

Certification of Compliance

CFR 47 Part 15 Subpart B

Test Report File No.:	06-IST-0043	Date of Issue:	February 6, 2006
Model (s)	: DVR065 (DAEWOO) : DVR075 (DAEWOO) : DG-R5205 (DAEWOO) : DG-R5215 (DAEWOO) : DW-Q73D3N-JS (DAEWOO)		
Kind of Product	: DVD Recorder		
FCC ID	: C5F7NF0018		
RF Frequency Range	: 60MHz-72MHz		
RF Channels	: Ch.3 / Ch.4		
Applicant	: Daewoo Electronics Corporation.		
	543, Dangjung-Dong, Kunpo-City, Kyounggi-Do, Korea		
Manufacturer	: DONGGUAN GVG DIGITAL TECHNOLOGY LTD		
	Da Pin Precinct, Tang Xia Town, Dongguan, China		

Test Result

☒ **Positive**

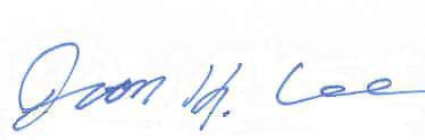
☐ **Negative**

Reviewed By

Approved By



S.J.Cho / EMC Group Manager



J.H.LEE / Chief

- Investigations requested : Measurement to the relevant clauses of F.C.C rules and regulations Part 15 Subpart B - Unintentional Radiators.
- The test report with appendix consists of 34 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 2003.



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Information OF TUNER

Manufacture	Manufacture Name
LG Innotek Co., Ltd.	TADS-H151F

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 °C
Humidity	47 %
Atmospheric pressure	1004 mbar

POWER SUPPLY SYSTEM USED

Power supply system	120Vac , 60Hz
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PRODUCT INFORMATIONS

FCC ID	C5F7NF0018
Power supply system	120Vac , 60Hz
Power consumption	Max. 20W (Power-off : 1.8W)
Signal system	NTSC
Inputs	Antenna (CATV) , Video (RCA) , Audio (RCA) , DV (IEEE 1394 standard)
Outputs	Video (RCA) , S-Video , component Video (RCA) , Audio (RCA) RF (CH3/4)
Dimension (approx.)	16.5*2.0*12.6 inches (420*50*319mm) (w*h*d)
Mass (approx.)	Net: 7.21 lbs (3.27kg) , Gross: 9.19 lbs (4.17kg)

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

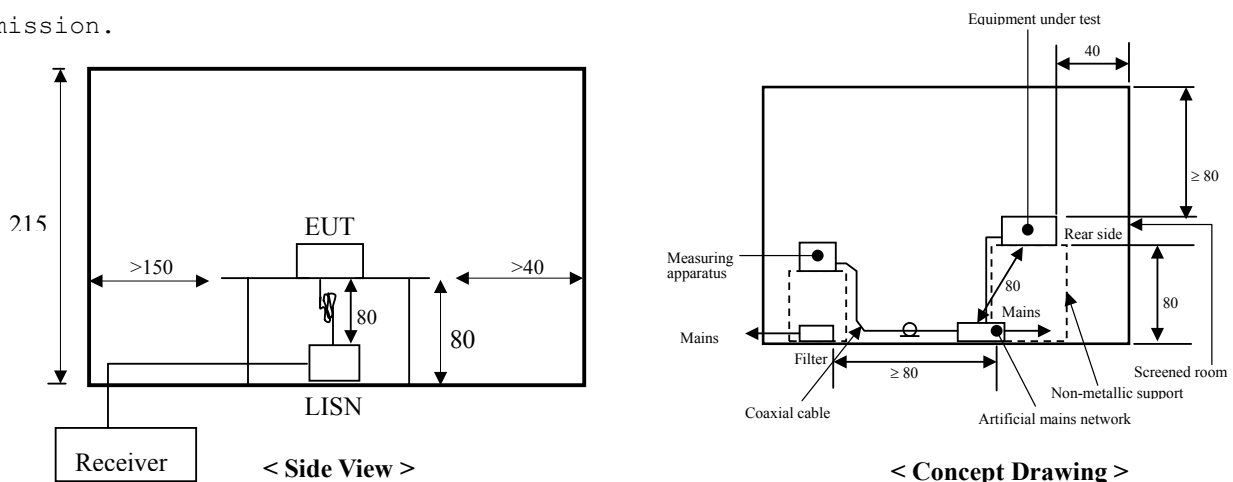
DESCRIPTIONS OF TEST

Conducted Emissions:

The measurement were performed over the frequency range of 0.15MHz to 30MHz using a 50 Ω /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.



