Engineering and Testing for EMC and Safety Compliance

Accredited under A2LA Testing Certificate # 2653.01

Certification Application Report
FCC Part 15 Subpart B

Test Lab:	Applicant:
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	XM Radio Inc. 1500 Eckington Place NE Washington, DC 20002-2164 Contact: James Blitz

FCC ID	RS2XDPRCL1	**Test Report Date**	August 12, 2009
EUT	Xpress RCi	**RTL Work Order Number**	2009219
Model #	XDRC2	**RTL Quote Number**	QRTL09-332

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 12, 2009

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

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1 General Information

1.1 Scope

FCC Rules Part 15 Subpart B, rule section 15.209

RSS-210 Issue 7 June 2007: Low Power License-Exempt Radio Communication Devices (All Frequency Bands)

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 Xpress RCi FM Transmitter, Model # XDRC2, FCC ID: RS2XDPRCL1.** The FM transmitter is located within the satellite broadcast receiver but is only capable of FM transmissions in the Vehicle Mode while docked in the car cradle. The test data contained in this report pertains only to the equipment tested.

2.2 Operation Mode

The **Sirius XM Radio Xpress RCi FM Transmitter** was set to transmit in the FM band while receiving live satellite broadcast. The EUT was tested while receiving live satellite broadcast.

2.3 Test Configuration Descriptions

The **Sirius XM Radio Xpress RCi FM Transmitter** was tested in a total of seven 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 Xpress RCi 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 Document: Xpress RCi; dated June 17, 2009. It should be noted that the Xpress RCi uses the following connection methods: Standalone injected FM Cigarette Lighter Adapter (CLA), FM Direct, Cassette, FM Extender Antenna (FEA), and SureConnect. This report contains all but the standalone connect which can be found in report 2009219 Sirius XM Xpress RCi FCC 15.239 IC RSS-210 Report R0.0.pdf.

3.2 Exercising the EUT

The EUT was tested with the FM modulator enabled while receiving live satellite broadcast. The EUT was tested using 89.1 MHz, 97.7 MHz and 106.3 MHz. There were no deviations from the test standard(s) and/or methods. The EUT was tested using frequencies from the low, mid, and high bands across its frequency tuning range 88.1 MHz-107.9 MHz. The lowest and highest tuning frequencies, namely, 88.1 MHz and 107.9 MHz, were not used during testing due to very strong local ambient that prevented their use. The tuning range of the Xpress RCi was verified during testing. 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
Xpress RCi	Sirius XM	XDRC2	FCC unit 1: HW P2SWV12	N/A	019076
Home Cradle	Audiovox	XPRESS HOME, 136-4060	071100000213640601	N/A	019068
Home AC Adapter	Phihong	PSM08A-052	N/A	Unshielded	019069
Home Antenna	Sirius XM	Satellite Radio	N/A	Shielded	019070
Vehicle Cradle (Gen2)	Audiovox	XDPIV1	CJ 1769	N/A	019078
Vehicle Cradle (Xpress)	Sirius XM	XPREZCAR_P8	13644580P08	N/A	019083
Power adapter for Gen2 cradle (to cradle)	Sirius XM	SXDPIP1, iFMCLA	HW: PV	N/A	019081
Power adapter for Xpress cradle (to cradle)	Sirius XM	CLA	N/A	Unshielded	019072
Vehicle XM Antenna	Sirius XM	Satellite Radio	N/A	N/A	019075
FM Direct Adapter	Sirius XM	FMDA25	N/A	Shielded	019102
FEA Adapter	Sirius XM	FEA Adapter	N/A	Unshielded	019104
SureConnect	Sirius XM	SureConnect	N/A	Shielded	019084
Cassette Adapter	Sirius XM	Cassette Adapter	N/A	Unshielded	019073
Car Aerial Antenna	Radio Shack	N/A	N/A	Shielded	019074
12V battery	Valucraft	N/A	N/A	N/A	N/A
CLA Power Adapter (socket)	Sirius XM	N/A	N/A	Unshielded	N/A

4 Emissions

4.1 Conducted Emissions FCC 15.107(a)

4.1.1 Test Configuration 1: Xpress RCi w/ Home Cradle

The conducted emissions were measured on the 120 Vac Line and Neutral power leads. The EUT was powered by the AC adapter. The audio level was set to the maximum audio level. The EUT was configured to receive a live satellite broadcast. The test configuration is shown below.

The data was recorded using a RBW of 9 kHz and a VBW of 100 kHz. The data was recorded using a Quasi Peak and Average detector.

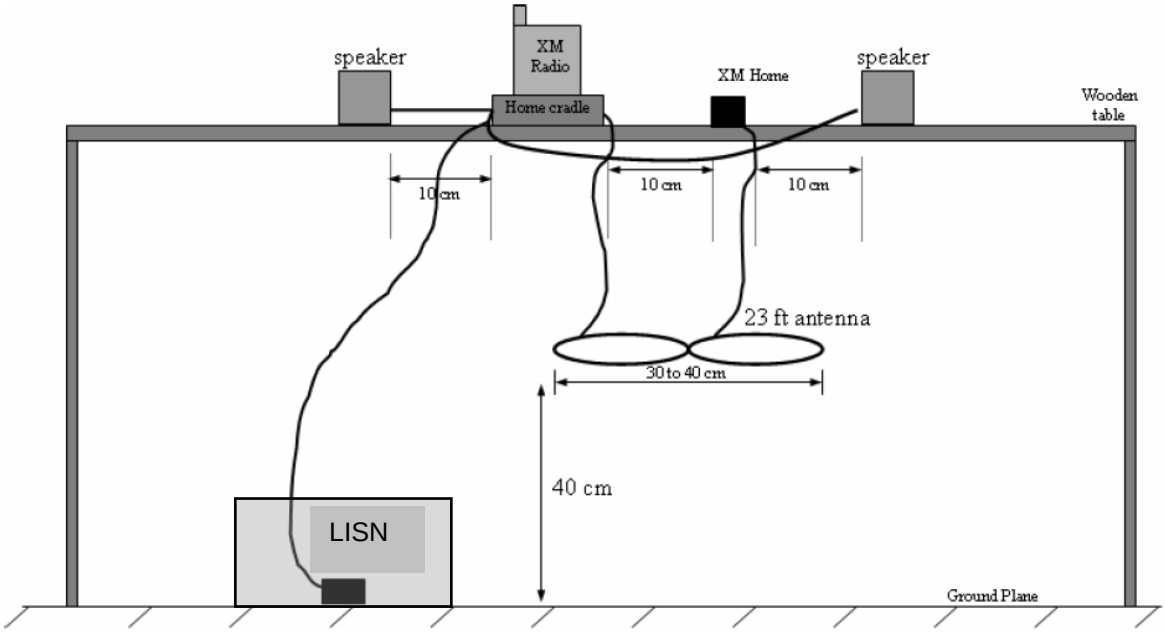


Figure 4.1-1: Test Configuration 1 - Xpress RCi w/ Home Cradle Conducted Emissions Setup

4.1.2 Conducted Emissions Test Data

Temperature: 74°F Humidity: 36%

Table 4.1-1: Conducted Emissions 120 Vac Phase

Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	CISPR B QP Limit (dBuV)	CISPR B QP Margin (dBuV)	CISPR B AV Limit (dBuV)	CISPR B AV Margin (dBuV)	Pass/ Fail
0.264	Av	29.5	0.2	29.7	61.3	-31.6	51.3	-21.6	Pass
0.264	Qp	40.4	0.2	40.6	61.3	-20.7	51.3	-10.7	Pass
0.309	Av	31.0	0.3	31.3	60.0	-28.7	50.0	-18.7	Pass
0.309	Qp	40.8	0.3	41.1	60.0	-18.9	50.0	-8.9	Pass
0.659	Qp	50.9	0.2	51.1	56.0	-4.9	46.0	---	Pass
0.659	Av	33.2	0.2	33.4	56.0	-22.6	46.0	-12.6	Pass
8.130	Pk	42.4	1.5	43.9	60.0	-16.1	50.0	-6.1	Pass
17.030	Pk	33.0	2.2	35.2	60.0	-24.8	50.0	-14.8	Pass
24.660	Pk	25.1	2.6	27.7	60.0	-32.3	50.0	-22.3	Pass

Table 4.1-2: Conducted Emissions 120 Vac Neutral

Emission Frequency (MHz)	Test Detector	Analyzer Reading (dBuV)	Site Correction Factor (dB)	Emission Level (dBuV)	CISPR B QP Limit (dBuV)	CISPR B QP Margin (dBuV)	CISPR B AV Limit (dBuV)	CISPR B AV Margin (dBuV)	Pass/ Fail
0.177	Av	26.3	0.2	26.5	64.6	-38.1	54.6	-28.1	Pass
0.309	Qp	38.7	0.3	39.0	60.0	-21.0	50.0	-11.0	Pass
0.309	Av	27.3	0.3	27.6	60.0	-32.4	50.0	-22.4	Pass
0.662	Qp	47.4	0.3	47.7	56.0	-8.3	46.0	---	Pass
0.663	Av	32.8	0.3	33.1	56.0	-22.9	46.0	-12.9	Pass
7.990	Pk	42.0	1.5	43.5	60.0	-16.5	50.0	-6.5	Pass
16.580	Pk	33.4	2.2	35.6	60.0	-24.4	50.0	-14.4	Pass
24.590	Pk	21.3	2.6	23.9	60.0	-36.1	50.0	-26.1	Pass

4.2 Unintentional Radiated Emissions 15.109(a)

4.2.1 Test Configuration 2: Xpress RCi w/ Home Cradle

The unintentional radiated emissions were measured at a distance of three meters. The EUT was powered by the AC adapter. The audio level was set to the maximum audio level. The EUT was configured to receive live satellite broadcast.

