



Engineering and Testing for EMC and Safety Compliance



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Certification Application Report FCC Part 15 Subpart B

Test Lab: Rhein Tech Laboratories, Inc. Phone:703-689-0368 360 Herndon Parkway Fax: 703-689-2056 Suite 1400 www.rheintech.com Herndon, VA 20170 Email: atcbinfo@rheintech.com		Applicant: XM Radio Inc. 1500 Eckington Place NE Washington, DC 20002-2164 Contact: James Blitz	
FCC ID	RS2XVSAP1V1	Test Report Date	August 6, 2009
EUT	SkyDock	RTL Work Order Number	2009220
Model #	XVSAP1V1	RTL Quote Number	QRTL09-333
FCC Classification	Part 15 Low Power Transceiver, Rx Verified		
FCC Rule Part(s)	FCC Part 15 Subpart B, Rule Section 15.209		
Industry Canada Standard	RSS-210 Issue 7 June 2007: Low Power License-Exempt Radio Communication Devices (All Frequency Bands)		
Receiver Information	Receiver was found to be compliant		
Frequency Range (MHz)	Output Power (W)	Frequency Tolerance	Emission Designator
88 – 108 (FM Band)	N/A	N/A	N/A

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 part of FCC Part 15 and ANSI C63.4.

Signature: 

Date: August 6, 2009

Typed/Printed Name: Desmond A. Fraser

Position: President

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Table of Contents

1	General Information	3
1.1	Scope	3
1.2	Modifications.....	3
1.3	Test Facility	3
2	Product Information	3
2.1	Equipment Description.....	3
2.2	Operation Mode	3
2.3	Test Configuration Descriptions.....	3
3	Test Information	4
3.1	Test Justification	4
3.2	Exercising the EUT	4
3.3	Test Result Summary	4
3.4	Test System Details.....	4
4	Radiated Emission– FCC 15.209	6
4.1	Radiated Spurious Emission Measurements - Test Configuration 3: FM Direct Adapter.....	6
4.2	Radiated Spurious Emission Measurements - Test Configuration 4: Cassette Adapter	9
4.3	200 kHz Bandwidth Measurement FCC 15.239(a) – Test Configuration 5: FM Direct Adapter (BW)	13
4.4	Radiated Spurious Emission Measurements - Test Configuration 6: FEA.....	18
5	Sample Calculations	20
5.1	Radiated Emissions Measurement Sample Calculation	20
6	Conclusion	20

1 General Information

1.1 Scope

FCC Rules Part 15 Subpart B, rule section 15.209

1.2 Modifications

N/A

1.3 Test Facility

The open area test site and conducted measurement facility used to collect the radiated data is located at Rhein Tech Laboratories (RTL), 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).

2 Product Information

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Sirius XM Radio SkyDock FM Transmitter, Model # XVSAP1V1, FCC ID: RS2XVSAP1V1**. The FM transmitter is located within the SkyDock housing which was inserted into the vehicle's cigarette lighter adapter socket and is only capable of FM transmissions in association with Apple's iPhone or iPod Touch and Sirius XM iPhone/iPod Touch app that facilitate the reception of Sirius XM satellite content using the iPhone or iPod Touch. The test data contained in this report pertains only to the emissions due to the FM band transmitter of the EUT.

2.2 Operation Mode

Sirius XM Radio SkyDock FM Transmitter was set to transmit in the FM band while receiving live satellite broadcast. The EUT was tested while receiving live satellite broadcast and playing iPod iTunes.

2.3 Test Configuration Descriptions

The **Sirius XM Radio SkyDock FM Transmitter** was tested in a total of four different configurations for unintentional and intentional emissions compliance to FCC rules and regulations and IC standards. Each test configuration is shown in the test information section.

3 Test Information

3.1 Test Justification

The FM transmitter is located within the SkyDock housing and is only capable of FM transmission. The test data contained in this report pertains only to the emissions due to the FM band transmitter of the EUT. The test procedure document used for this report was Sirius XM Satellite Radio Documents: SkyDock; dated July 14, 2009. It should be noted that the SkyDock uses the following connection methods: Standalone injected FM Cigarette Lighter Adapter (CLA), FM Direct, Cassette, and FM Extender Antenna (FEA). This report contains all but the standalone connect which can be found in report 2009220 Sirius XM SkyDock FCC 15.239 IC RSS-210 Report Rev4.pdf.

3.2 Exercising the EUT

The EUT was tested with the FM modulator enabled while receiving live satellite broadcast from an iPod Touch docked in the EUT and inserted into the vehicle's cigarette lighter adapter socket. The satellite content was received directly by the iPod Touch while docked in the EUT in association with Apple's iPod Touch and Sirius XM iPhone/iPod Touch application that facilitate the reception of Sirius XM satellite content. The EUT was tested using frequencies from the low, mid, and high bands across its frequency tuning range 88.1MHz-107.9 MHz. The lowest and highest tuning frequencies, namely, 88.1MHz and 107.9 MHz were not used during testing due to very strong local ambient that prevented their use. The tuning range of the SkyDock was verified during testing, SkyDock's firmware prevents any Apple Apps from tuning outside the SkyDock's tuning range. There were no deviations from the test standard(s) and/or methods.

3.3 Test Result Summary

Table 3.3-1: Test Result Summary with FCC Rules and Regulations

FCC Part Section	Test Description	Test Limit	Pass/Fail
15.239(a)	Bandwidth	< 200 kHz	Pass
15.109(a)	Out-of-Band Emissions	Emissions outside of the specified band must meet the radiated limits detailed in 15.209	Pass
15.107(a)	Conducted Emissions	Emissions must meet conducted emissions limits detailed in 15.107(a)	Pass

3.4 Test System Details

The test sample was received on June 20, 2009. The FCC Identifiers for all equipment, plus descriptions of all cables used in the tested system, are shown in the table below.

