Certification of Compliance

CFR 47 Part 15 Subpart B

Test Report File No.	04-IST-0066	**Date of Issue**	April 16,2004
Model(s)	DV-6T844N / Basic Model		
	DV1040 / Buyer Model		
Kind of Product	DVD VCR COMBO Receiver (TV Interface Device)		
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 84 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-H101F
LG Innotek Co., Ltd.	TADM-H201F
SAMSUNG Electric Co., Ltd.	TCMN0682PA20B4
Korea ALPS	TMZH2-030A

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	18 ℃
Humidity	47 %
Atmospheric pressure	1002 mbar

POWER SUPPLY SYSTEM USED

Power supply system	120Vac , 60Hz

PRODUCT INFORMATIONS

Power supply system	120Vac , 60Hz
Power consumption	24W (Supplementary 4W)
Installation Conditions	Horizontal / Relative humidity under 80%
Signal type	NTSC COLOR
Antenna Input/output	U/V-mixed : 75Ω unbalanced
Clock display	12hrs AM/PM
Timer Recording	8 Programs a year
VIDEO S/N (VCR)	Over 45dB (Standard recording)
Size(W X H X D)	435 X 93 X 255 mm
Weight	4.5Kg
VIDEO input	1.0 Vp-p unbalanced, RCA JACK
AUDIO input	-8.8dBm, RCA JACK
VHF output	3 or 4 CH

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

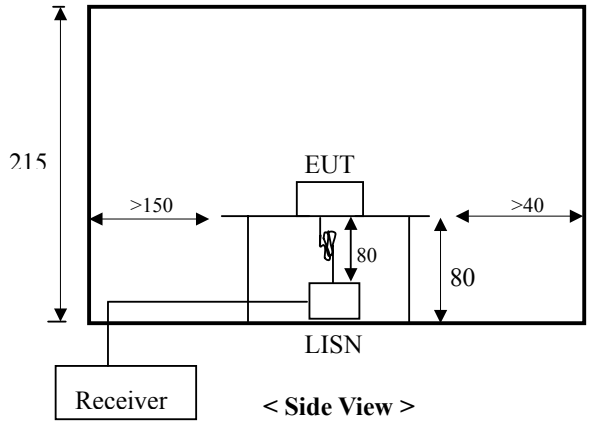
DESCRIPTIONS OF TEST

Conducted Emissions:

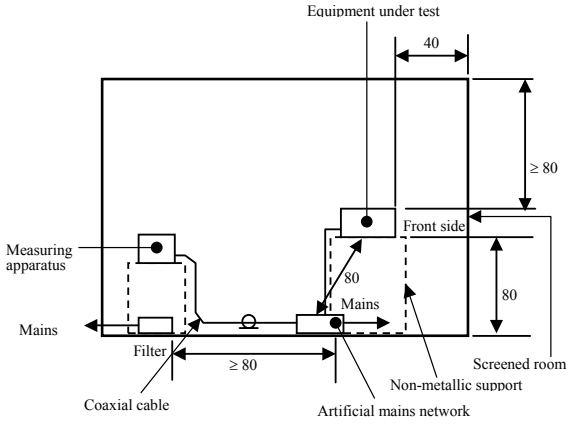
The measurement were performed over the frequency range of 0.45MHz to 30MHz using a 50Ω/50uH LISN as the input transducer to a Spectrum Analyzer or a Field Intensity Meter. The measurements were made with the detector set for "Peak" amplitude within an bandwidth of 10KHz or for "quasi-peak" within a 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 0.45 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 >

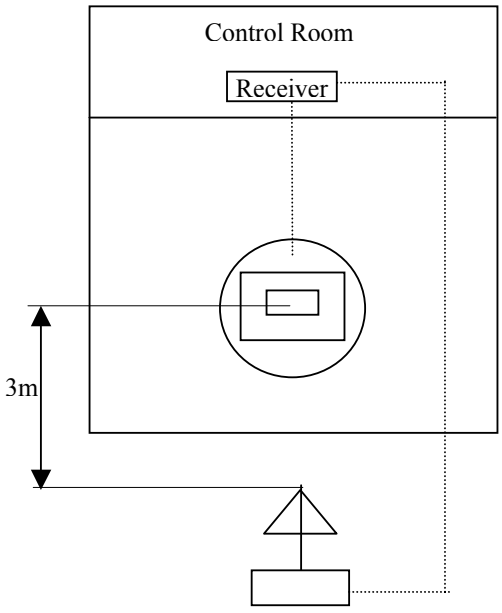
DESCRIPTION OF TEST

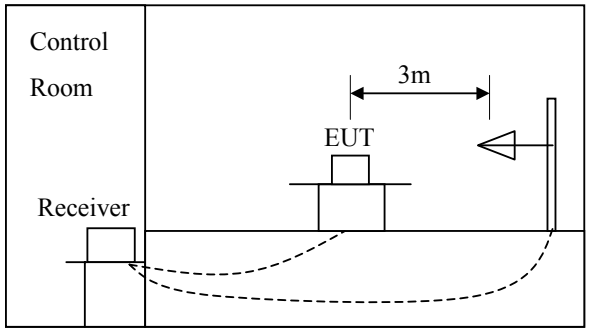
Radiated Emissions:

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.





DESCRIPTION OF TEST

Output Signal level measurements :

The RF output of the TV interface device was fed to the TV receiver via coaxial cable. The signal level was measured by direct connection to the spectrum analyzer with 50/75 ohm matching transformer between the spectrum analyzer and the TV interface device.
The RF output signal level measured RMS voltage was the highest RF level present at the output terminals during normal use of the device. Measurements were made of the levels of both the visual(61.25 MHz) and aural(71.25 MHz) of TV channel 3 and 4.
The voltage corresponding to the peak envelope power of the video modulated signal during maximum amplitude peaks across a resistance(R ohms) matching the rated output impedance of the device, must not exceed 346.4 times the square root of (R)[uV] for all other TV interface device. The voltage corresponding to peak envelope power of the audio modulated signal, if provided by the TV interface device, must not exceed 77.5 times the square root of (R)[uV] for all other TV interface device.(Sec 15.115 (b).(1).(ii))

Output Terminal Conducted Spurious Emission :

The RF output signal was fed to the TV receiver with coaxial cable. The measurements were made by direct connection to the spectrum analyzer and TV interface device with 50/75 ohm matching transformer. The frequency range 30 to 1000MHz was investigated for significant emission. The maximum RMS voltage of any emission appearing on frequencies removed by than 4.6MHz below or 7.4MHz above the video carrier frequency on which the TV interface device is operated must not exceed 10.95 timed the square root of (R) [uV](Sec 15.115 (b).(2).(ii)) This represents the 30dB attenuation.

Transfer Switch Isolation Measurement :

The measurements were made of the maximum RMS voltage at the antenna terminals of the switch for all positions of the transfer switch. The maximum voltage corresponds to the peak envelope power of the video signal during maximum amplitude peaks. In either position of the receiver transfer switch, the maximum voltage at the receiving antenna input terminals of the switch when terminated with a resistance (R ohms) matching the rated impedance of the antenna input of the switch, must not exceed 0.346 times the square root of (R) [uV]. (Sec 15.115 (c).(1).(ii))

SUMMARY

■ Conducted Emission

The requirements are ● MET ○ Not MET

Minimum limit margin 9.1 dB at 0.396 MHz

Maximum limit exceeding

Remarks : With live phase, for average detect mode (VCR Playback mode, Tuner: TADM-H201F)

■ Radiated Emission

The requirements are ● MET ○ Not MET

Minimum limit margin 3.0 dB at 216.0 MHz

Maximum limit exceeding

Remarks : VCR Playback mode (Tuner: TCMN0682PA20B4)

■ Output Signal Level Measurements

The requirements are ● MET ○ Not MET

Minimum limit margin

Maximum limit exceeding

Remarks : Limits are kept with more than 10dB margin

■ Output Terminal Conducted Spurious Emission

The requirements are ● MET ○ Not MET

Minimum limit margin

Maximum limit exceeding

Remarks : Limits are kept with more than 10dB margin

■ Transfer Switch Isolation Measurements

The requirements are ● MET ○ Not MET

Minimum limit margin

Maximum limit exceeding

Remarks : Limits are kept with more than 3dB margin

Prepared By

Note :

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

J.H.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

◆ Auxiliary Equipment Used

Model Name	Manufacturer	Descriptions
14C5NT	Daewoo Electronics.	Color TV Receiver

◆ Accessories including cables

Name	Length	Port and Descriptions
RCA	1.5m	Video / Audio
S-Video	1.5m	

◆ Environmental Conditions

Temperature	19 ℃
Humidity	47 %
Atmosphere pressure	1002 mbar

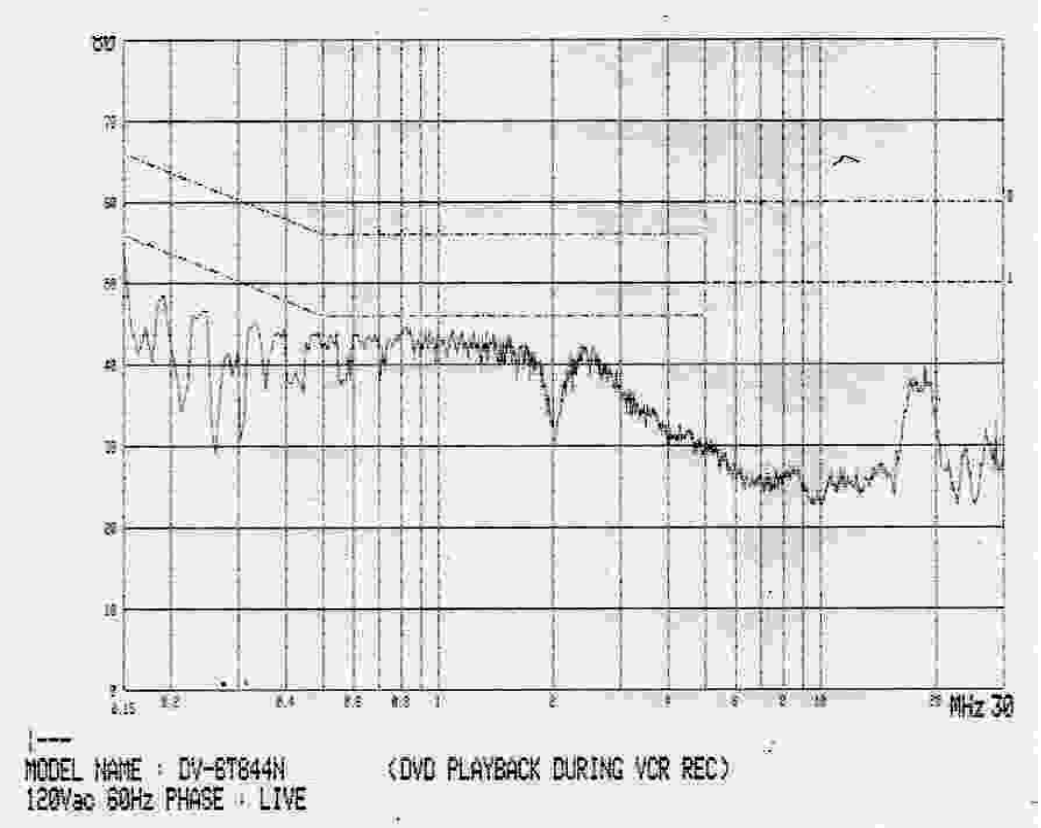
◆ Test Program DVD Playback during VCR REC, DVD Playback, RF Receiving during VCR REC, VCR Playback Mode