The data was recorded using a RBW of 120 kHz and a VBW of 300 kHz. The data was recorded using a Quasi Peak detector.

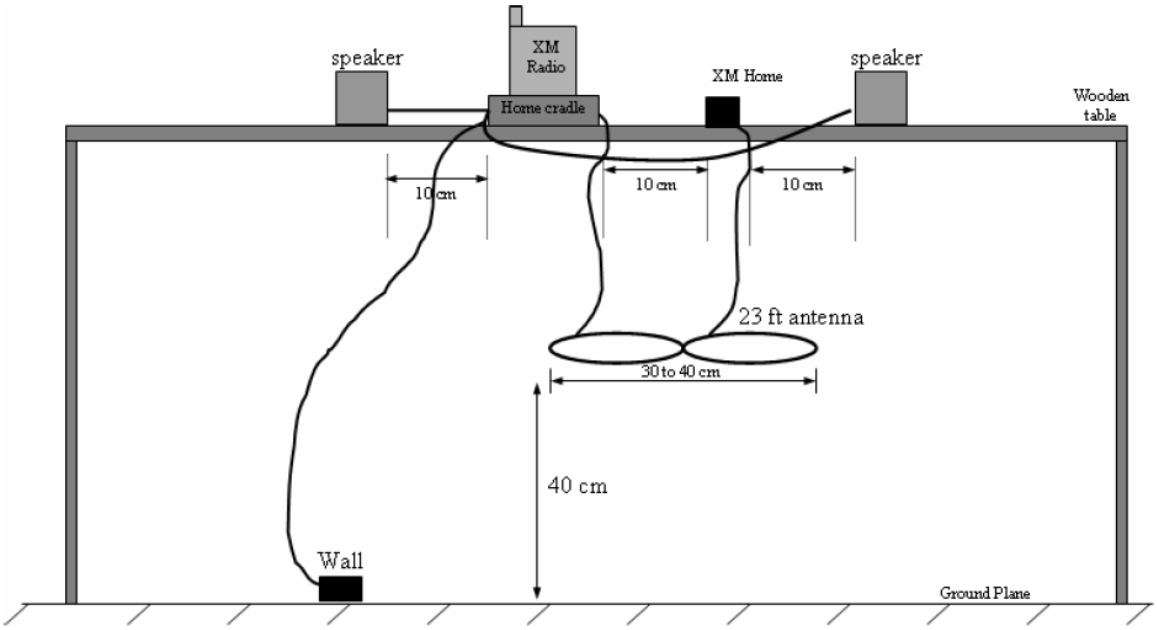


Figure 4.2-1: Test Configuration 2 – Xpress RCi w/ Home Cradle

4.2.2 Radiated Measurement Data for Xpress RCi w/Home Cradle (15.109(a))

Temperature: 83°F Humidity: 65%

Table 4.2-1: Radiated Measurement Data

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)	Pass/ Fail
79.525	Qp	H	180	2.0	49.0	-24.7	24.3	40.0	-15.7	Pass
79.525	Qp	V	270	1.0	47.5	-24.7	22.8	40.0	-17.2	Pass
145.068	Qp	H	0	1.0	35.5	-19.8	15.7	43.5	-27.8	Pass
145.068	Qp	V	0	1.0	35.8	-19.8	16.0	43.5	-27.5	Pass
218.420	Qp	H	90	2.0	38.0	-20.4	17.6	46.0	-28.4	Pass
218.420	Qp	V	180	1.0	37.3	-20.4	16.9	46.0	-29.1	Pass
312.000	Qp	H	120	1.0	35.6	-15.4	20.2	46.0	-25.8	Pass
312.000	Qp	V	0	1.0	35.0	-15.4	19.6	46.0	-26.4	Pass
360.000	Qp	H	90	1.0	39.1	-13.8	25.3	46.0	-20.7	Pass
360.000	Qp	V	0	1.0	34.2	-13.8	20.4	46.0	-25.6	Pass
800.736	Qp	H	0	1.0	33.7	-5.3	28.4	46.0	-17.6	Pass
800.736	Qp	V	0	1.0	33.9	-5.3	28.6	46.0	-17.4	Pass

4.3 Radiated Emission Measurements - Test Configuration 3: Xpress RCi with FM Direct Adapter

The EUT was configured as shown in the configuration below. 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 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: 89.1 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.

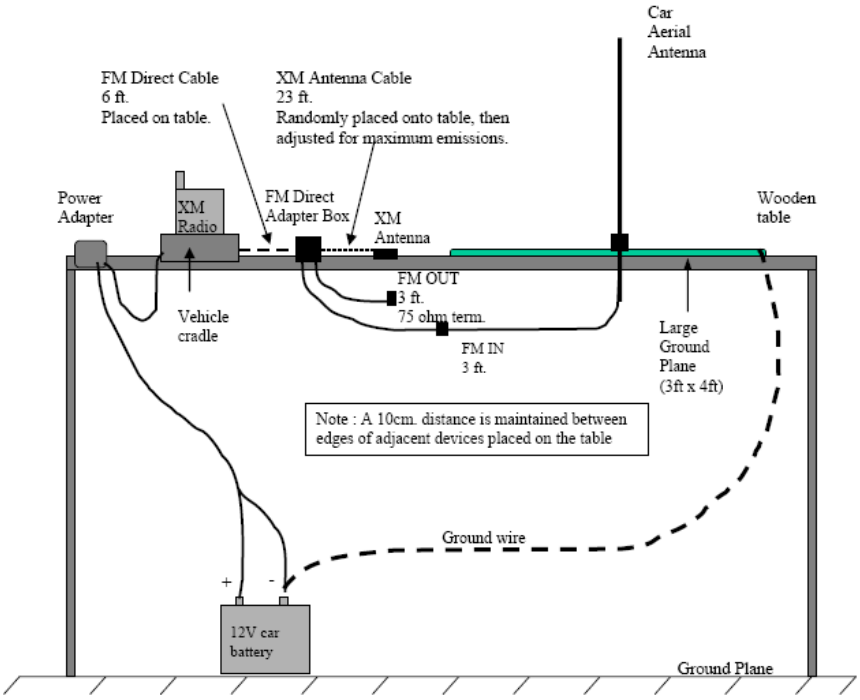


Figure 4.3-1: Test Configuration 3: Xpress RCi with FM Direct Adapter

4.3.1 15.109(a) Radiated Emission Measurements: Xpress RCi with FM Direct Adapter

Table 4.3-1: FM Direct Adapter with Gen 2 Cradle

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)	Pass/ Fail
71.999	Qp	V	90	1.0	43.2	-26.0	17.2	40.0	-22.8	Pass
72.000	Qp	H	180	2.5	47.4	-26.0	21.4	40.0	-18.6	Pass
143.999	Qp	V	30	1.0	38.2	-19.8	18.4	43.5	-25.1	Pass
144.000	Qp	H	90	2.0	39.6	-19.8	19.8	43.5	-23.7	Pass
168.012	Qp	H	230	1.5	41.2	-19.8	21.4	43.5	-22.1	Pass
168.012	Qp	V	180	1.0	37.9	-19.8	18.1	43.5	-25.4	Pass
215.999	Qp	V	0	1.0	41.8	-20.5	21.3	43.5	-22.2	Pass
216.000	Qp	H	180	1.0	41.6	-20.5	21.1	43.5	-22.4	Pass
288.000	Qp	H	260	1.0	46.7	-16.6	30.1	46.0	-15.9	Pass
288.040	Qp	V	270	1.0	42.7	-16.6	26.1	46.0	-19.9	Pass
359.994	Qp	H	225	1.0	47.2	-13.8	33.4	46.0	-12.6	Pass
360.001	Qp	V	180	1.0	39.5	-13.8	25.7	46.0	-20.3	Pass
431.994	Qp	H	270	1.0	37.0	-12.0	25.0	46.0	-21.0	Pass
432.001	Qp	V	0	1.0	34.3	-12.0	22.3	46.0	-23.7	Pass
503.994	Qp	H	225	1.0	35.1	-10.3	24.8	46.0	-21.2	Pass
504.001	Qp	V	180	1.0	35.5	-10.3	25.2	46.0	-20.8	Pass

Table 4.3-2: FM Direct Adapter with Xpress Cradle

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)	Pass/ Fail
30.500	Qp	H	0	1.0	33.9	-13.9	20.0	40.0	-20.0	Pass
30.500	Qp	V	0	1.0	35.8	-13.9	21.9	40.0	-18.1	Pass
144.000	Qp	H	120	1.0	36.8	-19.8	17.0	43.5	-26.5	Pass
144.000	Qp	V	180	1.0	35.4	-19.8	15.6	43.5	-27.9	Pass
168.012	Qp	H	180	1.0	34.7	-19.8	14.9	43.5	-28.6	Pass
168.012	Qp	V	270	3.0	35.0	-19.8	15.2	43.5	-28.3	Pass
288.004	Qp	H	270	1.0	37.3	-16.6	20.7	46.0	-25.3	Pass
288.040	Qp	V	225	1.0	39.9	-16.6	23.3	46.0	-22.7	Pass
312.000	Qp	H	250	1.0	41.1	-15.4	25.7	46.0	-20.3	Pass
312.000	Qp	V	70	1.0	34.3	-15.4	18.9	46.0	-27.1	Pass
360.000	Qp	H	225	1.0	40.0	-13.8	26.2	46.0	-19.8	Pass
360.000	Qp	V	0	1.0	36.7	-13.8	22.9	46.0	-23.1	Pass
431.996	Qp	H	170	1.0	40.1	-12.0	28.1	46.0	-17.9	Pass
431.996	Qp	V	220	1.0	36.0	-12.0	24.0	46.0	-22.0	Pass
800.000	Qp	H	0	1.0	32.3	-5.3	27.0	46.0	-19.0	Pass
800.000	Qp	V	0	1.0	32.4	-5.3	27.1	46.0	-18.9	Pass

4.4 Radiated Spurious Emission Measurements - Test Configuration 4: Xpress RCi with Cassette Adapter

The EUT was configured as shown in Test Configuration 4. The 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.

