

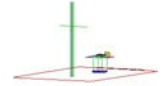


PCTEST ENGINEERING LABORATORY, INC.

7185 Oakland Mills Road, Columbia, MD 21046 USA

Tel. 410.290.6652 / Fax 410.290.6654

<http://www.pctestlab.com>



MEASUREMENT REPORT FCC Part 15.239

Applicant Name:

Sirius XM Satellite Radio, Inc.
1500 Eckington Place, NE
Washington, DC 20002
United States

Date of Testing:

9/21 - 10/2/2015, 2/3 - 2/5/2016

Test Site/Location:

PCTEST Lab, Columbia, MD, USA

Test Report Serial No.:

0Y1509281848-R6.RS2

FCC ID:

RS2SXPL2

APPLICANT:

Sirius XM Satellite Radio, Inc.

Application Type:

Certification

Model(s):

SXPL1 (Onyx PLUS (Gen 7.5))

EUT Type:

Satellite Radio with FM Transmitter

FCC Classification:

Low Power Communication Device Transmitter (DXX)

FCC Rule Part(s):

Part 15.239

Test Procedure(s):

ANSI C63.10-2009

This equipment has been shown to be capable of compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.10-2009. Test results reported herein relate only to the item(s) tested.

***This revised Test Report (S/N: 0Y1509281848-R6.RS2) supersedes and replaces the previously issued test report on the same subject EUT for the same type of testing as indicated. Please discard and destroy the previously issued test report (S/N: 0Y1509281848-R5.RS2) and dispose of it accordingly.**

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.


Randy Ortanez
President



FCC ID: RS2SXPL2		FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 1 of 52

TABLE OF CONTENTS

FCC PART 15.239 MEASUREMENT REPORT	3
1.0 INTRODUCTION	4
1.1 Scope	4
1.2 PCTEST Test Location	4
2.0 PRODUCT INFORMATION	5
2.1 Equipment Description	5
2.2 Device Capabilities	5
2.3 Test Configuration	5
2.4 EMI Suppression Device(s)/Modifications	5
3.0 DESCRIPTION OF TESTS	6
3.1 Evaluation Procedure	6
3.2 Radiated Emissions	6
3.3 Environmental Conditions	6
4.0 ANTENNA REQUIREMENTS	7
5.0 TEST EQUIPMENT CALIBRATION DATA	8
6.0 TEST RESULTS	9
6.1 Summary	9
6.2 20dB Bandwidth Measurement	10
6.2.1 20dB Bandwidth Measurement – Configuration #8	12
6.2.2 20dB Bandwidth Measurement – Configuration #10	14
6.3 Output Power Measurement	16
6.4 In-Band Emissions and Radiated Spurious Emissions – Below 1GHz	18
6.4.1 In-Band Emissions and Radiated Spurious Emissions – Configuration #6	21
6.4.2 In-Band Emissions and Radiated Spurious Emissions – Configuration #7	25
6.4.3 In-Band Emissions and Radiated Spurious Emissions – Configuration #9	29
6.5 Radiated Spurious Emissions – Above 1GHz	33
6.5.1 Radiated Spurious Emission Measurements – Configuration #6	36
6.5.2 Radiated Spurious Emission Measurements – Configuration #7	41
6.5.3 Radiated Spurious Emission Measurements – Configuration #9	46
7.0 CONCLUSION	52

FCC ID: RS2SXPL2		FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 2 of 52



MEASUREMENT REPORT

FCC Part 15.239



§ 2.1033 General Information

APPLICANT: Sirius XM Satellite Radio, Inc.

APPLICANT ADDRESS: 1500 Eckington Place, NE
Washington, DC 20002, United States

TEST SITE: PCTEST ENGINEERING LABORATORY, INC.

TEST SITE ADDRESS: 7185 Oakland Mills Road, Columbia, MD 21046 USA

FCC RULE PART(S): Part 15.239

BASE MODEL: SXPL1 (Onyx PLUS (Gen 7.5))

FCC Classification: Low Power Communication Device Transmitter (DXX)

FCC ID: RS2SXPL2

Test Device Serial No.: UT230DH6 ☐ Production ☒ Pre-Production ☐ Engineering

DATE(S) OF TEST: 9/21 - 10/2/2015, 2/3 - 2/5/2016

TEST REPORT S/N: 0Y1509281848-R6.RS2

Test Facility / Accreditations

Measurements were performed at PCTEST Engineering Lab located in Columbia, MD 21046, U.S.A.



- PCTEST facility is an FCC registered (PCTEST Reg. No. 159966) test facility with the site description report on file and has met all the requirements specified in Section 2.948 of the FCC Rules and Industry Canada (2451B-1).
- PCTEST Lab is accredited to ISO 17025 by U.S. National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP Lab code: 100431-0) in EMC, FCC and Telecommunications.
- PCTEST Lab is accredited to ISO 17025-2005 by the American Association for Laboratory Accreditation (A2LA) in Specific Absorption Rate (SAR) testing, Hearing Aid Compatibility (HAC) testing, CTIA Test Plans, and wireless testing for FCC and Industry Canada Rules.
- PCTEST Lab is a recognized U.S. Conformity Assessment Body (CAB) in EMC and R&TTE (n.b. 0982) under the U.S.-EU Mutual Recognition Agreement (MRA).
- PCTEST TCB is a Telecommunication Certification Body (TCB) accredited to ISO/IEC Guide 65 by the American National Standards Institute (ANSI) in all scopes of FCC Rules and Industry Canada Standards (RSS).
- PCTEST facility is an IC registered (2451B-1) test laboratory with the site description on file at Industry Canada.
- PCTEST is a CTIA Authorized Test Laboratory (CATL) for AMPS, CDMA, and EvDO wireless devices and for Over-the-Air (OTA) Antenna Performance testing for AMPS, CDMA, GSM, GPRS, EGPRS, UMTS (W-CDMA), CDMA 1xEVDO, and CDMA 1xRTT.

FCC ID: RS2SXPL2		FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 3 of 52

1.0 INTRODUCTION

1.1 Scope

Measurement and determination of electromagnetic emissions (EMC) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission and the Industry Canada Certification and Engineering Bureau.

1.2 PCTEST Test Location

The map below shows the location of the PCTEST LABORATORY, its proximity to the FCC Laboratory, the Columbia vicinity, the Baltimore-Washington Intern'l (BWI) airport, the city of Baltimore and the Washington, DC area. (See Figure 1-1).

These measurement tests were conducted at the PCTEST Engineering Laboratory, Inc. facility located at 7185 Oakland Mills Road, Columbia, MD 21046. The site coordinates are 39° 10'23" N latitude and 76° 49'50" W longitude. The facility is 0.4 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2014 on January 22, 2015.

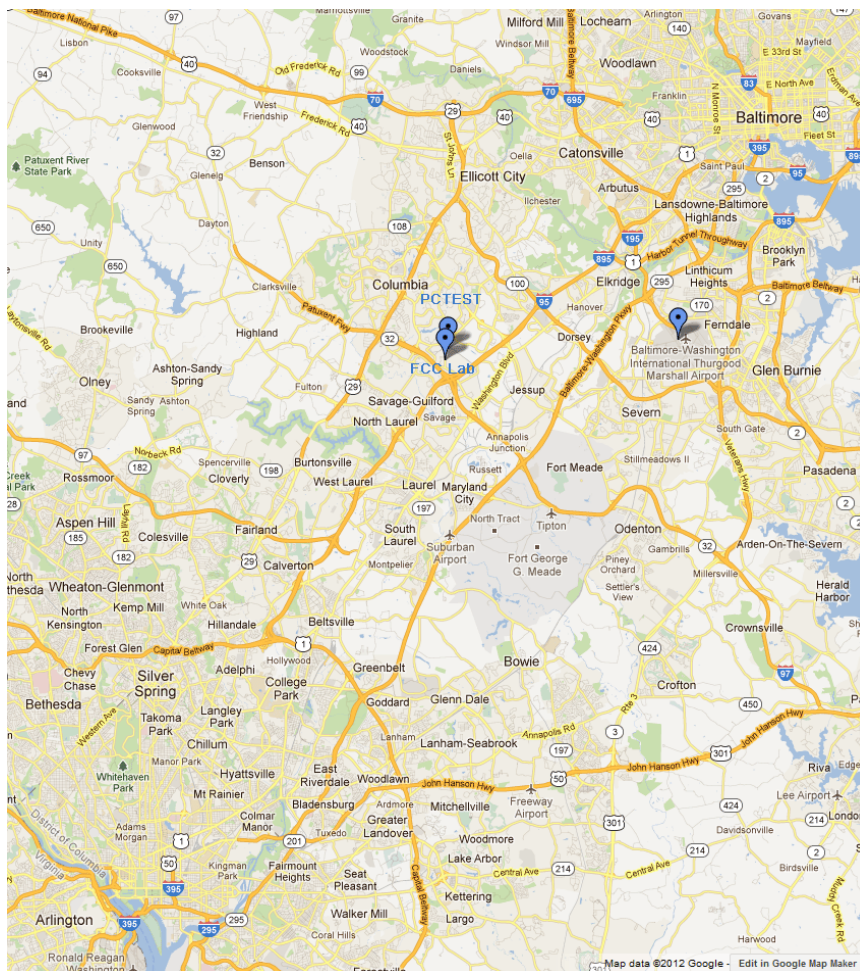


Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

FCC ID: RS2SXPL2	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)	SirusXM SATELLITE RADIO	Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 4 of 52

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **Sirius XM Satellite Radio with FM Transmitter FCC ID: RS2SXPL2**. The test data contained in this report pertains only to the emissions due to the EUT's FM transmitter.

2.2 Device Capabilities

This device contains the following capabilities:

FM Transmitter

2.3 Test Configuration

The Sirius XM Satellite Radio with FM Transmitter FCC ID: RS2SXPL2 was tested per the guidance of ANSI C63.10-2009. Below is a brief list of each configuration set-up.

Test Configuration #	Emissions Tested	Description
6	Intentional	Receiver (EUT) under test with FEA unit
7	Intentional	Receiver (EUT) under test with <i>PowerConnect</i> Dock
8	Intentional	Receiver (EUT) under test with <i>PowerConnect</i> Dock, DC Power Source & Bias-Tee
9	Intentional	Receiver (EUT) under test with <i>Xpress</i> Car Dock and <i>SureConnect</i> Adapter
10	Intentional	Receiver (EUT) under test with <i>Xpress</i> Car Dock and FM Direct Adapter

Table 2-1. Test Configuration Description

2.4 EMI Suppression Device(s)/Modifications

No EMI suppression device(s) were added and/or no modifications were made during testing.

FCC ID: RS2SXPL2		FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 5 of 52

3.0 DESCRIPTION OF TESTS

3.1 Evaluation Procedure

The measurement procedures described in the American National Standard for Testing Unlicensed Wireless Devices (ANSI C63.10-2009), was used in the measurement of the **Sirius XM Satellite Radio with FM Transmitter FCC ID: RS2SXPL2**.

Deviation from measurement procedure.....None

3.2 Radiated Emissions

The radiated test facilities consisted of an indoor 3 meter semi-anechoic chamber used for final measurements and exploratory measurements, when necessary. The measurement area is contained within the semi-anechoic chamber which is shielded from any ambient interference. The test site inside the chamber is a 6m x 5.2m elliptical, obstruction-free area in accordance with Clause 5, Figure 5.7 of ANSI C63.4-2009. For measurements above 1GHz absorbers are arranged on the floor between the turn table and the antenna mast in such a way so as to maximize the reduction of reflections. For measurements below 1GHz, the absorbers are removed. An ETS Lindgren Model 2188 raised turntable is used for radiated measurement. It is a continuously rotatable, remote-controlled, metallic turntable and 2 meters (6.56 ft.) in diameter. The turn table is flush with the raised floor of the chamber in order to maintain its function as a ground plane. A 78cm high PVC support structure is placed on top of the turntable. A 72.4cm high PVC support structure is placed on top of the turntable. A 3" (~7.6cm) sheet of high density polystyrene is used as the table top and is placed on top of the PVC supports to bring the total height of the table to 80cm.

For all measurements, the spectrum was scanned through all EUT azimuths and from 1 to 4 meter receive antenna height using a broadband antenna from 30MHz up to the upper frequency shown in 15.33(b)(1) depending on the highest frequency generated or used in the device or on which the device operates or tunes. For frequencies above 1GHz, linearly polarized double ridge horn antennas were used. For frequencies below 30MHz, a calibrated loop antenna was used. When exploratory measurements were necessary, they were performed at 1 meter test distance inside the semi-anechoic chamber using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequencies and modes producing the maximum emissions. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The test set-up was placed on top of the 0.8 meter high, 1 x 1.5 meter table. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each emission. Appropriate precaution was taken to ensure that all emissions from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, if applicable, turntable azimuth, and receive antenna height was noted for each frequency found.

Final measurements were made in the semi-anechoic chamber using calibrated, linearly polarized broadband and horn antennas. The test setup was configured to the setup that produced the worst case emissions. The spectrum analyzer was set to investigate all frequencies required for testing to compare the highest radiated disturbances with respect to the specified limits. The turntable containing the EUT was rotated through 360 degrees and the height of the receive antenna was varied 1 to 4 meters and stopped at the azimuth and height producing the maximum emission. Each emission was maximized by changing the orientation of the EUT through three orthogonal planes and changing the polarity of the receive antenna, whichever produced the worst-case emissions.

3.3 Environmental Conditions

The temperature is controlled within range of 15°C to 35°C. The relative humidity is controlled within range of 10% to 75%. The atmospheric pressure is monitored within the range 86-106kPa (860-1060mbar).

FCC ID: RS2SXPL2		FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 6 of 52

4.0 ANTENNA REQUIREMENTS

Excerpt from §15.203 of the FCC Rules/Regulations:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

- The FM transmit antenna used with the Satellite Radio uses a unique coupling.

Conclusion:

The **Sirius XM Satellite Radio with FM Transmitter FCC ID: RS2SXPL2** unit complies with the requirement of §15.203.

FCC ID: RS2SXPL2		FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 7 of 52

5.0 TEST EQUIPMENT CALIBRATION DATA

Test Equipment Calibration is traceable to the National Institute of Standards and Technology (NIST).

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	RE1	Radiated Emissions Cable Set (UHF/EHF)	4/28/2015	Annual	4/28/2016	N/A
Agilent	8447D	Broadband Amplifier	6/12/2015	Annual	6/12/2016	2443A01900
Agilent	E4448A	PSA (3Hz-50GHz) Spectrum Analyzer	3/19/2015	Annual	3/19/2016	US42510244
Agilent	N9020A	MXA Signal Analyzer	10/27/2014	Annual	10/27/2015	US46470561
Agilent	N9038A	MXE EMI Receiver	3/24/2015	Annual	3/24/2016	MY51210133
Emco	3115	Horn Antenna (1-18GHz)	1/30/2014	Biennial	1/30/2016	9704-5182
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	3/12/2015	Annual	3/12/2016	100342
Rohde & Schwarz	TS-PR18	1-18 GHz Pre-Amplifier	3/5/2015	Annual	3/5/2016	100071
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	1/28/2014	Biennial	1/28/2016	A051107

Table 5-1. Annual Test Equipment Calibration Schedule for 9/21 – 10/2/2015

Manufacturer	Model	Description	Cal Date	Cal Interval	Cal Due	Serial Number
-	RE1	Radiated Emissions Cable Set (UHF/EHF)	4/28/2015	Annual	4/28/2016	RE1
Agilent	8447D	Broadband Amplifier	6/12/2015	Annual	6/12/2016	2443A01900
Agilent	N9020A	MXA Signal Analyzer	11/5/2015	Annual	11/5/2016	US46470561
Emco	3115	Horn Antenna (1-18GHz)	3/30/2014	Biennial	3/30/2016	9704-5182
Rohde & Schwarz	ESU26	EMI Test Receiver (26.5GHz)	3/12/2015	Annual	3/12/2016	100342
Rohde & Schwarz	TS-PR18	1-18 GHz Pre-Amplifier	3/5/2015	Annual	3/5/2016	100071
Sunol	JB5	Bi-Log Antenna (30M - 5GHz)	3/28/2014	Biennial	3/28/2016	A051107

Table 5-2. Annual Test Equipment Calibration Schedule for 2/3 – 2/5-2016

FCC ID: RS2SXPL2		FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 8 of 52

6.0 TEST RESULTS

6.1 Summary

Company Name: Sirius XM Satellite Radio, Inc.
 FCC ID: RS2SXPL2
 FCC Classification: Low Power Communication Device Transmitter

FCC Part Section(s)	Test Description	Test Limit	Test Condition	Test Result	Reference
TRANSMITTER MODE (TX)					
15.239(a), 15.215(c)	20dB Bandwidth	< 200kHz and whole band shall lie wholly within frequency range 88-108MHz	CONDUCTED	PASS	Section 6.2
2.1046	Conducted Power	-29dBm (per C63.10-2013)		PASS	Sections 6.3
15.239(b), 15.209	In-Band Emissions and Radiated Spurious Emissions Below 1GHz	< 250µV/m within permitted 200 kHz band Emissions outside of the specified band must meet the radiated limits detailed in 15.209	RADIATED	PASS	Sections 6.4
15.239(c), 15.209	Radiated Spurious Emission Above 1GHz	Emissions outside of the specified band must meet the radiated limits detailed in 15.209		PASS	Section 6.5

Table 6-1. Summary of Test Results

Notes:

- 1) All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
- 2) The analyzer plots shown in this section were all taken with a correction table loaded into the analyzer. The correction table was used to account for the losses of the cables and attenuators used as part of the system to connect the EUT to the analyzer at all frequencies of interest.
- 3) All antenna port conducted emissions testing was performed on a test bench with the antenna port of the EUT connected to the spectrum analyzer through calibrated cables and attenuators.

FCC ID: RS2SXPL2		FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter	Page 9 of 52	

6.2 20dB Bandwidth Measurement

§15.239(a) §15.215(c)

Test Overview and Limit

The bandwidth at 20dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the receive antenna while the EUT is operating in transmission mode at the appropriate frequency.

Emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency. The 200kHz band shall lie wholly within the frequency range of 88 – 108 MHz.