◆ Test Area Shielded Room #3

Note :

Conducted Emissions

(Mains Terminal Disturbance Voltages)



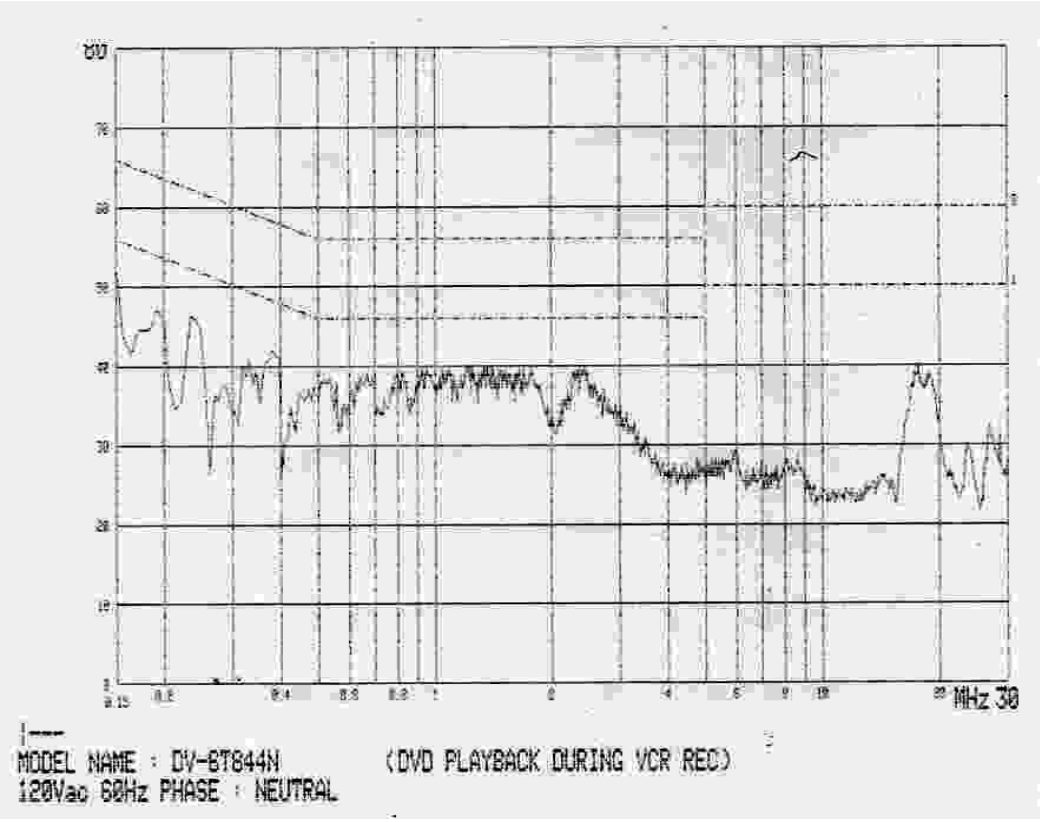
Tuner : TADM-H101F (LG)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.151	49.6	29.9	66.0	56.0	16.4	26.1
0.241	43.6	34.5	62.1	52.1	18.5	17.6
0.809	40.7	25.6	56.0	46.0	15.3	20.4

Note : The insertion loss, 0.8dB, is negligible compare with the margin evaluated.

Conducted Emissions

(Mains Terminal Disturbance Voltages)



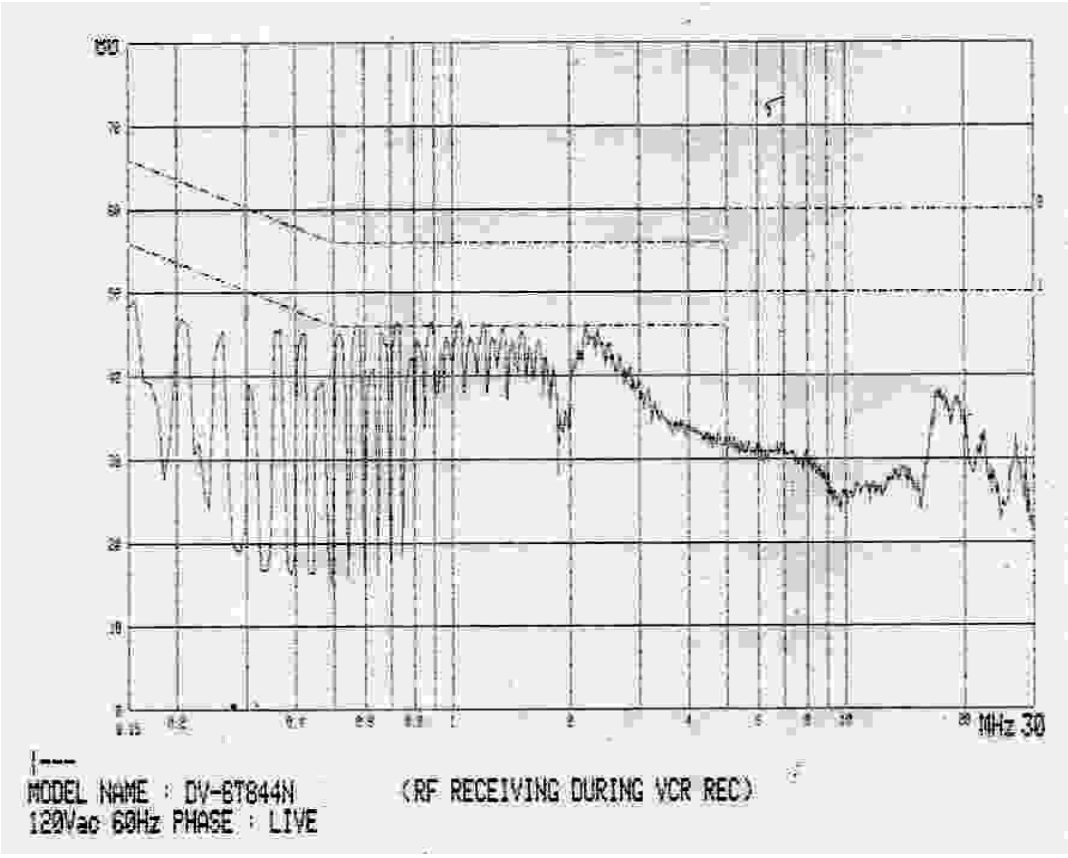
Tuner : TADM-H101F (LG)

Freq. [MHz]	Measurement [dB µV]		Limit [dB µV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.151	46.9	26.1	66.0	56.0	19.1	29.9
0.236	43.6	36.0	62.2	52.2	18.6	16.2

Note : The insertion loss, 0.8dB, is negligible compare with the margin evaluated.

Conducted Emissions

(Mains Terminal Disturbance Voltages)



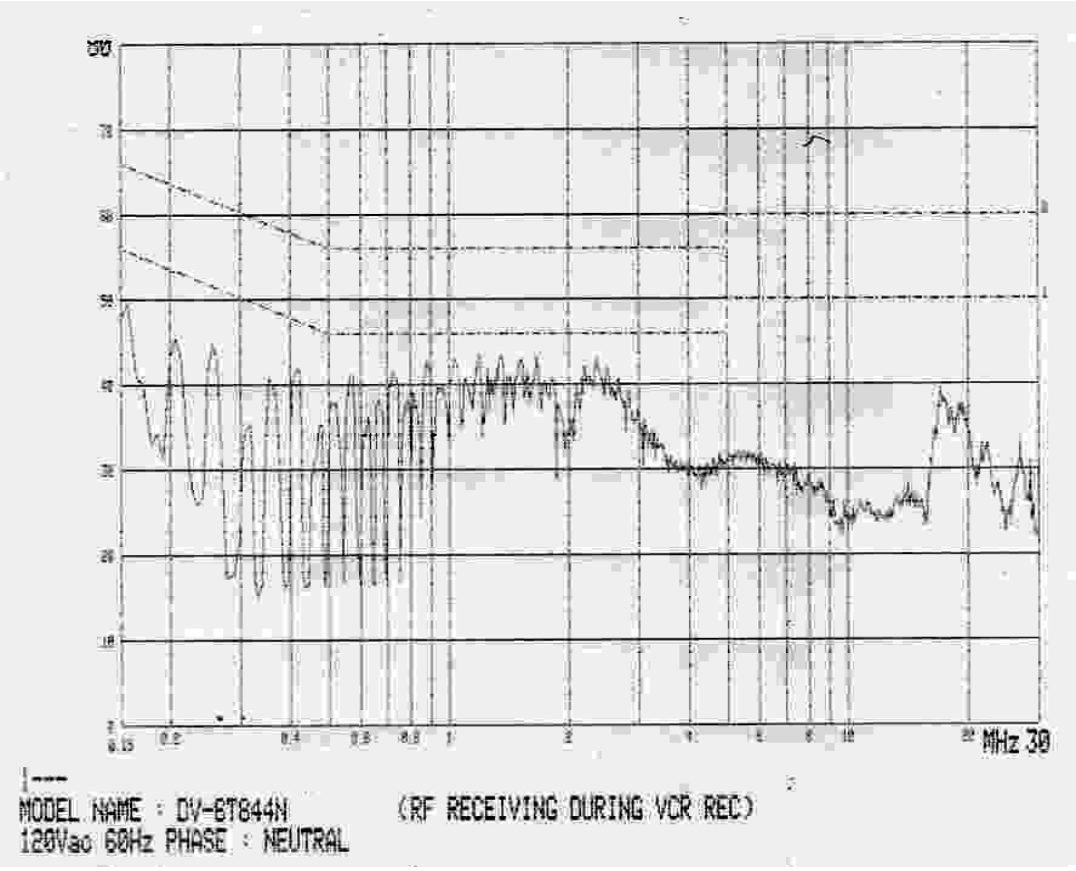
Tuner : TADM-H101F (LG)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.571	44.0	27.5	56.0	46.0	12.0	18.5
0.729	44.3	26.5	56.0	46.0	11.7	19.5
0.882	44.5	22.7	56.0	46.0	11.5	23.3
1.046	44.3	21.2	56.0	46.0	11.7	24.8

Note : The insertion loss, 0.8dB, is negligible compare with the margin evaluated.

