



**TEST REPORT**

Report Number: 101218412ATL-001

July 19, 2013

**Product Name: Sirius XM Onyx PLUS**

**Product Model Number: SXPL1**

Standard: FCC Part 15, Subpart C, Intentional Radiators (15.239)  
FCC Part 15, Subpart B, Unintentional radiator

Tested by:  
Intertek Testing Services NA Inc.  
1950 Evergreen Blvd., Suite 100  
Duluth, GA 30096

Client:  
SIRIUS XM Radio Inc  
1500 Eckington PL NE  
Washington, DC 20002  
Contact: Beejay Jolayemi  
Phone: 202.680.4288  
Fax: 202.380.4091

Report prepared by:

Yuneush Khan  
EMC Project Engineer

Report reviewed by:

Richard Bianco  
EMC Team Lead

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## 1.0 Introduction and Conclusion

The tests indicated in section 2.0 were performed on the product constructed as described in section 3.0. The remaining test sections are the verbatim text from the actual data sheets used during the investigation. These test sections include the test name, the specified test Method, a list of the actual Test Equipment Used, documentation Photos, Results and raw Data. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the product tested complies with the requirements of the standard(s) indicated. The results obtained in this test report pertain only to the item(s) tested. Refer to the Test Summary for the specific details.

## 2.0 Test Summary

Section	Test Full Name	Test Date	Result
4.0	System setup including cable interconnection details, support equipment and simplified block diagram. (System		PASS
5.0	Transmitter Information for equipment operating under Parts 11, 15 and 18 of the rules (Transmitter Info -		PASS
6.0	Occupied Bandwidth (FCC 15C - 15.239 (a))		PASS
7.0	§ 15.107(a) / RSS-Gen 7.2.2 Conducted Emissions – Home Cradle		PASS
8.0	§ 15.109(a) Unintentional Radiated Emissions – Home Cradle		PASS
9.0	§ 15.109(a) FCC Part15B (FCC 15B - 15.109) - FM Direct		PASS
10.0	§ 15.109(a) FCC Part15B (FCC 15B - 15.109) - Cassette Adapter		PASS
11.0	§ 15.239(b) / (c) Field strength requirements (FCC 15C - 15.239 (b)) – FEA Unit		PASS
12.0	§ 15.239(b) / (c) Field strength requirements (FCC 15C - 15.239 (b)) – PowerConnect		PASS
13.0	Conducted Power Measurements		PASS
14.0	Test Equipment List		
15.0	Revision History		

### 3.0 Description of Equipment Under Test

Equipment Under Test			
Description	Manufacturer	Model Number	Serial Number
Onyx PLUS	SIRIUS XM Satellite Radio	SXPL1	T301440C

EUT receive date:	June 19 , 2013
EUT receive condition:	Good

Description of EUT provided by Client:

Sirius XM onyx PLUS Hardware Features

- Revolutionary SiriusXM *PowerConnect*™ FM Transmitter works through your vehicle's radio\* with easy Do-It-Yourself installation. The color-coded Vehicle Dock makes it simple to connect.
- Customize your display by choosing the backlight color theme that matches your mood or vehicle dash lights.
- Personalize your radio by choosing the trim ring that reflects your taste or complements your vehicle interior.
- View artist name, song title, and channel information on the large color display.
- Browse programs, artists, and songs playing on other channels without having to change the channel.
- One-Touch Jump™ to traffic and weather of the 20 most congested cities, or to the previous channel to which you were listening.
- Save and enjoy fast access to up to 10 of your favorite channels.
- Lock and unlock channels with easy-to-use parental controls.
- Complete *PowerConnect* Vehicle Kit included.
- Universal docking capability - add accessories for your home, office, additional vehicles or even outdoors.

Description of EUT exercising:

The EUT was powered with a 12Vdc battery supplied to the car dock and with a power supply to 120Vac/60Hz with the home dock. The satellite signal was amplified and retransmitted into the emissions chamber to the radio under test. The radio then transmitted the music on the FM channel being investigated. The channels tested were 88.1, 96.9, and 107.9MHz.

Mode of Operation	Frequency Range (MHz)	Number of Channels	Channel Separation (kHz)
FM	88.1-107.9	100	200

Applicant Information:

XM Radio Inc.  
1500 Eckington Pl, NE  
Washington, DC 20002

Manufacturer Information:

WNC (Kunshan) Corp.  
NO. 88 Central Avenue, Area B, Kunshan Export Processing Zone  
Kunshan City, Jiangsu, China

#### 4.0 System setup including cable interconnection details, support equipment and simplified block diagram. (System Setup)

##### Method:

Record the details of EUT cabling, document the support equipment, and show the interconnections in a block diagram.

Support Equipment - Homedock Configurations			
Description	Manufacturer	Model Number	Serial Number
Indoor/Outdoor Antenna	Sirius XM	Not Labeled	Not Labeled
Homedock	Sirius XM	XDPHD1	1002
AC/DC Switching Supply	PHIHONG	PSM08A-052	NA

Support Equipment - Cassette Configuration			
Description	Manufacturer	Model Number	Serial Number
PowerConnect Dock	Sirius XM	XPVIV2	1249
Cassette	Sirius XM	XMTT200257	NA
Sirius Vehicle Antenna	Sirius XM	XVANT1	1248
Vehicle Power Adapter	Sirius XM	SXDPIP1	NA
Cigarette Lighter Socket	Sirius XM	NA	NA
12V AGM Battery	Werker	WKA12-55C	NA

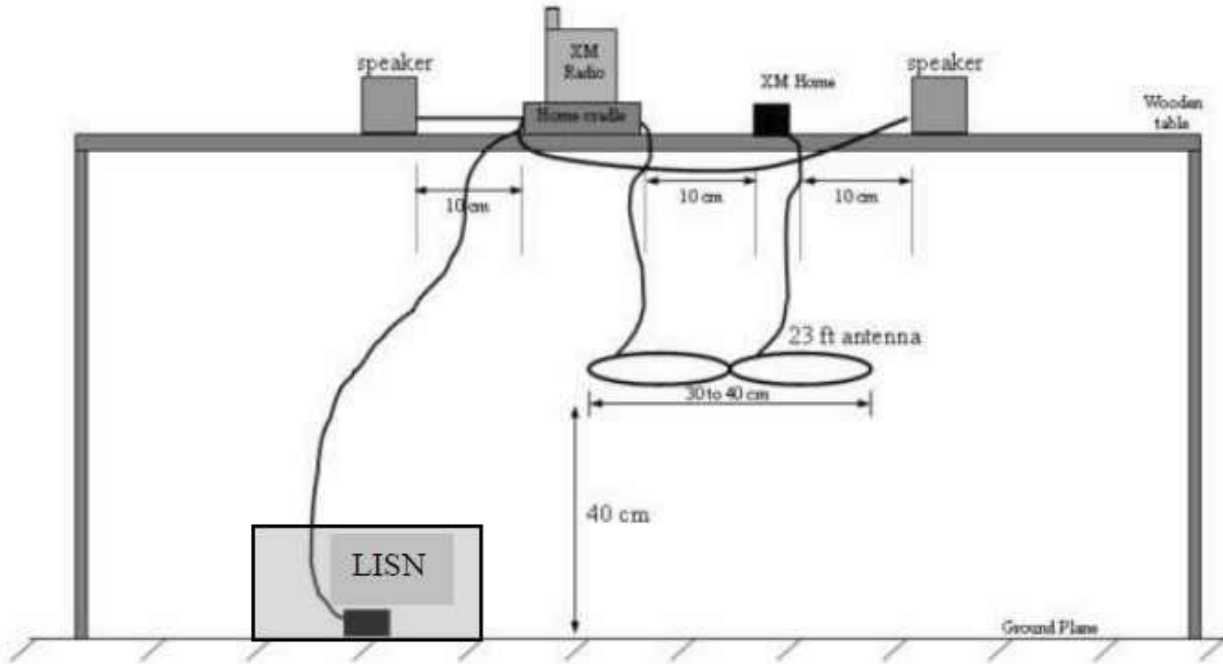
Support Equipment - FEA Configuration			
Description	Manufacturer	Model Number	Serial Number
PowerConnect Dock	Sirius XM	XPVIV2	1249
FM Extender Antenna (FEA)	Sirius XM	FEA25	NA
Sirius Vehicle Antenna	Sirius XM	XVANT1	1248
Vehicle Power Adapter	Sirius XM	SXDPIP1	NA
Cigarette Lighter Socket	Sirius XM	NA	NA
12V AGM Battery	Werker	WKA12-55C	NA

Support Equipment - FM Direct Configuration			
Description	Manufacturer	Model Number	Serial Number
PowerConnect Dock	Sirius XM	XPVIV2	1249
FM Direct Adapter	Sirius XM	FMDA25	NA
Auxiliary Cable	Sirius XM	VZCC-A4B9090-LP4	NA
Extendable Monopole	NA	NA	NA
Sirius Vehicle Antenna	Sirius XM	XVANT1	1248
Vehicle Power Adapter	Sirius XM	SXDPIP1	NA
Cigarette Lighter Socket	Sirius XM	NA	NA
12V AGM Battery	Werker	WKA12-55C	NA

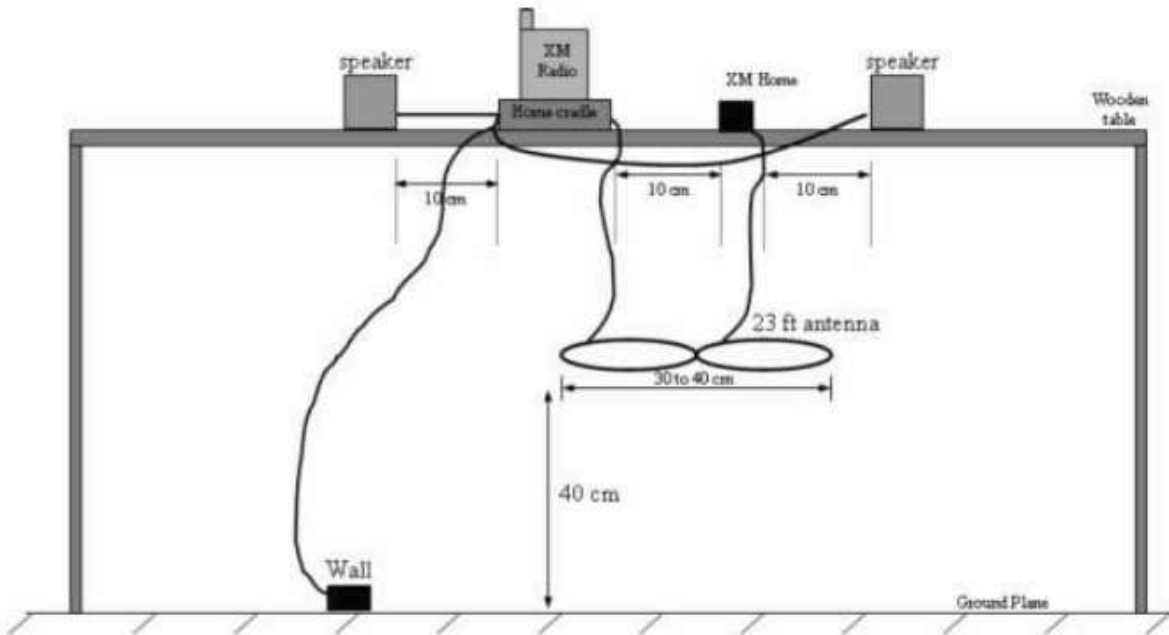
Support Equipment - PowerConnect Configuration			
Description	Manufacturer	Model Number	Serial Number
PowerConnect Dock	Sirius XM	XPVIV2	1249
Sirius Vehicle Antenna	Sirius XM	XVANT1	1248
Vehicle Power Adapter	Sirius XM	SXDPIP1	NA
Cigarette Lighter Socket	Sirius XM	NA	NA
12V AGM Battery	Werker	WKA12-55C	NA

