

# ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR FCC CERTIFICATION


**Test Report No.** : E073R-011  
**AGR No.** : A072A-036  
**Applicant** : DVS Korea Co., Ltd.  
**Address** : 497-3, Sangha-dong, Giheung-gu, Youngin-si, Gyeonggi-do, Korea  
**Manufacturer** : DVS Korea Co., Ltd.  
**Address** : 497-3, Sangha-dong, Giheung-gu, Youngin-si, Gyeonggi-do, Korea  
**Type of Equipment** : 4INCH WIDE TOUCH SCREEN NAVIGATION (FM Transmitter)  
**FCC ID.** : PGJVXA-4000  
**Model Name** : VXA-4000  
**Multiple Model Name** : SCOUT355  
**Serial number** : N/A  
**Total page of Report** : 18 pages (including this page)  
**Date of Incoming** : February 20, 2007  
**Date of Issuing** : March 08, 2007

## SUMMARY


The equipment complies with the regulation of *FCC CRF 47 PART 15, SUBPART C, SECTION 15.239*.

This test report contains only the results of a single test of the sample supplied for the examination. It is not a general valid assessment of the features of the respective products of the mass-production.

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## **CONTENTS**

**PAGE**

<b>1. VERIFICATION OF COMPLIANCE .....</b>	<b>3</b>
<b>2. GENERAL INFORMATION.....</b>	<b>4</b>
<b>2.1 PRODUCT DESCRIPTION.....</b>	<b>4</b>
<b>2.2 MODEL DIFFERENCES.....</b>	<b>4</b>
<b>2.3 RELATED SUBMITTAL(S) / GRANT(S).....</b>	<b>4</b>
<b>2.4 TEST SYSTEM DETAILS .....</b>	<b>4</b>
<b>2.5 TEST METHODOLOGY.....</b>	<b>4</b>
<b>2.6 TEST FACILITY.....</b>	<b>4</b>
<b>3. SYSTEM TEST CONFIGURATION.....</b>	<b>5</b>
<b>3.1 JUSTIFICATION.....</b>	<b>5</b>
<b>3.2 EUT EXERCISE SOFTWARE .....</b>	<b>5</b>
<b>3.3 CABLE DESCRIPTION FOR THE EUT .....</b>	<b>5</b>
<b>3.4 EQUIPMENT MODIFICATIONS.....</b>	<b>5</b>
<b>3.5 CONFIGURATION OF TEST SYSTEM.....</b>	<b>5</b>
<b>3.6 ANTENNA REQUIREMENT .....</b>	<b>6</b>
<b>4. PRELIMINARY TEST .....</b>	<b>6</b>
<b>4.1 AC POWER LINE CONDUCTED EMISSION TEST .....</b>	<b>6</b>
<b>4.2 RADIATED EMISSION TEST .....</b>	<b>6</b>
<b>5. FINAL RESULT OF MEASUREMENT .....</b>	<b>7</b>
<b>5.1 CONDUCTED EMISSION TEST .....</b>	<b>7</b>
<b>5.2 RADIATED EMISSION TEST (WITHIN THE PERMITTED 200 KHZ BAND).....</b>	<b>9</b>
<b>5.2.1 Operating Condition: Used Car Battery.....</b>	<b>9</b>
<b>5.2.2 Operating Condition: Used AC/DC Adaptor .....</b>	<b>10</b>
<b>5.3 RADIATED EMISSION TEST (OUTSIDE OF THE SPECIFIED 200 KHZ BAND) .....</b>	<b>11</b>
<b>5.3.1 Operating Condition: Used Car Battery.....</b>	<b>11</b>
<b>5.3.2 Operating Condition: Used AC/DC Adaptor .....</b>	<b>12</b>
<b>5.4 BANDWIDTH OF THE OPERATING FREQUENCY .....</b>	<b>13</b>
<b>5.5 TUNING RANGE OF THE OPERATING FREQUENCY.....</b>	<b>15</b>
<b>6. FIELD STRENGTH CALCULATION .....</b>	<b>17</b>
<b>7. LIST OF TEST EQUIPMENT .....</b>	<b>18</b>

