Certification of Compliance

CFR 47 Part 15 Subpart B

Test Report File No. : 02-IST-136 **Date of Issue** : July 3,2002

Model(s) : DV6T811N / DAEWOO

: DRC6000N / THOMSON

Kind of Product : Video Cassette Recorder with DVD Player(TV Interface Device)

Applicant : Daewoo Electronics Co., Ltd.

Address : 543, Dangjung-Dong, Kunpo-City, Kyonggi-Do
435-030, Korea

Manufacturer : Daewoo Electronics Co., Ltd.

Address : 295, Gondan-dong, Kumi-city, Kyungsangbuk-do, Korea

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

Reviewed By

J.H. Lee / General Manager

Approved By

G. Chung / Chief

- The test report with appendix consists of 18 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 1992.

TABLE OF CONTENTS

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	24 ℃
Humidity	43 %
Atmospheric pressure	998 mbar

POWER SUPPLY SYSTEM USED

Power supply system	120Vac , 60Hz

PRODUCT INFORMATIONS

Power supply system	120Vac / 60Hz
Power consumption	24W
Video signal	EIA STANDARD NTSC COLOR
RF input impedance	75 ohm Unbal. (U/V one input)
RF output impedance	75 ohm Unbal.
VHF output signal	Channel 3 or 4 (selectable)
Video input signal	Phono type 1.0 ±0.2Vp-p sync negative 75 ohms unbalanced
Video output signal	Phono type 1.0±0.2Vp-p sync negative 75 ohms unbalanced
Audio input signal	Phono type, -8.8dBm, more then 47k ohms unbalanced
Audio output signal	Phono type -8.8dBm(VCR) 2Vrms(DVD), less then 1k ohms unbalanced
VCR system	Hi-Fi Rotary Double Azimuth 4 heads helical scanning system.
DVD system	DVD, VCD, CD, MP3, CD-R, CD-RW Playback system

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

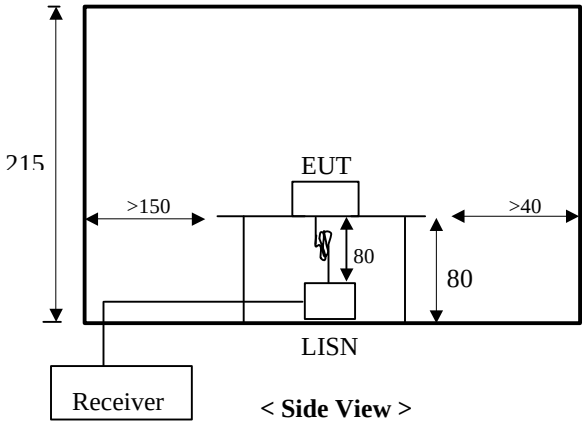
DESCRIPTIONS OF TEST

Conducted Emissions:

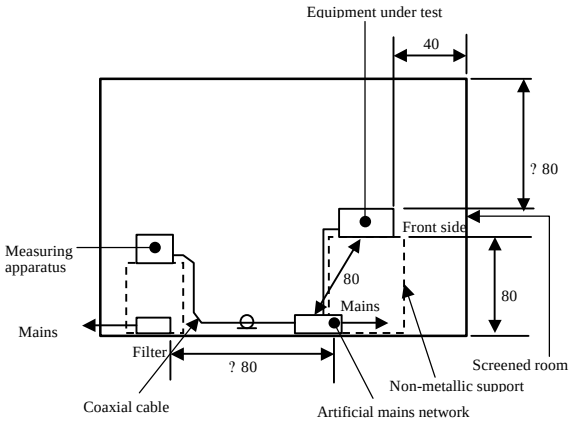
The measurement were performed over the frequency range of 0.45MHz to 30MHz using a 50Ω/50uH LISN as the input transducer to a Spectrum Analyzer or a Field Intensity Meter. The measurements were made with the detector set for "Peak" amplitude within an bandwidth of 10KHz or for "quasi-peak" within a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

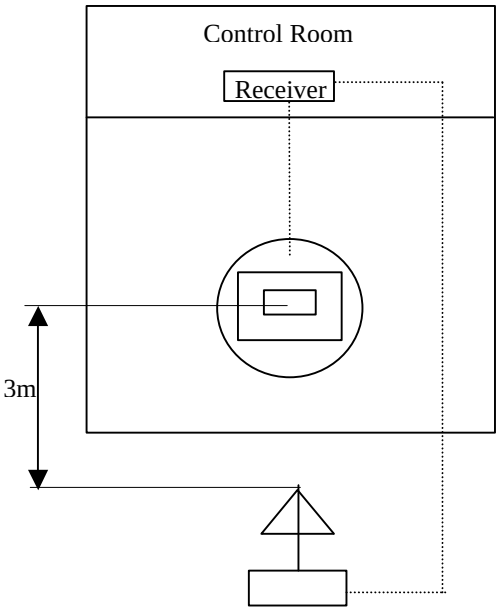
DESCRIPTION OF TEST

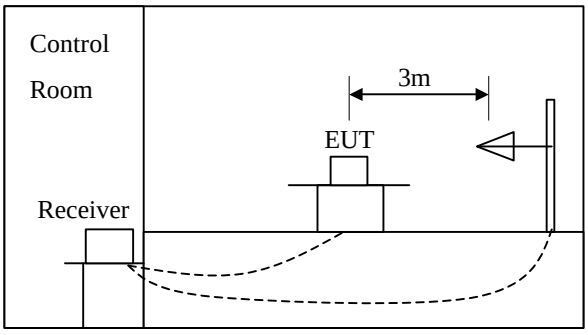
Radiated Emissions:

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.





