

# ELECTROMAGNETIC EMISSION COMPLIANCE REPORT FOR LOW-POWER, NON-LICENSED TRANSMITTER

**Test Report No.** : E072R-035

**AGR No.** : A068A-106R

**Applicant** : SAROTECH CO., LTD.  
**Address** : Sarotech Bldg. 320-15, Sungnae-Dong, Gangdong-Gu, Seoul, 134-851, Korea

**Manufacturer** : SAROTECH CO., LTD.  
**Address** : Hanlim Venture Town #204, 689-6, Gumjeong-Dong, Gunpo-City, Kyungki-Do, Korea

**Type of Equipment** : Multi Media Player (FM Transmitter)

**FCC ID.** : PBCDVP-260

**Model Name** : DVP-260

**Serial number** : N/A

**Total page of Report** : 16 pages (including this page)

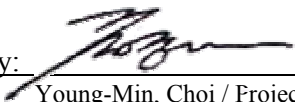
**Date of Incoming** : October 09, 2006


**Date of Issuing** : February 23, 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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**1. VERIFICATION OF COMPLIANCE**

- APPLICANT : SAROTECH CO., LTD.  
- ADDRESS : Sarotech Bldg. 320-15, Sungnae-Dong, Gangdong-Gu, Seoul, 134-851, Korea  
- CONTACT PERSON : Mr. Yong-Woo, Lee / Manager  
- TELEPHONE NO : +82-2-480-5140  
- BRAND NAME : abigs  
- FCC ID : PBCDVP-260  
- MODEL NAME : DVP-260  
- SERIAL NUMBER : N/A  
- DATE : February 23, 2007

DEVICE TYPE	DXX - Low Power Communication Device Transmitter
E.U.T. DESCRIPTION	Multi Media Player (FM Transmitter)
THIS REPORT CONCERNS	ORIGINAL GRANT
MEASUREMENT PROCEDURES	Charter 7 and 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	Yes
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 SAROTECH CO., LTD., Model DVP-260 (referred to as the EUT in this report) is a Multi Media Player that has a function for transmitting of FM broadcasting frequency range and PC peripheral. This report covers the FM transmitter from 88.1 MHz to 88.9 MHz with 400Hz step 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 27 MHz on the Main Board
POWER REQUIREMENT	DC 5V, 2.0A from an AC/DC Adaptor
TX FREQUENCY RANGE	88.1 MHz ~ 88.9 MHz (range into 400 kHz Step)
NUMBER OF LAYERS	4 Layers
EXTERNAL CONNECTOR	DC In, Composite Port, Component/ S-Video Port, Coaxial, USB Port, External IR In

### 2.2 Model Differences

-. 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
DVP-260	SAROTECH CO., LTD.	PBCDVP-260	Multi Media Player(EUT)	-
N/A	KTV Global	N/A	TV	EUT

### 2.5 Test Methodology

The radiated testing was performed according to the procedures in chapter 7, 13 of ANSI C63.4: 2003 and 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)

### 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	SAROTECH CO., LTD.	DVP-370W	N/A
FM Module	N/A	TX-M201 Rev.0	N/A
HDD	SAMSUNG	MP402H/DOM	N/A

#### 3.2 EUT exercise Software

The Model, DVP-260 is included a FM transmitter designed to operate on function in the 88.1 ~ 88.9 MHz. The EUT does not have an audio input port, so the EUT played movie file that was stored in the EUT and than transmitted audio signal with the maximum output volume.

#### 3.3 Cable Description

Ports Name	Shielded	Ferrite Bead	Metal Hood	Length (m)	Connected to
DC In	N	Y(EUT END)	EUT END	1.5	LISN
Composite(AV)	N	N	BOTH END	1.5	TV
Coaxial	N	N	BOTH END	1.5	TV
Component/S-Video(HDTV)	N	N	BOTH END	1.5	TV
Ext. IR In	N	N	EUT END	1.5	-

#### 3.4 Equipment Modifications

- The bypass Cap.(104) was added to the USB connector VCC line on the main board.
- The bypass Cap.(104) was added to the DC input connector VCC line on the main board.
- The gasket was added between inside of metal case and HDD.
- The ferrite core(E-Tech, CU0530G) was added to both side of USB connector cable.

