Certification of Compliance

CFR 47 Part 15 Subpart B

Test Report File No.	04-IST-0215	**Date of Issue**	August 24, 2004
Model(s)	RV4000	(Cinevision)	○ Basic ● Alternated
	SV294	(SENSORY SCIENCE)	○ Basic ● Alternated
	DF-S04	(DAEWOO)	○ Basic ● Alternated
	VR2940	(Go-Video)	○ Basic ● Alternated
	VR2945	(Go-Video)	○ Basic ● Alternated
	DVR-S04	(DAEWOO)	○ Basic ● Alternated
	DF-L71N	(DAEWOO)	○ Basic ● Alternated
Kind of Product	DVD Recorder + VCR		
Applicant	Daewoo Electronics Corporation.		
	543, Dangjung-Dong, Kunpo-City, Kyounggi-DO, Korea		
Manufacturer	Daewoo Electronics Corporation.		
	295, Gondan-dong, Kumi-city, Kyungsangbuk-do, Korea.		

Test Result ☒ **Positive** ☐ **Negative**

Reviewed By

J.H.LEE / EMC Group Manager

Approved By

G. Chung / Chief

- Investigations requested : Measurement to the relevant clauses of F.C.C rules and regulations Part 15 Subpart B – Unintentional Radiatiors
- The test report with appendix consists of 32 pages.
- The test result only responds to the tested sample.
- It is not allowed to copy this report even partly without the allowance of IST EMC Laboratory.
- This equipment as for has been shown to be capable of continued compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4 2001.

TABLE OF CONTENTS

Information of TUNERS

Manufacture	**Manufacture Name**
LG Innotek Co., Ltd.	TADM-H201F
Korea ALPS	TMZH2-030A

Information of Loader

Manufacture	**Manufacture Name**
LITE-ON IT CORP.	DDW-451S
BTC corp.	BDR-L04P

INFORMATIONS OF TEST LABORATORY

EMC LABORATORY of IST Co., Ltd. ***(FCC Filing Lab)***
San 21-8, Goan-Ri, Baekam-Myun, Yongin-City
Kyonggi-Do, 449-860, Korea
TEL : +82 31 333 4093 FAX : +82 31 333 4094

ENVIRONMENTAL CONDITIONS

Temperature	22 ℃
Humidity	49 %
Atmospheric pressure	1002 mbar

POWER SUPPLY SYSTEM USED

Power supply system	120Vac , 60Hz

PRODUCT INFORMATIONS

Power requirements	120Vac , 60Hz
Power consumption	34W
Operating conditions	41°F to 95°F(5°C to 35°C) , 5% to 90%(humidity)
Mass(approx.)	13.5lbs(6.18kg)
Dimensions(approx.)	16.9X3.54X14.0 inches(430X91X354mm) (wXhXd)
Signal system	NTSC
Antenna IN / RF OUT	Antenna or CATV input,75Ω / Channel 3 or 4 (Switchable)
Signal-to-noise ratio	43dB(VCR) , More than 95dB(DVD)
Head system	4 Head Video, 2 Head Hi-Fi helical scan azimuth system
Laser system	Semiconductor laser, wavelength 650mm
Inputs	Video/Audio(RCA jack)
Outputs	Video/Audio(RCA jack), S-video, component(RCA jack)

- EMC suppression device is not used during the test.
- Please refer to user's manual.

INFORMATIONS OF MODEL NAMES

Model Name	Model description	TCB Issued Date	Applied Loader	Applied Tuner
RV4000 SV294 DF-S04 VR2940 VR2945	Basic Model	06/07/2004	BTC	LG, Alps
RV4000 SV294 DF-S04 VR2940 VR2945	Permissive Ⅱ Change (Loader change)		LITE-ON	LG, Alps
DVR-S04 DF-L71N	Permissive Ⅱ Change (front PCB change)		BTC	Alps

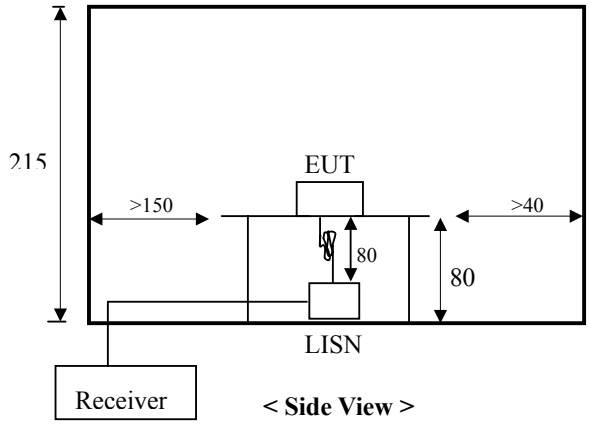
DESCRIPTIONS OF TEST

Conducted Emissions:

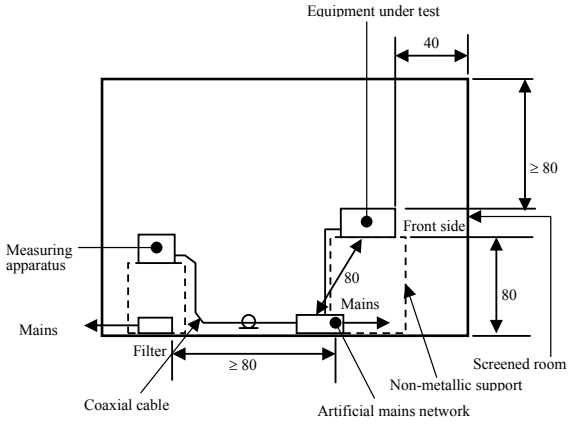
The measurement were performed over the frequency range of 0.15MHz to 30MHz using a 50Ω/50uH LISN as the input transducer to a Spectrum Analyzer or a Field Intensity Meter. The measurements were made with the detector set for "Peak" amplitude within an bandwidth of 10KHz or for "quasi-peak" within a bandwidth of 9KHz.

- Procedure of Test

The line-conducted facility is located inside a shielded room No.1. A 1m X 1.5m wooden table 80cm height is placed 40cm away from the vertical wall and 1.5m away from the other wall of the shielded room. The R/S ESH3-Z5 and EMCO 3825/2 LISN are bonded to bottom of the shielded room. The EUT is located on the wooden table with distance more than 80cm from the LISN and powered from the EMCO LISN .The peripheral equipment is powered from the other LISN. Power to the LISNs are filtered by a noise cut power line filters. All electrical cables are shielded by braided tinned steel tubing with inner ϕ 1.2cm. 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 lines will be connected to the EMCO LISN. All interconnecting cables more than 1m were shortened by non-inductive bundling to a 1m length. Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating conditions. The RF output of the LISN was connected to the R/S receiver to determine the frequency producing the maximum emission from the EUT. The frequency producing the maximum level was reexamined using Quasi-Peak mode by manual measurement, after scanned by automatic Peak mode for frequency range from 0.15 to 30MHz. The bandwidth of the receiver was set to 10kHz. The EUT, peripheral equipment, and interconnecting cables were arranged and manipulated to maximize each EME emission.



< Side View >



< Concept Drawing >

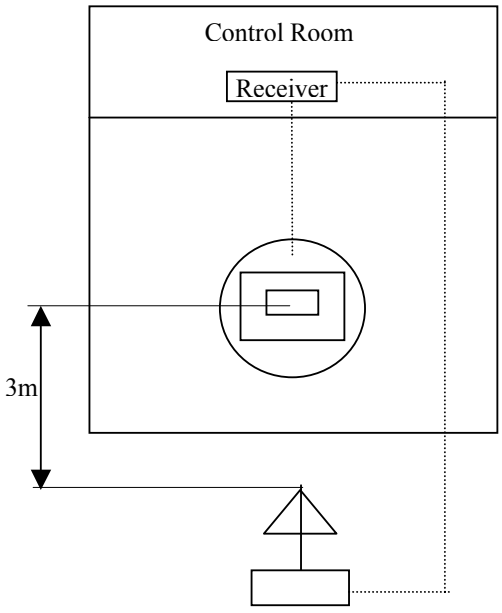
DESCRIPTION OF TEST

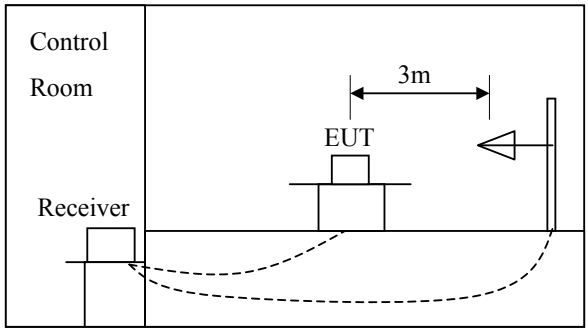
Radiated Emissions:

The measurement was performed over the frequency range of 30MHz to 1GHz using antenna as the input transducer to a Spectrum analyzer or a Field Intensity Meter. The measurement was made with the detector set for "quasi-peak" within a bandwidth of 120KHz.

- Procedure of Test

Preliminary measurements were made at 3 meter using bi-conical and log-periodic antennas, and spectrum analyzer to determine the frequency producing the max. emission in anechoic chamber. Appropriate precaution was taken to ensure that all emission from the EUT were maximized and investigated. The system configuration, mode of operation, turn table azimuth and height with respect to the antenna were noted for each frequency found. The spectrum was scanned from 40MHz to 300MHz using S/B bi-conical antenna and 300 to 1000MHz using S/B log-periodic antenna. Above 1GHz, linearly polarized double ridge horn antennas were used. Final measurements were made at open site with 3-meters test distance using S/B bi-log antenna or horn antenna. The OATS have been verified in regular for its normalized site attenuations. The test equipment was placed on a wooden table. Sufficient time for the EUT, peripheral equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. Each frequency found during pre-scan measurements was re-examined by manual. The detector function was set to CISPR quasi-peak mode and the bandwidth of the receiver was set to 120kHz or 1MHz depending on the frequency of type of signal. The EUT, peripheral equipment and interconnecting cables were re-configured to the set-up producing the max. emission for the frequency and were placed on top of a 0.8-meter high nonmetallic 1 x 1.5 meter table. The EUT, peripheral equipment, and interconnecting cables were re-arranged and manipulated to maximize each emission. The turntable containing the system was rotated; the antenna height was varied 1 to 4 meters and stopped at the azimuth or height producing the maximum emission. Each emission was maximized by: varying the mode of operation to the EUT and/or peripheral equipment and changing the polarity of the antenna, whichever determined the worst-case emission.





