



Engineering and Testing for EMC and Safety Compliance



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**Certificate of Compliance Report  
FCC Part 15.239 / IC RSS-210 Certification**

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<b>FCC ID</b>	RS2SDSV6	<b>Test Report Date</b>	August 17, 2009
<b>EUT</b>	Stratus 6	<b>RTL Work Order Number</b>	2009221
<b>Model #</b>	SDSV6	<b>RTL Quote Number</b>	QRTL09-334
<b>FCC Classification</b>	Part 15 Low Power Transceiver, Rx Verified		
<b>FCC Rule Part(s)</b>	FCC Part 15 Subpart C (15.239)		
<b>Industry Canada Standard</b>	RSS-210 Issue 7 June 2007: Low Power License-Exempt Radio Communication Devices (All Frequency Bands)		
<b>Receiver Information</b>	Receiver was found to be compliant		
<b>Frequency Range (MHz)</b>	<b>Output Power (W)</b>	<b>Frequency Tolerance</b>	<b>Emission Designator</b>
88 – 108 MHz (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, Industry Canada RSS-210, and ANSI C63.4.

Signature: 

Date: August 17, 2009

Typed/Printed Name: Desmond A. Fraser

Position: President

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## 1 General Information

### 1.1 Scope

FCC Rules Part 15 Subpart C (15.239); Operation within the band 88 – 108 MHz.

### 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 and Industry Canada 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 Stratus 6 FM Transmitter, Model # SDSV6, FCC ID: RS2SDSV6**. 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

**Sirius XM Radio Stratus 6 FM Transmitter** was set to transmit in the FM band while receiving live satellite broadcast.

### 2.3 Test Configuration Descriptions

The **Sirius XM Radio Stratus 6 FM Transmitter** was tested in two 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 EUT tested was the **Sirius XM Radio Stratus 6 with FM Transmitter, Model # SDSV6, FCC ID: RS2SDSV6**. The FM transmitter is located within the Stratus 6 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 results relate only to the item that was tested. The test procedure document used for this report was Sirius XM Satellite Radio Documents: Stratus 6; dated July 10, 2009.

#### 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 UPS-SV6 was verified during testing. There were no deviations from the test standard(s) and/or methods.

#### 3.3 Test Result Summary

FCC Part Section	IC Section	Test Description	Test Limit	Pass/Fail
15.239(a)	RSS-210 (A2.8)	Bandwidth	< 200 kHz	Pass
15.239(b)	RSS-210 (A2.8)	In-band Emissions	<250 uV/m within permitted 200 kHz band	Pass
15.239(c) 15.209	RSS-210 (2.7)	Out-of-Band Emissions	Emissions outside of the specified band must meet the radiated limits detailed in 15.209 (RSS-210 table 3 limits)	Pass

#### 3.4 Test System Details

The test sample was received on July 13, 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
Stratus 6 Transmitter	Sirius XM	SDSV6	U99J924A0036J01	N/A	019086
Vehicle Cradle	Sirius XM	SDPIV1	N/A	N/A	019085
Power Adapter (to cradle)	Sirius XM	SXDPIP1	SCDPIP1 U434927A000fJ01	unshielded with ferrite	019089
XM Antenna	Sirius XM	UCA-DOT	U17792400EBDJ01	Shielded	019088

#### 4 Radiated Emissions – FCC 15.209, 15.239 / IC RSS-210

##### 4.1 Radiated Emission Measurements Standalone Injected FM CLA - Test Configuration 1

The EUT was configured as shown in Test Configuration 1. The intentional 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 live satellite broadcast. The cables were manipulated to produce the highest emission level. The EUT was tested using the following in-band 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. The test configuration is shown below.

