PCTEST ENGINEERING LABORATORY, INC.
6660-B Dobbin Road, Columbia, MD 21045 USA
Tel. 410.290.6652 / Fax 410.290.6554
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VERIFICATION OF COMPLIANCE
FCC Part 15B / IC Verification

Manufacturer Name & Address:
XM Satellite Radio, Inc.
3161 S.W. 10th Street
Deerfield Beach, FL 33442

Date of Testing:
May 27-30, 2008
Test Site/Location:
PCTEST Lab, Columbia, MD, USA
Test Report Serial No.:
0806020771.RS2

TRADE NAME:	XMp3 Vehicle Cradle
U.S. RESPONSIBLE PARTY	XM Satellite Radio, Inc.
Address:	3161 S.W. 10th Street
	Deerfield Beach, FL 33442
Contact Person:	Beejay Jolayemi
Contact Telephone Number:	202-680-4288

EUT Type:	XMp3 Vehicle Cradle
Model:	XMP3CAR1
FCC ID:	RS2XMPCAR1
IC Cert No:	5697A-XMPCAR1
FCC Rule Part(s):	FCC Part 15 Subpart B, Part 2 (Verification)
IC Rule Part(s):	ICES-003, RSS-Gen, RSS-210
FCC Classification:	FCC Class B Digital Device
IC Classification:	Class B Digital Device/Receiver
Test Procedure:	ANSI C63.4-2003 / CISPR22 (ICES-003)

The device bearing the trade name and model specified above has been shown to comply with the applicable technical standards as indicated in the measurement report and has been tested in accordance with the measurement procedures specified in ANSI C63.4-2003 and CISPR22 (ICES-003) (See Test Report). These measurements were performed with no deviation from the standards.

I authorize and 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.

NVLAP accreditation does not constitute any product endorsement by NVLAP or any agency of the United States Government. PCTEST certifies that no party to this application has been denied the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C. 862.

Randy Ortanez
President

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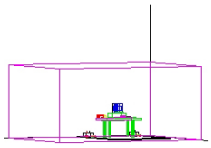

MEASUREMENT REPORT
FCC Part 15B / IC RSS-GEN

§ 2.1033 General Information

APPLICANT:	XM Satellite Radio, Inc.
APPLICANT ADDRESS:	3161 S.W. 10th Street
	Deerfield Beach, FL 33442,
TEST SITE:	PCTEST ENGINEERING LABORATORY, INC.
TEST SITE ADDRESS:	6660-B Dobbin Road, Columbia, MD 21045 USA
FCC RULE PART(S):	FCC Part 15 Subpart B, Part 2 (Verification)
IC RULE PART(S):	RSS-Gen Receiver
MODEL:	XMP3CAR1
EUT TYPE:	XMp3 Vehicle Cradle
Test Device Serial No.:	081800013 ☐ Production ☒ Pre-Production ☐ Engineering
FCC CLASSIFICATION:	FCC Class B Digital Device
IC CLASSIFICATION:	Class B Digital Device/Receiver
DATE(S) OF TEST:	May 27-30, 2008

Test Methodology

Radiated measurements were taken using the methods and procedures described in ANSI C63.4-2003. Radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility / NVLAP Accreditation

Conducted and radiated tests were performed at PCTEST Engineering Lab in Columbia, MD 21045, U.S.A.

- PCTEST facility is an FCC registered (PCTEST Reg. No. 90864) 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 (IC 2451).
- PCTEST Lab is accredited by U.S. National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP) in EMC, Telecommunication, and FCC for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. (NVLAP Lab code: 100431-0).
- 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 (IC-2451) test laboratory with the site description on file at Industry Canada.

1.0 INTRODUCTION

1.1 Evaluation Procedure

The evaluation of the XM XMp3 Car Kit was performed as described in the XM New Product Certification test plan dated April 29, 2008. The measurement procedure described in the American National Standard for Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9kHz to 40GHz (ANSI C63.4-2003) was used in the measurement of radiated and conducted emissions from the **XMp3 Vehicle Cradle** and with a representative XM Satellite Receiver.

Deviation from measurement procedure…….....None

1.2 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.

1.3 PCTEST Test Location

The map at the right shows the location of the PCTEST LABORATORY, its proximity to the FCC Laboratory, the Columbia vicinity are, the Baltimore-Washington Internt'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 in New Concept Business Park, Guilford Industrial Park, Columbia, Maryland. The site address is 6660-B Dobbin Road, Columbia, MD 21045. The test site is one of the highest points in the Columbia area with an elevation of 390 feet above mean sea level. The site coordinates are 39° 11'15" N latitude and 76° 49'38" W longitude. The facility is 1.5 miles North of the FCC laboratory, and the ambient signal and ambient signal strength are approximately equal to those of the FCC laboratory. There are no FM or TV transmitters within 15 miles of the site. The detailed description of the measurement facility was found to be in compliance with the requirements of § 2.948 according to ANSI C63.4-2003 on January 27, 2006 and Industry Canada.

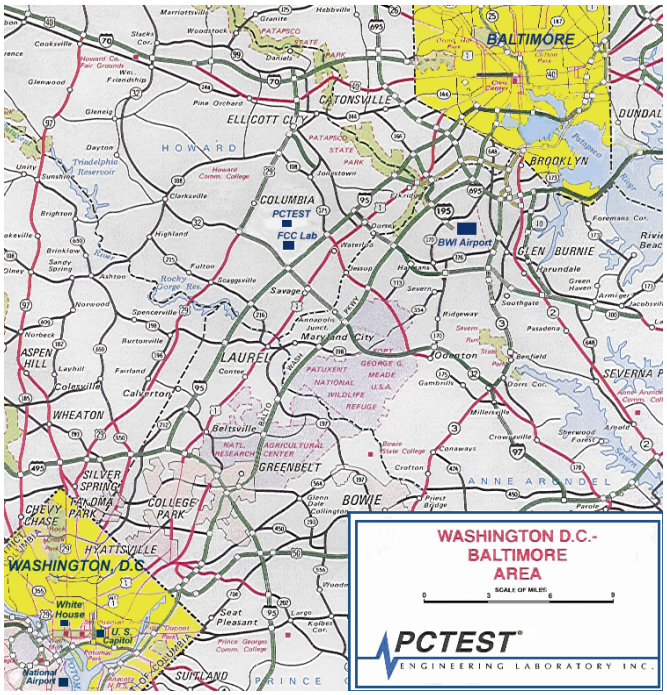

Figure 1-1. Map of the Greater Baltimore and Metropolitan Washington, D.C. area

2.0 PRODUCT INFORMATION

2.1 Equipment Description

The Equipment Under Test (EUT) is the **XMp3 Vehicle Cradle**. The test data contained in this report pertains only to the emissions due to the digital circuitry of the EUT. The XMp3 is powered via 12 Vdc provided to the car cradle.

Model	Description
XMP3CAR1	XMp3 Vehicle Cradle

Table 2-1. EUT Equipment Description

2.2 Operation Mode

The XMp3 Vehicle Cradle Model: XMP3CAR1 was connected to the cradle in order to record all of the necessary measurements. Three separate test configurations were examined for radiated emission compliance to section 15.109 using the vehicle cradle and the XM receiver. The first configuration was evaluated with two cradles from different manufacturers and also with two different FM Direct adapters. The following are the configurations investigated:

Test Configuration #1: Car cradle 1 with FM Direct Adapter 1
Test Configuration #1: Car cradle 2 with FM Direct Adapter 1
Test Configuration #1: Car cradle 1 with FM Direct Adapter 2
Test Configuration #2: Car cradle 1 with Cassette Adapter
Test Configuration #3: Car cradle 1 with XM Antenna Only

Conducted emissions testing was not performed as the device is battery powered. Please see Section 7.0 and the test setup photographs for more information on the test setup.

2.3 EMI Suppression Device(s)/Modifications

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

3.0 DESCRIPTION OF TEST

3.1 Conducted Emissions

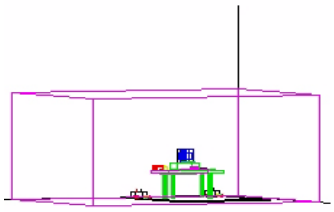

Figure 3-1. Shielded Enclosure Line-Conducted Test Facility

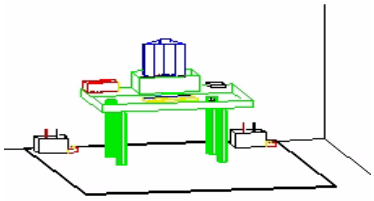

Figure 3-2. Line Conducted Emission Test Set-Up

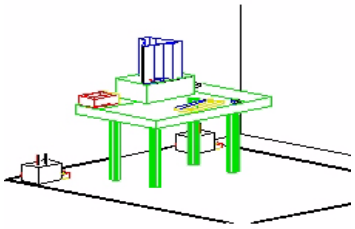

Figure 3-3. Wooden Table & Bonded LISNs

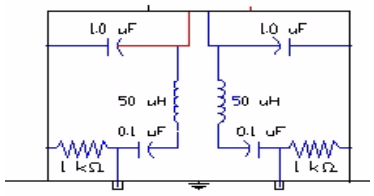

Figure 3-4. LISN Schematic Diagram

The line-conducted facility is located inside a 16'x20'x10' shielded enclosure, manufactured by Ray Proof Series 81 (*see Figure 3-1*). The shielding effectiveness of the shielded room is in accordance with MIL-Std-285 or NSA 65-5. A 1m x 1.5m wooden table 80cm high is placed 40cm away from the vertical wall and 1.5m away from the sidewall of the shielded room (*see Figure 3-2*). Solar Electronics and EMCO Model 3725/2 (10kHz-30MHz) 50Ω/50μH Line-Impedance Stabilization Networks (LISNs) are bonded to the shielded room (*see Figure 3-3).* The EUT is powered from the Solar LISN and the support equipment is powered from the EMCO LISN. Power to the LISNs are filtered by a high-current high-insertion loss Ray Proof power line filter (100dB 14Hz-10GHz). The purpose of the filter is to attenuate ambient signal interference and this filter is also bonded to the shielded enclosure. All electrical cables are shielded by braided tinned copper zipper tubing with an inner diameter of ½". If the EUT is a DC-powered device, power will be derived from the source power supply it normally will be powered from and this supply line(s) will be connected to the Solar LISN. The LISN schematic diagram is shown (*see Figure 3-4*). All interconnecting cables more than 1 meter were shortened to a 1 meter length by non-inductive bundling (serpentine fashion). 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 RF output of the LISN was connected to the spectrum analyzer to determine the frequency producing the maximum EME from the EUT.