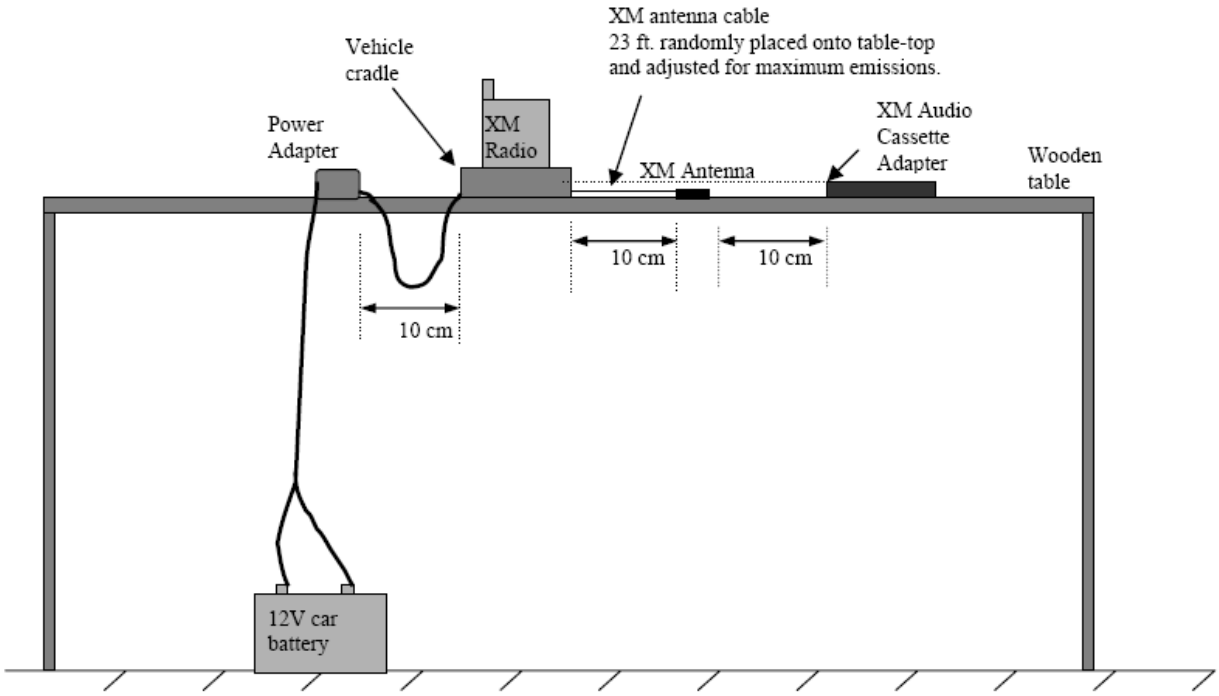


Figure 4.4-1: Test Configuration 4: Xpress RCi with Cassette Adapter

4.4.1 15.109(a) Radiated Emission Measurements: Xpress RCi with Cassette Adapter

Table 4.4-1: Cassette Adapter with Gen 2 Cradle

Temperature: 83°F Humidity: 65%										
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)	Pass/ Fail
79.525	Qp	V	0	1.0	42.0	-24.7	17.3	40.0	-22.7	Pass
79.825	Qp	H	180	1.0	34.6	-24.6	10.0	40.0	-30.0	Pass
144.000	Qp	H	20	1.4	44.3	-19.8	24.5	43.5	-19.0	Pass
144.000	Qp	V	180	1.0	36.5	-19.8	16.7	43.5	-26.8	Pass
168.880	Qp	H	90	1.0	34.2	-19.8	14.4	43.5	-29.1	Pass
168.880	Qp	V	180	1.0	36.5	-19.8	16.7	43.5	-26.8	Pass
218.500	Qp	H	90	1.5	43.1	-20.4	22.7	46.0	-23.3	Pass
218.500	Qp	V	180	1.0	38.8	-20.4	18.4	46.0	-27.6	Pass
312.000	Qp	H	180	1.0	43.4	-15.4	28.0	46.0	-18.0	Pass
312.000	Qp	V	180	2.0	37.6	-15.4	22.2	46.0	-23.8	Pass
360.000	Qp	H	225	1.0	47.1	-13.8	33.3	46.0	-12.7	Pass
360.000	Qp	V	90	2.0	38.0	-13.8	24.2	46.0	-21.8	Pass
800.000	Qp	H	0	1.0	33.3	-5.3	28.0	46.0	-18.0	Pass
800.000	Qp	V	0	1.0	33.6	-5.3	28.3	46.0	-17.7	Pass

Table 4.4-2: Cassette Adapter with Xpress Cradle

Temperature: 83°F Humidity: 67%										
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)	Pass/ Fail
30.500	Qp	H	180	1.0	33.9	-13.9	20.0	40.0	-20.0	Pass
30.500	Qp	V	0	1.0	35.6	-13.9	21.7	40.0	-18.3	Pass
80.500	Qp	H	0	3.0	37.1	-24.5	12.6	40.0	-27.4	Pass
80.500	Qp	V	180	1.0	37.1	-24.5	12.6	40.0	-27.4	Pass
144.000	Qp	H	90	3.0	41.0	-19.8	21.2	43.5	-22.3	Pass
144.000	Qp	V	180	1.0	43.3	-19.8	23.5	43.5	-20.0	Pass
145.130	Qp	H	180	2.6	38.3	-19.8	18.5	43.5	-25.0	Pass
145.130	Qp	V	180	1.5	36.3	-19.8	16.5	43.5	-27.0	Pass
168.012	Qp	H	180	1.2	38.9	-19.8	19.1	43.5	-24.4	Pass
168.012	Qp	V	90	1.0	36.4	-19.8	16.6	43.5	-26.9	Pass
312.000	Qp	H	180	1.0	38.9	-15.4	23.5	46.0	-22.5	Pass
312.000	Qp	V	120	1.5	35.2	-15.4	19.8	46.0	-26.2	Pass
360.000	Qp	H	225	1.0	37.7	-13.8	23.9	46.0	-22.1	Pass
360.000	Qp	V	0	1.0	34.1	-13.8	20.3	46.0	-25.7	Pass
800.000	Qp	H	180	1.0	33.8	-5.3	28.5	46.0	-17.5	Pass
800.000	Qp	V	0	1.0	32.3	-5.3	27.0	46.0	-19.0	Pass
1201.125	Pk	H	180	1.0	33.6	0.0	33.6	74.0	-40.4	Pass
1201.125	Av	H	180	1.0	26.7	0.0	26.7	54.0	-20.4	Pass
1201.125	Pk	V	0	1.0	32.2	0.0	32.2	74.0	-41.8	Pass
1201.125	Av	V	0	1.0	26.0	0.0	26.0	54.0	-21.8	Pass

4.5 Radiated Spurious Emission Measurements - Test Configuration 6: Xpress RCi with Gen 2 Car Cradle and FEA Unit

The EUT was configured as shown in the configuration below. The 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 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 following frequencies: 89.1 MHZ, 97.7 MHz and 106.3 MHz. Data was taken for both horizontal and vertical antenna polarizations with the worst case levels recorded.

