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Technical Report No. 07-027
For FCC ID: RS2XMCK20

"EMI Evaluation of the XM Satellite Radio, Inc. Xpress-R to FCC Class B Conducted and Radiated Emission Requirements And Intentional Radiator Requirements"

Date Performed: 3/05/2007 – 3/30/2007

Customer: XM Satellite Radio, Inc.
3161 S.W. 10th street
Deerfield Beach, FL 33442

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Date of Test Report: 4 April 2007

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1. INTRODUCTION

The XM Satellite Radio, **Xpress-R** receiver, software version V16(99), with Wintex display, was evaluated for compliance to the FCC Class B requirements and the results apply only to the specific items of equipment, configurations and procedures supplied to the Florida Atlantic University EMI Research Lab by XM Satellite Radio, Inc., as reported in this document. Note that throughout the measurements the audio level of the unit was set to the maximum and that it was verified that the unit could not be programmed outside of the tuning range of 88 MHz to 108 MHz.

2. OBJECTIVE

Test Specifications

This evaluation was performed to verify conformance of the XM Satellite Radio, Inc. **Xpress-R** receiver to U.S. Federal Communications Commission (FCC) Code of Federal Regulations (CFR), Title 47 - Telecommunication, Part 15 - Radio Frequency Devices,

- Subpart B - Unintentional Radiators, Section 15.107(a) Conducted limits, and Section 15.109(a) Radiated Class B Emission limits.
- Subpart C – Paragraph 15.239 (a) (b) (c) – Operation in the band 88 MHz to 108 MHz.

Mode of Operation

- During FCC Part 15 Subpart C, Paragraph 15.239 (b)(c) radiated emissions tests, the EUT was configured to transmit a continuous FM signal modulated at 88.1 MHz, 96.9 MHz and 107.9 MHz using the XM Satellite Radio's FM Coupler (SureConnect) attached to a standard FM aerial antenna attached to a large ground plane. The tests were conducted with two different model car cradles and two versions of the FM Coupler (SureConnect).
- During FCC Part 15 Subpart C, Paragraph 15.239(b)(c), the EUT was also configured to transmit a continuous FM signal modulated at 88.7 MHz, 96.9 MHz and 107.1 MHz in three representative vehicles, using the XM Satellite Radio's FM Coupler attached to the vehicle's in-glass FM antennas, in accordance with the intentional radiator limits described in 15.239(b). The tests were conducted with two different model car cradles and two versions of the FM Coupler (SureConnect).
- During FCC Part 15 Subpart B, Paragraph 15.107(a) conducted emissions tests, the EUT was configured to receive an XM Satellite Radio signal, with the EUT in a home cradle with the XM Home AC adapter. The tests were conducted with two different model home cradles and two versions of the Ac adapter.
- During FCC Part 15 Subpart B, Paragraph 15.109(a), the EUT was configured to receive an XM Satellite Radio signal, with the EUT in four different modes:
    - In a home cradle, using only an XM Satellite Radio home antenna
    - In a car cradle, using an FM Direct Adapter and car antenna.
    - In a car cradle, using an XM Cassette Adapter and a car antenna
    - In a car cradle, using an XM car antenna only

  The four different modes were respectively evaluated with the Universal and the Xpress cradles.

3. CONCLUSION

The XM Satellite Radio, Inc. **Xpress-R** receiver (FCC ID: RS2XMCK20) met the FCC Class B conducted and radiated emission requirements, as well as the intentional radiation limits, as described in the following pages.

4. TEST PROCEDURES AND RESULTS

4.1 GENERAL TEST PROCEDURES

The measurement techniques identified in the measurement procedure of ANSI C63.4-2003 *"American National Standard of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz"* were followed as close as practical during this evaluation. Complete details and specific procedures used are discussed in the respective test result sections.

This report provides results for the following tested items.

ITEM	Description	Base Kit w/ Universal Car Cradle	Xpress Home Kit	Xpress Car Kit
1	Junior (XpressR) Receiver	XMCK20 / Radio ID MRETE04B	N/A	N/A
SW	Junior Software Rev Number	Junior v16(99) Replay v28	Junior v16 (99) Replay v28	Junior v16 (99) Replay v28
2	Docking Cradle	Universal: xmcku-1	Xpress: AVOX 136-4060 Universal: xmhku-1	AVOX 136-4281
3	XM Satellite Antenna	Yokowo YOZ-50825XM01	Mitsumi R16-7315	Yokowo YOZ-50825XM01
4	FM Coupler (SureConnect)	United Cartel SureConnect v1.5 UCMXMFMB-1002V1.5	N/A	United Cartel SureConnect v1.0 UCMXMFMB-1001A
5	FM Direct Adapter	XMFM1	N/A	XMFM1
6	5V adapter	ITI CLA5V2A-XMLN-00	ITI SMPS5V2A-XMRPS Phihong PSM08A-052(S)-R	ITI CLA5V2A-XMS-04 ITI CLA5V2A-XMLN-00
7	Cassette Adapter	ITI SCD20MSSB-XMS	N/A	ITI SCD20MSSB-XMS

Table 1: EUT Items Specifications

4.2 CONDUCTED EMISSIONS – Section 15.107(a)

4.2.1 Home Cradle Setup

The XM Satellite Radio, Inc **Xpress-R** receiver was evaluated respectively for an I.T.E. (Model No.: SMPS5V2A-XM) wall adapter power supply and a PHIHONG (Model No.: PSM08A-052) wall adapter power supply. The unit and the 120VAC/ DC 5V switching power supplies were installed in the FAU EMI Research facilities conducted emissions shielded enclosure on a wooden test table 80 centimeters above the ground plane floor and 40 centimeters away from the metallic rear wall. The 120V AC/ DC 5V power supply was then plugged into an EMCO Model No.3825/2R Serial No. 1095, 50 Ω, 50 μH Line Impedance Stabilization Network (LISN). Photographs 1 and 2 in the document 07-027ph depict the conducted emissions test setup.

Conducted power line emissions were measured on both the phase and neutral lines with reference to earth ground, over the specified 150 kHz to 30 MHz range on a Hewlett Packard HP 8566B Spectrum Analyzer operated in the peak detection mode, in conjunction with HP 85685A Preselector, with a bandwidth of 9 kHz obtained through the HP 85650A Quasi Peak Adapter.

This document reports the test results for the three configurations that the **Xpress-R** receiver was evaluated:

- In the Universal Home Cradle , using ITI wall adapter
- In the Universal Home Cradle, using the PHIHONG wall adapter
- In the Xpress Home Cradle, using the PHIHONG wall adapter

The EUT was tested for the peak-detected emissions on phase and neutral lines while the **Xpress-R** unit was receiving a live XM broadcast. The audio level of EUT was set to the maximum and external speakers (Platinum Sound, PS-610) were connected to the audio output port (line out) of the device. The average values for the peak emissions exceeding the average limit were then measured by zooming in on the frequency of interest and reducing the VBW to 1 Hz.

4.2.1.1 Universal Home Cradle Using ITI Wall Adapter Data

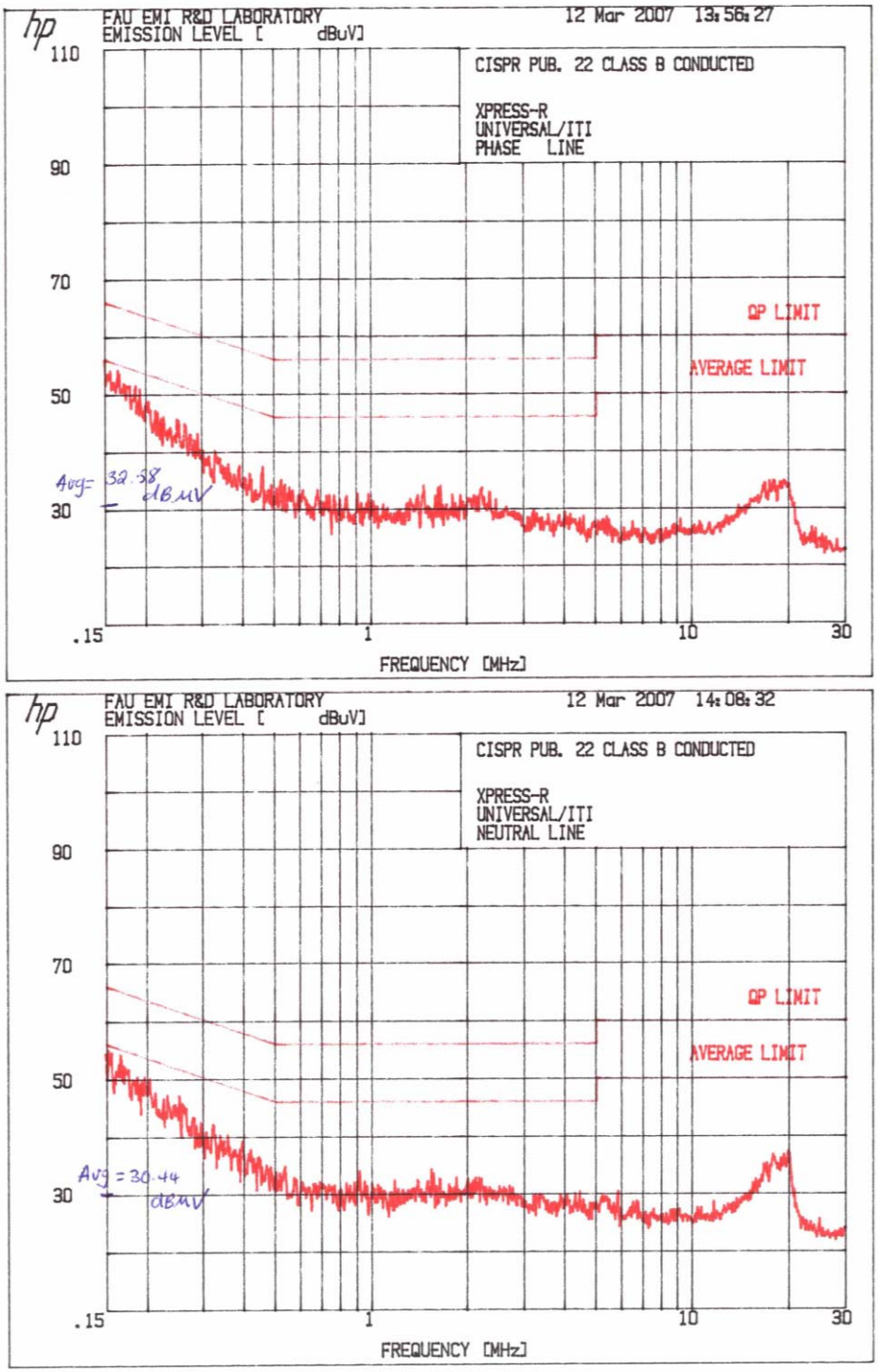

Figure 1: Phase and Neutral Conducted Emissions 150 kHz-30 MHz

4.2.1.2 Universal Home Cradle Using PHIHONG Wall Adapter Data

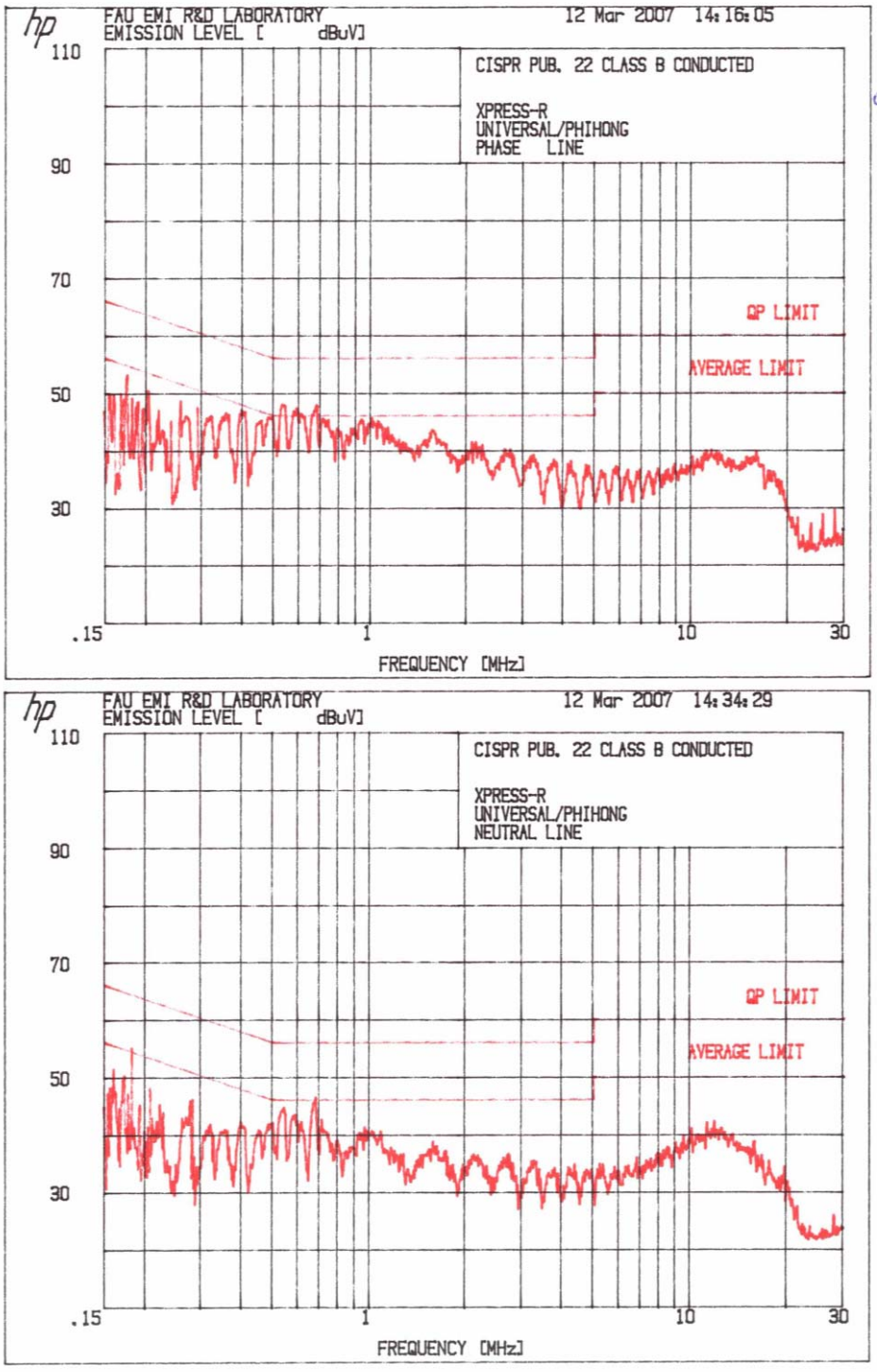

Figure 2: Phase and Neutral Conducted Emissions 150 kHz-30 MHz

4.2.1.3 Xpress Home Cradle Using PHIHONG Wall Adapter Data

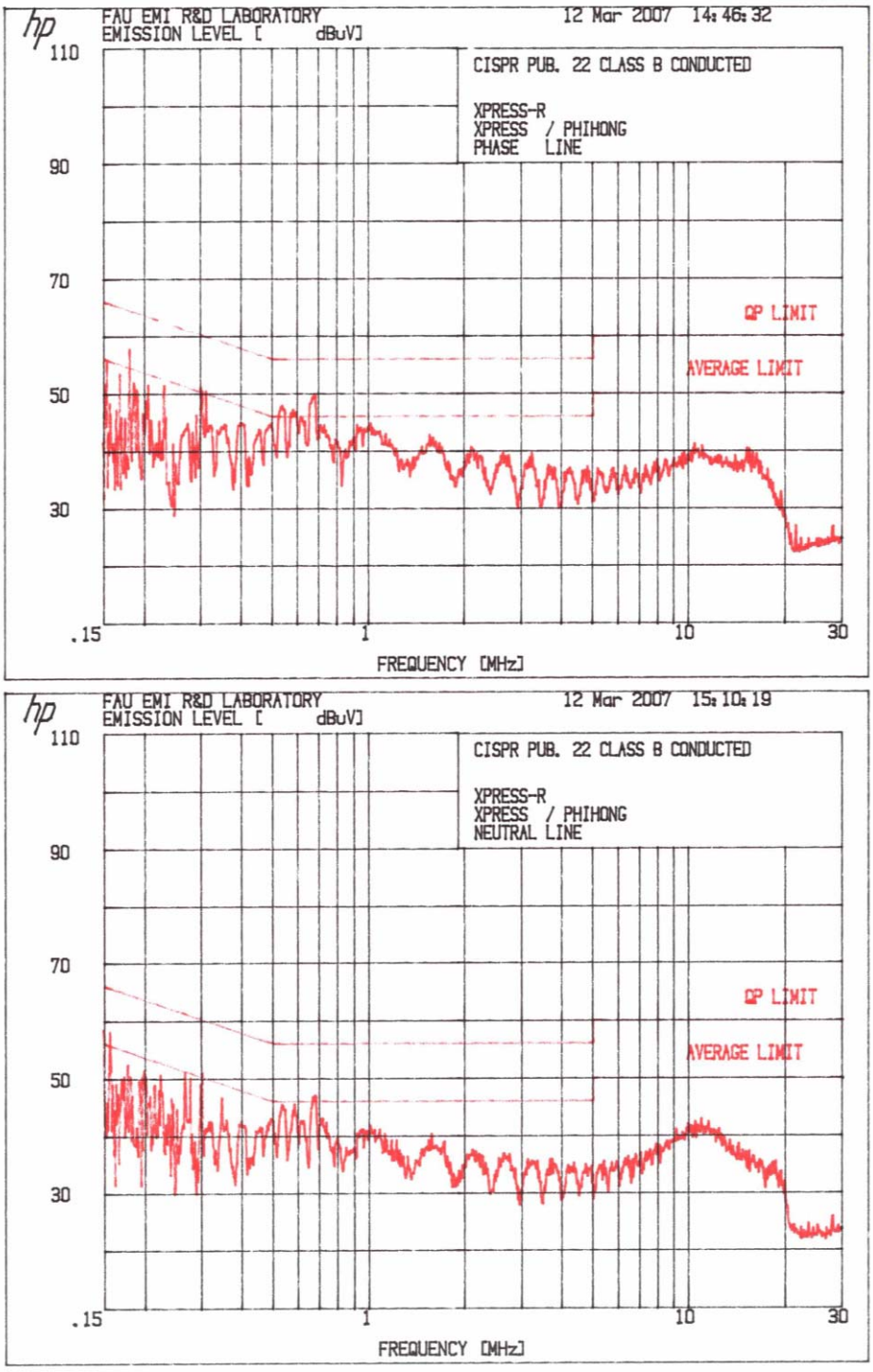

Figure 3: Phase and Neutral Conducted Emissions 150 kHz-30 MHz

4.2.2 Conducted Emissions Data Table

From Figures 1 to 3, emissions that exceeded or were within 5 dB of the limit are reported in Table 1. Where noted, data from the Average Value column is used. Table 1 shows that the emissions do not exceed the limit on both phase and neutral lines. Hence, the system is in compliance.

