FCC Test Report
for
47CFR15, Subpart B for Unintentional Radiators, per Section 101
Equipment authorization of unintentional radiators,
and
47CFR15, Subpart C for Intentional Radiators, per Section 247
Operation within the bands 902 to 928 MHz

on

Battery Field Service Unit (BFSU)

[FCC ID: OWS – 923]

models

Battery Field Service Unit with External Antenna
Battery Field Service Unit with Internal Antenna

report number

20050629-02-F15

manufacturer

Silver Spring Networks, Inc.
13000 West Silver Spring Drive
Butler, WI 53007

judgement

Complies as tested

tests and report by

ITC Engineering Services, Inc.
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Registration number: TTI-P-G 159/98-00 (RES-GmbH)

Table of Contents

List of Tables

List of Figures

PART 1 GENERAL INFORMATION

SECTION 1.1 TEST INFORMATION

Product Type **Model**	Battery Field Service Unit(BFSU) BFSU with External Antenna BFSU with Internal Antenna.	
Manufacturer's Name **Manufacturer's Address** **Contact**	Silver Spring Networks Inc. 13000 West Silver Springs Drive Butler,WI 53007 United States Tel: +1 (262) 364-5317 Juan Luglio, PhD	 Fax: +1 (262) 783-0205 email : juan.luglio@silverspringnetworks.com
Test Laboratory	ITC Engineering Services, Inc. 9959 Calaveras Road, PO Box 543 Sunol, CA 94586-0543 Email: docs@itcemc.com Web Site: http://www.itcemc.com	 Tel: +1(925) 862-2944 Fax: +1(925) 862-9013
Test Number and Report Numbers	20050629 – 02	20050629 – 02 – F15
Test Date(s) & Issue Date	July 08 –July 12,2005	July 19, 2005
Test Engineer(s)	Femi Ojo and Robert Kershaw	
Chief Engineer	Michael Gbadebo, P.E	
Documentation	George Brown.	
Test Results	☑ Complies as Tested	❑ Fail

The electromagnetic interference and RF tests, which this report describes, were performed by an independent engineering consultancy firm, ITC Engineering Services, Inc. (ITC), in accordance with the emissions and RF requirements specified in the FCC rules, 47CFR Part 15, Subparts B and C. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical characteristics. Any modifications specified in this report for compliance must be implemented in all production units for compliance to be maintained.

SECTION 1.2 TESTS PERFORMED:

Emissions Requirements:

- OPEN FIELD RADIATED EMISSIONS in accordance with the FCC 47 CFR 15.109

RF Requirements:

- MAXIMUM PEAK OUTPUT OF FUNDAMENTAL in accordance with the FCC 47 CFR 15.247(b) (1)
- OPERATING BAND in accordance with FCC 47 CFR 15.247(a)
- BAND-EDGE in accordance with the FCC 47 CFR 15.247(c)
- 6dB BANDWIDTH in accordance with FCC 47 CFR 15.247(a)(2)
- SPECTRAL DENSITY in accordance with FCC 47 CFR 15.247(d)
- HARMONIC/SPURIOUS EMISSIONS in accordance with the FCC 47 CFR 15.247(c)
- RESTRICTED BAND EMISSIONS in accordance with the FCC 47 CFR 15.205(c)

PART 1 General (Cont)

SECTION 1.3 DECLARATION/DISCLAIMER

ITC Engineering Services, Inc. (ITC) reports apply only to the specific samples tested under stated test conditions. It is the manufacturer's responsibility to assure that additional production units of this model are manufactured with identical electrical and mechanical components. ITC Engineering Services, Inc. shall have no liability for any deductions, inferences or generalizations drawn by the client or others from ITC Engineering Services, Inc. issued reports.

This report is the confidential property of the client. As a mutual protection to our clients, the public and ourselves, extracts from the test report shall not be reproduced except in full with our written approval. The applicant/manufacturer shall not use this report to claim product endorsement by NVLAP or any US Government agency.

ITC Engineering Services, Inc. (ITC) is:
Accepted by the Federal Communications Commission (FCC) for FCC Methods, CISPR Methods and AUSTEL Technical Standards (Ref: NVLAP Lab Code 200172-0)

Approved by the Industry Canada for Telecom Testing

Certified by Rockford Engineering Services GmbH for EMC Testing according to the European EMC Directive 89/336/EEC per EN45001

Certified by Reg. TP for EMC Testing according to the European EMC Directive 89/336/EEC per EN45001 for RES GmbH (DAR-Registration number: TTI-P-G 159/98-00)

Certified by the Voluntary Control Council for Interference by Information Technology Equipment (VCCI) for EMC testing, in accordance with the Regulations for Voluntary Control Measures, Article 8, Registration Numbers - Site 1: C-1582 and R-1497.

PART 1 General (Cont)

SECTION 1.4 TEST METHODOLOGY

The electromagnetic interference and RF tests, which this report describes, were performed by an independent engineering consultancy firm, ITC Engineering Services, Inc., in accordance with the FCC test procedure ANSI C63.4-2003.

SECTION 1.5 TEST FACILITY

The open area test site, the conducted measurement facility, the semi anechoic chamber and the test equipment used to collect the emissions data is located in Sunol, California, and is fully described in a site attenuation report. The approved site attenuation description is on file at the Federal Communications Commission.

Table 1 Radio Device Measurement Information

Product Type **Models**	Battery Field Service Unit (BFSU) BFSU with external antenna BFSU with internal antenna	
Applicant / Manufacturer Address	Silver Spring Networks, Inc. 13000 West Silver Spring Drive Butler, WI 53007	
Contact	Mr Juan Luglio Tel: (262) 364-5317	juan.luglio@silverspringnetworks.com Fax: (262) 783-0205
Test Results	☒ **Complies**	☐ **Not Compliant**
Total Number of Pages including Appendices	47 Pages	
Test Report File No.	20050629-02-F15	

Table 2 Measurement Uncertainty

RF frequency	± 1 x 10^{-7} HP8565E
RF power, conducted	± 1.5 dB
Adjacent channel power	± 3 dB
Conducted emission of transmitter, valid up to 1 GHz	± 1.5 dB
Conducted emission of transmitter, valid up to 18 GHz	± 1.5 dB
Conducted emission of receivers	± 1.5 dB
Radiated emission of transmitter, valid up to 1 GHz	± 1.5 dB
Radiated emission of transmitter, valid up to 18 GHz	± 1.5 dB
Radiated emission of transmitter, valid up to 26 GHz	± 3 dB
Radiated emission of transmitter, valid up to 40 GHz	± 3 dB
Radiated emission of transmitter, valid up to 75 GHz	± 3 dB

SECTION 1.6 ACCURACY OF TEST DATA

The test results contained in this report accurately represent the emissions generated by the sample equipment under test. ITC Engineering Services, Inc. (ITC) as an independent testing laboratory declares that the equipment as tested complies with the requirements of:

1. FCC standard 47CFR15.247.

for Intentional Radiators Operation within the bands 902MHz to 928MHz

PART 2 RECEIVER MEASUREMENTS

OPEN FIELD RADIATED EMISSIONS

SECTION 2.1 EUT DESCRIPTION AND TEST SPECIFICATION: 47 CFR PART 15, SUB-PART B

Silver Spring's product Battery Field Service Unit (BFSU), models (BFSU with external antenna and BFSU with internal antenna) are devices designed to communicate with various Silver Spring equipped devices for installation, configuration and trouble shooting. The units are similar both in design and configuration; the only difference is the external and internal antennas. The BFSU (or the EUT) were set up at 3 or 10 meters in accordance with the suggested configuration given in FCC Measurement Procedure ANSI C63.4-2003. The measurement instrumentation used was a receiver with bandwidth parameters as stipulated in ANSI C63.4-2003. The EUT were set up on a wooden non-conductive tabletop, 80 cm above the ground reference plane, in an open field. The transmit function was de-activated for the tests. For measurements below 1GHz, EUT were set up at a 10 meters distance from the search antenna with the EUT running in a continuous mode. The EUT were rotated 360 degrees azimuth and the search antenna height varied 1 to 4m in order to maximize the emissions. Significant peaks from the EUT were then recorded to determine margin to the limits. For measurements above 1GHz, the EUT running in continuous mode were set up at a 3 meter distance from the search antenna and was rotated 360 degrees azimuth and also rotated in its x-y-z axis positions to determine the precise amplitude of the emissions. The EUT were tested at the low, mid and high frequencies and the worst case was observed at the mid frequency. The worst case result between the two units was recorded in this test report.

Table 3 Test Equipment Used– Radiated Emissions Tests

Equipment Description	Manufacturer	Model Name	Serial Number	Calibration Due
Spectrum Analyzer	Hewlett-Packard	8568B	2841A04315	11-29-05
Spectrum Analyzer Display	Hewlett-Packard	85662A	2848A17028	11-29-05
Quasi Peak Adapter	Hewlett-Packard	85650	2521A00871	11-29-05
Preselector	Hewlett-Packard	85685A	2620A00265	11-29-05
Spectrum Analyzer	Hewlett-Packard	8565E	2618A02909	03-29-06
Biconical Antenna	EMCO	3104	3667	02-03-06
L. P. Ant. (200-1000 MHz)	EMCO	3146	9510-4202	02-03-06
Horn Antenna (Below 18GHz)	EMCO	3115	8812-3050	12-19-05

Table 4 Software Used– Radiated Emissions Tests

Software Used	Manufacturer	Model Name	Version Number	Calibration/Validation Date
Test Software	ITC	1.04b1	Rev. 4	02-05-06
Antenna Software	ITC	L.P-V/H 10m	Rev. 4	02-05-06
Antenna Software	ITC	B-V/H 10m	Rev. 4	02-05-06
Cable Software	ITC	OATS 30MHz-1GHz	Rev. 4	02-01-06

Table 5 Support Equipment – Radiated Emissions Tests

No	Description	Manufacturer	Model Name	Serial Number
1	FSU	N/A	N/A	BF00000034
2	NOTEBOOK	SONY	PCG – 974L	283293303418746

Test Voltage: 3.6Vdc (battery)

OPEN FIELD RADIATED EMISSIONS (cont)

SECTION 2.2 TEST RANGE RADIATED EMISSIONS TESTS

The frequency search range investigated was from 30 MHz to 10 GHz.

SECTION 2.3 SPECTRUM ANALYZER CONFIGURATION (SWEPT FREQUENCY SCANS)-

IF Bandwidth.....120 kHz
Measurements below 1000 MHz (unless stated otherwise)
Analyzer Mode (for Peak Measurements) ..... Peak/Log
Resolution Bandwidth..... 100 kHz
Video Bandwidth..... 100 kHz
Analyzer Mode (for Quasi-Peak Measurements)
Ouasi-Peak/Linear Resolution Bandwidth..... 1000 kHz
Video Bandwidth..... 1000 kHz
Measurements above 1000 MHz (unless stated otherwise)
Quasi-Peak Adapter Mode ..... Disabled
Analyzer Mode (for Peak Measurements) ..... Peak
Resolution Bandwidth..... 1000 kHz
Video Bandwidth..... 1000 kHz
Analyzer Mode (for Average Measurements) ..... Video Filter
Resolution Bandwidth..... 1000 kHz
Video Bandwidth..... 10 Hz

Table 6 Data Table Legend and Field Strength Calculation – Radiated Emissions Tests

Detector mode: Peak (P) or Quasi-Peak (QP) or Average (A)

	Polarization	Antenna	Freq Range (MHz)
VB	Vertical	EMCO 3104/sn 3549 Biconical	30 – 200
HB	Horizontal	EMCO 3104/sn 3549 Biconical	30 – 200
VL	Vertical	EMCO 3146/sn. 2075 Log Periodic	200 – 1000
HL	Horizontal	EMCO 3146/sn. 2075 Log Periodic	200 – 1000
VH1	Vertical	EMC 3115/sn. 2362 Horn	Below 18000
HH1	Horizontal	EMC 3115/sn. 2362 Horn	Below 18000
VH2	Vertical	EMC 3116/sn. 2655 Horn	Below 26500
HH2	Horizontal	EMC 3116/sn. 2655 Horn	Below 26500
VH4	Vertical	S&D DBD-520 Horn	Below 75000
HH4	Horizontal	S&D DBD-520 Horn	Below 75000

The margin in the Table 6 is calculated as follows:
Margin = Corrected Amplitude – Limit, where Corrected Amplitude = Spectrum Analyzer Amplitude + Cable Loss + Antenna Factor – Pre-Amp Gain.

SECTION 2.4 OPEN FIELD RADIATED EMISSIONS RESULTS

- ☐ Test Site 1 - Shielded Room: 16' x 12' x 9'
- ☒ Test Site 1 - 3m Open Field Radiated Site
- ☒ Test Site 1 - 10m Open Field Radiated Site
- ☐ Test Site 2 - Environmental Lab
- ☐ EMC Lab 1 - Test Laboratory
- ☐ Semi-Anechoic Absorber Lined Shielded Room
- ☐ Other: _____

SECTION 2.5 ADMINISTRATIVE AND ENVIRONMENTAL CONDITIONS DETAILS – RADIATED EMISSIONS

Test Date:	July 12 , 2005
Test Engineer:	Bob Kershaw and Femi Ojo
Temperature	79.4°F
Humidity	32%

SECTION 2.6 OPEN FIELD RADIATED EMISSIONS TEST RESULTS

Table 7 Test Data for Radiated Emissions Measurement Below 1 GHz

The table below shows a summary of the highest amplitudes of the radiated emissions from the equipment under test at various antenna heights, antenna polarization, and EUT orientations. The EUT was tested for radiated emissions at the low,mid and high frequency and the worst case was recorded at low frequency(905.0MHz).

INDICATED		CORRECTION		CORR	TURNTABLE	ANT		CLASS A		CLASS B			
FREQ	AMPL	ANT	CAB	AMPL	ANG	HT	POL	AMPL	MARG	AMPL	MARG	FILTER	
MHz	dBuV/m	dB	dB	dBuV/m	DEG	m	-	dBuV/m	dB	dBuV/m	db	MODE	NOTES
36.76	4.1	12.1	1.9	18.1	0	1.0	VL	-	-	30.0	-11.9	QP	
37.23	5.4	11.4	1.9	18.7	90	1.0	VB	-	-	30.0	-11.3	QP	
58.90	5.2	12.1	2.6	19.9	0	1.0	VL	-	-	30.0	-10.1	QP	
65.90	9.2	8.9	2.6	20.7	0	1.0	VB	-	-	30.0	-9.3	QP	
73.86	10.4	12.1	2.7	25.2	0	1.0	VL	-	-	30.0	-4.8	QP	
80.22	5.9	6.4	2.9	15.2	0	1.0	VB	-	-	30.0	-14.8	QP	
115.86	6.7	12.1	3.2	22.0	90	1.0	VL	-	-	33.0	-11.0	QP	
130.38	7.8	12.1	3.3	23.2	90	1.0	VL	-	-	33.0	-9.8	QP	
151.61	10.2	12.1	3.8	26.1	90	1.0	VL	-	-	33.0	-6.9	QP	
184.33	5.8	12.1	3.7	21.6	0	1.0	VL	-	-	33.0	-11.4	QP	
184.38	7.8	16.7	3.7	28.3	90	4.0	VB	-	-	33.0	-4.7	QP	
237.12	5.3	11.0	4.4	20.7	0	1.0	VL	-	-	36.0	-15.3	QP	
257.82	4.9	11.9	5.5	22.3	0	1.0	VL	-	-	36.0	-13.7	QP	
288.11	6.2	13.3	6.5	26.0	90	1.0	VL	-	-	36.0	-10.0	QP	
325.78	11.1	14.0	6.3	31.4	90	1.0	VL	-	-	36.0	-4.6	QP	
373.44	7.1	14.4	6.5	28.0	0	3.0	VL	-	-	36.0	-8.0	QP	
390.90	7.2	14.8	6.4	28.3	0	1.0	VL	-	-	36.0	-7.7	QP	
502.90	8.3	17.4	8.2	33.9	0	1.0	VL	-	-	36.0	-2.1	QP	
633.08	6.0	19.0	8.7	33.7	0	1.0	VL	-	-	36.0	-2.3	QP	
799.81	3.5	20.0	10.5	34.0	90	1.0	VL	-	-	36.0	-2.0	QP	2

No emissions of significant level were observed between 30MHz – 36.76MHz and 799.81MHz -1GHz.