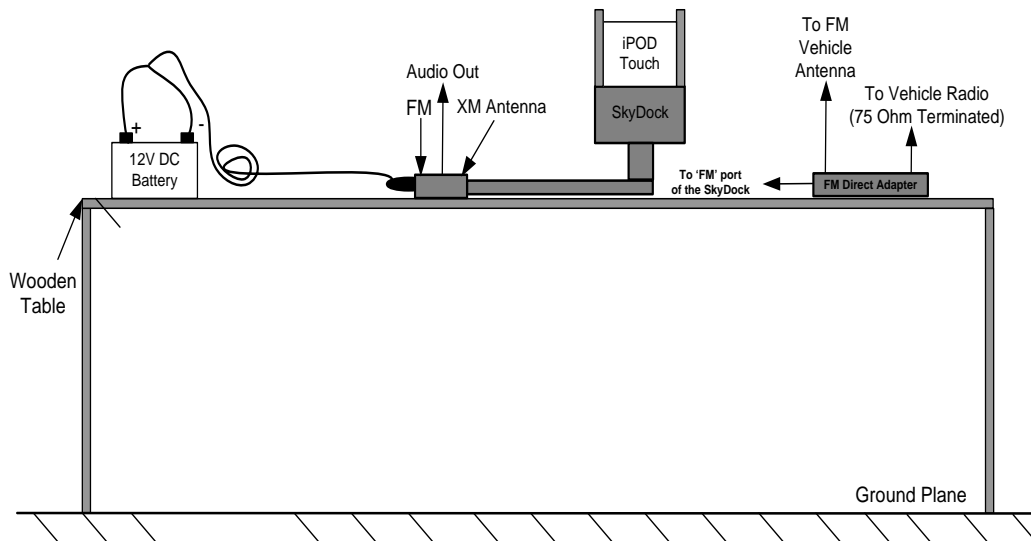
Table 3.4-1: Equipment under Test (EUT)

Part	Manufacturer	Model	Serial Number	Cable Description	RTL Bar Code
SkyDock	Sirius XM	SkyDock XVSAP1V1	P3MAIN UGB003R5	N/A	019118
iPod Touch	Apple	8 GB iPod Touch	300010084	N/A	019119
XM Antenna	Sirius XM	Satellite Antenna 11-ft	A232291	Shielded	019120
FM Direct Adapter	Sirius XM	FMDA25	N/A	Unshielded	019124
Car Aerial Antenna	Radio Shack	N/A	N/A	Shielded	019074
12V battery	Valucraft	N/A	N/A	N/A	N/A
Cassette Adapter	Sirius XM	Cassette Adapter	N/A	Unshielded	019073
Battery Power Adapter	Sirius XM	N/A	N/A	Unshielded	019122
FEA Adapter	Sirius XM	FEA Adapter	N/A	Unshielded	019104

4 Radiated Emission– FCC 15.209

4.1 Radiated Spurious Emission Measurements - Test Configuration 3: FM Direct Adapter

The EUT was configured as shown in Test Configuration 3. The car aerial antenna was mounted to a 4' by 3' aluminum plate to simulate the antenna being mounted to a vehicle. The FM direct adapter (output to radio) was terminated with a 75 Ω termination. The out-of-band radiated emissions were measured at a distance of three meters. The EUT was powered by a fully charged 12 Vdc car battery. The FM Modulator was enabled and the audio level set to the maximum audio level. The EUT was configured to receive a live satellite broadcast. The cables were manipulated to produce the highest emission level. The EUT was tested using the harmonics of the following frequencies: 89.5 MHz, 97.7 MHz and 106.3 MHz. Data was recorded for the ten harmonics of each fundamental frequency. Data was taken for both horizontal and vertical antenna polarizations. The test configuration is shown below.



Test Configuration 3: SkyDock with iPod Touch and FM Direct Adapter Radiated Emissions Setup

Table 4.1-1: 15.109(a) FM Direct Adapter Radiated Emission Measurements – In-Band

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)	FCC/IC Limit (dBuV/m)	FCC/IC Margin (dB)	Pass/Fail
89.100	Qp	H	350	3.0	48.3	-22.9	25.4	48.0	-22.6	Pass
89.100	Qp	V	90	4.0	46.7	-22.9	23.8	48.0	-24.2	Pass
97.700	Qp	H	270	4.0	52.5	-20.8	31.7	48.0	-16.3	Pass
97.700	Qp	V	0	4.0	52.6	-20.8	31.8	48.0	-16.2	Pass
106.302	Qp	H	260	2.7	49.5	-19.6	29.9	48.0	-18.1	Pass
106.302	Qp	V	225	1.0	43.6	-19.6	24.0	48.0	-24.0	Pass

Based on the operational mode of this test setup, 15.239 emissions limits apply to the above data table.

Table 4.1-2: 15.109(a) FM Direct Adapter Radiated Emission Measurements Out-of-Band - 89.1MHz

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)	FCC/IC Limit (dBuV/m)	FCC/IC Margin (dB)	Pass/Fail
178.200	Qp	V	0	1.0	41.5	-20.5	21.0	43.5	-22.5	Pass
267.300	Qp	V	0	1.0	28.0	-16.9	11.1	46.0	-34.9	Pass
356.400	Qp	V	0	1.0	30.0	-14.2	15.8	46.0	-30.2	Pass
445.500	Qp	V	0	1.0	30.1	-11.9	18.2	46.0	-27.8	Pass
534.600	Qp	V	0	1.0	30.8	-9.6	21.2	46.0	-24.8	Pass
637.806	Qp	V	0	1.0	34.0	-8.4	25.6	46.0	-20.4	Pass
744.106	Qp	V	0	1.0	33.6	-6.2	27.4	46.0	-18.6	Pass
850.406	Qp	V	0	1.0	32.3	-4.7	27.6	46.0	-18.4	Pass
956.706	Qp	V	0	1.0	21.5	-3.3	18.2	46.0	-27.8	Pass

Table 4.1-3: 15.109(a) FM Direct Adapter Radiated Emission Measurements Out-of-Band – 97.7MHz