**1. VERIFICATION OF COMPLIANCE**

-. APPLICANT : DVS Korea Co., Ltd.  
-. ADDRESS : 497-3, Sangha-dong, Giheung-gu, Youngin-si, Gyeonggi-do, Korea  
-. CONTACT PERSON : Mr. Hyundoo, Kim / Manager  
-. TELEPHONE NO : +82-31-546-3142  
-. FCC ID : PGJVXA-4000  
-. MODEL NAME : VXA-4000  
-. SERIAL NUMBER : N/A  
-. DATE : March 08, 2007

EQUIPMENT CLASS	DXX – Part 15 Low Power Communication Device Transmitter
E.U.T. DESCRIPTION	4INCH WIDE TOUCH SCREEN NAVIGATION (FM Transmitter)
THIS REPORT CONCERNS	ORIGINAL GRANT
MEASUREMENT PROCEDURES	Charter 13 of ANSI C63.4: 2003
TYPE OF EQUIPMENT TESTED	PRE-PRODUCTION
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	CERTIFICATION
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC PART 15 SECTION 15.239
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	No
FINAL TEST WAS CONDUCTED ON	3 METER OPEN AREA TEST SITE

-. The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

## 2. GENERAL INFORMATION

### 2.1 Product Description

The DVS Korea Co., Ltd., Model VXA-4000 (referred to as the EUT in this report) is a 4INCH WIDE TOUCH SCREEN NAVIGATION that has a function for transmitting of FM broadcasting frequency range. This report covers the FM transmitter from 88.1 MHz to 88.7 MHz for audio signal of FM radio receiver. Product specification described herein was obtained from product data sheet or user's manual.

CHASSIS TYPE	Plastic
LIST OF EACH OSC. or CRY. FREQ.(FREQ.>=1MHz)	12 MHz and 7.6 MHz on the main board
NUMBER OF LAYERS	8 Layers: Main Board, 6 Layers: Sub Board
POWER REQUIREMENT	DC 5V from a car battery or AC/DC adaptor
EXTERNAL CONNECTOR	DC In, Audio Out, GPS(Used only European), SD Card In

### 2.2 Model Differences

-. The difference(s) compared to the EUT is as follows:

	Model Name	Model Differences
Basic Model	VXA-4000	-
Multiple Models	SCOUT355B	This model is same to basic model, except for model designation only.

### 2.3 Related Submittal(s) / Grant(s)

-. Original submittal only

### 2.4 Test System Details

The model numbers for all the equipments which were used in the tested system is:

Model	Manufacturer	FCC ID	Description	Connected to
VXA-4000	DVS Korea Co., Ltd.	DoC	4INCH WIDE TOUCH SCREEN NAVIGATION (EUT)	-
CP79A0050V2000U	NCE	N/A	AC/DC Adaptor	EUT
N/A	N/A	N/A	Headset	EUT

### 2.5 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4: 2003. Radiated testing was performed at a distance of 3 meters from EUT to the antenna.

### 2.6 Test Facility

The open area test site and conducted measurement facilities are located on at 307-51 Daessangryung-Ri, Chowol-Eup, Kwangju-City, Kyunggi-Do, 464-080, Korea. Description details of test facilities were submitted to the Commission on August 30, 2005. (Registration Number: 340658)

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**HEAD OFFICE** : #505 SK APT. Factory 223-28, Sangdaewon 1 Dong, Jungwon-Gu, Seongnam-City, Kyunggi-Do, 462-705, Korea  
(TEL: +82-31-746-8500, FAX: +82-31-746-8700)

**EMC Testing Dept** : 307-51 Daessangryung-Ri, Chowol-Eup, Kwangju-City, Kyunggi-Do, 464-860, Korea. (TEL: +82-31-765-8289, FAX: +82-31-766-2904)

### 3. SYSTEM TEST CONFIGURATION

#### 3.1 Justification

This device was configured for testing in a typical way as a normal customer is supposed to be used. During the test, the following components were installed inside of the EUT.

DEVICE TYPE	MANUFACTURER	MODEL/PART NUMBER	FCC ID
Main Board	N/A	VXA4000 MAIN	N/A
LCD Panel	InnoLux	PT035TN01	N/A
GPS Module	LEADTEK	LR9552	N/A
Keypad Board	N/A	N/A	N/A
Cradle Board	N/A	N/A	N/A

#### 3.2 EUT exercise Software

The Model, VXA-4000 is included a FM transmitter designed to operate on function in the 88.1 ~ 88.7 MHz. The EUT does not have an audio input port, so the EUT played mp3 file that was stored in the SD memory and than transmitted audio signal with the maximum output volume.

