

Certification of Compliance

CFR 47 Part 15 Subpart B

Test Report File No. : 02-IST-160 **Date of Issue** : July 11, 2002

Model(s) : DV6T812N / DAEWOO

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.

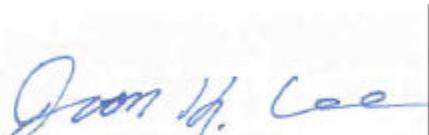
Address : 295, Gondan-dong, Kumi-city, Kyungsangbuk-do, Korea

Test Result

Positive

Negative

Reviewed By



J.H. Lee / General Manager

Approved By



G. Chung / Chief

- The test report with appendix consists of 52 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

Table of contents	2
Information of test laboratory, Environmental condition, Power used	3
Descriptions of test	4-6
Conducted Emission	4
Radiated Emission	5
Output Signal level measurements	6
Output Terminal Conducted Spurious Emission	6
Transfer Switch Isolation Measurement	6
Summary	7
Test Conditions and Data - Emission	
Conducted Emission	0.45MHz - 30MHz
Test equipment / Data and Plots	8-24
Radiated Emission	30MHz - 1GHz
Test equipment / Data and Plots	25-26
Output Signal level measurements	
Test equipment / Data and Plots	27-36
Output Terminal Conducted Spurious Emission	30MHz - 1GHz
Test equipment / Data and Plots	37-42
Transfer Switch Isolation Measurement	30MHz - 1GHz
Test equipment / Data and Plots	43-48

Information OF TUNERS

Manufacture	Manufacture Name	Daewoo Model Name
LG Innotek Co., Ltd	TADC-H301F	LGTMI-US4-S
Korea Alps Co., Ltd	TMDH2-A50A	ALTMI-US3-S

Appendix

A. The preliminary test results	49-52
---------------------------------	-------

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	25
Humidity	48 %
Atmospheric pressure	999 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 ± 0.2 Vp-p sync negative 75 ohms unbalanced
Video output signal	Phono type 1.0 ± 0.2 Vp-p sync negative 75 ohms unbalanced
Audio input signal	Phono type, -8.8dBm, more than 47k ohms unbalanced
Audio output signal	Phono type -8.8dBm(VCR) 2Vrms(DVD), less than 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.

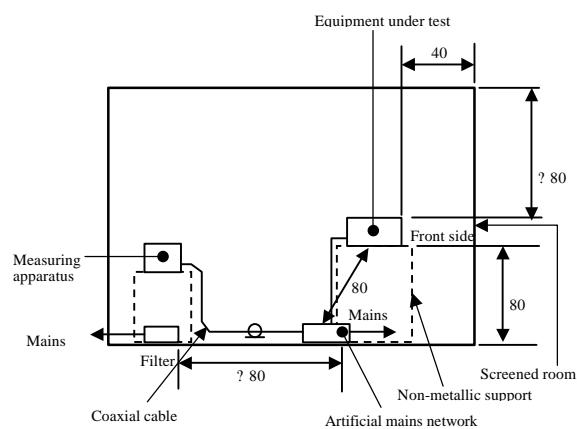
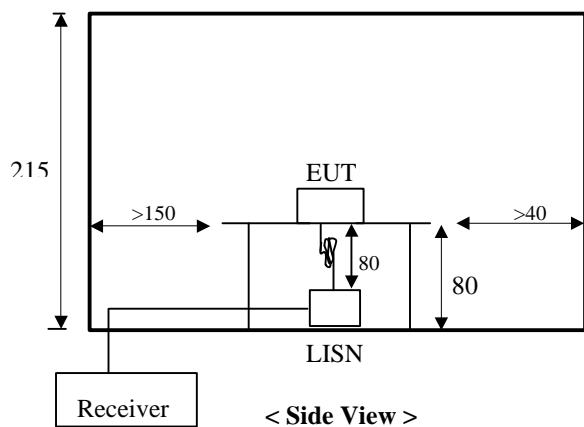
DESCRIPTIONS OF TEST

Conducted Emissions:

The measurement were performed over the frequency range of 0.45MHz to 30MHz using a 50 /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 \varnothing 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.



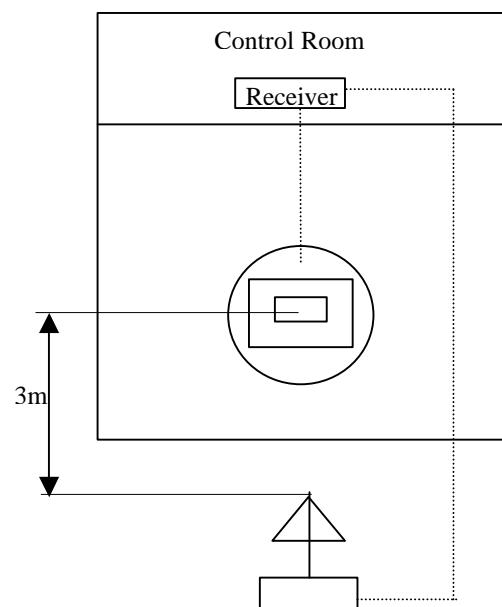
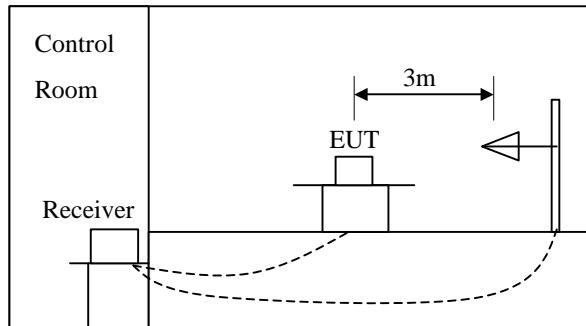
DESCRIPTION OF TEST

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



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 $(R)[\mu V]$ 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 $(R)[\mu V]$ 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 $(R)[\mu V]$ (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 $(R)[\mu V]$. (Sec 15.115 (c).(1).(ii))

SUMMARY

Conducted Emission

The requirements are	MET	Not MET
Minimum limit margin	6.9 dB at 18.897 MHz	
Maximum limit exceeding		

Remarks : With live phase, DVD playback and VCR record mode (Tuner: ALTMI-US3-S)

Radiated Emission

The requirements are	MET	Not MET
Minimum limit margin	3.2 dB at 640.8 MHz	
Maximum limit exceeding		

Remarks : With DVD playback and VCR record mode (Tuner: LGTMI-US4-S)

Output Signal Level Measurements

The requirements are	MET	Not MET
Minimum limit margin		
Maximum limit exceeding		

Remarks : Limits are kept with more than 9dB 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 :

Sang R. Yoon

- means the test is applicable, is not applicable.

S.R. Yoon / EMC Engineer

TEST CONDITIONS AND DATA

Conducted Emissions

Test Equipment Used

<u>Model Name</u>	<u>Manufacturer</u>	<u>Description</u>	<u>Next Cal. Date</u>
ESH3	Rohde Schwarz	Receiver	Jul. 25, 2003
ESH3-Z2	Rohde Schwarz	Pulse Limiter	Jul. 25, 2003
EZM	Rohde Schwarz	Spectrum monitor	-
3825/2	EMCO	LISN	Jun. 13, 2003
PM5515	Philips	Pattern Generator	Jun. 20, 2003

External Peripherals

<u>Device Description</u>	<u>Model Name</u>	<u>Manufacture</u>	<u>FCC Compliance Information</u>
TV Receiver	F19430	Daewoo	Verification

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

Test Area Shielded room #3

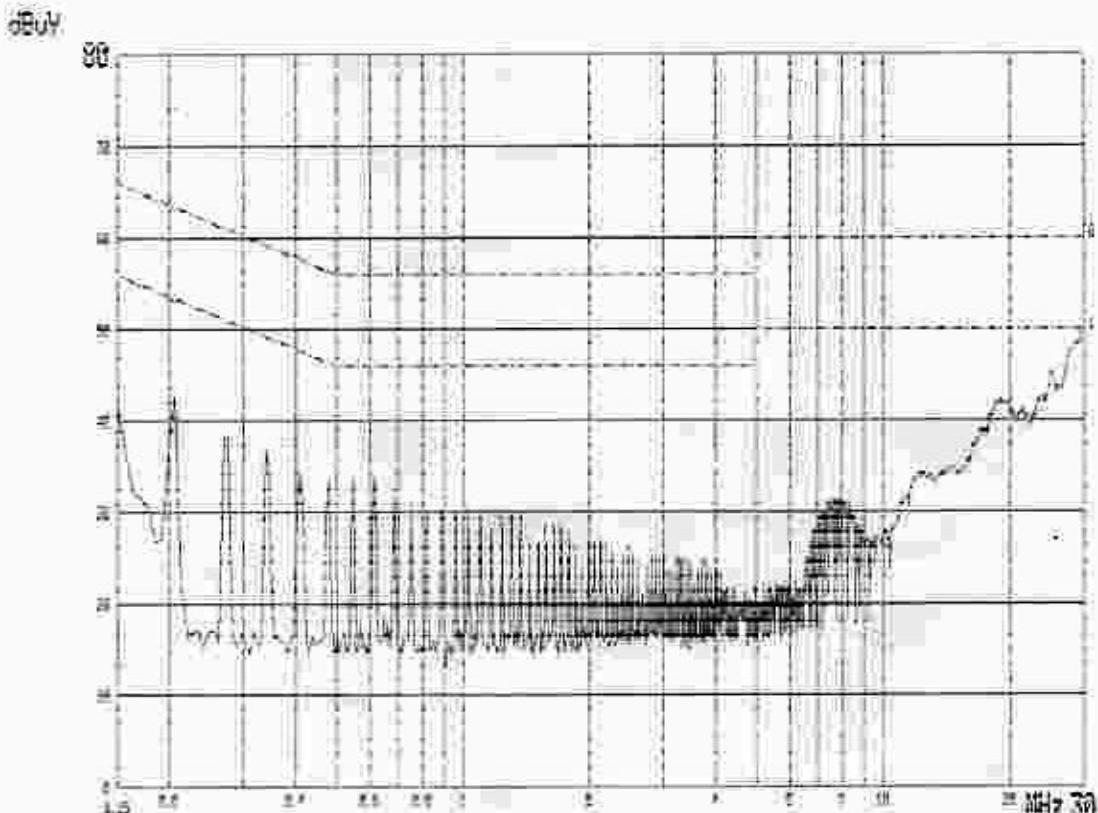
Note : The test were performed with color bar as VITS. The channels were assigned to playback mode for ch3 with 1Vpp pre-recorded reference tape and record mode for ch4 with video input of 5Vpp color bar signal amplified by HP8447D.