Conducted Emissions

(Mains Terminal Disturbance Voltages)



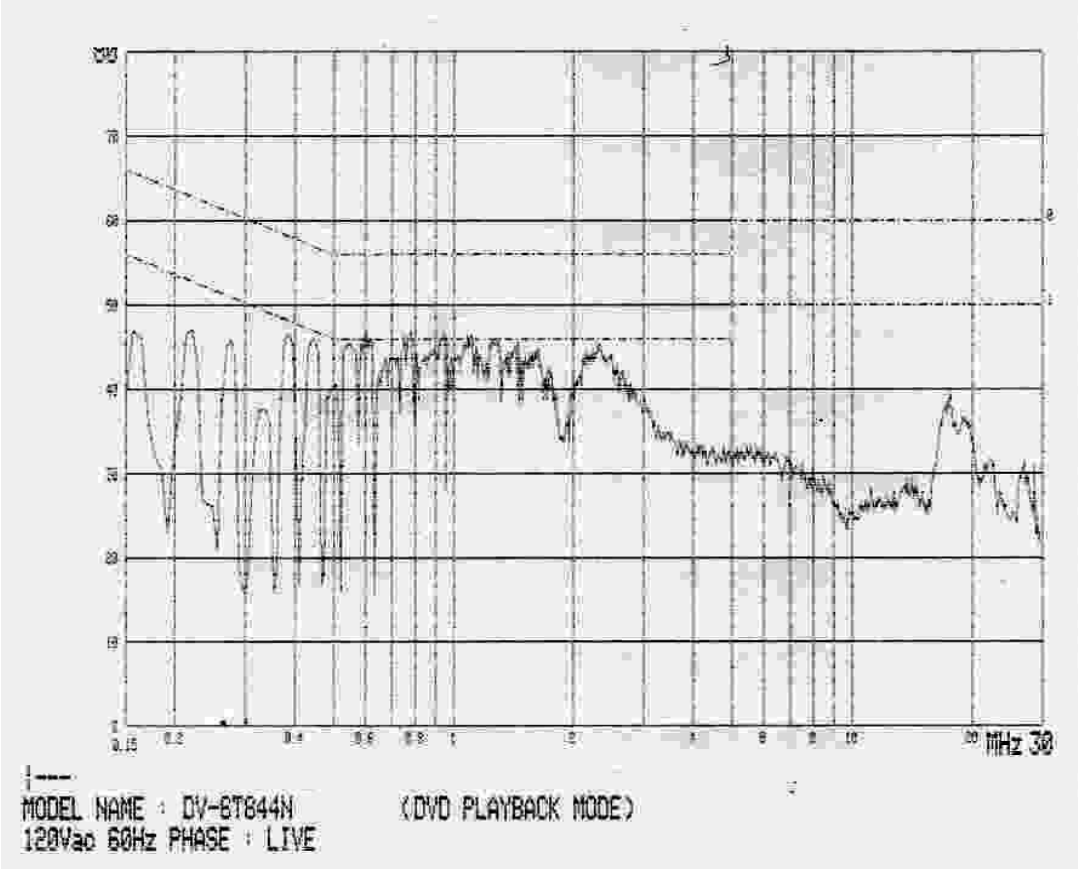
Tuner : TADM-H101F (LG)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.155	47.2	38.2	65.7	55.7	18.5	17.5
1.043	41.5	21.2	56.0	46.0	14.5	24.8
2.334	40.1	24.3	56.0	46.0	15.9	21.7

Note : The insertion loss, 0.8dB, is negligible compare with the margin evaluated.

Conducted Emissions

(Mains Terminal Disturbance Voltages)



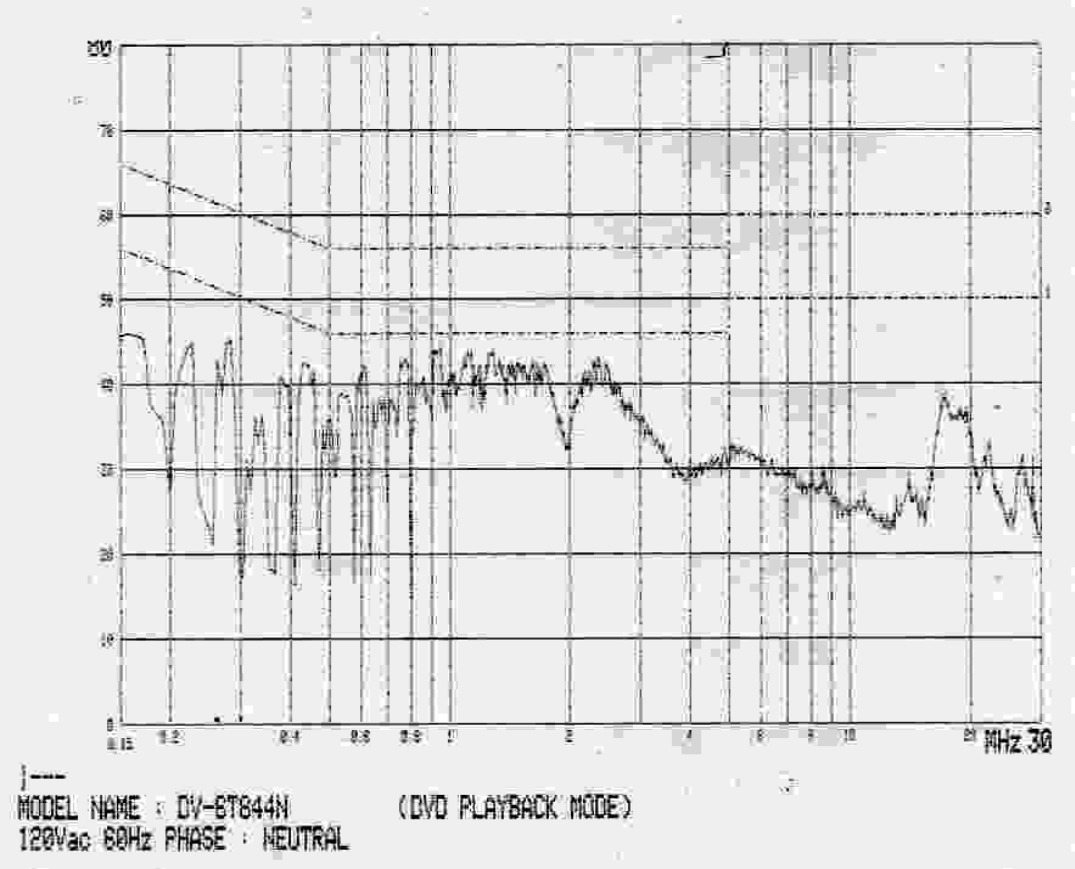
Tuner : TADM-H101F (LG)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.447	44.0	26.8	56.9	46.9	12.9	20.1
0.611	44.2	28.1	56.0	46.0	11.8	17.9
0.768	44.3	25.4	56.0	46.0	11.7	20.6
1.114	43.6	21.0	56.0	46.0	12.4	25.0
2.291	41.2	21.6	56.0	46.0	14.8	24.4

Note : The insertion loss, 0.8dB, is negligible compare with the margin evaluated.

Conducted Emissions

(Mains Terminal Disturbance Voltages)



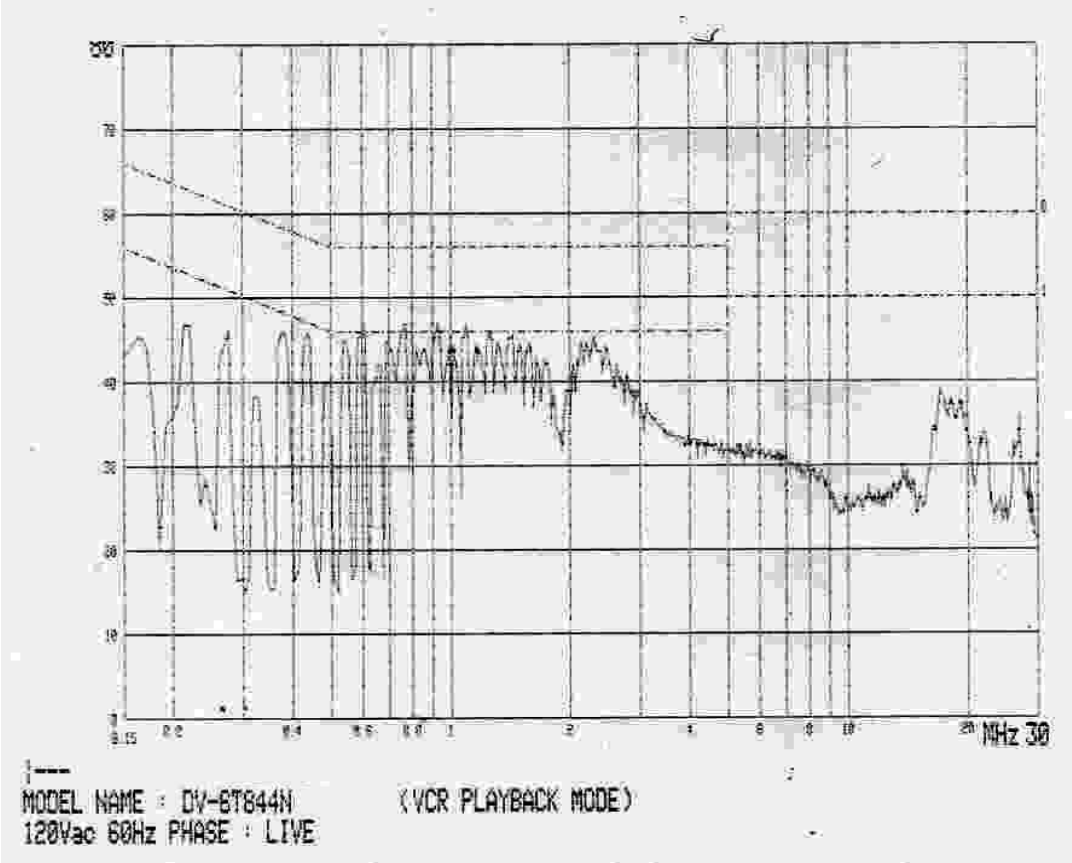
Tuner : TADM-H101F (LG)

Freq. [MHz]	Measurement [dB µV]		Limit [dB µV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.276	43.6	36.4	61.0	51.0	17.4	14.6
0.947	40.6	19.4	56.0	46.0	15.4	26.6
1.279	40.3	21.6	56.0	46.0	15.7	24.4

Note : The insertion loss, 0.8dB, is negligible compare with the margin evaluated.

