) + Attenuator (10 dB)

The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of -7 dB means the emission is 7 dB below the maximum limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corrected Amplitude} - \text{Limit}$$

5.6 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100044	2011-04-14
Solar Electronics	LISN	9252-R-24-BNC	511205	2011-06-25
TTE	Filter, High Pass	H9962-150K-50-21378	K7133	2011-06-10

Statement of Traceability: BACL Corp. attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

5.7 Test Environmental Conditions

Temperature:	21~24 °C
Relative Humidity:	38~45 %
ATM Pressure:	101.2-102 kPa

The testing was performed by Jerry Huang on 11-20-2011 to 11-21-2011 in 5 meter chamber 3.

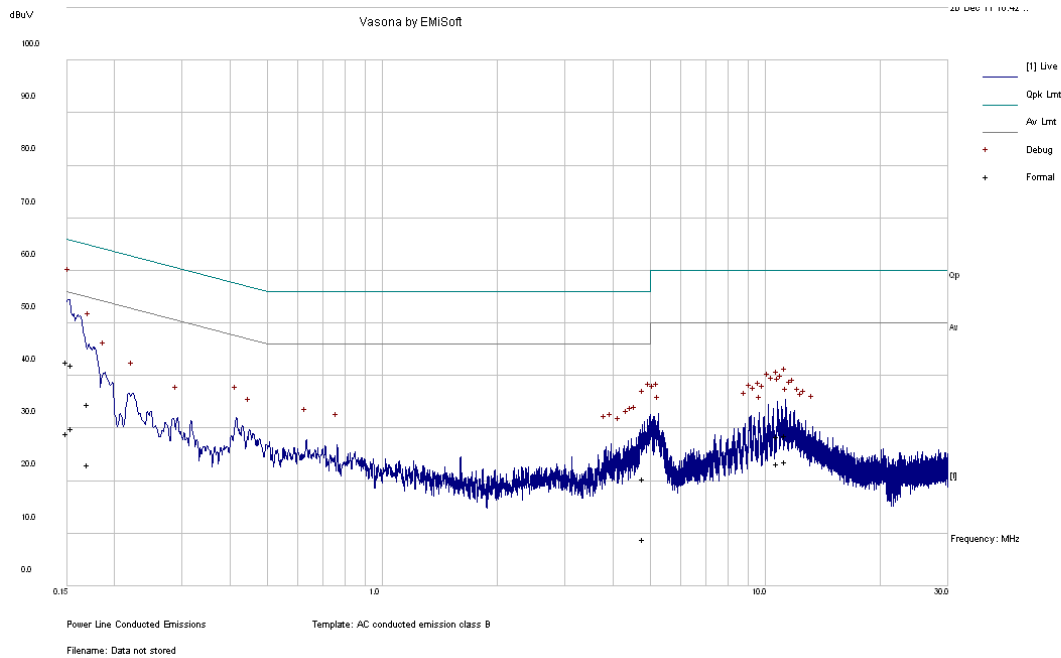
5.8 Summary of Test Results

According to the recorded data in following table, the EUT complied with the FCC/IC standard's conducted emissions limits, with the margin reading of:

Connection: 120 V/60 Hz, AC			
Margin (dB)	Frequency (MHz)	Conductor (Line/Neutral)	Range (MHz)
-14.85	0.151239	Neutral	0.15 to 30

5.9 Conducted Emissions Test Plots and Data

5.2 GHz - 120 V/60 Hz – Line



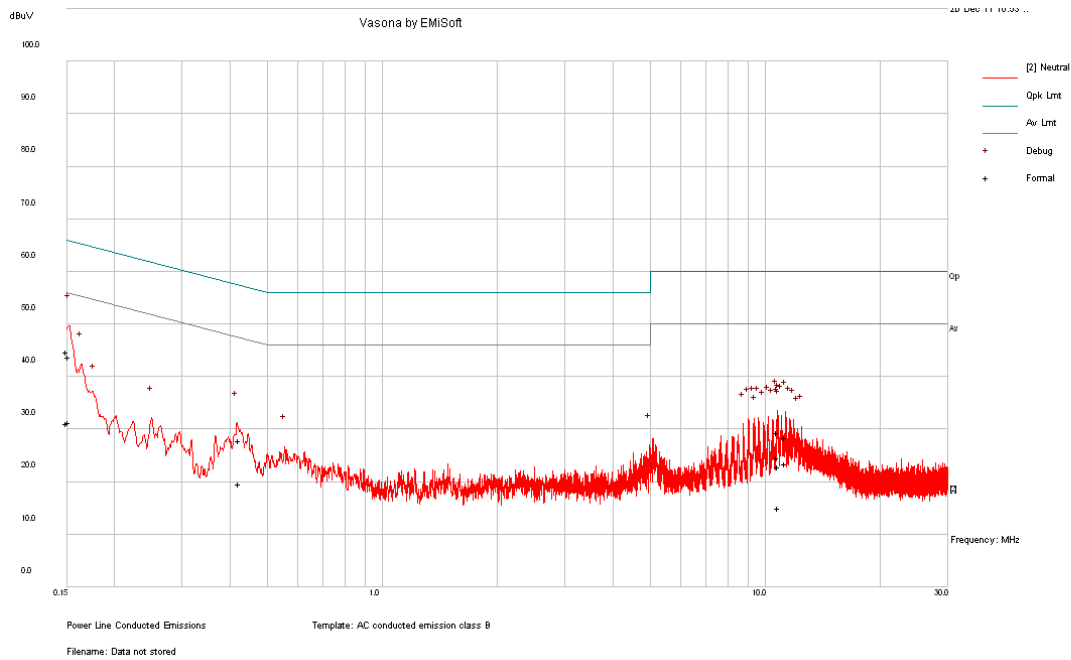
Quasi-Peak Measurements

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)
0.150066	42.7	Line	66	-23.3
0.154845	42	Line	65.74	-23.74
0.171225	34.5	Line	64.9	-30.41
11.29621	28.62	Line	60	-31.38
4.826165	20.33	Line	56	-35.67
10.75699	28.48	Line	60	-31.52

Average Measurements

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)
0.150066	29.12	Line	56	-26.87
0.154845	29.93	Line	55.74	-25.81
0.171225	23.01	Line	54.9	-31.89
11.29621	23.71	Line	50	-26.29
4.826165	8.96	Line	46	-37.04
10.75699	23.34	Line	50	-26.66

5.2 GHz - 120 V/60 Hz – Neutral



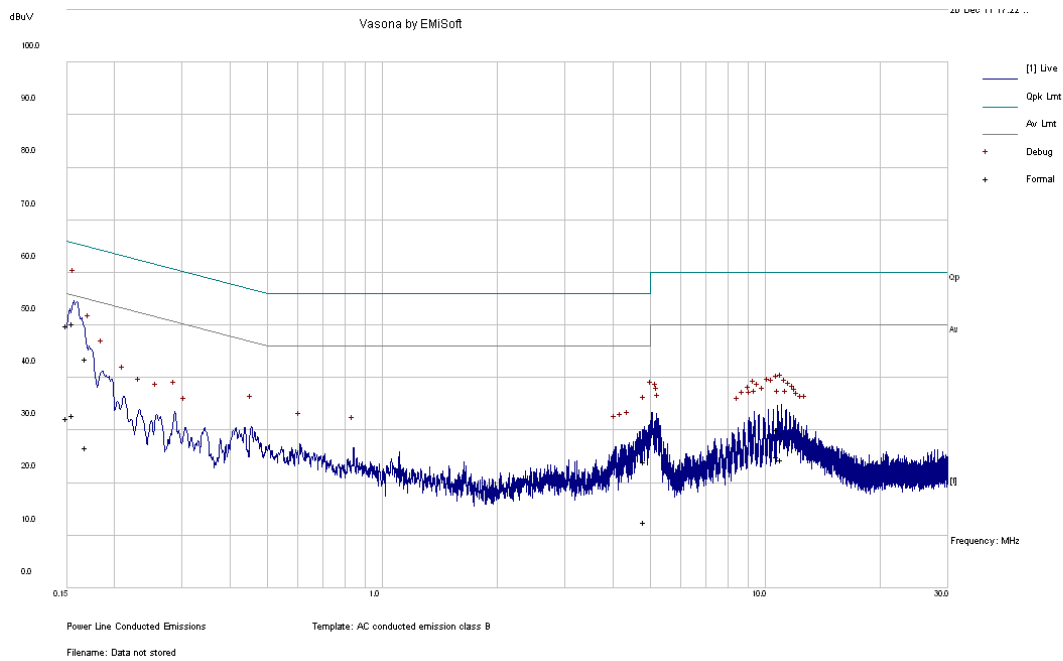
Quasi-Peak Measurements

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)
0.152208	43.8	Neutral	65.88	-22.08
0.150639	44.72	Neutral	65.96	-21.25
0.42339	27.92	Neutral	57.38	-29.46
10.7426	29.42	Neutral	60	-30.58
11.29363	28.41	Neutral	60	-31.59
10.82641	22.95	Neutral	60	-37.05

Average Measurements

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)
0.152208	31.29	Neutral	55.88	-24.59
0.150639	31.18	Neutral	55.96	-24.78
0.42339	19.73	Neutral	47.38	-27.65
10.7426	24.59	Neutral	50	-25.41
11.29363	23.39	Neutral	50	-26.61
10.82641	15.04	Neutral	50	-34.96

5.3 GHz - 120 V/60 Hz – Line



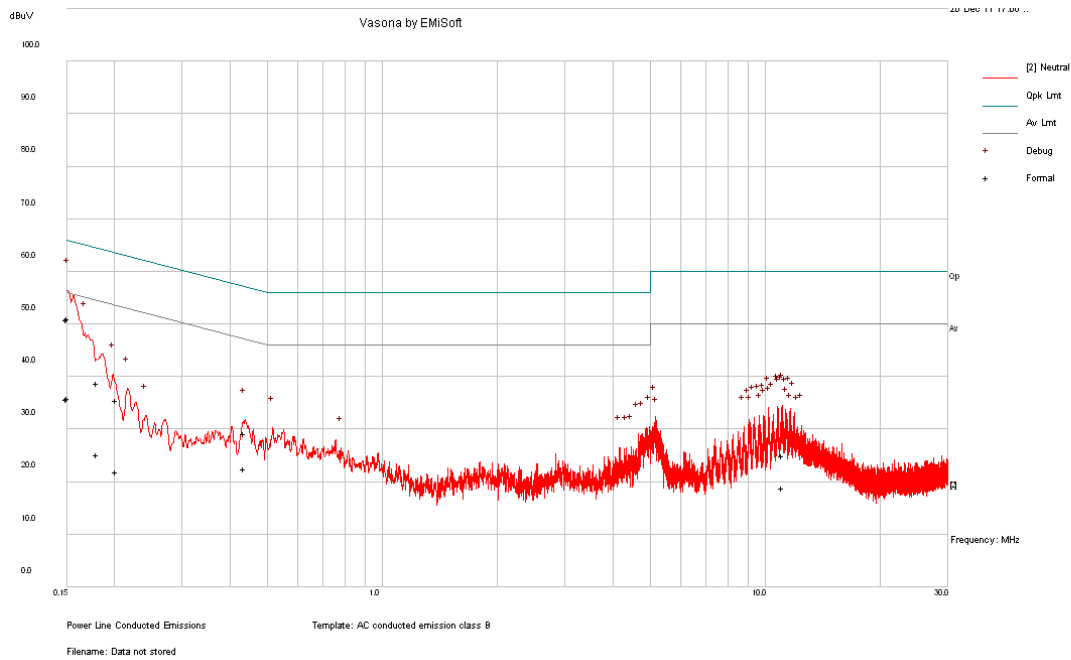
Quasi-Peak Measurements

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)
0.150627	49.85	Line	65.97	-16.12
0.155493	50.31	Line	65.7	-15.39
0.168387	43.51	Line	65.04	-21.53
11.02731	29.62	Line	60	-30.38
10.76042	30.12	Line	60	-29.88
4.848275	24.11	Line	56	-31.89

Average Measurements

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)
0.150627	32.33	Line	55.97	-23.63
0.155493	32.77	Line	55.7	-22.93
0.168387	26.69	Line	55.04	-28.35
11.02731	24.52	Line	50	-25.48
10.76042	25.02	Line	50	-24.98
4.848275	12.59	Line	46	-33.41

5.3 GHz - 120 V/60 Hz – Neutral



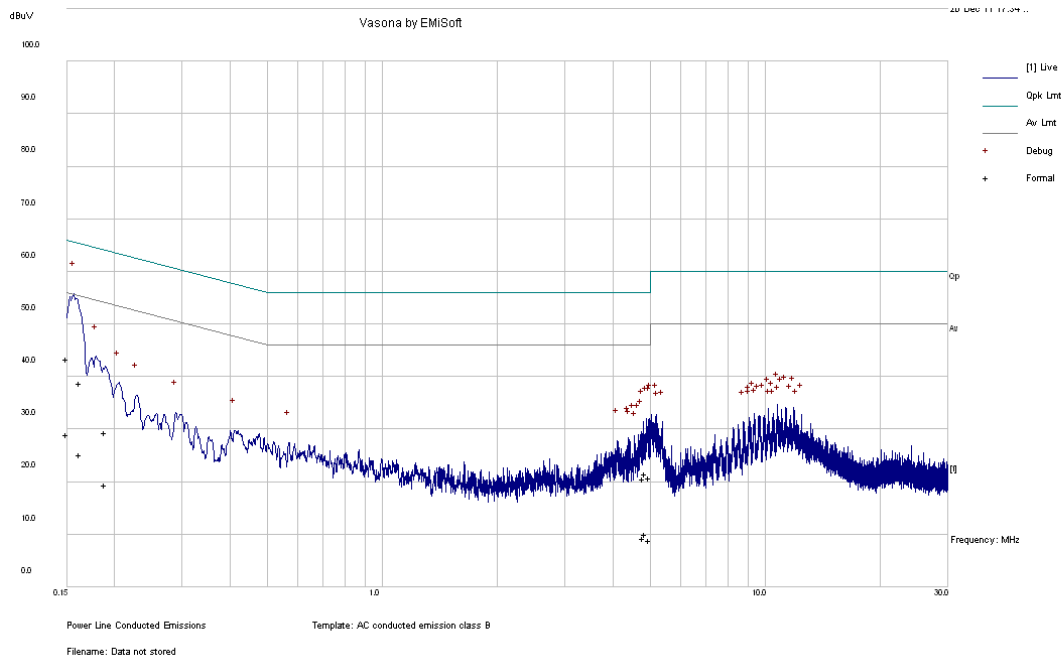
Quasi-Peak Measurements

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)
0.151239	51.09	Neutral	65.93	-14.85
0.150609	50.8	Neutral	65.97	-15.17
0.180642	38.74	Neutral	64.46	-25.71
0.201735	35.59	Neutral	63.54	-27.95
0.436284	29.23	Neutral	57.13	-27.9
11.10027	24.99	Neutral	60	-35.01

Average Measurements

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)
0.151239	35.98	Neutral	55.93	-19.96
0.150609	35.81	Neutral	55.97	-20.16
0.180642	25.1	Neutral	54.46	-29.35
0.201735	21.93	Neutral	53.54	-31.6
0.436284	22.44	Neutral	47.13	-24.69
11.10027	18.94	Neutral	50	-31.06

5.6 GHz - 120 V/60 Hz – Line



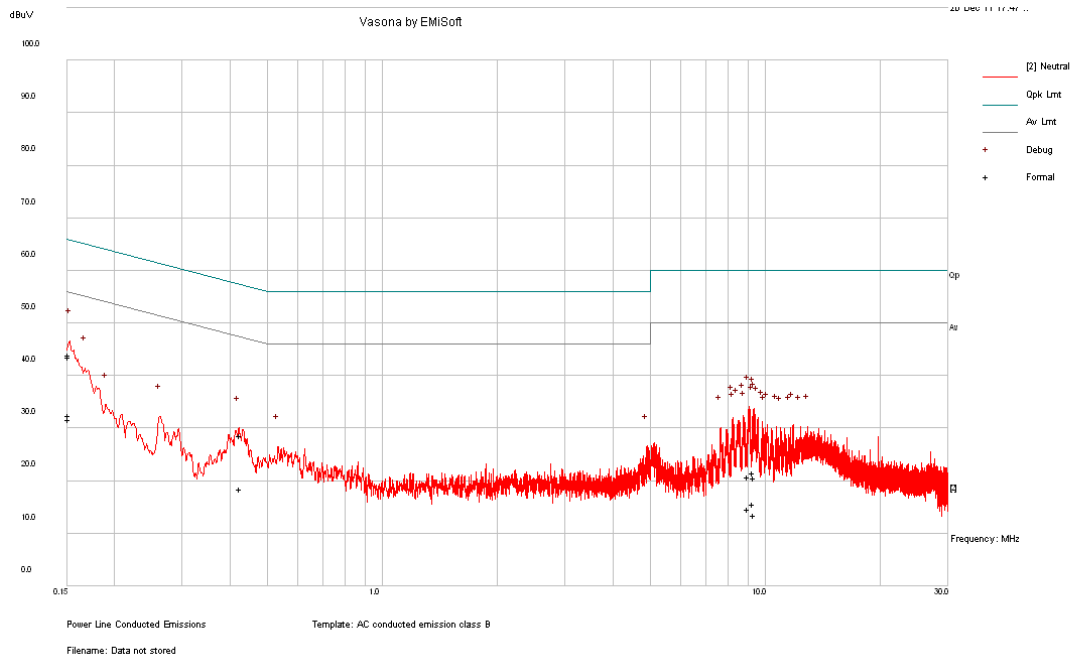
Quasi-Peak Measurements

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)
0.150753	43.31	Line	65.96	-22.64
0.162813	38.74	Line	65.32	-26.58
4.883702	21.56	Line	56	-34.44
4.999748	20.73	Line	56	-35.27
4.805672	20.69	Line	56	-35.31
0.189387	29.47	Line	64.06	-34.59

Average Measurements

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)
0.150753	29.01	Line	55.96	-26.94
0.162813	25.19	Line	55.32	-30.13
4.883702	10.07	Line	46	-35.93
4.999748	8.84	Line	46	-37.16
4.805672	9.27	Line	46	-36.73
0.189387	19.36	Line	54.06	-34.71

5.6 GHz - 120 V/60 Hz – Neutral



Quasi-Peak Measurements

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)
0.152367	43.91	Neutral	65.87	-21.96
0.151743	43.66	Neutral	65.9	-22.24
9.057773	20.84	Neutral	60	-39.16
9.334297	21.53	Neutral	60	-38.47
9.378328	20.6	Neutral	60	-39.4
0.426993	28.61	Neutral	57.31	-28.7

Average Measurements

Frequency (MHz)	Corrected Amplitude (dBµV)	Conductor (Line/Neutral)	Limit (dBµV)	Margin (dB)
0.152367	32.43	Neutral	55.87	-23.44
0.151743	31.76	Neutral	55.9	-24.14
9.057773	14.57	Neutral	50	-35.43
9.334297	15.67	Neutral	50	-34.33
9.378328	13.41	Neutral	50	-36.59
0.426993	18.4	Neutral	47.31	-28.91

6 FCC §15.209 (a), §15.407(b) & IC RSS-210 §A9.2 – Spurious Radiated Emissions

6.1 Applicable Standard

As per FCC §15.35(d): Unless otherwise specified, on any frequency or frequencies above 1000 MHz, the radiated emission limits are based on the use of measurement instrumentation employing an average detector function. Unless otherwise specified, measurements above 1000 MHz shall be performed using a minimum resolution bandwidth of 1 MHz.

As per FCC §15.209(a) and RSS-210: Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table

Frequency (MHz)	Field Strength (micro volts/meter)	Measurement Distance (meters)
0.009 - 0.490	2400/F(kHz)	300
0.490 - 1.705	24000/F(kHz)	30
1.705 - 30.0	30	30
30 - 88	100 Note 2	3
88 - 216	150 Note 2	3
216 - 960	200 Note 2	3
Above 960	500	3

Note 2: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

As Per FCC §15.205(a) except as show in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 – 0.110	16.42 – 16.423	960 – 1240	4.5 – 5.15
0.495 – 0.505	16.69475 – 16.69525	1300 – 1427	5.35 – 5.46
2.1735 – 2.1905	25.5 – 25.67	1435 – 1626.5	7.25 – 7.75
4.125 – 4.128	37.5 – 38.25	1645.5 – 1646.5	8.025 – 8.5
4.17725 – 4.17775	73 – 74.6	1660 – 1710	9.0 – 9.2
4.20725 – 4.20775	74.8 – 75.2	1718.8 – 1722.2	9.3 – 9.5
6.215 – 6.218	108 – 121.94	2200 – 2300	10.6 – 12.7
6.26775 – 6.26825	123 – 138	2310 – 2390	13.25 – 13.4
6.31175 – 6.31225	149.9 – 150.05	2483.5 – 2500	14.47 – 14.5
8.291 – 8.294	156.52475 – 156.52525	2690 – 2900	15.35 – 16.2
8.362 – 8.366	156.7 – 156.9	3260 – 3267	17.7 – 21.4
8.37625 – 8.38675	162.0125 – 167.17	3.332 – 3.339	22.01 – 23.12
8.41425 – 8.41475	167.72 – 173.2	3.3458 – 3.358	23.6 – 24.0
12.29 – 12.293	240 – 285	3.600 – 4.400	31.2 – 31.8
12.51975 – 12.52025	322 – 335.4		36.43 – 36.5
12.57675 – 12.57725	399.9 – 410		Above 38.6
13.36 – 13.41	608 – 614		

As per FCC Part 15.407 (b)(2), (3) and IC RSS-210

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

(3) For transmitters operating in the 5.47–5.725 GHz band: all emissions outside of the 5.47–5.725 GHz band shall not exceed an EIRP of -27 dBm/MHz.

6.2 EUT Setup

The radiated emissions tests were performed using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC 15E/IC RSS-210 limits.

The spacing between the peripherals was 10 centimeters.

External I/O cables were draped along the edge of the test table and bundle when necessary.

6.3 Test Procedure

For the radiated emissions test, the EUT host, and all support equipment power cords was connected to the AC floor outlet.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

The EUT is set 3 meter away from the testing antenna, which is varied from 1-4 meter, and the EUT is placed on a turntable, which is 0.8 meter above ground plane, the table shall be rotated for 360 degrees to find out the highest emission. The receiving antenna should be changed the polarization both of horizontal and vertical.

The spectrum analyzer or receiver is set as:

Below 1000 MHz:

RBW = 100 kHz / VBW = 300 kHz / Sweep = Auto

Above 1000 MHz:

- (1) Peak: RBW = 1MHz / VBW = 1MHz / Sweep = Auto
- (2) Average: RBW = 1MHz / VBW = 10Hz / Sweep = Auto

6.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude (CA) is calculated by adding the Antenna Factor (AF), the Cable Loss (CL), the Attenuator Factor (Atten) and subtracting the Amplifier Gain (Ga) to indicated Amplitude (Ai) reading. The basic equation is as follows:

$$CA = Ai + AF + CL + Atten - Ga$$

For example, a corrected amplitude of 40.3 dBuV/m = Indicated Reading (32.5 dBuV) + Antenna Factor (+23.5dB) + Cable Loss (3.7 dB) + Attenuator (10 dB) - Amplifier Gain (29.4 dB)

The “**Margin**” column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of -7 dB means the emission is 7 dB below the maximum limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corrected Amplitude} - \text{Limit}$$

6.5 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100338	2011-09-14
Agilent	Spectrum Analyzer	E4440A	MY44303352	2011-05-10
Sunol Science Corp	System Controller	SC99V	122303-1	N/R
Sunol Science Corp	Combination Antenna	JB3	A020106-2	2011-08-10
EMCO	Horn antenna	3115	9511-4627	2011-10-03
Hewlett Packard	Pre amplifier	8447D	2944A06639	2011-06-09
Mini-Circuits	Pre Amplifier	ZVA-183-S	667400960	2011-05-08

Statement of Traceability: BACL attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

6.6 Test Environmental Conditions

Temperature:	20-22 °C
Relative Humidity:	35-45%
ATM Pressure:	101-102kPa

The testing was performed by Jerry Huang from 2011-12-18 to 2011-12-20 at 5 meter chamber 3.

6.7 Summary of Test Results

According to the data hereinafter, the EUT complied with the FCC Part 15, Subpart C, section 15.205, 15.209 and 15.247 & IC RSS-210, RSS-Gen standard's radiated emissions limits, and had the worst margin of:

30-1000 MHz:

Mode: Transmitting			
Margin (dB)	Frequency (MHz)	Polarization (Horizontal/Vertical)	Channel, Range
-3.34	249.9545	Vertical	802.11a Worst, 30-1000 MHz

1 – 50 GHz:

Mode: Transmitting			
Margin (dB)	Frequency (MHz)	Polarization (Horizontal/Vertical)	Channel, Range
- ¹	-	-	-

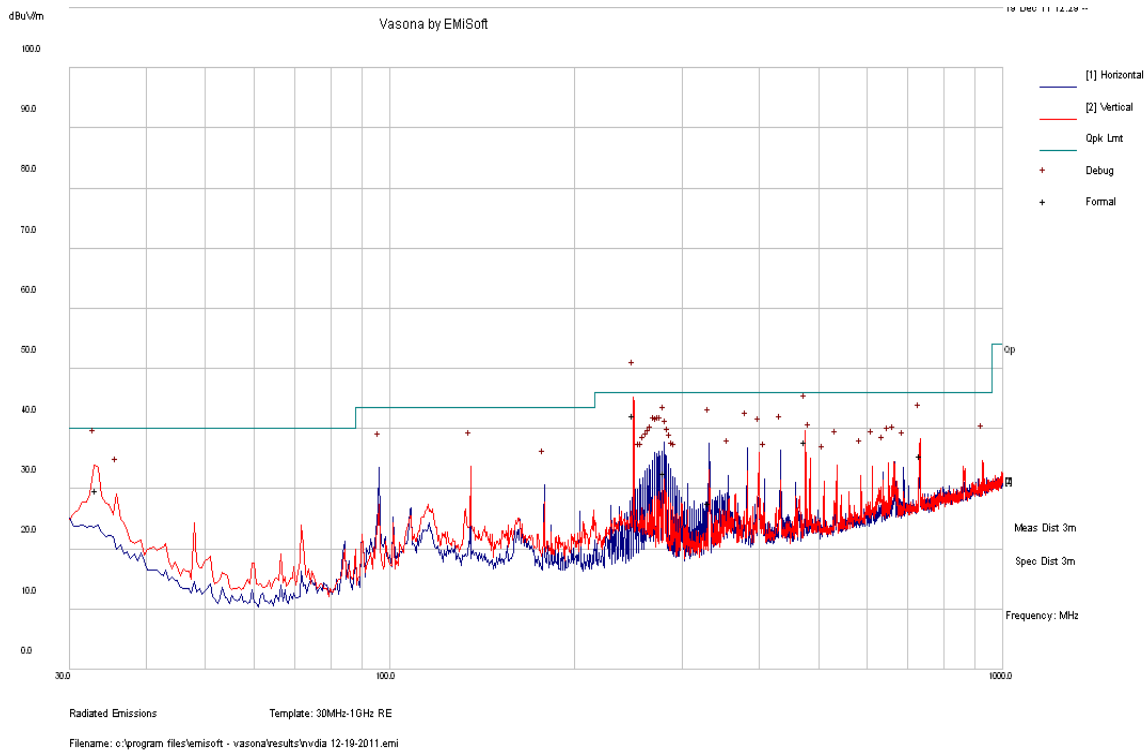
- **Note:** ¹All spurious emissions are 20 dB below the limit or are on the noise floor level

Please refer to the following table and plots for specific test result details

6.8 Radiated Emissions Test Result Data:

1) 30 MHz – 1 GHz, Measured at 3 meters

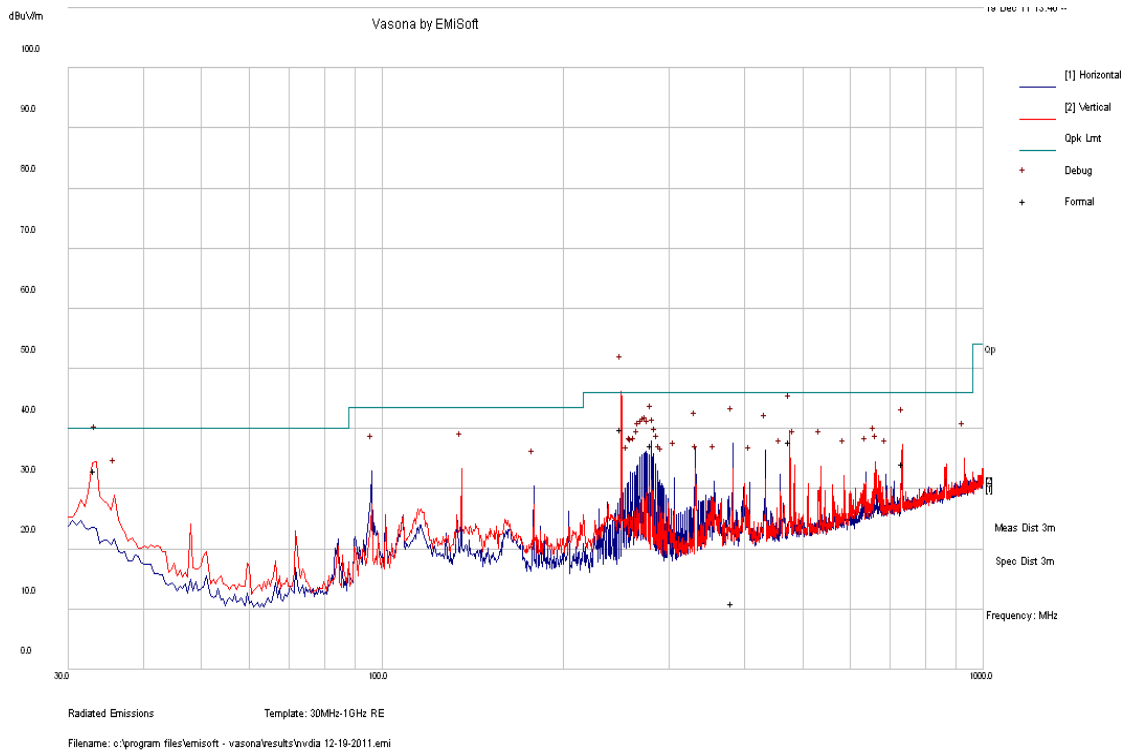
5.2 GHz, 802.11a Mode, Worst channel



Quasi-Peak Measurements

Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBμV/m)	Margin (dB)
249.955	42.23	100	V	179	46	-3.77
476.025	37.86	114	V	193	46	-8.14
33.146	29.79	101	V	327	40	-10.21
732.7925	35.58	100	V	144	46	-10.42
280.1575	32.72	100	H	258	46	-13.28
331.4533	27.76	122	H	169	46	-18.24

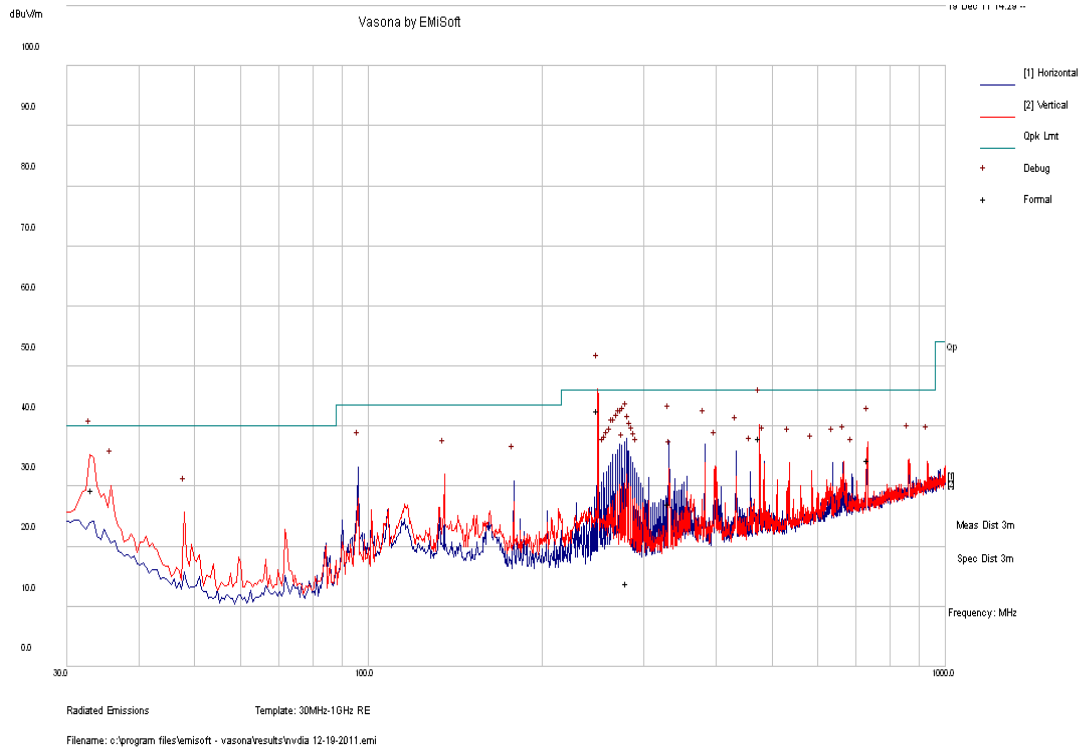
5.2 GHz, 802.11n Mode, Worst channel



Quasi-Peak Measurements

Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBμV/m)	Margin (dB)
249.955	39.94	100	V	168	46	-6.06
33.2595	33.12	136	V	155	40	-6.88
475.9868	37.93	99	V	197	46	-8.07
280.4903	37.32	109	H	360	46	-8.68
733.022	34.27	100	V	141	46	-11.73
382.3793	10.94	156	H	25	46	-35.06

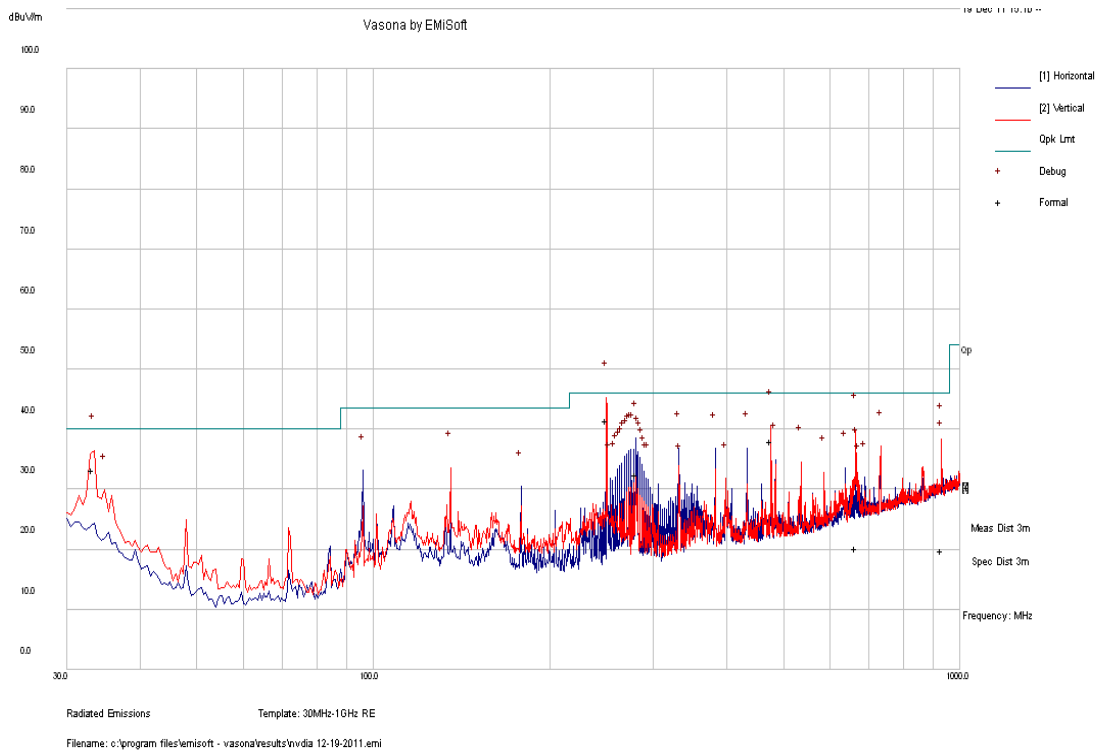
5.3 GHz, 802.11a Mode, Worst channel



Quasi-Peak Measurements

Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
249.9545	42.66	100	V	174	46	-3.34
475.9858	38.03	104	V	178	46	-7.97
33.15525	29.51	155	V	235	40	-10.49
733.0175	34.42	100	V	141	46	-11.58
331.4525	27.08	118	H	169	46	-18.92
280.4723	13.98	132	H	7	46	-32.02

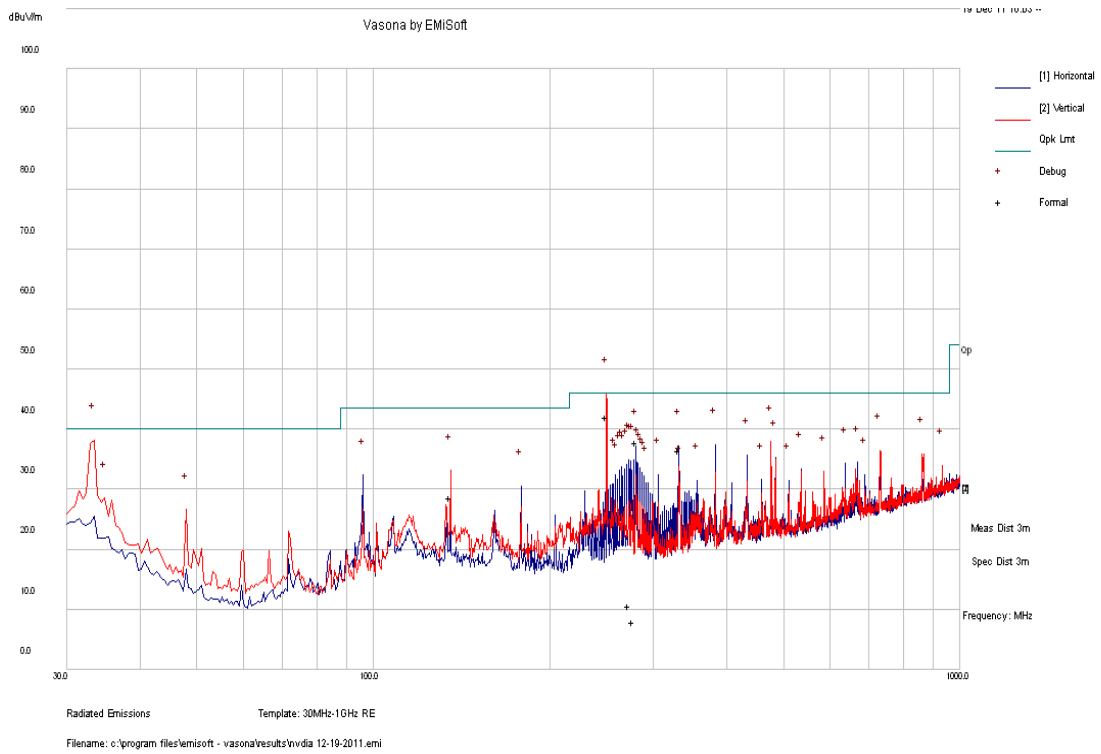
5.3 GHz, 802.11n Mode, Worst channel



Quasi-Peak Measurements

Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
249.955	41.5	100	V	175	46	-4.5
33.27375	33.27	127	V	158	40	-6.73
476.0218	38.02	100	V	191	46	-7.98
280.0988	32.46	102	H	252	46	-13.54
664.202	20.29	218	V	180	46	-25.71
928.8875	19.82	268	V	272	46	-26.18

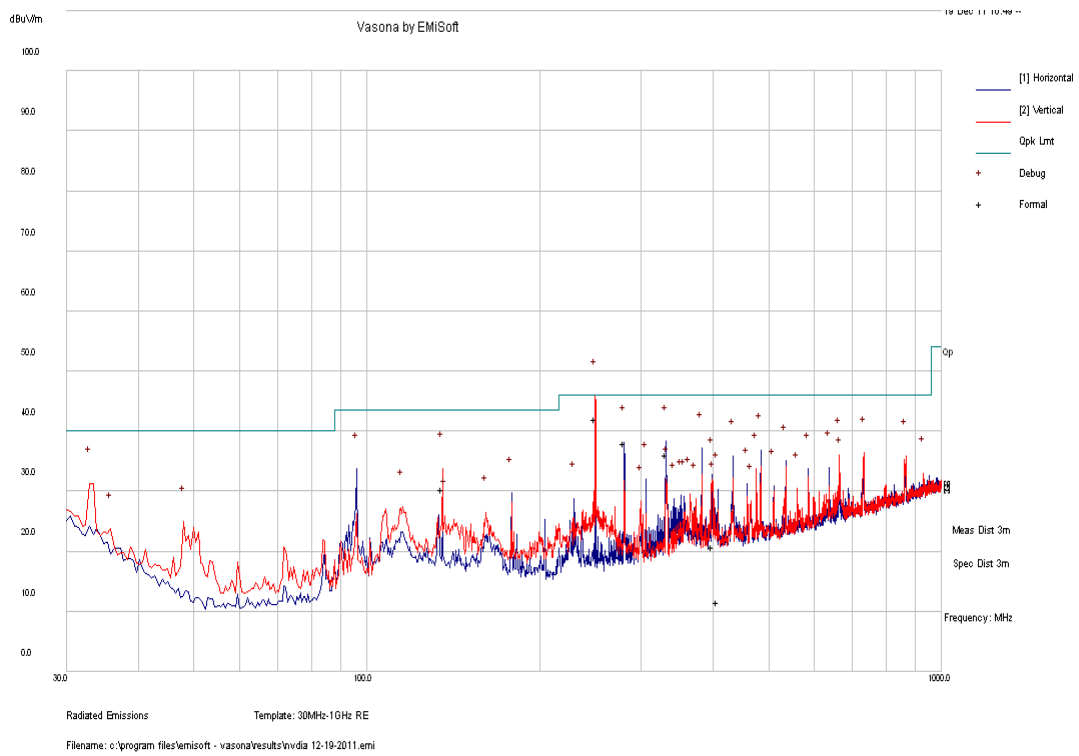
5.6 GHz, 802.11a Mode, Worst channel



Quasi-Peak Measurements

Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBμV/m)	Margin (dB)
249.9545	42.09	100	V	178	46	-3.91
280.4943	37.84	100	H	153	46	-8.16
331.475	36.5	100	H	141	46	-9.5
135.3458	28.68	170	V	284	43.5	-14.82
272.5365	10.69	126	H	149	46	-35.31
277.1535	7.87	121	H	252	46	-38.13

5.6 GHz, 802.11n Mode, Worst channel



Quasi-Peak Measurements

Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
249.9545	42.1	100	V	179	46	-3.9
280.4903	38.12	100	H	144	46	-7.88
331.5055	36.04	100	H	121	46	-9.96
135.3243	30.36	104	V	280	43.5	-13.14
399.0903	20.78	132	H	253	46	-25.22
407.885	11.66	302	H	18	46	-34.34

2) 1-50 GHz, Measured at 3 meters

5.2 GHz 802.11a mode:

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5180 MHz, measured at 3 meters											
5180	61.62	232	100	V	33.323	4.56	0	99.503	Fund	-	peak
5180	58.91	197	100	H	33.323	4.56	0	96.793	Fund	-	peak
5180	49.94	232	100	V	33.323	4.56	0	87.823	Fund	-	Ave
5180	47.01	197	100	H	33.323	4.56	0	84.893	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Middle Channel 5200 MHz, measured at 3 meters											
5200	58.67	230	100	V	33.545	4.55	0	96.765	Fund	-	peak
5200	57.43	200	100	H	33.545	4.55	0	95.525	Fund	-	peak
5200	47.19	230	100	V	33.545	4.55	0	85.285	Fund	-	Ave
5200	45.59	200	100	H	33.545	4.55	0	83.685	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
High Channel 5240 MHz, measured at 3 meters											
5240	57.23	233	100	V	33.545	4.6	0	95.375	Fund	-	peak
5240	57.31	200	100	H	33.545	4.6	0	95.455	Fund	-	peak
5240	46.05	233	100	V	33.545	4.6	0	84.195	Fund	-	Ave
5240	45.45	200	100	H	33.545	4.6	0	83.595	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

- **Note:** ¹All spurious emissions are 20 dB below the limit or are on the noise floor level

5.2 GHz 802.11n HT20 mode:

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5180 MHz, measured at 3 meters											
5180	59.04	230	100	V	33.323	4.56	0	96.923	Fund	-	peak
5180	56.27	200	100	H	33.323	4.56	0	94.153	Fund	-	peak
5180	47.65	230	100	V	33.323	4.56	0	85.533	Fund	-	Ave
5180	45.94	200	100	H	33.323	4.56	0	83.823	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Middle Channel 5200 MHz, measured at 3 meters											
5200	57.86	231	100	V	33.545	4.55	0	95.955	Fund	-	peak
5200	55.38	200	100	H	33.545	4.55	0	93.475	Fund	-	peak
5200	47.1	231	100	V	33.545	4.55	0	85.195	Fund	-	Ave
5200	45.09	200	100	H	33.545	4.55	0	83.185	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
High Channel 5240 MHz, measured at 3 meters											
5240	56.62	233	100	V	33.545	4.6	0	94.765	Fund	-	peak
5240	55.89	198	100	H	33.545	4.6	0	94.035	Fund	-	peak
5240	45.52	233	100	V	33.545	4.6	0	83.665	Fund	-	Ave
5240	44.8	198	100	H	33.545	4.6	0	82.945	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

- **Note:** ¹All spurious emissions are 20 dB below the limit or are on the noise floor level

5.3 GHz 802.11a mode:

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5260 MHz, measured at 3 meters											
5260	57.95	238	107	V	33.545	4.6	0	96.095	Fund	-	peak
5260	57.86	200	100	H	33.545	4.6	0	96.005	Fund	-	peak
5260	46.32	238	107	V	33.545	4.6	0	84.465	Fund	-	Ave
5260	45.66	200	100	H	33.545	4.6	0	83.805	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Middle Channel 5280 MHz, measured at 3 meters											
5280	56.75	238	100	V	33.659	4.6	0	95.009	Fund	-	peak
5280	58.58	200	100	H	33.659	4.6	0	96.839	Fund	-	peak
5280	47.8	238	100	V	33.659	4.6	0	86.059	Fund	-	Ave
5280	47.7	200	100	H	33.659	4.6	0	85.959	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
High Channel 5320 MHz, measured at 3 meters											
5320	59.34	241	102	V	33.659	4.7	0	97.699	Fund	-	peak
5320	60.62	200	100	H	33.659	4.7	0	98.979	Fund	-	peak
5320	48.28	241	102	V	33.659	4.7	0	86.639	Fund	-	Ave
5320	47.95	200	100	H	33.659	4.7	0	86.309	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

- **Note:** ¹All spurious emissions are 20 dB below the limit or are on the noise floor level

