Engineering and Testing for EMC and Safety Compliance

Certification Application Report
FCC Part 15.247

Test Lab:	Applicant:
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FCC ID	UEV-5GXI	**TEST REPORT DATE**	March 19, 2007
PLATFORM	N/A	**RTL WORK ORDER NUMBER**	2007118
MODEL	OSBRiDGE 5GXi	**RTL QUOTE NUMBER**	QRTL06-447

American National Standard Institute:	ANSI C63.4-2003 Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
FCC Classification:	DTS – Part 15 Digital Transmission System
FCC Rule Part(s)	Part 15.247: Operation within the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5850 MHz
Digital Interface Information	Digital Interface was found to be compliant

Frequency Range (MHz)	Output Power (W)	Frequency Tolerance	Emission Designator
5725–5850	0.085	N/A	33M1G7D

I, the undersigned, hereby declare that the equipment tested and referenced in this report conforms to the identified standard(s) as described in this test report. Modifications made to the equipment during testing, in order to achieve compliance with these standards, are listed in the report.

Furthermore, there was no deviation from, additions to, or exclusions from the applicable parts of FCC Part 2, FCC Part 15 and ANSI C63.4

Signature: _____ Date: March 19, 2007

Typed/Printed Name: Desmond A. Fraser Position: President

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1 General Information

1.1 Scope

FCC Rules Part 15.247: Operation within the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5850 MHz.

1.2 Modifications

A snap-on ferrite was added at the RJ45 power cable at the input of the radio to suppress unintentional digital emissions, Würth Elektronik part number 742 711 32.

1.3 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located at 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170. This site has been fully described in a report and approved by the Federal Communications Commission to perform AC line conducted and radiated emissions testing (ANSI C63.4 2003).

1.4 Related Submittal(s)/Grant(s)

This is an original certification application for the OSLINK Sp. z o.o., Model: OSBRiDGE 5GXi, FCC ID: UEV-5GXI. The EUT consists of a transceiver/antenna with POE Injector.

2 Test Information

2.1 Test Justification

A low channel at 5745 MHz, mid channel at 5785 MHz, and high channel at 5825 MHz, were tested and investigated from 9 kHz to 40 GHz. Data for all three channels are presented in this report. The test results relate only to the item that was tested. The EUT contains an antenna; in order to complete the configuration required for approval. The antenna was used to transmit and receive, and was connected to the control box which controlled access to continually transmit on a single channel using an WLAN RJ-45 connection.

2.2 Exercising the EUT

The EUT was tested in all three orthogonal planes in order to determine worst-case emissions. The EUT was provided with software to continuously transmit during testing. The carrier was also checked to verify that the information was being transmitted. There were no deviations from the test standard(s) and/or methods. The test results reported relate only to the item tested.

2.3 Test Result Summary

Table 2-1: Test Result Summary – FCC Part 15, Subpart C (Section 15.247) – DSSS WLAN

Standard	Test	Pass/Fail or N/A
FCC 15.209	Radiated Emissions	Pass
FCC 15.247(a)(2)	6 dB Bandwidth	Pass
FCC 15.247(b)	Maximum Peak Power Output	Pass
FCC 15.247(d)	Antenna Conducted Spurious Emissions	Pass
FCC 15.247(e)	Power Spectral Density	Pass
FCC 15.247(d)	Band Edge Measurement	Pass

2.4 Test System Details

The test sample was received by Rhein Tech Labs on February 13, 2007. The FCC identifiers for all applicable equipment, plus descriptions of all cables used in the tested system, are identified in the following tables.

Table 2-2: Equipment Under Test (EUT)

Part	Manufacturer	Model	Serial Number	FCC ID	Cable Description	RTL Bar Code
802.11a Access Point/Antenna	OSLINK	OSBRiDGE 5GXi	N/A	UEV-5GXI	10 m unshielded RJ-45 power; 10 m unshielded RJ-45 data	17764
POE Injector	OSLINK	OSBRiDGE 3	N/A	N/A	N/A	17809
AC Adapter	GME	GFP361DA-1623	0607-00011ROHS	N/A	Unshielded power	17770

Table 2-3: External Components in Test Configuration

Part	Manufacturer	Model	Serial Number	FCC ID	Cable Description	RTL Bar Code
Laptop	Dell	Inspiron/6400	20276140753	N/A	3 m unshielded power	901465

2.5 Configuration of Tested System

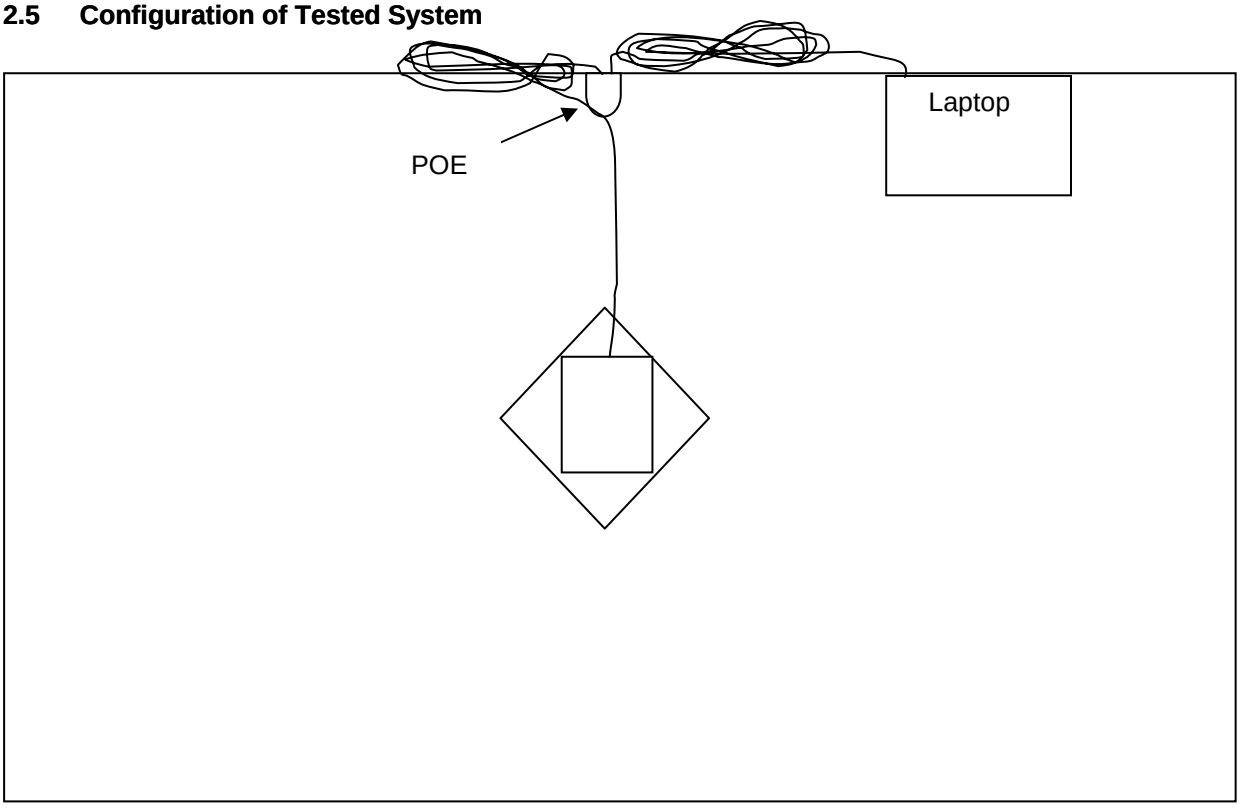


Figure 2-1: Worst Case Configuration of System under Test

3 Peak Output Power – FCC §15.247(b)(1)

3.1 Power Output Test Procedure

A conducted power measurement of the EUT was taken using an Agilent 4416A EPM-P Series Power Meter with an E9323A Peak and Average Power Sensor.

Table 3-1: Power Output Test Equipment

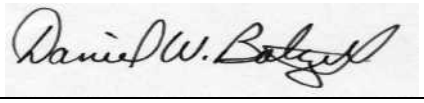
RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901356	Agilent Technologies	E9323A	Power Sensor	31764-264	10/3/07
901184	Agilent Technologies	E4416A	EPM-P Power Meter, single channel	GB41050573	10/3/07

3.2 Power Output Test Data

Table 3-2: Power Output Test Data – DSSS WLAN 802.11a

Frequency (MHz)	Peak Power Conducted Output (dBm)
5745	19.2
5760	18.0
5785	19.2
5800	18.1
5825	19.3

Test Personnel:



Daniel W. Baltzell		February 16th and 20th, 2007
EMC Test Engineer	Signature	Dates Of Tests

4 Compliance with the Band Edge – FCC §15.247(d)

4.1 Band Edge Test Procedure

The transmitter output was connected to its appropriate antenna. Peak (1 MHz RBW/VBW) and average (1 MHz RBW/10 Hz VBW) radiated measurements were taken with a suitable span to encompass the peak of the fundamental. A delta measurement was performed from the highest peak in the restricted band to the peak of the fundamental, and subtracted from the field strength; the result was compared to the limit in the restricted band (54 dBuV/m).