### 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 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 : 48 %

Temperature: 18 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.207 (a)Type of Test : Low Power Communication Device TransmitterResult : PASSED BY -5.89 dB at 2.03 MHz under average detector mode

EUT : Multi Media Player

Date: December 22, 2006

Operating Condition : Transmit the RF signal.

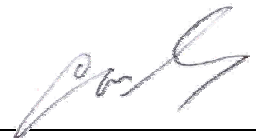
Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

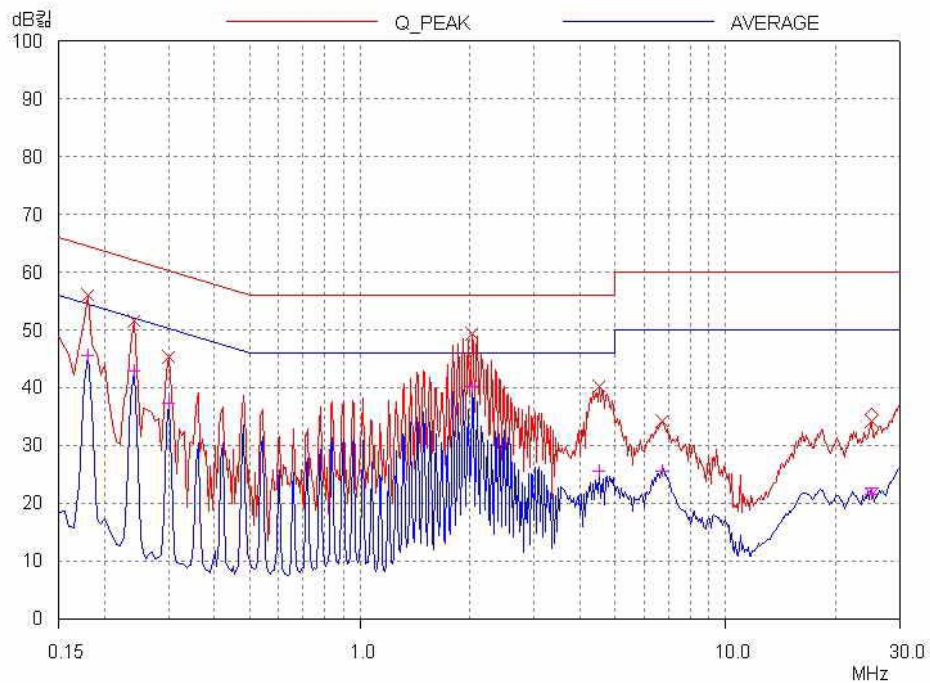
Frequency (MHz)	Line	Peak (dBuV)		Margin (dB)
		Emission level	Q.P Limits	
0.18	H	55.90	64.49	-8.59
0.24	H	51.55	62.10	-10.55
0.30	H	45.28	60.24	-14.96
2.02	N	48.16	56.00	-7.84
2.03	H	49.25	56.00	-6.75
4.49	H	40.20	56.00	-15.80
Frequency (MHz)	Line	Average (dBuV)		Margin (dB)
		Emission level	Limits	
0.18	H	45.56	54.49	-8.93
0.24	H	42.79	52.10	-9.31
0.30	H	37.23	50.24	-13.01
2.02	N	38.32	46.00	-7.68
2.03	H	40.11	46.00	-5.89
4.49	H	25.51	46.00	-20.49

