COMPLIANCE WORLDWIDE INC.
TEST REPORT 281-07

In Accordance with the Requirements of

FCC PART 15.407, Subpart E
INDUSTRY CANADA RSS 210, ISSUE 7, ANNEX 9

Low Power License-Exempt Radio Communication Devices
Intentional Radiators

Issued to

Bluesocket, Inc.
10 North Avenue
Burlington, MA 01803
(781) 328-0888

for

BlueSecure™ BSAP-1800

Report Issued on October 12, 2007

Tested by

Brian F. Breault

Reviewed by

Larry K. Stillings

Table of Contents

Compliance Worldwide, Inc. - 357 Main Street - Sandown, NH 03873
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http://www.cw-inc.com

1. Scope

This test report certifies that the Bluesocket BlueSecure™ Access Point 1800, BSAP-1800, as tested, meets the FCC Part 15.407, Subpart E and Industry Canada RSS 210, Issue 7, Annex 9 requirements. The scope of this test report is limited to the test sample provided by the client, only in as much as that sample represents other production units. If any significant changes are made to the unit, the changes shall be evaluated and a retest may be required.

2. Product Details

2.1. Manufacturer: Bluesocket, Inc.

2.2. Model Number: BlueSecure™ BSAP-1800

2.3. Serial Number: None

2.4. Description: The BlueSecure™ Access Point 1800 (BSAP-1800) is an enterprise-class 802.11a/b/g Wi-Fi certified AP to use MIMO technology. This approach achieves more than 30 percent better range and overall performance, using your existing standard 802.11a/b/g clients, than APs using legacy 802.11 technologies. ISM Channels 48 and 52 to 60 that require Dynamic Frequency Selection (DFS) and Transmit Power Control (TPC) have been disabled. ISM Channel 165 is also disabled.

2.5. Power Source: 48 Volts DC via Power Over Ethernet or
48 Volts DC Power Adapter

2.6. EMC Modifications: None

3. Product Configuration

3.1. Support Equipment

Device	Manufacturer	Model	Serial No.	Comment
Notebook PC	Dell	Inspiron 5160	CN-0T5326-12961-4C1-5477	Remotely located
PoE Injector	PowerDsine	3001	R06416050041283801	Remotely located

3.2. Cables

Cable Type	Length	Shield	From	To
CAT 5 Ethernet (UTP)	1.5 Meters	No	Notebook PC	PoE Injector
CAT 5 Ethernet (UTP)	10 Meters	No	PoIP Injector	BSAP-1800

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3. Product Configuration (continued)

3.3. Operational Characteristics & Software

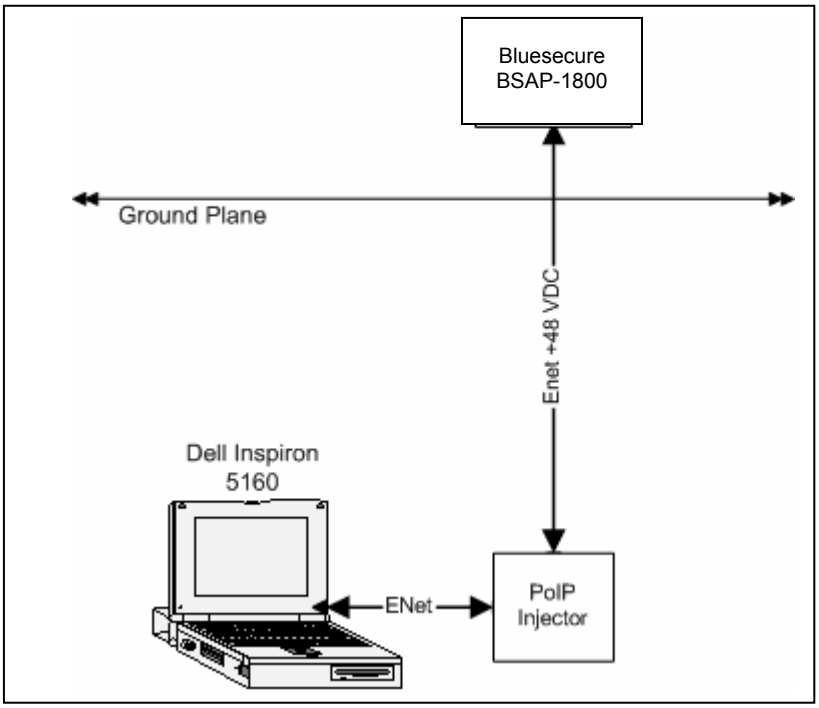
1. Click on the Login AP icon on the desktop. Type wg1000 as the pass phrase.
2. Navigate through the CLI to the command prompt (Enter option 6, then enter option 1)
3. At the command prompt, type /home/setup_1800 (this will configure the AP – there will be a delay of about 30 seconds before the prompt returns)
4. To set the channels, perform the following:
   To change 2.4GHz channels:
   iwconfig ath0 channel <channel number>
   To change 5 GHz channels:
   iwconfig ath1 channel <channel number>
5. `To set the power, perform the following:
   To change 2.4GHz channels:
   iwconfig ath0 txpower < value in dBm>

   To change 5 GHz channels:
   iwconfig ath1 txpower < value in dBm>

6. Click on the "Run Traffic" icon on the desktop. This will startup the traffic through the AP.

   Note : The 7 dBm setting was used for measurements on Channels 36 to 44.

3.4. Block Diagram



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4. Measurements Parameters

4.1. Measurement Equipment Used to Perform Test

Device	Manufacturer	Model No.	Serial No.	Cal Due
EMI Receiver	Hewlett Packard	8546A	3650A00360	3/14/2008
EMI Receiver	Agilent	E4407B	MY45108355	11/22/2008
Spectrum Analyzer	Hewlett Packard	8593E	3829A03887	3/8/2008
Microwave Preamp	Hewlett Packard	8449B	3008A01323	9/21/2008
Bilog Antenna	Com-Power	AC220	25509	8/2/2008
Horn Antenna	Electro-Metrics	EM-6961	6337	8/23/2008
Horn Antenna	ComPower	AH-840	03075	8/23/2008
2.4 GHz BP Filter	Micro-Tronics	BRM50702	14	11/16/2007

4.2. Measurement & Equipment Setup

Test Date:	9/4/2007
Test Engineer:	Brian Breault
Normal Site Temperature (15 - 35°C):	21.6
Relative Humidity (20 -75%RH):	25
Frequency Range:	30 MHz to 40 GHz
Measurement Distance:	3 Meters

4.3. Test Procedure

The test measurements contained in this report are based on the requirements detailed in FCC Part 15, Subpart E—Unlicensed National Information Infrastructure Devices, operating in the 5.15–5.35 GHz, 5.47–5.725 GHz and 5.725–5.825 GHz bands.

The test methods used to generate the data is this test report are in accordance with 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.

In accordance with ANSI C63.4-2003, section 13.1.4.1, c, the device under test was rotated through three orthogonal axes to determine which attitude produced the highest emission relative to the limit. The attitude that produced the highest emission relative to the limit was used for all radiated emission measurements.

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5. Measurement Summary

Test Requirement	FCC Part 15.407 Reference	Test Report Section	Result	Comment
Maximum Conducted Output Power	15.407(a)(1) 15.407(a)(3)	6.1	Compliant	
Peak Power Spectral Density	15.407(a)(5)	6.2	Compliant	
26 dB Emission Bandwidth	15.407(a)(1)	6.3	N/A	
99% Power Bandwidth	N/A	6.4	N/A	IC RSS 210
Peak Excursion of the Modulation Envelope	15.407(a)(6)	6.5	Compliant	
Spurious Radiated Emissions	15.209 15.407(b)(1) 15.407(b)(4)	6.7 - 6.10	Compliant	
Lower and Upper Band Edges	15.407(b)(1) 15.215 (c) 15.407(b)(4)	6.11	Compliant	
Public Exposure to RF Energy Levels	15.407(f)	6.12	Compliant	(1.1307 (b)(1)) RSS-GEN 5.5, RSS 102
Frequency Stability	15.407(g)	6.13	Compliant	
Conducted Emissions	15.207	6.14	Compliant	

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6. Measurement Data

6.1. Radiated Equivalent Isotropic Radiated Power

6.1.1. Field Strength Measurements

Note: The following equation was used to determine the output power from the measured field strength:

$$P = \frac{(E \times d)^2}{(30 \times G)}$$

E = the measured maximum field in V/m
G = the numeric gain of the transmitting antenna over an isotropic radiator.
d = the distance in meters of the field strength measurement.
P = the power in Watts.

Resolution Bandwidth : 1 MHz
Video Bandwidth : 3 MHz
Sweep Time : 20 mSec

6.1.1.1. Radiated Equivalent Isotropic Radiated Power 15.407(a)(1)

Requirement: 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 dBm + 10 log B], where B is the 26–dB emission bandwidth in MHz.

Channel	Channel Frequency	Peak Field Strength	Antenna Gain	Power		Limit		Result
	GHz	dBµV	Numeric	mW	dBm	mW	dBm	
36	5.180	117.12	3.581	43.16353	16.351	50.00	16.99	Compliant
40	5.200	117.21	3.581	44.06735	16.441	50.00	16.99	Compliant
44	5.220	117.20	3.581	43.96600	16.431	50.00	16.99	Compliant

6.1.1.2. Radiated Equivalent Isotropic Radiated Power 15.407(a)(3)

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

Channel	Channel Frequency	Peak Field Strength	Antenna Gain	Power		Limit		Result
	GHz	dBµV/m	Numeric	Watts	dBm	Watts	dBm	
149	5.745	128.43	3.206	0.65187	28.142	1	30	Compliant
153	5.765	128.73	3.206	0.69849	28.442	1	30	Compliant
161	5.805	129.22	3.206	0.78191	28.932	1	30	Compliant

[1] Reference section 6.3 for the 26 dB emissions bandwidth information.

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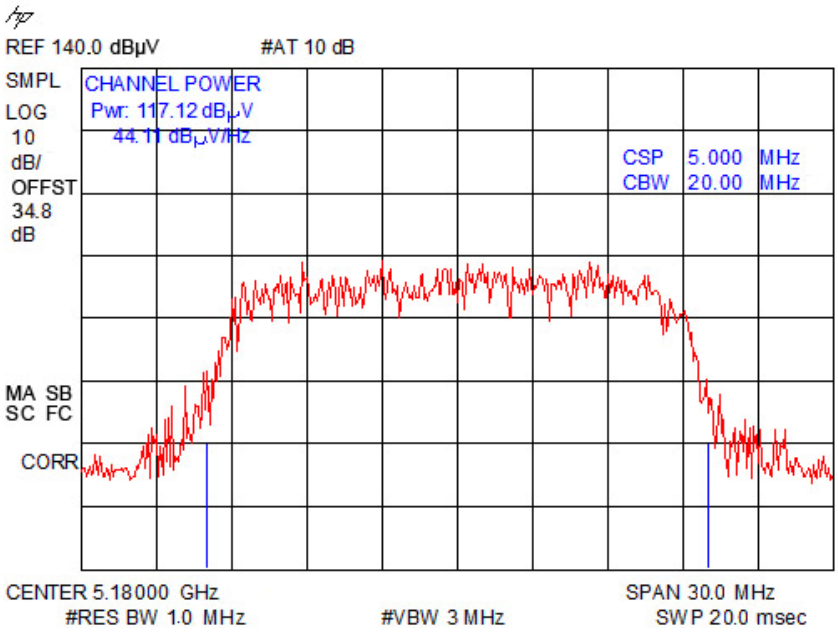
6. Measurement Data (continued)

6.1. Radiated Equivalent Isotropic Radiated Power

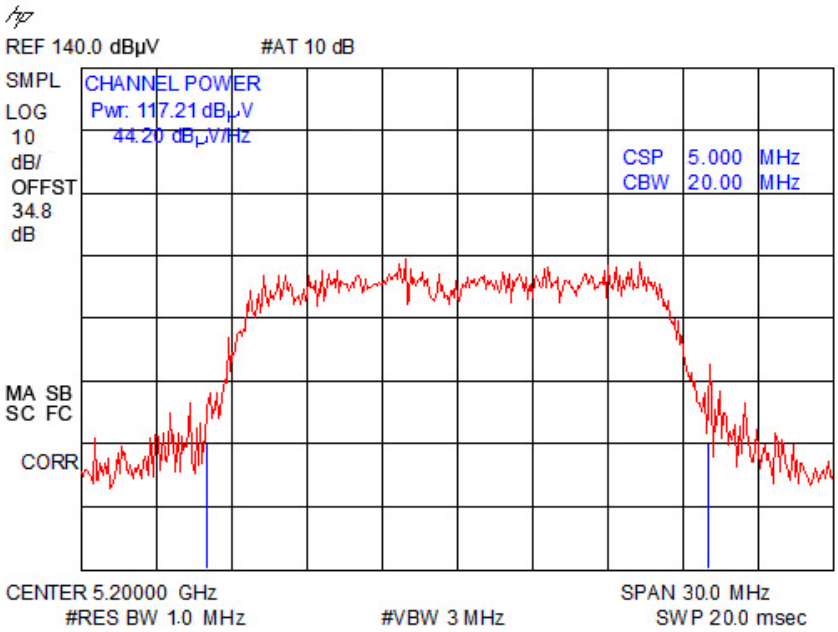
6.1.1. Field Strength Measurements

6.1.1.3. Radiated Equivalent Isotropic Radiated Power – Plots

6.1.1.3.1. Channel 36



6.1.1.3.2. Channel 40



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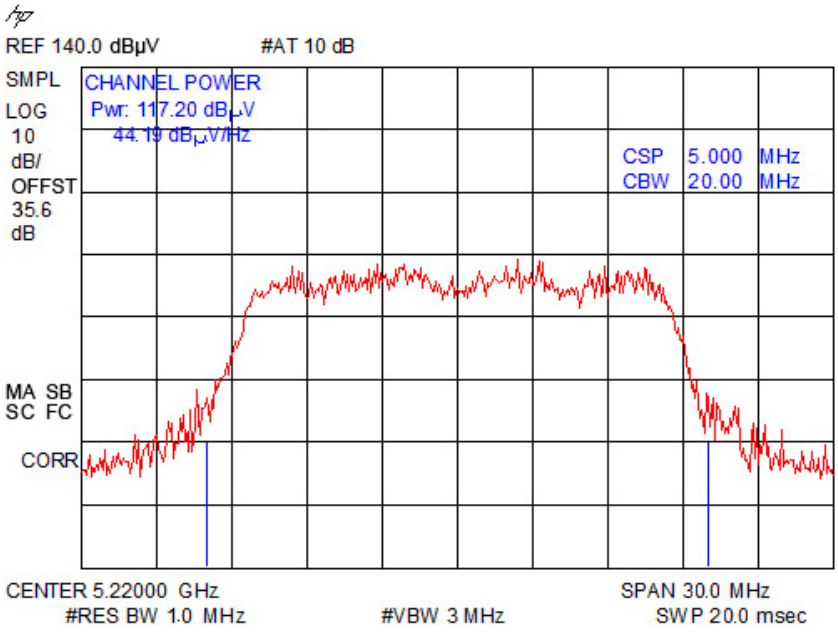
6. Measurement Data (continued)