SUMMARY

■ Conducted Emission

The requirements are	● MET ○ Not MET
Minimum limit margin	7.2 dB at 4.120 MHz
Maximum limit exceeding	

Remarks : **With live phase, DVD playback and VCR record mode**

■ Radiated Emission

The requirements are	● MET ○ Not MET
Minimum limit margin	3.4 dB at 330.0 MHz
Maximum limit exceeding	

Remarks : **The DVD playback and VCR record mode**

Prepared By

Note :

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

Sang R. Yoon

S.R. Yoon / EMC Engineer

TEST CONDITIONS AND DATA

Conducted Emissions

◆ Test Equipment Used

Model Name	Manufacturer	Description	Next Cal. Date
ESH3	Rohde & Schwarz	Test Receiver	08 Jun., 2003
ESH3-Z2	Rohde & Schwarz	Pulse Limiter	08 Jun., 2003
EZM	Rohde & Schwarz	Spectrum Monitor	-
3825/2	EMCC	LISN	08 Jun., 2003
PM5515	Philips	Pattern Generator	21 May., 2003

◆ External Peripherals

Device Description	Model Name	Manufacture	FCC Compliance Information
TV Receiver	F19430	Daewoo	Verification

◆ Test Program DVD Playback and VCR record, DVD Playback, VCR Playback, VCR record mode

◆ Test Area Shielded room #3

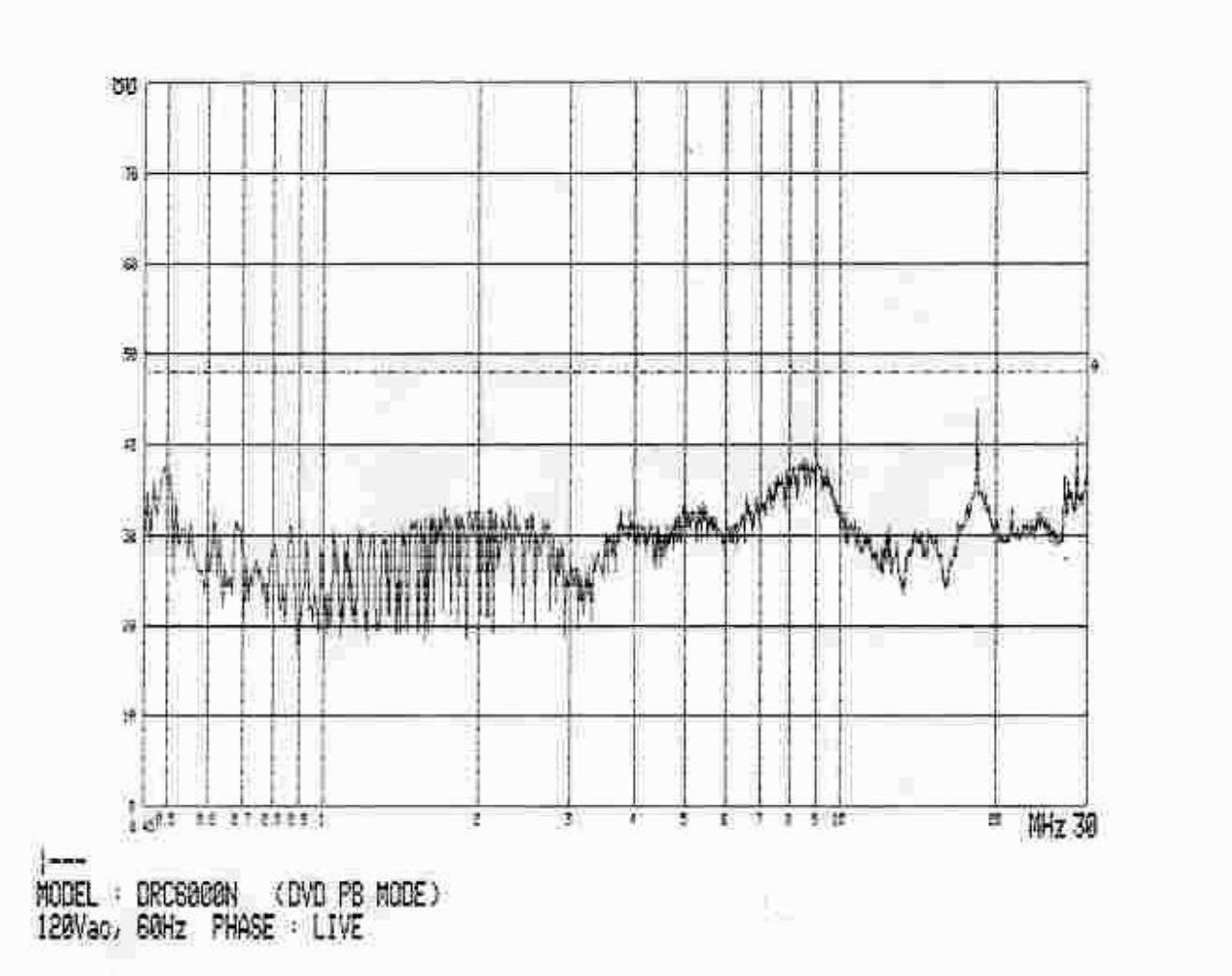
Note : The test were performed with color bar as VITS. The channels were assigned to playback mode for ch3 with 1Vpp pre-recorded reference tape and record mode for ch4 with video input of 5Vpp color bar signal amplified by HP8447D.

This test method cover all case of operation for RF output channels and modes of playback and record.

- Find the test data in following page(s) 9 to 15.

Conducted Emissions

(Mains Terminal Disturbance Voltages)