Test Procedure Used

ANSI C63.10-2009 – Clause 6.9.1

Test Settings

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 20dB bandwidth measurement. The "X" dB bandwidth parameter was set to $X = 20$. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. Center frequency set to nominal EUT channel center frequency
3. Span set between two times and five times the OBW
4. RBW = 1 – 5% OBW
5. VBW $\geq 3 \times$ RBW
6. Detector = Peak
7. Trace mode = max hold
8. Sweep = auto couple
9. The trace was allowed to stabilize

FCC ID: RS2SXPL2		FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter	Page 10 of 52	

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

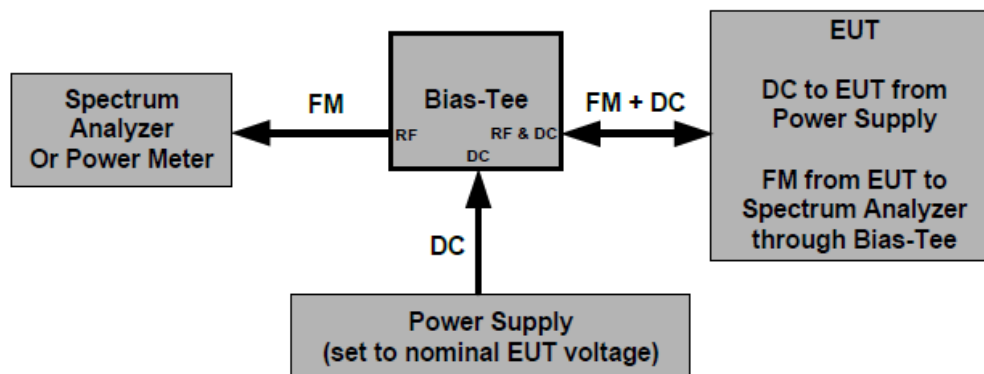


Figure 6-1. Test Instrument & Measurement Setup (Configuration #8)

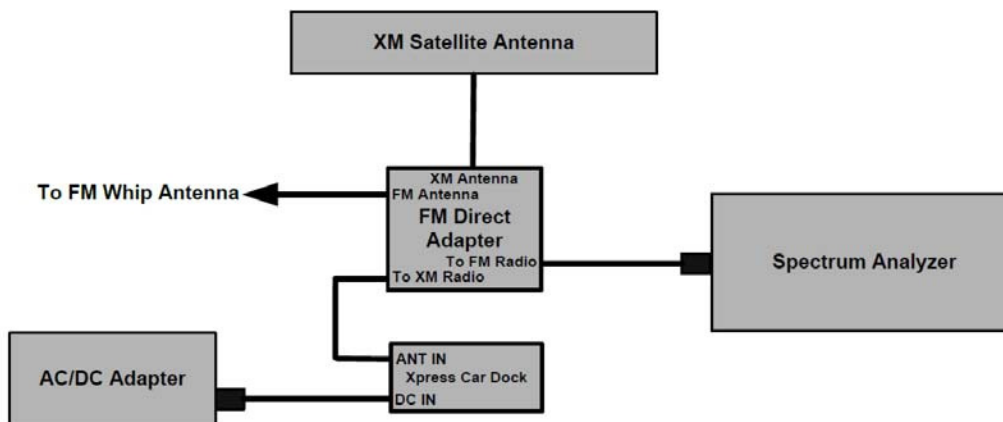


Figure 6-2. Test Instrument & Measurement Setup (Configuration #10)

Test Notes

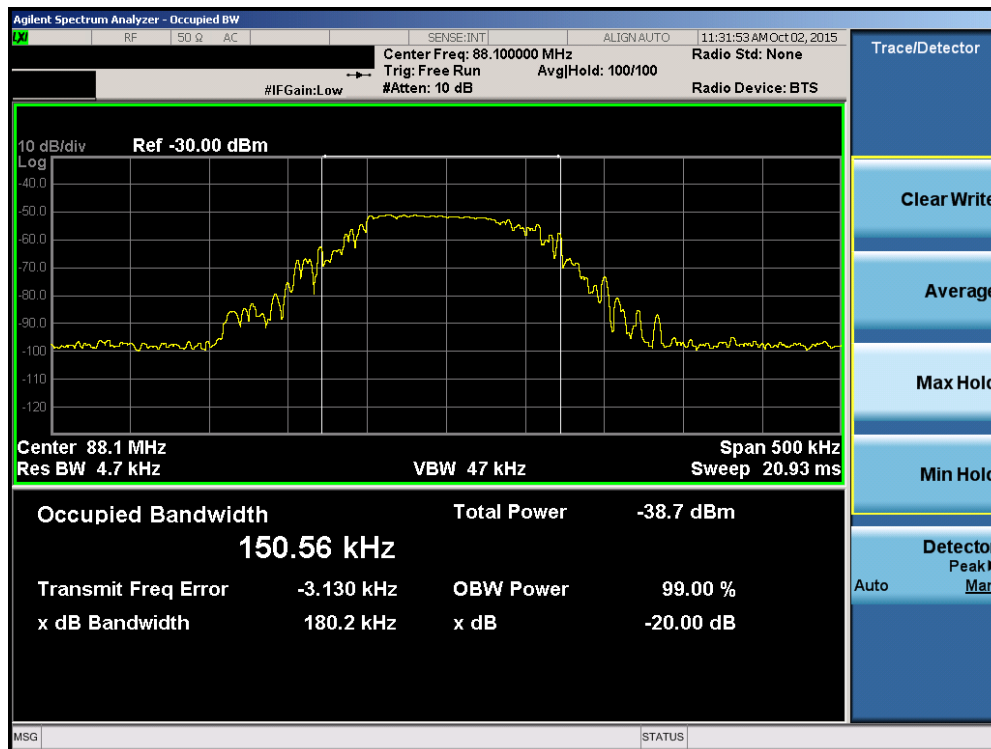
None

FCC ID: RS2SXPL2	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)	SirlusXM SATELLITE RADIO	Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 11 of 52

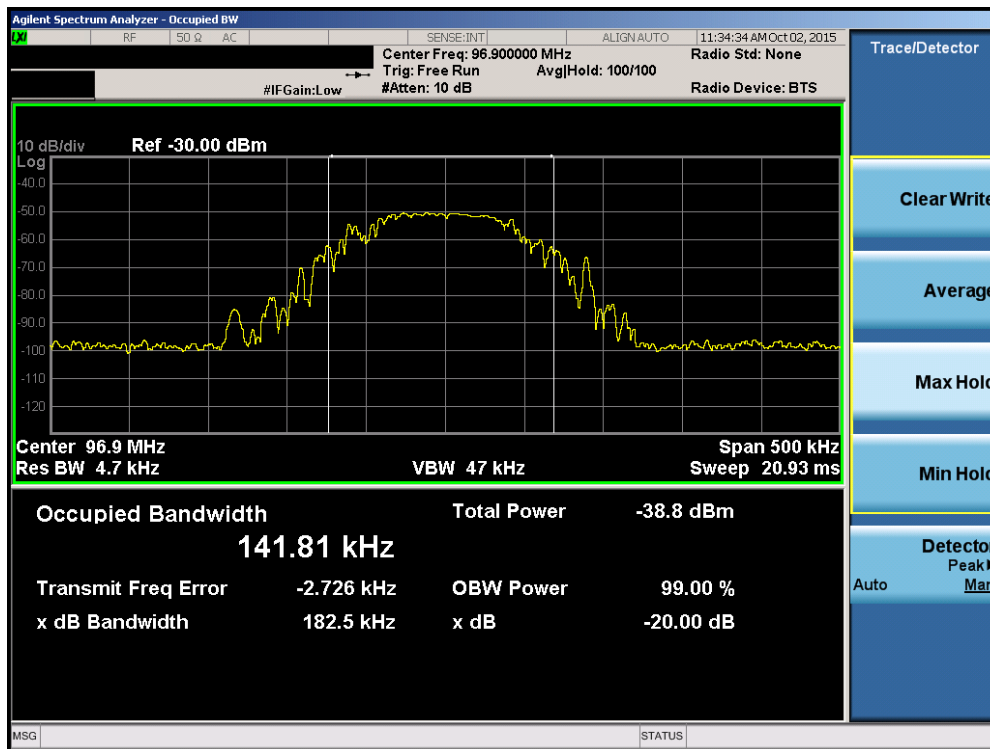
6.2.1 20dB Bandwidth Measurement – Configuration #8

Frequency [MHz]	Measured Bandwidth [kHz]	Maximum Bandwidth [kHz]	Pass / Fail
88.1	180.2	200.0	Pass
96.9	182.5	200.0	Pass
107.9	173.2	200.0	Pass

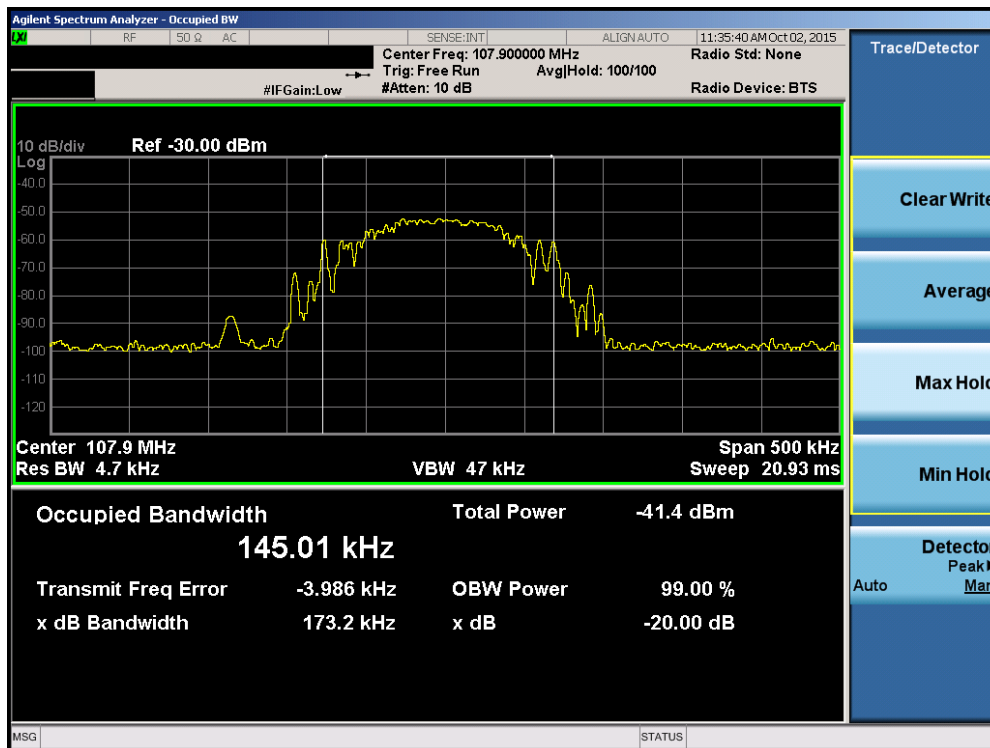
Table 6-2. Conducted Bandwidth Measurements



Plot 6-1. 20dB Bandwidth Plot (Low Channel – 88.1MHz)



Plot 6-2. 20dB Bandwidth Plot (Mid Channel – 96.9MHz)



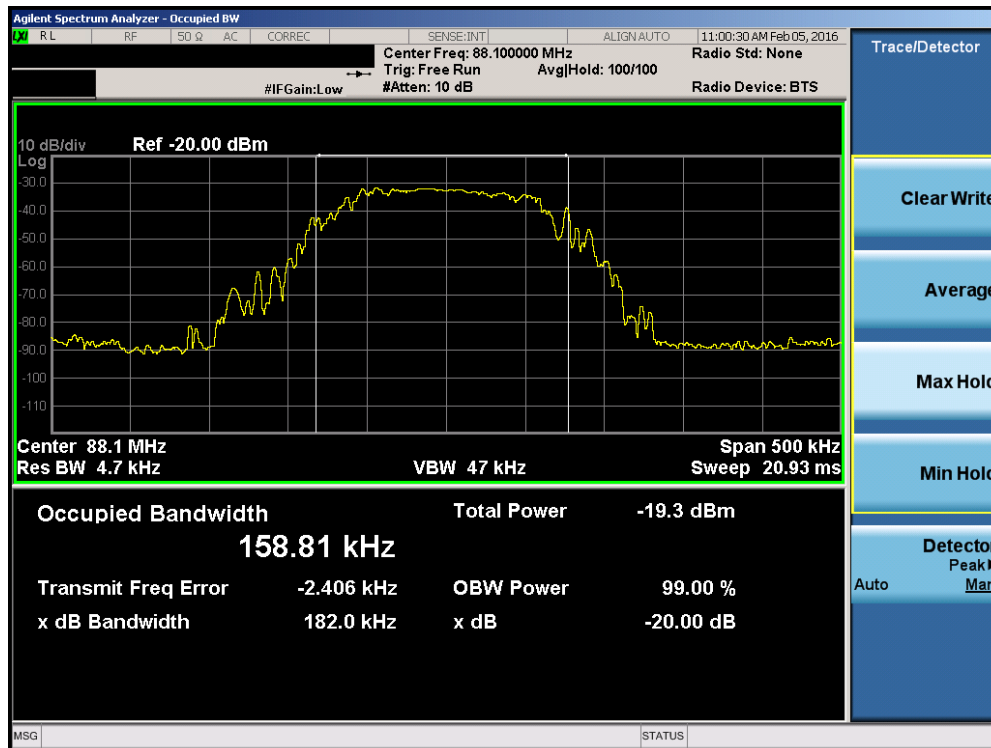
Plot 6-3. 20dB Bandwidth Plot (High Channel – 107.9MHz)

FCC ID: RS2SXPL2	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)	SiriusXM SATELLITE RADIO	Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 13 of 52

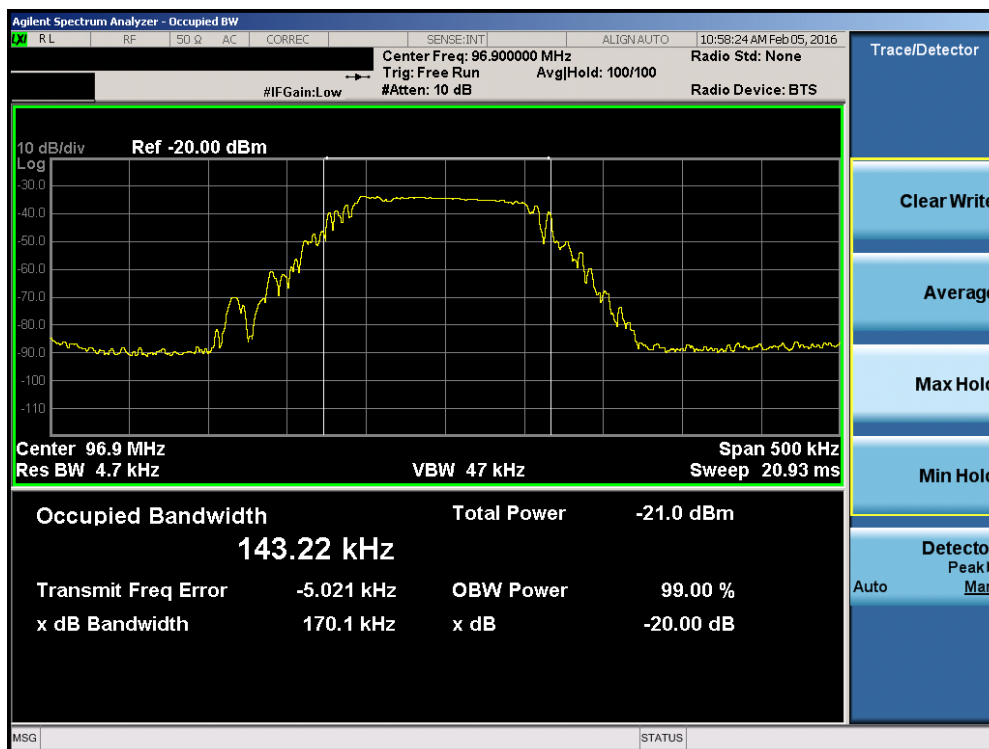
6.2.2 20dB Bandwidth Measurement – Configuration #10

Frequency [MHz]	Measured Bandwidth [kHz]	Maximum Bandwidth [kHz]	Pass / Fail
88.1	182.0	200.0	Pass
96.9	170.1	200.0	Pass
107.9	177.5	200.0	Pass

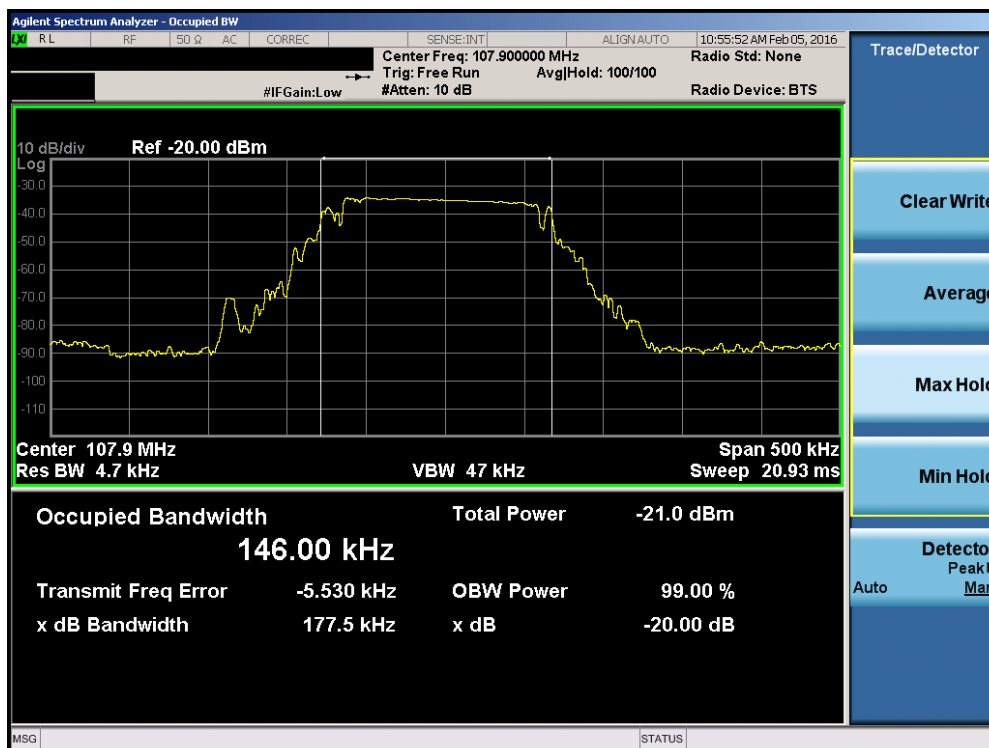
Table 6-3. Conducted Bandwidth Measurements



Plot 6-4. 20dB Bandwidth Plot (Low Channel – 88.1MHz)



Plot 6-5. 20dB Bandwidth Plot (Mid Channel – 96.9MHz)



Plot 6-6. 20dB Bandwidth Plot (High Channel – 107.9MHz)

FCC ID: RS2SXPL2	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)	SiriusXM SATELLITE RADIO	Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 15 of 52

6.3 Output Power Measurement

§2.1046

Test Overview

The FM transmitter was set to maximum audio output and was tuned between 88.1MHz and 107.9MHz. Correction factor of 0.5 was used for the insertion loss of the Bias-T. All other amplitude corrections of cables and attenuators have been loaded into the spectrum analyzer.