6.1. Radiated Equivalent Isotropic Radiated Power

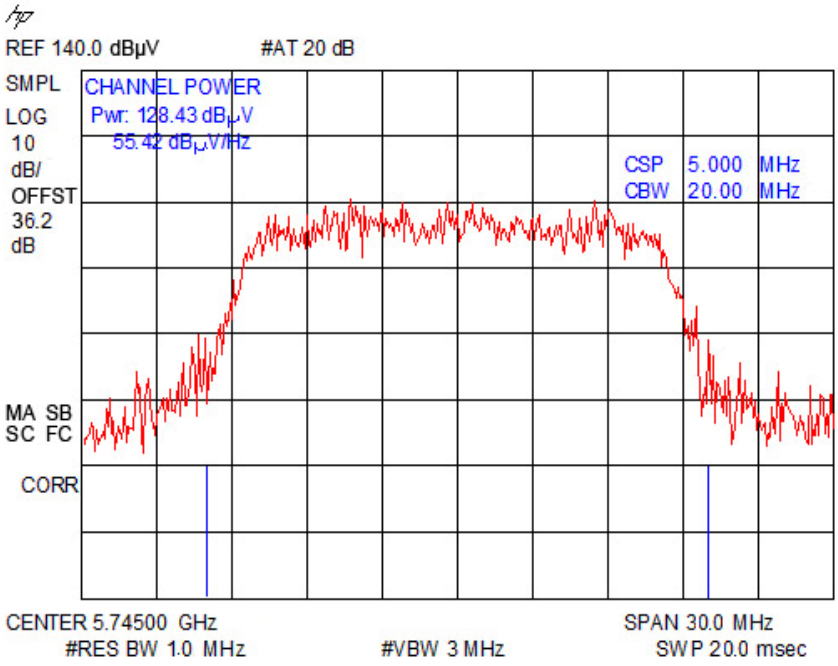
6.1.1. Field Strength Measurements

6.1.1.3. Radiated Equivalent Isotropic Radiated Power – Plots

6.1.1.3.3. Channel 44



6.1.1.3.4. Channel 149



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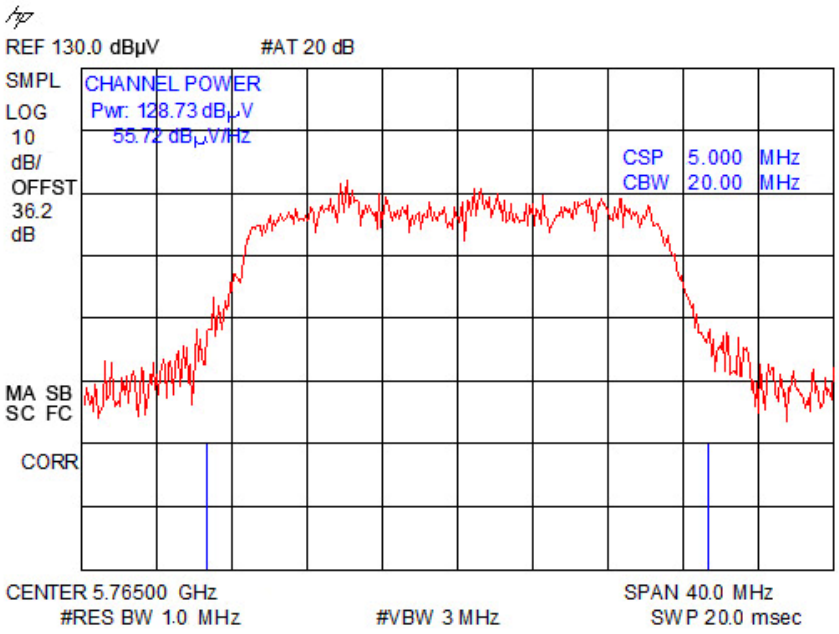
6. Measurement Data (continued)

6.1. Radiated Equivalent Isotropic Radiated Power

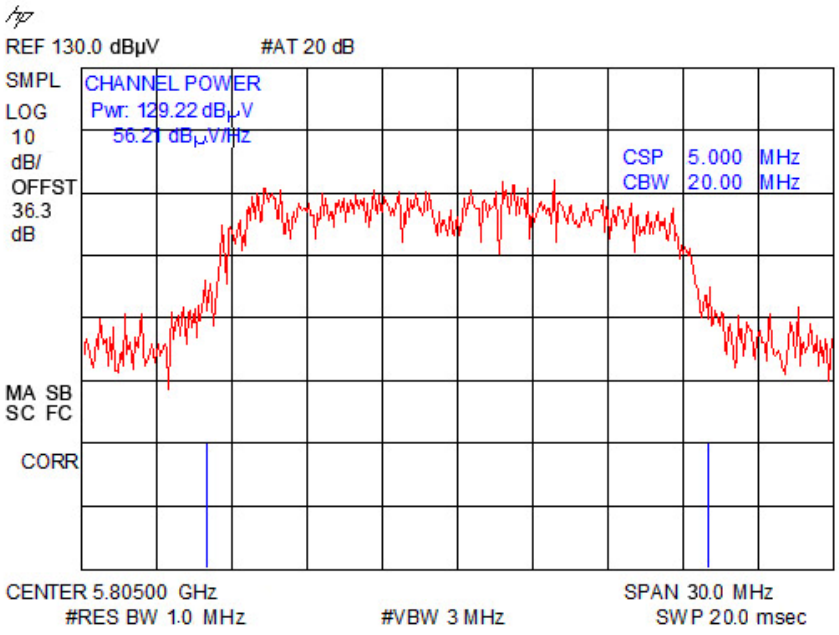
6.1.1. Field Strength Measurements

6.1.1.3. Radiated Equivalent Isotropic Radiated Power – Plots

6.1.1.3.5. Channel 153



6.1.1.3.6. Channel 161



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6. Measurement Data

6.1. Maximum Peak Conducted Output Power (15.247(b)(3))

6.1.2. Conducted Mode Measurements

Requirement: For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands, the maximum conducted output power over the frequency band of operation shall not exceed: 1 Watt.

The EUT consists of two transmitters and three receivers for the 2x3 MIMO array. Each transmitter was measured and the power was summed below mathematically.

The power was calculated using the spectrum analyzer power integration function with the following settings:

Resolution Bandwidth : 1 MHz
Video Bandwidth : 3 MHz
Frequency Span : 30 MHz
Channel Bandwidth : 20 MHz
Sweep Time : 20 mSec

Total Power (dBm) = 10 $_{LOG}$ ((10^(Chain 0 Power/10)) + (10^(Chain 2 Power/10)))

6.1.2.1. Maximum Peak Conducted Output Power 15.407(a)(1)

Requirement: 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 dBm + 10 log B], where B is the 26–dB emission bandwidth in MHz.

Channel	Channel Frequency	Power Meas. Chain 0	Power Meas. Chain 2	Power		Limit		Result
	GHz	dBm	dBm	dBm	mW	dBm	mW	
36	5.180	11.57	9.03	13.49	22.353	16.99	50.00	Compliant
40	5.200	11.77	9.03	13.62	23.030	16.99	50.00	Compliant
44	5.220	11.60	9.97	13.87	24.386	16.99	50.00	Compliant

6.1.2.2. Maximum Conducted Output Power 15.407(a)(3)

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

Channel	Channel Frequency	Power Meas. Chain 0	Power Meas. Chain 2	Power		Limit		Result
	GHz	dBm	dBm	dBm	mW	dBm	mW	
149	5.745	20.63	20.31	23.48	223.010	30.00	1000	Compliant
153	5.765	20.36	19.88	23.14	205.917	30.00	1000	Compliant
161	5.805	20.13	19.50	22.84	192.164	30.00	1000	Compliant

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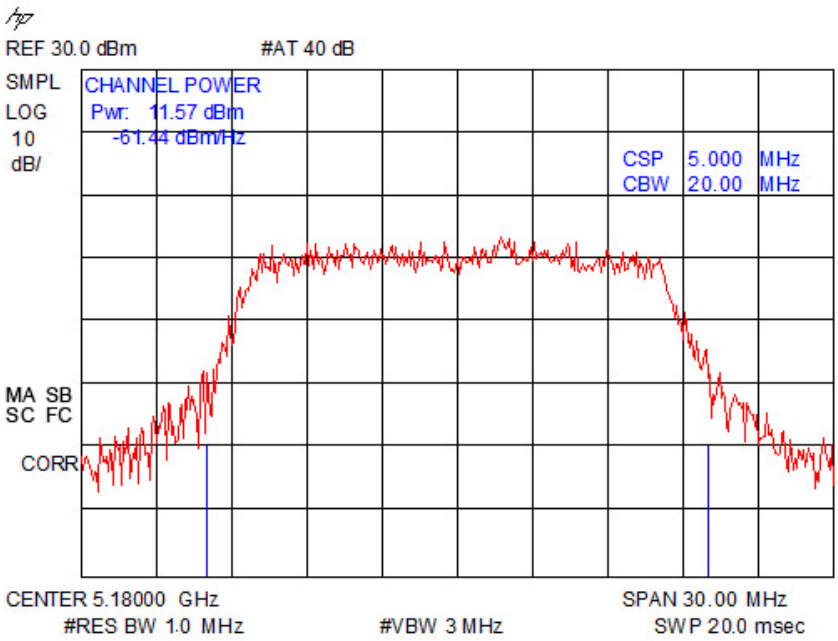
6. Measurement Data (continued)

6.1. Maximum Peak Conducted Output Power (15.247(b)(3)) (continued)

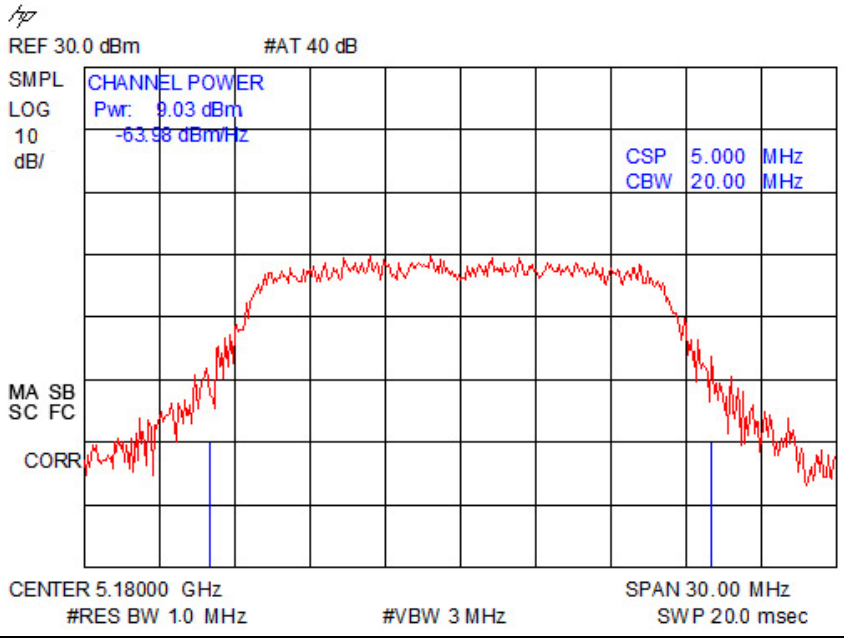
6.1.2. Conducted Mode Measurements (continued)

6.1.2.3. Maximum Peak Conducted Output Power – Plots

6.1.2.3.1. Channel 36 Chain 0



6.1.2.3.2. Channel 36 Chain 2



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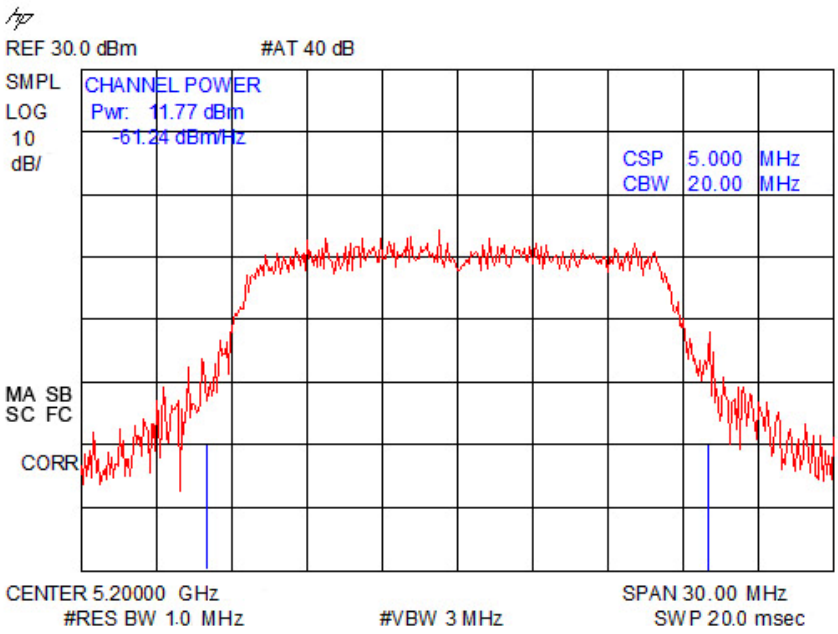
6. Measurement Data (continued)