The spectrum was scanned from 150kHz to 30MHz with a spectrum analyzer. The detector function was set to CISPR quasi-peak and average mode. The bandwidth of the analyzer was set to 10kHz. The EUT, support equipment, and interconnecting cables were arranged and manipulated to maximize each EME emission. Each emission was maximized by: switching power lines; varying the mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and/or support equipment, and powering the monitor from the floor mounted outlet box and the computer aux AC outlet, if applicable; whichever determined the worst-case emission. Photographs of the worst-case emission can be seen in the test setup photographs. Each EME reported was calibrated using the Agilent E8257D (250kHz – 20GHz) PSG Signal Generator.

3.2 Radiated Emissions

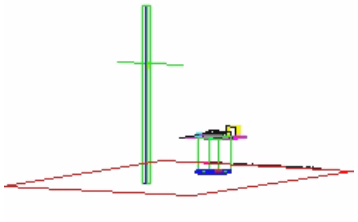

Figure 3-5. 3-Meter Test Site

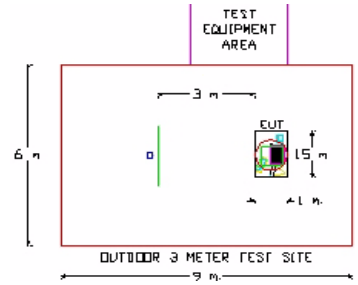

Figure 3-6. Dimensions of Outdoor Test Site

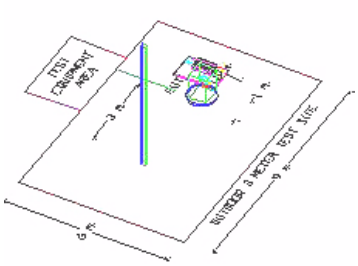

Figure 3-7. Turntable and System Setup

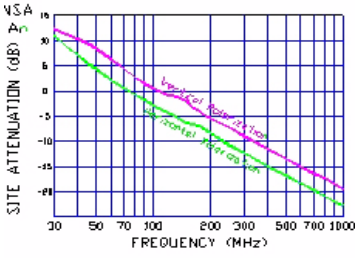

Figure 3-8. Normalized Site Attenuation Curves (H&V)

Preliminary measurements were made indoors at 1-meter using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequency producing the maximum EME. Appropriate precaution was taken to ensure that all EME from the EUT were maximized and investigated. The system configuration, clock speed, mode of operation or video resolution, and turntable azimuth with respect to the antenna was noted for each frequency found. The spectrum was scanned from 30 to 200 MHz using a bi-conical antenna and from 200 to 1000 MHz using a log-spiral antenna. Above 1 GHz, linearly polarized double ridge horn antennas were used.

Final measurements were made outdoors at 3-meter test range using Roberts™ Dipole antennas or horn antennas (*see Figure 3-5*). The test equipment was placed on a wooden and plastic bench situated on a 1.5m x 2m area adjacent to the measurement area (*see Figure 3-6*). 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 detector function was set to CISPR quasi-peak mode and the bandwidth of the spectrum analyzer was set to 100kHz for frequencies below 1GHz or 1MHz for frequencies above 1GHz. Above 1GHz the detector function was set to average mode (RBW = 1MHz, VBW = 10Hz).

The half-wave dipole antenna was tuned to the frequency found during preliminary radiated measurements. The EUT, support equipment and interconnecting cables were re-configured to the set-up producing the maximum emission for the frequency and were placed on top of a 0.8-meter high non-metallic 1 x 1.5 meter table (*see Figure 3-7*). The EUT, support equipment, and interconnecting cables were re-arranged and manipulated to maximize each EME emission. The turntable containing the system was rotated 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: varying the mode of operation or resolution; clock or data exchange speed; scrolling H pattern to the EUT and/or support equipment, and powering the monitor from the floor mounted outlet box and the computer aux AC outlet, if applicable; and changing the polarity of the antenna, whichever determined the worst-case emission. Photographs of the worst-case emission can be seen in the test setup photographs. Each EME reported was calibrated using the Agilent E8257D (250kHz – 20GHz) PSG Signal Generator. The Theoretical Normalized Site Attenuation Curves for both horizontal and vertical polarization are shown in Figure 3-8.

4.0 SAMPLE CALCULATIONS

4.1 Conducted Emission Measurement Sample Calculation

@ 20.3 MHz

Class B limit	**= 60.0 dBμV (Quasi-peak limit)**
Reading	= - 57.8 dBm (calibrated quasi-peak level)
Convert to dbμV	= - 57.8 + 107 = 49.2 dBμV
Margin	= 49.2 - 60.0 = - 10.8 dB
	= **10.8 dB below limit**

4.2 Radiated Emission Measurement Sample Calculation

@ 66.7 MHz

Class B limit	**= 100 μV/m = 40.0 dBμV/m**
Reading	= - 76.0 dBm (calibrated level)
Convert to dbμV	= - 76.0 + 107 = 31.0 dBμV
Antenna Factor + Cable Loss	= 5.8 dB/m
Total	= 36.8 dBμV/m
Margin	= 36.8 - 40.0 = - 3.2 dB
	= **3.2 dB below limit**

Note:

$$\text{Level}_{[dB\mu V]} = 20 \log_{10} (\text{Level}_{[\mu V/m]})$$

$$\text{Level}_{[dB\mu V]} = \text{Level}_{[dBm]} + 107$$

5.0 TEST EQUIPMENT CALIBRATION DATA

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

Manufacturer	Model	Description	Cal Interval	Calibration Due	Serial No.
-	No.165	(30MHz - 1000MHz) RG58 Coax Cable		N/A	N/A
-	No.166	(1000-26500MHz) Microwave RF Cable		N/A	N/A
-	No.167	(100kHz - 100MHz) RG58 Coax Cable		N/A	N/A
Agilent	11713A	Attenuation/Switch Driver	Annual	12/13/08	3439A02645
Agilent	8447D	Broadband Amplifier		N/A	1937A03348
Agilent	8447D	Broadband Amplifier		N/A	2443A01900
Agilent	8449B	(1-26.5GHz) Pre-Amplifier	Annual	12/12/08	3008A00985
Agilent	85650A	Quasi-Peak Adapter	Annual	3/13/09	2043A00301
Agilent	8566B	(100Hz–22GHz) Spectrum Analyzer	Annual	12/13/08	3638A08713
Agilent	8566B	Opt. 462 Impulse Bandwidth	Annual	12/12/08	3701A22204
Agilent	8591A	(9kHz-1.8GHz) Spectrum Analyzer	Annual	9/18/08	3144A02458
Agilent	E4407B	ESA Spectrum Analyzer	Annual	3/13/09	US39210313
Agilent	E4448A	(3Hz-50GHz) Spectrum Analyzer	Annual	1/24/09	US42510244
Agilent	E8257D	(250kHz-20GHz) Signal Generator	Biennial	3/8/09	MY45470194
Compliance Design	Roberts	Dipole Set	Biennial	11/8/09	146
Compliance Design	Roberts	Dipole Set	Biennial	11/8/09	147
Emco	6502	Active Loop Antenna (10k - 30 MHz)	Annual	11/5/08	267
Emco	3121C-DB4	Dipole Antenna	Biennial	1/22/09	00023951
Emco	3816/2	LISN	Biennial	8/8/08	9707-1077
Emco	3816/2	LISN	Biennial	8/8/08	9707-1079
Pasternack	PE7000-6	6 dB Attenuator		N/A	
Solar Electronics	8012-50-R-24-BNC	LISN	Biennial	11/8/09	0310233
Sunol	JB5	Bi-Log 3m Antenna (<1GHz)	Biennial	5/24/09	A051107

Table 5-1. Annual Test Equipment Calibration Schedule

6.0 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 controlled within the range 86-106kPa (860-1060mbar).

7.0 TEST DATA

7.1 Summary

Test Date(s): May 27-30, 2008

Test Engineer: Greg Snyder

FCC Part 15 Section	IC RSS-Gen Section	Description	Result
15.107	7.2.2	Conducted Emissions	N/A
15.109	7.2.3	Radiated Emissions	PASS

Table 7-1. Summary of Test Results

Frequency [MHz]	FCC Field Strength Limit at 3 Meters [dBµV/m]
30 – 88	100
88 – 216	150
216 – 960	200
> 960	500

Table 7-2. 3-Meter Radiated Limits (FCC CFR Title 47 Section 15.109)

Frequency [MHz]	IC Field Strength Limit at 3 Meters [dBµV/m]
30 – 230	40.46
230 – 1000	47.46

Table 7-3. 3-Meter Radiated Limits (ICES-003 Section 5.5)

Sample Calculation:

- Field Strength Level $_{[dB\mu V/m]}$ = Analyzer Level $_{[dBm]}$ + 107 + AFCL $_{[dB]}$

Notes:

- AFCL = Antenna Factor $_{[dB]}$ + Cable Loss $_{[dB]}$

Industry Canada 10 meter to 3 meter Limit Conversion = 10 meter Limit + 10.46 $_{[dB]}$

7.2 Emission Measurements for test configuration # 1

7.2.1 Test Setup Description

The XMp3 XM Satellite Radio Receiver was connected to the XMp3 vehicle cradle powered by a 12V battery through a cigarette lighter vehicle adapter. An XM FM Direct Adapter was connected through the "FM In" port to a FM aerial antenna, through the "FM Out" port to a 75Ω terminator, and to an XM antenna. A 3'x4' ground plane was used in the setup to replicate the conditions in which an FM antenna is installed in a vehicle. The EUT was configured to receive live XM broadcast signal and was configured for a maximum audio output level. A distance of 10 cm was maintained between the edges of all items on the setup table.

The test setup was tested for radiated emissions only. Photographs of equipment and cable placement can be found in the Test Setup Photographs.

7.2.2 Test Support Equipment – Test Configuration # 1

The following table lists the units used for the test configuration #1. Both versions of the car cradle and FM Direct Adapters are listed in the table.