Test Setup

The EUT and measurement equipment were set up as shown in the diagrams below.

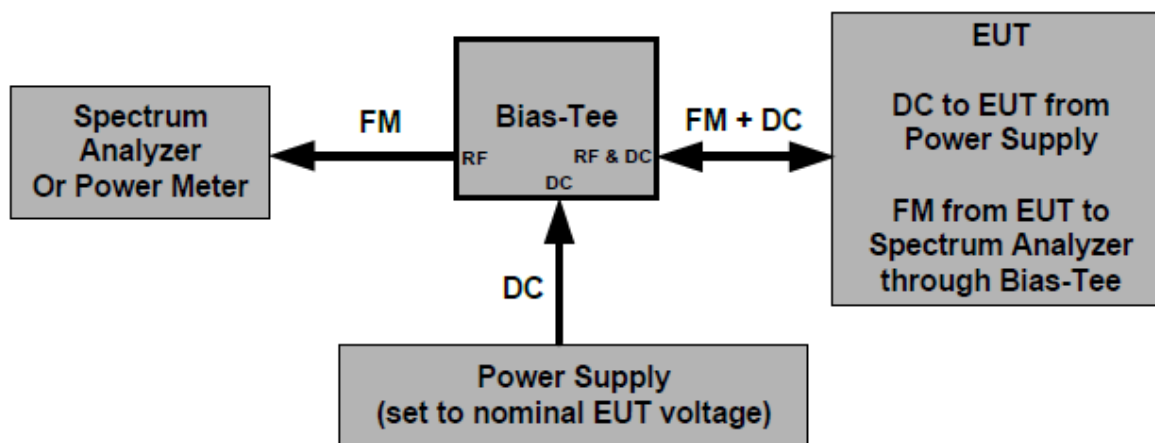


Figure 6-3. Test Instrument & Measurement Setup (Configuration #8)

Test Notes

Conducted power measurements were included to justify exclusion of in-situ measurements.

FCC ID: RS2SXPL2	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)	SiriusXM SATELLITE RADIO	Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 16 of 52

Frequency [MHz]	Mode	Conducted Power Test Results				
		Result [dBm]	Bias-T Loss [dB]	Corrected Result [dBm]	Limit [dBm]	Margin [dB]
88.1	Live	-33.53	0.50	-33.03	-29.00	-4.03
96.9	Live	-33.73	0.50	-33.23	-29.00	-4.23
107.9	Live	-34.25	0.50	-33.75	-29.00	-4.75

Table 6-4. Conducted Output Power Measurements

FCC ID: RS2SXPL2		FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter	Page 17 of 52	

6.4 In-Band Emissions and Radiated Spurious Emissions – Below 1GHz

§15.239(b) §15.209

Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at maximum power and at the appropriate frequencies. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

All in band emissions must not exceed 250 microvolts/meter within the permitted 200kHz band per Section 15.239(b).

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table 6-4 per Section 15.209.

Frequency	Field Strength [$\mu\text{V/m}$]	Measured Distance [Meters]
0.009 – 0.490 MHz	2400/F (kHz)	300
0.490 – 1.705 MHz	24000/F (kHz)	30
1.705 – 30.00 MHz	30	30
30.00 – 88.00 MHz	100	3
88.00 – 216.0 MHz	150	3
216.0 – 960.0 MHz	200	3
Above 960.0 MHz	500	3

Table 6-5. Radiated Limits

Test Procedures Used

ANSI C63.4-2009

Test Settings

Quasi-Peak Field Strength Measurements

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 120kHz (for emissions from 30MHz – 1GHz)
3. Detector = quasi-peak
4. Sweep time = auto couple
5. Trace mode = max hold
6. Trace was allowed to stabilize

FCC ID: RS2SXPL2		FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 18 of 52

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

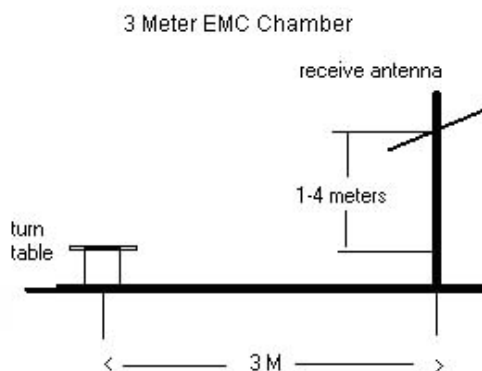


Figure 6-4. Test Instrument & Measurement Setup

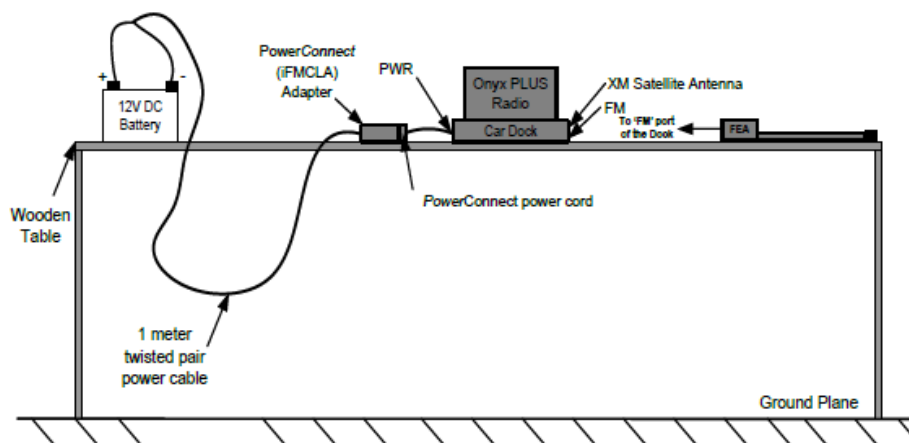


Figure 6-5. Test Instrument & Measurement Setup (Configuration #6)

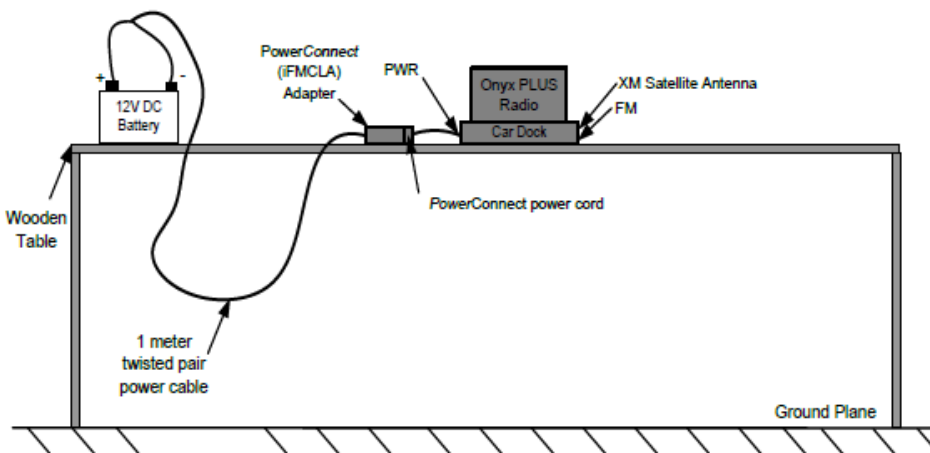


Figure 6-6. Test Instrument & Measurement Setup (Configuration #7)

FCC ID: RS2SXPL2	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)	SiriusXM SATELLITE RADIO	Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 19 of 52

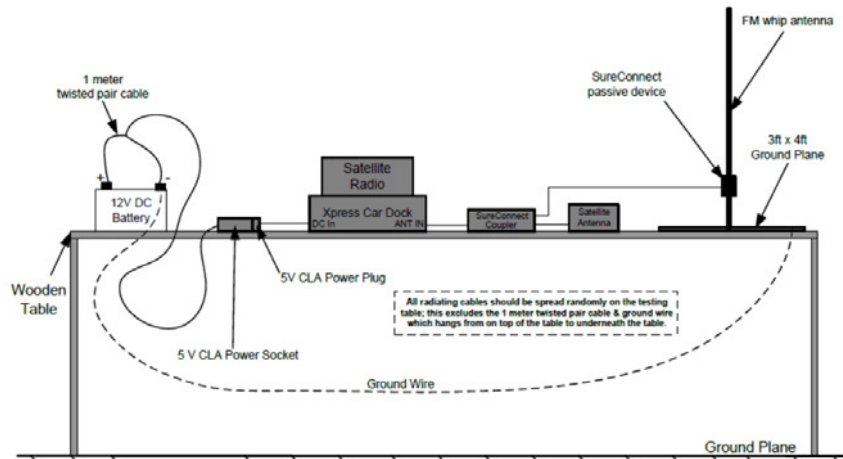


Figure 6-7. Test Instrument & Measurement Setup (Configuration #9)

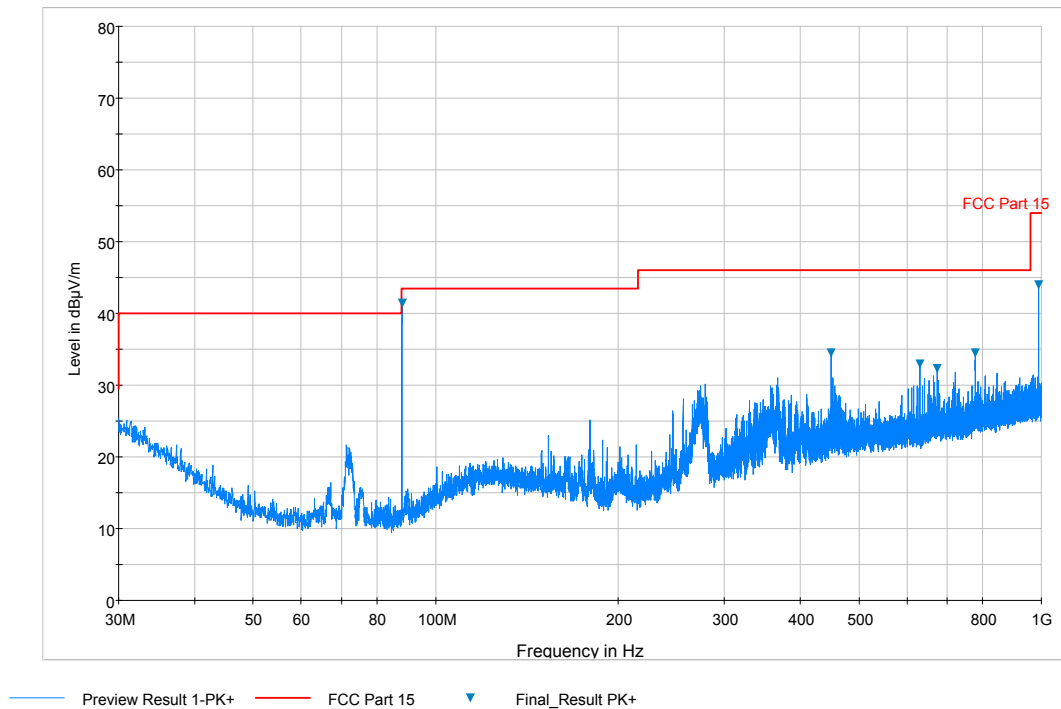
Test Notes

1. All emissions lying in restricted bands specified in §15.205 are below the limit shown in Table 6-4.
2. The broadband receive antenna is manipulated through vertical and horizontal polarizations during the tests. The EUT is manipulated through three orthogonal planes.
3. This unit was tested with its standard battery.
4. The spectrum is investigated using a peak detector. Final in-band measurements are recorded using an RMS detector, and final spurious emission measurements are recorded using a peak detector. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
5. Emissions were measured at a 3 meter test distance.
6. Emissions are investigated while operating on the center channel of the mode, band, and modulation that produced the worst case results during the transmitter spurious emissions testing.
7. No spurious emissions were detected within 20dB of the limit below 30MHz.
8. The results recorded using the broadband antenna is known to correlate with the results obtained by using a tuned dipole with an acceptable degree of accuracy. The VSWR for the measurement antenna was found to be less than 2:1.
9. The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. There were no emissions detected in the 30MHz – 1GHz frequency range, as shown in the subsequent plots.

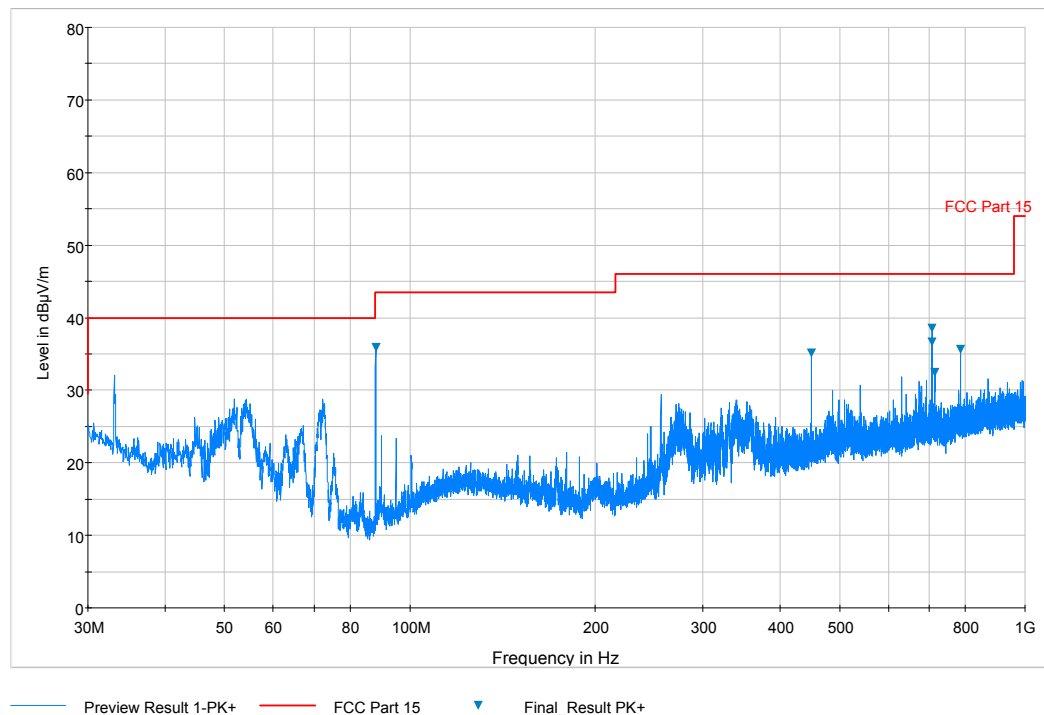
FCC ID: RS2SXPL2	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)	SirusXM SATELLITE RADIO	Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 20 of 52

6.4.1 In-Band Emissions and Radiated Spurious Emissions – Configuration #6

§15.239(b) §15.209

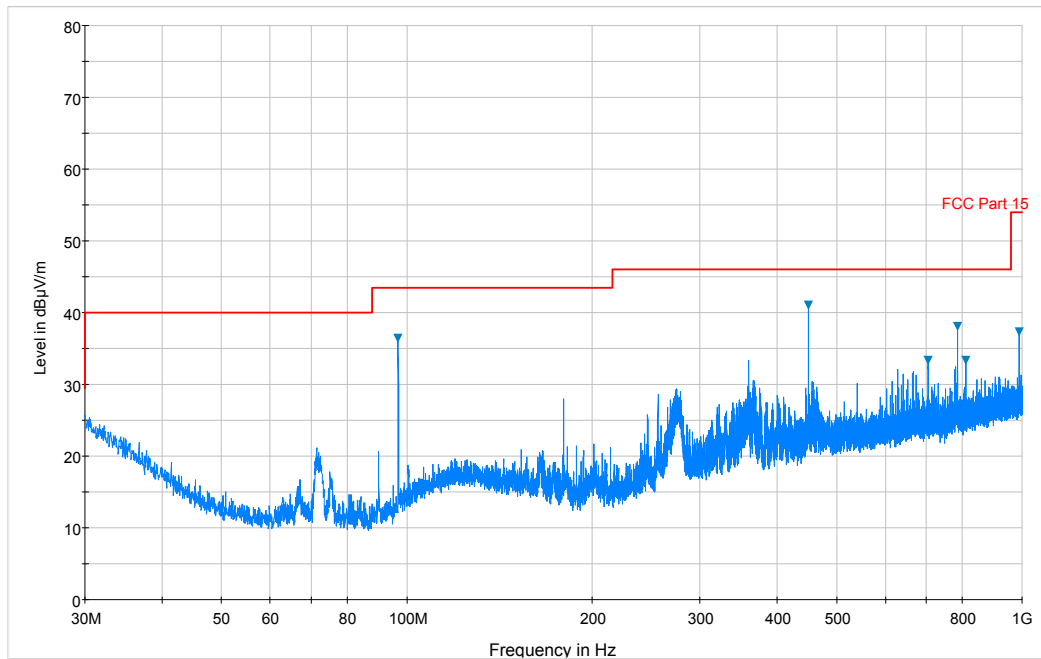


Plot 6-7. Radiated Spurious Plot below 1GHz (Pol. H, Low Channel – 88.1MHz)



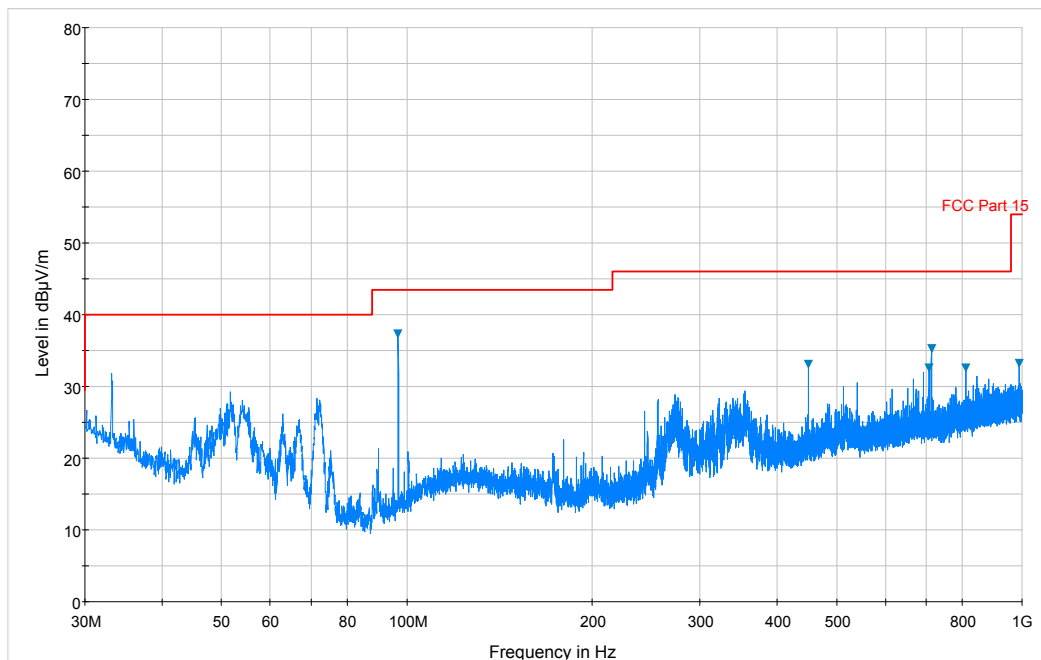
Plot 6-8. Radiated Spurious Plot below 1GHz (Pol. V, Low Channel – 88.1MHz)