SUMMARY

■ Conducted Emission

The requirements are ● MET ○ Not MET

Minimum limit margin 8.5 dB at 0.250 MHz

Maximum limit exceeding

Remarks : With live phase, for average detect mode – RV4000
(DVD Playback + VCR REC mode, Tuner: TMZH2-030A)

■ Radiated Emission

The requirements are ● MET ○ Not MET

Minimum limit margin 3.1 dB at 594.4 MHz

Maximum limit exceeding

Remarks : RV4000
RF Receiving + DVD REC mode (Tuner: TADM-H201F)

☐ Output Signal Level Measurements

The requirements are ○ MET ○ Not MET

Minimum limit margin

Maximum limit exceeding

Remarks :

☐ Output Terminal Conducted Spurious Emission

The requirements are ○ MET ○ Not MET

Minimum limit margin

Maximum limit exceeding

Remarks :

☐ Transfer Switch Isolation Measurements

The requirements are ○ MET ○ Not MET

Minimum limit margin

Maximum limit exceeding

Remarks :

Note :

- ■ means the test is applicable, ☐ is not applicable.

Prepared By

I.Y.Lee / EMC Engineer

TEST CONDITIONS AND DATA

Conducted Emissions

[Applicable]

◆ Test Equipment Used

The test equipment used is calibrated in regular for every year.

Model Name	Manufacturer	Descriptions
ESH3	Rohde & Schwarz	Test Receiver
ESH3-Z2	Rohde & Schwarz	Pulse Limiter
ESH3-Z5	Rohde & Schwarz	LISN
EZM	Rohde & Schwarz	Spectrum Monitor
PM5418	FLUKE	Pattern Generator

◆ Auxiliary Equipment Used

Model Name	Manufacturer	Descriptions
14C5T BLU	Daewoo Electronics.	Color TV Receiver

◆ Accessories including cables

Name	Length	Port and Descriptions
RCA	1m	Audio/Video Out

◆ Environmental Conditions

Temperature	22 ℃
Humidity	49 %
Atmosphere pressure	1002 mbar

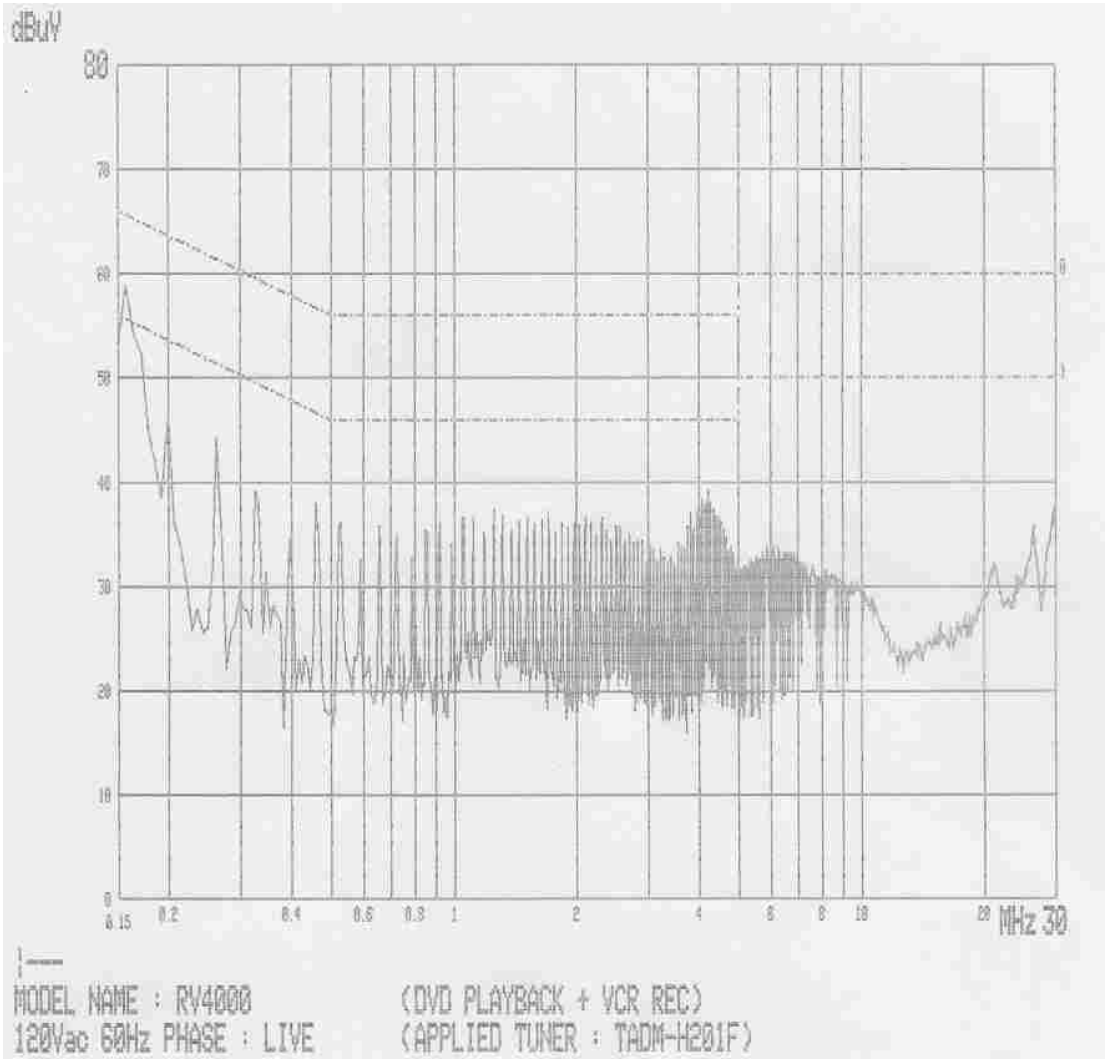
◆ Test Program DVD Playback + VCR REC, VCR Playback + DVD REC, RF Receiving + VCR REC, RF Receiving + DVD REC

◆ Test Area Shielded Room #3

Note :

Conducted Emissions

(Mains Terminal Disturbance Voltages)



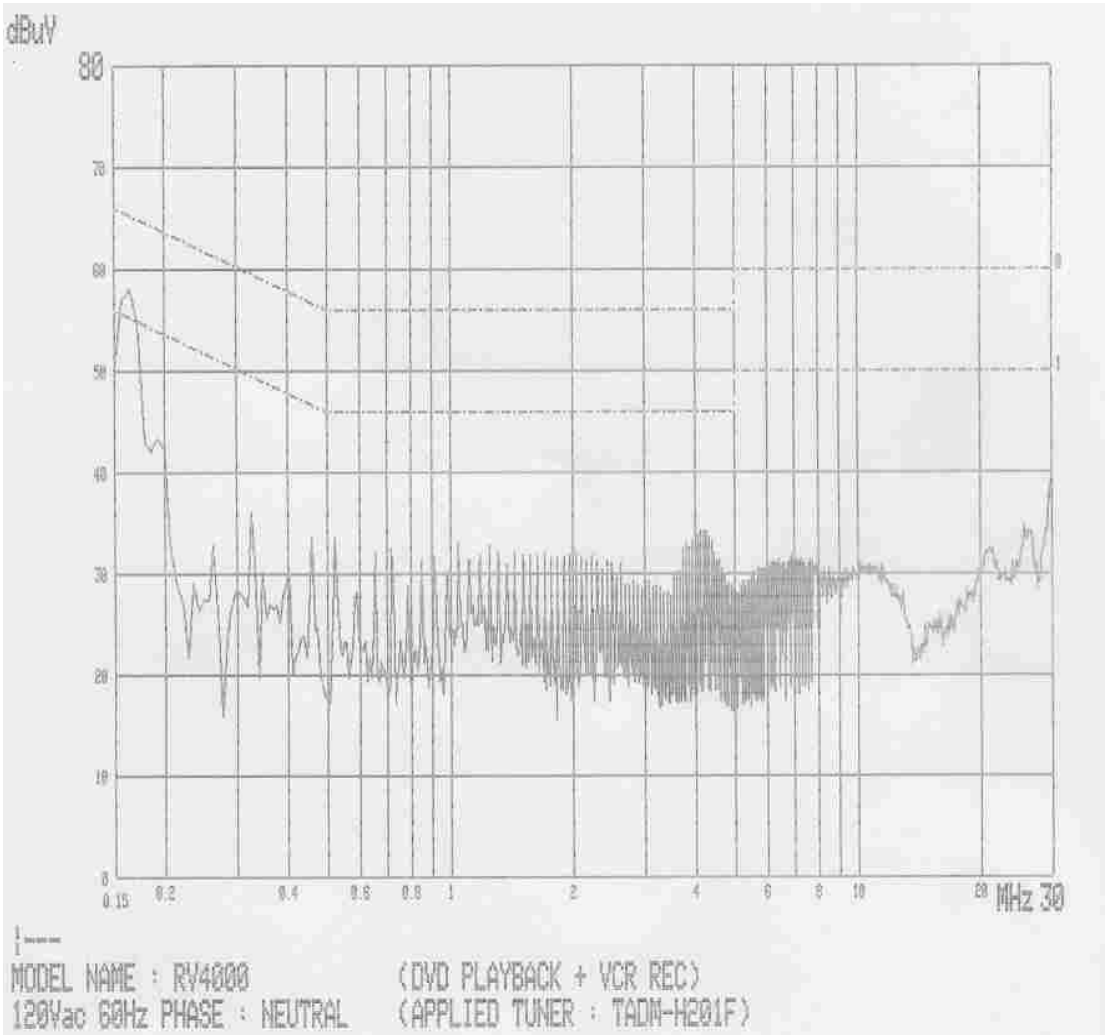
Tuner : TADM-H201F (LG)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.152	54.3	21.1	65.9	55.9	11.6	34.8
0.196	45.9	35.6	63.8	53.8	17.9	18.2
0.261	44.3	42.8	61.4	51.4	17.1	8.6

Note :

Conducted Emissions

(Mains Terminal Disturbance Voltages)