5.3 GHz 802.11n HT20 mode:

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5260 MHz, measured at 3 meters											
5260	56.51	234	100	V	33.545	4.6	0	94.655	Fund	-	peak
5260	57.14	200	100	H	33.545	4.6	0	95.285	Fund	-	peak
5260	45.72	234	100	V	33.545	4.6	0	83.865	Fund	-	Ave
5260	46.28	200	100	H	33.545	4.6	0	84.425	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Middle Channel 5280 MHz, measured at 3 meters											
5280	59.36	242	100	V	33.659	4.6	0	97.619	Fund	-	peak
5280	60.68	200	102	H	33.659	4.6	0	98.939	Fund	-	peak
5280	47.04	242	100	V	33.659	4.6	0	85.299	Fund	-	Ave
5280	47.96	200	102	H	33.659	4.6	0	86.219	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
High Channel 5320 MHz, measured at 3 meters											
5320	57.26	241	100	V	33.659	4.7	0	95.619	Fund	-	peak
5320	58.05	200	100	H	33.659	4.7	0	96.409	Fund	-	peak
5320	46.7	241	100	V	33.659	4.7	0	85.059	Fund	-	Ave
5320	46.7	200	100	H	33.659	4.7	0	85.059	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

- **Note:** ¹All spurious emissions are 20 dB below the limit or are on the noise floor level

5.6 GHz 802.11a mode:

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5500 MHz, measured at 3 meters											
5500	64.28	230	100	V	33.081	4.57	0	101.931	Fund	-	peak
5500	65.45	220	100	H	33.081	4.57	0	103.101	Fund	-	peak
5500	51.46	230	100	V	33.081	4.57	0	89.111	Fund	-	Ave
5500	53.16	220	100	H	33.081	4.57	0	90.811	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Middle Channel 5580 MHz, measured at 3 meters											
5580	60.37	248	100	V	33.931	4.84	0	99.141	Fund	-	peak
5580	61.09	230	100	H	33.931	4.84	0	99.861	Fund	-	peak
5580	47.69	248	100	V	33.931	4.84	0	86.461	Fund	-	Ave
5580	48.85	230	100	H	33.931	4.84	0	87.621	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
High Channel 5700 MHz, measured at 3 meters											
5700	60.29	263	112	V	33.699	4.85	0	98.839	Fund	-	peak
5700	60.02	131	110	H	33.699	4.85	0	98.569	Fund	-	peak
5700	48.02	263	112	V	33.699	4.85	0	86.569	Fund	-	Ave
5700	48.26	131	110	H	33.699	4.85	0	86.809	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

- **Note:** ¹All spurious emissions are 20 dB below the limit or are on the noise floor level

5.6 GHz 802.11n HT20 mode:

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5500 MHz, measured at 3 meters											
5500	62.18	241	100	V	33.081	4.57	0	99.831	Fund	-	peak
5500	62.73	224	100	H	33.081	4.57	0	100.381	Fund	-	peak
5500	50.82	241	100	V	33.081	4.57	0	88.471	Fund	-	Ave
5500	52.05	224	100	H	33.081	4.57	0	89.701	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Middle Channel 5580 MHz, measured at 3 meters											
5580	57.55	250	100	V	33.931	4.84	0	96.321	Fund	-	peak
5580	58.09	215	100	H	33.931	4.84	0	96.861	Fund	-	peak
5580	46.35	250	100	V	33.931	4.84	0	85.121	Fund	-	Ave
5580	47.21	215	100	H	33.931	4.84	0	85.981	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

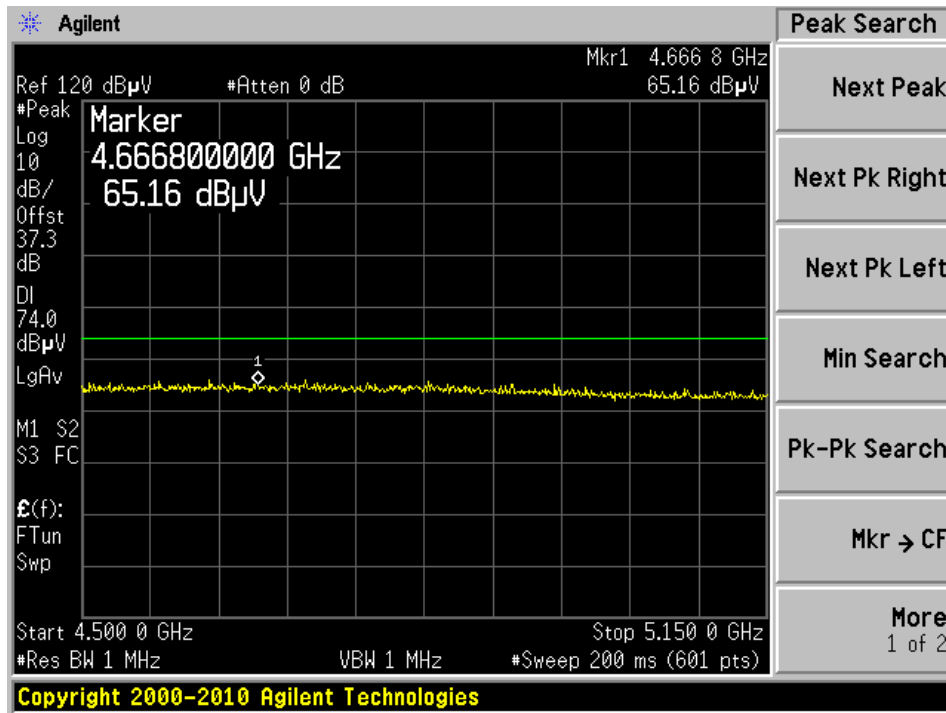
Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
High Channel 5700 MHz, measured at 3 meters											
5700	58.51	265	100	V	33.699	4.85	0	97.059	Fund	-	peak
5700	57.9	132	100	H	33.699	4.85	0	96.449	Fund	-	peak
5700	47	265	100	V	33.699	4.85	0	85.549	Fund	-	Ave
5700	46.77	132	100	H	33.699	4.85	0	85.319	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

- **Note:** ¹All spurious emissions are 20 dB below the limit or are on the noise floor level

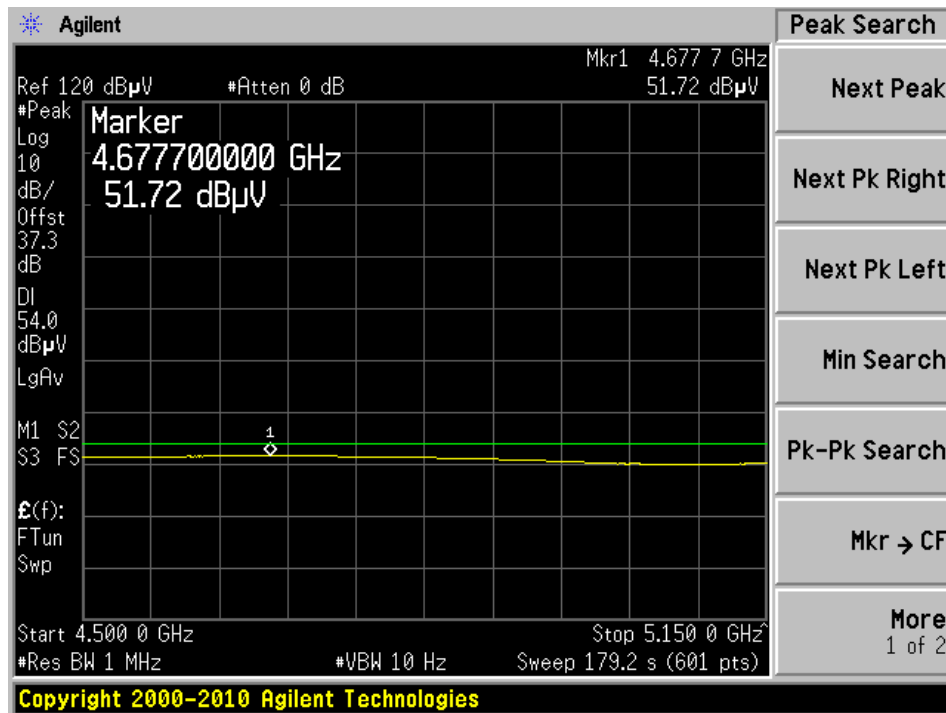
3) Restricted Band Emissions

5.2 GHz 802.11a mode:

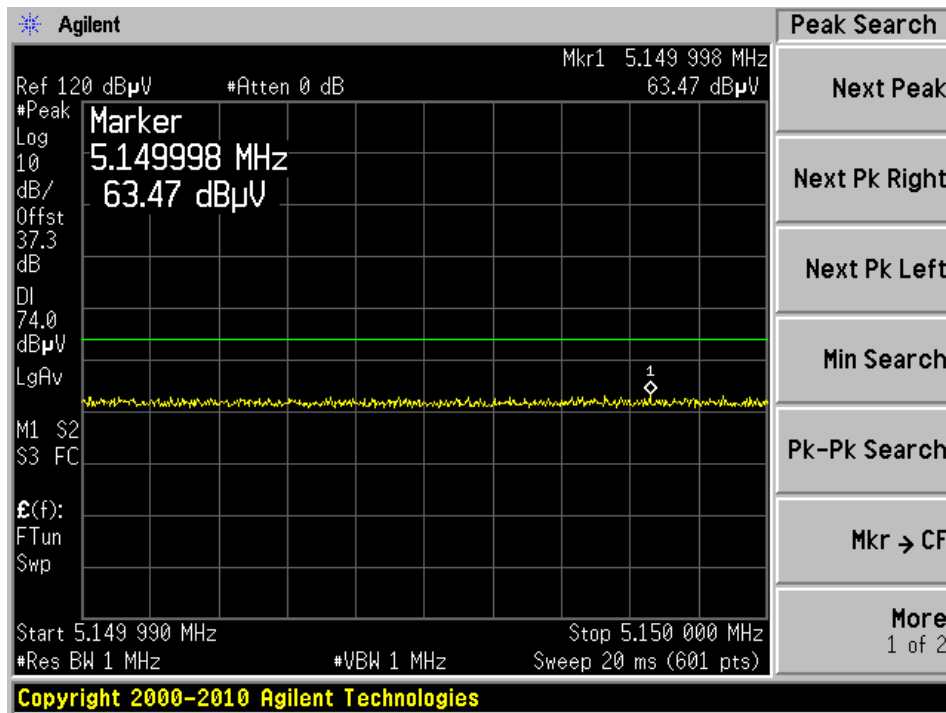
Low Channel-Peak (Horizontal)



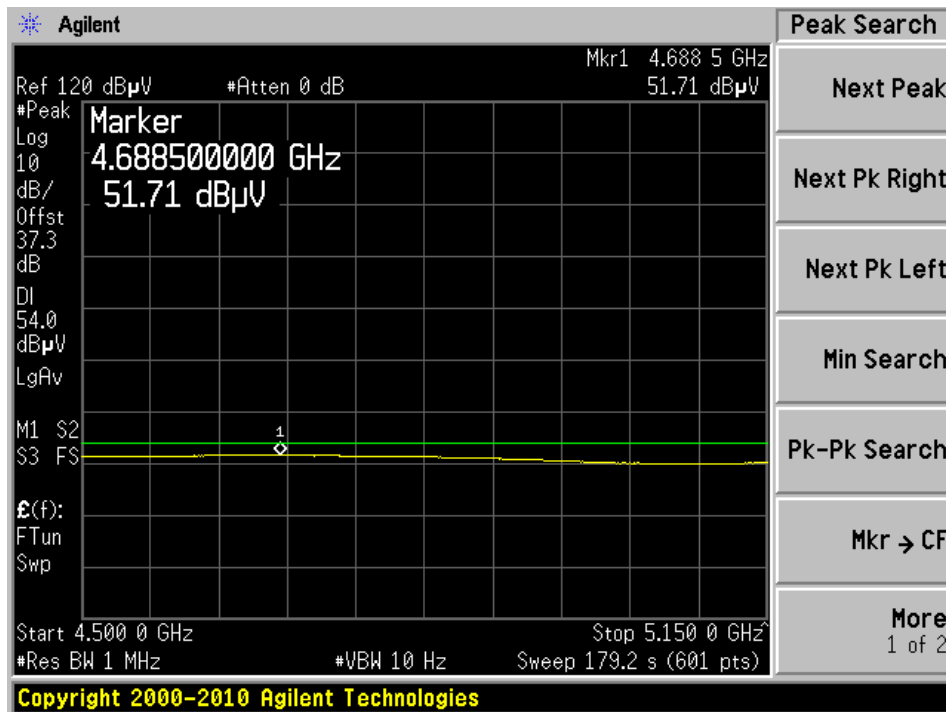
Low Channel-Average (Horizontal)



Low Channel-Peak (Vertical)

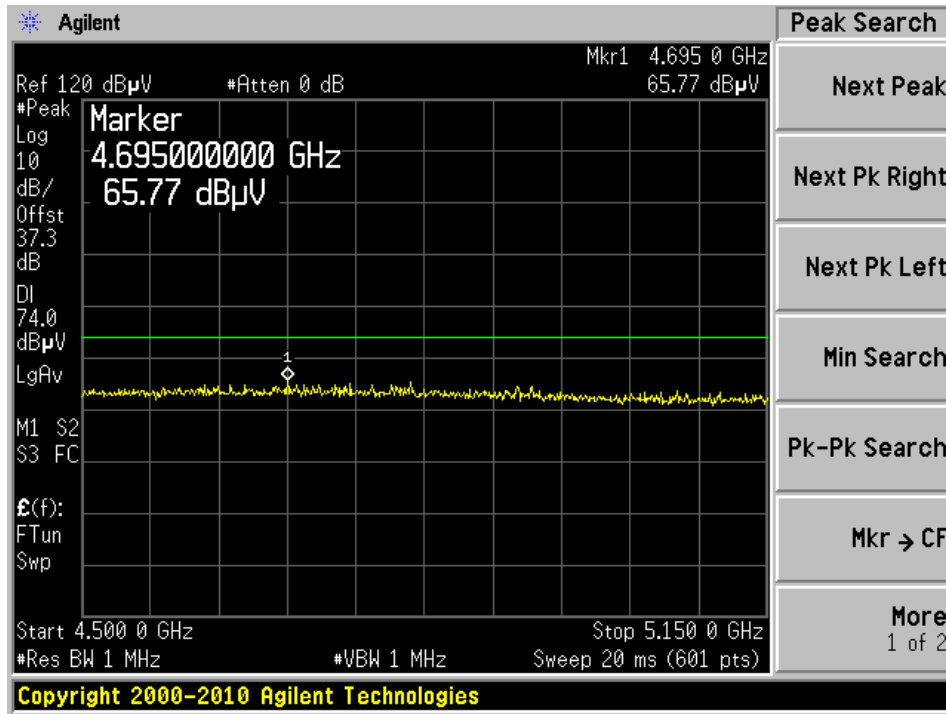


Low Channel-Average (Vertical)

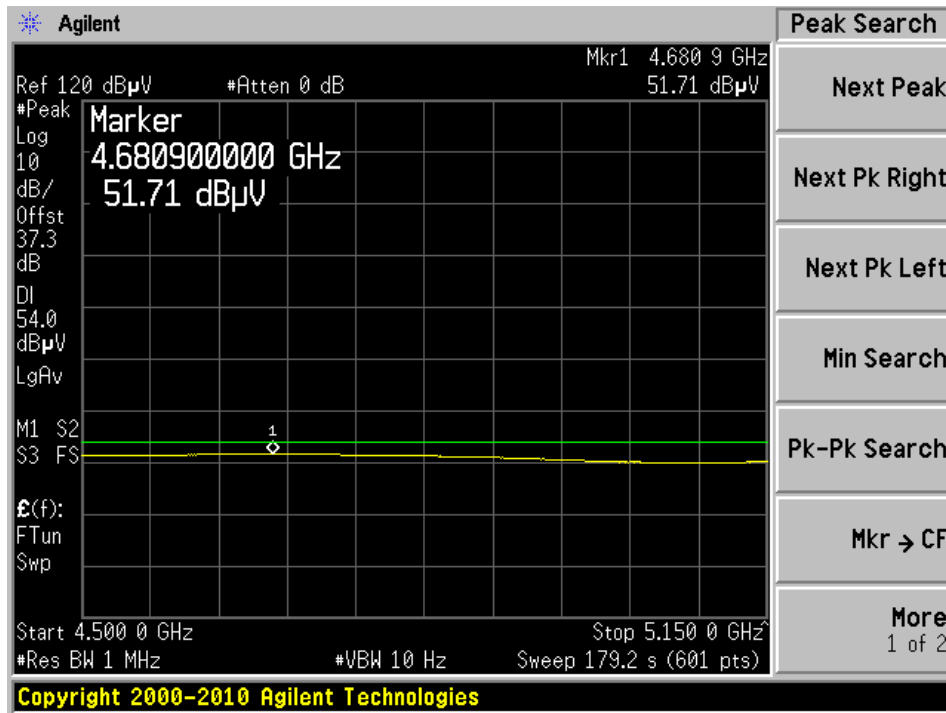


5.2 GHz 802.11n mode:

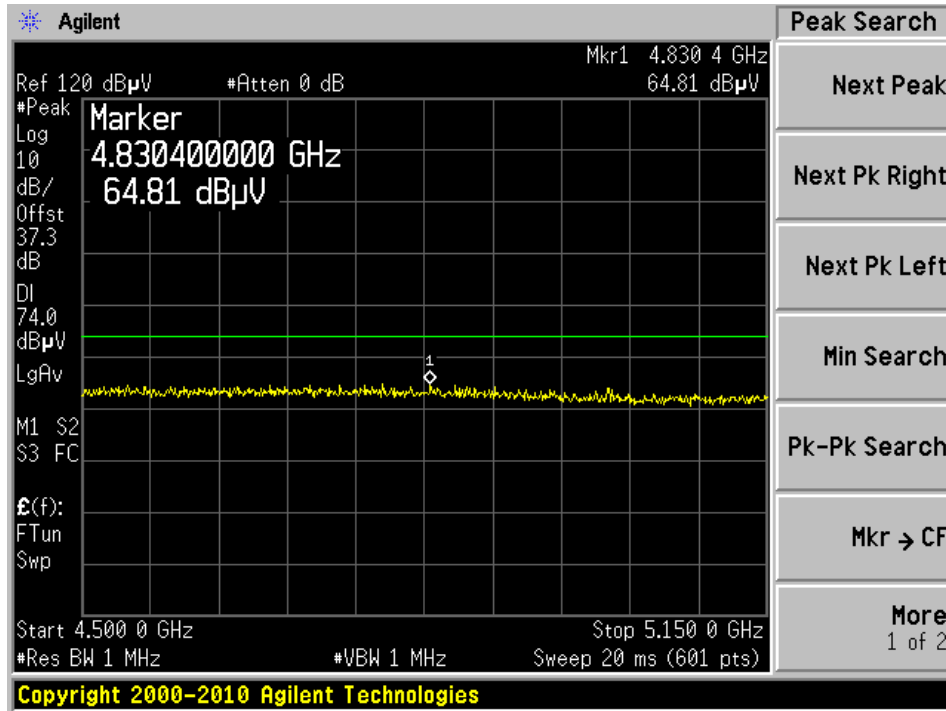
Low Channel-Peak (Horizontal)



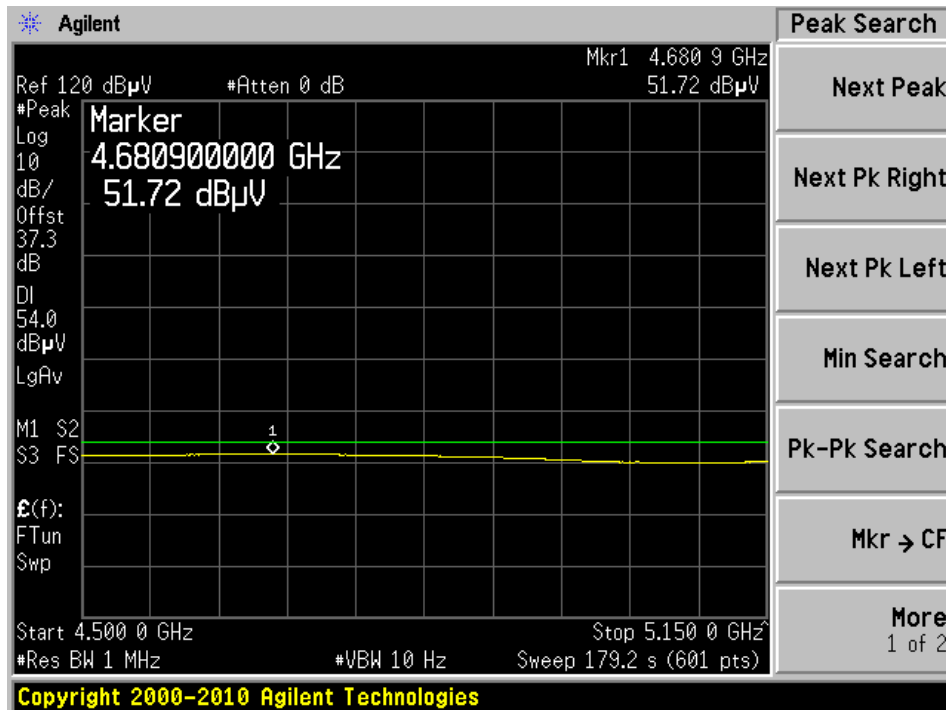
Low Channel-Average (Horizontal)



Low Channel-Peak (Vertical)

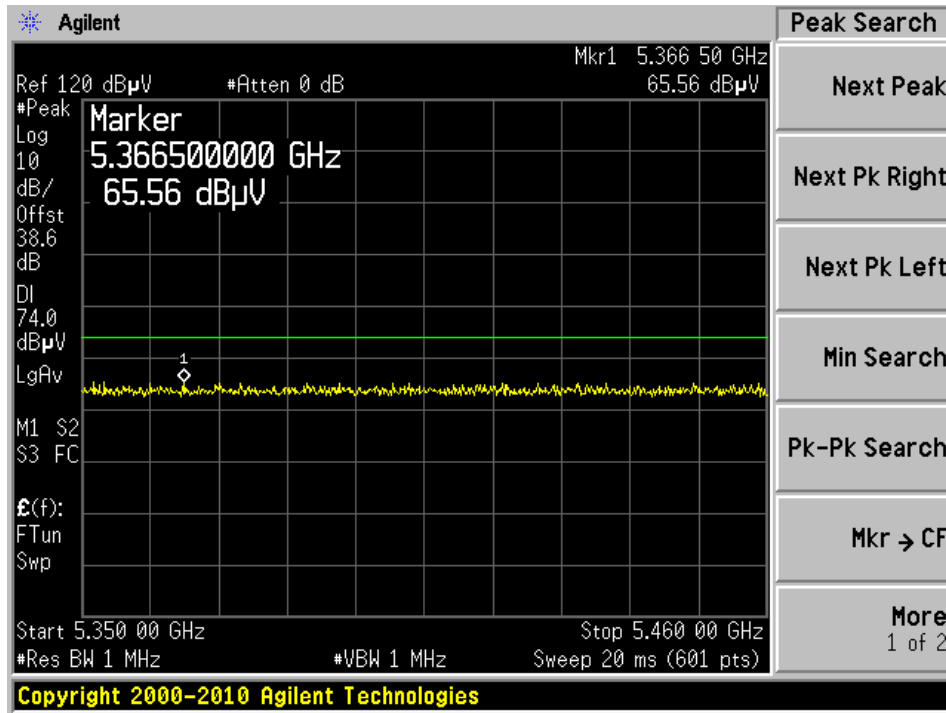


Low Channel-Average (Vertical)

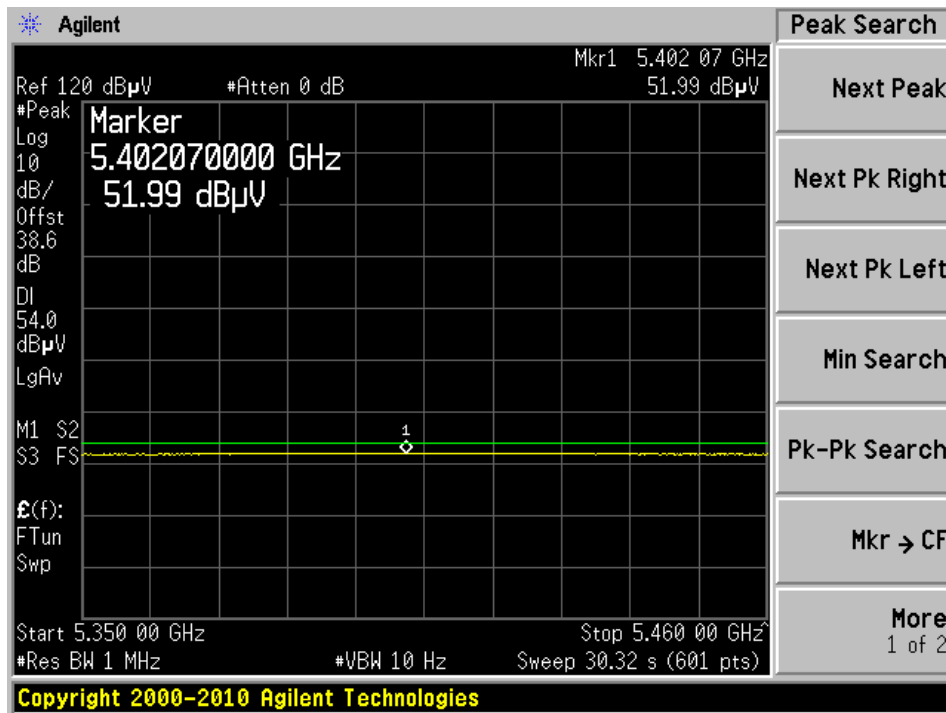


5.3 GHz 802.11a mode:

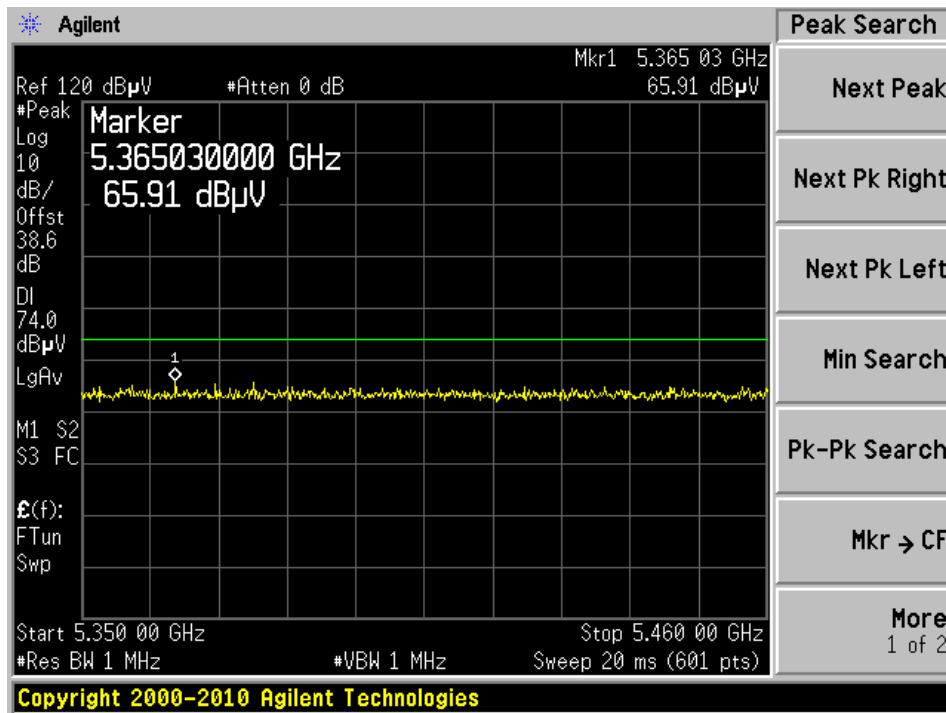
High Channel-Peak (Horizontal)



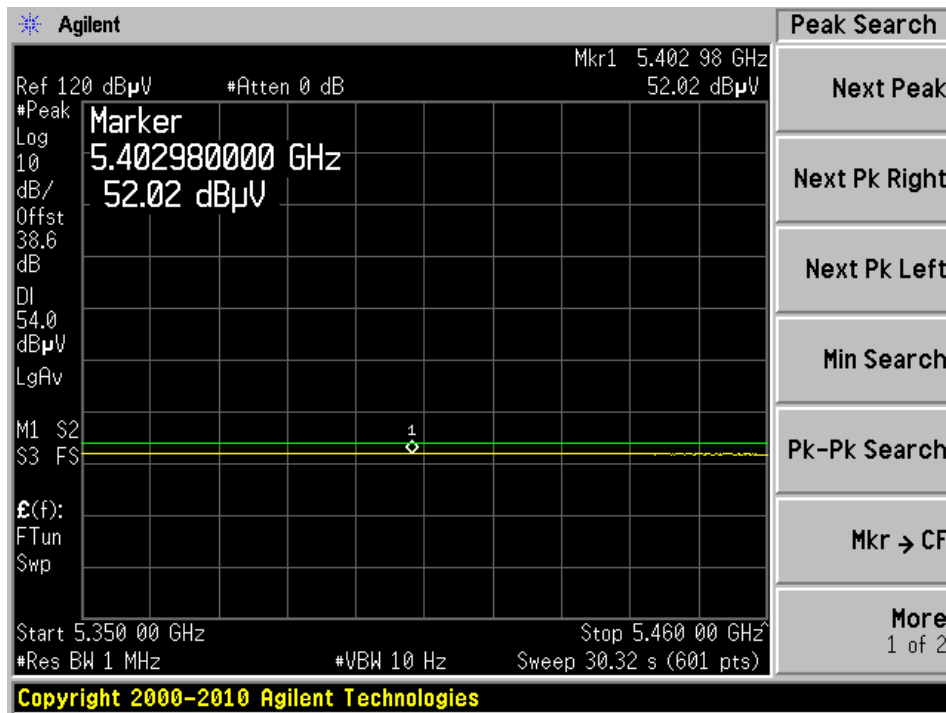
High Channel-Average (Horizontal)



High Channel-Peak (Vertical)

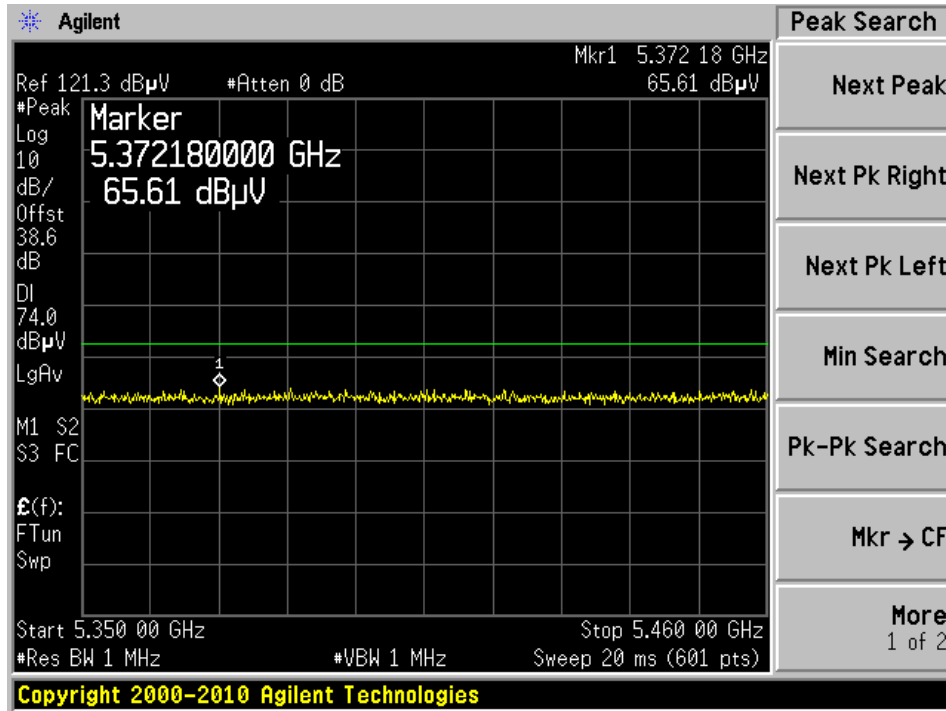


High Channel-Average (Vertical)

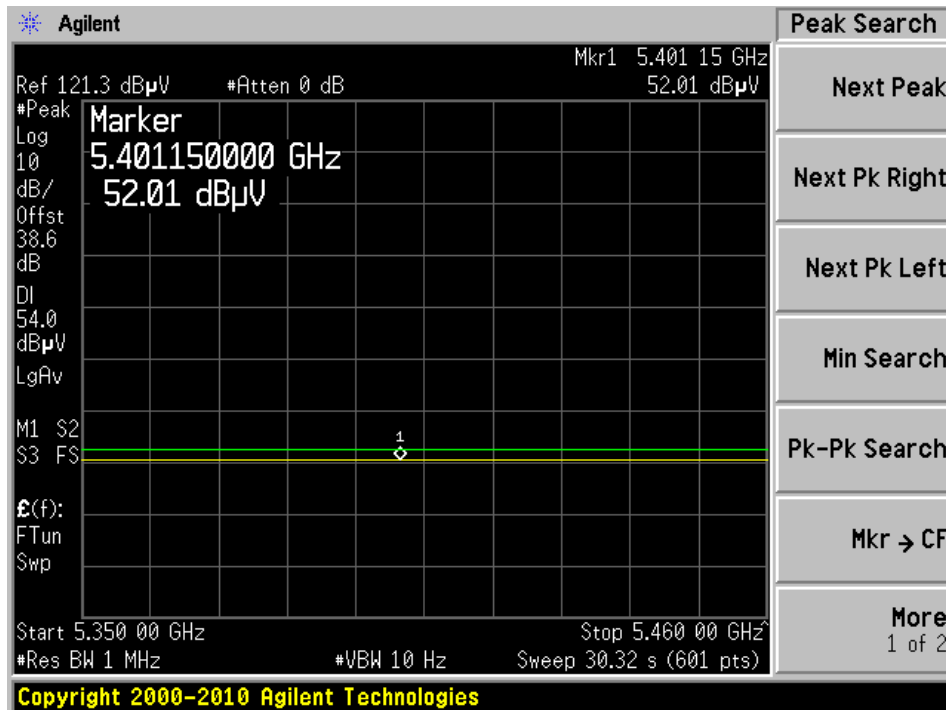


5.3 GHz 802.11n mode:

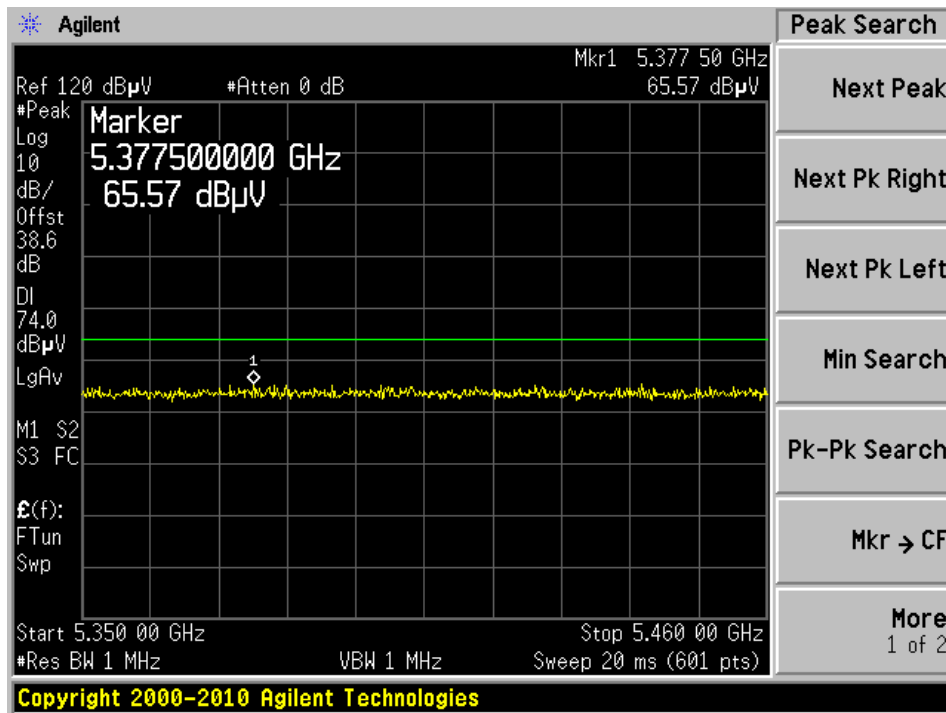
High Channel-Peak (Horizontal)



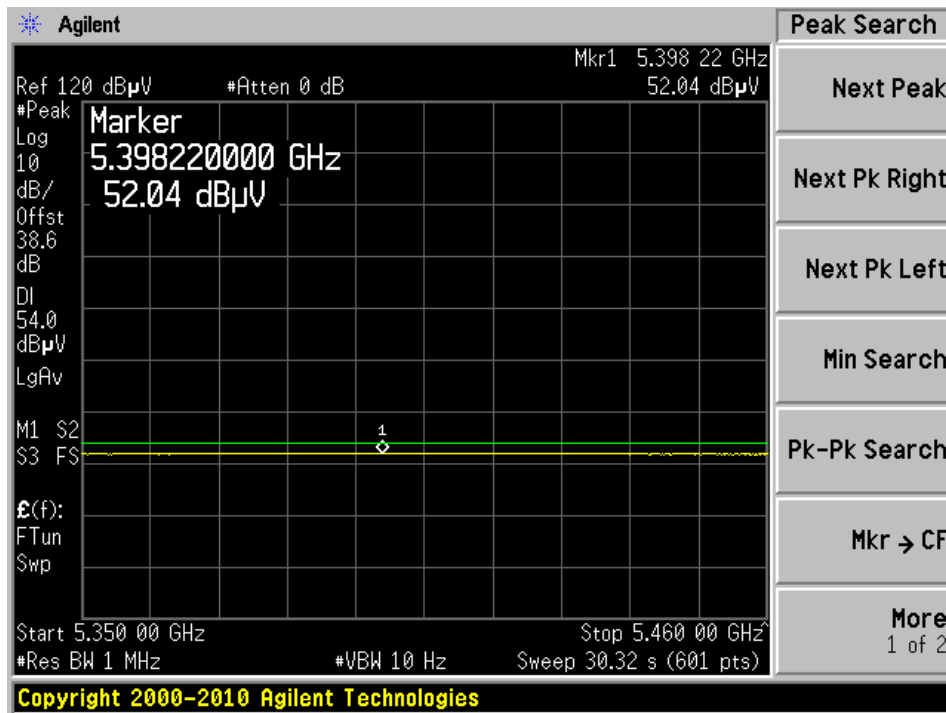
High Channel-Average (Horizontal)



High Channel-Peak (Vertical)

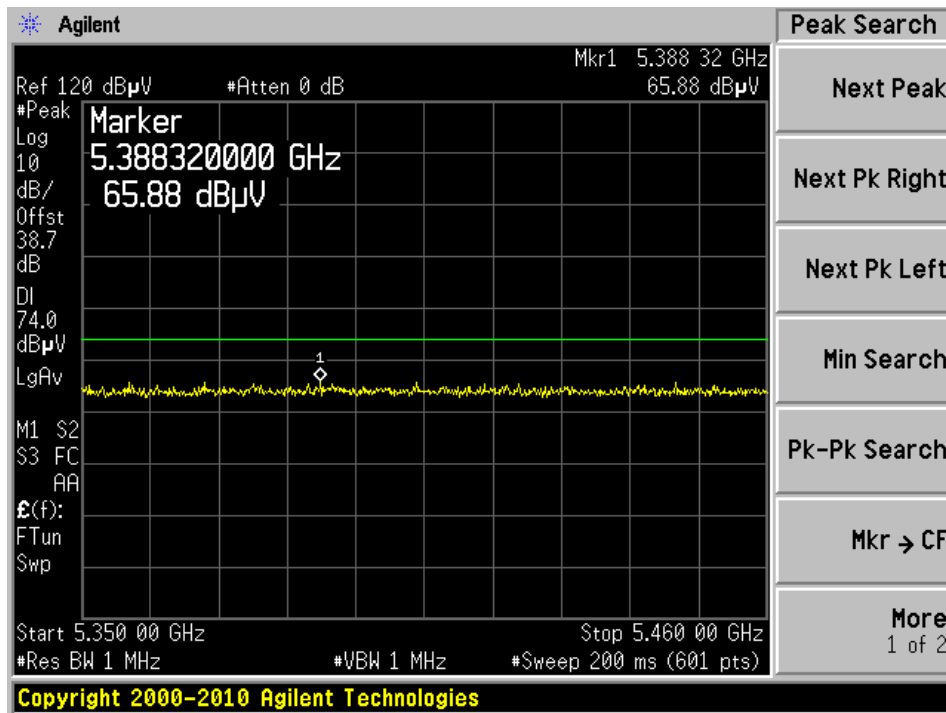


High Channel-Average (Vertical)

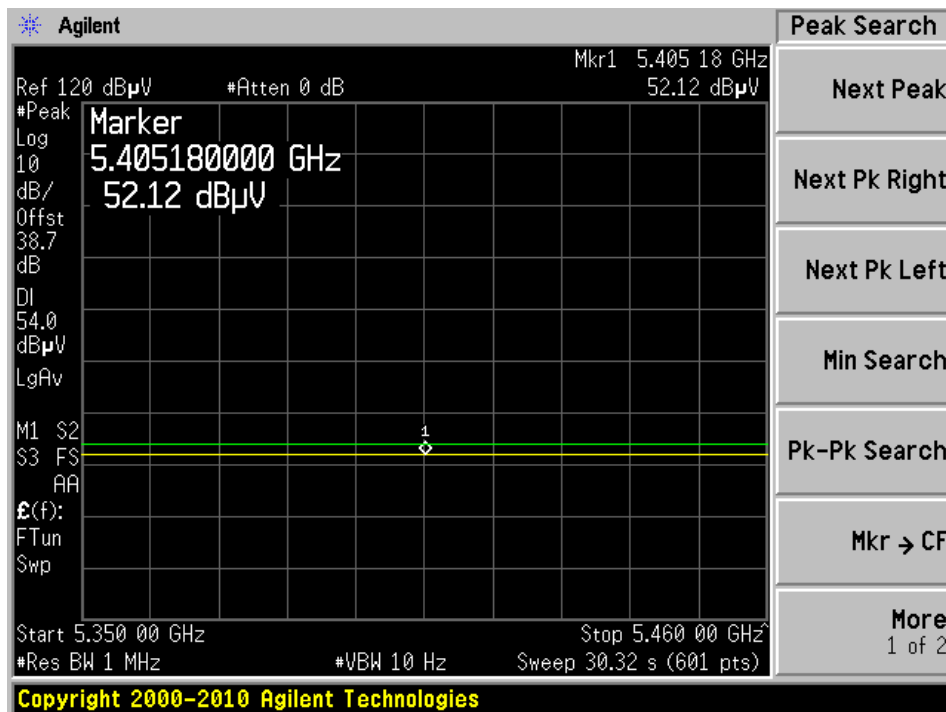


5.6 GHz 802.11a mode:

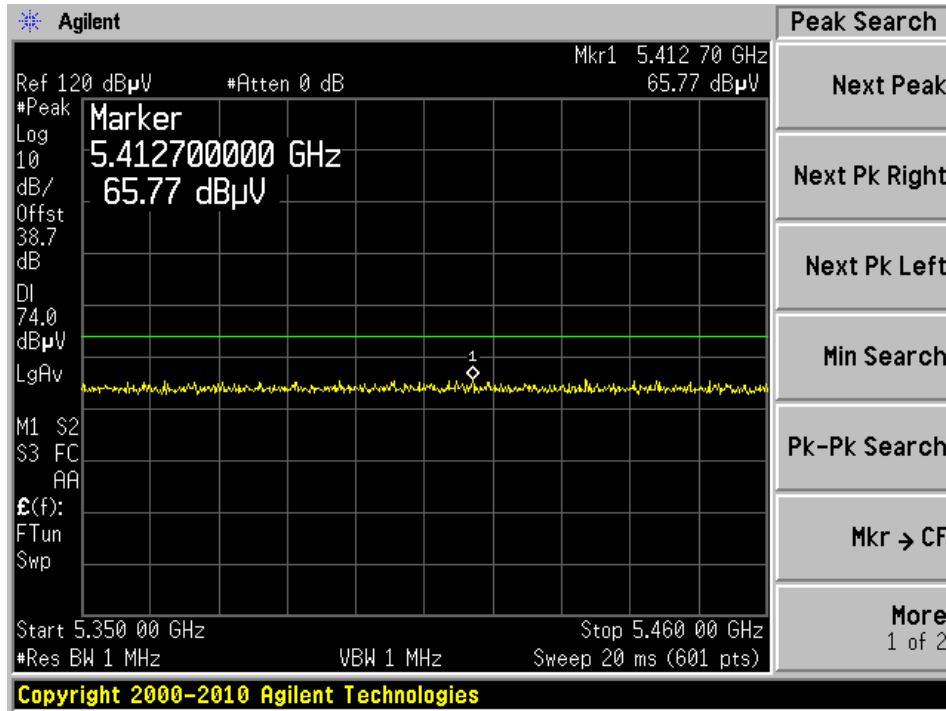
Low Channel-Peak (Horizontal)



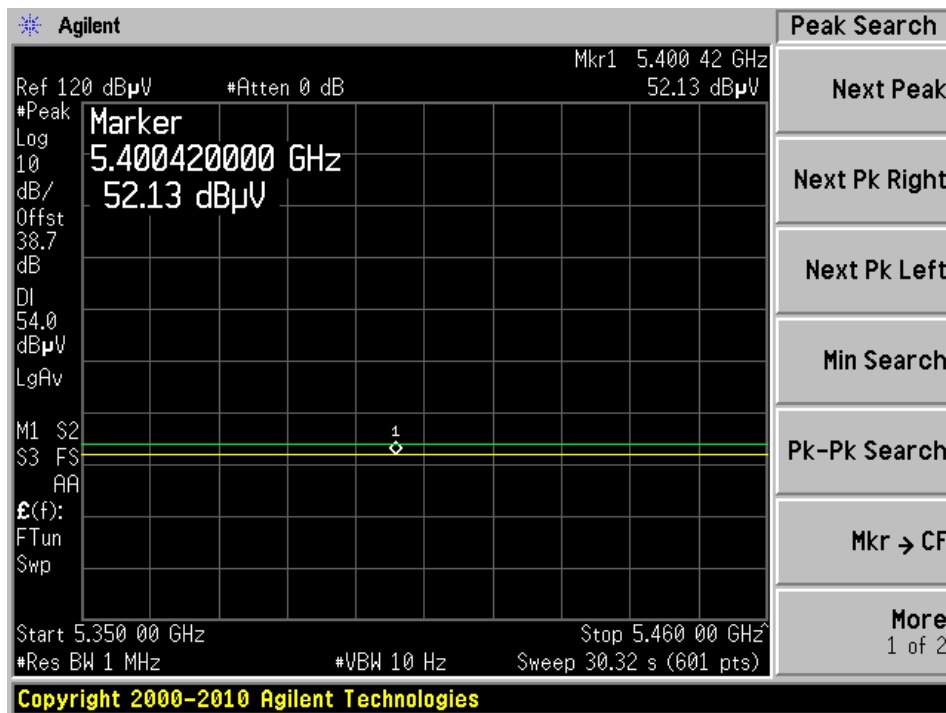
Low Channel-Average (Horizontal)



Low Channel-Peak (Vertical)