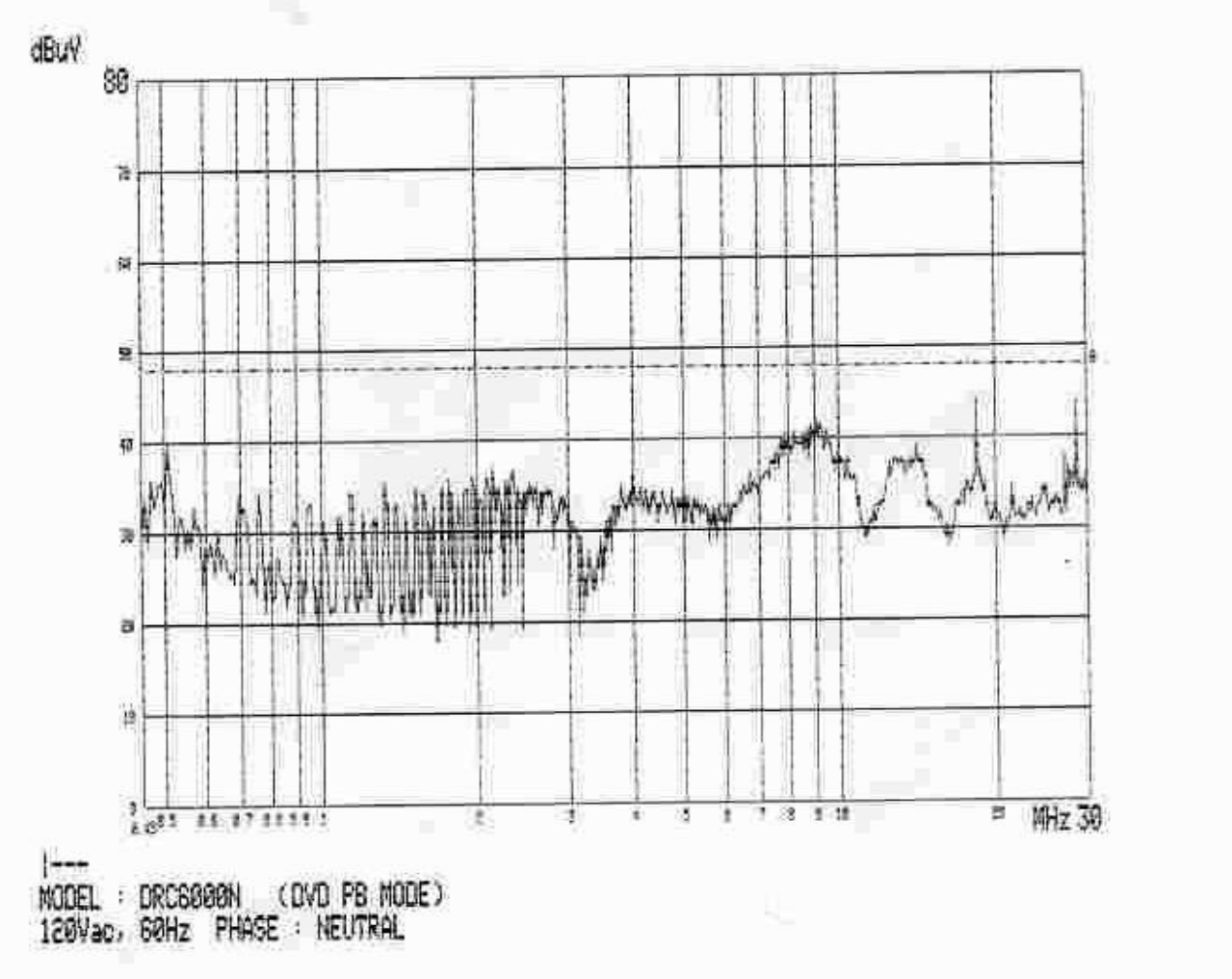


Frequency [MHz]	Measurement [dBuV]	Limit [dBuV]	Margin [dB]
	Q-Peak	Q-Peak	Q-Peak
9.010	31.0	48.0	16.2
18.433	41.4	48.0	5.8
28.637	39.4	48.0	7.8

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

Conducted Emissions

(Mains Terminal Disturbance Voltages)