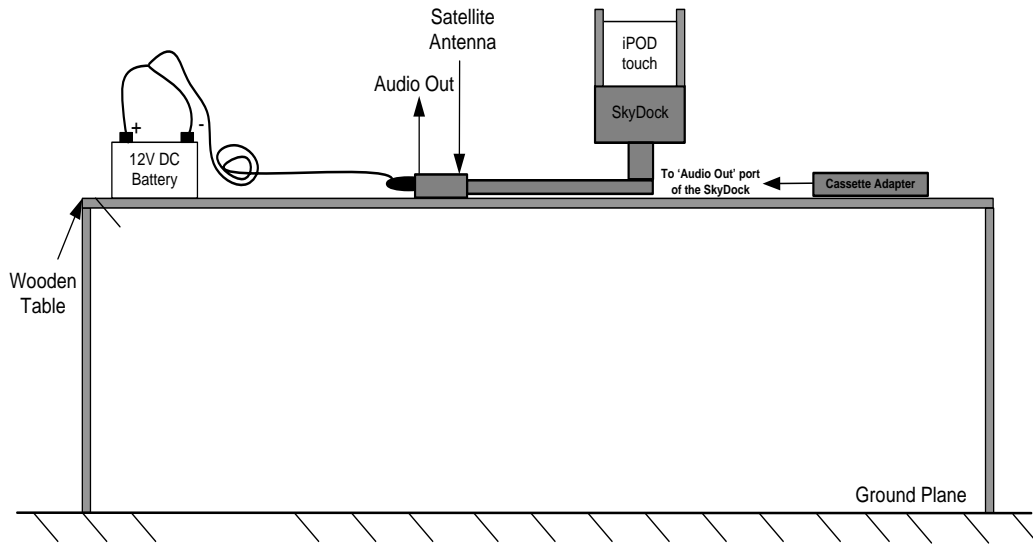
Emission Frequency (MHz)	Test Detector	Antenna Polarity (H/V)	Turntable Azimuth (deg)	Antenna Height (m)	Analyzer Reading (dBuV)	Site Correction Factor (dB/m)	Emission Level (dBuV/m)	FCC/IC Limit (dBuV/m)	FCC/IC Margin (dB)	Pass/Fail
195.400	Qp	H	0	1.0	34.6	-20.1	14.5	43.5	-29.0	Pass
293.100	Qp	H	0	1.0	33.3	-16.5	16.8	46.0	-29.2	Pass
390.800	Qp	H	0	1.0	44.6	-13.3	31.3	46.0	-14.7	Pass
488.500	Qp	H	0	1.0	34.8	-10.5	24.3	46.0	-21.7	Pass
586.200	Qp	H	0	1.0	29.5	-8.9	20.6	46.0	-25.4	Pass
683.900	Qp	H	0	1.0	33.3	-7.3	26.0	46.0	-20.0	Pass
781.600	Qp	H	0	1.0	33.0	-5.9	27.1	46.0	-18.9	Pass
879.300	Qp	H	0	1.0	25.2	-4.5	20.7	46.0	-25.3	Pass
977.000	Qp	H	0	1.0	23.8	-2.9	20.9	54.0	-33.1	Pass

Table 4.1-4: 15.109(a) FM Direct Adapter Radiated Emission Measurements Out-of-Band - 106.3 MHz

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)	FCC/IC Limit (dBuV/m)	FCC/IC Margin (dB)	Pass/Fail
212.600	Qp	V	0	1.0	39.2	-20.4	18.8	43.5	-24.7	Pass
318.900	Qp	V	0	1.0	33.5	-15.3	18.2	46.0	-27.8	Pass
425.200	Qp	V	0	1.0	33.1	-12.0	21.1	46.0	-24.9	Pass
531.500	Qp	V	0	1.0	44.9	-9.7	35.2	46.0	-10.8	Pass
623.700	Qp	V	0	1.0	28.4	-8.4	20.0	46.0	-26.0	Pass
712.800	Qp	V	0	1.0	29.2	-6.8	22.4	46.0	-23.6	Pass
801.900	Qp	V	0	1.0	29.1	-5.3	23.8	46.0	-22.2	Pass
891.000	Qp	V	0	1.0	29.3	-4.4	24.9	46.0	-21.1	Pass
1063.006	Av	V	0	1.0	26.1	-2.1	24.0	54.0	-30.0	Pass
1063.006	Pk	V	0	1.0	35.8	-2.1	33.7	74.0	-40.3	Pass

4.2 Radiated Spurious Emission Measurements - Test Configuration 4: Cassette Adapter

The EUT was configured as shown in Test Configuration 4. The out-of-band radiated emissions were measured at a distance of three meters. The EUT was powered by a fully charged 12 VDC car battery. The FM Modulator was disabled and the audio level was set to the maximum audio level. The EUT was configured to receive a live satellite broadcast. The cables were manipulated to produce the highest emission level. Data was taken for both horizontal and vertical antenna polarizations. The test configuration is shown below.



Test Configuration 4: SkyDock with iPod Touch and Cassette Adapter Out-of-Band Radiated Emissions

Table 4.2-1: 15.109(a) Cassette Adapter Radiated Emission Measurements In-Band

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)	FCC Limit (dBuV/m)	FCC Margin (dB)	IC Limit (dBuV/m)	IC Margin (dB)
89.100	Qp	H	200	3.0	60.5	-22.9	37.6	48.0	-10.4	60.0	-22.4
89.100	Qp	V	1	1.0	65.0	-22.9	42.1	48.0	-5.9	60.0	-17.9
97.700	Qp	H	190	3.2	60.0	-20.8	39.2	48.0	-8.8	60.0	-20.8
97.700	Qp	V	310	1.0	63.8	-20.8	43.0	48.0	-5.0	60.0	-17.0
106.300	Qp	H	210	2.5	59.3	-19.6	39.7	48.0	-8.3	60.0	-20.3
106.300	Qp	V	345	1.0	62.3	-19.6	42.7	48.0	-5.3	60.0	-17.3

Based on the operational mode of this test setup, 15.239 emissions limits apply to the above data table.

