

# ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR FCC CERTIFICATION

Test Report No. : E065R-012  
AGR No. : A064A-149R  
Applicant : DVS Korea Co., Ltd.  
Address : 196, Geumgok-Dong, Bundang-Gu, Seongnam-Si, Gyeonggi-Do, Korea  
Manufacturer : DVS Korea Co., Ltd.  
Address : 196, Geumgok-Dong, Bundang-Gu, Seongnam-Si, Gyeonggi-Do, Korea  
Type of Equipment : 7 Inch Navigation System (FM Transmitter)  
FCC ID. : PGJVXA3000  
Model Name : VXA-3000  
Serial number : N/A  
Total page of Report : 11 pages (including this page)  
Date of Incoming : April 24, 2006  
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## 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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**1. VERIFICATION OF COMPLIANCE**

- . APPLICANT : DVS Korea Co., Ltd.  
- . ADDRESS : 196, Geumgok-Dong, Bundang-Gu, Seongnam-Si, Gyeonggi-Do, Korea  
- . CONTACT PERSON : Mr. Insang, Oh / Associate Engineer  
- . TELEPHONE NO : +82-31-710-4929  
- . FCC ID : PGJVXA3000  
- . MODEL NO/NAME : VXA-3000  
- . SERIAL NUMBER : N/A  
- . DATE : May 09, 2006

EQUIPMENT CLASS	DXX – Part 15 Low Power Communication Device Transmitter
E.U.T. DESCRIPTION	7 Inch Navigation System (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-3000 (referred to as the EUT in this report) is a 7 Inch Navigation System that has a function for transmitting of FM broadcasting frequency range. This report covers the FM transmitter from 88.1 MHz to 88.9 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)	16.9344 MHz, 24.576 MHz, 27 MHz and 7.6 MHz on the main board
NUMBER OF LAYERS	6 Layers
POWER REQUIREMENT	DC 12V, 1A from a car battery
EXTERNAL CONNECTOR	DC In, Audio/Video In, Audio Out, COMM, SAFETY USB Port for service man only

### 2.2 Model Differences

- The difference(s) compared to the EUT is as follows: None

### 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-3000	DVS Korea Co., Ltd.	PGJVXA3000	7 Inch Navigation System (EUT)	-
N/A	N/A	N/A	Earphone	EUT
LT 416	Leader	N/A	Pattern Generator	EUT

### 2.5 Test Methodology

The radiated testing was performed according to the procedures in chapter 13 of ANSI C63.4: 2003 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 April 04, 2003. (Registration Number: 340658)

### 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	VXA3000 MAIN Rev 0.4	N/A
LCD	N/A	AT070TN01	N/A
Inverter	N/A	B1L07D12B	N/A
GPS Module	N/A	C3-470A	N/A

#### 3.2 EUT exercise Software

The EUT is included a FM transmitter designed to transmit function in the 88.1 ~ 88.9 MHz. During the testing, the EUT was set on audio setup with FM transmission and the transmitter function is activated and then the volume control of the EUT was set at maximized position during the testing.

#### 3.3 Cable Description for the EUT

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

#### 3.4 Equipment Modifications

- None

#### 3.5 Configuration of Test System

**Line Conducted Test:** This test is not performed because the EUT is operated by car battery and is not connected to public low-voltage distribution system.

**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.

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EMC-002 (Rev.0)

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### 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)
This test is not performed because the EUT is operated by car battery and is not connected to public low-voltage distribution system.	

### 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 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.

Humidity Level	: <u>44 %</u>	Temperature: <u>16 °C</u>
Limits apply to	: <u>FCC CFR 47, PART 15, SUBPART C, SECTION 15.239 (b)</u>	
Type of Test	: <u>Low Power Communication Device Transmitter</u>	
Result	: <u>PASSED BY -6.80 dB at 88.50 MHz</u>	

EUT	: 7 Inch Navigation System	Date: May 09, 2006
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	28.90	Peak	H	7.97	1.73	38.60	48.00	-9.40
88.50	31.50	Peak	V	7.97	1.73	41.20	48.00	-6.80

#### 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 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.

Humidity Level	: <u>45 %</u>	Temperature: <u>18 °C</u>
Limits apply to	: <u>FCC CFR 47, PART 15, SUBPART C, SECTION 15.209 (a)</u>	
Type of Test	: <u>Low Power Communication Device Transmitter</u>	
Result	: <u>PASSED BY -7.97 dB at 162.00 MHz</u>	

EUT	: 7 Inch Navigation System	Date: April 24, 2006
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)		Ant. (dBuV/m)	Cable (dB)		Amp. (dBuV/m)	Limit (dBuV/m)
65.32	16.00	V	6.40	1.50	23.90	40.00	-16.10
102.84	15.91	V	10.40	1.90	28.21	43.52	-15.31
120.53	17.61	V	12.71	2.01	32.33	43.52	-11.19
162.00	18.10	H	15.05	2.40	35.55	43.52	-7.97
216.00	14.20	H	16.63	2.93	33.76	43.52	-9.76
378.01	11.20	H	16.40	4.31	31.91	46.02	-14.11