FCC ID: RS2SXPL2	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)	SiriusXM SATELLITE RADIO	Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 21 of 52



— Preview Result 1-PK+ — FCC Part 15 ▼ Final_Result PK+

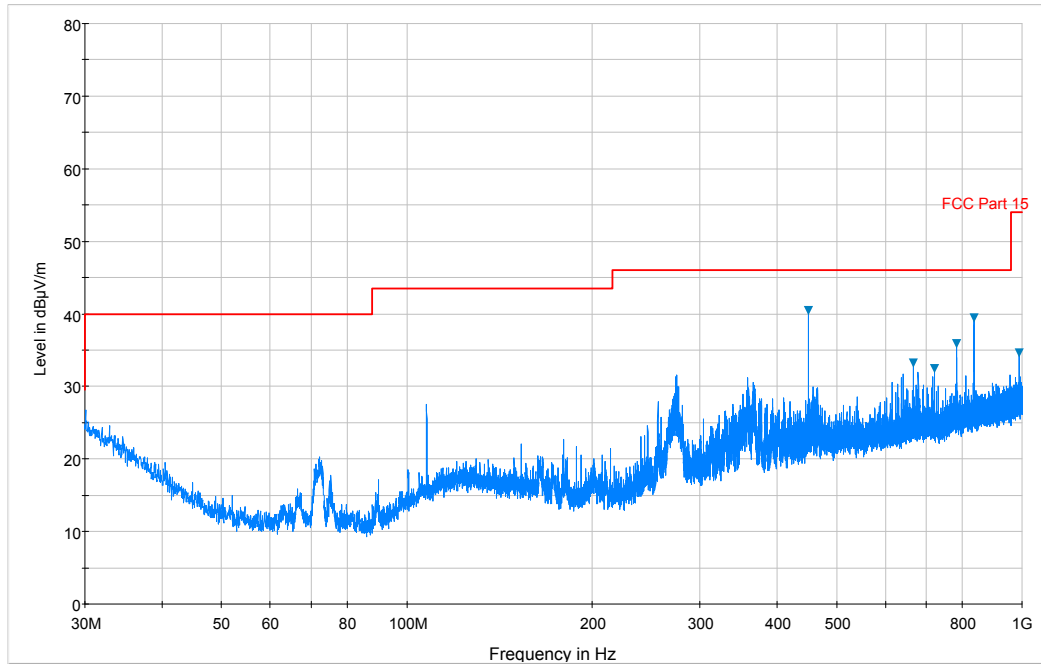
Plot 6-9. Radiated Spurious Plot below 1GHz (Pol. H, Mid Channel – 96.9MHz)



— Preview Result 1-PK+ — FCC Part 15 ▼ Final_Result PK+

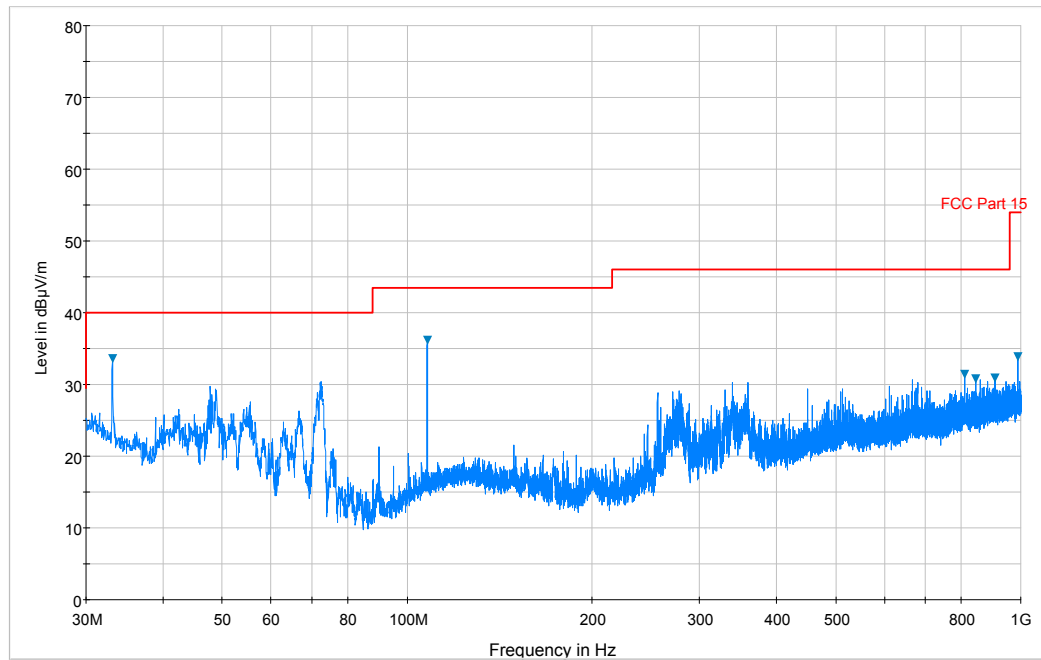
Plot 6-10. Radiated Spurious Plot below 1GHz (Pol. V, Mid Channel – 96.9MHz)

FCC ID: RS2SXPL2	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)	SiriusXM SATELLITE RADIO	Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 22 of 52



Preview Result 1-PK+ FCC Part 15 Final_Result PK+

Plot 6-11. Radiated Spurious Plot below 1GHz (Pol. H, High Channel – 107.9MHz)



Preview Result 1-PK+ FCC Part 15 Final_Result PK+

Plot 6-12. Radiated Spurious Plot below 1GHz (Pol. V, High Channel – 107.9MHz)

FCC ID: RS2SXPL2	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)	SiriusXM SATELLITE RADIO	Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 23 of 52

In-Band Emissions and Radiated Spurious Emissions – Configuration #6

§15.239(b) §15.209

Frequency [MHz]	Detector	Analyzer Level [dBm]	AFCL [dB/m]	POL [H/V]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
88.1	RMS	-82.69	8.54	V	32.85	47.96	-15.11
176.2	Peak	-94.60	12.26	V	24.65	43.52	-18.87
264.3	Peak	-90.28	14.63	V	31.36	46.02	-14.66
352.4	Peak	-91.87	16.57	V	31.70	46.02	-14.32
440.5	Peak	-94.61	18.53	V	30.92	46.02	-15.11
528.6	Peak	-95.34	20.24	V	31.90	46.02	-14.12

Table 6-6. Radiated Spurious Emissions below 1GHz (Low Channel – 88.1MHz)

Frequency [MHz]	Detector	Analyzer Level [dBm]	AFCL [dB/m]	POL [H/V]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
96.9	RMS	-79.93	10.49	V	37.56	47.96	-10.40
193.8	Peak	-96.05	12.73	V	23.67	43.52	-19.85
290.9	Peak	-96.52	15.26	V	25.74	46.02	-20.28
388	Peak	-97.13	17.30	V	27.17	46.02	-18.85
485.1	Peak	-98.17	19.66	V	28.49	46.02	-17.53
582.2	Peak	-97.42	21.06	V	30.64	46.02	-15.38

Table 6-7. Radiated Spurious Emissions below 1GHz (Mid Channel – 96.9MHz)

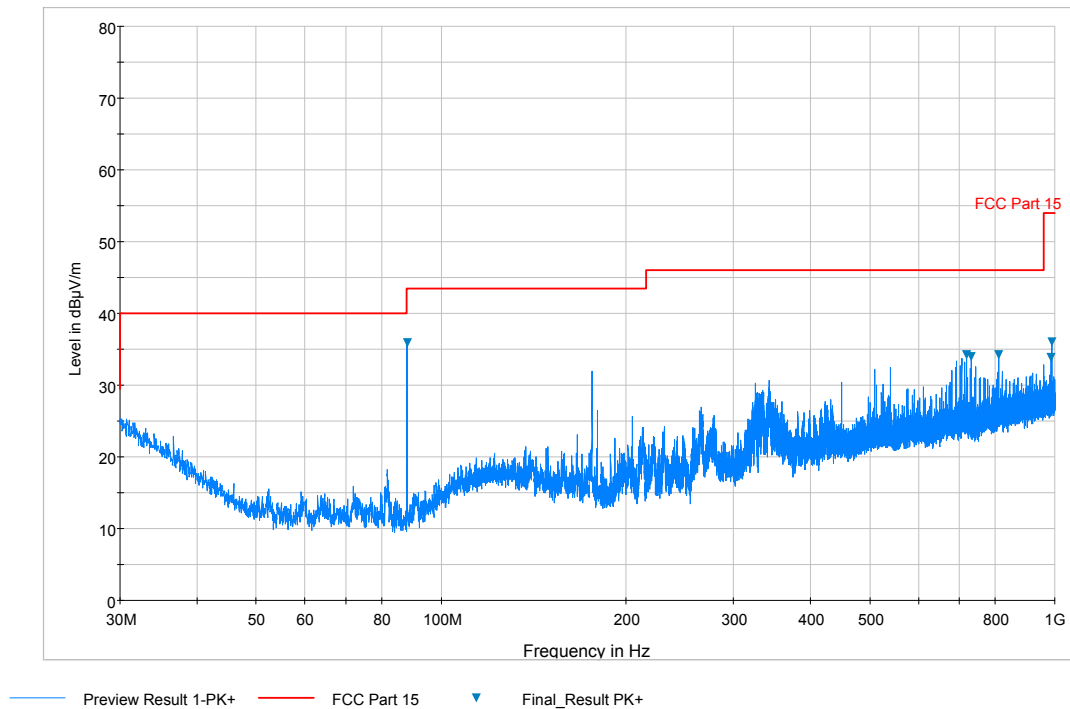
Frequency [MHz]	Detector	Analyzer Level [dBm]	AFCL [dB/m]	POL [H/V]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
107.9	RMS	-87.03	13.00	V	32.97	47.96	-14.99
215.8	Peak	-95.11	12.32	V	24.21	43.52	-19.31
323.3	Peak	-93.27	15.92	V	29.65	46.02	-16.37
430.8	Peak	-93.91	18.29	V	31.38	46.02	-14.64
538.3	Peak	-93.37	20.34	V	33.97	46.02	-12.05
645.8	Peak	-96.28	21.99	V	32.71	46.02	-13.31

Table 6-8. Radiated Spurious Emissions below 1GHz (High Channel – 107.9MHz)

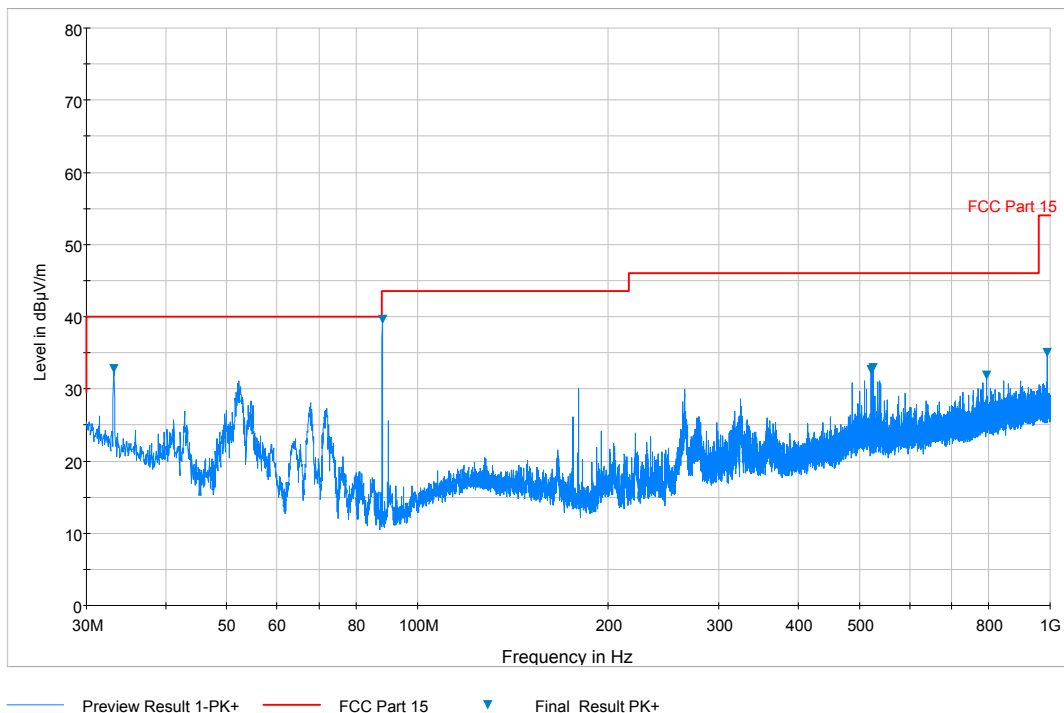
FCC ID: RS2SXPL2		FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 24 of 52

6.4.2 In-Band Emissions and Radiated Spurious Emissions – Configuration #7

§15.239(b) §15.209

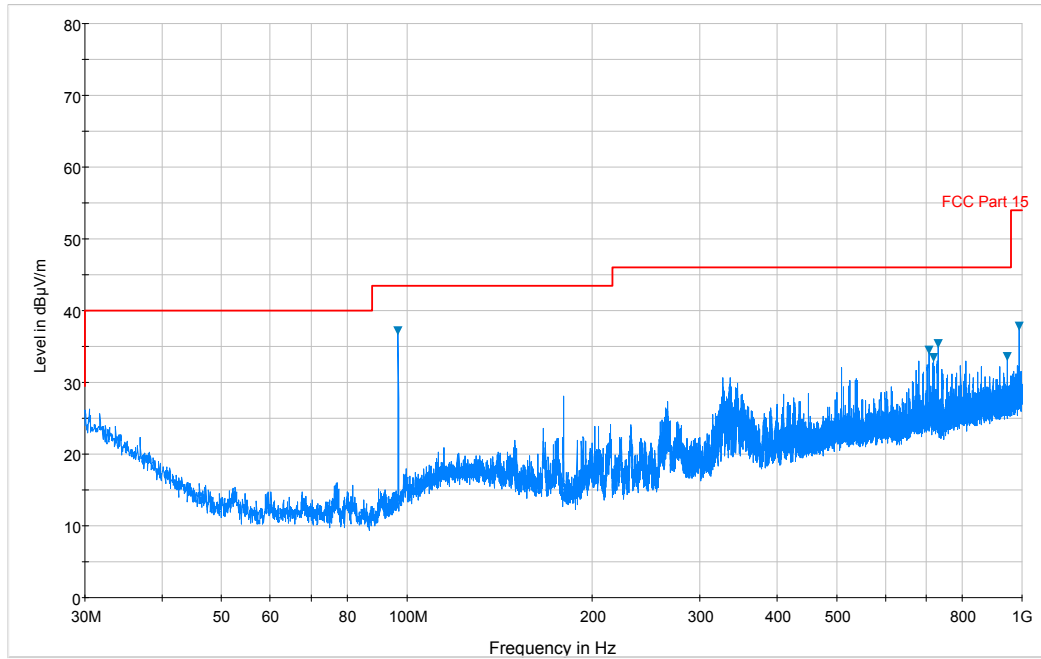


Plot 6-13. Radiated Spurious Plot below 1GHz (Pol. H, Low Channel – 88.1MHz)



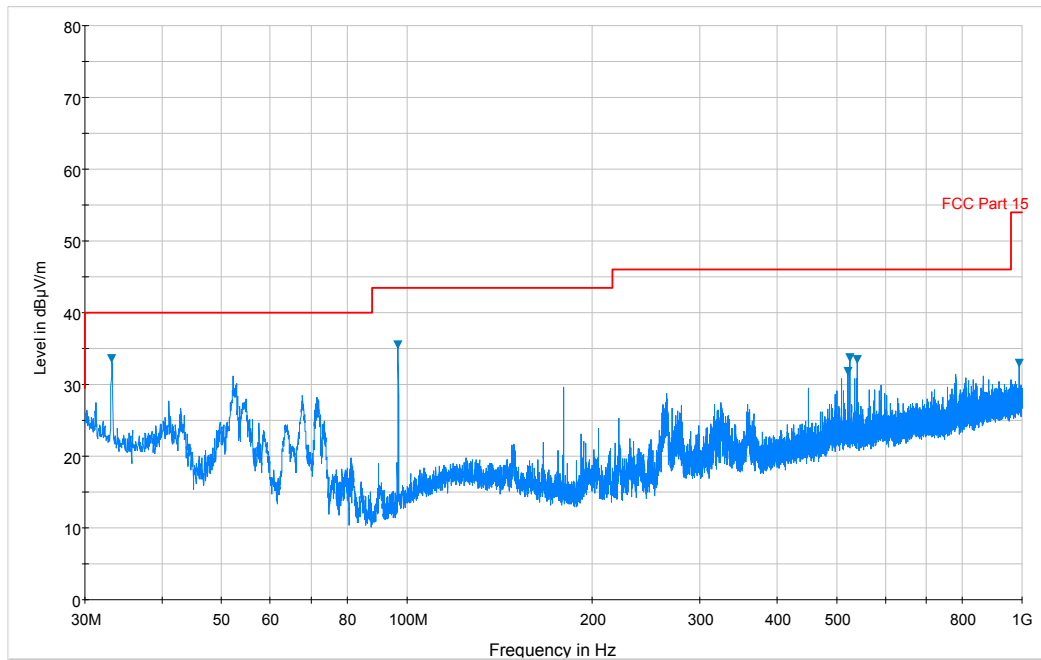
Plot 6-14. Radiated Spurious Plot below 1GHz (Pol. V, Low Channel – 88.1MHz)

FCC ID: RS2SXPL2	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)	SiriusXM SATELLITE RADIO	Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 25 of 52