Table 4.2-2: 15.109(a) Cassette Adapter Radiated Emission Measurements Out-of-Band – 89.1MHz

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)	FCC/IC Limit (dBuV/m)	FCC/IC Margin (dB)	Pass/Fail
178.200	Qp	H	45	3.5	37.6	-20.5	17.1	43.5	-26.4	Pass
178.200	Qp	V	320	1.0	36.2	-20.5	15.7	43.5	-27.8	Pass
267.300	Qp	H	95	3.5	37.1	-16.9	20.2	46.0	-25.8	Pass
267.300	Qp	V	345	1.0	37.3	-16.9	20.4	46.0	-25.6	Pass
356.400	Qp	H	125	3.0	36.9	-14.2	22.7	46.0	-23.3	Pass
356.400	Qp	V	290	1.0	36.8	-14.2	22.6	46.0	-23.4	Pass
445.500	Qp	H	145	3.0	35.9	-11.9	24.0	46.0	-22.0	Pass
445.500	Qp	V	275	1.0	38.1	-11.9	26.2	46.0	-19.8	Pass
534.600	Qp	H	65	2.5	38.8	-9.6	29.2	46.0	-16.8	Pass
534.600	Qp	V	290	1.0	38.5	-9.6	28.9	46.0	-17.1	Pass
623.700	Qp	H	125	2.5	37.8	-8.4	29.4	46.0	-16.6	Pass
623.700	Qp	V	300	1.0	36.8	-8.4	28.4	46.0	-17.6	Pass
712.800	Qp	H	180	2.0	36.6	-6.8	29.8	46.0	-16.2	Pass
712.800	Qp	V	355	1.0	37.0	-6.8	30.2	46.0	-15.8	Pass
801.900	Qp	H	210	2.0	37.1	-5.3	31.8	46.0	-14.2	Pass
801.900	Qp	V	25	1.0	36.2	-5.3	30.9	46.0	-15.1	Pass
891.000	Qp	H	200	2.0	38.8	-4.4	34.4	46.0	-11.6	Pass
891.000	Qp	V	45	1.0	36.3	-4.4	31.9	46.0	-14.1	Pass
980.100	Qp	H	155	11.5	36.6	-2.8	33.8	54.0	-20.2	Pass
980.100	Qp	V	75	1.0	37.4	-2.8	34.6	54.0	-19.4	Pass

Table 4.2-3: 15.109(a) Cassette Adapter Radiated Emission Measurements Out-of-Band – 97.7MHz

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)	FCC/IC Limit (dBuV/m)	FCC/IC Margin (dB)	Pass/Fail
195.400	Qp	H	155	3.0	39.3	-20.1	19.2	43.5	-24.3	Pass
195.400	Qp	V	120	1.0	45.0	-20.1	24.9	43.5	-18.6	Pass
293.100	Qp	H	270	3.0	38.4	-16.5	21.9	46.0	-24.1	Pass
293.100	Qp	V	45	1.0	39.0	-16.5	22.5	46.0	-23.5	Pass
390.800	Qp	H	290	3.0	37.5	-13.3	24.2	46.0	-21.8	Pass
390.800	Qp	V	90	1.0	37.8	-13.3	24.5	46.0	-21.5	Pass
488.500	Qp	H	320	3.0	38.8	-10.5	28.3	46.0	-17.7	Pass
488.500	Qp	V	180	1.0	38.5	-10.5	28.0	46.0	-18.0	Pass
586.200	Qp	H	45	2.5	37.2	-8.9	28.3	46.0	-17.7	Pass
586.200	Qp	V	270	1.0	38.0	-8.9	29.1	46.0	-16.9	Pass
683.900	Qp	H	355	2.5	39.5	-7.3	32.2	46.0	-13.8	Pass
683.900	Qp	V	125	1.0	36.6	-7.3	29.3	46.0	-16.7	Pass
781.600	Qp	H	25	2.0	36.4	-5.9	30.5	46.0	-15.5	Pass
781.600	Qp	V	145	1.0	36.9	-5.9	31.0	46.0	-15.0	Pass
879.300	Qp	H	45	2.0	38.0	-4.5	33.5	46.0	-12.5	Pass
879.300	Qp	V	75	1.0	37.5	-4.5	33.0	46.0	-13.0	Pass
977.000	Qp	H	90	1.5	37.5	-2.9	34.6	54.0	-19.4	Pass
977.000	Qp	V	90	1.0	36.5	-2.9	33.6	54.0	-20.4	Pass

Table 4.2-4: 15.109(a) Cassette Adapter Radiated Emission Measurements Out-of-Band – 106.3MHz

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)	FCC/IC Limit (dBuV/m)	FCC/IC Margin (dB)	Pass/Fail
212.600	Qp	H	355	2.5	42.1	-20.4	21.7	43.5	-21.8	Pass
212.605	Qp	V	155	1.0	43.2	-20.4	22.8	43.5	-20.7	Pass
318.905	Qp	H	280	2.5	37.8	-15.3	22.5	46.0	-23.5	Pass
318.905	Qp	V	45	1.0	37.1	-15.3	21.8	46.0	-24.2	Pass
425.205	Qp	H	150	3.0	37.2	-12.0	25.2	46.0	-20.8	Pass
425.205	Qp	V	75	1.0	37.2	-12.0	25.2	46.0	-20.8	Pass
531.505	Qp	H	180	2.5	35.3	-9.7	25.6	46.0	-20.4	Pass
531.505	Qp	V	150	1.0	36.7	-9.7	27.0	46.0	-19.0	Pass
637.805	Qp	H	270	2.5	38.2	-8.4	29.8	46.0	-16.2	Pass
637.805	Qp	V	270	1.0	36.7	-8.4	28.3	46.0	-17.7	Pass
744.105	Qp	H	45	2.0	37.5	-6.2	31.3	46.0	-14.7	Pass
744.105	Qp	V	25	1.0	38.1	-6.2	31.9	46.0	-14.1	Pass
850.405	Qp	H	90	2.0	37.2	-4.7	32.5	46.0	-13.5	Pass
850.405	Qp	V	290	1.0	36.1	-4.7	31.4	46.0	-14.6	Pass
956.705	Qp	H	75	1.5	36.2	-3.3	32.9	46.0	-13.1	Pass
956.705	Qp	V	90	1.0	36.3	-3.3	33.0	46.0	-13.0	Pass
1063.005	Av	H	90	1.5	38.1	-2.1	36.0	54.0	-18.0	Pass
1063.005	Pk	H	90	1.0	25.8	-2.1	23.7	74.0	-50.3	Pass
1063.005	Av	V	180	1.0	37.2	-2.1	35.1	54.0	-18.9	Pass
1063.005	Pk	V	180	1.0	27.0	-2.1	24.9	74.0	-49.1	Pass