Figure No.	Line Tested	Frequency (kHz)	Peak Value (dBµV)	Average Value (dBµV)	QP Value (dBµV)	Avg. Limit (dBµV)	Margin to Avg. Limit (dB)
1	Phase	152	55.36	32.58		56	23.42*
1	Neutral	152	55.2	30.44		56	25.56*
2	Phase	180	53.2			55.5	2.3
2	Neutral	180	55.4	21.9		55.5	33.6*
2	Phase	210	50.5			54.9	4.4
2	Neutral	210	48.2			54.9	6.7
2	Phase	400	46.3			50.1	3.8
2	Neutral	400	42			50.1	8.1
2	Phase	540.1	48	33.08		46	12.92*
2	Neutral	540.1	44.8			46	1.2
2	Phase	584	47.1	33.67		46	12.33*
2	Neutral	584	43.7			46	2.3
2	Phase	680	48	33.92		46	12.08*
2	Neutral	680	46.3	22.7		46	23.3*
2	Phase	1010	46	25.8		46	20.2*
2	Neutral	1010	41.1			46	4.9
3	Phase	152	56	25.6		56	30.4*
3	Neutral	152	58.2	29.9		56	26.1*
3	Phase	184	58.3	25.9		55.4	29.5*
3	Neutral	184	52.5	26.27		55.4	29.13*
3	Phase	219	52	24.75		54.7	29.95*
3	Neutral	219	51.2	25.71		54.7	28.99*
3	Phase	268	44.2			53.7	9.5
3	Neutral	268	51	27.34		53.7	26.36*
3	Phase	316	50.8	34.57		52.6	18.03*
3	Neutral	316	51.2	27.07		52.6	25.53*
3	Phase	359.1	46.1	32.52		51.4	18.88*
3	Neutral	359.1	46.3			51.4	5.1
3	Phase	402	45.7	32.46		50.1	17.64*
3	Neutral	402	43			50.1	7.1
3	Phase	456	44.62	28.5		48	19.5*
3	Neutral	456	41.8			48	6.2
3	Phase	501	45.87	30.18		46	15.82*
3	Neutral	501	43.9			46	2.1
3	Phase	535	47.8	33.01		46	12.99*
3	Neutral	535	45.7	26.87		46	19.13*
3	Phase	582	47.1	32.51		46	13.49*
3	Neutral	582	45.6	26.89		46	19.11*
3	Phase	616	46.1	30.74		46	15.26*
3	Neutral	616	43.2			46	2.8
3	Phase	675	50	35.24		46	10.76*
3	Neutral	675	47.1	28.18		46	17.82*

Table 2: Conducted Emissions Peak Measurement

4.3 RADIATED EMISSIONS – Section 15.109(a)

4.3.1 General Test Setup

The XM Satellite Radio, Inc **Xpress-R** receiver was set up on a wooden table 80 centimeters above the ground plane turntable of the FCC listed Semi-Anechoic test site.

An EMCO 3104 Broadband Biconical antenna was installed on an EMCO pneumatically controlled Antenna Mast at a distance of 3 meters from the system. The 30 to 200 MHz frequency range was automatically scanned on the HP 8566B Spectrum Analyzer operated in the peak detector mode with a bandwidth of 120 kHz obtained through the HP 85650A Quasi Peak Adapter. It should be noted that the RES BW and VBW of the spectrum analyzer must be set to 1 MHz for the Quasi Peak Adapter to provide 120 kHz bandwidth correctly. Hence, in the figures RES BW and VBW are still indicated as 1 MHz. The turntable was incrementally rotated through 360 degrees and at the same time the receiving antenna was scanned in height from 1 to 4 meters in both the horizontal and vertical polarizations. An EMCO 3146 Log Periodic antenna was then installed and the above procedure was repeated for the 200 to 1000 MHz ranges.

The FCC Class B limit lines have been corrected for the appropriate antenna factors, cable loss, and amplifier gain based on the following equation:

E (dBμV/m) = SA reading (dBμV) + Antenna Factor (dB/m) + Cable Loss (dB) - Amp Gain (dB)

The **Xpress-R** unit was tested in two configurations under Section 15.109(a)

- Home Cradle with speakers attached
- Car Cradle using FM Direct Adapter

All unused ports of the EUT were terminated as applicable during the measurements and the audio output levels were set to the maximum. Furthermore, note that for the home cradle configuration, data is reported for different combinations of cradles and home AC power adapters.

4.3.2 Home Cradle Test Setup

In the home cradle setup, the EUT was placed in a home cradle, with an XM home antenna and a 5V AC power adapter. External speakers (Platinum Sound, PS-610) were connected to the audio output connector on the home cradle with the unit receiving a live XM broadcast signal. Diagram 1 below, and Photograph 3 in the document 07-027ph depict the radiated emissions home cradle test setup.

EUT was evaluated with different types of home cradles and AC power adapters. The home cradle test was performed using the following combinations:

- Xpress-R in a Universal Home Cradle, using a PHIHONG (Model No.: PSM08A-052) wall adapter
- Xpress-R in a Universal Home Cradle, using an ITI (Model No.: SMPS5V2A-XM) wall adapter
- Xpress-R in an Xpress Home Cradle, using an ITI (Model No.: SMPS5V2A-XM) wall adapter

Note: Diagram 1 below and Photograph 3 in the document 07-027ph depict the test setup for all 3 combinations listed above.

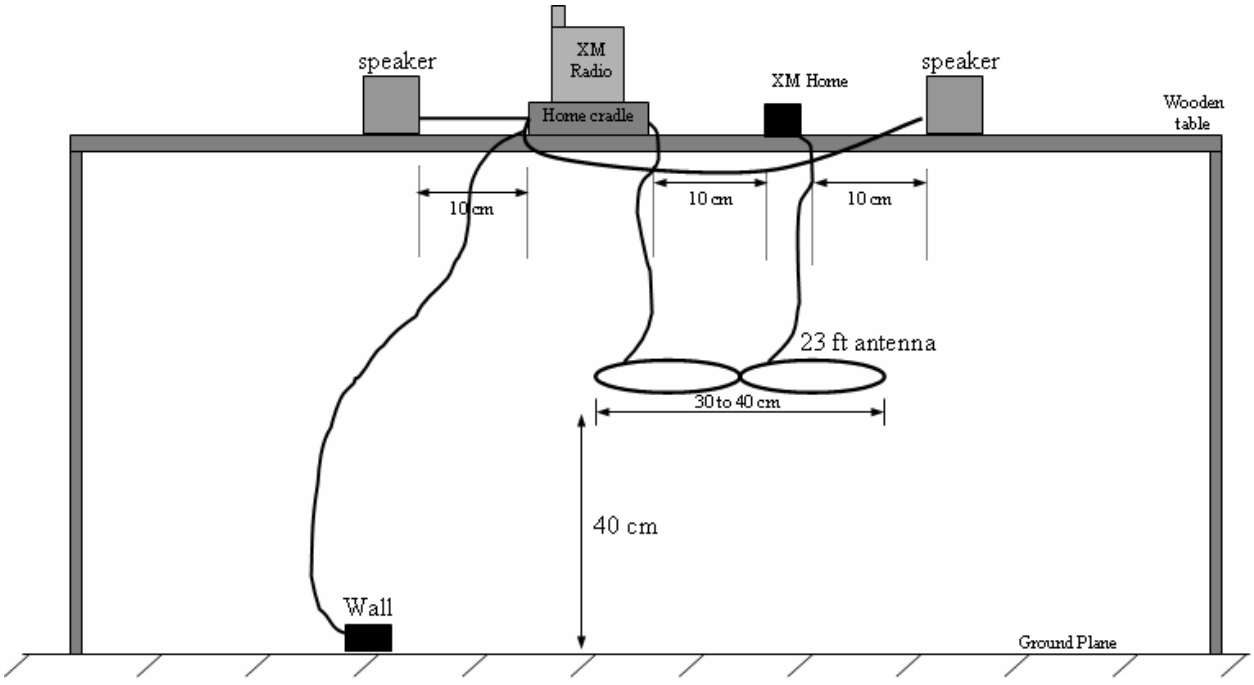

Diagram 1: Home Cradle Radiated Emissions Setup

Figures 4 to 15 show the worst case radiated emissions for the home cradle configurations independent of azimuth or antenna height.