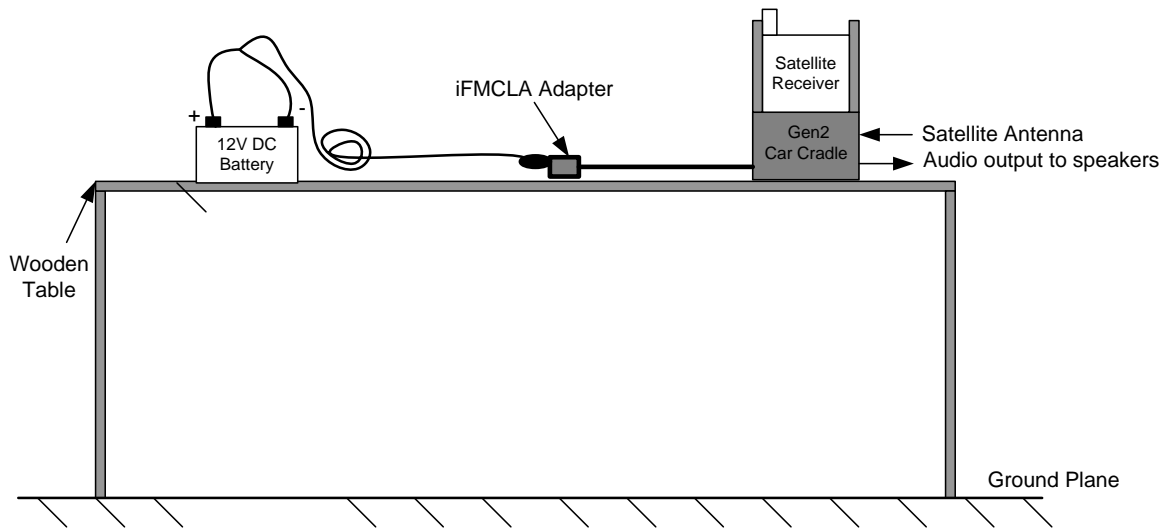


Figure 4.1-1: Test Configuration1: Stratus 6

##### 4.1.1 In-Band Radiated Emissions Test Data

Table 4.1-1: In-Band Radiated Emissions Data - WNCMOB02 Antenna

Temperature: 85°F Humidity: 45%											
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)	IC Limit (dBuV/m)	IC Margin (dB)
89.100	Qp	H	190	3.0	57.0	-22.9	34.1	48.0	-13.9	60.0	-25.9
89.100	Qp	V	270	1.0	66.4	-22.9	43.5	48.0	-4.5	60.0	-16.5
97.700	Qp	H	220	3.2	61.7	-20.8	40.9	48.0	-7.1	60.0	-19.1
97.700	Qp	V	300	1.0	62.3	-20.8	41.5	48.0	-6.5	60.0	-18.5
106.300	Qp	H	55	3.5	63.9	-19.6	44.3	48.0	-3.7	60.0	-15.7
106.300	Qp	V	200	1.0	63.7	-19.6	44.1	48.0	-3.9	60.0	-15.9

Table 4.1-2: **In-Band Radiated Emissions Data - RCTMOB05 Antenna**

Temperature: 85°F Humidity: 45%											
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)	IC Limit (dBuV/m)	IC Margin (dB)
89.090	Qp	H	250	4.0	60.5	-22.9	37.6	48.0	-10.4	60.0	-22.4
89.090	Qp	V	250	1.0	63.8	-22.9	40.9	48.0	-7.1	60.0	-19.1
97.700	Qp	H	210	3.0	64.0	-20.8	43.2	48.0	-4.8	60.0	-16.8
97.700	Qp	V	255	1.0	61.4	-20.8	40.6	48.0	-7.4	60.0	-19.4
106.300	Qp	H	240	3.0	59.7	-19.6	40.1	48.0	-7.9	60.0	-19.9
106.300	Qp	V	250	1.0	61.5	-19.6	41.9	48.0	-6.1	60.0	-18.1