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 24.

Conducted Emissions

(Mains Terminal Disturbance Voltages)



MODEL : DVST812N (DVI PC MODE)
 120Vac 60Hz PHASE : LIVE

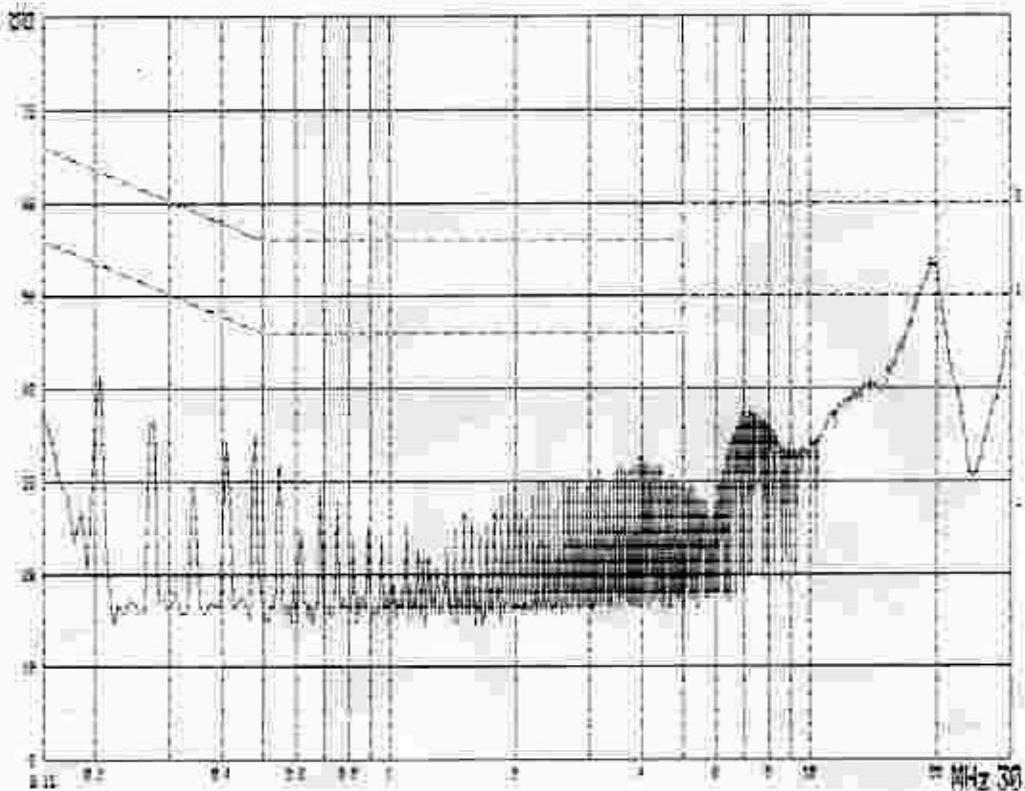
Tuner: ALTMI-US3-S

Frequency [MHz]	Measurement [dBuV]		Limit [dBuV]		Margin [dB]	
	Q-Peak	Average	Q-Peak	Average	Q-Peak	Average
0.224	42.2	31.6	62.7	52.7	20.5	21.1
29.312	49.6	32.6	60.0	50.0	10.4	17.4

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

Conducted Emissions

(Mains Terminal Disturbance Voltages)



MODEL : DV6TB12H (DVD PB MODE)
120Vac 60Hz PHASE : NEUTRAL

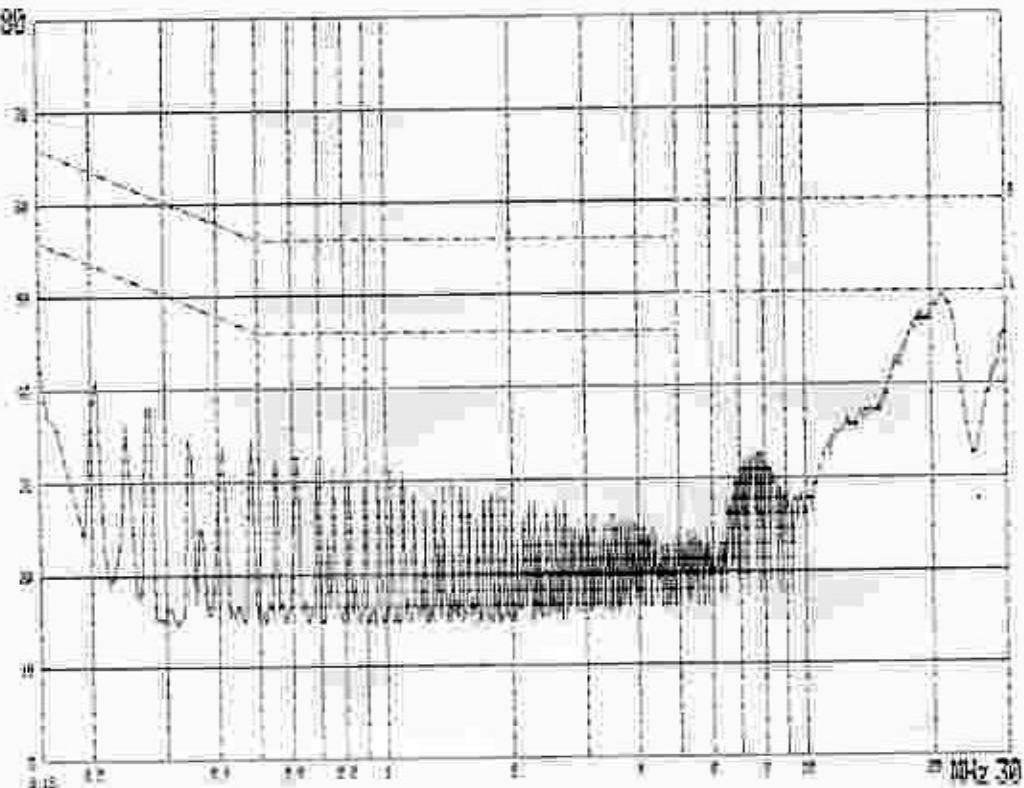
Tuner: ALTM1-US3-S

Frequency [MHz]	Measurement [dBuV]		Limit [dBuV]		Margin [dB]	
	Q-Peak	Average	Q-Peak	Average	Q-Peak	Average
0.224	39.9	29.6	62.7	52.7	22.8	23.1
18.996	29.6	40.9	60.0	50.0	30.4	9.1

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

Conducted Emissions

(Mains Terminal Disturbance Voltages)



MODEL : DV67812N (DVD PB, VCR REC MODE)
 120Vac 60Hz PHASE : LIVE

Tuner: ALTM1-US3-S

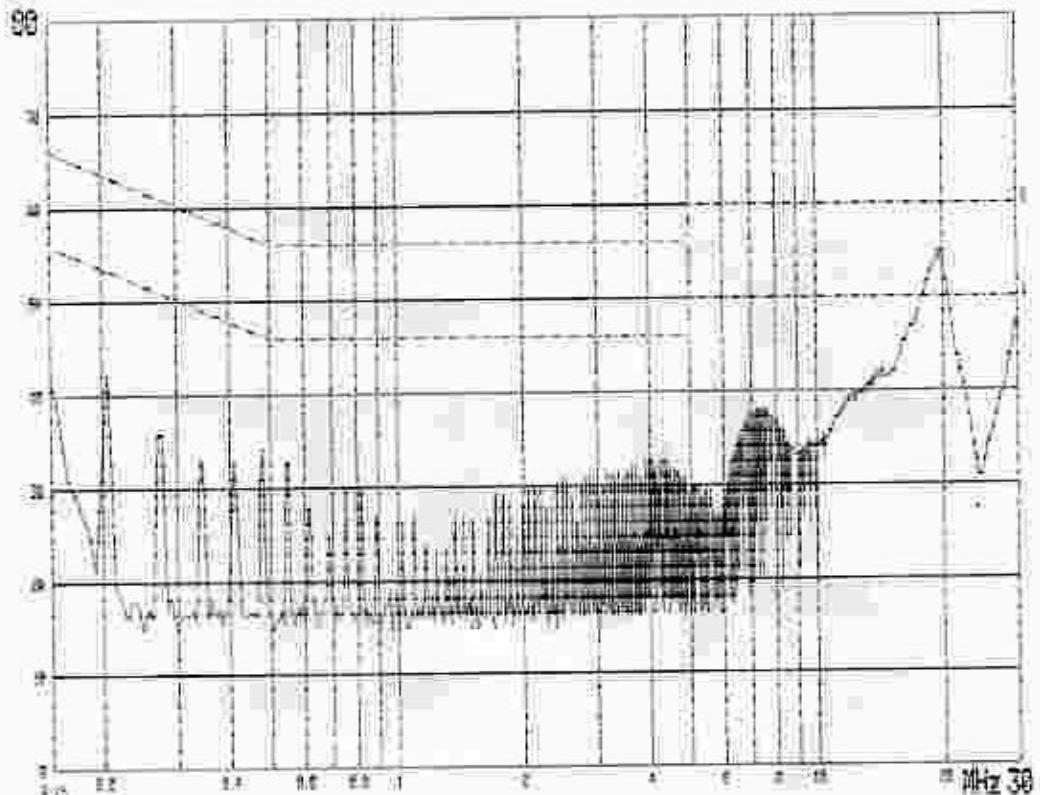
Frequency [MHz]	Measurement [dBuV]		Limit [dBuV]		Margin [dB]	
	Q-Peak	Average	Q-Peak	Average	Q-Peak	Average
0.152	42.1	33.2	65.9	55.9	23.8	22.7
18.211	45.3	31.6	60.0	50.0	14.7	18.4
22.651	49.3	33.7	60.0	50.0	10.7	16.3