4.3.2.2 Universal Home Cradle Using PHIHONG Wall Adapter Data

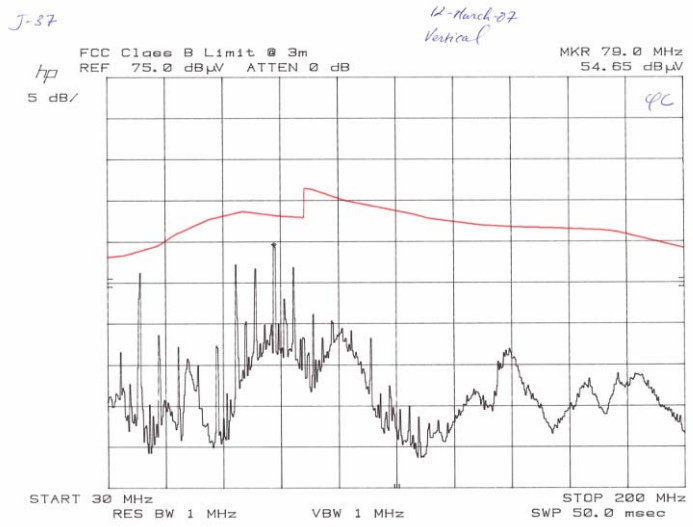

Figure 4: Radiated Emission 30 – 200 MHz Vertical Polarization

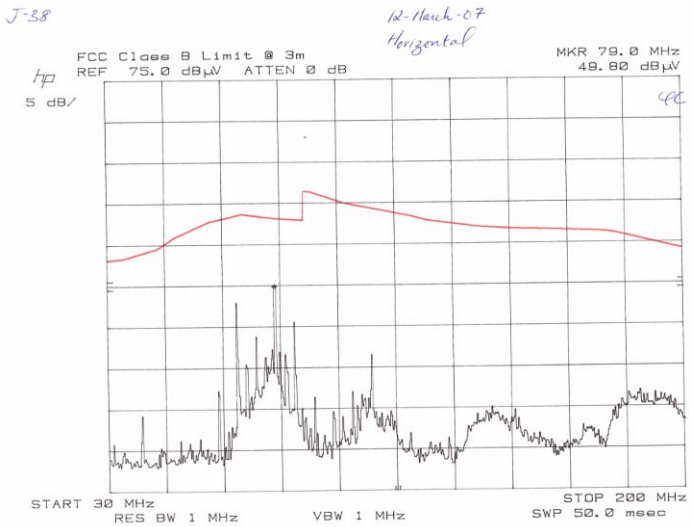

Figure 5: Radiated Emission 30 – 200 MHz Horizontal Polarization

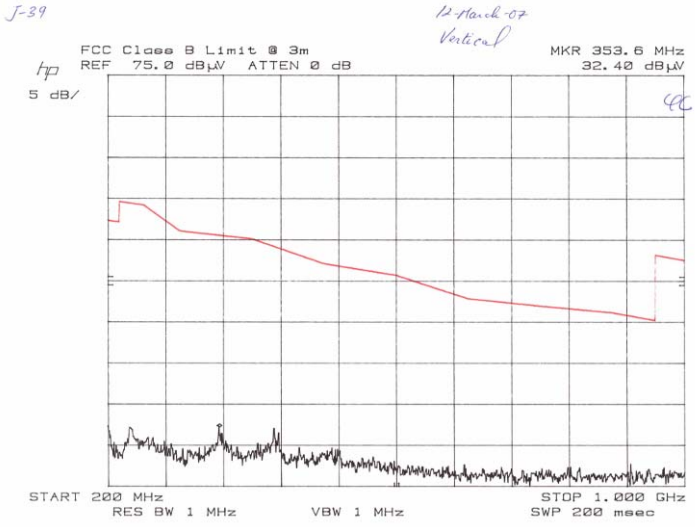

Figure 6: Radiated Emission 200 MHz – 1 GHz Vertical Polarization

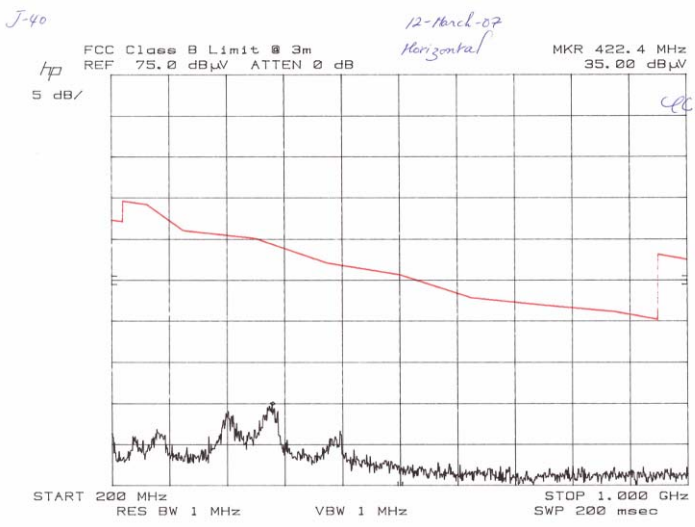

Figure 7: Radiated Emission 200 MHz– 1 GHz Vertical Polarization

4.3.2.2 Universal Home Cradle Using ITI Wall Adapter Data

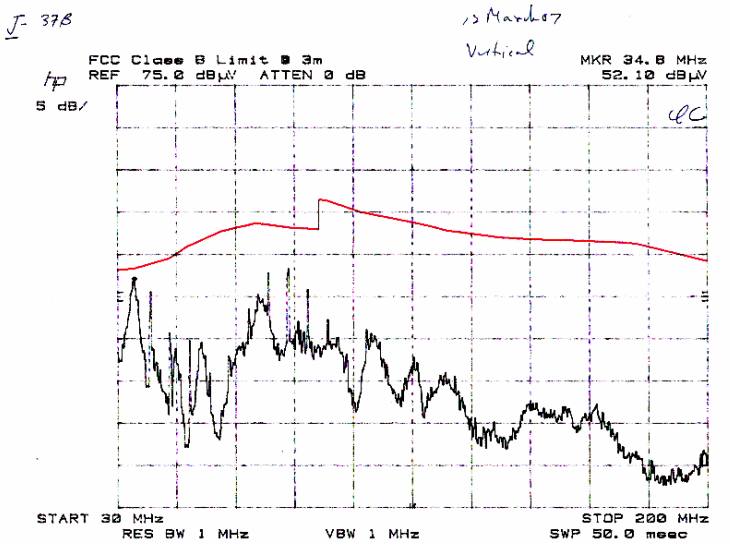

Figure 8: Radiated Emission 30 – 200 MHz Vertical Polarization

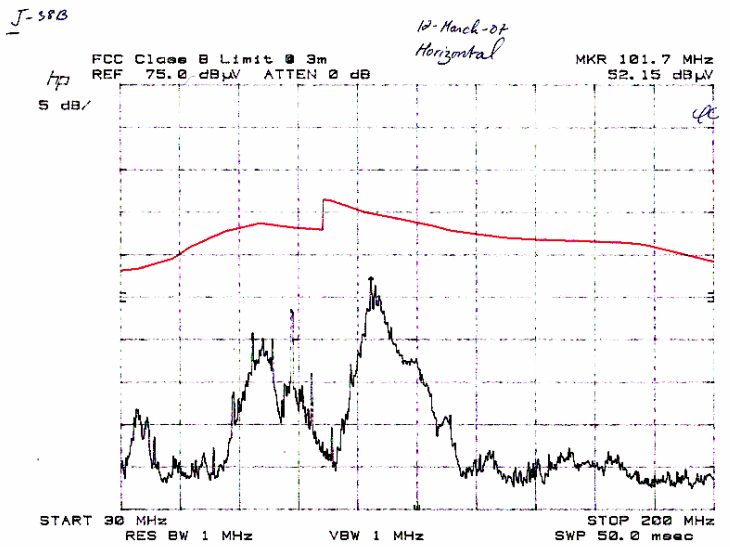

Figure 9: Radiated Emission 30 – 200 MHz Horizontal Polarization

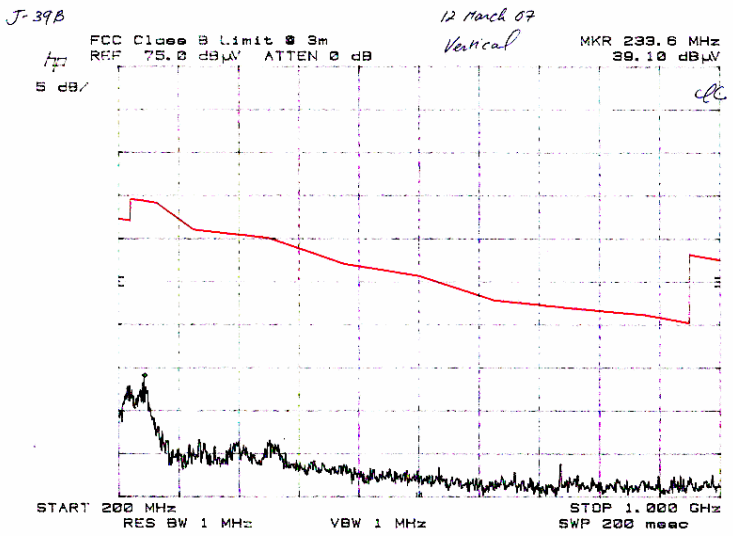

Figure 10: Radiated Emission 200 MHz – 1 GHz Vertical Polarization

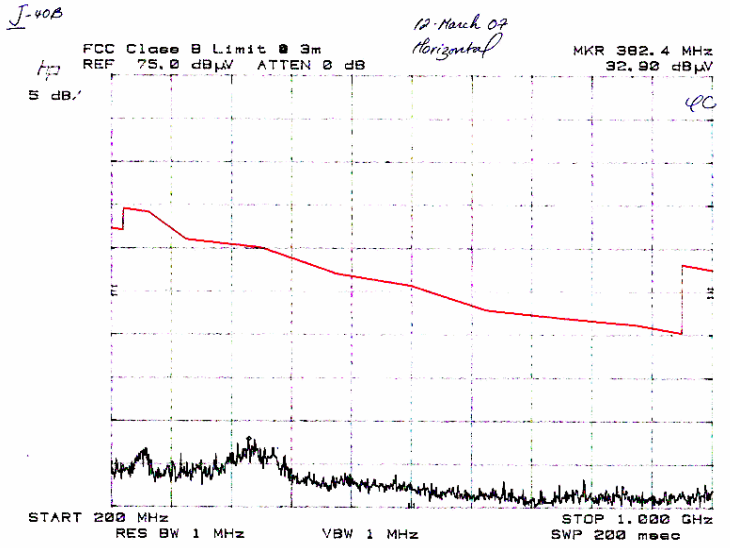

Figure 11: Radiated Emission 200 MHz – 1 GHz Vertical Polarization

4.3.2.3 Xpress Home Cradle Using ITI Wall Adapter Data

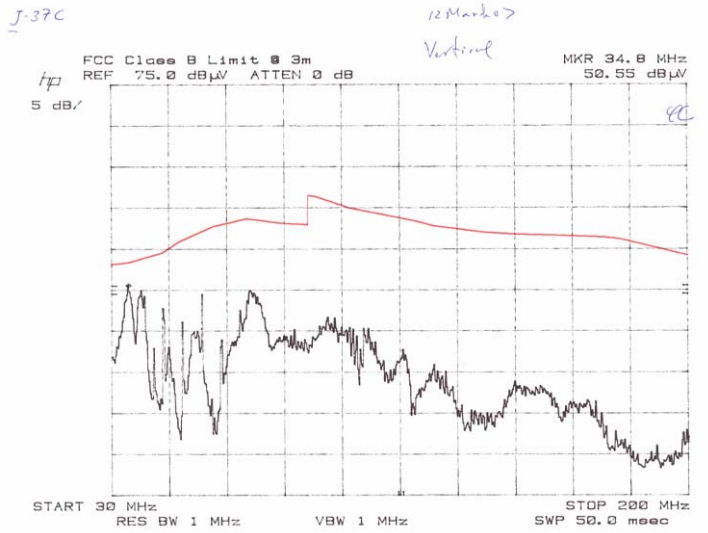

Figure 12: Radiated Emission 30 – 200 MHz Vertical Polarization

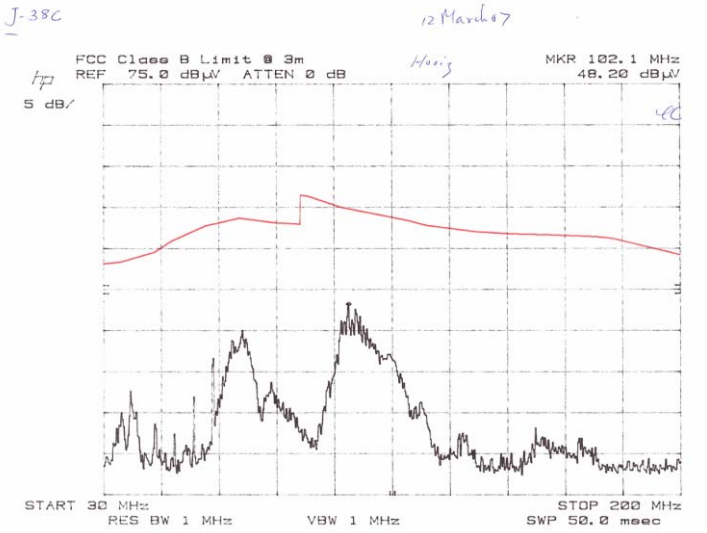

Figure 13: Radiated Emission 30 – 200 MHz Horizontal Polarization

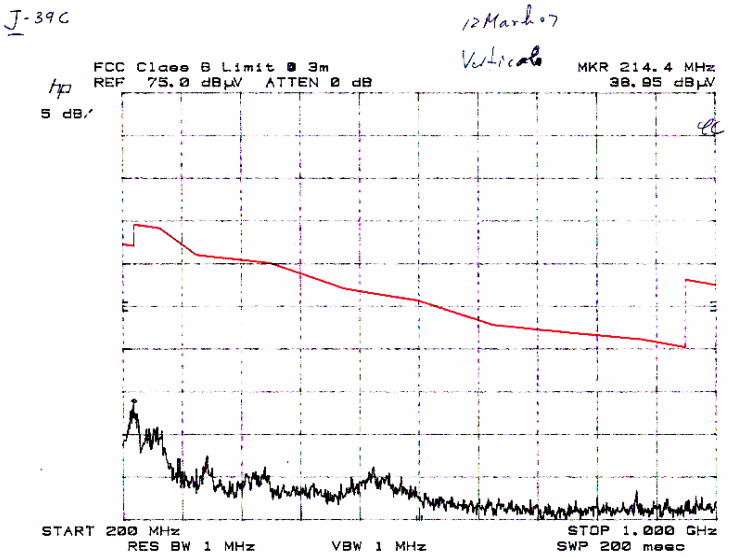

Figure 14: Radiated Emission 200 MHz – 1 GHz Vertical Polarization

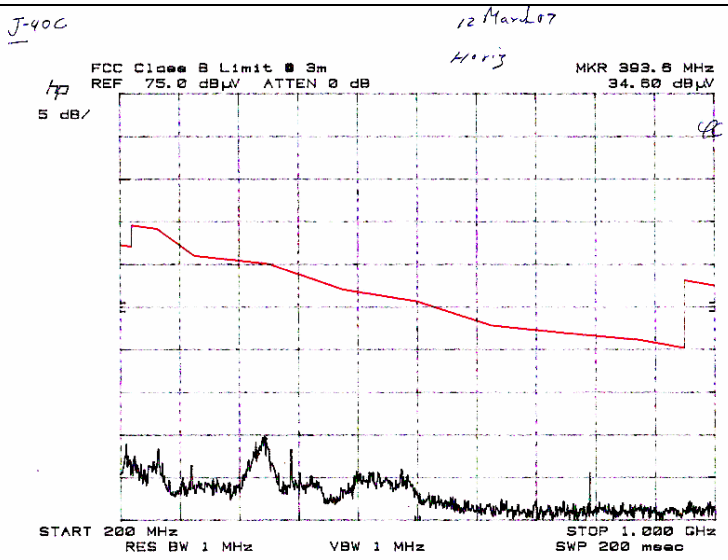

Figure 15: Radiated Emission 200 MHz – 1 GHz Vertical Polarization

4.3.3 Car Cradle with FM Direct Adapter Setup

In the FM Direct Adapter setup, the EUT was placed in the Universal Car Cradle, with an XM FM Direct Adapter, XM car antenna, XM 5V cigarette adapter (CLA) power supply and an audio out cable. The FM Direct Adapter FM OUT cable was terminated with 75 ohms to simulate an FM radio's FM input jack. The FM Direct Adapter FM IN cable was attached to an FM aerial antenna on a ground plane to simulate a vehicle's FM antenna. The ground plane is connected to the negative supply of the vehicle battery. Diagram 2 below, and Photograph 4 in the document 07-027ph depict the radiated emissions FM Direct test setup.

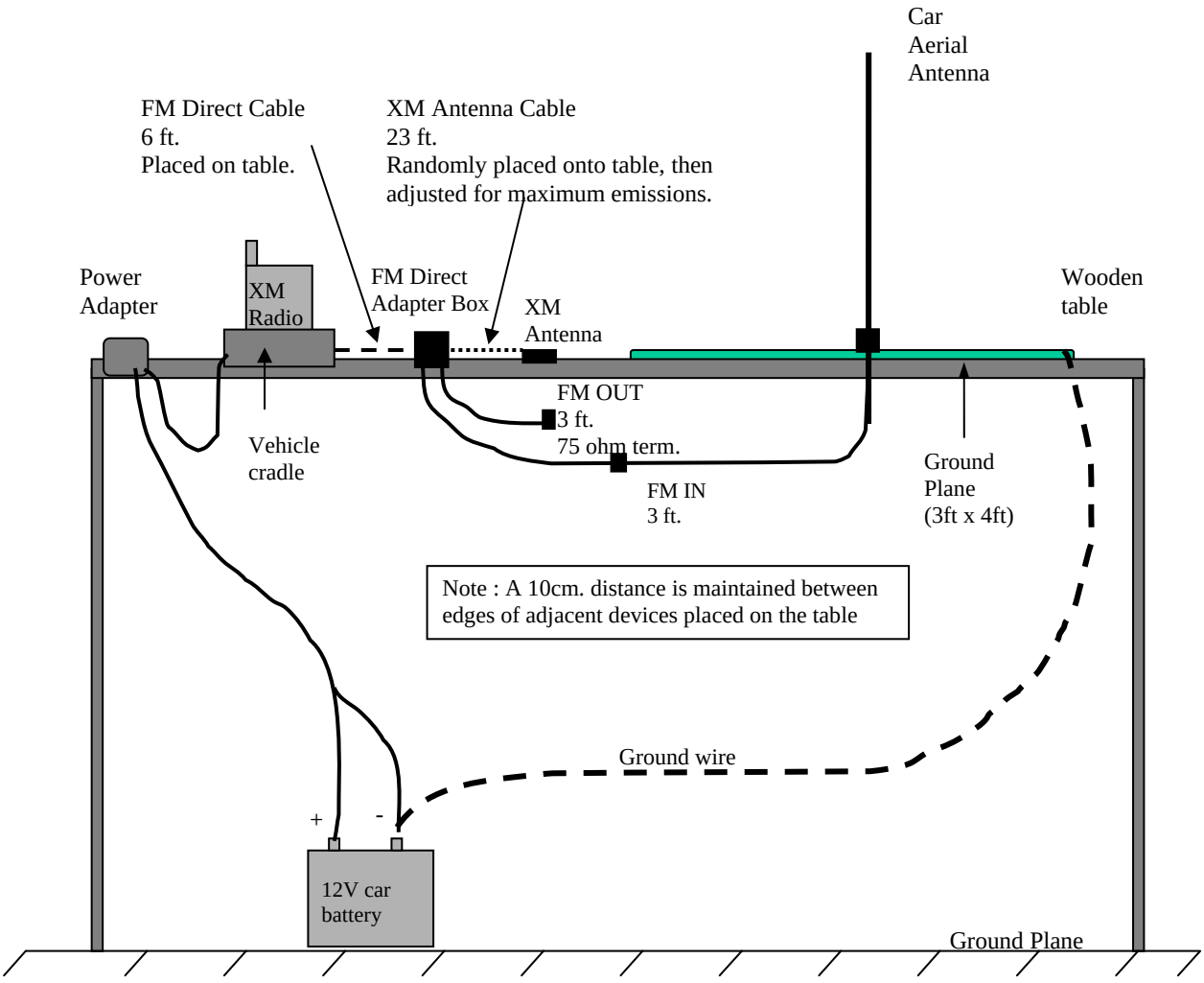

Diagram 2 : FM Direct Adapter Radiated Emissions Setup

This document reports results for EUT evaluated:

- In the Universal Car Cradle and the ITI low noise CLA
- In the Xpress Car Cradle with the ITI low noise CLA

Figures 16 to 39 show the worst case radiated emissions for the FM Direct Adapter configuration independent of azimuth or antenna height.

4.3.3.1 Universal Car Cradle with FM Direct Adapter Data

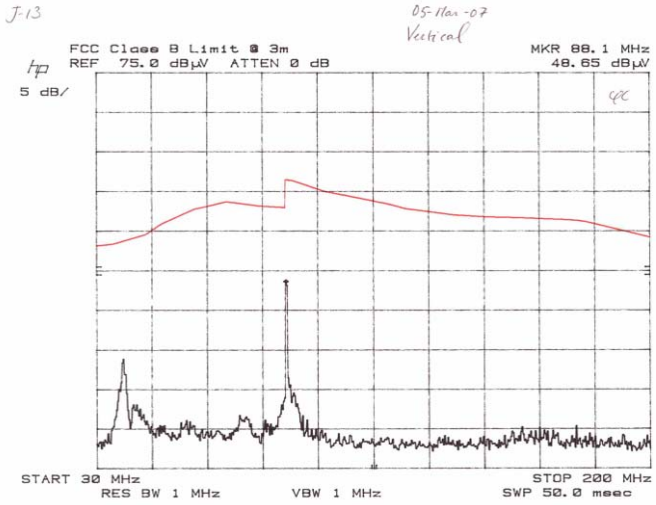

Figure 16 30 MHz to 200 MHz Vertical (FM programmed to 88.1 MHz)

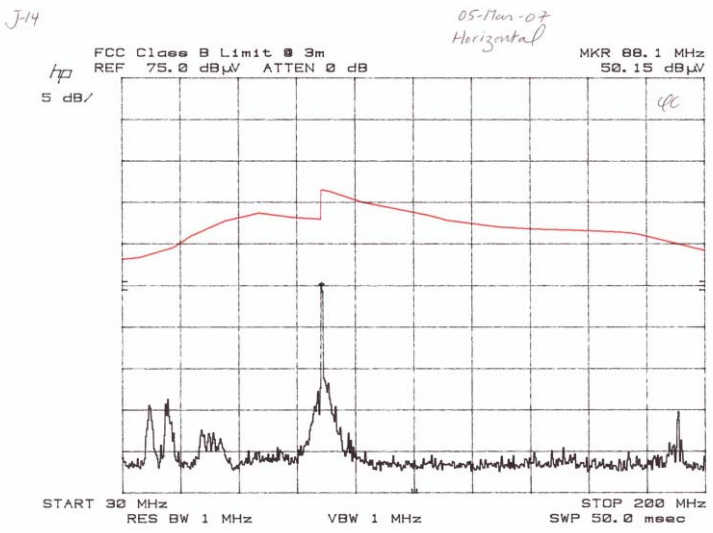

Figure 17 30 MHz to 200 MHz Horizontal (FM programmed to 88.1 MHz

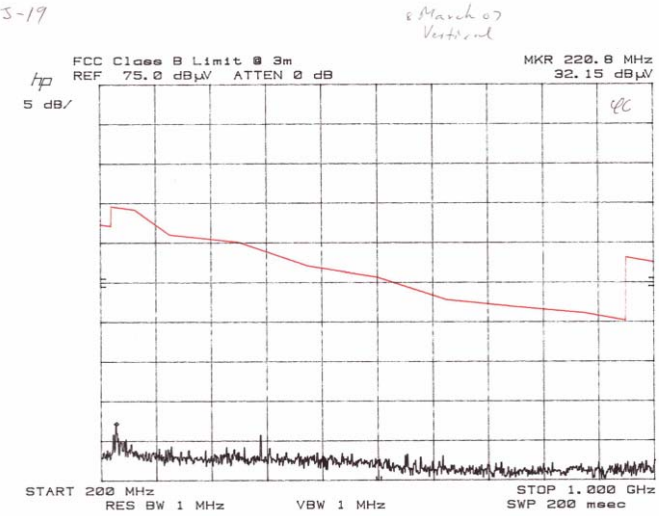

Figure 18 200 MHz to 1 GHz Vertical (FM programmed to 88.1 MHz)

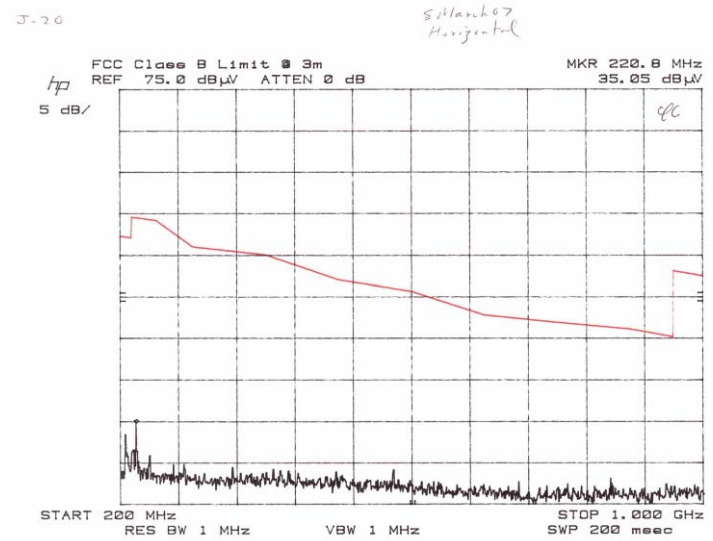

Figure 19 200 MHz to 1 GHz Horizontal (FM programmed to 88.1 MHz)

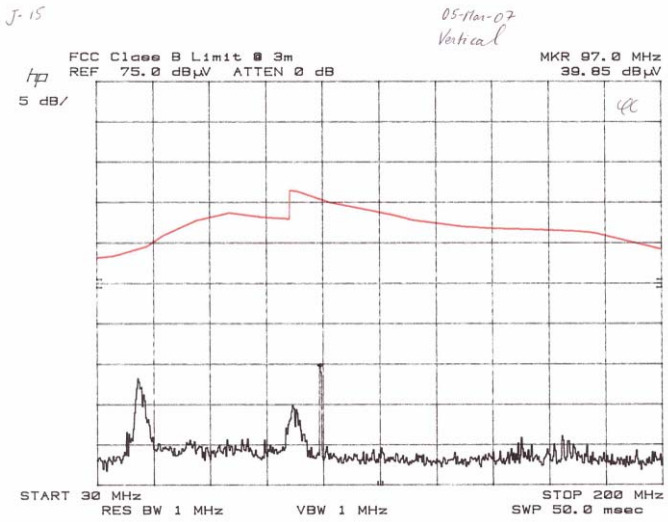

Figure 20 30 MHz to 200 MHz Vertical (FM programmed to 96.9 MHz)

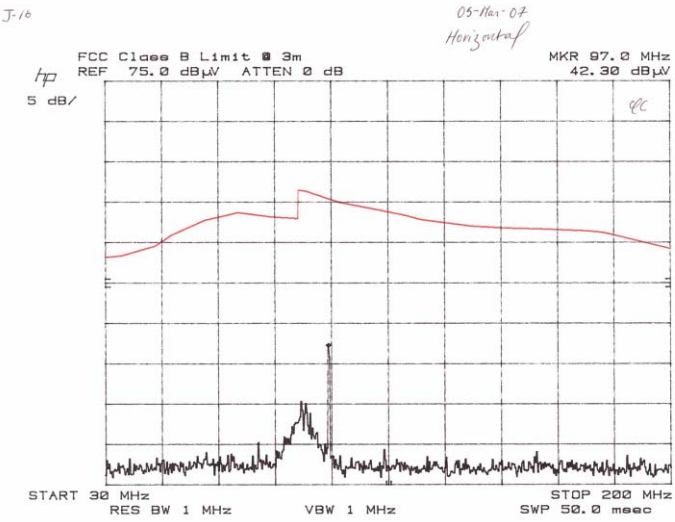

Figure 21 30 MHz to 200 MHz Horizontal (FM programmed to 96.9MHz)

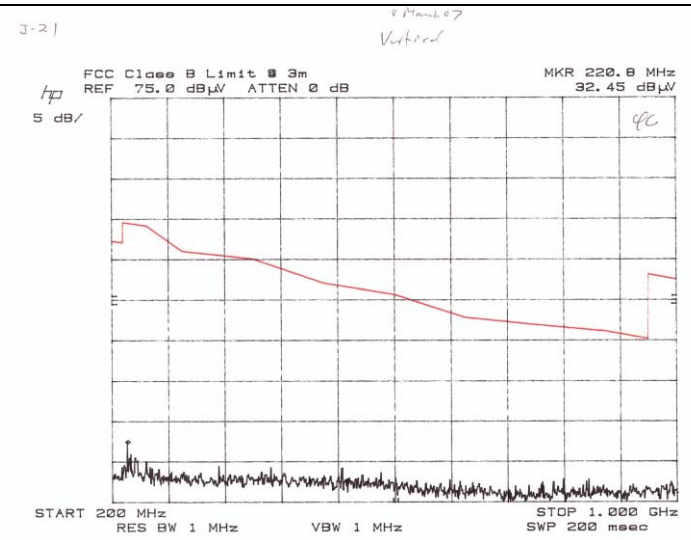

Figure 22 200 MHz to 1 GHz Vertical (FM programmed to 96.9 MHz

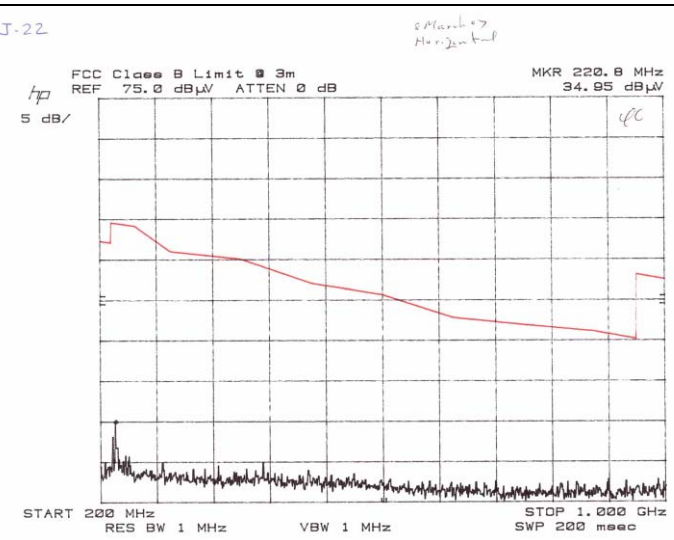

Figure 23 200 MHz to 1 GHz Horizontal (FM programmed to 96.9 MHz)