Table 8 Test Data for Radiated Emissions Measurement (Above 1 GHz)

The table below shows a summary of the highest amplitudes of the radiated emissions from the equipment under test at various antenna heights, antenna polarization, and EUT orientations. The EUT was tested for radiated emissions at the low,mid and high frequency and the worst case was recorded at low frequency(905.0MHz).

INDICATED		CORRECTION		CORR	TURNTABLE	ANT		CLASS A		CLASS B			
FREQ	AMPL	ANT	CAB	AMPL	ANG	HT	POL	AMPL	MARG	AMPL	MARG	FILTER	
MHz	dBuV/m	dB	dB	dBuV/m	DEG	m	-	dBuV/m	dB	dBuV/m	db	MODE	NOTES
905.00	33.8	22.4	4.3	60.5	0	1.0	VL	-	-	141.0	-80.5	P	Fund.
905.00	60.2	23.1	4.3	87.6	0	1.0	HL	-	-	141.0	-53.4	P	Fund.
912.00	7.5	22.4	4.1	34.0	0	1.0	VL	-	-	46.0	-12.0	P	
932.00	3.6	22.7	4.4	30.7	0	1.0	VL	-	-	46.0	-15.3	P	
932.00	7.0	23.3	4.4	34.7	0	1.0	HL	-	-	46.0	-11.3	P	
1001.0	31.5	24.2	-34.7	21.0	0	1.0	VH	-	-	54.0	-33.0	P	
1001.0	31.7	24.2	-34.7	21.2	0	1.0	HH	-	-	54.0	-32.8	P	
1288.0	32.3	24.7	-34.3	22.8	0	1.0	HH	-	-	54.0	-31.2	P	
1288.0	31.8	24.7	-34.3	22.3	0	1.0	VH	-	-	54.0	-31.7	P	
1609.0	31.3	25.7	-33.7	23.3	0	1.0	VH	-	-	54.0	-30.7	P	
1609.0	32.3	25.7	-33.7	24.4	0	1.0	HH	-	-	54.0	-29.6	P	
1807.0	43.7	26.7	-33.4	37.0	0	1.0	VH	-	-	54.0	-17.0	P	
1807.0	54.3	26.8	-33.4	47.8	90	1.0	HH	-	-	54.0	-6.2	P	
1999.0	31.5	27.7	-33.0	26.2	0	1.0	VH	-	-	54.0	-27.8	P	
1999.0	32.7	27.9	-33.0	27.6	0	1.0	HH	-	-	54.0	-26.4	P	
2607.0	33.7	28.9	-32.1	30.5	0	1.0	HH	-	-	54.0	-23.5	P	
2607.0	31.8	28.9	-32.1	28.7	0	1.0	VH	-	-	54.0	-25.3	P	
2703.0	46.2	29.2	-32.0	43.4	0	1.0	VH	-	-	54.0	-10.6	P	
2703.0	51.5	29.2	-32.0	48.7	0	1.0	HH	-	-	54.0	-5.3	P	
3147.0	34.5	30.4	-31.7	33.2	0	1.0	VH	-	-	54.0	-20.8	P	
3147.0	35.3	30.5	-31.7	34.0	0	1.0	HH	-	-	54.0	-20.0	P	
3441.0	35.5	31.2	-31.3	35.4	0	1.0	HH	-	-	54.0	-18.6	P	
3441.0	34.1	31.1	-31.3	33.9	0	1.0	VH	-	-	54.0	-20.1	P	
3571.0	33.2	31.4	-31.2	33.4	0	1.0	VH	-	-	54.0	-20.6	P	
3571.0	34.8	31.5	-31.2	35.2	0	1.0	HH	-	-	54.0	-18.8	P	
3634.0	35.0	31.7	-31.2	35.5	0	1.0	HH	-	-	54.0	-18.5	P	
3634.0	33.2	31.6	-31.2	33.6	0	1.0	VH	-	-	54.0	-20.4	P	
4508.0	33.5	32.4	-30.5	35.4	0	1.0	VH	-	-	54.0	-18.6	P	
4508.0	34.6	32.4	-30.5	36.5	90	1.0	HH	-	-	54.0	-17.5	P	
5420.0	32.8	34.1	-29.4	37.5	0	1.0	VH	-	-	54.0	-16.5	P	
5420.0	37.5	34.1	-29.4	42.1	90	1.0	HH	-	-	54.0	-11.9	P	
6324.0	33.5	34.4	-28.9	39.0	0	1.0	HH	-	-	54.0	-15.0	P	
6324.0	31.7	34.5	-28.9	37.2	0	1.0	VH	-	-	54.0	-16.8	P	
7200.0	36.0	35.8	-29.0	42.8	0	1.0	HH	-	-	54.0	-11.2	P	
7200.0	35.8	35.8	-29.0	42.7	0	1.0	VH	-	-	54.0	-11.3	P	
7228.0	35.0	35.9	-28.9	42.0	0	1.0	VH	-	-	54.0	-12.0	P	
7228.0	36.0	35.8	-28.9	42.9	0	1.0	HH	-	-	54.0	-11.1	P	
8120.0	36.7	36.9	-29.0	44.5	0	1.0	HH	-	-	54.0	-9.5	P	
8120.0	34.0	36.9	-29.0	41.9	0	1.0	VH	-	-	54.0	-12.1	P	
8600.0	36.0	37.2	-29.0	44.2	0	1.0	VH	-	-	54.0	-9.8	P	
8600.0	38.0	37.2	-29.0	46.2	0	1.0	HH	-	-	54.0	-7.8	P	
9035.0	33.8	37.4	-28.9	42.3	0	1.0	HH	-	-	54.0	-11.7	P	
9035.0	33.0	37.4	-28.9	41.5	0	1.0	VH	-	-	54.0	-12.5	P	
9410.0	35.3	37.5	-28.2	44.6	0	1.0	VH	-	-	54.0	-9.4	P	
9410.0	36.0	37.5	-28.2	45.3	0	1.0	HH	-	-	54.0	-8.7	P	
9550.0	37.2	37.5	-28.1	46.7	0	1.0	HH	-	-	54.0	-7.3	P	
9550.0	35.2	37.5	-28.1	44.7	0	1.0	VH	-	-	54.0	-9.3	P	

No emission of significant level was observed between 9.55 GHz -10 GHz

SECTION 2.7 TEST DATA SUMMARY

The margin is calculated as follows:
Margin = Corrected Amplitude - Limit; where Corrected Amplitude = Amplitude + Cable Loss + Antenna Factor.

SECTION 2.8 CONCLUSION

The BFSU meets the requirements of FCC Part 15, Class B for Open Field Radiated Emissions.

OPEN FIELD RADIATED EMISSIONS Results (cont)

SECTION 2.9 RADIATED EMISSIONS TEST SETUP PHOTOGRAPHS

Figure 1: Radiated Emissions Test Setup (Below 1 GHz) Front View

Figure 2 Radiated Emissions Test Setup (Below 1 GHz) Rear View

OPEN FIELD RADIATED EMISSIONS Results (cont)

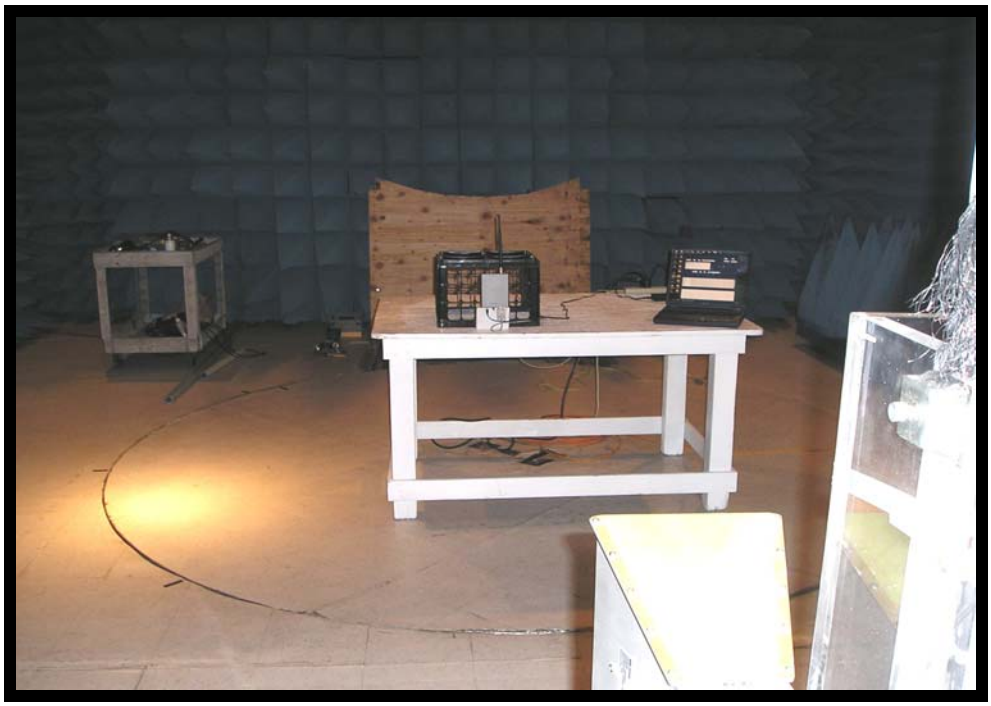

Figure 3: Radiated Emissions Test Setup (Above 1 GHz) Front View

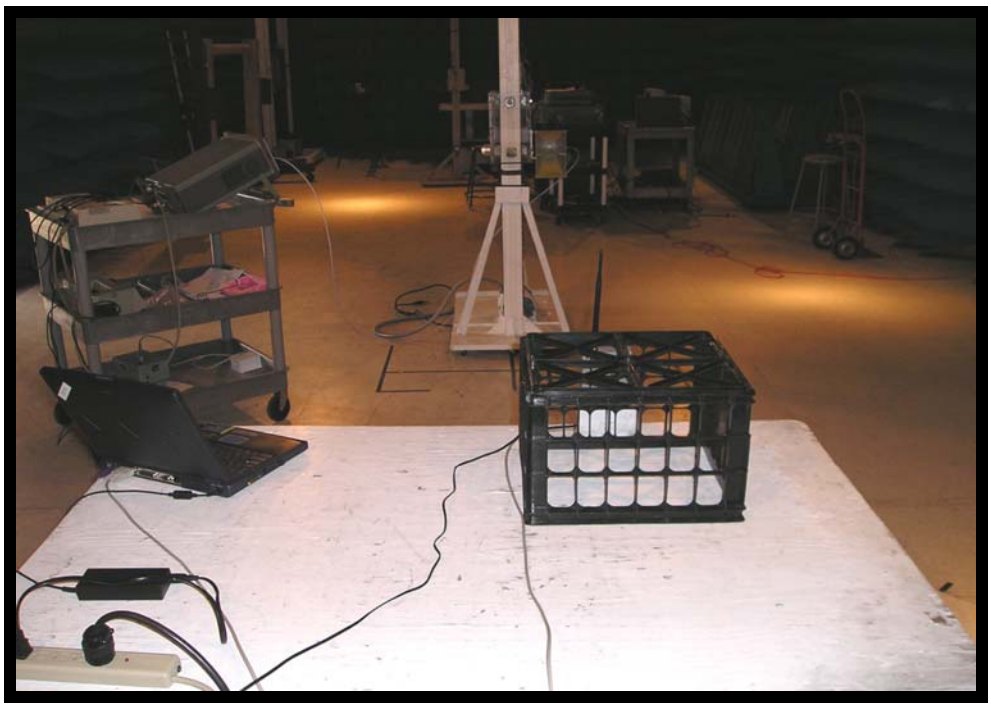

Figure 4: Radiated Emissions Test Setup (Above 1 GHz) Rear View

PART 3 RF MEASUREMENTS

SECTION 3.1 LIST OF EQUIPMENT USED DURING RF TESTS

Table 9: Support Equipment – RF Measurements

No	Description	Manufacturer	Model Name	Serial Number
1	FSU	N/A	N/A	BF00000034
2	PLOTTER	HEWLETT PACKARD	7440A	N/A
3	NOTEBOOK	SONY	PCG – 974L	283293303418746

Table 10: Test Equipment – RF Measurements

Equipment Description	Manufacturer	Model Name	Serial Number	Calibration Due
Spectrum Analyzer	Hewlett-Packard	8568B	2841A04315	11-29-05
Spectrum Analyzer Display	Hewlett-Packard	85662A	2848A17028	11-29-05
Quasi Peak Adapter	Hewlett-Packard	85650	2521A00871	11-29-05
Preselector	Hewlett-Packard	85685A	2620A00265	11-29-05
Spectrum Analyzer	Hewlett-Packard	8565E	2618A02909	03-29-06
Biconical Antenna	EMCO	3104	3667	02-03-06
L. P. Ant. (200-1000 MHz)	EMCO	3146	9510-4202	02-03-06
Horn Antenna (Below 18GHz)	EMCO	3115	8812-3050	12-19-05

Software Used	Manufacturer	Model Name	Version Number	Calibration/Validation Date
Test Software	ITC	1.04b1	Rev. 4	02-05-06
Antenna Software	ITC	L.P-V/H 10m	Rev. 4	02-05-06
Antenna Software	ITC	B-V/H 10m	Rev. 4	02-05-06
Cable Software	ITC	OATS 30MHz-1GHz	Rev. 4	02-01-06

Table 11: Data Table Legend and Field Strength Calculation

Detector mode: Peak (P) or Quasi-Peak (QP) or Average (A)

	Polarization	Antenna	Freq Range (MHz)
VB	Vertical	EMCO 3104/sn 3549 Biconical	30 – 200
HB	Horizontal	EMCO 3104/sn 3549 Biconical	30 – 200
VL	Vertical	EMCO 3146/sn. 2075 Log Periodic	200 – 1000
HL	Horizontal	EMCO 3146/sn. 2075 Log Periodic	200 – 1000
VH1	Vertical	EMC 3115/sn. 2362 Horn	Below 18000
HH1	Horizontal	EMC 3115/sn. 2362 Horn	Below 18000
VH2	Vertical	EMC 3116/sn. 2655 Horn	Below 26500
HH2	Horizontal	EMC 3116/sn. 2655 Horn	Below 26500
VH4	Vertical	S&D DBD-520 Horn	Below 75000
HH4	Horizontal	S&D DBD-520 Horn	Below 75000