DESCRIPTION OF TEST

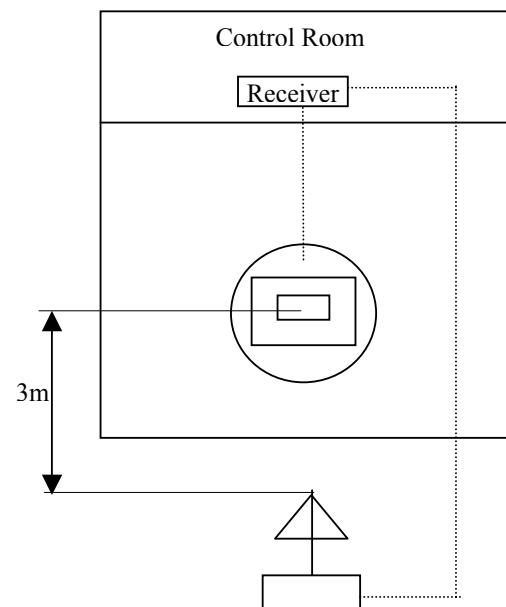
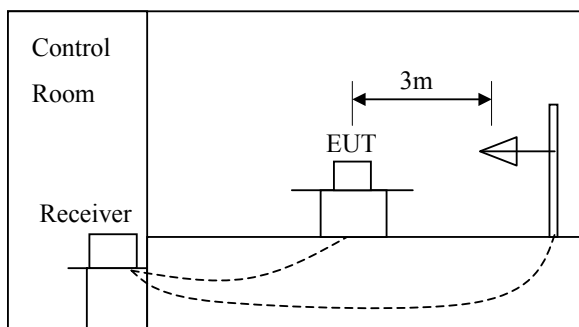
Radiated Emissions:

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.

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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

4.57dB at 24.007MHz

Maximum limit exceeding

Remarks : With Neutral phase and average detect mode(RF Receiving during DVD Record).

■ Radiated Emission

The requirements are

● MET ○ Not MET

Minimum limit margin

3.14dB at 344.1MHz

Maximum limit exceeding

Remarks : At DVD Playback mode

■ 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

Test Date

Begin of Test : January 13, 2006

End of Test : February 2, 2006

Prepared By



Note :

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

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.

<u>Model Name</u>	<u>Manufacturer</u>	<u>Descriptions</u>	<u>Calibration Date</u>	<u>Serial Number</u>
ESH3	Rohde & Schwarz	Test Receiver	Jul. 12, 2005	892108/018
ESH3-Z2	Rohde & Schwarz	Pulse Limiter	Jul. 12, 2005	357.8810.52
ESH3-Z5	Rohde & Schwarz	LISN	Jul. 12, 2005	862770/025
EZM	Rohde & Schwarz	Spectrum Monitor	-	-

◆ Auxiliary Equipment Used

<u>Model Name</u>	<u>Manufacturer</u>	<u>Descriptions</u>
14C5T BLU	Daewoo Electronics	Color TV Receiver