Table 4-1: Band Edge Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
901215	Hewlett Packard	8596EM	Spectrum Analyzer (9 kHz - 12.8 GHz)	3826A00144	10/16/07
900878	Rhein Tech Laboratories	AM3-1197-0005	3 meter antenna mast, polarizing	Outdoor Range 1	Not Required
901242	Rhein Tech Laboratories	WRT-000-0003	Wood rotating table	N/A	Not Required
900321	EMCO	3161-03	Horn Antennas (4 – 8.2 GHz)	9508-1020	5/20/07
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz – 22 GHz)	3138A07771	9/13/07

4.2 Restricted Band Edge Test Results

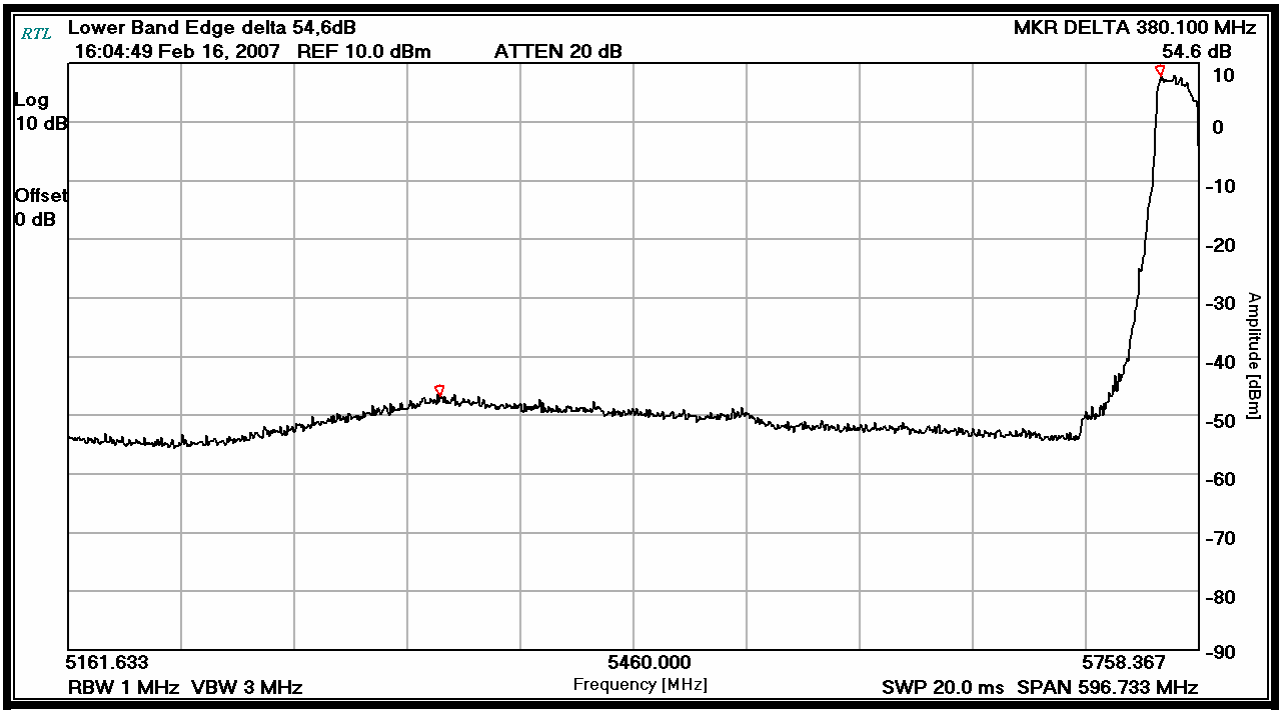
4.2.1 Calculation of Lower Band Edge – 802.11a

100.7 dBuV/m is the field strength measurement, from which the delta measurement of 54.6 dB is subtracted (reference plots), resulting in a level of 46.1 dB. This level has a margin of 7.9 dB below the limit of 54 dBuV/m.

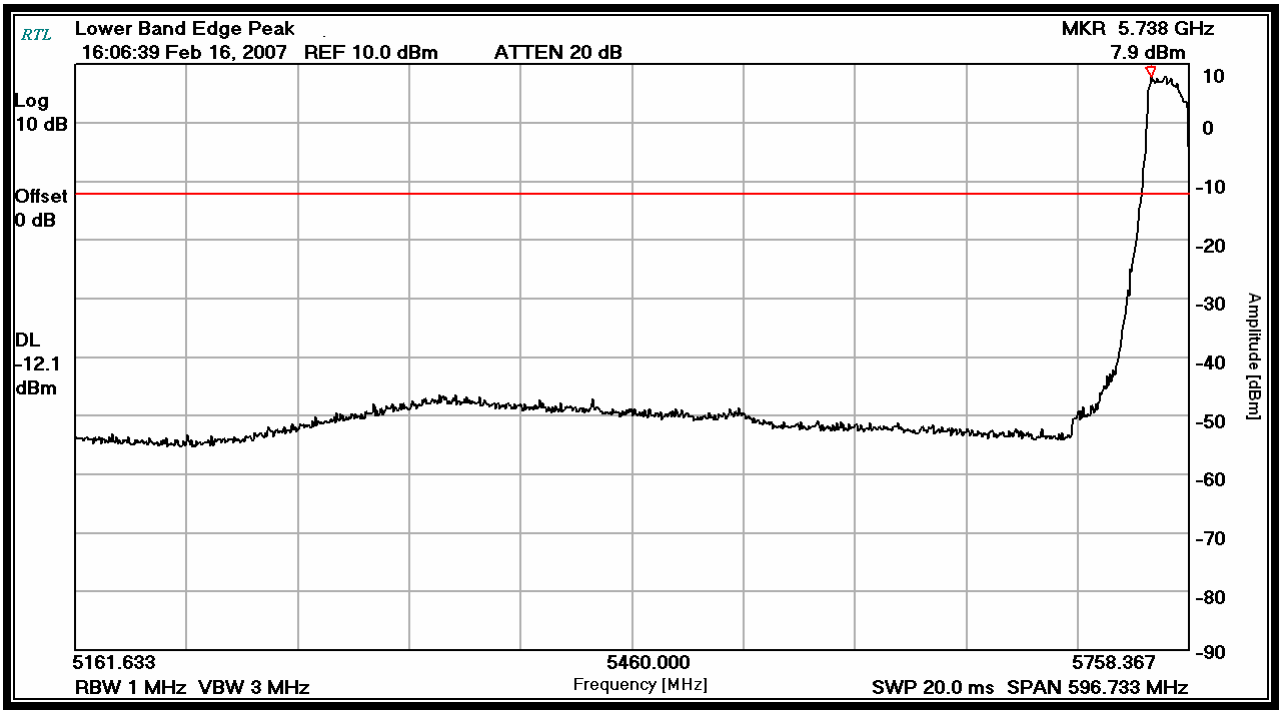
Calculation: 100.7 dBuV/m – 54.6 dB – 54 dBuV/m = -7.9 dB

Peak Field Strength of Lower Band Edge (1 MHz RBW/1 MHz VBW) = 124.5 dBuV/m
Average Field Strength of Lower Band Edge (1 MHz RBW/10 Hz VBW) = 100.7 dBuV/m
Delta measurement = 54.6 dB

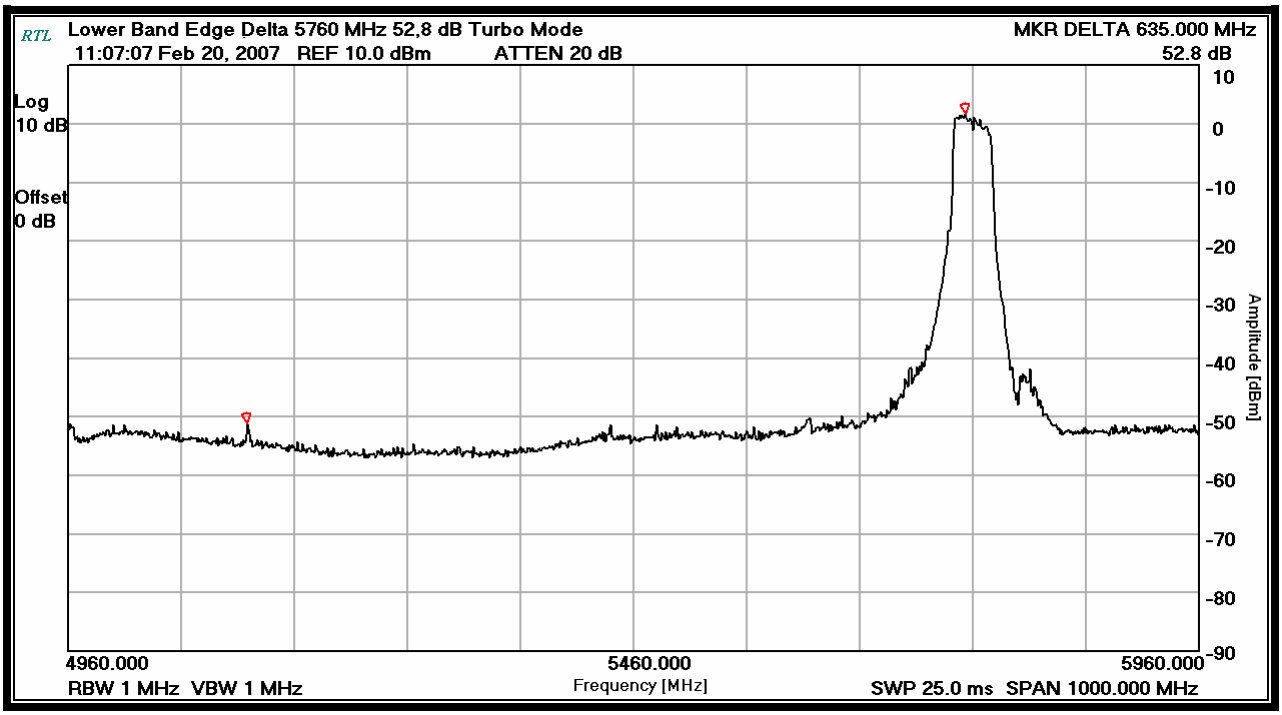
Plot 4-1: Lower Band Edge: Delta Measurement (TX Frequency: 5745 MHz)



Plot 4-2: Lower Band Edge: Peak Measurement (TX Frequency: 5745 MHz)



Plot 4-3: Lower Band Edge: Delta Measurement (TX Frequency: 5760 MHz Turbo Mode)



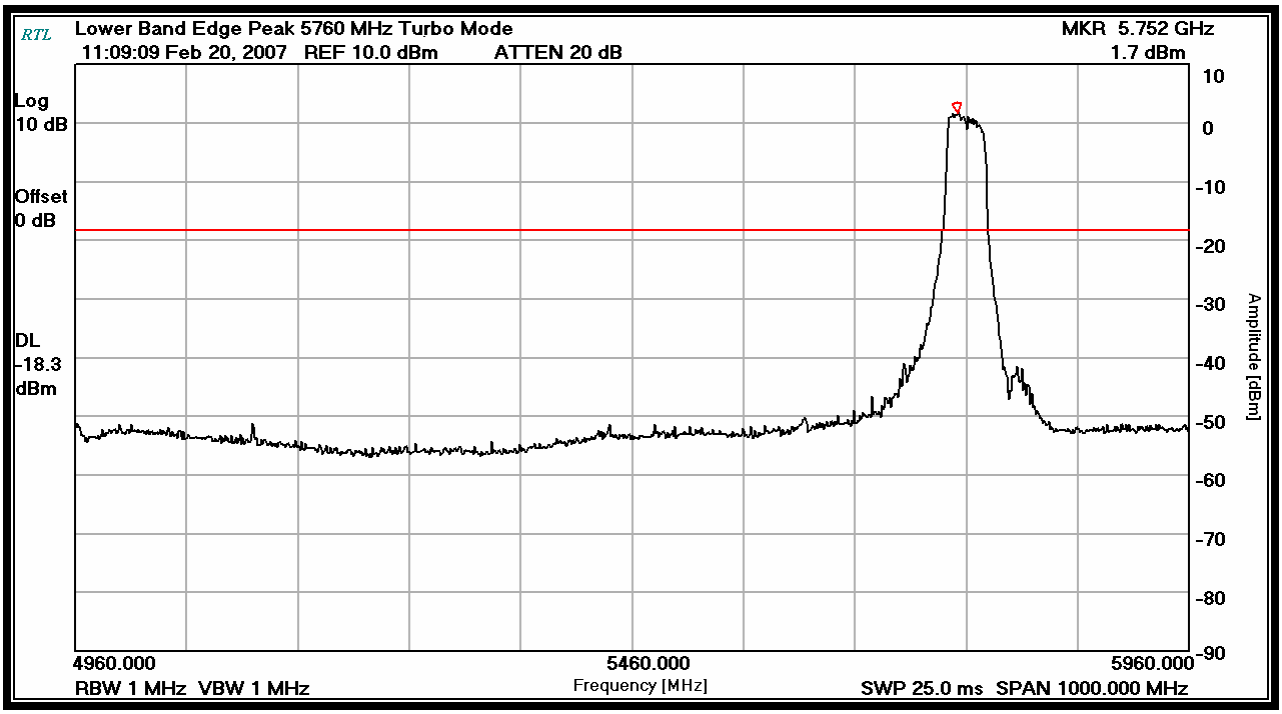
4.2.2 Calculation of Lower Band Edge – 802.11a Turbo Mode