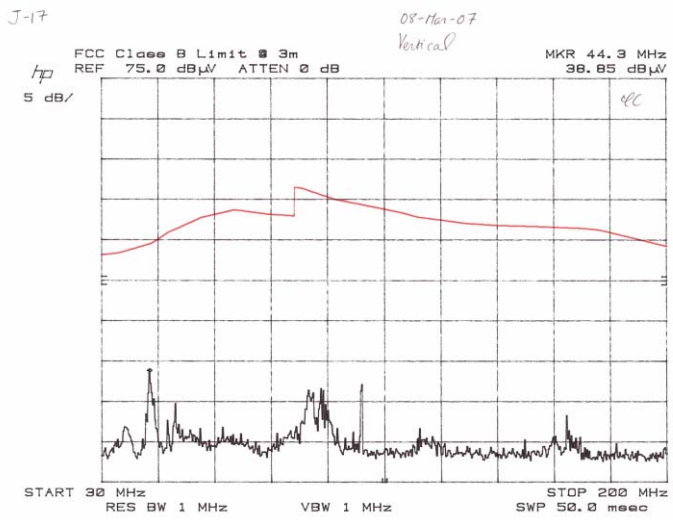

Figure 24 30 MHz to 200 MHz Vertical (FM programmed to 107.9 MHz)

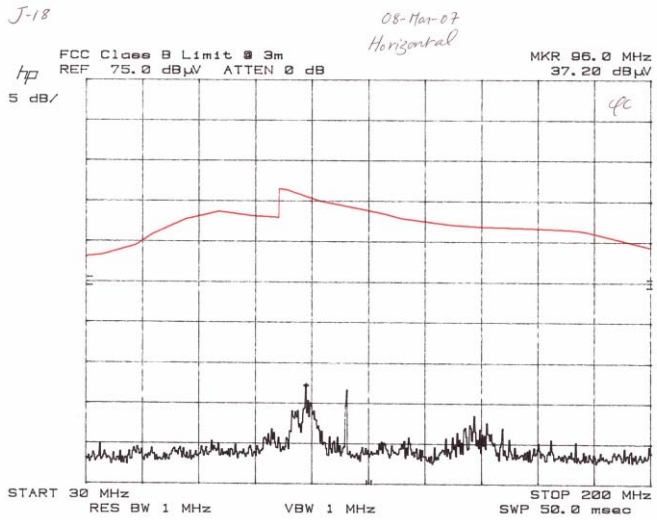

Figure 25 30 MHz to 200 MHz Horizontal (FM programmed to 107.9 MHz)

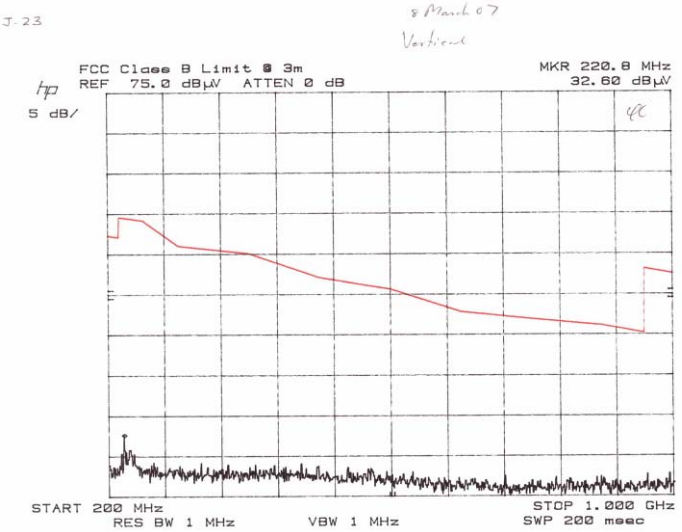

Figure 26 200 MHz to 1 GHz Vertical (FM programmed to 107.9 MHz

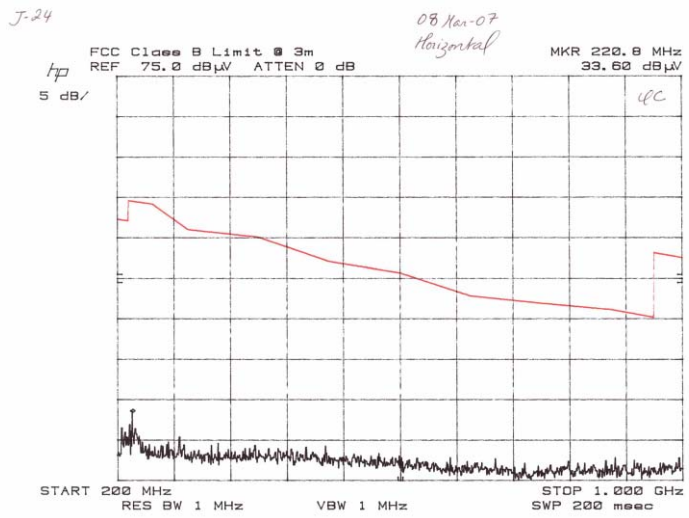

Figure 27 200 MHz to 1 GHz Horizontal (FM programmed to 107.9 MHz)

4.3.3.2 Xpress Car Cradle with FM Direct Adapter Data

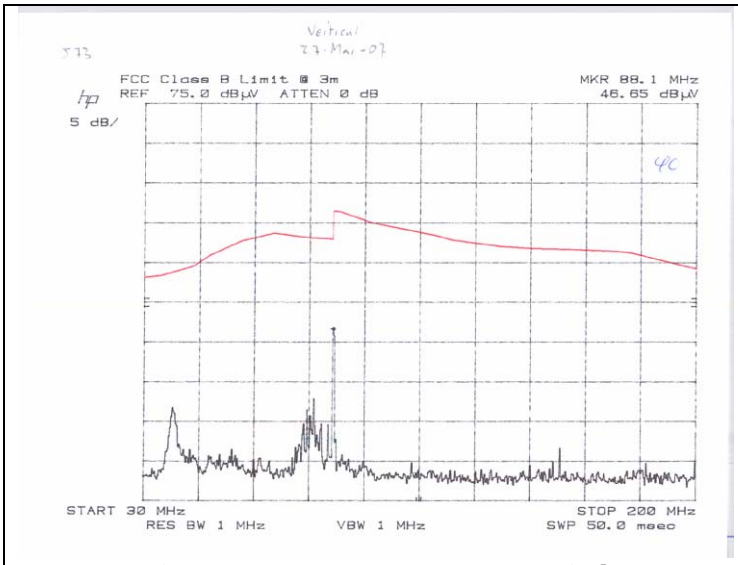

Figure 28 30 MHz to 200 MHz Vertical (FM programmed to 88.1 MHz)

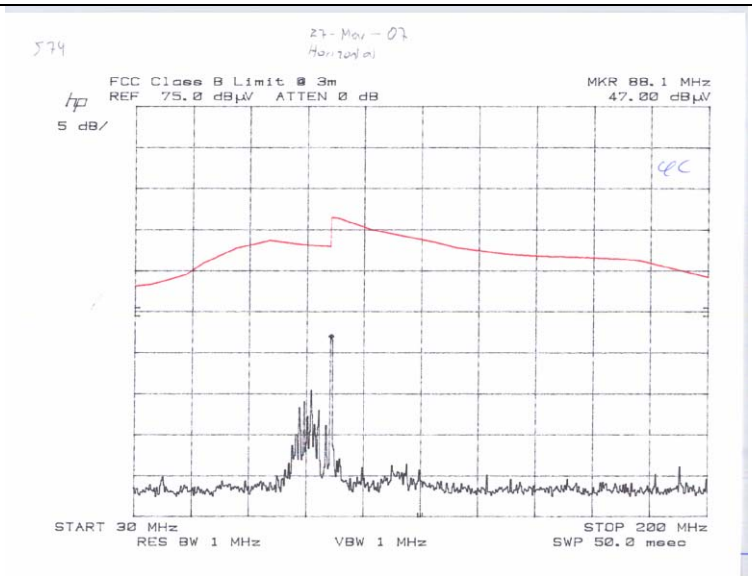

Figure 29 30 MHz to 200 MHz Horizontal (FM programmed to 88.1 MHz

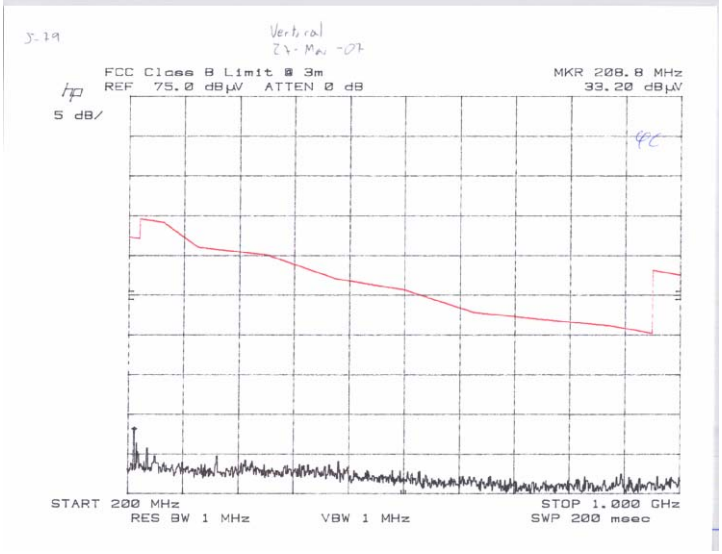

Figure 30 200 MHz to 1 GHz Vertical (FM programmed to 88.1 MHz)

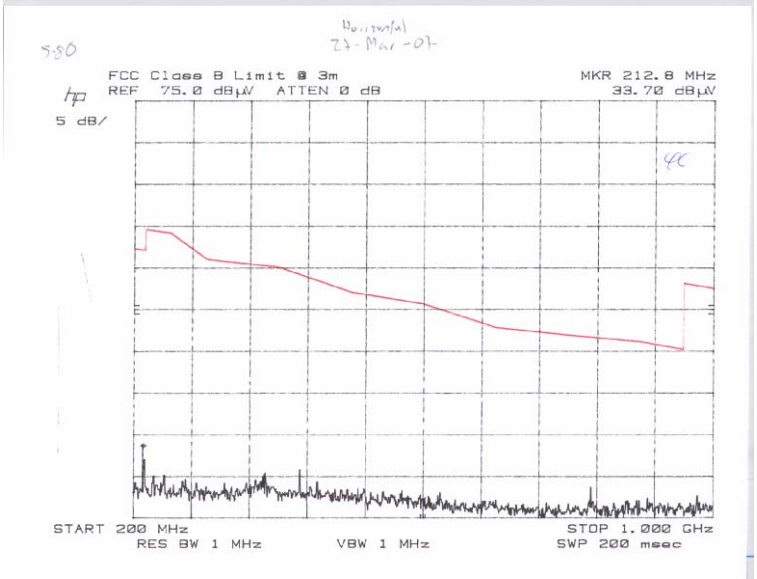

Figure 31 200 MHz to 1 GHz Horizontal (FM programmed to 88.1 MHz)

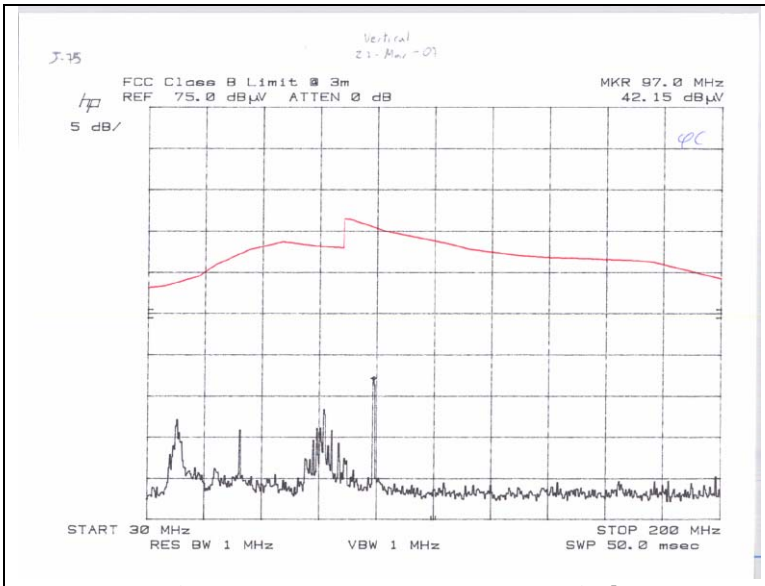

Figure 32 30 MHz to 200 MHz Vertical (FM programmed to 96.9 MHz)

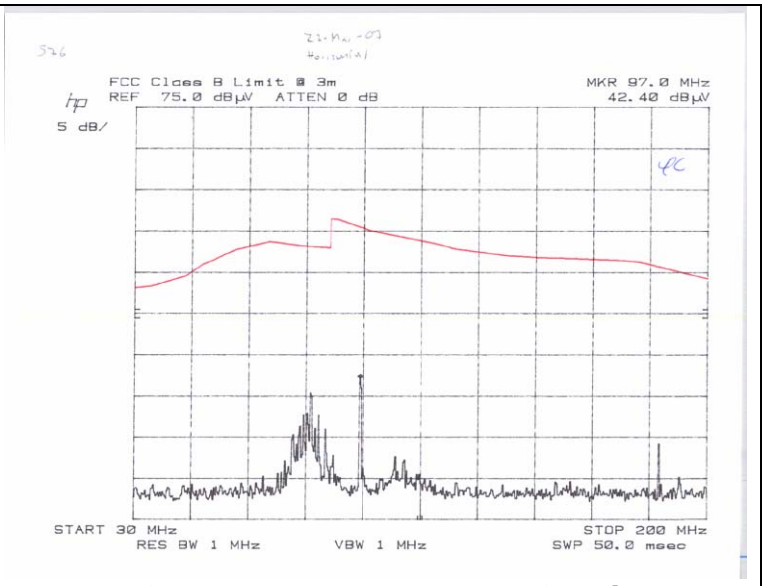

Figure 33 30 MHz to 200 MHz Horizontal (FM programmed to 96.9MHz)

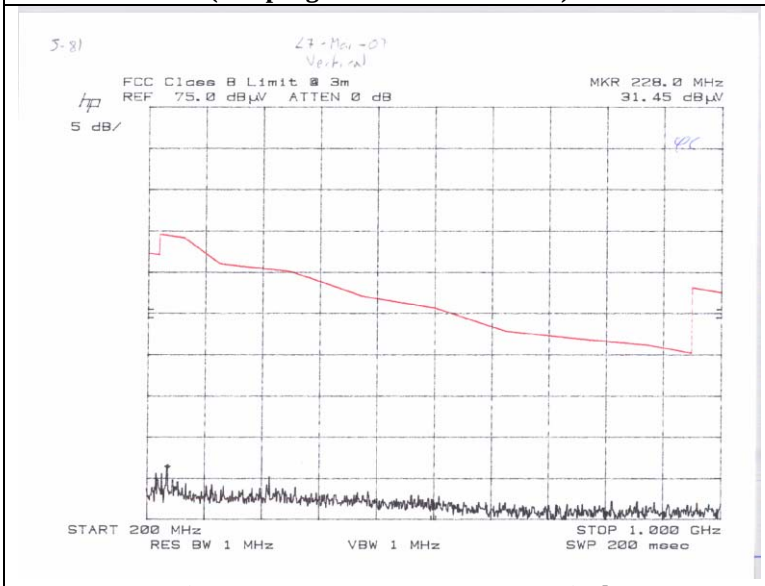

Figure 34 200 MHz to 1 GHz Vertical (FM programmed to 96.9 MHz

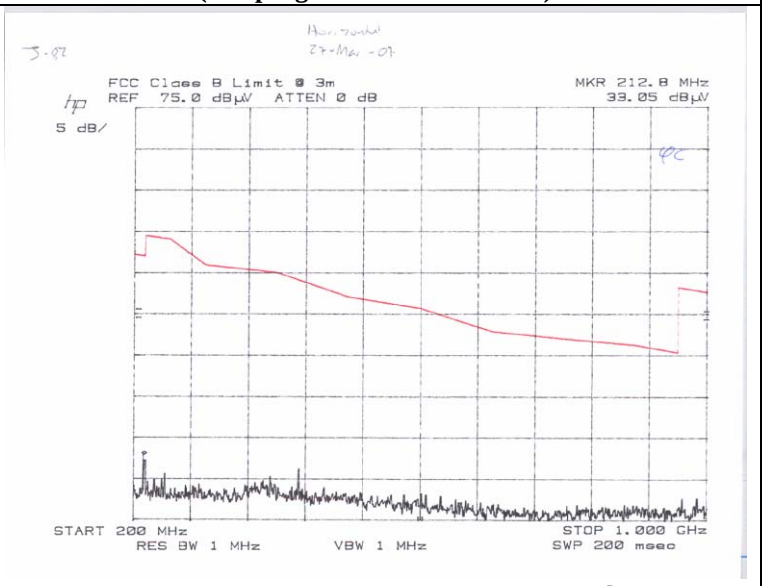

Figure 35 200 MHz to 1 GHz Horizontal (FM programmed to 96.9 MHz)

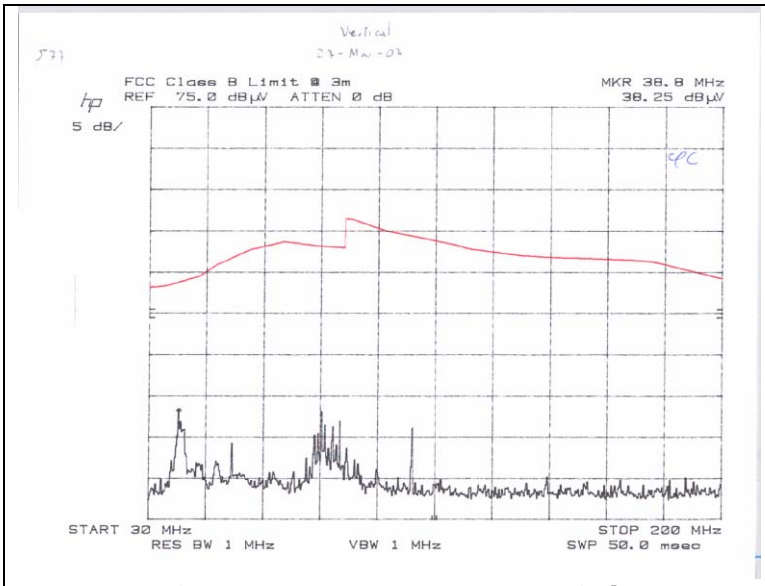

Figure 36 30 MHz to 200 MHz Vertical (FM programmed to 107.9 MHz)