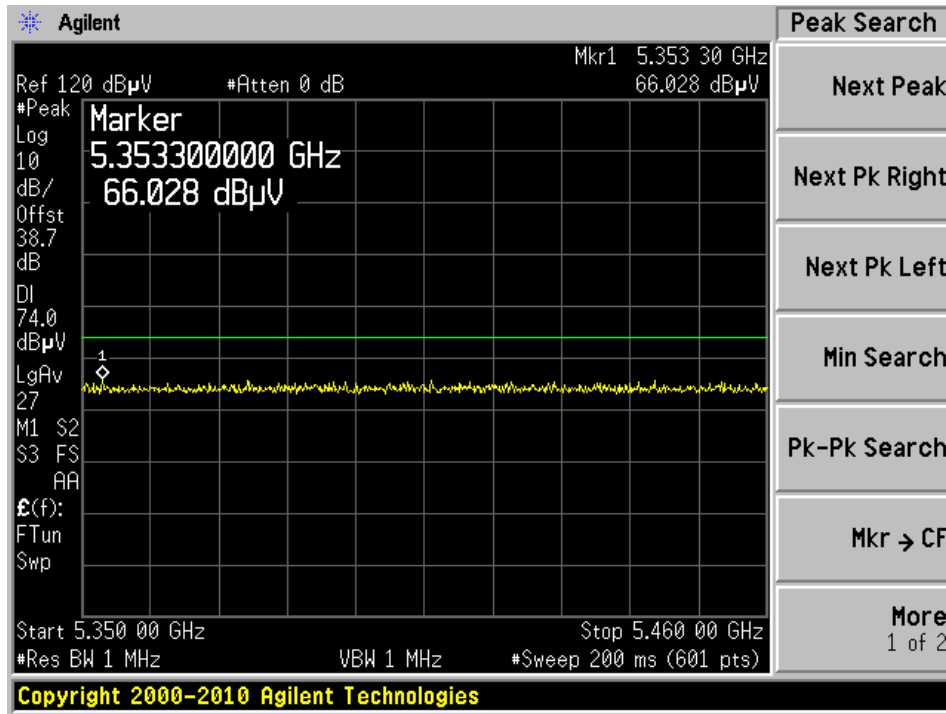


Low Channel-Average (Vertical)

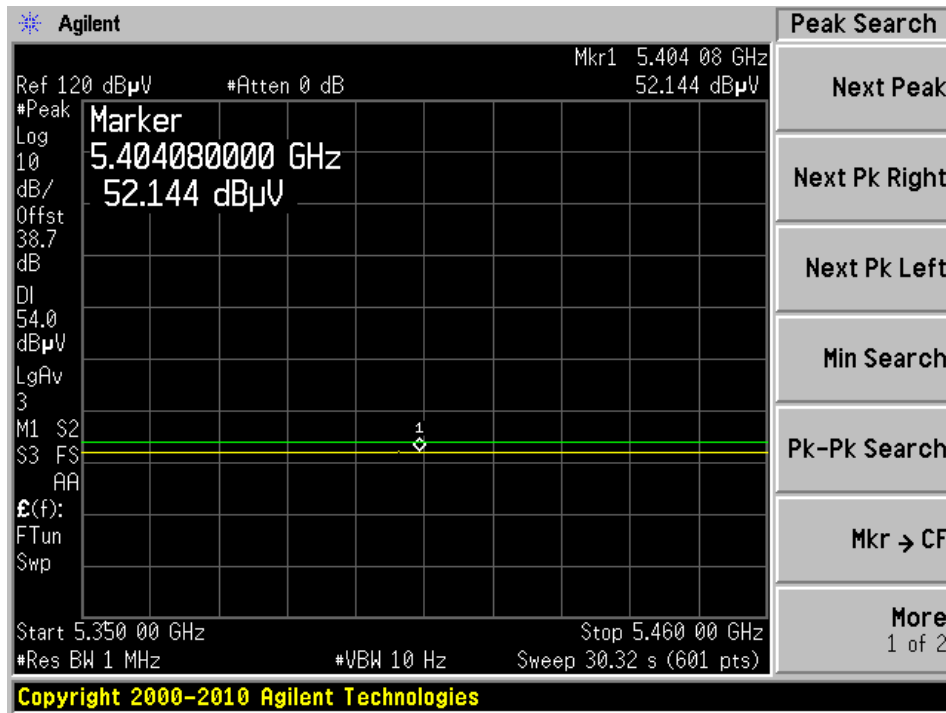


5.6 GHz 802.11n mode:

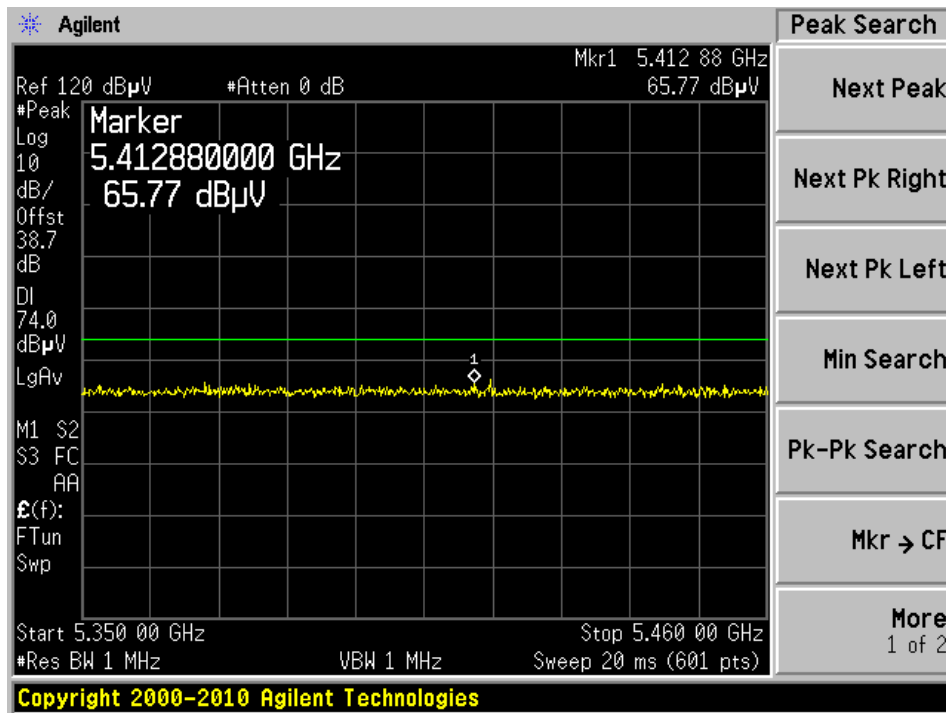
Low Channel-Peak (Horizontal)



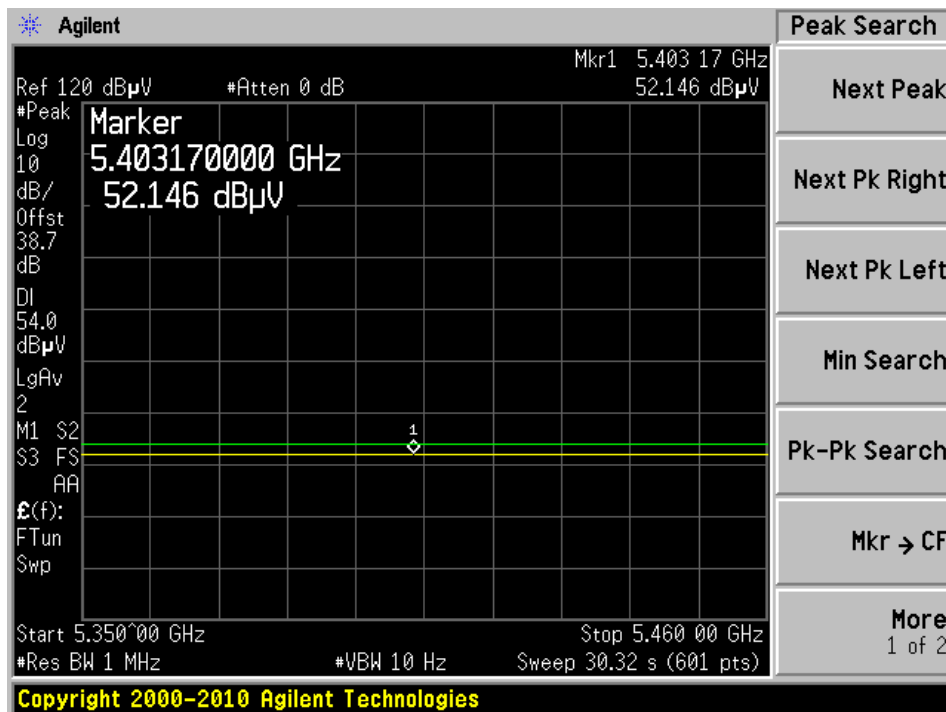
Low Channel-Average (Horizontal)



Low Channel-Peak (Vertical)



Low Channel-Average (Vertical)



7 FCC §15.407(a) & IC RSS-210 §A9.2 – 26 dB and 99% Emission Bandwidth

7.1 Applicable Standard

FCC §15.407(a) and RSS-210 A9.2.

7.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 26 dB from the reference level. Record the frequency difference as the emissions bandwidth.
4. Repeat above procedures until all frequencies measured were complete.

7.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date
Agilent	Spectrum Analyzer	E4440A	MY44303352	2011-05-10

Statement of Traceability: **BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

7.4 Test Environmental Conditions

Temperature:	20-22 °C
Relative Humidity:	35-45%
ATM Pressure:	101-102kPa

The testing was performed by Lionel Lara from 2011-12-18 to 2011-12-20 at RF Test Site.

7.5 Test Results

5.2 GHz Band:

Antenna Port	Channel	Frequency (MHz)	99% Emission Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)	Results
802.11a mode					
Main	Low	5180	16.3244	18.311	Compliant
	Middle	5200	16.3277	18.330	Compliant
	High	5240	16.3231	18.319	Compliant
Aux	Low	5180	16.3303	18.356	Compliant
	Middle	5200	16.3266	18.343	Compliant
	High	5240	16.3314	18.368	Compliant
802.11n mode					
Main	Low	5180	17.5077	18.759	Compliant
	Middle	5200	17.5035	18.773	Compliant
	High	5240	17.507	18.772	Compliant
Aux	Low	5180	17.5114	18.753	Compliant
	Middle	5200	17.5106	18.765	Compliant
	High	5240	17.5103	18.799	Compliant

5.3 GHz Band:

Antenna Port	Channel	Frequency (MHz)	99% Emission Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)	Results
802.11a mode					
Main	Low	5260	16.3226	18.308	Compliant
	Middle	5280	16.3205	18.293	Compliant
	High	5320	16.3223	18.290	Compliant
Aux	Low	5260	16.3377	18.425	Compliant
	Middle	5280	16.3452	18.438	Compliant
	High	5320	16.3443	18.523	Compliant
802.11n mode					
Main	Low	5260	17.5044	18.803	Compliant
	Middle	5280	17.5075	18.740	Compliant
	High	5320	17.5010	18.747	Compliant
Aux	Low	5260	17.5198	18.822	Compliant
	Middle	5280	17.5230	18.845	Compliant
	High	5320	17.5208	18.866	Compliant

5.6 GHz Band:

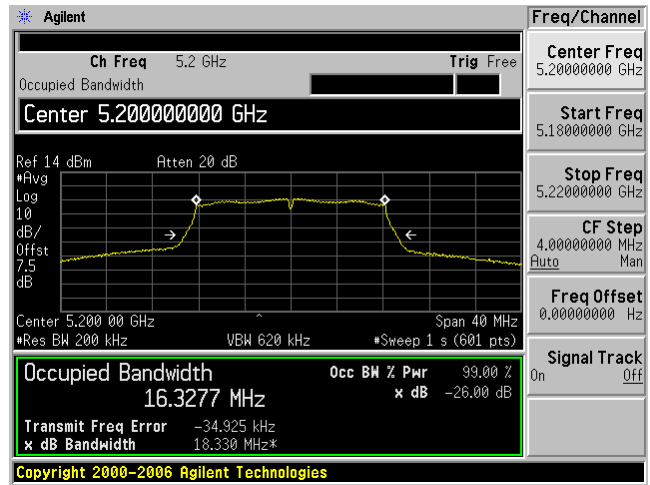
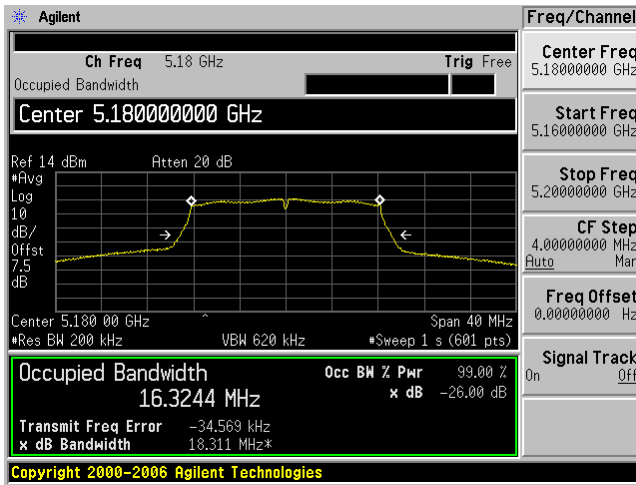
Antenna Port	Channel	Frequency (MHz)	99% Emission Bandwidth (MHz)	26 dB Emission Bandwidth (MHz)	Results
802.11a mode					
Main	Low	5500	16.3181	18.304	Compliant
	Middle	5580	16.3430	18.437	Compliant
	High	5700	16.3183	18.331	Compliant
Aux	Low	5500	16.3190	18.310	Compliant
	Middle	5580	16.3580	18.587	Compliant
	High	5700	16.3331	18.374	Compliant
802.11n mode					
Main	Low	5500	17.5048	18.739	Compliant
	Middle	5580	17.5020	18.751	Compliant
	High	5700	17.5010	18.707	Compliant
Aux	Low	5500	17.5393	18.978	Compliant
	Middle	5580	17.4971	18.763	Compliant
	High	5700	17.5113	18.800	Compliant

Please refer to the following plots.

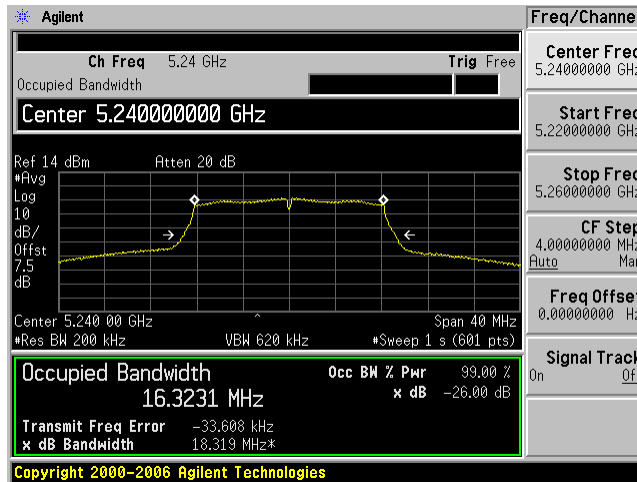
5150-5250 MHz

5180 MHz, 802.11a mode, Main,

5200 MHz, 802.11a mode, Main,

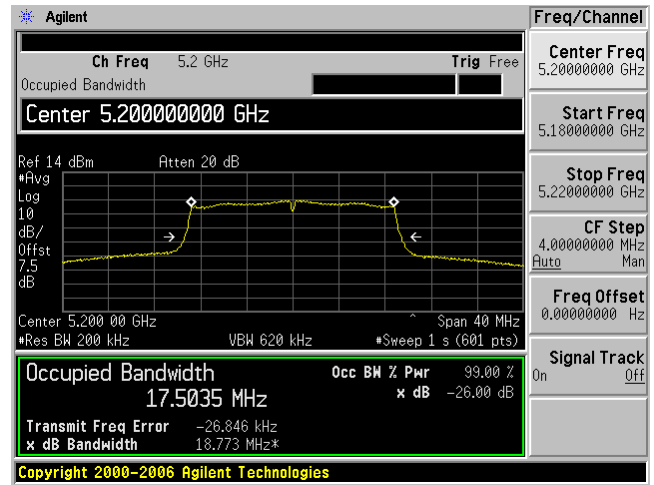
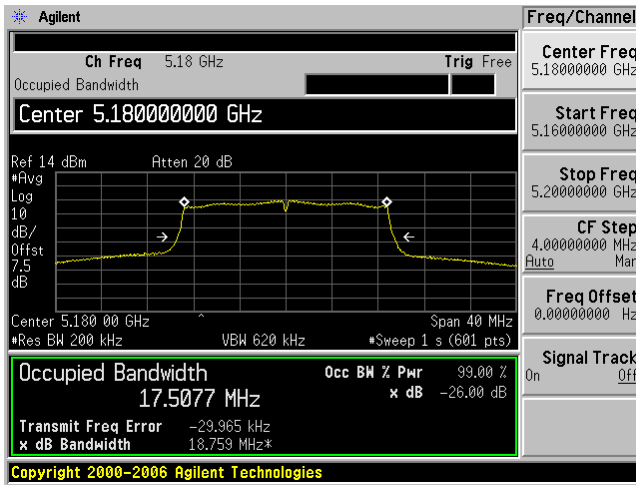


5240 MHz, 802.11a mode, Main,

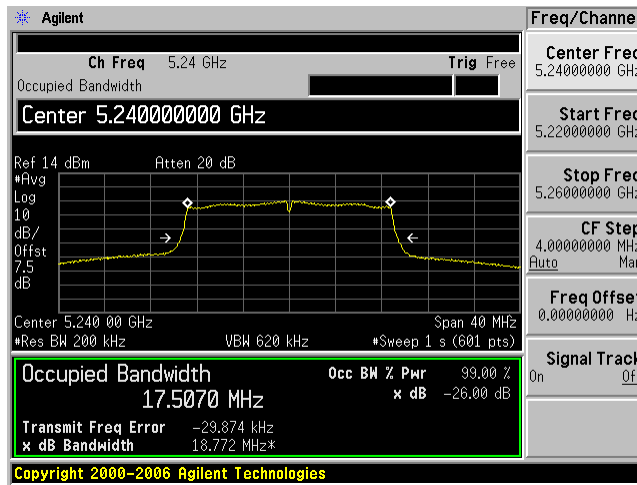


5180 MHz, 802.11n mode, Main,

5200 MHz, 802.11n mode, Main,



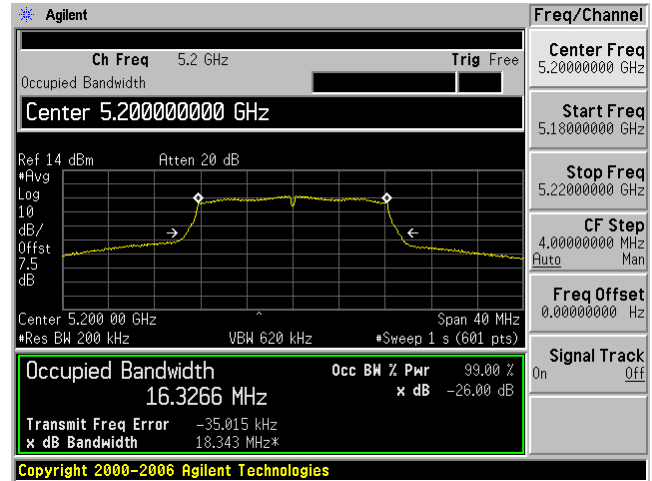
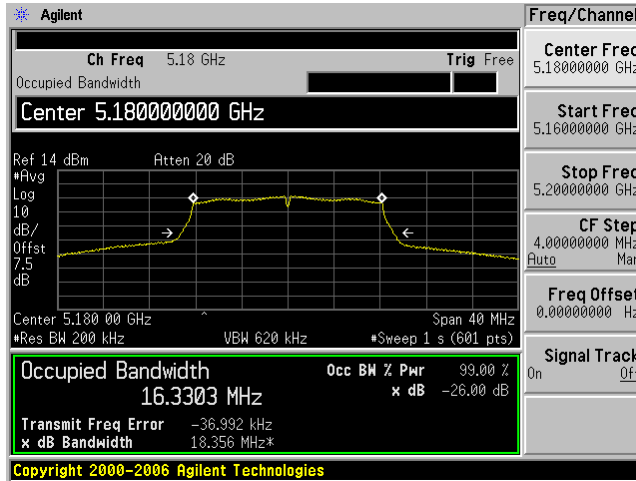
5240 MHz, 802.11n mode, Main,



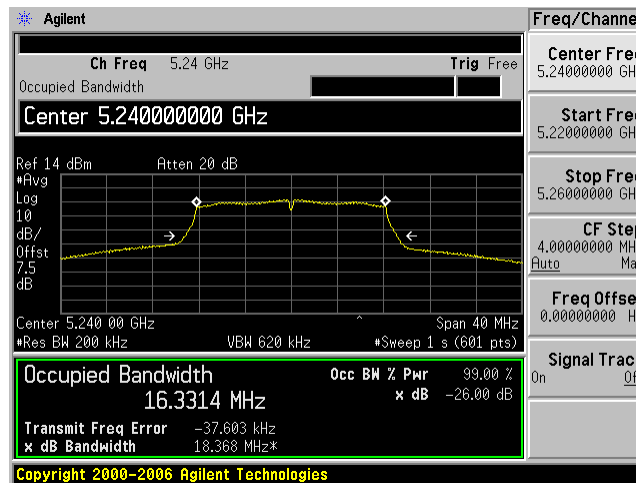
5150-5250 MHz

5180 MHz, 802.11a mode, Aux,

5200 MHz, 802.11a mode, Aux,

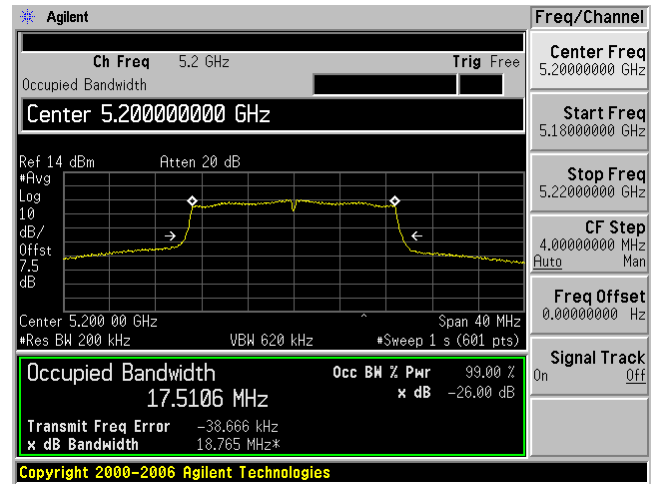
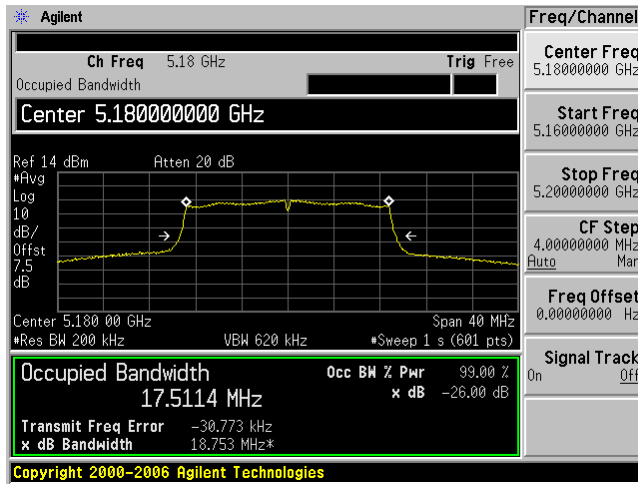


5240 MHz, 802.11a mode, Aux,

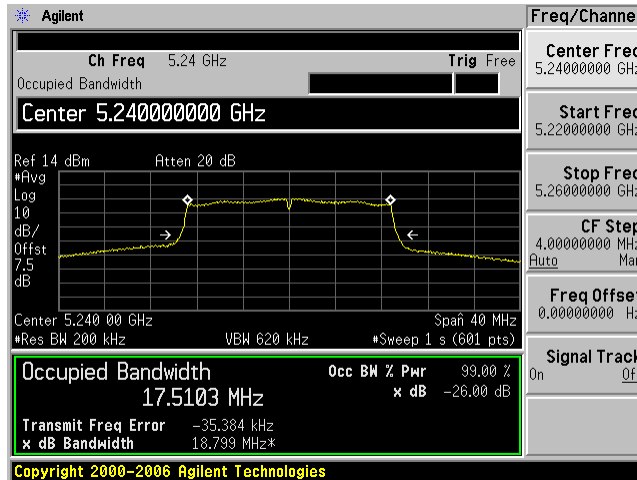


5180 MHz, 802.11n mode, Aux,

5200 MHz, 802.11n mode, Aux,



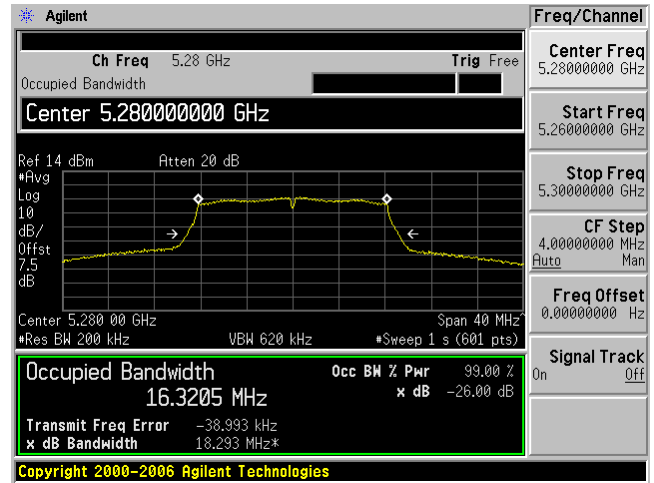
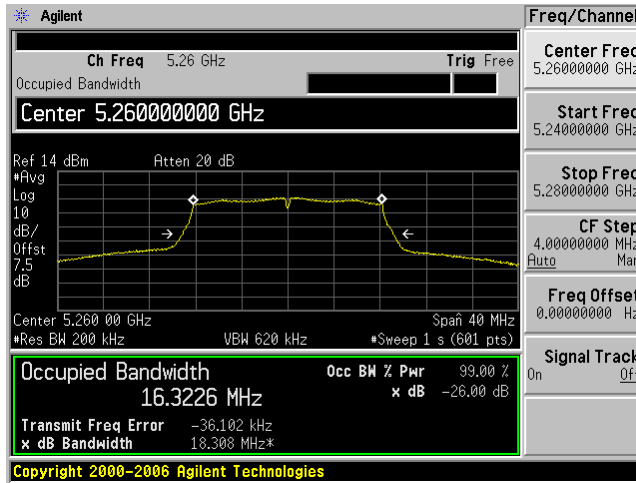
5240 MHz, 802.11n mode Aux



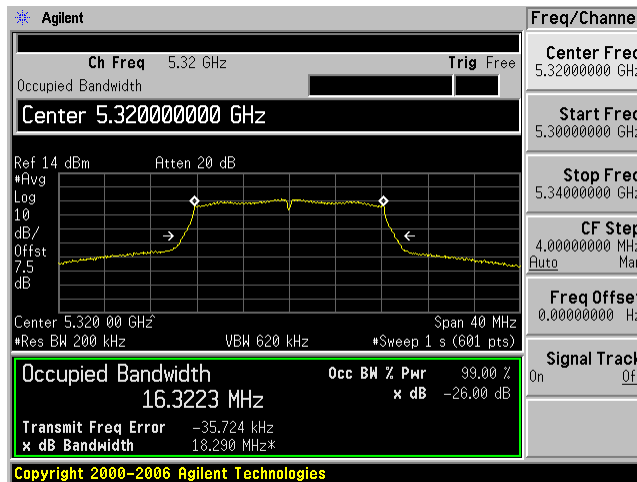
5250-5350 MHz

5260 MHz, 802.11a mode, Main,

5280 MHz, 802.11a mode, Main,

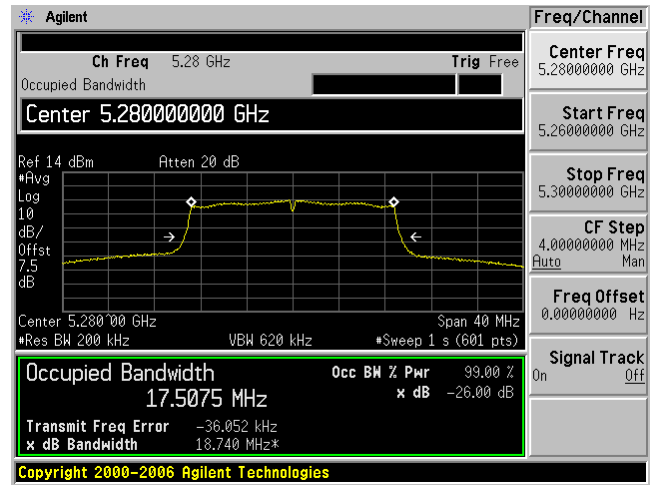
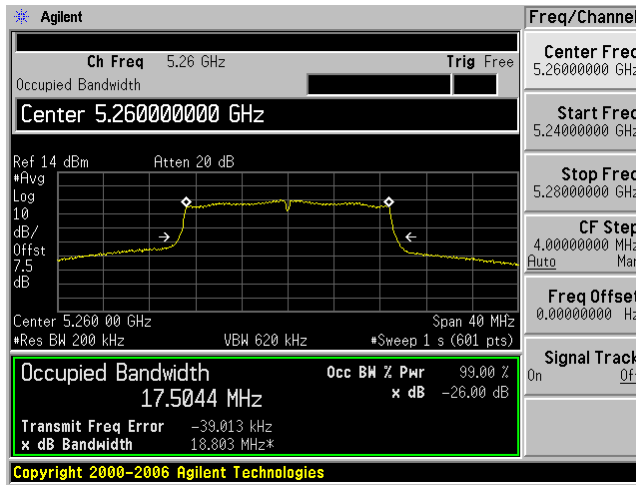


5320 MHz, 802.11a mode, Main,

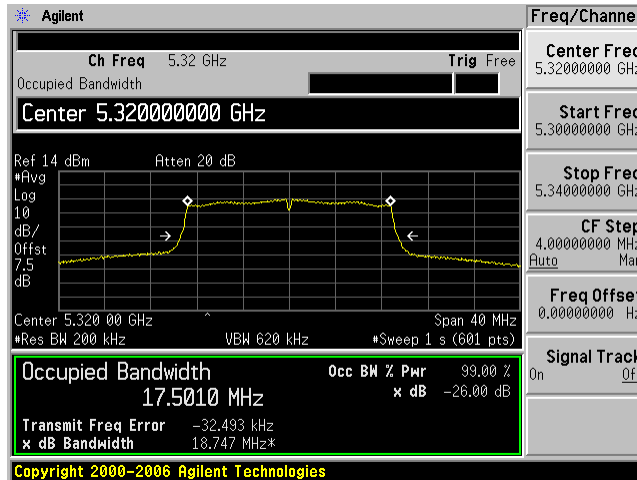


5260 MHz, 802.11n mode, Main,

5280 MHz, 802.11n mode, Main,



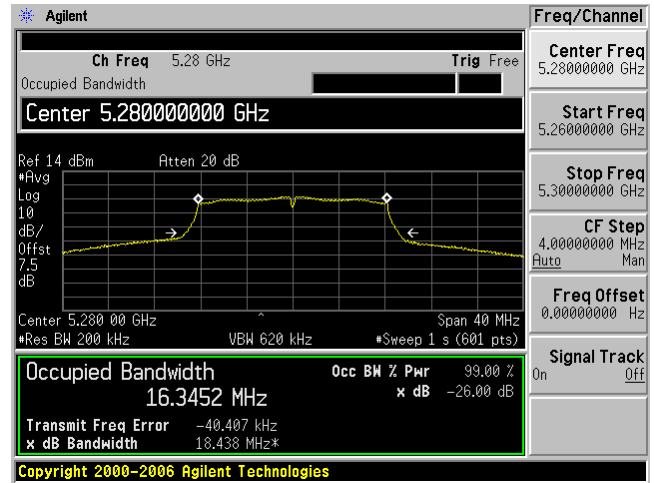
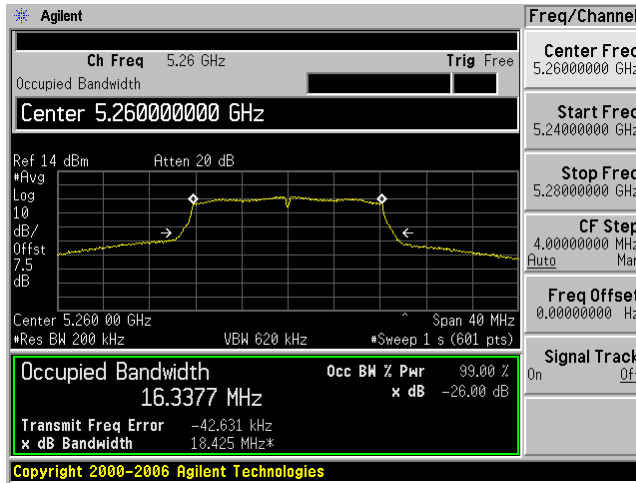
5320 MHz, 802.11n mode, Main,



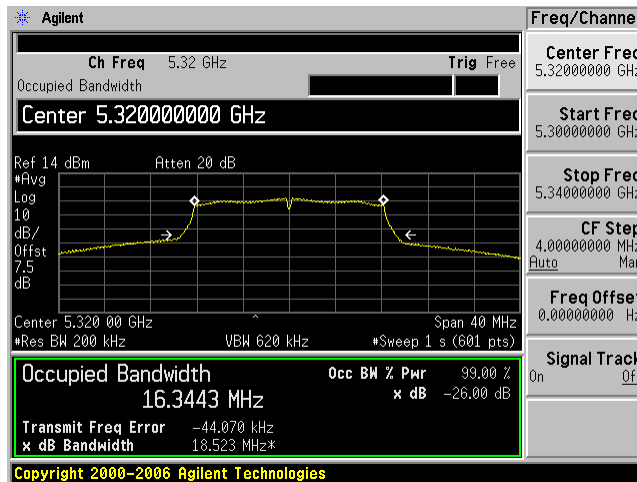
5250-5350 MHz

5260 MHz, 802.11a mode, Aux,

5280 MHz, 802.11a mode, Aux,

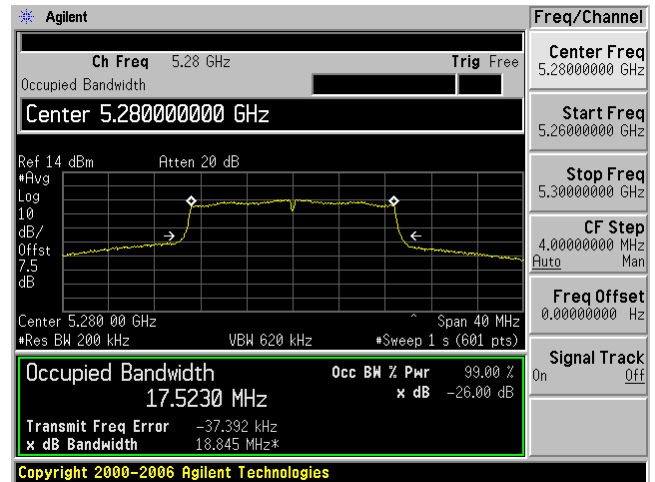
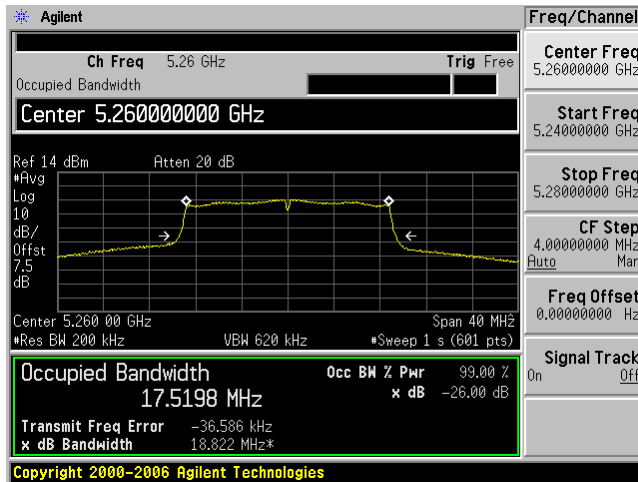


5320 MHz, 802.11a mode, Aux,

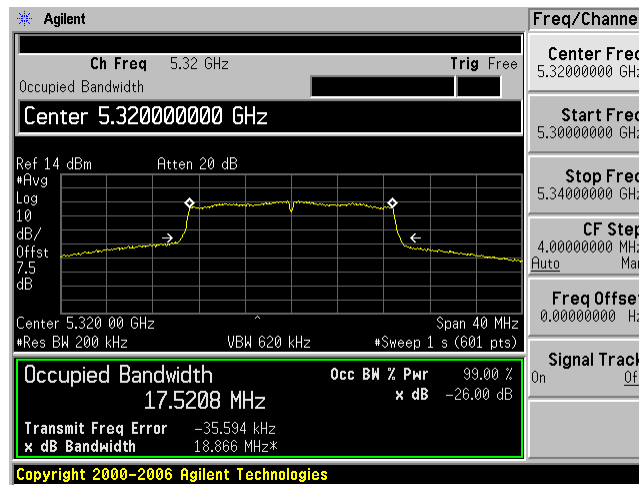


5260 MHz, 802.11n mode, Aux,

5280 MHz, 802.11n mode, Aux,



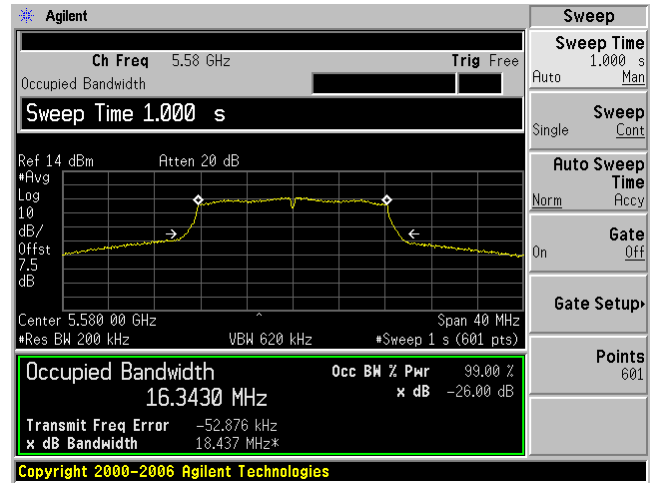
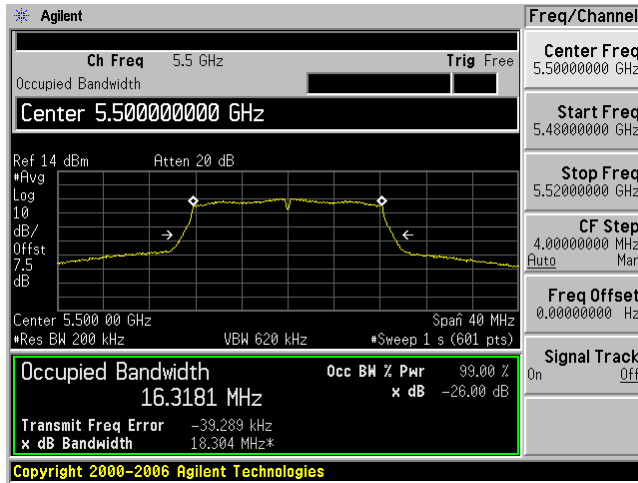
5320 MHz, 802.11n mode, Aux



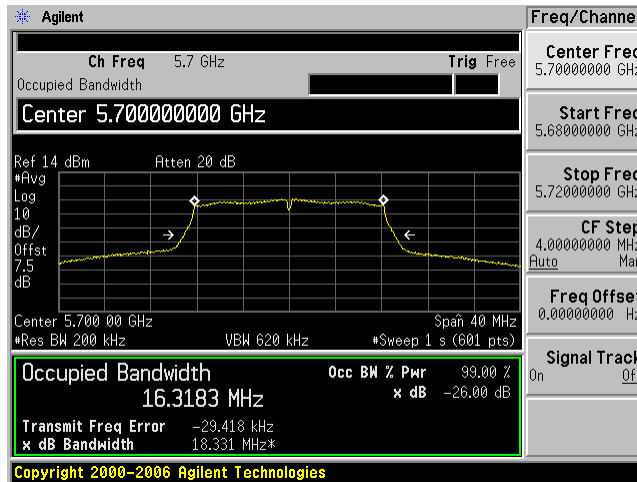
5470-5725 MHz

5500 MHz, 802.11a mode, Main

5580 MHz, 802.11a mode, Main

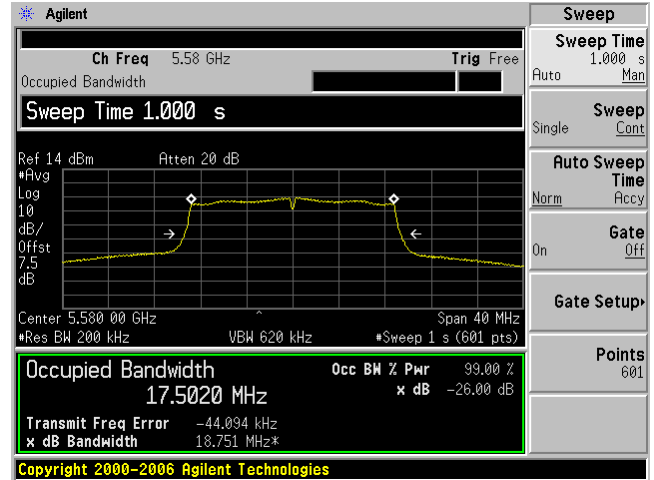
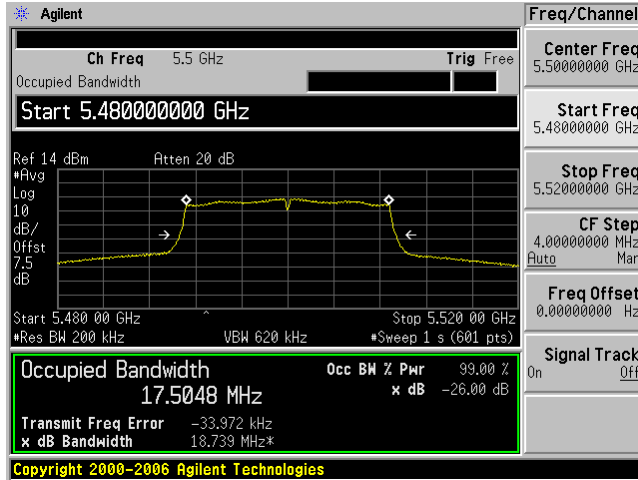


5700 MHz, 802.11a mode, Main,

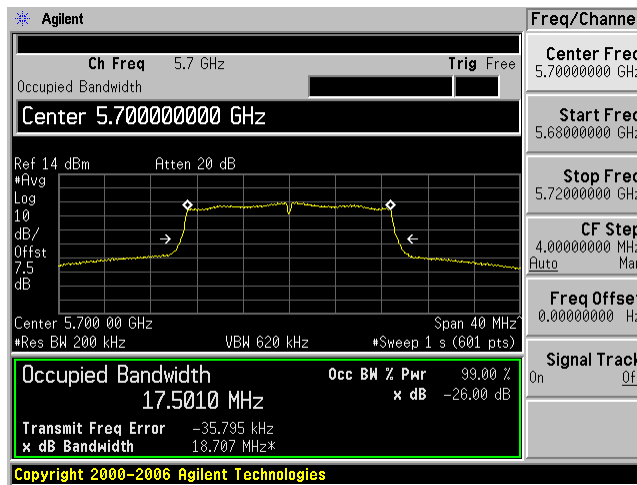


5500 MHz, 802.11n mode, Main,

5580 MHz, 802.11n mode, Main

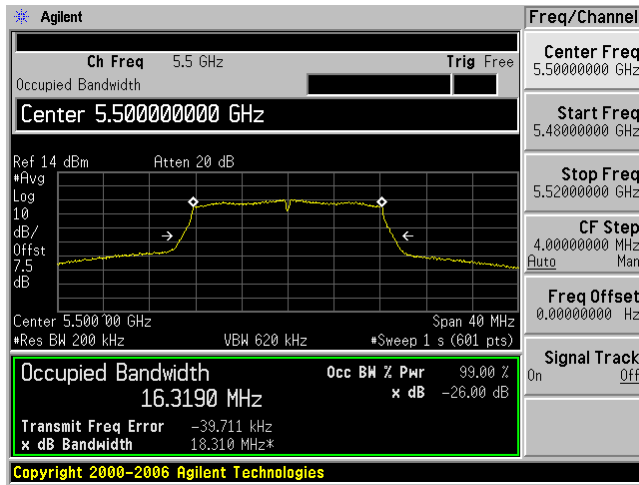


5700 MHz, 802.11n mode, Main

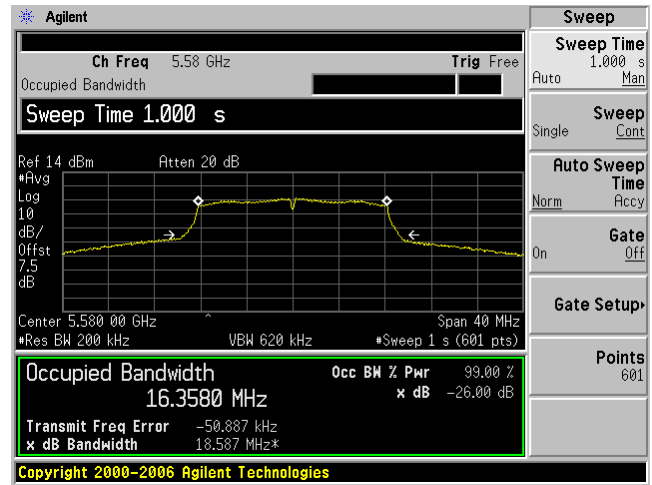


5470-5725 MHz

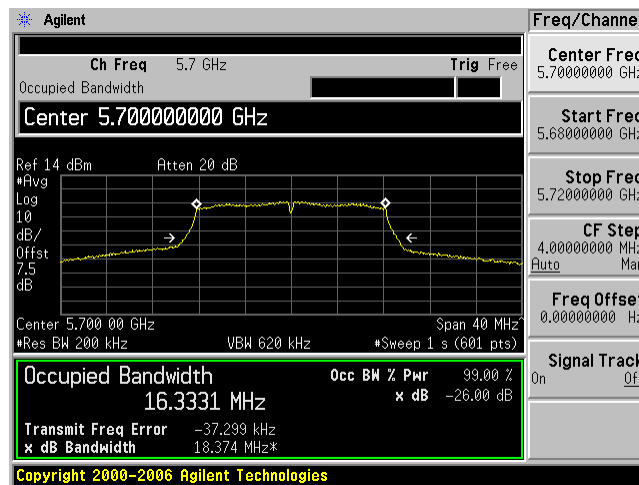
5500 MHz, 802.11a mode, Aux



5580 MHz, 802.11a mode, Aux,

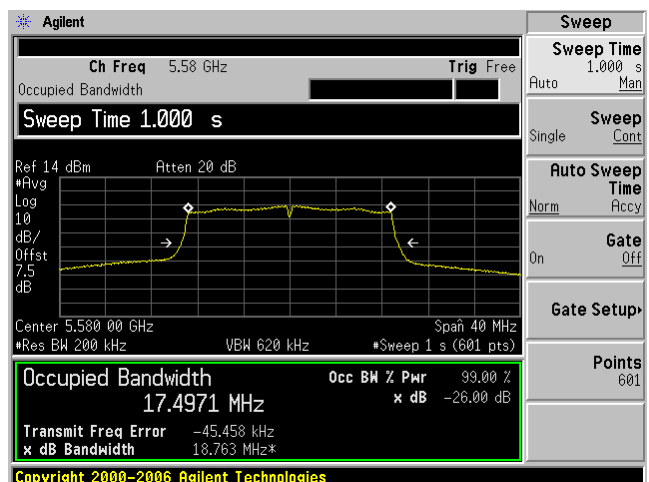
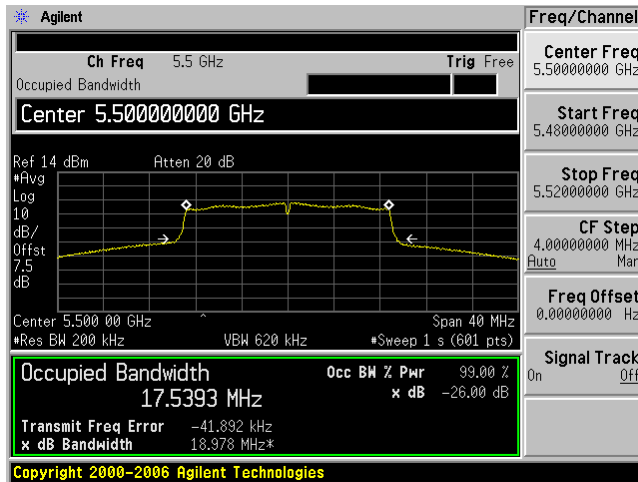


5700 MHz, 802.11a mode, Aux

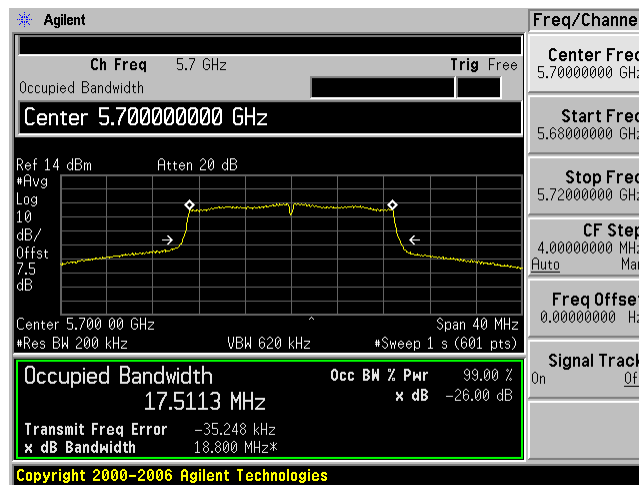


5500 MHz, 802.11n mode, Aux,

5600 MHz, 802.11n mode, Aux,



5700 MHz, 802.11n mode, Aux



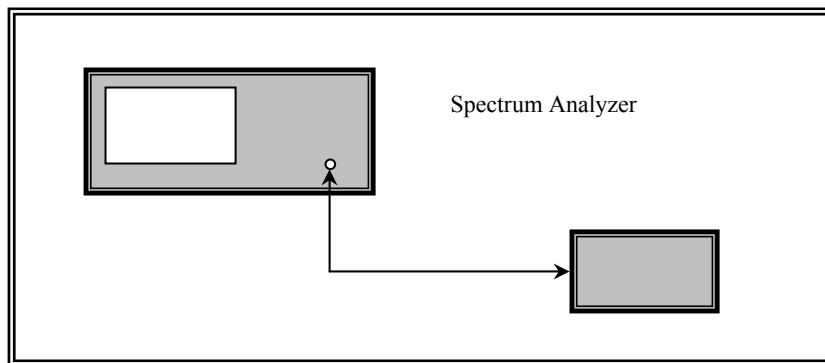
8 FCC §407(a) & IC RSS-210 §A9.2 - Peak Output Power

8.1 Applicable Standard

FCC §15.407(a) and IC RESS-210 §A9.2

8.2 Test Procedure

1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to a spectrum analyzer.
3. Add a correction factor to the display.