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

Conducted Emissions

(Mains Terminal Disturbance Voltages)

dBuV



MODEL : DVST312N (IND. P.C. VCR REC MODE)
 120Vac 60Hz PHASE : NEUTRAL

Tuner: ALTM1-US3-S

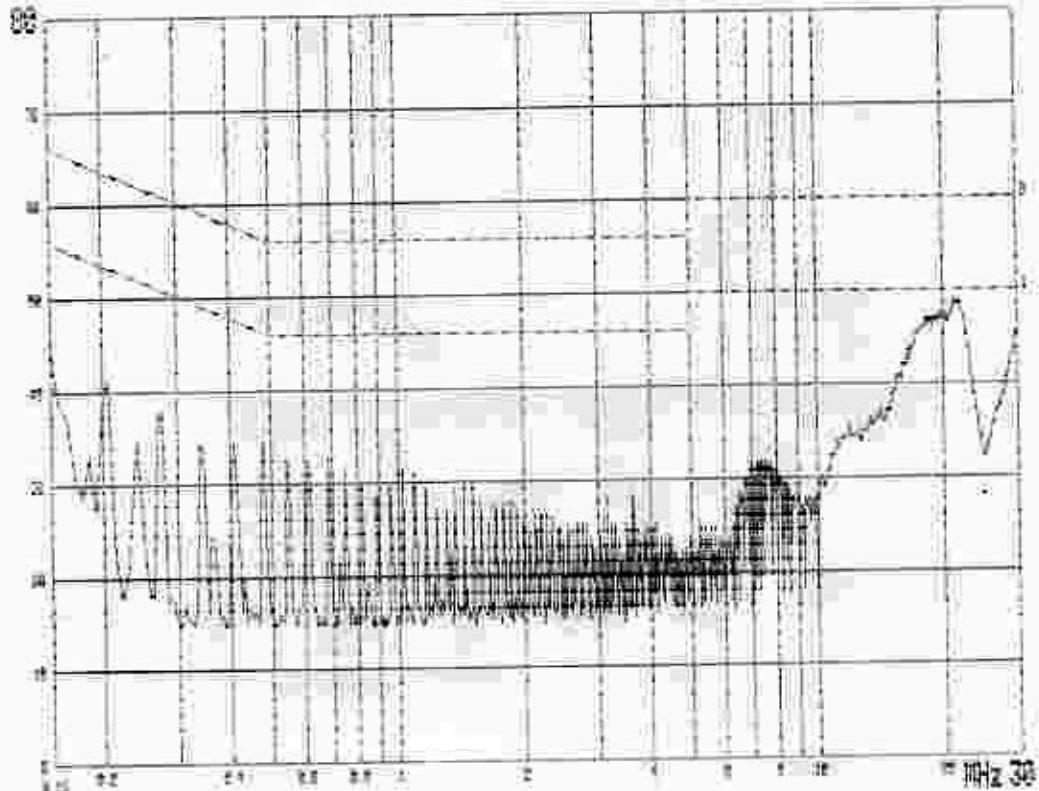
Frequency [MHz]	Measurement [dBuV]		Limit [dBuV]		Margin [dB]	
	Q-Peak	Average	Q-Peak	Average	Q-Peak	Average
0.224	40.3	31.6	62.7	52.7	22.4	21.1
18.996	52.6	41.3	60.0	50.0	7.4	8.7
19.897	52.8	43.1	60.0	50.0	7.2	6.9

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

Conducted Emissions

(Mains Terminal Disturbance Voltages)

dBuV



 MODEL : DVST812N (VCR PB MODE)
 120Vac 60Hz PHASE : LIVE

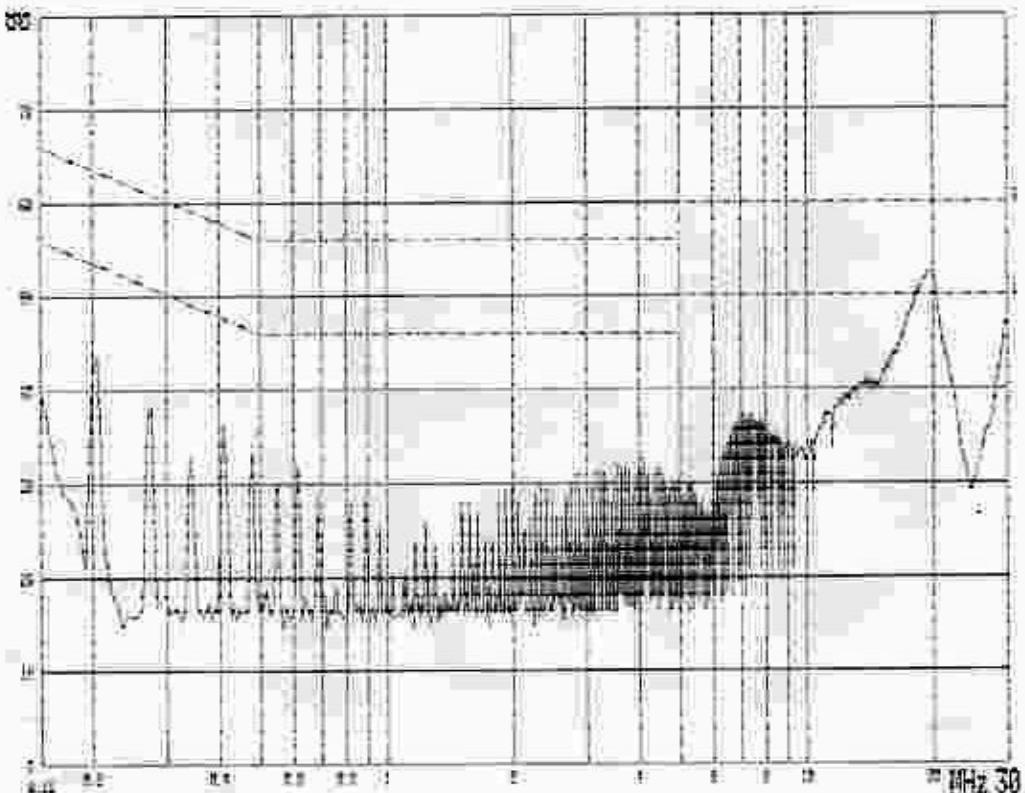
Tuner: ALTMI-US3-S

Frequency [MHz]	Measurement [dBuV]		Limit [dBuV]		Margin [dB]	
	Q-Peak	Average	Q-Peak	Average	Q-Peak	Average
0.152	41.9	31.7	65.9	55.9	24.0	24.2
19.897	47.2	32.3	60.0	50.0	12.8	17.7
22.651	49.6	34.5	60.0	50.0	10.4	15.5

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

Conducted Emissions

(Mains Terminal Disturbance Voltages)