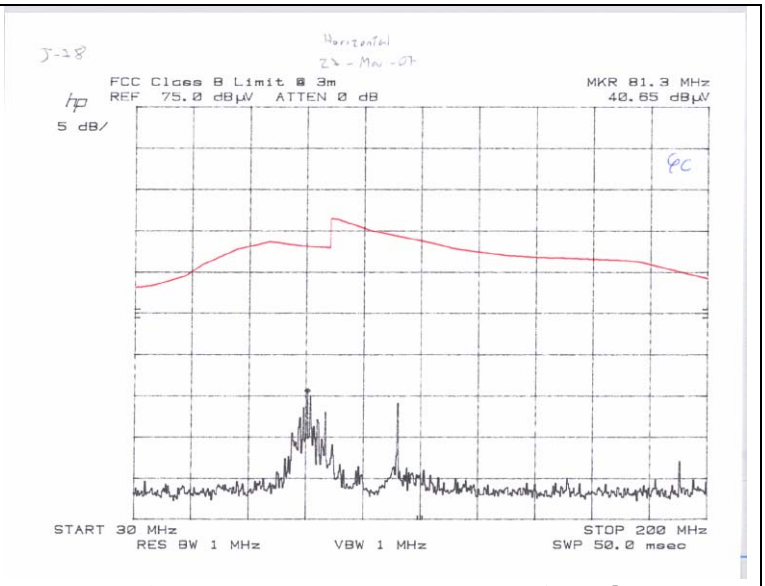

Figure 37 30 MHz to 200 MHz Horizontal (FM programmed to 107.9 MHz)

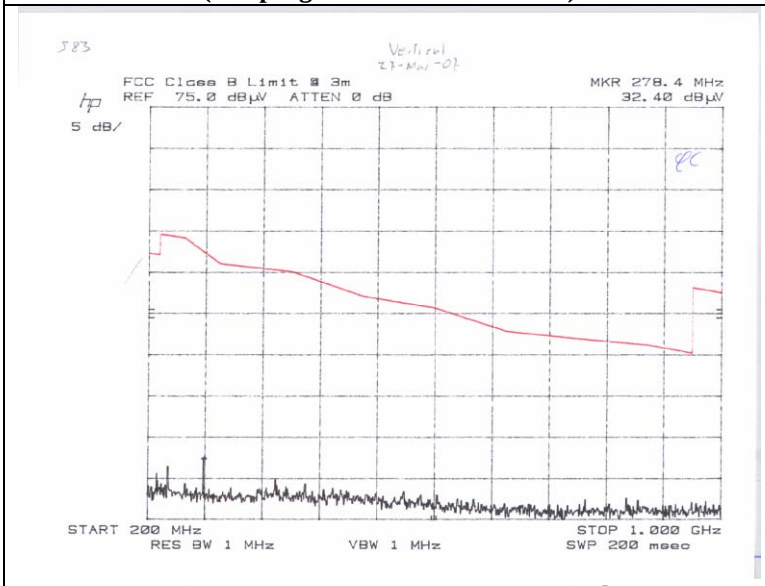

Figure 38 200 MHz to 1 GHz Vertical (FM programmed to 107.9 MHz

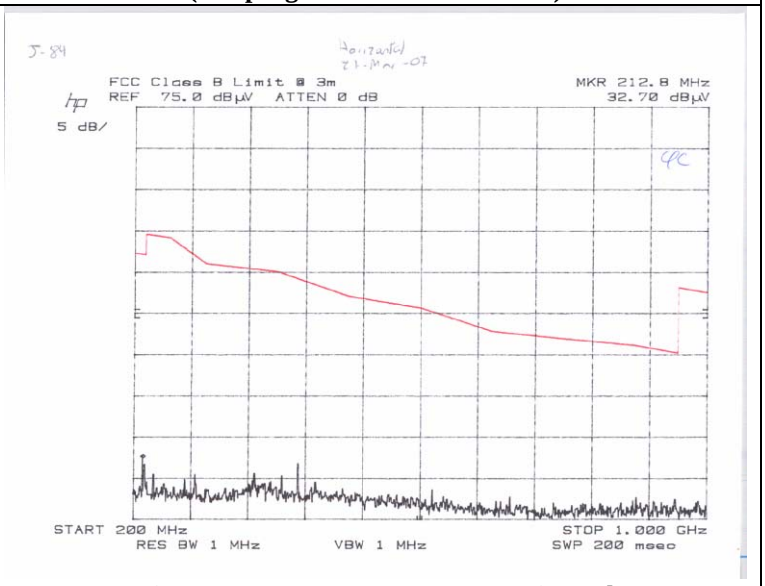

Figure 39 200 MHz to 1 GHz Horizontal (FM programmed to 107.9 MHz)

4.3.4 Car Cradle with XM Cassette Adapter Setup

In this test setup, the EUT was placed into a car cradle with an XM antenna, an XM Cassette Adapter and 5V Cigarette adaptor (ITI Low-Noise CLA) power supply connected to the radio. Diagram 3 below, and Photograph 5 in the document '07-027ph' depict the radiated emissions car cradle with XM antenna only test setup.

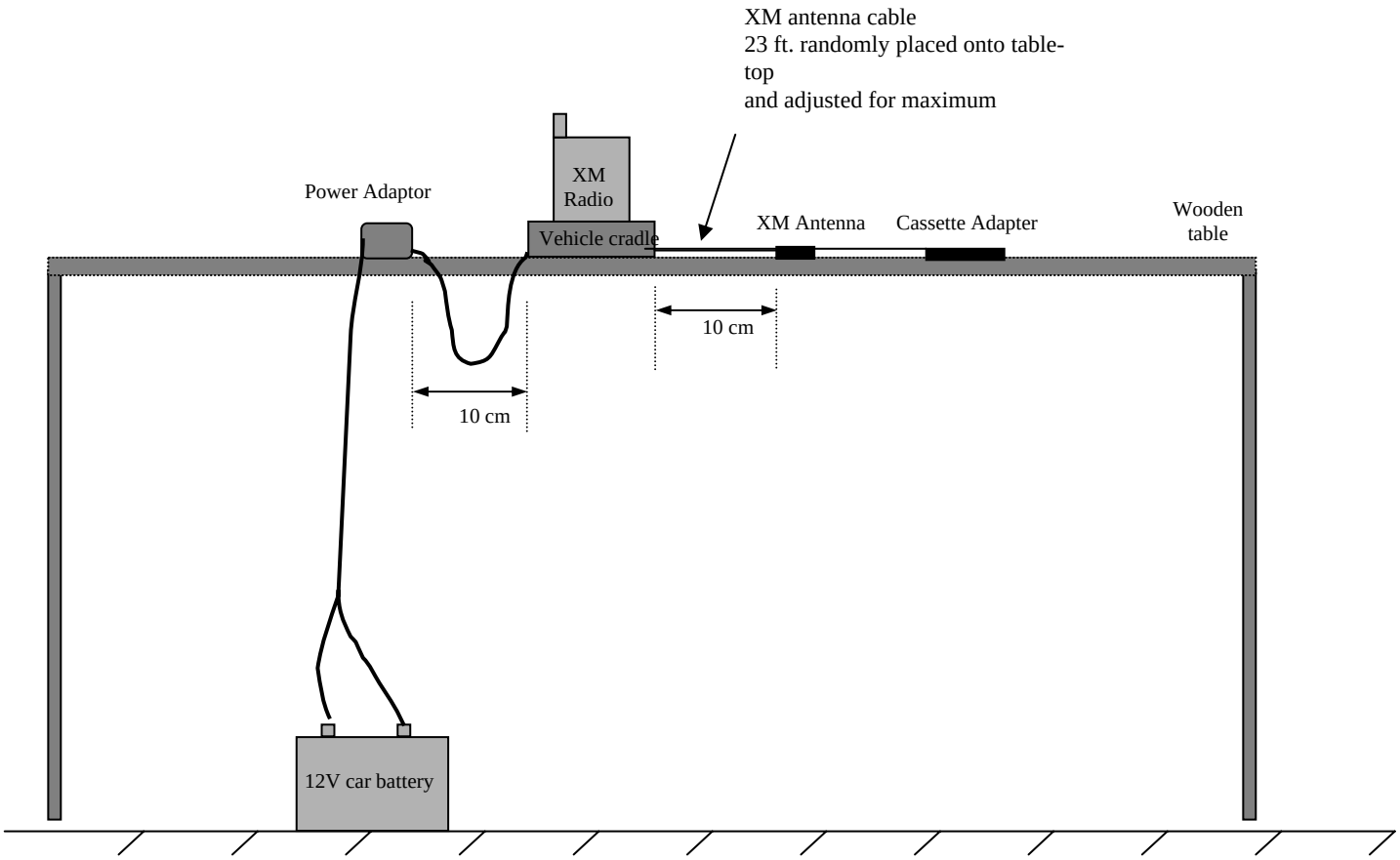

Diagram 3: XM Cassette Adapter- Radiated Emissions Setup

For this configuration, the device was evaluated for both the Universal Car cradle and the Xpress Car Cradle.

It should be noted that for the Universal Car cradle the FM modulator of the Xpress-R receiver is turned off when the XM Cassette Adapter is connected to the line out port of the receiver. As a result, the device could not be programmed to transmit an FM signal for this setup.

4.3.4.1 Universal Car Cradle with XM Cassette Adapter Data

The XM Satellite Radio, Inc. Xpress R is receiving a live XM signal. It should be noted that, the internal FM modulator of the device is turned off when the Cassette Adapter is attached to the line out port of the device.

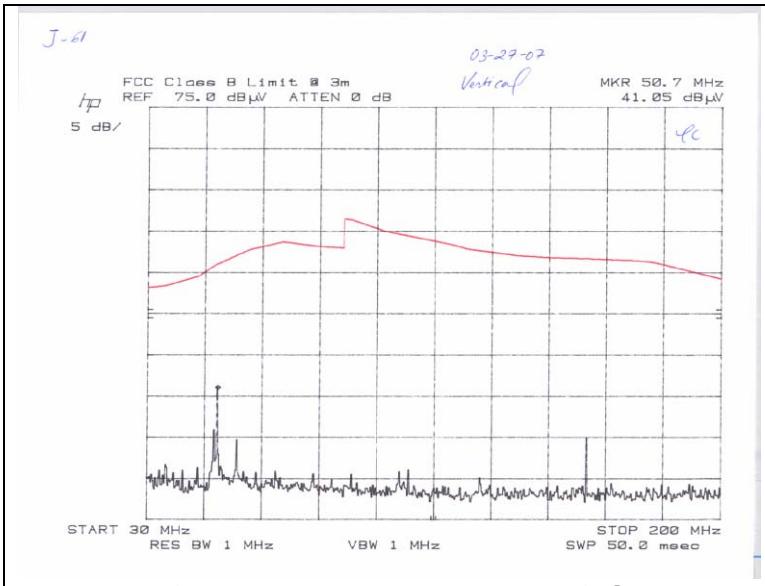

Figure 40 30 MHz to 200 MHz Vertical

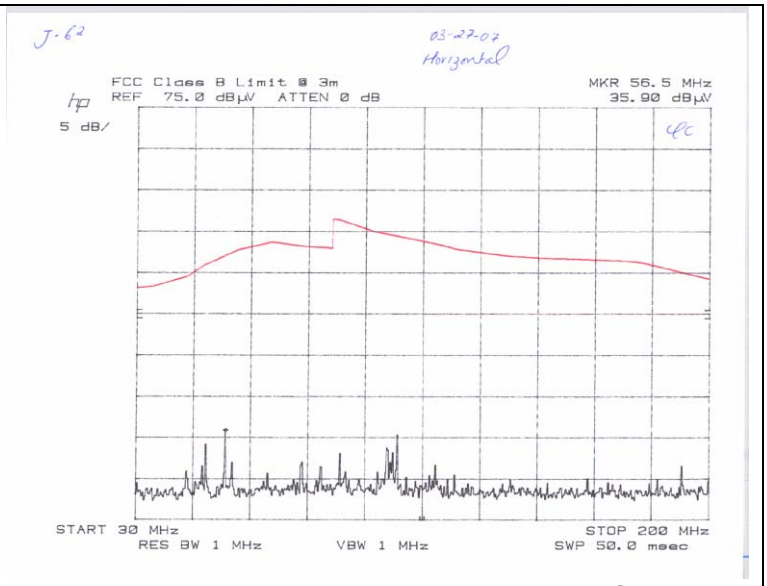

Figure 41 30 MHz to 200 MHz Horizontal

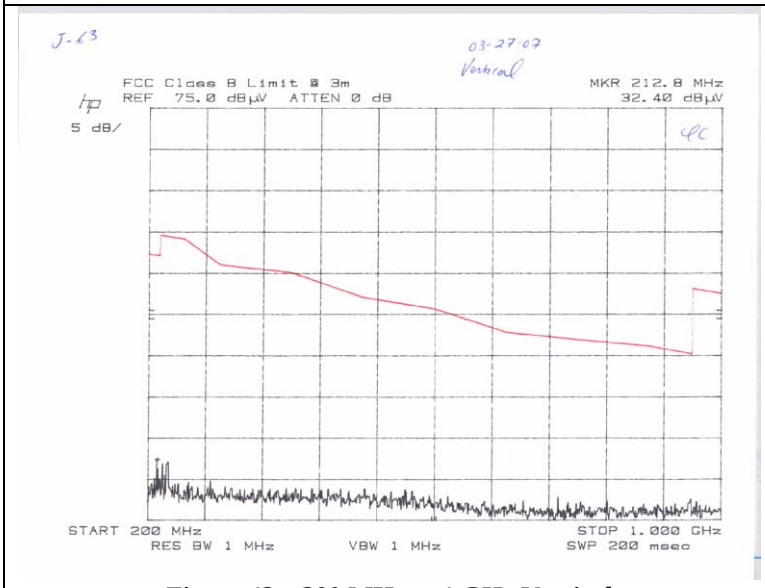

Figure 42 200 MHz to 1 GHz Vertical

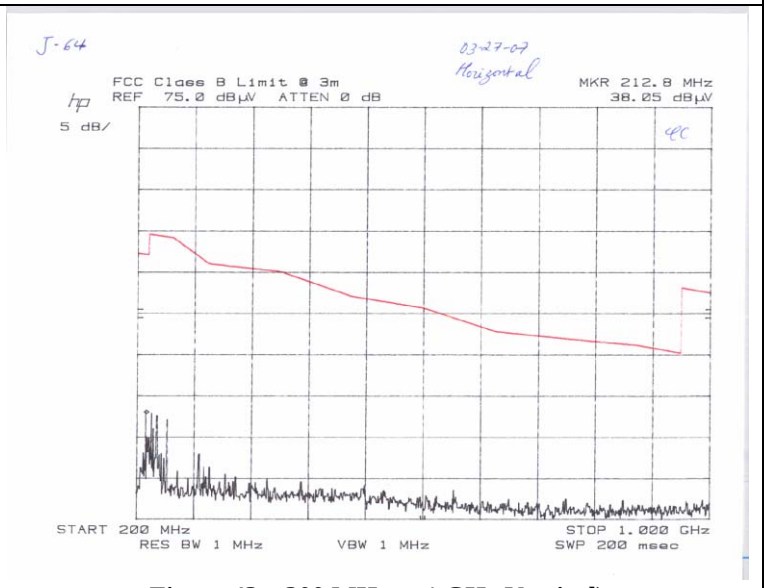

Figure 43 200 MHz to 1 GHz Vertical)

4.3.4.2 Xpress Car Cradle with XM Cassette Adapter Data

The Xpress-R unit is receiving a live XM signal. Note that for the Xpress Car Cradle, the FM modulator is still accessible.

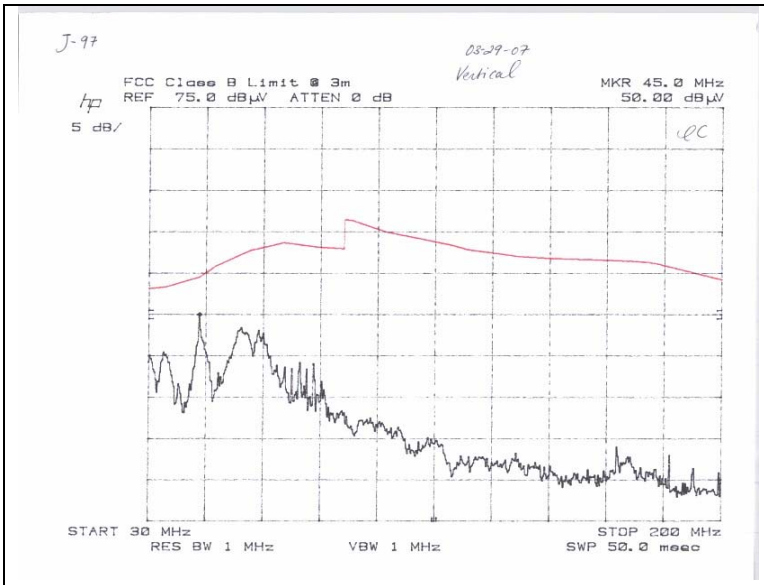

Figure 44 30 MHz to 200 MHz Vertical (FM programmed to 88.1 MHz)

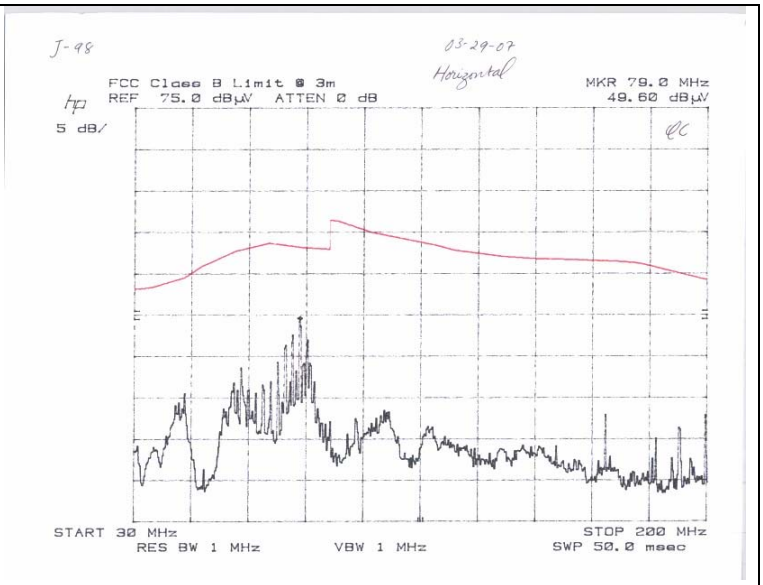

Figure 45 30 MHz to 200 MHz Horizontal (FM programmed to 88.1 MHz)