8.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date
Agilent	Spectrum Analyzer	E4440A	MY44303352	2011-05-10

Statement of Traceability: **BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

8.4 Test Environmental Conditions

Temperature:	23-25 °C
Relative Humidity:	35-50 %
ATM Pressure:	101-103kPa

The testing was performed by Lionel Lara from 2011-12-18 to 2011-12-20 at RF Test Site.

8.5 Test Results

5.2 GHz Band:

Channel	Frequency (MHz)	Main Ant. Output Power (dBm)	Aux Ant. Output Power (dBm)	Maximum Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11a mode						
Low	5180	11.42	11.43	11.43	17	-5.57
Middle	5200	11.40	11.50	11.50	17	-5.5
High	5240	11.46	11.64	11.64	17	-5.36
802.11n mode						
Low	5180	9.94	10.47	10.47	17	-6.53
Middle	5200	9.95	10.50	10.50	17	-6.5
High	5240	10.08	10.63	10.63	17	-6.37

5.3 GHz Band:

Channel	Frequency (MHz)	Main Ant. Output Power (dBm)	Aux Ant. Output Power (dBm)	Maximum Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11a mode						
Low	5260	11.44	11.68	11.68	17	-5.32
Middle	5280	11.25	11.60	11.60	17	-5.4
High	5320	11.26	11.56	11.56	17	-5.44
802.11n mode						
Low	5260	10.22	10.75	10.75	17	-6.25
Middle	5280	10.24	10.73	10.73	17	-6.27
High	5320	10.41	10.71	10.71	17	-6.29

5.6 GHz Band:

Channel	Frequency (MHz)	Main Ant. Output Power (dBm)	Aux Ant. Output Power (dBm)	Maximum Output Power (dBm)	Limit (dBm)	Margin (dB)
802.11a mode						
Low	5500	10.88	11.25	11.25	17	-5.75
Middle	5580	11.02	11.30	11.30	17	-5.7
High	5700	11.21	11.18	11.21	17	-5.79
802.11n mode						
Low	5500	9.68	10.06	10.06	17	-6.94
Middle	5580	9.96	10.18	10.18	17	-6.82
High	5700	10.35	10.38	10.38	17	-6.62

9 FCC §15.407(b) & IC RSS-210 §A9.2 – Out of Band Emissions

9.1 Applicable Standard

According to FCC §15.407(b) and IC RSS-210 §A9.2, For transmitters operating in the 5.25–5.35 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of –27 dBm/MHz. Devices operating in the 5.25–5.35 GHz band that generate emissions in the 5.15–5.25 GHz band must meet all applicable technical requirements for operation in the 5.15–5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of –27 dBm/MHz in the 5.15–5.25 GHz band. For transmitters operating in the 5.47–5.725 GHz band: all emissions outside of the 5.47–5.725 GHz band shall not exceed an EIRP of –27 dBm/MHz.

9.2 Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 100 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

9.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date
Agilent	Spectrum Analyzer	E4440A	MY44303352	2011-05-10

Statement of Traceability: **BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

9.4 Test Environmental Conditions

Temperature:	23-25 °C
Relative Humidity:	35-50 %
ATM Pressure:	101-103kPa

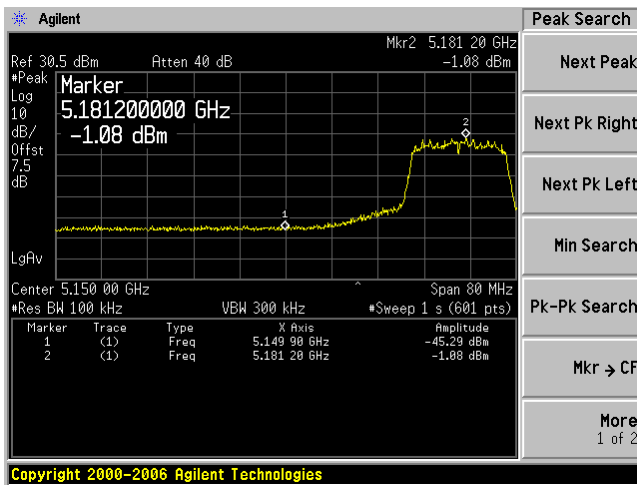
The testing was performed by Lionel Lara from 2011-12-18 to 2011-12-20 at RF Test Site.

9.5 Test Results

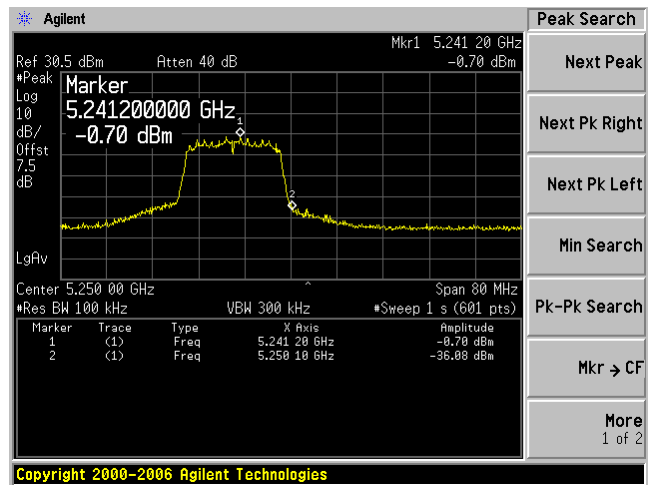
Please refer to following pages for plots of band edge.

5150-5250 MHz

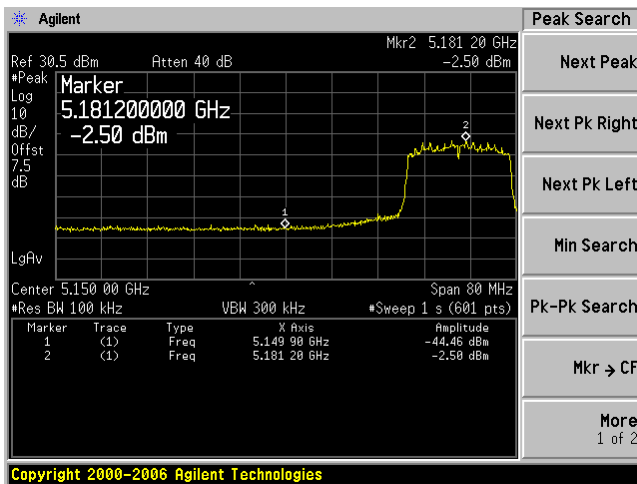
802.11 a mode, Main, 5150



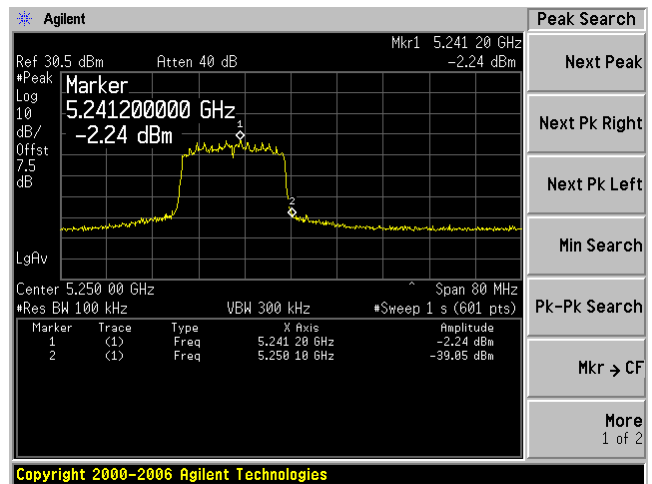
802.11 a mode, Main, 5250



802.11 n mode, Main, 5150

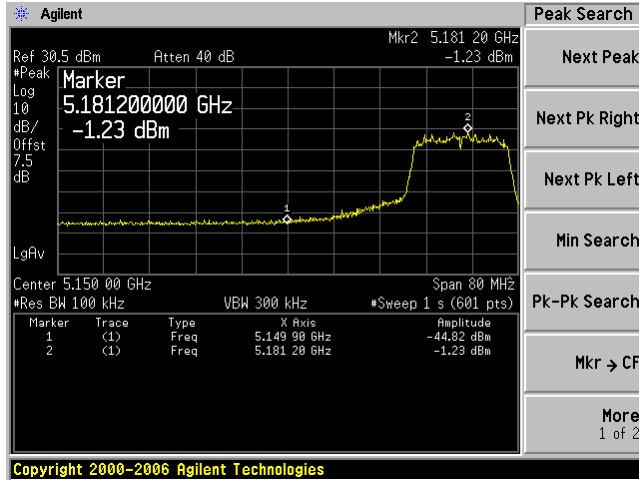


802.11 n mode, Main, 5250

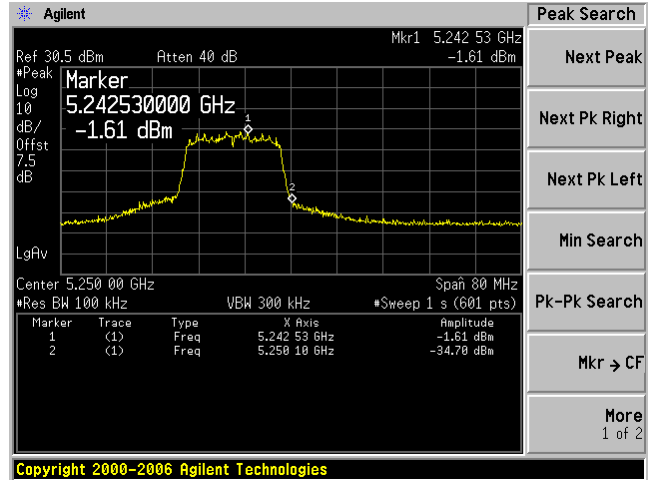


5150-5250 MHz

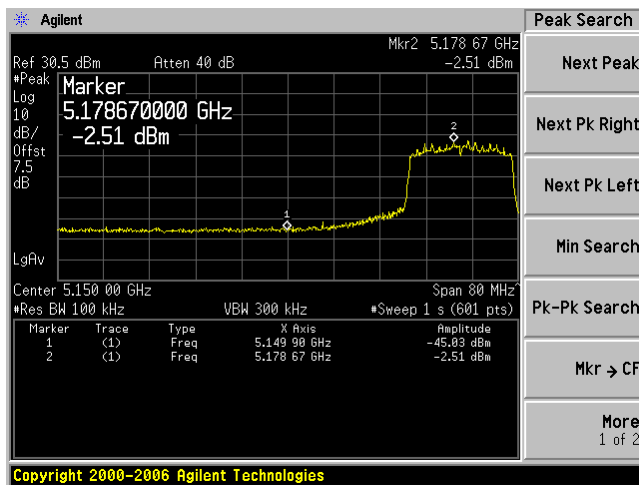
802.11 a mode, Aux, 5150



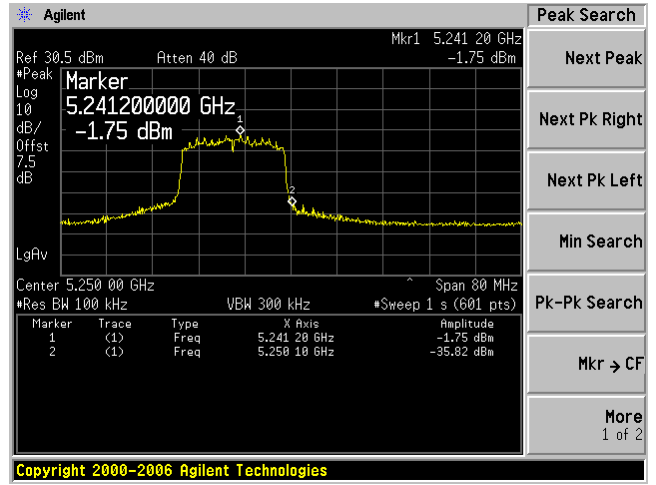
802.11 a mode, Aux, 5250



802.11 n mode, Aux, 5150

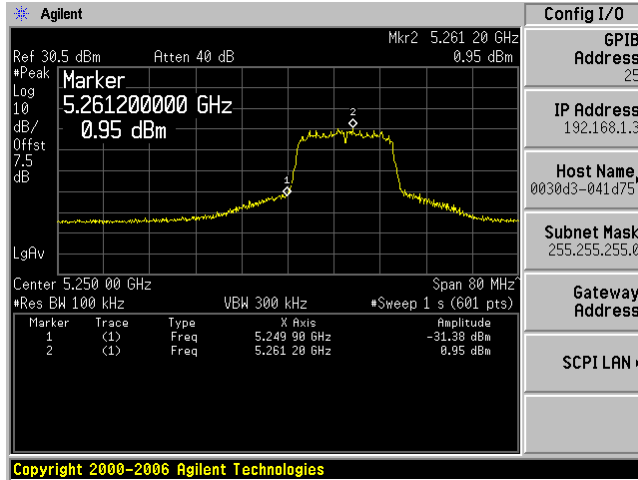


802.11 n mode, Aux, 5250

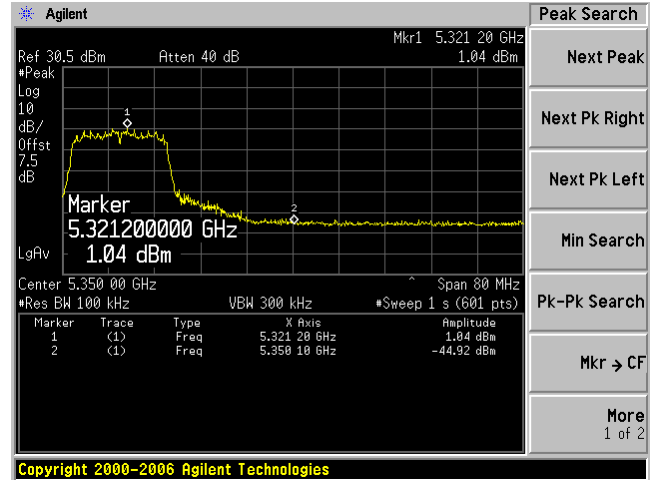


5250-5350 MHz

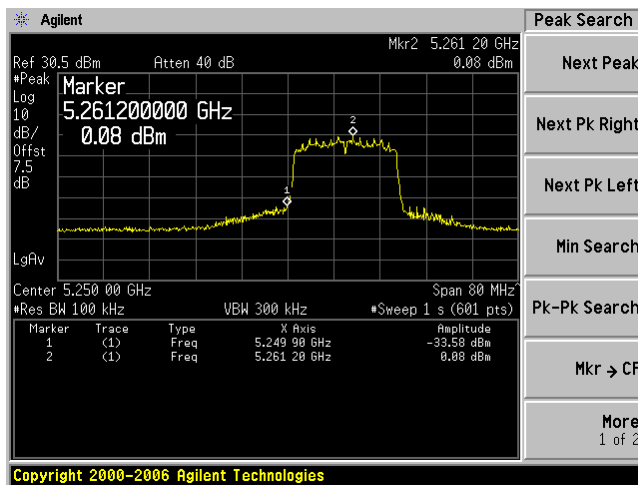
802.11 a mode, Main, 5250



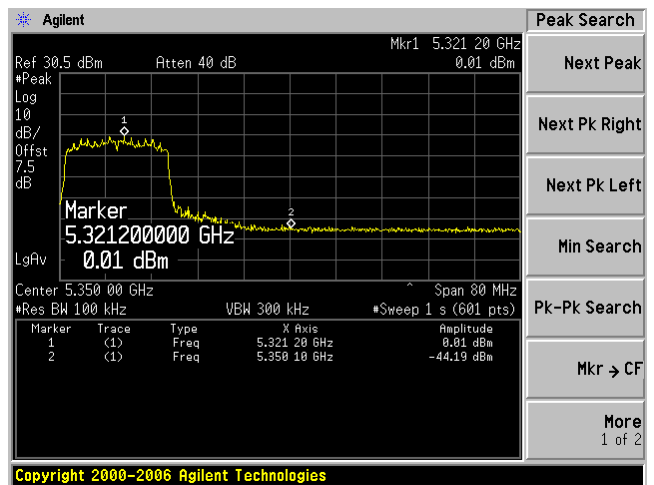
802.11 a mode, Main, 5350



802.11 n mode, Main, 5250

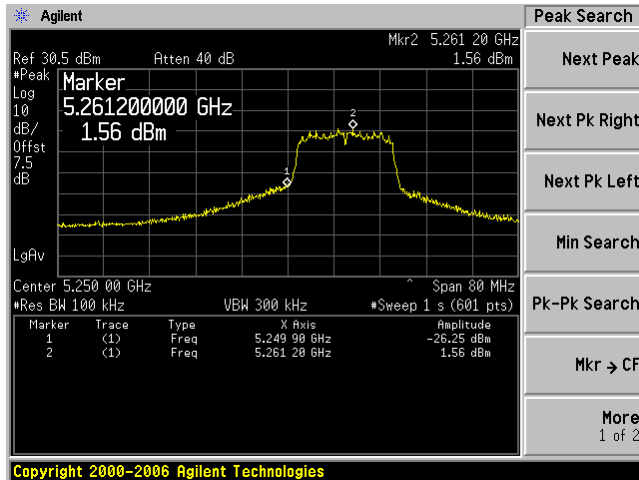


802.11 n mode, Main, 5350

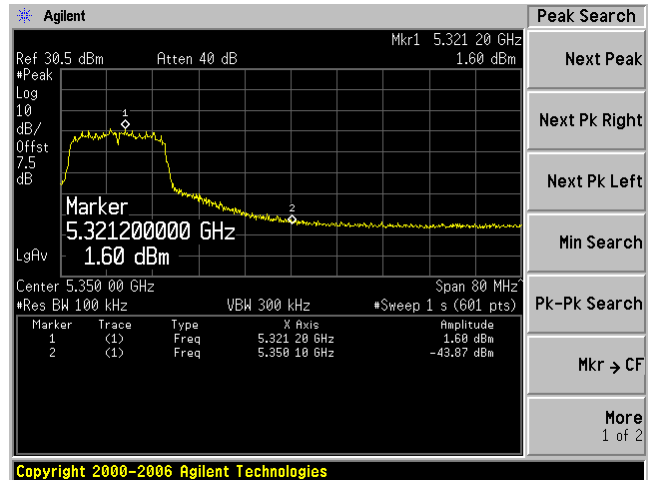


5250-5350 MHz

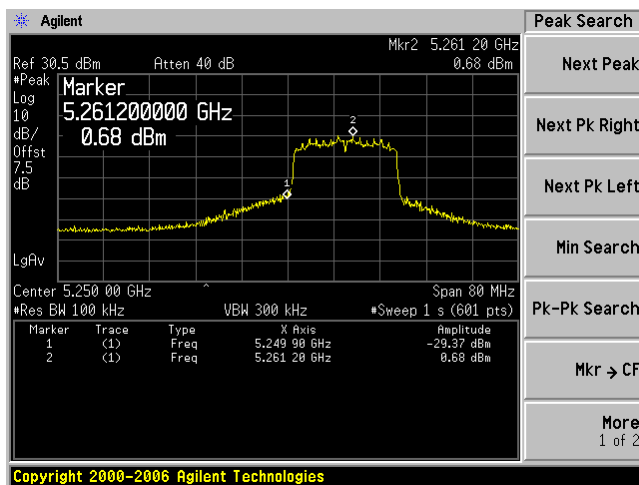
802.11 a mode, Aux, 5250



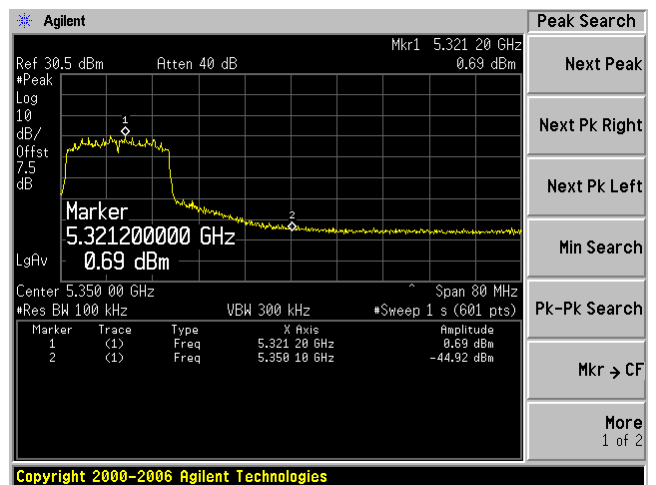
802.11 a mode, Aux, 5350



802.11 n mode, Aux, 5250

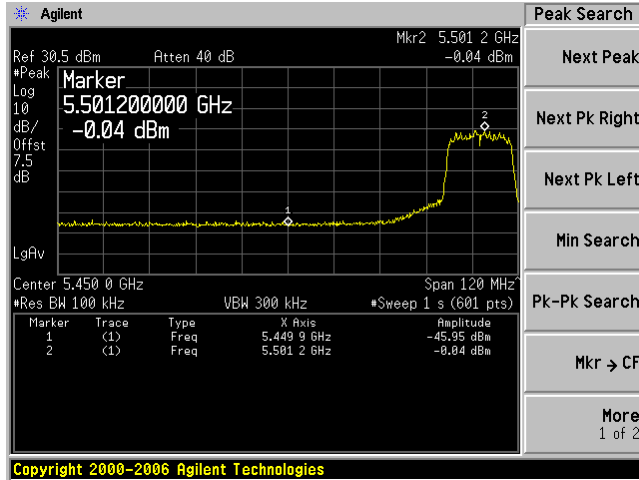


802.11 n mode, Aux, 5350

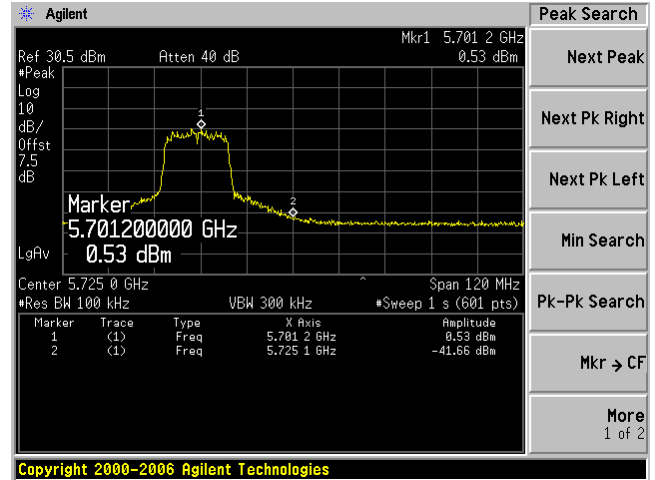


5450-5725 MHz

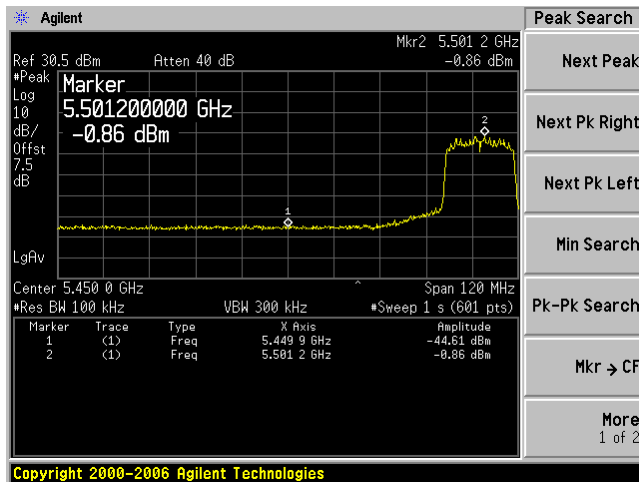
802.11 a mode, Main, 5450



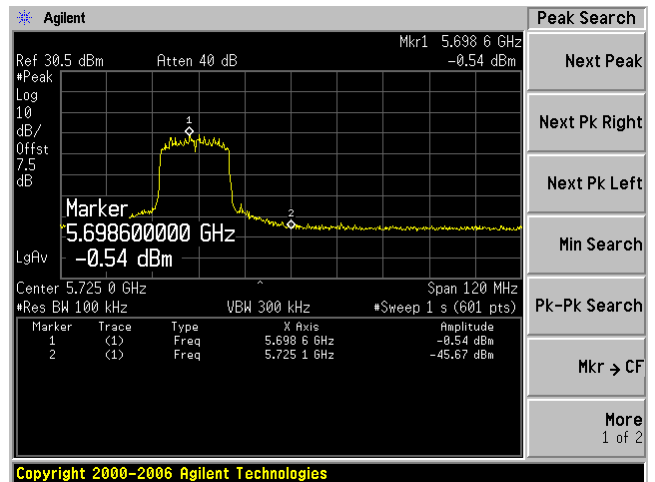
802.11 a mode, Main, 5725



802.11 n mode, Main, 5450

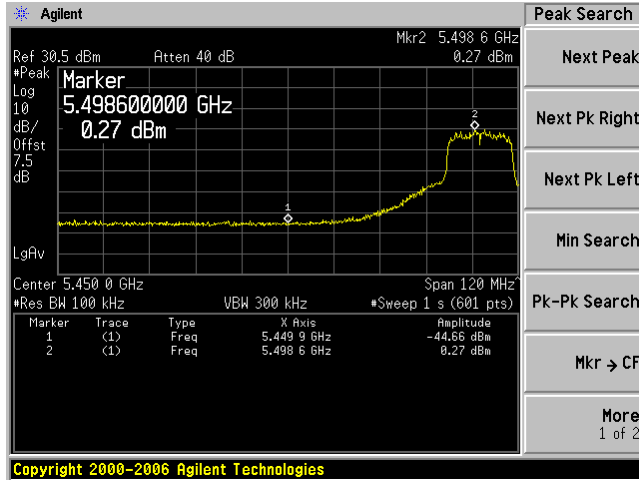


802.11 n mode, Main, 5725

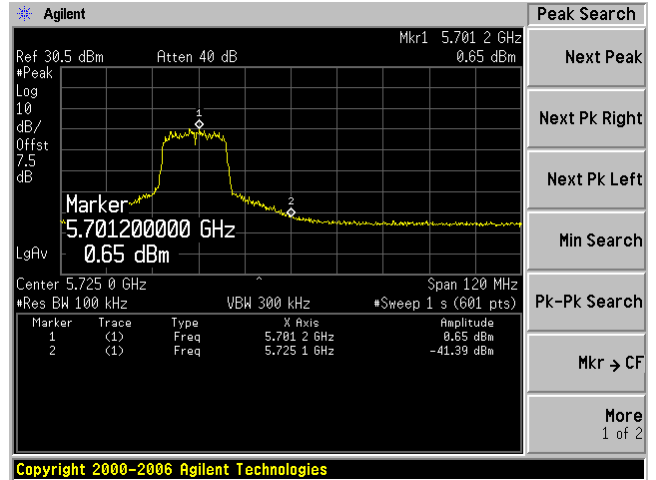


5450-5725 MHz

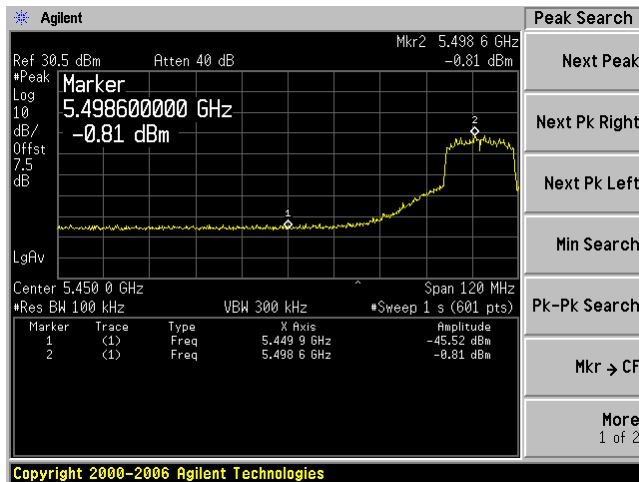
802.11 a mode, Aux, 5450



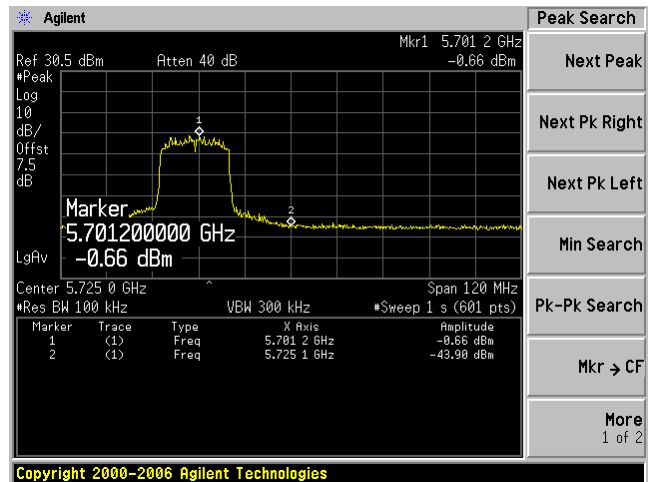
802.11 a mode, Aux, 5725



802.11 n mode, Aux, 5450



802.11 n mode, Aux, 5725



10 FCC §15.407(a) & IC RSS-210 §A9.2 - Power Spectral Density

10.1 Applicable Standard

According to FCC §15.407(a) and UC RSS-210 §A9.2

(1) For the band 5.15–5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or $4 \text{ dBm} + 10 \log B$, where B is the 26-dB emission bandwidth in MHz. In addition, the peak power spectral density shall not exceed 4 dBm in any 1-MHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

2) For the 5.25–5.35 GHz and 5.47–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or $11 \text{ dBm} + 10 \log B$, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

10.2 Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT was set without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Adjust the center frequency of SA on any frequency be measured and set SA to 1.5MHz span mode. And then, set RBW and VBW of spectrum analyzer to proper value.
4. Repeat above procedures until all frequencies measured were complete.

10.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date
Agilent	Spectrum Analyzer	E4440A	MY44303352	2011-05-10

Statement of Traceability: **BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

10.4 Test Environmental Conditions

Temperature:	23-25 °C
Relative Humidity:	35-50 %
ATM Pressure:	101-103kPa

The testing was performed by Ning Ma on 2011-11-14~ 2011-11-19 at RF Site.

10.5 Test Results**5150-5250 MHz Band:**

Channel	Frequency (MHz)	TX Main PSD (dBm)	TX Aux PSD (dBm)	Worst PSD (dBm)	Limit (dBm/MHz)	Margin (dB)
802.11a mode						
Low	5180	5.623	5.718	5.718	10	-4.282
Middle	5200	5.609	5.334	5.609	10	-4.391
High	5240	5.612	5.619	5.619	10	-4.381
802.11n mode						
Low	5180	4.582	4.448	4.582	10	-5.418
Middle	5200	5.334	4.1	5.334	10	-4.666
High	5240	5.619	4.82	5.619	10	-4.381

5250-5350 MHz Band:

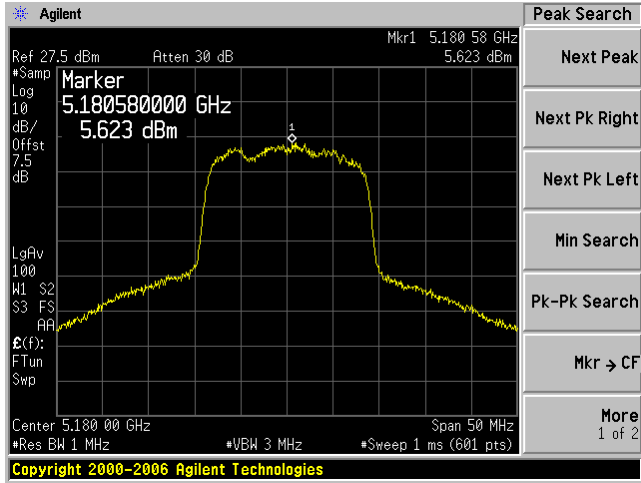
Channel	Frequency (MHz)	TX Main PSD (dBm)	TX Aux PSD (dBm)	Worst PSD (dBm)	Limit (dBm/MHz)	Margin (dB)
802.11a mode						
Low	5260	4.684	5.424	5.424	10	-4.576
Middle	5280	4.973	5.68	5.68	10	-4.32
High	5320	5.44	5.75	5.75	10	-4.25
802.11n mode						
Low	5260	4.582	4.328	4.582	10	-5.418
Middle	5280	5.334	4.936	5.334	10	-4.666
High	5320	5.619	4.018	5.619	10	-4.381

5450-5725 MHz Band:

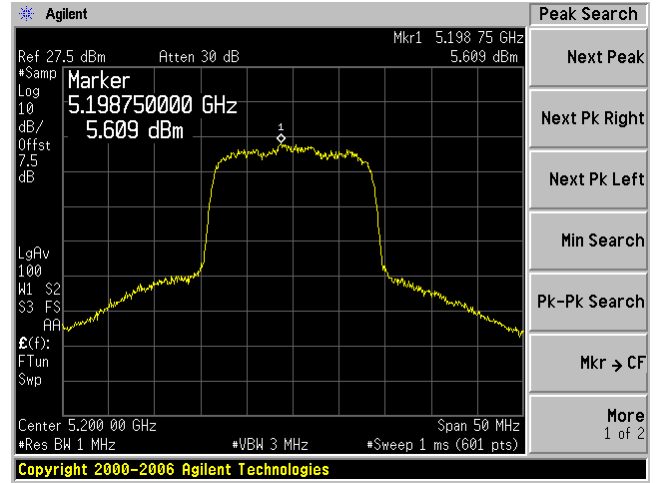
Channel	Frequency (MHz)	TX Main PSD (dBm)	TX Aux PSD (dBm)	Worst PSD (dBm)	Limit (dBm/MHz)	Margin (dB)
802.11a mode						
Low	5500	3.911	4.168	4.168	10	-5.832
Middle	5580	4.515	3.952	4.515	10	-5.485
High	5700	4.655	4.595	4.655	10	-5.345
802.11n mode						
Low	5500	2.799	2.742	2.799	10	-7.201
Middle	5580	3.399	3.571	3.571	10	-6.429
High	5700	3.604	3.915	3.915	10	-6.085