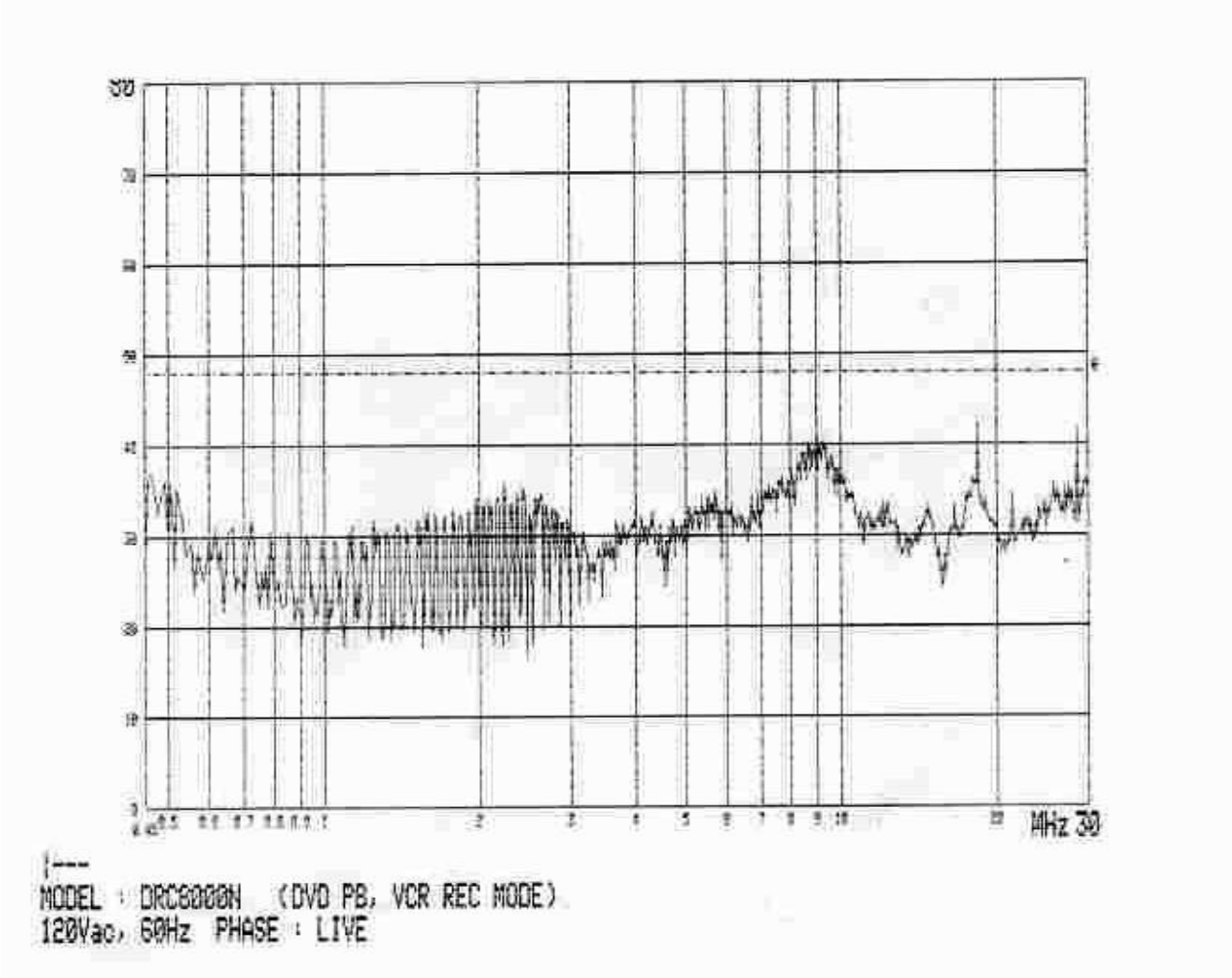


Frequency [MHz]	Measurement [dBuV]	Limit [dBuV]	Margin [dB]
	Q-Peak	Q-Peak	Q-Peak
9.010	34.3	48.0	12.9
18.432	41.5	48.0	5.7
28.637	41.3	48.0	5.9

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

Conducted Emissions

(Mains Terminal Disturbance Voltages)

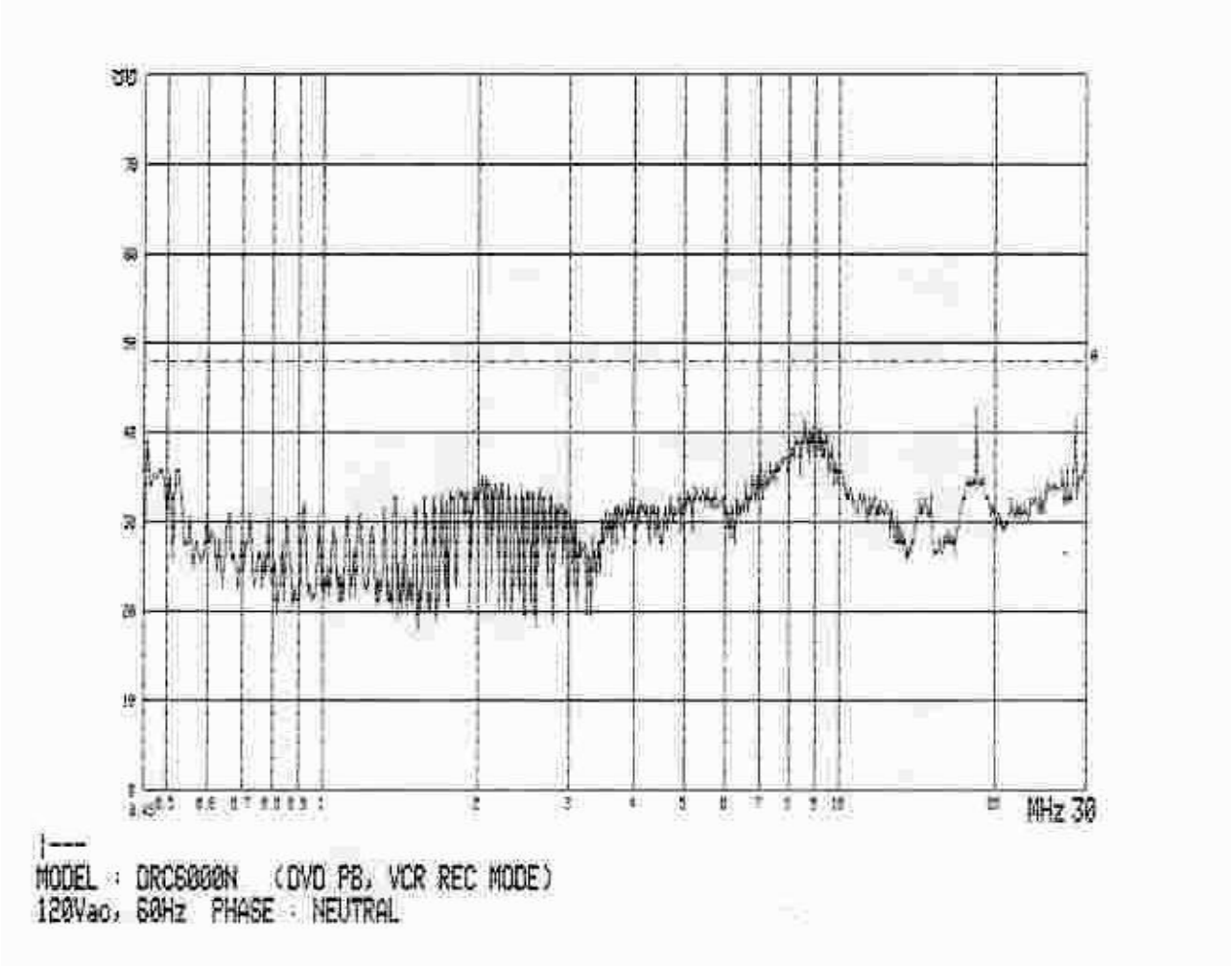


Frequency [MHz]	Measurement [dBuV]	Limit [dBuV]	Margin [dB]
	Q-Peak	Q-Peak	Q-Peak
9.012	33.8	48.0	13.4
18.433	41.1	48.0	6.1
28.637	40.8	48.0	6.4

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

Conducted Emissions

(Mains Terminal Disturbance Voltages)