1a	Fox Electronics Car Dock	P/N: XM P/N:	636A-4-2 XM-2320-0116	S/N:	081800013
1b	Abracon Corporation Car Dock	P/N: XM P/N:	ASFL1-4.000MHz-E-K-T XM-2320-0116	S/N:	081800087
2	5.0V DC vehicle power adapter	1.05m	Unshielded cable with ferrite bead on one end	S/N:	CLAJRP50317
3a	FM Direct Adapter Box with 75Ω termination	Model:	XM-7700-0022	S/N:	0801000140
3b	Audiovox FM Direct Adapter Box with 75Ω termination	Model:	XMFM1	S/N:	061103114411236140
4	XM Antenna	7.01m	Shielded coax antenna cable	S/N:	N/A
5	FM aerial antenna	Model:	N/A	S/N:	N/A
6	EverStart Lawn/Garden 12V AC bat	Model:	N/A	S/N:	N/A

Table 7-4. Test Support Equipment for Test Configuration # 1

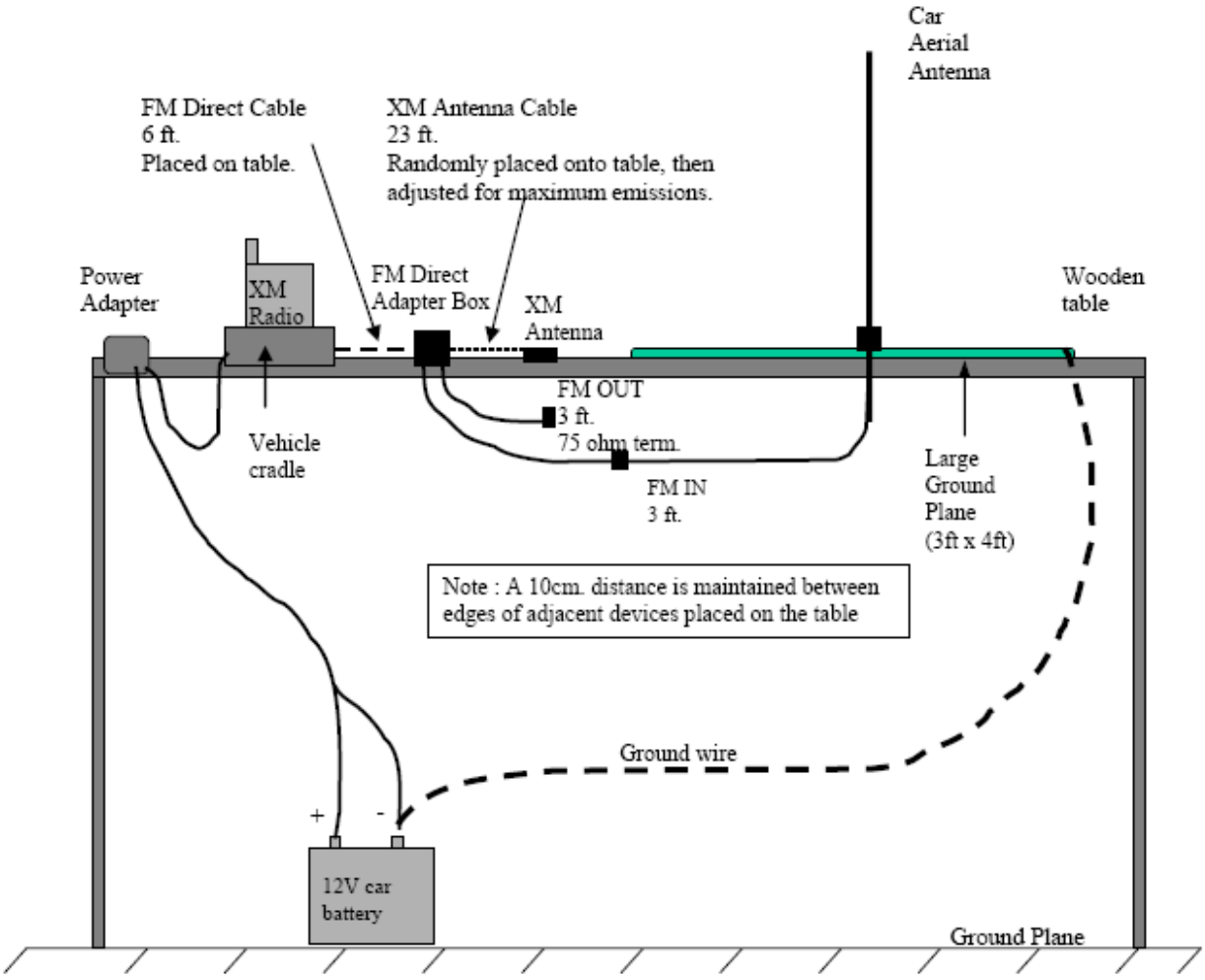

Figure 9: Test Setup Configuration # 1

7.2.3 Radiated Measurement Data – Test Configuration # 1 (FOX Car Cradle)

§15.109, RSS-Gen (7.2.3)

Frequency [MHz]	Peak Level [dBm]	AFCL [dB]	Pol [H/V]	Height [m]	Azimuth [degrees]	Field Strength [dBυV/m]	FCC Field Strength Limit [dBuV/m]	Margin [dB]
48.42	-90.42	9.99	V	1.2	180	26.57	40.00	-13.43
55.80	-91.52	9.72	V	1.2	180	25.19	40.00	-14.81
131.65	-94.92	13.14	V	1.5	45	25.23	43.52	-18.30
194.05	-100.61	14.16	H	2.5	67	20.55	43.52	-22.97
242.70	-96.29	13.55	H	2.5	67	24.26	46.02	-21.76
340.00	-93.63	16.76	H	2.5	180	30.13	46.02	-15.90

Table 7-5. Radiated Measurements at 3-meters– FCC Part 15

Frequency [MHz]	Peak Level [dBm]	AFCL [dB]	Pol [H/V]	Height [m]	Azimuth [degrees]	Field Strength [dBuV/m]	IC 3m Limit [dBuV/m]	Margin [dB]
48.42	-90.42	9.99	V	1.2	180	26.57	40.46	-13.89
55.80	-91.52	9.72	V	1.2	180	25.19	40.46	-15.27
131.65	-94.92	13.14	V	1.5	45	25.23	40.46	-15.23
194.05	-100.61	14.16	H	2.5	67	20.55	40.46	-19.91
242.70	-96.29	13.55	H	2.5	67	24.26	47.46	-23.20
340.00	-93.63	16.76	H	2.5	180	30.13	47.46	-17.33

Table 7-6. Radiated Measurements at 3-meters– ICES-003

7.2.4 Radiated Measurement Data – Test Configuration # 1 (Abracon Car Cradle)

§15.109, RSS-Gen (7.2.3)

Frequency [MHz]	Peak Level [dBm]	AFCL [dB]	Pol [H/V]	Height [m]	Azimuth [degrees]	Field Strength [dBµV/m]	FCC Field Strength Limit [dBuV/m]	Margin [dB]
30.85	-102.63	19.73	V	1.8	222	24.10	40.00	-15.90
48.70	-89.48	9.87	V	1.6	315	27.39	40.00	-12.61
55.20	-93.58	9.68	H	1.2	313	23.10	40.00	-16.90
56.35	-96.65	9.75	H	1.0	312	20.10	40.00	-19.90
168.27	-105.55	14.05	H	1.0	300	15.50	43.52	-28.02
340.00	-104.46	16.76	H	1.9	296	19.30	46.02	-26.72

Table 7-7. Radiated Measurements at 3-meters– FCC Part 15

Frequency [MHz]	Peak Level [dBm]	AFCL [dB]	Pol [H/V]	Height [m]	Azimuth [degrees]	Field Strength [dBuV/m]	IC 3m Limit [dBuV/m]	Margin [dB]
30.85	-102.63	19.73	V	1.8	222	24.10	40.46	-16.36
48.70	-89.48	9.87	V	1.6	315	27.39	40.46	-13.07
55.20	-93.58	9.68	H	1.2	313	23.10	40.46	-17.36
56.35	-96.65	9.75	H	1.0	312	20.10	40.46	-20.36
168.27	-105.55	14.05	H	1.0	300	15.50	40.46	-24.96
340.00	-104.46	16.76	H	1.9	296	19.30	47.46	-28.16

Table 7-8. Radiated Measurements at 3-meters– ICES-003

7.2.5 Radiated Measurement Data Plots– Test Configuration # 1 (Fox Car Cradle)

§15.109, RSS-Gen (7.2.3)