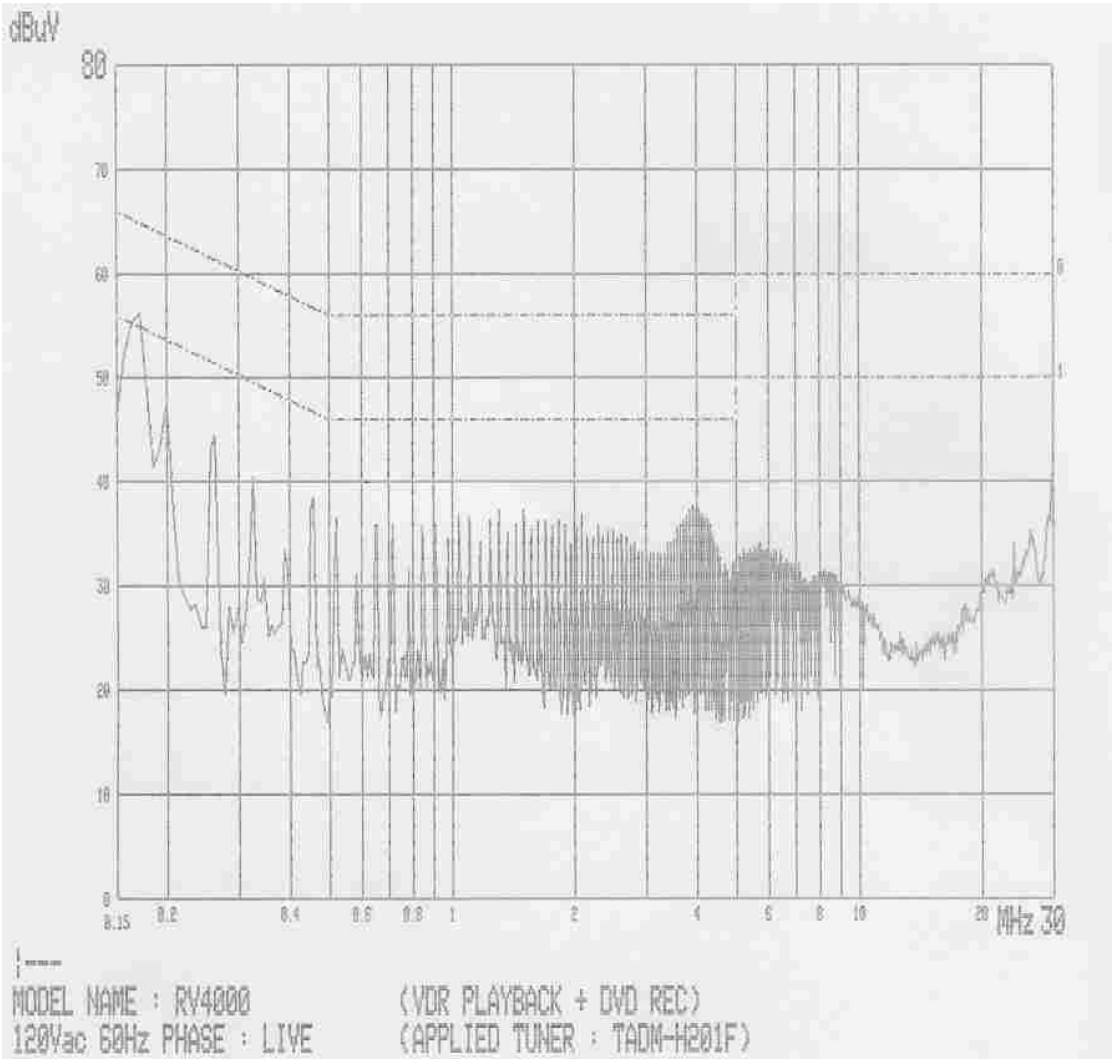
Tuner : TADM-H201F (LG)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.157	53.0	26.9	65.6	55.6	12.6	28.7
0.195	44.1	33.7	63.8	53.8	19.7	20.1

Note :

Conducted Emissions

(Mains Terminal Disturbance Voltages)



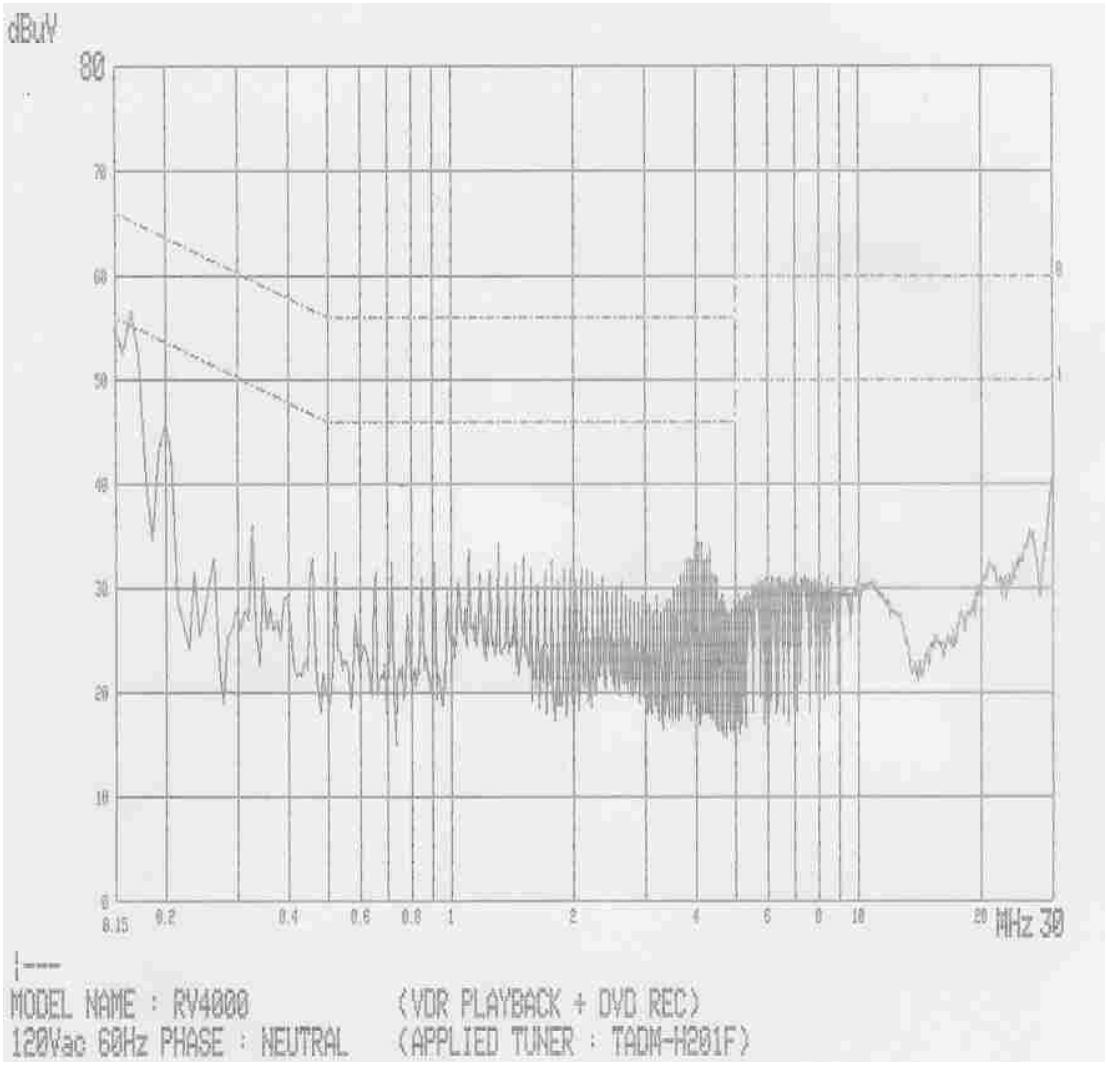
Tuner : TADM-H201F (LG)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.161	52.9	25.4	65.4	55.4	12.5	30.0
0.195	47.7	35.4	63.8	53.8	16.1	18.4
0.259	44.3	42.7	61.5	51.5	17.2	8.8

Note :

Conducted Emissions

(Mains Terminal Disturbance Voltages)



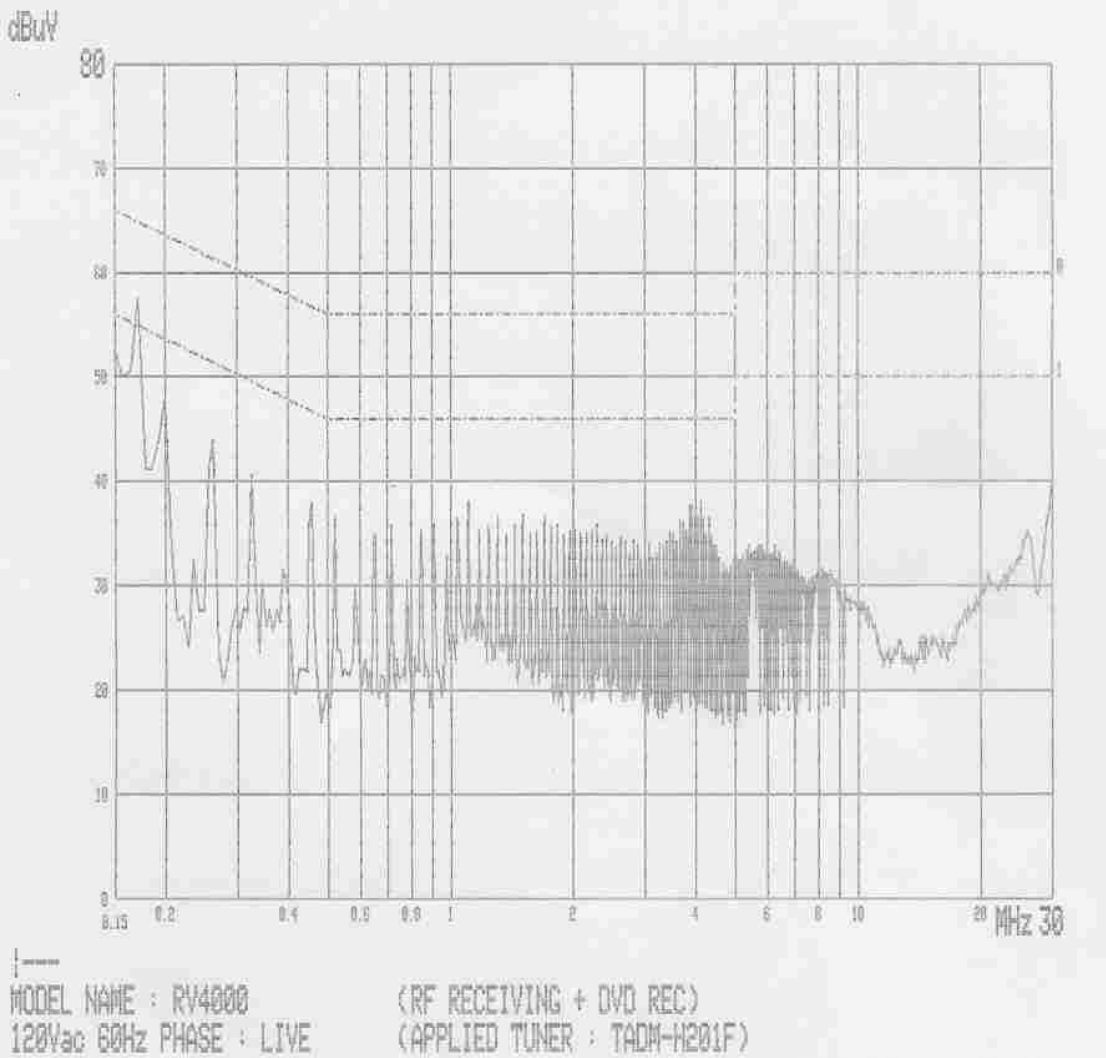
Tuner : TADM-H201F (LG)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.158	53.0	27.0	65.6	55.6	12.6	28.6
0.195	45.0	33.6	63.8	53.8	18.8	20.2

Note :

Conducted Emissions

(Mains Terminal Disturbance Voltages)