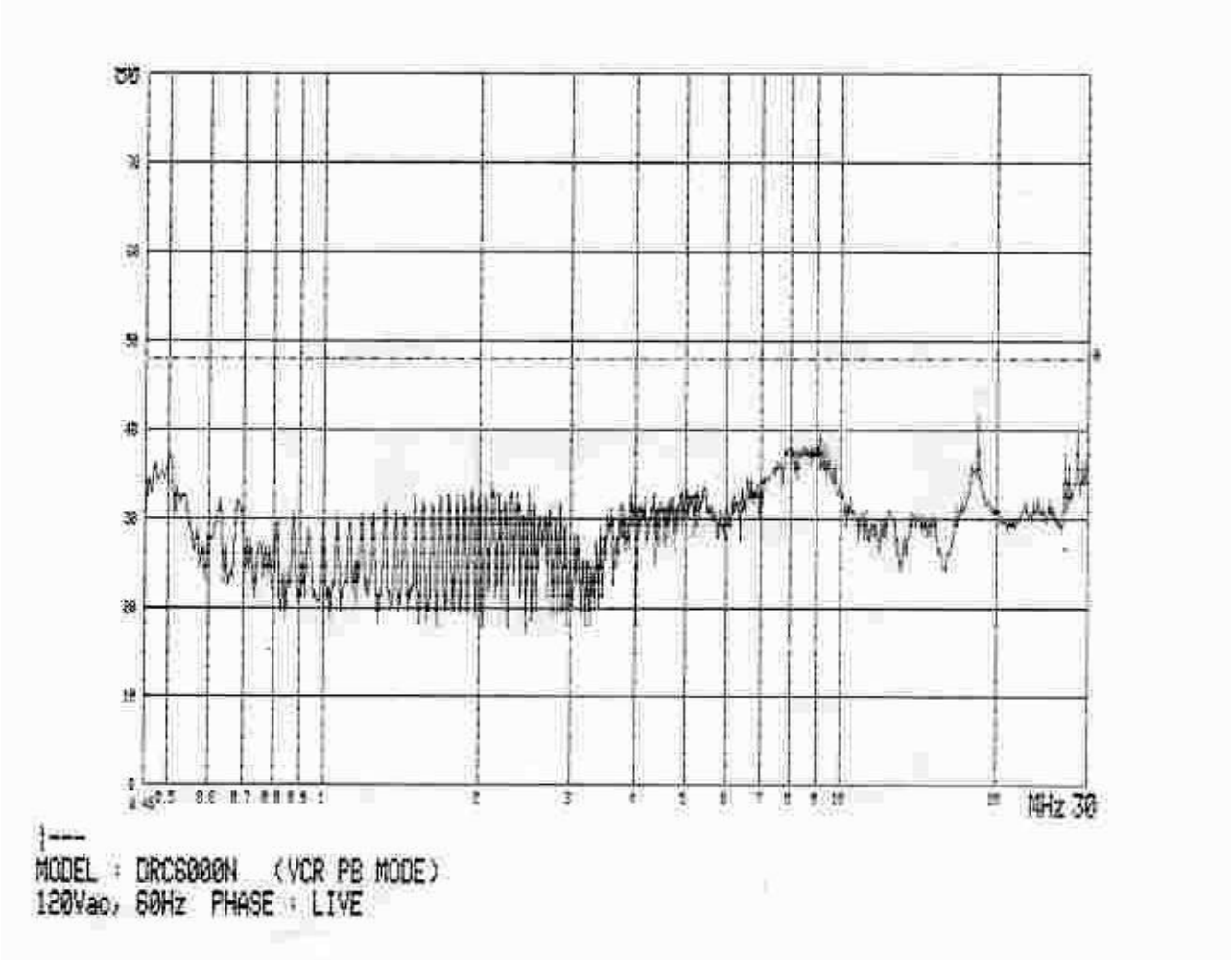


Frequency [MHz]	Measurement [dBuV]	Limit [dBuV]	Margin [dB]
	Q-Peak	Q-Peak	Q-Peak
9.009	34.3	48.0	12.9
18.434	41.0	48.0	6.2
28.636	42.0	48.0	5.2

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

Conducted Emissions

(Mains Terminal Disturbance Voltages)