MODEL : DVST812N (VCR PG MODE)
 120Vac 60Hz PHASE : NEUTRAL

Tuner: ALTM1-US3-S

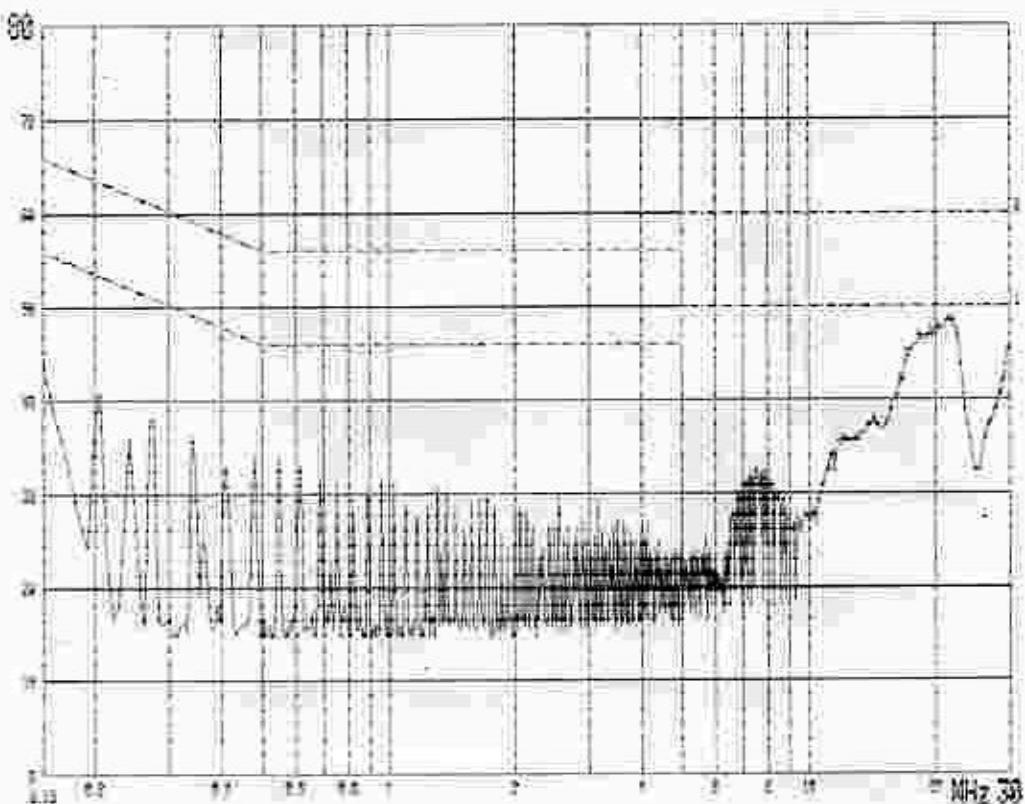
Frequency [MHz]	Measurement [dBuV]		Limit [dBuV]		Margin [dB]	
	Q-Peak	Average	Q-Peak	Average	Q-Peak	Average
0.224	44.1	31.7	62.7	52.7	18.6	21.0
18.996	52.3	42.6	60.0	50.0	7.7	7.4

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

Conducted Emissions

(Mains Terminal Disturbance Voltages)

VOLT



MODEL : DVST812N (VCR REC MODE)
 120Vac 60Hz PHASE : LIVE

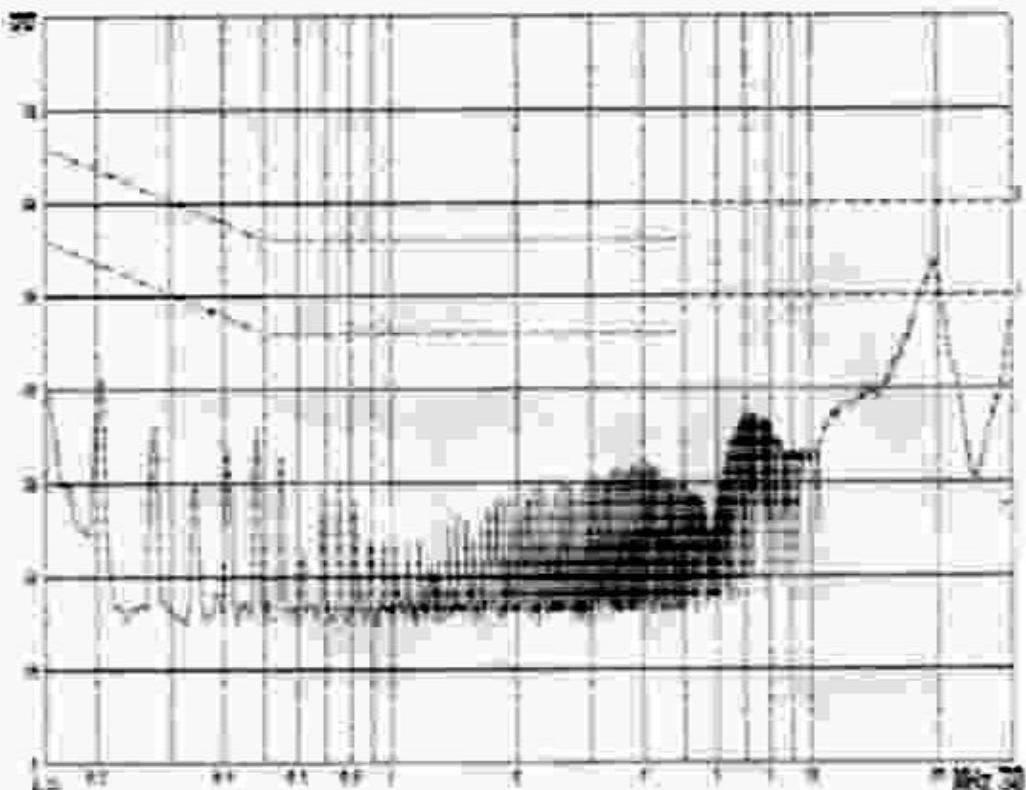
Tuner: ALTM1-US3-S

Frequency [MHz]	Measurement [dBuV]		Limit [dBuV]		Margin [dB]	
	Q-Peak	Average	Q-Peak	Average	Q-Peak	Average
0.152	42.5	32.9	65.9	55.9	23.4	23.0
19.897	47.3	38.6	60.0	50.0	12.7	11.4
22.651	48.7	34.6	60.0	50.0	11.3	15.4

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

Conducted Emissions

(Mains Terminal Disturbance Voltages)



MODEL : DV67812N (VCR REC MODE)
120Vac 60Hz PHASE : NEUTRAL

Tuner: ALTMI-US3-S

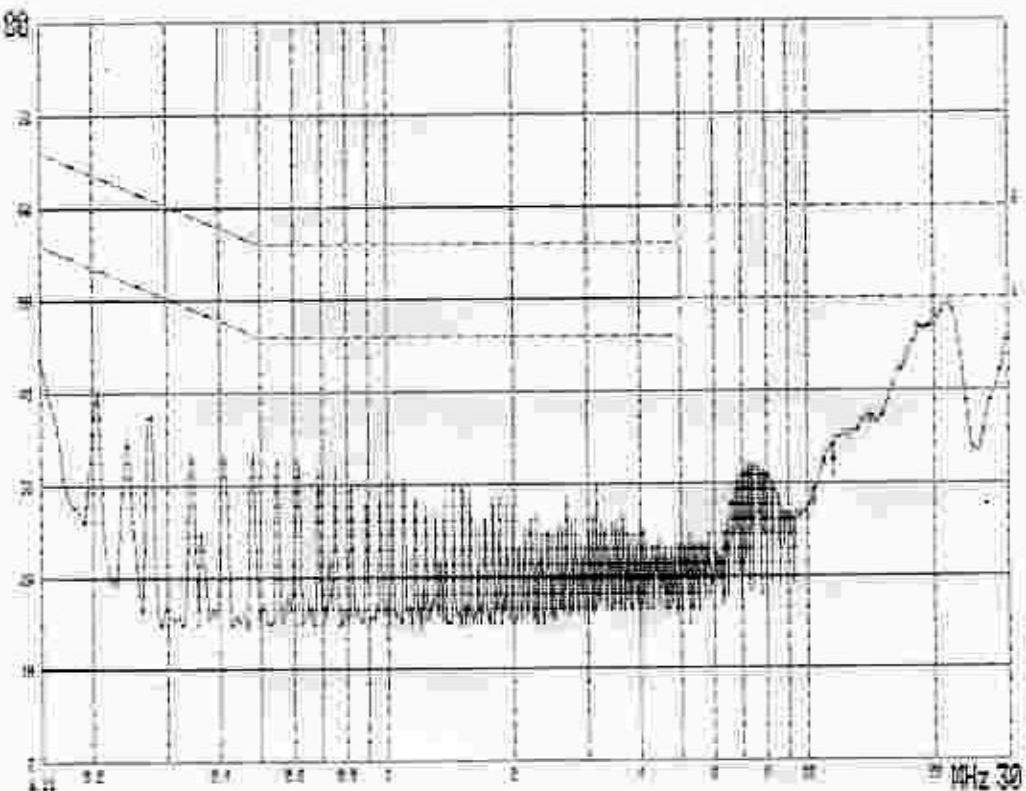
Frequency [MHz]	Measurement [dBuV]		Limit [dBuV]		Margin [dB]	
	Q-Peak	Average	Q-Peak	Average	Q-Peak	Average
0.224	41.2	33.6	62.7	52.7	21.5	19.1
18.996	52.4	42.4	60.0	50.0	7.6	7.6