4.0 System setup including cable interconnection details, support equipment and simplified block diagram. (System Setup)

Configuration Diagram –Conducted Emissions (Home Dock)

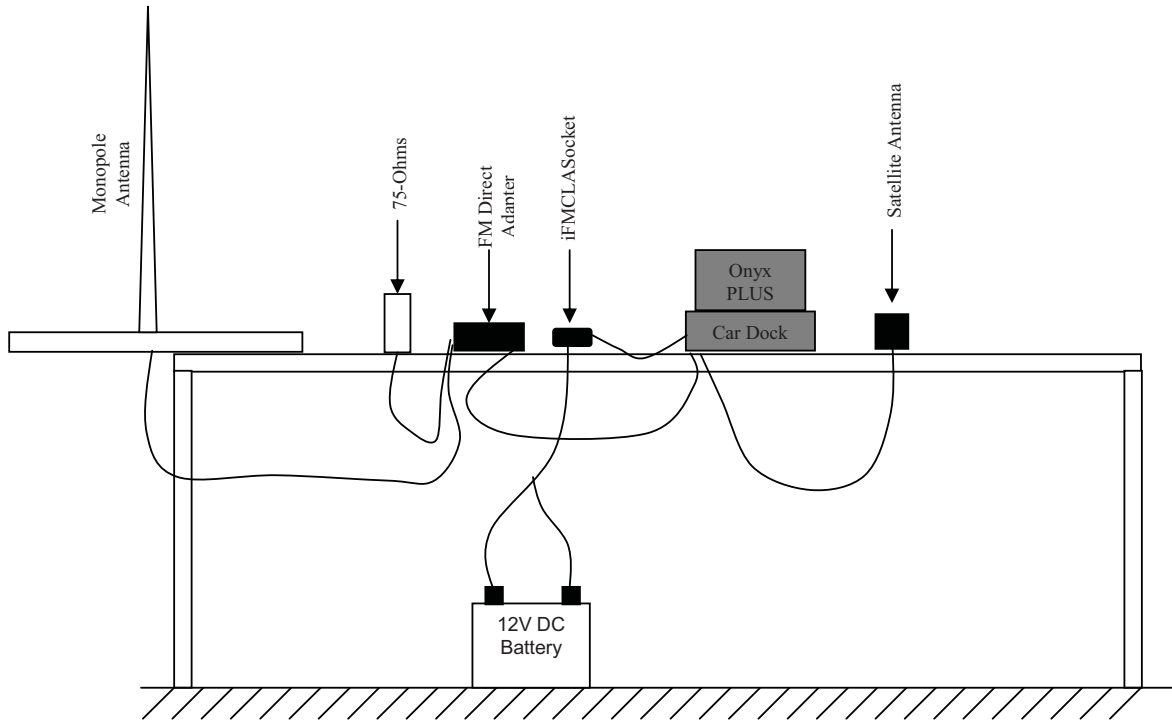


Configuration Diagram –Radiated Emissions (Home Dock)



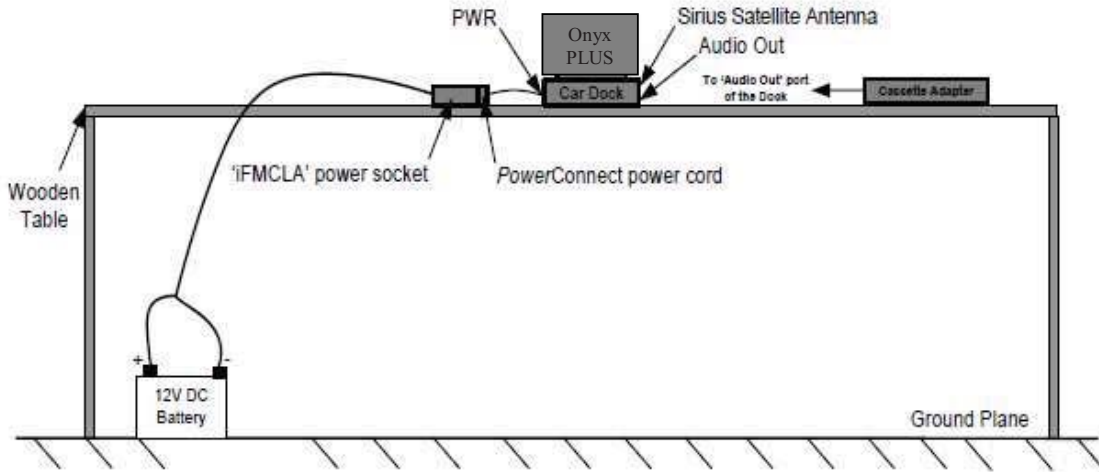
**4.0 System setup including cable interconnection details, support equipment and simplified block diagram. (System Setup)**

**Configuration Diagram – FM Direct Configuration**

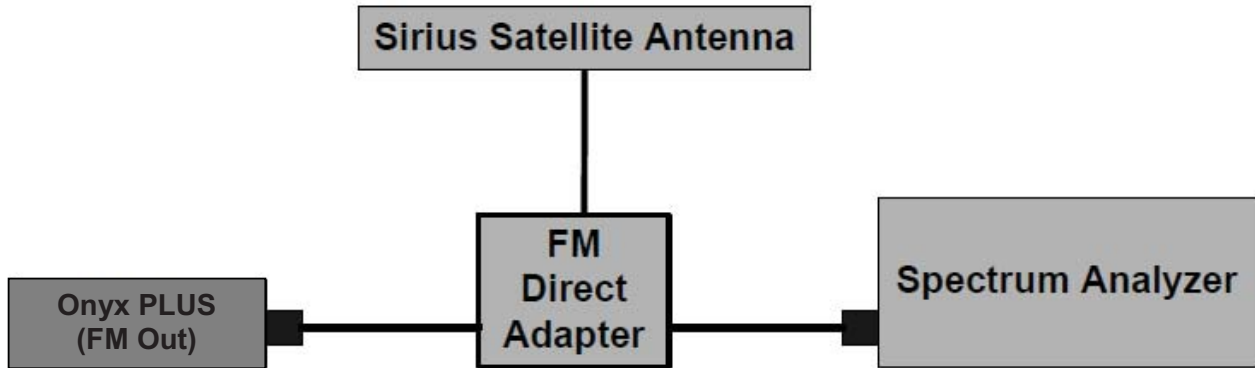


**4.0 System setup including cable interconnection details, support equipment and simplified block diagram. (System Setup)**

**Configuration Diagram – Cassette Adapter Configuration**

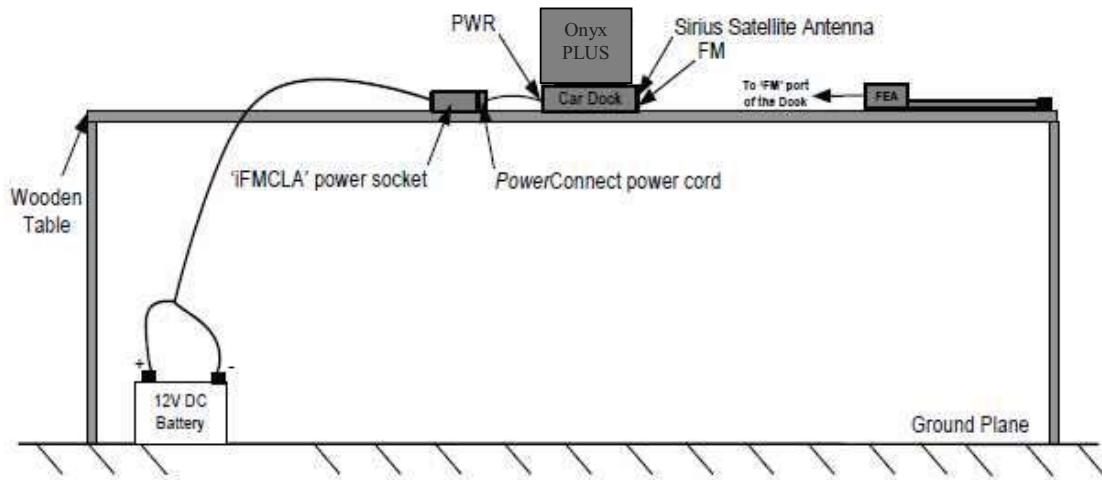


**Configuration Diagram – FM Direct OBW Configuration**

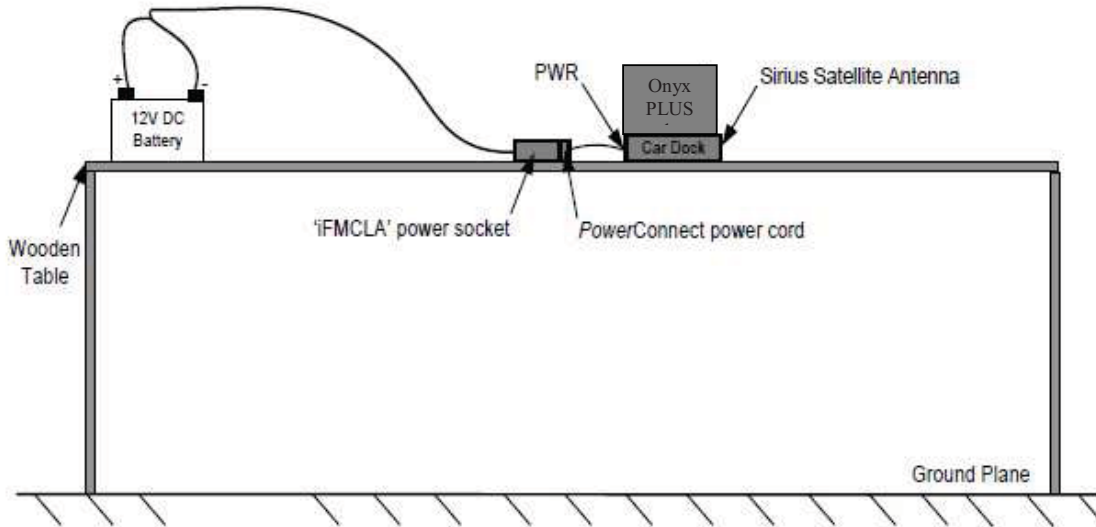


4.0 System setup including cable interconnection details, support equipment and simplified block diagram. (System Setup)

Configuration Diagram – FEA Configuration



Configuration Diagram – PowerConnect Configuration





## 5.0 Transmitter Information for equipment operating under Parts 11, 15 and 18 of the rules (Transmitter Info - Unlicensed)