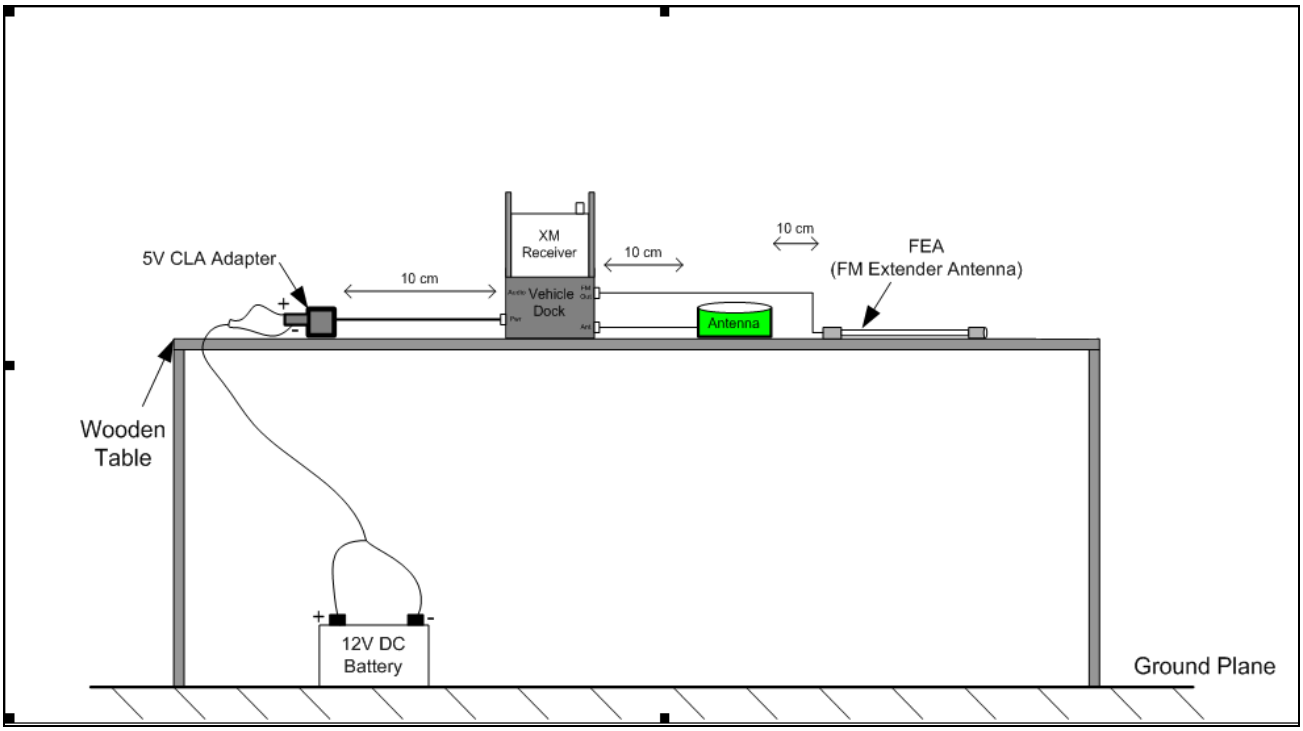


Figure 4.5-1: Test Configuration 6 - Xpress RCi with Gen 2 Car Cradle and FEA unit

4.5.1 Radiated Emission Measurements: Xpress RCi with Gen 2 Car Cradle and FEA unit

Temperature: 85°F **Humidity: 55%**

Table 4.5-1: FEA Adapter with Gen 2 Cradle - In-Band (15.239)

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	90	3.5	57.3	-22.9	34.4	48.0	-13.6	60.0	-25.6
89.100	Qp	V	10	1.0	52.0	-22.9	29.1	48.0	-18.9	60.0	-30.9
97.700	Qp	H	290	3.5	61.3	-20.8	40.5	48.0	-7.5	60.0	-19.5
97.700	Qp	V	15	1.0	56.1	-20.8	35.3	48.0	-12.7	60.0	-24.7
106.300	Qp	H	100	2.8	52.0	-19.6	32.4	48.0	-15.6	60.0	-27.6
106.300	Qp	V	0	1.0	48.1	-19.6	28.5	48.0	-19.5	60.0	-31.5

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

Table 4.5-2: FEA Adapter with Gen 2 Cradle - Out-of-Band (15.209)

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
195.425	Qp	H	355	3.0	43.9	-20.1	23.8	43.5	-19.7	Pass
212.600	Qp	V	45	1.0	41.6	-20.4	21.2	43.5	-22.3	Pass
293.125	Qp	H	200	3.5	37.6	-16.5	21.1	46.0	-24.9	Pass
318.900	Qp	V	95	1.0	41.8	-15.3	26.5	46.0	-19.5	Pass
390.825	Qp	H	190	3.2	38.2	-13.3	24.9	46.0	-21.1	Pass
425.200	Qp	V	90	1.0	36.7	-12.0	24.7	46.0	-21.3	Pass
488.525	Qp	H	100	3.0	39.5	-10.5	29.0	46.0	-17.0	Pass
531.500	Qp	V	180	1.0	40.2	-9.7	30.5	46.0	-15.5	Pass
586.225	Qp	H	335	3.0	41.0	-8.9	32.1	46.0	-13.9	Pass
637.800	Qp	V	90	1.0	37.8	-8.4	29.4	46.0	-16.6	Pass
683.925	Qp	H	210	3.0	37.6	-7.3	30.3	46.0	-15.7	Pass
744.100	Qp	V	45	1.0	36.3	-6.2	30.1	46.0	-15.9	Pass
781.625	Qp	H	145	3.0	39.3	-5.9	33.4	46.0	-12.6	Pass
850.400	Qp	V	180	1.0	34.9	-4.7	30.2	46.0	-15.8	Pass
879.325	Qp	H	200	2.5	35.2	-4.5	30.7	46.0	-15.3	Pass
956.700	Qp	V	180	1.0	36.0	-3.3	32.7	46.0	-13.3	Pass
977.025	Qp	H	45	3.0	37.1	-2.9	34.2	54.0	-19.8	Pass
1063.000	Pk	V	170	1.0	37.0	-2.1	34.9	74.0	-39.1	Pass
1063.000	Av	V	170	1.0	26.1	-2.1	24.0	54.0	-30.0	Pass

Note:
No harmonics found above the noise floor. Investigated 89.1, 97.7, and 106.3 MHz to the 10th harmonic. The data table above represents the investigation of the harmonics of 97.7 and 106.3 MHz. These emissions represent noise floor measurements.

4.6 Radiated Spurious Emission Measurements - Test Configuration 7: Xpress RCi and SureConnect

The EUT was configured as shown below. The whip antenna was mounted on a 4' by 3' aluminum plate to simulate the whip antenna mounted on a vehicle, while its port was terminated with a 75 Ohm load. The SureConnect adapter was connected to the antenna. The 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 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 following frequencies: 89.1 MHZ, 97.7 MHz and 106.3 MHz. Data was taken for both horizontal and vertical antenna polarizations with the worst case levels recorded.

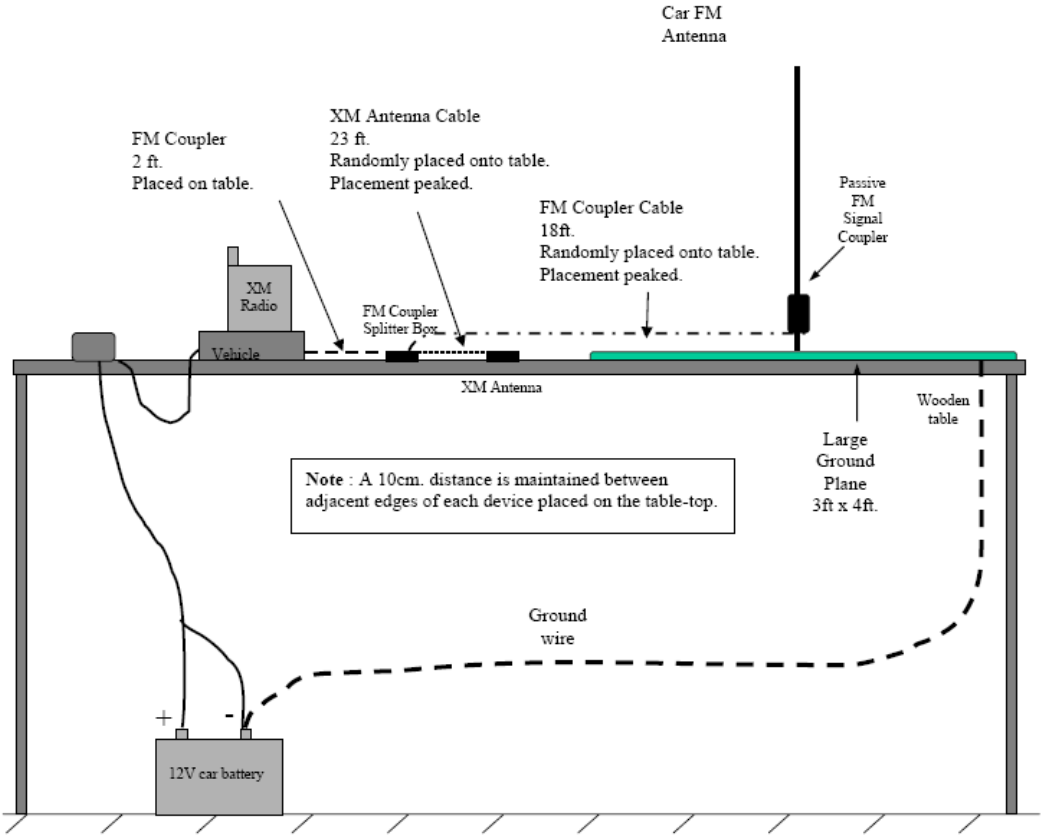


Figure 4.6-1: Test Configuration 7 - Xpress RCi and SureConnect

4.6.1 15.209(a) Radiated Emission Measurements – Xpress RCi and SureConnect

Table 4.6-1: Xpress RCi and SureConnect - In-Band (15.239)

Temperature: 80°F Humidity: 56%											
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	310	3.5	65.3	-26.0	39.3	48.0	-8.7	60.0	-20.7
89.100	Qp	V	255	1.0	62.7	-26.0	36.7	48.0	-11.3	60.0	-23.3
97.700	Qp	H	20	3.0	61.9	-23.2	38.7	48.0	-9.3	60.0	-21.3
97.700	Qp	V	95	1.0	61.5	-23.2	38.3	48.0	-9.7	60.0	-21.7
106.300	Qp	H	10	3.0	58.8	-21.8	37.0	48.0	-11.0	60.0	-23.0
106.300	Qp	V	90	1.0	61.3	-21.8	39.5	48.0	-8.5	60.0	-20.5

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

Xpress RCi and SureConnect - Out-of-Band (15.209)

Harmonics were investigated and none were found above the noise floor. Investigation was performed up to the 10th harmonic of 89.5 MHz, 97.7 MHz, and 106.3 MHz.