93.8 dBuV/m is the field strength measurement, from which the delta measurement of 52.8 dB is subtracted (reference plots), resulting in a level of 41 dB. This level has a margin of 13 dB below the limit of 54 dBuV/m.

Calculation: 93.8 dBuV/m – 52.8 dB – 54 dBuV/m = -13 dB

Peak Field Strength of Lower Band Edge (1 MHz RBW/1 MHz VBW) = 122.7 dBuV/m
Average Field Strength of Lower Band Edge (1 MHz RBW/10 Hz VBW) = 93.8 dBuV/m
Delta measurement = 52.8 dB

Plot 4-4: Lower Band Edge: Peak Measurement (TX Frequency: 5760 MHz Turbo Mode)



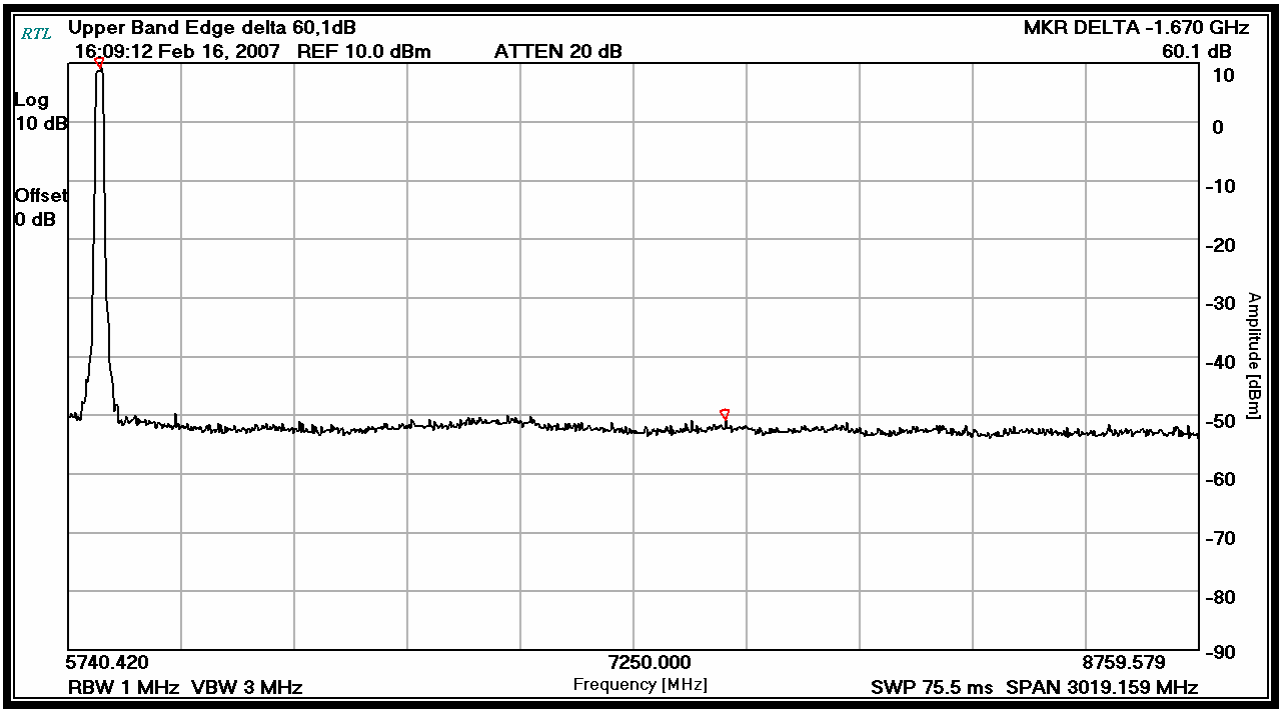
4.2.3 Calculation of Upper Band Edge – 802.11a

103.1 dBuV/m is the field strength measurement, from which the delta measurement of 60.1 dB is subtracted (reference plots), resulting in a level of 43 dB. This level has a margin of 11 dB below the limit of 54 dBuV/m.

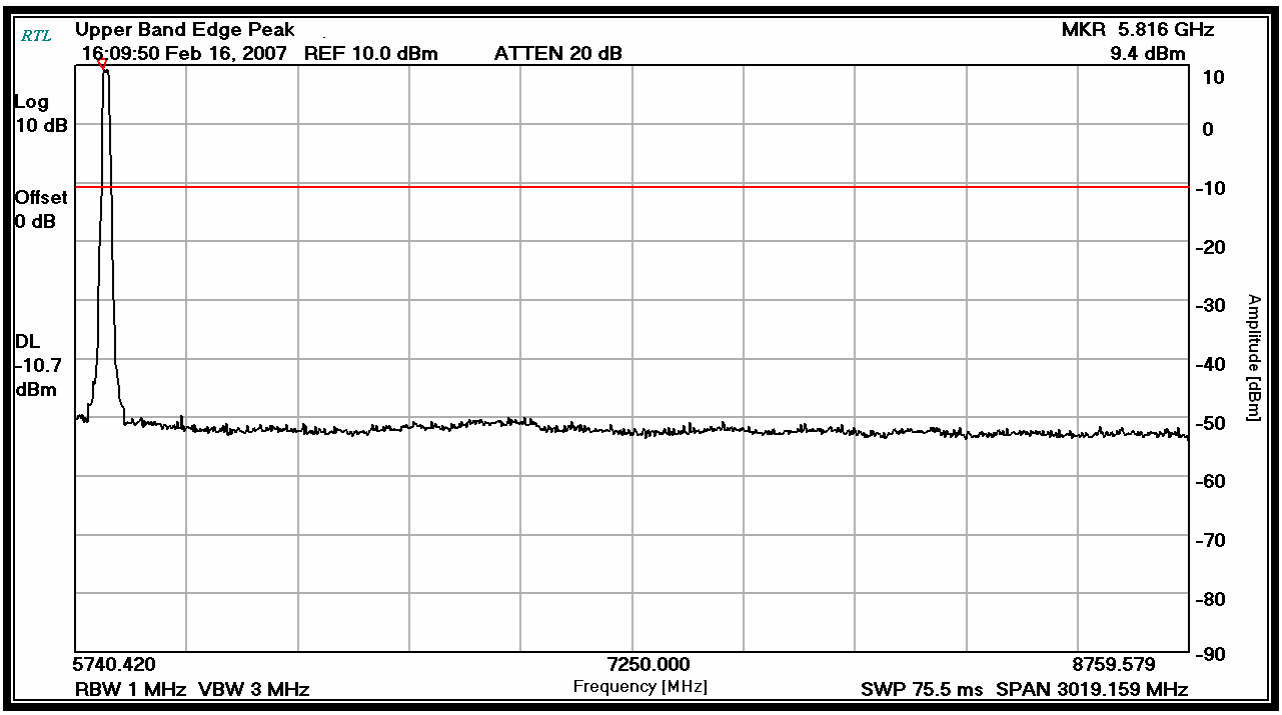
Calculation: 103.1 dBuV/m – 60.1 dB – 54 dBuV/m = -11 dB

Peak Field Strength of Upper Band Edge (1 MHz RBW/1 MHz VBW) = 126.6 dBuV/m
Average Field Strength of Upper Band Edge (1 MHz RBW/10 Hz VBW) = 103.1 dBuV/m
Delta measurement = 60.1 dB

Plot 4-5: Upper Band Edge: Delta Measurement (TX Frequency: 5825 MHz)



Plot 4-6: Upper Band Edge: Peak Measurement (TX Frequency: 5825 MHz)



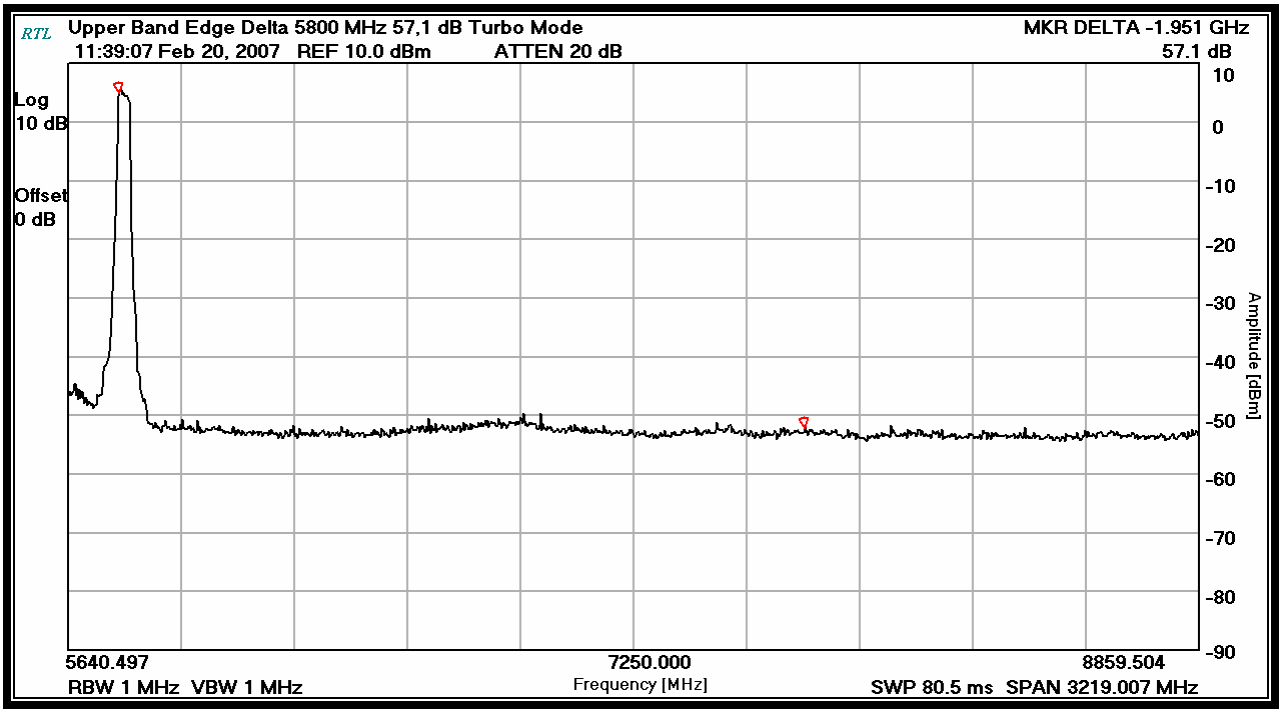
4.2.4 Calculation of Upper Band Edge – 802.11a

93.8 dBuV/m is the field strength measurement, from which the delta measurement of 57.1 dB is subtracted (reference plots), resulting in a level of 36.7 dB. This level has a margin of 17.3 dB below the limit of 54 dBuV/m.