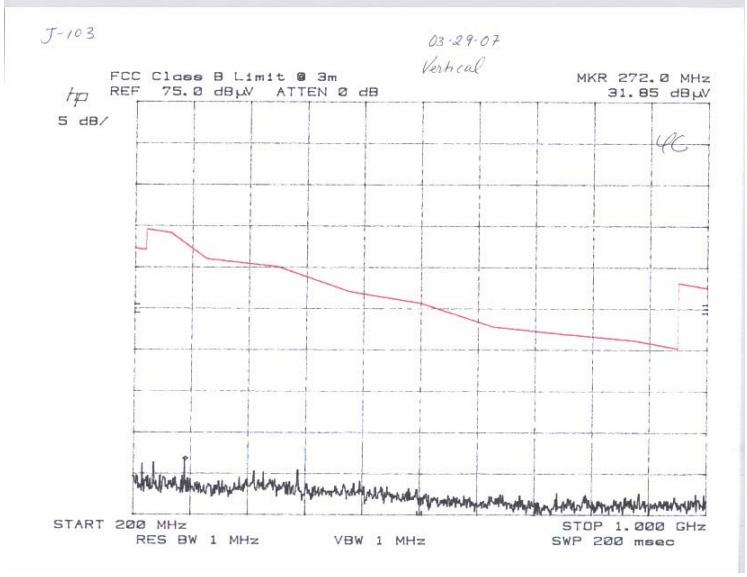

Figure 46 200 MHz to 1 GHz Vertical (FM programmed to 88.1 MHz)

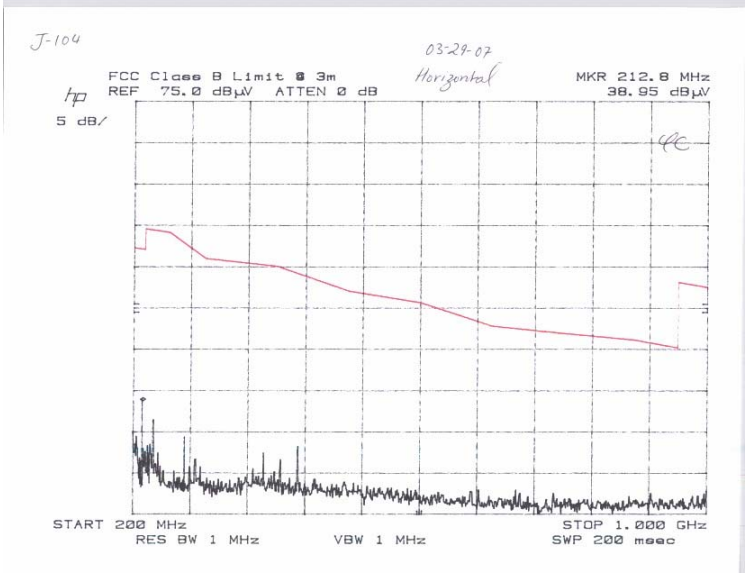

Figure 47 200 MHz to 1 GHz Horizontal (FM programmed to 88.1 MHz)

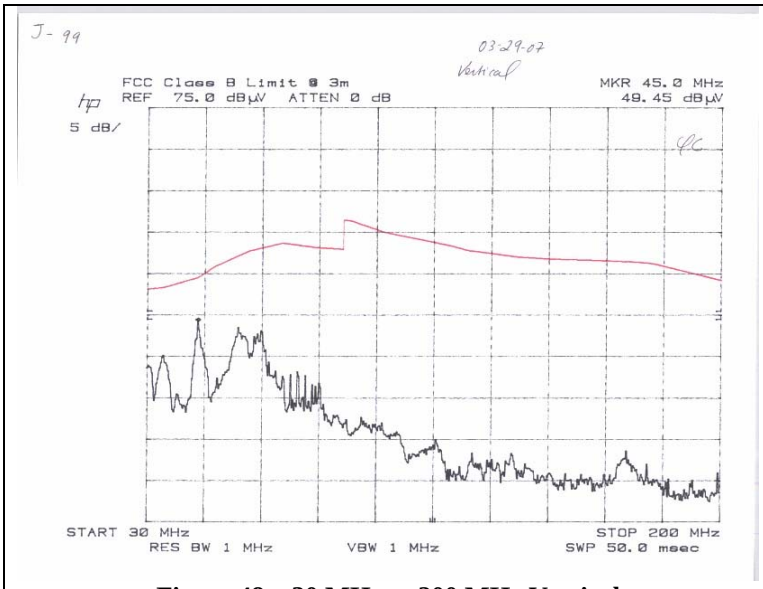

Figure 48 30 MHz to 200 MHz Vertical (FM programmed to 96.9 MHz)

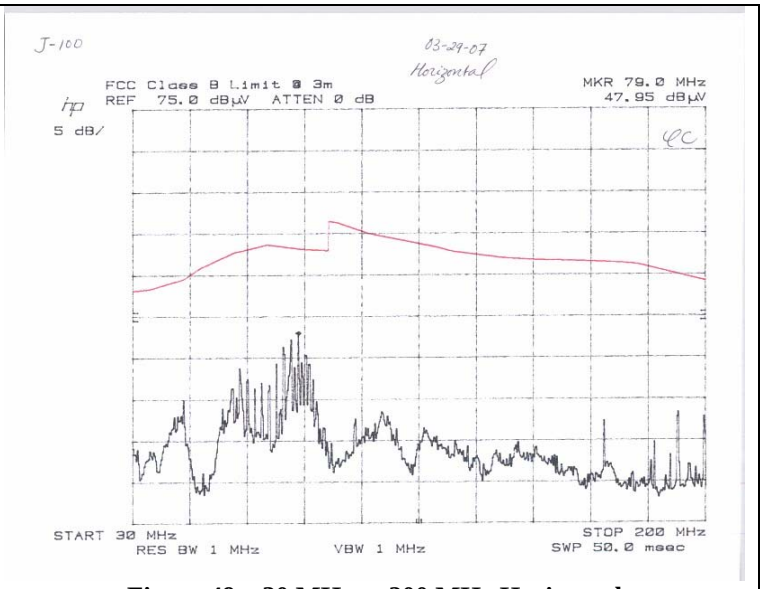

Figure 49 30 MHz to 200 MHz Horizontal (FM programmed to 96.9 MHz)

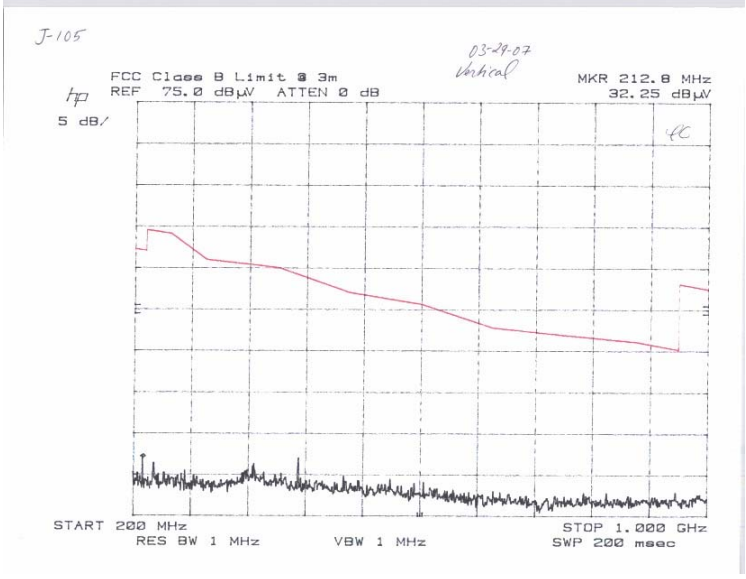

Figure 50 200 MHz to 1 GHz Vertical (FM programmed to 96.9 MHz)

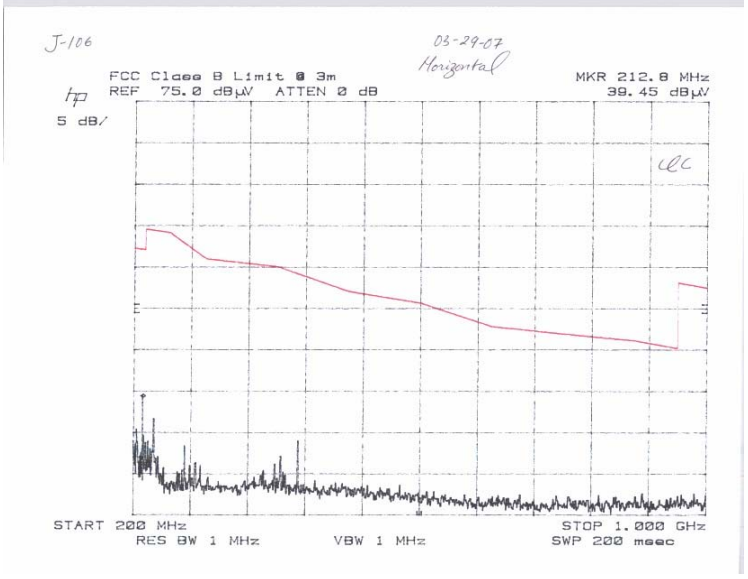

Figure 51 200 MHz to 1 GHz Horizontal (FM programmed to 96.9 MHz)

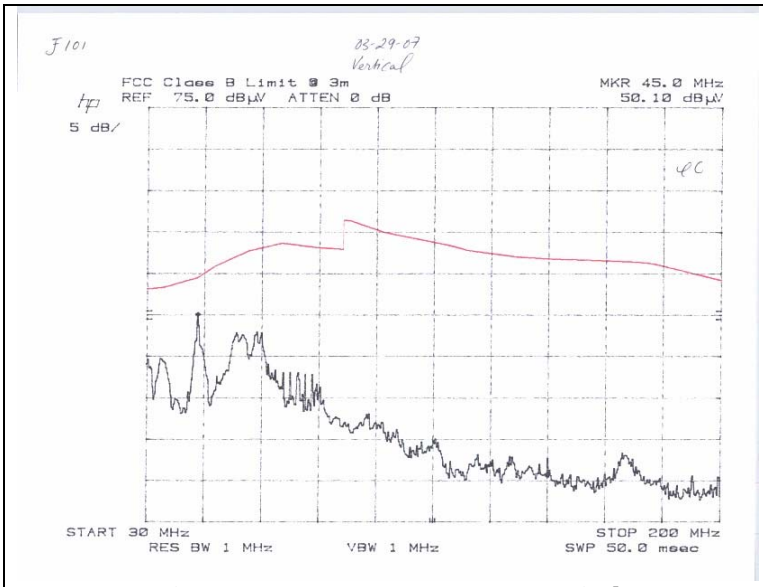

Figure 52 30 MHz to 200 MHz Vertical (FM programmed to 107.9 MHz)

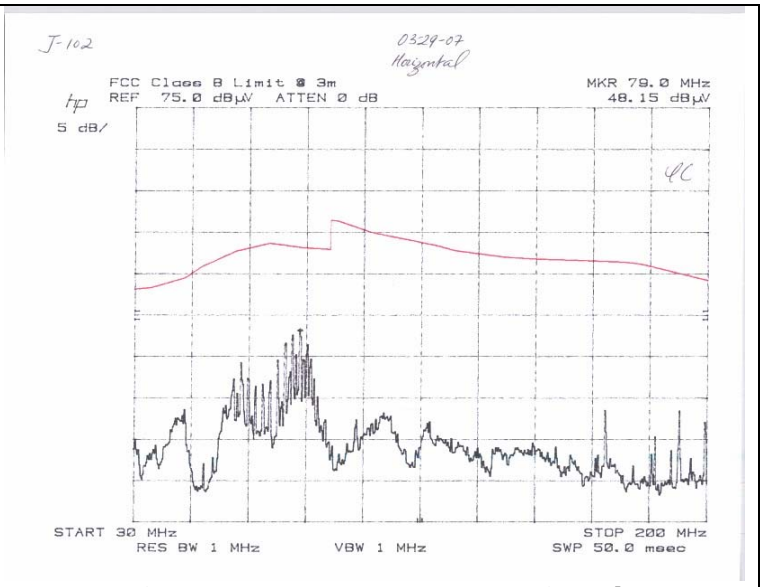

Figure 53 30 MHz to 200 MHz Horizontal (FM programmed to 107.9 MHz)

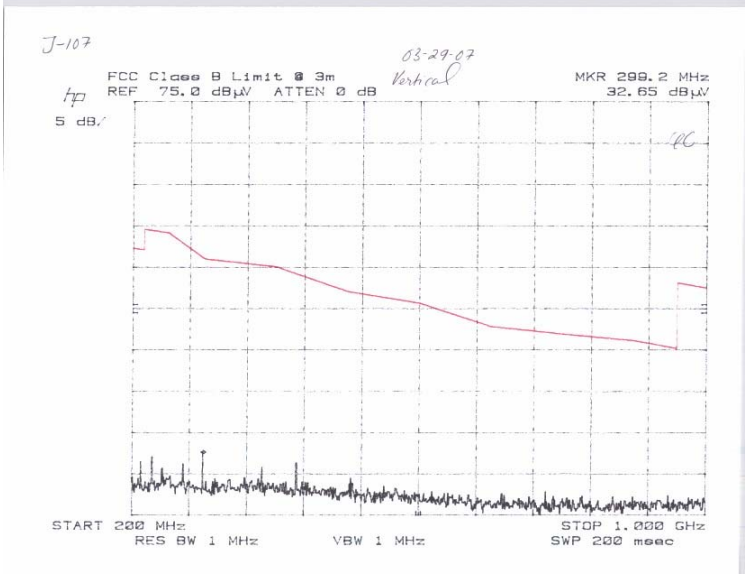

Figure 54 200 MHz to 1 GHz Vertical (FM programmed to 107.9 MHz)

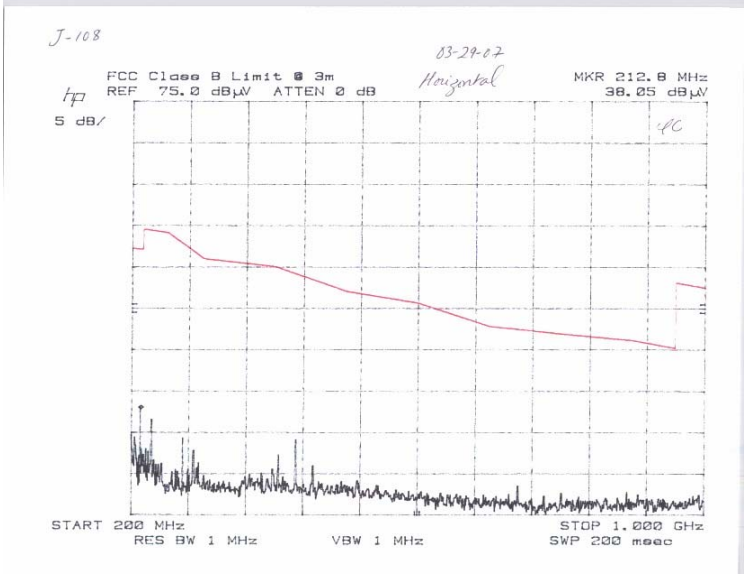

Figure 55 200 MHz to 1 GHz Horizontal (FM programmed to 107.9 MHz)

4.3.5 Xpress Car Cradle with Car Antenna Only Setup

In this test setup, the EUT was placed into a car cradle with an XM antenna and 5V Cigarette adaptor (ITI Low-Noise CLA) power supply connected to the radio. Diagram 4 below, and Photograph 6 in the document '07-027ph' depict the radiated emissions car cradle with XM antenna only test setup.

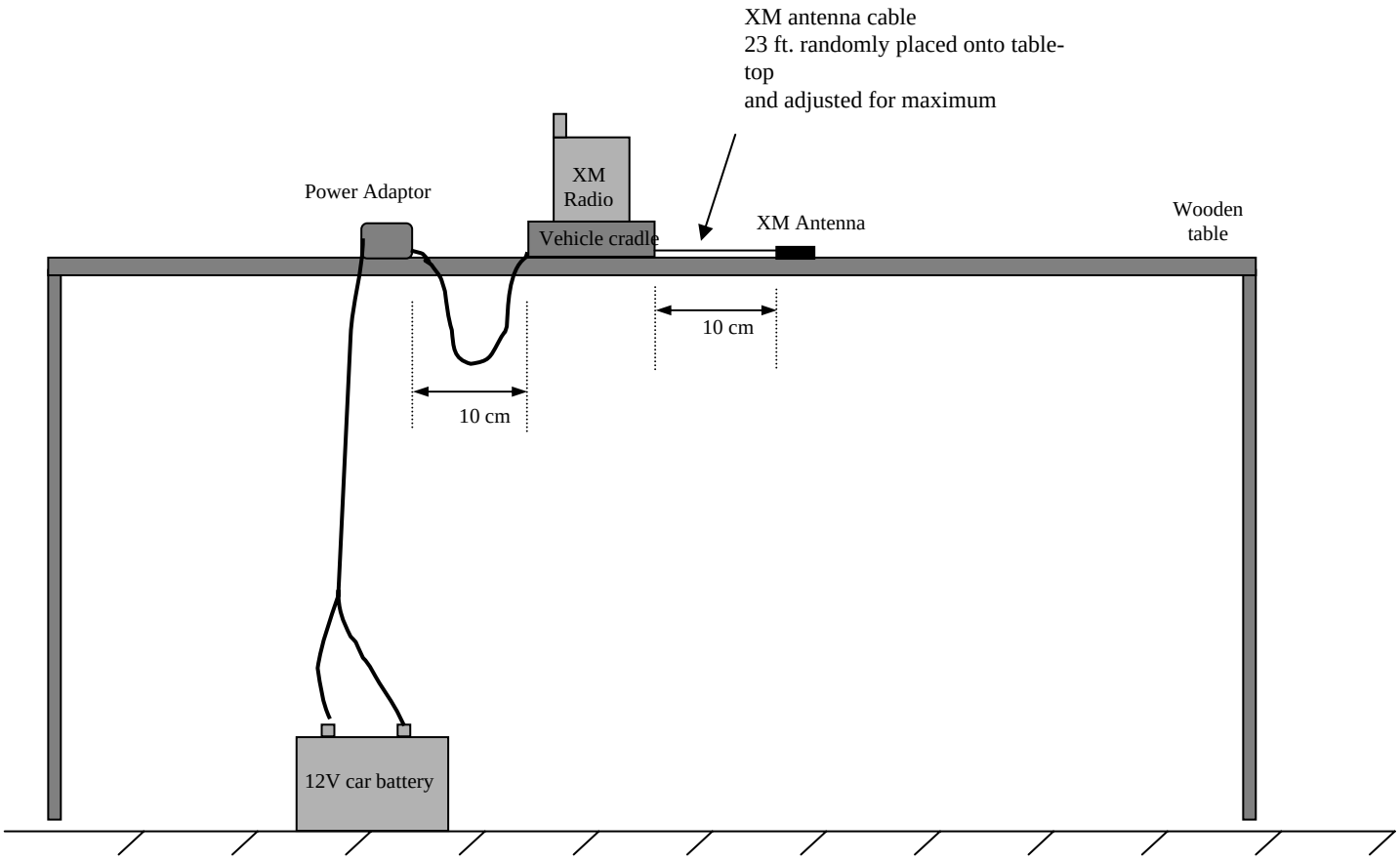

Diagram 4: XM Antenna Only - Radiated Emissions Setup

4.3.5.1 Universal Car Cradle with Car Antenna Only Data

The Xpress-R unit is placed in the Universal Car Cradle and is set to receive a live XM signal.