#### 3.3 Cable Description for the EUT

Ports Name	Shielded	Ferrite Bead	Metal Hood	Length (m)	Connected to
DC In	N	N	EUT END	1.2	-
Audio Out	N	N	BOTH END	1.5	Headset

#### 3.4 Equipment Modifications

-. None

#### 3.5 Configuration of Test System

**Line Conducted Test:** The EUT was connected to adaptor and the power line of adaptor was connected to LISN. All supporting equipments were connected to another LISN. Preliminary Power line Conducted Emission test was performed by using the procedure in ANSI C63.4: 2003 7.2.3 and ICES-003 to determine the worse operating conditions.

**Radiated Emission Test:** Preliminary radiated emissions test were conducted using the procedure in ANSI C63.4: 2003 8.3.1.1 and 13.1.4.1 to determine the worse operating conditions. Final radiated emission tests were conducted at 3 meter open area test site.

**Occupied Bandwidth Measurement:**

This measurement is performed with the antenna located close enough to give a full-scale deflection of the modulated carrier on the spectrum analyzer.

**Tuning Range Measurement:**

This measurement is performed with the search coil located close to the EUT enough to get a full-scale of the modulated carrier on the spectrum analyzer.

**3.6 Antenna Requirement**

For intentional device, according to section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

**Antenna Construction:**

FM transmitter antenna of the EUT is fixed inside the EUT, no consideration of replacement by the user.

**4. PRELIMINARY TEST****4.1 AC Power line Conducted Emission Test**

During Preliminary Test, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
Transmit the RF Signal continuously	X

**4.2 Radiated Emission Test**

During Preliminary Test, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
Transmit the RF Signal continuously	X

## 5. FINAL RESULT OF MEASUREMENT

Preliminary test was done in normal operation mode. And the final measurement was selected for the maximized emission level

### 5.1 Conducted Emission Test

Humidity Level : 36 % Temperature: 20 °C  
 Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.207 (a)  
 Type of Test : Low Power Communication Device Transmitter  
 Result : PASSED BY -9.14 dB at 0.16 MHz under peak detector mode

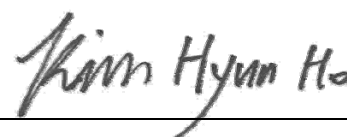
EUT : 4INCH WIDE TOUCH SCREEN NAVIGATION Date: March 02, 2007  
 Operating Condition : Transmit the RF signal.  
 Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

Frequency (MHz)	Line	Peak (dBuV)		Margin (dB)
		Emission level	Q.P Limits	
0.16	N	56.32	65.46	-9.14
0.21	N	51.51	63.21	-11.70
0.35	H	49.29	58.96	-9.67
0.69	H	43.83	56.00	-12.17
1.04	N	43.55	56.00	-12.45
1.71	H	43.77	56.00	-12.23
Frequency (MHz)	Line	Average (dBuV)		Margin (dB)
		Emission level	Limits	
0.16	N	31.86	55.46	-23.60
0.21	N	17.49	53.21	-35.72
0.35	H	29.95	48.96	-19.01
0.69	H	25.56	46.00	-20.44