Conducted Emissions

(Mains Terminal Disturbance Voltages)



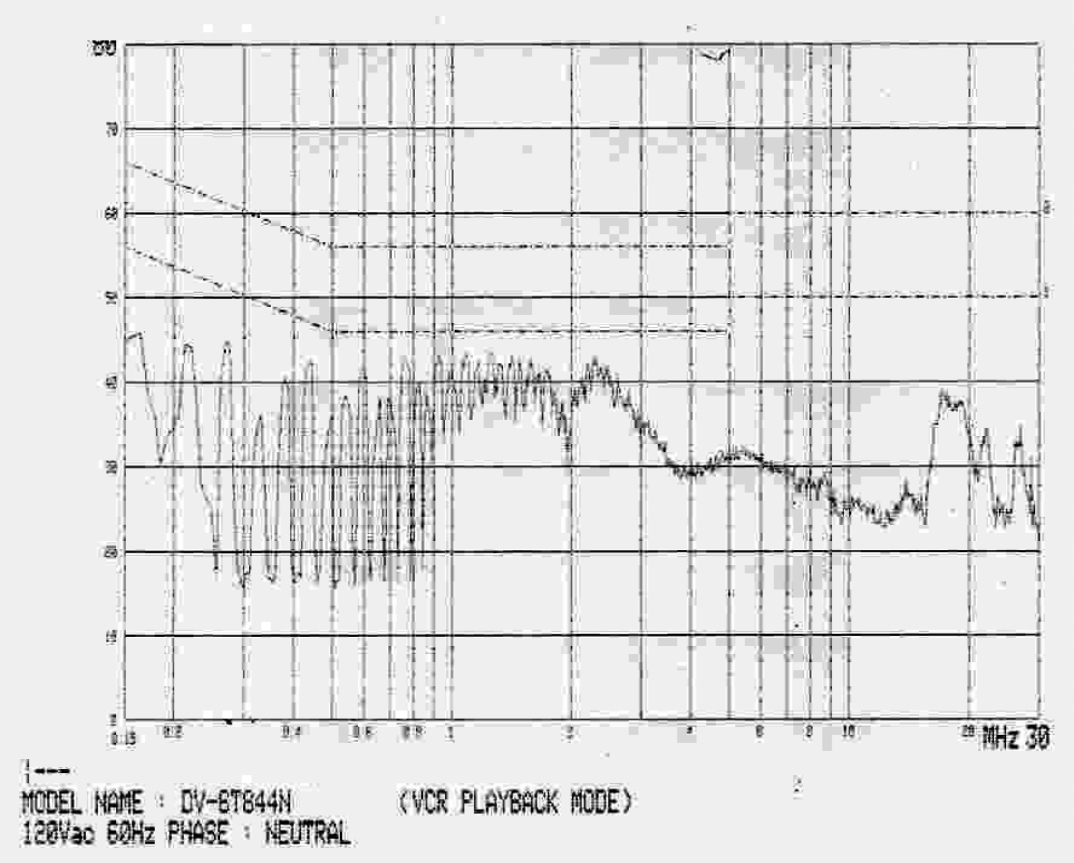
Tuner : TADM-H101F (LG)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.435	44.4	35.9	57.2	47.2	12.8	11.3
0.604	44.5	28.6	56.0	46.0	11.5	17.4
0.765	44.9	27.9	56.0	46.0	11.1	18.1
0.931	44.7	24.3	56.0	46.0	11.3	21.7
1.090	44.4	22.6	56.0	46.0	11.6	23.4

Note : The insertion loss, 0.8dB, is negligible compare with the margin evaluated.

Conducted Emissions

(Mains Terminal Disturbance Voltages)



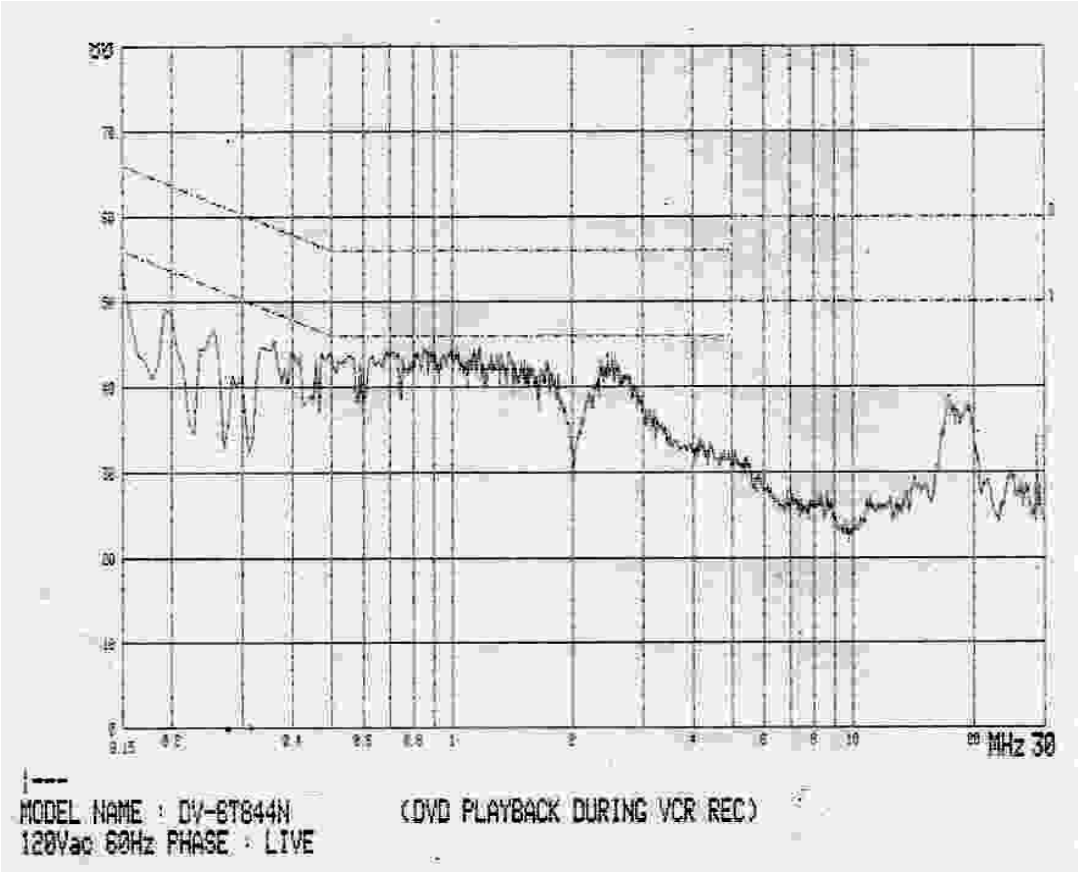
Tuner : TADM-H101F (LG)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.272	43.5	40.7	61.1	51.1	17.6	10.4
1.092	41.6	21.2	56.0	46.0	14.4	24.8

Note : The insertion loss, 0.8dB, is negligible compare with the margin evaluated.

Conducted Emissions

(Mains Terminal Disturbance Voltages)



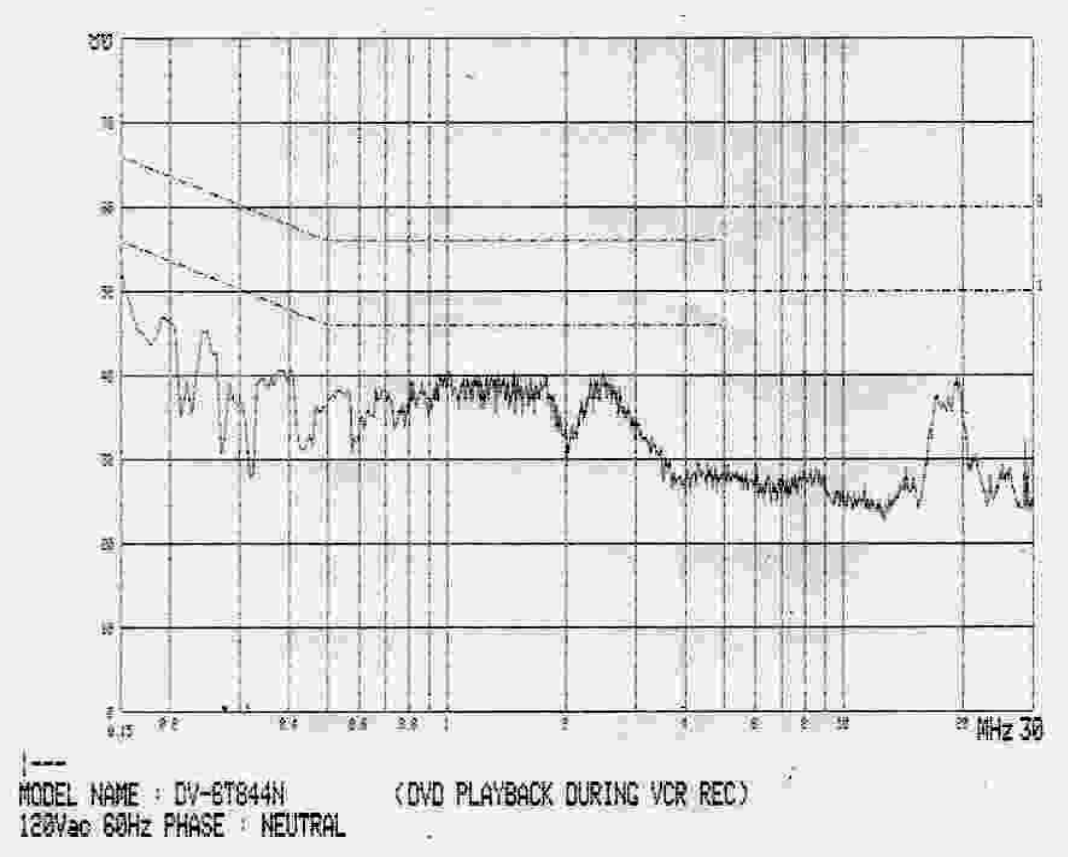
Tuner : TADM-H201F (LG)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.151	48.9	38.0	65.9	55.9	17.0	17.9
0.362	42.2	32.7	58.7	48.7	16.5	16.0
0.867	40.6	25.2	56.0	46.0	15.4	20.8
2.429	38.9	30.2	56.0	46.0	17.1	15.8

Note : The insertion loss, 0.8dB, is negligible compare with the margin evaluated.