RF Conducted Measurements

SECTION 3.2 SETUP PHOTOGRAPHS

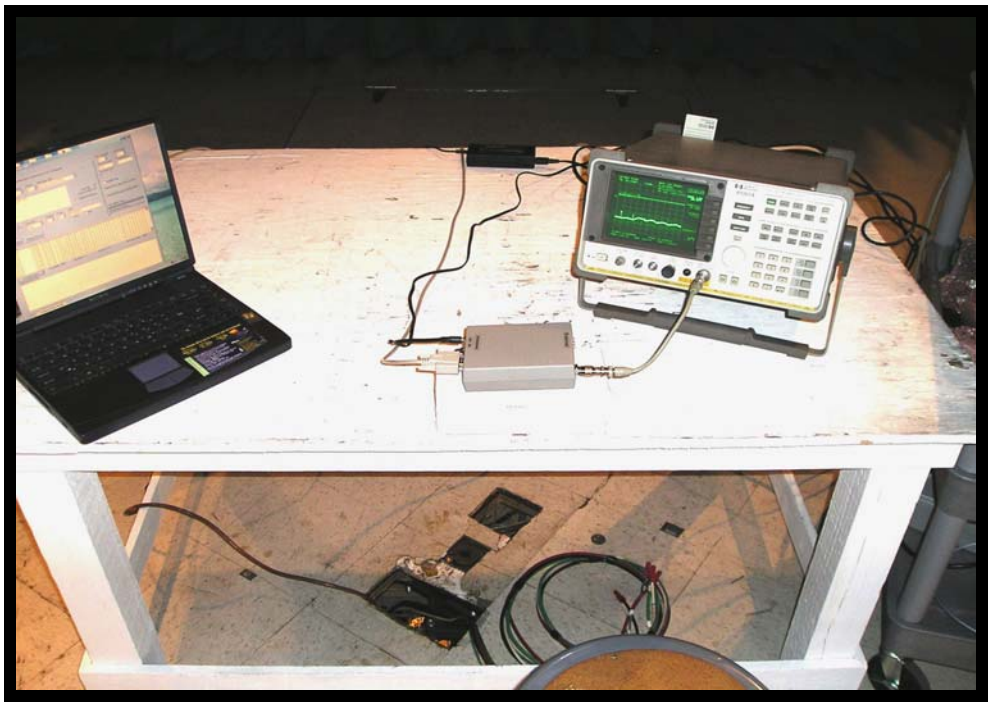

Figure 5 Test Set Up Photos – (Front View)

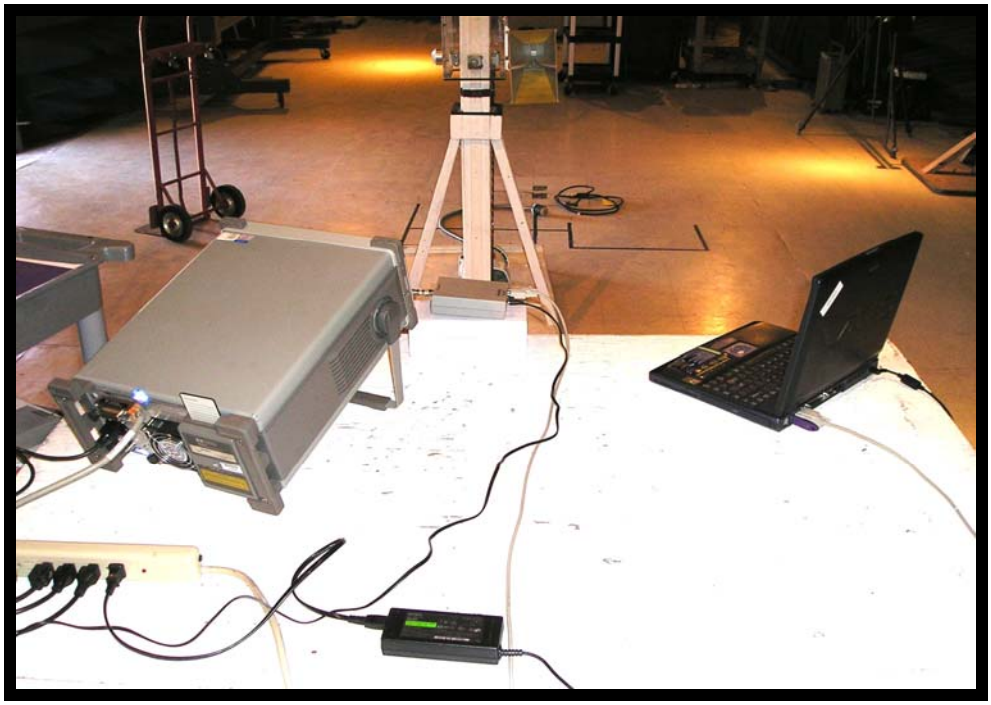

Figure 6 Test Set Up Photos (Rear View)

PART 4 MAXIMUM IN-BAND PEAK / NUMBER OF CHANNELS

SECTION 4.1 MAXIMUM PEAK MEASUREMENT

The EUT was set up on a wooden non-conductive tabletop, attached at the antenna connector to the measuring device. The measurement instrumentation used was a receiver with bandwidth parameters as stipulated in ANSI C63.4-2003. The EUT was configured to run in continuous mode during the tests. The measurement data below represents the maximum worst-case result from the measurement performed in accordance to the requirements of this section.

SECTION 4.2 SITE USED – MAXIMUM IN-BAND PEAK MEASUREMENT

☐ Test Site 1 - 10m Open Field Radiated Site
☐ Test Site 2 - Environmental Lab
☐ EMC Lab 1 - Test Laboratory
☒ Semi-Anechoic Absorber Lined Shielded Room

SECTION 4.3 ADMINISTRATIVE AND ENVIRONMENTAL DETAILS –MAXIMUM IN-BAND PEAK DATA

Test Date(s):	July 08, 2005
Test Engineer(s):	Bob Kershaw and Femi Ojo
Temperature	74.8°F
Humidity	34.4%

SECTION 4.4 TEST DATA – MAXIMUM IN-BAND PEAK MEASUREMENT

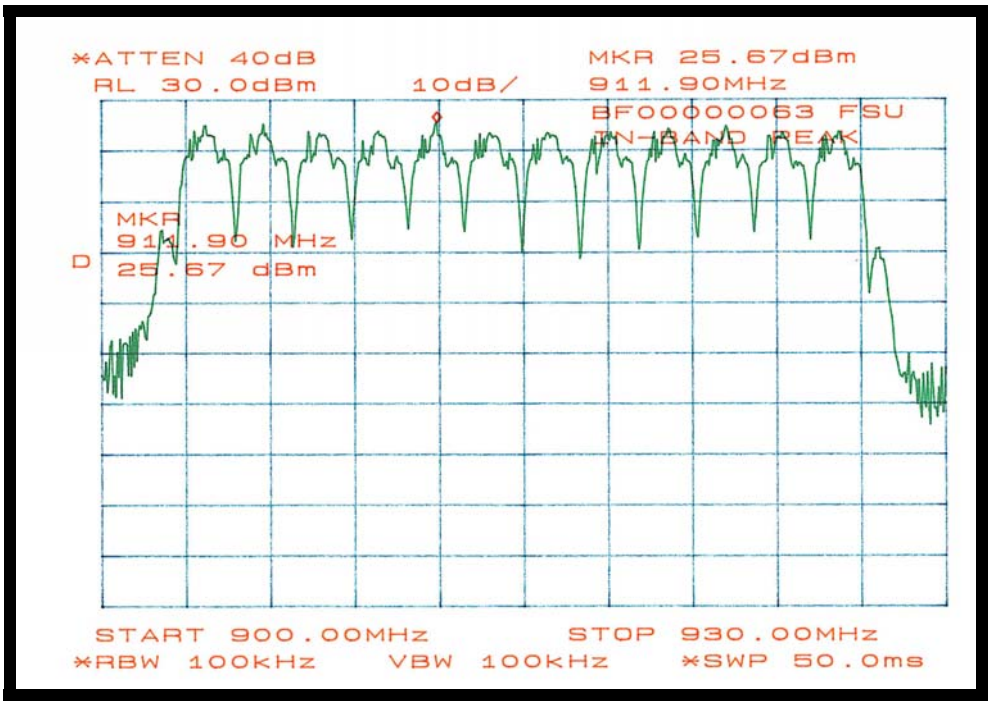

Figure 7: Plot of In-Band Peak Measurement

Test-Data Summary – Peak Measurement:

Peak Frequency = 911.90MHz
Peak Level: = 25.67dBm
Number of Channels = 11

PART 5 CHANNEL SEPARATION MEASUREMENT

SECTION 5.1 CHANNEL SEPARATION MEASUREMENT

The EUT was set up on a wooden non-conductive tabletop, attached at the antenna connector to the measuring device. The measurement instrumentation used was a receiver with bandwidth parameters as stipulated in ANSI C63.4-2003. The EUT was configured to run in continuous mode during the tests. The measurement data below represents the maximum worst-case result from the measurement performed in accordance to the requirements of this section.

SECTION 5.2 SITE USED – CHANNEL SEPARATION MEASUREMENT

☐ Test Site 1 - Shielded Room: 16' x 12' x 9'
☐ Test Site 1 - 3m Open Field Radiated Site
☐ Test Site 1 - 10m Open Field Radiated Site
☐ Test Site 2 - Environmental Lab
☐ EMC Lab 1 - Test Laboratory
☒ Semi-Anechoic Absorber Lined Shielded Room

SECTION 5.3 ADMINISTRATIVE AND ENVIRONMENTAL DETAILS – CHANNEL SEPARATION MEASUREMENT

Test Date(s):	July 08, 2005
Test Engineer(s):	Femi Ojo and Bob Kershaw
Temperature	74.8°F
Humidity	34.4%

SECTION 5.4 TEST DATA – CHANNEL SEPARATION MEASUREMENT

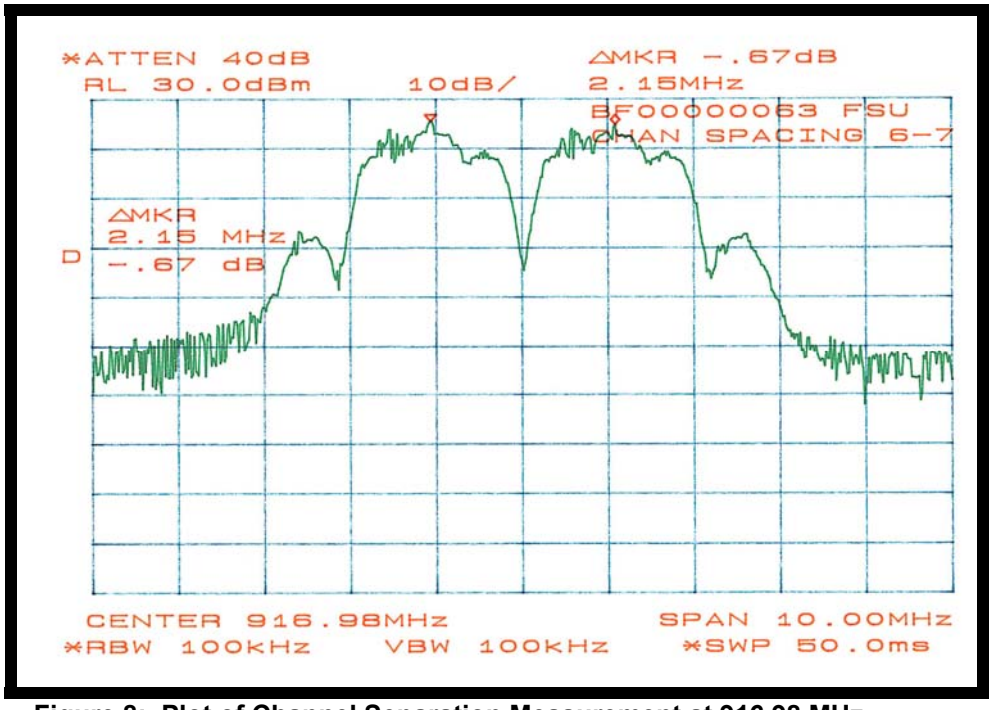

Figure 8: Plot of Channel Separation Measurement at 916.98 MHz

Test-Data Summary – Channel Separation Measurement:

Peak Frequencies = 915.968 MHz (CH 6) & 918.016MHz (CH 7)
Channel Separation (measured) = 2.15MHz.

PART 6 MAXIMUM POWER OUTPUT PER 47 CFR 15.247(B) (1)

SECTION 6.1 MAXIMUM POWER MEASUREMENT

The EUT was set up on a wooden non-conductive tabletop, attached at the antenna connector to the measuring device. The measurement instrumentation used was a receiver with bandwidth parameters as stipulated in ANSI C63.4-2003. The EUT was configured to run in continuous mode during the tests. The measurement data below represents the maximum worst-case result from the measurement performed in accordance to the requirements of this section.

SECTION 6.2 SITE USED – MAXIMUM POWER MEASUREMENT

☐ Test Site 1 - Shielded Room: 16' x 12' x 9'
☐ Test Site 1 - 3m Open Field Radiated Site
☐ Test Site 1 - 10m Open Field Radiated Site
☐ Test Site 2 - Environmental Lab
☐ EMC Lab 1 - Test Laboratory
☒ Semi-Anechoic Absorber Lined Shielded Room

SECTION 6.3 ADMINISTRATIVE DETAILS – MAXIMUM POWER MEASUREMENT

Test Date(s):	July 08, 2005
Test Engineer(s):	Bob Kershaw and Femi Ojo
Temperature	74.8°F
Humidity	34.4%

SECTION 6.4 TEST DATA – MAXIMUM POWER MEASUREMENT (CH 0 -903.68MHZ)

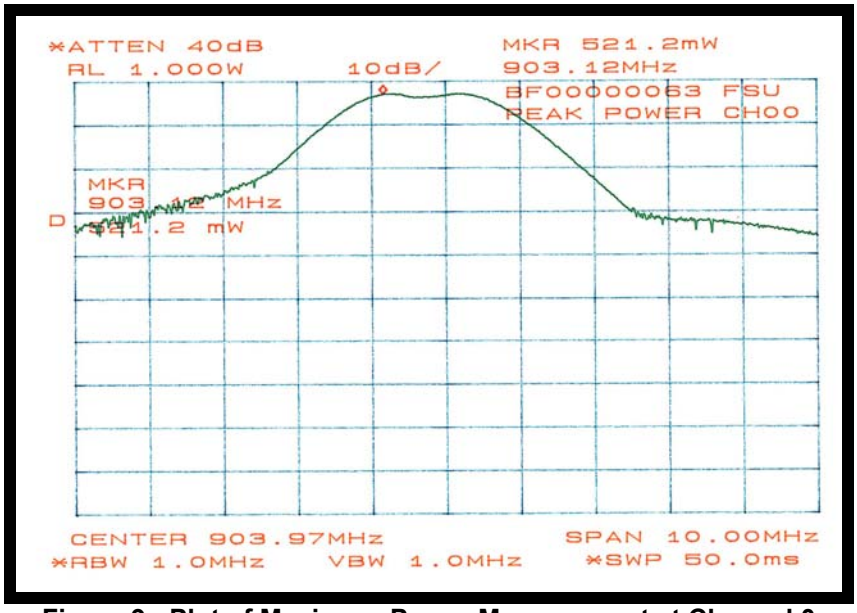

Figure 9: Plot of Maximum Power Measurement at Channel 0

Test-Data Summary – Peak Measurement (CH 0– 903.68MHz)