Test Personnel:

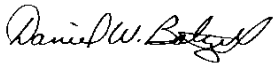
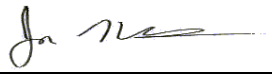
Dan Baltzell		August 13, 2009
EMC Engineer	Signature	Date of Tests
Jon Wilson		August 13, 2009
EMC Engineer	Signature	Date Of Tests

Table 4.6-2: Emissions Equipment List

Part Type	Manufacturer	Model	Serial Number	Barcode	Calibration Due Date
Conducted Emissions					
Spectrum Analyzer (100 Hz - .15 GHz)	Hewlett Packard	8567A	2602A00160	900968	9/8/2009
Spectrum Analyzer Display Section	Hewlett Packard	85662A	2542A11239	900970	9/8/2009
Quasi-Peak Adapter	Hewlett Packard	85650A	2521A00743	900339	9/11/2009
Filter	Solar	8130	947306	900729	8/19/2009
16A LISN	AFJ International	LS16/110VAC	16010020081	901083	10/23/2009
Emissions testing software	Quantum Change	Tile	4.0.A.8	N/A	N/A
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 - 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

4.7 200 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 below. 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 Xpress RCi. The 20 dB bandwidth was measured with the EUT receiving a live satellite broadcast as well iTunes MP3 files played from the iPod Touch 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 Tables 4.7-1 and 4.7-2. The plots of the bandwidth measurements are shown in plots 4.7-1 through 4.7-6 below.

Table 4.7-1: 200 kHz Bandwidth Measurements: Live Radio Mode

Frequency (MHz)	Mode	200 kHz Bandwidth Test Results	
		(kHz)	Pass / Fail
88.1	With Modulation	154.500	Pass
96.9	With Modulation	162.500	Pass
107.9	With Modulation	175.600	Pass
88.1	No Modulation	43.500	Pass
96.9	No Modulation	43.500	Pass
107.9	No Modulation	43.800	Pass

Table 4.7-2: 200 kHz Bandwidth Measurements: Playback Mode

Frequency (MHz)	Mode	200 kHz Bandwidth Test Results	
		(kHz)	Pass / Fail
88.1	With Modulation	144.000	Pass
96.9	With Modulation	153.000	Pass
107.9	With Modulation	144.500	Pass
88.1	No Modulation	43.500	Pass
96.9	No Modulation	43.500	Pass
107.9	No Modulation	43.500	Pass

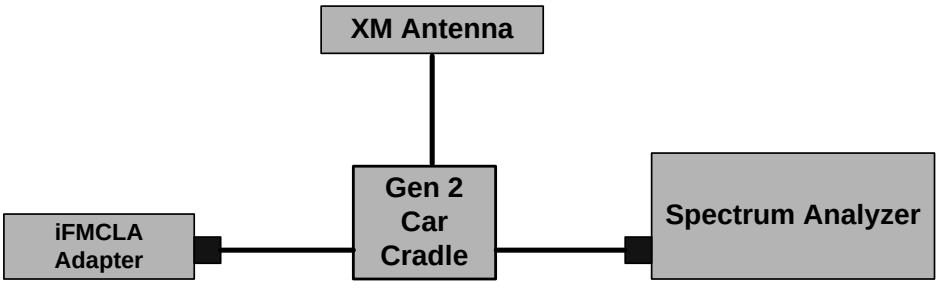
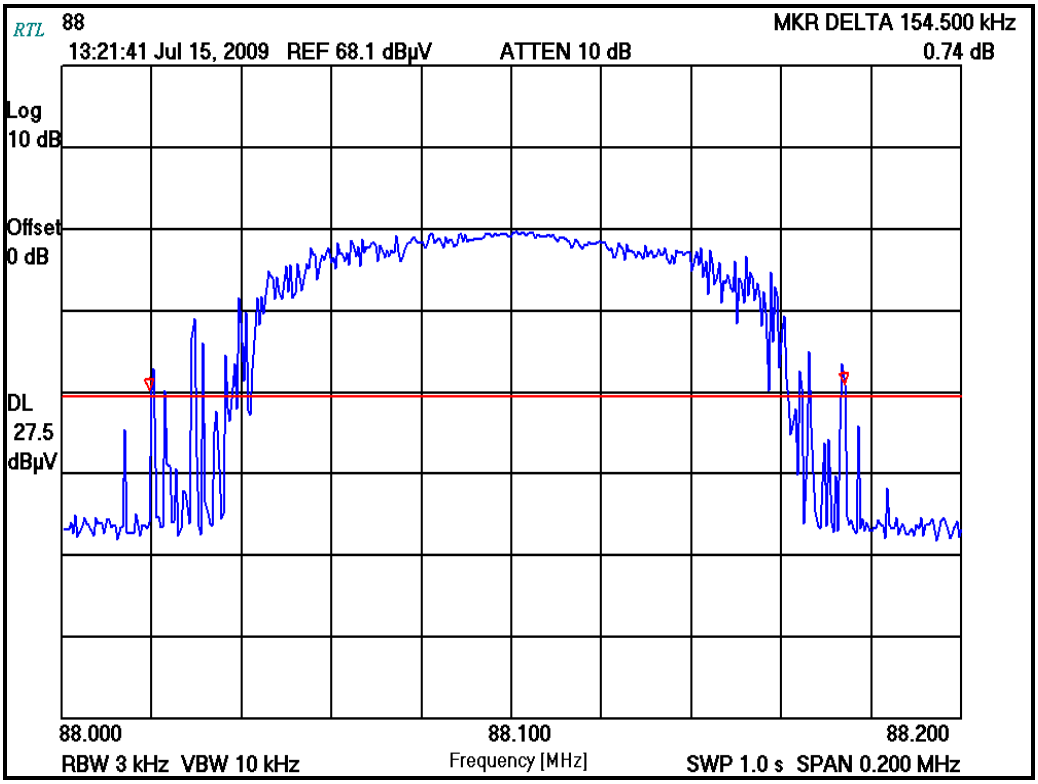


Figure 4.7-1: Test Configuration 5 - Occupied Bandwidth Test Setup

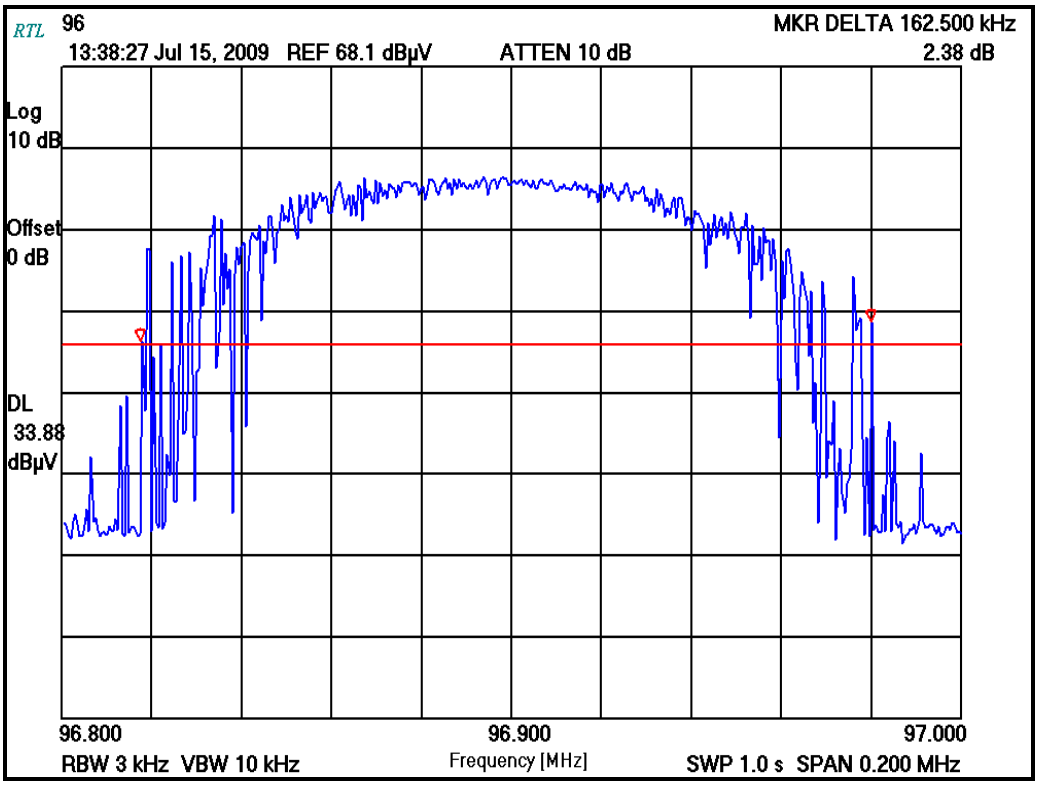
4.7.1 200 kHz Bandwidth Measurement FCC 15.239(a) – Test Configuration 5: Live Radio Mode

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.