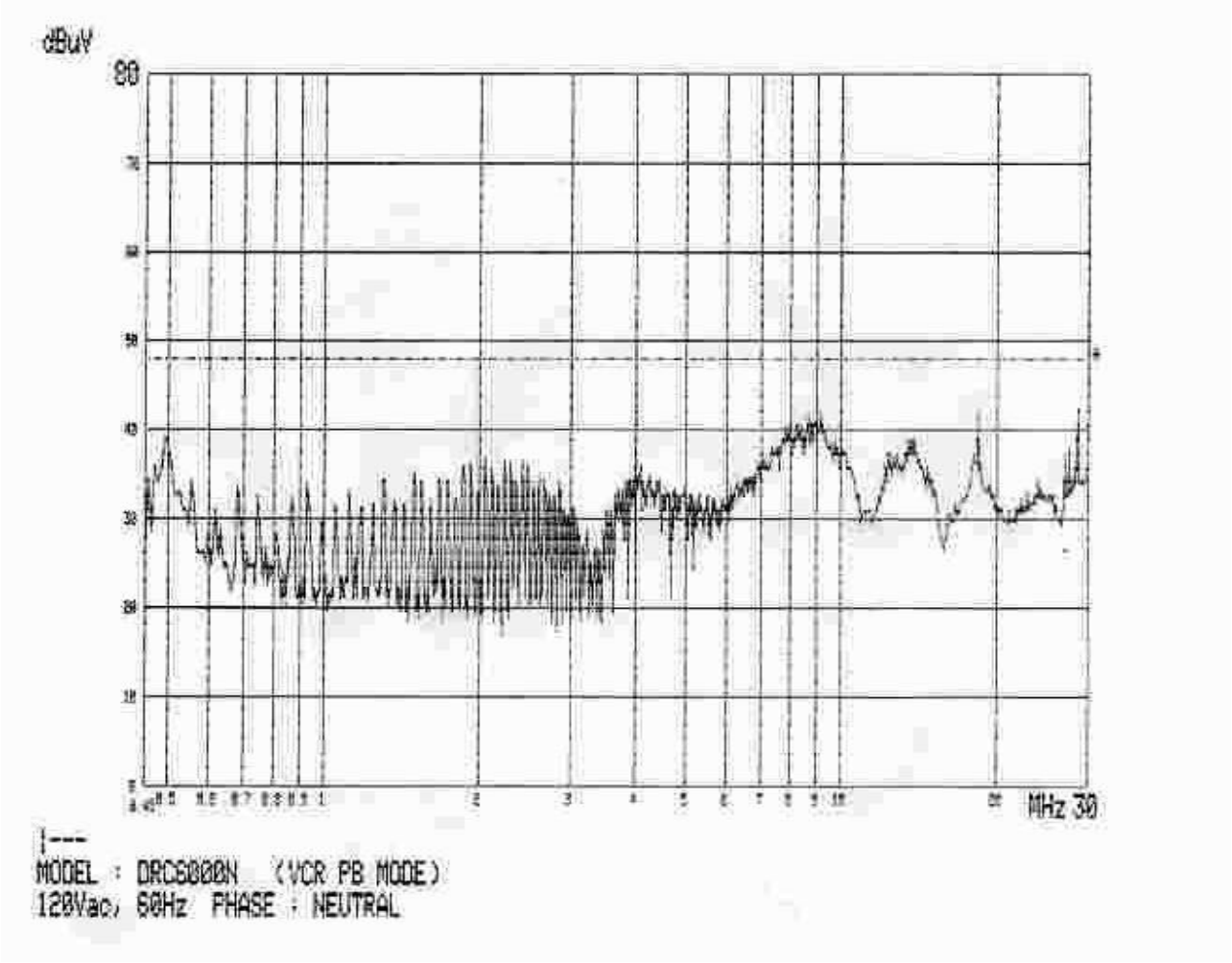


Frequency [MHz]	Measurement [dBuV]	Limit [dBuV]	Margin [dB]
	Q-Peak	Q-Peak	Q-Peak
9.009	29.9	48.0	17.3
18.434	40.4	48.0	6.8
28.637	40.0	48.0	7.2

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

Conducted Emissions

(Mains Terminal Disturbance Voltages)

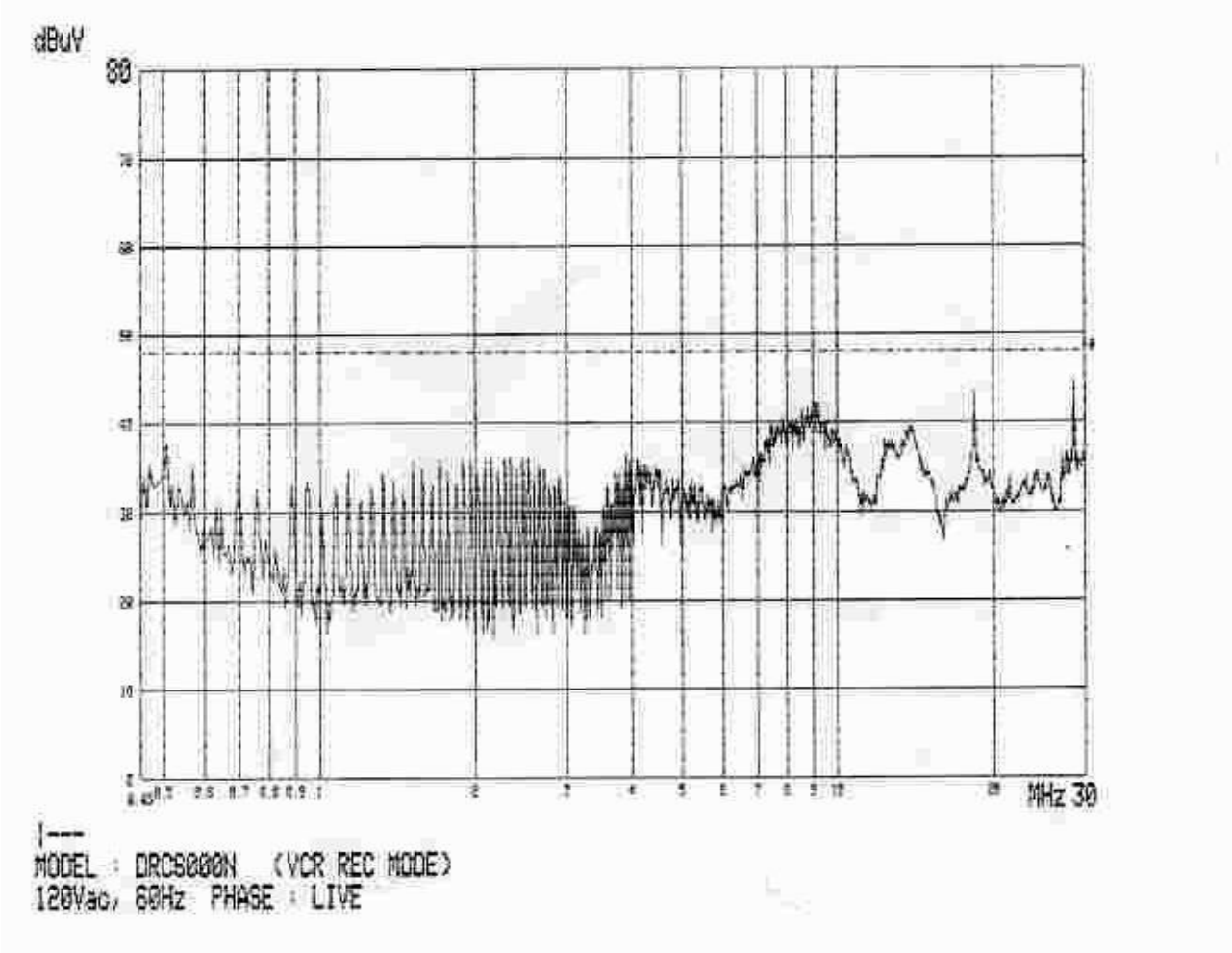


Frequency [MHz]	Measurement [dBuV]	Limit [dBuV]	Margin [dB]
	Q-Peak	Q-Peak	Q-Peak
9.009	35.2	48.0	12.0
18.433	40.2	48.0	7.0
28.636	41.3	48.0	5.9

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

Conducted Emissions

(Mains Terminal Disturbance Voltages)