Preview Result 1-PK+ FCC Part 15 Final_Result PK+

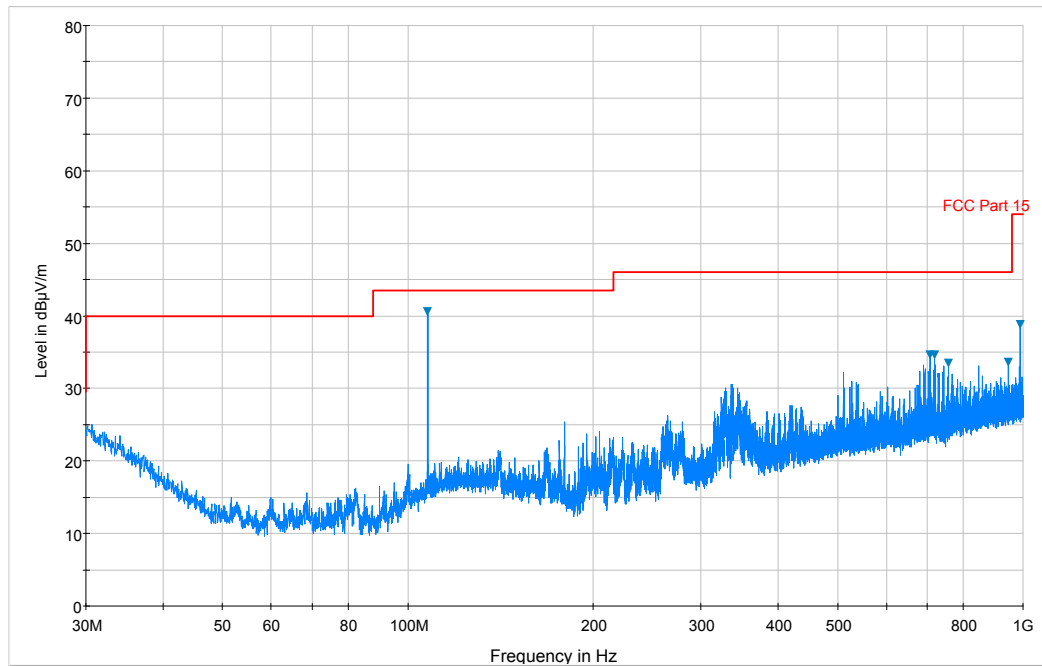
Plot 6-15. Radiated Spurious Plot below 1GHz (Pol. H, Mid Channel – 96.9MHz)



Preview Result 1-PK+ FCC Part 15 Final_Result PK+

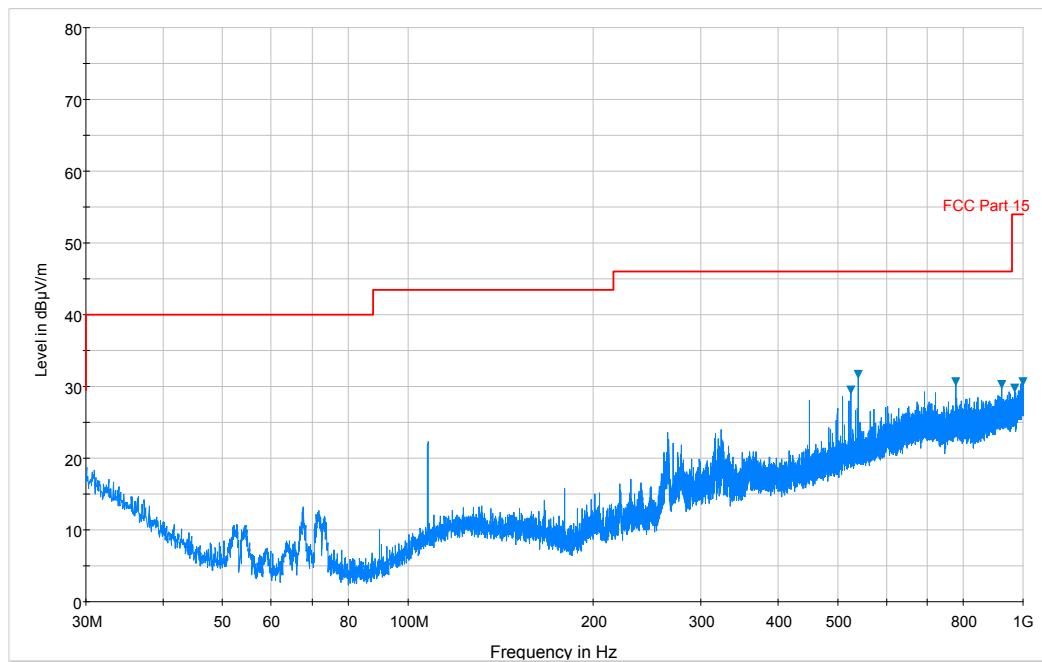
Plot 6-16. Radiated Spurious Plot below 1GHz (Pol. V, Mid Channel – 96.9MHz)

FCC ID: RS2SXPL2	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)	SiriusXM SATELLITE RADIO	Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 26 of 52



Preview Result 1-PK+ FCC Part 15 Final_Result PK+

Plot 6-17. Radiated Spurious Plot below 1GHz (Pol. H, High Channel – 107.9MHz)



Preview Result 1-PK+ FCC Part 15 Final_Result PK+

Plot 6-18. Radiated Spurious Plot below 1GHz (Pol. V, High Channel – 107.9MHz)

FCC ID: RS2SXPL2	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)	SiriusXM SATELLITE RADIO	Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 27 of 52

In-Band Emissions and Radiated Spurious Emissions – Configuration #7

§15.239(b) §15.209

Frequency [MHz]	Detector	Analyzer Level [dBm]	AFCL [dB/m]	POL [H/V]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
88.1	RMS	-76.17	8.54	V	39.37	47.96	-8.59
176.2	Peak	-97.44	12.26	V	21.81	43.52	-21.71
264.3	Peak	-90.58	14.63	V	31.06	46.02	-14.96
352.4	Peak	-99.52	16.57	V	24.05	46.02	-21.97
440.5	Peak	-106.89	18.53	V	18.64	46.02	-27.39
528.6	Peak	-105.60	20.24	V	21.64	46.02	-24.38

Table 6-9. Radiated Spurious Emissions below 1GHz (Low Channel – 88.1MHz)

Frequency [MHz]	Detector	Analyzer Level [dBm]	AFCL [dB/m]	POL [H/V]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
96.9	RMS	-77.34	10.49	V	40.15	47.96	-7.81
193.8	Peak	-97.82	12.73	V	21.90	43.52	-21.62
290.9	Peak	-94.69	15.26	V	27.57	46.02	-18.45
388	Peak	-101.33	17.30	V	22.97	46.02	-23.05
485.1	Peak	-105.06	19.66	V	21.60	46.02	-24.42

Table 6-10. Radiated Spurious Emissions below 1GHz (Mid Channel – 96.9MHz)

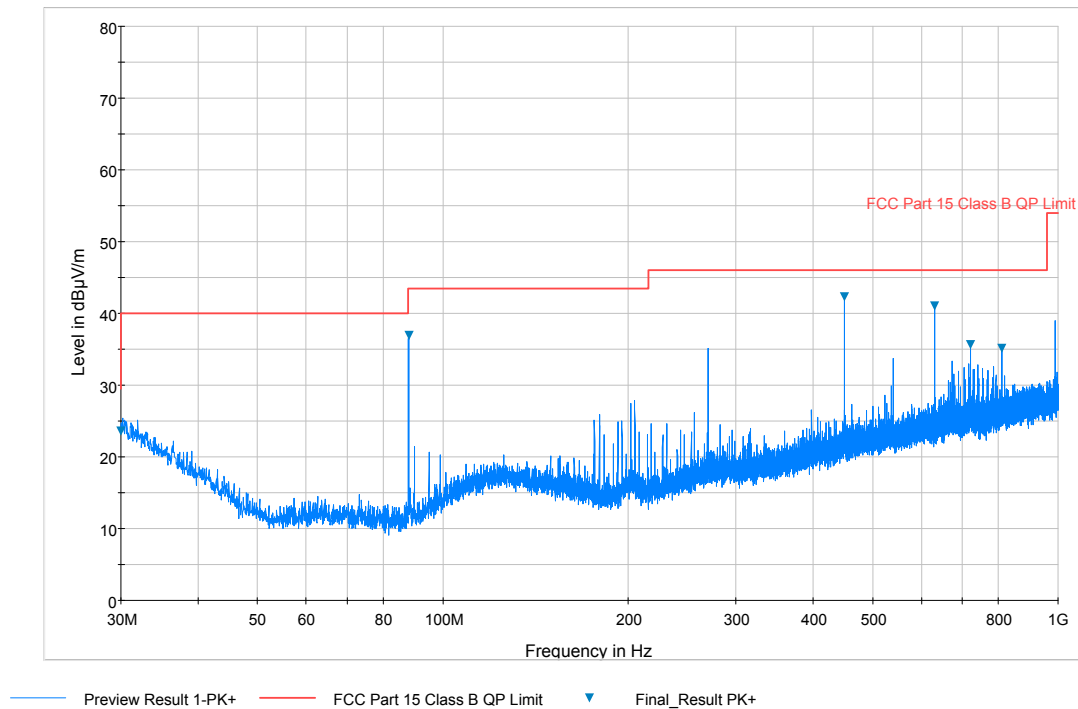
Frequency [MHz]	Detector	Analyzer Level [dBm]	AFCL [dB/m]	POL [H/V]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
107.9	RMS	-81.92	13.00	V	38.08	47.96	-9.88
215.8	Peak	-97.18	12.32	V	22.14	43.52	-21.38
323.3	Peak	-94.86	15.92	V	28.06	46.02	-17.96
430.8	Peak	-105.58	18.29	V	19.71	46.02	-26.31
538.3	Peak	-98.30	20.34	V	29.04	46.02	-16.98
645.8	Peak	-106.01	21.99	V	22.98	46.02	-23.04

Table 6-11. Radiated Spurious Emissions below 1GHz (High Channel – 107.9MHz)

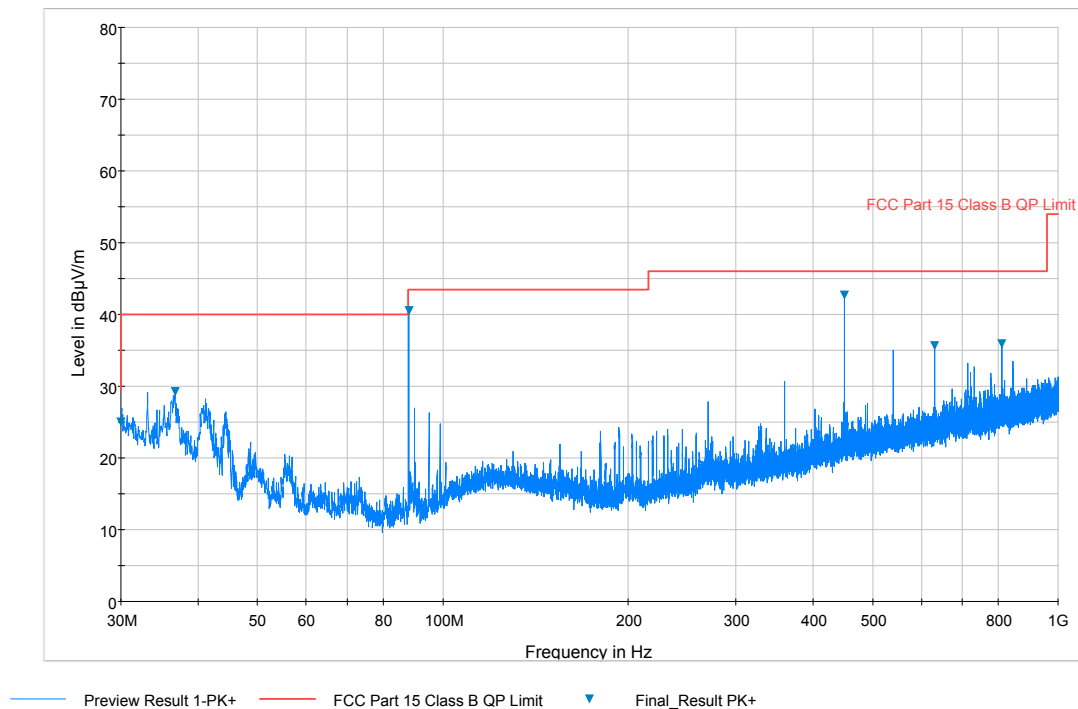
FCC ID: RS2SXPL2		FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 28 of 52

6.4.3 In-Band Emissions and Radiated Spurious Emissions – Configuration #9

§15.239(b) §15.209

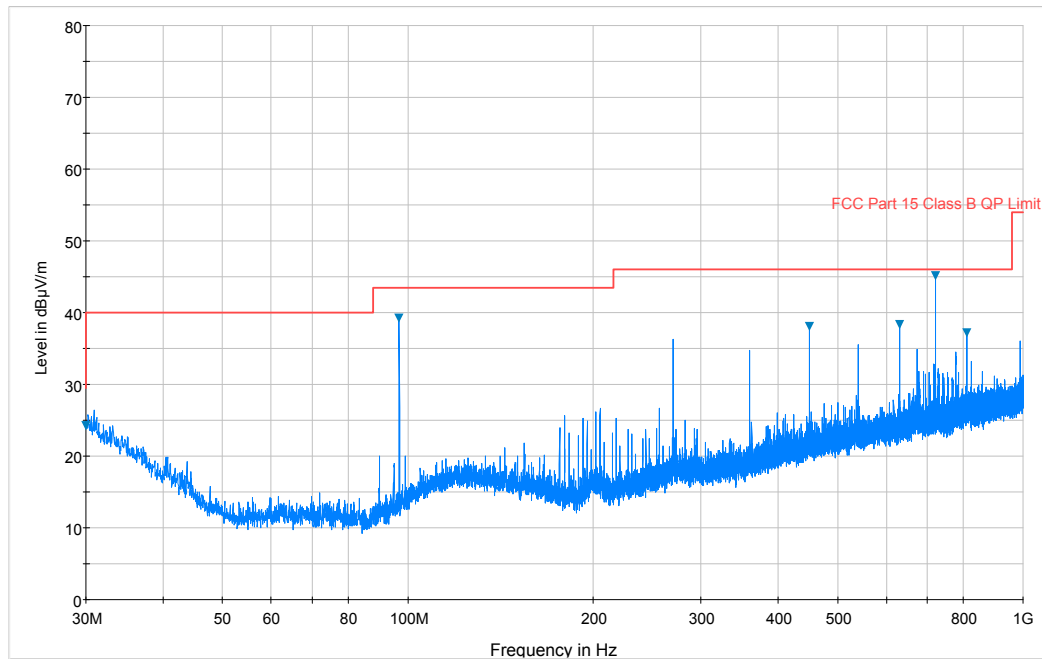


Plot 6-19. Radiated Spurious Plot below 1GHz (Pol. H, Low Channel – 88.1MHz)



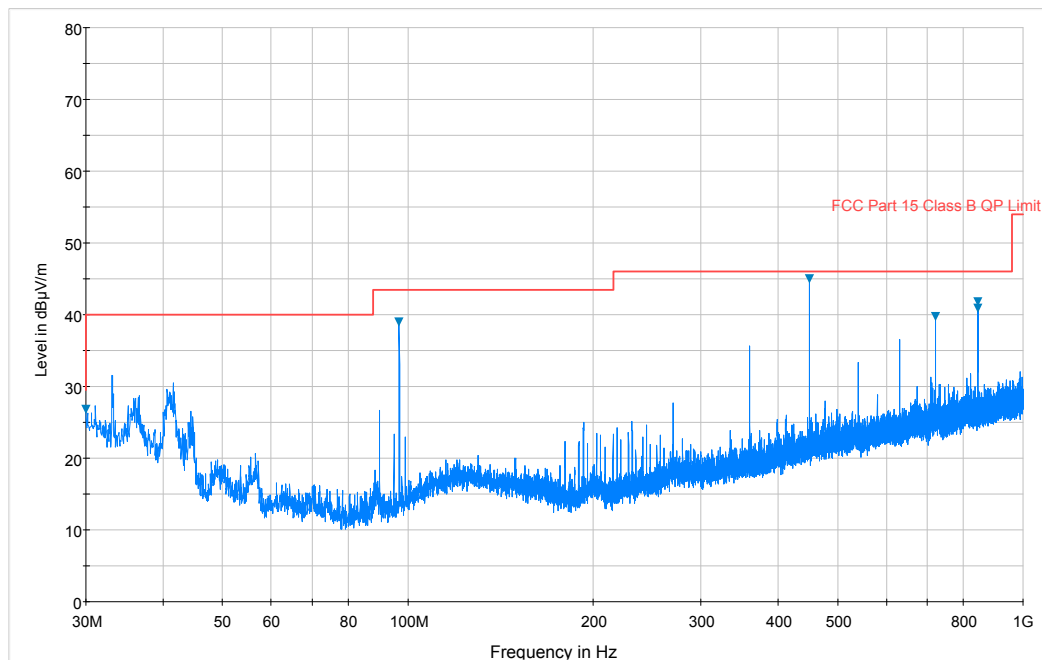
Plot 6-20. Radiated Spurious Plot below 1GHz (Pol. V, Low Channel – 88.1MHz)

FCC ID: RS2SXPL2	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)	SiriusXM SATELLITE RADIO	Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 29 of 52



— Preview Result 1-PK+ — FCC Part 15 Class B QP Limit ▼ Final_Result PK+

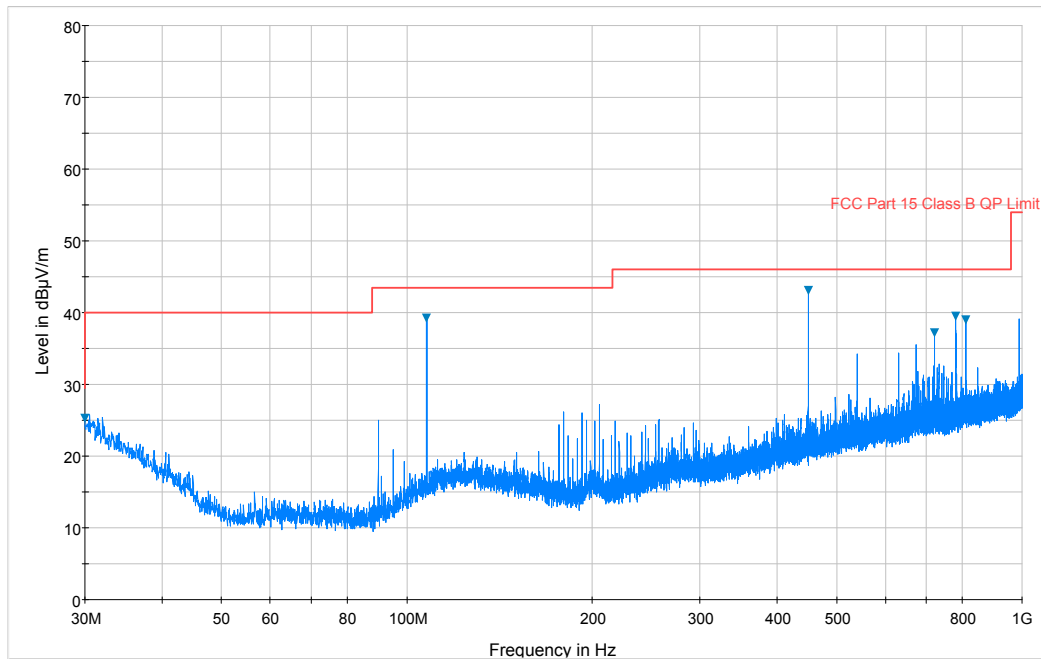
Plot 6-21. Radiated Spurious Plot below 1GHz (Pol. H, Mid Channel – 96.9MHz)