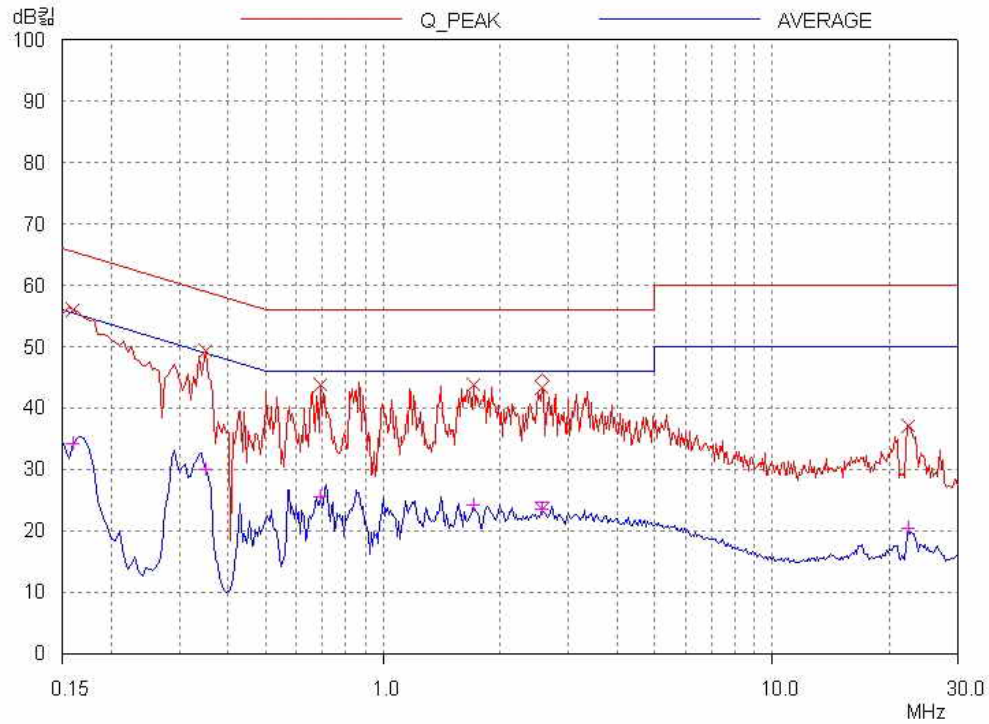
Line Conducted Emission Tabulated Data

Remark : "H": Hot Line, "N": Neutral line

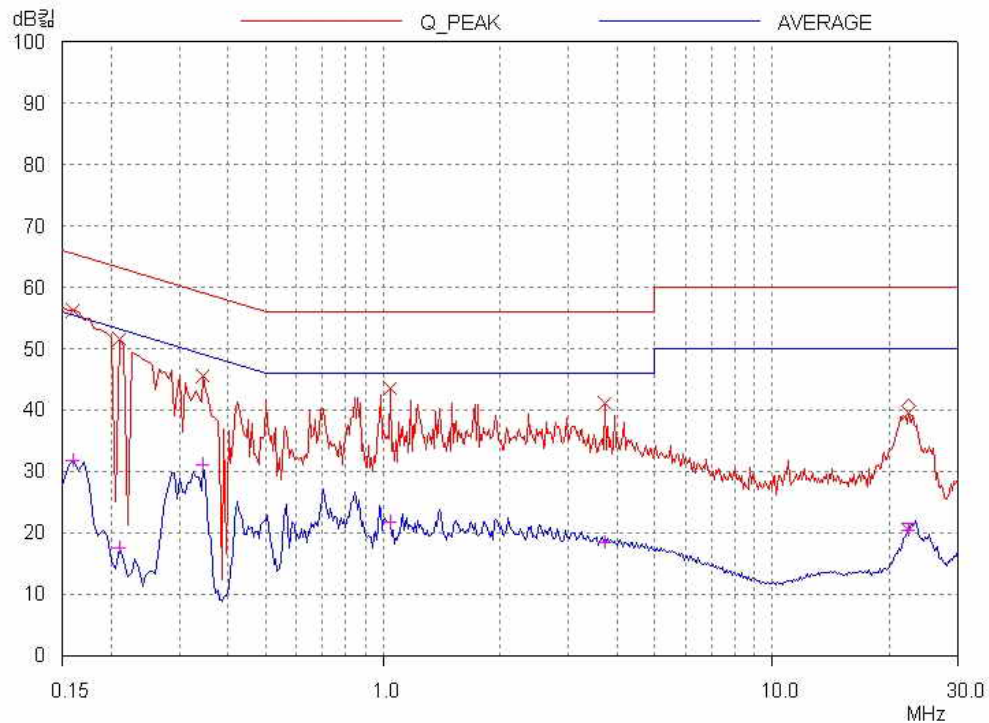
See next page for an overview sweep performed with peak and average detector.



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## HOT LINE



## NEUTRAL LINE

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**5.2 Radiated Emission Test (Within the permitted 200 kHz band)**

The following table shows the highest levels of radiated emission on both polarizations of horizontal and vertical.