5150-5250 MHz

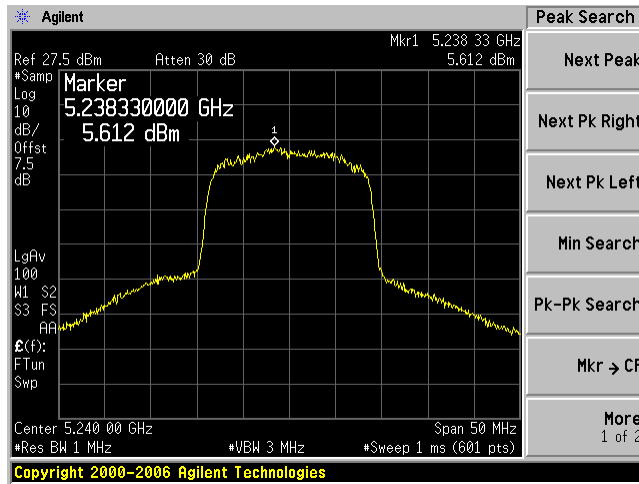
802.11a mode, main, 5180



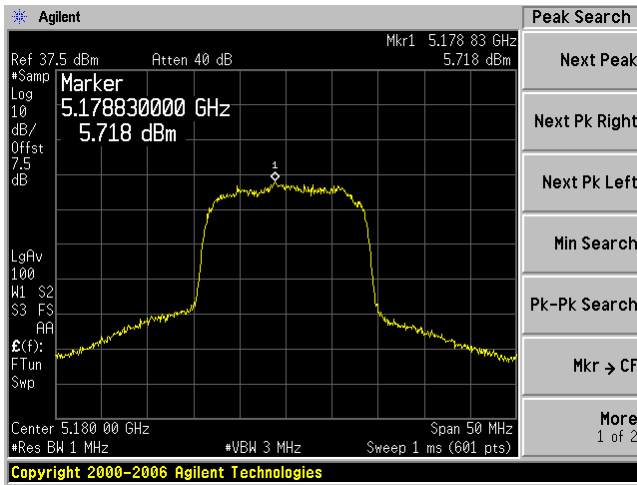
802.11a mode, main, 5200



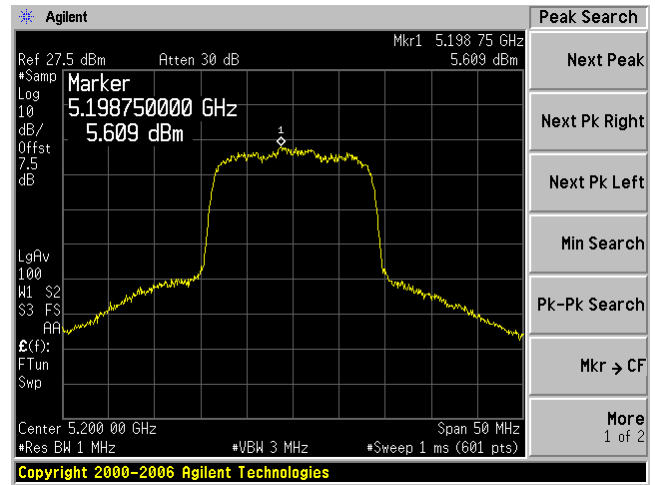
802.11a mode, main, 5240



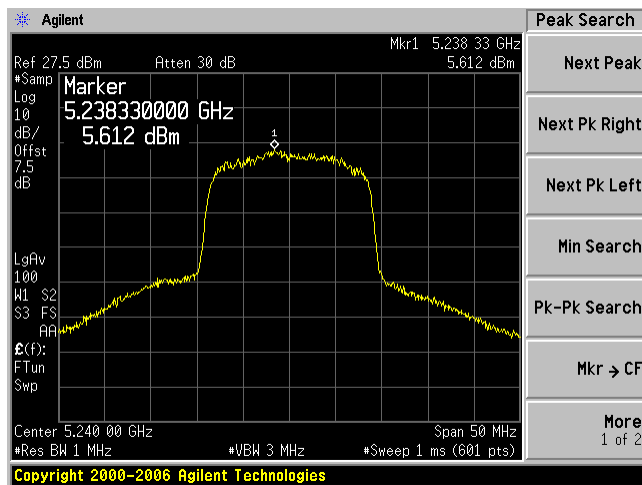
802.11a mode, aux, 5180



802.11a mode, aux, 5200

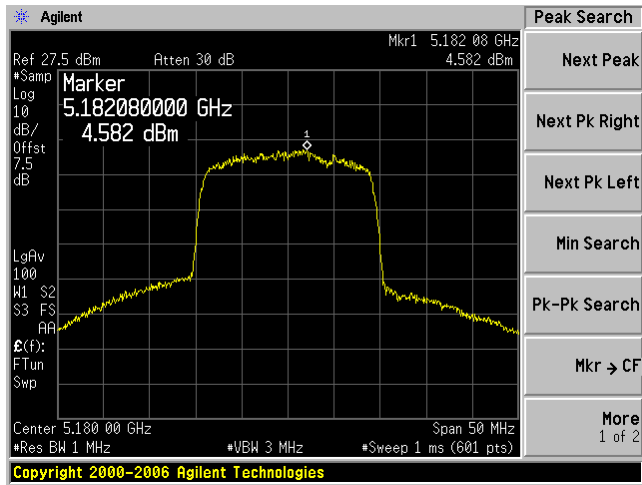


802.11a mode, aux, 5240

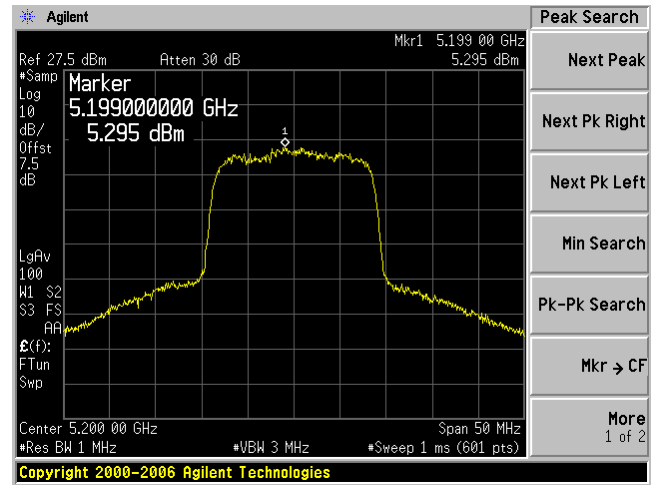


5150-5250 MHz

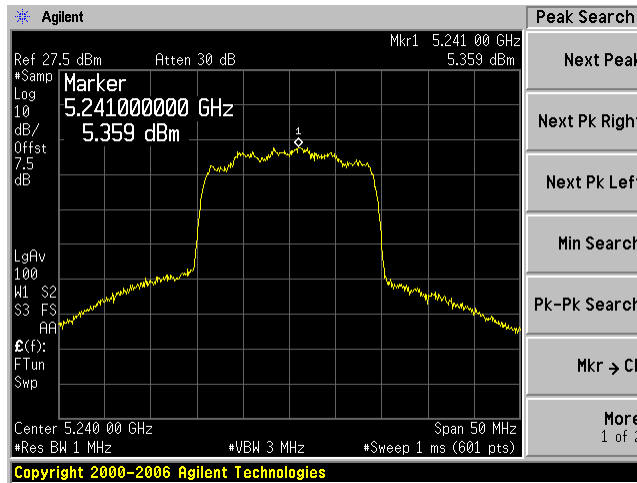
802.11n mode, main, 5180



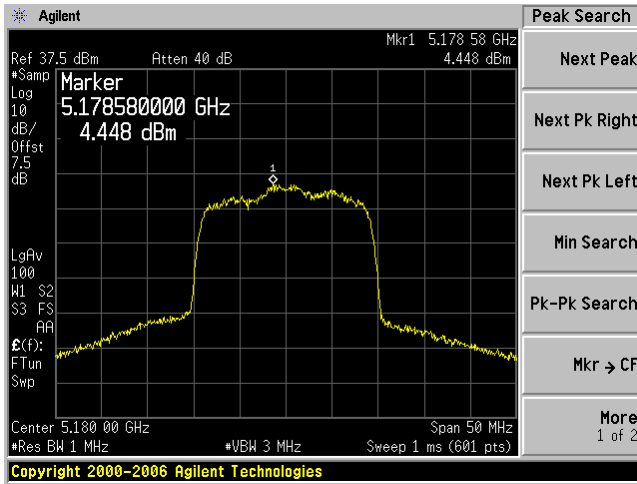
802.11n mode, main, 5200



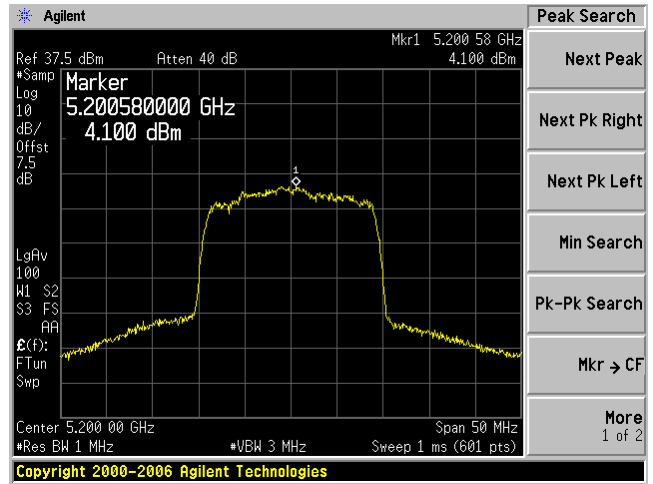
802.11n mode, main, 5240



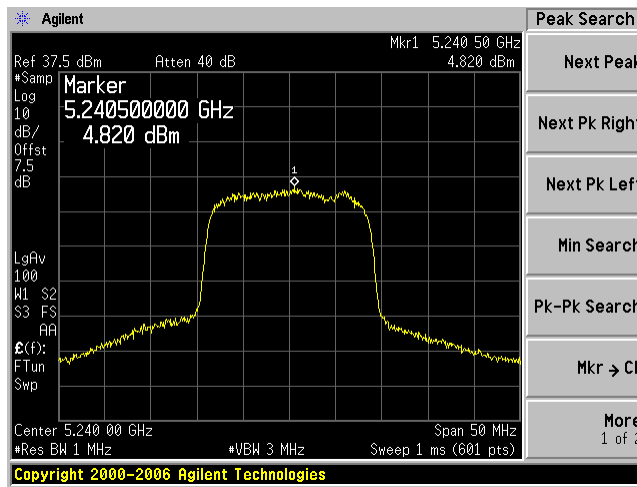
802.11n mode, aux, 5180



802.11n mode, aux, 5200

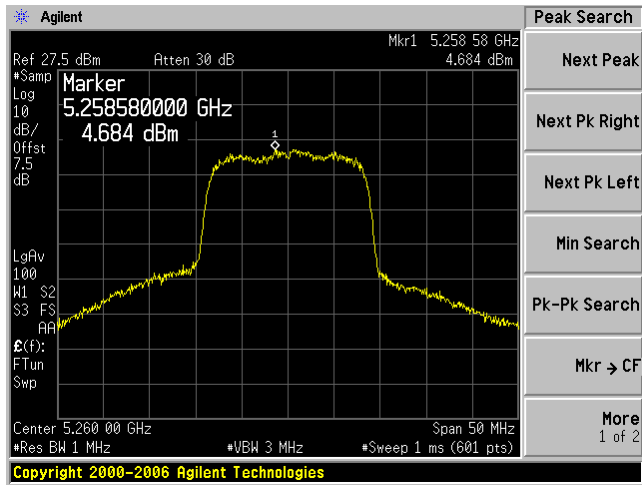


802.11n mode, aux, 5240

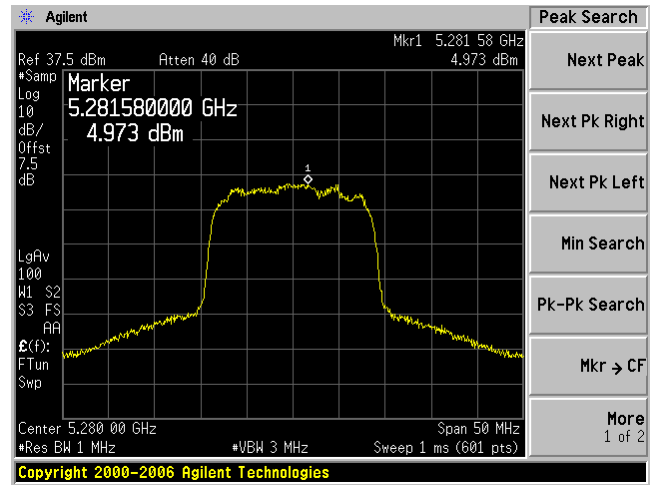


5250-5350 MHz

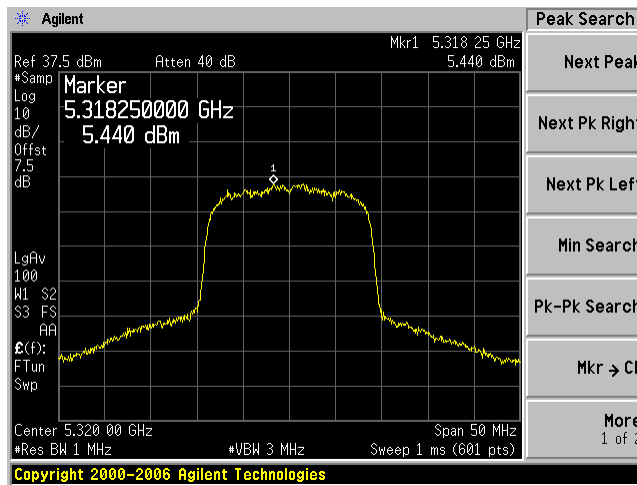
802.11a mode, main, 5260



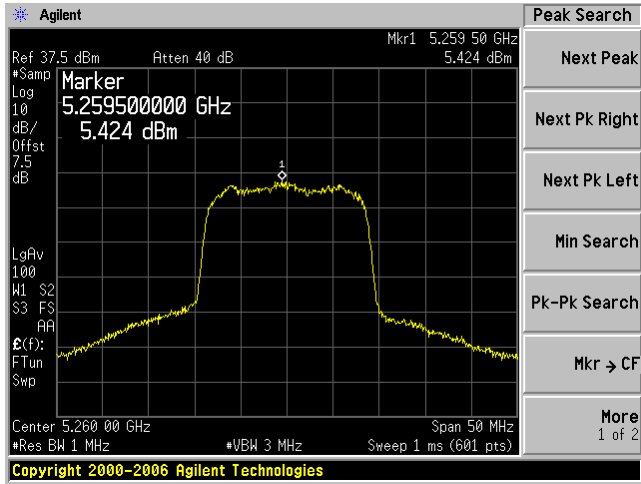
802.11a mode, main, 5280



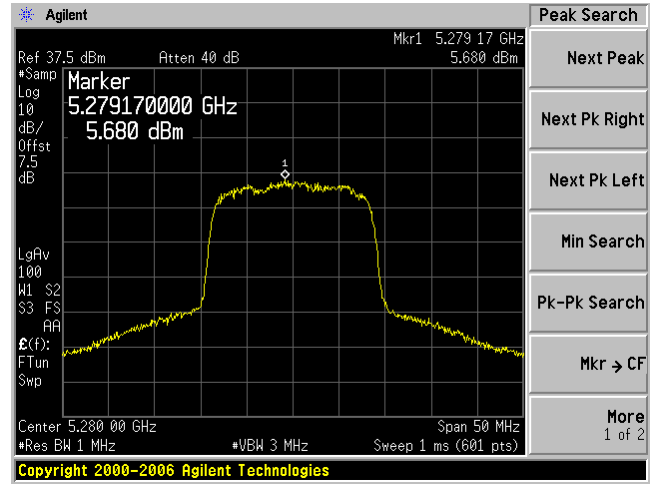
802.11a mode, main, 5320



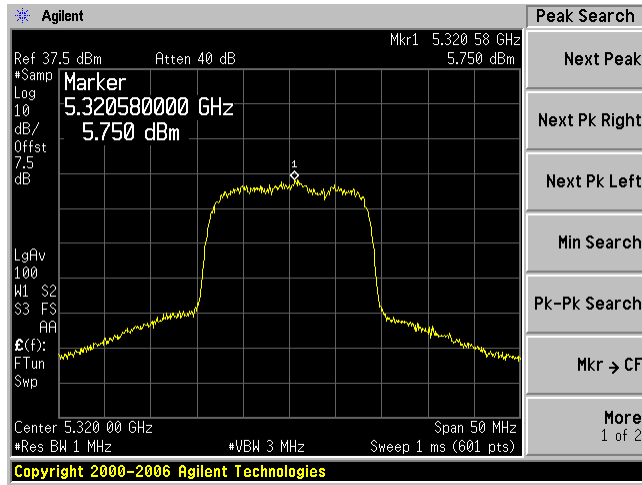
802.11a mode, aux, 5260



802.11a mode, aux, 5280

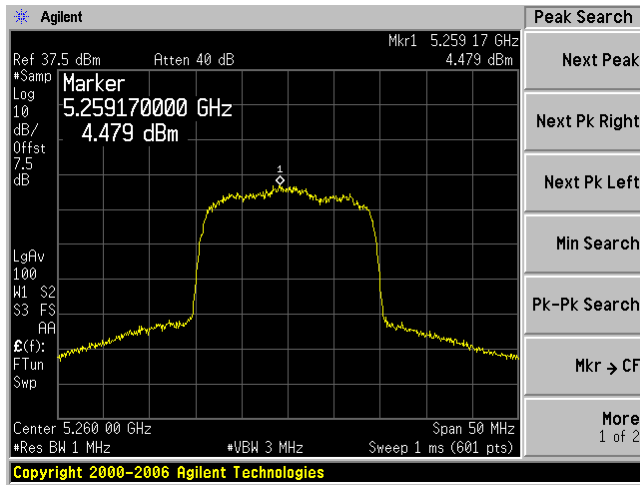


802.11a mode, aux, 5320

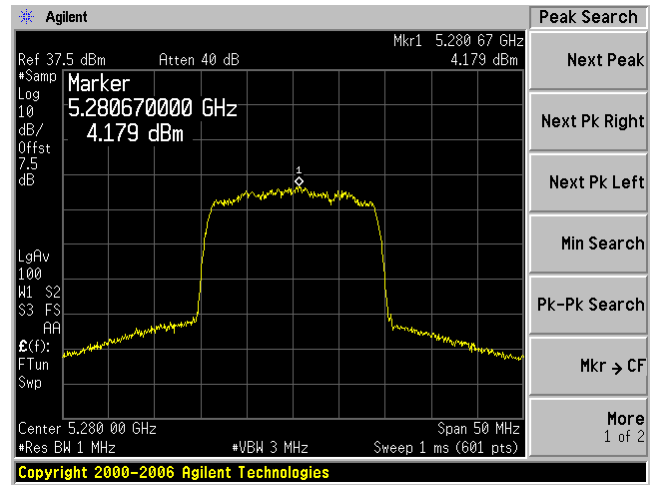


5250-5350 MHz

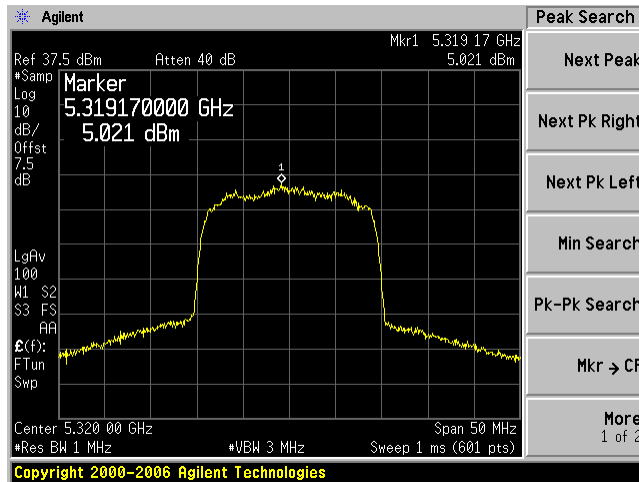
802.11n mode, main, 5260



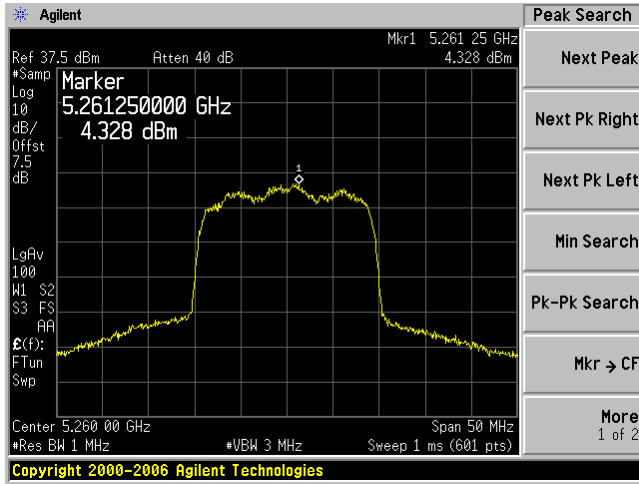
802.11n mode, main, 5280



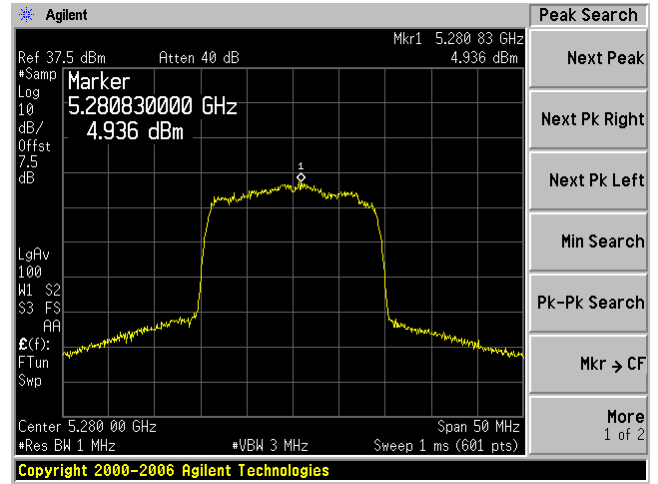
802.11n mode, main, 5320



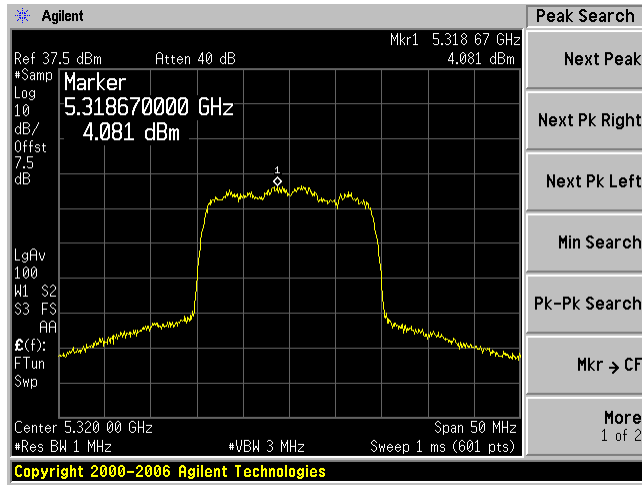
802.11n mode, aux, 5260



802.11n mode, aux, 5280



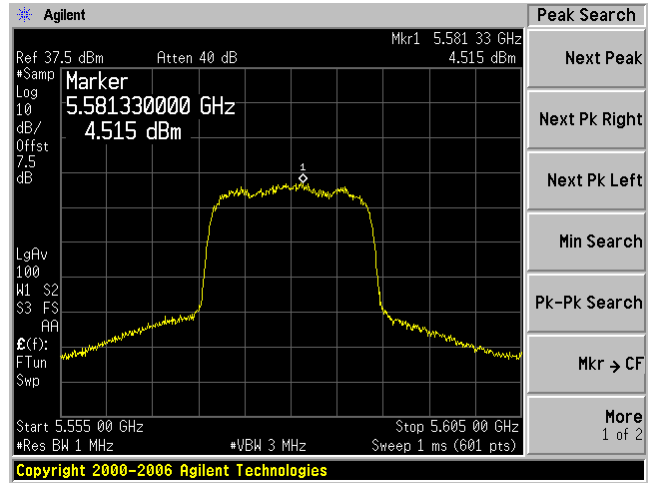
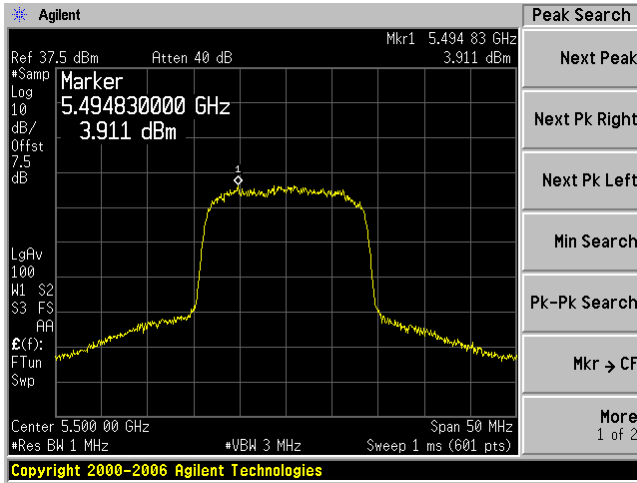
802.11n mode, aux, 5320



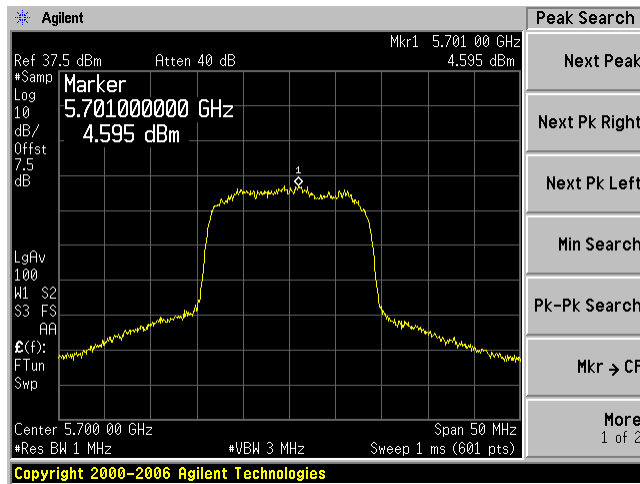
5450-5700 MHz

802.11a mode, main, 5500

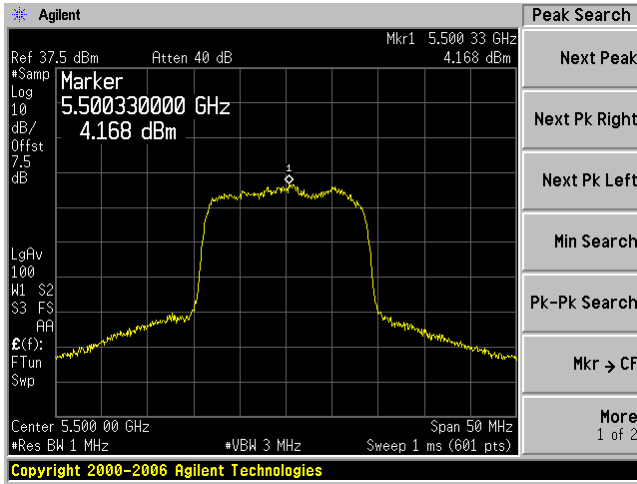
802.11a mode, main, 5580



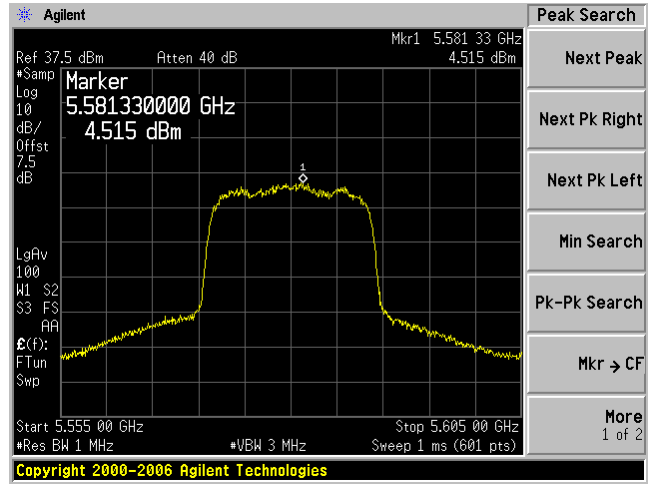
802.11a mode, main, 5700



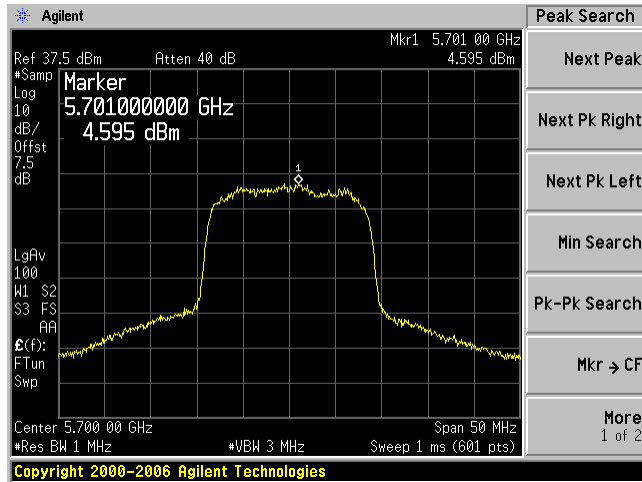
802.11a mode, aux, 5500



802.11a mode, aux, 5580

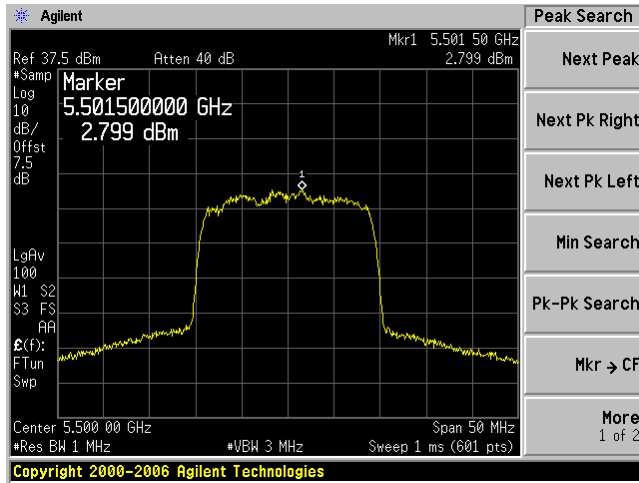


802.11a mode, aux, 5700

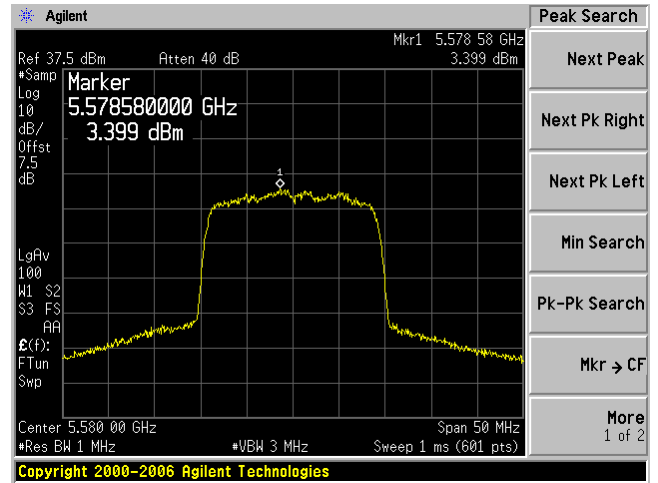


5450-5725 MHz

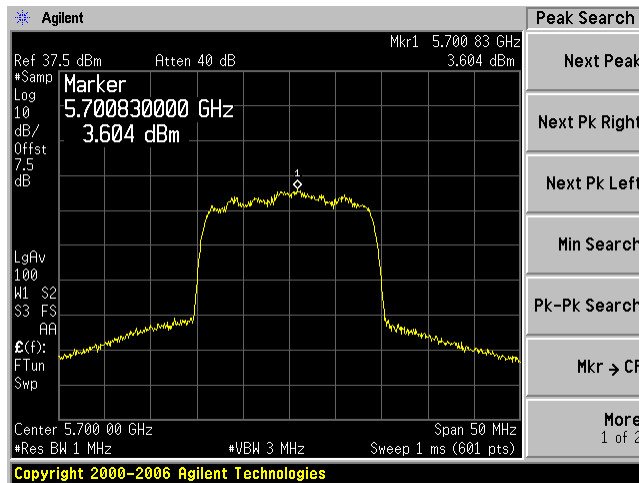
802.11n mode, main, 5500



802.11n mode, main, 5580

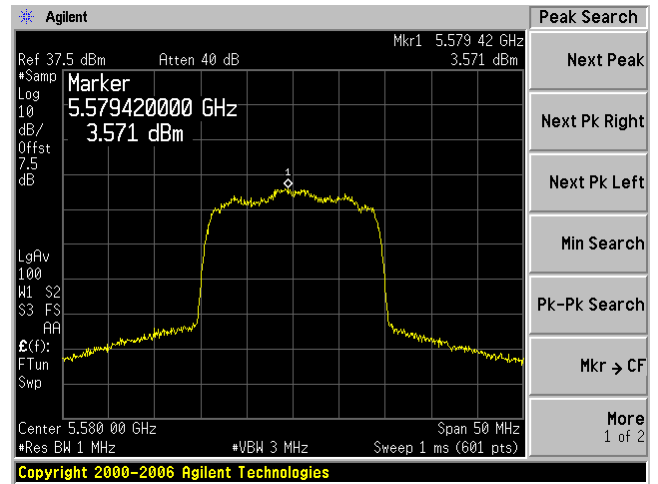
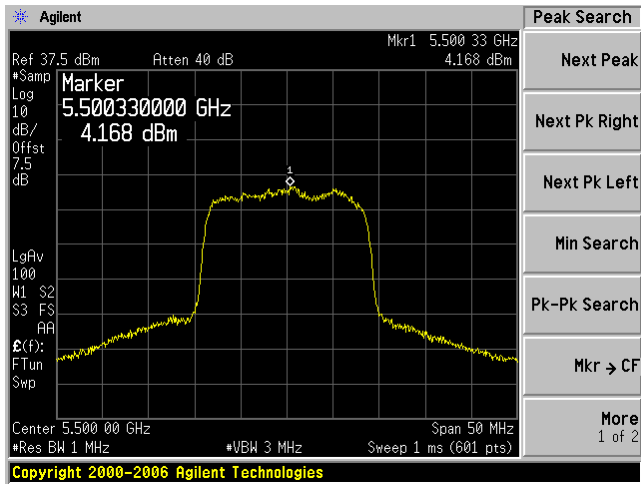


802.11n mode, main, 5700

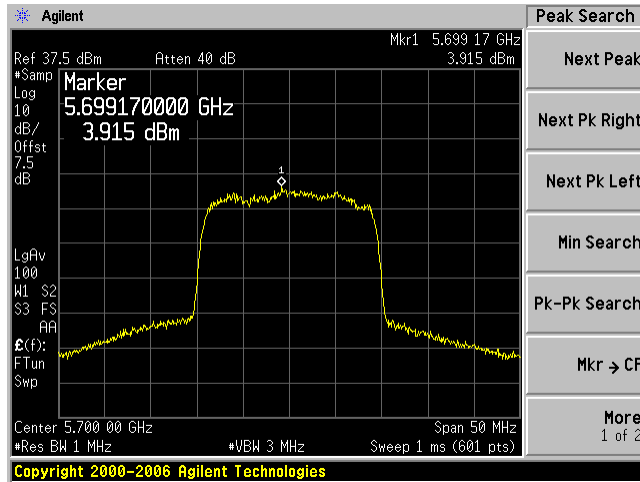


802.11 n 20 mode, aux, 5500

802.11 n 20 mode, aux, 5580



802.11n mode, aux, 5700



11 FCC §15.407(a)(6) – Peak Excursion Ratio

11.1 Applicable Standard

According to FCC §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.

11.2 Test Procedure

Set the spectrum analyzer span to view the entire emission bandwidth. The largest difference between the following two traces must be ≤ 13 dB for all frequencies across the emission bandwidth. Submit a plot.

1st Trace:

- Set RBW = 1 MHz, VBW ≥ 3 MHz with peak detector and maxhold settings.

2nd Trace:

- create the 2nd trace using the settings described in the setion “FCC §15.407(a)(1)(2) – CONDUCTED TRANSMITTER OUTPUT POWER”.

11.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date
Agilent	Spectrum Analyzer	E4440A	MY44303352	2011-05-10

Statement of Traceability: BACL Corp. attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

11.4 Test Environmental Conditions

Temperature:	23-25 °C
Relative Humidity:	35-50 %
ATM Pressure:	101-103kPa

The testing was performed by Ning Ma on 2011-11-14~ 2011-11-19 at RF Site.

11.5 Test Results**5150-5250 MHz Band:**

Channel	Frequency (MHz)	TX Main PER (dB)	TX Aux PER (dB)	Worst PER (dB)	Limit (dB)
802.11a mode					
Low	5180	8.37	7.79	9.37	13
Middle	5200	8.28	7.63	9.28	
High	5240	8.17	7.58	9.17	
802.11n mode					
Low	5180	9.02	8.98	10.02	13
Middle	5200	9.13	8.96	10.13	
High	5240	9.11	8.57	10.11	

5250-5350 MHz Band:

Channel	Frequency (MHz)	TX Main PER (dB)	TX Aux PER (dB)	Worst PER (dB)	Limit (dB)
802.11a mode					
Low	5260	8.12	7.63	8.12	13
Middle	5280	8.29	7.65	8.29	
High	5320	8.37	7.37	8.37	
802.11n mode					
Low	5260	8.89	8.69	8.89	13
Middle	5280	8.86	8.72	8.86	
High	5320	8.92	8.83	8.92	

5450-5725 MHz Band:

Channel	Frequency (MHz)	TX Main PER (dB)	TX Aux PER (dB)	Worst PER (dB)	Limit (dB)
802.11a mode					
Low	5500	8.89	8.13	8.89	13
Middle	5580	8.87	8.21	8.87	
High	5700	8.68	8.09	8.68	
802.11n mode					
Low	5500	9.13	8.89	9.13	13
Middle	5580	9.19	8.76	9.19	
High	5700	9.07	8.92	9.07	

12 IC RSS-210 §2.6 & RSS-Gen §6 - Receiver Spurious Radiated Emissions

12.1 Applicable Standard

According to RSS-Gen §4.10, The receiver shall be operated in the normal receive mode near the mid-point of the band over which the receiver is designed to operate.

Unless otherwise specified in the applicable RSS, the radiated emission measurement is the standard measurement method (with the device's antenna in place) to measure receiver spurious emissions.

Radiated emission measurements are to be performed using a calibrated open-area test site.

For either method, the search for spurious emissions shall be from the lowest frequency internally generated or used in the receiver (e.g. local oscillator, intermediate or carrier frequency), or 30 MHz, whichever is the higher, to at least 3 times the highest tuneable or local oscillator frequency, whichever is the higher, without exceeding 40 GHz.

For emissions below 1 GHz, measurements shall be performed using a CISPR quasi-peak detector and the related measurement bandwidth. As an alternative to CISPR quasi-peak measurement, compliance with the emission limit can be demonstrated using measuring equipment employing a peak detector with the same measurement bandwidth as that for CISPR quasi-peak measurements. Above 1 GHz, measurements shall be performed using an average detector and a resolution bandwidth of 300 kHz to 1 MHz.

According to RSS-210 §2.6, Tables 2 and 3 show the general field strength limits of unwanted emissions, where applicable, for transmitters and receivers operating in accordance with the provisions specified in this RSS. Transmitters whose wanted emissions are also within the limits shown in Tables 2 and 3 may operate in any of the frequency bands of Tables 2 and 3, other than the restricted bands of Table 1 and the TV bands, and shall be certified under RSS-210.

Table 2: General Field Strength Limits for Transmitters and Receivers at Frequencies above 30 MHz ^(Note)

Frequency (MHz)	Field Strength Microvolts/m at 3 meters (watts, e.i.r.p.)	
	Transmitters	Receivers
30-88	100 (3 nW)	100 (3 nW)
88-216	150 (6.8 nW)	150 (6.8 nW)
216-960	200 (12 nW)	200 (12 nW)
Above 960	500 (75 nW)	500 (75 nW)

Note: Transmitting devices are not permitted in Table 1 bands or in TV bands (54-72 MHz, 76-88 MHz, 174-216 MHz, 470-608 MHz, and 614-806 MHz). Prohibition of operation in TV bands does not apply to momentary devices, or to medical telemetry devices in the band 174-216 MHz, and to perimeter protection systems in the bands 54-72 and 76-88 MHz. The perimeter protection devices are to meet Table 3 field strengths limits.

Table 3: General Field Strength Limits for Transmitters at Frequencies below 30 MHz (Transmit)

Frequency (fundamental or spurious)	Field Strength (microvolts/m)	Magnetic H-Field (microamperes/m)	Measurement Distance (metres)
9-490 kHz	2,400/F (F in kHz)	2,400/377F (F in kHz)	300
490-1,705 kHz	24,000/F (F in kHz)	24,000/377F (F in kHz)	30
1.705-30 MHz	30	N/A	30

Note: The emission limits for the bands 9-90 kHz and 110-490 kHz are based on measurements employing an average detector.

12.2 EUT Setup

The radiated emissions tests were performed in the 3 meter chamber, using the setup in accordance with ANSI C63.4-2003.

12.3 Test Procedure

Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations.

All data were recorded in the peak detection mode. Quasi-peak readings was performed only when an emissions was found to be marginal (within -4 dB of specification limits), and are distinguished with a "QP" in the data table.

12.4 Corrected Amplitude & Margin Calculation

The Corrected Amplitude (CA) is calculated by adding the Antenna Factor (AF), the Cable Loss (CL), the Attenuator Factor (Atten) and subtracting the Amplifier Gain (Ga) to indicated Amplitude (Ai) reading. The basic equation is as follows:

$$CA = Ai + AF + CL + Atten - Ga$$

For example, a corrected amplitude of 40.3 dBuV/m = Indicated Reading (32.5 dBuV) + Antenna Factor (+23.5dB) + Cable Loss (3.7 dB) + Attenuator (10 dB) - Amplifier Gain (29.4 dB)

The "**Margin**" column of the following data tables indicates the degree of compliance within the applicable limit. For example, a margin of -7 dB means the emission is 7 dB below the maximum limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corrected Amplitude} - \text{Limit}$$

12.5 Test Equipment Lists and Details

Manufacturer	Description	Model Number	Serial Number	Calibration Date
Rohde & Schwarz	EMI Test Receiver	ESCI 1166.5950K03	100337	2011-03-21
Agilent	Spectrum Analyzer	E4440A	MY44303352	2011-05-10
Sunol Science Corp	System Controller	SC99V	122303-1	N/R
Sunol Science Corp	Combination Antenna	JB3	A0020106-3	2011-06-29
A.R.A Inc	Horn antenna	DRG-1181A	1132	2010-11-29
Hewlett Packard	Pre amplifier	8447D	2944A06639	2011-06-09
Mini-Circuits	Pre Amplifier	ZVA-183-S	570400946	2011-05-09

Statement of Traceability: BACL attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

12.6 Test Environmental Conditions

Temperature:	18~21 °C
Relative Humidity:	30~35 %
ATM Pressure:	101.2-102.2kPa

The testing was performed by jerry Huang from 2011-12-15 to 2011-12-17.

12.7 Summary of Test Results

According to the test data,, the EUT complied with the with the RSS-210, with the closest margins from the limit listed below:

30-1000 MHz:

Mode: Receiving			
Margin (dB)	Frequency (MHz)	Polarization (Horizontal/Vertical)	Range (MHz)
-3.88	249.9533	Vertical	30 to 1000

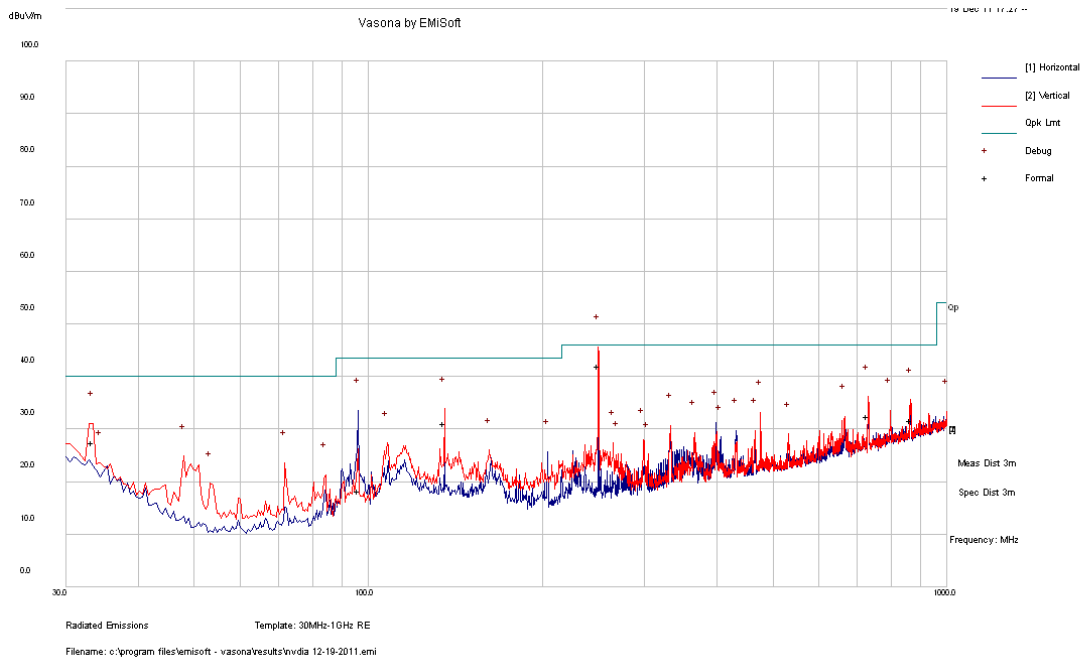
1 – 50 GHz:

Mode: Transmitting			
Margin (dB)	Frequency (MHz)	Polarization (Horizontal/Vertical)	Channel, Range
- ¹	-	-	-

- **Note:** ¹All spurious emissions are 20 dB below the limit or are on the noise floor level

Radiated Emission at 3 meters, 30 MHz -1GHz

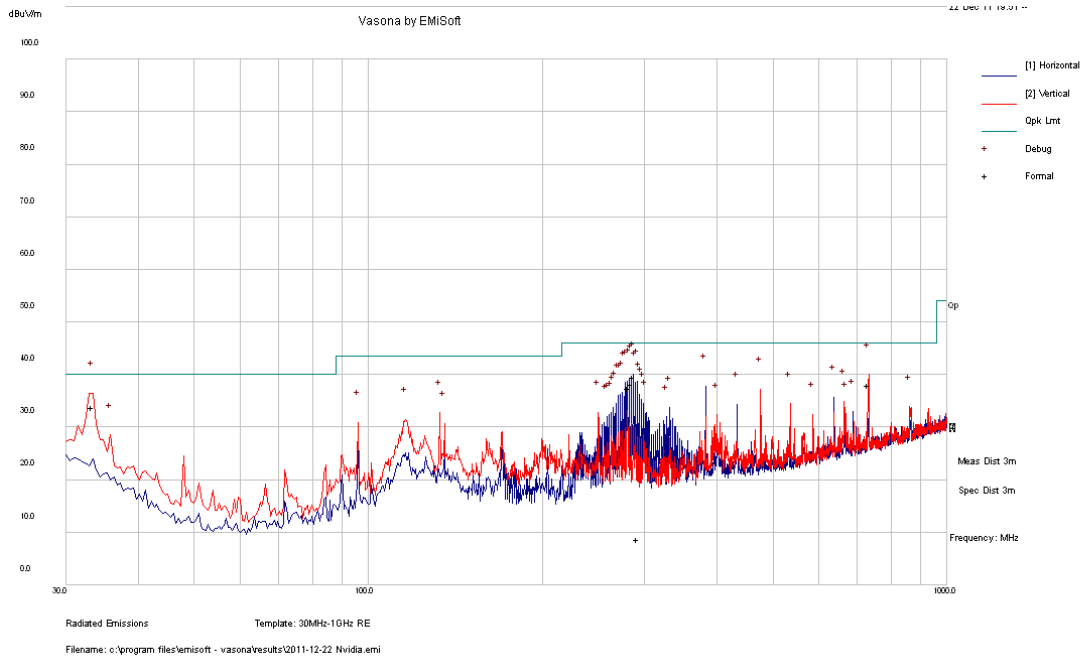
5.2 GHz Band



Quasi-Peak Measurements

Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
249.9533	42.12	100	V	178	46	-3.88
33.289	27.51	150	V	211	40	-12.49
135.336	31.05	116	V	280	43.5	-12.45
729.4933	32.43	99	V	171	46	-13.57
95.99775	18.3	302	H	283	43.5	-25.2
865.681	31.65	112	V	160	46	-14.35

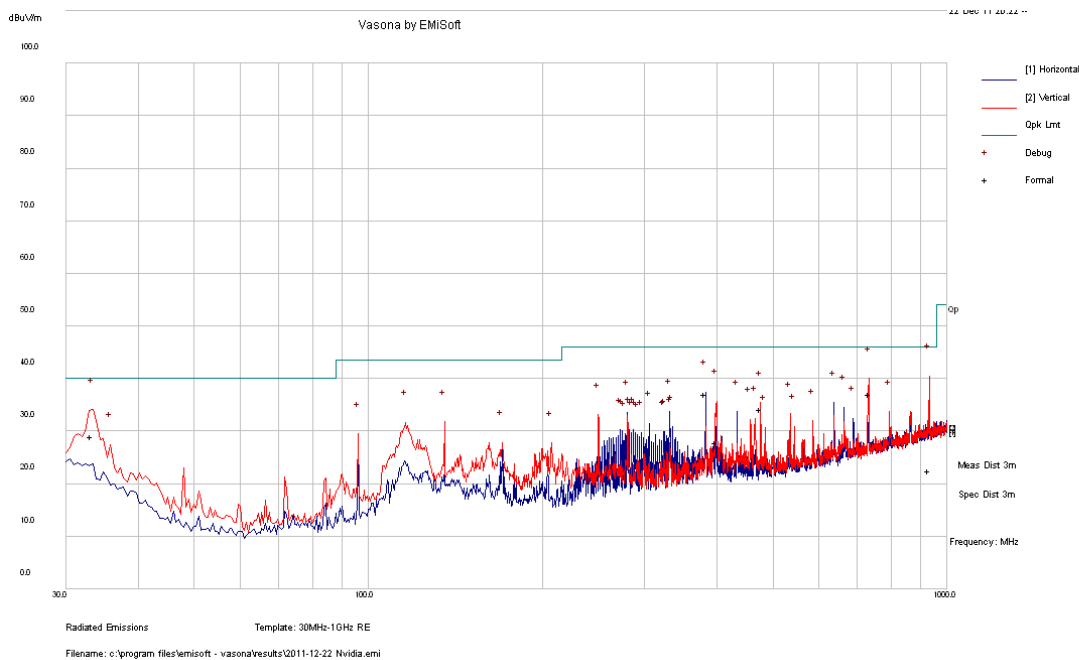
5.3 GHz Band



Quasi-Peak Measurements

Frequency (MHz)	Corrected Amplitude (dBµV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBµV/m)	Margin (dB)
33.28975	33.8	112	V	125	40	-6.2
286.967	39.61	99	H	140	46	-6.39
732.6328	37.95	99	V	185	46	-8.05
284.7123	38.24	113	H	137	46	-7.76
282.1153	37.46	124	H	133	46	-8.54
291.8143	8.71	177	H	52	46	-37.29

5.6 GHz Band



Quasi-Peak Measurements

Frequency (MHz)	Corrected Amplitude (dBμV/m)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Azimuth (degrees)	Limit (dBμV/m)	Margin (dB)
931.1538	22.48	112	V	140	46	-23.52
33.18475	28.95	161	V	108	40	-11.05
733.0678	37.17	100	V	182	46	-8.83
382.4628	37.03	99	H	40	46	-8.97
399.7485	27.93	99	V	299	46	-18.07
476.0443	34.18	100	V	145	46	-11.82

1-50 GHz, Measured at 3 meters

5.2 GHz 802.11a mode:

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5180 MHz, measured at 3 meters											
5180	61.62	232	100	V	33.323	4.56	0	99.503	Fund	-	peak
5180	58.91	197	100	H	33.323	4.56	0	96.793	Fund	-	peak
5180	49.94	232	100	V	33.323	4.56	0	87.823	Fund	-	Ave
5180	47.01	197	100	H	33.323	4.56	0	84.893	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Middle Channel 5200 MHz, measured at 3 meters											
5200	58.67	230	100	V	33.545	4.55	0	96.765	Fund	-	peak
5200	57.43	200	100	H	33.545	4.55	0	95.525	Fund	-	peak
5200	47.19	230	100	V	33.545	4.55	0	85.285	Fund	-	Ave
5200	45.59	200	100	H	33.545	4.55	0	83.685	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
High Channel 5240 MHz, measured at 3 meters											
5240	57.23	233	100	V	33.545	4.6	0	95.375	Fund	-	peak
5240	57.31	200	100	H	33.545	4.6	0	95.455	Fund	-	peak
5240	46.05	233	100	V	33.545	4.6	0	84.195	Fund	-	Ave
5240	45.45	200	100	H	33.545	4.6	0	83.595	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

- **Note:** ¹All spurious emissions are 20 dB below the limit or are on the noise floor level

5.2 GHz 802.11n mode:

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5180 MHz, measured at 3 meters											
5180	59.04	230	100	V	33.323	4.56	0	96.923	Fund	-	peak
5180	56.27	200	100	H	33.323	4.56	0	94.153	Fund	-	peak
5180	47.65	230	100	V	33.323	4.56	0	85.533	Fund	-	Ave
5180	45.94	200	100	H	33.323	4.56	0	83.823	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Middle Channel 5200 MHz, measured at 3 meters											
5200	57.86	231	100	V	33.545	4.55	0	95.955	Fund	-	peak
5200	55.38	200	100	H	33.545	4.55	0	93.475	Fund	-	peak
5200	47.1	231	100	V	33.545	4.55	0	85.195	Fund	-	Ave
5200	45.09	200	100	H	33.545	4.55	0	83.185	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
High Channel 5240 MHz, measured at 3 meters											
5240	56.62	233	100	V	33.545	4.6	0	94.765	Fund	-	peak
5240	55.89	198	100	H	33.545	4.6	0	94.035	Fund	-	peak
5240	45.52	233	100	V	33.545	4.6	0	83.665	Fund	-	Ave
5240	44.8	198	100	H	33.545	4.6	0	82.945	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

- **Note:** ¹All spurious emissions are 20 dB below the limit or are on the noise floor level

5.3 GHz 802.11a mode:

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5180 MHz, measured at 3 meters											
5260	57.95	238	107	V	33.545	4.6	0	96.095	Fund	-	peak
5260	57.86	200	100	H	33.545	4.6	0	96.005	Fund	-	peak
5260	46.32	238	107	V	33.545	4.6	0	84.465	Fund	-	Ave
5260	45.66	200	100	H	33.545	4.6	0	83.805	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Middle Channel 5200 MHz, measured at 3 meters											
5280	56.75	238	100	V	33.659	4.6	0	95.009	Fund	-	peak
5280	58.58	200	100	H	33.659	4.6	0	96.839	Fund	-	peak
5280	47.8	238	100	V	33.659	4.6	0	86.059	Fund	-	Ave
5280	47.7	200	100	H	33.659	4.6	0	85.959	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
High Channel 5240 MHz, measured at 3 meters											
5320	59.34	241	102	V	33.659	4.7	0	97.699	Fund	-	peak
5320	60.62	200	100	H	33.659	4.7	0	98.979	Fund	-	peak
5320	48.28	241	102	V	33.659	4.7	0	86.639	Fund	-	Ave
5320	47.95	200	100	H	33.659	4.7	0	86.309	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

- **Note:** ¹All spurious emissions are 20 dB below the limit or are on the noise floor level

5.3 GHz 802.11n mode:

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5180 MHz, measured at 3 meters											
5260	56.51	234	100	V	33.545	4.6	0	94.655	Fund	-	peak
5260	57.14	200	100	H	33.545	4.6	0	95.285	Fund	-	peak
5260	45.72	234	100	V	33.545	4.6	0	83.865	Fund	-	Ave
5260	46.28	200	100	H	33.545	4.6	0	84.425	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Middle Channel 5200 MHz, measured at 3 meters											
5280	59.36	242	100	V	33.659	4.6	0	97.619	Fund	-	peak
5280	60.68	200	102	H	33.659	4.6	0	98.939	Fund	-	peak
5280	47.04	242	100	V	33.659	4.6	0	85.299	Fund	-	Ave
5280	47.96	200	102	H	33.659	4.6	0	86.219	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
High Channel 5240 MHz, measured at 3 meters											
5320	57.26	241	100	V	33.659	4.7	0	95.619	Fund	-	peak
5320	58.05	200	100	H	33.659	4.7	0	96.409	Fund	-	peak
5320	46.7	241	100	V	33.659	4.7	0	85.059	Fund	-	Ave
5320	46.7	200	100	H	33.659	4.7	0	85.059	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

- **Note:** ¹All spurious emissions are 20 dB below the limit or are on the noise floor level

5.6 GHz 802.11a mode:

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5180 MHz, measured at 3 meters											
5500	64.28	230	100	V	33.081	4.57	0	101.931	Fund	-	peak
5500	65.45	220	100	H	33.081	4.57	0	103.101	Fund	-	peak
5500	51.46	230	100	V	33.081	4.57	0	89.111	Fund	-	Ave
5500	53.16	220	100	H	33.081	4.57	0	90.811	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Middle Channel 5200 MHz, measured at 3 meters											
5600	60.37	248	100	V	33.931	4.84	0	99.141	Fund	-	peak
5600	61.09	230	100	H	33.931	4.84	0	99.861	Fund	-	peak
5600	47.69	248	100	V	33.931	4.84	0	86.461	Fund	-	Ave
5600	48.85	230	100	H	33.931	4.84	0	87.621	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
High Channel 5240 MHz, measured at 3 meters											
5700	60.29	263	112	V	33.699	4.85	0	98.839	Fund	-	peak
5700	60.02	131	110	H	33.699	4.85	0	98.569	Fund	-	peak
5700	48.02	263	112	V	33.699	4.85	0	86.569	Fund	-	Ave
5700	48.26	131	110	H	33.699	4.85	0	86.809	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

- **Note:** ¹All spurious emissions are 20 dB below the limit or are on the noise floor level

5.6 GHz 802.11n mode:

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Low Channel 5180 MHz, measured at 3 meters											
5500	62.18	241	100	V	33.081	4.57	0	99.831	Fund	-	peak
5500	62.73	224	100	H	33.081	4.57	0	100.381	Fund	-	peak
5500	50.82	241	100	V	33.081	4.57	0	88.471	Fund	-	Ave
5500	52.05	224	100	H	33.081	4.57	0	89.701	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
Middle Channel 5200 MHz, measured at 3 meters											
5600	57.55	250	100	V	33.931	4.84	0	96.321	Fund	-	peak
5600	58.09	215	100	H	33.931	4.84	0	96.861	Fund	-	peak
5600	46.35	250	100	V	33.931	4.84	0	85.121	Fund	-	Ave
5600	47.21	215	100	H	33.931	4.84	0	85.981	Fund	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

Frequency (MHz)	S.A. Reading (dBµV)	Azimuth (degrees)	Test Antenna			Cable Loss (dB)	Pre-Amp. (dB)	Cord. Reading (dBµV/m)	FCC/IC		Comments
			Height (cm)	Polarity (H/V)	Factor (dB/m)				Limit (dBµV/m)	Margin (dB)	
High Channel 5240 MHz, measured at 3 meters											
5700	58.51	265	100	V	33.699	4.85	0	97.059	5700	-	peak
5700	57.9	132	100	H	33.699	4.85	0	96.449	5700	-	peak
5700	47	265	100	V	33.699	4.85	0	85.549	5700	-	Ave
5700	46.77	132	100	H	33.699	4.85	0	85.319	5700	-	Ave
-	-	-	-	-	-	-	-	-	-	-	- ¹

- **Note:** ¹All spurious emissions are 20 dB below the limit or are on the noise floor level

13 FCC §15.407(b) & IC RSS-210 §A9.2 - Spurious Emissions at Antenna Terminals

13.1 Applicable Standard

For FCC §15.407(b) and IC RSS-210 §A9.2, For transmitters operating in the 5.25–5.35 GHz band: all emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of –27 dBm/MHz. Devices operating in the 5.25–5.35 GHz band that generate emissions in the 5.15–5.25 GHz band must meet all applicable technical requirements for operation in the 5.15–5.25 GHz band (including indoor use) or alternatively meet an out-of-band emission EIRP limit of –27 dBm/MHz in the 5.15–5.25 GHz band. For transmitters operating in the 5.47–5.725 GHz band: all emissions outside of the 5.47–5.725 GHz band shall not exceed an EIRP of –27 dBm/MHz.