FCC Rule Part			
2.1033(b)(1)	<b>Applicant</b>	Company Name:	Sirius XM Satellite Radio, Inc.
		Address:	3161 S.W. 10th Street, Deerfield Beach, FL 33442
		Phone:	202-680-4288
		Contact Name:	Beejay Jolayemi
	<b>Manufacturer</b>	Company Name:	Sirius XM Satellite Radio, Inc.
		Address:	3161 S.W. 10th Street,
		Phone:	202-680-4288
		Contact Name:	Beejay Jolayemi
2.1033(b)(2)	<b>Equipment</b>	FCC ID:	RS2SXPL1
		EUT Model Number:	SXPL1
		EUT Serial Number:	T301440C
2.1033(b)(3)	User Manual		Attach as separate exhibit.
2.1033(b)(4)	Brief description of circuit functions		Attach as separate exhibit.
2.1033(b)(5)	Block diagram showing frequency of oscillators		Attach as separate exhibit.
2.1033(b)(6)	Test report		Incorporated with this document
2.1033(b)(7)	Internal and external photographs		Attach as separate exhibit.
2.1033(b)(8)	Peripheral Equipment	Can be used?	N/A
		Comercially available?	N/A
2.1033(b)(9)	Transition rules apply?		No
2.1033(b)(10)	Scanning receiver?		No
2.1033(b)(11)	Transmitter in 59-64 GHz band?		No
2.1033(b)(12)	Software defined radio?		No

### 6.0 Occupied Bandwidth (FCC 15C - 15.239 (a))

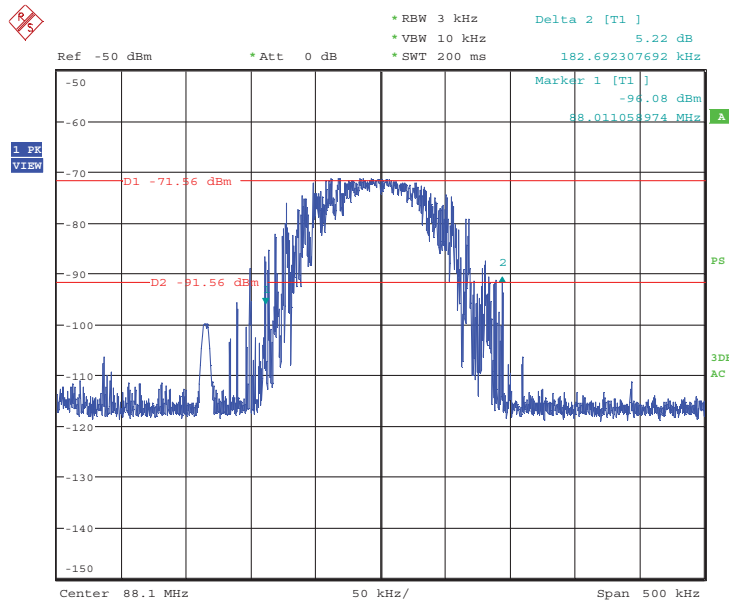
**Method:**

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

Test Procedure: ANSI C63.4: 2003, Section 13.1.7 and Annex H.6

**Results: The sample tested was found to Comply**

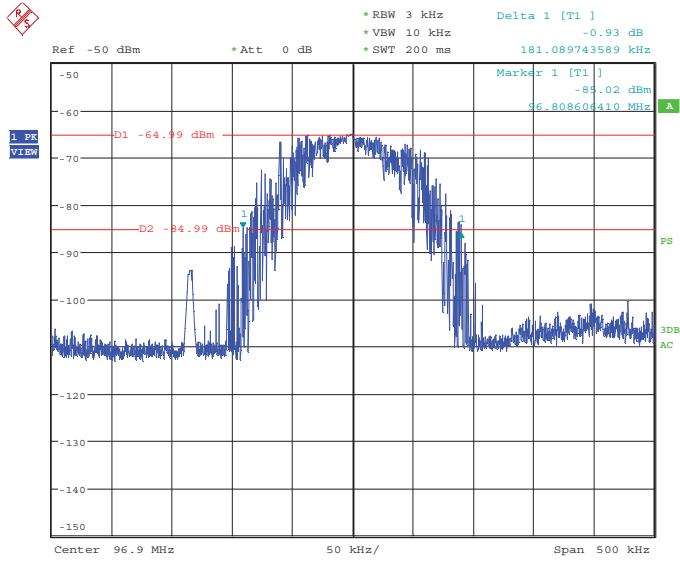
Channel 88.1 – 182.7kHz



Date: 23.JUL.2013 15:25:15

Lower Channel – 88.1MHz

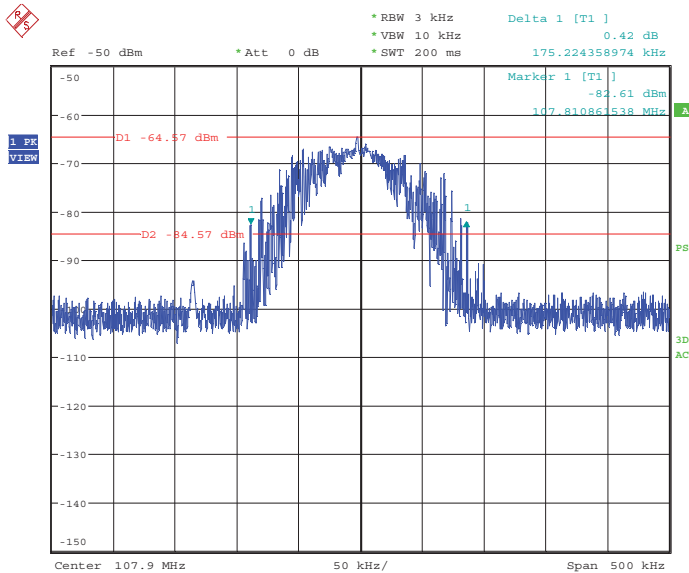
Channel 96.9 – 181.1kHz



Date: 23.JUL.2013 15:33:43

Middle Channel – 96.9MHz

Channel 107.9 – 175.2kHz



Date: 23.JUL.2013 15:42:52

Upper Channel – 107.9MHz

## 7.0 § 15.107(a) / RSS-Gen 7.2.2 Conducted Emissions – Home Cradle

### Method:

Equipment setup for conducted disturbance tests shall follow the guidelines of ANSI C63.4.

Measurements in the frequency range of 150kHz to 30 MHz shall be performed with a quasi-peak or average detector instrument that meets the requirements of Section One of CISPR 16. An AMN shall be used to provide a defined impedance at high frequencies across the power feed at the point of measurement of terminal voltage and also to provide isolation of the circuit under test from the ambient noise on the power lines. An AMN defined in CISPR 16 shall be used.

In the frequency range of 150 kHz to 30 MHz, a resolution/video bandwidth of 9kHz/30kHz or greater shall be used.

The EUT shall be located so that the distance between the boundary of the EUT and the closest surface of the AMN is 0.8m.

If a flexible mains cord is provided by the manufacturer that is in excess of 1m, the excess cable shall be folded back and forth as far as possible to form a bundle not exceeding 0.4m in length.

The EUT shall be arranged and connected with cables terminated in accordance with the product specification.

Conducted disturbance shall be measured between each current carrying conductor and the reference ground. Each measured values shall be reported.

If EUT is intended for tabletop use, the EUT shall be placed on a table whose top is 0.8m above the ground plane. A vertical, metal reference plane is placed 0.4m from the EUT. The vertical metal reference-plane is at least 2m by 2m. The EUT shall be kept at least 0.8m from any other metal surface or other ground plane not being part of the EUT. The table shall be constructed of non-conductive materials. Its dimensions are at least 1m by 1.5m, but may be extended for larger EUT.

If EUT is floor standing, the floor standing EUT shall be placed on a horizontal metal ground plane and isolated from the ground plane by up to 12 mm of insulating material. The metal ground plane shall extend at least 0.5m beyond the boundaries of the EUT and had minimum dimensions of 2m by 2m.

### TEST SITE

The test site for conducted emissions is located at 1950 Evergreen Blvd, Suite 100, Duluth, Georgia 30096. The VCCI Registration Number for this site is C-2818.

### MEASUREMENT UNCERTAINTY

Compliance of the product is based on the measured value. However, the measurement uncertainty is included for informational purposes. The values given are the measurement uncertainty values with an expanded uncertainty of k=2.

150 kHz to 30 MHz: +/- 2.8 dB

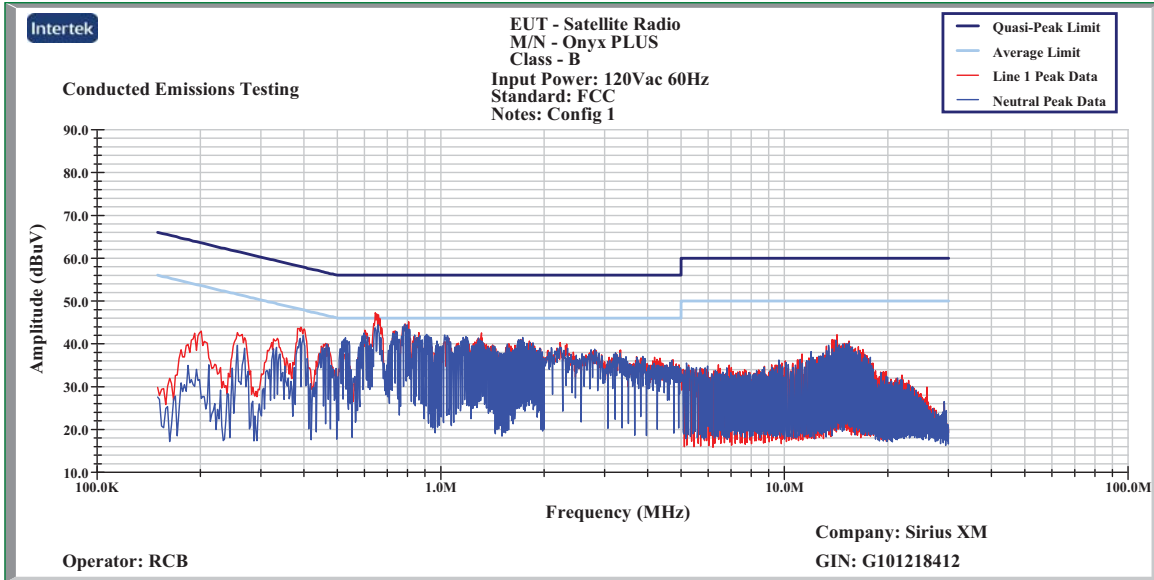
### Results: The sample tested was found to Comply.

#### Specific Setup Details

- Home cradle connected to Home Sirius Satellite Antenna
- Home cradle connected to speaker set with supplied RCA audio cables
- Home cradle powered by AC home plug adapter
- Receiver configured to receive live Sirius Satellite programming
- Receiver configured for the Max audio output level.