Test Personnel:

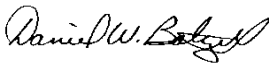
Dan Baltzell EMC Engineer	 Signature	August 6, 2009 Date Of Tests
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Table 4.2-5: Radiated Emissions Equipment List

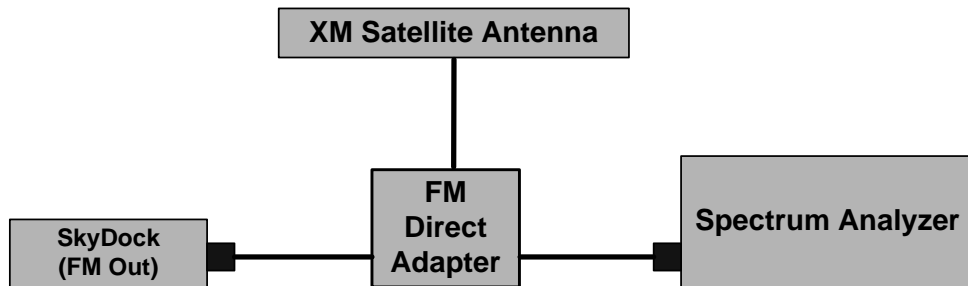
Part Type	Manufacturer	Model	Serial Number	Barcode	Cal Due Date
Radiated Emissions (OATS1)					
Amplifier (20 MHz - 2 GHz)	Rhein Tech Laboratories, Inc.	PR-1040	900905	900905	6/2/2010
Bi-Log Antenna (20 MHz - 2 GHz)	Schaffner Chase	CBL6112B	2099	900791	12/12/2010
EMI Receiver RF Section, 9 KHz - 6.5 GHz	Hewlett Packard	85462A	3325A00159	900913	4/15/2010
RF Filter Section, 100 KHz to 6.5 GHz	Hewlett Packard	85460A	3330A00107	900914	4/15/2010
Emissions testing software	Rhein Tech Laboratories, Inc.	Automated Emission Tester	Rev. 14.0.2	N/A	N/A

4.3 200 kHz Bandwidth Measurement FCC 15.239(a) – Test Configuration 5: FM Direct Adapter (BW)

The FM transmitter audio level was set to maximum. The EUT was setup as shown in Test Configuration 5. The 200 kHz bandwidth measurements were made at 88.1 MHz, 96.9 MHz and 107.9 MHz. The bandwidth at 20 dB down from the highest in-band spectral density was measured with the spectrum analyzer connected to the audio output port on the SkyDock. The 20 dB bandwidth was measured with the EUT receiving a live satellite broadcast as well iTunes MP3 files played from the iPod/iTouch device. The 20 dB bandwidth measurements were made with modulation. All measurements were made with the spectrum analyzer in max hold. The test results are shown in Table 4.3-1. The plots of the bandwidth measurements are shown in plots 4.3-1 through 4.3-3 below.

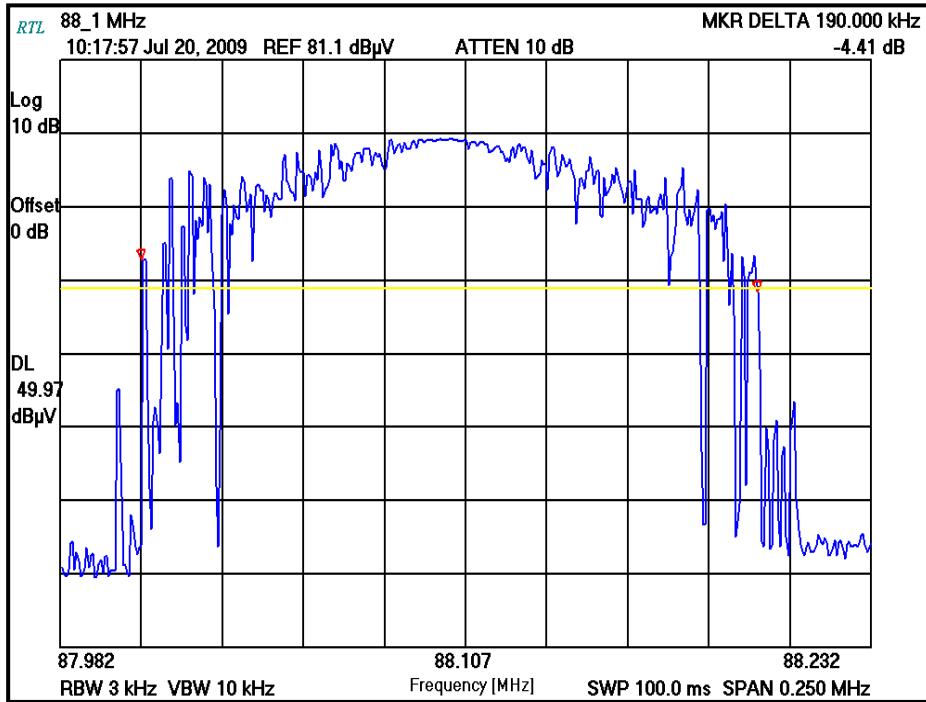
Table 4.3-1: 200 kHz Bandwidth Measurements

Frequency (MHz)	Mode	200 kHz Bandwidth Test Results	
		(kHz)	Pass / Fail
88.1	With Modulation Live Satellite	190.0	Pass
96.9	With Modulation Live Satellite	180.6	Pass
106.3	With Modulation Live Satellite	176.9	Pass
88.1	With Modulation - iTunes	184.4	Pass
96.9	With Modulation - iTunes	180.0	Pass
106.3	With Modulation - iTunes	179.4	Pass