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

Conducted Emissions

(Mains Terminal Disturbance Voltages)

dBuV



MODEL : DV67812K (DVD PB MODE)
 128Vac 60Hz PHASE : LIVE

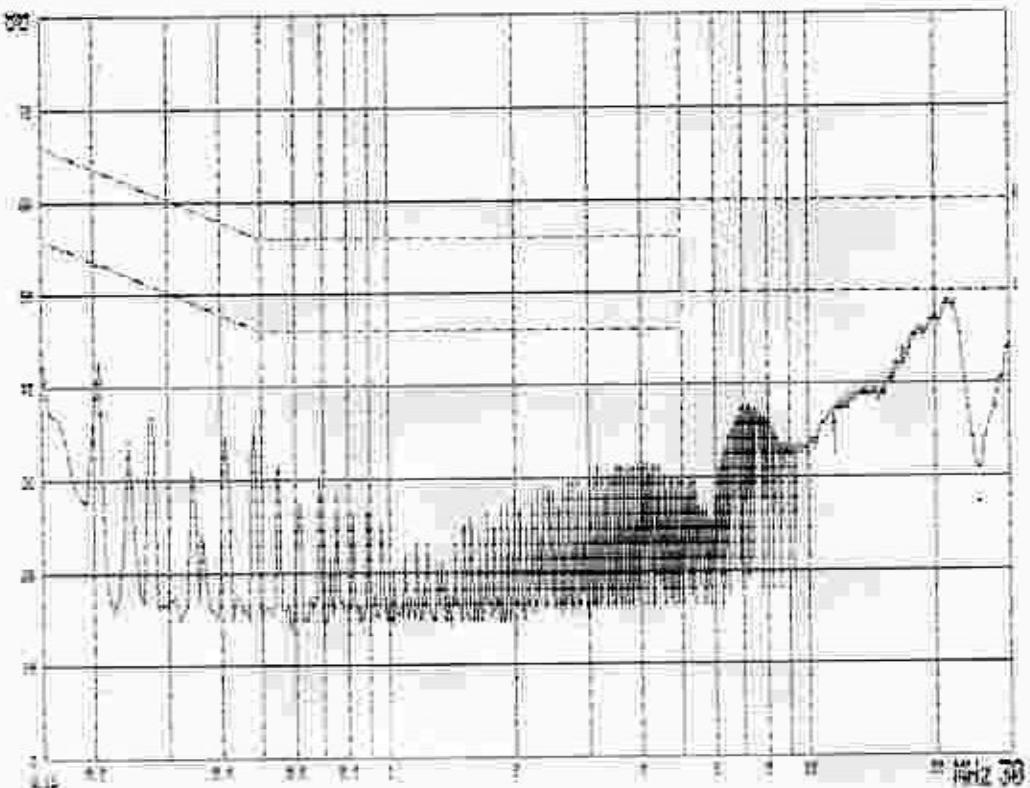
Tuner: LGTMI-US4-S

Frequency [MHz]	Measurement [dBuV]		Limit [dBuV]		Margin [dB]	
	Q-Peak	Average	Q-Peak	Average	Q-Peak	Average
0.151	40.9	29.6	65.9	55.9	25.0	26.3
22.562	46.5	36.3	60.0	50.0	13.5	13.7

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

Conducted Emissions

(Mains Terminal Disturbance Voltages)



MODEL: DV67812N (DVD PB MODE)
 120V_{ac} 60Hz PHASE: NEUTRAL

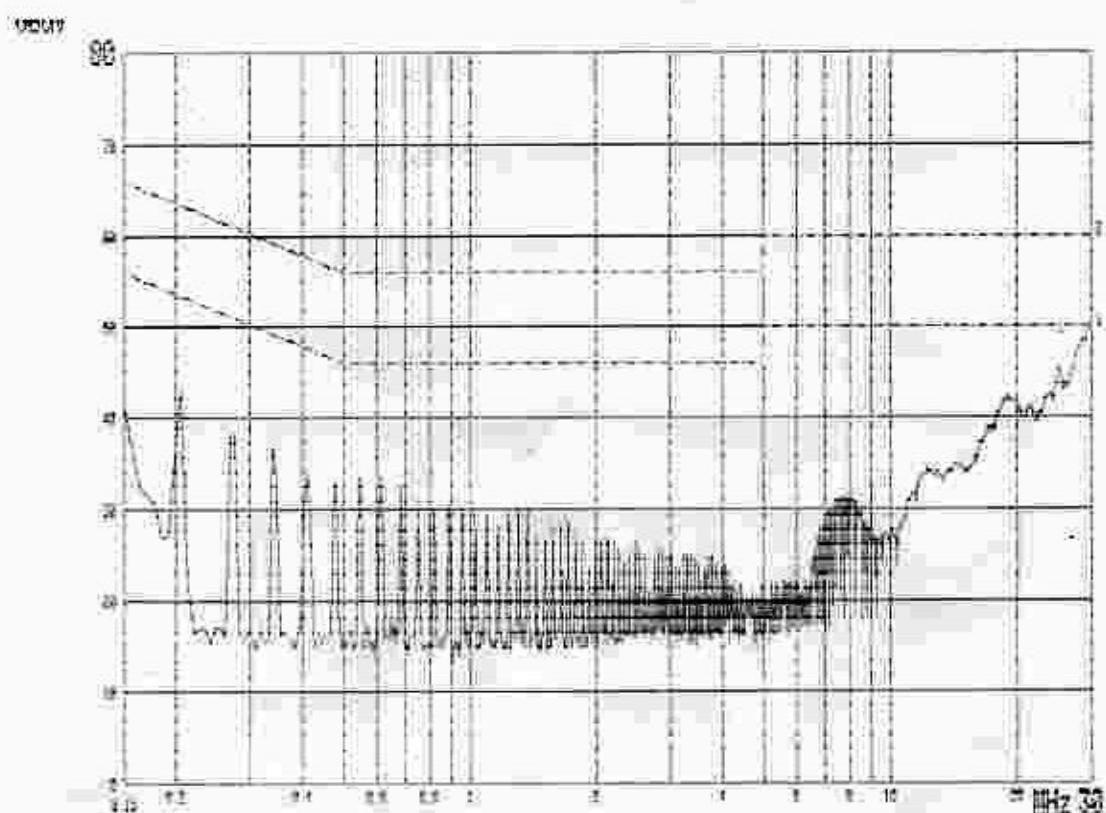
Tuner: LGTMI-US4-S

Frequency [MHz]	Measurement [dBuV]		Limit [dBuV]		Margin [dB]	
	Q-Peak	Average	Q-Peak	Average	Q-Peak	Average
0.225	41.3	29.5	62.6	52.6	21.3	23.1
22.651	46.2	37.1	60.0	50.0	13.8	12.9

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

Conducted Emissions

(Mains Terminal Disturbance Voltages)



MODEL : DV6781EN (DVD PB, VCR REC MODE)
 120Vac 60Hz PHASE : LIVE

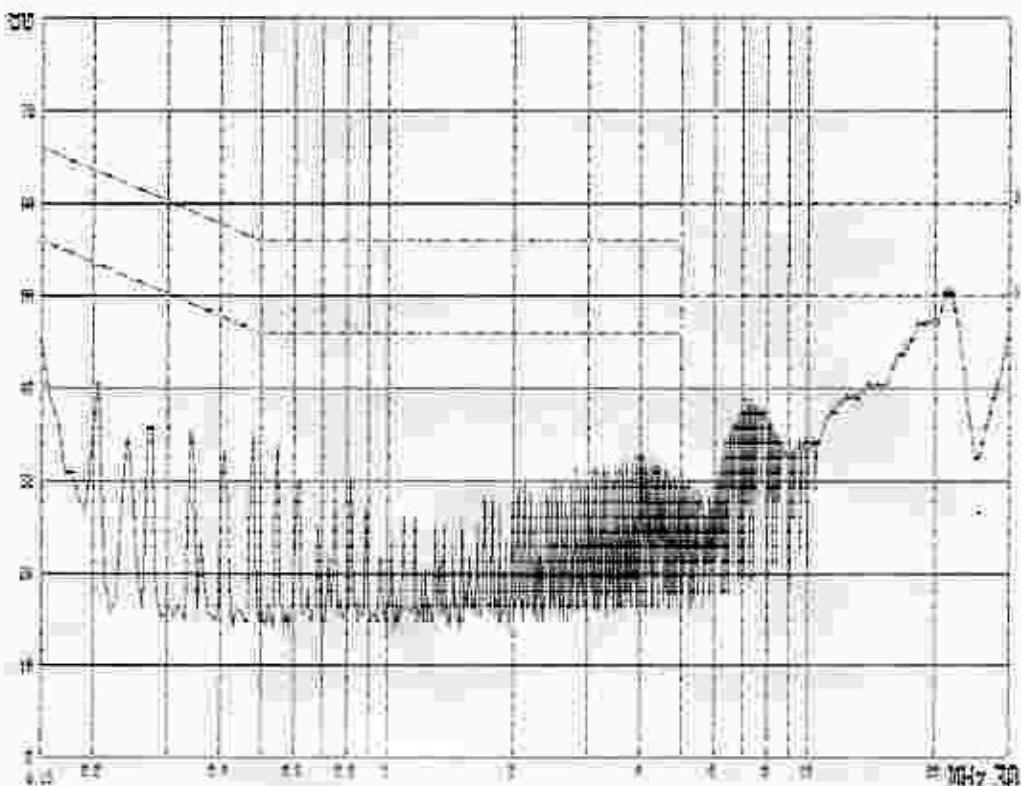
Tuner: LGTMI-US4-S

Frequency [MHz]	Measurement [dBuV]		Limit [dBuV]		Margin [dB]	
	Q-Peak	Average	Q-Peak	Average	Q-Peak	Average
0.224	41.2	30.1	62.7	52.7	21.5	22.6
28.712	48.1	36.2	60.0	50.0	11.9	13.8

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

Conducted Emissions

(Mains Terminal Disturbance Voltages)