**4.1.2 Out-of-Band Radiated Emissions Test Data - Sirius XM Live Radio**

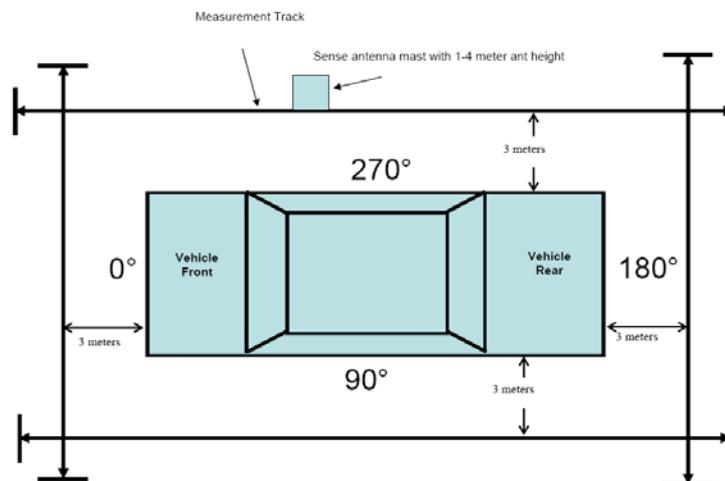
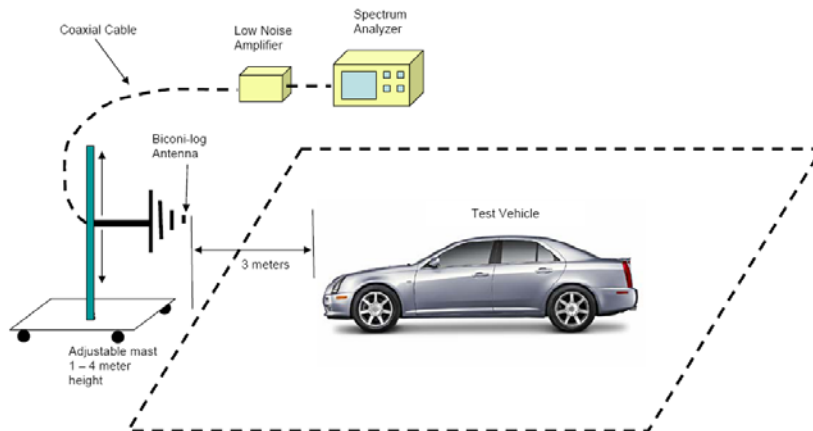
Harmonics were investigated and none were found above the noise floor. Investigation was performed up to the 10<sup>th</sup> harmonic of 89.1 MHz, 97.7 MHz, and 106.3 MHz.

#### 4.2 In-Band Radiated Emission Measurements – In-Situ Test Configuration 2

The Stratus 6 was installed into the Gen2 car cradle placed on the center (middle) of the vehicle's dashboard. The Gen2 car cradle was powered by the FM injected CLA power adapter cable which was plugged into the vehicle's CLA port. The satellite antenna port of the Gen2 car cradle was also fed with the satellite signal via the XM satellite antenna cable for the following three vehicles: (1) Nissan Sentra, (2) Subaru Outback, and (3) Range Rover SUV. The XM satellite antenna was placed in the rear center of the vehicles roof, with its cable routed all the way to the vehicle's dash board along the vehicle's door lining spaces. The EUT was configured to receive live satellite broadcast signals and the audio levels were set to maximum. The antenna mast was moved along the side of the vehicle under test to maximize the emission levels. During the maximization process, a three meter distance was maintained between the antenna mast and vehicle. At the emission peaks, the antenna height was also varied between 1 & 4 meters to maximize the emissions. The frequencies used were 89.1 MHz, 97.7 MHz & 106.3 MHz.

Testing was performed using both horizontal and vertical antenna polarities, with the highest level recorded. 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.

Each vehicle was tested on all four sides. The test configuration is shown below.