Line Conducted Emission Tabulated Data

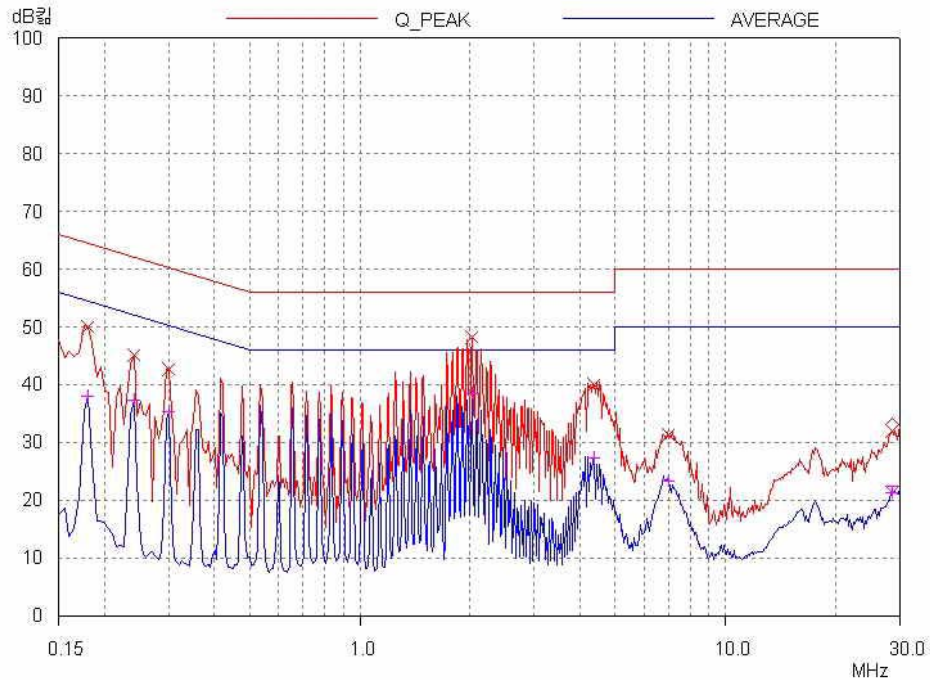
Remark : "H": Hot Line, "N": Neutral line

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


**Tested by: In-Sub, Youn / Test Engineer**



## HOT LINE



## NEUTRAL LINE

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EMC-002 (Rev.0)

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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.

Humidity Level : 49% Temperature: 16°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 -3.66 dB at 85.50 MHz under average detector mode

EUT : Multi Media Player Date: December 19, 2006  
 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	36.30	Peak	H	7.97	2.37	46.68	68.00	-21.32
	33.30	Average	H	7.97	2.37	43.64	48.00	-4.36
	38.00	Peak	V	7.97	2.37	48.38	68.00	-19.62
	34.00	Average	V	7.97	2.37	44.34	48.00	-3.66

Radiated Emission Tabulated Data



Tested by: In-Sub, Youn / Test Engineer

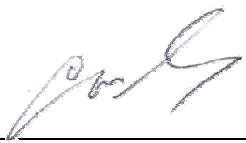
**5.3 Radiated Emission Test (Outside of the specified 200 kHz band)**

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

Humidity Level : 49 % Temperature: 16 °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 -5.66 dB at 500.40MHz

EUT : Multi Media Player Date: December 19, 2006  
 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	
Freq. (MHz)	Amp. (dBuV)	Pol.	Ant. (dBuV/m)	Cable (dB)	Amp. (dBuV/m)	Limit (dBuV/m)	Margin (dB)
119.10	17.30	V	12.55	2.68	32.53	43.52	-10.99
129.80	16.50	V	13.44	2.60	32.54	43.52	-10.98
150.30	16.90	H	14.63	3.19	34.72	43.52	-8.80
215.20	15.40	H	16.61	3.52	35.53	43.52	-7.99
240.10	12.10	H	17.02	3.42	32.54	46.02	-13.48
500.40	15.90	H	19.16	5.30	40.36	46.02	-5.66