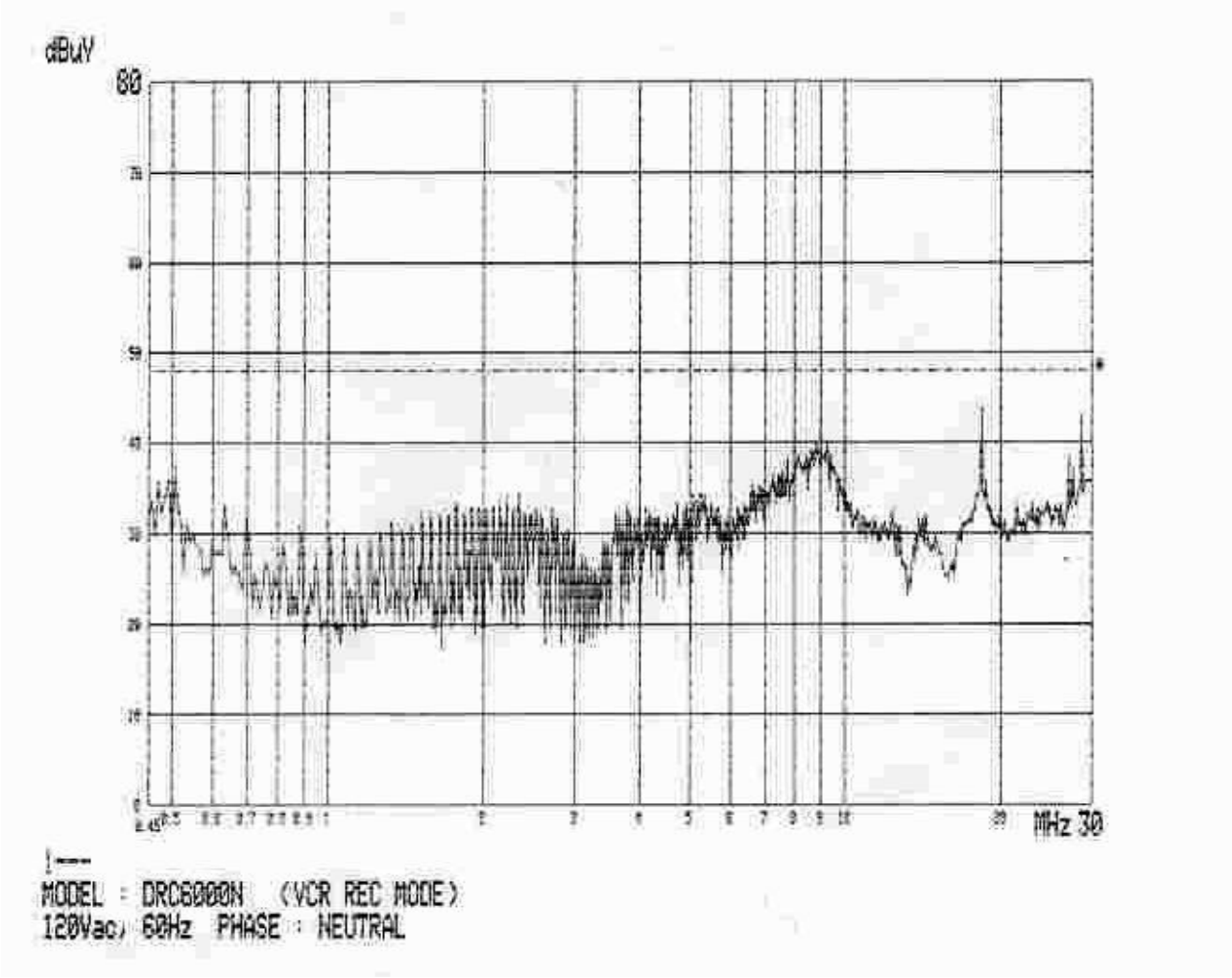


Frequency [MHz]	Measurement [dBuV]	Limit [dBuV]	Margin [dB]
	Q-Peak	Q-Peak	Q-Peak
9.010	36.8	48.0	10.4
18.431	40.9	48.0	6.3
28.636	43.1	48.0	4.1

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

Conducted Emissions

(Mains Terminal Disturbance Voltages)



Frequency [MHz]	Measurement [dBuV]	Limit [dBuV]	Margin [dB]
	Q-Peak	Q-Peak	Q-Peak
9.010	34.0	48.0	13.2
18.432	40.9	48.0	6.3
28.637	41.7	48.0	5.5

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

TEST CONDITIONS AND DATA

Radiated Emission

◆ Test Equipment Used

Model Name	Manufacturer	Description	Next Cal. Date
ESVP	Rohde & Schwarz	Receiver	10 Jun., 2003
VULB9160	Schwarzbeck	Antenna	04 Jun., 2003
EZM	Rohde & Schwarz	Spectrum Monitor	-
PM5515	Philips	Pattern Generator	21 May., 2003
8566B	Hewlett Packard	Spectrum Analyzer	Jul. 13, 2002
85685A	Hewlett Packard	RF preselector	Jul. 13, 2002

◆ External Peripherals

Device Description	Model Name	Manufacture	FCC Compliance Information
TV Receiver	F19430	Daewoo	Verification

◆ Test Program DVD playback and VCR record mode

◆ Test Area Open Field Test Site #2

Note : The final measurement in OATS was performed for worst case investigated. Please refer to all of other results of preliminary test in appendix A.

The test were performed with color bar as VITS. The channels were assigned to playback mode for ch3 with 1Vpp pre-recorded reference tape and record mode for ch4 with video input of 5Vpp color bar signal amplified by HP8447D.

This test method cover all case of operation for RF output channels and modes of playback and record.

Find the test data in following page(s) 19.