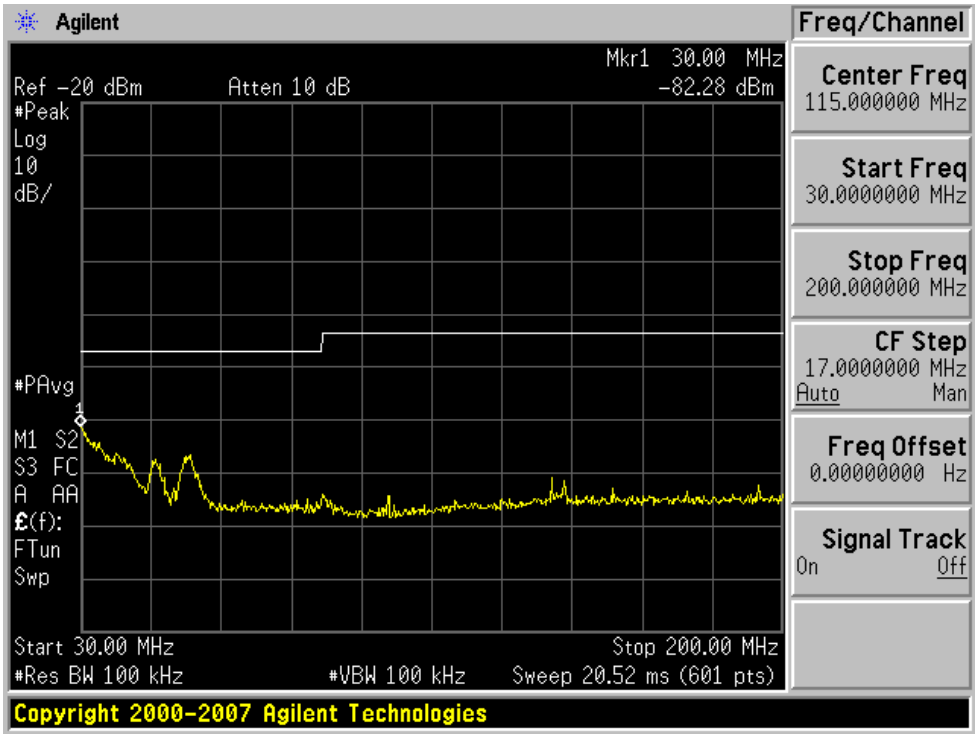

Figure 10: Fox Car Cradle A, 30 – 200MHz, Horizontal

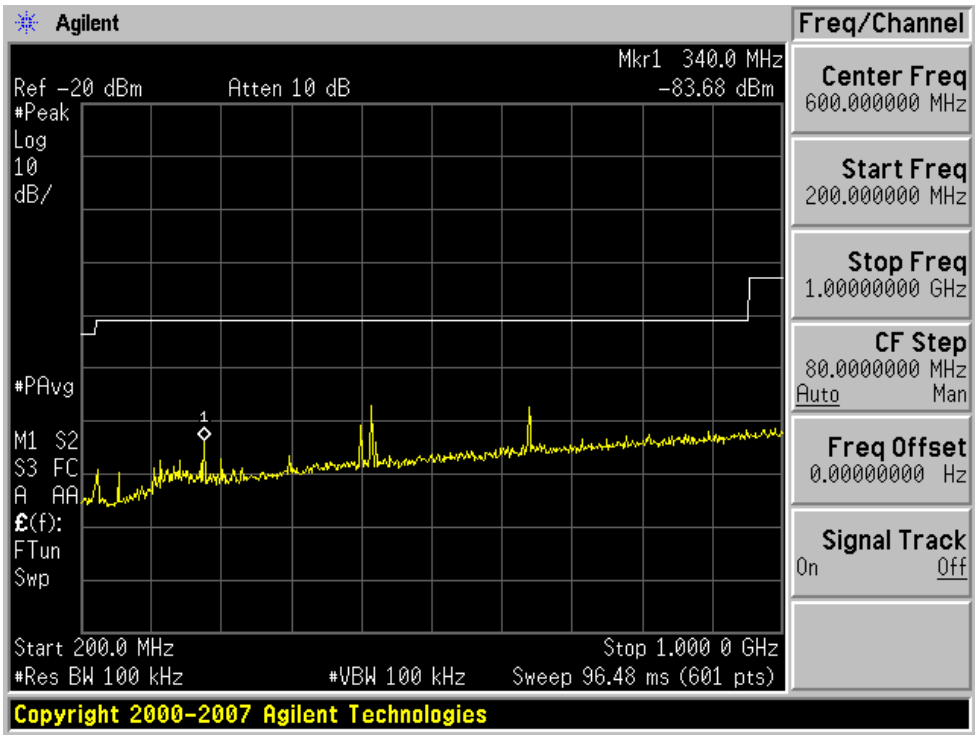

Figure 11: Fox Car Cradle A, 200M – 1GHz, Horizontal

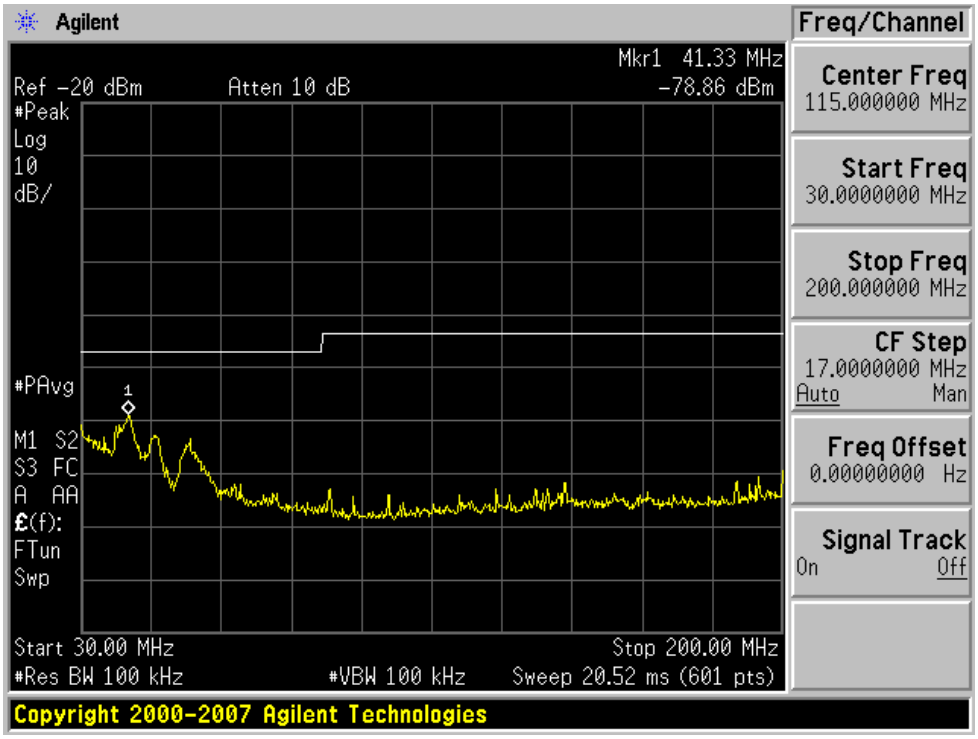

Figure 12: Fox Car Cradle A, 30 – 200MHz, Vertical

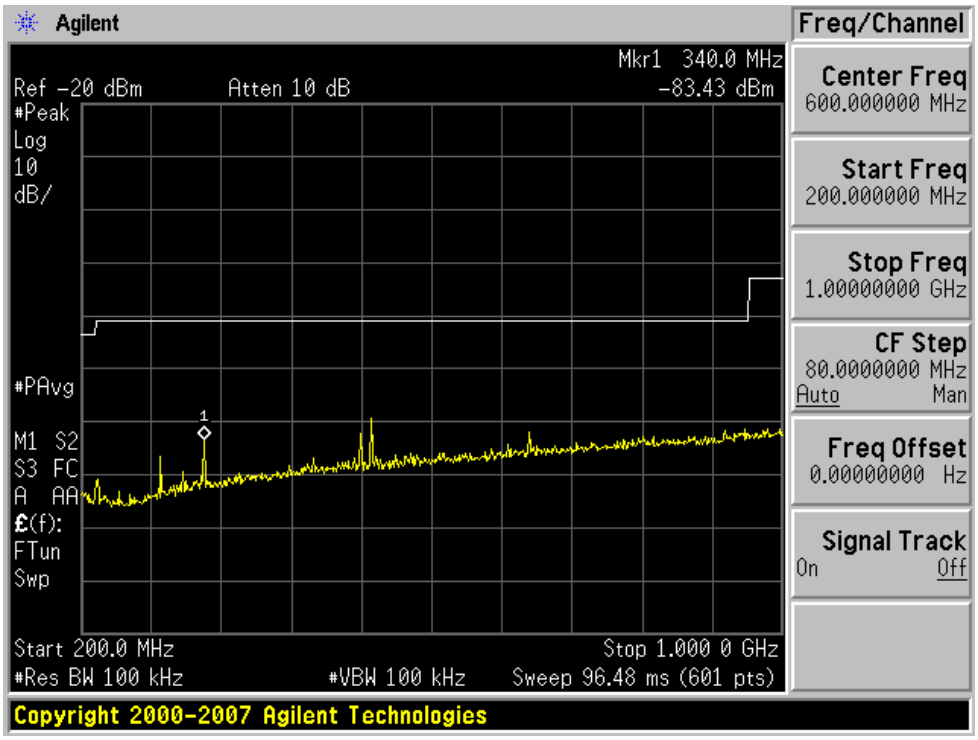

Figure 13: Fox Car Cradle A, 200M – 1GHz, Vertical

7.2.6 Radiated Measurement Data Plots– Test Configuration # 1 (Abracon Car Cradle)

§15.109, RSS-Gen (7.2.3)