— Preview Result 1-PK+ — FCC Part 15 Class B QP Limit ▼ Final_Result PK+

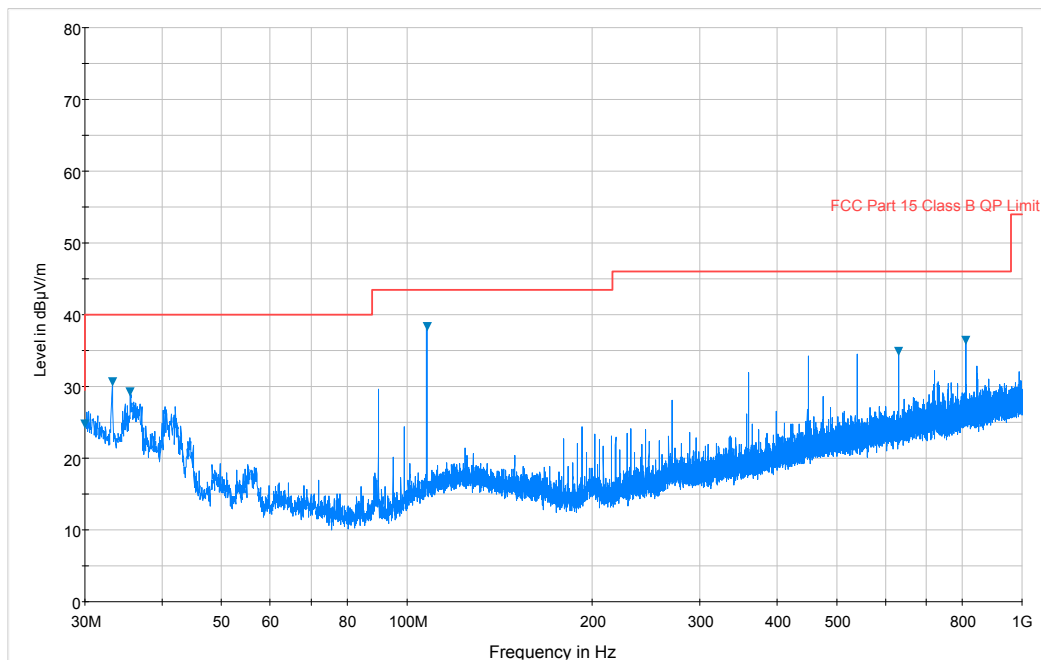
Plot 6-22. Radiated Spurious Plot below 1GHz (Pol. V, Mid Channel – 96.9MHz)

FCC ID: RS2SXPL2	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)	SiriusXM SATELLITE RADIO	Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 30 of 52



— Preview Result 1-PK+ — FCC Part 15 Class B QP Limit ▼ Final_Result PK+

Plot 6-23. Radiated Spurious Plot below 1GHz (Pol. H, High Channel – 107.9MHz)



— Preview Result 1-PK+ — FCC Part 15 Class B QP Limit ▼ Final_Result PK+

Plot 6-24. Radiated Spurious Plot below 1GHz (Pol. V, High Channel – 107.9MHz)

FCC ID: RS2SXPL2	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)	SiriusXM SATELLITE RADIO	Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 31 of 52
© 2016 PCTEST Engineering Laboratory, Inc.				V 3.0 08/10/2015

In-Band Emissions and Radiated Spurious Emissions – Configuration #9

§15.239(b) §15.209

Frequency [MHz]	Detector	Analyzer Level [dBm]	AFCL [dB/m]	POL [H/V]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
88.1	RMS	-78.47	9.57	V	38.10	47.96	-9.86
176.2	Peak	-100.83	12.66	V	18.83	43.52	-24.69
264.3	Peak	-104.83	14.70	V	16.87	46.02	-29.15
352.4	Peak	-104.77	16.40	V	18.63	46.02	-27.39
440.5	Peak	-105.37	18.32	V	19.95	46.02	-26.07
528.6	Peak	-105.17	19.84	V	21.67	46.02	-24.35

Table 6-12. Radiated Spurious Emissions below 1GHz (Low Channel – 88.1MHz)

Frequency [MHz]	Detector	Analyzer Level [dBm]	AFCL [dB/m]	POL [H/V]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
96.9	RMS	-79.63	11.25	V	38.62	47.96	-9.34
193.8	Peak	-105.47	12.41	V	13.95	43.52	-29.57
290.9	Peak	-104.37	15.01	V	17.63	46.02	-28.39
388	Peak	-105.23	17.18	V	18.95	46.02	-27.07
485.1	Peak	-106.05	19.28	V	20.24	46.02	-25.78
582.2	Peak	-104.20	20.57	V	23.37	46.02	-22.65

Table 6-13. Radiated Spurious Emissions below 1GHz (Mid Channel – 96.9MHz)

Frequency [MHz]	Detector	Analyzer Level [dBm]	AFCL [dB/m]	POL [H/V]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
107.9	RMS	-85.15	13.40	V	35.24	47.96	-12.72
215.8	Peak	-105.01	12.36	V	14.36	43.52	-29.16
323.3	Peak	-104.07	15.62	V	18.55	46.02	-27.47
430.8	Peak	-105.66	18.11	V	19.45	46.02	-26.57
538.3	Peak	-104.36	19.89	V	22.52	46.02	-23.50
645.8	Peak	-105.68	21.50	V	22.82	46.02	-23.20

Table 6-14. Radiated Spurious Emissions below 1GHz (High Channel – 107.9MHz)

FCC ID: RS2SXPL2		FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 32 of 52

6.5 Radiated Spurious Emissions – Above 1GHz

§15.239(c) §15.209

Test Overview and Limit

All out of band radiated spurious emissions are measured with a spectrum analyzer connected to a receive antenna while the EUT is operating at maximum power and at the appropriate frequencies. Only the radiated emissions of the configuration that produced the worst case emissions are reported in this section.

All out of band emissions appearing in a restricted band as specified in Section 15.205 of the Title 47 CFR must not exceed the limits shown in Table 6-15 per Section 15.209.

Frequency	Field Strength [$\mu\text{V/m}$]	Measured Distance [Meters]
Above 960.0 MHz	500	3

Table 6-15. Radiated Limits

Test Procedures Used

ANSI C63.10-2009 – Clause 6.6

Test Settings

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = 1MHz
3. VBW = 3MHz
4. Detector = peak
5. Sweep time = auto couple
6. Trace mode = max hold
7. Trace was allowed to stabilize

FCC ID: RS2SXPL2		FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 33 of 52

Test Setup

The EUT and measurement equipment were set up as shown in the diagram below.

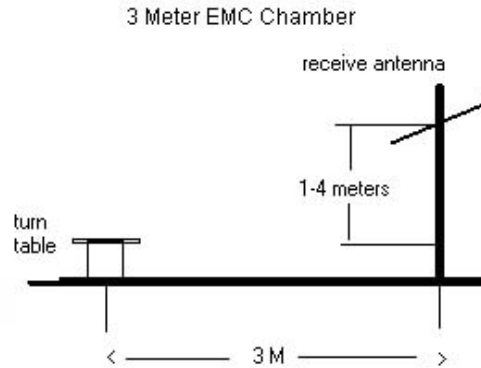


Figure 6-8. Test Instrument & Measurement Setup

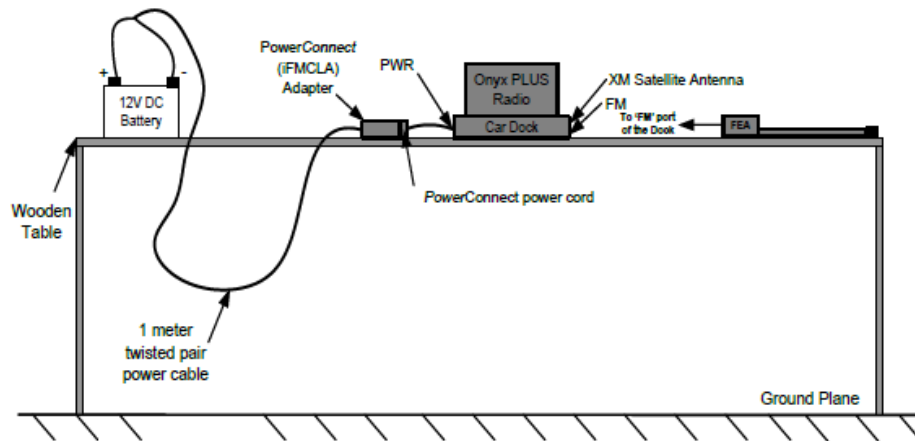


Figure 6-9. Test Instrument & Measurement Setup (Configuration #6)

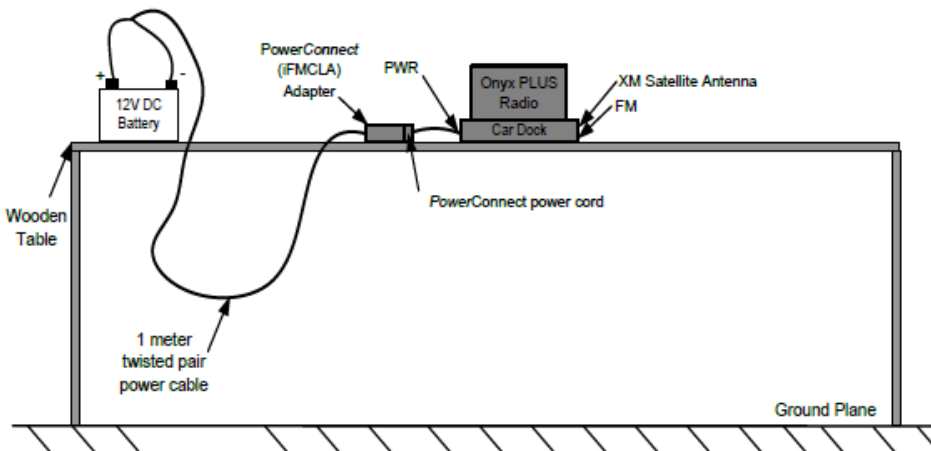


Figure 6-10. Test Instrument & Measurement Setup (Configuration #7)

FCC ID: RS2SXPL2	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)	SiriusXM SATELLITE RADIO	Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 34 of 52

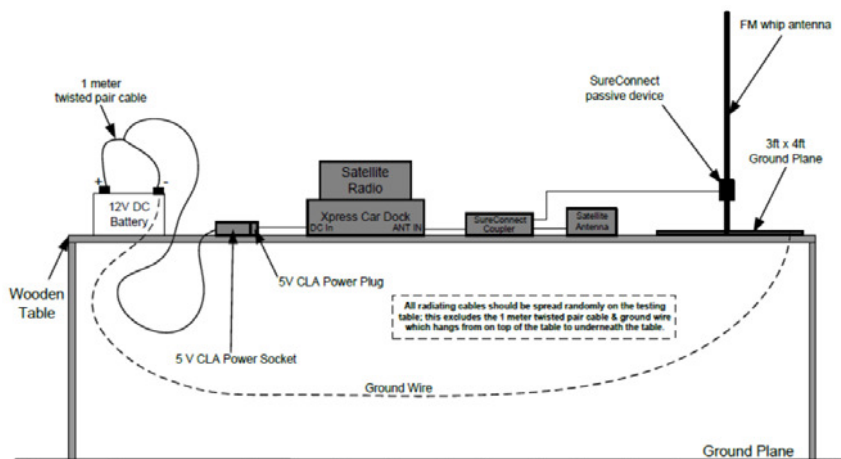


Figure 6-11. Test Instrument & Measurement Setup (Configuration #9)

Test Notes

1. All emissions lying in restricted bands specified in §15.205 are below the limit shown in Table 6-7.
2. The antenna is manipulated through typical positions, polarity and length during the tests.
3. This unit was tested with its standard battery.
4. The spectrum is measured from 9kHz to the 10th harmonic of the fundamental frequency of the transmitter using CISPR quasi peak detector below 1GHz. Above 1 GHz, peak measurements were taken using linearly polarized horn antennas. The worst-case emissions are reported however emissions whose levels were not within 20dB of the respective limits were not reported.
5. Emissions below 18GHz were measured at a 3 meter test distance while emissions above 18GHz were measured at a 1 meter test distance with the application of a distance correction factor.
6. The wide spectrum spurious emissions plots shown on the following pages are used only for the purpose of emission identification. Any emissions found to be within 20dB of the limit are fully investigated and the results are shown in this section.
7. Per ANSI C63.10-2009, average measurements not included since peak measured values comply with the average limit.

Sample Calculations

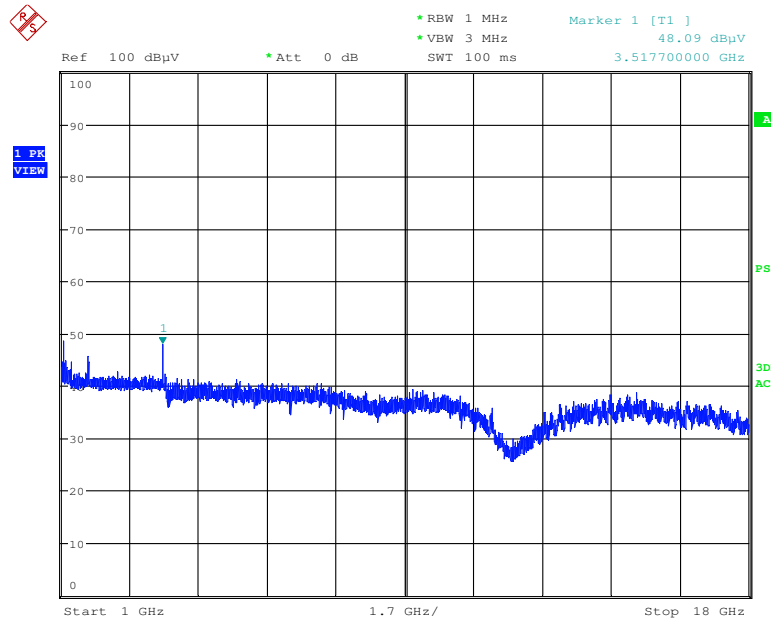
Determining Spurious Emissions Levels

- Field Strength Level $_{[dB\mu V/m]} = \text{Analyzer Level}_{[dBm]} + 107 + \text{AFCL}_{[dB/m]}$
- $\text{AFCL}_{[dB/m]} = \text{Antenna Factor}_{[dB/m]} + \text{Cable Loss}_{[dB]}$
- $\text{Margin}_{[dB]} = \text{Field Strength Level}_{[dB\mu V/m]} - \text{Limit}_{[dB\mu V/m]}$

FCC ID: RS2SXP2	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)	SirlusXm SATELLITE RADIO	Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 35 of 52

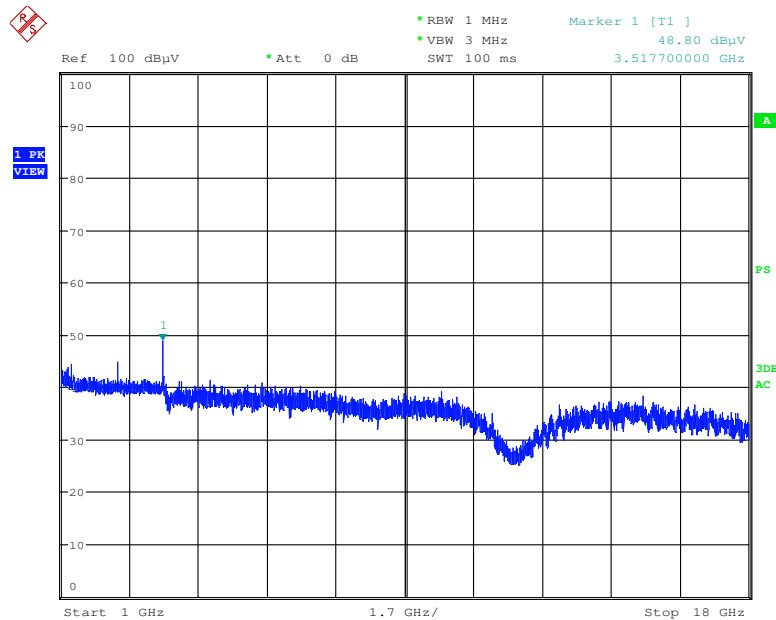
6.5.1 Radiated Spurious Emission Measurements – Configuration #6

§15.239(c) §15.209



Date: 28.SEP.2015 12:08:06

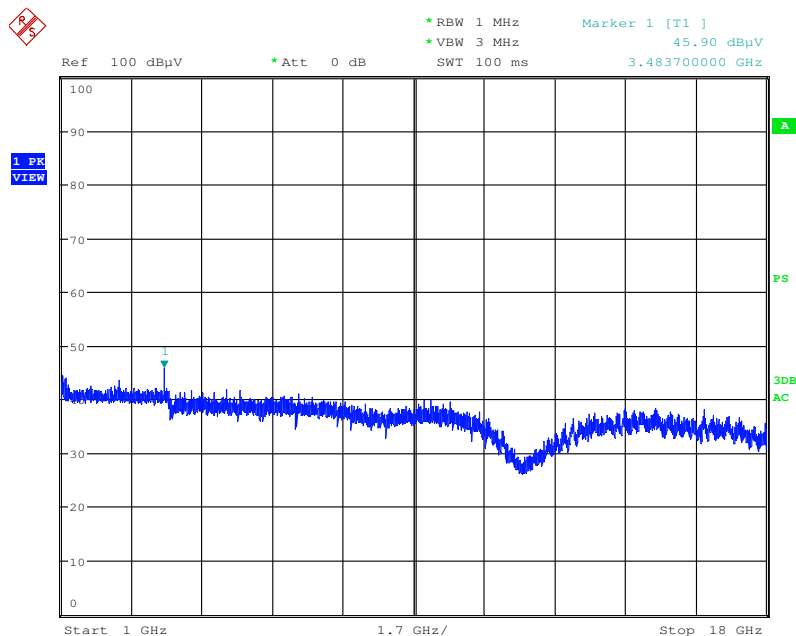
Plot 6-25. Radiated Spurious Plot above 1GHz (Ant. Pol. H, Low Channel – 88.1MHz)



Date: 28.SEP.2015 12:48:49

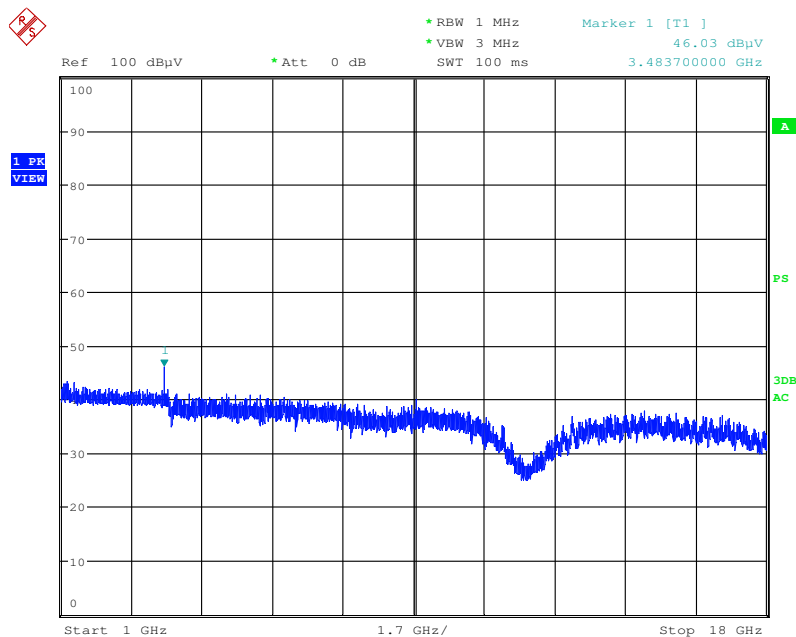
Plot 6-26. Radiated Spurious Plot above 1GHz (Ant. Pol. V, Low Channel – 88.1MHz)

FCC ID: RS2SXPL2	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)	SiriusXM SATELLITE RADIO	Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 36 of 52
© 2016 PCTEST Engineering Laboratory, Inc.				