Radiated Emissions

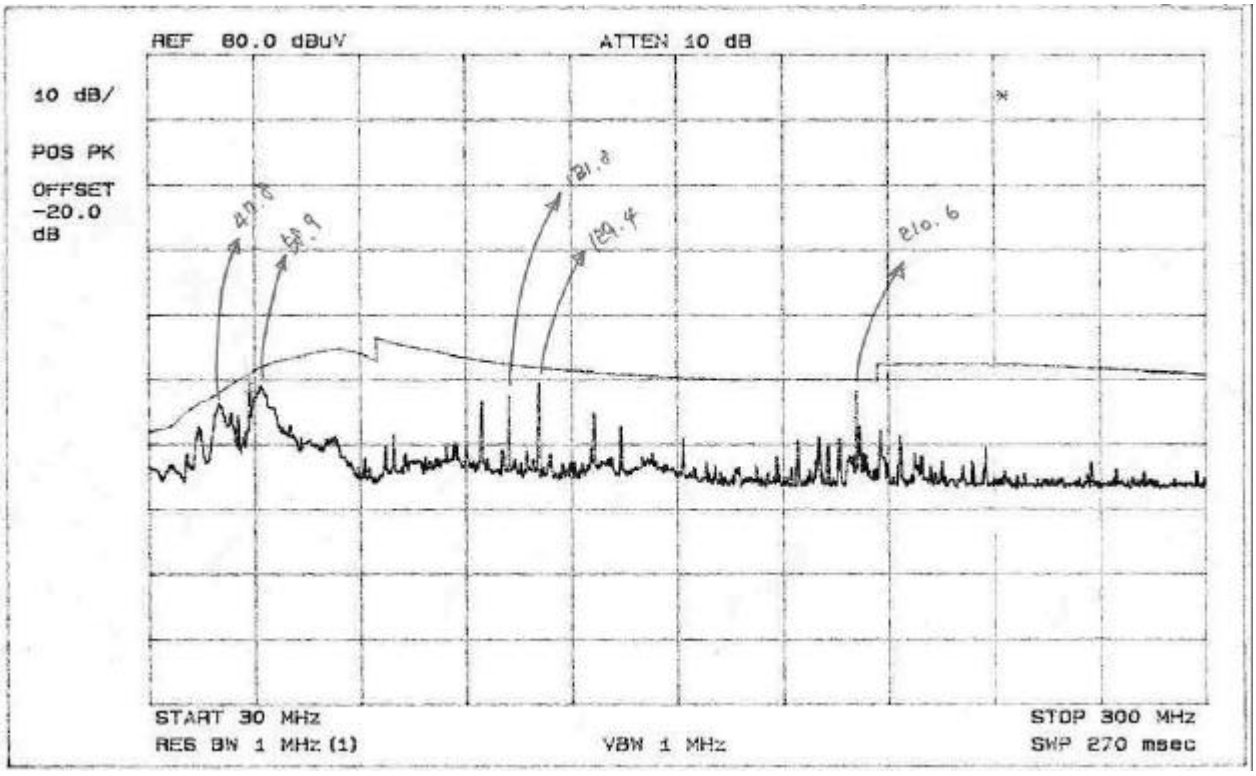
(Disturbance Radiation)

Mode	Freq. [MHz]	Reading [dBuV]	Antenna Factor [dB]	Cable Loss [dB]	Angle [deg]	Polar. [H/V]	Result [dBuV]	Limit [dBuV]	Margin [dB]
DVD	55.2	22.8	11.4	1.7	245	V	35.9	40.0	4.1
Playback	114.5	24.7	10.8	2.5	251	H	38.0	43.5	5.5
and	121.4	23.7	11.6	2.6	311	V	37.9	43.5	5.6
VCR	129.0	24.1	11.9	2.7	315	V	38.7	43.5	4.8
Record	210.0	19.4	9.2	3.4	281	H	32.0	43.5	11.5
	330.0	24.9	13.1	4.6	257	H	42.6	46.0	3.4
	364.5	21.1	13.9	5.0	149	V	40.0	46.0	6.0

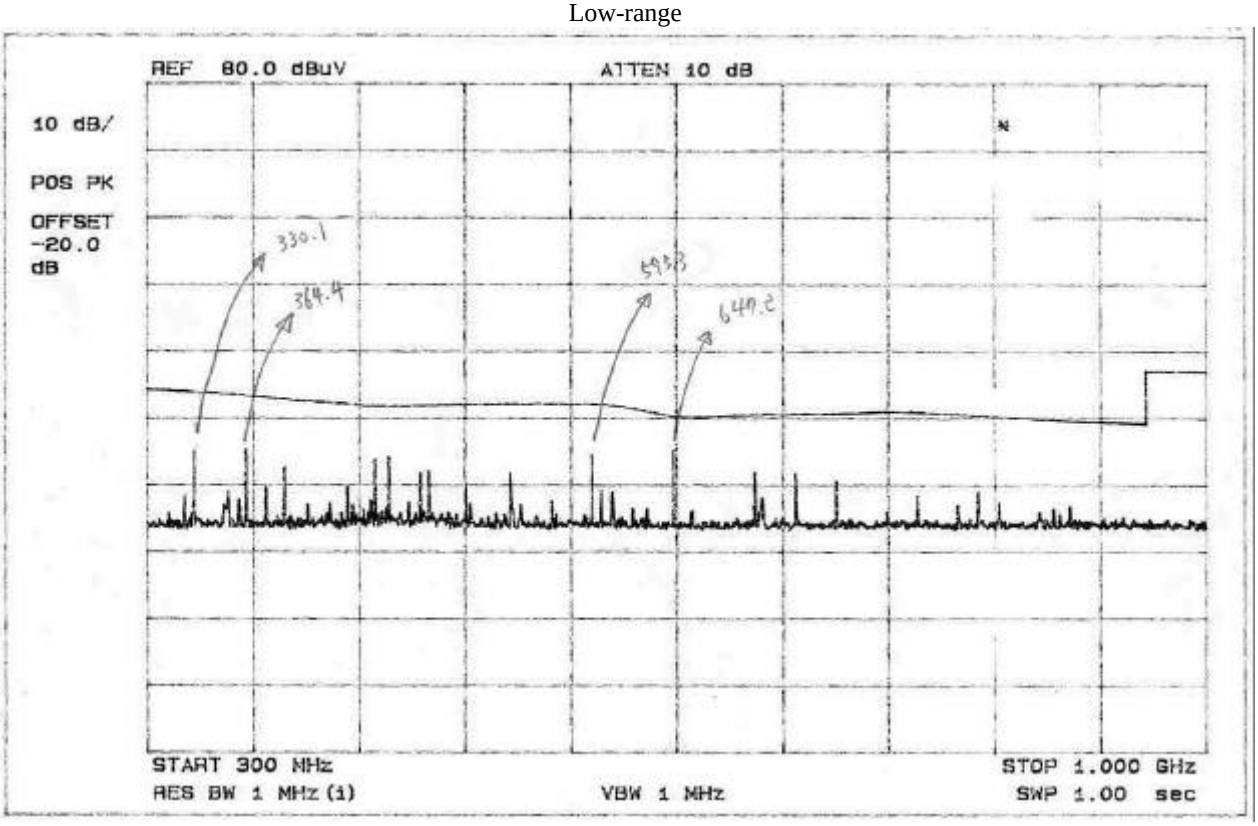
End of data

Note :

Appendix A. Preliminary Test Data



Low-range



High-range