6.1. Maximum Peak Conducted Output Power (15.247(b)(3)) (continued)

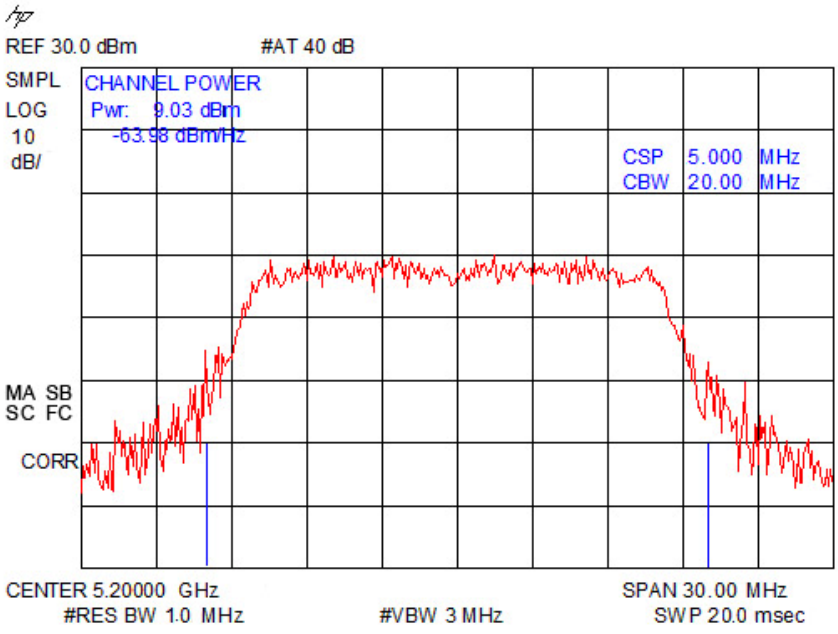
6.1.2. Conducted Mode Measurements (continued)

6.1.2.3. Maximum Peak Conducted Output Power – Plots

6.1.2.3.3. Channel 40 Chain 0



6.1.2.3.4. Channel 40 Chain 2



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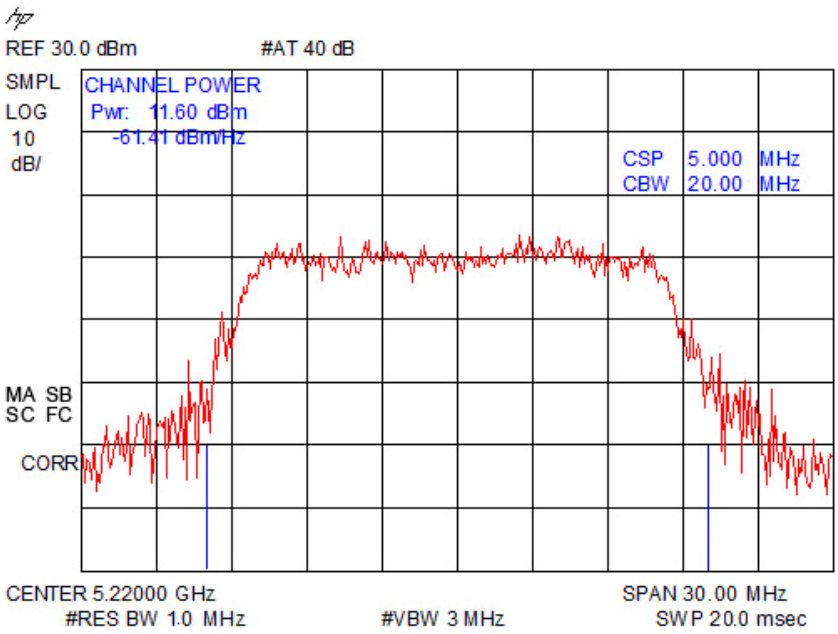
6. Measurement Data (continued)

6.1. Maximum Peak Conducted Output Power (15.247(b)(3)) (continued)

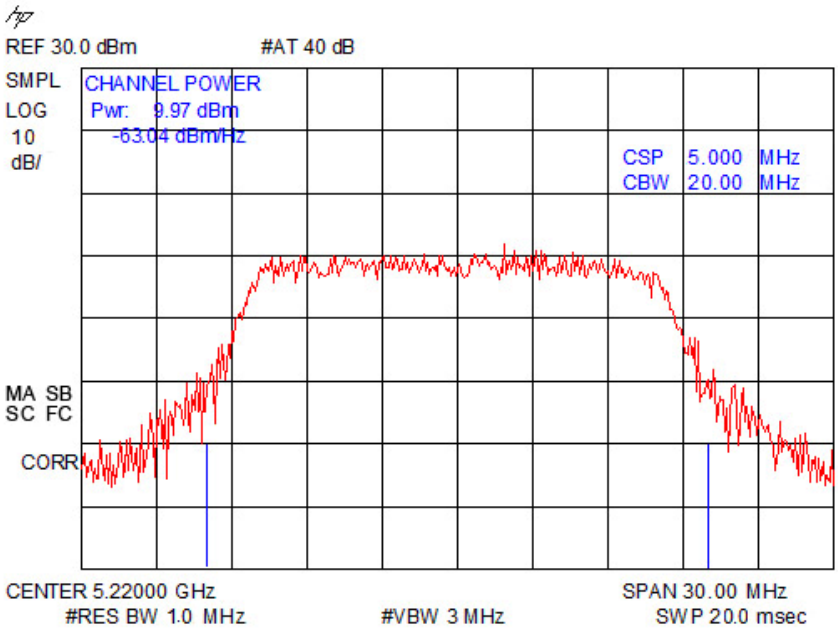
6.1.2. Conducted Mode Measurements (continued)

6.1.2.3. Maximum Peak Conducted Output Power – Plots

6.1.2.3.5. Channel 44 Chain 0



6.1.2.3.6. Channel 44 Chain 2



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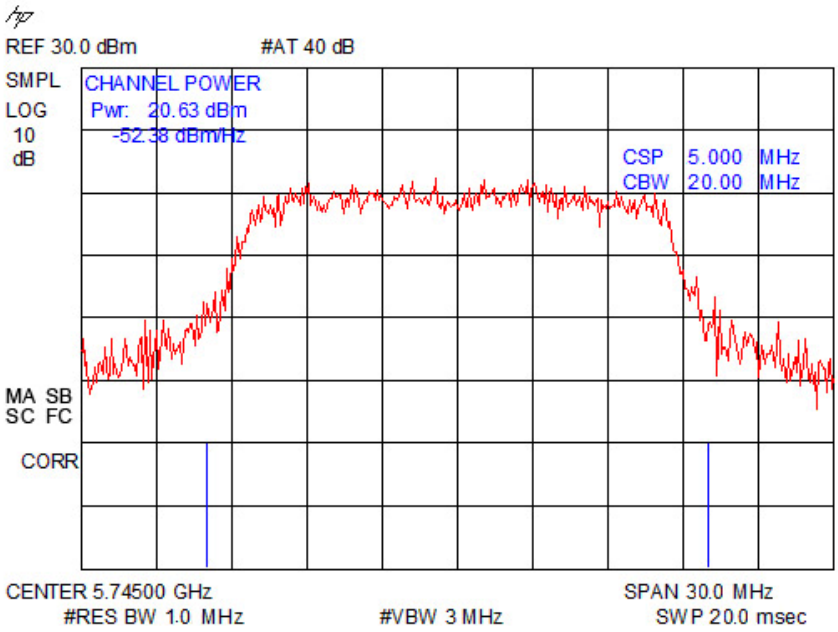
6. Measurement Data (continued)

6.1. Maximum Peak Conducted Output Power (15.247(b)(3)) (continued)

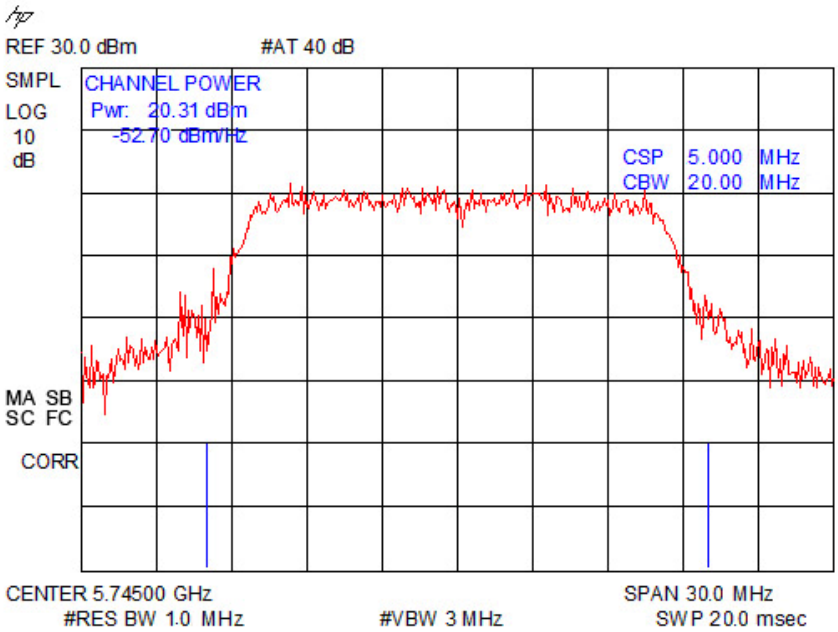
6.1.2. Conducted Mode Measurements (continued)

6.1.2.3. Maximum Peak Conducted Output Power – Plots

6.1.2.3.7. Channel 149 Chain 0



6.1.2.3.8. Channel 149 Chain 2



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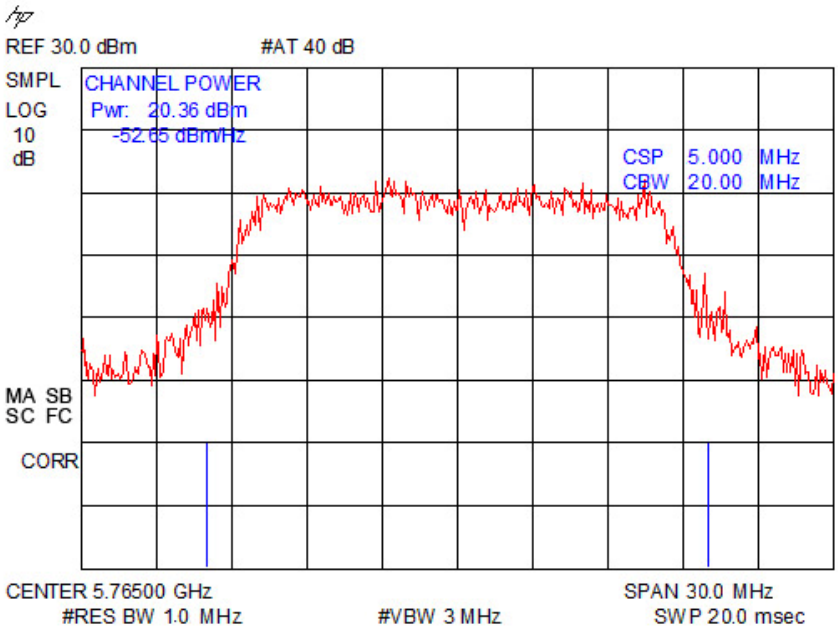
6. Measurement Data (continued)

6.1. Maximum Peak Conducted Output Power (15.247(b)(3)) (continued)

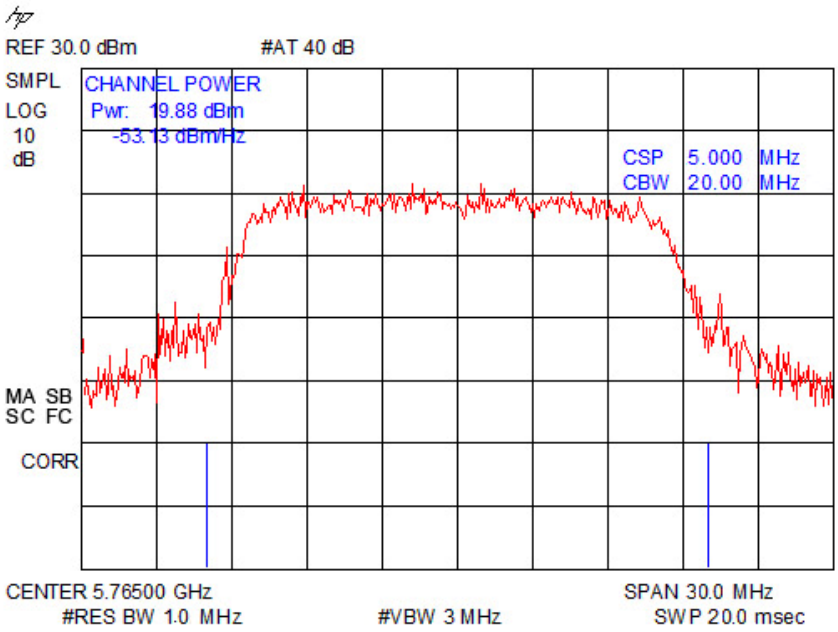
6.1.2. Conducted Mode Measurements (continued)