13.2 Measurement Procedure

The RF output of the EUT was connected to a spectrum analyzer through appropriate attenuation. The resolution bandwidth of the spectrum analyzer was set at 100 kHz. Sufficient scans were taken to show any out of band emissions up to 10th harmonic.

13.3 Test Equipment List and Details

Manufacturer	Description	Model No.	Serial No.	Calibration Date
Agilent	Spectrum Analyzer	E4440A	MY44303352	2011-05-10

Statement of Traceability: **BACL Corp.** attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

13.4 Test Environmental Conditions

Temperature:	23-25 °C
Relative Humidity:	35-50 %
ATM Pressure:	101-103kPa

The testing was performed by Lionel Lara from 2011-12-18 to 2011-12-20 at RF Test Site.

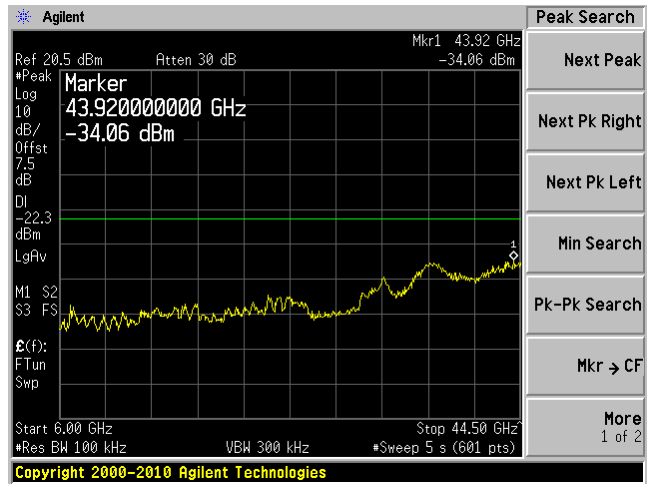
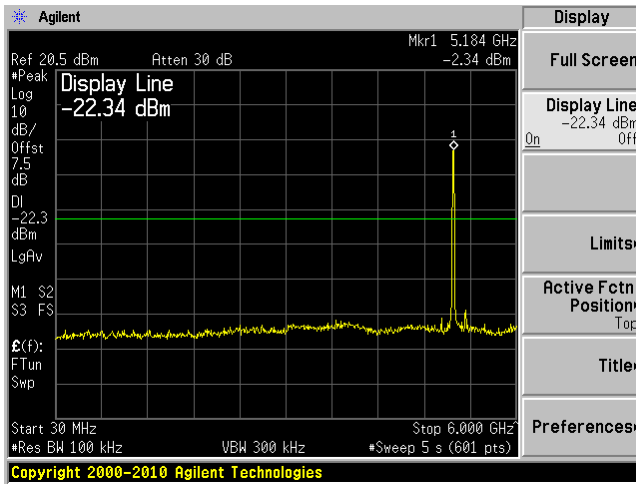
13.5 Test Results

Please refer to following plots of spurious emissions.

5150 - 5250 MHz

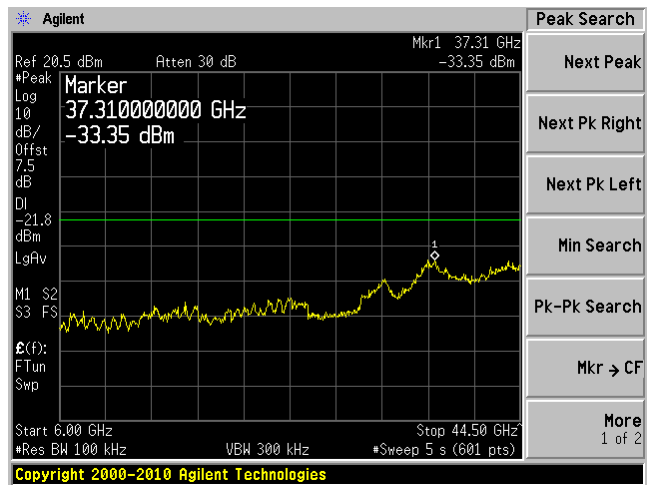
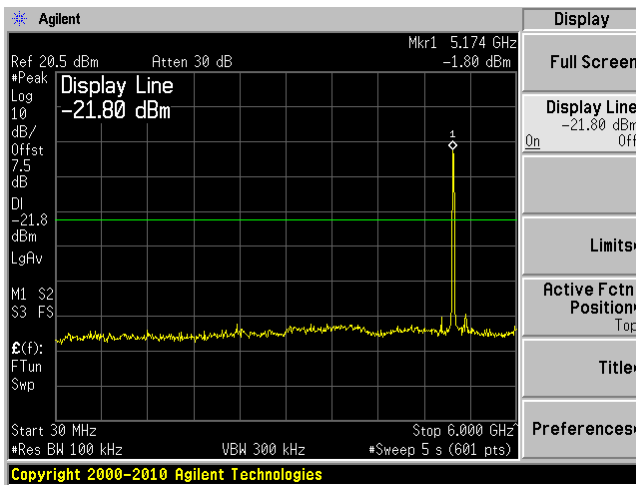
802.11 a mode, Low channel main
30MHz – 6GHz

802.11 a mode, Low channel, main
6G – 44 GHz



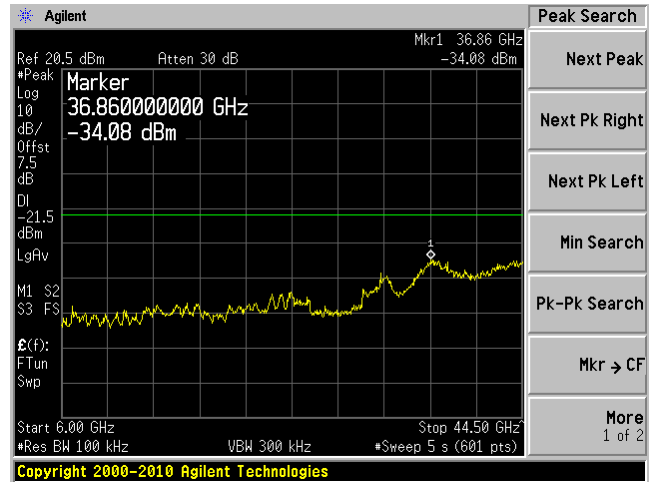
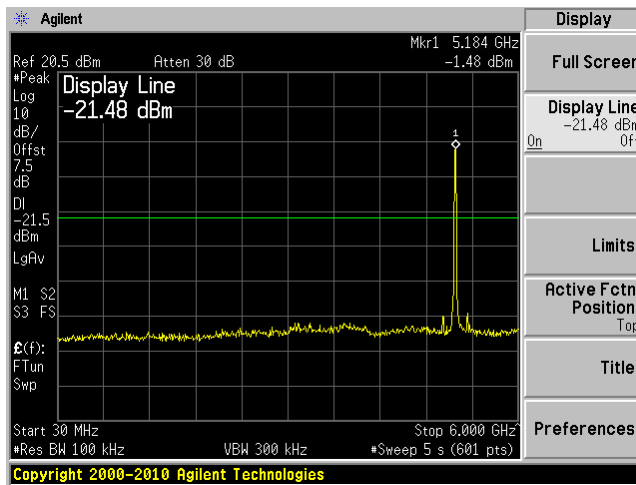
802.11 n mode, Low channel, Main
30MHz – 6 GHz

802.11 n mode, Low channel, main
6G – 44 GHz



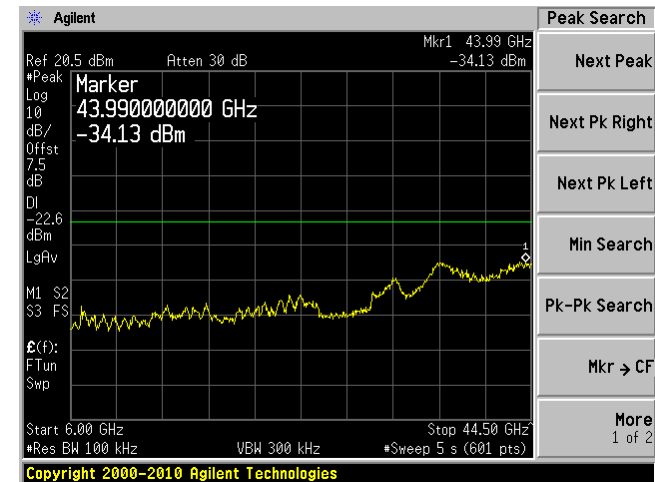
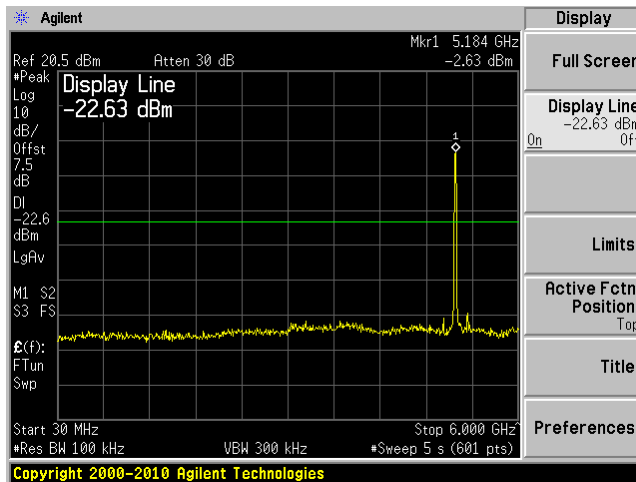
802.11 a mode, Low channel aux
30MHz – 6GHz

802.11 a mode, Low channel, aux
6G – 44 GHz

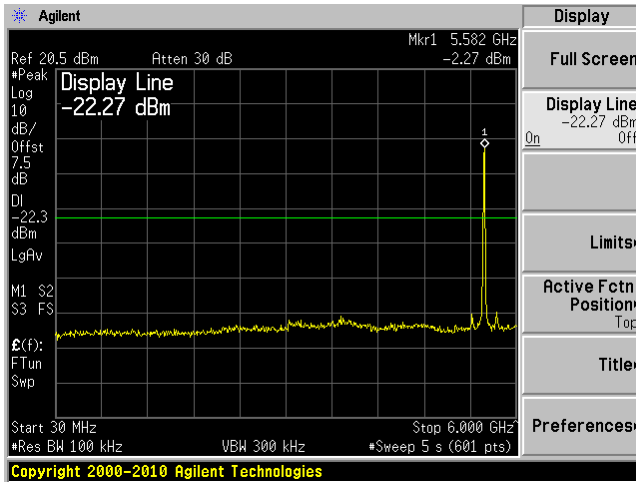


802.11 n mode, Low channel, aux
30MHz – 6 GHz

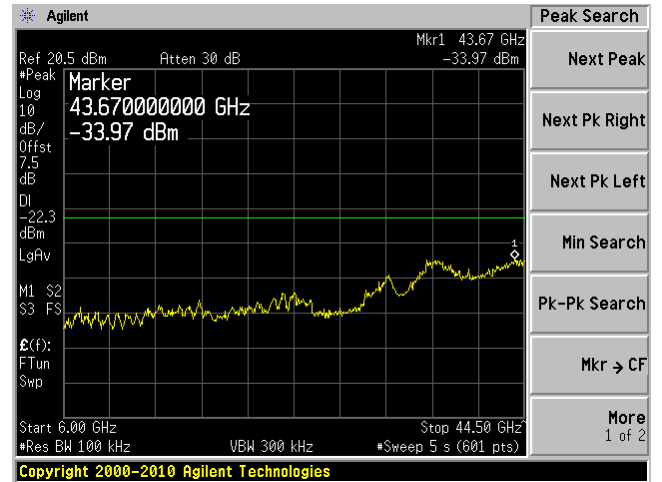
802.11 n mode, Low channel, aux
6G – 44 GHz



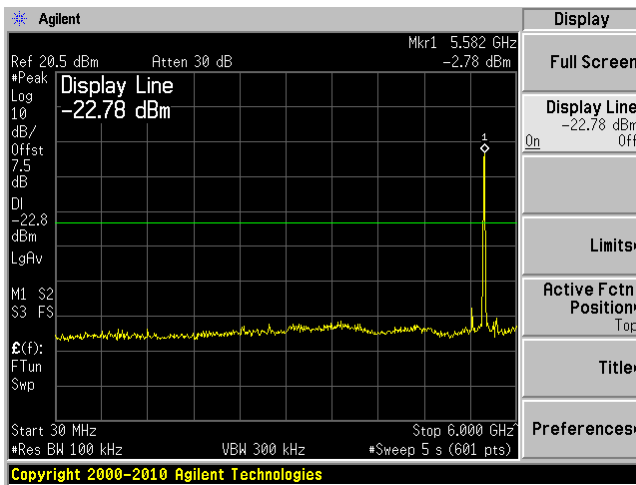
802.11 a mode, Middle channel, main
30MHz – 6GHz



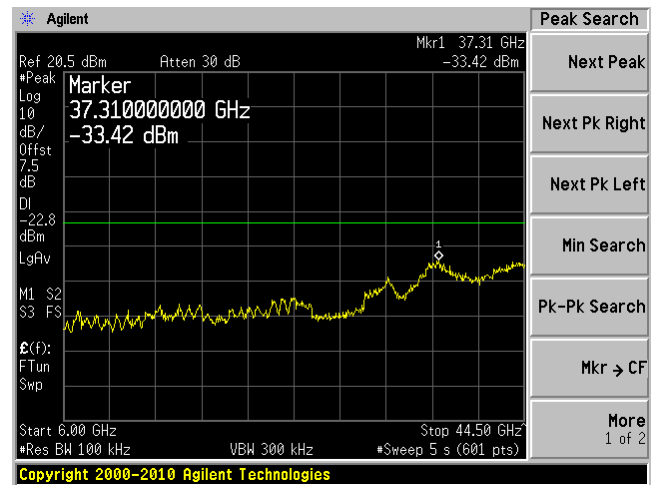
802.11 a mode, Middle channel, main
6G – 44 GHz



802.11 n mode, Middle channel, main
30MHz – 6GHz

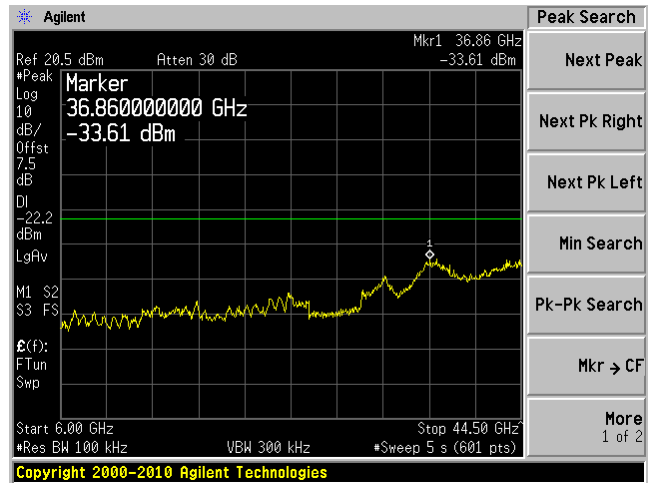
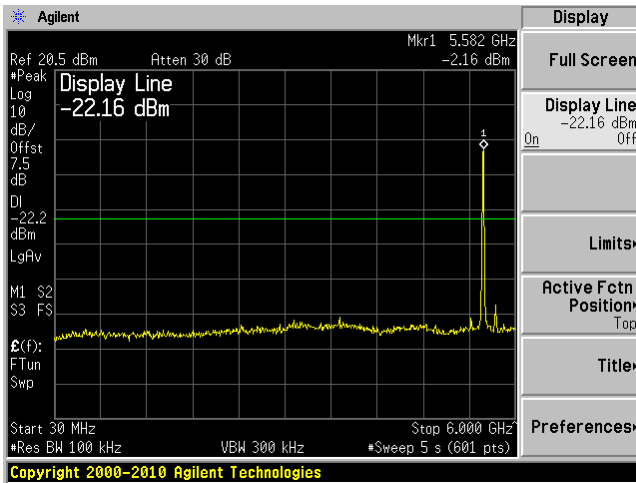


802.11 n mode, Middle channel, main
6G – 44 GHz



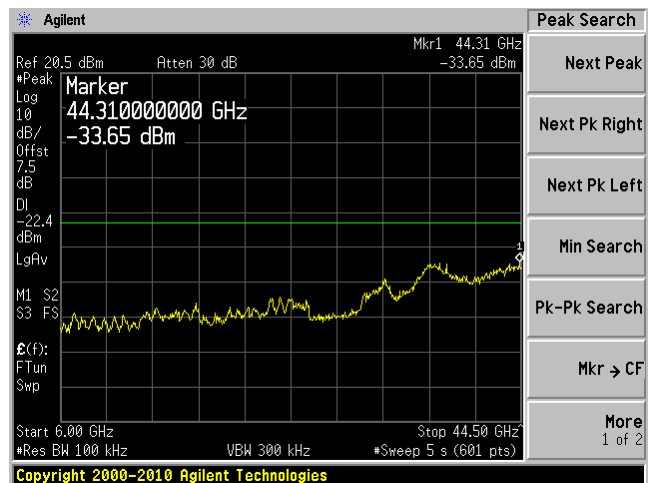
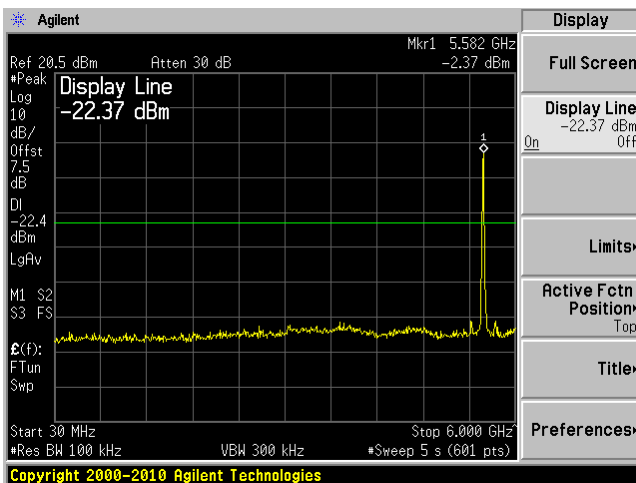
802.11 a mode, Middle channel aux
30MHz – 6GHz

802.11 a mode, middle channel, aux
6G – 44 GHz



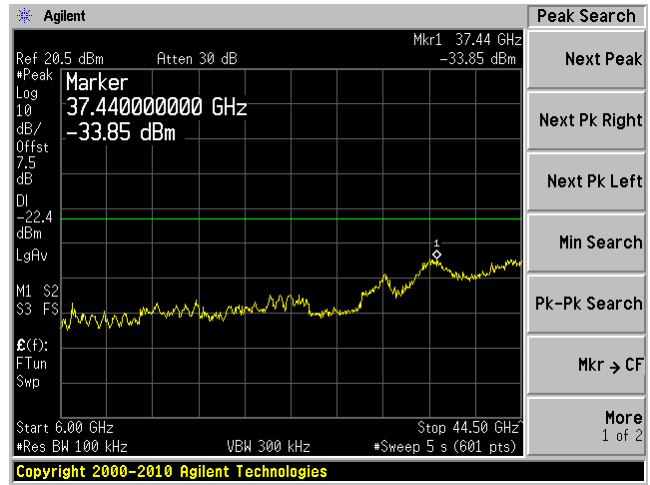
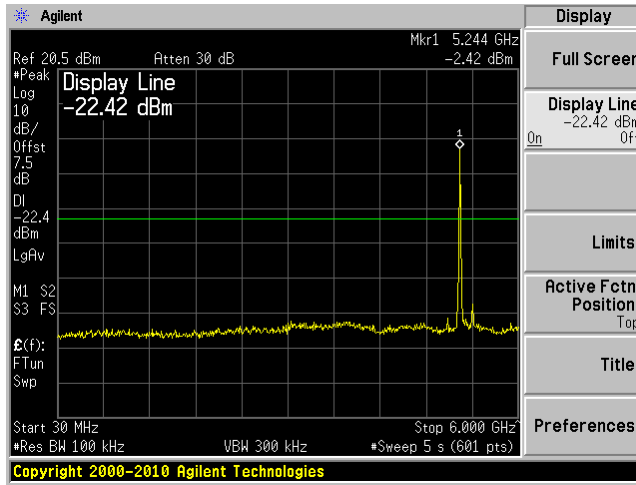
802.11 n mode, Middle channel, aux
30MHz – 6 GHz

802.11 n mode, Middle channel, aux
6G – 44 GHz



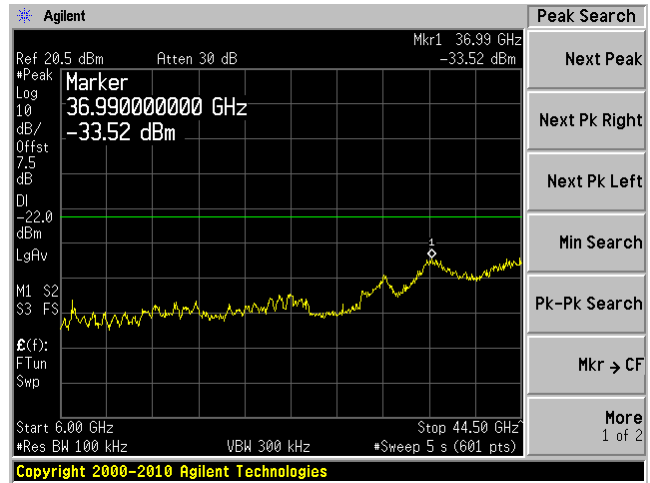
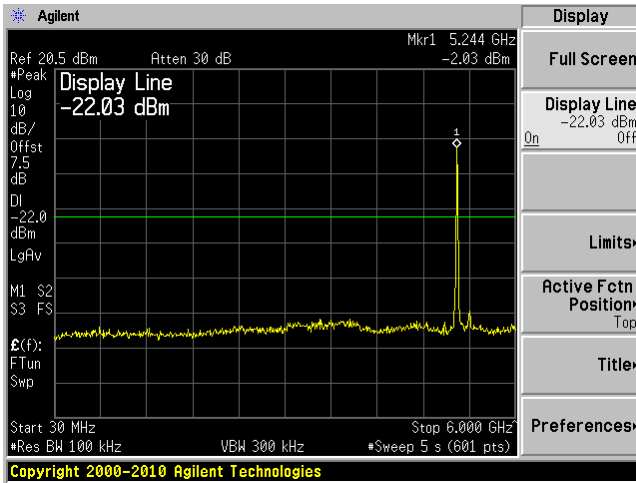
802.11 a mode, High channel, main
30MHz – 6GHz

802.11 a mode, High channel, main
6G – 44 GHz

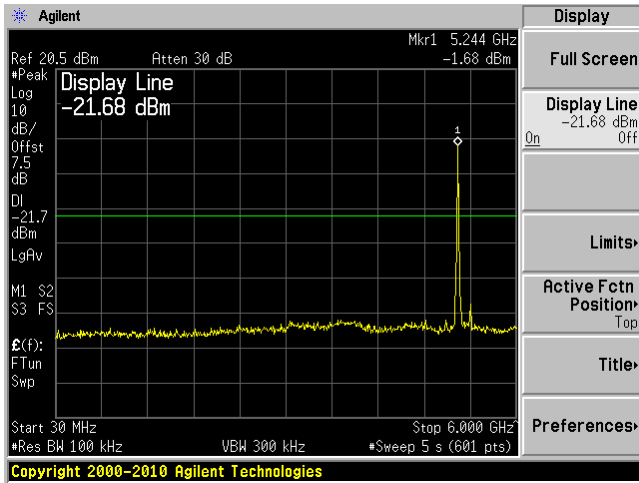


802.11 n mode, High channel, main
30MHz – 6GHz

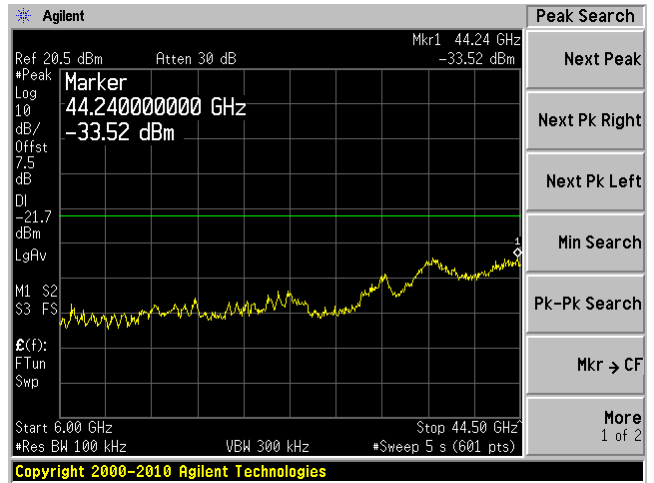
802.11 n mode, High channel, main
6G – 44 GHz



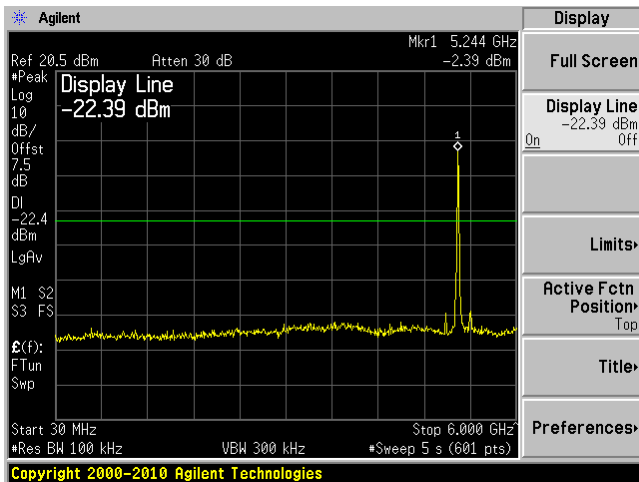
802.11 a mode, High channel aux
30MHz – 6GHz



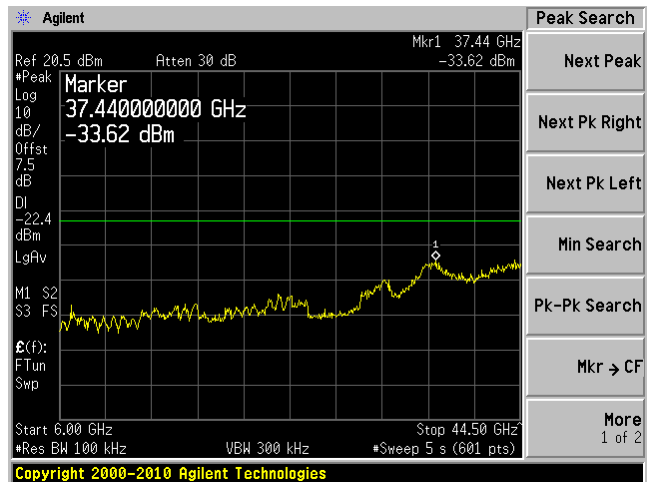
802.11 a mode, High channel, aux
6G – 44 GHz



802.11 n mode, High channel, aux
30MHz – 6 GHz



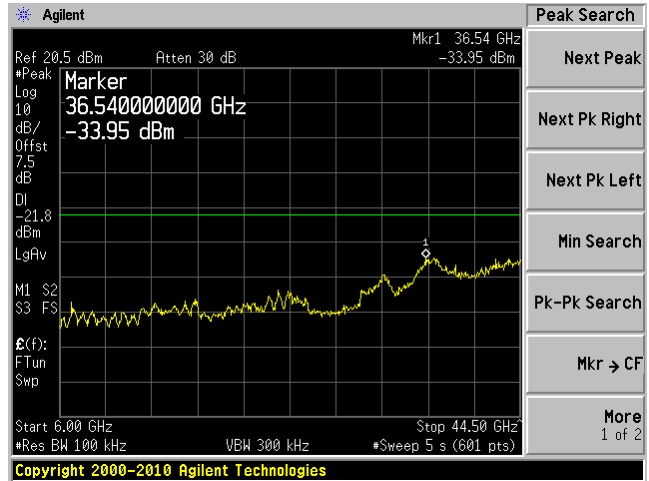
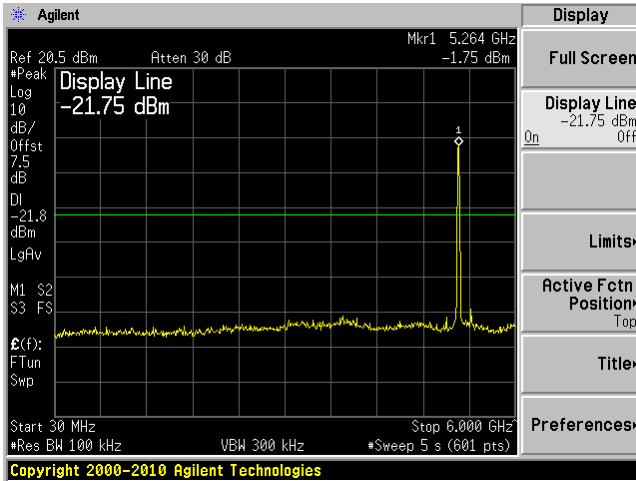
802.11 n mode, High channel, aux
6G – 44 GHz



5250-5350 MHz

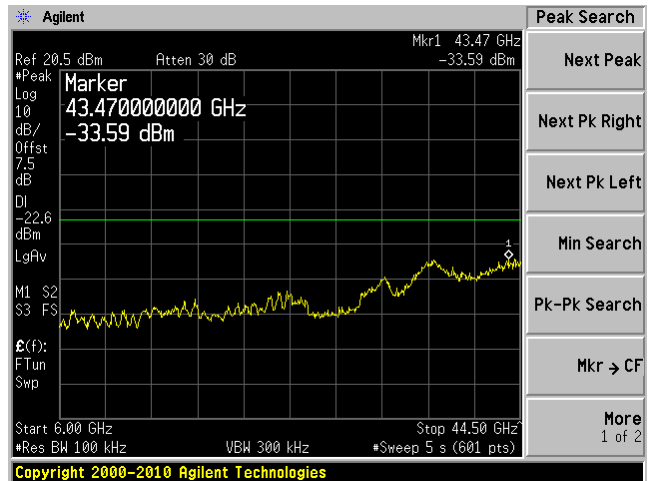
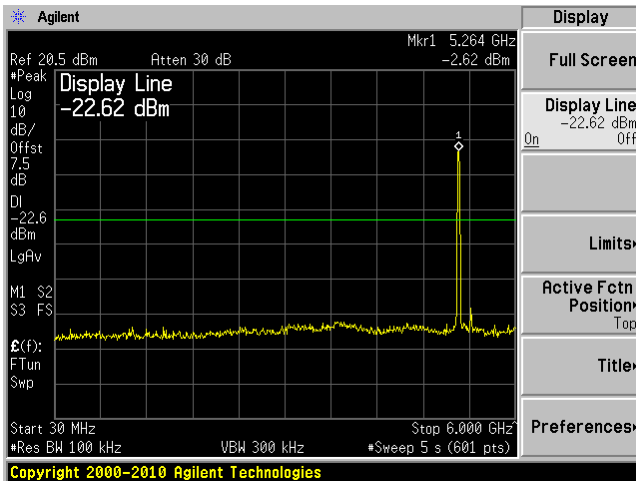
802.11 a mode, Low channel main
30MHz – 6GHz

802.11 a mode, Low channel, main
6G – 44 GHz



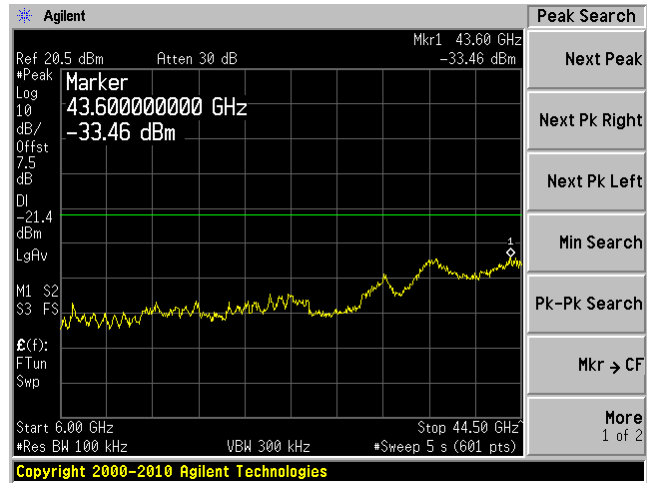
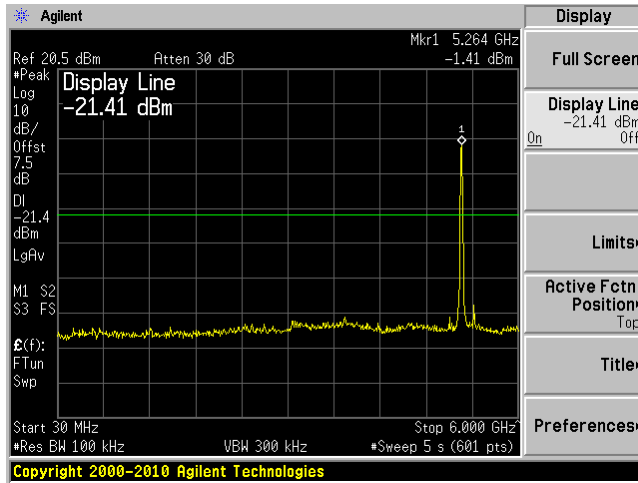
802.11 n mode, Low channel, Main
30MHz – 6 GHz

802.11 n mode, Low channel, main
6G – 44 GHz



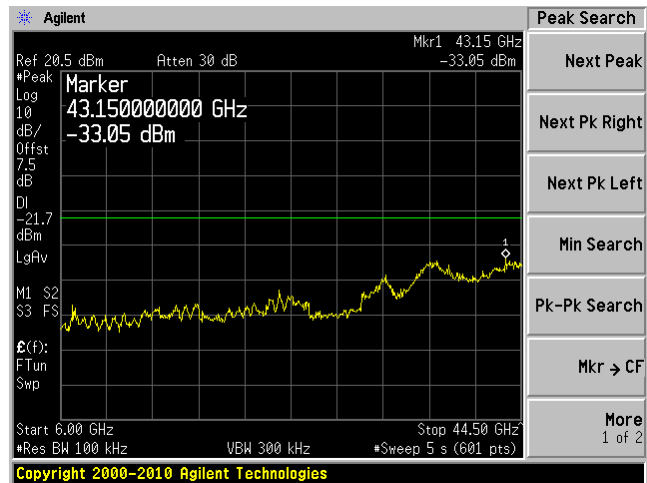
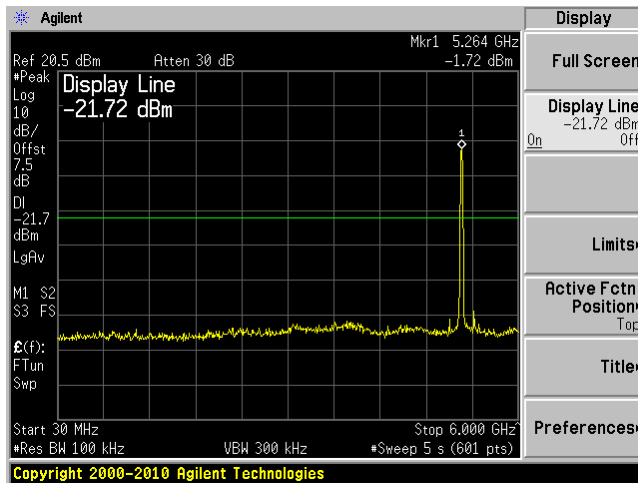
802.11 a mode, Low channel aux
30MHz – 6GHz

802.11 a mode, Low channel, aux
6G – 44 GHz



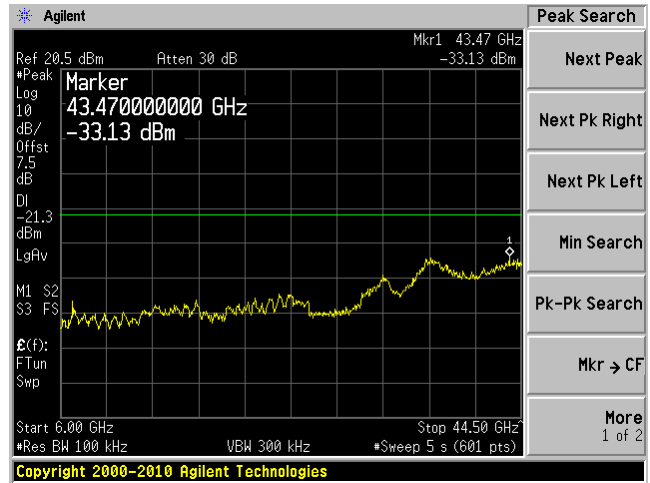
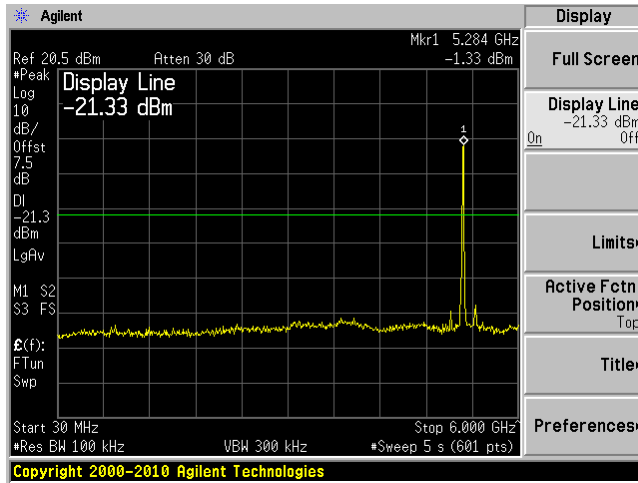
802.11 n mode, Low channel, aux
30MHz – 6 GHz

802.11 n mode, Low channel, aux
6G – 44 GHz



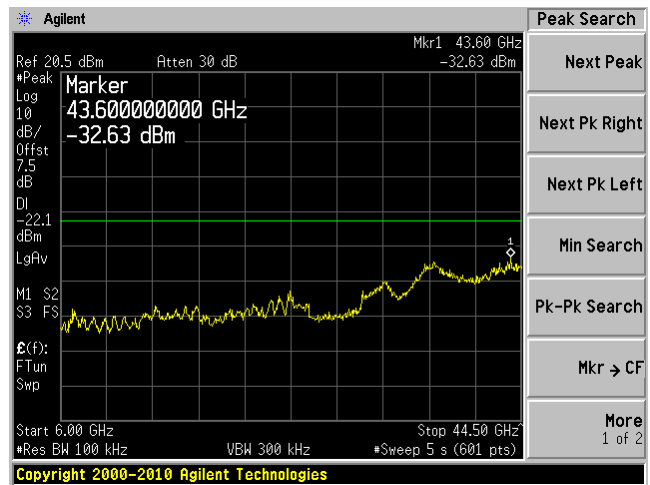
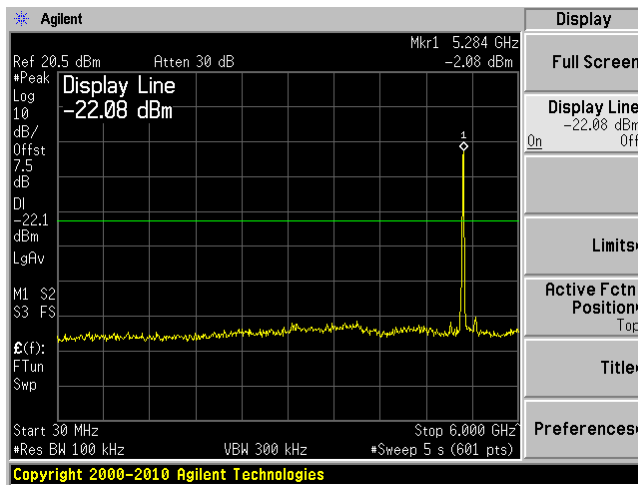
802.11 a mode, Middle channel, main
30MHz – 6GHz

802.11 a mode, Middle channel, main
6G – 44 GHz

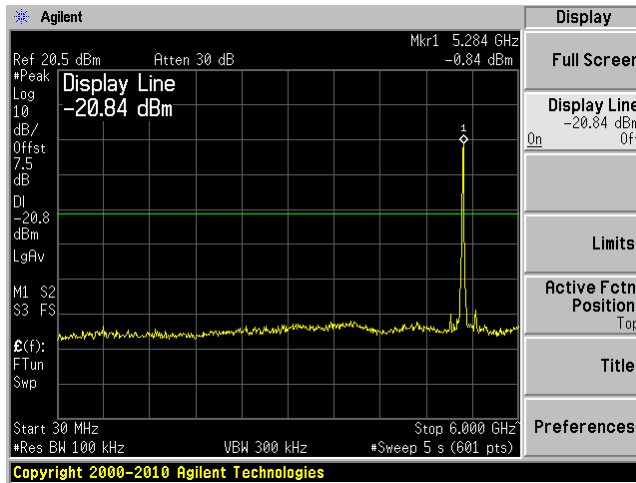


802.11 n mode, Middle channel, main
30MHz – 6GHz

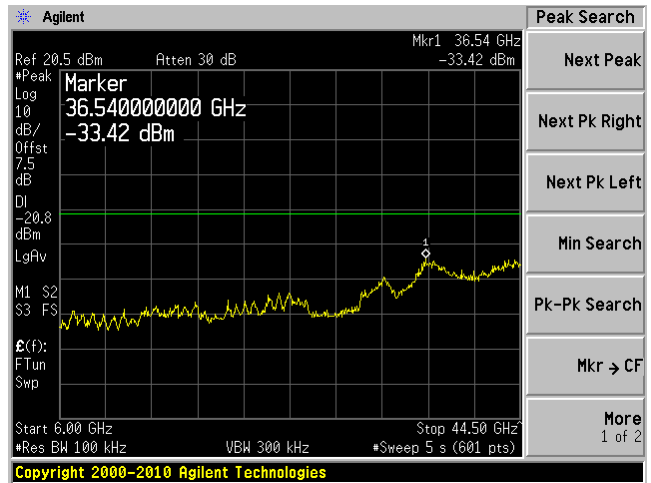
802.11 n mode, Middle channel, main
6G – 44 GHz



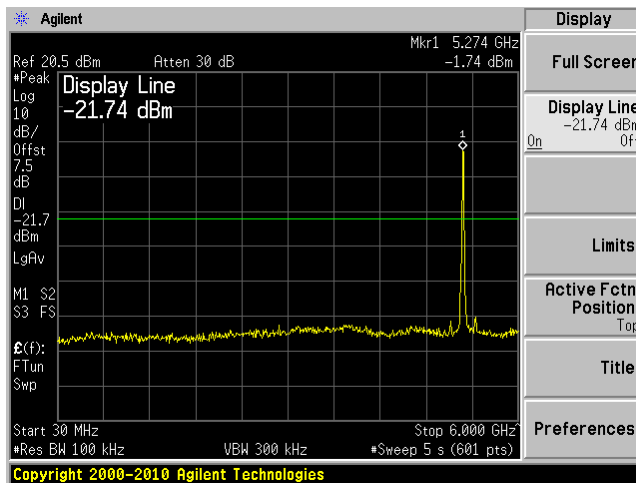
802.11 a mode, Middle channel aux
30MHz – 6GHz