◆ Accessories including cables

<u>Name</u>	<u>Length</u>	<u>Port and Descriptions</u>
RCA	1.5m	Video / Audio

◆ Environmental Conditions

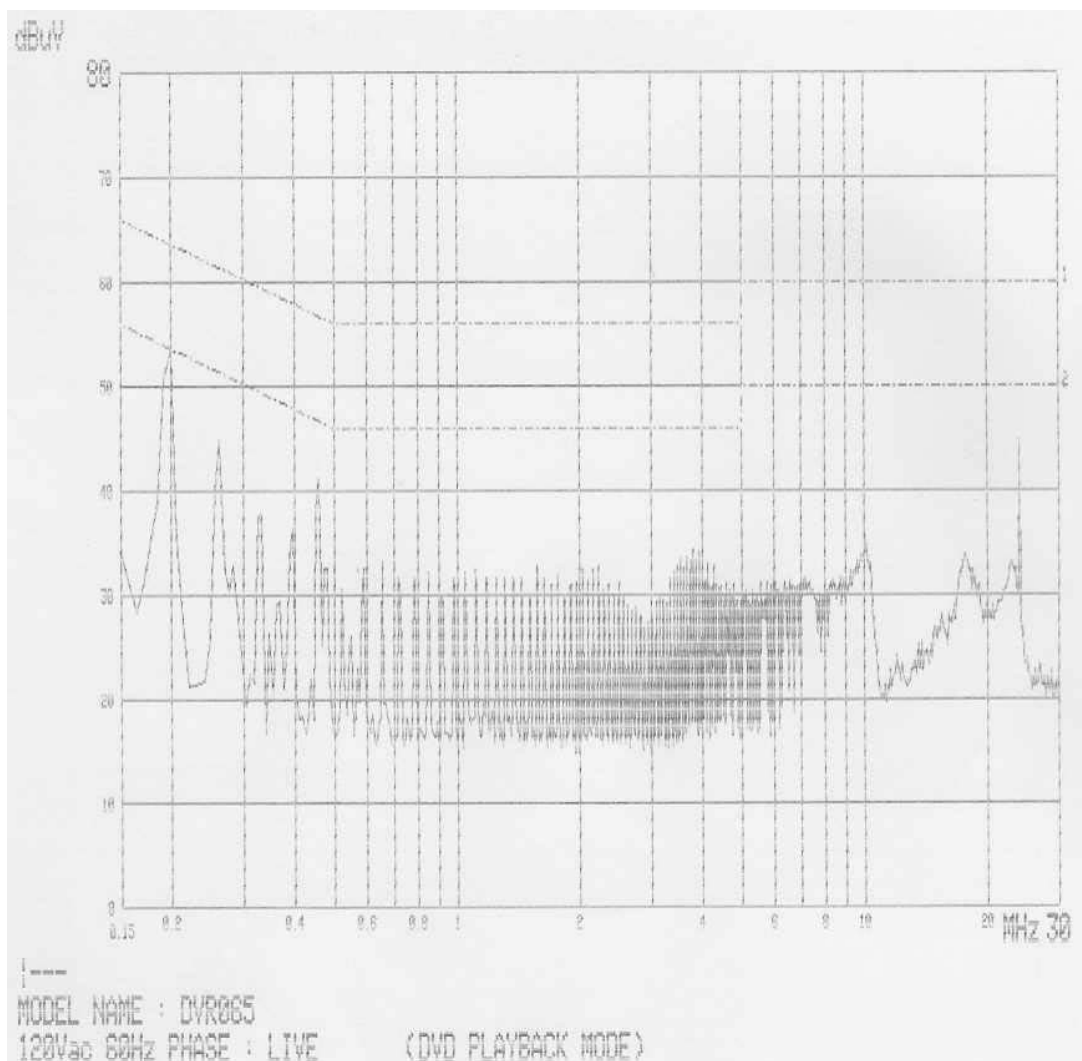
Temperature	17 °C
Humidity	48 %
Atmosphere pressure	1004 mbar

◆ Test Program	DVD Playback Mode, RF Receiving during DVD Record Mode
◆ Test Area	Conducted Room
◆ Test Date	January 13, 2006

Note :

Conducted Emissions

(Mains Terminal Disturbance Voltages)