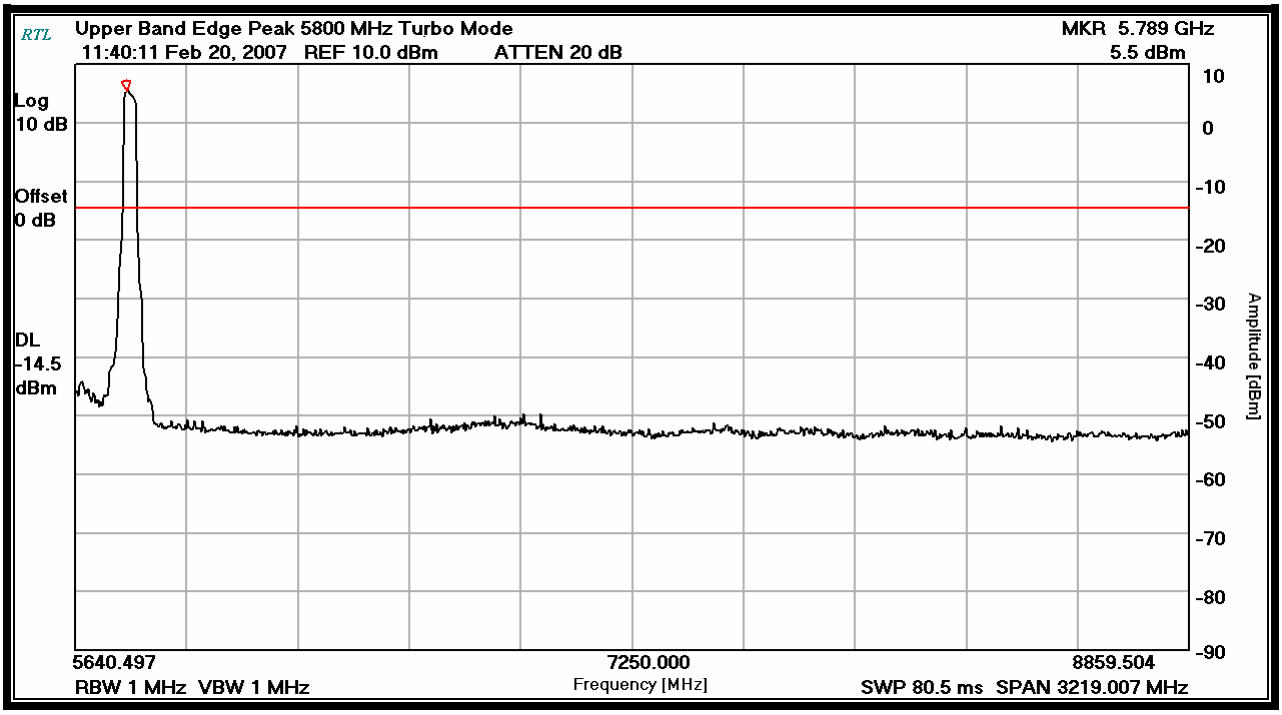
Calculation: 93.8 dBuV/m – 57.1 dB – 54 dBuV/m = -17.3 dB

Peak Field Strength of Upper Band Edge (1 MHz RBW/1 MHz VBW) = 123.3 dBuV/m
Average Field Strength of Upper Band Edge (1 MHz RBW/10 Hz VBW) = 93.8 dBuV/m
Delta measurement = 57.1 dB

Plot 4-7: Upper Band Edge: Delta Measurement (TX Frequency: 5800 MHz Turbo Mode)



Plot 4-8: Upper Band Edge: Peak Measurement (TX Frequency: 5800 MHz Turbo Mode)



Test Personnel:

Daniel W. Baltzell	Daniel W. Baltzell	February 16 and 20, 2007
Test Engineer	Signature	Dates of Tests

5 Antenna Conducted Spurious Emissions – FCC §15.247(d)

5.1 Antenna Conducted Spurious Emissions Test Procedures

Antenna spurious emissions per FCC 15.247(c) were measured from the EUT antenna port using a 50 ohm spectrum analyzer with the resolution bandwidth set at 100 kHz, and the video bandwidth set at 100 kHz. The modulated carrier was identified at the following frequencies: 5745 MHz, 5785 MHz and 5825 MHz.

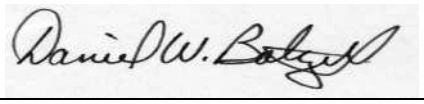
5.2 Antenna Conducted Spurious Emissions Test Results – DSSS WLAN

No harmonics or spurs were found within 20 dB of the carrier level from the carrier to the 10th harmonic of the carrier frequency (note that we are reporting power as peak). Per FCC 15.31(o), no data is being reported.

Table 5-1: Antenna Conducted Spurious Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz – 22 GHz)	3138A07771	9/13/07

Test Personnel:



Daniel W. Baltzell		February 16, 2007
Test Engineer	Signature	Date of Test

6 6 dB Bandwidth – FCC §15.247(a)(2)

6.1 6 dB Bandwidth Test Procedure – Minimum 6 dB Bandwidth

The minimum 6 dB bandwidths per FCC 15.247(a)(2) were measured using a 50 ohm spectrum analyzer with the resolution bandwidth set at 100 kHz, and the video bandwidth set at 1 MHz. The device was modulated. The minimum 6 dB bandwidths are presented below.

Table 6-1: 6 dB Bandwidth Test Equipment

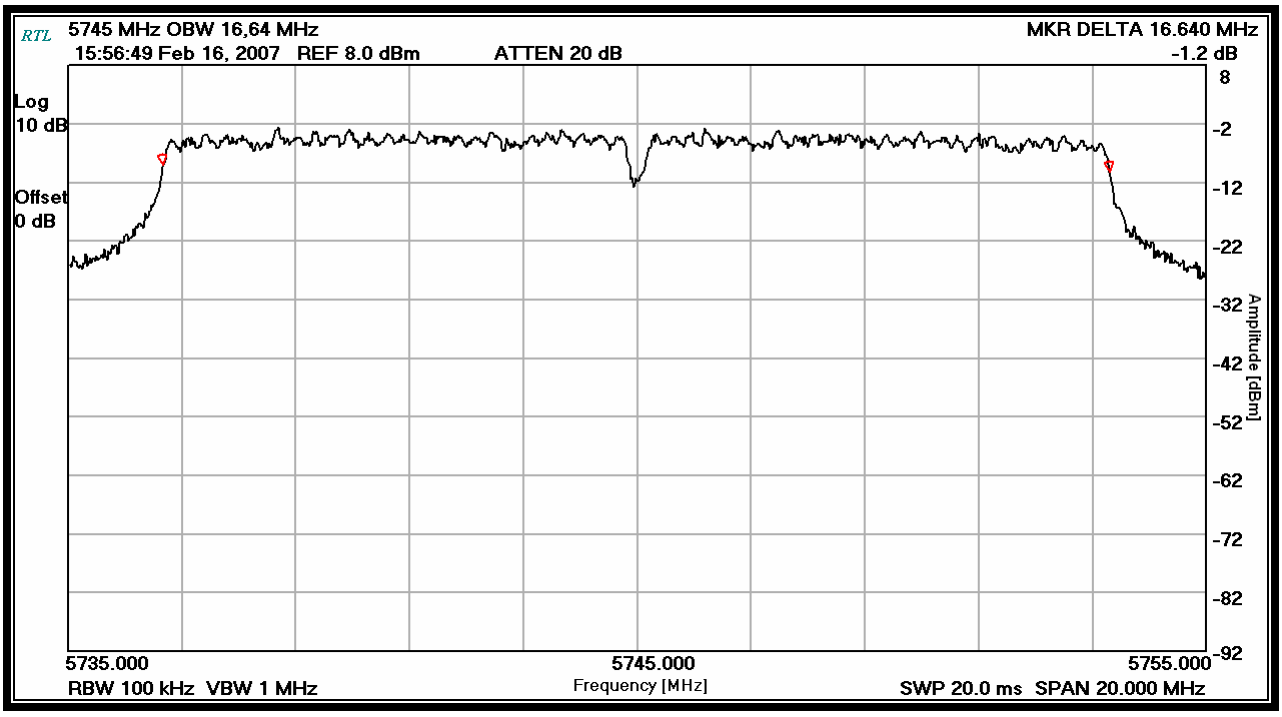
RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900930/900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz – 22 GHz)	3138A07771	9/13/07