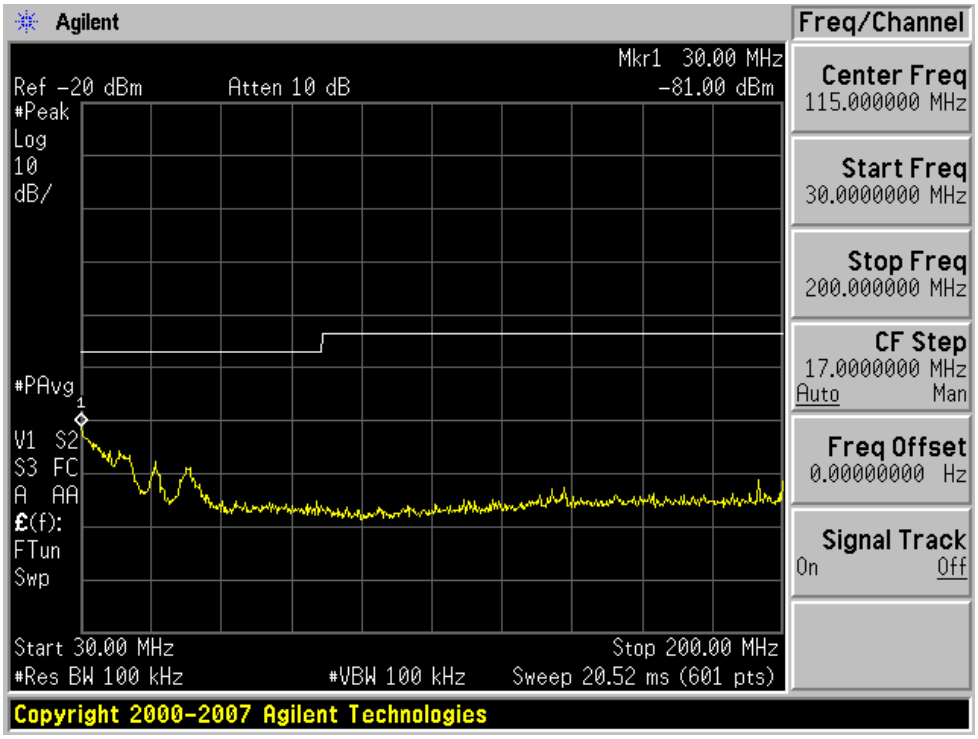

Figure 14: Abracon Car Cradle B, 30 – 200MHz, Horizontal

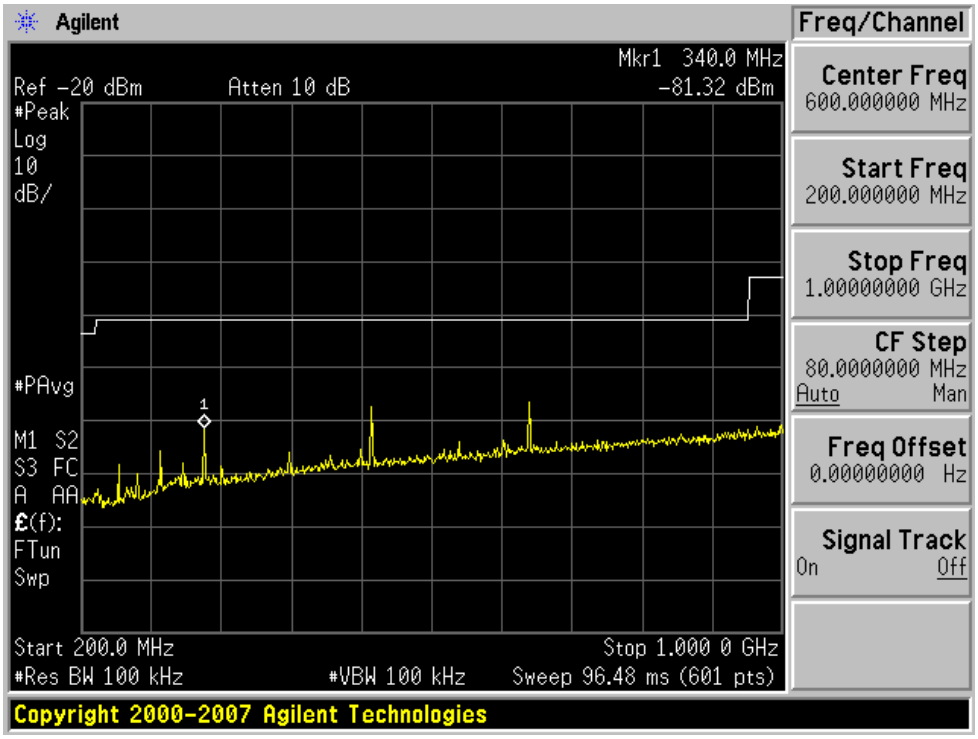

Figure 15: Abracon Car Cradle B, 200M – 1GHz, Horizontal

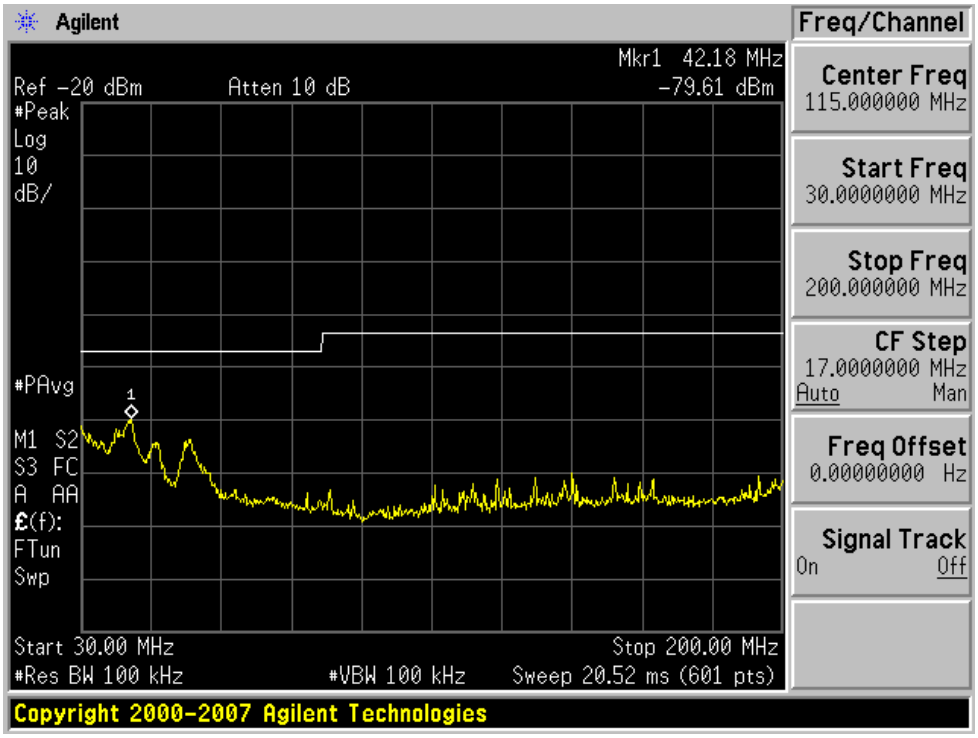

Figure 16: Abracon Car Cradle B, 30 – 200MHz, Vertical

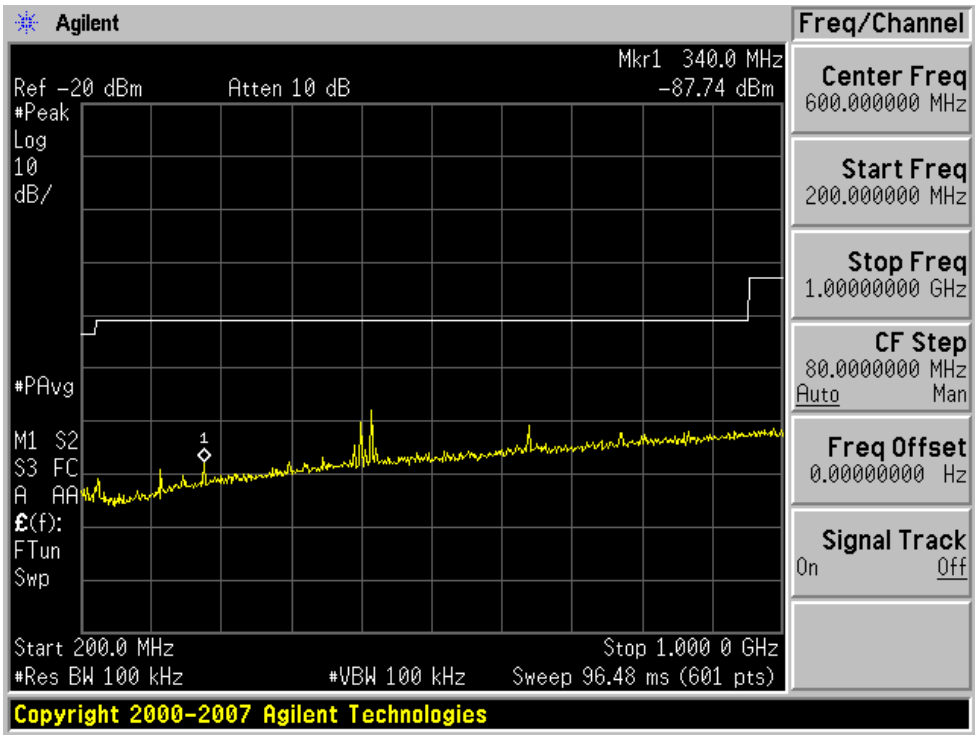

Figure 17: Abracon Car Cradle B, 200M – 1GHz, Vertical

7.2.7 Radiated Measurement Data – Test Configuration # 1 (FM Direct A) (P/N: XM-7700-0022)

§15.109, RSS-Gen (7.2.3)

Frequency [MHz]	Peak Level [dBm]	AFCL [dB]	Pol [H/V]	Height [m]	Azimuth [degrees]	Field Strength [dBυV/m]	FCC Field Strength Limit [dBuV/m]	Margin [dB]
48.42	-90.42	9.99	V	1.2	180	26.57	40.00	-13.43
55.80	-91.52	9.72	V	1.2	180	25.19	40.00	-14.81
131.65	-94.92	13.14	V	1.5	45	25.23	43.52	-18.30
194.05	-100.61	14.16	H	2.5	67	20.55	43.52	-22.97
242.70	-96.29	13.55	H	2.5	67	24.26	46.02	-21.76
340.00	-93.63	16.76	H	2.5	180	30.13	46.02	-15.90

Table 7-9. Radiated Measurements at 3-meters– FCC Part 15 – (XM-7700-0022)

Frequency [MHz]	Peak Level [dBm]	AFCL [dB]	Pol [H/V]	Height [m]	Azimuth [degrees]	Field Strength [dBuV/m]	IC 3m Limit [dBuV/m]	Margin [dB]
48.42	-90.42	9.99	V	1.2	180	26.57	40.46	-13.89
55.80	-91.52	9.72	V	1.2	180	25.19	40.46	-15.27
131.65	-94.92	13.14	V	1.5	45	25.23	40.46	-15.23
194.05	-100.61	14.16	H	2.5	67	20.55	40.46	-19.91
242.70	-96.29	13.55	H	2.5	67	24.26	47.46	-23.20
340.00	-93.63	16.76	H	2.5	180	30.13	47.46	-17.33

Table 7-10. Radiated Measurements at 3-meters– ICES-003 – (XM-7700-0022)

7.2.8 Radiated Measurement Data – Test Configuration # 1 (FM Direct B) (P/N: XMFM1)

§15.109, RSS-Gen (7.2.3)

Frequency [MHz]	Peak Level [dBm]	AFCL [dB]	Pol [H/V]	Height [m]	Azimuth [degrees]	Field Strength [dBµV/m]	FCC Field Strength Limit [dBuV/m]	Margin [dB]
40.77	-90.14	13.99	V	1.2	180	30.84	40.00	-9.16
56.63	-88.67	9.77	V	1.0	180	28.10	40.00	-11.90
90.35	-102.26	11.19	V	1.5	180	15.92	43.52	-27.60
139.65	-101.82	13.51	V	1.5	180	18.69	43.52	-24.83
242.70	-109.73	13.55	H	2.5	220	10.82	46.02	-35.20
416.00	-114.36	18.49	H	2.5	220	11.12	46.02	-34.90