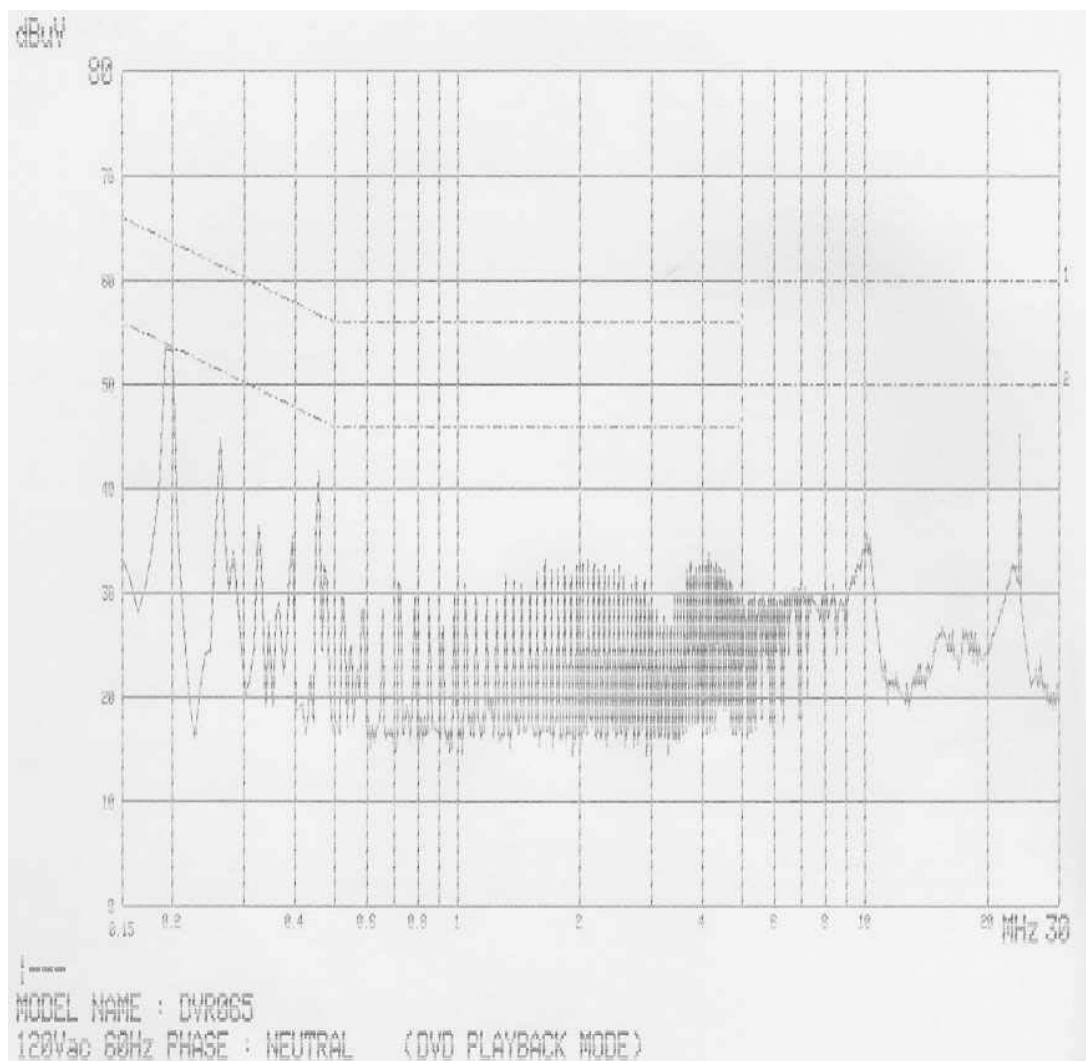


Freq. [MHz]	Measurement [dB μ V]		Limit [dB μ V]		Insertion Loss	Cable Loss	Result [dB μ V]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	[dB]	[dB μ V]	Q-peak	Average	Q-peak	Average
0.197	51.80	37.40	63.74	53.74	0.32	0.20	52.32	37.92	11.42	15.82
0.262	42.70	28.70	61.37	51.37	0.27	0.36	43.33	29.33	18.04	22.04
0.458	39.30	36.20	56.73	46.73	0.20	0.45	39.95	36.85	16.78	9.88
24.007	42.70	43.50	60.00	50.00	0.71	1.10	44.51	45.31	15.49	4.69

Note :

Conducted Emissions

(Mains Terminal Disturbance Voltages)