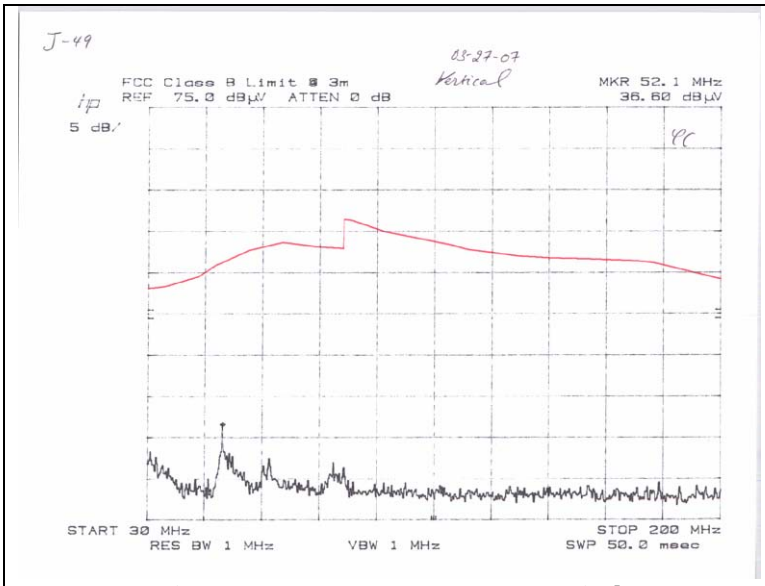

Figure 56 30 MHz to 200 MHz Vertical (FM programmed to 88.1 MHz)

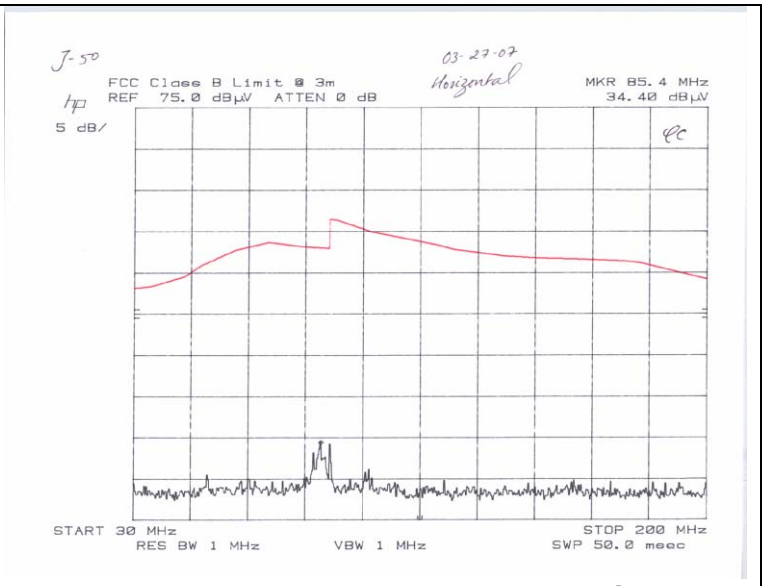

Figure 57 30 MHz to 200 MHz Horizontal (FM programmed to 88.1 MHz)

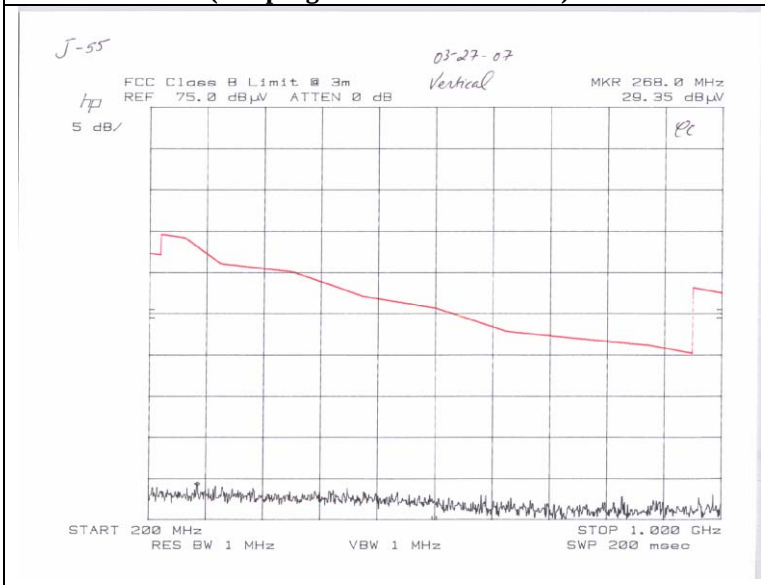

Figure 58 200 MHz to 1 GHz Vertical (FM programmed to 88.1 MHz)

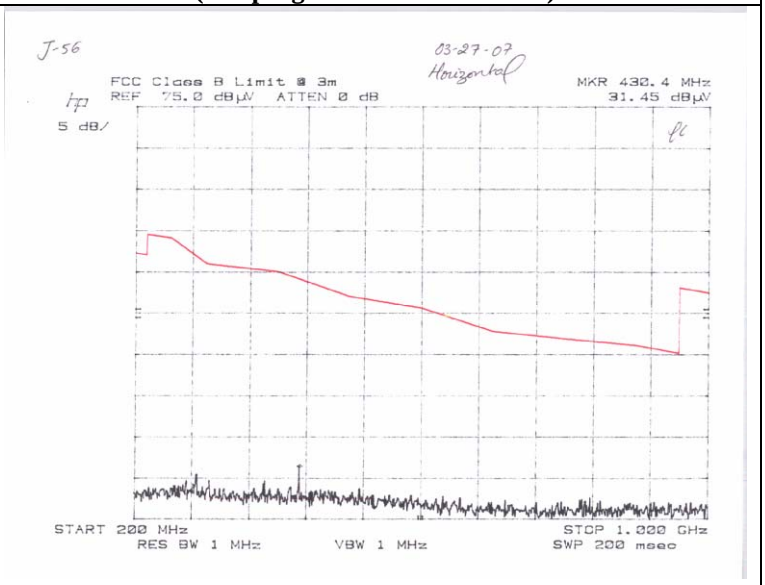

Figure 59 200 MHz to 1 GHz Horizontal (FM programmed to 88.1 MHz)

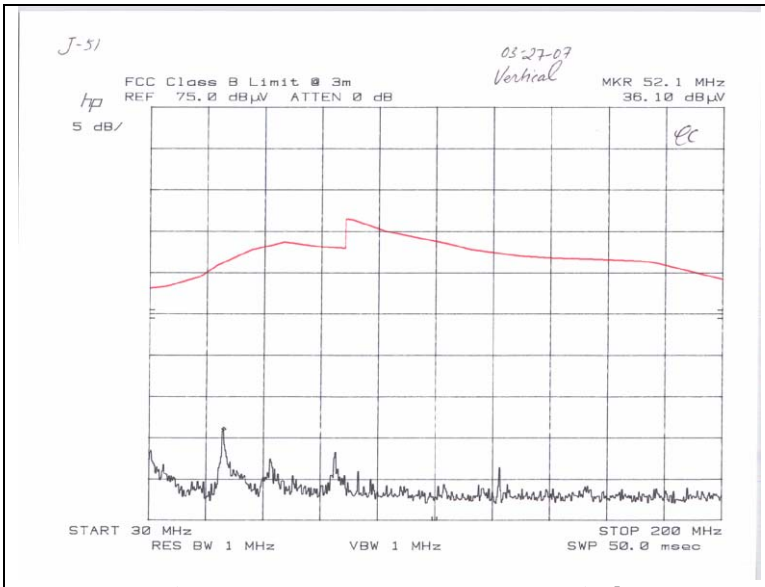

Figure 60 30 MHz to 200 MHz Vertical (FM programmed to 96.9 MHz)

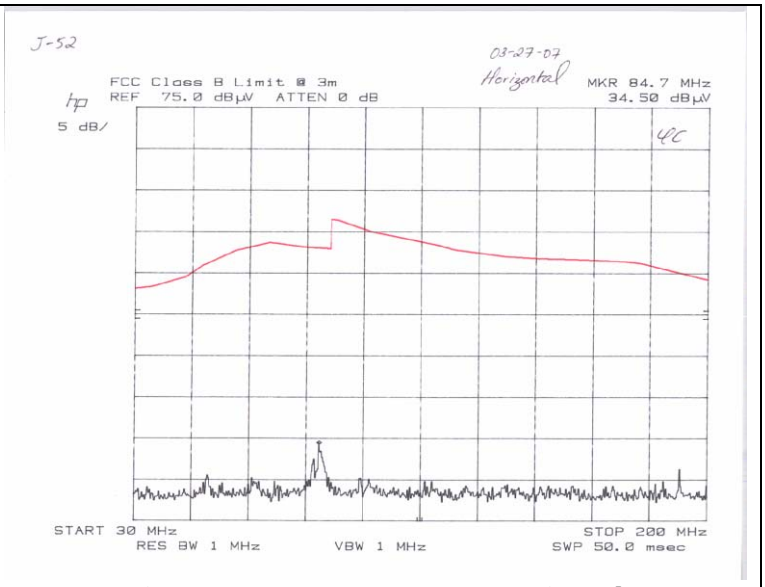

Figure 61 30 MHz to 200 MHz Horizontal (FM programmed to 96.9 MHz)

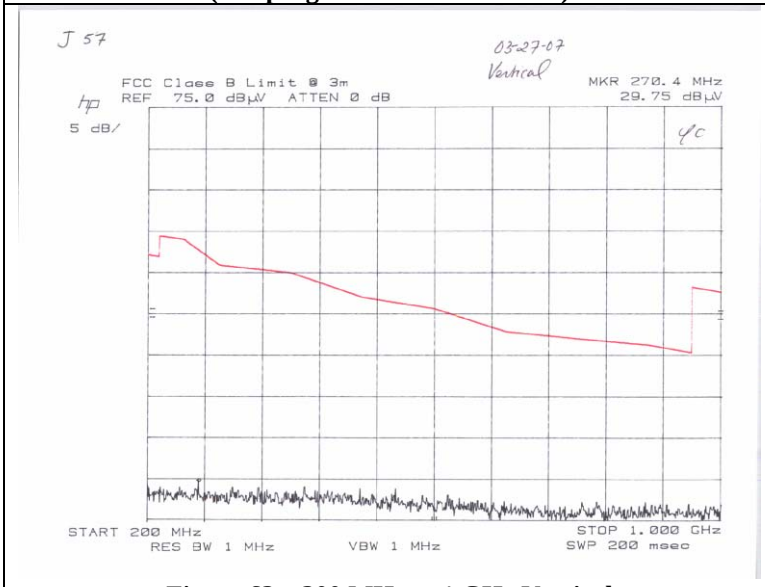

Figure 62 200 MHz to 1 GHz Vertical (FM programmed to 96.9 MHz)

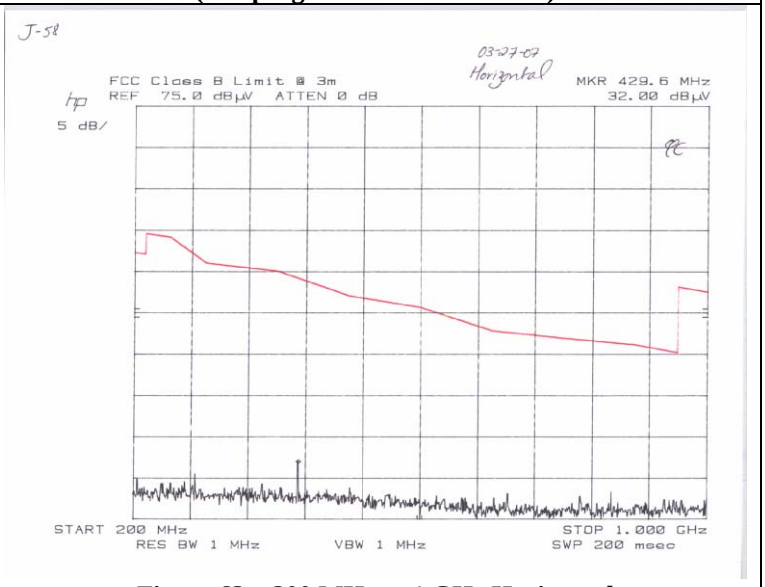

Figure 63 200 MHz to 1 GHz Horizontal (FM programmed to 96.9 MHz)

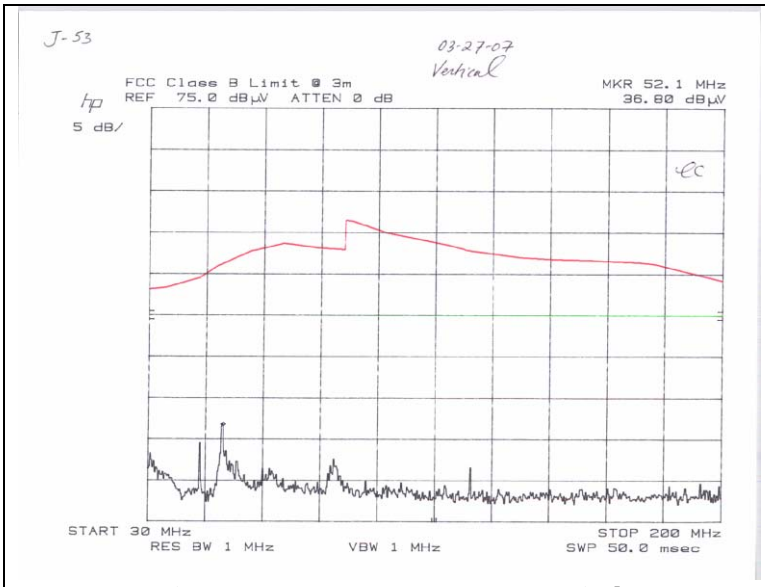

Figure 64 30 MHz to 200 MHz Vertical (FM programmed to 107.9 MHz)

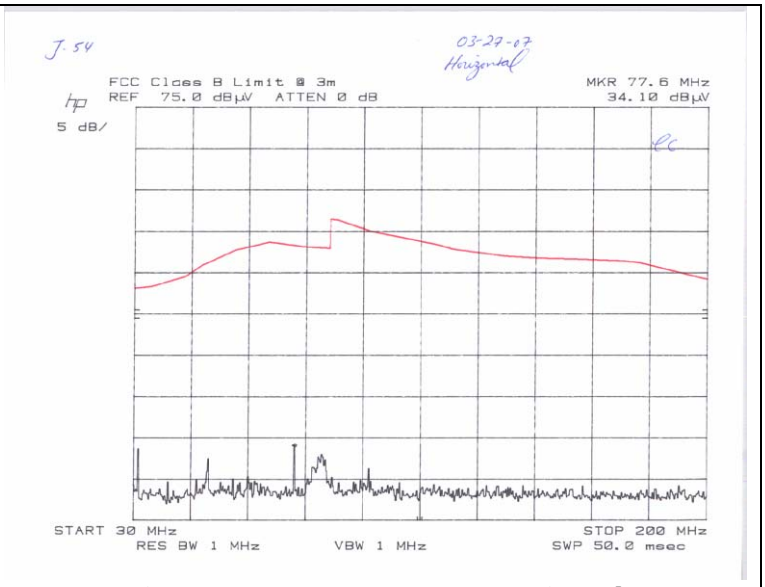

Figure 65 30 MHz to 200 MHz Horizontal (FM programmed to 107.9 MHz)

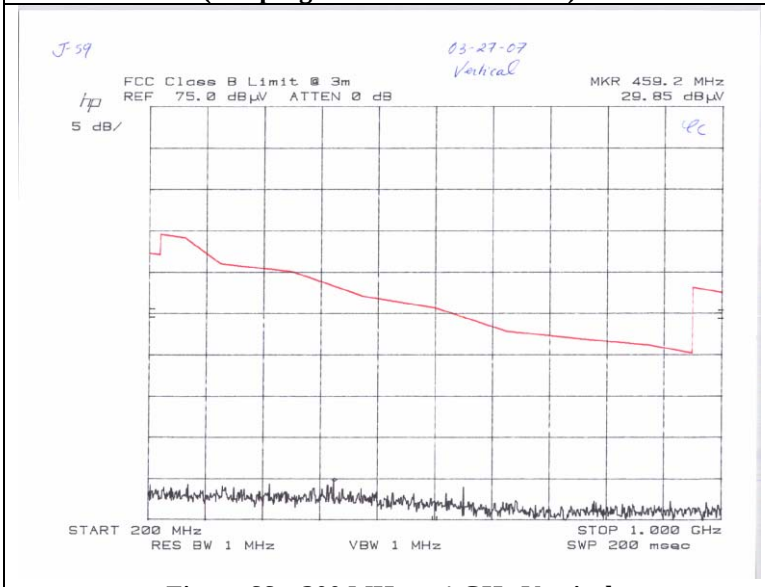

Figure 66 200 MHz to 1 GHz Vertical (FM programmed to 107.9 MHz)

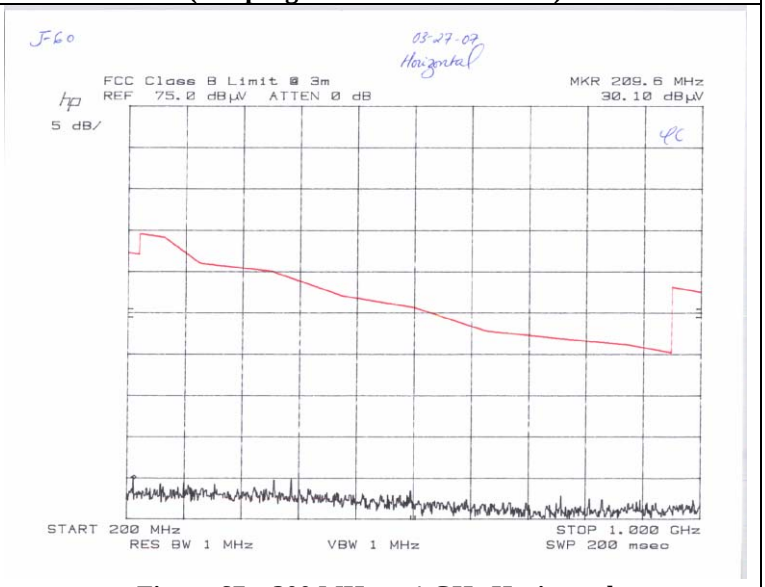

Figure 67 200 MHz to 1 GHz Horizontal (FM programmed to 107.9 MHz)

4.3.5.2 Xpress Car Cradle with Car Antenna Only Data

The Xpress-R unit is placed in the Xpress Car Cradle and is set to receive a live XM signal.