Table 7-11. Radiated Measurements at 3-meters– FCC Part 15 – (XMFM1)

Frequency [MHz]	Peak Level [dBm]	AFCL [dB]	Pol [H/V]	Height [m]	Azimuth [degrees]	Field Strength [dBuV/m]	IC 3m Limit [dBuV/m]	Margin [dB]
40.77	-90.14	13.99	V	1.2	180	30.84	40.46	-9.62
56.63	-88.67	9.77	V	1.0	180	28.10	40.46	-12.36
90.35	-102.26	11.19	V	1.5	180	15.92	40.46	-24.54
139.65	-101.82	13.51	V	1.5	180	18.69	40.46	-21.77
242.70	-109.73	13.55	H	2.5	220	10.82	47.46	-36.64
416.00	-114.36	18.49	H	2.5	220	11.12	47.46	-36.34

Table 7-12. Radiated Measurements at 3-meters– ICES-003 – (XMFM1)

7.2.9 Radiated Measurement Data Plots– Test Configuration # 1 (FM Direct A)

§15.109, RSS-Gen (7.2.3)

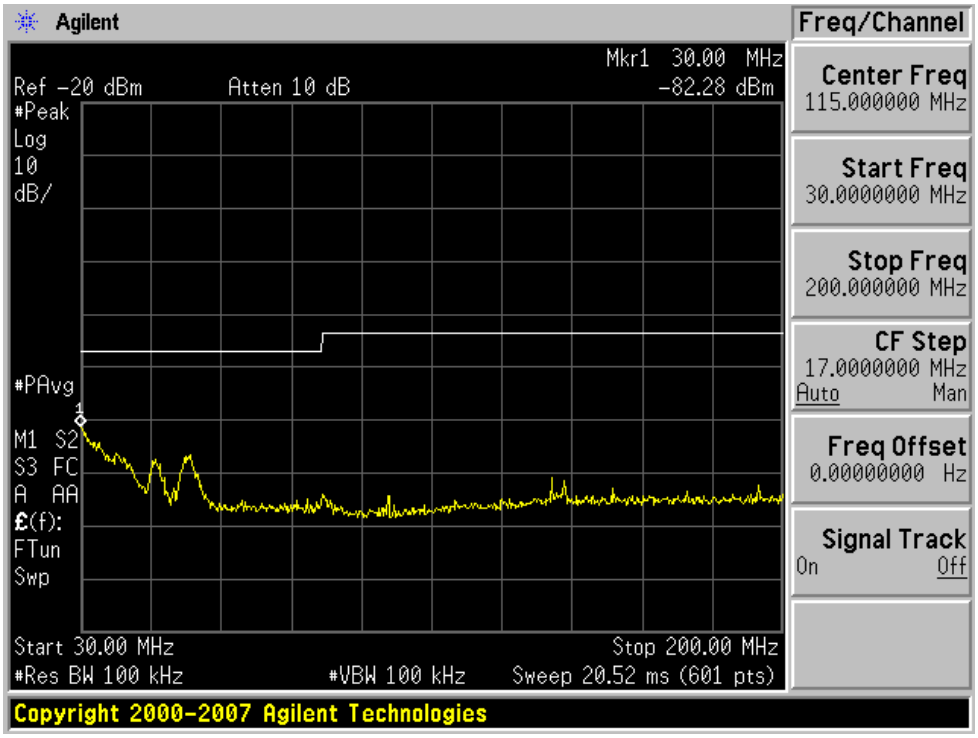

Figure 18: FM Direct A XM-7700-0022, 30 – 200MHz, Horizontal

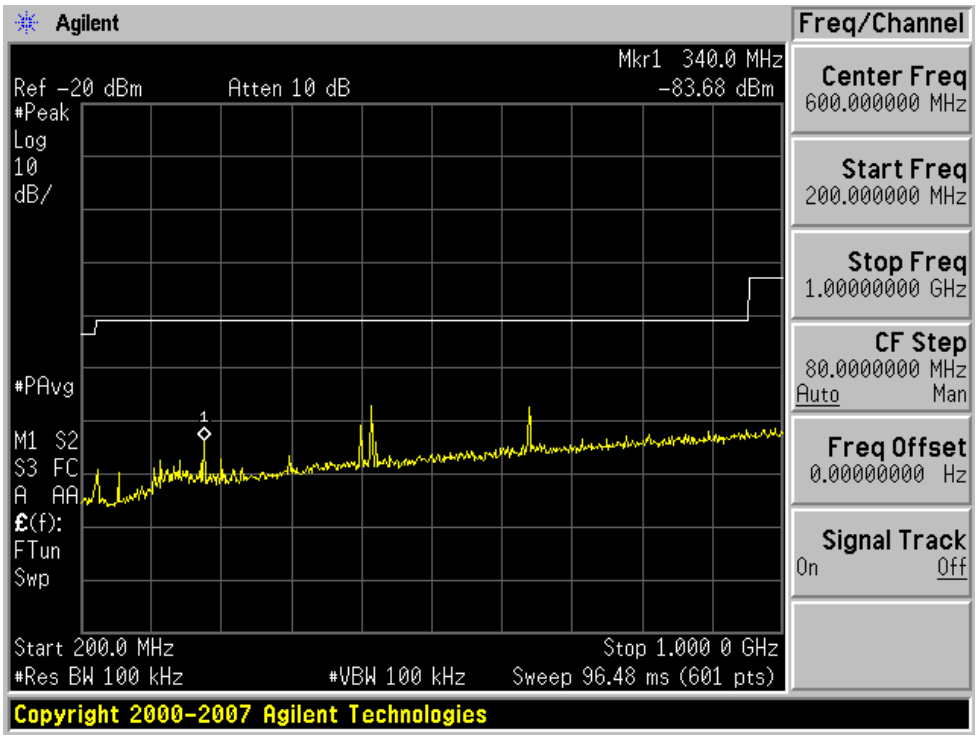

Figure 19: FM Direct A XM-7700-0022, 200M – 1GHz, Horizontal

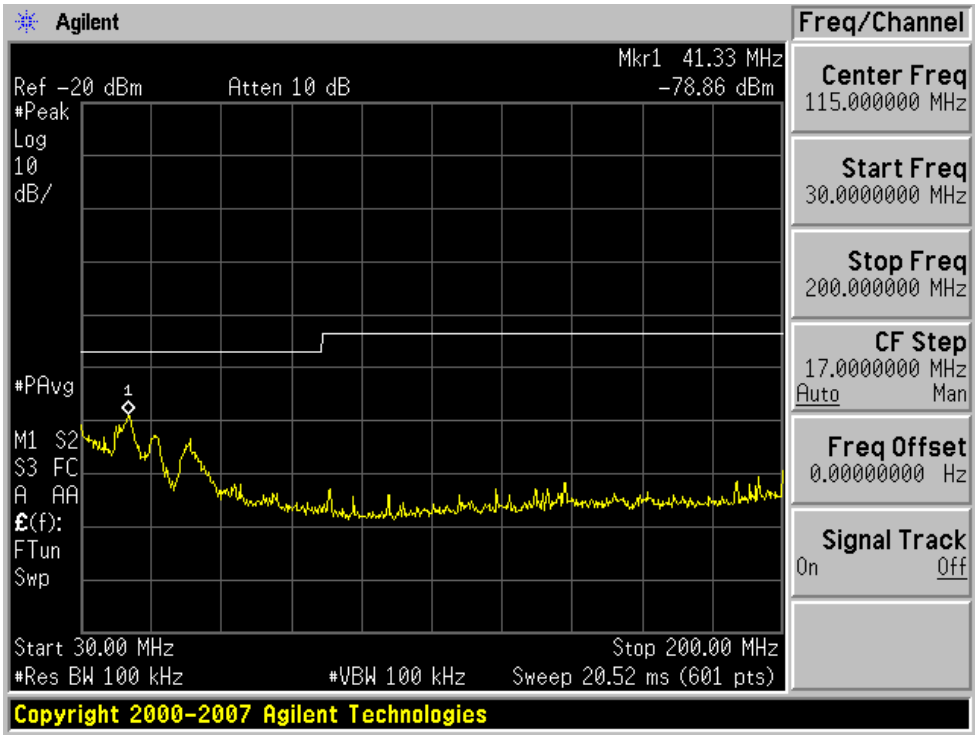

Figure 20: FM Direct A XM-7700-0022, 30 – 200MHz, Vertical

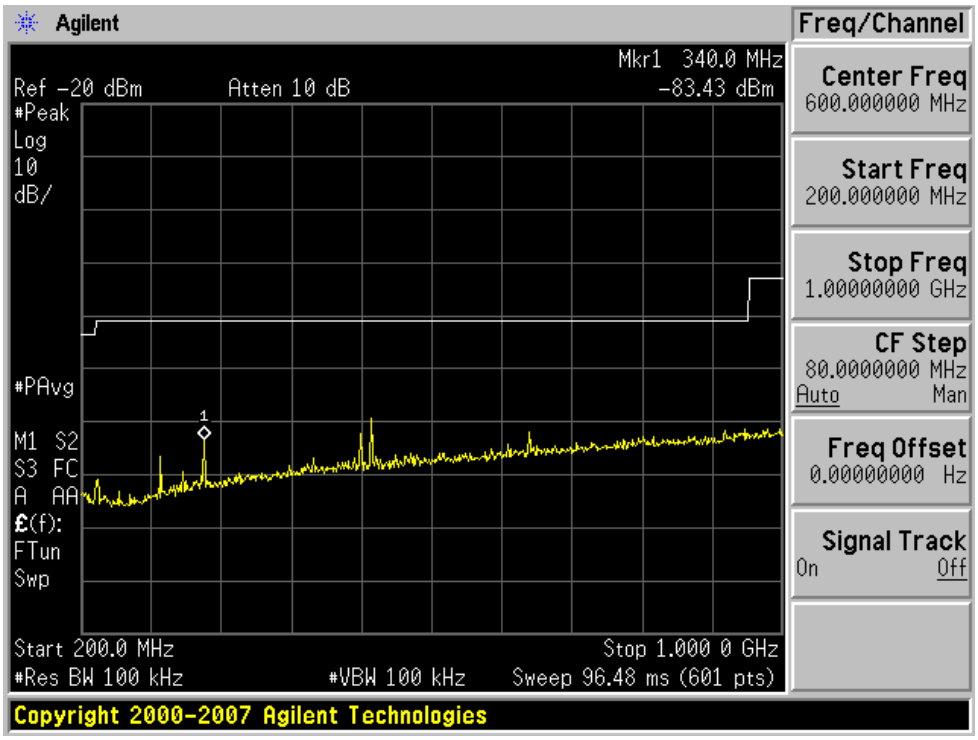

Figure 21: FM Direct A XM-7700-0022, 200M – 1GHz, Vertical

7.2.10 Radiated Measurement Data Plots– Test Configuration # 1 (FM Direct B)

§15.109, RSS-Gen (7.2.3)