6.1.2.3. Maximum Peak Conducted Output Power – Plots

6.1.2.3.9. Channel 153 Chain 0



6.1.2.3.10. Channel 153 Chain 2



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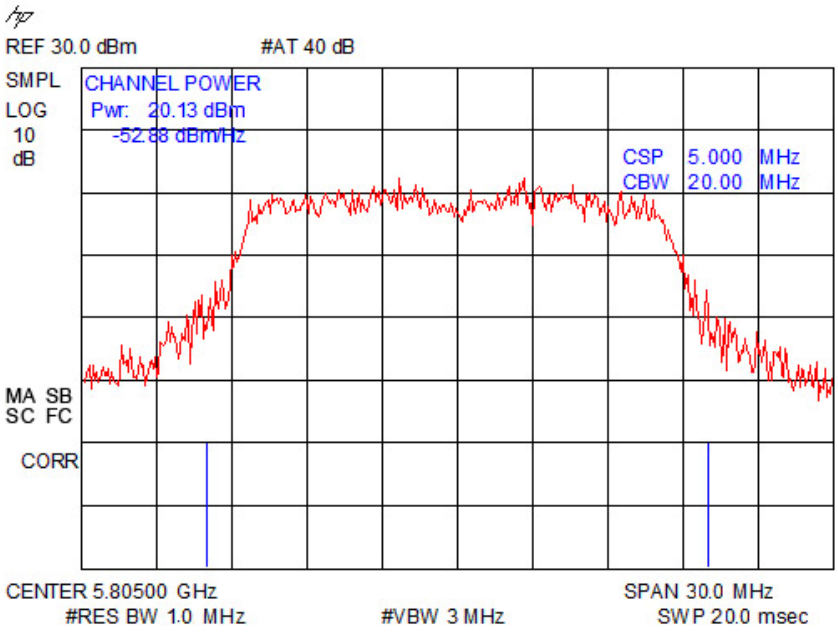
6. Measurement Data (continued)

6.1. Maximum Peak Conducted Output Power (15.247(b)(3)) (continued)

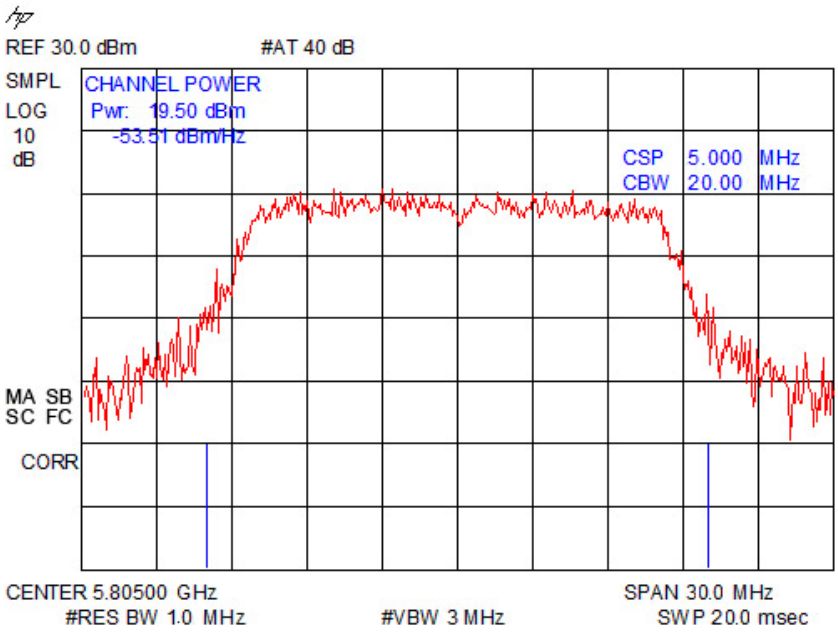
6.1.2. Conducted Mode Measurements (continued)

6.1.2.3. Maximum Peak Conducted Output Power – Plots

6.1.2.3.11. Channel 161 Chain 0



6.1.2.3.12. Channel 161 Chain 2



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6. Measurement Data (continued)

6.2. Power Spectral Density (15.407(a)(1)) (15.407(a)(3))

Requirement: (15.407(a)(1)) For the band 5.15–5.25 GHz, the peak power spectral density shall not exceed 4 dBm in any 1–MHz band.

(15.407(a)(3)) For the band For the 5.725–5.825 GHz, the peak power spectral density shall not exceed 17 dBm in any 1–MHz band.

Note: This test was performed in accordance with the information outlined in Measurement of Digital Transmission Systems Operating under Section 15.247, March 23 2005, Section 15.247(d): Power spectral density (PSD), PSD Option 1. Refer to the graphs in Section 6.1.2 of this report for the noise power density values used for the following table. A 35 dB correction factor was used to convert dBµV /Hz or dBm/Hz values to a 3 kHz Resolution Bandwidth.

dBm = dBµV – 107.

6.2.1. Measurement Results (From Radiated Measurements)

Channel	Channel Frequency	Noise Pwr Density	BW Corr Factor	Power Spectral Density		Limit	Result
	GHz	dBµV/Hz	dB	mW	dBm	dBm	
36	5.180	44.11	60	0.5140	-2.89	4	Compliant
40	5.200	44.20	60	0.5248	-2.80	4	Compliant
44	5.240	44.19	60	0.5236	-2.81	4	Compliant
149	5.745	55.42	60	6.9502	8.42	17	Compliant
153	5.765	55.72	60	7.4473	8.72	17	Compliant
161	5.805	56.21	60	8.3368	9.21	17	Compliant

6.2.2. Measurement Results (From Conducted Measurements)

Channel	Channel Frequency	Noise Power Density Chain 0	Noise Power Density Chain 2	BW Correction Factor	Power Spectral Density	Limit	Result
	GHz	dBm/Hz	dBm/Hz	dB	dBm	dBm	
36	5.180	-61.44	-63.98	+60	0.48	+4	Compliant
40	5.200	-61.24	-63.98	+60	0.61	+4	Compliant
44	5.220	-61.41	-63.04	+60	0.86	+4	Compliant
149	5.745	-52.38	-52.70	+60	10.47	+17	Compliant
153	5.765	-52.65	-53.13	+60	10.13	+17	Compliant
161	5.805	-52.88	-53.51	+60	9.83	+17	Compliant

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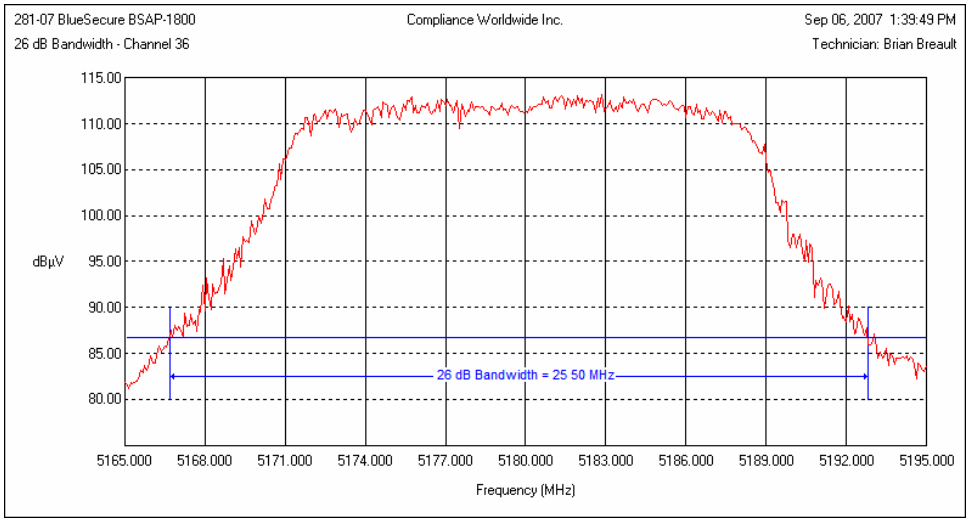
6. Measurement Data (continued)

6.3. 26 dB Emission Bandwidth (15.407(a)(1))

Channel	Channel Frequency	Emission Bandwidth	Channel	Channel Frequency	Emission Bandwidth
	GHz	MHz		GHz	MHz
36	5.180	25.50	149	5.745	24.08
40	5.200	24.98	153	5.765	24.68
44	5.220	25.20	161	5.805	27.80

6.3.1. 26 dB Emission Bandwidth – Measurement Plots (continued)

Channel 36



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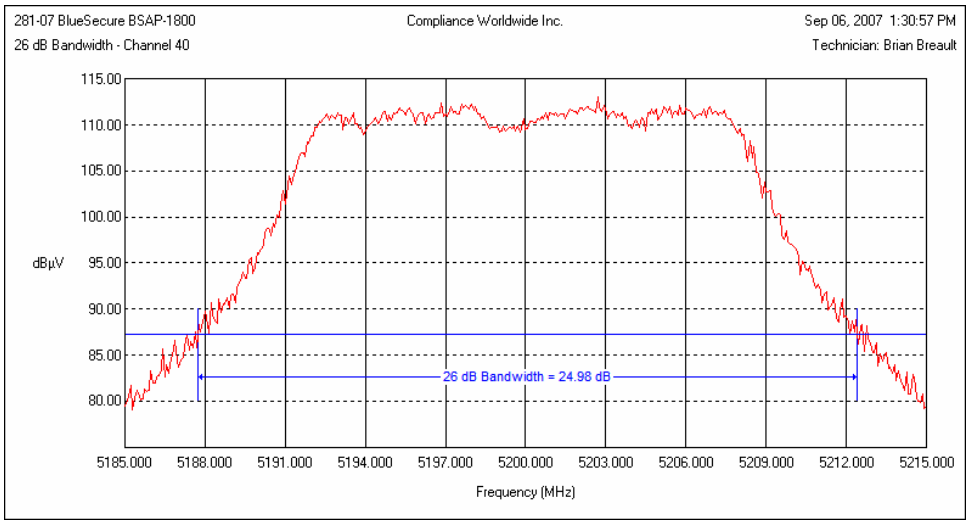
6. Measurement Data (continued)

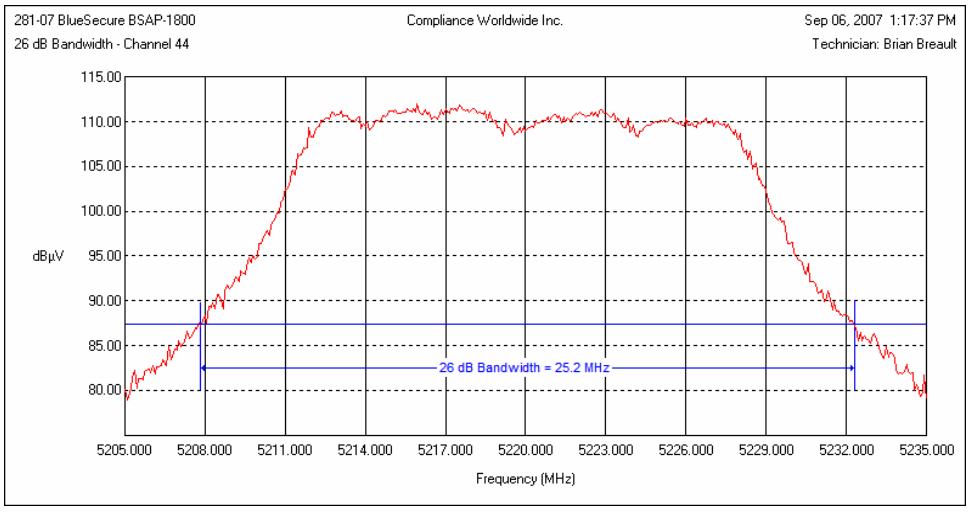
6.3. 26 dB Emission Bandwidth (15.407(a)(1)) (continued)

6.3.1. 26 dB Emission Bandwidth – Measurement Plots (continued)

Channel 40



Channel 44



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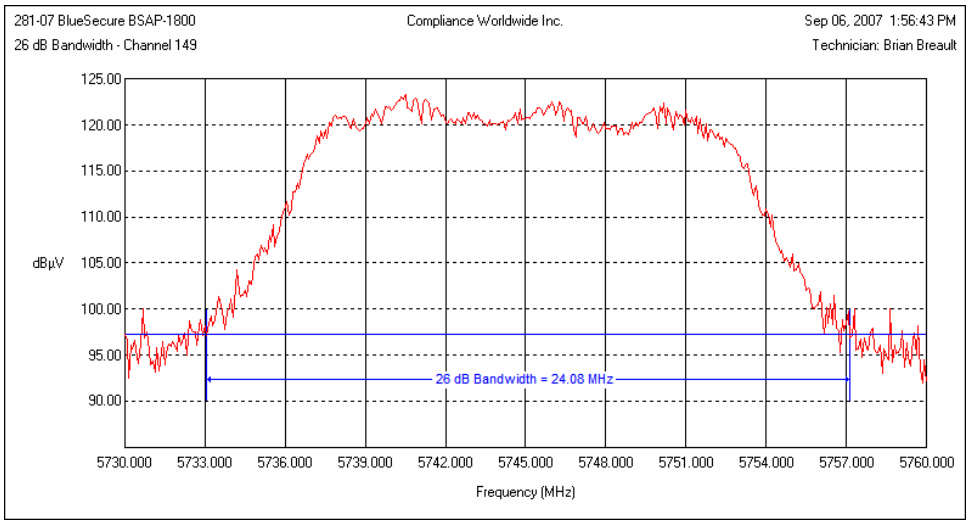
6. Measurement Data (continued)

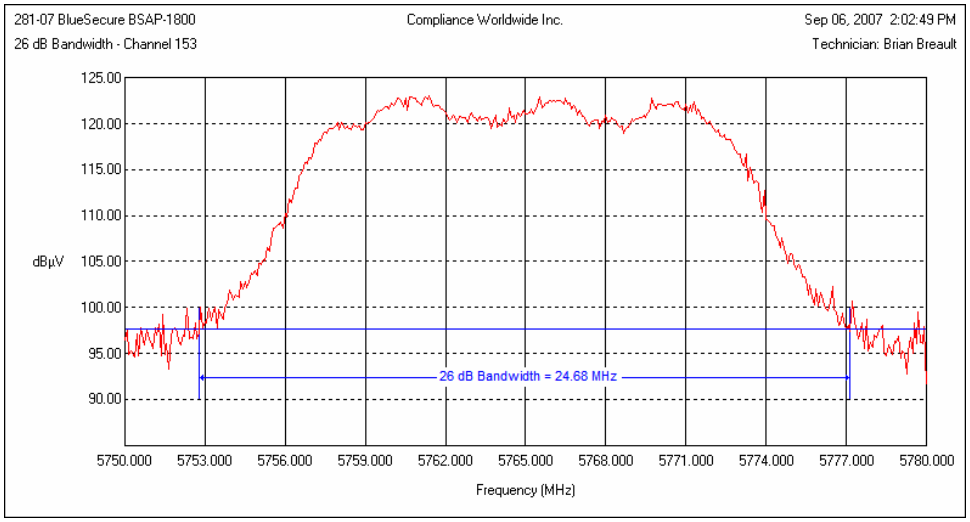
6.3. 26 dB Emission Bandwidth (15.407(a)(1)) (continued)