6.2 6 dB Bandwidth Test Results – DSSS WLAN 802.11a

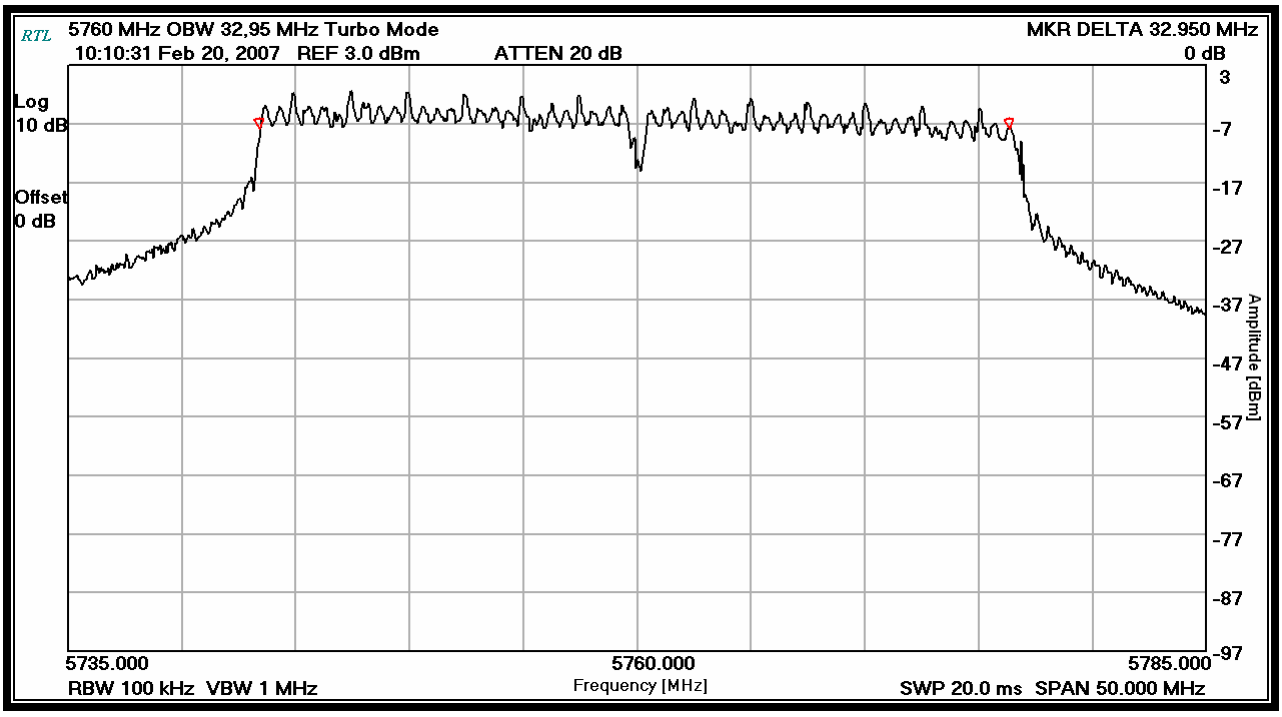
Table 6-2: 6 dB Bandwidth Test Data – DSSS WLAN 802.11a

Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass/Fail
5745	16.64	0.5	Pass
5760 (Turbo mode)	32.95	0.5	Pass
5785	16.70	0.5	Pass
5800 (Turbo mode)	33.05	0.5	Pass
5825	16.64	0.5	Pass

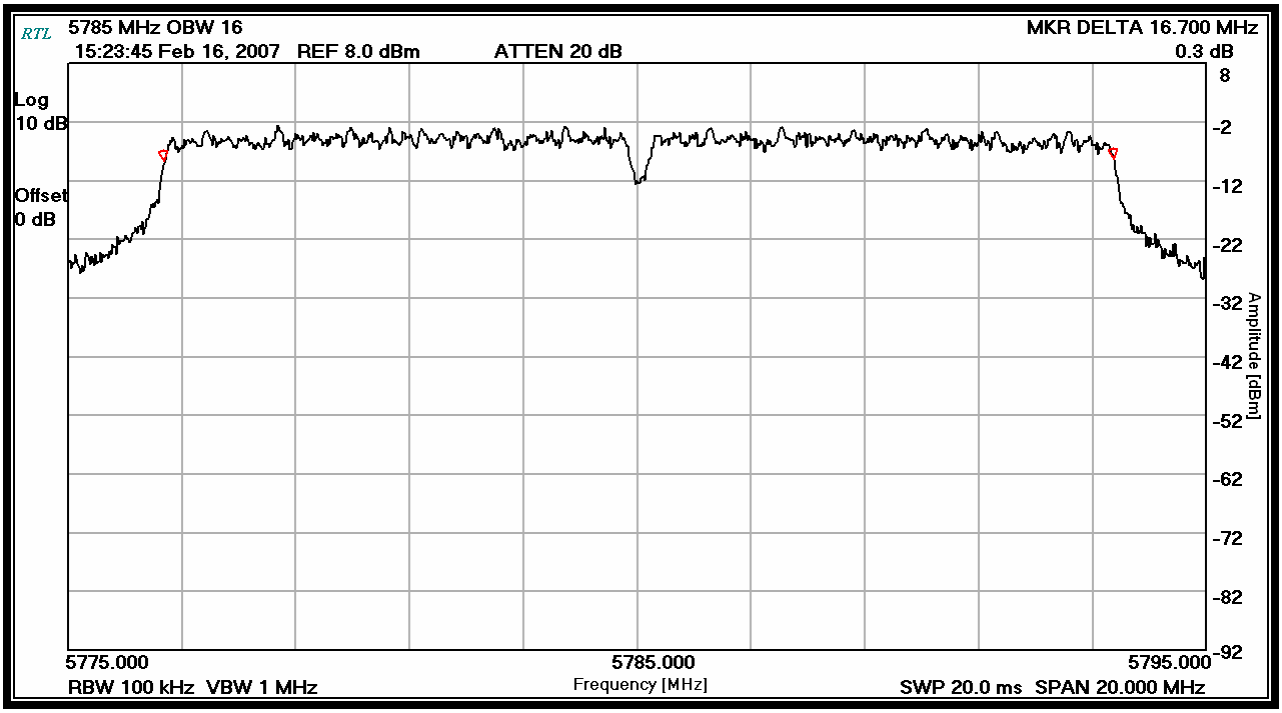
Plot 6-1: 6 dB Bandwidth (TX Frequency: 5745 MHz)



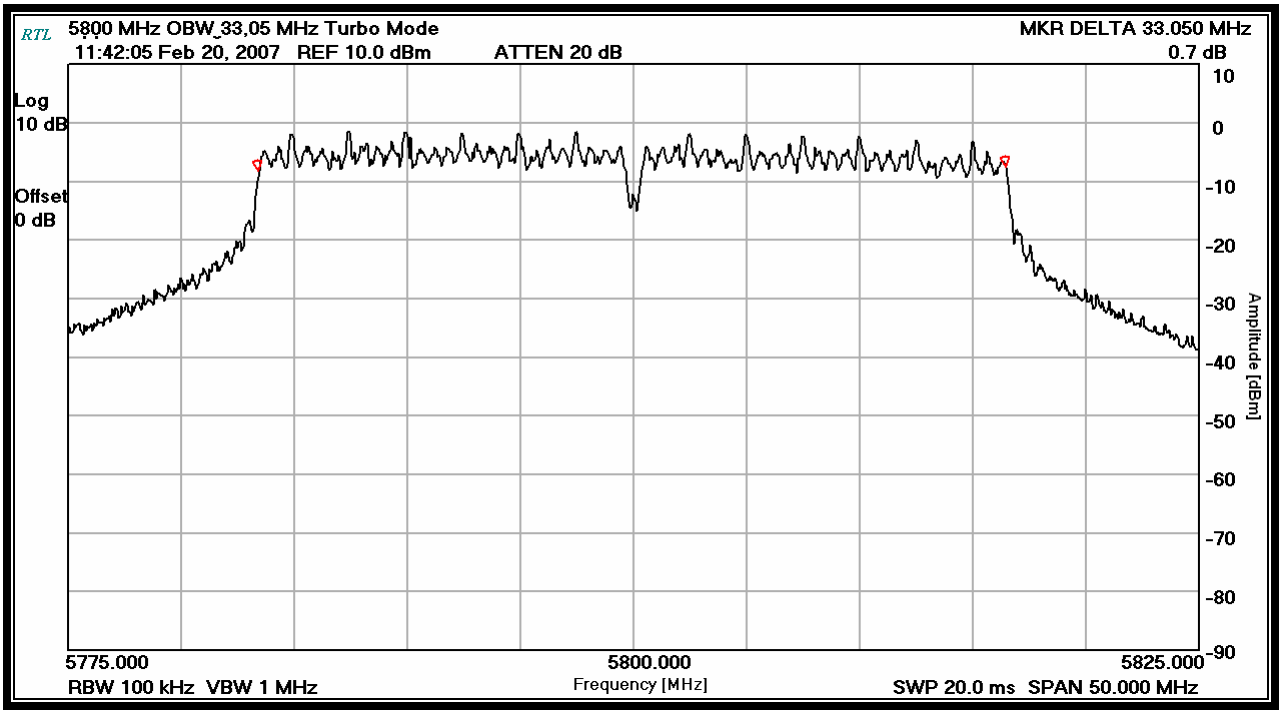
Plot 6-2: 6 dB Bandwidth (TX Frequency: 5760 MHz Turbo Mode)



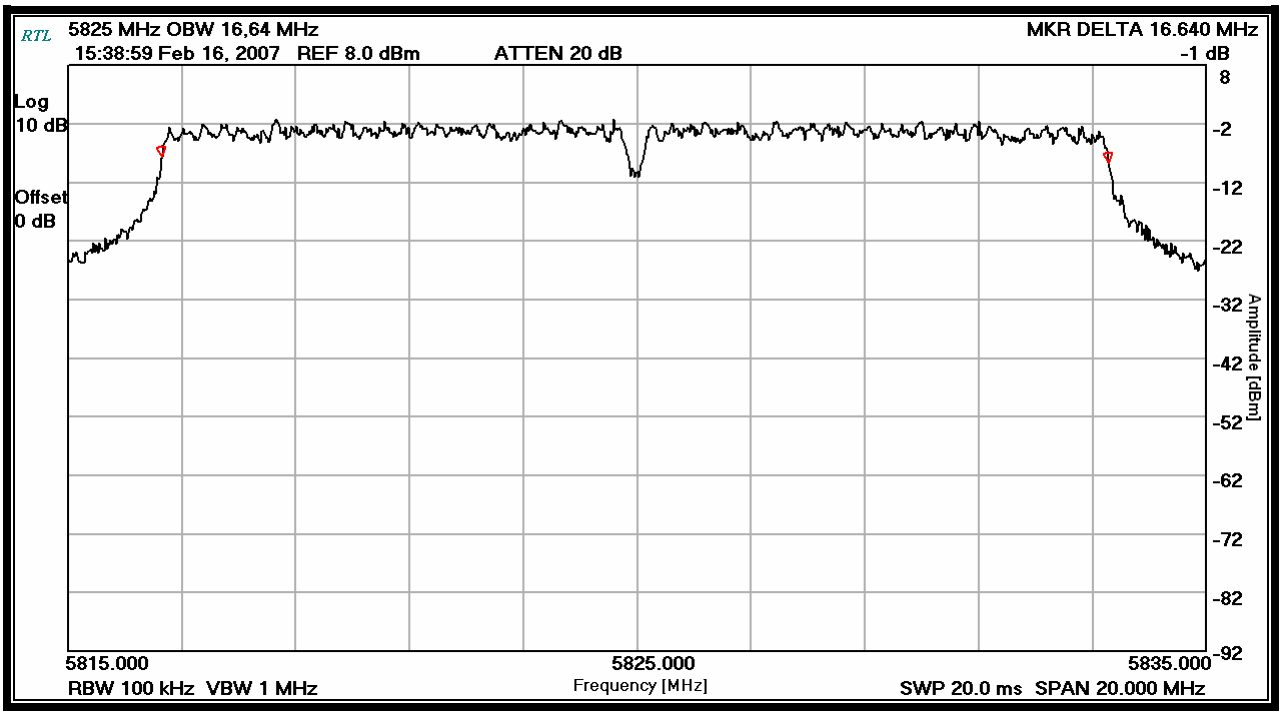
Plot 6-3: 6 dB Bandwidth (TX Frequency: 5785 MHz)