Conducted Emissions

(Mains Terminal Disturbance Voltages)



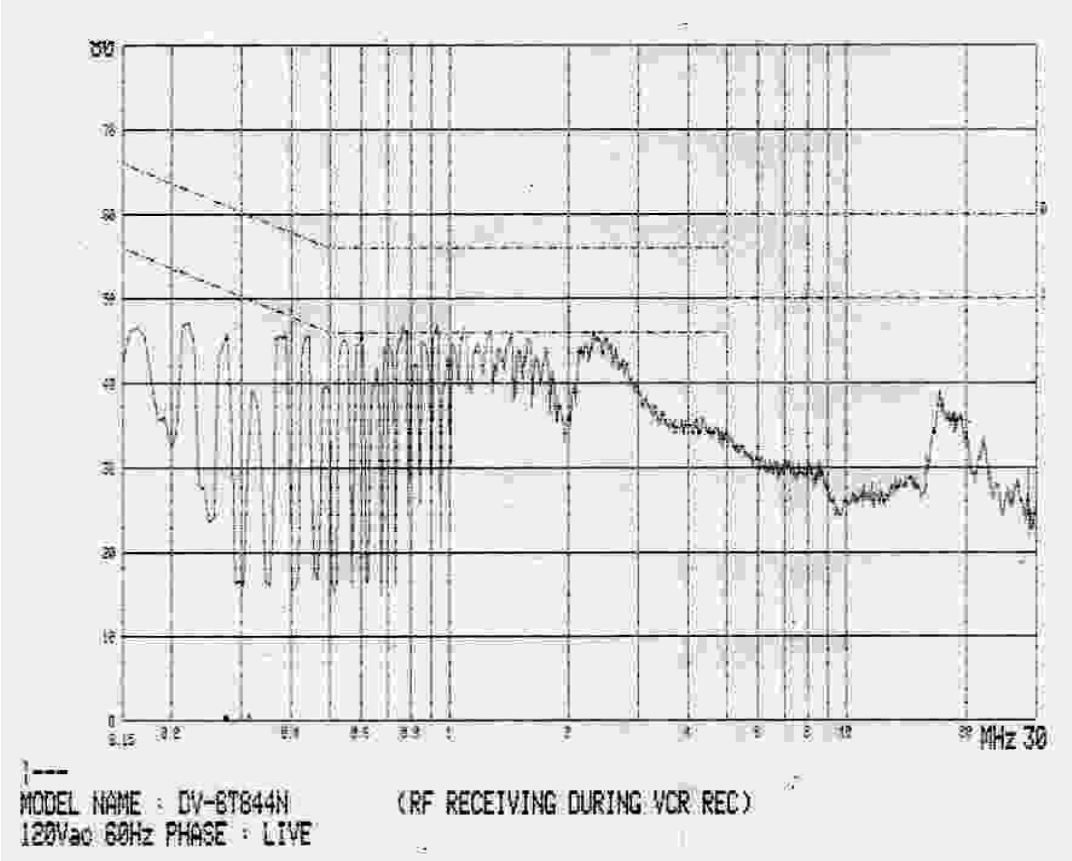
Tuner : TADM-H201F (LG)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.151	48.4	36.1	66.0	56.0	17.6	19.9
0.248	42.9	34.3	61.8	51.8	18.9	17.5
2.492	35.2	25.9	56.0	46.0	20.8	20.1

Note : The insertion loss, 0.8dB, is negligible compare with the margin evaluated.

Conducted Emissions

(Mains Terminal Disturbance Voltages)



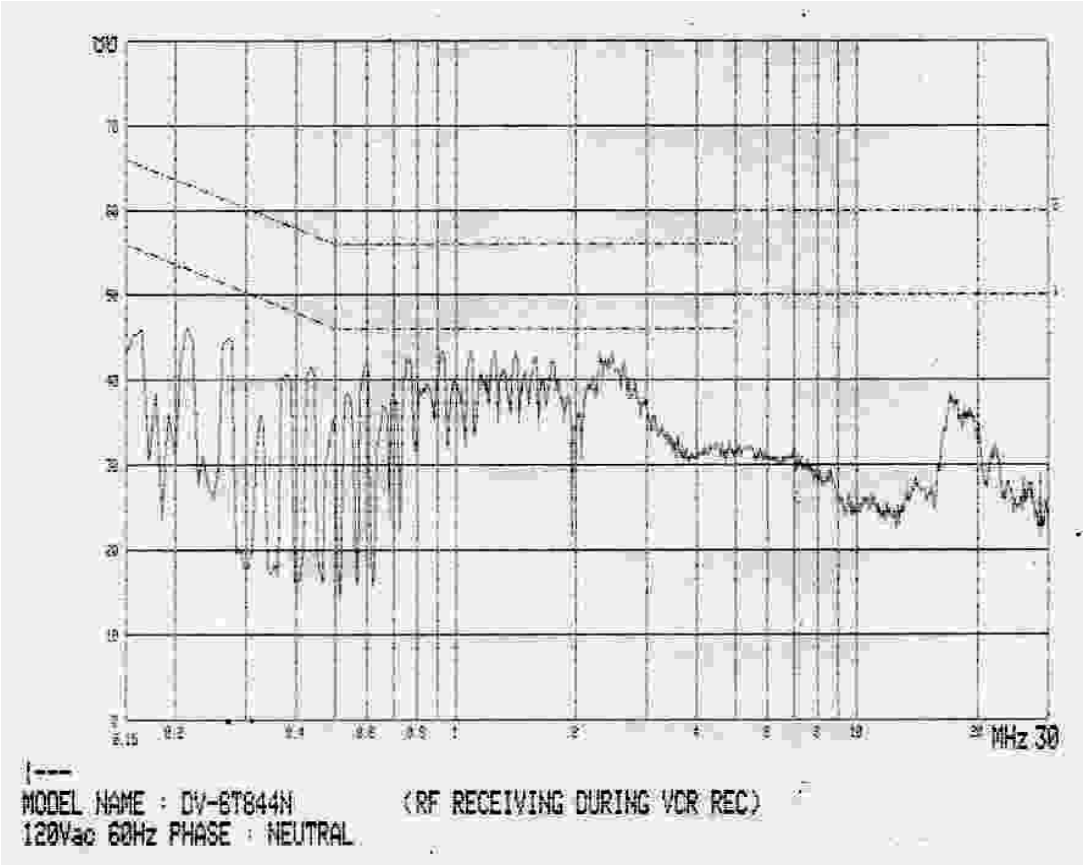
Tuner : TADM-H201F (LG)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.606	44.5	25.4	56.0	46.0	11.5	20.6
0.922	44.2	24.5	56.0	46.0	11.8	21.5
1.265	44.4	23.7	56.0	46.0	11.6	22.3
2.289	43.3	23.8	56.0	46.0	12.7	22.2

Note : The insertion loss, 0.8dB, is negligible compare with the margin evaluated.

Conducted Emissions

(Mains Terminal Disturbance Voltages)



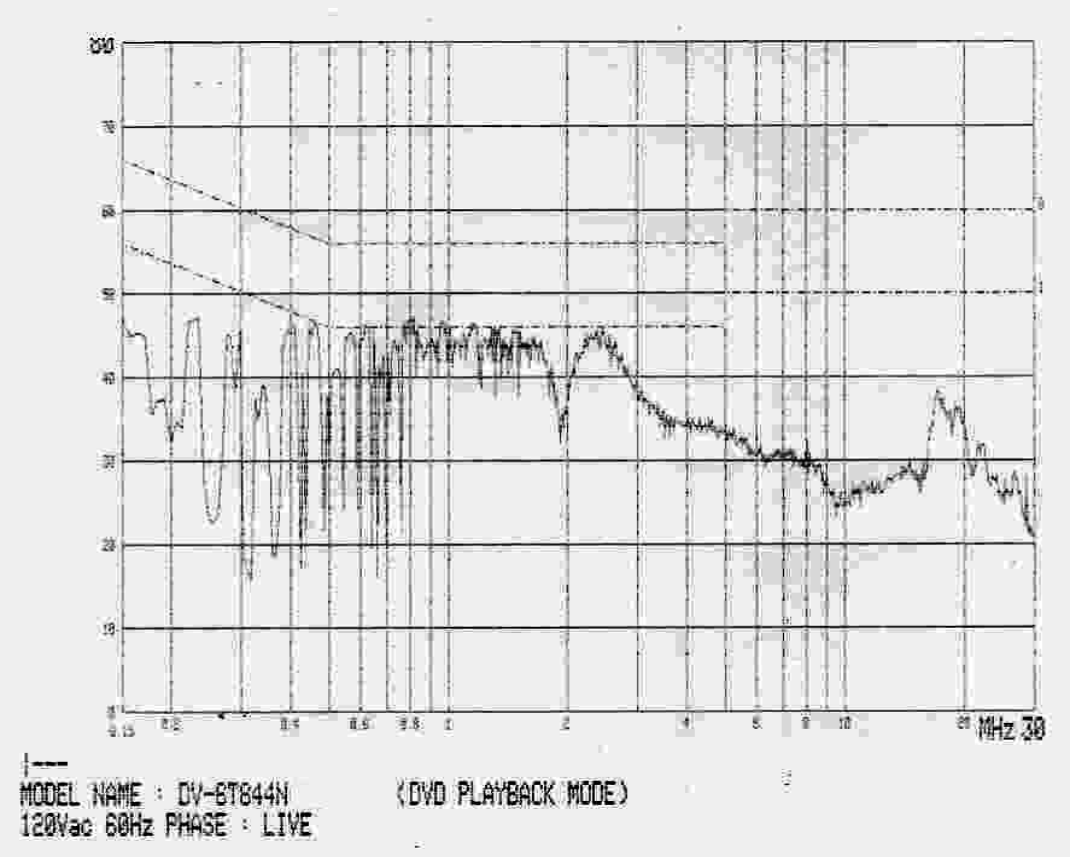
Tuner : TADM-H201F (LG)

Freq. [MHz]	Measurement [dBμV]		Limit [dBμV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.217	43.7	41.8	62.9	52.9	19.2	11.1
1.094	41.6	19.0	56.0	46.0	14.4	27.0
2.464	40.2	22.3	56.0	46.0	15.8	23.7

Note : The insertion loss, 0.8dB, is negligible compare with the margin evaluated.