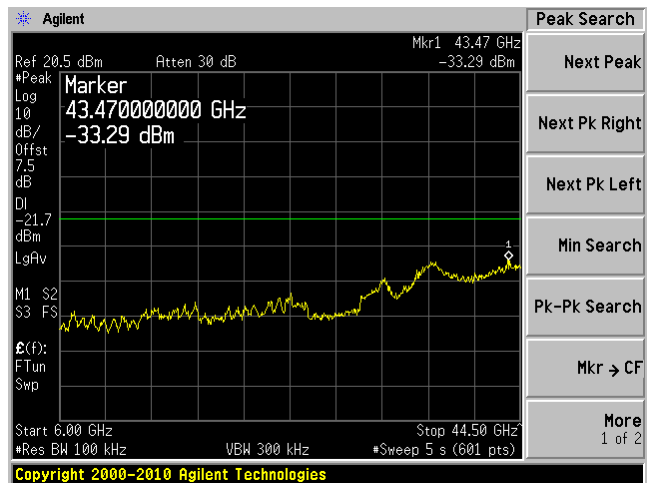
802.11 a mode, middle channel, aux
6G – 44 GHz



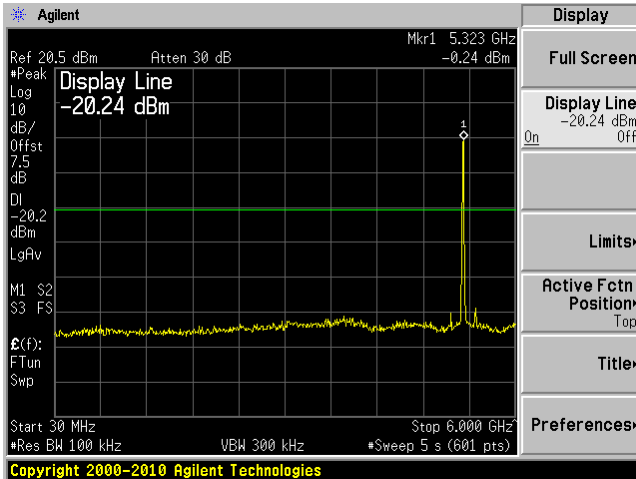
802.11 n mode, Middle channel, aux
30MHz – 6 GHz



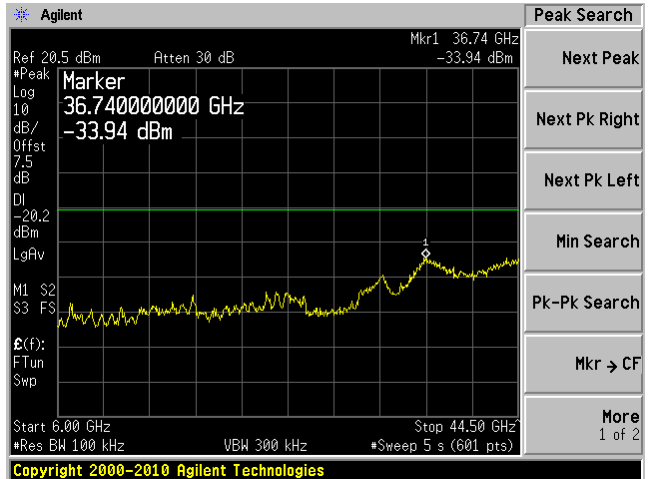
802.11 n mode, Middle channel, aux
6G – 44 GHz



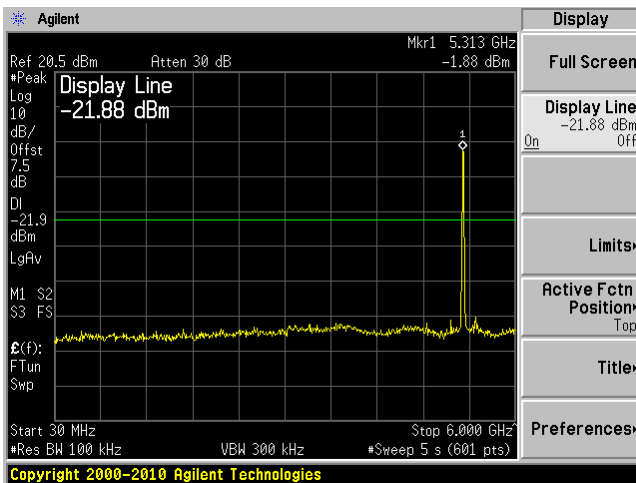
802.11 a mode, High channel, main
30MHz – 6GHz



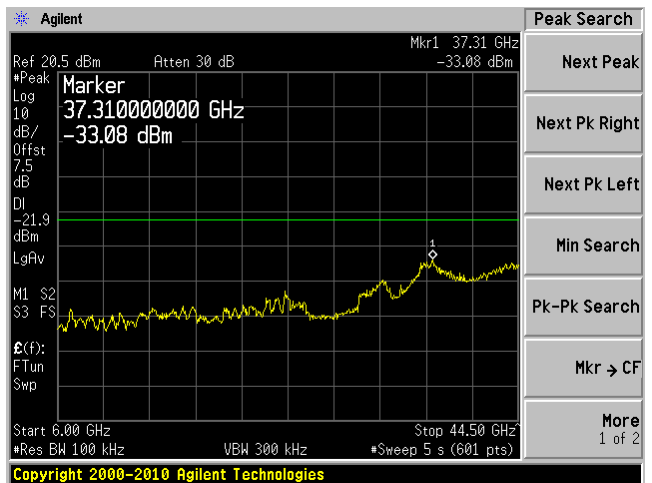
802.11 a mode, High channel, main
6G – 44 GHz



802.11 n mode, High channel, main
30MHz – 6GHz

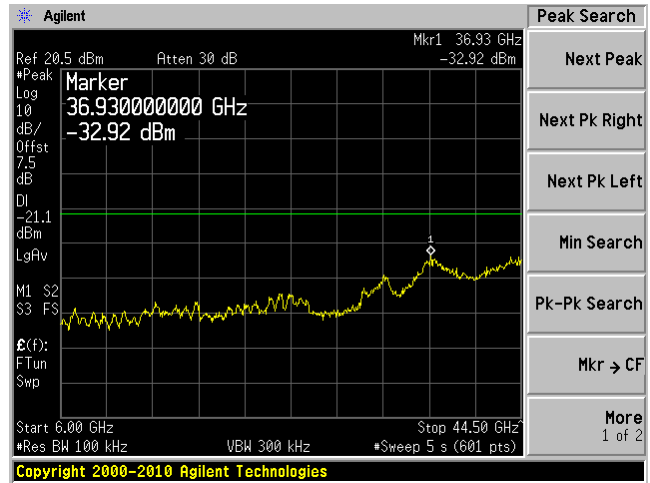
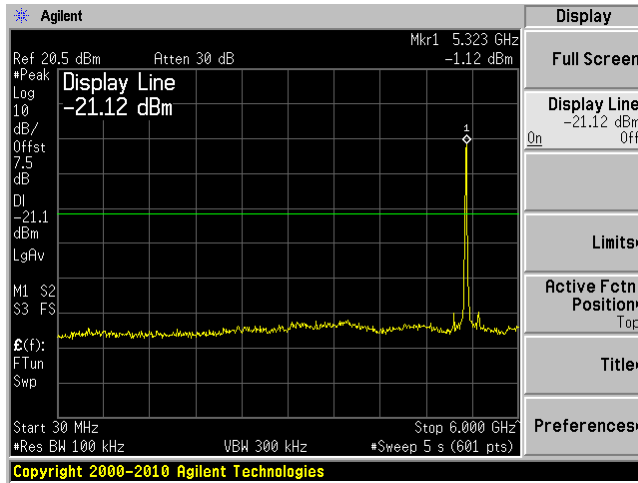


802.11 n mode, High channel, main
6G – 44 GHz



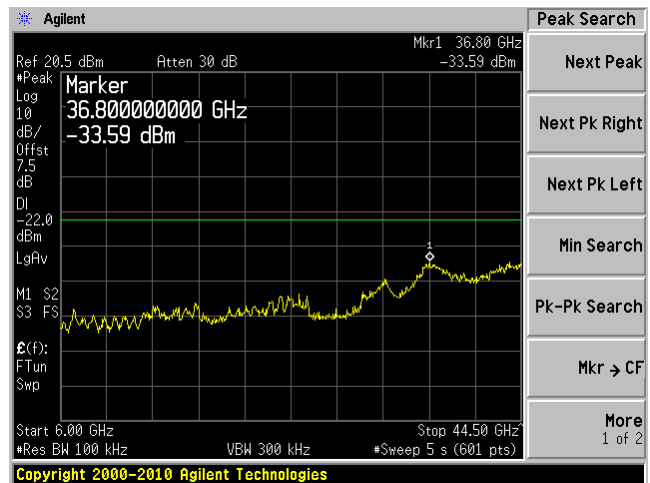
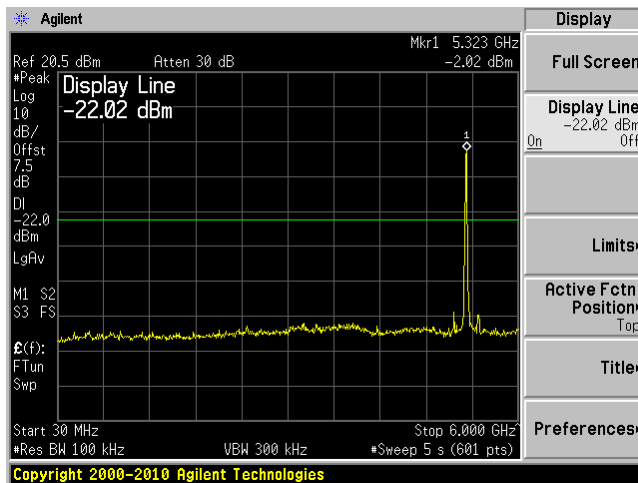
802.11 a mode, High channel aux
30MHz – 6GHz

802.11 a mode, High channel, aux
6G – 44 GHz



802.11 n mode, High channel, aux
30MHz – 6 GHz

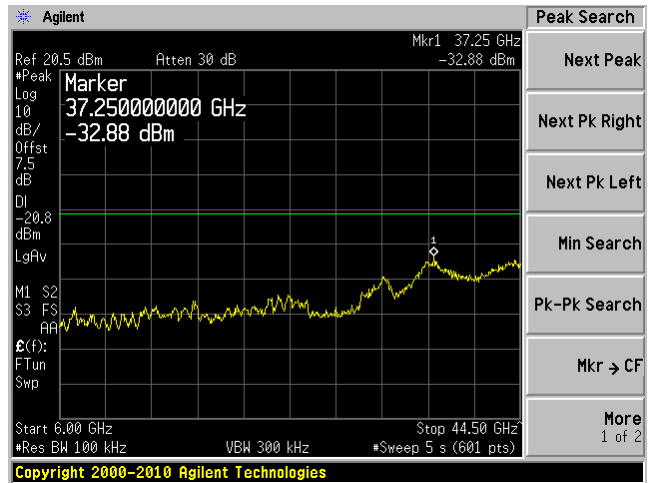
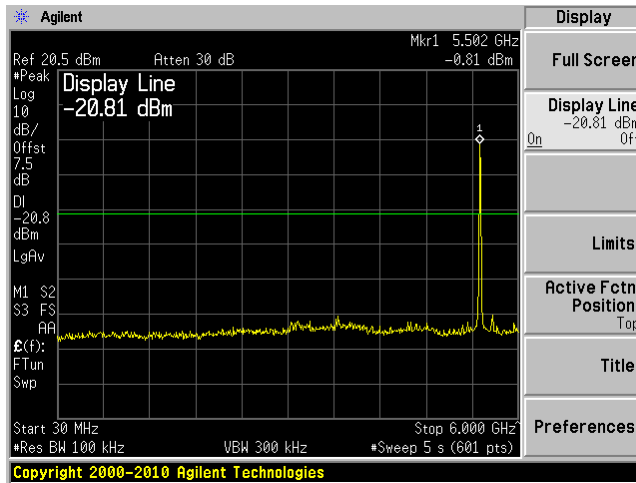
802.11 n mode, High channel, aux
6G – 44 GHz



5450 – 5725 MHz

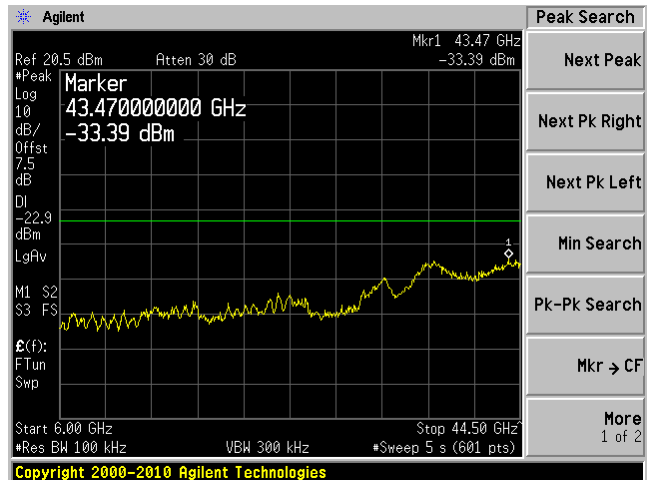
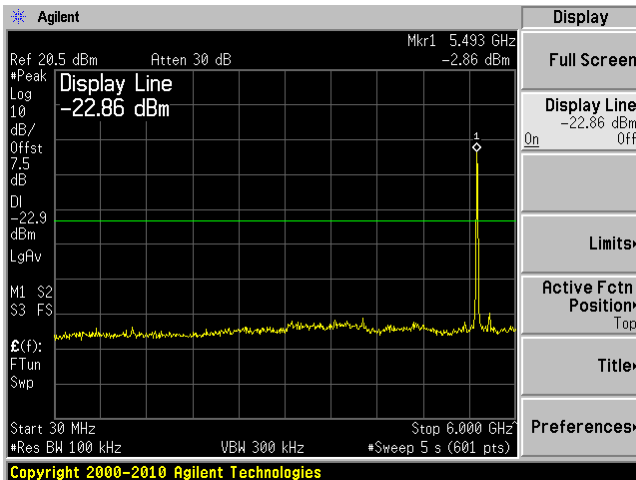
802.11 a mode, Low channel main
30MHz – 6GHz

802.11 a mode, Low channel, main
6G – 44 GHz

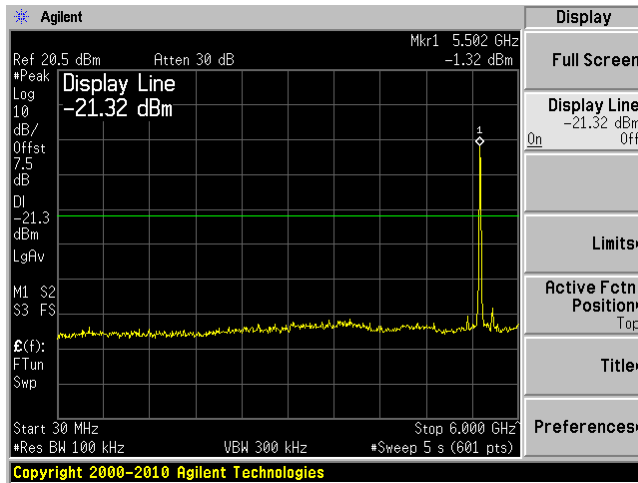


802.11 n mode, Low channel, Main
30MHz – 6 GHz

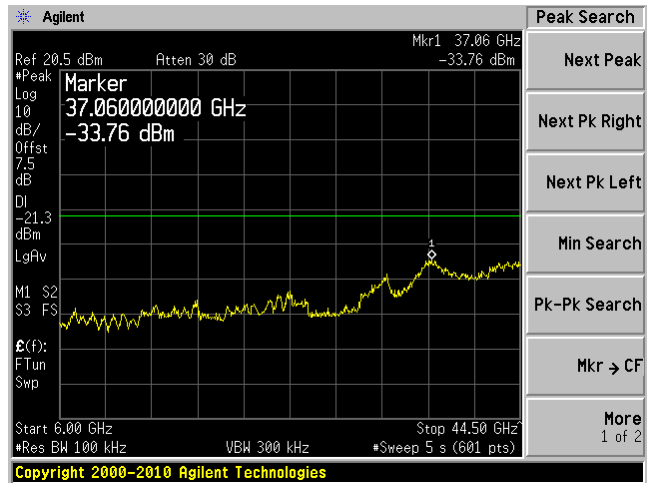
802.11 n mode, Low channel, main
6G – 44 GHz



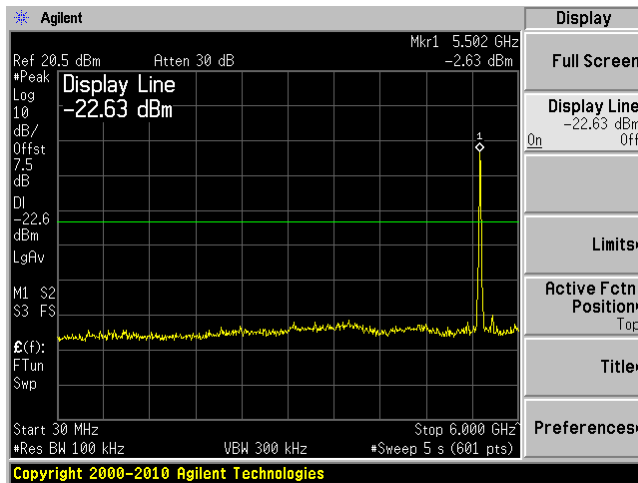
802.11 a mode, Low channel aux
30MHz – 6GHz



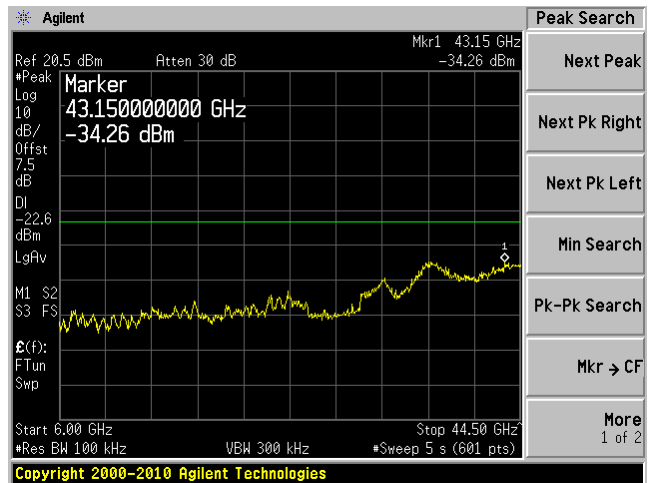
802.11 a mode, Low channel, aux
6G – 44 GHz



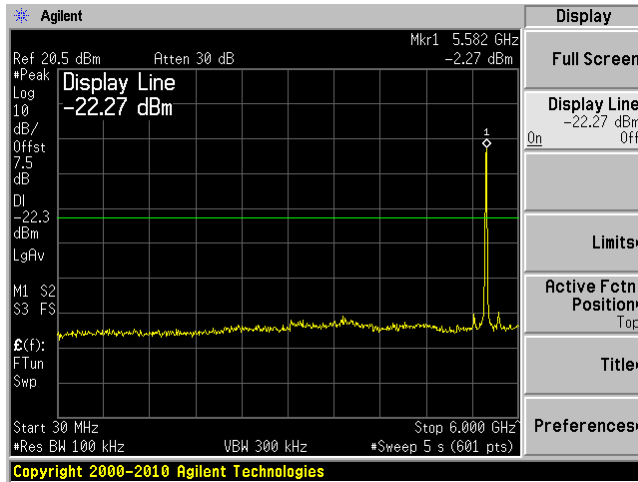
802.11 n mode, Low channel, aux
30MHz – 6 GHz



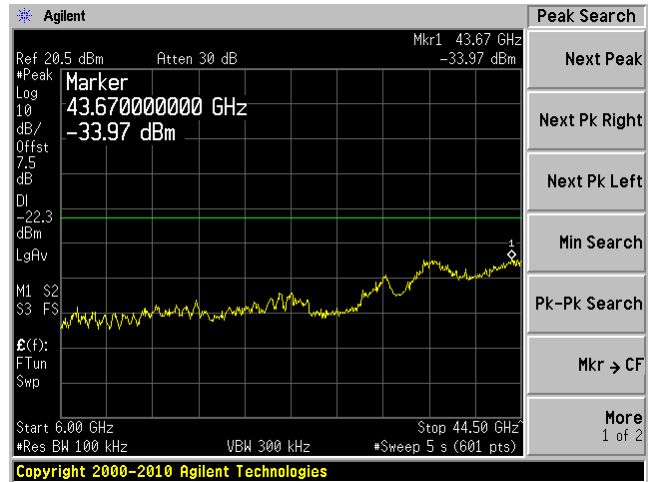
802.11 n mode, Low channel, aux
6G – 44 GHz



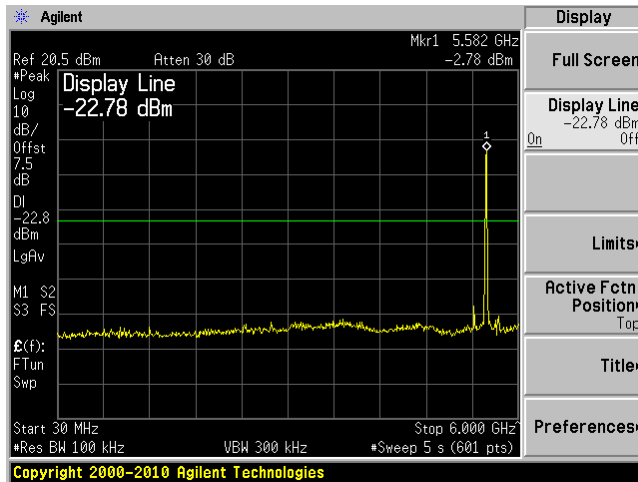
802.11 a mode, Middle channel, main
30MHz – 6GHz



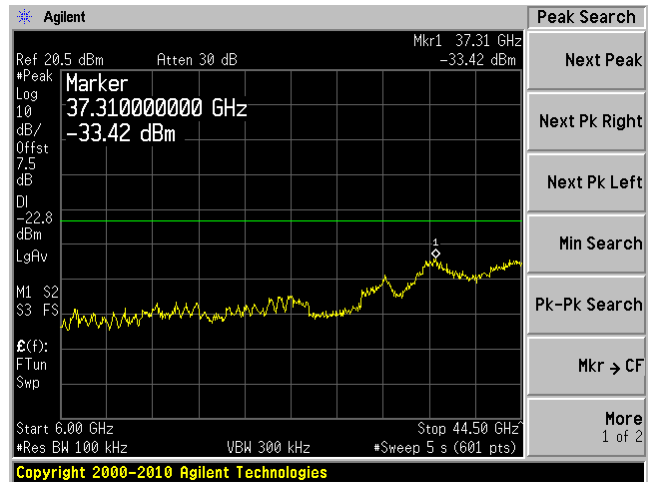
802.11 a mode, Middle channel, main
6G – 44 GHz



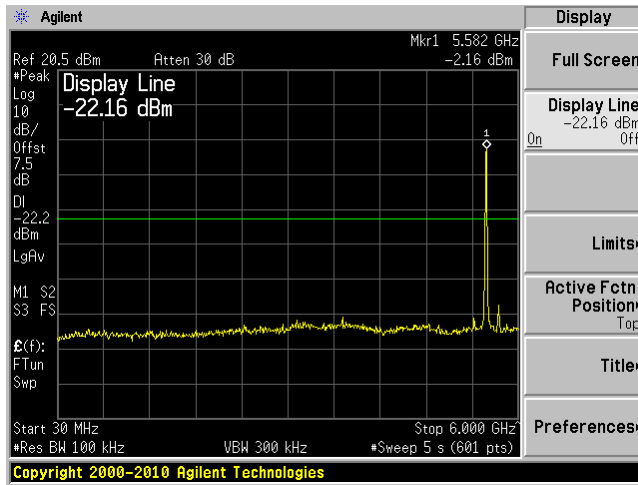
802.11 n mode, Middle channel, main
30MHz – 6GHz



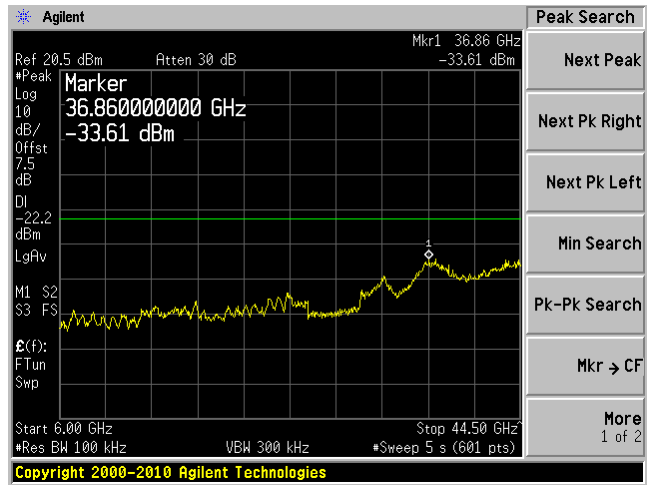
802.11 n mode, Middle channel, main
6G – 44 GHz



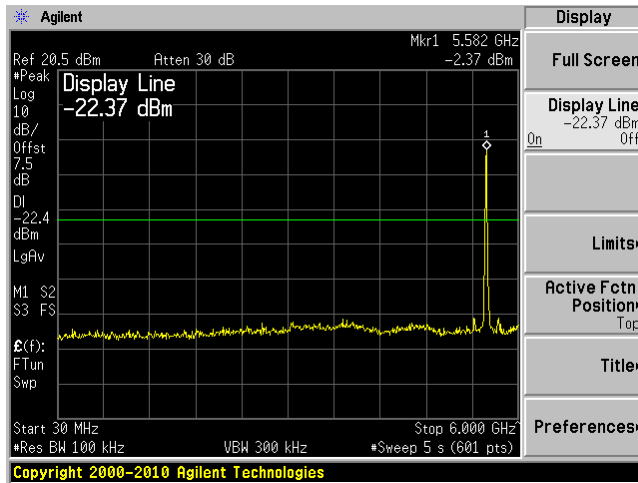
802.11 a mode, Middle channel aux
30MHz – 6GHz



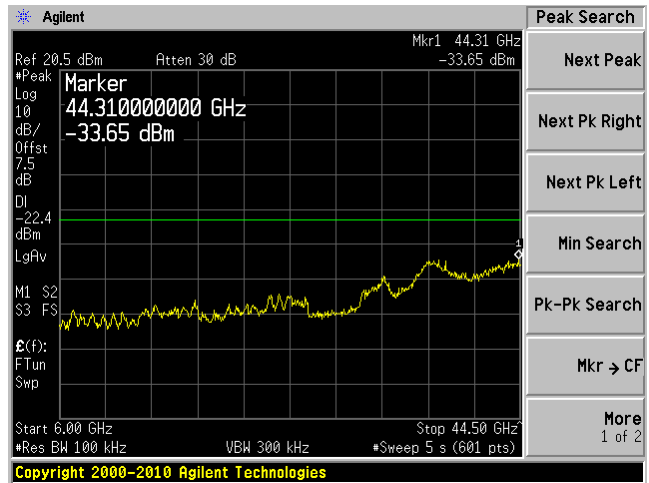
802.11 a mode, middle channel, aux
6G – 44 GHz



802.11 n mode, Middle channel, aux
30MHz – 6 GHz

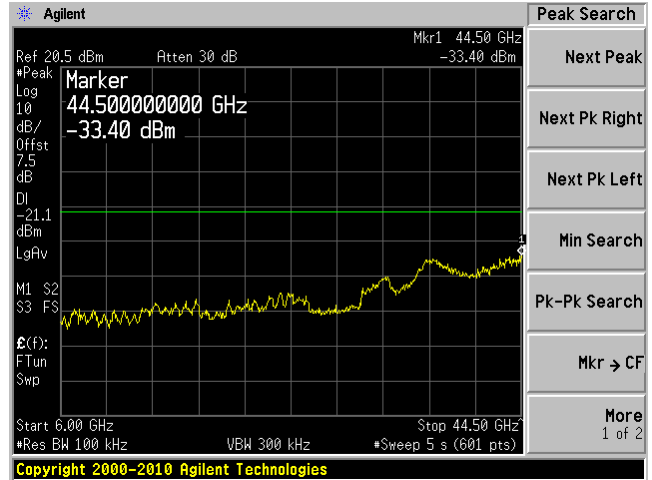
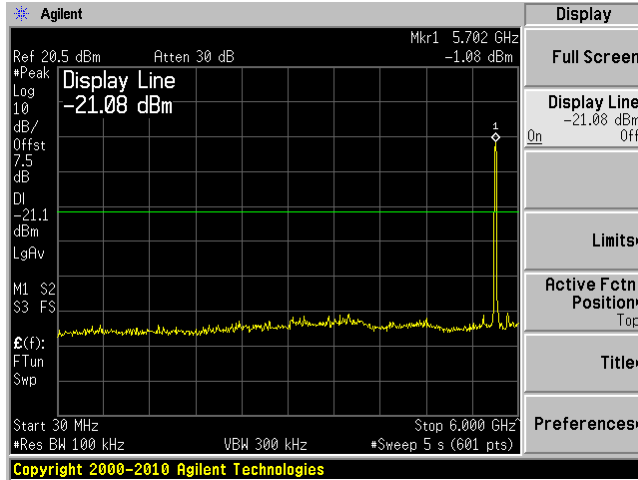


802.11 n mode, Middle channel, aux
6G – 44 GHz



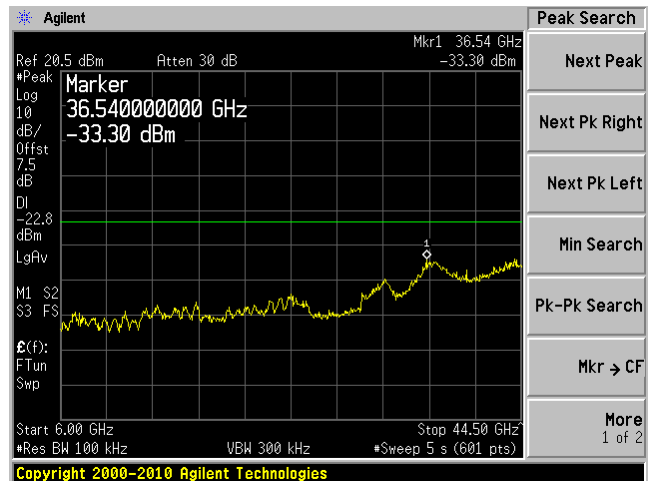
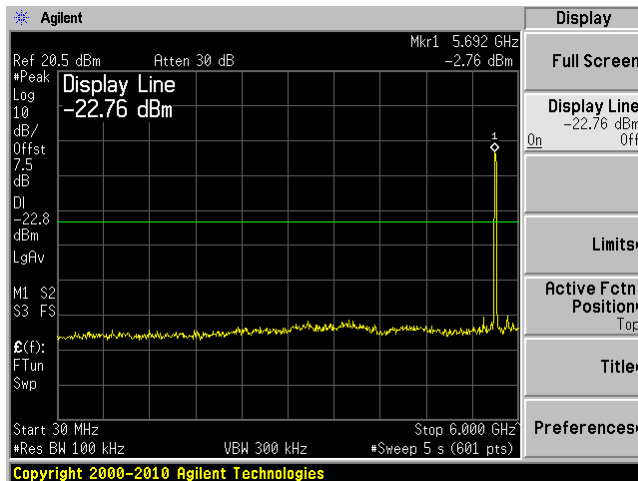
802.11 a mode, High channel, main
30MHz – 6GHz

802.11 a mode, High channel, main
6G – 44 GHz

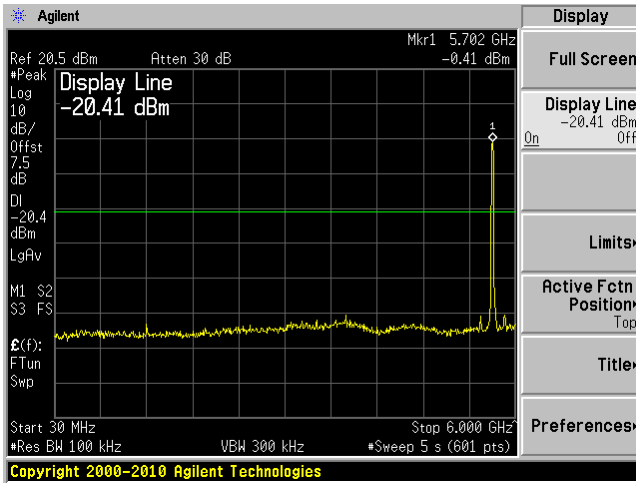


802.11 n mode, High channel, main
30MHz – 6GHz

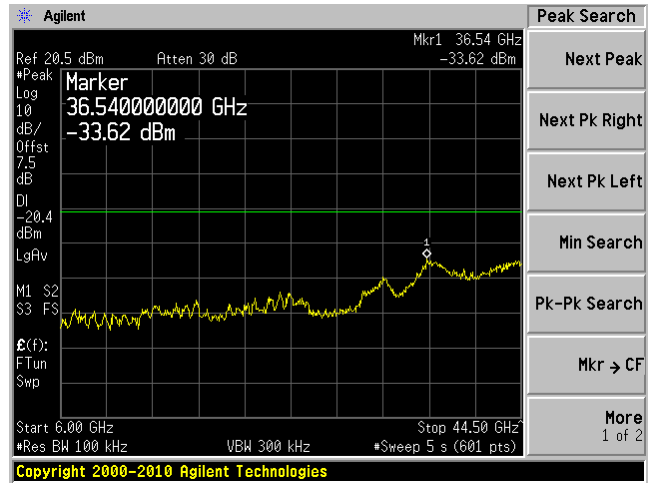
802.11 n mode, High channel, main
6G – 44 GHz



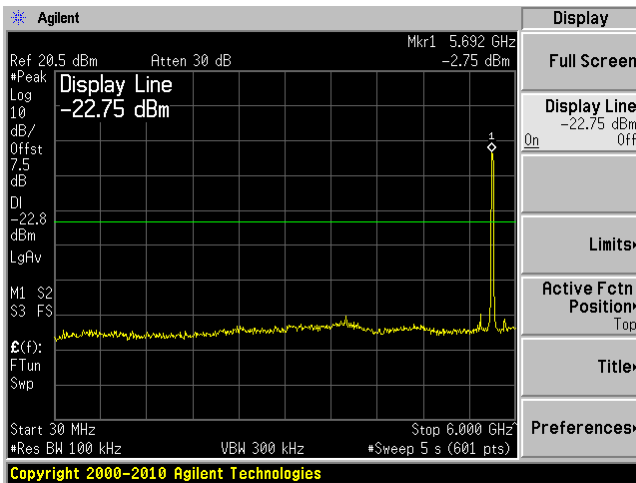
802.11 a mode, High channel aux
30MHz – 6GHz



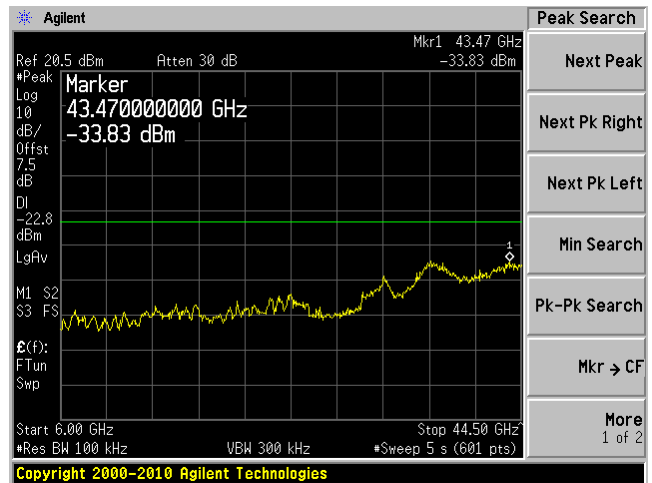
802.11 a mode, High channel, aux
6G – 44 GHz



802.11 n mode, High channel, aux
30MHz – 6 GHz



802.11 n mode, High channel, aux
6G – 44 GHz



14 FCC §15.407(h) & IC RSS-210 §A9.3 - Dynamic Frequency Selection (DFS)

14.1 DFS Requirement

FCC CFR47 §15.407 (h) and FCC 06-96 Appendix.

Table 1: Applicability of DFS requirements prior to use of a channel

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 2: Applicability of DFS requirements during normal operation

Requirement	Operational Mode		
	Master	Client (Without DFS)	Client (With DFS)
DFS Detection Threshold	Yes	Not Required	Yes
Channel Closing Transmission Time	Yes	Yes	Yes
Channel Move Time	Yes	Yes	Yes

Table 3: Interference Threshold values, Master or Client incorporating In-Service Monitoring

Maximum Transmit Power	Value (See Notes 1 and 2)
≥ 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 4: DFS Response requirement values

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 UNII 99% transmission 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 Waveform*.

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 to facilitate a *Channel* move (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 percent. Measurements are performed with no data traffic.

Table 5: Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (Microseconds)	PRI (Microseconds)	Pulses	Minimum Percentage of Successful Detection	Minimum Number of 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

Table 6: Long Pulse Radar Test Signal

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

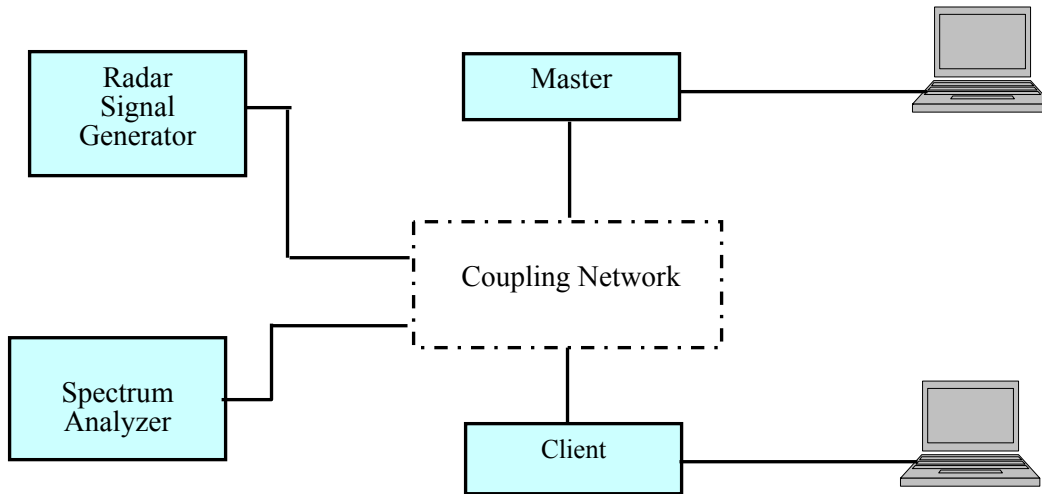
Table 7: Frequency Hopping Radar Test Signal

Radar Type	Pulse Width (μsec)	PRI (μsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Number of Trials
6	1	333	9	0.333	300	70%	30

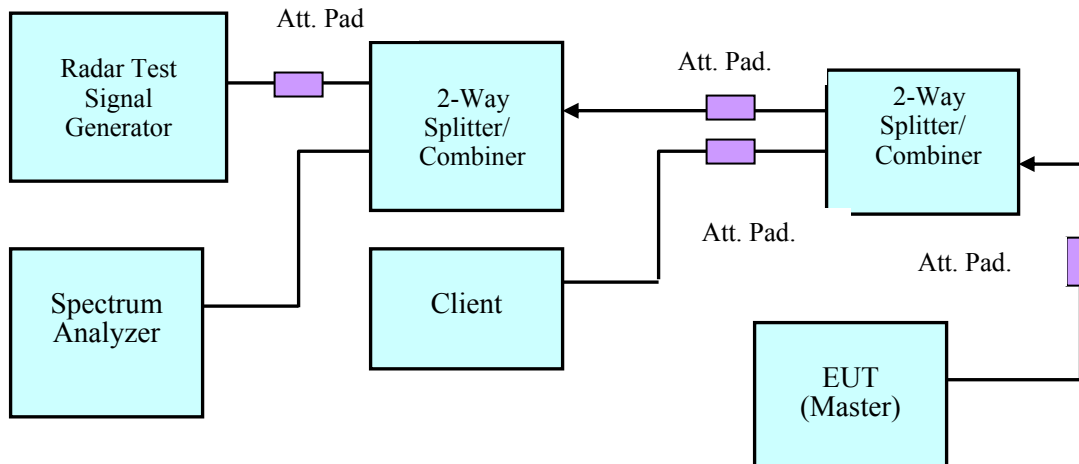
14.2 DFS Measurement System

BACL DFS measurement system consists of two subsystems: (1) The radar signal generating subsystem and (2) the traffic monitoring subsystem.

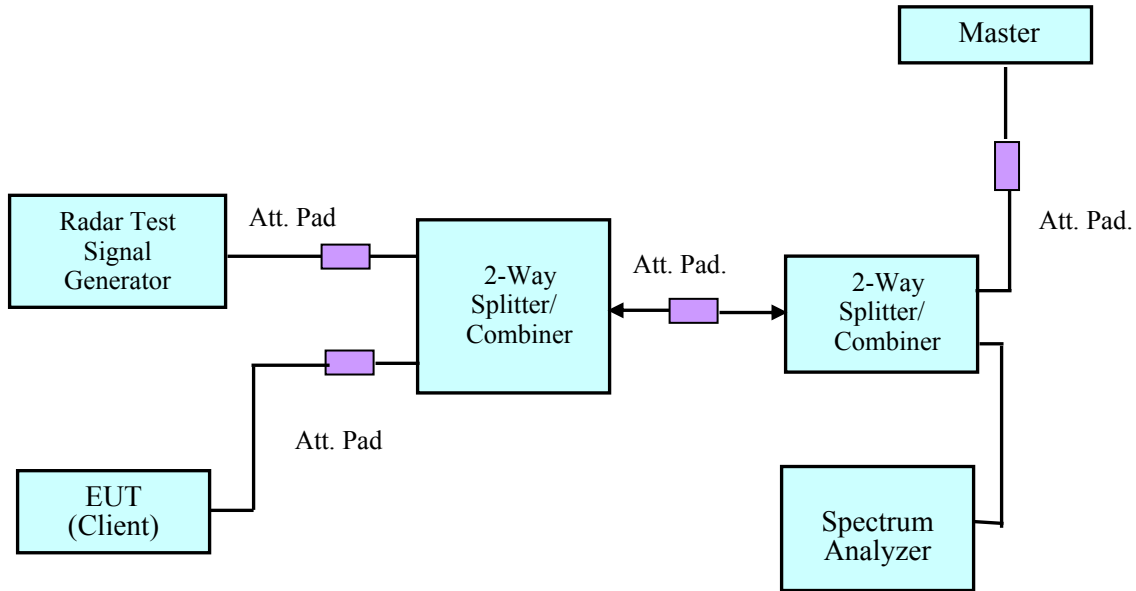
14.3 System Block Diagram



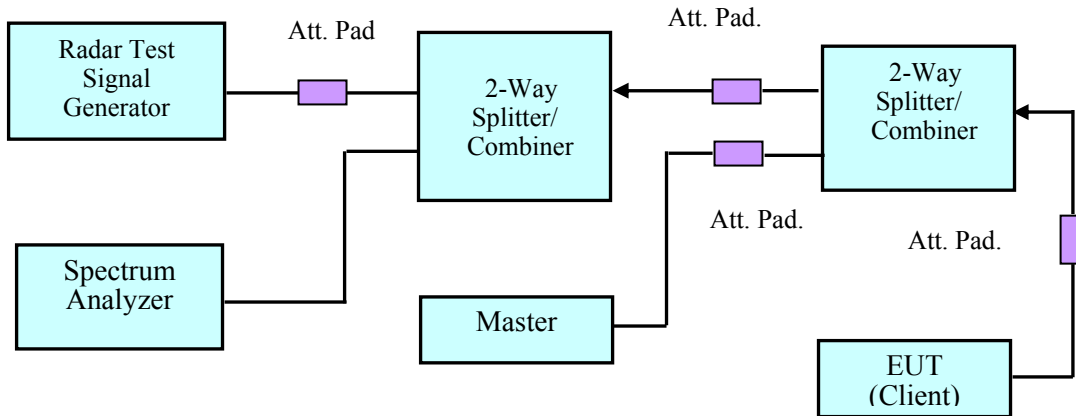
Conducted Method



Setup for Master with injection at the Master

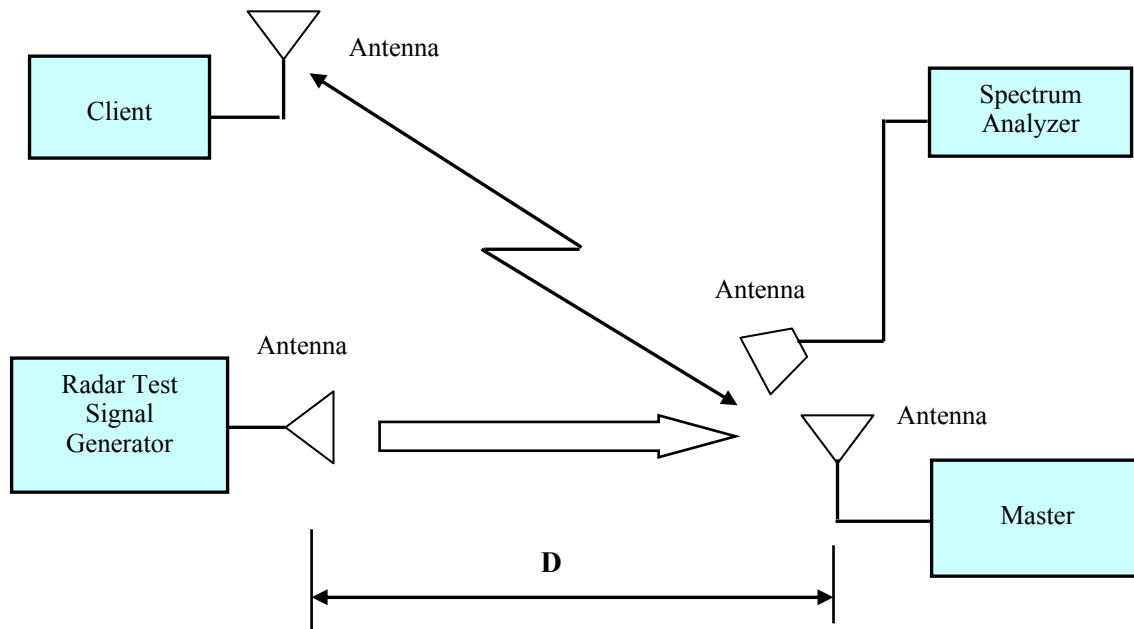


Setup for Client with injection at the Master



Setup for Client with injection at the Client

14.4 Radiated Method



14.5 Test Procedure

A spectrum analyzer is used as a monitor verifies that the EUT status including Channel Closing Transmission Time and Channel Move Time, and does not transmit on a Channel during the Non-Occupancy Period after the diction and Channel move. It is also used to monitor EUT transmissions during the Channel Availability Check Time.

14.6 Summary

The following result table represents the list of measurements required under the CFR47 §47 Part15.407 (h) and FCC 06-96.

Items	Description of Test	Result
Detection Bandwidth	UNII Detection Bandwidth	NR
Performance Requirements Check	Initial Channel Availability Check Time (CAC)	NR
	Radar Burst at the Beginning of the CAC	NR
	Radar Burst at the End of the CAC	NR
In-Service Monitoring	Channel Move Time	Complies
	Channel Closing Transmission Time	Complies
	Non-Occupancy Period	NR
Radar Detection	Statistical Performance Check	NR

Note: NR – Not Required.

14.7 Description of EUT

The EUT operates in 5150-5350 MHz and 5470-5725 MHz range.

The EUT is a Slave device without radar detection function.