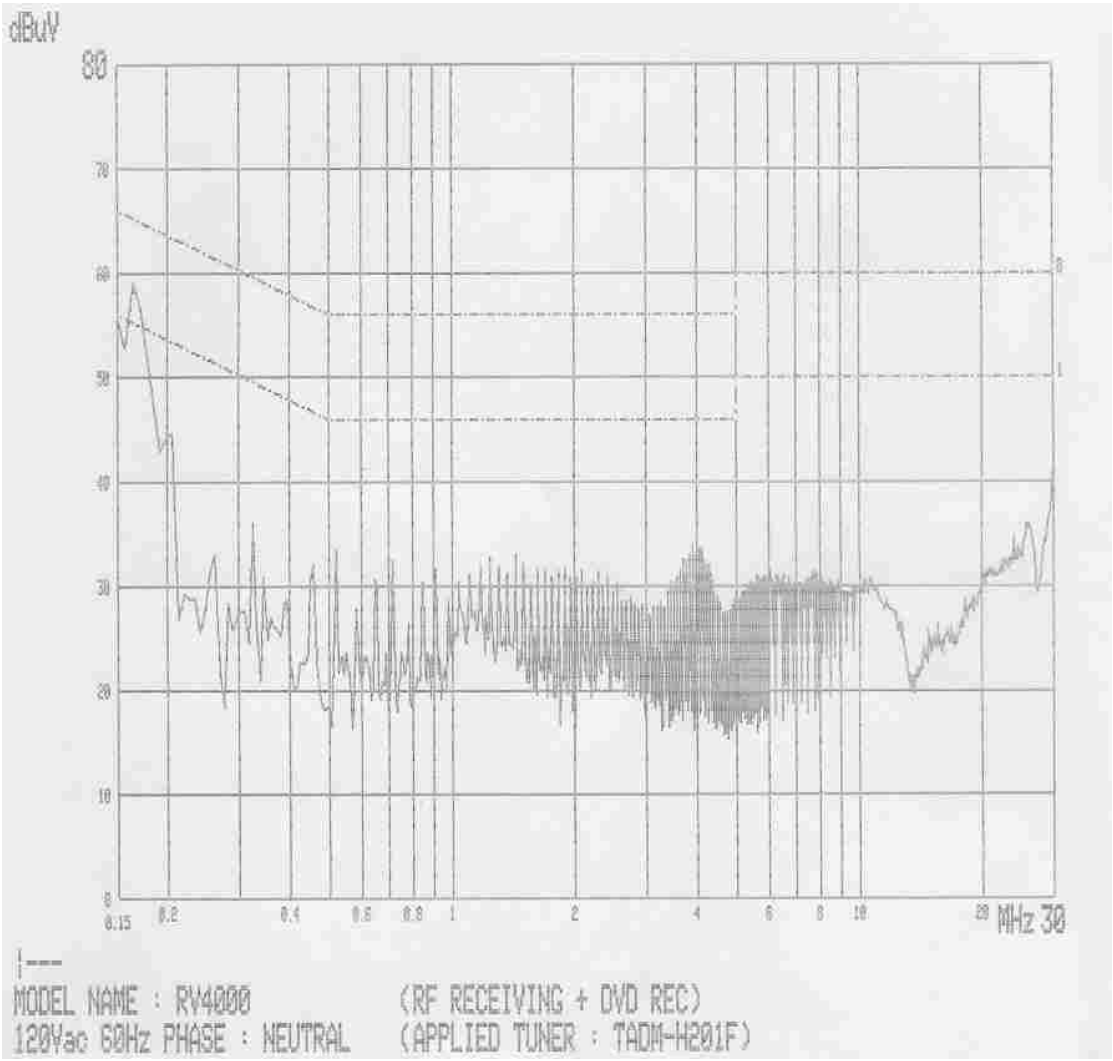
Tuner : TADM-H201F (LG)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.158	53.1	26.1	65.6	55.6	12.5	29.5
0.195	48.1	35.2	63.8	53.8	15.7	18.6
0.260	44.2	42.6	61.4	51.4	17.2	8.8

Note :

Conducted Emissions

(Mains Terminal Disturbance Voltages)



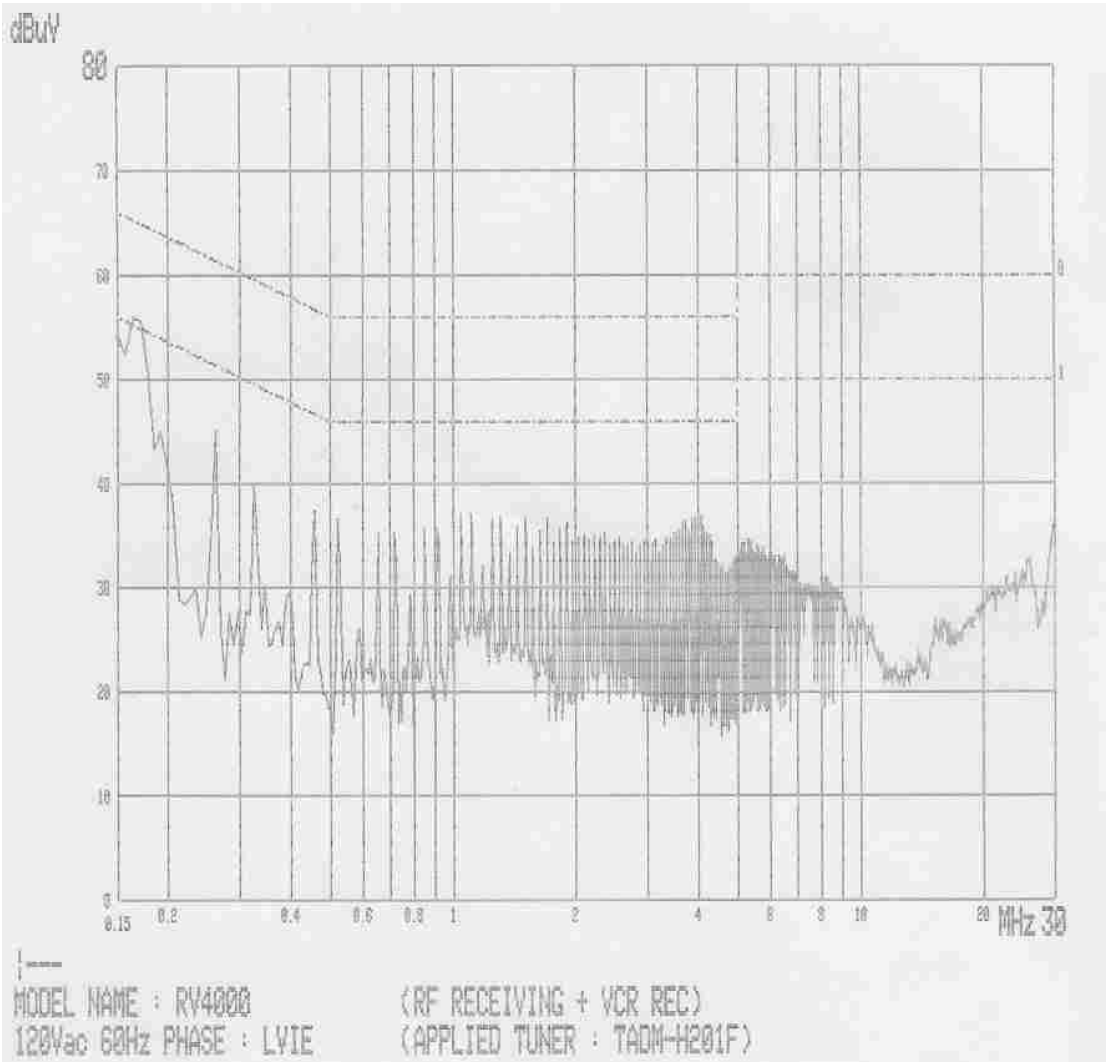
Tuner : TADM-H201F (LG)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.162	52.3	23.9	65.4	55.4	13.1	31.5
0.195	46.2	33.8	63.8	53.8	17.6	20.0

Note :

Conducted Emissions

(Mains Terminal Disturbance Voltages)



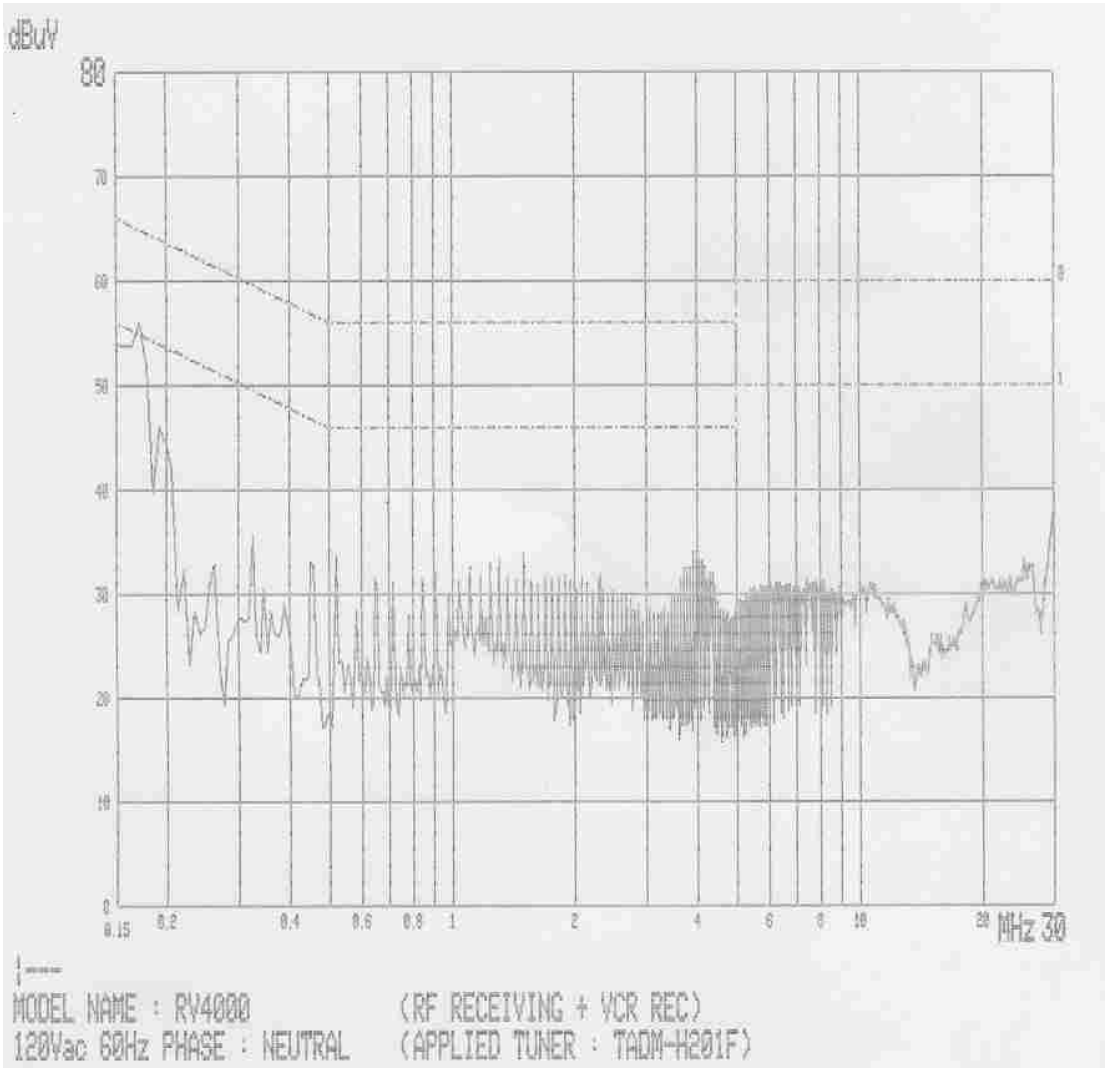
Tuner : TADM-H201F (LG)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.158	52.2	26.2	65.6	55.6	13.4	29.4
0.196	46.8	33.0	63.8	53.8	17.0	20.8
0.262	43.5	41.9	61.4	51.4	17.9	9.5