6.3.1. 26 dB Emission Bandwidth – Measurement Plots (continued)

Channel 149



Channel 153



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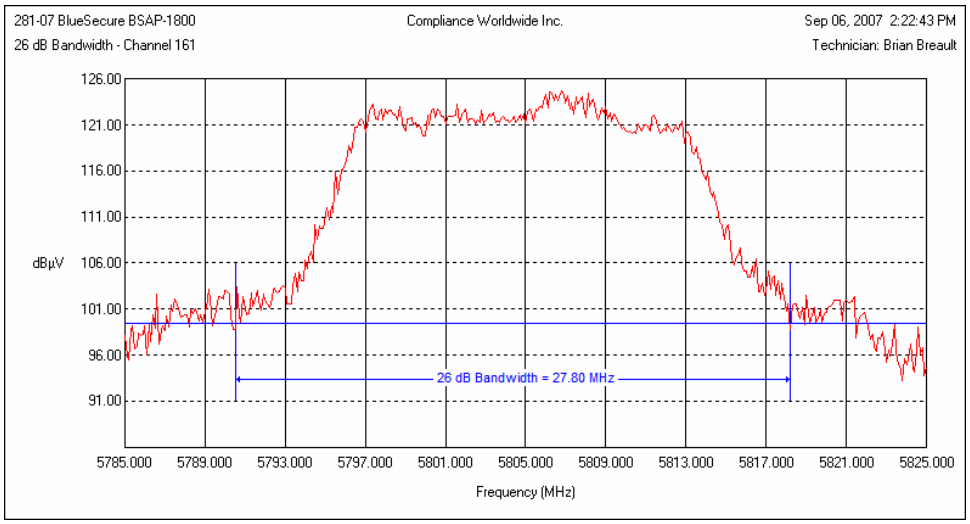
6. Measurement Data (continued)

6.3. 26 dB Emission Bandwidth (15.407(a)(1)) (continued)

6.3.1. 26 dB Emission Bandwidth – Measurement Plots (continued)

Channel 161



6.4. 99% Power Bandwidth (IC RSS 210)

Channel	Channel Frequency	99% Power Bandwidth	Channel	Channel Frequency	99% Power Bandwidth
	GHz	MHz		GHz	MHz
36	5.180	17.48	149	5.745	16.60
40	5.200	16.43	153	5.765	16.50
44	5.220	16.35	161	5.805	18.20

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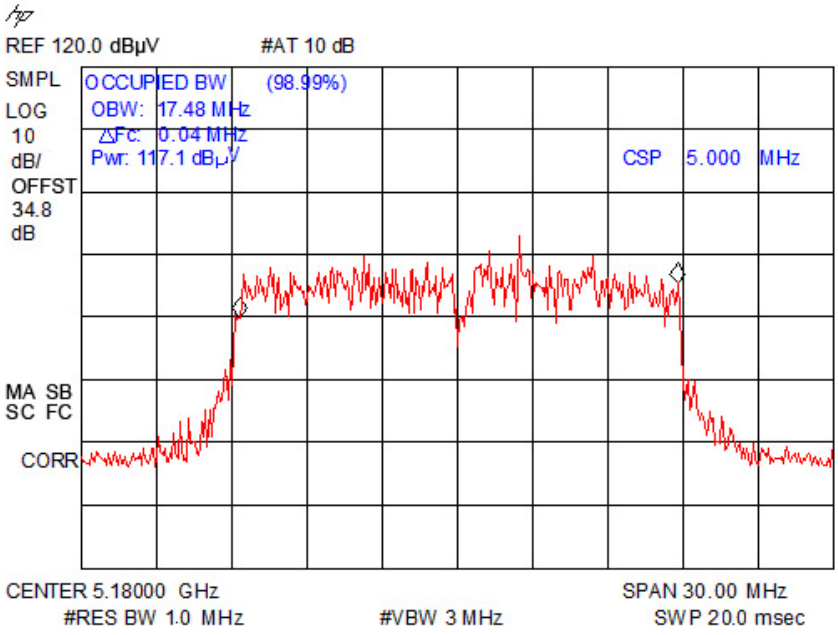
6. Measurement Data (continued)

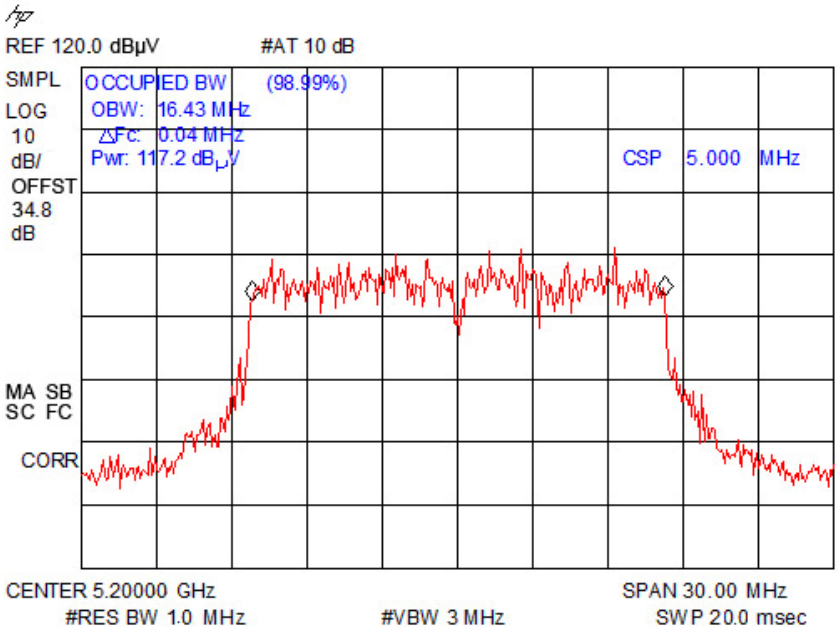
6.4. 99% Power Bandwidth (IC RSS 210) (continued)

6.4.1. 99% Power Bandwidth Emission Bandwidth – Measurement Plots

Channel 36



Channel 40



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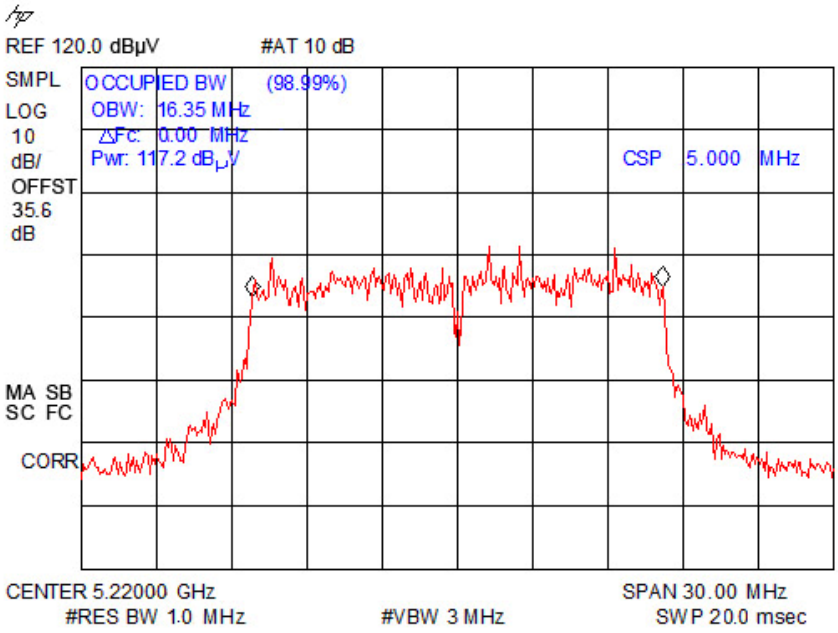
6. Measurement Data (continued)

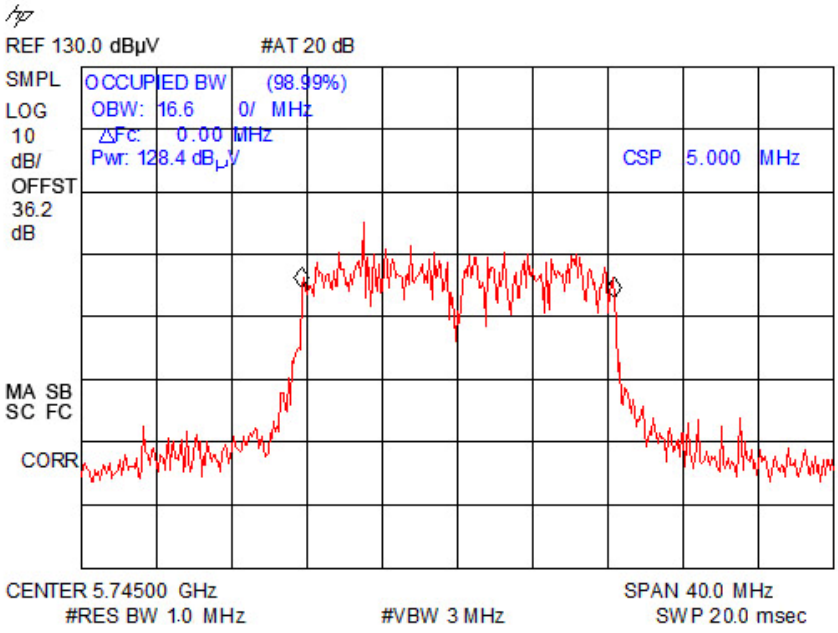
6.4. 99% Power Bandwidth (IC RSS 210) (continued)

6.4.1. 99% Power Bandwidth Emission Bandwidth – Measurement Plots

Channel 44



Channel 149



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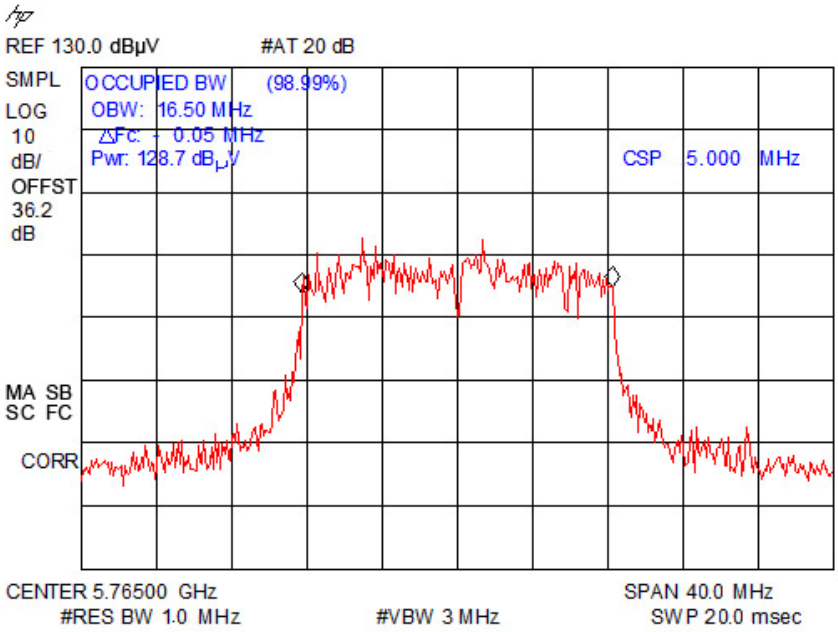
6. Measurement Data (continued)

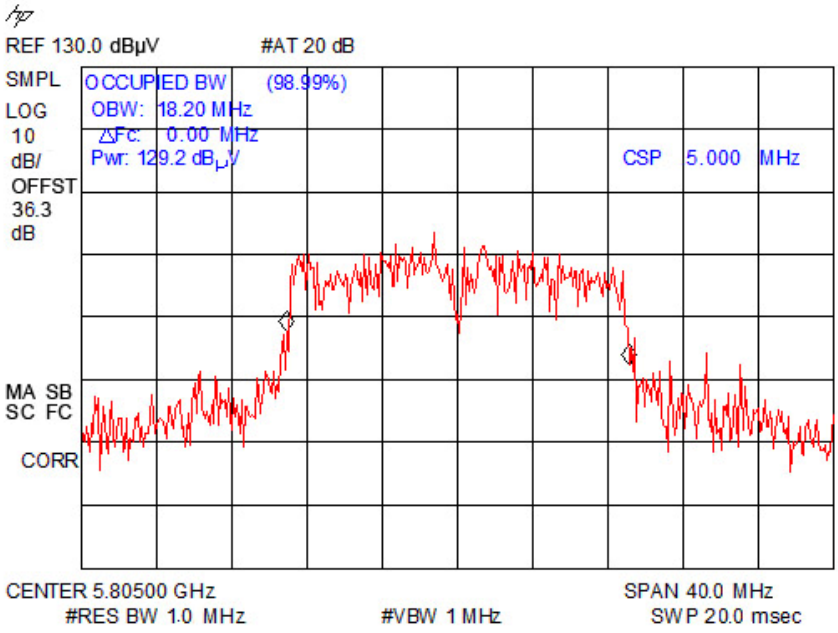
6.4. 99% Power Bandwidth (IC RSS 210) (continued)

6.4.1. 99% Power Bandwidth Emission Bandwidth – Measurement Plots

Channel 153



Channel 161



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6. Measurement Data (continued)

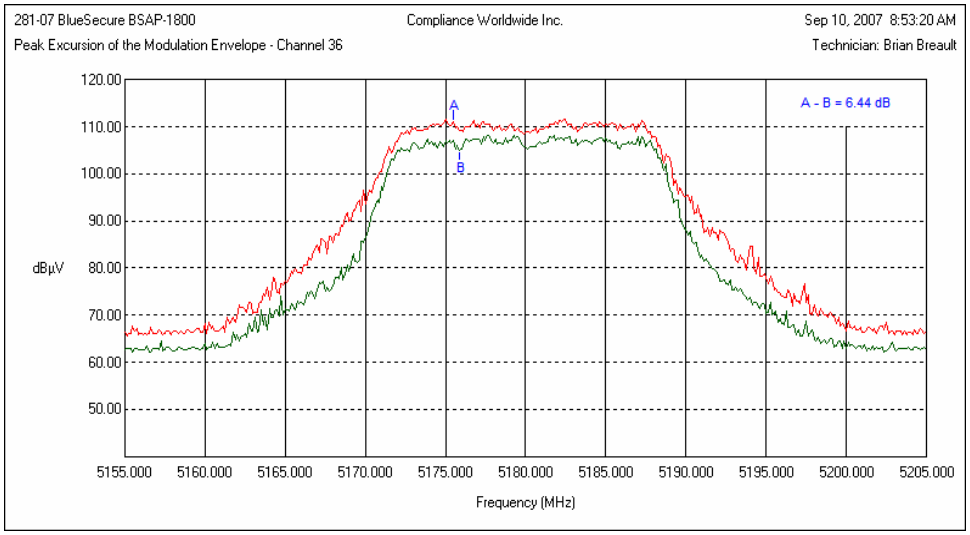
6.5. Peak Excursion of the Modulation Envelope (15.407(a)(6))

Requirement: 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 band-width whichever is less.