**5.2.1 Operating Condition: Used Car Battery**

Humidity Level : 52 % Temperature: 15 °C  
 Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.239 (b)  
 Type of Test : Low Power Communication Device Transmitter  
 Result : PASSED BY -6.46 dB at 88.50 MHz under average detector mode

EUT : 4INCH WIDE TOUCH SCREEN NAVIGATION Date: March 02, 2007  
 Operating Condition : Transmit the RF signal.  
 Distance : 3 Meter

Radiated Emission			Ant	Correction Factors		Total	Limit (dBuV/m)	Margin (dB)
Freq. (MHz)	Amp. (dBuV)	Detect Mode	Pol.	Ant. (dBuV/m)	Cable (dB)	Amp. (dBuV/m)		
88.50	34.10	Peak	H	8.27	2.37	45.24	68.00	-22.76
	30.60	Average	H	8.27	2.37	41.24	48.00	-6.76
88.50	34.50	Peak	V	8.27	2.37	45.94	68.00	-22.06
	30.90	Average	V	8.27	2.37	41.54	48.00	-6.46

Radiated Emission Tabulated Data

Remark: Per 15.31(m), one channel (middle) was tested because the EUT's frequency range is less than 1 MHz.



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## 5.2.2 Operating Condition: Used AC/DC Adaptor

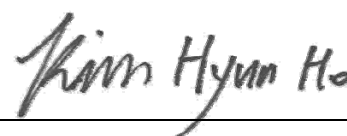
Humidity Level : 52 % Temperature: 15 °C  
 Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.239 (b)  
 Type of Test : Low Power Communication Device Transmitter  
 Result : PASSED BY -7.26 dB at 88.50 MHz under average detector mode

EUT : 4INCH WIDE TOUCH SCREEN NAVIGATION Date: March 02, 2007  
 Operating Condition : Transmit the RF signal.  
 Distance : 3 Meter

Radiated Emission			Ant	Correction Factors		Total	Limit (dBuV/m)	Margin (dB)
Freq. (MHz)	Amp. (dBuV)	Detect Mode	Pol.	Ant. (dBuV/m)	Cable (dB)	Amp. (dBuV/m)		
88.50	34.60	Peak	H	8.27	2.37	45.24	68.00	-22.76
	29.40	Average	H	8.27	2.37	40.04	48.00	-7.96
88.50	35.30	Peak	V	8.27	2.37	45.94	68.00	-22.06
	30.10	Average	V	8.27	2.37	40.74	48.00	-7.26

Radiated Emission Tabulated Data

Remark: Per 15.31(m), one channel (middle) was tested because the EUT's frequency range is less than 1 MHz.



Tested by: Hyun-Ho, Kim / Test Engineer

**5.3 Radiated Emission Test (Outside of the specified 200 kHz band)**

The following table shows the highest levels of radiated emission on both polarizations of horizontal and vertical.

**5.3.1 Operating Condition: Used Car Battery**

Humidity Level : 52 % Temperature: 15 °C  
 Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.209 (a)  
 Type of Test : Low Power Communication Device Transmitter  
 Result : PASSED BY -10.36 dB at 54.22 MHz

EUT : 4INCH WIDE TOUCH SCREEN NAVIGATION Date: March 02, 2007  
 Operating Condition : Transmit the RF signal.  
 Frequency range : 30MHz – 1000MHz  
 Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)  
 Distance : 3 Meter  
 Remark : Other emissions

Radiated Emission		Ant	Correction Factors		Total	FCC CLASS B	
Freq. (MHz)	Amp. (dBuV)	Pol.	Ant. (dBuV/m)	Cable (dB)	Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
54.22	18.40	H	9.64	1.60	29.64	40.00	-10.36
124.20	14.20	V	13.29	2.66	30.15	43.52	-13.37
253.00	11.60	V	17.62	3.38	32.60	46.02	-13.42
354.40	12.40	H	16.18	4.43	33.01	46.02	-13.01
370.90	9.80	V	16.68	4.53	31.01	46.02	-15.01



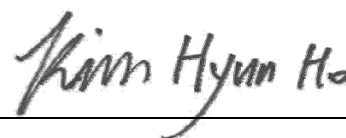
Tested by: Hyun-Ho, Kim / Test Engineer

**5.3.2 Operating Condition: Used AC/DC Adaptor**

Humidity Level : 52 % Temperature: 15 °C  
 Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.209 (a)  
 Type of Test : Low Power Communication Device Transmitter  
 Result : PASSED BY -10.55 dB at 55.60 MHz

EUT : 4INCH WIDE TOUCH SCREEN NAVIGATION Date: March 02, 2007  
 Operating Condition : Transmit the RF signal.  
 Frequency range : 30MHz – 1000MHz  
 Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)  
 Distance : 3 Meter  
 Remark : Other emissions