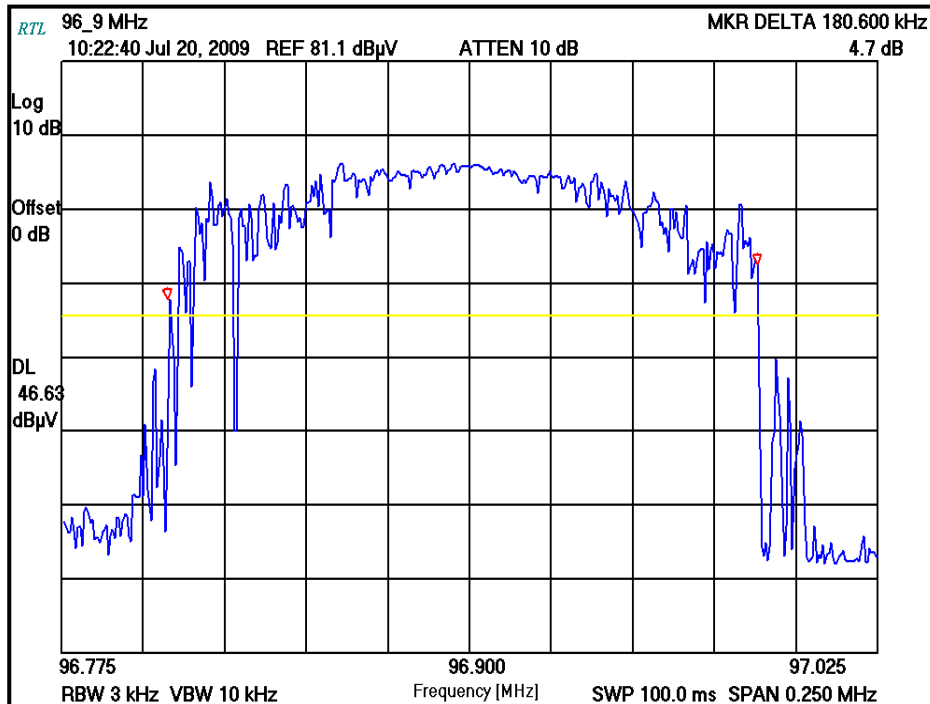


Test Configuration 5: Occupied Bandwidth Test Setup

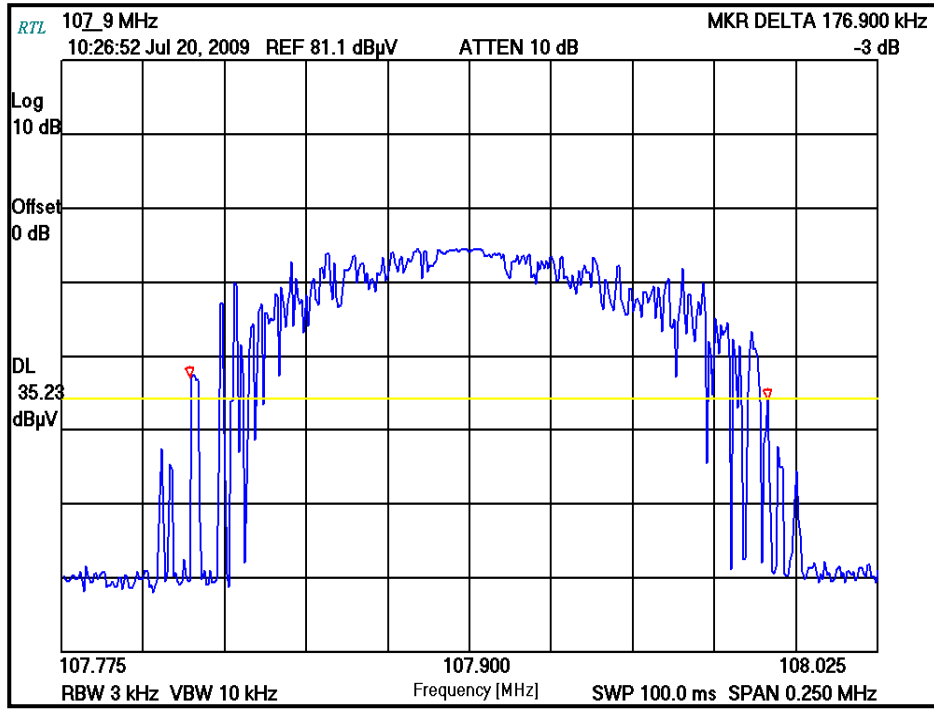
The plots of the 20 dB bandwidths are shown below. The plots were taken using the peak detector with the spectrum analyzer in max hold.



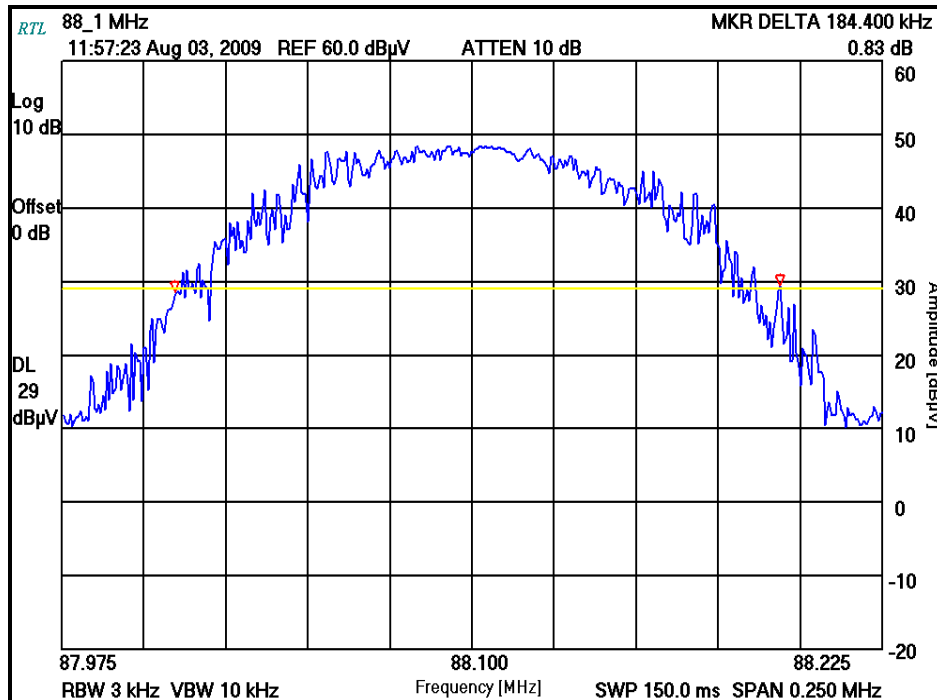
Plot 4.3-1: Bandwidth Plot at 88.1 MHz Live Satellite