Note :

Conducted Emissions

(Mains Terminal Disturbance Voltages)



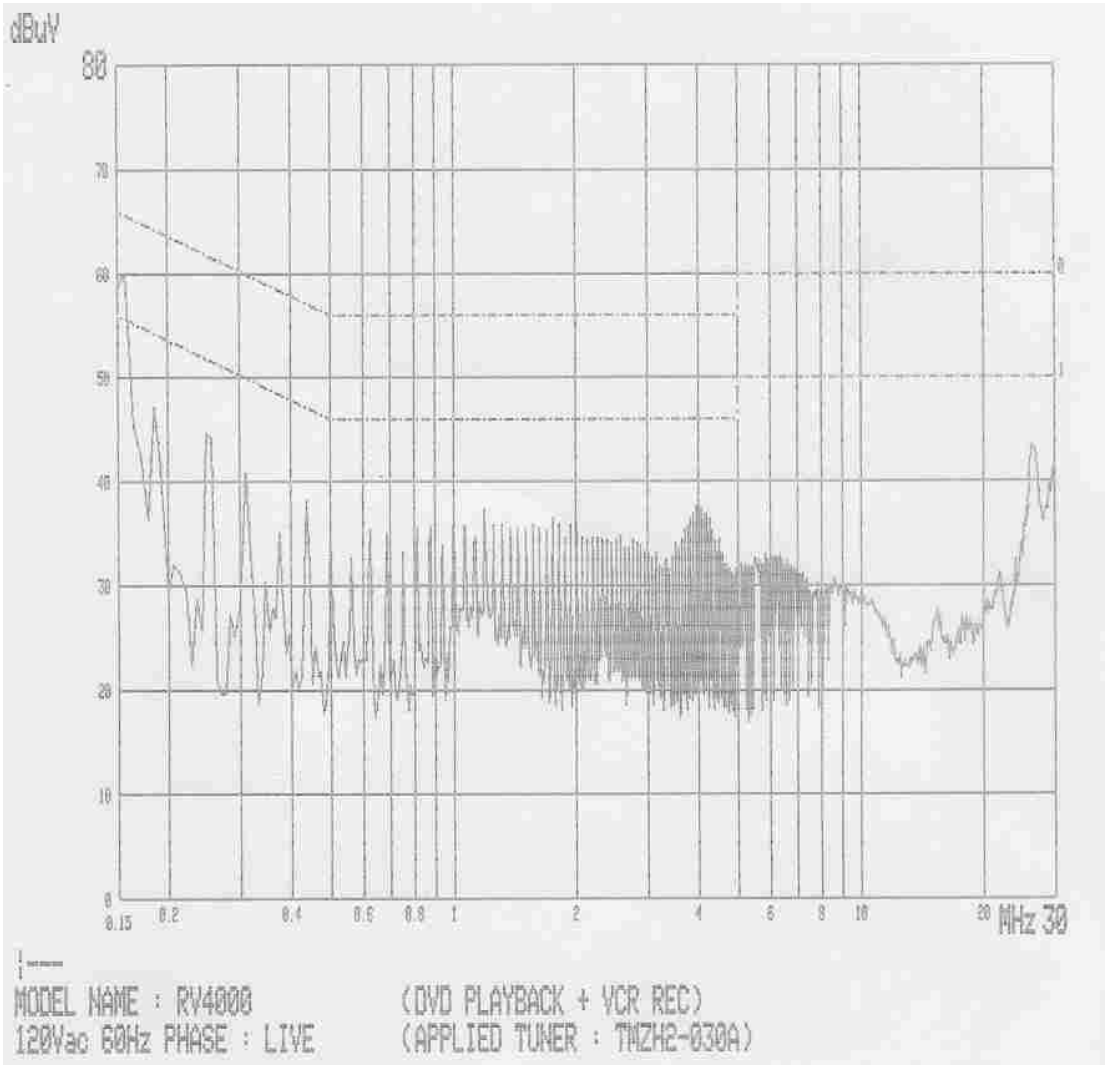
Tuner : TADM-H201F (LG)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.158	51.8	23.2	65.6	55.6	13.8	32.4
0.196	45.4	32.8	63.8	53.8	18.4	21.0

Note :

Conducted Emissions

(Mains Terminal Disturbance Voltages)



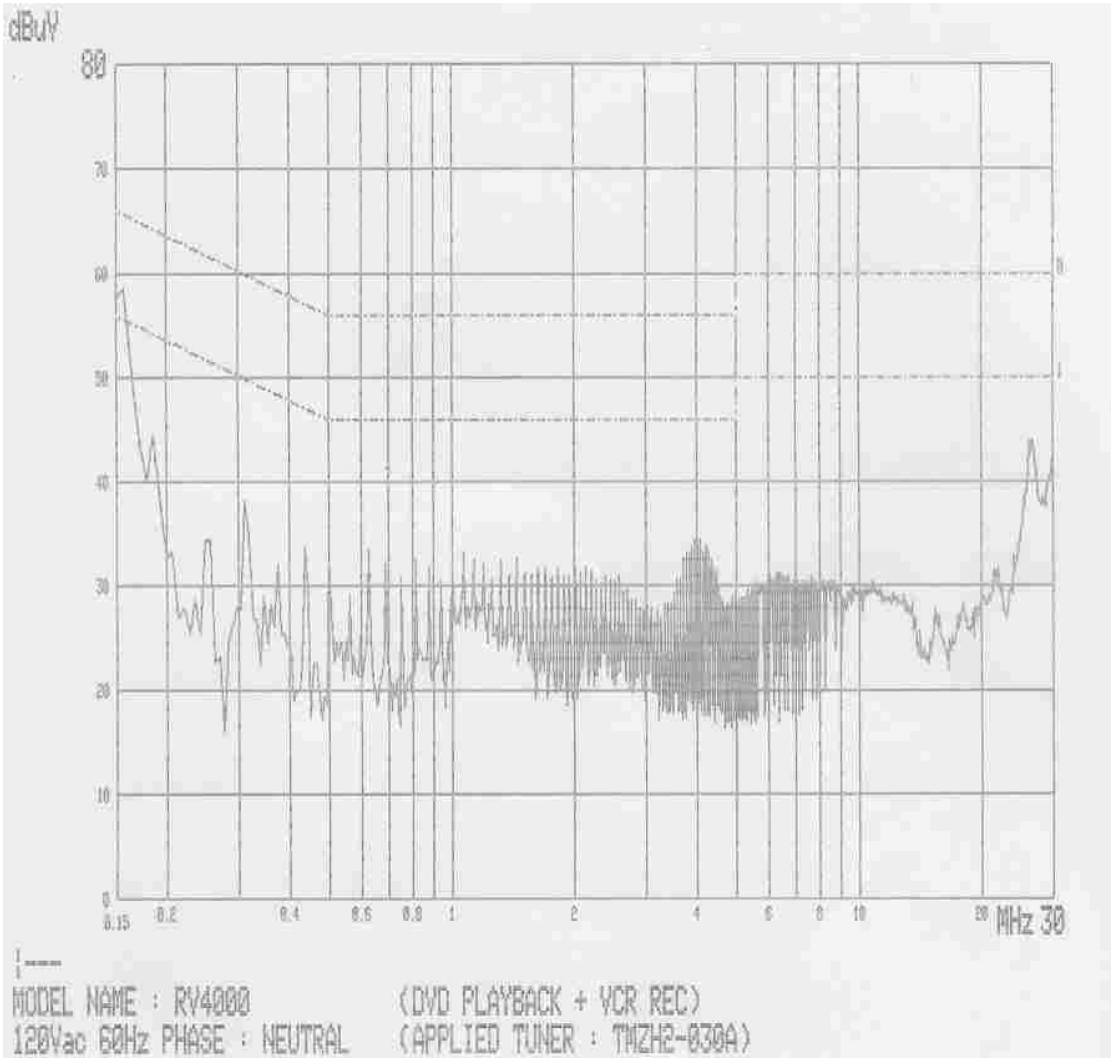
Tuner : TMZH2-030A (ALPS)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.156	55.1	26.7	65.7	55.7	10.6	29.0
0.187	47.0	35.8	64.2	54.2	17.2	18.4
0.250	45.0	43.3	61.8	51.8	16.8	8.5

Note :

Conducted Emissions

(Mains Terminal Disturbance Voltages)