MODEL : DVST312N (DVD P3, VCR REC MODE)
 120Vac 60Hz PHASE : NEUTRAL

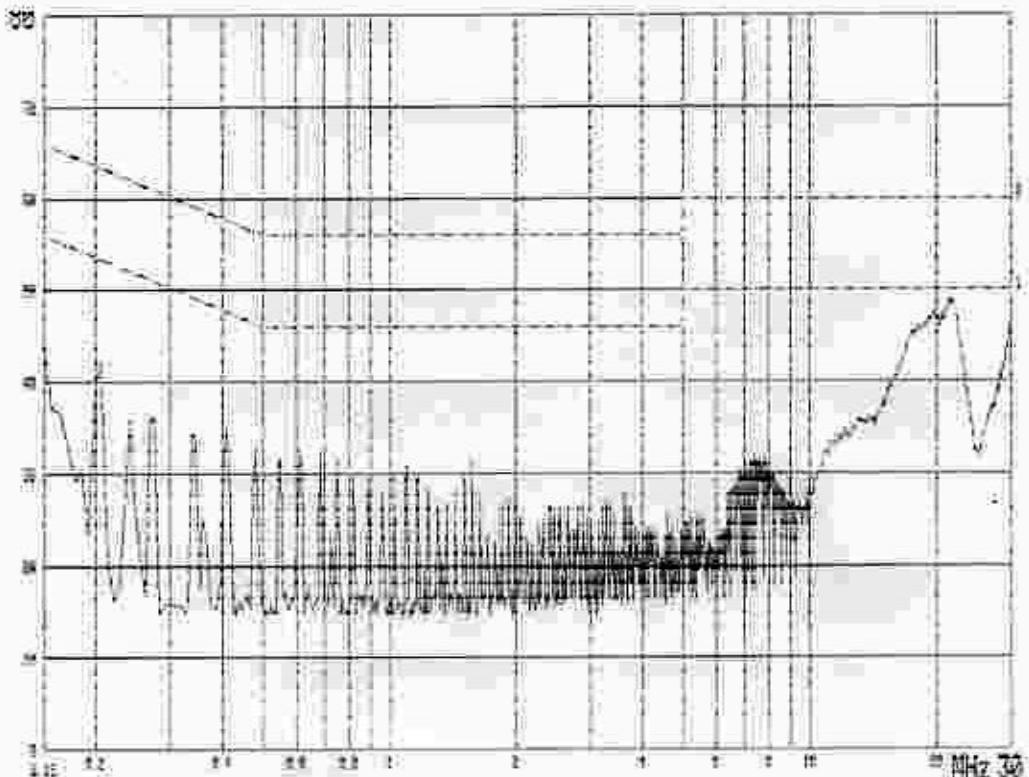
Tuner: LGTMI-US4-S

Frequency [MHz]	Measurement [dBuV]		Limit [dBuV]		Margin [dB]	
	Q-Peak	Average	Q-Peak	Average	Q-Peak	Average
0.223	40.7	29.6	62.7	52.7	22.0	23.1
22.561	47.6	37.1	60.0	50.0	12.4	12.9

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

Conducted Emissions

(Mains Terminal Disturbance Voltages)



MODEL : DV67012N (VCR REC MODE)
 120VAC 60Hz PHASE : LIVE

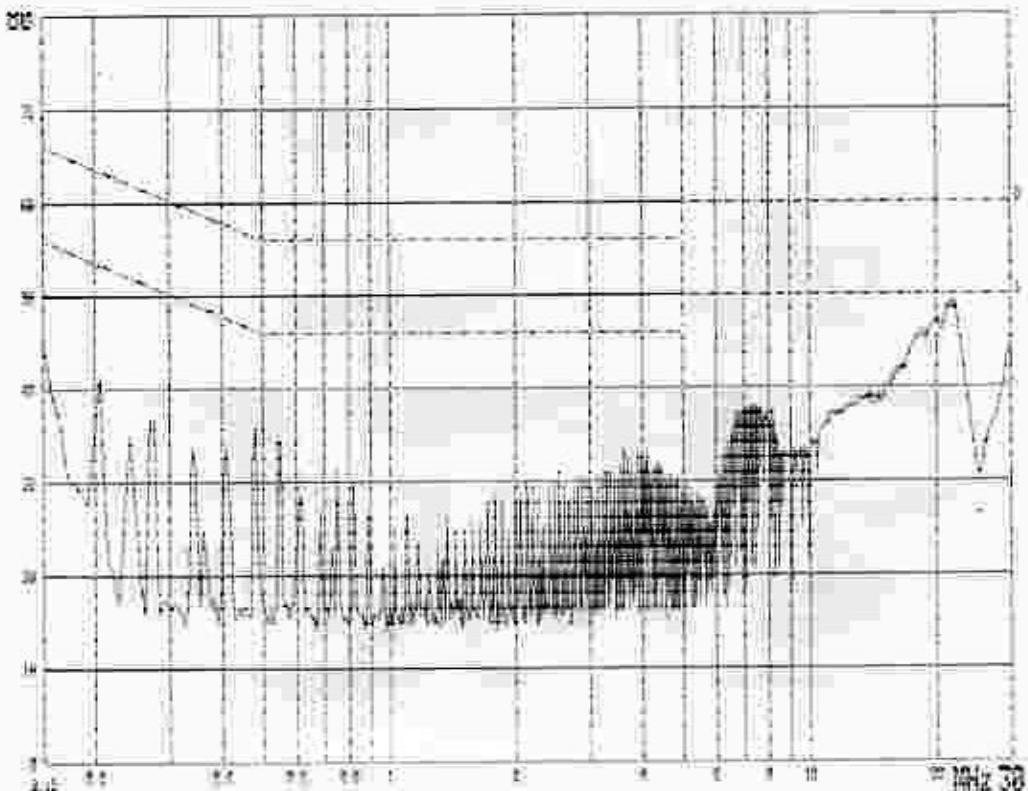
Tuner: LGTMI-US4-S

Frequency [MHz]	Measurement [dBuV]		Limit [dBuV]		Margin [dB]	
	Q-Peak	Average	Q-Peak	Average	Q-Peak	Average
0.151	41.1	30.6	65.9	55.9	24.8	25.3
0.224	39.6	31.1	62.7	52.7	23.1	21.6
22.650	45.9	36.8	60.0	50.0	14.1	13.2

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

Conducted Emissions

(Mains Terminal Disturbance Voltages)



MODEL: DV67B12N (VOR REC MODE)
 120V_{AC} 60Hz PHASE: NEUTRAL

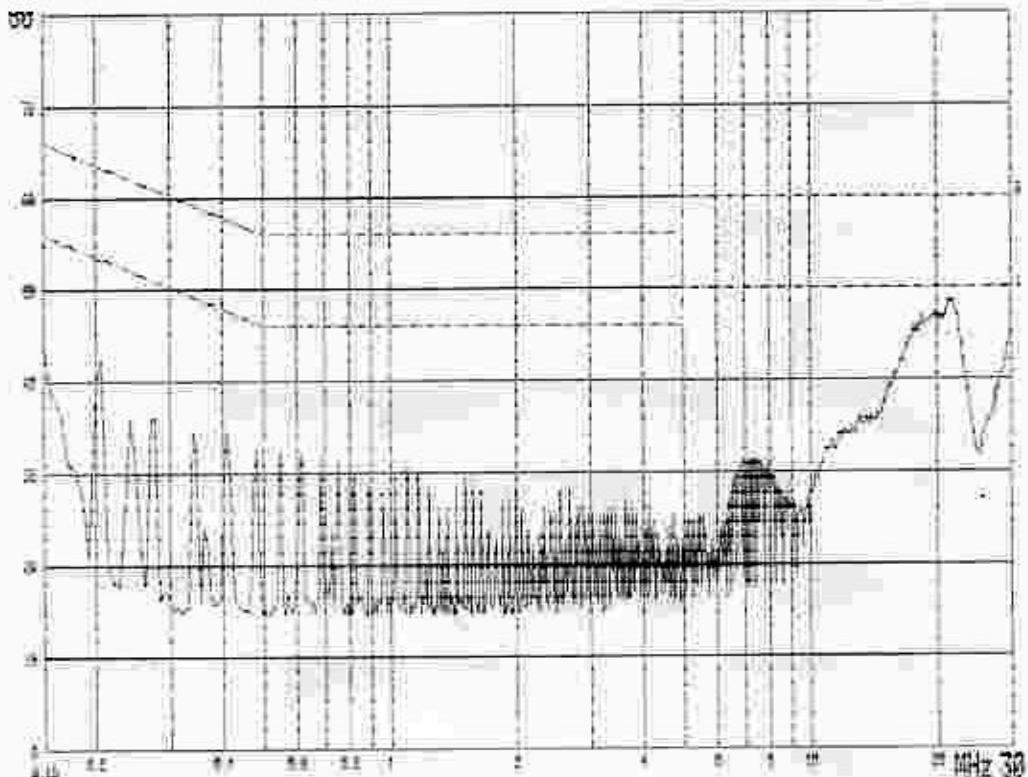
Tuner: LGTMI-US4-S

Frequency [MHz]	Measurement [dBuV]		Limit [dBuV]		Margin [dB]	
	Q-Peak	Average	Q-Peak	Average	Q-Peak	Average
0.151	40.8	31.2	65.9	55.9	25.1	24.7
0.224	39.7	32.0	62.7	52.7	23.0	20.7
22.650	46.2	36.9	60.0	50.0	13.8	13.1

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

Conducted Emissions

(Mains Terminal Disturbance Voltages)