Radiated Emission		Ant	Correction Factors		Total	FCC CLASS B	
Freq. (MHz)	Amp. (dBuV)	Pol.	Ant. (dBuV/m)	Cable (dB)	Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
55.60	18.70	H	9.13	1.62	29.45	40.00	-10.55
111.30	17.20	H	11.84	2.53	31.57	43.52	-11.95
124.30	16.30	V	13.30	2.66	32.26	43.52	-11.26
252.10	12.20	V	17.60	3.36	33.16	46.02	-12.86
305.30	16.90	H	14.23	3.68	34.81	46.02	-11.21



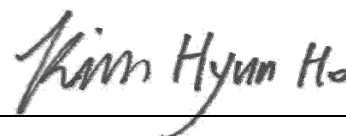
Tested by: Hyun-Ho, Kim / Test Engineer

**5.4 Bandwidth of the operating frequency**

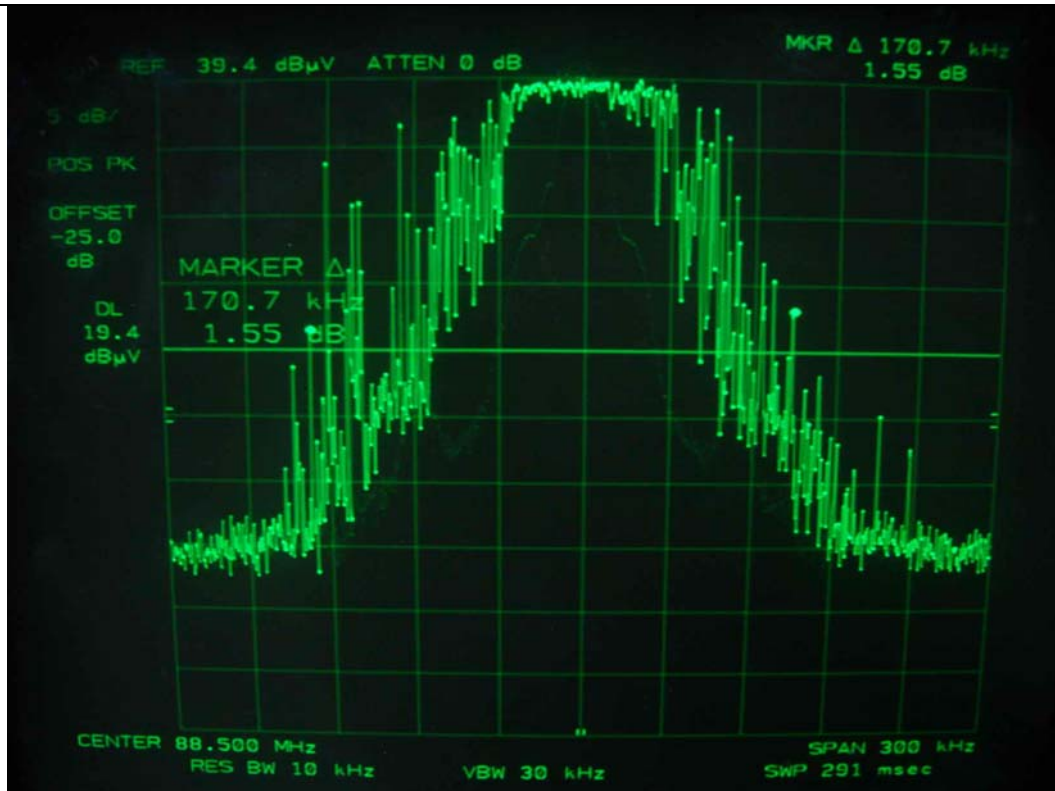
Humidity Level : 46 % Temperature: 18 °C  
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.239 (a)  
Result : PASSED

EUT : 4INCH WIDE TOUCH SCREEN NAVIGATION Date: March 02, 2007  
Operating Condition : Transmit the RF signal.  
Minimum Resolution  
Bandwidth : 10 kHz