Channel	Channel Frequency	Peak Excursion	Limit	Result
	GHz	dB	dB	
36	5.180	6.44	13	Compliant
40	5.200	6.24	13	Compliant
44	5.220	5.66	13	Compliant
149	5.745	6.25	13	Compliant
153	5.765	6.40	13	Compliant
161	5.805	5.91	13	Compliant

6.5.1. Peak Excursion of the Modulation Envelope – Measurement Plots

Channel 36



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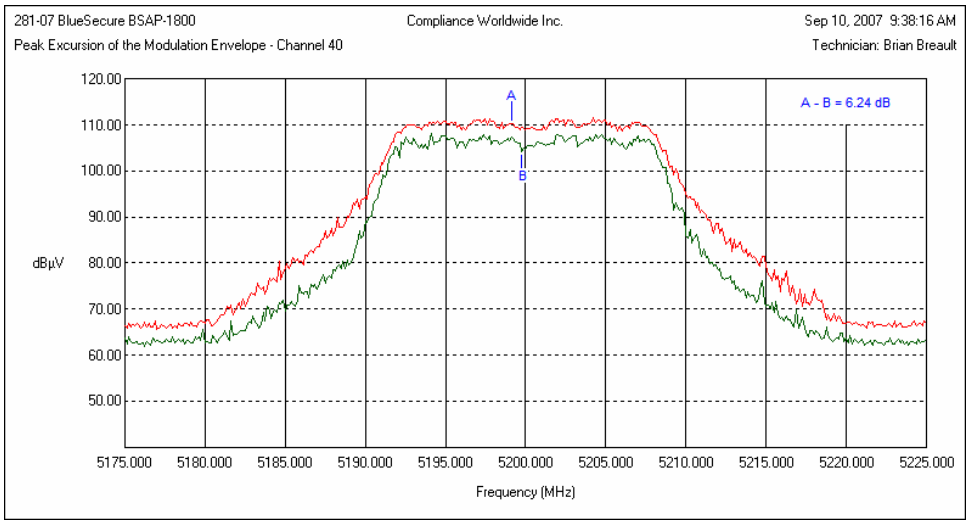
6. Measurement Data (continued)

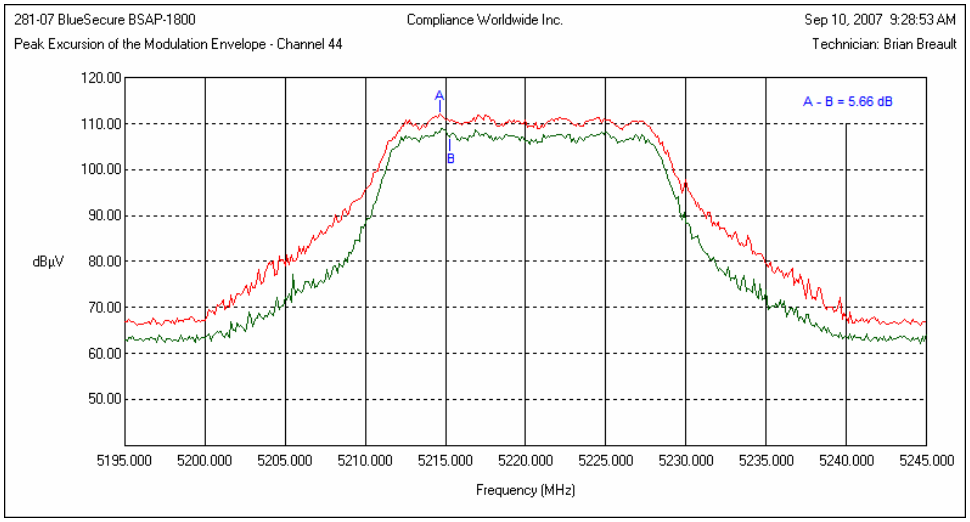
6.5. Peak Excursion of the Modulation Envelope (15.407(a)(6)) (continued)

6.5.1. Peak Excursion of the Modulation Envelope – Measurement Plots

Channel 40



Channel 44



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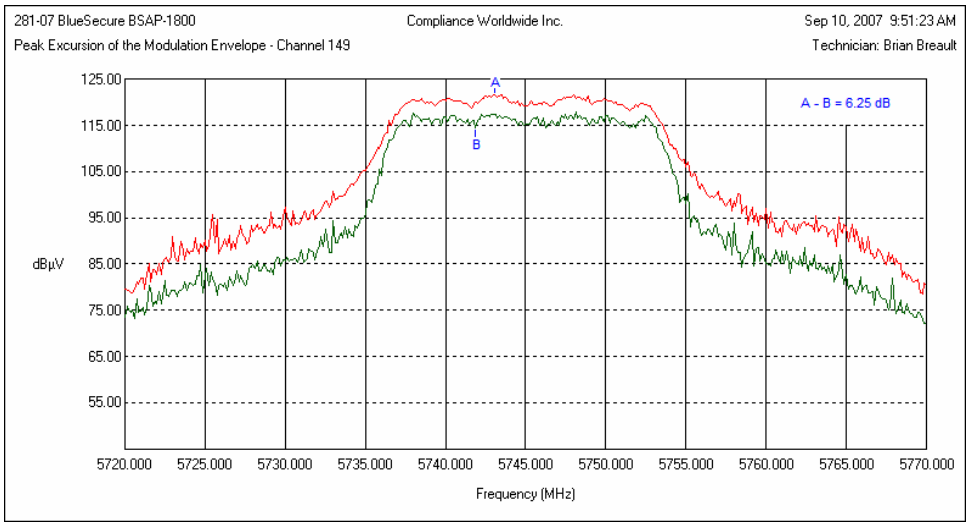
6. Measurement Data (continued)

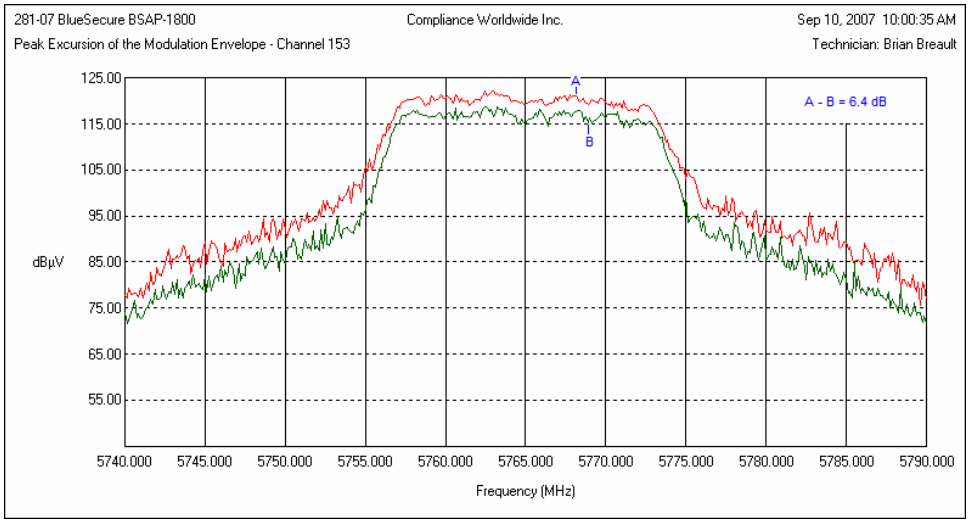
6.5. Peak Excursion of the Modulation Envelope (15.407(a)(6))

6.5.1. Peak Excursion of the Modulation Envelope – Measurement Plots

Channel 149



Channel 153



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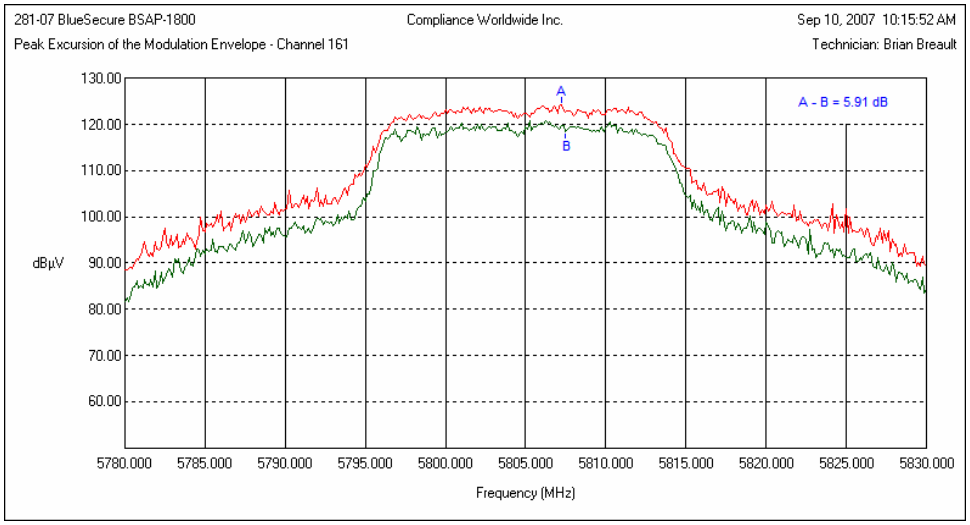
6. Measurement Data (continued)

6.5. Peak Excursion of the Modulation Envelope (15.407(a)(6))

6.5.1. Peak Excursion of the Modulation Envelope – Measurement Plots

Channel 161



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6.6. Spurious Radiated Emissions (30 MHz to 1 GHz) Test

6.6.1. Regulatory Limit: FCC Part 209, Quasi-Peak

Frequency Range (MHz)	Distance (Meters)	Limit (dBµV/m)
30 to 88	3	40.0
88 to 216	3	43.5
216 to 960	3	46.0
960 to 1000	3	54.0

6.6.2. Measurement Equipment Used to Perform Test

Device	Manufacturer	Model No.	Serial No.	Cal Due
EMI Receiver	Hewlett Packard	8546A	3650A00360	3/14/2008
Biconilog Antenna	Com-Power	AC220	25509	8/3/2008

6.6.3. Measurement & Equipment Setup

Test Date:	04/30/2007
Test Engineer:	Brian Breault
Site Temperature (°C):	21.3
Relative Humidity (%RH):	31
Frequency Range:	30 MHz to 1 GHz
Measurement Distance:	3 Meters
EMI Receiver IF Bandwidth:	120 kHz
EMI Receiver Avg Bandwidth:	300 kHz
Detector Functions:	Peak and Quasi-Peak.
Antenna Height:	1 to 4 meters

6.6.4. Test Procedure

Test measurements were made in accordance with ANSI C63.4-2003, Standard Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronics Equipment in the Range of 9 kHz to 40 GHz.

6.6.5. Spurious Radiated Emissions (30 MHz to 1 GHz) Test Results

An emissions comparison of the DUT with and without the transmitter modules was made. There were no measurable emissions that could be attributed to the BlueSecure BSAP-1800 transmitter modules.

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6. Measurement Data (continued)

6.7. Spurious Radiated Emissions (Above 1 GHz) Test Part 1

6.7.1. Regulatory Limit: FCC Part 209, Average

Frequency Range (MHz)	Distance (Meters)	Limit (dBµV/m)
Above 1 GHz	3	54.0

6.7.2. Measurement Equipment Used to Perform Test

Device	Manufacturer	Model No.	Serial No.	Cal Due
Spectrum Analyzer	Hewlett Packard	8593E	3829A03887	3/16/2008
EMI Receiver	Agilent	E4407B	MY45108355	11/22/2008
Microwave Preamp	Hewlett Packard	8449B	3008A01323	9/21/2008
Horn Antenna	Electro-Metrics	EM-6961	6337	8/23/2008
Harmonic Mixer	Hewlett Packard	11970A	3003A08210	Not Req'd
Horn Antenna	Alpha Industries	861A/599	324	Not Req'd
2.4 GHz BP Filter	Micro-Tronics	BRM50702	14	11/16/2007

6.7.3. Measurement & Equipment Setup

Test Date:	09/18/2007
Test Engineer:	Brian Breault
Site Temperature (°C):	21.3
Relative Humidity (%RH):	31
Frequency Range:	1 GHz to 40 GHz
Measurement Distance:	3 Meters
EMI Receiver IF Bandwidth:	1 MHz
EMI Receiver Avg Bandwidth:	3 MHz
Detector Functions:	Peak and Average
Antenna Height:	1 to 4 meters

6.7.4. Test Procedure

Test measurements were made in accordance with ANSI C63.4-2003, Standard Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronics Equipment in the Range of 9 kHz to 40 GHz.