The antenna of the EUT is tri-band Omni antenna, the gain is 5.5 dBi.

The rated output power of EUT is <23 dBm (EIRP).

WLAN traffic is generated by streaming the video file TestFile.mpg, this file is used by IP and Frame based systems for loading the test channel during the In-service compliance testing of the U-NII device. The file is streamed from the Access Point to the Client in full motion video mode using the media player with the V2.61 Codec package.

The Master device supported for testing is Cisco Aironet 1130AG Series IEEE 802.11 a/b/g Access Point
 FCC ID: LDK102054E
 Model No.: AIR-AP1131AG-A-K9
 S/N: FTX1109T0X8
 Manufacturer: Cisco Systems, Inc.

14.8 Test Equipment List and Details

Equipment Description	Manufacturer	Model Number	S/N
NI PXI-1042 8-Slot chassis	National Instruments	PXI-1042	V08X01EE1
Arbitrary Waveform Generator	National Instruments	PXI-5421	N/A
RF Upconverter	National Instruments	PXI-5610	N/A
Upconverter	Ascor	AS-7206	N/A
Spectrum Analyzer	Agilent	E4440A	MY44303352
Pre-Amplifier	Avantek	2-8 GHz Lab AMP	218
Pre-Amplifier	Ducommun Technologies	ALN-09173030-01	990297-02
Splitter/Combiner	Mini-Circuits	2FSC-2-10G	0349
Splitter/Combiner	Narada	4326B-2	03514
Attenuator	MIDWest	290-30	N/A
Attenuator	Mini-Circuits	BW-S30W2	N/A

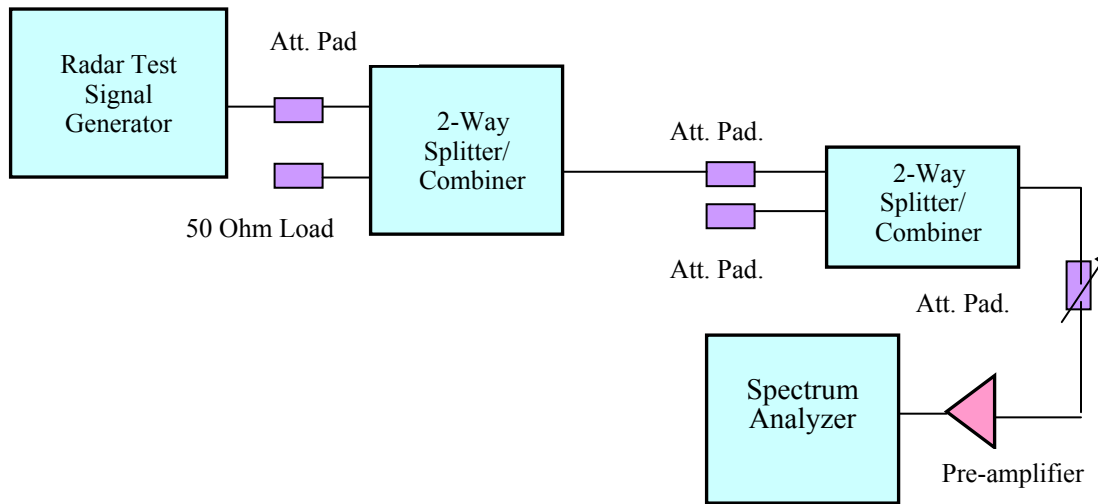
* **Statement of Traceability:** BACL Corp. attests that all calibrations have been performed per the NVLAP requirements, traceable to the NIST.

14.9 Test Environmental Conditions

Temperature:	20-23 °C
Relative Humidity:	48 % - 55 %
ATM Pressure:	1015 kPa

Testing performed by Ning Ma on 2011-12-28

14.10 Radar Waveform Calibration

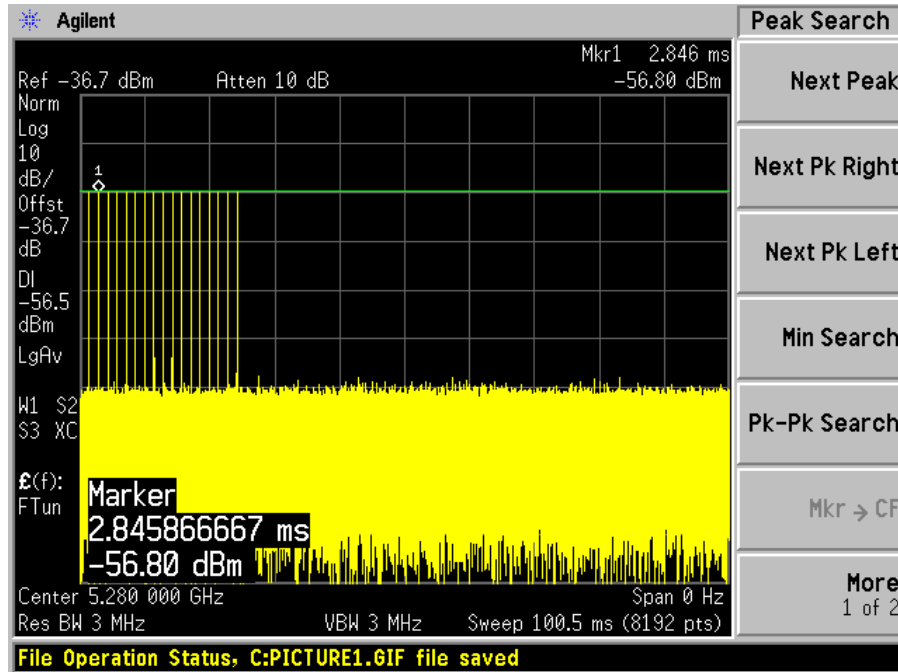


Conducted Calibration Setup Block Diagram

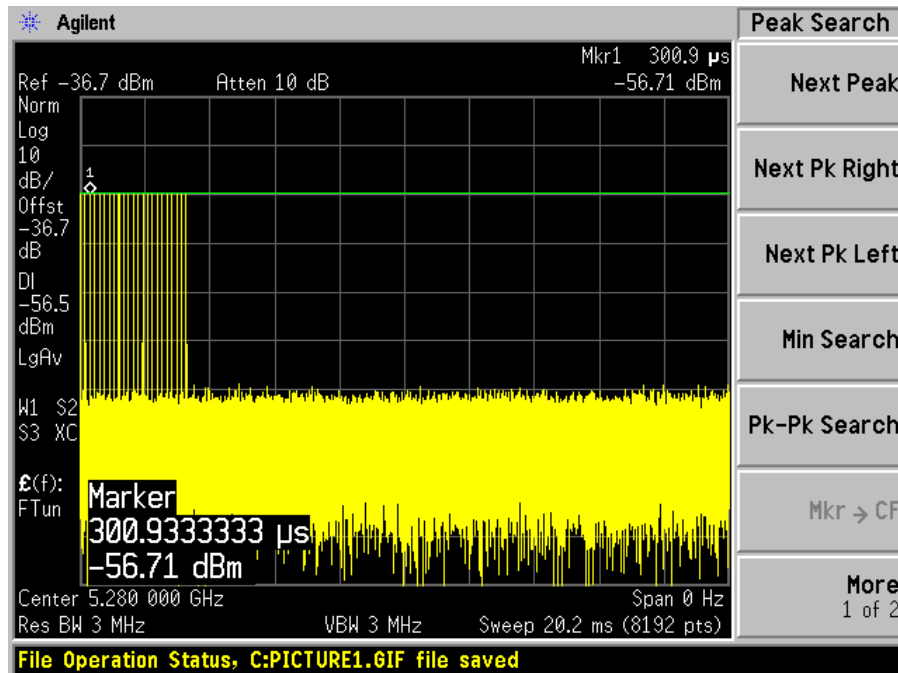
Plots of Radar Waveforms

5280 MHz

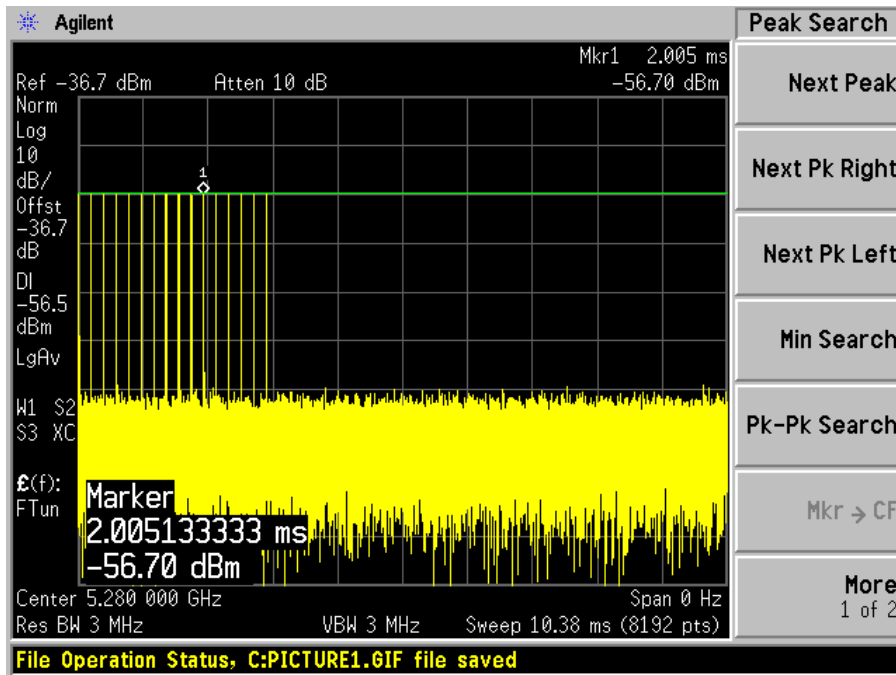
Radar Type 1



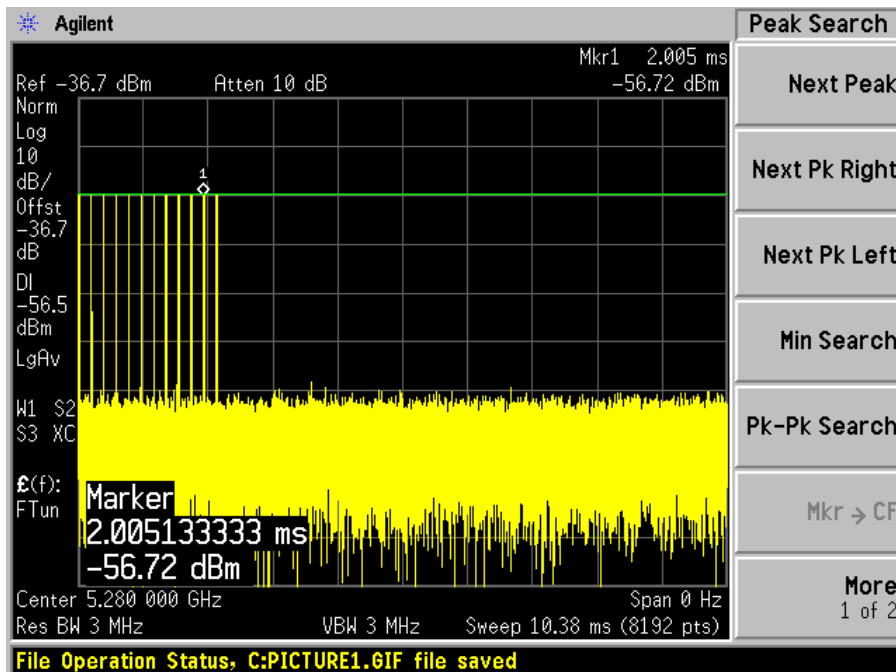
Radar Type 2



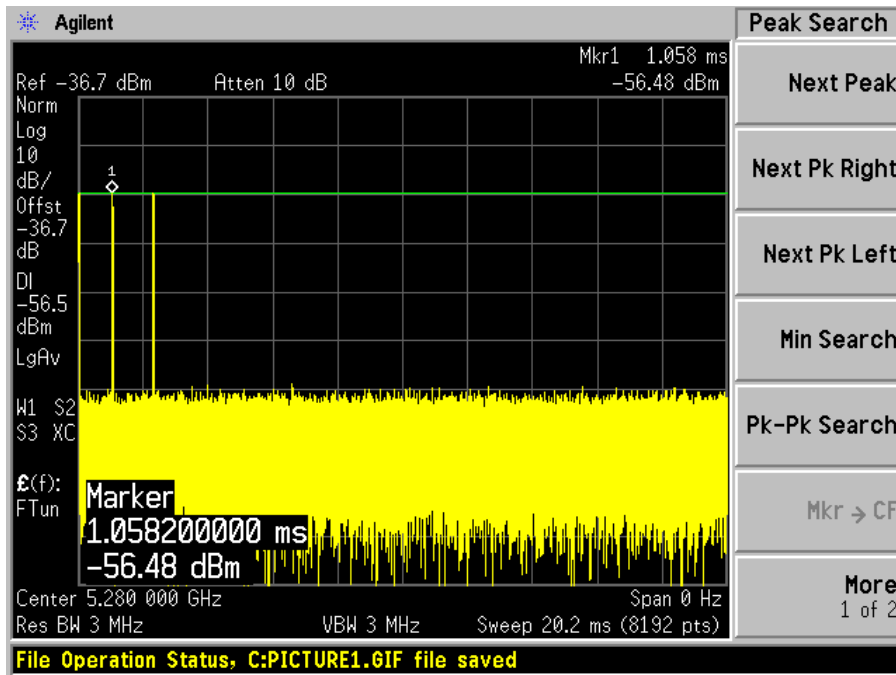
Radar Type 3



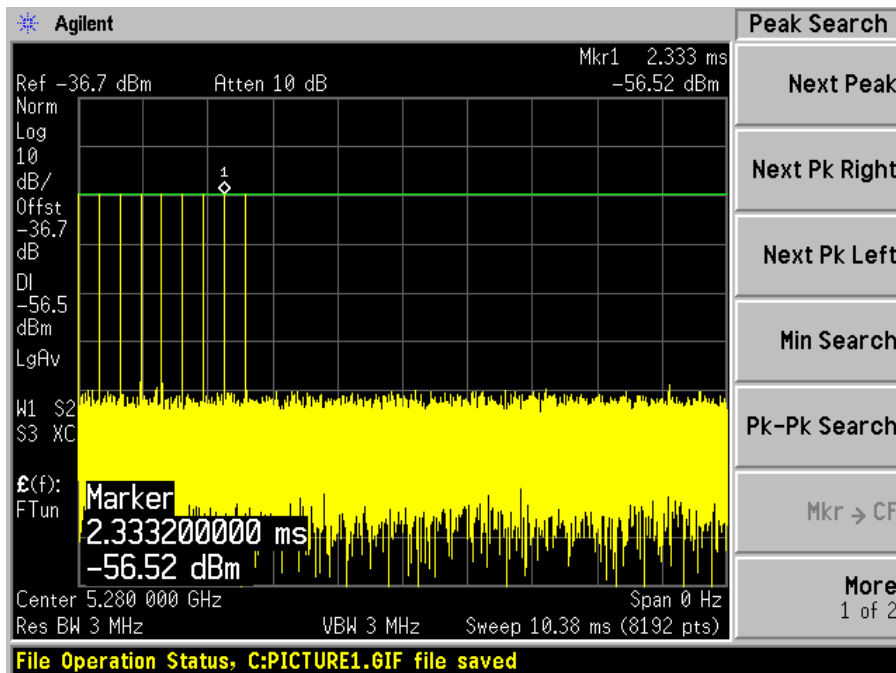
Radar Type 4



Radar Type 5

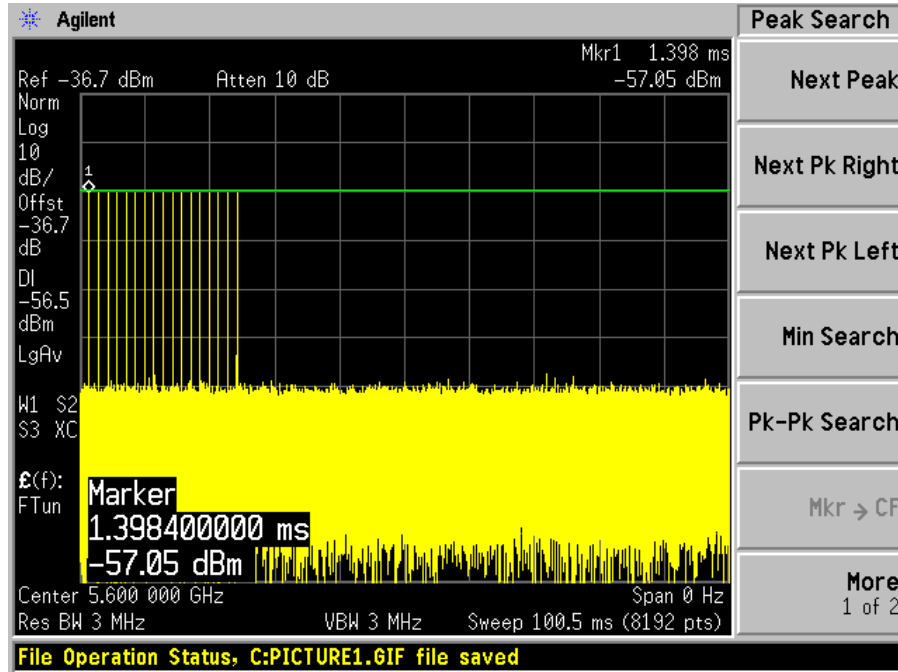


Radar Type 6

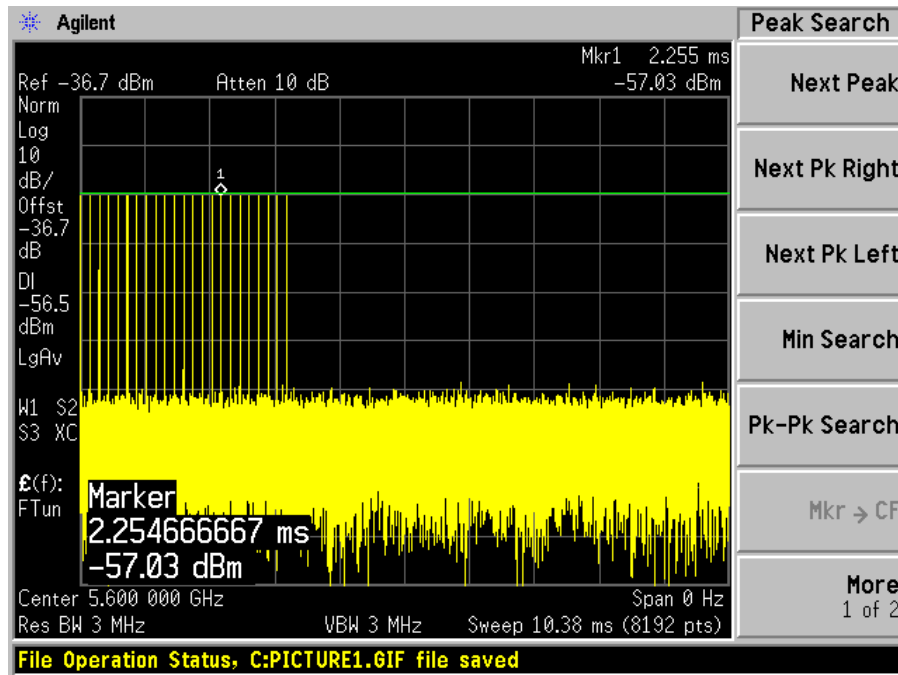


5600 MHz

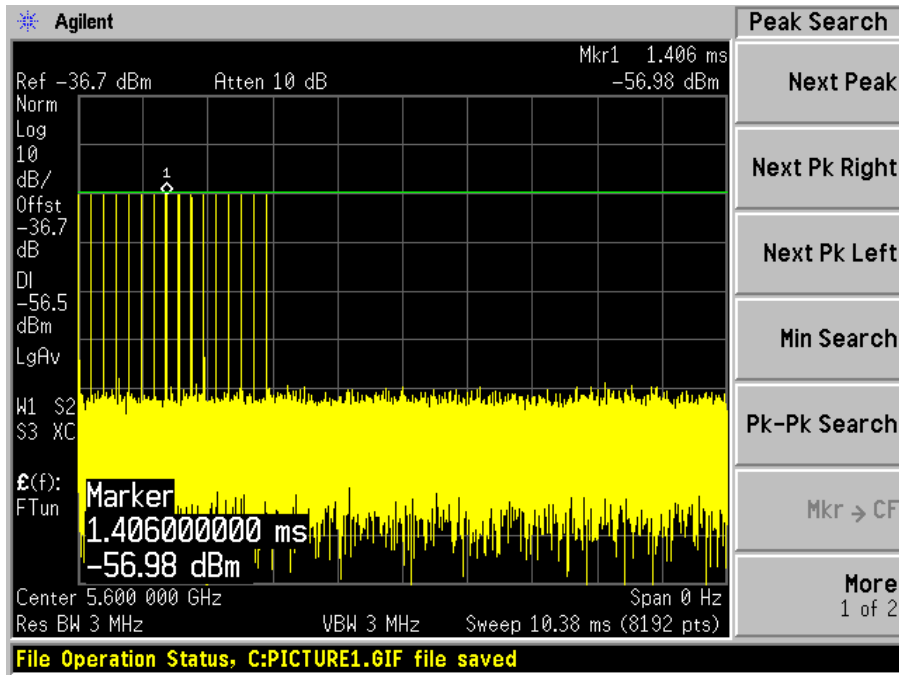
Radar Type 1



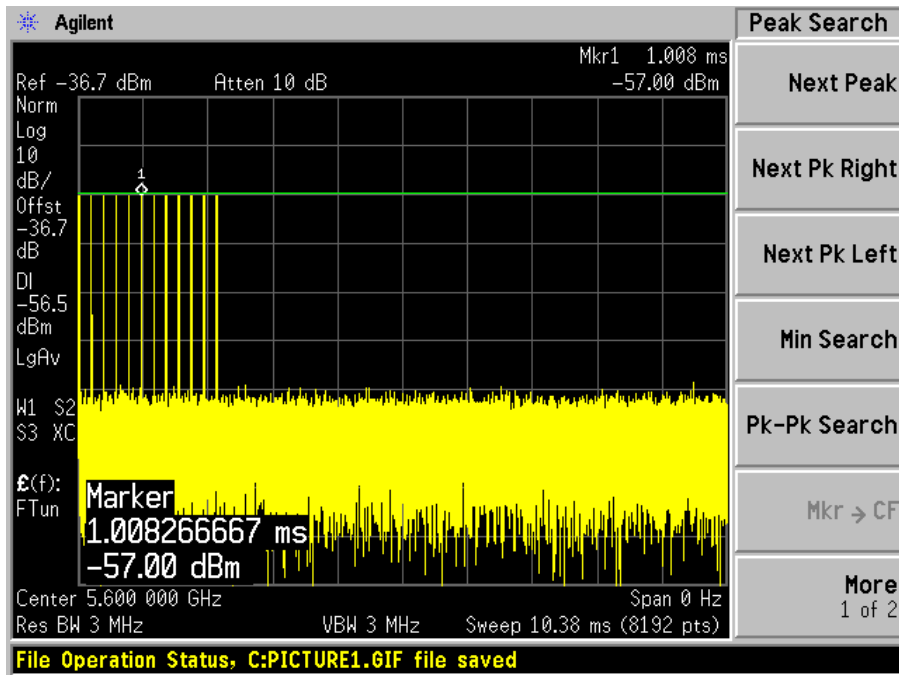
Radar Type 2



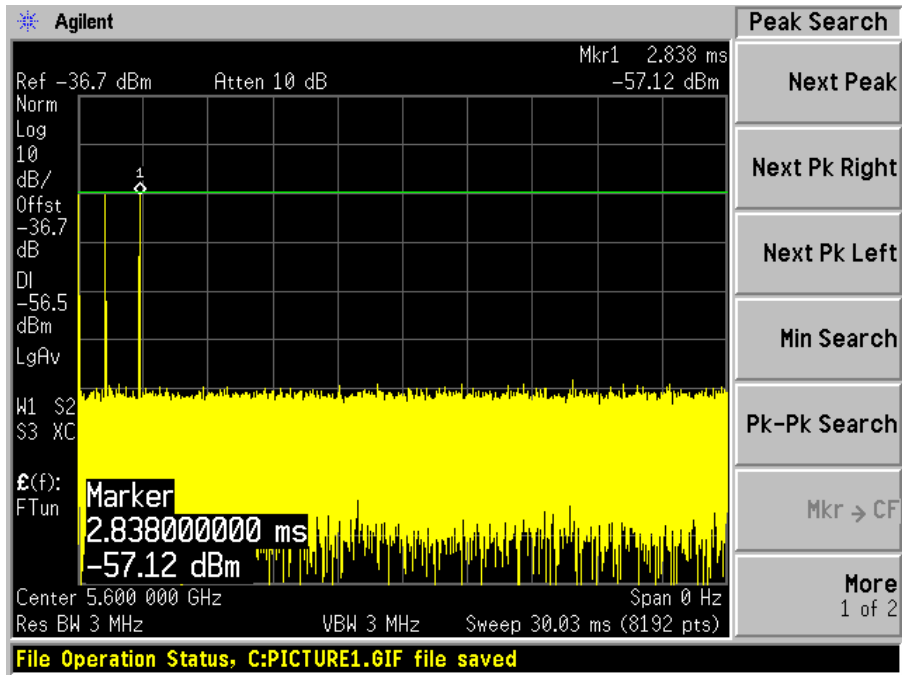
Radar Type 3



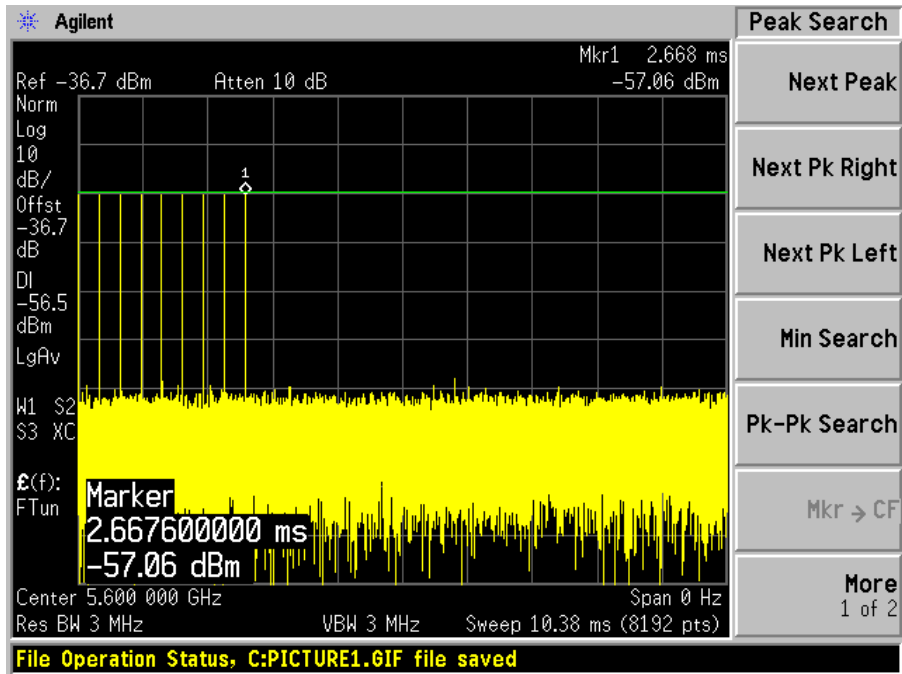
Radar Type 4



Radar Type 5



Radar Type 6



Channel Availability Check Time (CAC)

Test Procedure

- 1) Measure the initial power-up time of EUT.
- 2) With link established on channel, apply a radar signal within 0~6 seconds after the initial power-up period, monitor the transmissions on channel from the spectrum analyzer.
- 3) Reboot EUT, with a link established on channel, apply a radar signal within 54~60 seconds after the initial power-up period, monitor the transmission on channel from the spectrum analyzer.

EUT Initial power-up Cycle Time

EUT initial Power-up cycle (Second)
/

Results: Not Required.

Timing of Radar Burst	Spectrum Analyzer Display
No Radar Triggered	/
Within 6 seconds of the CAC starting	/
Within the last 6 seconds of the CAC	/

14.11 Channel Move time and channel closing transmission time

Test Procedure:

Perform one of the type1 to type 4 short pulse radar waveform, BACL use type 1 radar signal, repeat using a long pulse radar type5 waveform.

The aggregate channel closing transmission time is calculated as follows:

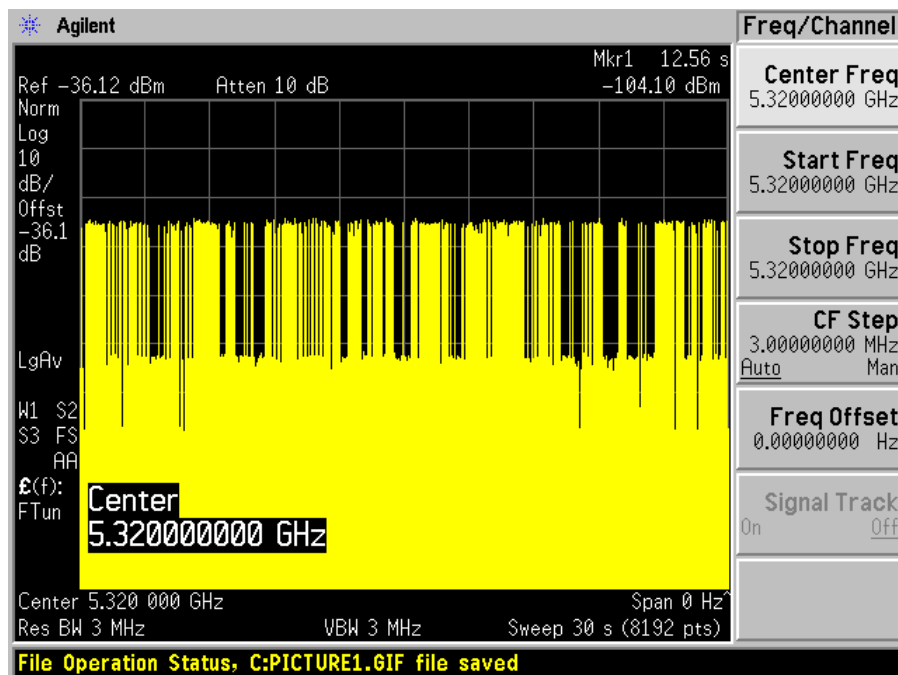
$$\text{Aggregate Transmission Time} = N * \text{Dwell Time}$$

N is the number of spectrum analyzer bins showing a device transmission

Dwell Time is the dwell time per bin (i.e. Dwell Time = S/B, S is the sweep time and B is the number of bin, i.e. 8192)

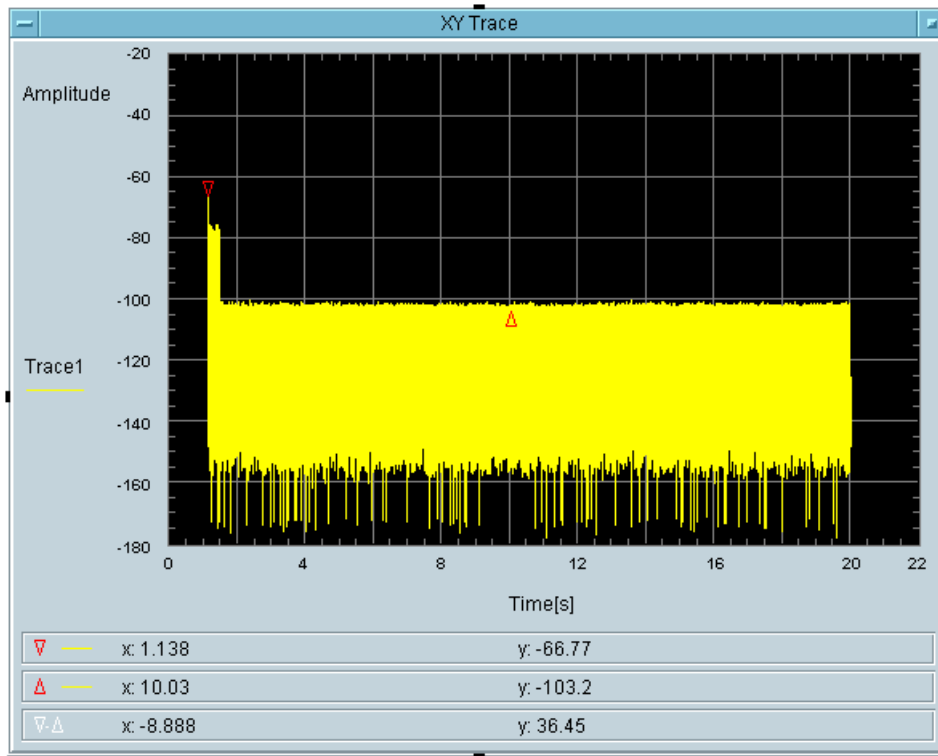
5320 MHz

WLAN Traffic:



Type1 radar channel closing transmission time result:

Aggregate Transmission Time (ms)	Limit (ms)	Margin (ms)
17.09	60	42.91

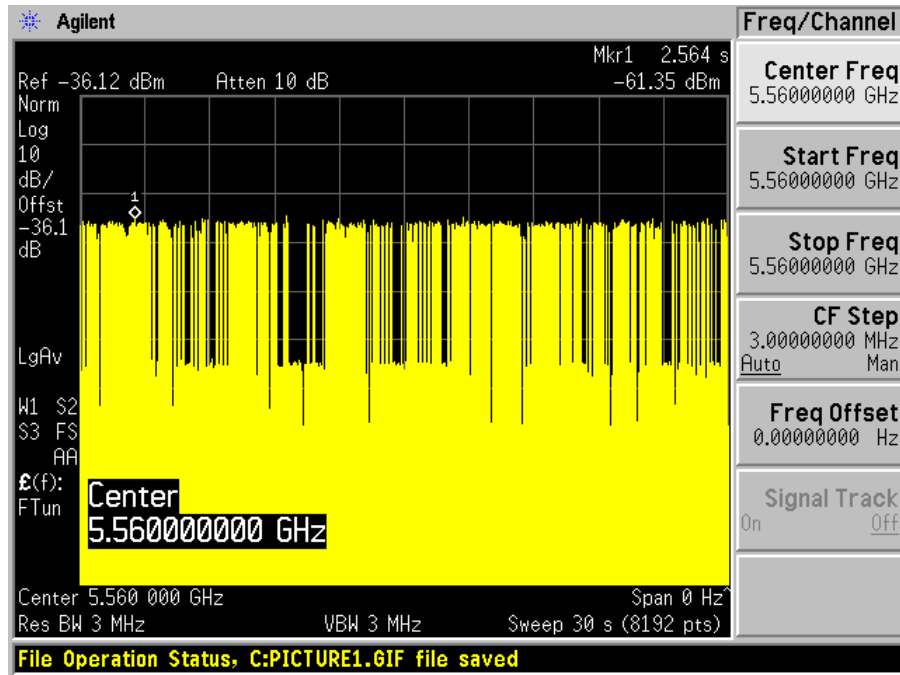


Total On Time [s]
46.39m

Total On Time After Delay [s]
17.09m

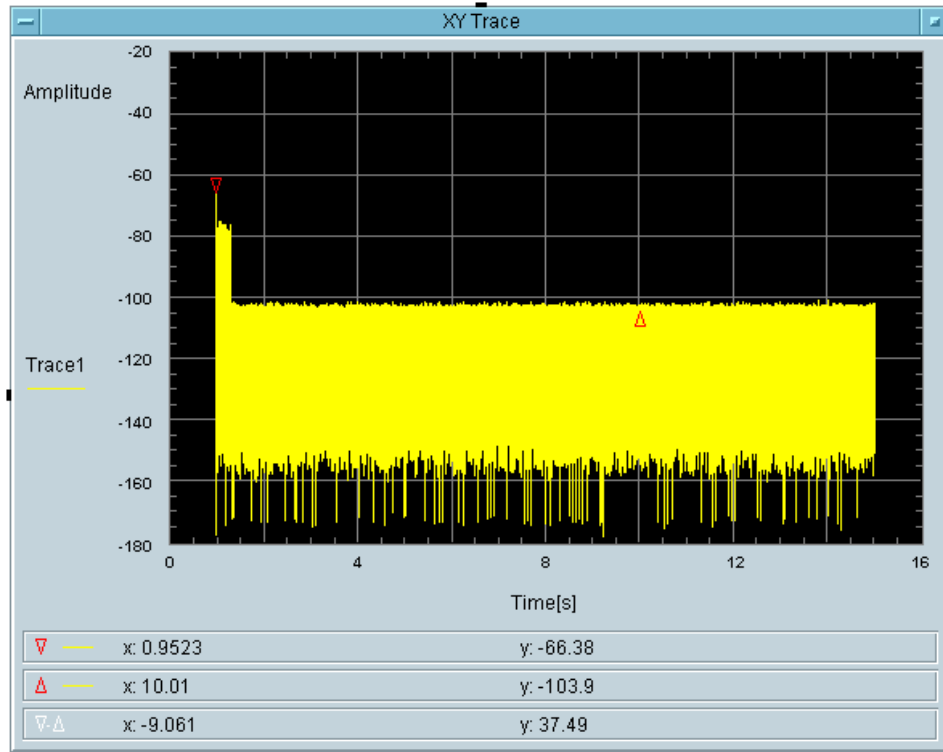
5560 MHz

WLAN Traffic:



Type1 radar channel closing transmission time result:

Aggregate Transmission Time (ms)	Limit (ms)	Margin (ms)
16.48	60	43.52



Total On Time [s]
42.12m

Total On Time After Delay [s]
16.48m

Non-Occupancy Period

Test Procedure

Client device is not permitted to transmit beacons on DFS frequencies.

- 1) Non-associated test: The master has been off, monitor the analyzer on the test mode frequency that have been selected for testing, power up the client for 30 minutes to make sure no beacons have been transmitted.
- 2) Associated test: Associate the master and client and stream the movie as specified for non-occupancy test. Transmit Radar type 1, monitor the test frequency to make sure no beacons have been transmitted for 30 minutes.

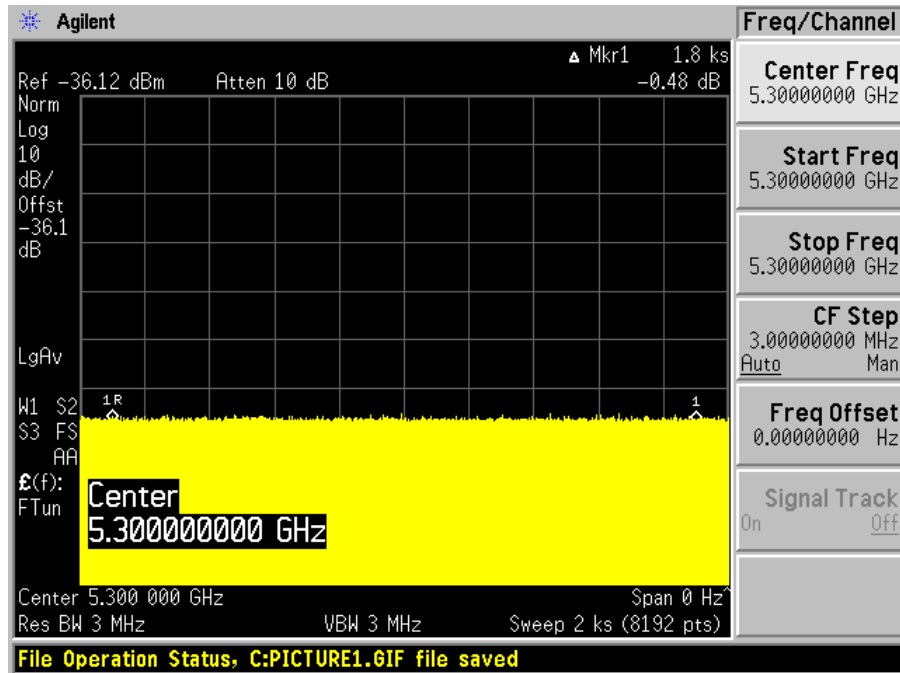
Result: Pass.

Mode	Results
Non-Associated	No Beacons transmit
Associated	No transmissions

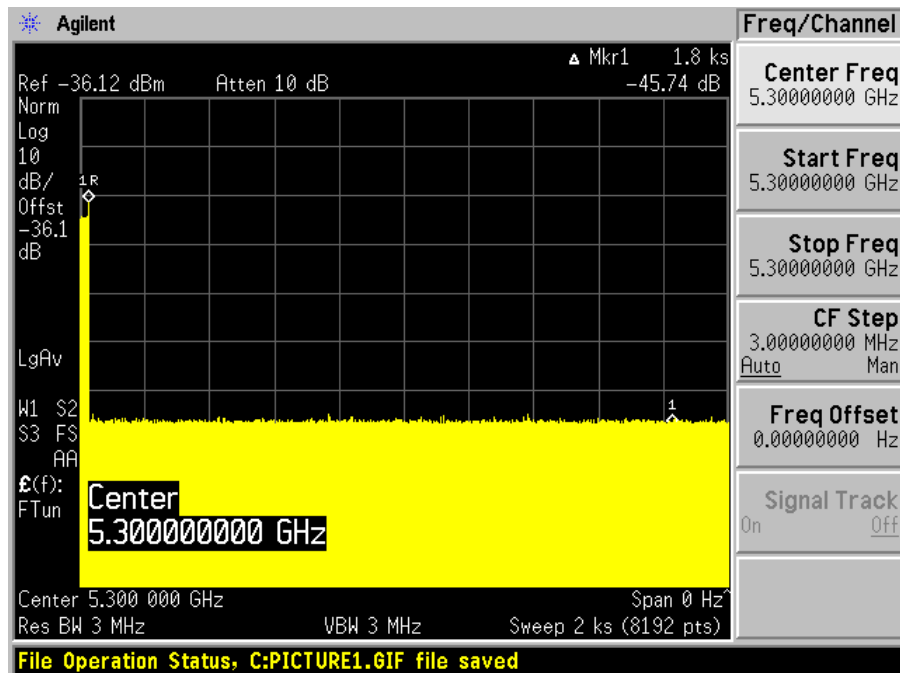
Please refer to the following plots.

5300 MHz:

1) Non-associated:

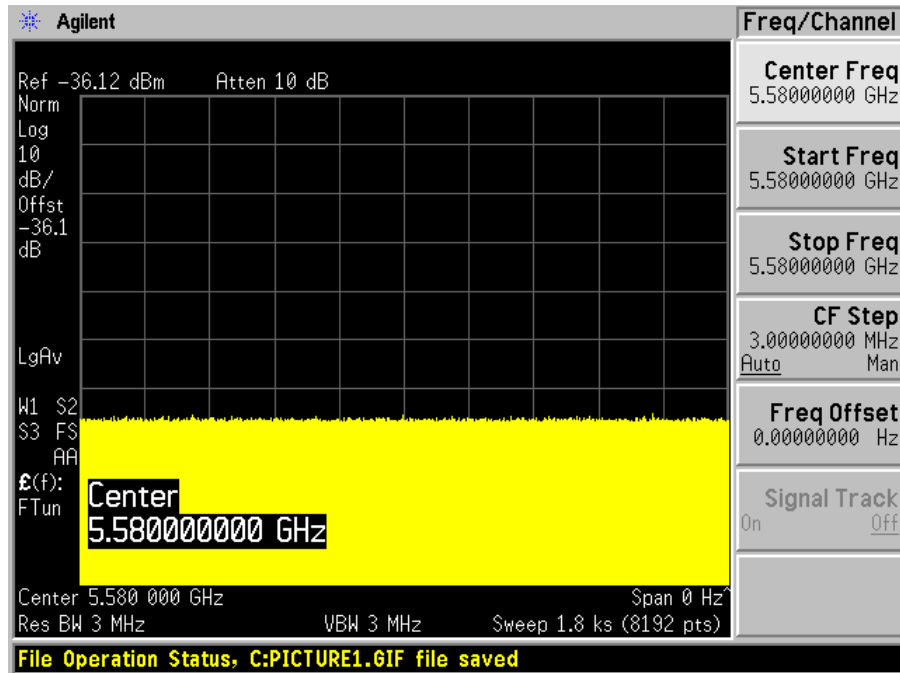


2) Associated:

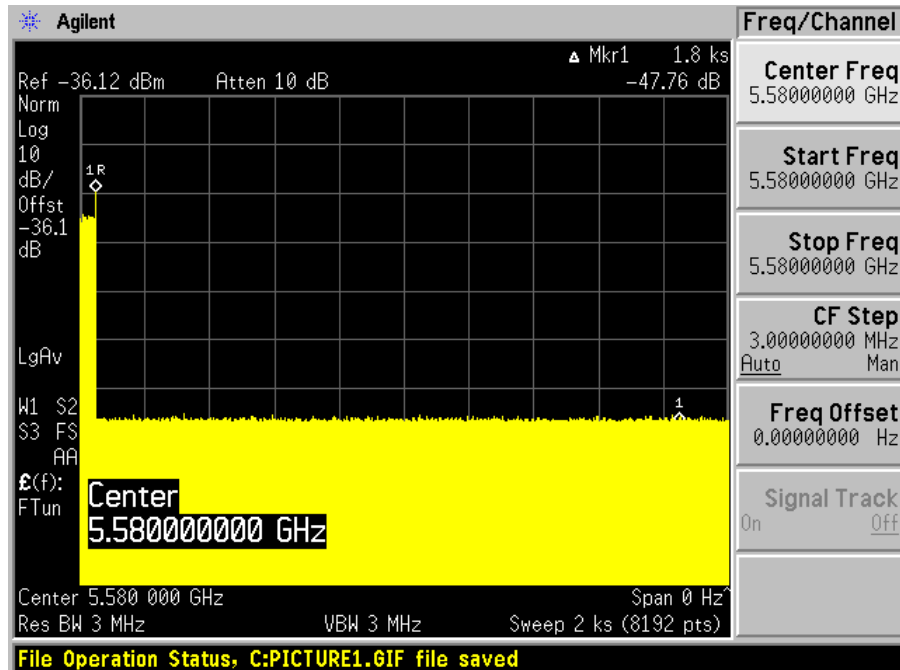


5580 MHz:

1) Non-associated:



2) Associated:



Detection Bandwidth

Procedure:

Performed with any one of the short pulse radar waveforms (type 1, 2, 3 or 4)

Start with radar generator frequency set to the center of the channel (F_c)

Perform at least 10 trials and confirm at least 90% detected

Increment radar generator frequency by 1 MHz and repeat

Perform at least 10 trials and confirm at least 90% detected

Continue incrementing the radar frequency until detection rate falls below 90%

Starting at $F_c - 1$ MHz, repeat the process, this time decrementing the radar frequency by 1 MHz

F_L is the lowest frequency at which detection was 80% or better

F_H is the highest frequency at which detection was 80% or better

UNII Detection Bandwidth = $F_H - F_L$

Result: Not Required.

In-Service Monitoring

Procedure:

Stream MPEG file from master to slave

Generate radar waveform

Record whether or not the waveform was detected

At least 30 trials are applied for each radar type

For radar types with randomized parameters, each trial uses a unique waveform

Perform with each of the radar types 1-6

Confirm that the detection rate for each radar type meets the minimum requirement

Type 1, 2, 3, 4: 60% each

Type 5: 80%

Type 6: 70%

Confirm that the mean of the rates for radar types 1 through 4 meets the requirement of 80%

$$\text{Detection Ratio} = \frac{\text{Total Waveform Detections}}{\text{Total Waveform Trails}} \times 100$$

Result: Not Required.