



**TEST REPORT**

Report Number: 100455091ATL-006

September 28, 2011

**Product Name: Sirius XM Lynx Portable Radio**

**Product Model Number: SXi1**

Standard: FCC Part 15, Subpart B, Unintentional radiator  
ICES-003 Issue 4

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:

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EMC Team Leader

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Senior Staff Engineer

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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
3.0	Description of Equipment Under Test		
4.0	System setup including cable interconnection details, support equipment and simplified block diagram.		
5.0	Transmitter Information for equipment operating under Parts 11, 15 and 18 of the rules (Transmitter Info -		PASS
6.0	§ 15.107(a) / RSS-Gen 7.2.2 Conducted Emissions – Charger kit		PASS
7.0	§ 15.109(a) Unintentional Radiated Emissions – Charger kit		PASS
8.0	Test Equipment List		
9.0	Revision History		

### 3.0 Description of Equipment Under Test

Equipment Under Test			
Description	Manufacturer	Model Number	Serial Number
Satellite Radio	SIRIUS XM Satellite Radio	SXi1	NA

EUT receive date:	July 11, 2011
EUT receive condition:	Good

Description of EUT provided by Client:

Sirius XM Lynx 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 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.
- Connectivity could be achieved via Satellite, WiFi, Bluetooth & USB.

Description of EUT exercising:

The EUT was powered with a 12Vdc battery supplied to the 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)
Charging	NA	NA	NA

Applicant Information:

XM Radio Inc.  
1500 Eckington PI, 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)**

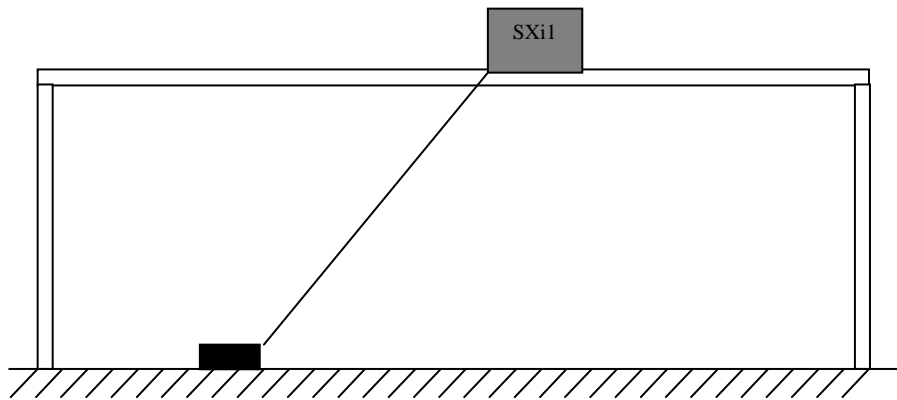
**Method:**

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

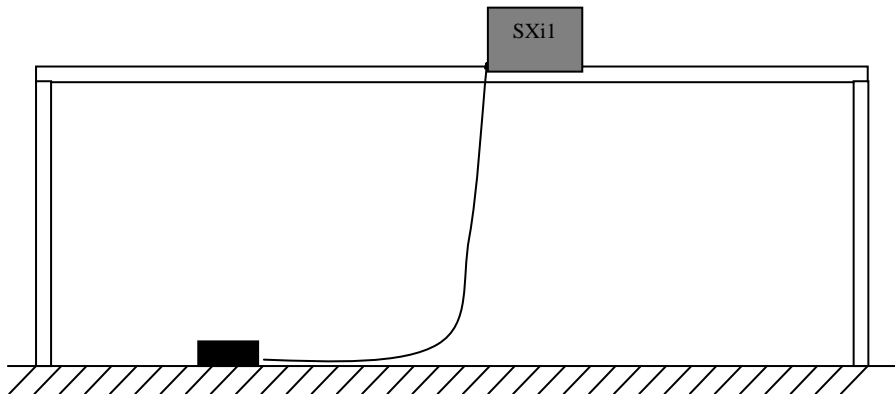
Support Equipment - Homedock Configurations			
Description	Manufacturer	Model Number	Serial Number
AC/DC Power Supply	NA	USBACBL5V1A	NA

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

**Configuration Diagram – Conducted Emissions (Charge kit)**



**Configuration Diagram – Radiated Emissions (Charge kit)**



**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: Same
		Address: Same
		Phone: Same
2.1033(b)(2)	<b>Equipment</b>	FCC ID: RS2SXI1
		EUT Model Number: SXi1
		EUT Serial Number: NA
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 § 15.107(a) / RSS-Gen 7.2.2 Conducted Emissions – Charge kit