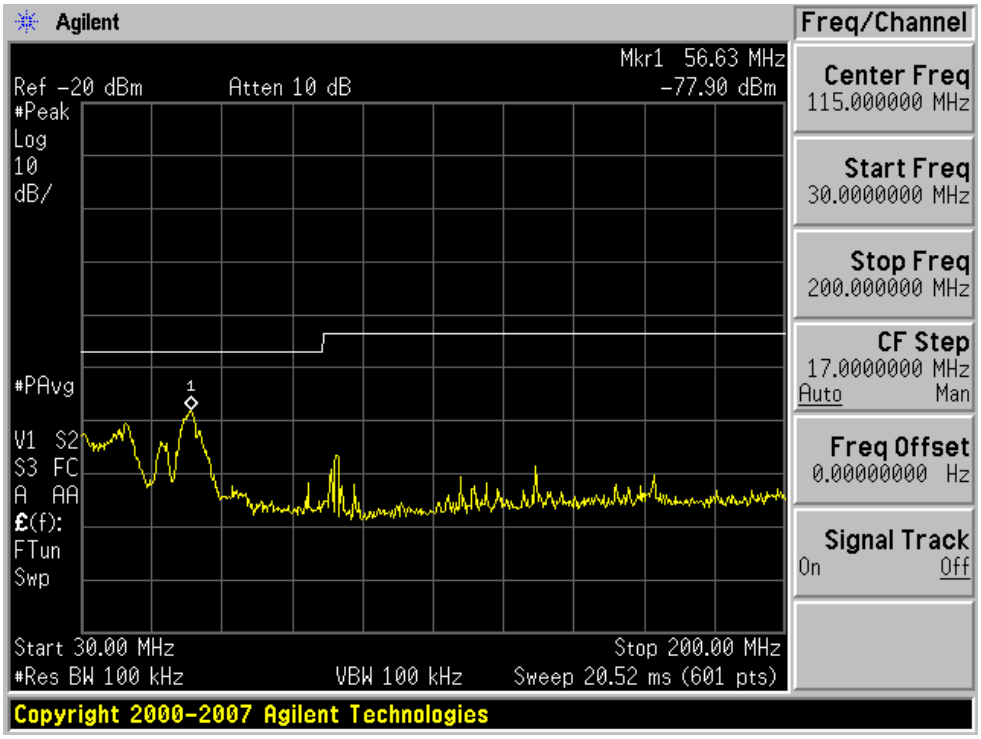

Figure 22: FM Direct B XMFM1, 30 – 200MHz, Horizontal

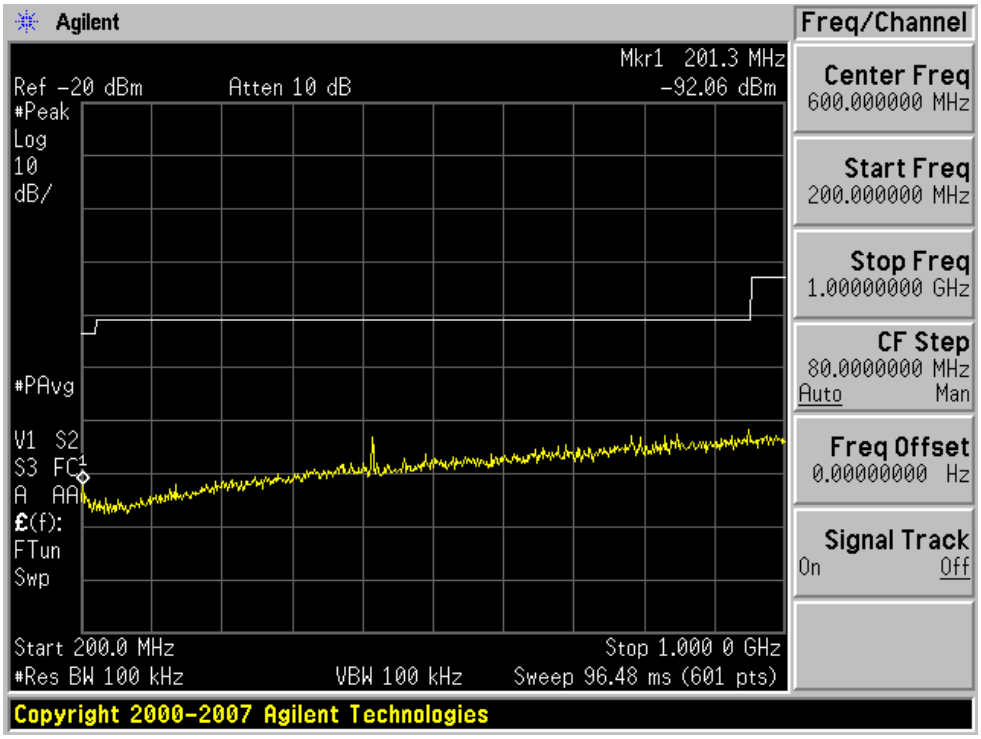

Figure 23: FM Direct B XMFM1, 200M – 1GHz, Horizontal

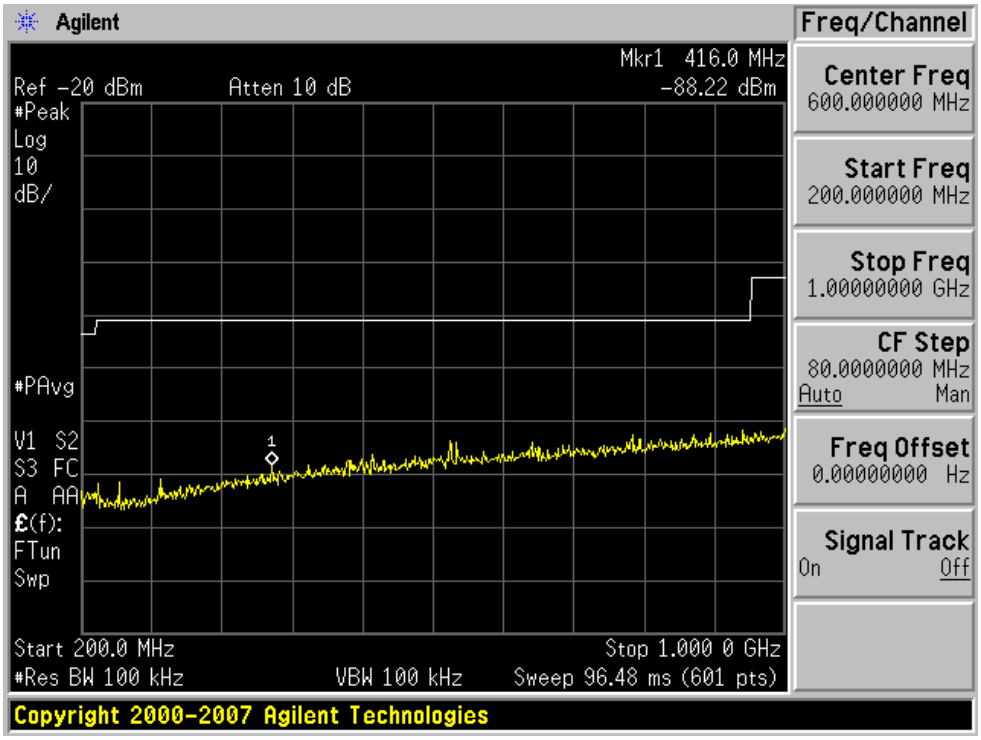

Figure 24: FM Direct B XMFM1, 30 – 200MHz, Vertical

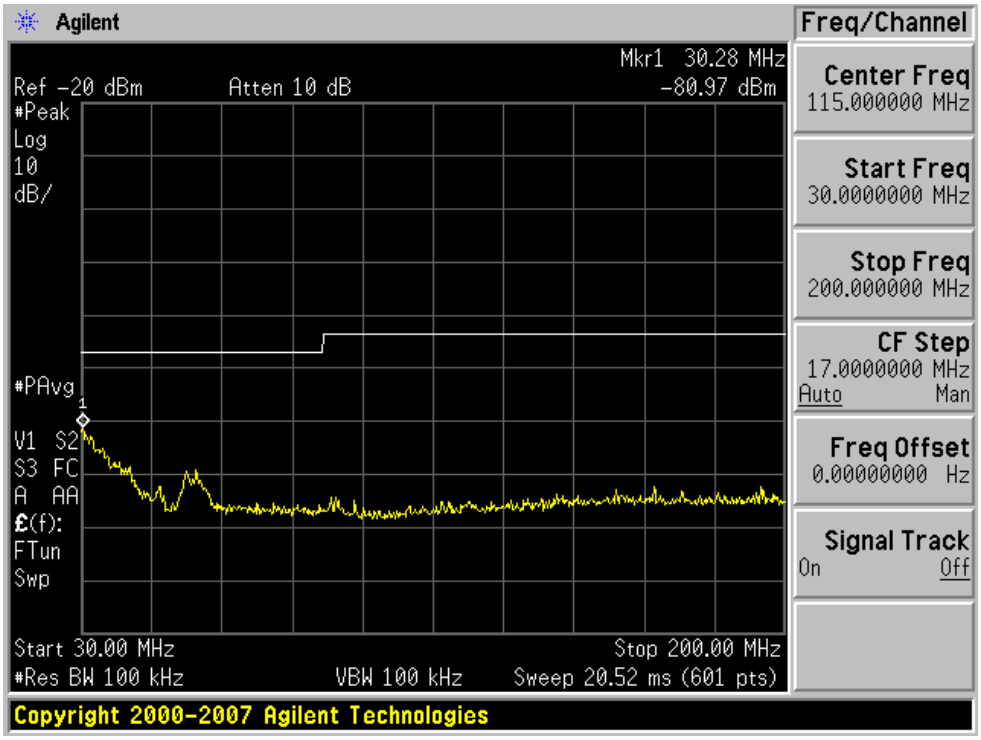

Figure 25: FM Direct B XMFM1, 200M – 1GHz, Vertical

7.3 Emission Measurements for test configuration # 2

7.3.1 Test Setup Description

The XMp3 Vehicle Cradle Model: XMP3CAR1 was connected to the vehicle cradle powered by a 12V battery through a cigarette lighter vehicle adapter. The vehicle cradle was connected to an XM audio cassette adapter and an XM antenna. The EUT was configured to receive live XM broadcast signal and was configured for a maximum audio output level. A distance of 10 cm was maintained between the edges of all items on the setup table.