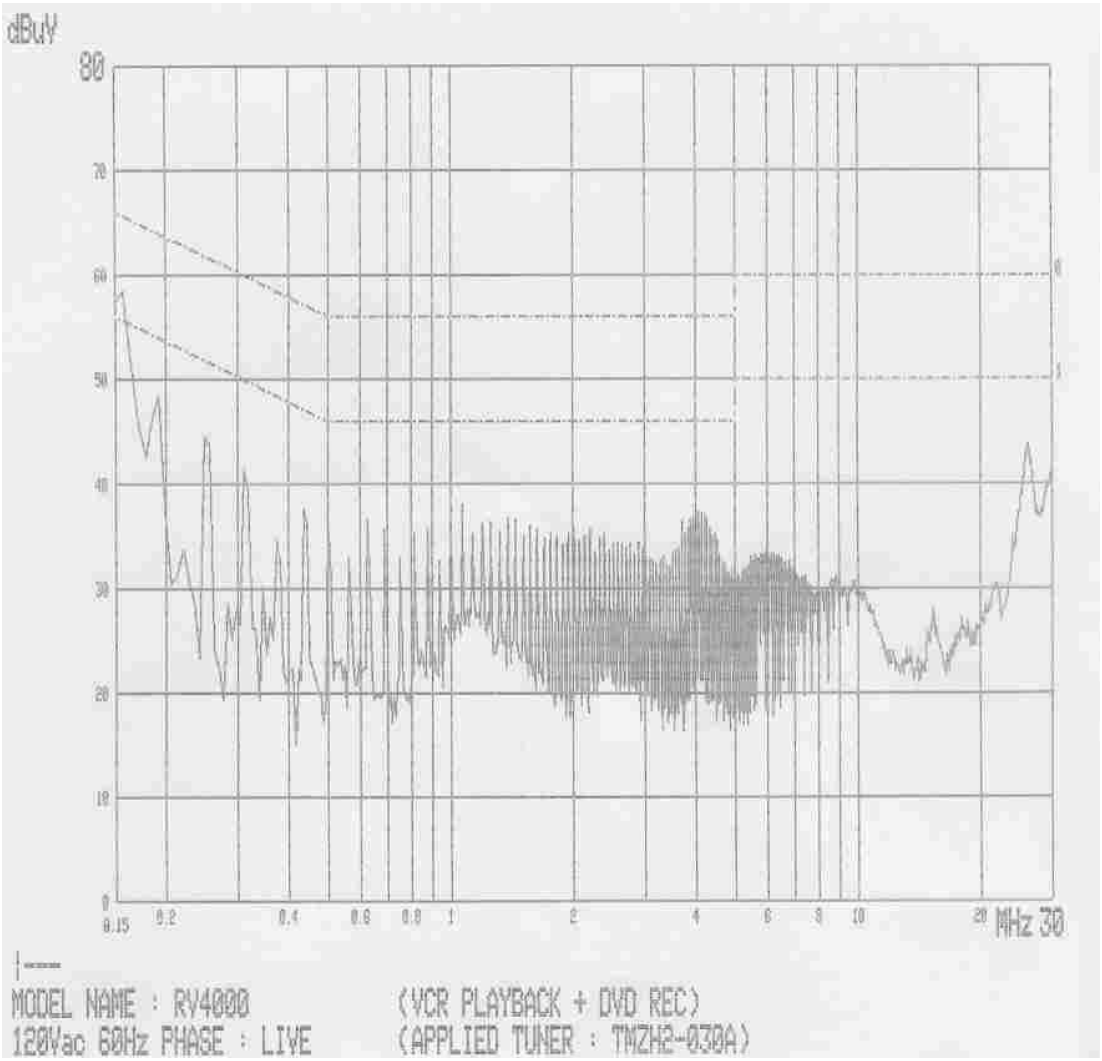
Tuner : TMZH2-030A (ALPS)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.155	54.8	26.8	65.7	55.7	10.9	28.9
0.188	44.8	33.9	64.1	54.1	19.3	20.2
26.670	42.2	37.6	60.0	50.0	17.8	12.4

Note :

Conducted Emissions

(Mains Terminal Disturbance Voltages)



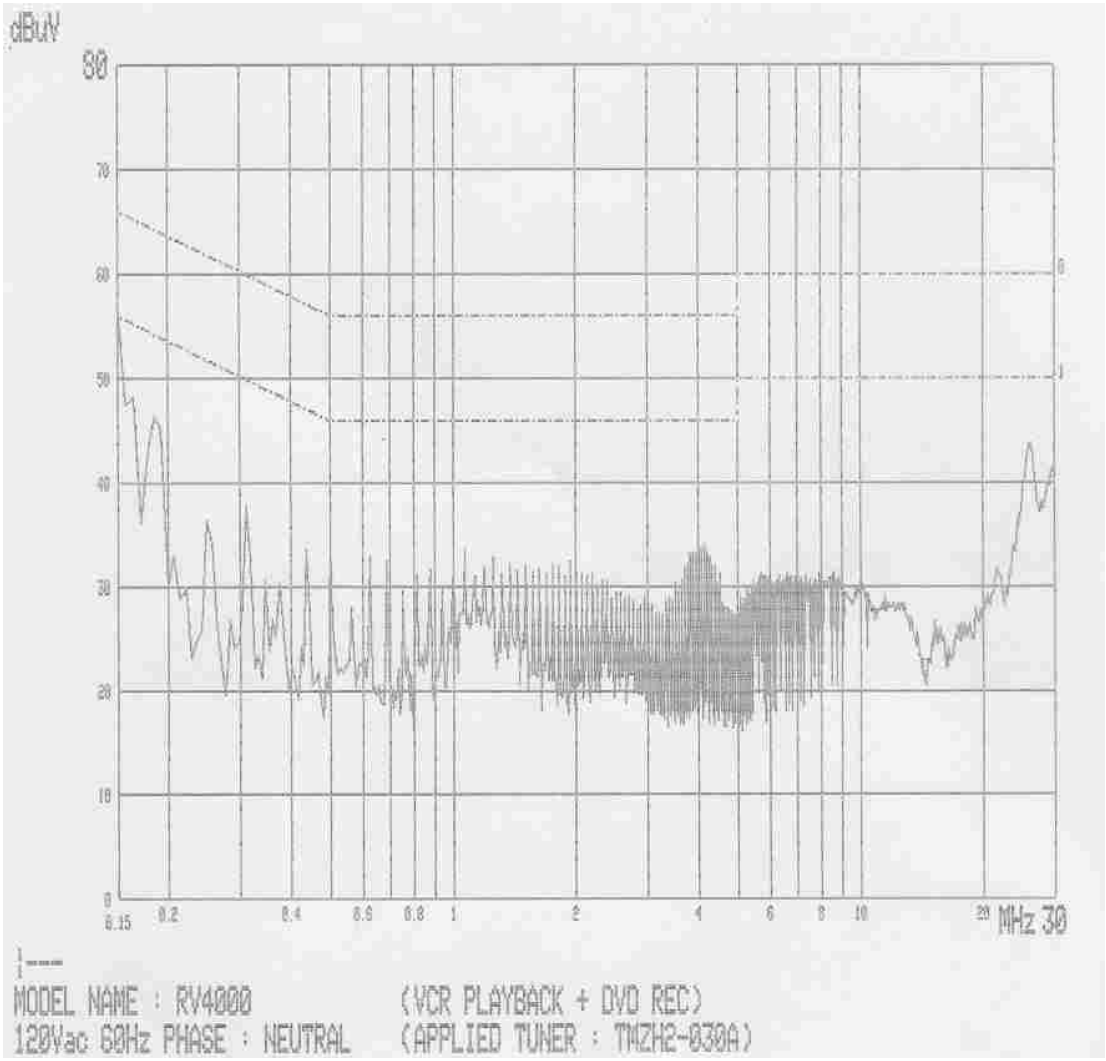
Tuner : TMZH2-030A (ALPS)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.156	55.3	24.4	65.7	55.7	10.4	31.3
0.188	48.9	37.0	64.1	54.1	15.2	17.1
0.250	45.0	43.2	61.8	51.8	16.8	8.6

Note :

Conducted Emissions

(Mains Terminal Disturbance Voltages)



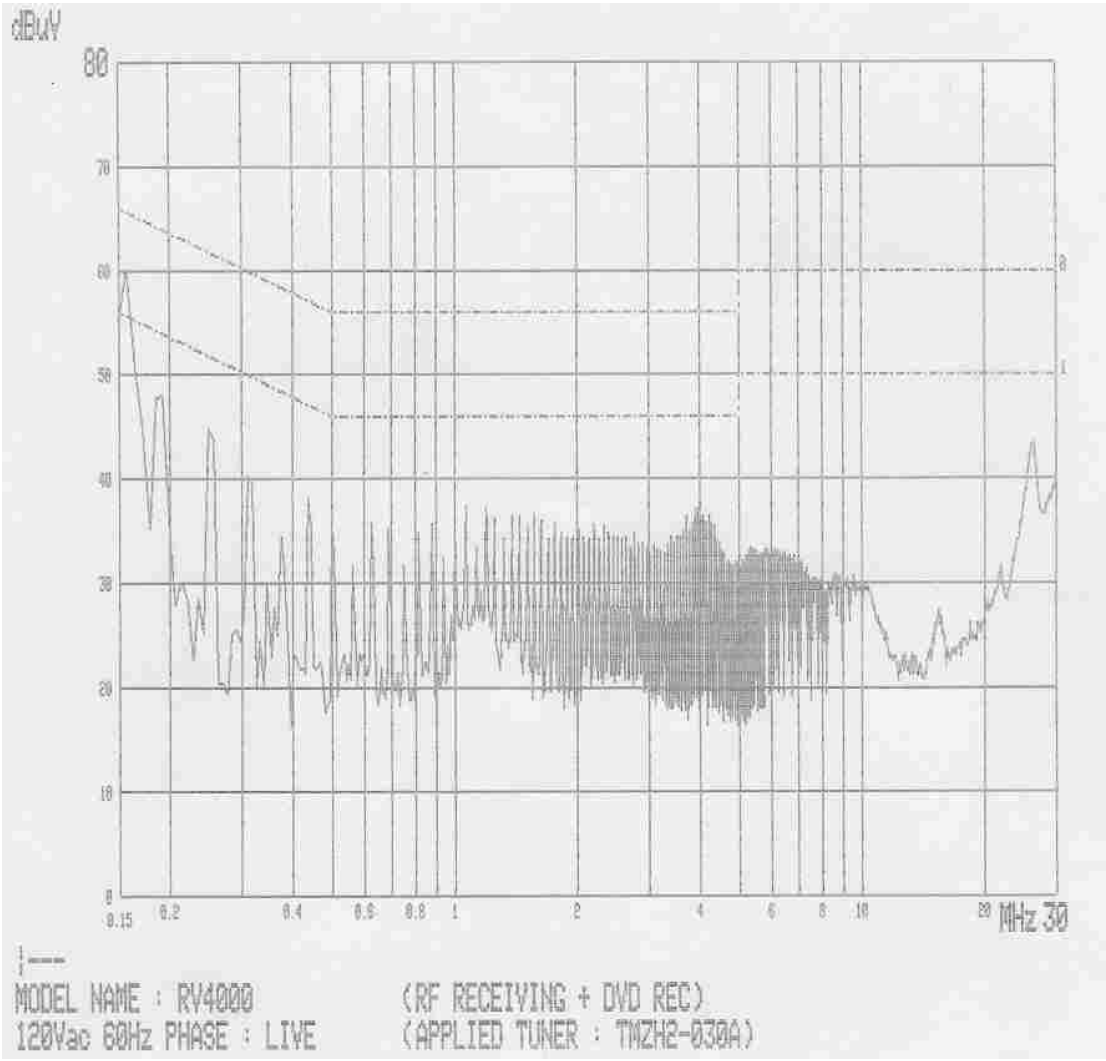
Tuner : TMZH2-030A (ALPS)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.157	54.6	23.8	65.6	55.6	11.0	31.8
0.187	46.7	35.3	64.2	54.2	17.5	18.9
26.170	42.2	39.2	60.0	50.0	17.8	10.8

Note :

Conducted Emissions

(Mains Terminal Disturbance Voltages)