### 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

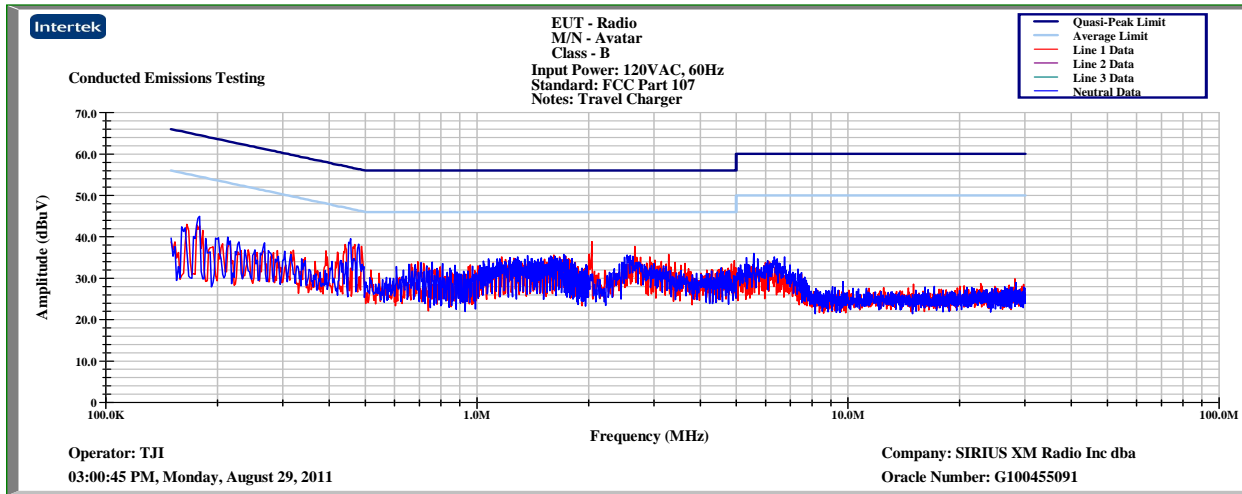
### Results: The sample tested was found to Comply.

#### Specific Setup Details for Charge kit

- Charge kit connected to Sirius Radio

## 6.0 § 15.107(a) / RSS-Gen 7.2.2 Conducted Emissions – Charge kit

Peak Plot – 150kHz-30MHz



### Tabular Data

**Frequency Range (MHz):** 0.15-30

**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 1,2	Detector (P,QP, A)	Frequency MHz	Reading dBuV	Cable Loss dB	LISN Ins. Loss dB	Net dBuV	Limit dBuV	Margin dB
1	P	0.156	33.1	0.0	7.6	40.7	55.7	-15.0
1	P	0.173	36.2	0.0	7.3	43.5	55.0	-11.5
1	P	0.195	35.6	0.0	7.0	42.6	53.8	-11.2
1	P	0.472	32.4	0.0	6.4	38.8	46.5	-7.7
1	P	1.750	28.7	0.0	6.2	34.9	46.0	-11.1
1	P	2.881	29.7	0.0	6.2	35.9	46.0	-10.1
2	P	0.156	35.6	0.0	7.6	43.2	55.7	-12.5
2	P	0.183	37.2	0.0	7.2	44.4	54.5	-10.1
2	P	0.217	33.8	0.0	6.9	40.7	53.0	-12.3
2	P	0.449	32.6	0.0	6.5	39.1	47.0	-7.9
2	P	1.859	27.5	0.0	6.3	33.8	46.0	-12.2
2	P	2.576	28.6	0.0	6.3	34.9	46.0	-11.1
<b>Calculations</b>		G=D+E+F		I=G-H				

Note: Peak measurements are compared to the average limit.