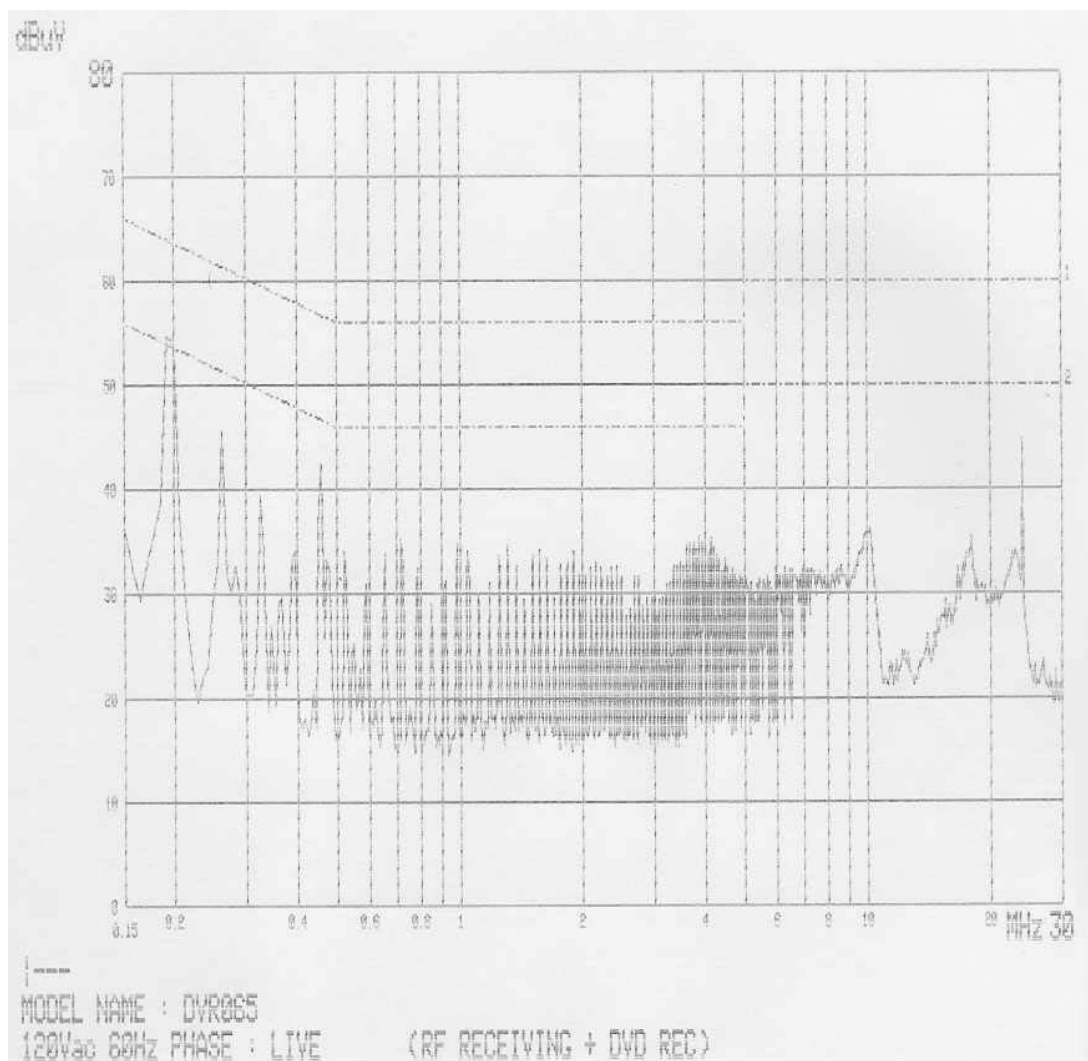


Freq. [MHz]	Measurement [dB μ V]		Limit [dB μ V]		Insertion Loss	Cable Loss	Result [dB μ V]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	[dB]	[dB μ V]	Q-peak	Average	Q-peak	Average
0.197	51.70	37.70	63.74	53.74	0.30	0.20	52.20	38.20	11.54	15.54
0.262	42.50	26.00	61.37	51.37	0.26	0.36	43.12	26.62	18.25	24.75
0.458	38.50	35.00	56.73	46.73	0.22	0.45	39.17	35.67	17.56	11.06
24.007	42.90	43.40	60.00	50.00	0.73	1.10	44.73	45.23	15.27	4.77

Note :

Conducted Emissions

(Mains Terminal Disturbance Voltages)