MODEL : DV67B12N (VER PB MODE)
 120Vao 60Hz PHASE : LIVE

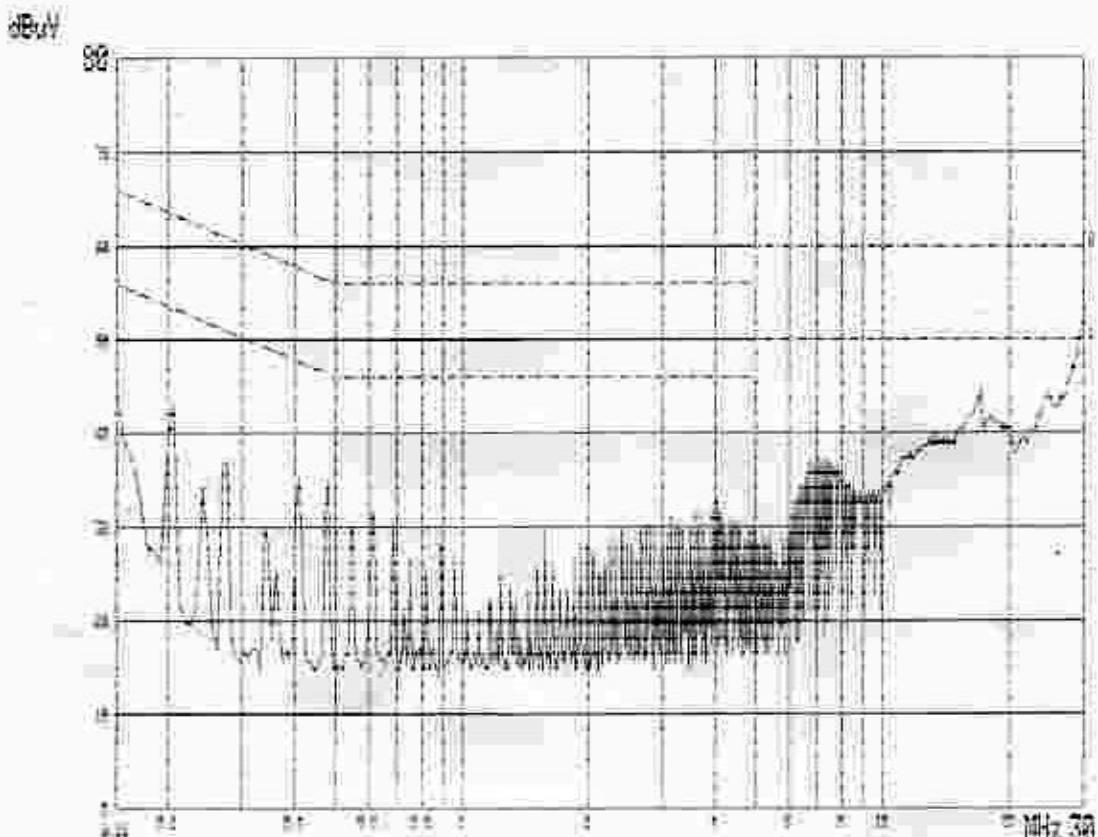
Tuner: LGTMI-US4-S

Frequency [MHz]	Measurement [dBuV]		Limit [dBuV]		Margin [dB]	
	Q-Peak	Average	Q-Peak	Average	Q-Peak	Average
0.151	41.0	31.2	65.9	55.9	24.9	24.7
0.225	39.9	32.3	62.6	52.6	22.7	20.3
22.651	45.4	36.4	60.0	50.0	14.6	13.6

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

Conducted Emissions

(Mains Terminal Disturbance Voltages)



MODEL : DVST612N (VCR PG MODE)
 120Vac 60Hz PHASE : NEUTRAL

Tuner: LGTMI-US4-S

Frequency [MHz]	Measurement [dBuV]		Limit [dBuV]		Margin [dB]	
	Q-Peak	Average	Q-Peak	Average	Q-Peak	Average
0.151	41.1	31.3	65.9	55.9	24.8	24.6
0.225	39.7	32.5	62.6	52.6	22.9	20.1
29.861	49.3	37.9	60.0	50.0	10.7	12.1

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

TEST CONDITIONS AND DATA

Radiated Emission

Test Equipment Used

<u>Model Name</u>	<u>Manufacturer</u>	<u>Description</u>	<u>Next Cal. Date</u>
ESVP	Rohde Schwarz	Receiver	Jul. 26, 2003
VULB9160	Schwarzbeck	Antenna	Jul. 10, 2003
EZM	Rohde Schwarz	Spectrum monitor	-
8566B	Hewlett Packard	Spectrum Analyzer	Jul. 13, 2002
85685A	Hewlett Packard	RF preselector	Jul. 13, 2002

External Peripherals

<u>Device Description</u>	<u>Model Name</u>	<u>Manufacture</u>	<u>FCC Compliance Information</u>
TV Receiver	F19430	Daewoo	Verification

Test Program DVD Playback and VCR record, DVD Playback,
VCR Playback, 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.

The final measurement was performed for only LG tuner after investigation of radiation characteristic.

Find the test data in following page(s) 49.

Radiated Emissions

(Disturbance Radiation)

- Tuner : **LGTMI-US4-S**

-	Freq. [MHz]	Reading [dBuV]	Antenna Factor [dB]	Cable Loss [dB]	Angle [deg]	Polar. [H/V]	Result [dBuV]	Limit [dBuV]	Margin [dB]
	50.5	22.1	1.6	11.5	240	V	40.0	35.2	4.8
	104.8	25.7	2.3	9.9	252	H	43.5	37.9	5.6
	108.3	18.4	2.4	10.1	310	V	43.5	30.8	12.7
	203.3	17.3	3.3	9.3	281	H	43.5	29.9	13.6
	221.7	25.1	3.6	9.7	190	H	46.0	38.4	7.6
	243.6	24.4	3.9	10.7	223	H	46.0	39.0	7.0
	364.4	18.5	5.0	13.9	256	H	46.0	37.4	8.7
	414.1	16.4	5.3	15.1	191	H	46.0	36.8	9.2
	606.6	13.1	6.8	18.7	183	V	46.0	38.6	7.5

End of data

Note :

TEST CONDITIONS AND DATA
Output Signal Level Measurements

Test Equipment Used

Model Name	Manufacturer	Description	Next Cal. Date
8566B	Hewlett Packard	Spectrum Analyzer	Jul. 13, 2002
85685A	Hewlett Packard	RF preselector	Jul. 13, 2002
RAM	Rohde & Schwarz	Matching Pad	Sep. 21, 2002

External Peripherals

<u>Device Description</u>	<u>Model Name</u>	<u>Manufacture</u>	<u>FCC Compliance Information</u>
TV Receiver	F19430	Daewoo	Verification

Test Program Playback and record mode

Test Area Compact Chamber

Note : Limit Calculations

For Video Signal

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

For Audio Signal

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

The test were performed with color bar 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.

Find the test data in following page(s) 28 to 36.

Output Signal Level Measurements

TV CH.	Freq. (MHz)	Level (dBuV)	Limit (dBuV)	Mode	Margin (dB)
3 (Pix)	61.28	59.8	69.54	Playback	9.74
3 (Aud)	65.81	41.2	56.53	Playback	15.33
3 (Pix)	61.29	56.2	69.54	Record	13.34
3 (Aud)	65.80	41.2	56.53	Record	15.33
4 (Pix)	67.26	56.4	69.54	Playback	13.14
4 (Aud)	62.73	41.6	56.53	Playback	14.93
4 (Pix)	67.26	56.7	69.54	Record	12.84
4 (Aud)	62.75	41.5	56.53	Record	15.03

Output Signal Tabulated Data with Tuner

(Korea Alps Model: **AL-TMI-US3-S**)