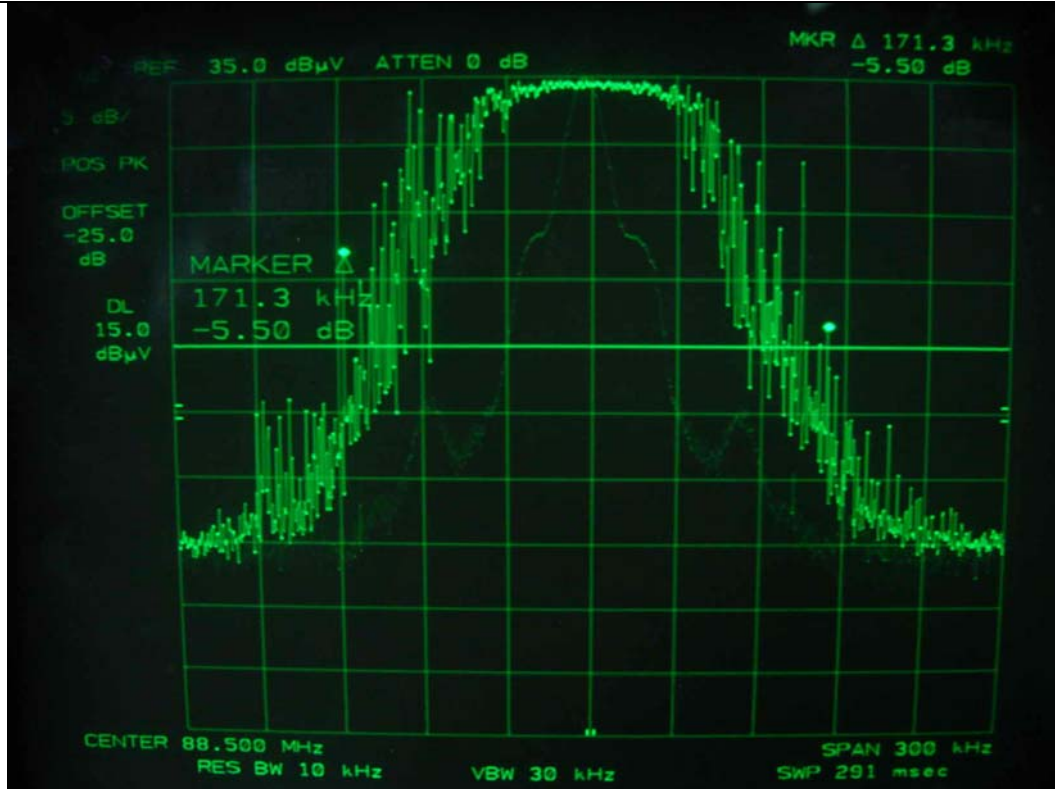
Operating Condition	Frequency (MHz)	Measured Value (kHz)	Limit (kHz)	Margin (kHz)
Used Car Battery	88.50	170.7	200	-29.3
Used AC/DC Adaptor	88.50	171.3		-28.7



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Used Car Battery - Middle Frequency (88.5 MHz)



Used AC/DC Adaptor - Middle Frequency (88.5 MHz)

**5.5 Tuning Range of the operating frequency**

Humidity Level : 46 % Temperature: 18 °C  
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.239 (a)  
Result : PASSED