Center Frequency = 903.97MHz
Peak Level: = 521.2mW
Limit per 15.247(b)(1) = 1 W

SECTION 6.5 TEST DATA – MAXIMUM POWER MEASUREMENT (CH 6 – 915.968MHZ)

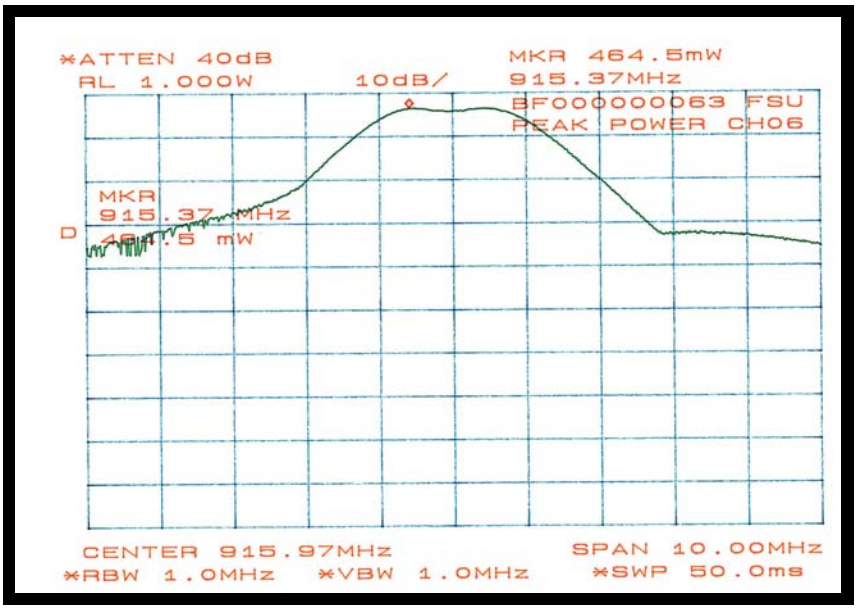

Figure 10: Plot of Maximum Power Measurement at Channel 6

Test-Data Summary – Maximum Power Measurement (CH 6 – 915.968MHz)

Center Frequency	=	915.97MHz
Peak Level:	=	464.5 mW
Limit per 15.247(b)(1)	=	1 W

SECTION 6.6 TEST DATA – MAXIMUM POWER MEASUREMENT (CH 11 – 926.208MHZ)

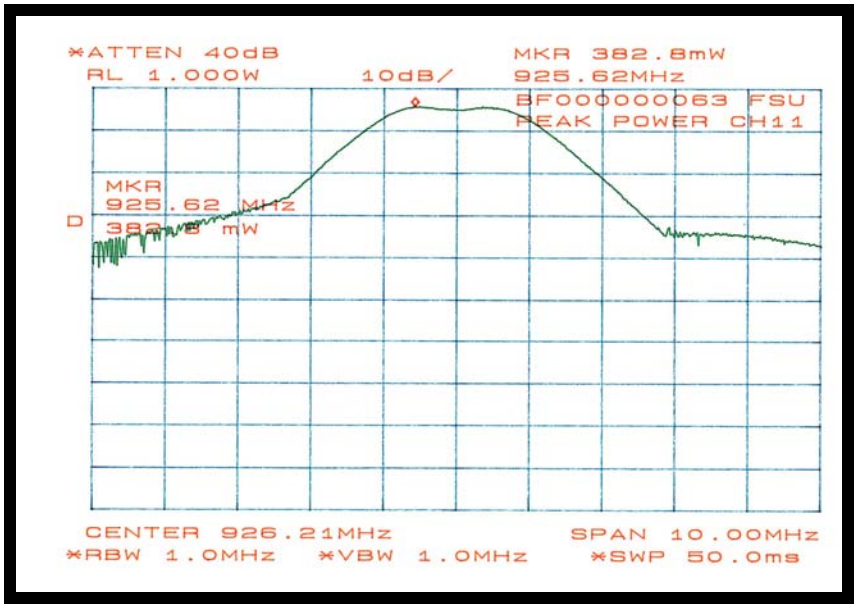

Figure 11: Plot of Maximum Power Measurement at Channel 11

Test-Data Summary – Maximum Power Measurement (CH 11 – 926.208MHz)

Center Frequency	=	926.21MHz
Peak Level:	=	382.8mW
Limit per 15.247(b)(1)	=	1 W

PART 7 SPECTRAL DENSITY per 47 CFR 15.247(c)

SECTION 7.1 SPECTRAL DENSITY MEASUREMENT

The EUT was set up on a wooden non-conductive tabletop, attached at the antenna connector to the measuring device. The measurement instrumentation used was a receiver with bandwidth parameters as stipulated in ANSI C63.4-2003. The EUT was configured to run in continuous mode during the tests. The measurement data below represents the maximum worst-case result from the measurement performed in accordance to the requirements of this section.

SECTION 7.2 SITE USED – SPECTRAL DENSITY MEASUREMENT

☐ Test Site 1 - Shielded Room: 16' x 12' x 9'
☐ Test Site 1 - 3m Open Field Radiated Site
☐ Test Site 1 - 10m Open Field Radiated Site
☐ Test Site 2 - Environmental Lab
☐ EMC Lab 1 - Test Laboratory
☒ Semi-Anechoic Absorber Lined Shielded Room

SECTION 7.3 ADMINISTRATIVE AND ENVIRONMENTAL DETAILS-

Test Date(s):	July 11, 2005
Test Engineer(s):	Bob Kershaw and Femi Ojo
Temperature	74.7°F
Humidity	35%

SECTION 7.4 TEST DATA – SPECTRAL DENSITY MEASUREMENT (CHANNEL 0 -903.680MHZ)

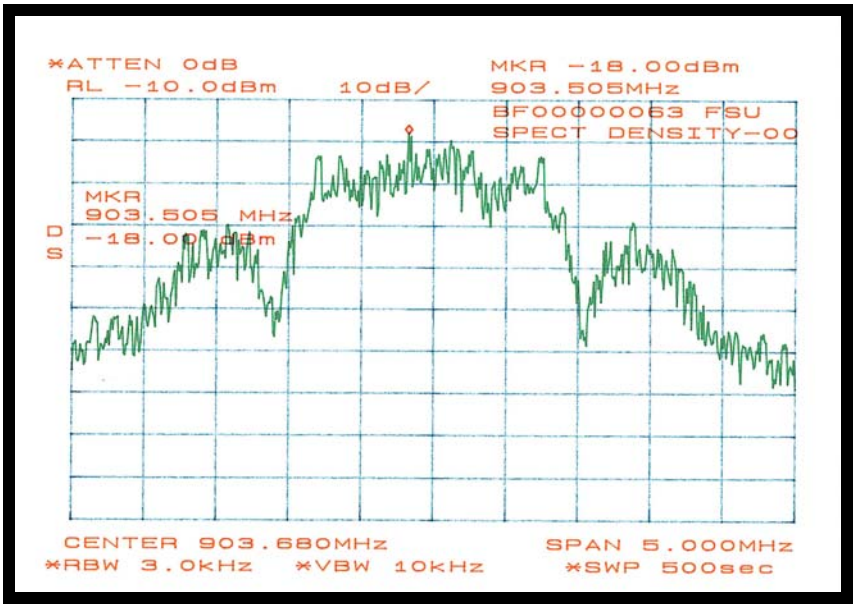

Figure 12: Plot of Spectral Density Measurement at Channel 0

Test-Data Summary – Spectral Density Measurement (903.505MHz):

Center Frequency = 903.680 MHz
Peak Level: = -18.00dBm = 89.0dBµV
Field Strength: = 89.0+22.4+1.0=112.40dBµV
112.40dBµV = 5.4dBm.

Power Spectral Density (alternate method) per FCC Appendix C

$P=(Ed)^2/(30G)$

$P = (5.4 \times 3)^2/(30 \times 5.0) = 1.75$dBm

P = Power Spectral Density
E = Field strength = 5.4dBm.
d = Distance (m) = 3m
G = Gain of the antenna = 5.0
Limit per 15.247(c) =8dBm

SECTION 7.5 TEST DATA – SPECTRAL DENSITY MEASUREMENT (CHANNEL 6 – 915.968MHZ)

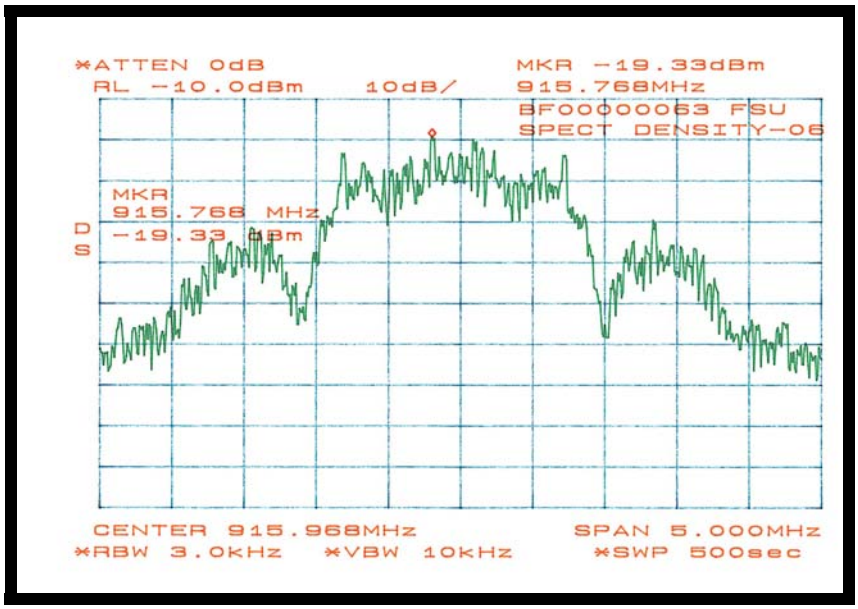

Figure 13: Plot of Spectral Density Measurement at Channel 6

Test-Data Summary – Spectral Density Measurement (915.768 MHz)

Center Frequency = 915.968 MHz
Peak Level: = -19.33dBm = 87.67dBµV
Field Strength: = 87.67+22.5+1.0=111.17dBµV
111.17dBµV = 4.17dBm.

Power Spectral Density (alternate method) per FCC Appendix C

$P=(Ed)^2/(30G)$

$P = (4.17 \times 3)^2 / (30 \times 5.0) = 1.04$dBm

P = Power Spectral Density
E = Field strength = 4.17dBm.
d = Distance (m) = 3m
G = Gain of the antenna = 5.0
Limit per 15.247(c) =8dBm

SECTION 7.6 TEST DATA – SPECTRAL DENSITY MEASUREMENT (CHANNEL 11 – 926.208MHZ)

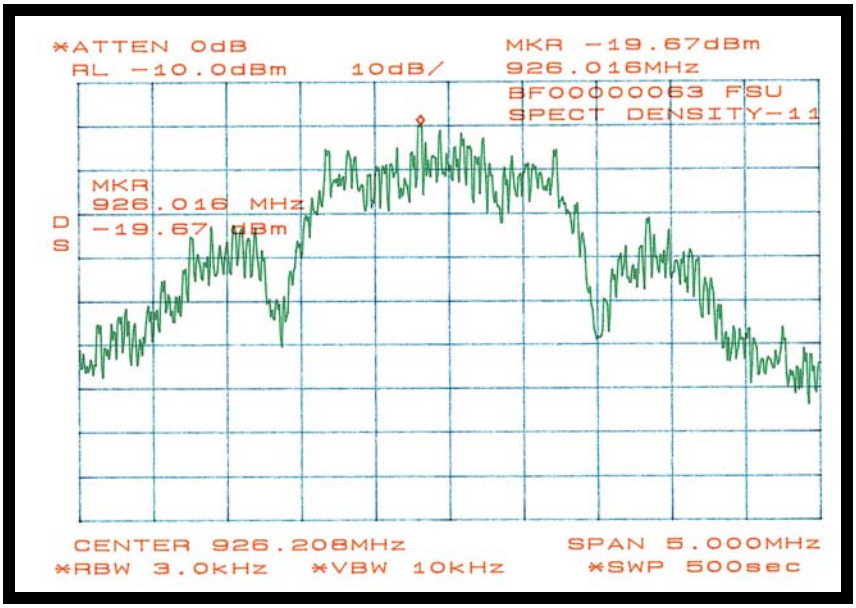

Figure 14: Plot of Spectral Density Measurement at Channel 11

Test-Data Summary – Spectral Density Measurement (926.016 MHz)

Center Frequency = 926.208 MHz
Peak Level: = -19.67dBm = 87.33dBµV
Field Strength: = 87.33+22.6+1.0=110.93dBµV
110.93dBµV = 3.93dBm.

Power Spectral Density (alternate method) per FCC Appendix C

$P=(Ed)^2/(30G)$

$P = (3.93 \times 3)^2/(30 \times 5.0) = 0.93$dBm

P = Power Spectral Density
E = Field strength = 3.93dBm.
d = Distance (m) = 3m
G = Gain of the antenna = 5.0
Limit per 15.247(c) =8dBm

SECTION 7.7 TEST SETUP PHOOTOGRAPH

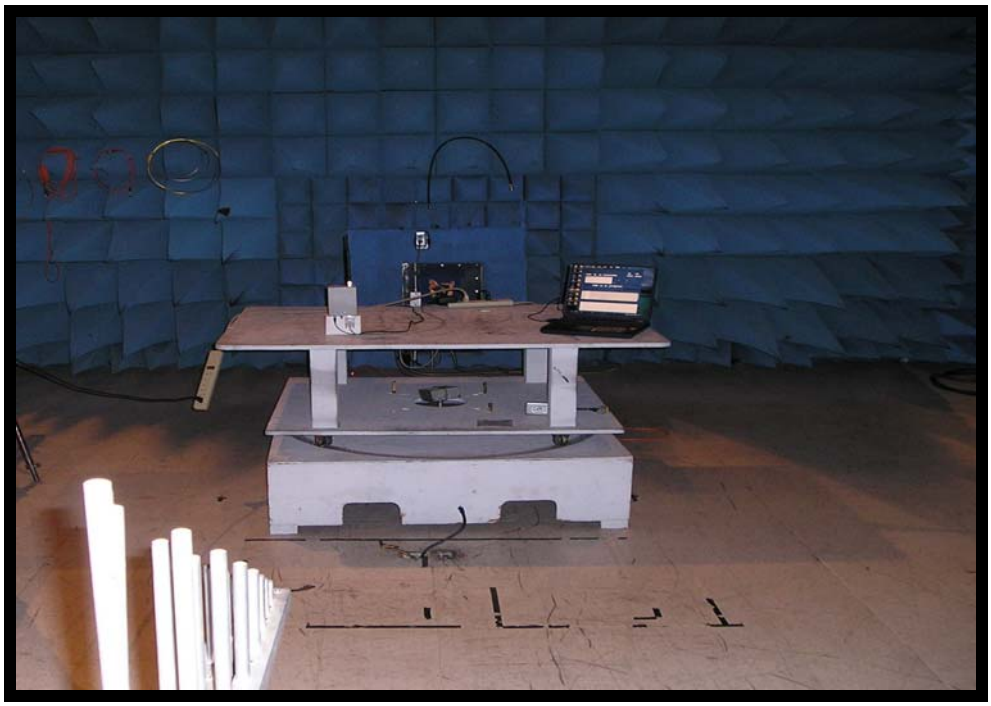

Figure 15: Power Spectral Density Test Setup

PART 8 6dB BANDWIDTH per 47 CFR 15.247(a) (2)

SECTION 8.1 6DB BANDWIDTH MEASUREMENT

The EUT was set up on a wooden non-conductive tabletop, attached at the antenna connector to the measuring device. The measurement instrumentation used was a receiver with bandwidth parameters as stipulated in ANSI C63.4-2003. The EUT was configured to run in continuous mode during the tests. The measurement data below represents the maximum worst-case result from the measurement performed in accordance to the requirements of this section.