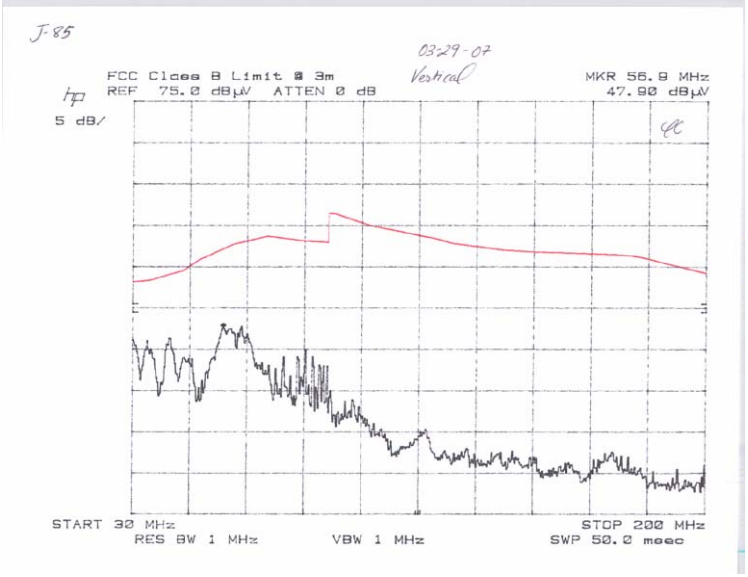

Figure 68 30 MHz to 200 MHz Vertical (FM programmed to 88.1 MHz)

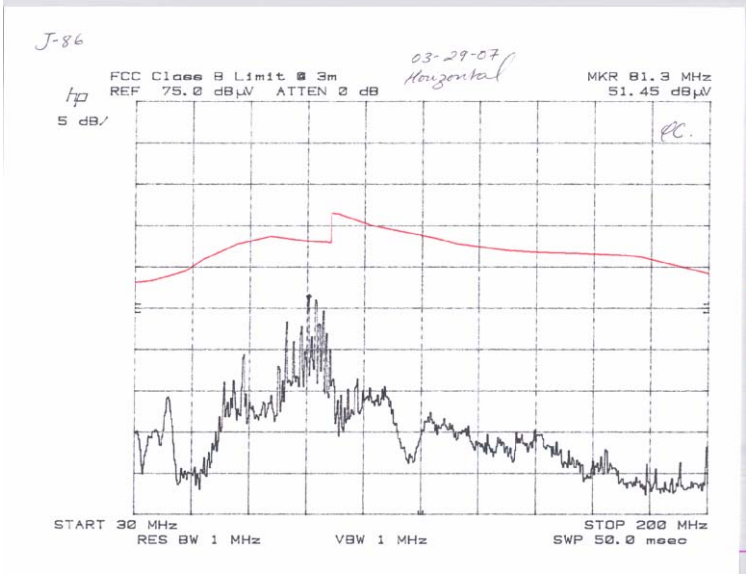

Figure 69 30 MHz to 200 MHz Horizontal (FM programmed to 88.1 MHz)

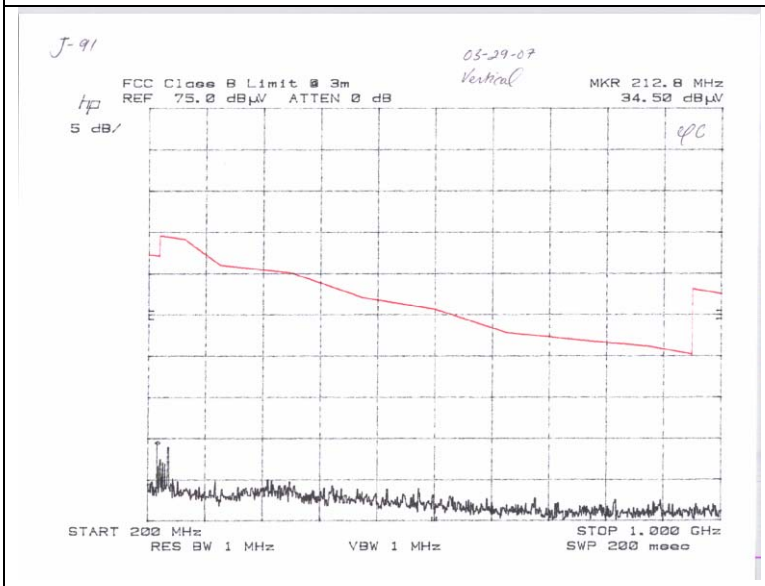

Figure 70 200 MHz to 1 GHz Vertical (FM programmed to 88.1 MHz)

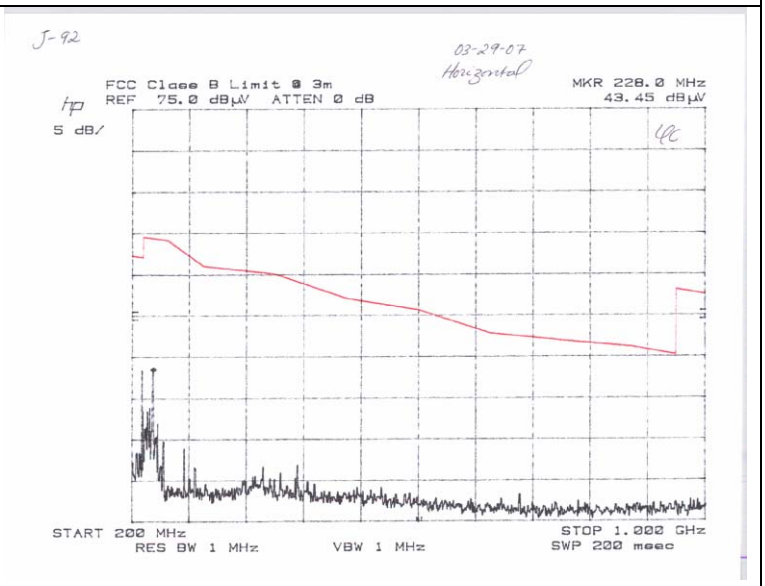

Figure 71 200 MHz to 1 GHz Horizontal (FM programmed to 88.1 MHz)

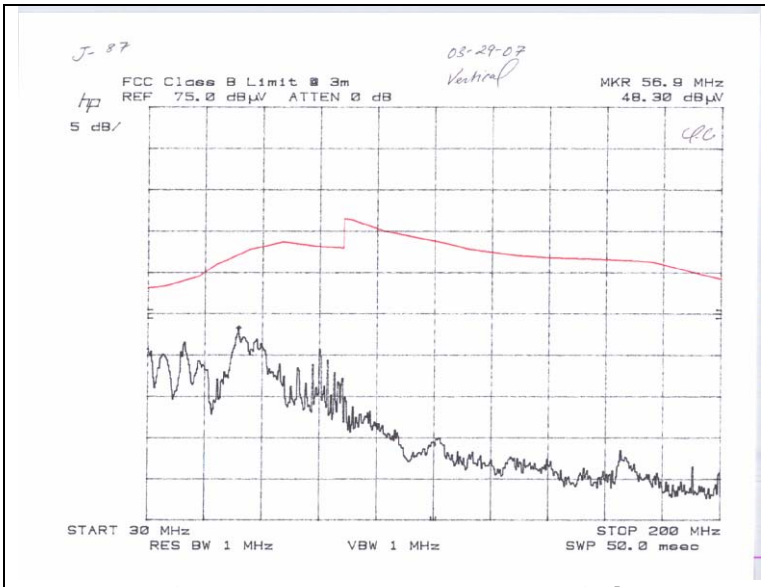

Figure 72 30 MHz to 200 MHz Vertical (FM programmed to 96.9 MHz)

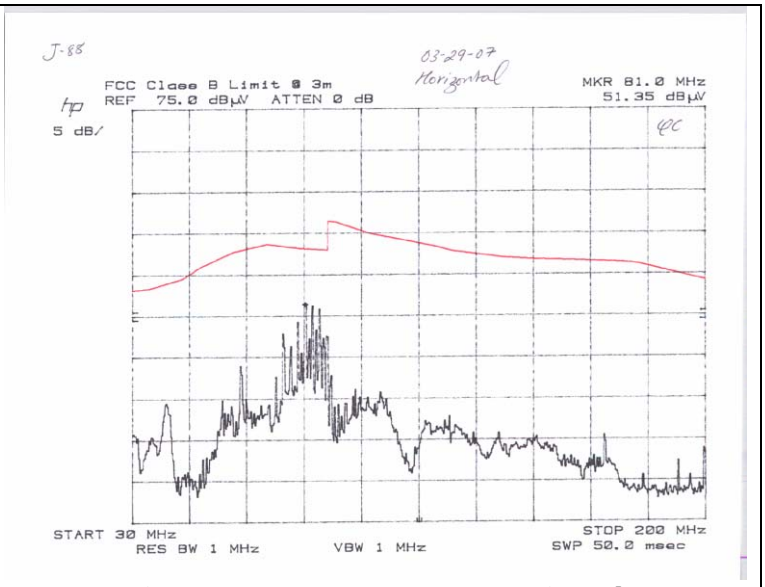

Figure 73 30 MHz to 200 MHz Horizontal (FM programmed to 96.9 MHz)

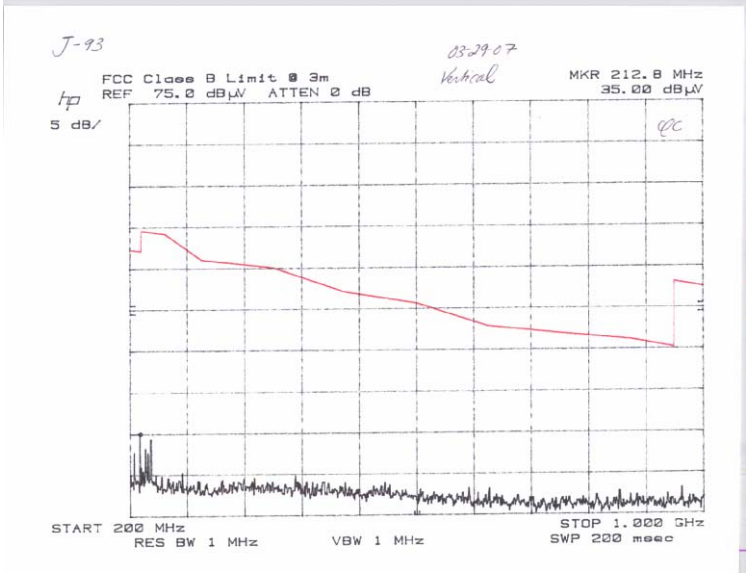

Figure 74 200 MHz to 1 GHz Vertical (FM programmed to 96.9 MHz)

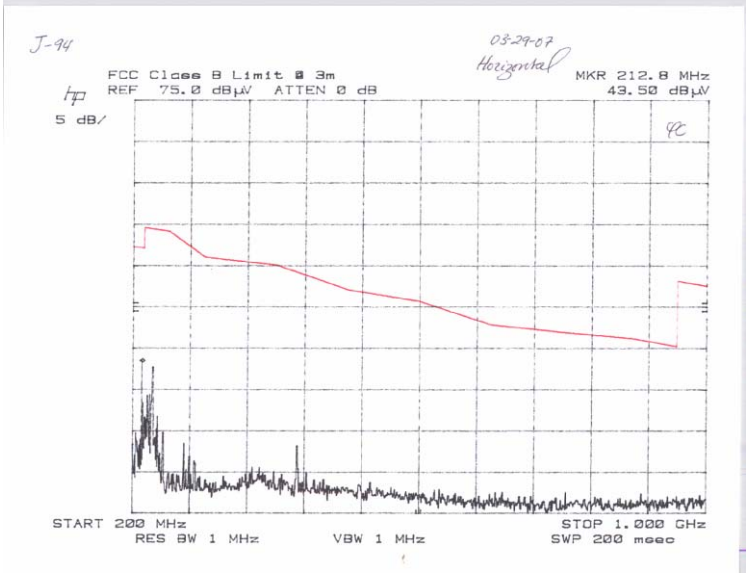

Figure 75 200 MHz to 1 GHz Horizontal (FM programmed to 96.9 MHz)

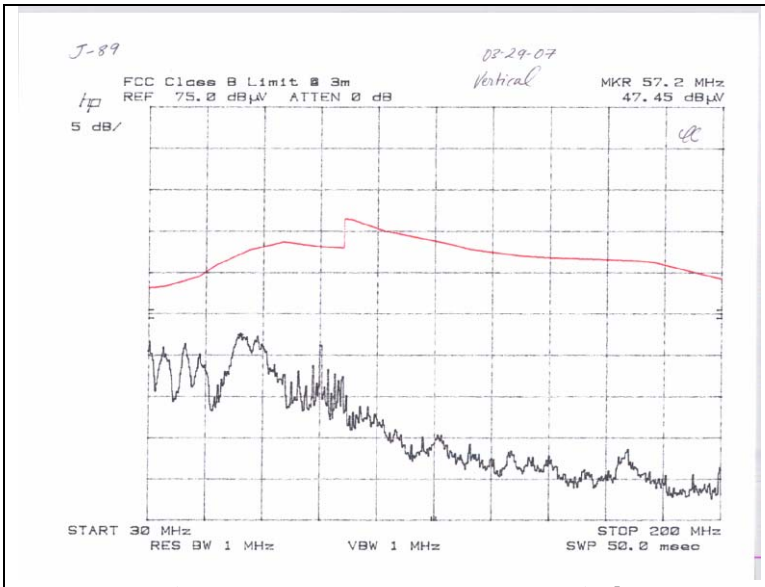

Figure 76 30 MHz to 200 MHz Vertical (FM programmed to 107.9 MHz)

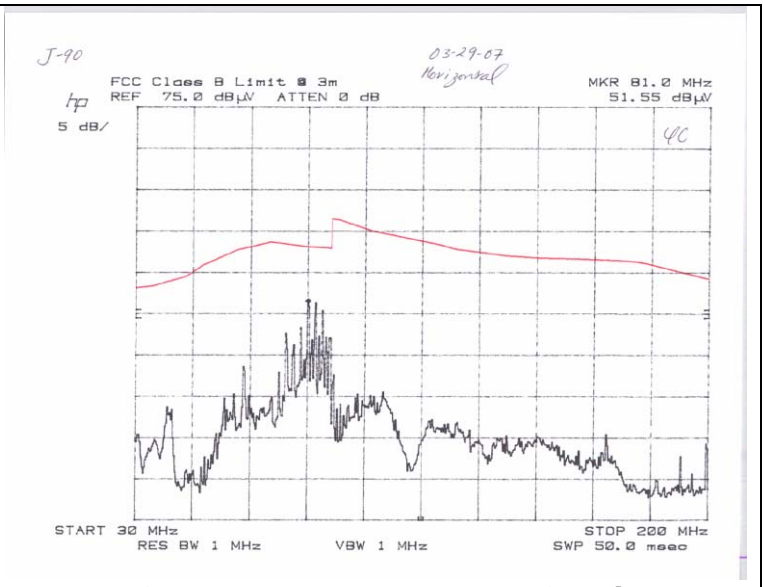

Figure 77 30 MHz to 200 MHz Horizontal (FM programmed to 107.9 MHz)

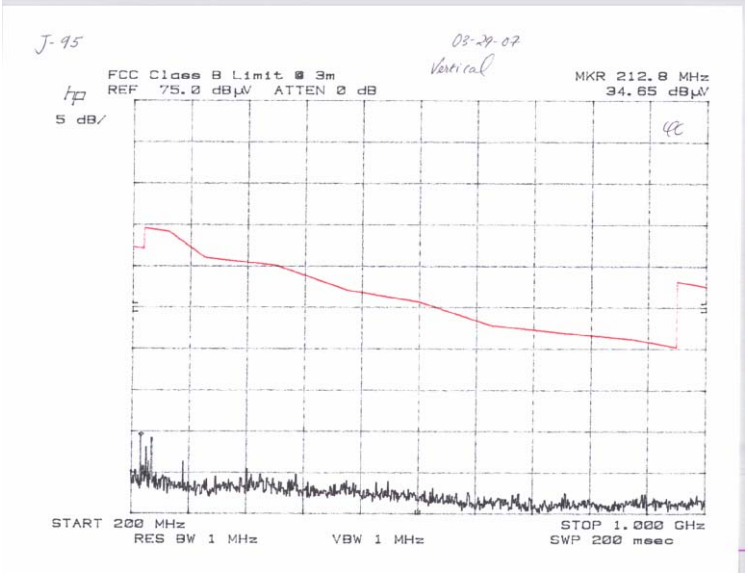

Figure 78 200 MHz to 1 GHz Vertical (FM programmed to 107.9 MHz)

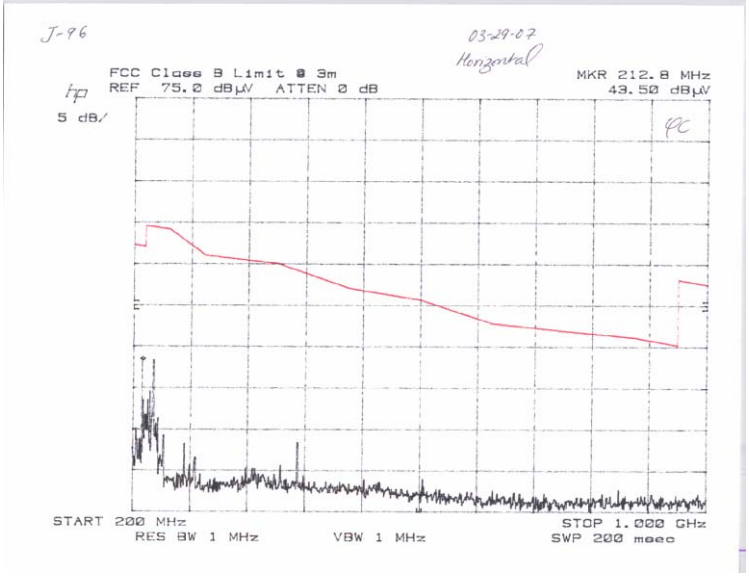

Figure 79 200 MHz to 1 GHz Horizontal (FM programmed to 107.9 MHz)

4.3.6 Data Table

The following table shows peak emissions that were within 5dB of the limit for Figures 4 to 79.

		Frequency	Peak Voltage	Quasi peak	Correction Factor	Corrected Peak Voltage	FCC Limit	Margin to Limit
Figure	Plot ID	(MHz)	(dBµV)	(dBµV)	(dB)	(dBµV/m)	dBµV/m	dB
4	J-37	39.5	51.5		13.89	37.61	40	2.39
4	J-37	79.0	54.65		18.21	36.44	40	3.56
8	J-37B	34.8	52.1		13.34	38.76	40	1.24
8	J-37B	78.9	53.5		18.21	35.29	40	4.71
12	J-37C	34.8	50.55		13.34	37.21	40	2.79
12	J-37C	38.6	50.0		13.79	36.21	40	3.79
44	J-97	45.0	50.0		14.55	35.45	40	4.55
48	J-99	45.0	49.45		14.55	34.9	40	5.1
52	J101	45.0	50.1		14.55	35.55	40	4.45

Table 3: Measurements from FAU 3-m chamber

It can be observed from the previous data that the emissions did not exceed the limit. Hence, the device is in compliance.