#### 4.2.1 Radiated Measurement Data for Nissan Sentra (15.239(b) / 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 Limit (dBuV/m)	FCC Margin (dB)	IC Limit (dBuV/m)	IC Margin (dB)
89.100	Qp	H	0	4.0	44.3	-22.9	21.4	48.0	-26.6	60.0	-38.6
89.100	Qp	H	90	3.5	49.5	-22.9	26.6	48.0	-21.4	60.0	-33.4
89.100	Qp	H	270	2.0	49.8	-22.9	26.9	48.0	-21.1	60.0	-33.1
89.100	Qp	H	180	3.5	50.8	-22.9	27.9	48.0	-20.1	60.0	-32.1
89.100	Qp	V	0	3.0	49.8	-22.9	26.9	48.0	-21.1	60.0	-33.1
89.100	Qp	V	90	3.5	47.1	-22.9	24.2	48.0	-23.8	60.0	-35.8
89.100	Qp	V	270	1.5	49.6	-22.9	26.7	48.0	-21.3	60.0	-33.3
89.100	Qp	V	180	1.0	49.2	-22.9	26.3	48.0	-21.7	60.0	-33.7
97.700	Qp	H	0	3.0	45.0	-20.8	24.2	48.0	-23.8	60.0	-35.8
97.700	Qp	H	90	3.2	48.4	-20.8	27.6	48.0	-20.4	60.0	-32.4
97.700	Qp	H	270	3.5	47.0	-20.8	26.2	48.0	-21.8	60.0	-33.8
97.700	Qp	H	180	2.5	49.5	-20.8	28.7	48.0	-19.3	60.0	-31.3
97.700	Qp	V	0	3.0	48.1	-20.8	27.3	48.0	-20.7	60.0	-32.7
97.700	Qp	V	90	1.5	46.9	-20.8	26.1	48.0	-21.9	60.0	-33.9
97.700	Qp	V	270	1.5	49.1	-20.8	28.3	48.0	-19.7	60.0	-31.7
97.700	Qp	V	180	1.0	49.8	-20.8	29.0	48.0	-19.0	60.0	-31.0
106.300	Qp	H	0	4.0	48.9	-19.6	29.3	48.0	-18.7	60.0	-30.7
106.300	Qp	H	90	3.0	45.9	-19.6	26.3	48.0	-21.7	60.0	-33.7
106.300	Qp	H	270	3.0	48.4	-19.6	28.8	48.0	-19.2	60.0	-31.2
106.300	Qp	H	180	3.5	47.5	-19.6	27.9	48.0	-20.1	60.0	-32.1
106.300	Qp	V	0	3.0	50.0	-19.6	30.4	48.0	-17.6	60.0	-29.6
106.300	Qp	V	90	2.5	44.6	-19.6	25.0	48.0	-23.0	60.0	-35.0
106.300	Qp	V	270	1.2	50.7	-19.6	31.1	48.0	-16.9	60.0	-28.9
106.300	Qp	V	180	11.8	49.8	-19.6	30.2	48.0	-17.8	60.0	-29.8

**NOTE:** No out-of-band emissions were found.



#### 4.2.2 Radiated Measurement Data for Subaru Outback (15.239(b) / 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 Limit (dBuV/m)	FCC Margin (dB)	IC Limit (dBuV/m)	IC Margin (dB)
89.100	Qp	H	0	2.5	44.8	-22.9	21.9	48.0	-26.1	60.0	-38.1
89.100	Qp	H	90	2.5	45.3	-22.9	22.4	48.0	-25.6	60.0	-37.6
89.100	Qp	H	180	2.0	45.9	-22.9	23.0	48.0	-25.0	60.0	-37.0
89.100	Qp	H	270	1.2	44.3	-22.9	21.4	48.0	-26.6	60.0	-38.6
89.100	Qp	V	0	1.0	46.4	-22.9	23.5	48.0	-24.5	60.0	-36.5
89.100	Qp	V	90	1.0	47.6	-22.9	24.7	48.0	-23.3	60.0	-35.3
89.100	Qp	V	180	1.0	45.3	-22.9	22.4	48.0	-25.6	60.0	-37.6
89.100	Qp	V	270	1.0	47.6	-22.9	24.7	48.0	-23.3	60.0	-35.3
97.700	Qp	H	0	2.0	44.6	-20.8	23.8	48.0	-24.2	60.0	-36.2
97.700	Qp	H	90	1.5	43.9	-20.8	23.1	48.0	-24.9	60.0	-36.9
97.700	Qp	H	180	1.5	43.2	-20.8	22.4	48.0	-25.6	60.0	-37.6
97.700	Qp	H	270	1.5	43.4	-20.8	22.6	48.0	-25.4	60.0	-37.4
97.700	Qp	V	0	1.5	46.6	-20.8	25.8	48.0	-22.2	60.0	-34.2
97.700	Qp	V	90	1.0	45.1	-20.8	24.3	48.0	-23.7	60.0	-35.7
97.700	Qp	V	180	1.0	44.3	-20.8	23.5	48.0	-24.5	60.0	-36.5
97.700	Qp	V	270	1.0	47.8	-20.8	27.0	48.0	-21.0	60.0	-33.0
106.300	Qp	H	0	2.0	44.4	-19.6	24.8	48.0	-23.2	60.0	-35.2
106.300	Qp	H	90	2.0	46.0	-19.6	26.4	48.0	-21.6	60.0	-33.6
106.300	Qp	H	180	1.5	47.0	-19.6	27.4	48.0	-20.6	60.0	-32.6
106.300	Qp	H	270	1.8	45.6	-19.6	26.0	48.0	-22.0	60.0	-34.0
106.300	Qp	V	0	1.5	49.7	-19.6	30.1	48.0	-17.9	60.0	-29.9
106.300	Qp	V	90	1.0	51.3	-19.6	31.7	48.0	-16.3	60.0	-28.3
106.300	Qp	V	180	1.0	50.9	-19.6	31.3	48.0	-16.7	60.0	-28.7
106.300	Qp	V	270	1.0	50.5	-19.6	30.9	48.0	-17.1	60.0	-29.1