SECTION 8.2 SITE USED – 6DB BANDWIDTH MEASUREMENT

☐ Test Site 1 - Shielded Room: 16' x 12' x 9'
☐ Test Site 1 - 3m Open Field Radiated Site
☐ Test Site 1 - 10m Open Field Radiated Site
☐ Test Site 2 - Environmental Lab
☐ EMC Lab 1 - Test Laboratory
☒ Semi-Anechoic Absorber Lined Shielded Room

SECTION 8.3 ADMINISTRATIVE & ENVIRONMENTAL - 6DB BANDWIDTH DETAILS

Test Date(s):	July 08, 2005
Test Engineer(s):	Bob Kershaw and Femi Ojo
Temperature	74.8°F
Humidity	34.4%

SECTION 8.4 TEST DATA – 6DB BANDWIDTH MEASUREMENT (CH 0– 903.680MHZ)

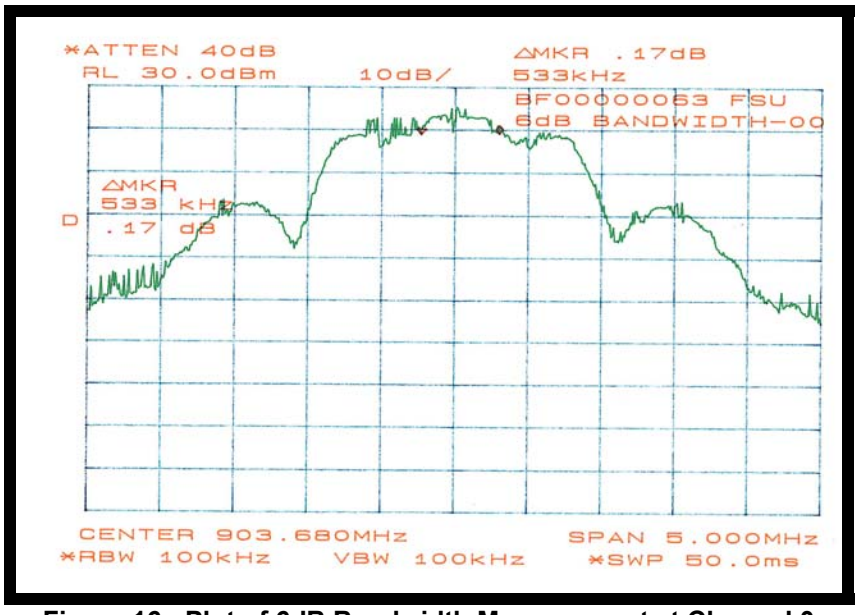

Figure 16: Plot of 6dB Bandwidth Measurement at Channel 0

Test-Data Summary – 6dB Bandwidth Measurement (Channel 0 – 903.680MHz)

Center Frequency = 903.680MHz
6dB Bandwidth = 533kHz
Limit per 15.247(a)(2) = 500kHz minimum

SECTION 8.5 TEST DATA – 6DB BANDWIDTH MEASUREMENT (CH 6 – 915.680MHZ)

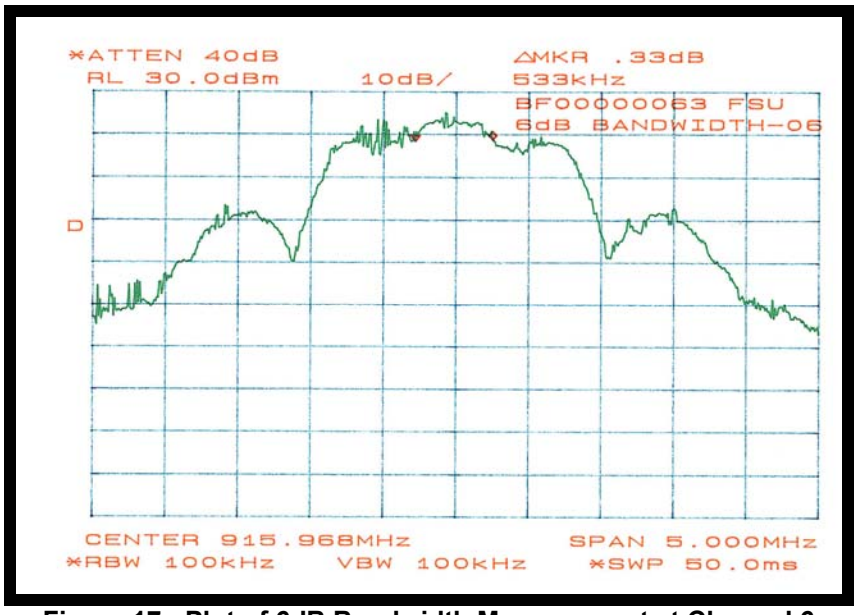

Figure 17: Plot of 6dB Bandwidth Measurement at Channel 6

Test-Data Summary – 6dB Bandwidth Measurement (Channel 6 – 915.680MHz)

Center Frequency	=	915.680MHz
6dB Bandwidth	=	533 kHz
Limit per 15.247(a)(2)	=	500kHz minimum

SECTION 8.6 TEST DATA – 6DB BANDWIDTH MEASUREMENT (CH 11 – 926.208MHZ)

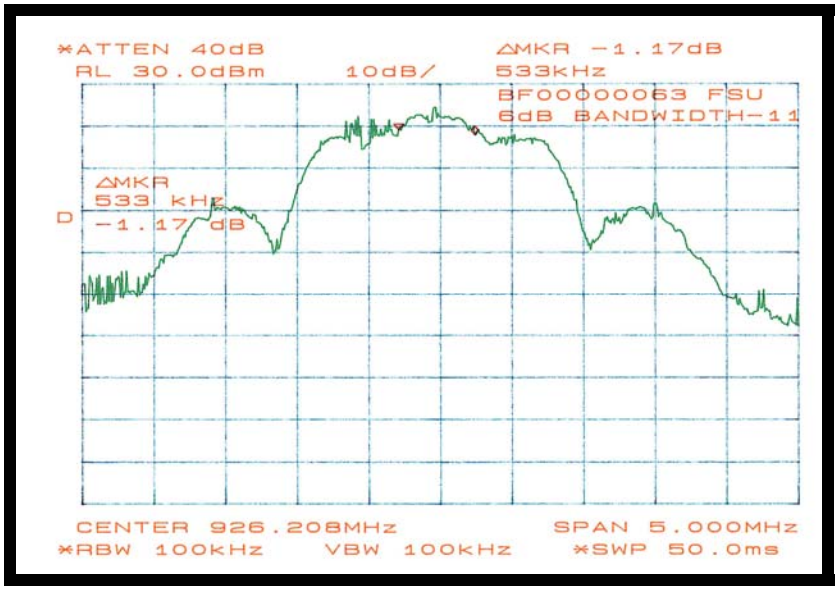

Figure 18: Plot of 6dB Bandwidth Measurement at Channel 11

Test-Data Summary – 6dB Bandwidth Measurement (Channel 11 – 926.208MHz)

Center Frequency	=	926.208MHz
6dB Bandwidth	=	533 kHz
Limit per 15.247(a)(2)	=	500kHz minimum

PART 9 6DB BANDEDGE MEASUREMENT per 47 CFR 15.247(c)

SECTION 9.1 6DB BAND-EDGE MEASUREMENT

The EUT was set up on a wooden non-conductive tabletop, attached at the antenna connector to the measuring device. The measurement instrumentation used was a receiver with bandwidth parameters as stipulated in ANSI C63.4-2003. The EUT was configured to run in continuous mode during the tests. The measurement data below represents the maximum worst-case result from the measurement performed in accordance to the requirements of this section.

SECTION 9.2 SITE USED –BAND-EDGE MEASUREMENT

☐ Test Site 1 - 10m Open Field Radiated Site
☐ Test Site 2 - Environmental Lab
☐ EMC Lab 1 - Test Laboratory
☒ Semi-Anechoic Absorber Lined Shielded Room

SECTION 9.3 ADMINISTRATIVE AND ENVIRONMENTAL DETAILS–BAND-EDGE MEASUREMENT

Test Date(s):	July 08, 2005
Test Engineer(s):	Bob Kershaw and Femi Ojo
Temperature	74.8°F
Humidity	34.4%

SECTION 9.4 TEST DATA –BAND-EDGE MEASUREMENT (LOWER BANDEDGE - 902MHZ)

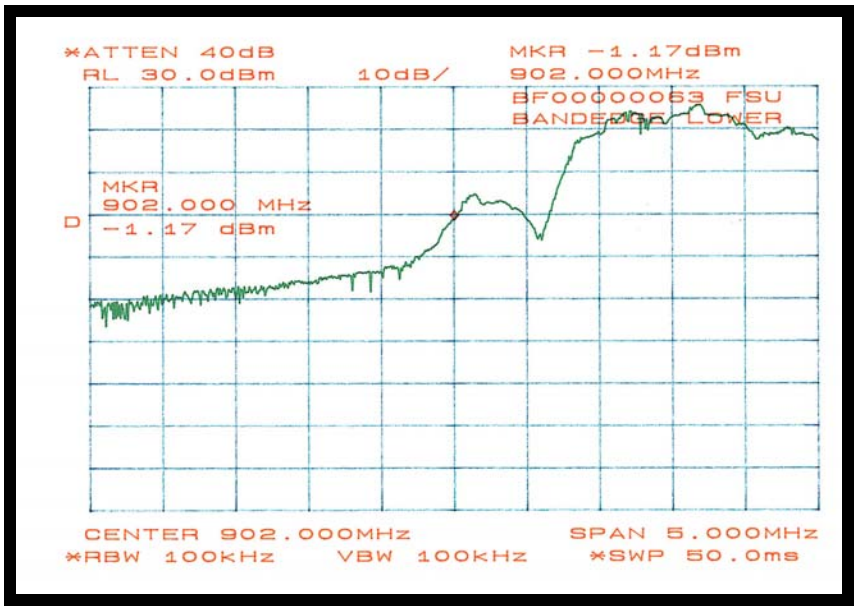

Figure 19: Plot of Lower Band-Edge Measurement at 902MHz

Test-Data Summary –Band-Edge Measurement (Lower Band Edge – 902MHz):

Center Frequency = 902 MHz
Band-Edge Level = -1.17dBm
Limit per 15.247(c) = 20dB below in-band peak (or -20dB)

BAND-EDGE MEASUREMENT (cont)

SECTION 9.5 TEST DATA –BAND-EDGE MEASUREMENT (UPPER BAND EDGE - 928MHZ)

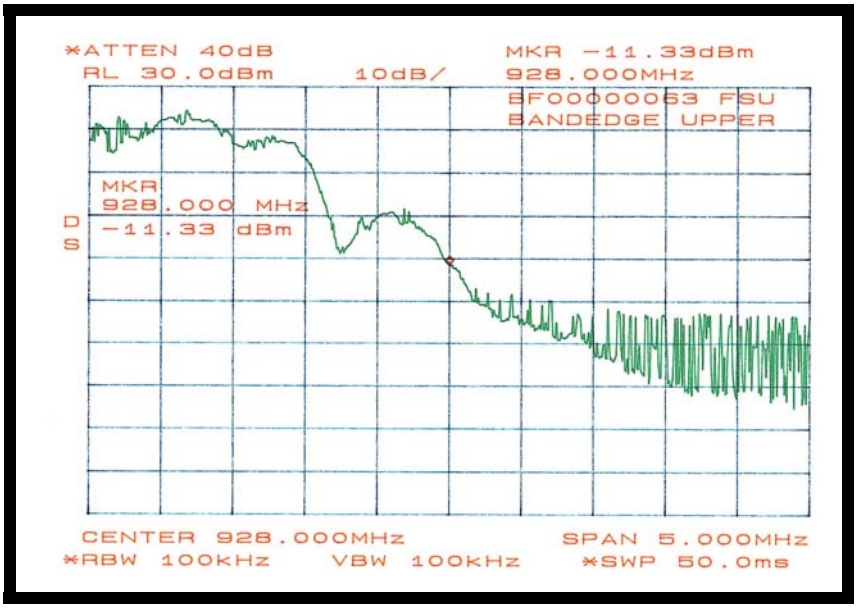

Figure 20: Plot of Band-Edge Measurement at 928MHz

Test-Data Summary –Band-Edge Measurement (Upper Band Edge – 928MHz):

Center Frequency	=	928MHz
Band-Edge Level	=	-11.33dBm
Limit per 15.247(c)	=	20dB below in-band peak (or -20dB)

PART 10 100kHz Bandwidth Out-of-Band Emissions per 47 CFR 15.247(a) (2)

SECTION 10.1 100KHZ BANDWIDTH OUT-OF-BAND EMISSIONS MEASUREMENT

The EUT was set up on a wooden non-conductive tabletop, attached at the antenna connector to the measuring device. The measurement instrumentation used was a receiver with bandwidth parameters as stipulated in ANSI C63.4-2003. The EUT was configured to run in continuous mode during the tests. The measurement data below represents the maximum worst-case result from the measurement performed in accordance to the requirements of this section.