Conducted Emissions

(Mains Terminal Disturbance Voltages)



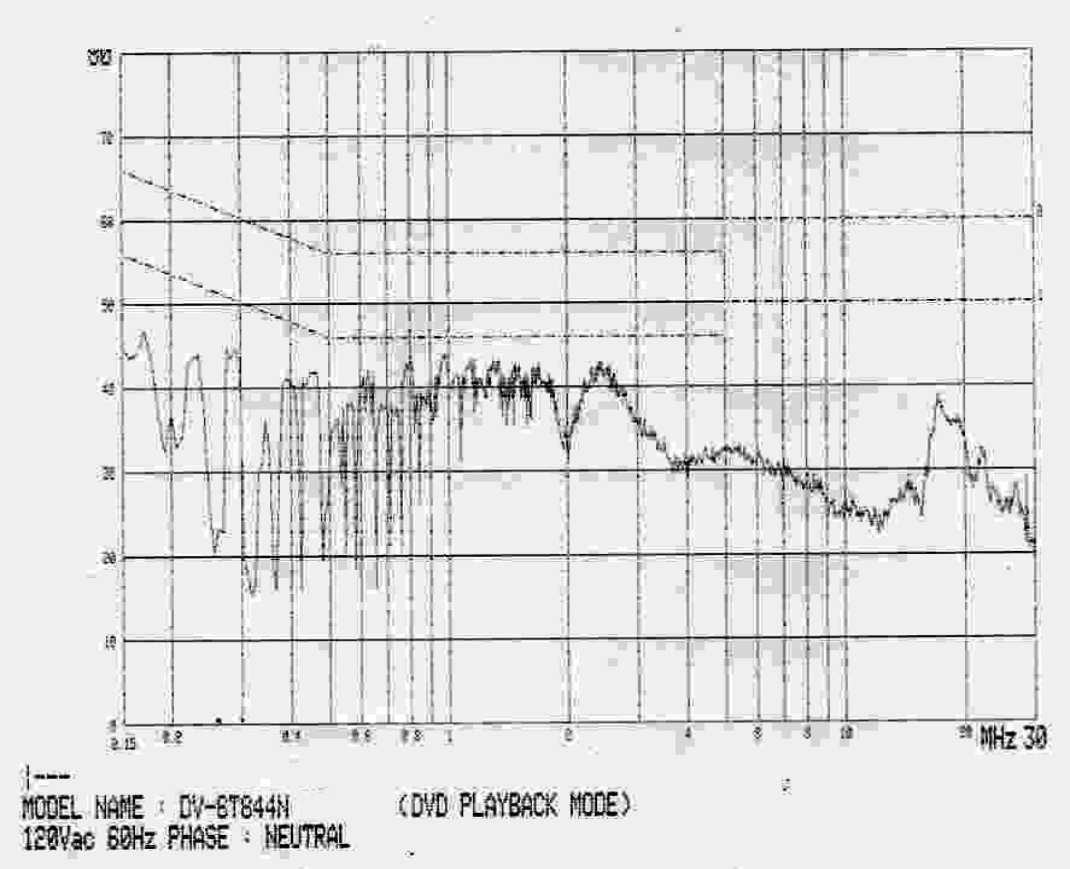
Tuner : TADM-H201F (LG)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.463	44.0	22.9	56.6	46.6	12.6	23.7
0.795	44.3	24.4	56.0	46.0	11.7	21.6
0.970	44.1	22.6	56.0	46.0	11.9	23.4
2.439	41.7	21.2	56.0	46.0	14.3	24.8

Note : The insertion loss, 0.8dB, is negligible compare with the margin evaluated.

Conducted Emissions

(Mains Terminal Disturbance Voltages)



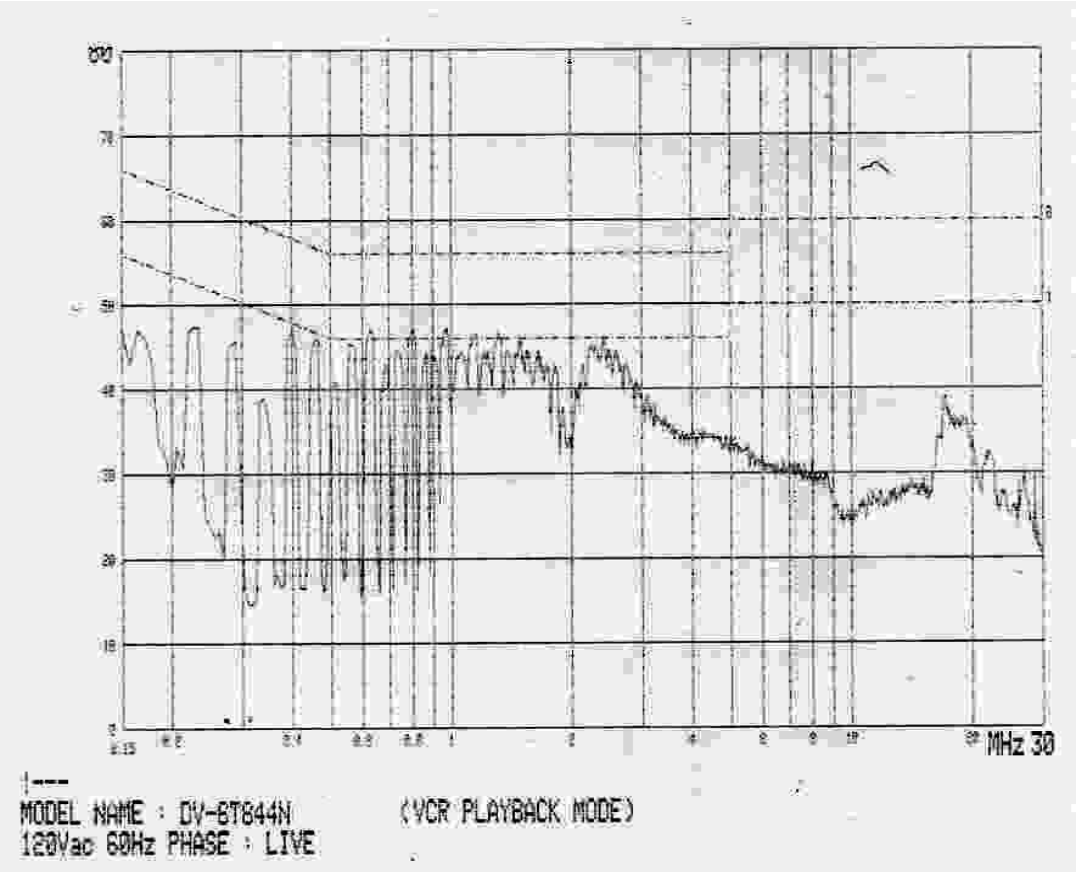
Tuner : TADM-H201F (LG)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.286	43.6	33.2	60.6	50.6	17.0	17.4
0.966	40.9	21.1	56.0	46.0	15.1	24.9
2.445	39.0	20.6	56.0	46.0	17.0	25.4

Note : The insertion loss, 0.8dB, is negligible compare with the margin evaluated.

Conducted Emissions

(Mains Terminal Disturbance Voltages)



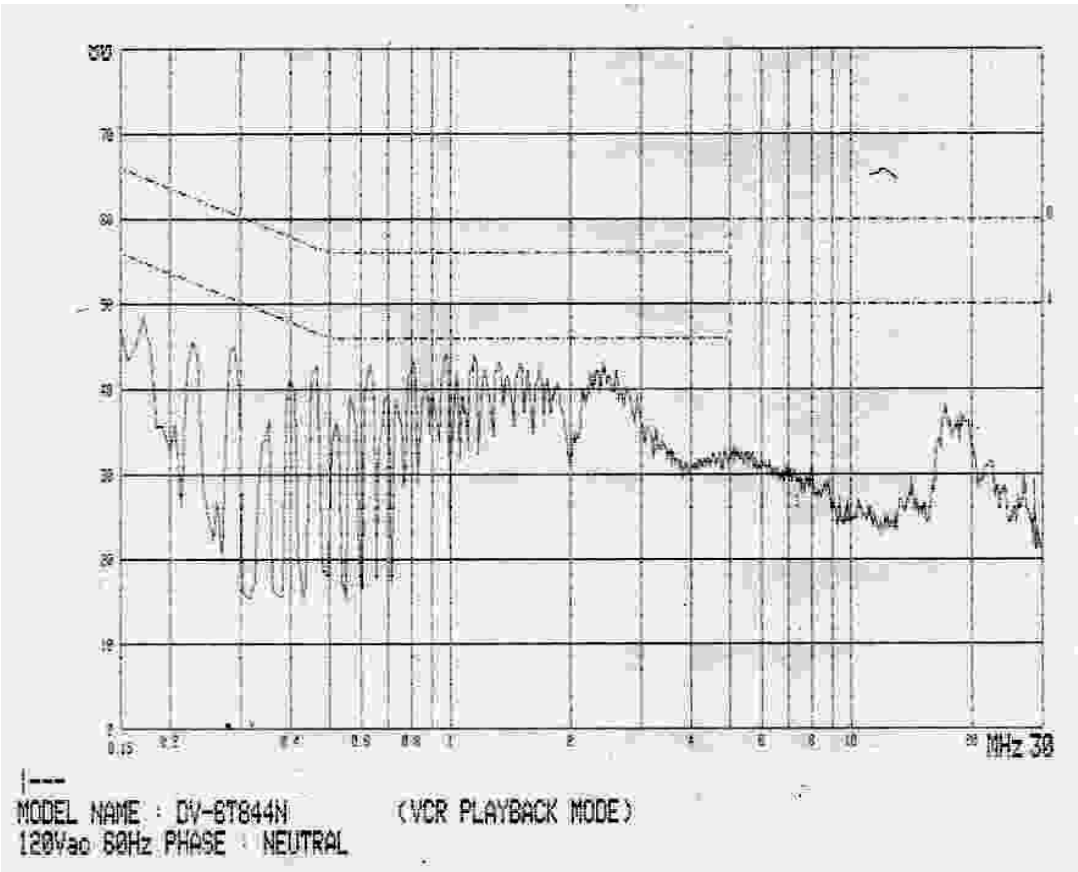
Tuner : TADM-H201F (LG)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.396	45.0	38.8	57.9	47.9	12.9	9.1
0.629	44.9	28.3	56.0	46.0	11.1	17.7
0.801	45.2	26.1	56.0	46.0	10.8	19.9
2.386	42.8	21.3	56.0	46.0	13.2	24.7

Note : The insertion loss, 0.8dB, is negligible compare with the margin evaluated.