6.7.5. Spurious Radiated Emissions (Above 1 GHz) Test Results

An emissions comparison of the DUT with and without the transmitter modules was made. There were no measurable emissions that could be attributed to the BlueSecure BSAP-1800 transmitter modules.

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6. Measurement Data (continued)

6.8. Spurious Radiated Emissions (Above GHz) Test Part 2

6.8.1. Measurement Results – Channel 36 (5.15 GHz–5.25 GHz, Low Channel)

Frequency (MHz)	Peak (dBµV)	Avg (dBµV)	Corr Factor (dB)	Average (dBµV/m)	Limit (dB)	Margin (dB)	Polarity (H/V)	Height (cm)	TT Pos (Deg)	Note
5180.000	---	---	---	---	---	---	---	---	---	Fundamental
10360.000	48.32	28.32	6.42	34.74	54.00	-19.26	---	---	---	Noise floor
15540.000	49.63	29.63	12.73	42.36	54.00	-11.64	---	---	---	Noise floor
20720.000	52.88	32.88	9.24	42.12	54.00	-11.88	---	---	---	Noise floor
25900.000	54.87	34.87	15.02	49.89	54.00	-4.11	---	---	---	Noise floor
31080.000	11.24	-8.76	22.50	13.74	54.00	-40.26	---	---	---	Noise floor
36260.000	11.69	-8.31	22.50	14.19	54.00	-39.81	---	---	---	Noise floor

6.8.2 Measurement Results – Channel 40 (5.15 GHz–5.25 GHz, Middle Channel)

Frequency (MHz)	Peak (dBµV)	Avg (dBµV)	Corr Factor (dB)	Avg (dBµV/m)	Limit (dB)	Margin (dB)	Polarity (H/V)	Height (cm)	TT Pos (Deg)	Note
5200.000	---	---	---	---	---	---	---	---	---	Fundamental
10400.000	46.94	26.94	6.44	33.38	54.00	-20.62	---	---	---	Noise floor
15600.000	49.35	29.35	12.99	42.34	54.00	-11.66	---	---	---	Noise floor
20800.000	50.68	30.68	9.32	40.00	54.00	-14.00	---	---	---	Noise floor
26000.000	55.41	35.41	15.20	50.61	54.00	-3.39	---	---	---	Noise floor
31200.000	11.27	-8.73	35.93	22.50	54.00	-40.23	---	---	---	Noise floor
36400.000	12.09	-7.91	36.65	22.50	54.00	-39.41	---	---	---	Noise floor

6.8.3 Measurement Results – Channel 44 (5.15 GHz–5.25 GHz, High Channel)

Frequency (MHz)	Peak (dBµV)	Avg (dBµV)	Corr Factor (dB)	Avg (dBµV/m)	Limit (dB)	Margin (dB)	Polarity (H/V)	Height (cm)	TT Pos (Deg)	Note
5240.000	---	---	---	---	---	---	---	---	---	Fundamental
10440.000	47.14	27.14	6.44	33.58	54.00	-20.42	---	---	---	Noise floor
15660.000	48.14	28.14	13.48	41.62	54.00	-12.38	---	---	---	Noise floor
20880.000	49.57	29.57	9.44	39.01	54.00	-14.99	---	---	---	Noise floor
26100.000	53.45	33.45	15.19	48.64	54.00	-5.36	---	---	---	Noise floor
31320.000	11.38	-8.62	35.94	13.88	54.00	-40.12	---	---	---	Noise floor
36540.000	11.18	-8.82	36.70	13.68	54.00	-40.32	---	---	---	Noise floor

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6. Measurement Data (continued)

6.8. Spurious Radiated Emissions (> GHz) Test Data (continued)

6.8.4. Measurement Results – Channel 149 (5.725–5.825 GHz, Low Channel)

Frequency (MHz)	Peak (dBµV)	Avg (dBµV)	Corr Factor (dB)	Average (dBµV/m)	Limit (dB)	Margin (dB)	Polarity (H/V)	Height (cm)	TT Pos (Deg)	Note
5745.000[1]	---	---	---	---	---	---	---	---	---	Fundamental
11490.000[1]	58.31	35.67	7.10	42.77	54.00	-11.23	H	120	90	
17235.000	49.53	29.53	18.03	47.56	54.00	-6.44	---	---	---	Noise floor
22980.000[1]	53.31	33.31	9.88	43.19	54.00	-10.81	---	---	---	Noise floor
28725.000	11.87	-8.13	23.50	15.37	54.00	-38.63	---	---	---	Noise floor
34470.000	11.70	-8.30	22.50	14.20	54.00	-39.80	---	---	---	Noise floor

[1] Frequency falls within the Restricted Bands of Operation. See FCC Part 15, Section 15.205 for additional information.

6.8.5. Measurement Results – Channel 153 (5.725–5.825 GHz, Middle Channel)

Frequency (MHz)	Peak (dBµV)	Avg (dBµV)	Corr Factor (dB)	Average (dBµV/m)	Limit (dB)	Margin (dB)	Polarity (H/V)	Height (cm)	TT Pos (Deg)	Note
5765.000[1]	---	---	---	---	---	---	---	---	---	Fundamental
11530.000[1]	57.66	36.26	7.10	43.36	54.00	-10.64	H	120	90	
17295.000	48.17	28.17	18.12	46.29	54.00	-7.71	---	---	---	Noise floor
23060.000[1]	52.13	32.13	9.88	42.01	54.00	-11.99	---	---	---	Noise floor
28825.000	12.96	-7.04	23.50	16.46	54.00	-37.54	---	---	---	Noise floor
34590.000	11.40	-8.60	22.50	13.90	54.00	-40.10	---	---	---	Noise floor

[1] Frequency falls within the Restricted Bands of Operation. See FCC Part 15, Section 15.205 for additional information.

6.8.6. Measurement Results – Channel 161 (5.725–5.825 GHz, High Channel)

Frequency (MHz)	Peak (dBµV)	Avg (dBµV)	Corr Factor (dB)	Average (dBµV/m)	Limit (dB)	Margin (dB)	Polarity (H/V)	Height (cm)	TT Pos (Deg)	Note
5805.000[1]	---	---	---	---	---	---	---	---	---	Fundamental
11610.000[1]	64.59	42.83	7.10	49.93	54.00	-4.07	H	120	80	
17415.000	48.04	28.04	18.29	46.33	54.00	-7.67	---	---	---	Noise floor
23220.000	51.76	31.76	9.88	41.64	54.00	-12.36	---	---	---	Noise floor
29025.000	11.29	-8.71	23.50	14.79	54.00	-39.21	---	---	---	Noise floor
34830.000	12.71	-7.29	22.50	15.21	54.00	-38.79	---	---	---	Noise floor

[1] Frequency falls within the Restricted Bands of Operation. See FCC Part 15, Section 15.205 for additional information.

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6. Measurement Data (continued)

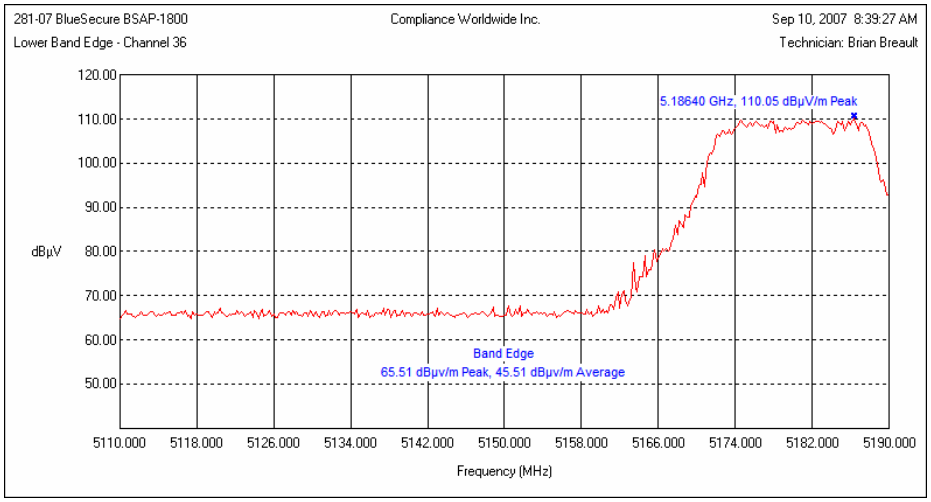
6.9. Band Edge Measurements

6.9.1. Lower and Upper Band Edge (15.407(b)(1)), 15.215(c)

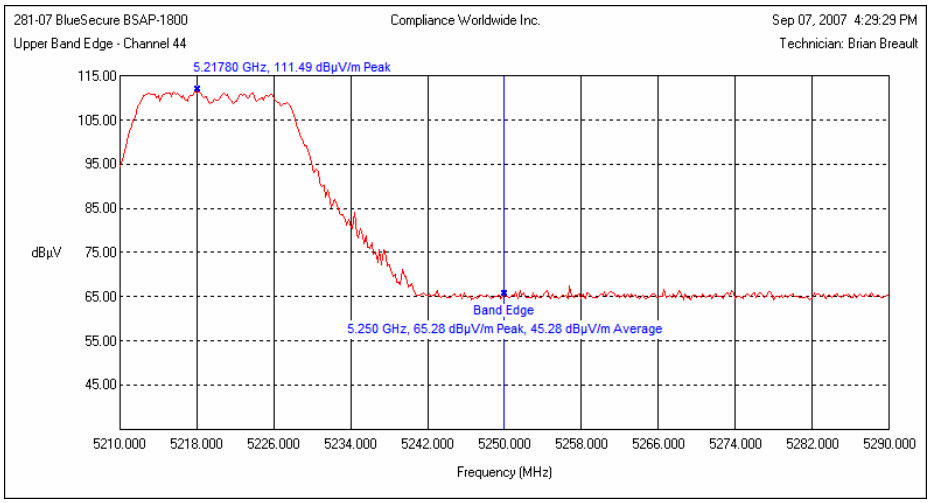
Requirement: For transmitters operating in the 5.15–5.25 GHz band: All emissions outside of the 5.15–5.35 GHz band shall not exceed an EIRP of –27 dBm/MHz. In addition, the provisions of § 15.205 apply to intentional radiators operating under this section. Also under 15.215(c) the emission at the band edge shall be 20 dB down from the carrier.

Chan.	Chan. Freq.	Field Strength Peak	Band Edge	Field Strength Average	15.407 Limit		15.205 Limit Average	Result
	GHz	dBµV/m	GHz	dBµV/m	EIRP	dBµV/m	dBµV/m	
36	5.180	110.05	5.150	45.51	-27 dBm/MHz	68.30	54.0	Compliant
44	5.220	111.49	5.250	45.28	-27 dBm/MHz	68.30	54.0	Compliant

6.9.1.1. Lower Band Edge – Measurement Plot



6.9.1.2. Upper Band Edge – Measurement Plot



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6. Measurement Data (continued)

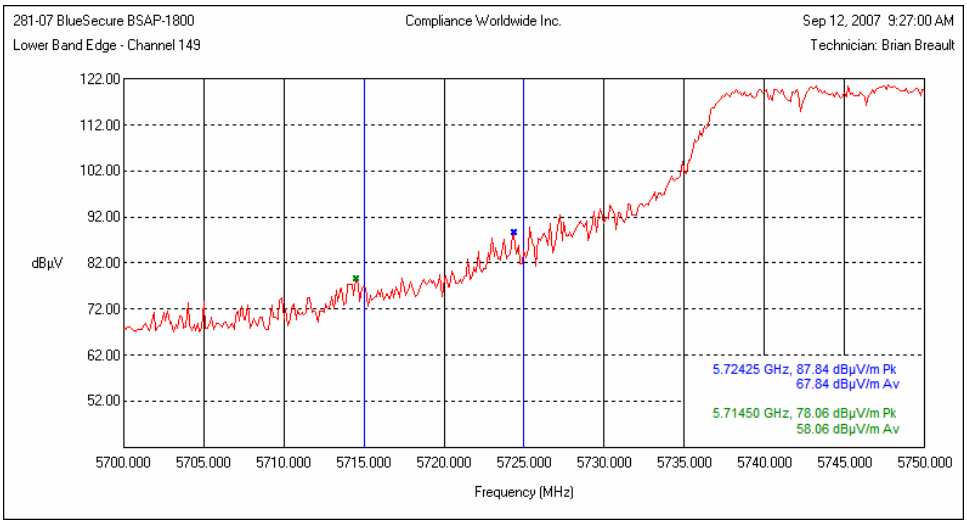
6.9. Band Edge Measurements

6.9.2. Lower and Upper Band Edge (15.407(b)(4))

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

Chan	Chan. Freq.	Worst Case Emission - 1st 10 MHz Band				Worst Case Emission - >10 MHz				Result
		Freq	Field Strength	15.407 Limit		Freq	Field Strength	15.407 Limit		
	GHz	GHz	dBµV/m	EIRP (dBm/MHz)	dBµV/m (Av)	GHz	dBµV/m	EIRP (dBm/MHz)	dBµV/m (Av)	
149	5.745	5.72425	67.84	-17	78.3	5.71450	58.06	-27	68.3	Compliant
161	5805	5.82688	64.25	-17	78.3	5.83513	56.75	-27	68.3	Compliant