SECTION 10.2 SITE USED – 100 KHZ BANDWIDTH OUT-OF-BAND MEASUREMENT

☐ Test Site 1 - Shielded Room: 16' x 12' x 9'
☐ Test Site 1 - 3m Open Field Radiated Site
☐ Test Site 1 - 10m Open Field Radiated Site
☐ Test Site 2 - Environmental Lab
☐ EMC Lab 1 - Test Laboratory
☒ Semi-Anechoic Absorber Lined Shielded Room

SECTION 10.3 ADMINISTRATIVE & ENVIRONMENTAL - (OUT OF BAND DETAILS)

Test Date(s):	July 08, 2005
Test Engineer(s):	Femi Ojo and Bob Kershaw
Temperature	74.8°F
Humidity	34.4%

SECTION 10.4 TEST DATA – 100KHZ (OUT-OF-BAND) MEASUREMENT (IN-BAND PEAK)

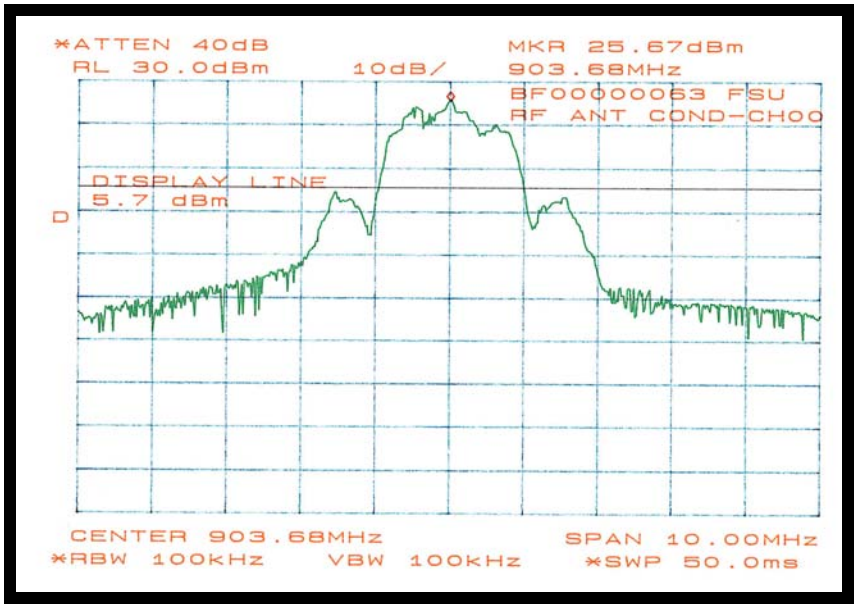

Figure 21: Plot of 100 kHz Bandwidth Out-of-Band Measurement (In-Band Peak)

Test-Data Summary – 100 kHz Bandwidth Out-of-Band Measurement (In-Band Peak):

Center Frequency	=	903.68 MHz
Center Frequency Peak	=	25.67dBm
20dB Limit (measured) per 15.247(c)	=	5.7dBm

SECTION 10.5 TEST DATA – 100 KHZ BANDWIDTH (OUT-OF-BAND) (CHANNEL) 27MHZ-940MHZ

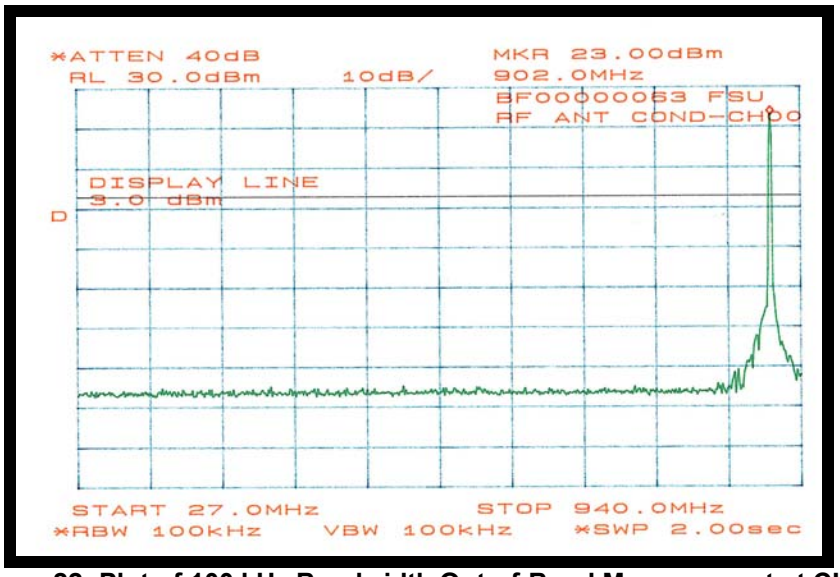

Figure 22: Plot of 100 kHz Bandwidth Out-of-Band Measurement at CH 0

Test-Data Summary – 100 kHz Bandwidth Out-of-Band Measurement (Channel 0)27MHz- 940MHz

Peak Frequency (Fundamental) = 902.0 MHz

Maximum Peak (27MHz – 940MHz) = Noise floor
20dB Limit (measured) per 15.247(c) = 3.0dBm

SECTION 10.6 TEST DATA – 100 KHZ BANDWIDTH (OUT-OF-BAND) (CHANNEL 0) 834MHZ-5 GHZ

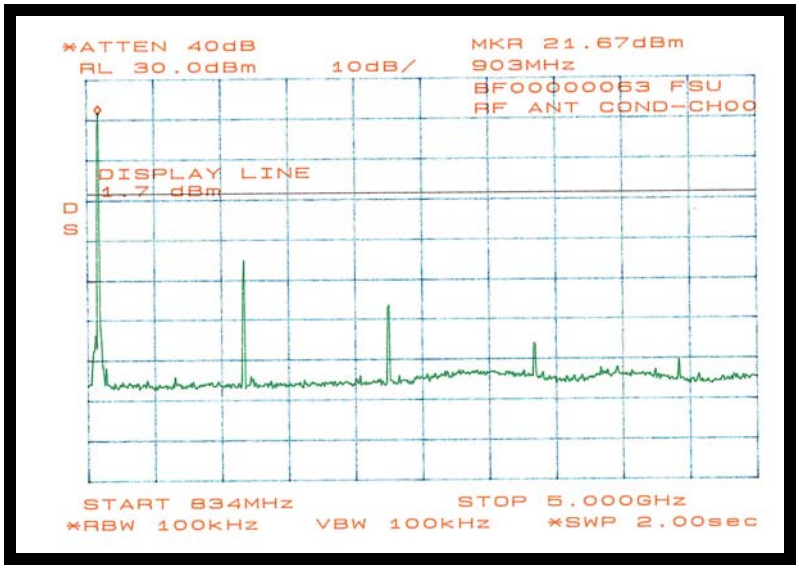

Figure 23: Plot of 100 kHz Bandwidth Out-of-Band Measurement at CH 0

Test-Data Summary – 100 kHz Bandwidth Out-of-Band Measurement (Channel 0) 834MHz- 5 GHz

Peak Frequency (Fundamental) = 903 MHz

Maximum Peak (834MHz – 5GHz) = Below 20dB limit
20dB Limit (measured) per 15.247(c) = 1.7dBm

SECTION 10.7 TEST DATA – 100 KHZ BANDWIDTH (OUT-OF-BAND) (CHANNEL 0) 5 GHZ-10 GHZ

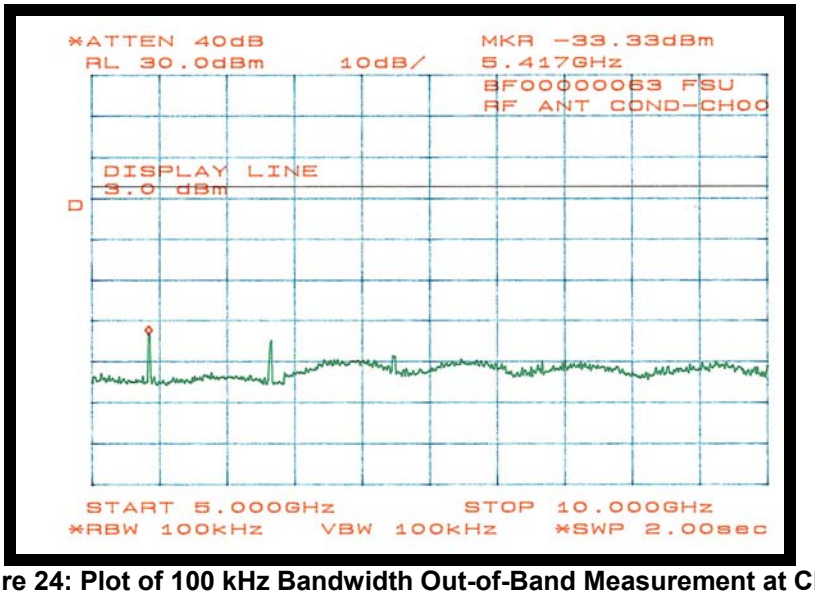

Figure 24: Plot of 100 kHz Bandwidth Out-of-Band Measurement at CH 0

Test-Data Summary – 100 kHz Bandwidth Out-of-Band Measurement (Channel 0) 5 GHz to 10 GHz

Peak Frequency (Fundamental) = 903.680MHz

Maximum Peak (5GHz – 10GHz) = -33.33dBm
20dB Limit (measured) per 15.247(c) = 3.0dBm

SECTION 10.8 TEST DATA – 100 KHZ BANDWIDTH (OUT-OF-BAND) (CHANNEL 6) 27MHZ-940MHZ

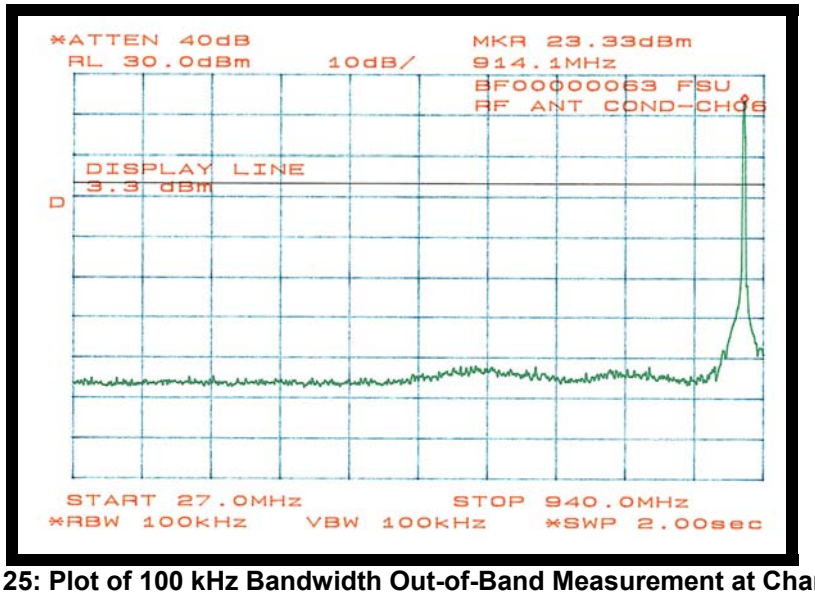

Figure 25: Plot of 100 kHz Bandwidth Out-of-Band Measurement at Channel 6

Test-Data Summary – 100 kHz Bandwidth Out-of-Band Measurement (Channel 6)27MHz- 940MHz

Peak Frequency (Fundamental) = 914.1MHz

Maximum Peak (27MHz – 940MHz) = Noise floor
20dB Limit (measured) per 15.247(c) = 3.3dBm

SECTION 10.9 TEST DATA – 100 KHZ BANDWIDTH (OUT-OF-BAND) (CHANNEL 6) 834MHZ- 5GHZ

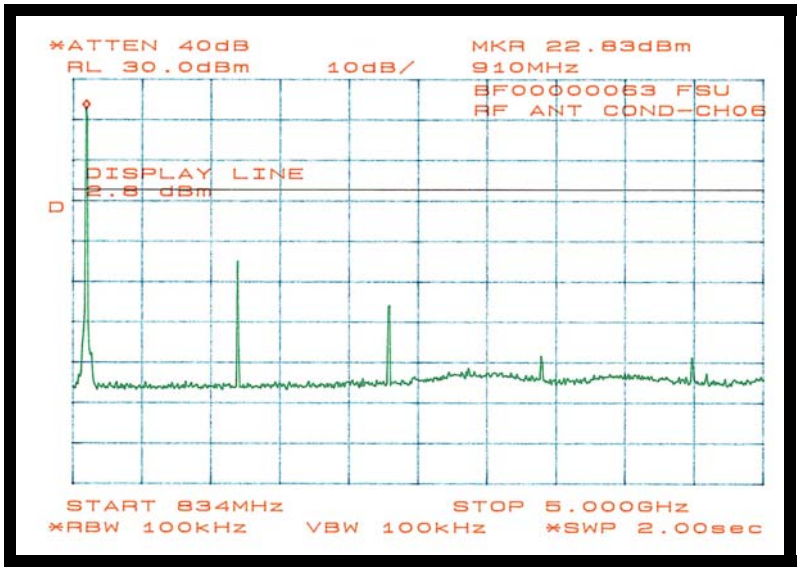

Figure 26: Plot of 100 kHz Bandwidth Out-of-Band Measurement at Channel 6

Test-Data Summary – 100 kHz Bandwidth Out-of-Band Measurement (Channel 6) 834MHz – 5GHz.

Peak Frequency (Fundamental)	**=**	910MHz
Maximum Peak (834MHz – 5GHz)	**=**	Below 20dB limit
20dB Limit (measured) per 15.247(c)	=	2.8dBm

SECTION 10.10 TEST DATA – 100 KHZ BANDWIDTH (OUT-OF-BAND) (CHANNEL 6) 5GHZ – 10GHZ

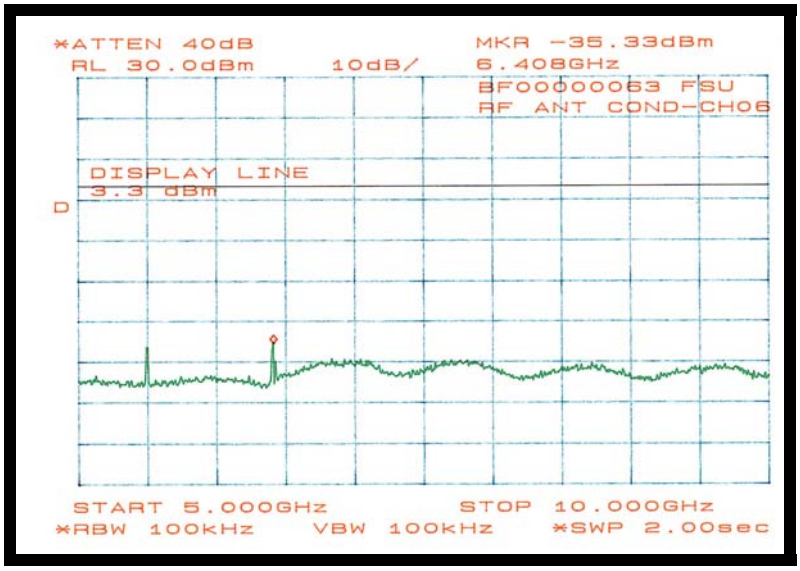

Figure 27: Plot of 100 kHz Bandwidth Out-of-Band Measurement at Channel 6

Test-Data Summary – 100 kHz Bandwidth Out-of-Band Measurement (Channel 6) 5GHz – 10GHz.

Peak Frequency (Fundamental)	**=**	915.968MHz
Maximum Peak (5GHz – 10GHz)	**=**	-35.33dBm
20dB Limit (measured) per 15.247(c)	=	3.3dBm

SECTION 10.11 TEST DATA – 100 KHZ BANDWIDTH (OUT-OF-BAND) (CHANNEL 11) 27MHZ – 940MHZ

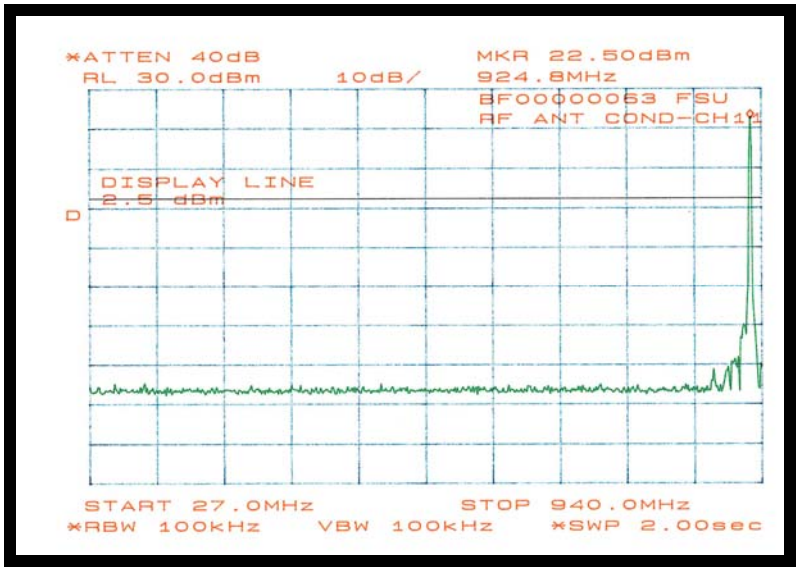

Figure 28: Plot of 100 kHz Bandwidth Out-of-Band Measurement at Channel 11

Test-Data Summary – 100 kHz Bandwidth Out-of-Band Measurement (Channel 11) 27MHz – 940MHz.