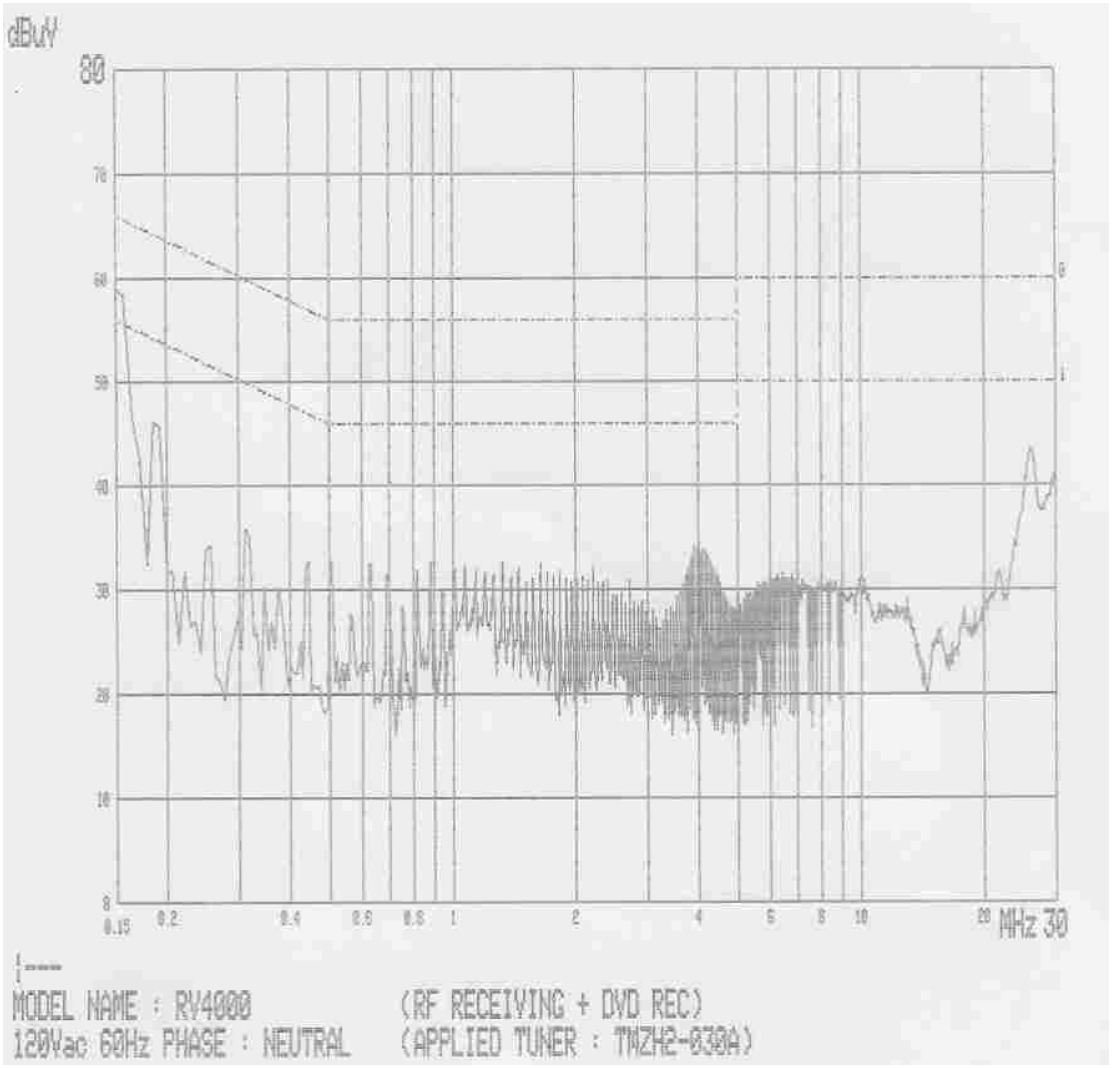
Tuner : TMZH2-030A (ALPS)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.156	54.9	24.3	65.7	55.7	10.8	31.4
0.188	48.8	36.4	64.1	54.1	15.3	17.7
0.251	44.9	43.1	61.7	51.7	16.8	8.6

Note :

Conducted Emissions

(Mains Terminal Disturbance Voltages)



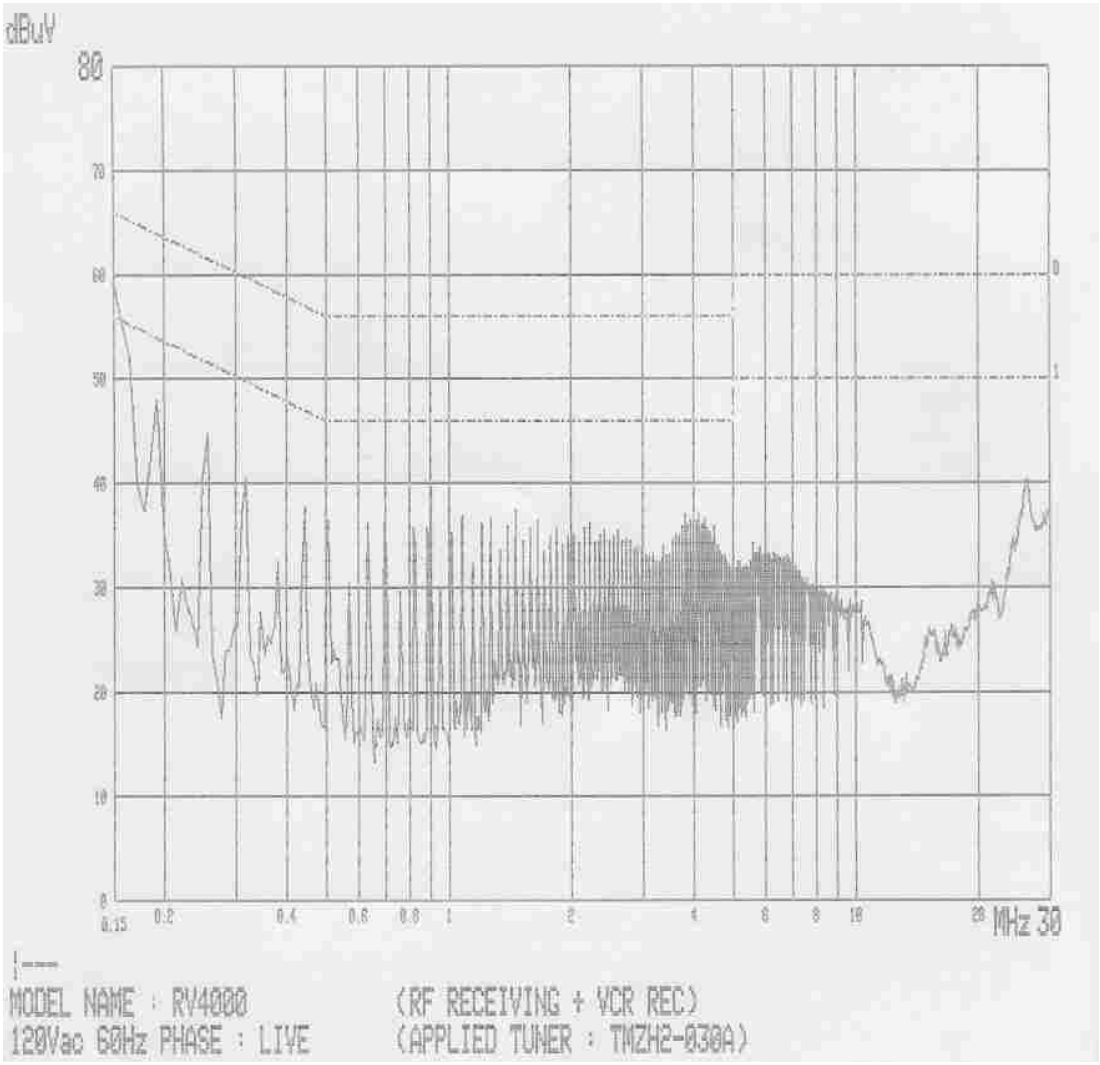
Tuner : TMZH2-030A (ALPS)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.156	54.7	24.1	65.7	55.7	11.0	31.6
0.188	46.1	34.9	64.1	54.1	18.0	19.2
27.000	38.0	34.8	60.0	50.0	22.0	15.2

Note :

Conducted Emissions

(Mains Terminal Disturbance Voltages)



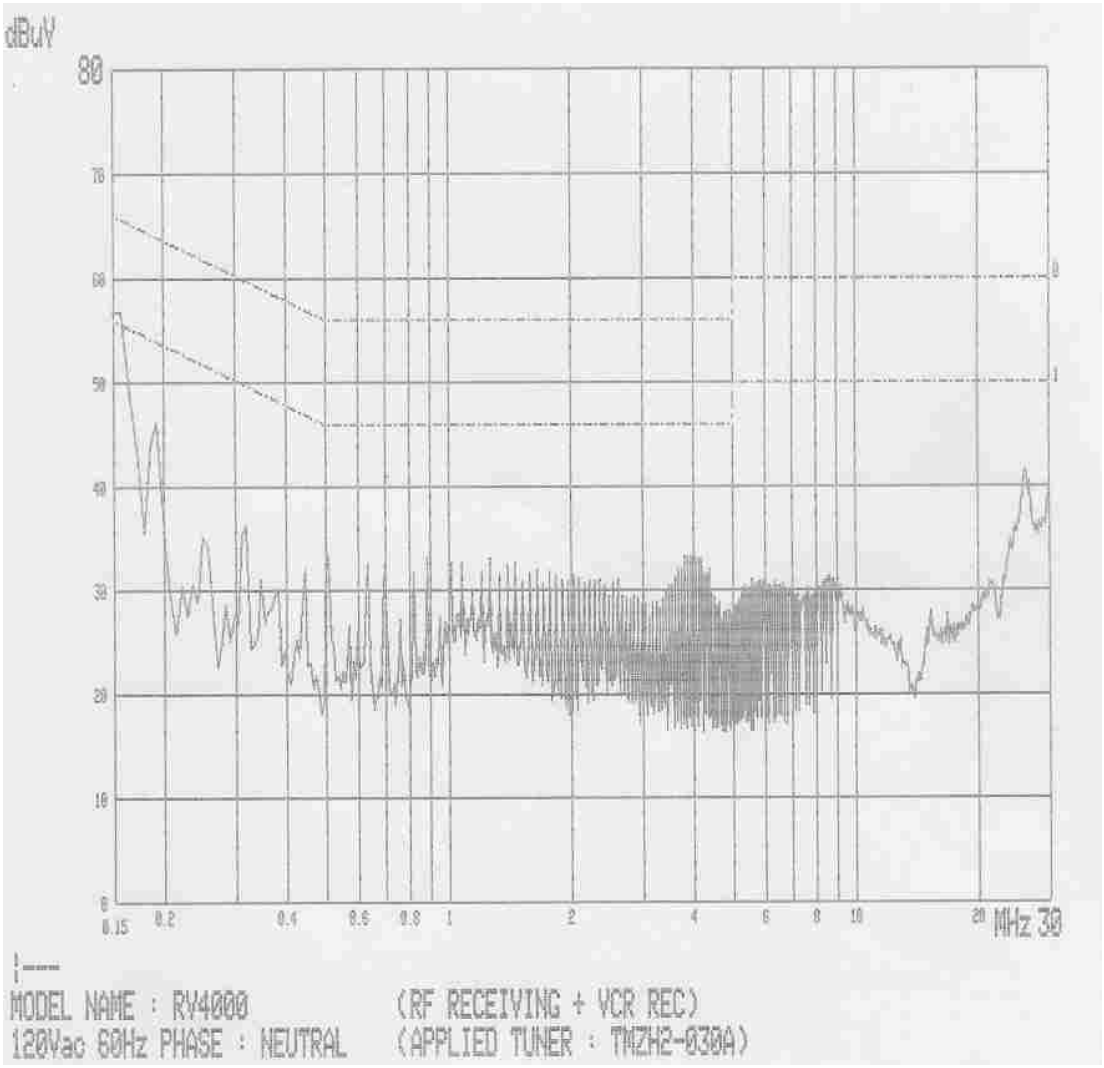
Tuner : TMZH2-030A (ALPS)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.153	54.3	22.9	65.8	55.8	11.5	32.9
0.189	48.0	35.5	64.1	54.1	16.1	18.6
0.253	44.5	42.7	61.7	51.7	17.2	9.0