**7.0 § 15.107(a) / RSS-Gen 7.2.2 Conducted Emissions – Home Cradle**

Peak Plot – 150kHz-30MHz



Tabular Data

Frequency Range (MHz): .150-30Mhz  
Input power: 120Vac 60Hz

Limit: CISPR Class B

Modifications for compliance (y/n): n

A	B	C	D	E	F	G	H	I
LISN Number	Detector (P,QP, A)	Frequency MHz	Reading dBuV	Cable Loss dB	LISN Ins. Loss dB	Net dBuV	Limit dBuV	Margin dB
1	QP	0.392	41.6	0.2	0.1	41.9	58.1	-16.2
1	A	0.392	31.7	0.2	0.1	32.0	48.1	-16.1
1	QP	0.602	38.0	0.2	0.1	38.3	56.0	-17.7
1	A	0.602	26.2	0.2	0.1	26.5	46.0	-19.5
1	QP	0.660	43.1	0.2	0.1	43.4	56.0	-12.6
1	A	0.660	30.8	0.2	0.1	31.1	46.0	-14.9
1	QP	0.728	37.5	0.2	0.1	37.8	56.0	-18.2
1	A	0.728	27.1	0.2	0.1	27.4	46.0	-18.6
1	QP	0.806	37.1	0.2	0.1	37.4	56.0	-18.6
1	A	0.806	21.9	0.2	0.1	22.2	46.0	-23.8
1	QP	0.910	37.6	0.2	0.1	37.9	56.0	-18.1
1	A	0.910	24.0	0.2	0.1	24.3	46.0	-21.7
2	QP	0.392	38.7	0.2	0.2	39.1	58.1	-19.0
2	A	0.392	25.5	0.2	0.2	25.9	48.1	-22.2
2	QP	0.602	37.8	0.2	0.1	38.1	56.0	-17.9
2	A	0.602	23.5	0.2	0.1	23.8	46.0	-22.2
2	QP	0.660	38.7	0.2	0.1	39.0	56.0	-17.0
2	A	0.660	26.6	0.2	0.1	26.9	46.0	-19.1
2	QP	0.728	37.4	0.2	0.1	37.7	56.0	-18.3
2	A	0.728	23.7	0.2	0.1	24.0	46.0	-22.0
2	QP	0.806	36.1	0.2	0.1	36.4	56.0	-19.6
2	A	0.806	17.1	0.2	0.1	17.4	46.0	-28.6
2	QP	0.910	38.2	0.2	0.1	38.5	56.0	-17.5
2	A	0.910	18.9	0.2	0.1	19.2	46.0	-26.8
<b>Calculations</b>		G=D+E+F		I=G-H				

## 8.0 § 15.109(a) Unintentional Radiated Emissions – Home Cradle

### Method:

Measurements in the frequency range of 30 MHz to 1000 MHz shall be performed with a quasi-peak detector instrument that meets the requirements of Section One of CISPR 16. Above 1000 MHz, a peak detector shall be used. Peak values converted to average by applying the duty cycle correction factor, when applicable. When an average detector is used, it shall meet the requirements of Section One of CISPR 16. The measuring antenna shall correlate to a balanced dipole.

Bandwidths:

30 MHz to 1000 MHz: 120 kHz RBW and 1 MHz VBW

Above 1000 MHz: 1 MHz RBW and 3 MHz VBW

Measurements of the radiated field are made with the antenna located at a distance of 3 or 10 meters from the EUT. The limit applied to the measurement shall be appropriate for the test distance. The test distance shall be indicated in the results section.

The EUT shall be arranged and connected with cables terminated in accordance with the product specification.

Exploratory tests should be carried out while varying the cable positions to determine the maximum or near-maximum emission level. During manipulation, cables shall not be placed under or on top of the system test components unless such placement is required by the inherent equipment design.

The antenna shall be adjusted between 1m and 4m in height above the ground plane for maximum meter reading at each test frequency.

The antenna-to-EUT azimuth shall be varied during the measurement to find the maximum field-strength readings.

The antenna-to-EUT polarization (horizontal and vertical) shall be varied during the measurements to find the maximum field-strength readings.

If the EUT is intended for tabletop use, it shall be placed on a table whose top is 0.8m above the ground plane. The table shall be constructed of non-conductive materials. Its dimensions are at least 1m by 1.5m, but may be extended for larger EUT.

If EUT is floor standing, the EUT was placed on a horizontal metal ground plane and isolated from the ground plane by up to 12 mm of insulating material.

Equipment setup for radiated disturbance tests shall follow the guidelines of ANSI C63.4.

### TEST SITE

The test site for radiated emissions is located at 1950 Evergreen Blvd, Suite 100, Duluth, Georgia 30096. It is a 10 meter semi-anechoic chamber manufactured by Panashield. Embedded in the floor is a 3 meter diameter turntable.

A2LA: 1455.01

IC: 2077-1

VCCI Registration Number: R-2570

### MEASUREMENT UNCERTAINTY

Compliance of the product is based on the measured value. However, the measurement uncertainty is included for informational purposes. The values given are the measurement uncertainty values with an expanded uncertainty of k=2.

30 MHz to 1000 MHz at 3 meters: +/- 3.9 dB

30 MHz to 1000 MHz at 10 meters: +/- 3.6 dB

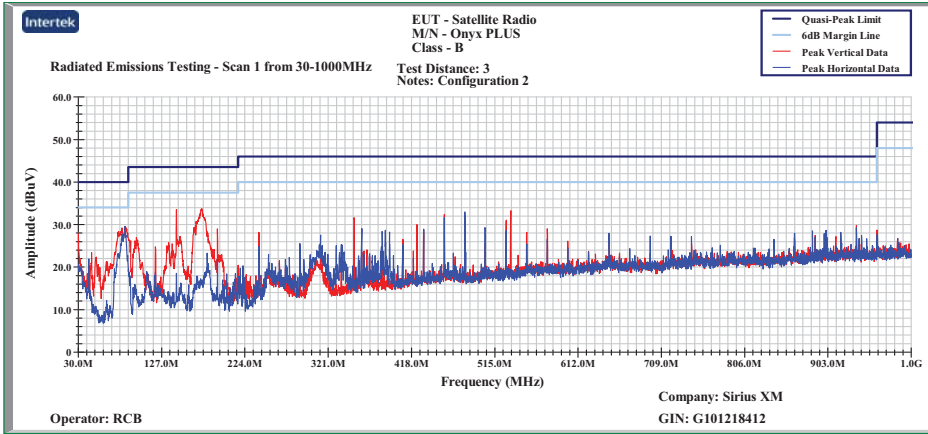
1 GHz to 18 GHz at 3 meters: +/- 4.2 dB

### Specific Setup Details

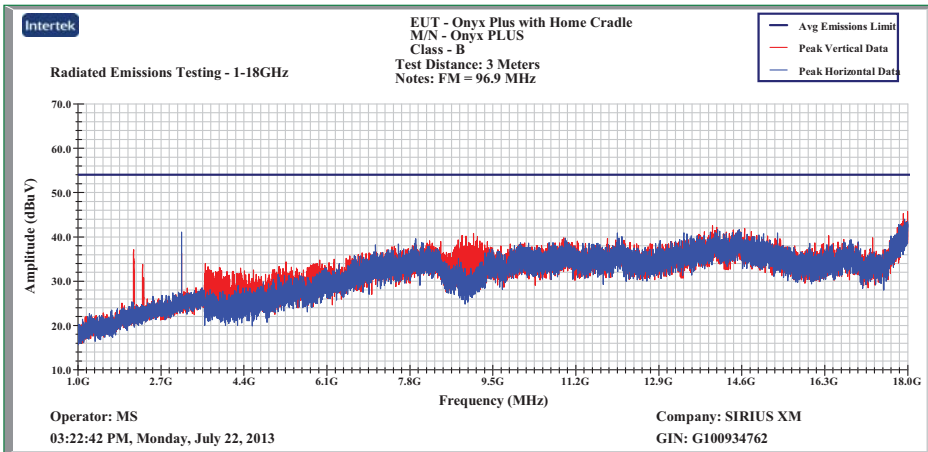
- Home cradle connected to Home Sirius Satellite Antenna
- Home cradle connected to speaker set with supplied RCA audio cables
- Home cradle powered by AC home plug adapter
- Receiver configured to receive live Sirius Satellite Programming
- Receiver configured for the Max audio output level

### 8.0 § 15.109(a) Unintentional Radiated Emissions – Home Cradle

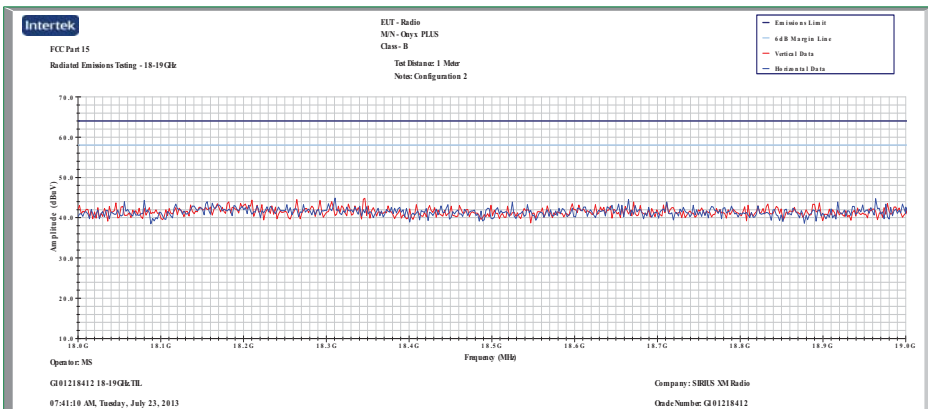
#### Peak Plot – 30MHz-1000MHz



#### Peak Plot – 1000MHz-18000MHz



#### Peak Plot – 18000MHz-19000MHz



**8.0 § 15.109(a) Unintentional Radiated Emissions – Home Cradle**

Tabular Data

**Frequency Range (MHz):** 30-19000Mhz

**Test Distance (m):** 3

**Input power:** 120Vac 60Hz

**Limit:** 15\_109-3m

**Modifications for compliance (y/n):** N

A	B	C	D	E	F	G	H	I	J
Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Net dB(uV/m)	3m Limit dB(uV/m)	Margin dB	Detectors / Bandwidths Det/RBW/VBW
V	76.000	58.3	7.2	2.0	43.3	24.2	40.0	-15.8	QP/120/300
V	144.000	60.1	11.8	2.6	43.7	30.9	43.5	-12.6	QP/120/300
V	177.600	58.8	9.8	2.9	43.7	27.9	43.5	-15.6	QP/120/300
V	349.700	36.0	15.3	4.1	43.5	11.9	46.0	-34.1	QP/120/300
V	532.600	34.2	18.3	5.0	43.3	14.2	46.0	-31.8	QP/120/300
<b>Calculations</b>		G=C+D+E-F		I=G-H					



## 9.0 § 15.109 Field strength requirements (FCC Part15B - 15.109) – FM Direct

### Method:

Testing was performed using the emissions test methods described in section 8

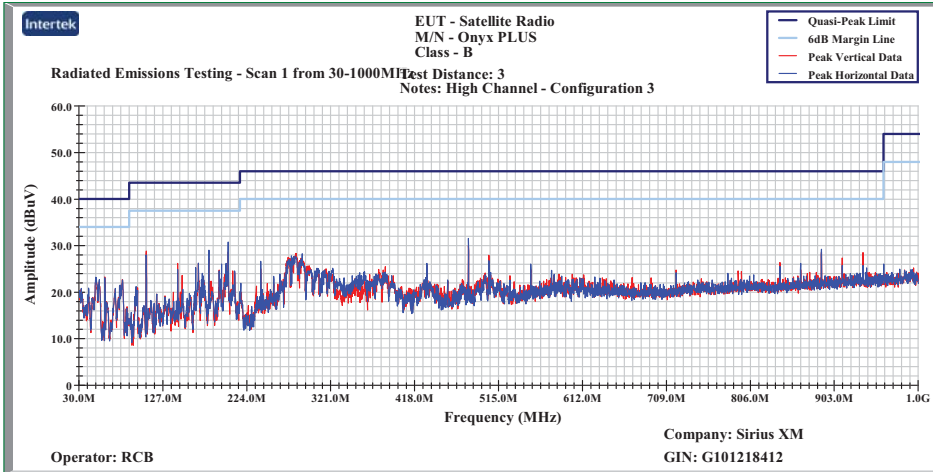
**Results: The sample tested was found to Comply.**