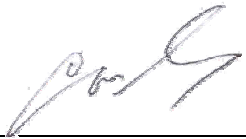
Tested by: In-Sub, Youn / Test Engineer

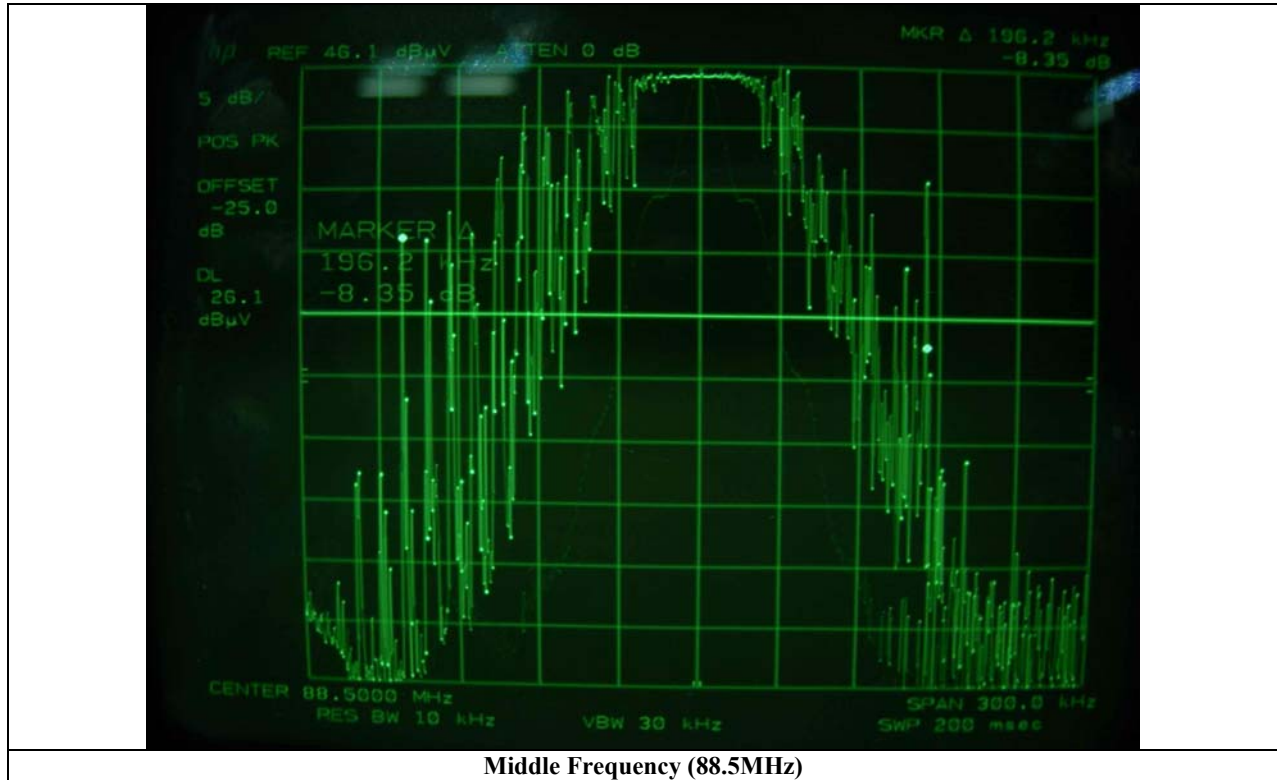
**5.4 Bandwidth of the operating frequency**

Humidity Level : 48 % Temperature: 19 °C  
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.239 (a)  
Result : PASSED

EUT : Multi Media Player Date: December 22, 2006  
Operating Condition : Transmit the RF signal.  
Minimum Resolution  
Bandwidth : 10 kHz  
Remark : Refer to test data in next page.

Frequency (MHz)	Measured Value (kHz)	Limit (kHz)	Margin (kHz)
88.5	196.2	200	-3.8

  
**Tested by: In-Sub, Youn / Test Engineer**

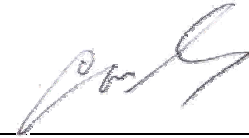


**5.5 Tuning Range of the operating frequency**

Humidity Level : 48 % Temperature: 19 °C  
Limits apply to : FCC CFR 47, PART 15, SUBPART C, SECTION 15.239 (a)  
Result : PASSED