## 7.0 § 15.109(a) Unintentional Radiated Emissions – Charge kit

### 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

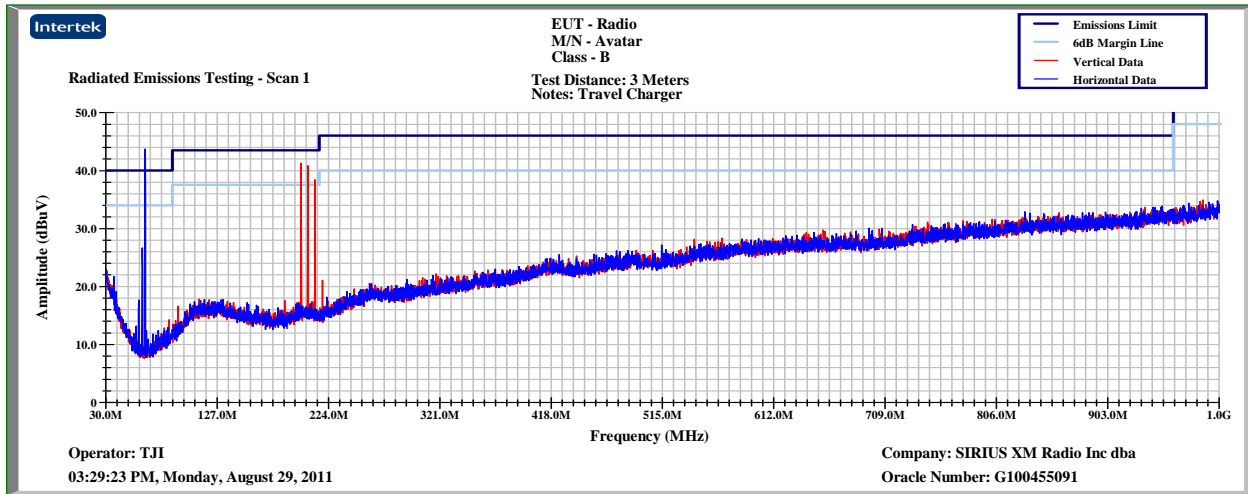
1 GHz to 18 GHz at 3 meters: +/- 4.2 dB

### Specific Setup Details

- Charge kit connected to Sirius Radio

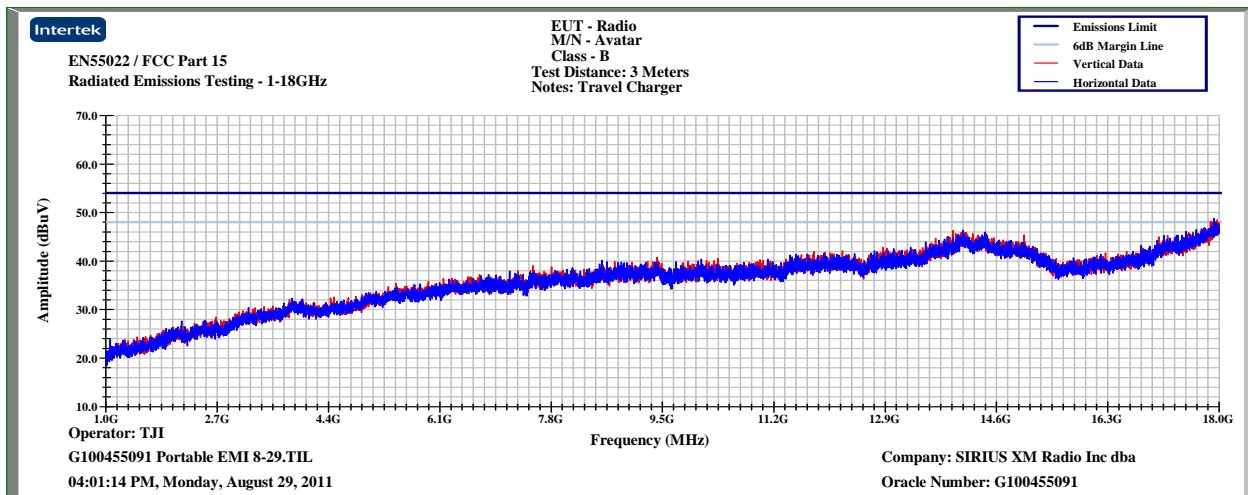
### 7.0 § 15.109(a) Unintentional Radiated Emissions – Charge kit