Date: 28.SEP.2015 12:20:17

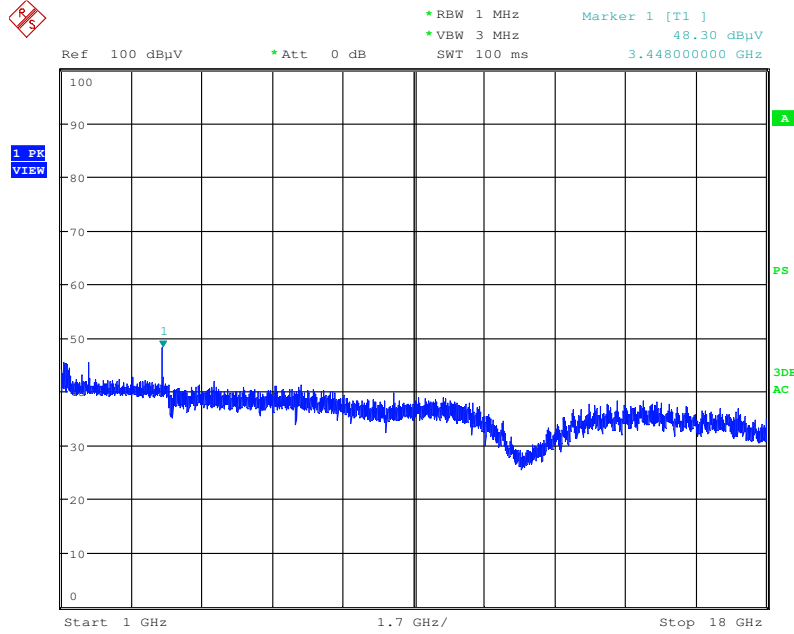
Plot 6-27. Radiated Spurious Plot above 1GHz (Ant. Pol. H, Mid Channel – 96.9MHz)



Date: 28.SEP.2015 12:45:28

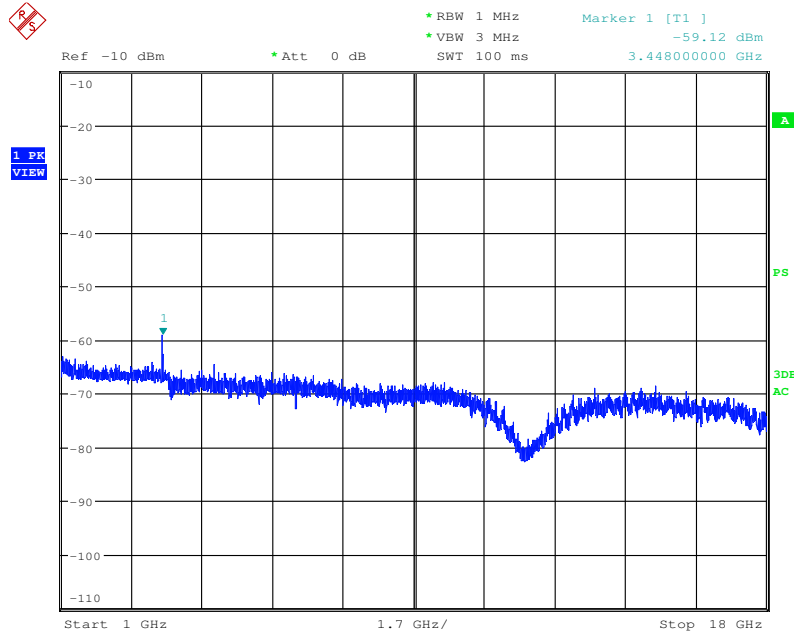
Plot 6-28. Radiated Spurious Plot above 1GHz (Ant. Pol. V, Mid Channel – 96.9MHz)

FCC ID: RS2SXPL2	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)	SiriusXM SATELLITE RADIO	Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 37 of 52



Date: 28.SEP.2015 12:34:20

Plot 6-29. Radiated Spurious Plot above 1GHz (Ant. Pol. H, High Channel – 107.9MHz)



Date: 28.SEP.2015 15:31:37

Plot 6-30. Radiated Spurious Plot above 1GHz (Ant. Pol. V, High Channel – 107.9MHz)

FCC ID: RS2SXPL2	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)	SiriusXM SATELLITE RADIO	Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 38 of 52
© 2016 PCTEST Engineering Laboratory, Inc.				V 3.0 08/10/2015

Radiated Spurious Emission Measurements

§15.247(d) §15.209

Distance of Measurements: 3 Meters

Operating Frequency: 88.1MHz

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
1076.00	Peak	V	-95.60	26.67	38.07	53.98	-15.90
2407.00	Peak	V	-93.74	31.79	45.05	53.98	-8.93
3517.00	Peak	V	-92.70	35.52	49.83	53.98	-4.15
4689.00	Peak	V	-98.49	38.85	47.36	53.98	-6.62
5969.00	Peak	V	-98.11	40.06	48.95	53.98	-5.03
7822.00	Peak	V	-98.84	43.59	51.75	53.98	-2.23

Table 6-16. Radiated Measurements (Low Channel – 88.1MHz)

Distance of Measurements: 3 Meters

Operating Frequency: 96.9MHz

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
1740.00	Peak	V	-98.18	29.26	38.08	53.98	-15.90
2448.00	Peak	V	-93.75	31.91	45.17	53.98	-8.81
3483.00	Peak	V	-92.79	35.41	49.62	53.98	-4.36
4328.00	Peak	V	-97.54	38.72	48.18	53.98	-5.80
5309.00	Peak	V	-98.81	39.34	47.53	53.98	-6.45
6752.00	Peak	V	-98.39	41.17	49.79	53.98	-4.19

Table 6-17. Radiated Measurements (Mid Channel – 96.9MHz)

FCC ID: RS2SXPL2		FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 39 of 52

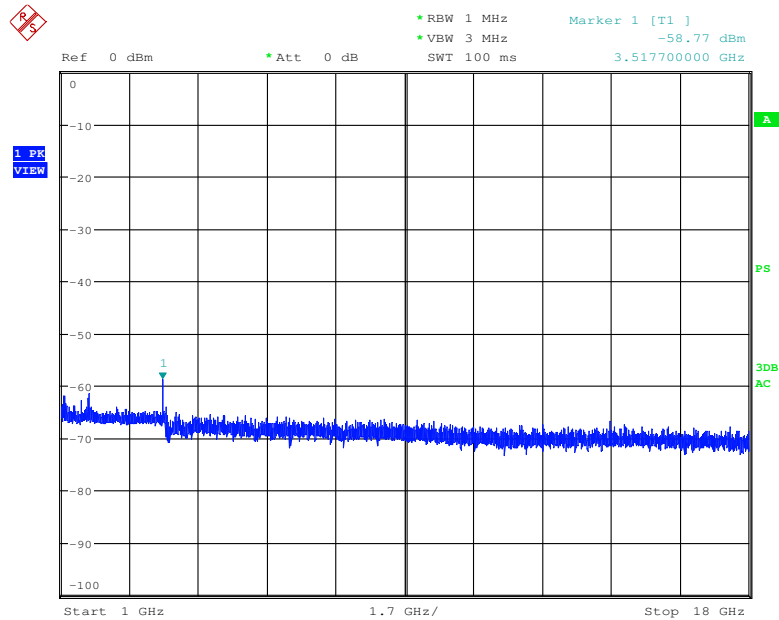
Distance of Measurements: 3 Meters
 Operating Frequency: 107.9MHz

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
2409.00	Peak	V	-94.44	31.80	44.36	53.98	-9.62
3448.00	Peak	V	-93.35	35.30	48.95	53.98	-5.03
4701.00	Peak	V	-98.71	38.87	47.17	53.98	-6.81
6090.00	Peak	V	-99.54	40.37	47.83	53.98	-6.15
7071.00	Peak	V	-99.12	41.67	49.54	53.98	-4.44
9577.00	Peak	V	-99.64	45.44	52.80	53.98	-1.18

Table 6-18. Radiated Measurements (High Channel – 107.9MHz)

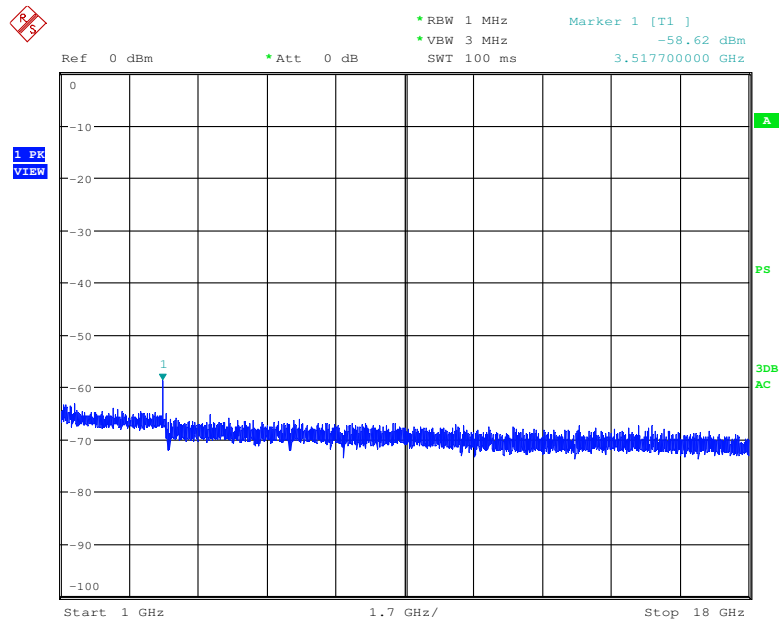
6.5.2 Radiated Spurious Emission Measurements – Configuration #7

§15.239(c) §15.209



Date: 24.SEP.2015 17:51:58

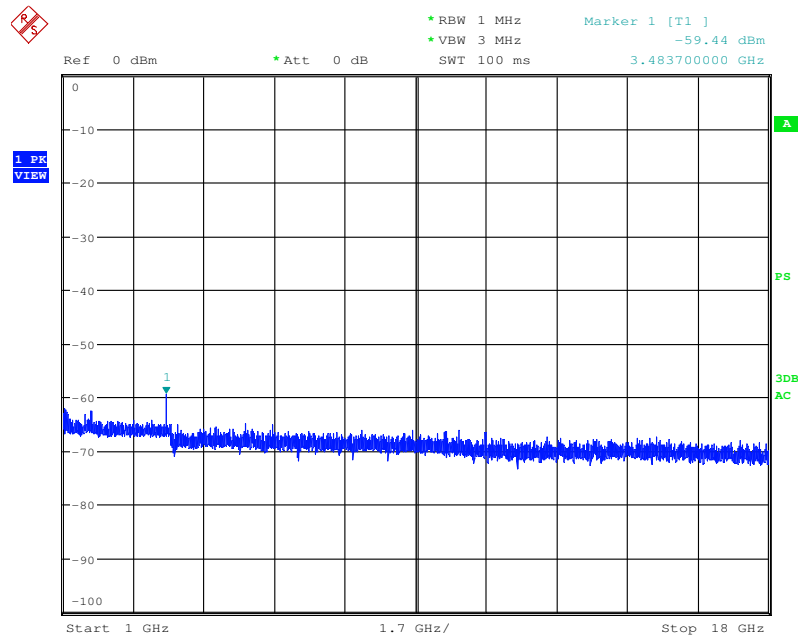
Plot 6-31. Radiated Spurious Plot above 1GHz (Ant. Pol. H, Low Channel – 88.1MHz)



Date: 24.SEP.2015 17:23:03

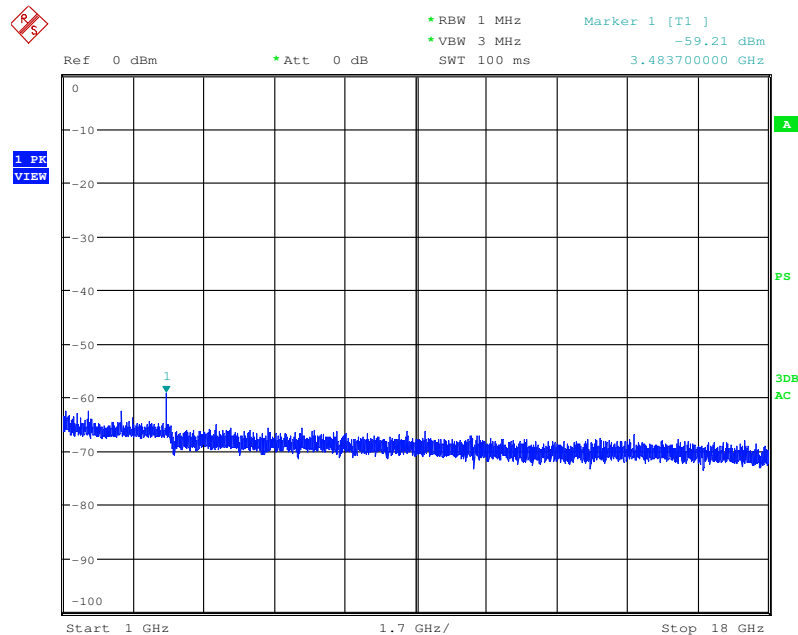
Plot 6-32. Radiated Spurious Plot above 1GHz (Ant. Pol. V, Low Channel – 88.1MHz)

FCC ID: RS2SXPL2	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)	SiriusXM SATELLITE RADIO	Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 41 of 52



Date: 24.SEP.2015 17:49:22

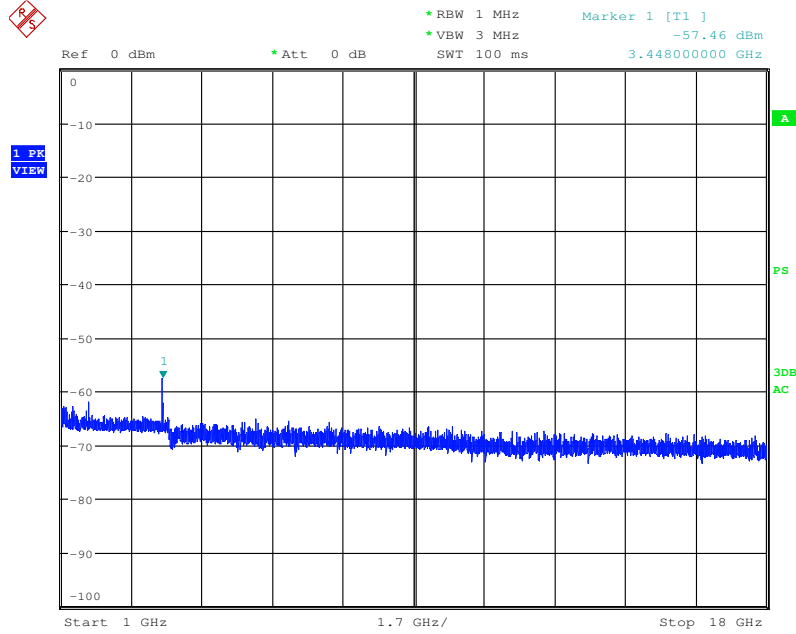
Plot 6-33. Radiated Spurious Plot above 1GHz (Ant. Pol. H, Mid Channel – 96.9MHz)



Date: 24.SEP.2015 17:32:48

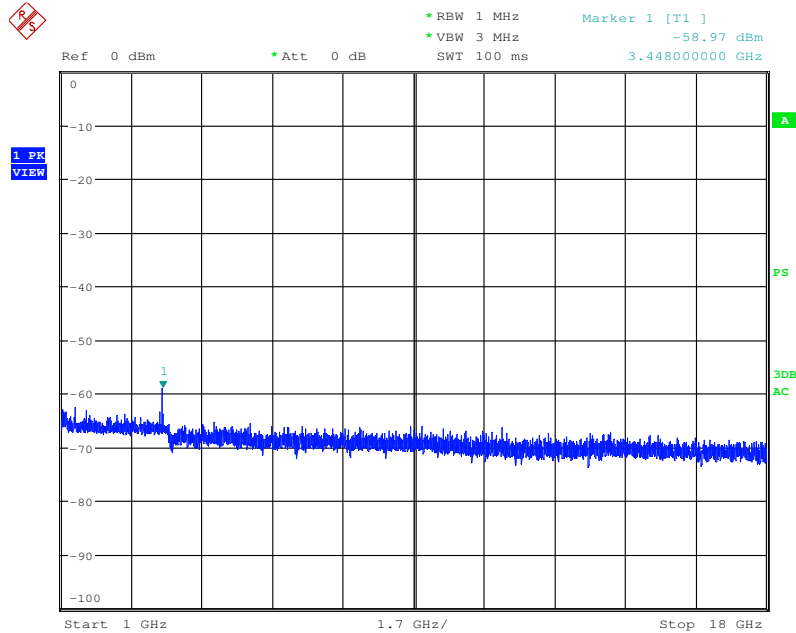
Plot 6-34. Radiated Spurious Plot above 1GHz (Ant. Pol. V, Mid Channel – 96.9MHz)