### Specific Setup Details

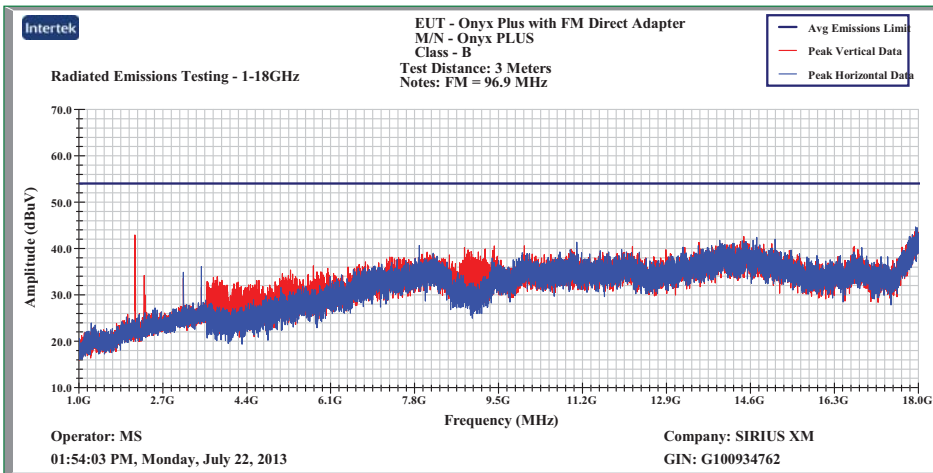
- Sirius Onyx PLUS is powered by its 5V *PowerConnect* adapter via a 12V DC battery placed on the floor and an 'iFMCLA' power socket.
- Sirius satellite antenna is connected to the Sirius Onyx PLUS 'Antenna' port.
- Sirius Onyx PLUS is configured to receive live **SiriusXM** programming service.
- Sirius Onyx PLUS is configured for Max audio level outputs.
- Sirius Onyx PLUS FM Modulator is disabled via the Sirius Onyx PLUS menu button.
- Sirius Onyx PLUS is configured for Max audio level output.

### 9.0 § 15.109 Field strength requirements (FCC Part15B - 15.109) – FM Direct

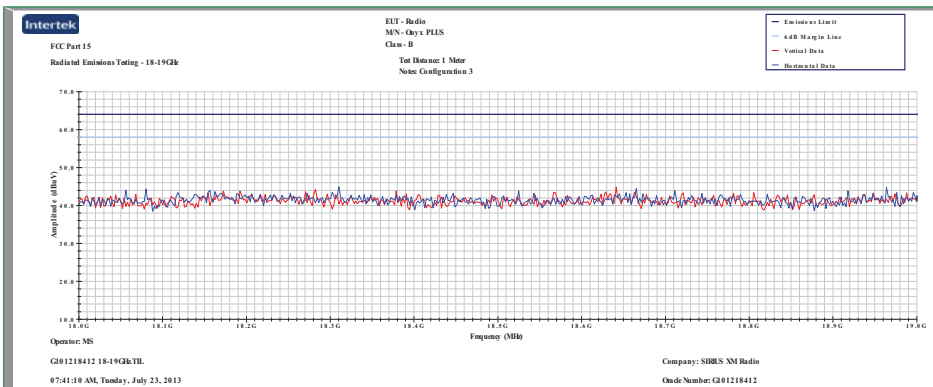
#### Peak Plot – 30MHz-1000MHz



#### Peak Plot – 1000MHz-18000MHz



#### Peak Plot – 18000MHz-19000MHz



**9.0 § 15.109 Field strength requirements (FCC Part15B - 15.109) – FM Direct**

Tabular Data

Frequency Range (MHz): 30-19000Mhz

Test Distance (m): 3

Input power: 12.2Vdc

Limit: 15\_109-3m

Modifications for compliance (y/n): N

A	B	C	D	E	F	G	H	I	J
Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Net dB(uV/m)	3m Limit dB(uV/m)	Margin dB	Detectors / Bandwidths Det/RBW/VBW
V	179.900	58.2	9.7	3.0	43.7	27.2	43.5	-16.3	QP/120/300
V	240.000	65.9	12.2	3.5	43.6	37.9	46.0	-8.1	QP/120/300
V	168.000	55.6	10.2	2.9	43.7	25.0	43.5	-18.5	QP/120/300
V	200.200	45.3	10.7	3.1	43.7	15.5	43.5	-28.0	QP/120/300
V	180.000	59.5	9.7	3.0	43.7	28.5	43.5	-15.0	QP/120/300
V	202.400	58.3	10.8	3.2	43.7	28.6	43.5	-14.9	QP/120/300
<b>Calculations</b>		G=C+D+E-F		I=G-H					

## 10.0 § 15.109 Field strength requirements (FCC Part15B - 15.109) – Cassette Adapter

### Method:

Testing was performed using the emissions test methods described in section 8

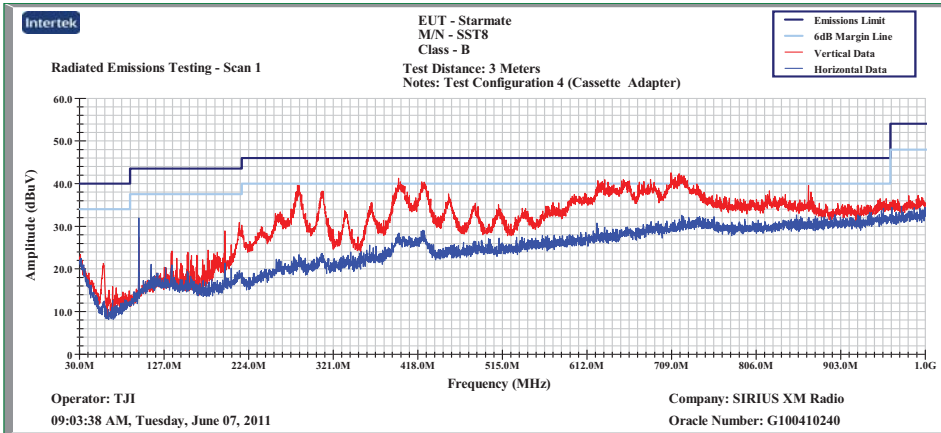
**Results: The sample tested was found to Comply.**

### Specific Setup Details

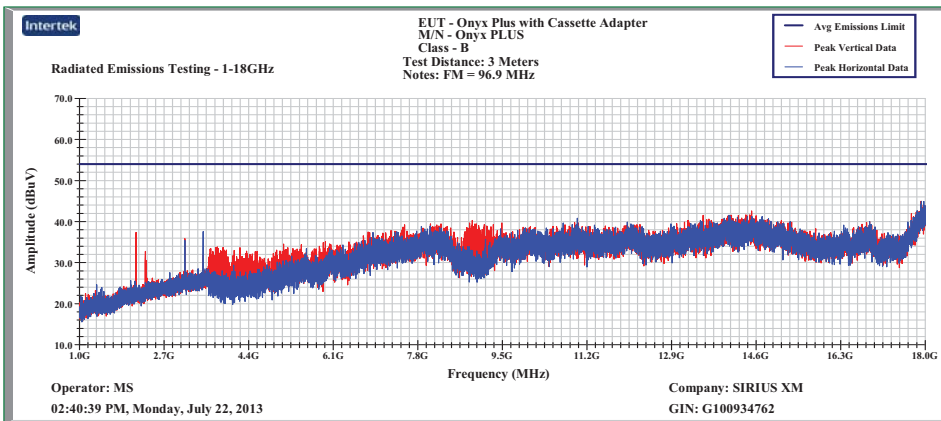
- Sirius Onyx PLUS is powered by its 5V PowerConnect adapter via a 12V DC battery placed on the floor and an 'iFMCLA' power socket.
- Sirius satellite antenna is connected to the Sirius Onyx PLUS's 'Antenna' port.
- Sirius Onyx PLUS is configured to receive live **SiriusXM** programming service.
- Sirius Onyx PLUS is configured for Max audio level outputs.
- Sirius Onyx PLUS's FM Modulator is disabled via the Sirius Onyx PLUS's menu button.
- Sirius Onyx PLUS is connected to the cassette adapter through its 'Audio' port.
- Sirius Onyx PLUS is configured for Max audio level output.

### 10.0 § 15.109 Field strength requirements (FCC Part15B - 15.109) – Cassette Adapter

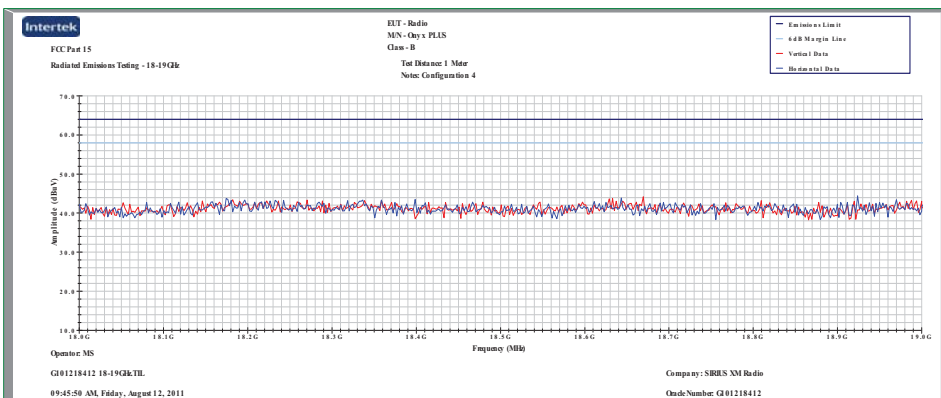
Peak Plot – 30MHz-1000MHz



Peak Plot – 1000MHz-18000MHz



Peak Plot – 18000MHz-19000MHz



**10.0 § 15.109 Field strength requirements (FCC Part15B - 15.109) – Cassette Adapter**

Tabular Data

**Frequency Range (MHz):** 30-19000Mhz

**Test Distance (m):** 3

**Input power:** Battery

**Limit:** 15\_109-3m

**Modifications for compliance (y/n):** N

A	B	C	D	E	F	G	H	I	J
Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Net dB(uV/m)	3m Limit dB(uV/m)	Margin dB	Detectors / Bandwidths Det/RBW/VBW
H	60.000	59.2	7.3	1.8	43.0	25.2	40.0	-14.8	QP/120/300
V	168.000	64.8	10.2	2.9	43.7	34.2	43.5	-9.3	QP/120/300
V	300.000	48.3	13.9	3.9	43.5	22.6	46.0	-23.4	QP/120/300
H	336.000	48.4	14.3	4.1	43.5	23.2	46.0	-22.8	QP/120/300
H	480.000	51.5	17.5	4.7	43.3	30.4	46.0	-15.6	QP/120/300
<b>Calculations</b>		G=C+D+E-F		I=G-H					