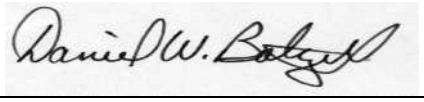
Plot 6-4: 6 dB Bandwidth (TX Frequency: 5800 MHz Turbo Mode)



Plot 6-5: 6 dB Bandwidth (TX Frequency: 5825 MHz)



Test Personnel:

Daniel W. Baltzell		February 16 and 20, 2007
Test Engineer	Signature	Dates of Tests

7 Power Spectral Density – FCC §15.247(e)

7.1 Power Spectral Density Test Procedure

The power spectral density per FCC 15.247(d) was measured using a 50 ohm spectrum analyzer with the resolution bandwidth set at 3 kHz, the video bandwidth set at 30 kHz, and the sweep time set at 500 seconds. The spectral lines were resolved for the modulated carriers at 2.412 GHz, 2.437 GHz, and 2.462 GHz respectively. These levels are below the +8 dBm limit. See the power spectral density table and plots.

Table 7-1: Power Spectral Density Test Equipment

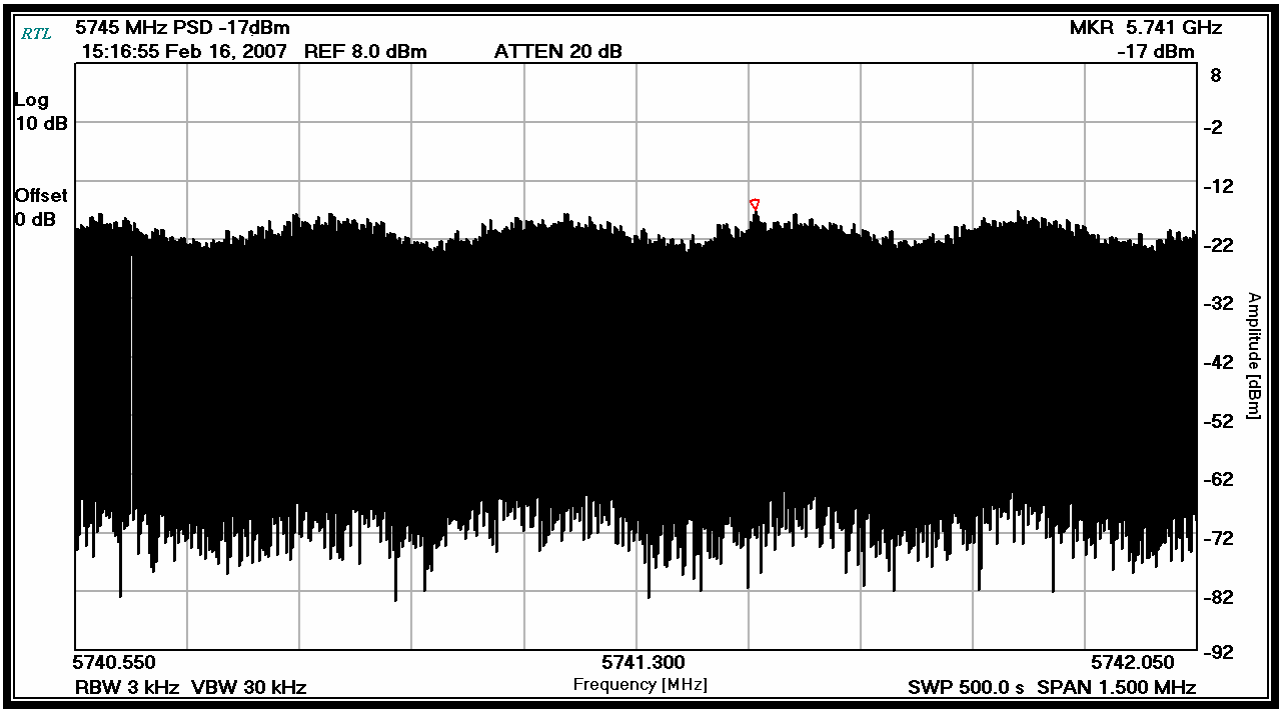
RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz – 22 GHz)	3138A07771	9/13/07

7.2 Power Spectral Density Test Data – DSSS WLAN; 802.11a

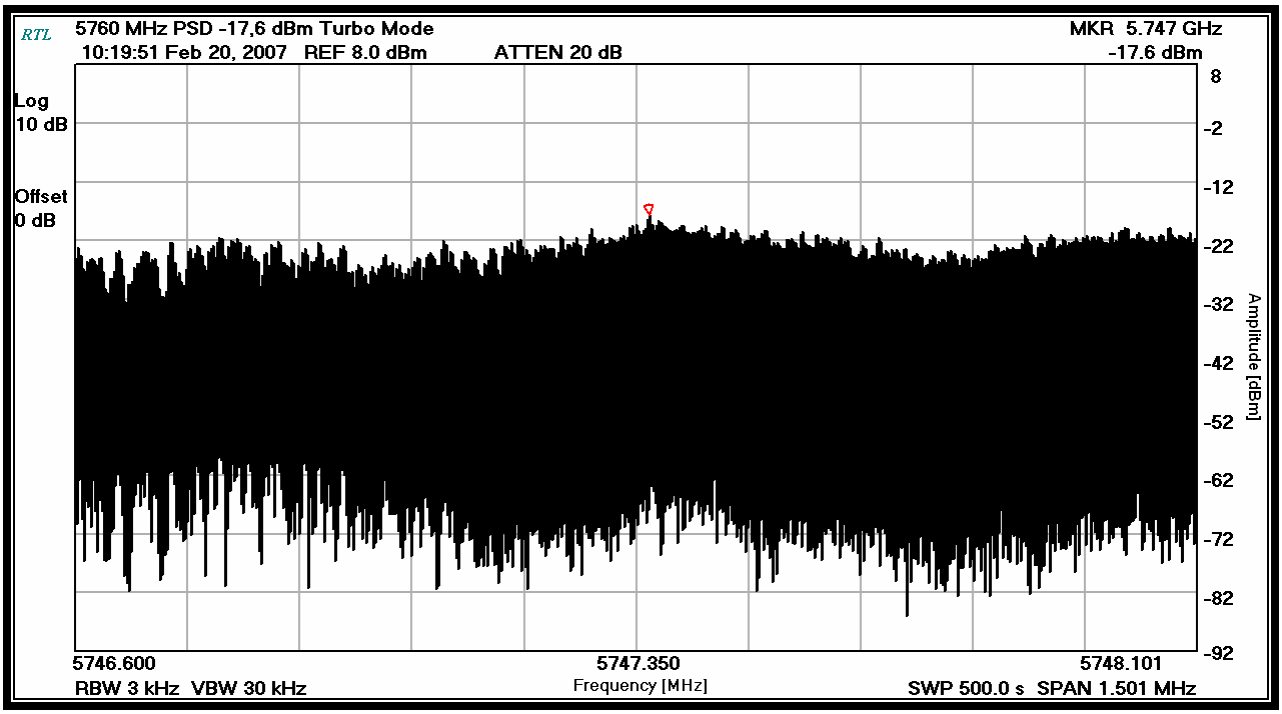
Table 7-2: Power Spectral Density Test Data – DSSS WLAN; 802.11a

Frequency (MHz)	RF Power Level (dBm)	Maximum Limit +8dBm	Pass/Fail
5745	-17.0	8	Pass
5760	-17.6	8	Pass
5785	-15.2	8	Pass
5800	-19.8	8	Pass
5825	-13.6	8	Pass

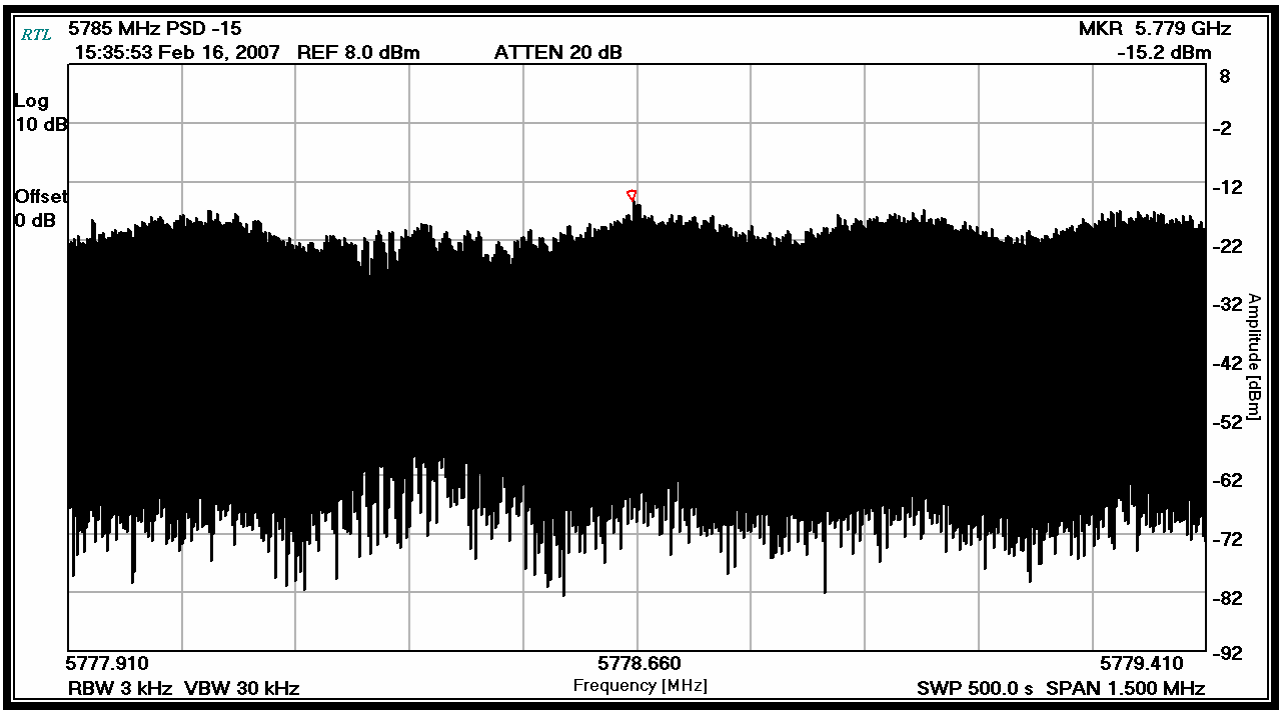
Plot 7-1: Power Spectral Density: 5745 MHz