Conducted Emissions

(Mains Terminal Disturbance Voltages)



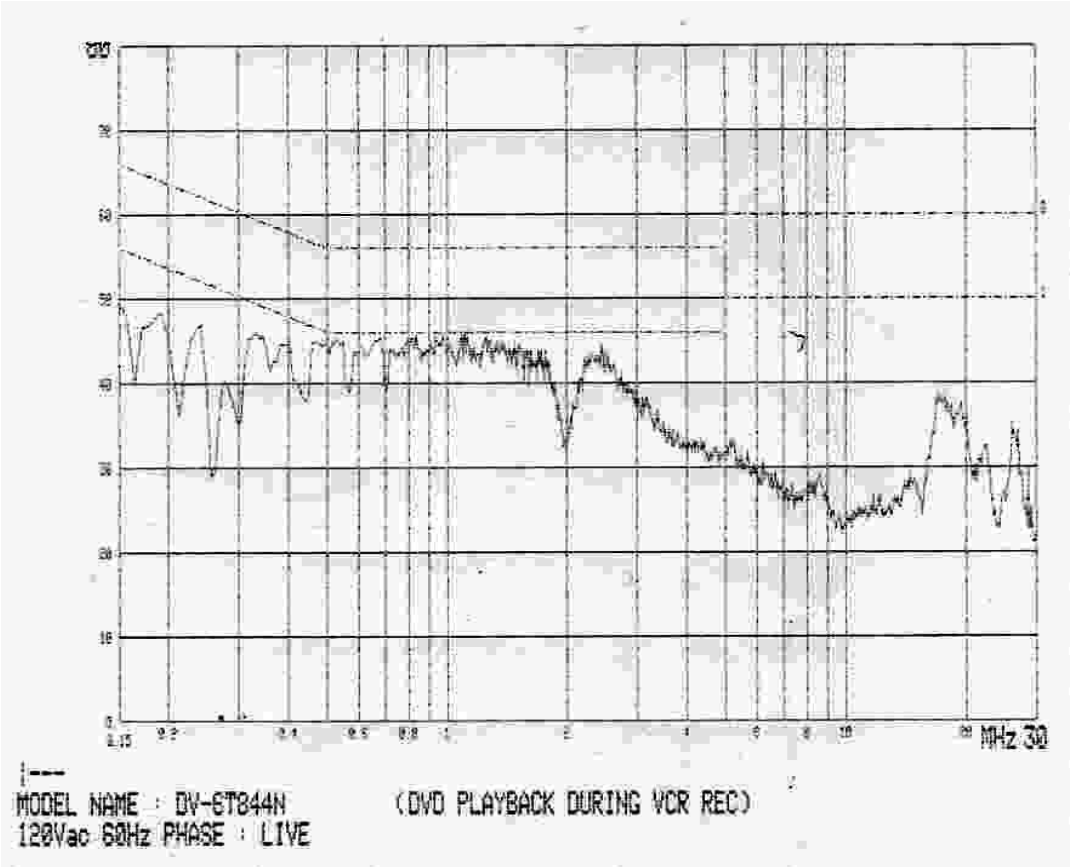
Tuner : TADM-H201F (LG)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.175	45.4	28.2	64.7	54.7	19.3	26.5
0.973	41.7	23.3	56.0	46.0	14.3	22.7
2.412	40.0	23.2	56.0	46.0	16.0	22.8

Note : The insertion loss, 0.8dB, is negligible compare with the margin evaluated.

Conducted Emissions

(Mains Terminal Disturbance Voltages)



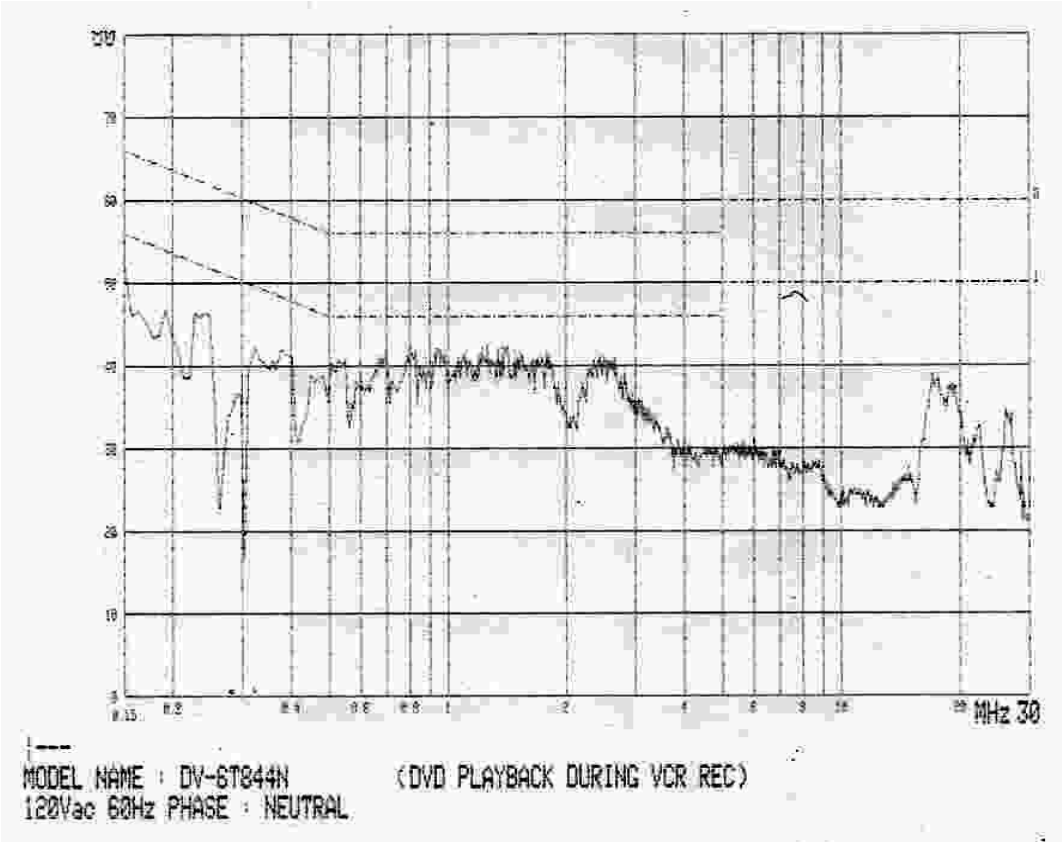
Tuner : TMZH2-030A (ALPS)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.676	42.3	25.9	56.0	46.0	13.7	20.1
1.104	41.4	28.1	56.0	46.0	14.6	17.9
2.451	38.9	30.2	56.0	46.0	17.1	15.8

Note : The insertion loss, 0.8dB, is negligible compare with the margin evaluated.

Conducted Emissions

(Mains Terminal Disturbance Voltages)



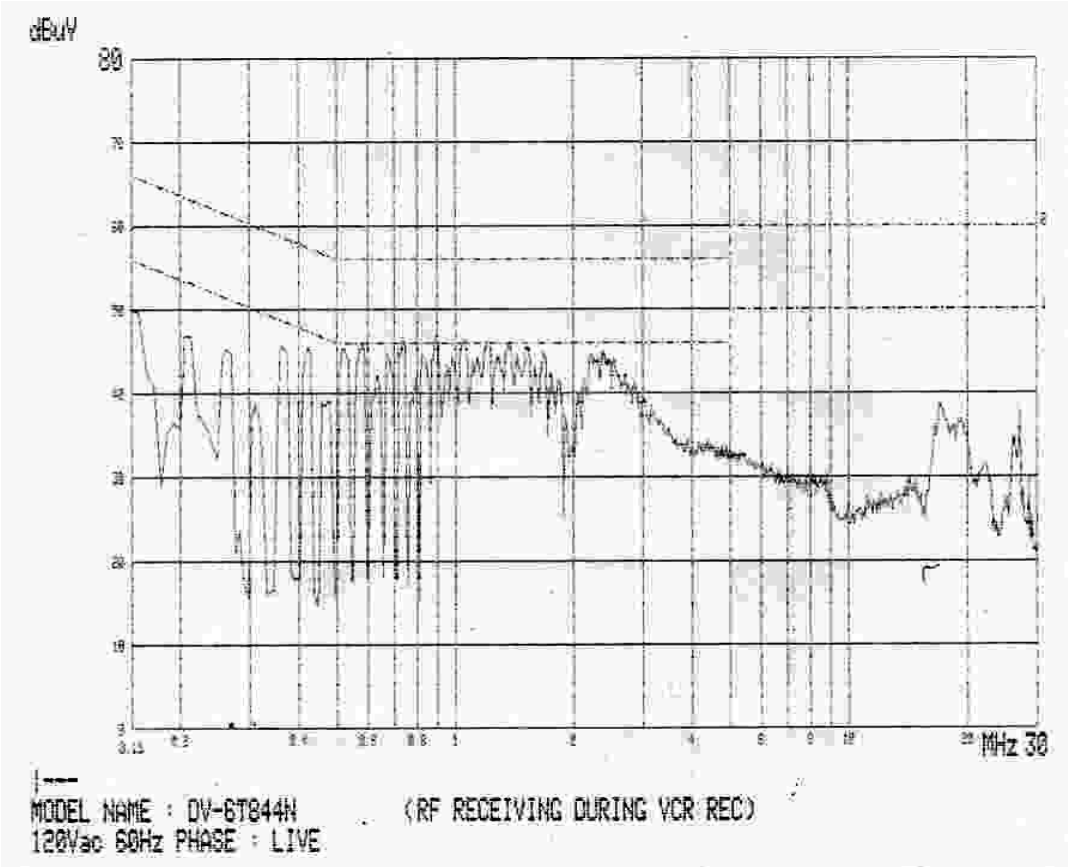
Tuner : TMZH2-030A (ALPS)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.150	47.3	24.4	66.0	56.0	18.7	31.6
0.240	44.1	33.8	62.1	52.1	18.0	18.3

Note : The insertion loss, 0.8dB, is negligible compare with the margin evaluated.