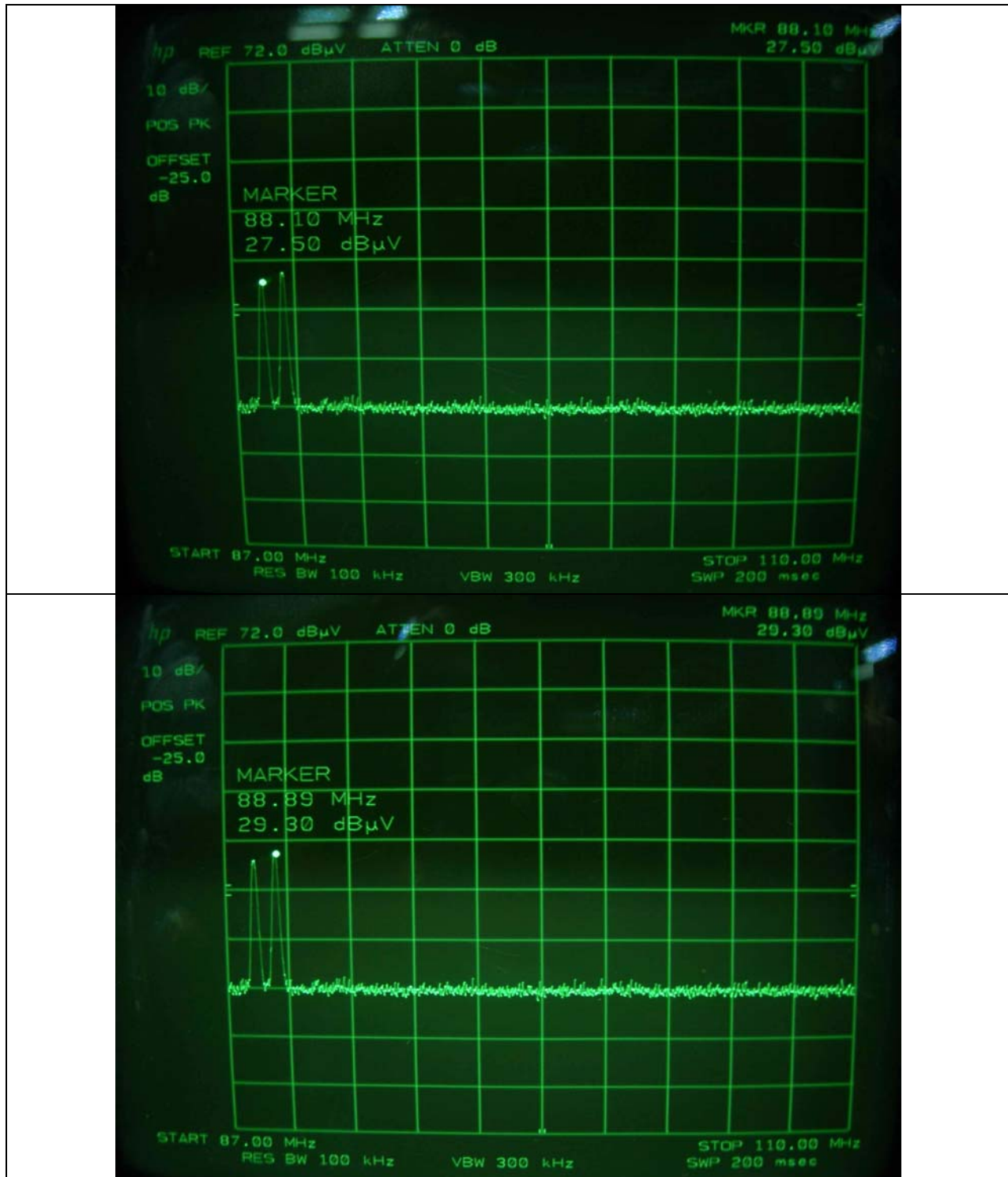
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EUT : Multi Media Player Date: December 22, 2006  
Operating Condition : Transmit the RF signal at the lowest and highest frequency.  
Test Result : Met the requirement. Refer to test data in next page.



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**Tested by: In-Sub, Youn / 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/06	12MONTH	■
2.	Test receiver	R/S	ESHS 10	834467/007	MAY/06	12MONTH	■
3.	Spectrum analyzer	HP	8566B	3407A08547	JUN/06	12MONTH	■
4.	TRILOG Broadband Antenna	Schwarzbeck	VULB9163	VULB9163 166	MAY/06	12MONTH	
5.	Biconical antenna	EMCO	3110	9003-1121	FEB/06	12MONTH	
		Schwarzbeck	VHA9103	91031852	FEB/06		■
6.	Log Periodic antenna	EMCO	3146	9001-2614	FEB/06	12MONTH	
		Schwarzbeck	9108-A(494)	62281001	FEB/06		■
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	■