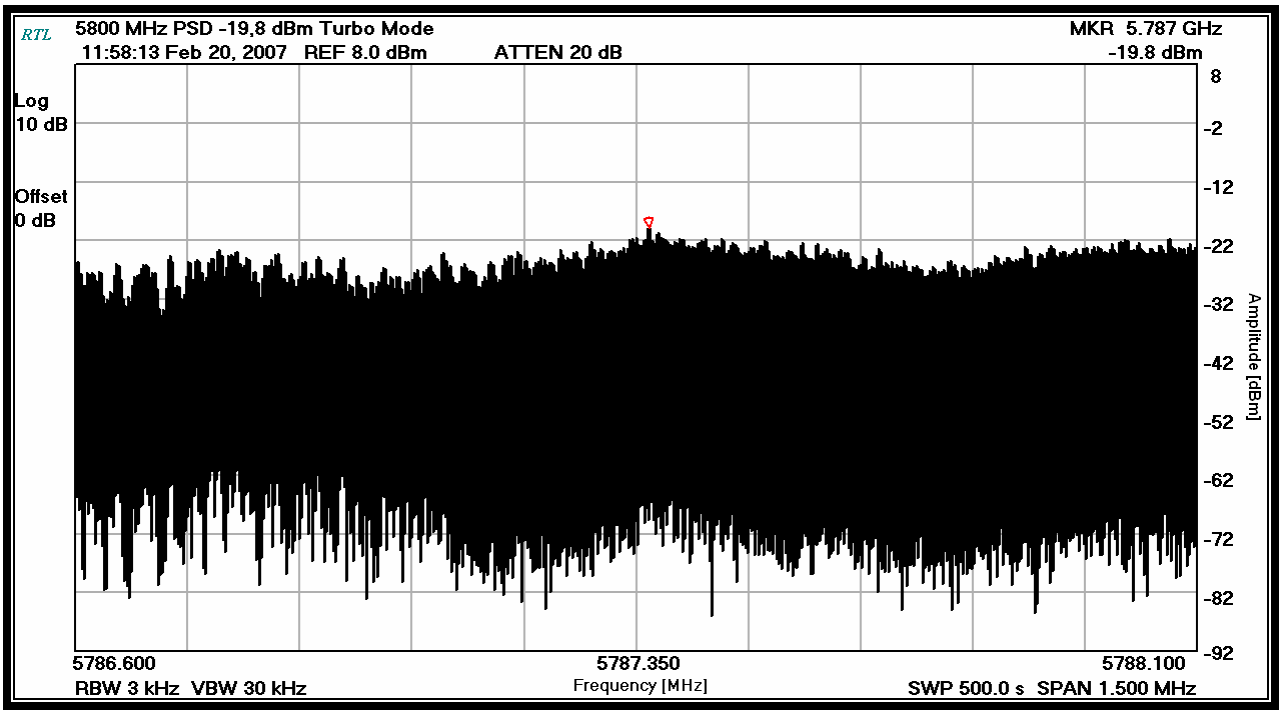
Plot 7-2: Power Spectral Density: 5760 MHz Turbo Mode



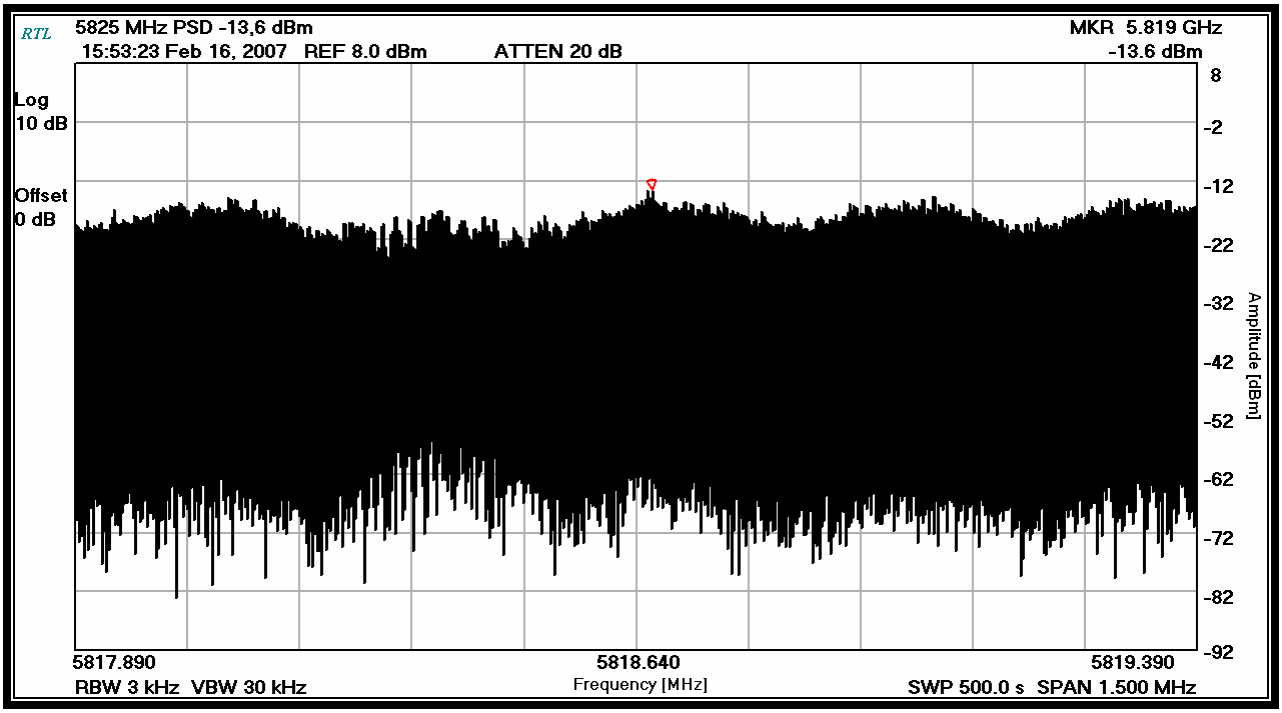
Plot 7-3: Power Spectral Density: 5785 MHz



Plot 7-4: Power Spectral Density: 5800 MHz Turbo Mode



Plot 7-5: Power Spectral Density: 5825 MHz



Test Personnel:

Daniel W. Baltzell		February 16 and 20, 2007
Test Engineer	Signature	Dates of Tests

8 Radiated Emissions – FCC §15.209

8.1 Limits of Radiated Emissions Measurements

Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009-0.490	2400/f (kHz)	300
0.490-1.705	2400/f (kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

As shown in 15.35(b), for frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any circumstances of modulation.

8.2 Radiated Emissions Measurement Test Procedure

Before final measurements of radiated emissions were made on the open-field three/ten meter range, the EUT was scanned indoors at one and three meter distances. This was done in order to determine its emissions spectrum signature. The physical arrangement of the test system and associated cabling was varied in order to determine the effect on the EUT's emissions in amplitude, direction and frequency. This process was repeated during final radiated emissions measurements on the open-field range, at each frequency, in order to ensure that maximum emission amplitudes were attained.

Final radiated emissions measurements were made on the three/ten-meter, open-field test site. The EUT was placed on a nonconductive turntable 0.8 meters above the ground plane. The spectrum was examined from 9 kHz to the 10^{th} harmonic of the highest fundamental transmitter frequency.

At each frequency, the EUT was rotated 360°, and the antenna was raised and lowered from 1 to 4 meters in order to determine the emission's maximum level. Measurements were taken using both horizontal and vertical antenna polarizations. For frequencies between 30 and 1000 MHz, the spectrum analyzer's 6 dB bandwidth was set to 120 kHz, and the analyzer was operated in the CISPR quasi-peak detection mode. For emissions above 1000 MHz, emissions are measured using the average detector function with a minimum resolution bandwidth of 1 MHz. No video filter less than 10 times the resolution bandwidth was used. The highest emission amplitudes relative to the appropriate limit were measured and recorded in this report.

Table 8-1: Radiated Emissions Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900151	Rohde and Schwarz	HFH2-Z2	Antenna (Loop, 9 kHz - 30 MHz)	827525/019	9/15/09
901053	Schaffner Chase	CBL6112B	Bi-Log Antenna (20 MHz - 2 GHz)	2648	11/01/07
901365	Miteq	JS4-00102600-41-5P	Amplifier, 15 V, 0.1 - 26 GHz, 28 dB gain	1094152	3/24/07
900905	Rhein Tech Labs	PR-1040	OATS 1 Preamplifier 40 dB (30 MHz – 2 GHz)	1006	3/15/07
900878	Rhein Tech Labs	AM3-1197-0005	3 meter antenna mast, polarizing	Outdoor Range 1	Not Required
901425	Insulated Wire, Inc.	KPS-1503-2400-KPS	RF cable, 20'	NA	12/5/07
901424	Insulated Wire Inc.	KPS-1503-360-KPS	RF cable 36"	NA	12/5/07
901242	Rhein Tech Labs	WRT-000-0003	Wood rotating table	N/A	Not Required
900772	EMCO	3161-02	Horn Antenna (2 - 4 GHz)	9804-1044	5/20/07
900321	EMCO	3161-03	Horn Antennas (4 - 8,2 GHz)	9508-1020	5/20/07
900323	EMCO	3160-7	Horn Antennas (8,2 - 12,4 GHz)	9605-1054	5/20/07
900356	EMCO	3160-08	Horn Antenna (12.4 - 18 GHz)	9607-1044	5/20/07
900325	EMCO	3160-9	Horn Antennas (18 - 26.5 GHz)	9605-1051	5/20/07
901218	EMCO	3301B	Horn Antenna (18 - 26.5 GHz)	960281-003	5/20/07
900392	Hewlett Packard	1197OK	Harmonic Mixer (18 – 26.5 GH)z	3525A00159	11/27/07
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz - 22 GHz)	3138A07771	9/13/07
900930	Hewlett Packard	85662A	Spectrum Analyzer Display Section	3144A20839	9/13/07
900889	Hewlett Packard	85685A	RF Preselector (20 Hz - 2 GHz)	3146A01309	4/12/07
900913	Hewlett Packard	85462A	EMI Receiver RF Section (9 KHz – 6.5 GHz)	3325A00159	2/28/07