FCC ID: RS2SXPL2	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)	SiriusXM SATELLITE RADIO	Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 42 of 52



Date: 24.SEP.2015 17:42:23

Plot 6-35. Radiated Spurious Plot above 1GHz (Ant. Pol. H, High Channel – 107.9MHz)



Date: 24.SEP.2015 17:38:26

Plot 6-36. Radiated Spurious Plot above 1GHz (Ant. Pol. V, High Channel – 107.9MHz)

FCC ID: RS2SXPL2	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)	SiriusXM SATELLITE RADIO	Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 43 of 52

Radiated Spurious Emission Measurements

§15.239(c) §15.209

Distance of Measurements: 3 Meters
 Operating Frequency: 88.1MHz

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
2390.00	Peak	V	-97.31	31.71	41.40	53.98	-12.58
3517.00	Peak	V	-90.52	35.52	52.01	53.98	-1.97
4498.00	Peak	V	-97.63	38.56	47.93	53.98	-6.05
5370.00	Peak	V	-98.10	39.57	48.47	53.98	-5.51
8394.00	Peak	V	-98.35	44.74	53.40	53.98	-0.58
11173.00	Peak	V	-99.99	46.30	53.31	53.98	-0.67

Table 6-19. Radiated Measurements (Low Channel – 88.1MHz)

Distance of Measurements: 3 Meters
 Operating Frequency: 96.9MHz

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
2414.00	Peak	V	-93.50	31.81	45.32	53.98	-8.66
3483.00	Peak	V	-95.44	35.41	46.97	53.98	-7.01
5663.00	Peak	V	-97.82	39.68	48.86	53.98	-5.12
7254.00	Peak	V	-99.75	42.60	49.86	53.98	-4.12
8861.00	Peak	V	-99.70	45.47	52.78	53.98	-1.20
9368.00	Peak	V	-99.31	45.55	53.23	53.98	-0.75

Table 6-20. Radiated Measurements (Mid Channel – 96.9MHz)

FCC ID: RS2SXP2		FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 44 of 52

Distance of Measurements: 3 Meters
 Operating Frequency: 107.9MHz

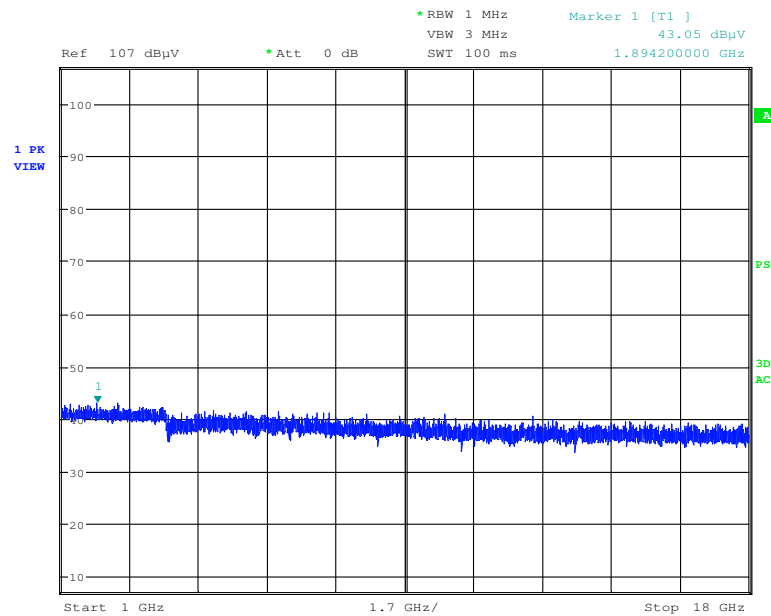
Frequency [MHz]	Detector	Ant. Pol. [H/V]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
2358.00	Peak	V	-96.43	31.50	42.07	53.98	-11.91
3448.00	Peak	V	-90.31	35.30	51.99	53.98	-1.99
6036.00	Peak	V	-98.47	40.25	48.78	53.98	-5.20
7098.00	Peak	V	-100.69	41.71	48.03	53.98	-5.95
8597.00	Peak	V	-99.01	45.22	53.22	53.98	-0.76
9441.00	Peak	V	-100.00	45.60	52.60	53.98	-1.38

Table 6-21. Radiated Measurements (High Channel – 107.9MHz)

FCC ID: RS2SXPL2		FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 45 of 52

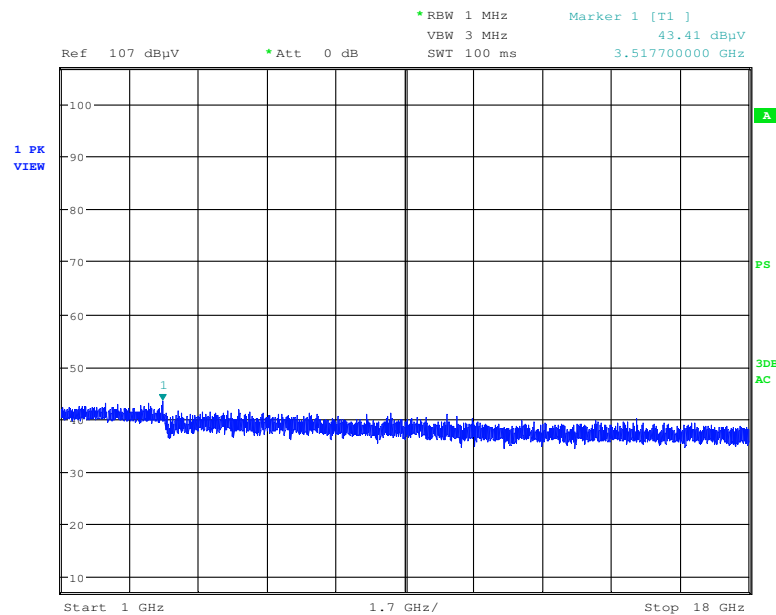
6.5.3 Radiated Spurious Emission Measurements – Configuration #9

§15.239(c) §15.209



Date: 3.FEB.2016 13:45:47

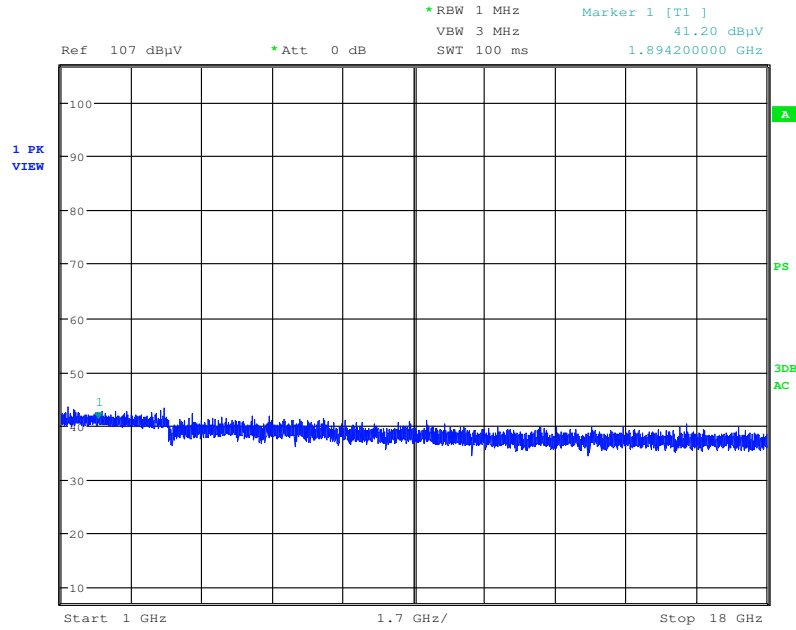
Plot 6-37. Radiated Spurious Plot above 1GHz (Ant. Pol. H, Low Channel – 88.1MHz)



Date: 3.FEB.2016 14:11:45

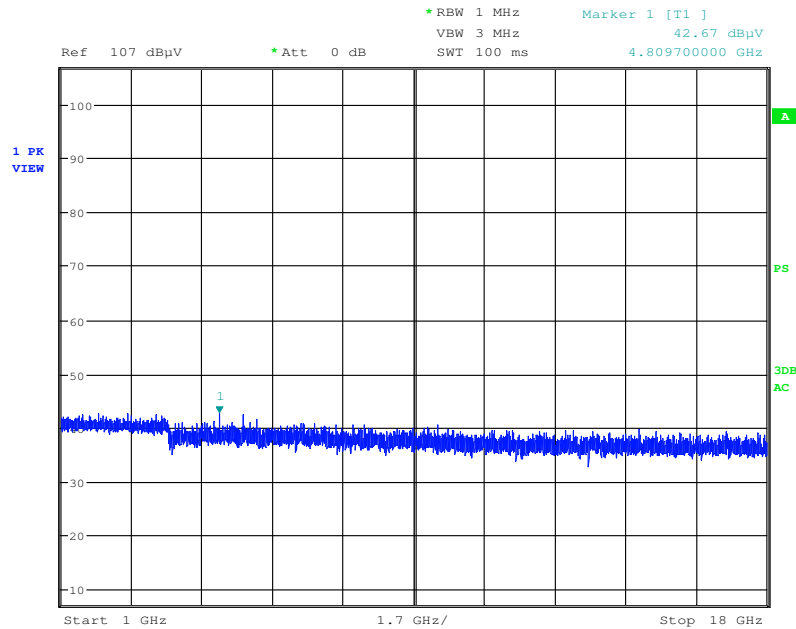
Plot 6-38. Radiated Spurious Plot above 1GHz (Ant. Pol. V, Low Channel – 88.1MHz)

FCC ID: RS2SXPL2	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)	SiriusXM SATELLITE RADIO	Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 46 of 52



Date: 3.FEB.2016 13:56:04

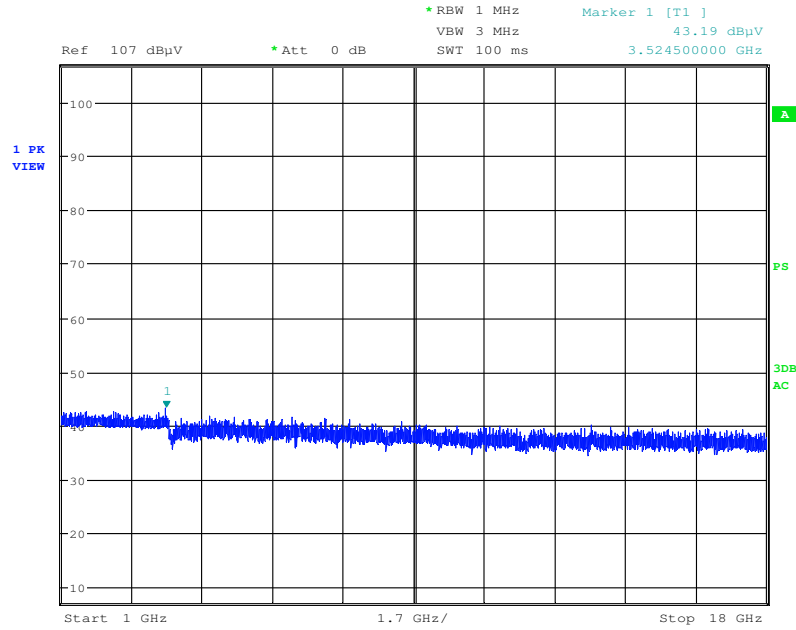
Plot 6-39. Radiated Spurious Plot above 1GHz (Ant. Pol. H, Mid Channel – 96.9MHz)



Date: 3.FEB.2016 14:05:42

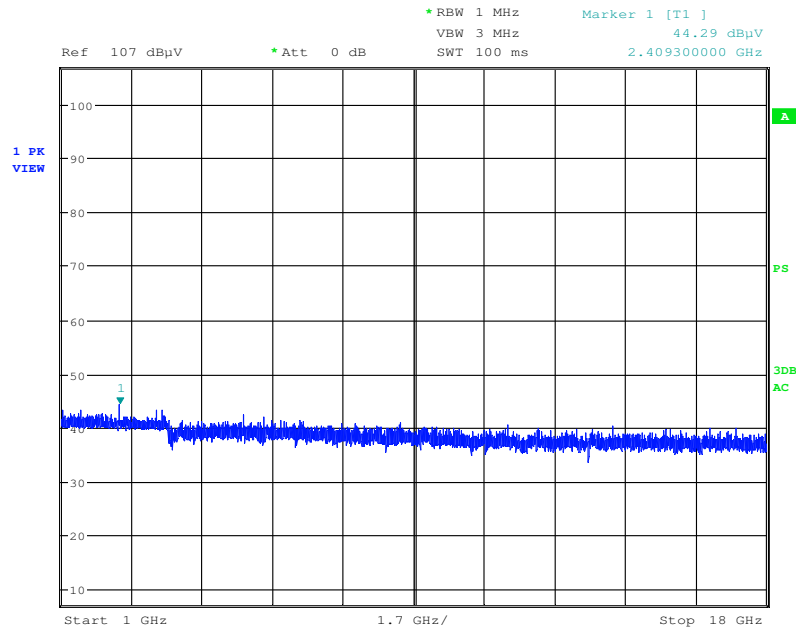
Plot 6-40. Radiated Spurious Plot above 1GHz (Ant. Pol. V, Mid Channel – 96.9MHz)

FCC ID: RS2SXPL2	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)	SiriusXM SATELLITE RADIO	Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 47 of 52
© 2016 PCTEST Engineering Laboratory, Inc.				V 3.0 08/10/2015



Date: 3.FEB.2016 13:59:24

Plot 6-41. Radiated Spurious Plot above 1GHz (Ant. Pol. H, High Channel – 107.9MHz)



Date: 3.FEB.2016 14:03:10

Plot 6-42. Radiated Spurious Plot above 1GHz (Ant. Pol. V, High Channel – 107.9MHz)

FCC ID: RS2SXPL2	PCTEST ENGINEERING LABORATORY, INC.	FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)	SiriusXM SATELLITE RADIO	Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 48 of 52

Radiated Spurious Emission Measurements

§15.239(c) §15.209

Distance of Measurements: 3 Meters

Operating Frequency: 88.1MHz

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
3517.00	Avg	V	-100.60	37.63	44.03	53.98	-9.95
3517.00	Peak	V	-96.00	37.63	48.63	73.98	-25.35
5370.00	Avg	V	-108.25	43.33	42.08	53.98	-11.90
5370.00	Peak	V	-97.70	43.33	52.63	73.98	-21.35
6378.00	Avg	V	-107.62	45.49	44.87	53.98	-9.11
6378.00	Peak	V	-99.08	45.49	53.41	73.98	-20.57
7277.00	Avg	V	-108.77	46.59	44.82	53.98	-9.16
7277.00	Peak	V	-99.85	46.59	53.74	73.98	-20.24
9020.00	Avg	V	-107.79	49.54	48.75	53.98	-5.23
9020.00	Peak	V	-99.27	49.54	57.27	73.98	-16.71
9892.00	Avg	V	-108.14	49.34	48.20	53.98	-5.78
9892.00	Peak	V	-98.76	49.34	57.58	73.98	-16.40

Table 6-22. Radiated Measurements (Low Channel – 88.1MHz)

FCC ID: RS2SXPL2		FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 49 of 52

Distance of Measurements: 3 Meters
 Operating Frequency: 96.9MHz

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
3446.00	Avg	V	-106.29	37.27	37.98	53.98	-16.00
3446.00	Peak	V	-98.87	37.27	45.40	73.98	-28.58
5598.00	Avg	V	-108.38	44.22	42.83	53.98	-11.15
5598.00	Peak	V	-98.69	44.22	52.52	73.98	-21.46
6579.00	Avg	V	-108.12	49.82	48.70	53.98	-5.28
6579.00	Peak	V	-99.15	49.82	57.67	73.98	-16.31
8568.00	Avg	V	-108.13	48.41	47.27	53.98	-6.71
8568.00	Peak	V	-98.79	48.41	56.61	73.98	-17.37
9167.00	Avg	V	-108.18	48.93	47.75	53.98	-6.23
9167.00	Peak	V	-99.23	48.93	56.70	73.98	-17.28
9794.00	Avg	V	-107.90	49.34	48.44	53.98	-5.54
9794.00	Peak	V	-98.83	49.34	57.51	73.98	-16.47

Table 6-23. Radiated Measurements (Mid Channel – 96.9MHz)

Distance of Measurements: 3 Meters
 Operating Frequency: 107.9MHz

Frequency [MHz]	Detector	Ant. Pol. [H/V]	Analyzer Level [dBm]	AFCL [dB/m]	Field Strength [dBμV/m]	Limit [dBμV/m]	Margin [dB]
2572.00	Avg	V	-105.63	33.97	35.34	53.98	-18.64
2572.00	Peak	V	-98.89	33.97	42.08	73.98	-31.90
3525.00	Avg	V	-105.56	37.70	39.14	53.98	-14.84
3525.00	Peak	V	-98.97	37.70	45.73	73.98	-28.25
4697.00	Avg	V	-107.90	39.95	39.05	53.98	-14.93
4697.00	Peak	V	-98.49	39.95	48.46	73.98	-25.52
5542.00	Avg	V	-108.27	44.34	43.07	53.98	-10.91
5542.00	Peak	V	-98.95	44.34	52.39	73.98	-21.59
6595.00	Avg	V	-108.42	50.46	49.04	53.98	-4.94
6595.00	Peak	V	-98.99	50.46	58.47	73.98	-15.51
7340.00	Avg	V	-108.23	46.90	45.67	53.98	-8.31
7340.00	Peak	V	-98.75	46.90	55.15	73.98	-18.82

Table 6-24. Radiated Measurements (High Channel – 107.9MHz)

7.0 CONCLUSION

The data collected relate only the item(s) tested and show that the **Sirius XM Satellite Radio with FM Transmitter FCC ID: RS2SXPL2** is in compliance with Part 15C of the FCC Rules.

FCC ID: RS2SXPL2		FCC Pt. 15.239 MEASUREMENT REPORT (CERTIFICATION)		Reviewed by: Quality Manager
Test Report S/N: 0Y1509281848-R6.RS2	Test Dates: 9/21 - 10/2/2015, 2/3 - 2/5/2016	EUT Type: Satellite Radio with FM Transmitter		Page 52 of 52