6.9.2.1. Lower Band Edge Plot



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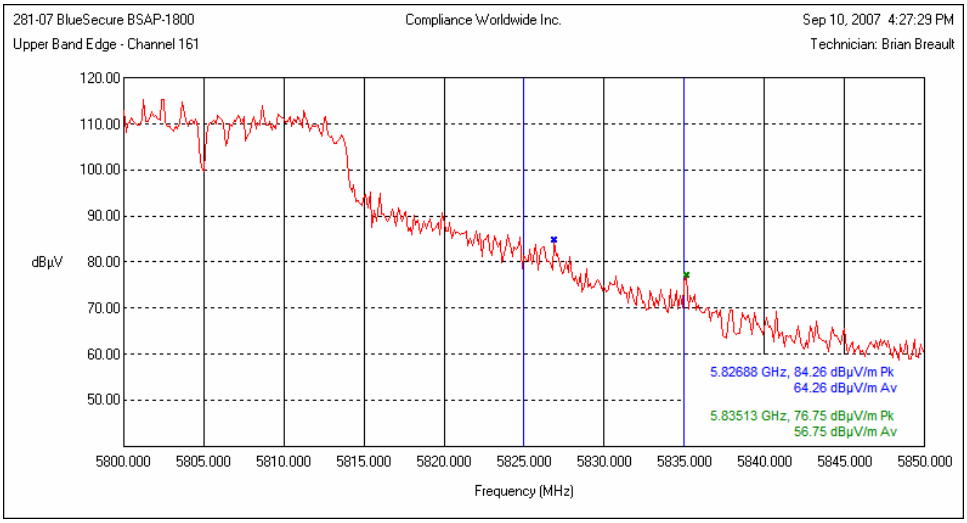
6. Measurement Data (continued)

6.9. Band Edge Measurements

6.9.2. Lower and Upper Band Edge (15.407(b)(4))

6.9.2.1. Upper Band Edge Plot



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6. Measurement Data (continued)

6.10. Public Exposure to Radio Frequency Energy Levels (15.407(f))

Channel	MPE Distance (cm)	DUT Output Power (dBm)	DUT Antenna Gain (dBi)	Power Density		Limit (mW/cm^2)	Result
				(mW/cm^2)	(W/m^2)		
	(1)	(2)	(3)	(4)		(5)	
36	20	16.351	5.54	0.0308	0.3075	1	Compliant
40	20	16.441	5.54	0.0314	0.3139	1	Compliant
44	20	16.431	5.54	0.0313	0.3132	1	Compliant
149	20	28.142	5.06	0.4158	4.1580	1	Compliant
153	20	28.442	5.06	0.4455	4.4554	1	Compliant
161	20	28.932	5.06	0.4988	4.9876	1	Compliant

$$PD = \frac{OP + AG}{(4 \times \pi \times d^2)}$$

1. Reference CFR 2.1093(b): For purposes of this section, a portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is/are within 20 centimeters of the body of the user.
2. Sections 6.1.1 and 6.1.2 .of this test report.
3. Data supplied by the client.
4. Power density is calculated from field strength measurement and antenna gain.
5. Reference CFR 1.1310, Table 1: Limits for Maximum Permissible Exposure (MPE), Section (B): Limits for General Population/Uncontrolled Exposure.

6.11. Frequency Stability (15.407(g))

Requirement: Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

6.11.1. Temperature

Channel	Channel Freq.	Temp.	Meas. Frequency	Deviation		Limit	Result
	GHz	Deg. C	GHz	kHz	%	%	
40	5200	0	5200.0150	15.000	0.000288	0.02	Compliant
		20	5200.0200	20.000	0.000385	0.02	Compliant
		40	5200.0350	35.000	0.000673	0.02	Compliant

6.11.2. Voltage

Channel	Channel Freq.	Operating Voltage[1]	Meas. Frequency	Deviation		Limit	Result
	GHz		GHz	kHz	%	%	
40	5200	102	5200.0200	20.000	0.000385	0.02	Compliant
		120	5200.0380	38.000	0.000731	0.02	Compliant
		138	5200.0250	25.000	0.000481	0.02	Compliant

[1] DUT AC power adapter input voltage was varied ±15%,

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6. Measurement Data (continued)

6.12. Power Line Conducted Emissions (15.207)

Requirement: 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 µH/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

Test Note: A D-Link model DSA-0421S-50 1 24 power adapter was used to power the BSAP-1800. The power adapter was not serialized.

6.12.1 Power Line Conducted Emissions Test Setup

6.12.1.1 Regulatory Limit: (15.207) (FCC Part 15, Class B)

Frequency Range (MHz)	Limits (dBµV)	
	Quasi-Peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5.0	56	46
5.0 to 30.0	60	50
* Decreases with the logarithm of the frequency.		

6.12.1.2 Measurement Equipment Used to Perform Test

Device	Manufacturer	Model	Serial No.	Cal Due
EMI Receiver	Hewlett Packard	8546A	3650A00360	3/14/2008
LISN	EMCO	3825/2	9109-1860	1/11/2008

6.12.1.3 Measurement & Equipment Setup

Test Date:	10/09/2007
Test Engineer:	Brian Breault
Site Temperature (°C):	20.8
Relative Humidity (%RH):	30
Frequency Range:	0.15 MHz to 30 MHz
EMI Receiver IF Bandwidth:	9 kHz
EMI Receiver Avg Bandwidth:	30 kHz
Detector Functions:	Peak, Quasi-Peak. & Average

6.12.1.4 Test Procedure

Test measurements were made in accordance with ANSI C63.4-2003, Standard Methods of Measurement of Radio Noise Emissions from Low-Voltage Electrical and Electronics Equipment in the Range of 9 kHz to 40 GHz.

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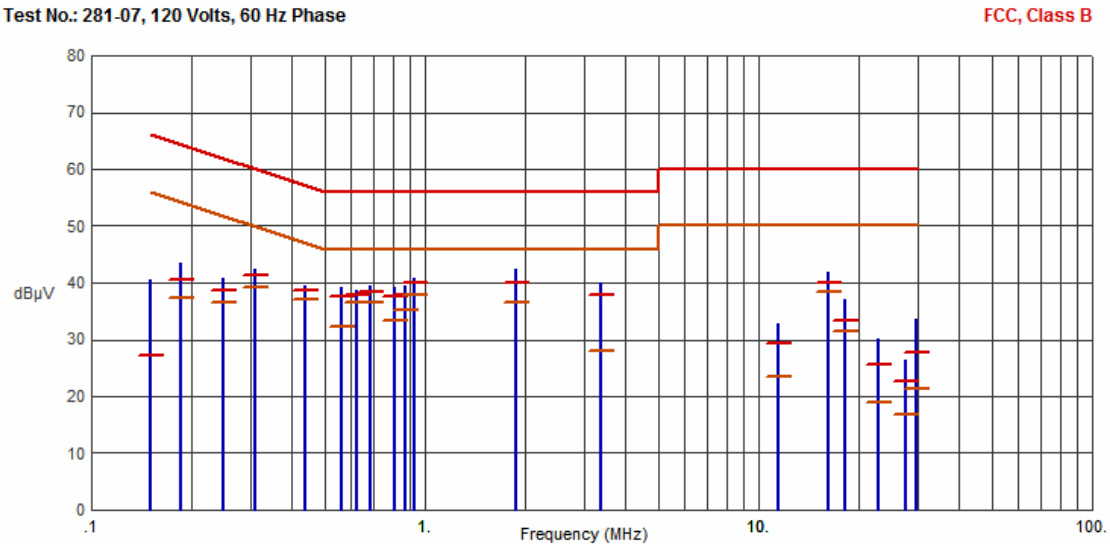
6. Measurement Data (continued)

6.12. Power Line Conducted Emissions Test Data (15.207) (continued)

6.12.2 Conducted Emissions Test Data

6.12.2.1 120 Volts, 60 Hz Phase



Frequency (MHz)	Pk Amp (dBµV)	QP Amp (dBµV)	QP Limit (dBµV)	QP Margin (dB)	Avg Amp (dBµV)	Avg Limit (dBµV)	Avg Margin (dB)	Comments
.1506	40.63	27.24	65.97	-38.73	-2.55	55.97	-58.52	
.1861	43.34	40.62	64.21	-23.59	37.32	54.21	-16.89	
.2479	40.85	38.54	61.83	-23.29	36.41	51.83	-15.42	
.3112	42.35	41.21	59.94	-18.73	39.26	49.94	-10.68	
.4356	39.48	38.61	57.15	-18.54	37.18	47.15	-9.97	
.5598	39.07	37.67	56.00	-18.33	32.32	46.00	-13.68	
.6215	38.72	37.94	56.00	-18.06	36.54	46.00	-9.46	
.6843	39.53	38.35	56.00	-17.65	36.43	46.00	-9.57	
.8074	39.14	37.62	56.00	-18.38	33.31	46.00	-12.69	
.8693	39.59	37.81	56.00	-18.19	35.16	46.00	-10.84	
.9329	40.85	39.90	56.00	-16.10	37.91	46.00	-8.09	
1.8677	42.38	40.07	56.00	-15.93	36.53	46.00	-9.47	
3.3576	40.05	37.85	56.00	-18.15	28.01	46.00	-17.99	
11.4471	32.90	29.22	60.00	-30.78	23.43	50.00	-26.57	
16.2273	41.98	40.08	60.00	-19.92	38.30	50.00	-11.70	
18.2433	36.96	33.21	60.00	-26.79	31.50	50.00	-18.50	
22.8803	30.19	25.65	60.00	-34.35	18.93	50.00	-31.07	
27.5497	26.39	22.70	60.00	-37.30	16.93	50.00	-33.07	
29.7892	33.55	27.78	60.00	-32.22	21.37	50.00	-28.63	

Result: Passed

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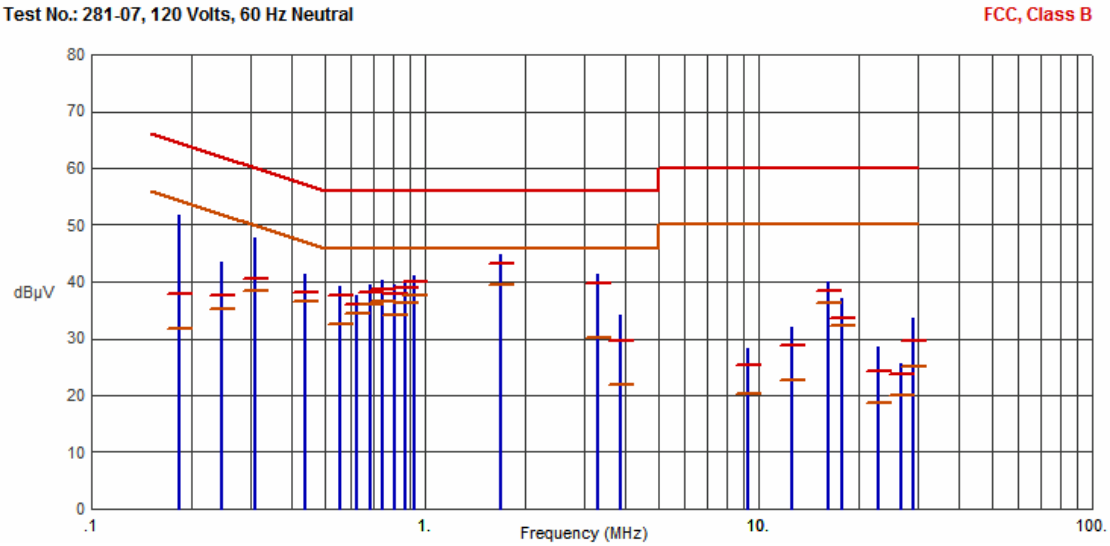
6. Measurement Data (continued)

6.12. Power Line Conducted Emissions (15.207) (continued)

6.12.2 Conducted Emissions Test Data (continued)

6.12.2.2 120 Volts, 60 Hz Neutral



Frequency (MHz)	Pk Amp (dBµV)	QP Amp (dBµV)	QP Limit (dBµV)	QP Margin (dB)	Avg Amp (dBµV)	Avg Limit (dBµV)	Avg Margin (dB)	Comments
.1828	51.63	37.92	64.36	-26.44	31.73	54.36	-22.63	
.2469	43.46	37.49	61.86	-24.37	35.11	51.86	-16.75	
.3091	47.77	40.46	59.99	-19.53	38.37	49.99	-11.62	
.4353	41.43	38.20	57.15	-18.95	36.55	47.15	-10.60	
.5593	39.11	37.68	56.00	-18.32	32.66	46.00	-13.34	
.6246	37.50	36.04	56.00	-19.96	34.33	46.00	-11.67	
.6836	39.44	38.18	56.00	-17.82	36.13	46.00	-9.87	
.7459	40.17	38.68	56.00	-17.32	36.48	46.00	-9.52	
.8082	39.38	37.95	56.00	-18.05	34.12	46.00	-11.88	
.8701	39.87	38.85	56.00	-17.15	36.29	46.00	-9.71	
.9320	40.95	39.90	56.00	-16.10	37.65	46.00	-8.35	
1.6790	44.86	43.17	56.00	-12.83	39.50	46.00	-6.50	
3.2951	41.42	39.69	56.00	-16.31	30.08	46.00	-15.92	
3.8559	34.00	29.62	56.00	-26.38	21.81	46.00	-24.19	
9.3256	28.32	25.46	60.00	-34.54	20.22	50.00	-29.78	
12.6255	31.90	28.90	60.00	-31.10	22.73	50.00	-27.27	
16.1674	40.11	38.36	60.00	-21.64	36.20	50.00	-13.80	
17.6924	37.12	33.56	60.00	-26.44	32.25	50.00	-17.75	
22.8820	28.54	24.38	60.00	-35.62	18.76	50.00	-31.24	
26.6083	25.69	23.78	60.00	-36.22	19.96	50.00	-30.04	
29.1111	33.71	29.65	60.00	-30.35	24.96	50.00	-25.04	

Result: Passed

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7. Test Site Description

Compliance Worldwide is located at 357 Main Street in Sandown, New Hampshire. The test sites at Compliance Worldwide are used for conducted and radiated emissions testing in accordance with Federal Communications Commission (FCC) and Industry Canada standards. A description of the test sites is on file with the FCC (registration number **96392**) and Industry Canada (file number **IC 3023)**.

The radiated emissions test site is a 3 and 10 meter enclosed open area test site (OATS). Personnel, support equipment and test equipment are located in the basement beneath the OATS ground plane.

The conducted emissions site is part of a 16' x 20' x 12' ferrite tile chamber and uses one of the walls for the vertical ground plane required by EN 55022.

Both sites are designed to test products or systems 1.5 meter W x 1.5 meter L x 2.0 meter H, floor standing or table top.

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