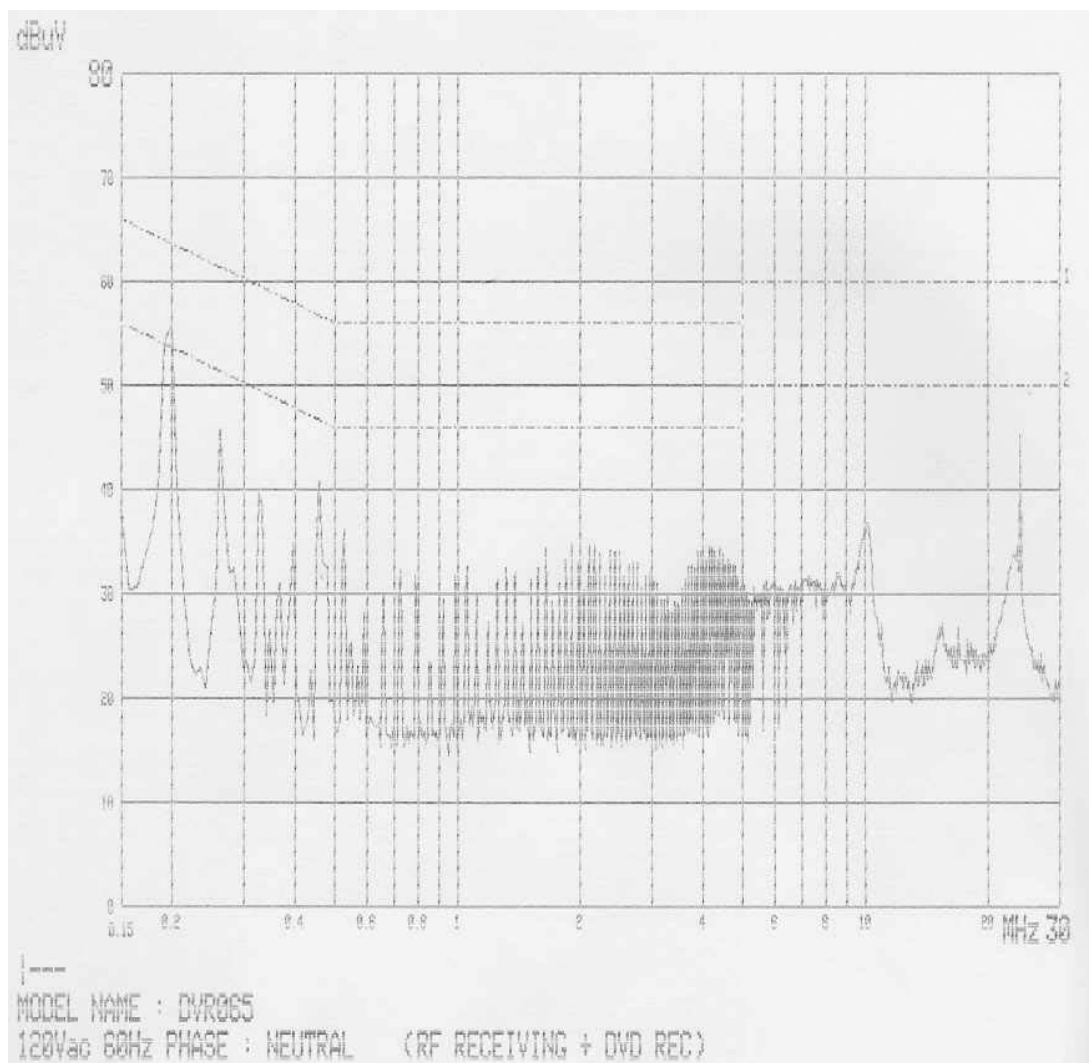


Freq. [MHz]	Measurement [dB μ V]		Limit [dB μ V]		Insertion Loss	Cable Loss	Result [dB μ V]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	[dB]	[dB μ V]	Q-peak	Average	Q-peak	Average
0.197	52.60	37.60	63.74	53.74	0.32	0.20	53.12	38.12	10.62	15.62
0.262	42.90	26.60	61.37	51.37	0.27	0.36	43.53	27.23	17.84	24.14
0.457	39.80	36.70	56.75	46.75	0.20	0.45	40.45	37.35	16.30	9.40
24.007	42.70	43.50	60.00	50.00	0.71	1.10	44.51	45.31	15.49	4.69

Note :

Conducted Emissions

(Mains Terminal Disturbance Voltages)