#### Peak Plot – 30MHz-1000MHz

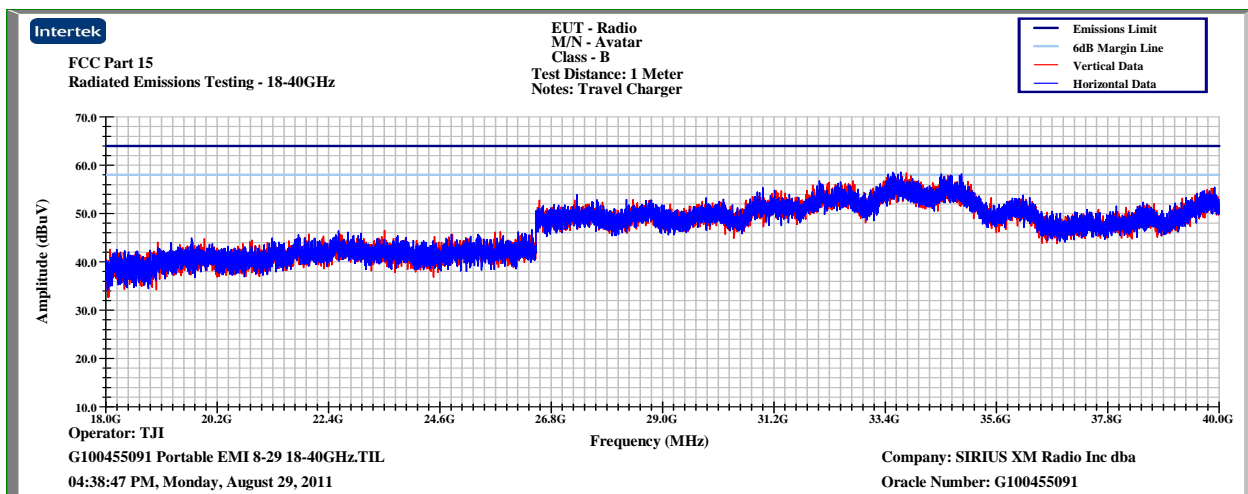


Note: Peaks above the limit around 65 and 200MHz are signals transmitted into the chamber with the satellite signal and are not related to the DUT.

#### Peak Plot – 1000MHz-18000MHz



#### Peak Plot – 18000MHz-40000MHz



## 7.0 § 15.109(a) Unintentional Radiated Emissions – Charge kit

### Tabular Data

Frequency Range (MHz): 30-40000

Test Distance (m): 3

Input power: 120VAC, 60Hz

Limit: FCC15 Class B-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>Travel Charger mode</b>									
h	65.650	22.2	5.9	1.7	28.5	1.4	40.0	-38.6	QP/120k/300k
v	198.550	21.2	10.7	2.9	28.0	6.8	43.5	-36.7	QP/120k/300k
v	206.250	21.1	11.0	2.9	28.0	7.0	43.5	-36.5	QP/120k/300k
v	214.238	21.2	10.4	3.0	28.0	6.5	43.5	-37.0	QP/120k/300k
v	218.188	20.9	10.5	3.0	28.1	6.3	46.0	-39.7	QP/120k/300k
h	830.238	20.6	20.7	6.5	27.6	20.2	46.0	-25.8	QP/120k/300k
<b>Calculations</b>		G=C+D+E-F			I=G-H				

## 8.0 Test Equipment List

Description	Manufacturer	Model	Serial Number	Cal Due
Bilog Antenna	Chase	CBL6112A	2622	10/13/2011
Cable E205	Megaphase	TM18 NKNK 118	9053201 003	05/12/2012
Cable E206	Megaphase	TM18 NKNK 118	9053201 004	05/12/2012
Cable MP3	Megaphase	G919-NKNK-394	MP3	05/12/2012
Cable ST-3	Storm Products Co.	PR90-195-7MTR	09-07-601	08/19/2012
Cable E401	Megaphase	TR40	E401	07/07/2012
Cable E402	Megaphase	TR40	E402	07/07/2012
Cable E403	Megaphase	TR40	E403	07/07/2012
Cable TT4	Andrews	TT4	TT4	05/24/2012
EMI Receiver	Hewlett Packard	8546A	213109	10/26/2011
EMI Receiver RF Preselector	Hewlett Packard	85460A	213108	10/26/2011
Horn Antenna (1-18GHz)	EMCO	3115	9208-3919	05/07/2012
Horn Antenna (18-40GHz)	EMCO	3116	9310-2222	07/07/2012
LISN	Fischer	FCC-LISN-50-50-M	2019	11/12/2011
Preamplifier, 10 MHz to 2000 MHz	Mini-Circuits	ZKL-2	D052005	08/16/2012
Preamplifier (1-18GHz)	Miteq	AMF-4D-001180-24-10P	1020106	10/04/2011
Preamplifier (18-40GHz)	Miteq	JS4	965178	07/06/2012
Preamplifier (18-40GHz)	Miteq	JS4	818197	07/06/2012
Spectrum Analyzer	Rohde & Schwartz	FSEK30	100253	10/22/2011

**9.0 Revision History**

Revision Level	Date	Report Number	Notes
Original issue	August 29, 2011	100455091ATL-006	--
1	August 30, 2011	100455091ATL-006	Page 9 - Changed model name to Charge kit Page 10 - Changed model name to Charge kit
2	September 28, 2011	100455091ATL-006	Page 10 – Included statement explaining satellite noise in the test area. Page 6 – Changed FCC ID to RS2SX11