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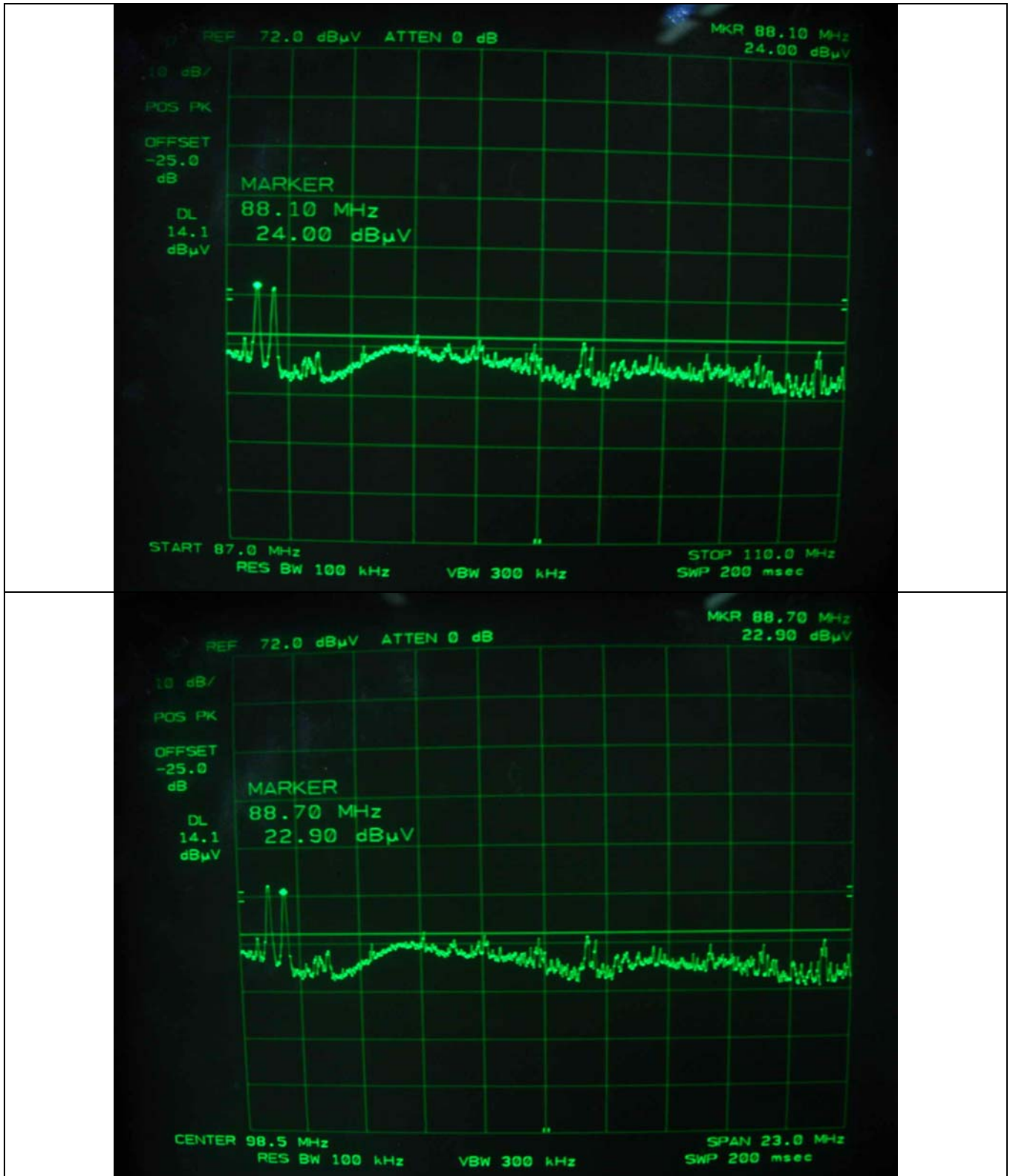
EUT : 4INCH WIDE TOUCH SCREEN NAVIGATION Date: March 02, 2007  
Operating Condition : The lowest and highest frequency was adjusted by manual using up/down button on the side of the EUT and the spectrum was in max hold mode for capturing the spectrum.  
Test Result : Met the requirement. Refer to test data in next page.



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## 6. FIELD STRENGTH CALCULATION

Meter readings are compared to the specification limit correcting for antenna and cable losses

+ Meter reading (dBuV)

+ Cable Loss (dB)

+ Antenna Factor (Loss) (dB/meter)

---

= Corrected Reading (dBuV/meter)

- Specification Limit (dBuV/meter)

= dB Relative to Spec (+/- dB)

**7. LIST OF TEST EQUIPMENT**

No.	EQUIPMENTS	MFR.	MODEL	SER. NO.	LAST CAL	DUE CAL	USE
1.	Test receiver	R/S	ESVS10	827864/005	DEC/06	12MONTH	■
2.	Test receiver	R/S	ESHS 10	834467/007	MAY/06	12MONTH	■
3.	Spectrum analyzer	R/S	FSP	100017	JUN/06	12MONTH	■
4.	TRILOG Broadband Antenna	Schwarzbeck	VULB9163	VULB9163 166	MAY/06	12MONTH	
5.	Biconical antenna	EMCO	3110	9003-1121	JUN/06	12MONTH	
		Schwarzbeck	VHA9103	91031852	FEB/07		■
6.	Log Periodic antenna	EMCO	3146	9001-2614	JUN/06	12MONTH	
		Schwarzbeck	9108-A(494)	62281001	FEB/07		■
7.	LISN	EMCO	3825/2	9109-1867	JUN/06	12MONTH	■
				9109-1869	JUN/06		
		Schwarzbeck	NSLK 8126	8126-404	JUL/06		■
8.	Position Controller	HD GmbH	HD100	N/A	N/A	N/A	■
9.	Turn Table	HD GmbH	DS420S	N/A	N/A	N/A	■
10.	Antenna Master	HD GmbH	MA240	N/A	N/A	N/A	■