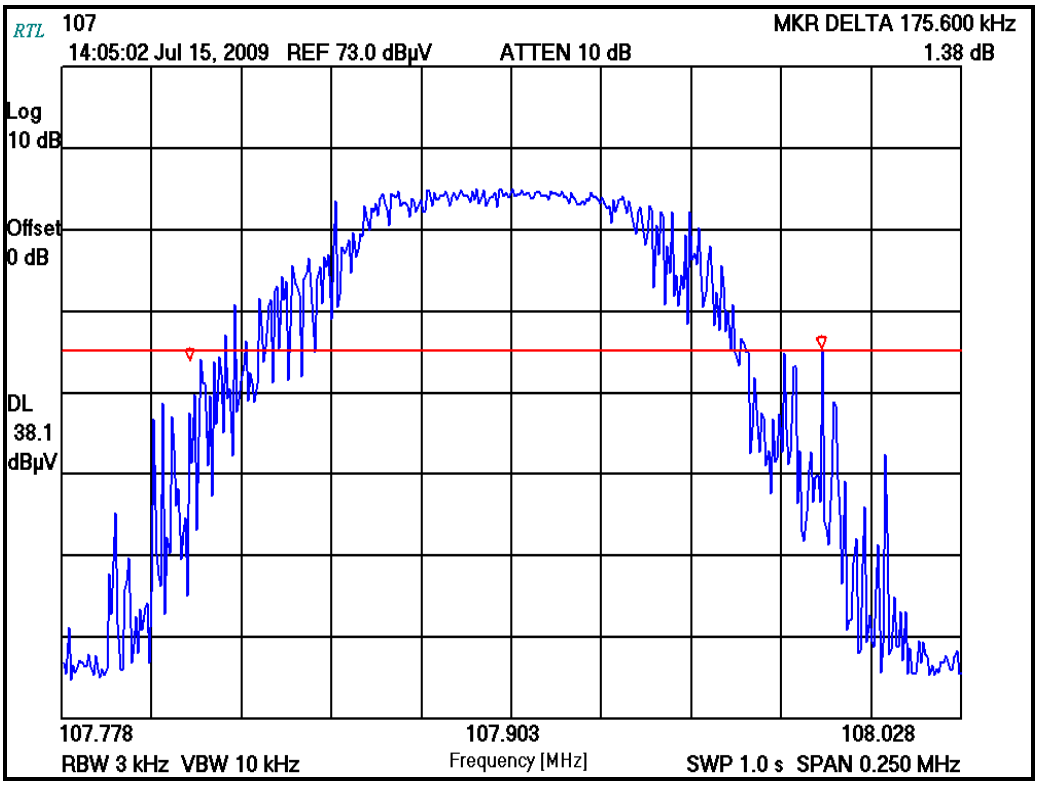
Plot 4.7-1: Bandwidth Plot at 88.1 MHz with Modulation



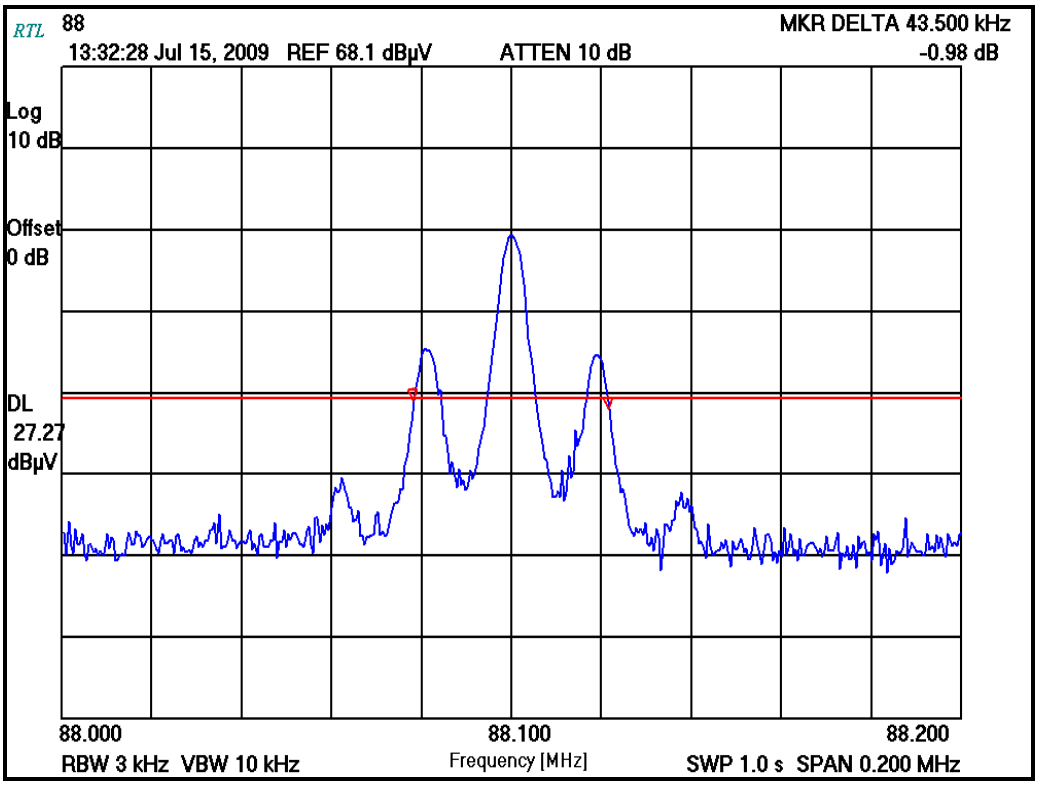
Plot 4.7-2: Bandwidth Plot at 96.9 MHz with Modulation



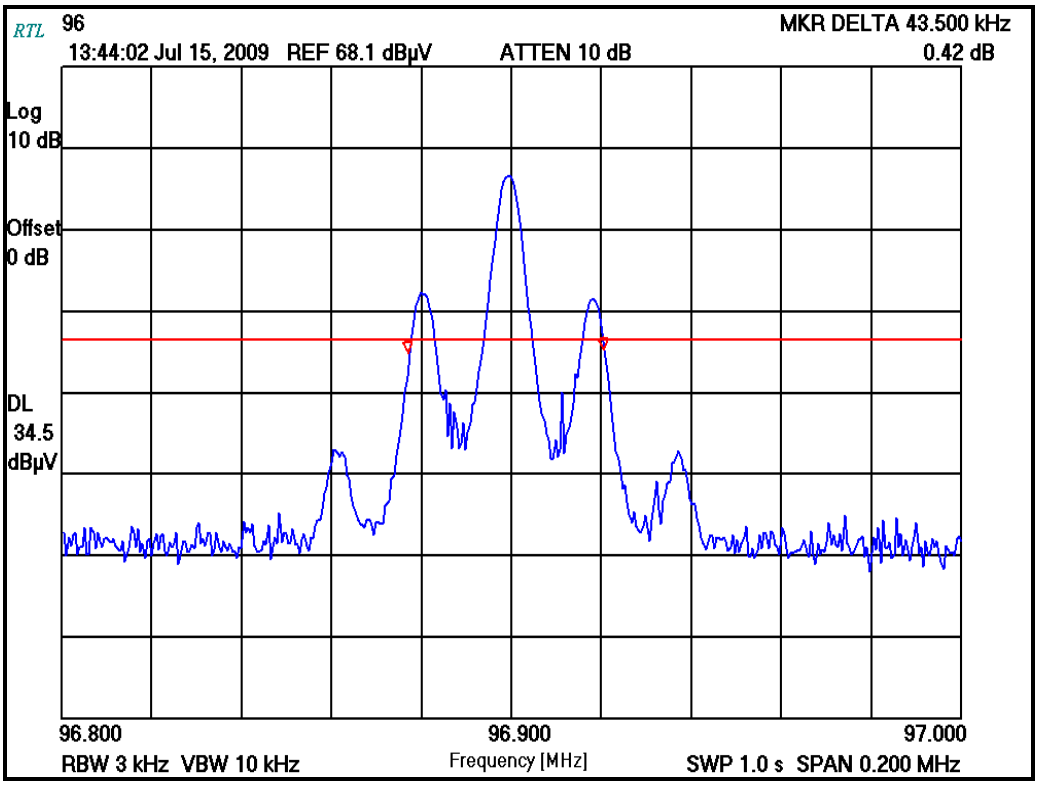
Plot 4.7-3: Bandwidth Plot at 107.9 MHz with Modulation