The test setup was tested for radiated emissions only. Photographs of equipment and cable placement can be found in the Test Setup Photographs.

7.3.2 Test Support Equipment – Test Configuration # 2

1	Fox Electronics Car Dock	P/N: XM P/N:	636A-4-2 XM-2320-0116	S/N:	081800013
2	5.0V DC vehicle power adapter	1.05m	Unshielded cable with ferrite bead on one end	S/N:	N/A
3	XM cassette adapter	1.12m	Unshielded audio cable	S/N:	N/A
4	XM Antenna	7.01m	Shielded coax antenna cable	S/N:	N/A
5	EverStart Lawn/Garden 12V AC battery	Model:	N/A	S/N:	N/A

Table 7-13. Test Support Equipment for Test Configuration # 2

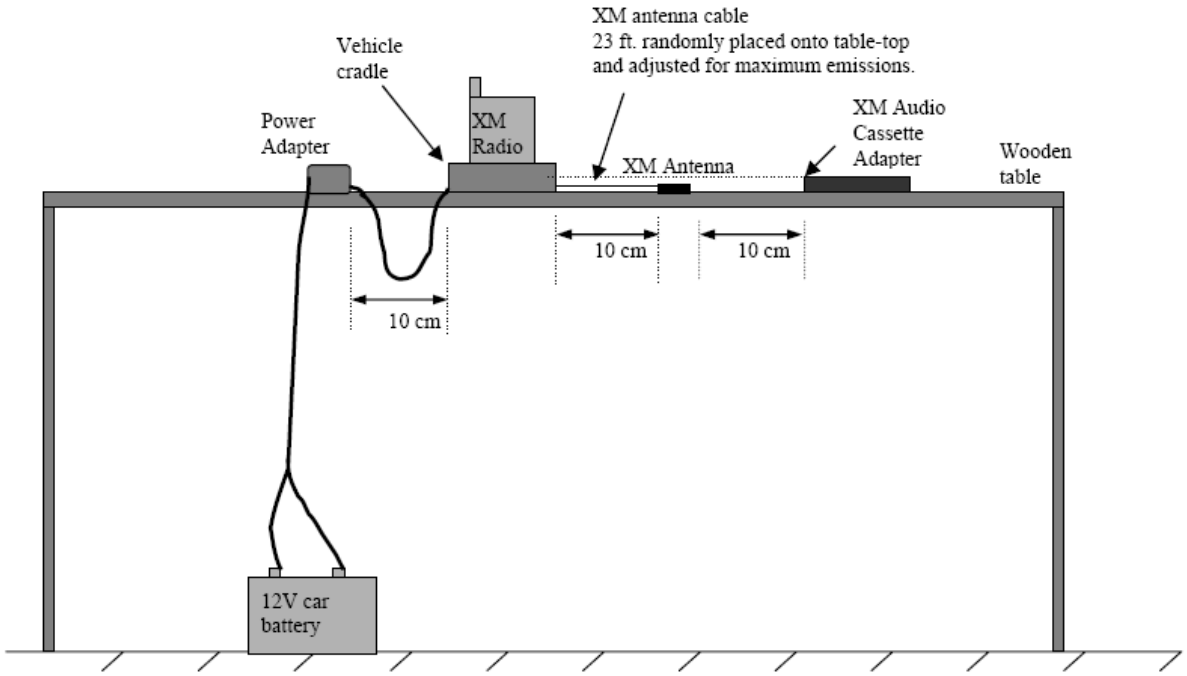

Figure 26: Test Setup Configuration # 2

7.3.3 Radiated Measurement Data – Test Configuration # 2

§15.109, RSS-Gen (7.2.3)

Frequency [MHz]	Peak Level [dBm]	AFCL [dB]	Pol [H/V]	Height [m]	Azimuth [degrees]	Field Strength [dBμV/m]	FCC Field Strength Limit [dBuV/m]	Margin [dB]
30.28	-96.26	22.15	H	1.8	180	32.89	40.00	-7.11
41.05	-85.13	13.81	V	1.5	180	35.68	40.00	-4.32
48.98	-87.66	9.75	V	1.5	180	29.09	40.00	-10.91
62.02	-95.79	10.09	H	2.0	68	21.31	40.00	-18.69
67.68	-95.53	10.40	H	2.0	122	21.87	40.00	-18.13
84.68	-107.44	11.02	H	2.0	122	10.57	40.00	-29.43

Table 7-14. Radiated Measurements at 3-meters – FCC Part 15B

Frequency [MHz]	Peak Level [dBm]	AFCL [dB]	Pol [H/V]	Height [m]	Azimuth [degrees]	Field Strength [dBuV/m]	IC 3m Limit [dBuV/m]	Margin [dB]
30.28	-96.26	22.15	H	1.8	180	32.89	40.46	-7.57
41.05	-85.13	13.81	V	1.5	180	35.68	40.46	-4.78
48.98	-87.66	9.75	V	1.5	180	29.09	40.46	-11.37
62.02	-95.79	10.09	H	2.0	68	21.31	40.46	-19.15
67.68	-95.53	10.40	H	2.0	122	21.87	40.46	-18.59
84.68	-107.44	11.02	H	2.0	122	10.57	40.46	-29.89

Table 7-15. Radiated Measurements at 3-meters – ICES-003

7.4 Emission Measurements for test configuration # 3

7.4.1 Test Setup Description

The XMp3 Vehicle Cradle Model: XMP3CAR1 receiver was connected to the car cradle powered by a 12V battery through a cigarette lighter adapter. The XM antenna was also connected to the car cradle. The EUT was configured to receive live XM broadcast signal and was configured for a maximum audio output level. A distance of 10 cm was maintained between the edges of all items on the setup table.

The test setup was tested for radiated emissions only. Photographs of equipment and cable placement can be found in the Test Setup Photographs.

7.4.2 Test Support Equipment – Test Configuration # 3

1	Fox Electronics Car Dock	P/N: XM P/N:	636A-4-2 XM-2320-0116	S/N:	081800013
2	5.0V DC vehicle power adapter	1.05m	Unshielded cable with ferrite bead on one end	S/N:	N/A
3	XM Antenna	7.01m	Shielded coax antenna cable	S/N:	N/A
4	EverStart Lawn/Garden 12V AC battery	Model:	N/A	S/N:	N/A

Table 7-16. Test Support Equipment for Test Configuration # 3

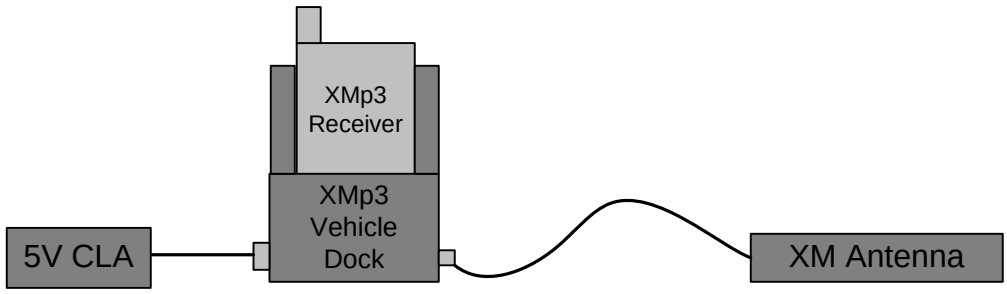

Figure 27: Test Setup Configuration # 3

7.4.3 Radiated Measurement Data – Test Configuration # 3

§15.109, RSS-Gen (7.2.3)

Frequency [MHz]	Peak Level [dBm]	AFCL [dB]	Pol [H/V]	Height [m]	Azimuth [degrees]	Field Strength [dBµV/m]	FCC Field Strength Limit [dBuV/m]	Margin [dB]
41.90	-96.10	13.30	H	1.8	180	24.19	40.00	-15.81
48.70	-85.05	9.87	V	1.0	45	31.82	40.00	-8.18
56.07	-87.67	9.73	V	1.0	45	29.06	40.00	-10.94
137.70	-96.37	13.42	H	1.5	150	24.05	43.52	-19.47
168.27	-96.12	14.05	H	1.8	150	24.93	43.52	-18.60
340.00	-107.82	16.76	H	1.8	180	15.94	46.02	-30.09

Table 7-17. Radiated Measurements at 3-meters – FCC Part 15B

Frequency [MHz]	Peak Level [dBm]	AFCL [dB]	Pol [H/V]	Height [m]	Azimuth [degrees]	Field Strength [dBuV/m]	IC 3m Limit [dBuV/m]	Margin [dB]
41.90	-96.10	13.30	H	1.8	180	24.19	40.46	-16.27
48.70	-85.05	9.87	V	1.0	45	31.82	40.46	-8.64
56.07	-87.67	9.73	V	1.0	45	29.06	40.46	-11.40
137.70	-96.37	13.42	H	1.5	150	24.05	40.46	-16.41
168.27	-96.12	14.05	H	1.8	150	24.93	47.46	-22.53
340.00	-107.82	16.76	H	1.8	180	15.94	47.46	-31.52

Table 7-18. Radiated Measurements at 3-meters – ICES-003

8.0 CONCLUSION

The data collected relate only to the item(s) tested and show that the **XMp3 Vehicle Cradle Model: XMP3CAR1** has been verified to comply with the requirements specified in Part 15 (§15.107 and §15.109) and Part 2 of the FCC Rules as well as RSS-Gen/ICES-003 for Industry Canada.