8.3 Radiated Emissions Test Results

8.3.1 Radiated Emissions Digital/Receiver Test Data

Table 8-2: Digital/Receiver Radiated Emissions Test Data

Temperature: 32° F Humidity: 27%									
Emission Frequency (MHz)	**Test Detector**	**Antenna Polarity (H/V)**	**Turntable Azimuth (deg)**	**Antenna Height (m)**	**Analyzer Reading (dBuV)**	**Site Correction Factor (dB/m)**	**Emission Level (dBuV/m)**	**Limit (dBuV/m)**	**Margin (dB)**
87.503	Qp	V	170	1.0	45.7	-20.8	24.9	40.0	-15.1
87.509	Qp	V	0	1.0	56.7	-20.8	35.9	40.0	-4.1
125.003	Qp	H	170	1.0	42.2	-17.1	25.1	43.5	-18.4
275.008	Qp	H	90	1.0	53.6	-14.2	39.4	46.0	-6.6
375.005	Qp	H	120	1.0	52.7	-11.0	41.7	46.0	-4.3
625.018	Qp	H	260	1.0	47.0	-5.8	41.2	46.0	-4.8

Test Personnel:

Daniel W. Baltzell		March 15, 2007
Test Engineer	Signature	Date Of Test

8.3.2 Radiated Emissions Harmonics/Spurious Test Data - WLAN DSSS 802.11a

Table 8-3: Radiated Emissions Harmonics/Spurious (Low Channel, 5745 MHz)

Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
11490.0	Pk	31.5	15.8	47.3	74.0	-26.7
11490.0	Av	18.2	15.8	34.0	54.0	-20.0
17235.0	Pk	31.7	21.5	53.2	74.0	-20.8
17235.0	Av	18.3	21.5	39.8	54.0	-14.2

Peak Resolution/Video Bandwidth is 1 MHz/3 MHz; Average Resolution/Video Bandwidth is 1 MHz/10 Hz

Table 8-4: Radiated Emissions Harmonics/spurious (Low Channel, 5760 MHz Turbo Mode)

Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
11520.0	Pk	29.6	15.5	45.1	74.0	-28.9
11520.0	Av	17.6	15.5	33.1	54.0	-20.9
17280.0	Pk	33.7	21.6	55.3	74.0	-18.7
17280.0	Av	21.0	21.6	42.6	54.0	-11.4

Peak Resolution/Video Bandwidth is 1 MHz/3 MHz; Average Resolution/Video Bandwidth is 1 MHz/10 Hz

Table 8-5: Radiated Emissions Harmonics/Spurious (Mid Channel, 5785 MHz)

Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
11570.0	Pk	29.9	16.0	45.9	74.0	-28.1
11570.0	Av	17.7	16.0	33.7	54.0	-20.3
17355.0	Pk	31.8	23.1	54.9	74.0	-19.1
17355.0	Av	17.9	23.1	41.0	54.0	-13.0

Peak Resolution/Video Bandwidth is 1 MHz/3 MHz; Average Resolution/Video Bandwidth is 1 MHz/10 Hz

Table 8-6: Radiated Emissions Harmonics/Spurious (Mid Channel, 5800 MHz turbo mode)

Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
11600.0	Pk	29.9	16.0	45.9	74.0	-28.1
11600.0	Av	17.7	16.0	33.7	54.0	-20.3
17400.0	Pk	33.5	22.6	56.1	74.0	-17.9
17400.0	Av	21.1	22.6	43.7	54.0	-10.3

Peak Resolution/Video Bandwidth is 1 MHz/3 MHz; Average Resolution/Video Bandwidth is 1 MHz/10 Hz

Table 8-7: Radiated Emissions Harmonics/Spurious (High Channel, 5825 MHz)

Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)
11650.0	Pk	33.1	16.0	49.1	74.0	-24.9
11650.0	Av	21.0	16.0	37.0	54.0	-17.0
17475.0	Pk	30.5	22.6	53.1	74.0	-20.9
17475.0	Av	17.8	22.6	40.4	54.0	-13.6

Peak Resolution/Video Bandwidth is 1 MHz/3 MHz; Average Resolution/Video Bandwidth is 1 MHz/10 Hz

TEST PERSONNEL:

Daniel Baltzell		February 21, 2007
Test Engineer	Signature	Date Of Test

9 Conducted Limits - §15.207

9.1 Test Methodology for Conducted Emissions Measurements

The power line conducted emission measurements were performed in a Series 81 type shielded enclosure manufactured by Rayproof. The EUT was assembled on a wooden table 80 centimeters high. Power was fed to the EUT through a 50 ohm / 50 microHenry Line Impedance Stabilization Network (EUT LISN). The EUT LISN was fed power through an A.C. filter box on the outside of the shielded enclosure. The filter box and EUT LISN housing are bonded to the ground plane of the shielded enclosure. A second LISN, the peripheral LISN, provides isolation for the EUT test peripherals. This peripheral LISN was also fed A.C. power. A metal power outlet box, which is bonded to the ground plane and electrically connected to the peripheral LISN, powers the EUT host peripherals.

The spectrum analyzer was connected to the A.C. line through an isolation transformer. The 50 ohm output of the EUT LISN was connected to the spectrum analyzer input through a Solar high-pass filter. The filter is used to prevent overload of the spectrum analyzer from noise below 150 kHz. Conducted emission levels were measured on each current-carrying line with the spectrum analyzer operating in the CISPR quasi-peak mode (or peak mode if applicable). The analyzer's 6 dB bandwidth was set to 9 kHz. No video filter less than 10 times the resolution bandwidth was used. Average measurements are performed in linear mode using a 10 kHz resolution bandwidth, a 1 Hz video bandwidth, and by decreasing the sweep time in order to obtain a calibrated measurement. The emission spectrum was scanned from 150 kHz to 30 MHz. The highest emission amplitudes relative to the appropriate limit were measured and have been recorded in this report.

Note: Rhein Tech Laboratories, Inc. has implemented procedures to minimize errors that occur from test instruments, calibration, procedures, and test setups. Test instrument and calibration errors are documented from the manufacturer or calibration lab. Other errors have been defined and calculated within the Rhein Tech Quality Manual, Section 6.1. Rhein Tech implements the following procedures to minimize errors that may occur: yearly as well as daily calibration methods, technician training, and emphasis to employees on avoiding error.

9.2 Conducted Emissions Test

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. If the conducted emissions exceed the limit with the instrument set to the quasi-peak mode, then measurements are made in the average mode. The conducted test was performed with the EUT exercise program loaded, and the emissions were scanned between 150 kHz to 30 MHz on the NEUTRAL SIDE and PHASE SIDE.

Table 9-1: Conducted Spurious Emissions Test Equipment

RTL Asset #	Manufacturer	Model	Part Type	Serial Number	Calibration Due Date
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz - 22 GHz)	3138A07771	9/13/07
901083	AFJ International	LS16	16A LISN	16010020080	3/28/08

9.3 Conducted Emissions Test Data

Table 9-2: Conducted Emissions (Neutral Side) Transmit

Temperature: 21.9°C Humidity: 24%									
Emission Frequency (MHz)	**Test Detector**	**Analyzer Reading (dBuV)**	**Site Correction Factor (dB)**	**Emission Level (dBuV)**	**QP Limit (dBuV)**	**QP Margin (dBuV)**	**AV Limit (dBuV)**	**AV Margin (dBuV)**	**Pass/ Fail**
0.219	Av	49.4	0.2	49.6			52.9	-3.3	Pass
0.219	Qp	50.2	0.2	50.4	62.9	-12.5			Pass
0.436	Av	39.7	0.2	39.9			47.1	-7.2	Pass
0.436	Qp	42.7	0.2	42.9	57.1	-14.2			Pass
0.873	Av	36.6	0.3	36.9			46.0	-9.1	Pass
0.873	Qp	42.4	0.3	42.7	56.0	-13.3			Pass
1.094	Av	37.1	0.4	37.5			46.0	-8.5	Pass
1.094	Qp	43.5	0.4	43.9	56.0	-12.1			Pass
3.500	Av	31.9	1.0	32.9			46.0	-13.1	Pass
3.500	Qp	43.6	1.0	44.6	56.0	-11.4			Pass
26.610	Av	44.3	2.4	46.7			50.0	-3.3	Pass
26.610	Qp	48.7	2.4	51.1	60.0	-8.9			Pass

Table 9-3: Conducted Emissions (Phase Side) Transmit

Temperature: 21.9°C Humidity: 24%									
Emission Frequency (MHz)	**Test Detector**	**Analyzer Reading (dBuV)**	**Site Correction Factor (dB)**	**Emission Level (dBuV)**	**QP Limit (dBuV)**	**QP Margin (dBuV)**	**AV Limit (dBuV)**	**AV Margin (dBuV)**	**Pass/ Fail**
0.216	Av	44.1	0.2	44.3			53.0	-8.7	Pass
0.216	Qp	44.9	0.2	45.1	63.0	-17.9			Pass
0.432	Av	39.2	0.2	39.4			47.2	-7.8	Pass
0.432	Qp	43.3	0.2	43.5	57.2	-13.7			Pass
1.085	Pk	43.7	0.4	44.1			46.0	-1.9	Pass
1.736	Av	30.0	0.6	30.6			46.0	-15.4	Pass
1.736	Qp	41.0	0.6	41.6	56.0	-14.4			Pass
11.318	Av	29.8	1.8	31.6			50.0	-18.4	Pass
11.318	Qp	47.2	1.8	49.0	60.0	-11.0			Pass
26.765	Av	25.3	2.4	27.7			50.0	-22.3	Pass
26.766	Qp	43.4	2.4	45.8	60.0	-14.2			Pass

TEST PERSONNEL:

Daniel Baltzell		February 19, 2007
Test Engineer	Signature	Date of Test

10 Conclusion

The data in this measurement report shows that the OSLINK Model OSBRiDGE 5GXi; FCC ID: UEV-5GXI, complies with all the applicable requirements of Parts 2 and 15 of the FCC Rules.