Peak Frequency (Fundamental)	**=**	924.8MHz
Maximum Peak (27MHz – 940MHz)	**=**	Noise floor
20dB Limit (measured) per 15.247(c)	=	2.5dBm

SECTION 10.12 TEST DATA – 100 KHZ BANDWIDTH (OUT-OF-BAND) (CHANNEL 11) 817MHZ – 5GHZ

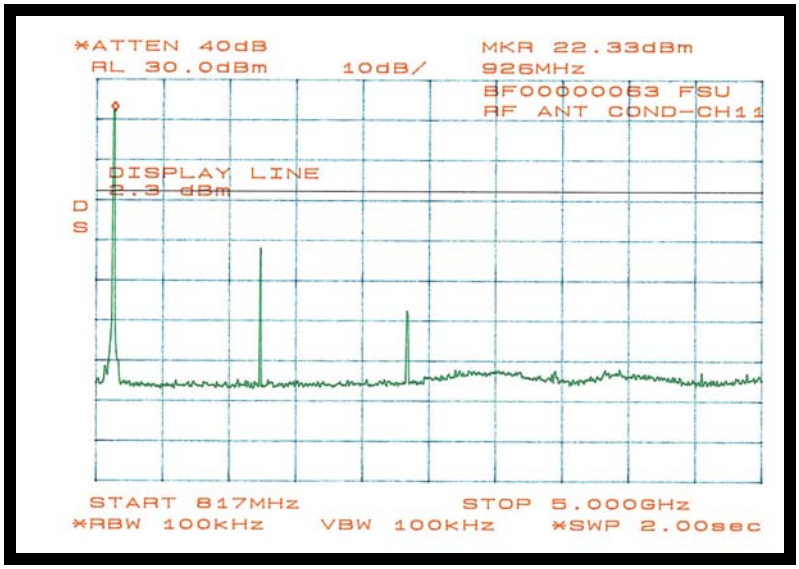

Figure 29: Plot of 100 kHz Bandwidth Out-of-Band Measurement at Channel 11

Test-Data Summary – 100 kHz Bandwidth Out-of-Band Measurement (Channel 11) 817MHz – 5GHz

Peak Frequency (Fundamental)	**=**	926.0 MHz
Maximum Peak (817MHz – 5GHz)	**=**	Below 20dB limit
20dB Limit (measured) per 15.247(c)	=	2.3dBm

SECTION 10.13 TEST DATA – 100 KHZ BANDWIDTH (OUT-OF-BAND) (CHANNEL 11) 5GHZ – 10GHZ

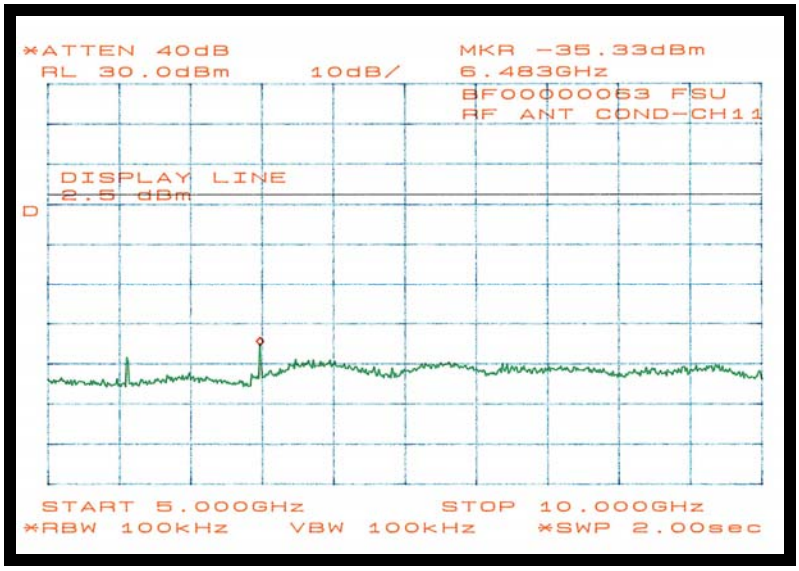

Figure 30: Plot of 100 kHz Bandwidth Out-of-Band Measurement at Channel 11

Test-Data Summary – 100 kHz Bandwidth Out-of-Band Measurement (Channel 11) 5GHz – 10GHz

Peak Frequency (Fundamental)	**=**	926.208MHz
Maximum Peak (830MHz – 5GHz)	**=**	-35.33dBm
20dB Limit (measured) per 15.247(c)	=	2.3dBm

PART 11 SPURIOUS/HARMONIC EMISSIONS IN THE RESTRICTED BANDS

SECTION 11.1 TEST SPECIFICATION:

FCC PART 15 SECTION 47 CFR 15.205
FCC PART 15 SECTION 47 CFR 15.247(c)

SECTION 11.2 TEST RANGE – SPURIOUS/HARMONICS EMISSIONS:

The measurement range investigated was from 30 MHz to 10GHz.

SECTION 11.3 SITE USED – SPURIOUS/HARMONICS EMISSIONS MEASUREMENTS

☐ Test Site 1 - Shielded Room: 16' x 12' x 9'
☐ Test Site 1 - 3m Open Field Radiated Site
☒ Test Site 1 - 10m Open Field Radiated Site
☐ Test Site 2 - Environmental Lab
☐ EMC Lab 1 - Test Laboratory
☒ Semi-Anechoic Absorber Lined Shielded Room

SECTION 11.4 ADMINISTRATIVE AND ENVIRONMENTAL DETAILS

Test Date:	July 12 ,2005
Test Engineer:	Bob Kershaw and Femi Ojo
Temperature	79.4°F
Humidity	32%

SECTION 11.5 SPURIOUS AND HARMONIC EMISSION IN THE RESTRICTED BANDS

Table 12 Test Data – Spurious Emissions (Below 1 GHz)

The table below shows the summary of the highest amplitudes of the spurious RF radiated emissions from the equipment under test. The EUT was tested for spurious emissions at the low,mid and high frequency and the worst case was recorded at low frequency(905.0MHz).

INDICATED		CORRECTION		CORR	TURNTABLE	ANT		CLASS A		CLASS B			
FREQ	AMPL	ANT	CAB	AMPL	ANG	HT	POL	AMPL	MARG	AMPL	MARG	FILTER	
MHz	dBuV/m	dB	dB	dBuV/m	DEG	m	-	dBuV/m	dB	dBuV/m	db	MODE	NOTES
36.76	4.1	12.1	1.9	18.1	0	1.0	VL	-	-	30.0	-11.9	QP	
37.23	5.4	11.4	1.9	18.7	90	1.0	VB	-	-	30.0	-11.3	QP	
58.90	5.2	12.1	2.6	19.9	0	1.0	VL	-	-	30.0	-10.1	QP	
65.90	9.2	8.9	2.6	20.7	0	1.0	VB	-	-	30.0	-9.3	QP	
73.86	10.4	12.1	2.7	25.2	0	1.0	VL	-	-	30.0	-4.8	QP	
80.22	5.9	6.4	2.9	15.2	0	1.0	VB	-	-	30.0	-14.8	QP	
115.86	6.7	12.1	3.2	22.0	90	1.0	VL	-	-	33.0	-11.0	QP	
130.38	7.8	12.1	3.3	23.2	90	1.0	VL	-	-	33.0	-9.8	QP	
151.61	10.2	12.1	3.8	26.1	90	1.0	VL	-	-	33.0	-6.9	QP	
184.33	5.8	12.1	3.7	21.6	0	1.0	VL	-	-	33.0	-11.4	QP	
184.38	7.8	16.7	3.7	28.3	90	4.0	VB	-	-	33.0	-4.7	QP	
237.12	5.3	11.0	4.4	20.7	0	1.0	VL	-	-	36.0	-15.3	QP	
257.82	4.9	11.9	5.5	22.3	0	1.0	VL	-	-	36.0	-13.7	QP	
288.11	6.2	13.3	6.5	26.0	90	1.0	VL	-	-	36.0	-10.0	QP	
325.78	11.1	14.0	6.3	31.4	90	1.0	VL	-	-	36.0	-4.6	QP	
373.44	7.1	14.4	6.5	28.0	0	3.0	VL	-	-	36.0	-8.0	QP	
390.90	7.2	14.8	6.4	28.3	0	1.0	VL	-	-	36.0	-7.7	QP	
502.90	8.3	17.4	8.2	33.9	0	1.0	VL	-	-	36.0	-2.1	QP	
633.08	6.0	19.0	8.7	33.7	0	1.0	VL	-	-	36.0	-2.3	QP	
799.81	3.5	20.0	10.5	34.0	90	1.0	VL	-	-	36.0	-2.0	QP	2

No emissions of significant level were observed between 30MHz – 36.76MHz and 799.81MHz -1GHz.

Table 13 Test Data – Spurious and Harmonics Emissions (Above 1 GHz)

The table below shows the summary of the highest amplitudes of the spurious RF radiated emissions from the equipment under test at various antenna heights, antenna polarization, and EUT orientations The EUT was tested for spurious emissions at the low,mid and high frequency and the worst case was recorded at low frequency(905.0MHz).

INDICATED		CORRECTION		CORR	TURNTABLE	ANT		CLASS A		CLASS B			
FREQ	AMPL	ANT	CAB	AMPL	ANG	HT	POL	AMPL	MARG	AMPL	MARG	FILTER	
MHz	dBuV/m	dB	dB	dBuV/m	DEG	m	-	dBuV/m	dB	dBuV/m	db	MODE	NOTES
905.00	33.8	22.4	4.3	60.5	0	1.0	VL	-	-	141.0	-80.5	P	Fund.
905.00	60.2	23.1	4.3	87.6	0	1.0	HL	-	-	141.0	-53.4	P	Fund.
912.00	7.5	22.4	4.1	34.0	0	1.0	VL	-	-	46.0	-12.0	P	
932.00	3.6	22.7	4.4	30.7	0	1.0	VL	-	-	46.0	-15.3	P	
932.00	7.0	23.3	4.4	34.7	0	1.0	HL	-	-	46.0	-11.3	P	
1001.0	31.5	24.2	-34.7	21.0	0	1.0	VH	-	-	54.0	-33.0	P	
1001.0	31.7	24.2	-34.7	21.2	0	1.0	HH	-	-	54.0	-32.8	P	
1288.0	32.3	24.7	-34.3	22.8	0	1.0	HH	-	-	54.0	-31.2	P	
1288.0	31.8	24.7	-34.3	22.3	0	1.0	VH	-	-	54.0	-31.7	P	
1609.0	31.3	25.7	-33.7	23.3	0	1.0	VH	-	-	54.0	-30.7	P	
1609.0	32.3	25.7	-33.7	24.4	0	1.0	HH	-	-	54.0	-29.6	P	
1807.0	43.7	26.7	-33.4	37.0	0	1.0	VH	-	-	54.0	-17.0	P	
1807.0	54.3	26.8	-33.4	47.8	90	1.0	HH	-	-	54.0	-6.2	P	
1999.0	31.5	27.7	-33.0	26.2	0	1.0	VH	-	-	54.0	-27.8	P	
1999.0	32.7	27.9	-33.0	27.6	0	1.0	HH	-	-	54.0	-26.4	P	
2607.0	33.7	28.9	-32.1	30.5	0	1.0	HH	-	-	54.0	-23.5	P	

2607.0	31.8	28.9	-32.1	28.7	0	1.0	VH	-	-	54.0	-25.3	P	
2703.0	46.2	29.2	-32.0	43.4	0	1.0	VH	-	-	54.0	-10.6	P	
2703.0	51.5	29.2	-32.0	48.7	0	1.0	HH	-	-	54.0	-5.3	P	
3147.0	34.5	30.4	-31.7	33.2	0	1.0	VH	-	-	54.0	-20.8	P	
3147.0	35.3	30.5	-31.7	34.0	0	1.0	HH	-	-	54.0	-20.0	P	
3441.0	35.5	31.2	-31.3	35.4	0	1.0	HH	-	-	54.0	-18.6	P	
3441.0	34.1	31.1	-31.3	33.9	0	1.0	VH	-	-	54.0	-20.1	P	
3571.0	33.2	31.4	-31.2	33.4	0	1.0	VH	-	-	54.0	-20.6	P	
3571.0	34.8	31.5	-31.2	35.2	0	1.0	HH	-	-	54.0	-18.8	P	
3634.0	35.0	31.7	-31.2	35.5	0	1.0	HH	-	-	54.0	-18.5	P	
3634.0	33.2	31.6	-31.2	33.6	0	1.0	VH	-	-	54.0	-20.4	P	
4508.0	33.5	32.4	-30.5	35.4	0	1.0	VH	-	-	54.0	-18.6	P	
4508.0	34.6	32.4	-30.5	36.5	90	1.0	HH	-	-	54.0	-17.5	P	
5420.0	32.8	34.1	-29.4	37.5	0	1.0	VH	-	-	54.0	-16.5	P	
5420.0	37.5	34.1	-29.4	42.1	90	1.0	HH	-	-	54.0	-11.9	P	
6324.0	33.5	34.4	-28.9	39.0	0	1.0	HH	-	-	54.0	-15.0	P	
6324.0	31.7	34.5	-28.9	37.2	0	1.0	VH	-	-	54.0	-16.8	P	
7200.0	36.0	35.8	-29.0	42.8	0	1.0	HH	-	-	54.0	-11.2	P	
7200.0	35.8	35.8	-29.0	42.7	0	1.0	VH	-	-	54.0	-11.3	P	
7228.0	35.0	35.9	-28.9	42.0	0	1.0	VH	-	-	54.0	-12.0	P	
7228.0	36.0	35.8	-28.9	42.9	0	1.0	HH	-	-	54.0	-11.1	P	
8120.0	36.7	36.9	-29.0	44.5	0	1.0	HH	-	-	54.0	-9.5	P	
8120.0	34.0	36.9	-29.0	41.9	0	1.0	VH	-	-	54.0	-12.1	P	
8600.0	36.0	37.2	-29.0	44.2	0	1.0	VH	-	-	54.0	-9.8	P	
8600.0	38.0	37.2	-29.0	46.2	0	1.0	HH	-	-	54.0	-7.8	P	
9035.0	33.8	37.4	-28.9	42.3	0	1.0	HH	-	-	54.0	-11.7	P	
9035.0	33.0	37.4	-28.9	41.5	0	1.0	VH	-	-	54.0	-12.5	P	
9410.0	35.3	37.5	-28.2	44.6	0	1.0	VH	-	-	54.0	-9.4	P	
9410.0	36.0	37.5	-28.2	45.3	0	1.0	HH	-	-	54.0	-8.7	P	
9550.0	37.2	37.5	-28.1	46.7	0	1.0	HH	-	-	54.0	-7.3	P	
9550.0	35.2	37.5	-28.1	44.7	0	1.0	VH	-	-	54.0	-9.3	P	

No emission of significant level was observed between 9.55 GHz -10 GHz

SECTION 11.6 TEST DATA SUMMARY

The margin is calculated as follows:
Margin = Corrected Amplitude - Limit; where Corrected Amplitude = Amplitude + Cable Loss + Antenna Factor.