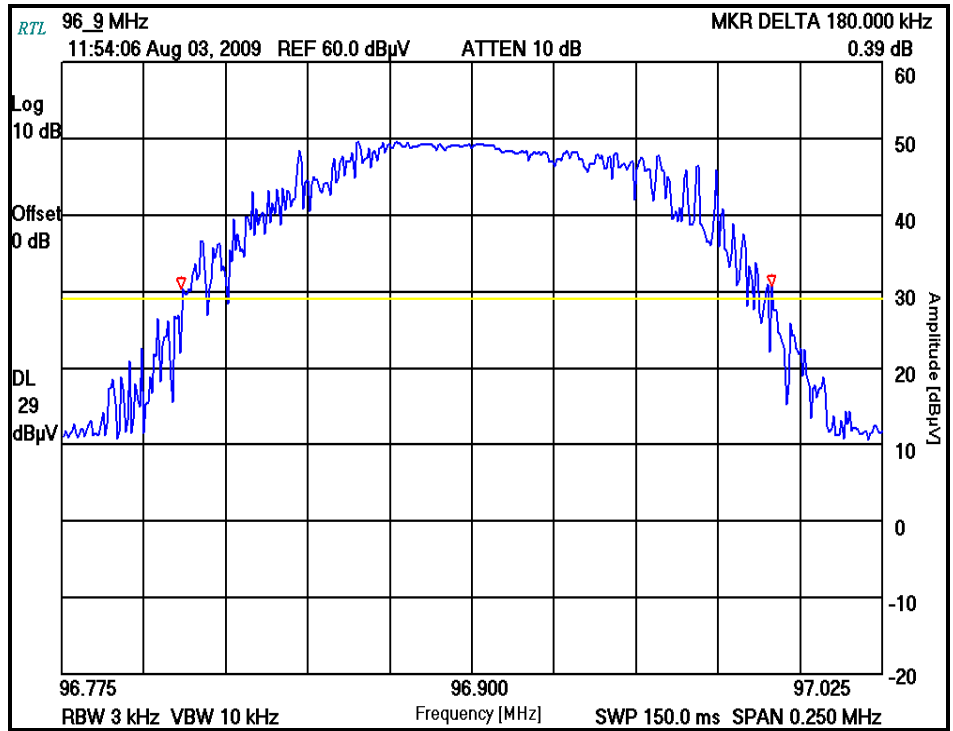
Plot 4.3-2: Bandwidth Plot at 96.9 MHz Live Satellite



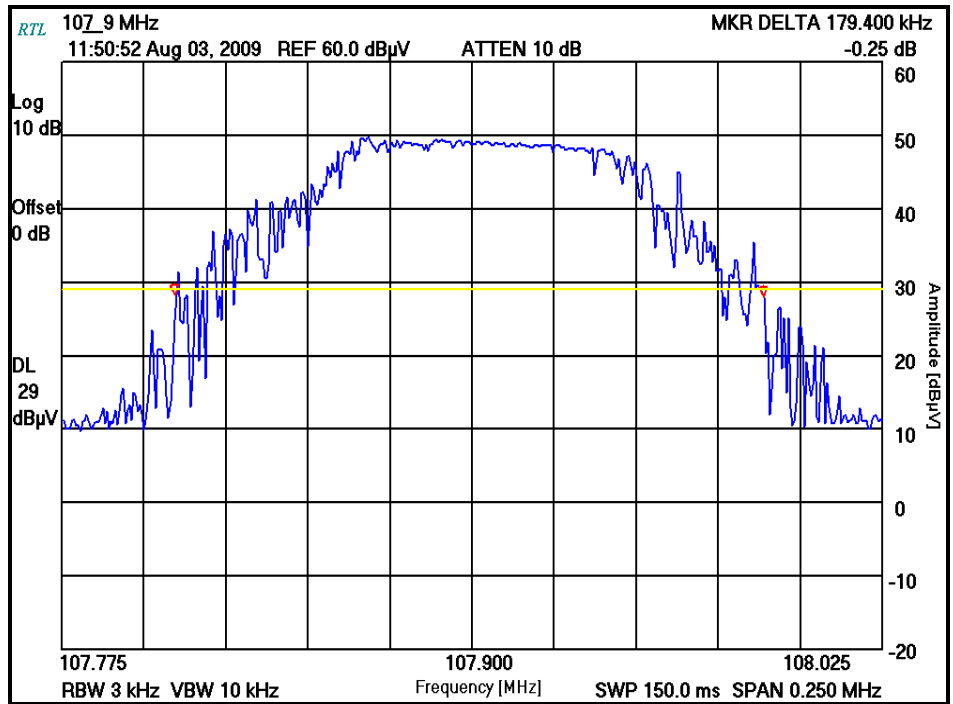
Plot 4.3-3: Bandwidth Plot at 107.9 MHz Live Satellite