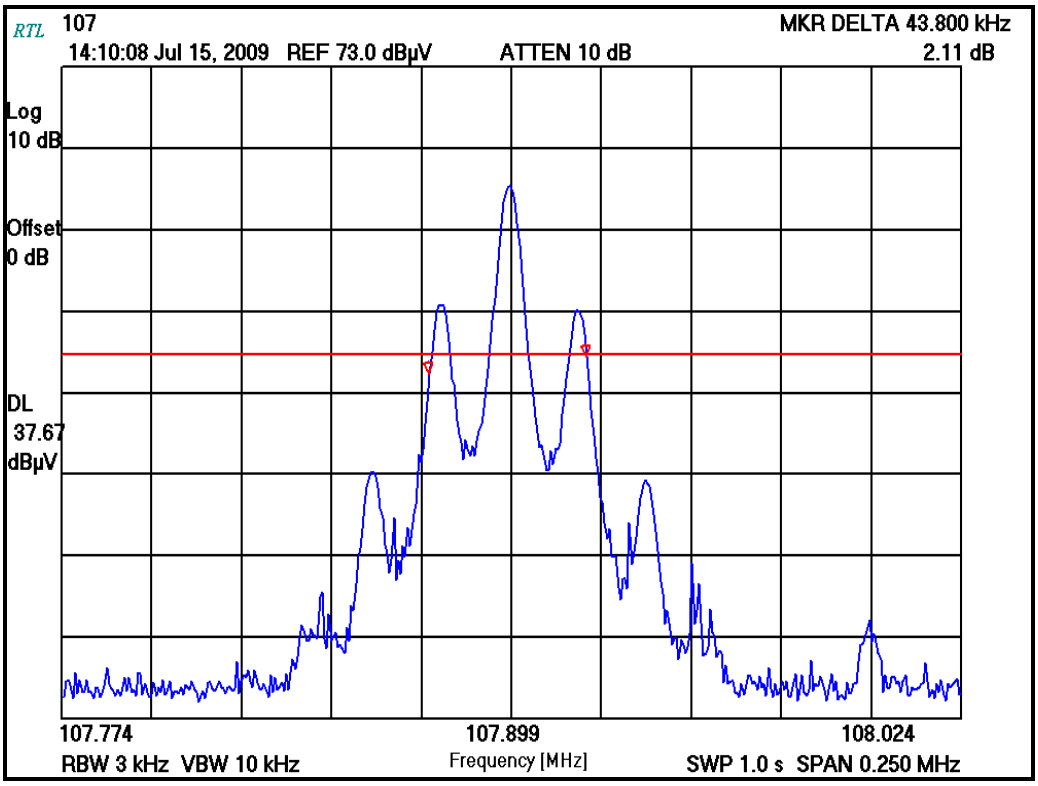
Plot 4.7-4: Bandwidth Plot at 88.1 MHz without Modulation



Plot 4.7-5: Bandwidth Plot at 96.9 MHz without Modulation



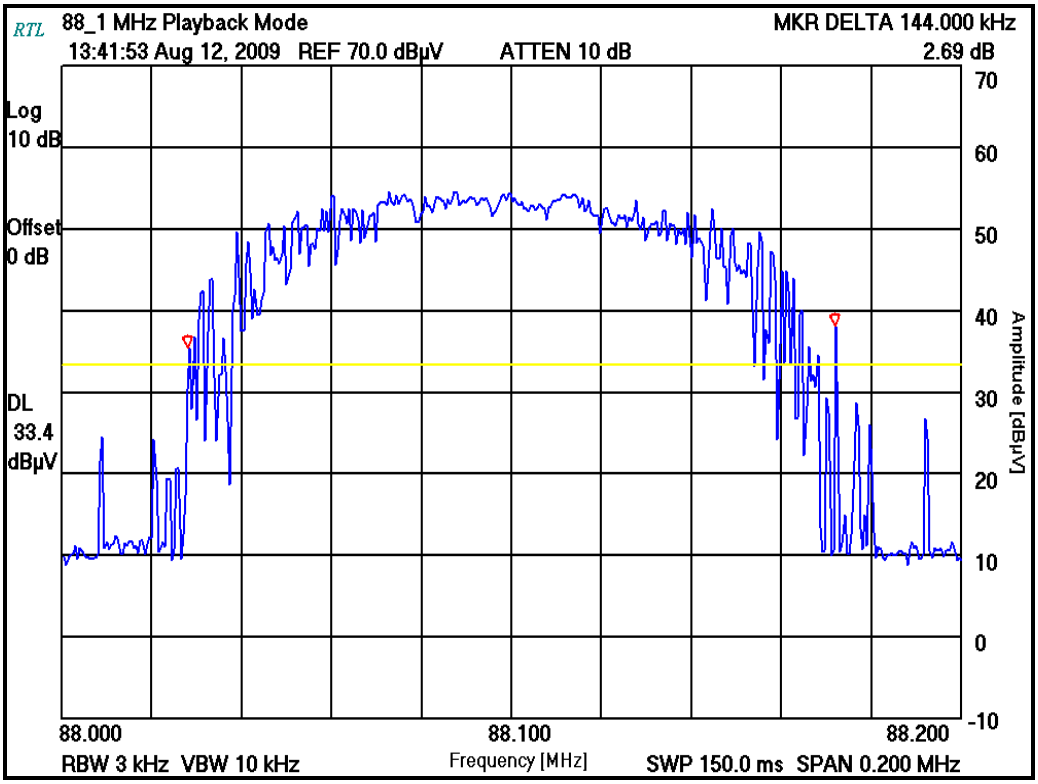
Plot 4.7-6: Bandwidth Plot at 107.9 MHz without Modulation



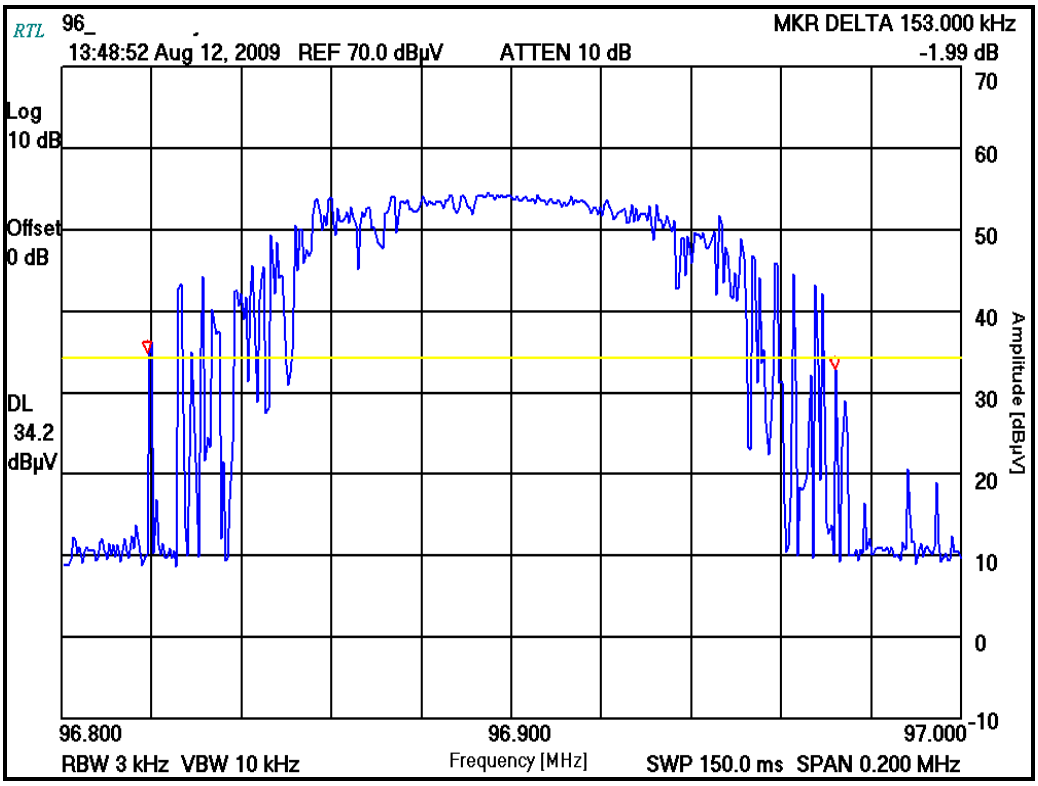
4.7.2 200 kHz Bandwidth Measurement FCC 15.239(a) – Test Configuration 5: Playback Mode

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.

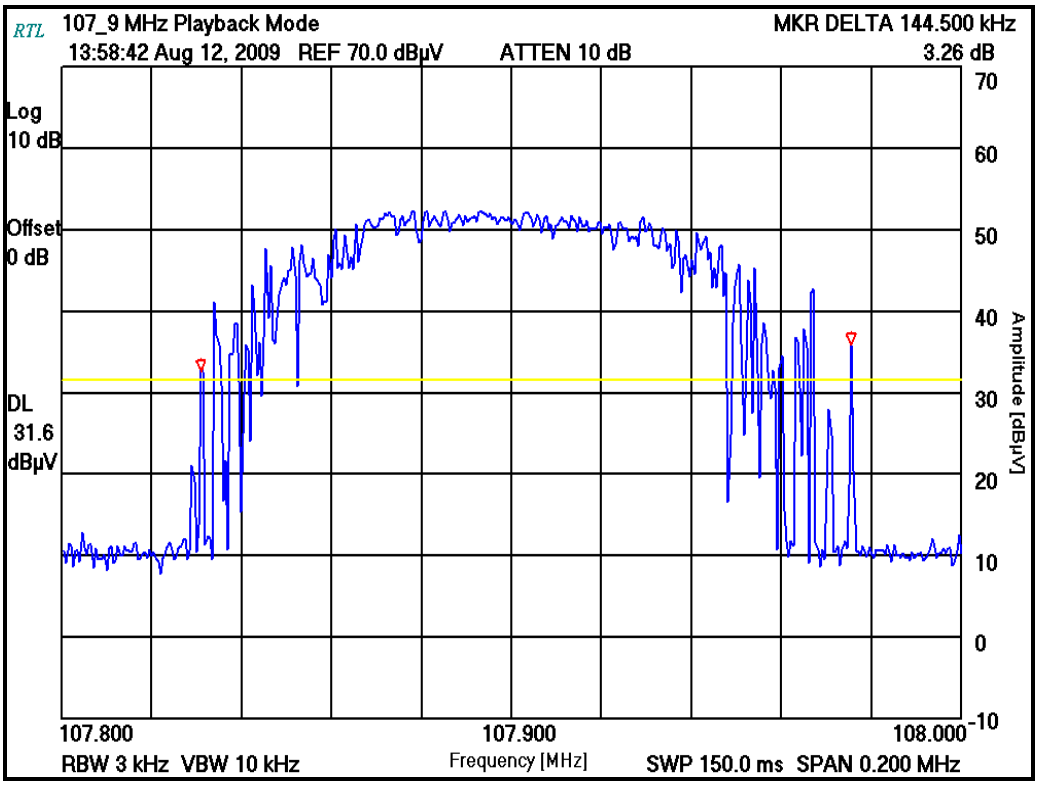
Plot 4.7-7: Bandwidth Plot at 88.1 MHz with Modulation