**11.0 § 15.239(b) / (c) Field strength requirements (FCC 15C - 15.239 (b)) – FEA Unit****Method:**

Testing was performed using the emissions test methods described in section 8

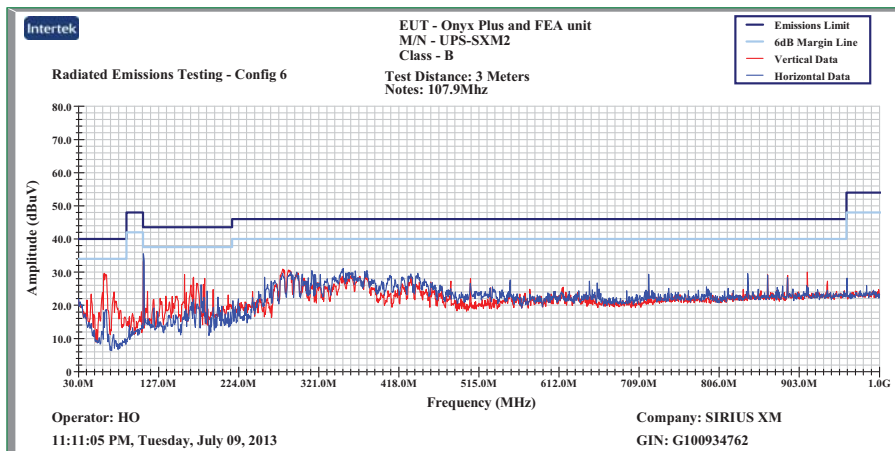
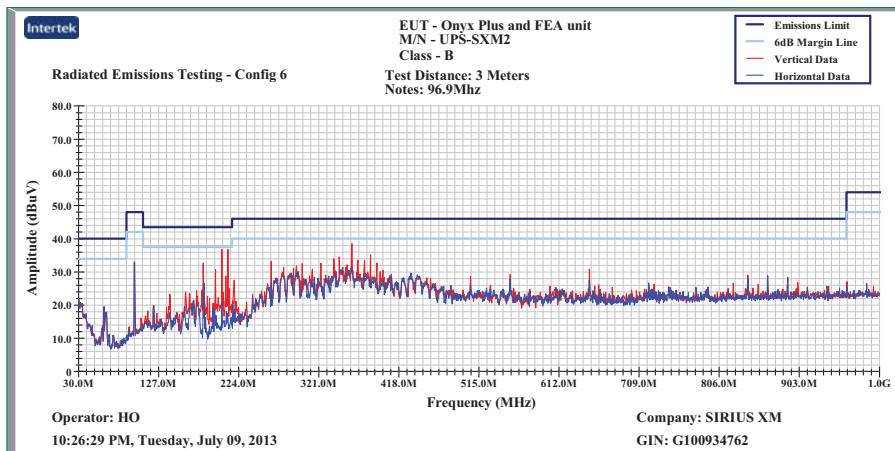
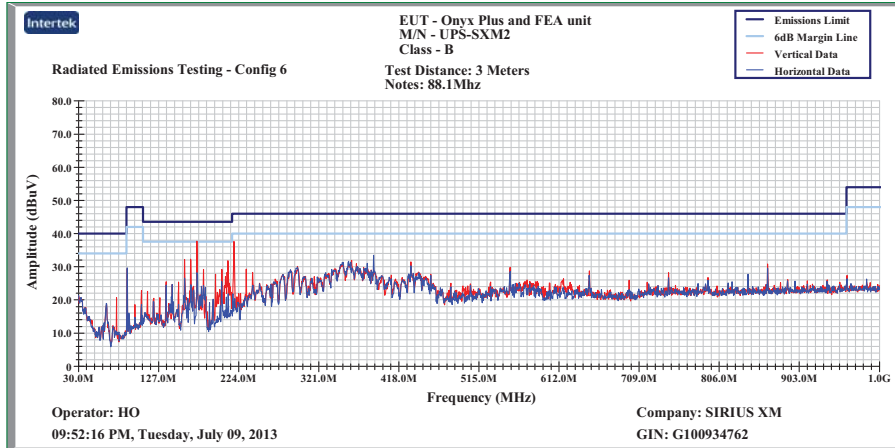
**Results: The sample tested was found to Comply.**

**Specific Setup Details**

- The Sirius Onyx PLUS is positioned in a vertical position with at the back edge of the wooden testing table.
- The FEA unit is connected to the Sirius Onyx PLUS's dock 'FM' port with its cable spread out all over the testing table.
- Sirius Onyx PLUS is powered by its 5V PowerConnect adapter via a 12V DC battery placed on the floor and an 'iFMCLA' power socket.
- The Sirius satellite antenna is connected to the Sirius Onyx PLUS's 'Antenna' port.
- The 'Audio' port of the Sirius Onyx PLUS is terminated with its 'Aux-In' audio cable.
- The FM Modulator button should be used to enable the FM signal from the RSR.
- The Sirius Onyx PLUS is configured to receive live **SiriusXM** programming service.
- The Sirius Onyx PLUS is configured for Max audio output level.

11.0 § 15.239(b) / (c) Field strength requirements (FCC 15C - 15.239 (b)) – FEA Unit

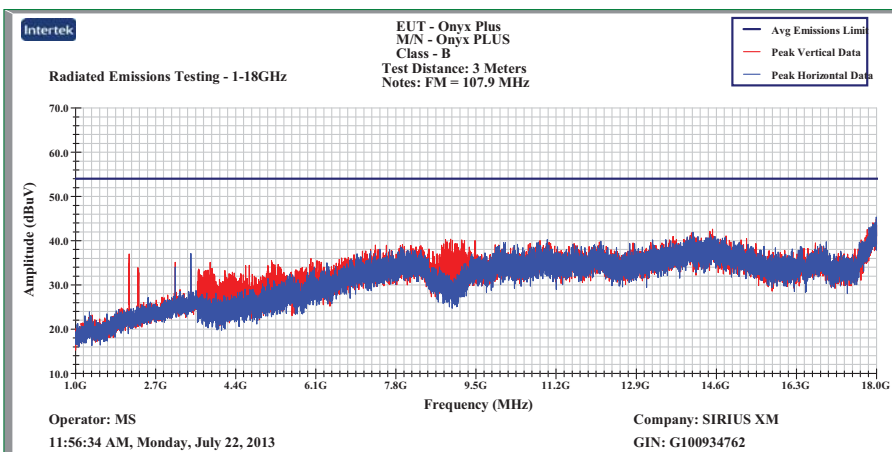
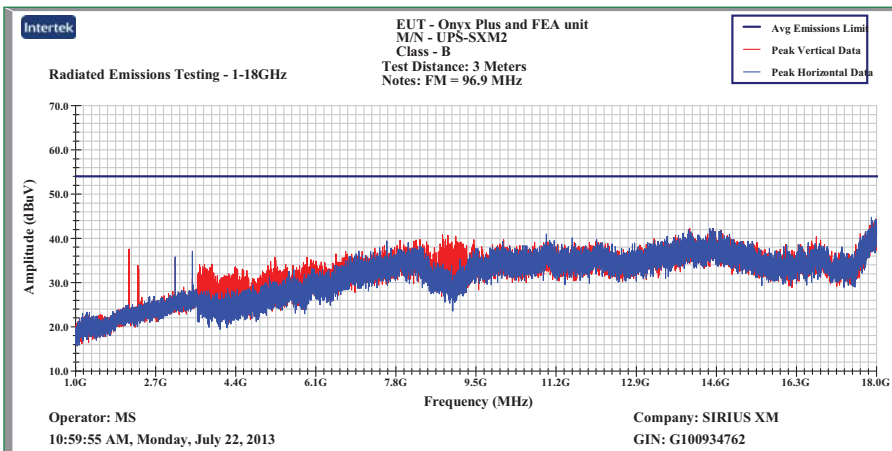
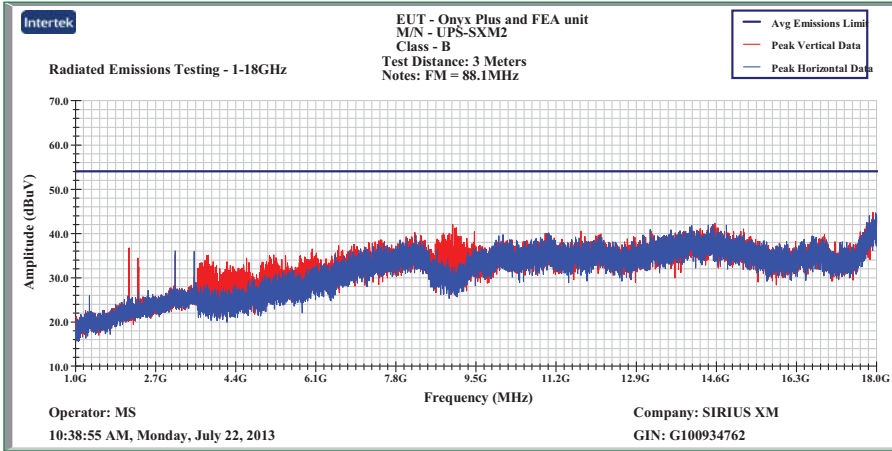
Peak Plot – 30MHz-1000MHz





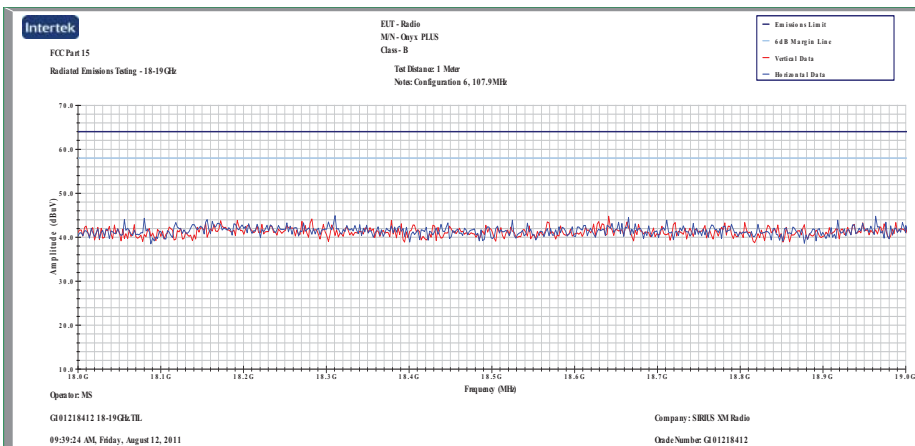
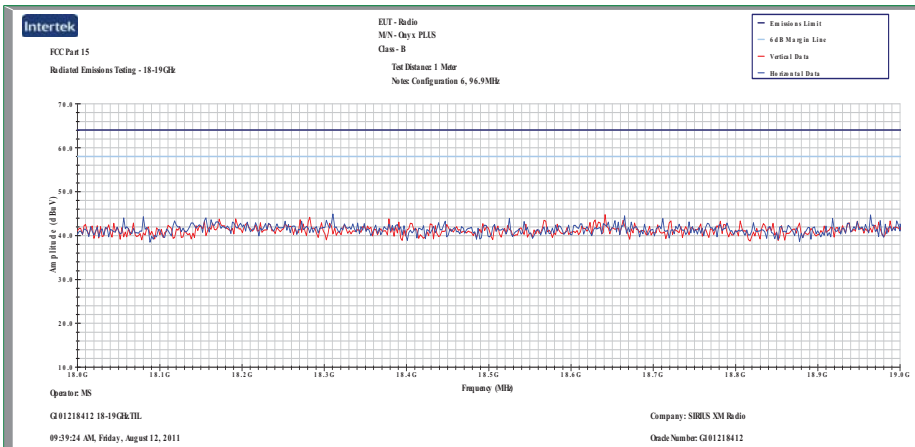
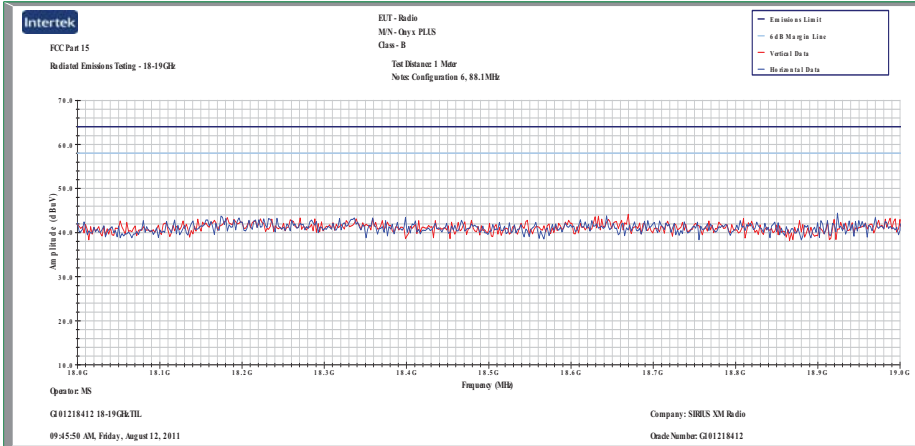
11.0 § 15.239(b) / (c) Field strength requirements (FCC 15C - 15.239 (b)) – FEA Unit