**NOTE:** No out-of-band emissions were found.

#### 4.2.3 Radiated Measurement Data for Range Rover SUV (15.239(b) / 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 Limit (dBuV/m)	FCC Margin (dB)	IC Limit (dBuV/m)	IC Margin (dB)
89.100	Qp	H	0	3.0	47.5	-22.9	24.6	48.0	-23.4	60.0	-35.4
89.100	Qp	H	90	1.0	48.1	-22.9	25.2	48.0	-22.8	60.0	-34.8
89.100	Qp	H	180	1.5	49.1	-22.9	26.2	48.0	-21.8	60.0	-33.8
89.100	Qp	H	270	2.5	49.6	-22.9	26.7	48.0	-21.3	60.0	-33.3
89.100	Qp	V	0	1.5	44.9	-22.9	22.0	48.0	-26.0	60.0	-38.0
89.100	Qp	V	90	1.2	46.0	-22.9	23.1	48.0	-24.9	60.0	-36.9
89.100	Qp	V	180	1.0	45.8	-22.9	22.9	48.0	-25.1	60.0	-37.1
89.100	Qp	V	270	1.0	48.4	-22.9	25.5	48.0	-22.5	60.0	-34.5
97.700	Qp	H	0	1.5	43.0	-20.8	22.2	48.0	-25.8	60.0	-37.8
97.700	Qp	H	90	1.0	47.5	-20.8	26.7	48.0	-21.3	60.0	-33.3
97.700	Qp	H	180	2.5	46.6	-20.8	25.8	48.0	-22.2	60.0	-34.2
97.700	Qp	H	270	2.0	44.0	-20.8	23.2	48.0	-24.8	60.0	-36.8
97.700	Qp	V	0	1.0	43.3	-20.8	22.5	48.0	-25.5	60.0	-37.5
97.700	Qp	V	90	1.0	43.5	-20.8	22.7	48.0	-25.3	60.0	-37.3
97.700	Qp	V	180	1.0	45.5	-20.8	24.7	48.0	-23.3	60.0	-35.3
97.700	Qp	V	270	1.0	43.6	-20.8	22.8	48.0	-25.2	60.0	-37.2
106.300	Qp	H	0	1.0	51.5	-19.6	31.9	48.0	-16.1	60.0	-28.1
106.300	Qp	H	90	1.0	52.1	-19.6	32.5	48.0	-15.5	60.0	-27.5
106.300	Qp	H	180	2.5	51.3	-19.6	31.7	48.0	-16.3	60.0	-28.3
106.300	Qp	H	270	2.5	51.2	-19.6	31.6	48.0	-16.4	60.0	-28.4
106.300	Qp	V	0	1.2	44.4	-19.6	24.8	48.0	-23.2	60.0	-35.2
106.300	Qp	V	90	2.0	42.6	-19.6	23.0	48.0	-25.0	60.0	-37.0
106.300	Qp	V	180	1.5	43.0	-19.6	23.4	48.0	-24.6	60.0	-36.6
106.300	Qp	V	270	1.5	44.3	-19.6	24.7	48.0	-23.3	60.0	-35.3

**NOTE:** No out-of-band emissions were found.

## 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 demonstrates that the **Sirius XM Radio Stratus 6 with FM Transmitter, Model # SDSV6, FCC ID: RS2SDSV6 / IC: 5697A-SDSV6**, is in compliance with the requirements specified within FCC Section 15.239 and Annex A2 of RSS-210 of Industry Canada standard.