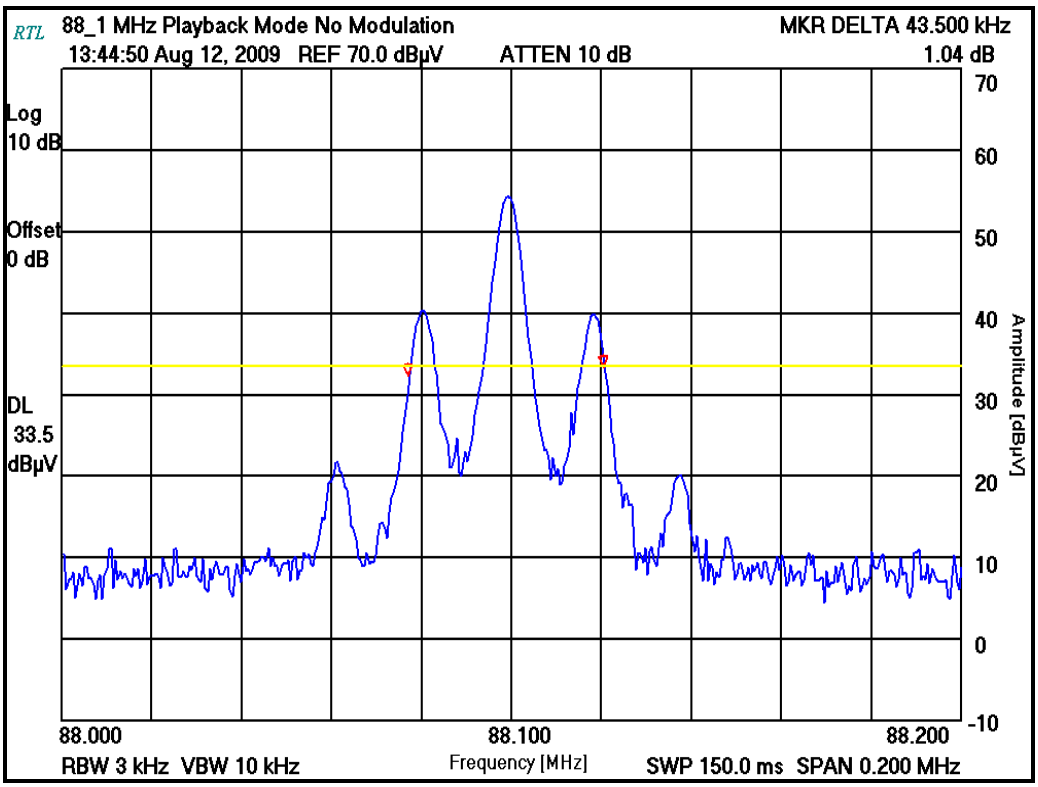
Plot 4.7-8: Bandwidth Plot at 96.9 MHz with Modulation



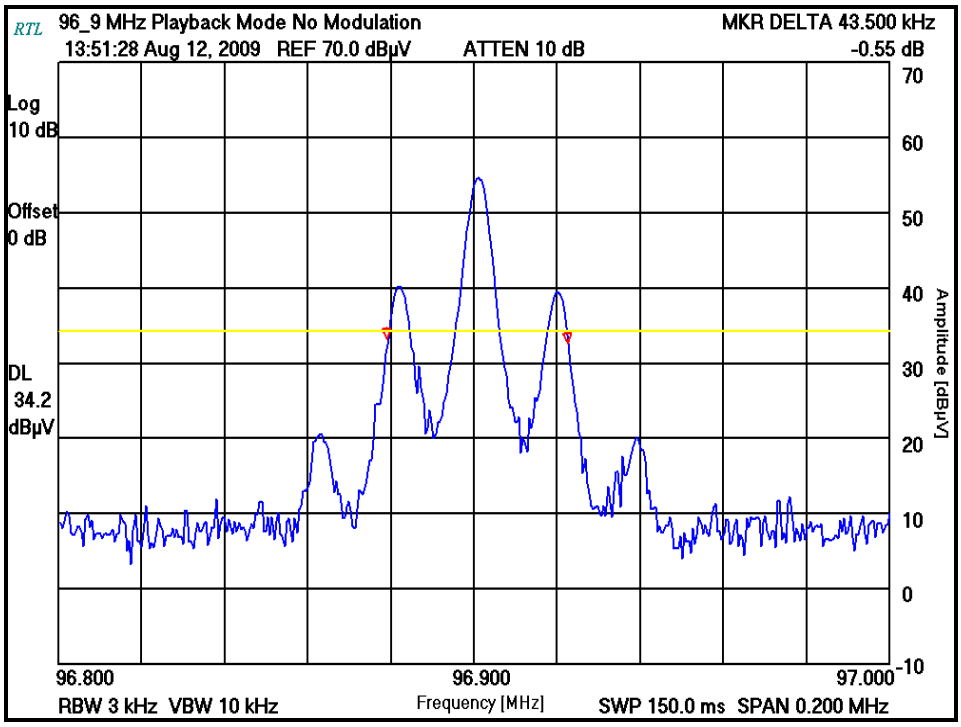
Plot 4.7-9: Bandwidth Plot at 107.9 MHz with Modulation



Plot 4.7-10: Bandwidth Plot at 88.1 MHz without Modulation



Plot 4.7-11: Bandwidth Plot at 96.9 MHz without Modulation



Plot 4.7-12: Bandwidth Plot at 107.9 MHz without Modulation

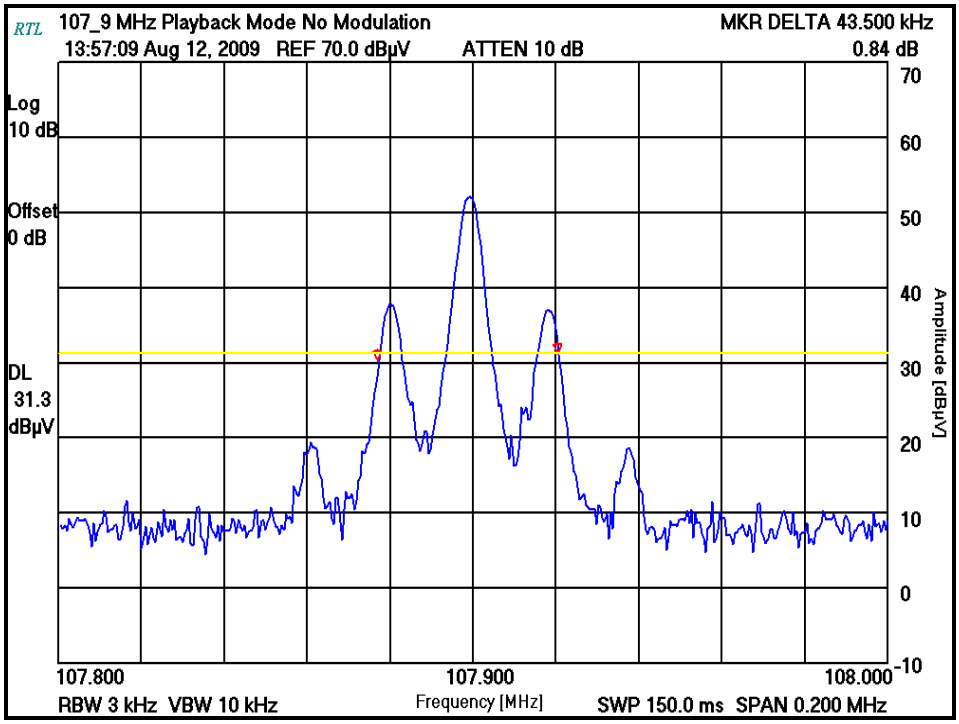


Table 4.7-3: Bandwidth Equipment List

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

Test Personnel:

Jon Wilson		July 15 and August 12, 2009
EMC Engineer	Signature	Dates Of Tests

5 Sample Calculations

5.1 Radiated Emissions Measurement Sample Calculation

Limit = 150 µV/m = 20 * log (150µV/1µV) = 43.5 dBµV/m

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

Where:

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

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

6 Conclusion

The data in this test report demonstrates that the **Sirius XM Radio Xpress RCi FM Transmitter, Model # XDRC2, FCC ID: RS2XDPRCL1,** is in compliance with the requirements specified within FCC Part 15 Subpart B and IC RSS-210.