Peak Plot – 1000MHz-18000MHz



### 11.0 § 15.239(b) / (c) Field strength requirements (FCC 15C - 15.239 (b)) – FEA Unit

Peak Plot – 18000MHz-19000MHz



**11.0 § 15.239(b) / (c) Field strength requirements (FCC 15C - 15.239 (b)) – FEA Unit**

Tabular Data

Frequency Range (MHz): 30-19000Mhz

Test Distance (m): 3

Input power: Battery

Limit: 15\_239-3m

Modifications for compliance (y/n): N

A	B	C	D	E	F	G	H	I	J
Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Net dB(uV/m)	3m Limit dB(uV/m)	Margin dB	Detectors / Bandwidths Det/RBW/VBW
<b>88.1Mhz</b>									
V	157.500	46.5	10.8	2.8	43.7	16.4	43.5	-27.1	QP/120/300
V	165.000	45.6	10.4	2.8	43.7	15.2	43.5	-28.3	QP/120/300
V	173.000	48.8	10.0	2.9	43.7	18.0	43.5	-25.5	QP/120/300
V	217.600	43.1	10.4	3.3	43.6	13.1	46.0	-32.9	QP/120/300
V	88.100	62.6	8.8	2.1	43.5	30.1	48.0	-17.9	QP/120/300
H	88.100	60.8	9.7	2.1	43.5	29.2	48.0	-18.8	QP/120/300
<b>96.9Mhz</b>									
V	180.000	55.4	9.7	3.0	43.7	24.4	43.5	-19.1	QP/120/300
V	202.300	42.4	10.8	3.2	43.7	12.7	43.5	-30.8	QP/120/300
V	210.000	44.1	10.7	3.2	43.7	14.4	43.5	-29.1	QP/120/300
V	360.000	49.0	15.8	4.2	43.5	25.5	46.0	-20.5	QP/120/300
V	96.900	57.3	10.8	2.2	43.6	26.7	48.0	-21.3	QP/120/300
H	96.900	62.1	12.1	2.2	43.6	32.8	48.0	-15.2	QP/120/300
<b>107.9Mhz</b>									
V	62.480	59.6	6.0	1.8	43.1	24.3	40.0	-15.7	QP/120/300
V	71.570	52.7	6.6	1.9	43.2	18.0	40.0	-22.0	QP/120/300
V	160.600	38.3	10.6	2.8	43.7	8.0	43.5	-35.5	QP/120/300
V	107.900	57.9	10.8	2.2	43.6	27.3	48.0	-20.8	QP/120/300
H	107.900	63.0	12.1	2.2	43.6	33.7	48.0	-14.3	QP/120/300

## 12.0 § 15.239(b) / (c) Field strength requirements (FCC 15C - 15.239 (b)) – PowerConnect

### Method:

Testing was performed using the emissions test methods described in section 8

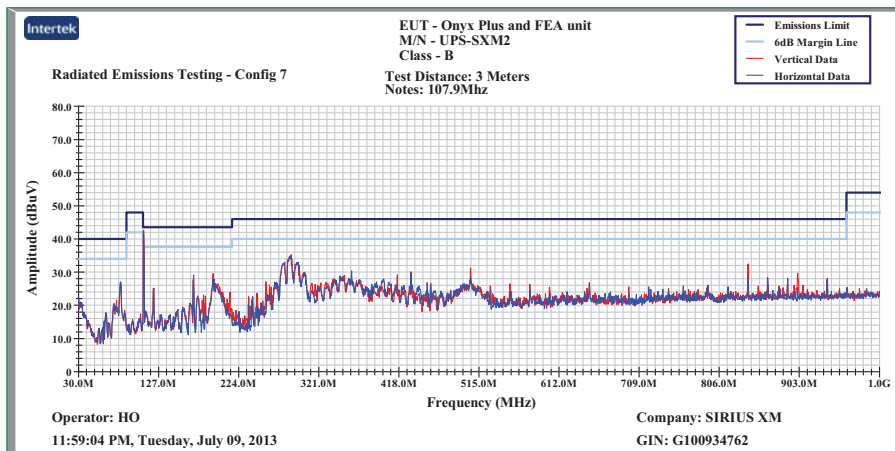
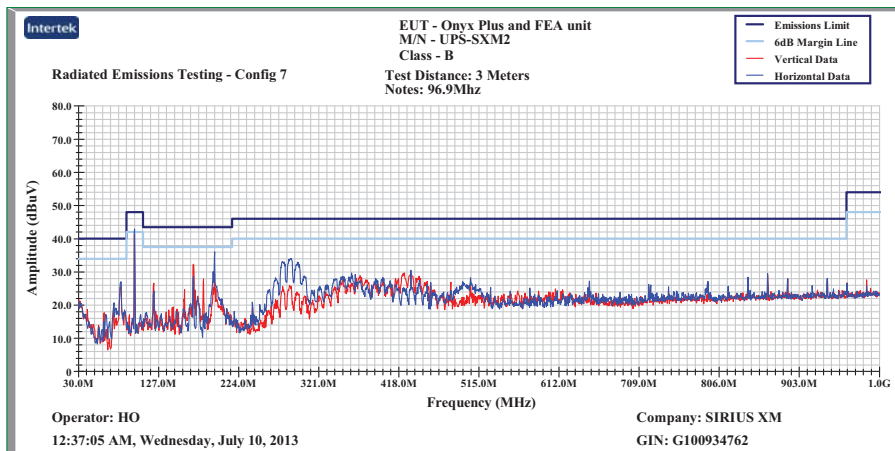
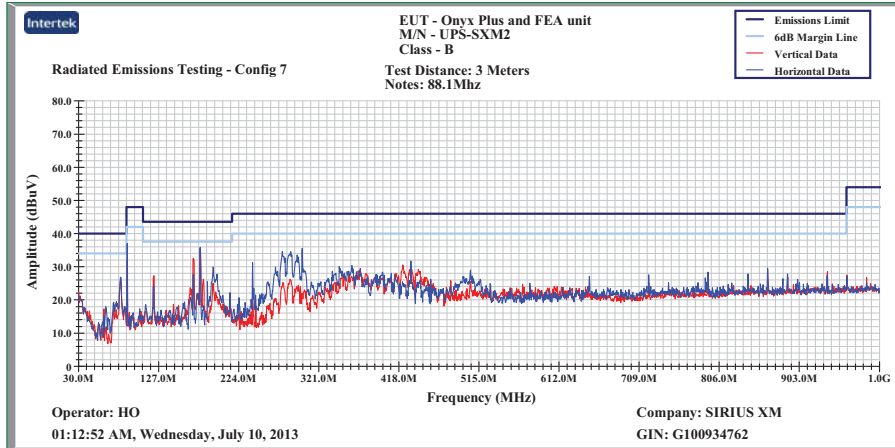
**Results: The sample tested was found to Comply.**

### Specific Setup Details

- The Sirius Onyx PLUS is positioned in a vertical position with at the back edge of the wooden testing table.
- Sirius Onyx PLUS is powered by its 5V PowerConnect adapter via a 12V DC battery placed on the testing table and an 'iFMCLA' power adapter.
- The Sirius satellite antenna is connected to the Sirius Onyx PLUS's 'Antenna' port.
- The 'Audio' port of the Sirius Onyx PLUS's dock is terminated with its 'Aux-In' audio cable.
- The FM Modulator menu should be used to enable the FM signal from the Sirius Onyx PLUS.
- The Sirius Onyx PLUS is configured to receive live **SiriusXM** programming service.
- The Sirius Onyx PLUS is configured for Max audio output level.

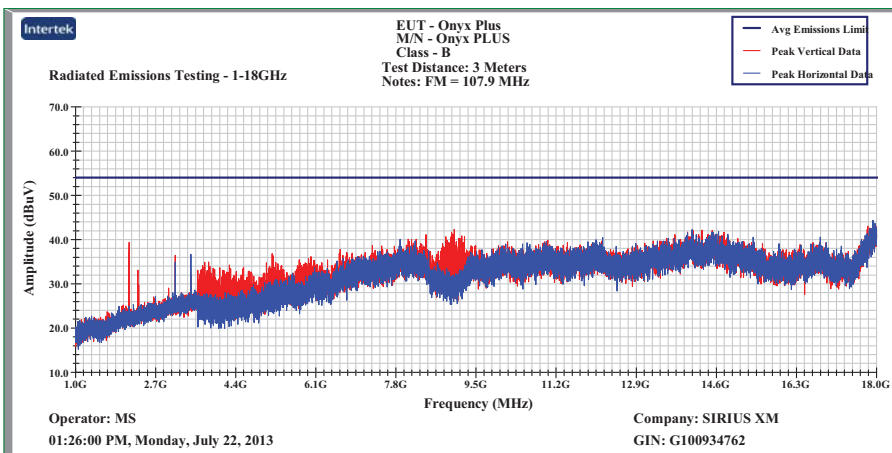
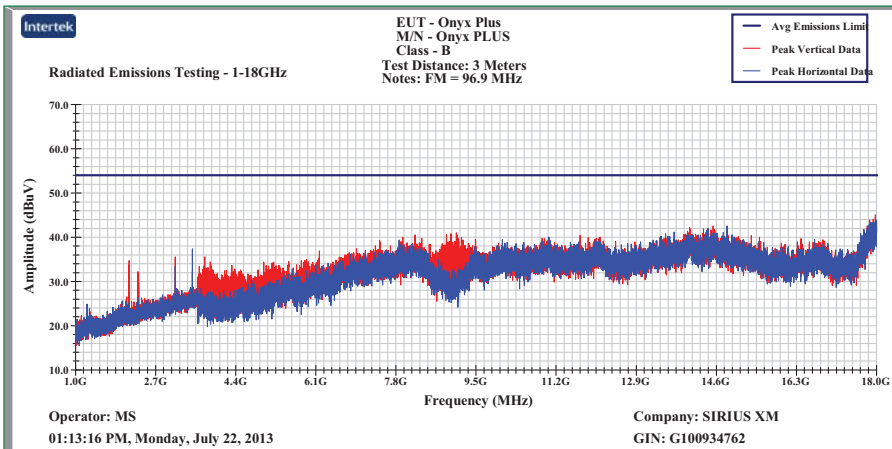
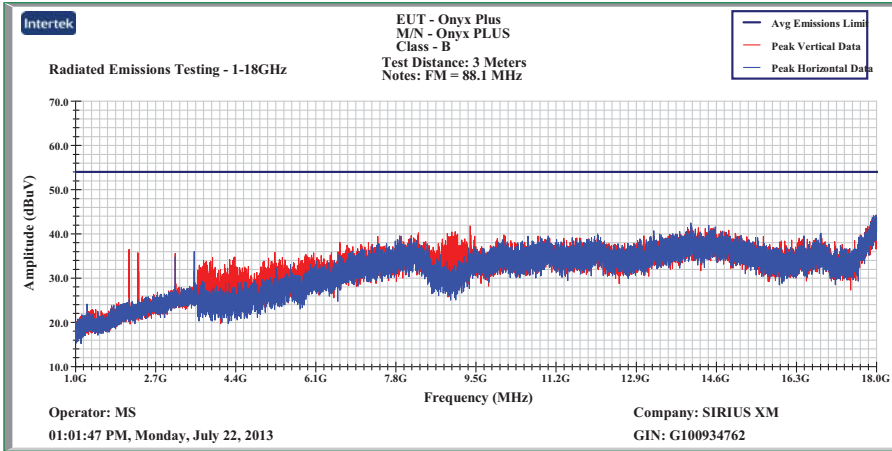
12.0 § 15.239(b) / (c) Field strength requirements (FCC 15C - 15.239 (b)) – PowerConnect