Freq. [MHz]	Measurement [dB μ V]		Limit [dB μ V]		Insertion Loss	Cable Loss	Result [dB μ V]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	[dB]	[dB μ V]	Q-peak	Average	Q-peak	Average
0.197	53.30	37.90	63.74	53.74	0.30	0.20	53.80	38.40	9.94	15.34
0.262	43.60	23.90	61.37	51.37	0.26	0.36	44.22	24.52	17.15	26.85
0.458	38.60	35.00	56.73	46.73	0.22	0.45	39.27	35.67	17.46	11.06
24.007	42.80	43.60	60.00	50.00	0.73	1.10	44.63	45.43	15.37	4.57

Note :

TEST CONDITIONS AND DATA

Radiated Emissions

[Applicable]

◆ Test Equipment Used

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

<u>Model Name</u>	<u>Manufacturer</u>	<u>Descriptions</u>	<u>Calibration Date</u>	<u>Serial Number</u>
ESVS10	Rohde & Schwarz	Test Receiver	Aug. 16, 2005	839049/004
VULB 9160	Schwarzbeck	Antenna	Aug. 23, 2005	3048
54200M01	FLUKE	TV Pattern Generator	Jul. 27, 2005	DM:865032

◆ Auxiliary Equipment Used

<u>Model Name</u>	<u>Manufacturer</u>	<u>Descriptions</u>
14C5NT	Daewoo Electronics.	Color TV Receiver

◆ Accessories including cables

<u>Name</u>	<u>Length</u>	<u>Port and Descriptions</u>
RCA	1.5m	Video / Audio

◆ Environmental Conditions

Temperature	10 °C
Humidity	47 %
Atmosphere pressure	1008 mbar

◆ Test Program	DVD Playback Mode, RF Receiving during DVD Record Mode
◆ Test Area	Open Area Test Site #2
◆ Test Date	January 17, 2006

Note :

Radiated Emissions

(Disturbance Radiation)

[Applicable]

Test Mode	CH	Frequency (MHz)	Polar (H/V)	Limits (dBuV/m)	Result (dBuV/m)	Margin (dB)
DVD Playback Mode		297.0	H	46.00	34.88	11.12
		333.7	H	46.00	38.58	7.42
		344.1	H	46.00	42.86	3.14
		378.0	V	46.00	38.76	7.24
		442.4	V	46.00	36.87	9.13
		445.5	V	46.00	39.00	7.00
RF Receiving during DVD Record Mode		297.0	H	46.00	34.28	11.72
		332.3	H	46.00	40.11	5.89
		344.1	H	46.00	42.66	3.34
		378.0	V	46.00	38.46	7.54
		442.4	V	46.00	36.37	9.63
		445.5	V	46.00	37.80	8.20

End of data

Note :

TEST CONDITIONS AND DATA

Output Signal Level Measurements

[Applicable]

◆ Test Equipment Used

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

<u>Model Name</u>	<u>Manufacturer</u>	<u>Descriptions</u>	<u>Calibration Date</u>	<u>Serial Number</u>
8566B	Hewlett Packard	Spectrum Analyzer	Nov. 29, 2005	3014A07159
85685A	Hewlett Packard	RF preselector	Nov. 29, 2005	2817A00760
RAM	Rohde & Schwarz	50/75ohms matching pad	-	836625/033

◆ Auxiliary Equipment Used

<u>Model Name</u>	<u>Manufacturer</u>	<u>Descriptions</u>
14C5T BLU	Daewoo Electronics.	Color TV Receiver

◆ Accessories including cables

<u>Name</u>	<u>Length</u>	<u>Port and Descriptions</u>
RCA	1.5m	Video / Audio

◆ Environmental Conditions

Temperature	17 °C
Humidity	48 %
Atmosphere pressure	1004 mbar

◆ Test Program DVD Playback, DVD Recording Mode

◆ Test Area Compact Chamber

◆ Test Date February 2, 2006

Note : Limit Calculations

For Video Signal

$$346.4 \times 75^{1/2} = 2999\mu V = 69.54\text{dBuV} = -37.46 \text{ dBm}$$

For Audio Signal

$$77.5 \times 75^{1/2} = 671.17\mu V = 56.53\text{dBuV} = -50.46 \text{ dBm}$$

The test were performed with RF receiving as VITS. The VITS signals, 1V and 5V peak-to-peak, were used for channel 3 and channel 4 with alternate. The above test program were employed for each channel.