Note :

Conducted Emissions

(Mains Terminal Disturbance Voltages)



Tuner : TMZH2-030A (ALPS)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.153	54.1	22.4	65.8	55.8	11.7	33.4
0.189	55.5	35.3	64.1	54.1	8.6	18.8
26.205	38.7	35.1	60.0	50.0	21.3	14.9

Note :

TEST CONDITIONS AND DATA

Radiated Emissions

[Applicable]

◆ Test Equipment Used

The test equipment used is calibrated in regular for every year.

Model Name	Manufacturer	Descriptions
ESVP	Rohde & Schwarz	Test Receiver
VULB9160	Schwarzbeck	Antenna
EZM	Rohde & Schwarz	Spectrum Monitor
PM5418	FLUKE	Pattern Generator

◆ Auxiliary Equipment Used

Model Name	Manufacturer	Descriptions
14C5T BLU	Daewoo Electronics.	Color TV Receiver

◆ Accessories including cables

Name	Length	Port and Descriptions
RCA	1.5m	Audio/Video Out

◆ Environmental Conditions

Temperature	23℃
Humidity	50 %
Atmosphere pressure	1002mbar

◆ Test Program DVD Playback + VCR REC, VCR Playback + DVD REC, RF Receiving + VCR REC, RF Receiving + DVD REC

◆ Test Area Open Area Test Site #2

Note :

Radiated Emissions

(Disturbance Radiation)

[Applicable]

Tuner : TADM-H201F (LG)

Loader : DDW-451S(LITE-ON)

System	CH	Freq. (MHz)	Pol. (H/V)	Limits (dBuV/m)	Result (dBuV/m)	Margin (dB)
DVD Playback		203.4	H	43.5	32.7	10.8
+		297.2	H	46.0	39.4	6.6
VCR record		300.0	H	46.0	36.9	9.1
		339.0	H	46.0	37.4	8.6
		474.6	H	46.0	34.7	11.3
		594.4	H	46.0	42.6	3.4
VCR Playback		203.4	H	43.5	33.0	10.5
+		297.2	H	46.0	40.0	6.0
DVD record		300.0	H	46.0	37.3	8.7
		339.0	H	46.0	36.9	9.1
		474.6	H	46.0	34.7	11.3
		594.4	H	46.0	42.8	3.2
RF Receiving		203.4	H	43.5	32.6	10.9
+		297.2	H	46.0	39.6	6.4
VCR record		300.0	H	46.0	37.4	8.6
		339.0	H	46.0	37.5	8.5
		474.6	H	46.0	34.4	11.6
		594.4	H	46.0	42.5	3.5
RF Receiving		203.4	H	43.5	32.9	10.6
+		297.2	H	46.0	39.8	6.2
DVD record		300.0	H	46.0	37.2	8.8
		339.0	H	46.0	37.3	8.7
		474.6	H	46.0	34.9	11.1
		594.4	H	46.0	42.9	3.1

Note : RV4000 (Loader change) Model.

Radiated Emissions

(Disturbance Radiation)

[Applicable]

Tuner : TMZH2-030A(ALPS)

Loader : DDW-451S(LITE-ON)

System	CH	Freq. (MHz)	Pol. (H/V)	Limits (dBuV/m)	Result (dBuV/m)	Margin (dB)
DVD Playback		159.7	H	43.5	36.6	6.9
+		184.3	H	43.5	36.0	7.5
VCR record		203.2	H	43.5	37.9	5.6
		338.8	H	46.0	38.7	7.3
		474.3	V	46.0	39.4	6.6
		607.9	H	46.0	37.8	8.2
VCR Playback		159.7	H	43.5	36.4	7.1
+		184.3	H	43.5	35.9	7.6
DVD record		203.2	H	43.5	38.0	5.5
		338.8	H	46.0	38.3	7.7
		474.3	V	46.0	40.1	5.9
		607.9	H	46.0	38.1	7.9
RF Receiving		159.7	H	43.5	37.1	6.4
+		184.3	H	43.5	36.3	7.2
VCR record		203.2	H	43.5	37.9	5.6
		338.8	H	46.0	38.5	7.5
		474.3	V	46.0	39.8	6.2
		607.9	H	46.0	38.1	7.9
RF Receiving		159.7	H	43.5	36.9	6.6
+		184.3	H	43.5	36.1	7.4
DVD record		203.2	H	43.5	38.3	5.2
		338.8	H	46.0	39.0	7.0
		474.3	V	46.0	39.5	6.5
		607.9	H	46.0	38.2	7.8

Note : RV4000 (Loader change) Model.

Radiated Emissions

(Disturbance Radiation)

[Applicable]

Tuner : TMZH2-030A(ALPS)

Loader : BDR-L04P (BTC)

System	CH	Freq. (MHz)	Pol. (H/V)	Limits (dBuV/m)	Result (dBuV/m)	Margin (dB)
DVD Playback		147.5	V	43.5	31.9	11.6
+		184.3	H	43.5	32.4	11.1
VCR record		196.6	V	43.5	32.0	11.5
		300.0	H	46.0	37.5	8.5
		600.0	V	46.0	39.7	6.3
VCR Playback		147.5	V	43.5	32.0	11.5
+		184.3	H	43.5	32.0	11.5
DVD record		196.6	V	43.5	31.8	11.7
		300.0	H	46.0	37.8	8.2
		600.0	V	46.0	39.6	6.4
RF Receiving		147.5	V	43.5	32.1	11.4
+		184.3	H	43.5	32.5	11.0
VCR record		196.6	V	43.5	31.2	12.3
		300.0	H	46.0	37.1	8.9
		600.0	V	46.0	39.8	6.2
RF Receiving		147.5	V	43.5	32.2	11.3
+		184.3	H	43.5	32.2	11.3
DVD record		196.6	V	43.5	31.3	12.2
		300.0	H	46.0	37.7	8.3
		600.0	V	46.0	40.0	6.0

End of data

Note : DVR-S04 (Front PCB change) Model.

The DUT photos – RV4000(Loader change)

Front View

Rear View

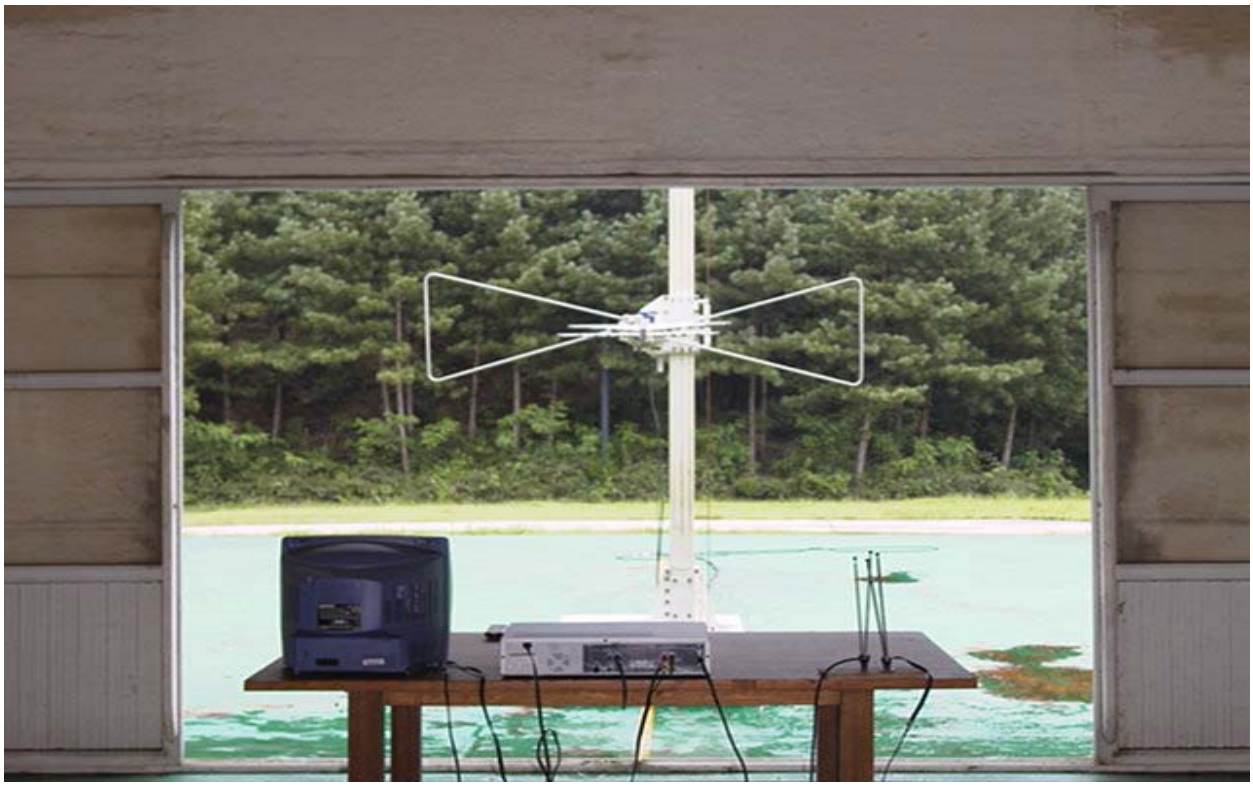
The DUT photos – DVR-S04(Front change)

Front View

Rear View

Test Setup Photos – Radiated Emissions

Front View



Rear View

Test Setup Photos – Conducted Emissions

Front View

Rear View