Peak Plot – 30MHz-1000MHz



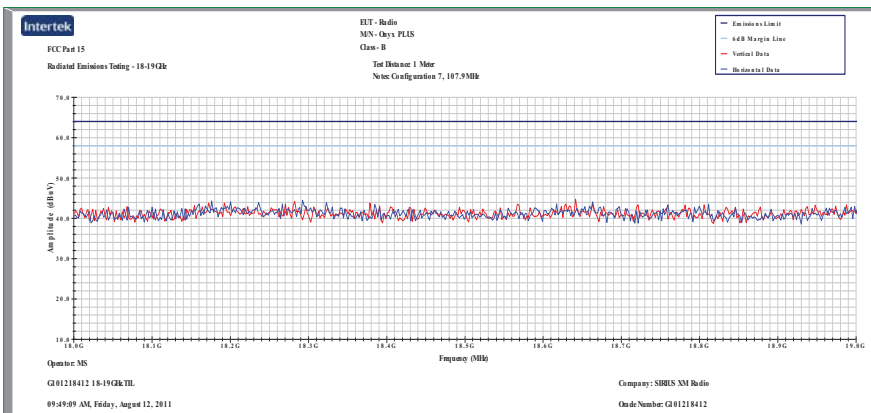
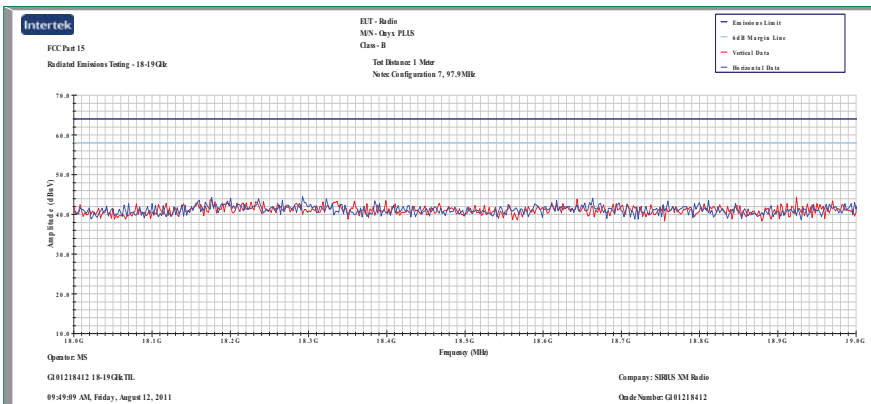
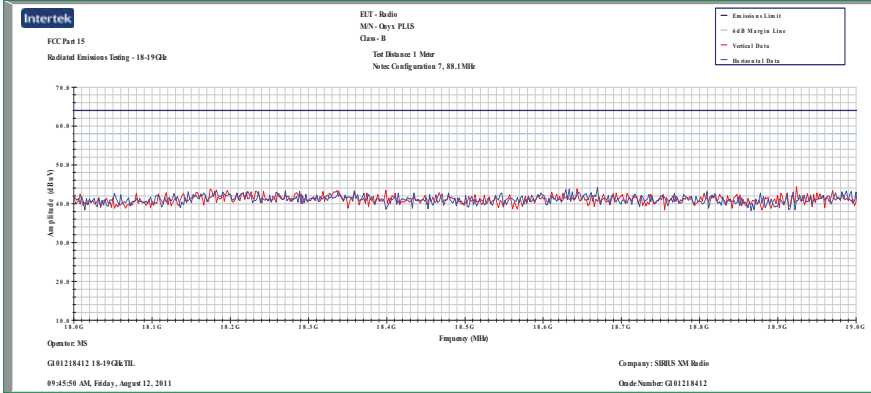
12.0 § 15.239(b) / (c) Field strength requirements (FCC 15C - 15.239 (b)) – PowerConnect

Peak Plot – 1000MHz-18000MHz



12.0 § 15.239(b) / (c) Field strength requirements (FCC 15C - 15.239 (b)) – PowerConnect

Peak Plot – 18000MHz-19000MHz



**12.0 § 15.239(b) / (c) Field strength requirements (FCC 15C - 15.239 (b)) – PowerConnect**

Tabular Data

Frequency Range (MHz): 30-19000Mhz

Test Distance (m): 3

Input power: Battery

Limit: 15\_239-3m

Modifications for compliance (y/n): N

A	B	C	D	E	F	G	H	I	J
Ant. Pol. (V/H)	Frequency MHz	Reading dB(uV)	Antenna Factor dB(1/m)	Cable Loss dB	Pre-amp Factor dB	Net dB(uV/m)	3m Limit dB(uV/m)	Margin dB	Detectors / Bandwidths Det/RBW/VBW
<b>88.1Mhz</b>									
V	168.000	62.5	10.2	2.9	43.7	31.9	43.5	-11.6	QP/120/300
V	176.200	65.2	9.8	2.9	43.7	34.3	43.5	-9.2	QP/120/300
H	285.100	49.3	13.3	3.8	43.6	22.8	46.0	-23.2	QP/120/300
									QP/120/300
V	88.100	64.5	8.8	2.1	43.5	32.0	48.0	-16.0	
H	88.100	68.8	9.7	2.1	43.5	37.2	48.0	-10.8	QP/120/300
									QP/120/300
<b>96.9Mhz</b>									
V	168.000	62.7	10.2	2.9	43.7	32.1	43.5	-11.4	QP/120/300
V	193.900	54.9	9.9	3.1	43.7	24.2	43.5	-19.3	QP/120/300
H	285.300	55.8	13.3	3.8	43.6	29.3	46.0	-16.7	QP/120/300
V	96.900	70.3	10.8	2.2	43.6	39.7	48.0	-8.3	QP/120/300
H	96.900	73.4	12.1	2.2	43.6	44.1	48.0	-3.9	QP/120/300
<b>107.9Mhz</b>									
V	79.860	54.2	7.7	2.0	43.3	20.6	40.0	-19.4	QP/120/300
V	168.000	62.4	10.2	2.9	43.7	31.8	43.5	-11.7	QP/120/300
H	285.200	55.7	13.3	3.8	43.6	29.2	46.0	-16.8	QP/120/300
V	107.900	69.8	10.8	2.2	43.6	39.2	48.0	-8.8	QP/120/300
H	107.900	73.0	12.1	2.2	43.6	43.7	48.0	-4.3	QP/120/300



## 13.0 Conducted Power Measurements - In Band

### Method:

Testing was performed using the following method;

- The EUT will be connected to a bias-T circuit which will be connected to a spectrum analyzer (or EMI receiver).
- The Bias-T circuit will provide direct current (DC) voltage to the CLA (for connection of the EUT) and will pass the FM signal, without attenuation, to the spectrum analyzer while blocking the DC voltage. To match the impedance of the EUT with that of the spectrum analyzer, an impedance matching transformer (or a minimum loss impedance matching pad attenuator) may be inserted ahead of the bias-T. The insertion loss of the impedance matching device\* see note ded in the final measurement results for the EUT.
- The conducted power of the fundamental frequency will be made using the following settings for the spectrum analyzer:
  - Average Detector
  - Resolution Bandwidth of 120 kHz
  - Video Bandwidth of 300 kHz
  - Reference Level set 10 dB above the peak emission to provide sufficient dynamic range to the measurement system noise floor
  - Span will be wide enough to capture the entire emission in the display screen yet narrow enough to provide adequate measurement resolution of the peak.
- Any loss between the EUT and the spectrum analyzer shall be added to the instrument reading to obtain the power level at the EUT output.
- Conducted Power limit for in-band emissions: -29dBm.

\* Note: Also, compliance was verified using the anticipated ANSI C63.10 draft being released in the near future. Limits using this test setup procedure are listed as -29dBm.

**Results: The sample tested was found to Comply.**

### Specific Setup Details

- The Sirius Onyx PLUS is connected to the FM port of the bias-T.
- Sirius Onyx PLUS is powered by its 5V PowerConnect adapter via a 12V DC power supply and an 'iFMCLA' power socket.
- The Sirius satellite antenna is connected to the Sirius Onyx PLUS's 'Antenna' port.
- The FM Modulator menu should be used to enable the FM signal from the Onyx Plus.
- The Sirius Onyx PLUS is configured to receive live **SiriusXM** programming service.
- The Sirius Onyx PLUS is configured for Max audio output level.

### 13.0 Conducted Power Measurements

Tabular Data:

Channel	Initial Reading dBm	Correction Factor (bias-T and cable loss) dBm	Conducted dBm	Limit dBm	Margin dBm	Results
88.1	-31.09	1.00	-30.09	-29	1.09	Pass
96.9	-30.71	1.00	-29.71	-29	0.71	Pass
107.9	-31.22	1.00	-30.22	-29	1.22	Pass

**14.0 Test Equipment List**

Description	Manufacturer	Model	Serial Number	Cal Due
Bilog Antenna	Chase	CBL6112A	2622	10/11/2013
Cable E205	Megaphase	TM18 NKNK 118	9053201 003	05/07/2014
Cable E206	Megaphase	TM18 NKNK 118	9053201 004	05/07/2014
Cable MP3	Megaphase	G919-NKNK-394	MP3	05/07/2014
Cable ST-3	Storm Products Co.	PR90-195-7MTR	09-07-601	08/22/2013
Cable E401	Megaphase	TR40	E401	06/18/2014
Cable E402	Megaphase	TR40	E402	06/18/2014
Cable E403	Megaphase	TR40	E403	06/18/2014
Cable TT4	Andrews	TT4	TT4	05/17/2014
EMI Receiver	Hewlett Packard	8546A	213109	10/05/2013
EMI Receiver RF Preselector	Hewlett Packard	85460A	213108	10/05/2013
Horn Antenna (1-18GHz)	EMCO	3115	9208-3919	05/07/2014
Horn Antenna (18-40GHz)	EMCO	3116	9310-2222	06/08/2014
LISN	Fischer	FCC-LISN-50-50-M	2019	11/15/2013
Preamplifier, 10 MHz to 2000 MHz	Mini-Circuits	ZKL-2	D052005	08/16/2013
Preamplifier (1-18GHz)	Miteq	AMF-4D-001180-24-10P	1020106	10/04/2013
Preamplifier (18-40GHz)	Miteq	JS4	965178	10/06/2013
Preamplifier (18-40GHz)	Miteq	JS4	818197	10/06/2013
Spectrum Analyzer	Rohde & Schwartz	ESU	203446A	02/11/2014

**15.0 Revision History**

Revision Level	Date	Report Number	Notes
Original issue			