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### 5.3 Bandwidth of the operating frequency

Humidity Level : 45 % Temperature: 18 °C  
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.239 (a)  
Result : PASSED

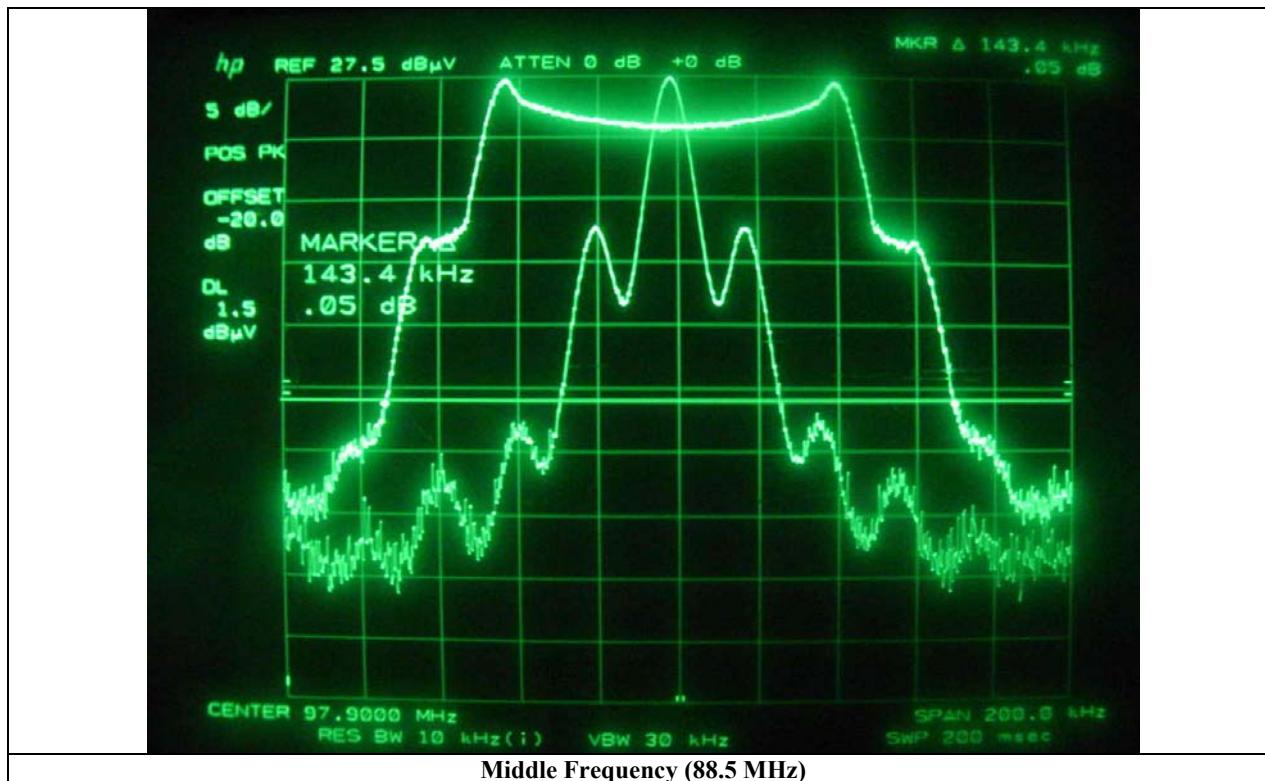
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EUT : 7 Inch Navigation System Date: April 24, 2006  
Operating Condition : Transmit the RF signal.  
Minimum Resolution :  
Bandwidth : 10 kHz



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Tested by: Dong-Yub, Lee / Test Engineer



## 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)

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= 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/05	12MONTH	■
2.	Test receiver	R/S	ESHS 10	834467/007	MAY/05	12MONTH	■
3.	Spectrum analyzer	HP	8566B	3407A08547	JUL/05	12MONTH	
4.	Spectrum analyzer	HP	8568B	3109A05456	APR/06	12MONTH	■
5.	RF preselector	HP	85685A	3107A01264	APR/06	12MONTH	■
6.	Quasi-Peak Adapter	HP	8574B	2811A01432	APR/06	12MONTH	■
7.	TRILOG Broadband Antenna	Schwarzbeck	VULB9163	VULB9163 166	APR/06	12MONTH	
8.	Biconical antenna	EMCO	3110	9003-1121	FEB/06	12MONTH	
		Schwarzbeck	VHA9103	91031852	FEB/06		■
9.	Log Periodic antenna	EMCO	3146	9001-2614	FEB/06	12MONTH	
		Schwarzbeck	9108-A(494)	62281001	FEB/06		■
10.	LISN	EMCO	3825/2	9109-1867	JUL/05	12MONTH	■
				9109-1869	JUL/05		
		Schwarzbeck	NSLK 8126	8126-404	AUG/05		■
11.	Position Controller	HD GmbH	HD100	N/A	N/A	N/A	■
12.	Turn Table	HD GmbH	DS420S	N/A	N/A	N/A	■
13.	Antenna Master	HD GmbH	MA240	N/A	N/A	N/A	■