Plot 4.3-4: Bandwidth Plot at 89.1 MHz iPod Touch iTunes



Plot 4.3-5: Bandwidth Plot at 96.9 MHz iPod Touch iTunes

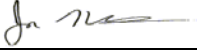


Plot 4.3-6: Bandwidth Plot at 106.3 MHz iPod Touch iTunes

Table 4.3-2: Bandwidth Equipment List

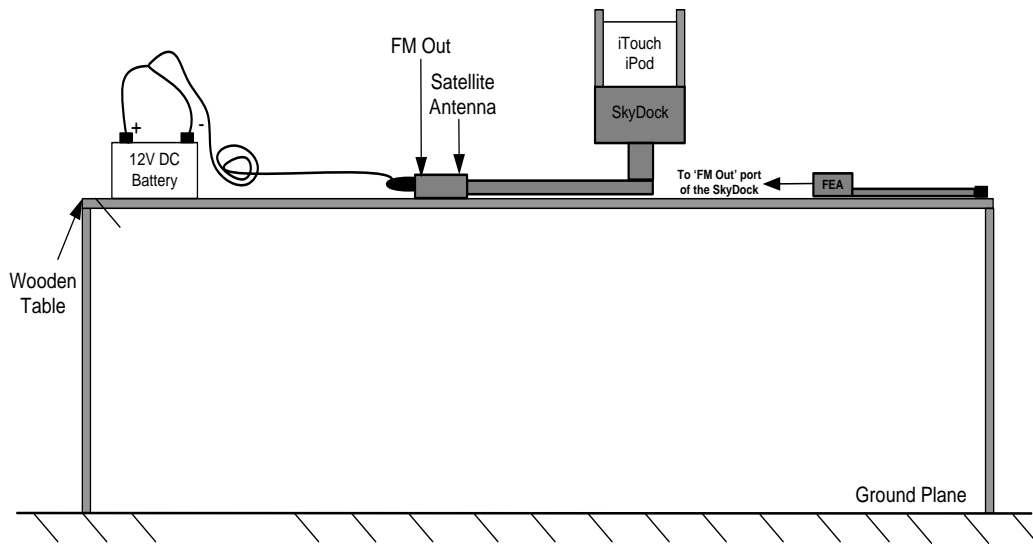
Part Type	Manufacturer	Model	Serial Number	Barcode	Cal Due Date
EMI Receiver RF Section, (9 KHz - 6.5 GHz)	Hewlett Packard	85462A	3325A00159	900913	4/15/2010
RF Filter Section, (100 KHz to 6.5 GHz)	Hewlett Packard	85460A	3330A00107	900914	4/15/2010

Test Personnel:

Jon Wilson EMC Engineer	 Signature	July 20, 2009 Date Of Tests
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4.4 Radiated Spurious Emission Measurements - Test Configuration 6: FEA

The EUT was configured as shown in Test Configuration 6. The out-of-band radiated emissions were measured at a distance of three meters. The EUT was powered by a fully charged 12 Vdc car battery. The FM Modulator was enabled and the audio level was set to the maximum, under this configuration, the transmitter's (CLA) center pin is disabled. The EUT was configured to receive a live satellite broadcast. The cables were manipulated to produce the highest emission level. The EUT was tested using the following frequencies: 89.1 MHz, 97.7 MHz and 106.3 MHz. Data was taken for both horizontal and vertical antenna polarizations. The test configuration is shown below.



Test Configuration 6: Car Cradle with FEA (FM Extender Antenna) In-Band Radiated Emissions

Table 4.4-1: 15.239(b) FEA Radiated Emission Measurements In-Band

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)	FCC Limit (dBuV/m)	FCC Margin (dB)	IC Limit (dBuV/m)	IC Margin (dB)	Pass/Fail
89.100	Qp	H	95	3.0	63.3	-22.9	40.4	48.0	-7.6	60.0	-19.6	Pass
89.100	Qp	V	120	3.5	51.4	-22.9	28.5	48.0	-19.5	60.0	-31.5	Pass
97.700	Qp	H	90	1.8	64.7	-20.8	43.9	48.0	-4.1	60.0	-16.1	Pass
97.700	Qp	V	290	3.5	51.2	-20.8	30.4	48.0	-17.6	60.0	-29.6	Pass
106.300	Qp	H	90	2.5	63.2	-19.6	43.6	48.0	-4.4	60.0	-16.4	Pass
106.300	Qp	V	30	4.0	57.5	-19.6	37.9	48.0	-10.1	60.0	-22.1	Pass

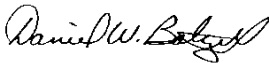
Based on the operational mode of this test setup, 15.239 emissions limits apply to the above data table.

Note: There were no out of band emissions found for all frequencies.

Table 4.4-2: Radiated Emissions Equipment List

Part Type	Manufacturer	Model	Serial Number	Barcode	Cal Due Date
Radiated Emissions (OATS1)					
Amplifier (20 MHz - 2 GHz)	Rhein Tech Laboratories, Inc.	PR-1040	900905	900905	6/2/2010
Bi-Log Antenna (20 MHz - 2 GHz)	Schaffner Chase	CBL6112B	2099	900791	12/12/2010
EMI Receiver RF Section, 9 KHz - 6.5 GHz	Hewlett Packard	85462A	3325A00159	900913	4/15/2010
RF Filter Section, 100 KHz to 6.5 GHz	Hewlett Packard	85460A	3330A00107	900914	4/15/2010
Emissions testing software	Rhein Tech Laboratories, Inc.	Automated Emission Tester	Rev. 14.0.2	N/A	N/A

Test Personnel:

Dan Baltzell EMC Engineer	 Signature	August 6, 2009 Date Of Tests
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5 Sample Calculations

5.1 Radiated Emissions Measurement Sample Calculation

$$\text{Limit} = 150 \mu\text{V/m} = 20 * \log (150\mu\text{V}/1\mu\text{V}) = 43.5 \text{ dB}\mu\text{V/m}$$

$$\text{Field Strength Level}_{(\text{dB}\mu\text{V/m})} = \text{Analyzer Level}_{(\text{dB}\mu\text{V})} + \text{Site Correction Factor}_{(\text{dB})}$$

Where:

$$\text{Site Correction Factor}_{(\text{dB})} = \text{Antenna Correction Factor}_{(\text{dB})} + \text{Cable Loss}_{(\text{dB})} - \text{Preamp Gain}_{(\text{dB})}$$

$$\text{Margin}_{(\text{dB})} = \text{Field Strength Level} - \text{Limit}$$

6 Conclusion

The data in this test report demonstrate that the **Sirius XM Radio SkyDock FM Transmitter, Model # XVSAP1V1, FCC ID: RS2XVSAP1V1** is in compliance with the requirements specified within FCC Part 15 Subpart B.