SECTION 11.7 CONCLUSION

The BFSU meets the requirements of the test reference for Spurious and Restricted Bands emissions levels specified in the 47CFR15.209

SECTION 11.8 SPURIOUS PHOTOGRAPHS

Figure 31: Spurious Emissions Front View (Below 1 GHz)

Figure 32: Spurious Emissions Rear View (Below 1 GHz)

Spurious Emissions (cont)

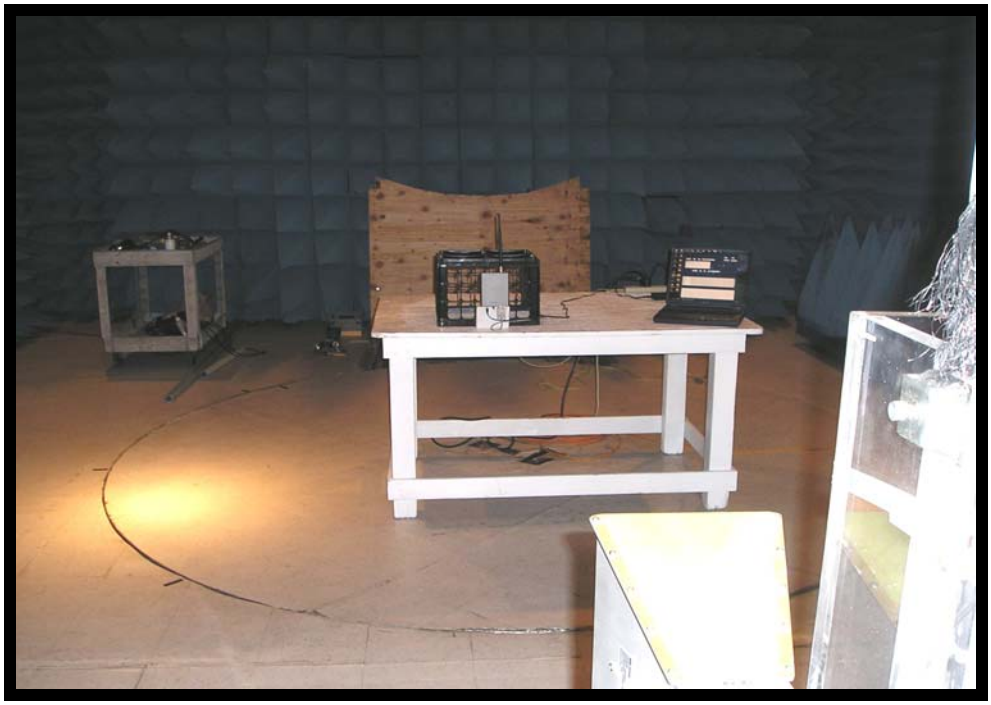

Figure 33: Spurious Emissions Front View (Above 1 GHz)

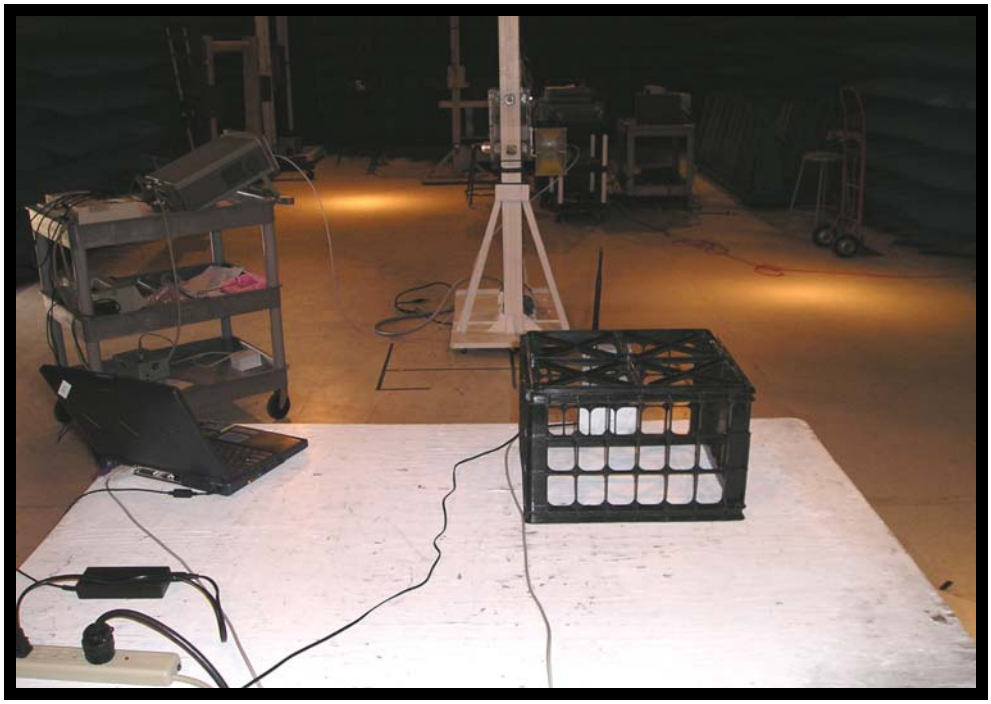

Figure 34: Spurious Emissions Rear View (Above 1 GHz)

PART 12 APPENDICES

A EUT TECHNICAL SPECIFICATION

Applicant	Silver Spring Networks
General Description	Battery Field Service Unit (BFSU)
Model	BFSU with External antenna BFSU with Internal antenna
Dimension	H= 1.5in ,L=5.25in ,W= 3.88in, Weight= 1lb
Power Input	3.6Vdc

B EUT PHOTOGRAPHS.

Figure 35: EUT Top View (with external antenna)

Figure 36: EUT Top View (with internal antenna)

Figure 37: EUT Front View

Figure 38: EUT Rear View

Figure 39: EUT Internal View

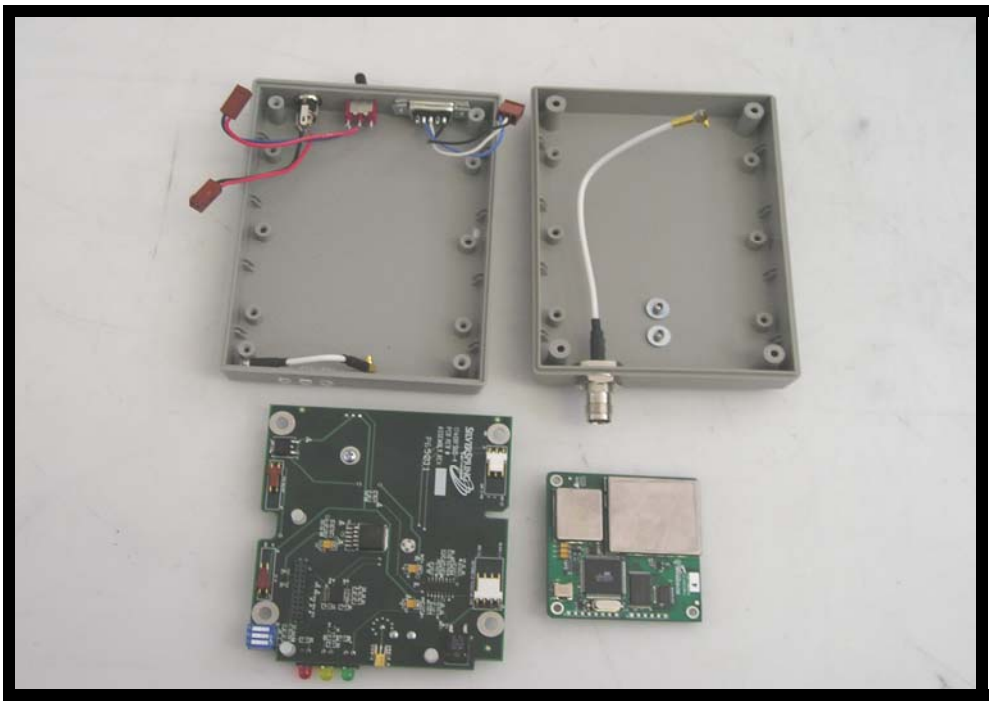

Figure 40: Component View

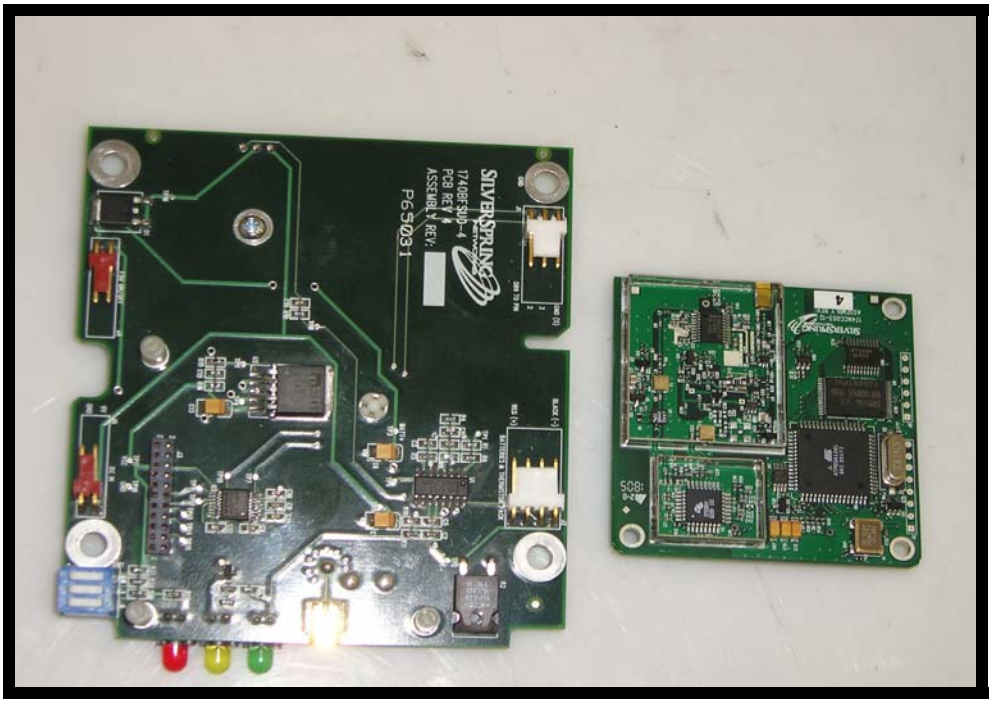

Figure 41: Component View With Shield Off

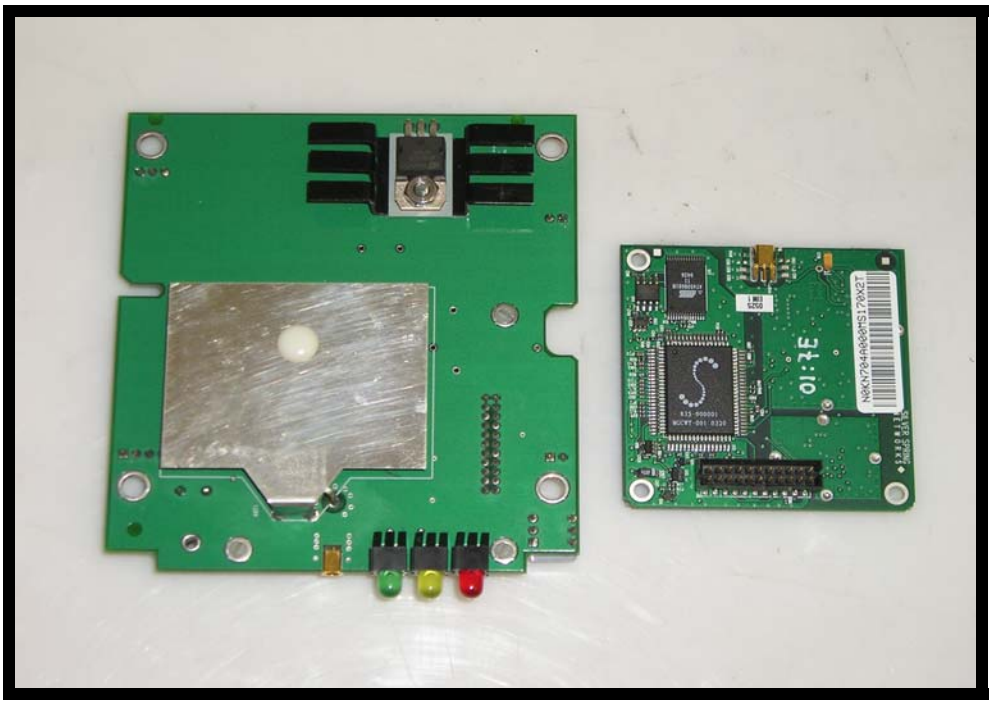

Figure 42: Solder View

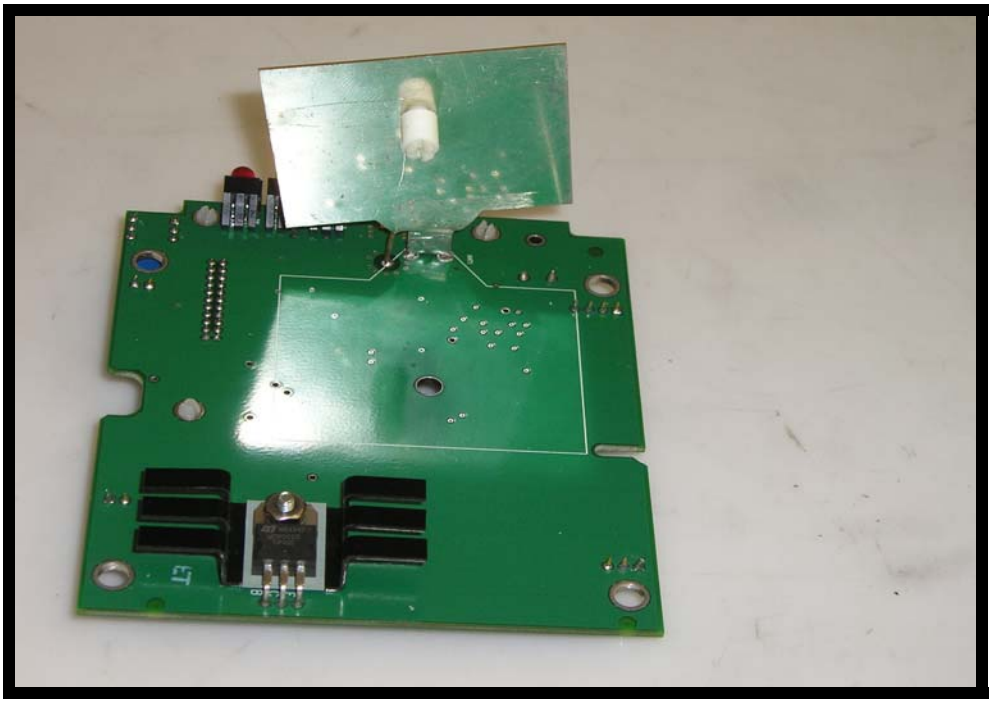

Figure 43: Solder View with shield off

C. MODIFICATION LETTER

To Whom It May Concern:

This is to certify that no modifications were necessary for Battery Field Service Unit (BFSU); model BFSU with external antenna and BFSU with internal antenna to comply with the requirements of the standard listed below.

FCC Rules and Regulations per 47 CFR 15.247

It is the manufacturer's responsibility to ensure that additional production units of the Battery Field Service Unit(BFSU) are manufactured with identical electrical and mechanical characteristics.

For further information, please contact the manufacturer at:

Silver Spring Network, Inc.
13000 West Silver Spring Drive
Butler, WI 53007

ATTN: Juan Luglio,Ph.D
Tel: (262) 364-5317
juan.luglio@silverspringnetworks.com