Conducted Emissions

(Mains Terminal Disturbance Voltages)



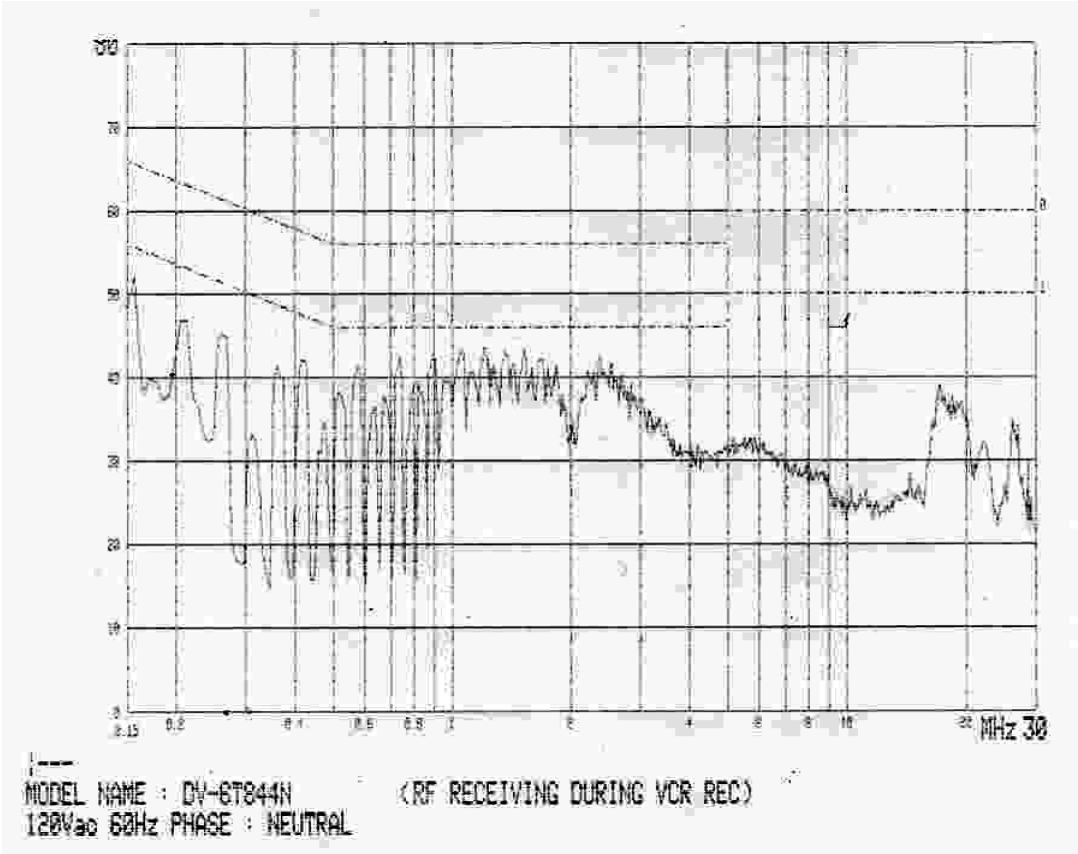
Tuner : TMZH2-030A (ALPS)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.582	44.3	25.4	56.0	46.0	11.7	20.6
0.743	44.3	23.5	56.0	46.0	11.7	22.5
0.899	44.6	22.4	56.0	46.0	11.4	23.6
1.060	44.4	23.7	56.0	46.0	11.6	22.3

Note : The insertion loss, 0.8dB, is negligible compare with the margin evaluated.

Conducted Emissions

(Mains Terminal Disturbance Voltages)



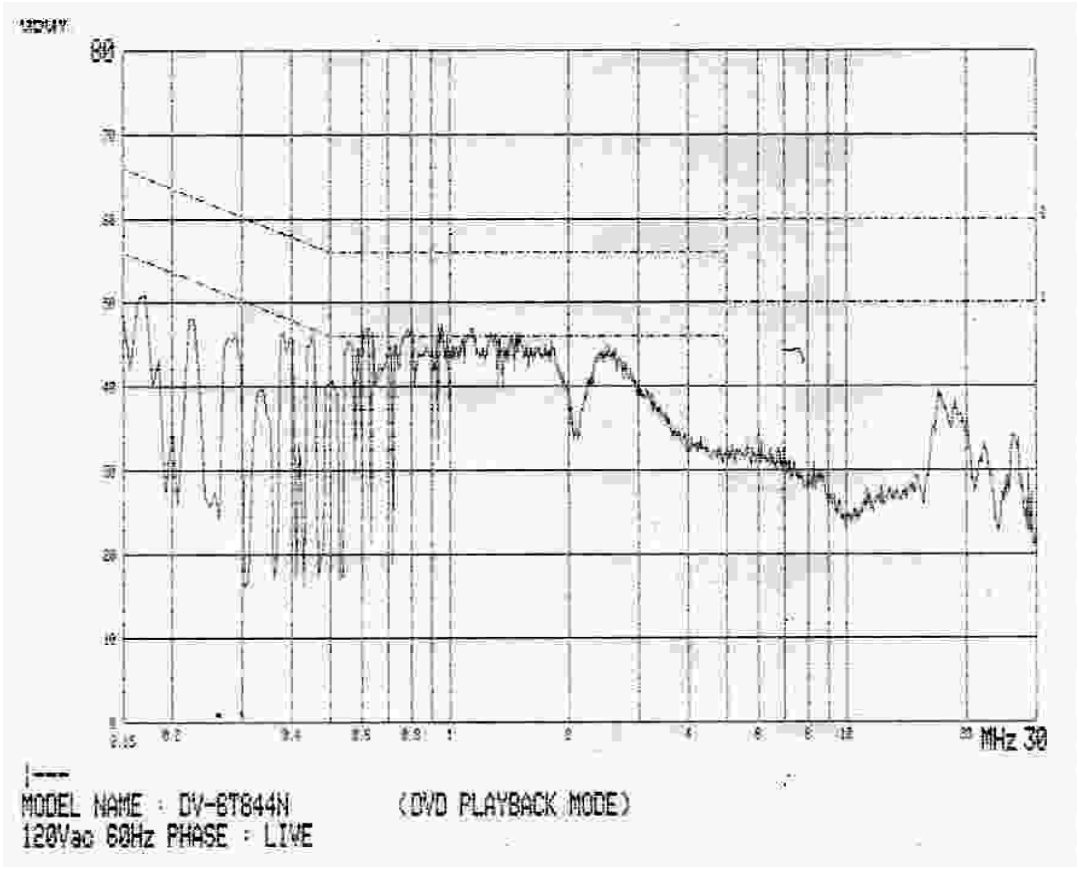
Tuner : TMZH2-030A (ALPS)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.157	46.2	37.7	65.6	55.6	19.4	17.9
1.208	41.6	18.8	56.0	46.0	14.4	27.2

Note : The insertion loss, 0.8dB, is negligible compare with the margin evaluated.

Conducted Emissions

(Mains Terminal Disturbance Voltages)



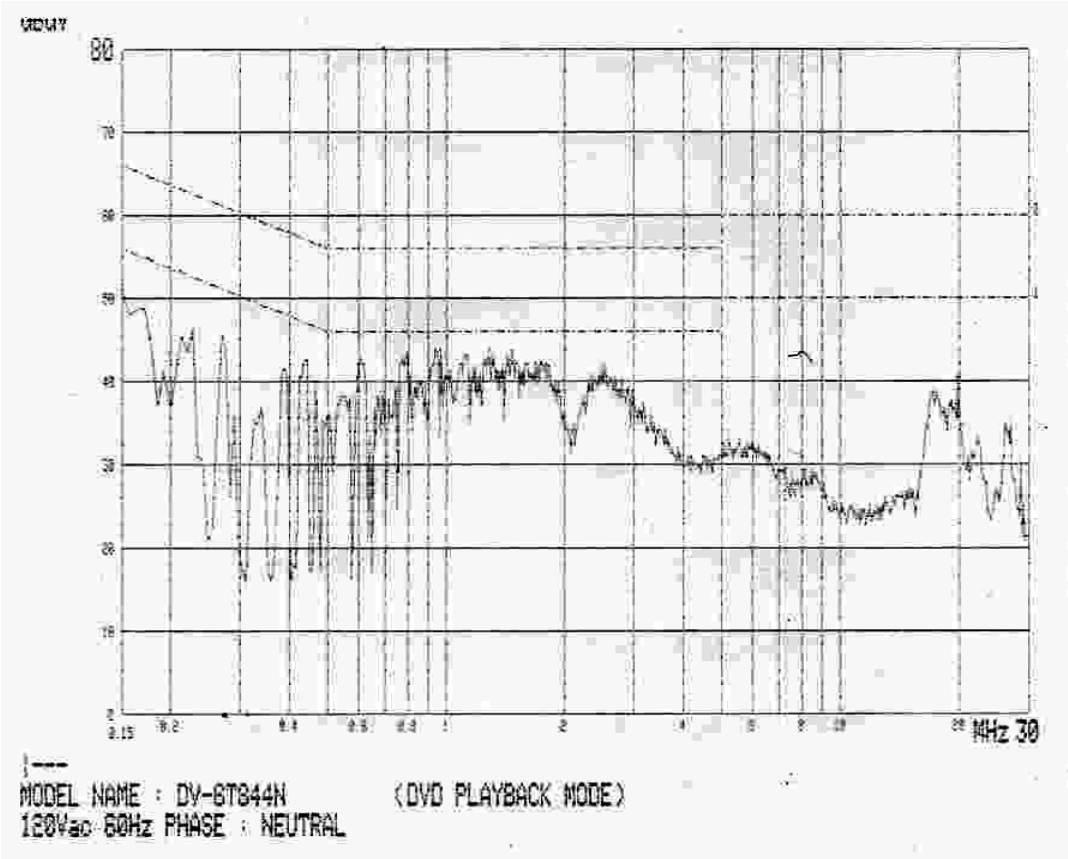
Tuner : TMZH2-030A (ALPS)

Freq. [MHz]	Measurement [dB μV]		Limit [dB μV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	Q-peak	Average
0.452	44.2	27.9	56.8	46.8	12.6	18.9
0.616	44.3	25.2	56.0	46.0	11.7	20.8
0.778	44.4	25.8	56.0	46.0	11.6	20.2
0.940	44.1	23.3	56.0	46.0	11.9	22.7
1.109	44.0	21.6	56.0	46.0	12.0	24.4

Note : The insertion loss, 0.8dB, is negligible compare with the margin evaluated.

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
0.150	44.2	12.9	66.0	56.0	21.8	43.1
0.282	43.8	29.9	60.8	50.8	17.0	20.9
0.942	40.7	21.2	56.0	46.0	15.3	24.8

Note : The insertion loss, 0.8dB, is negligible compare with the margin evaluated.