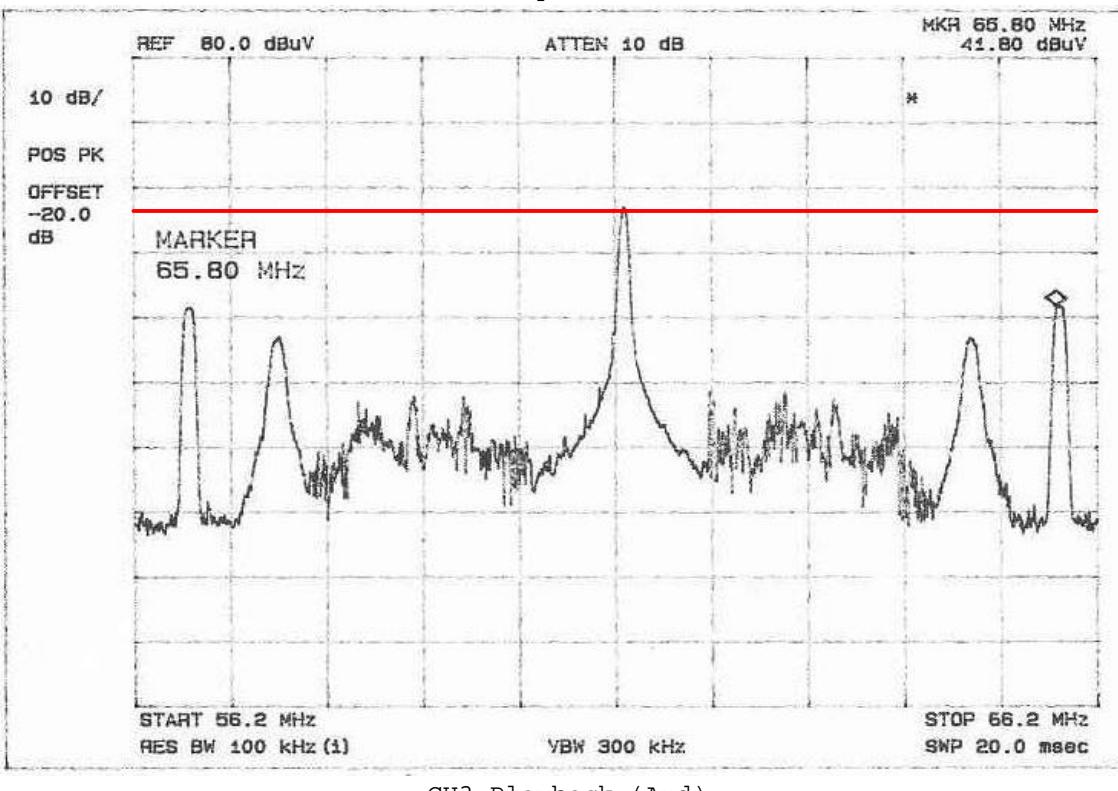
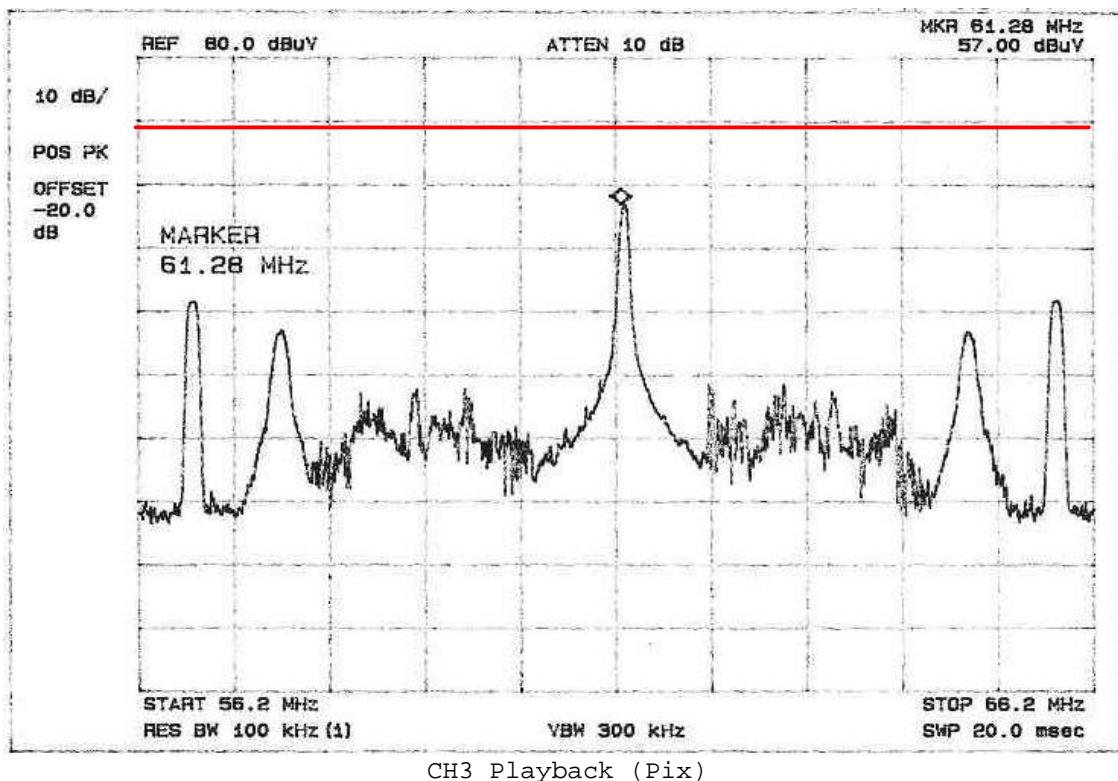
TV CH.	Freq. (MHz)	Level (dBuV)	Limit (dBuV)	Mode	Margin (dB)
3 (Pix)	61.28	57.5	69.54	Playback	12.04
3 (Aud)	65.81	43.2	56.53	Playback	13.33
3 (Pix)	61.27	57.5	69.54	Record	12.04
3 (Aud)	65.81	43.4	56.53	Record	13.13
4 (Pix)	67.27	57.8	69.54	Playback	11.74
4 (Aud)	62.74	43.6	56.53	Playback	12.93
4 (Pix)	67.27	57.8	69.54	Record	11.74
4 (Aud)	62.75	43.3	56.53	Record	13.23

Output Signal Tabulated Data with Tuner

(LG Innotek Co., Ltd. Model: **LGTMI-US4-S**)

Output Signal Level Measurements

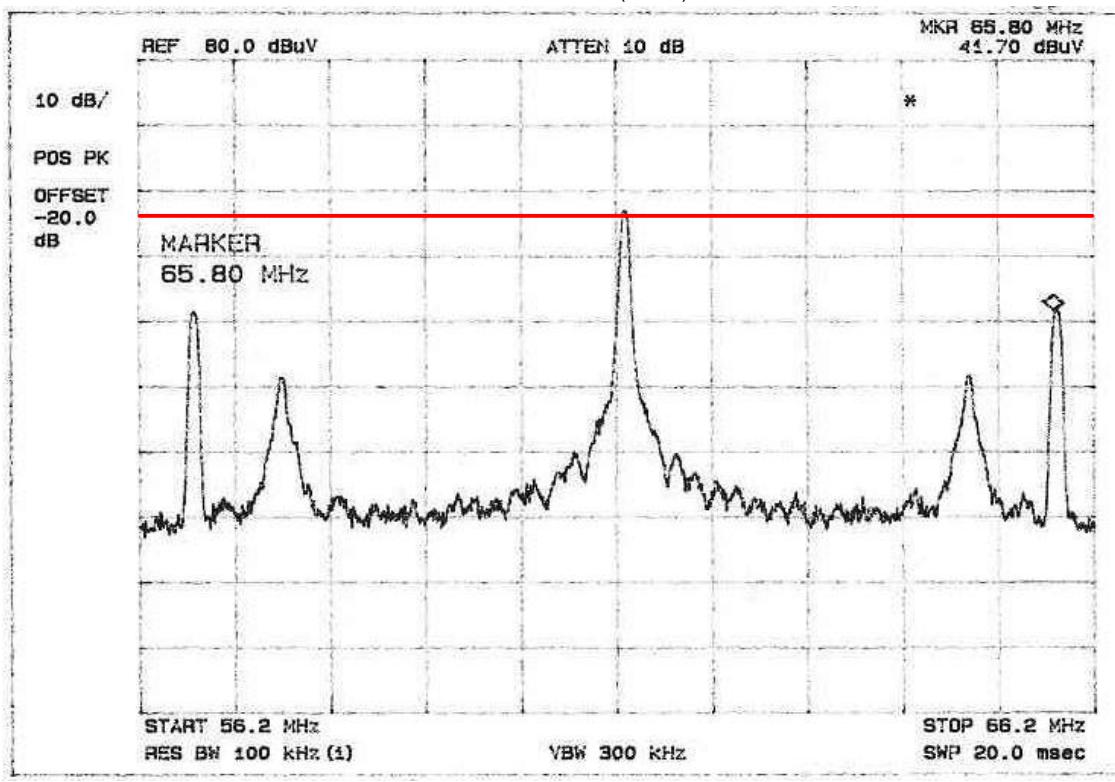
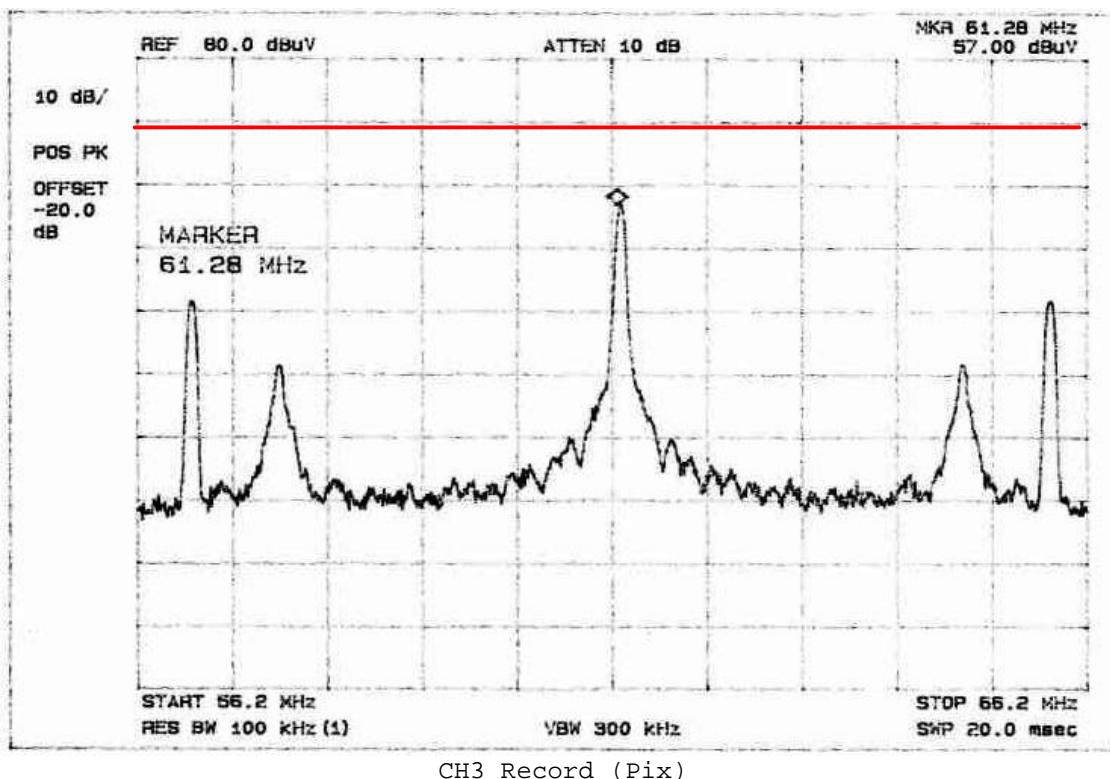
Tuner: ALTMI-US3-S



CH3 Playback (Aud)

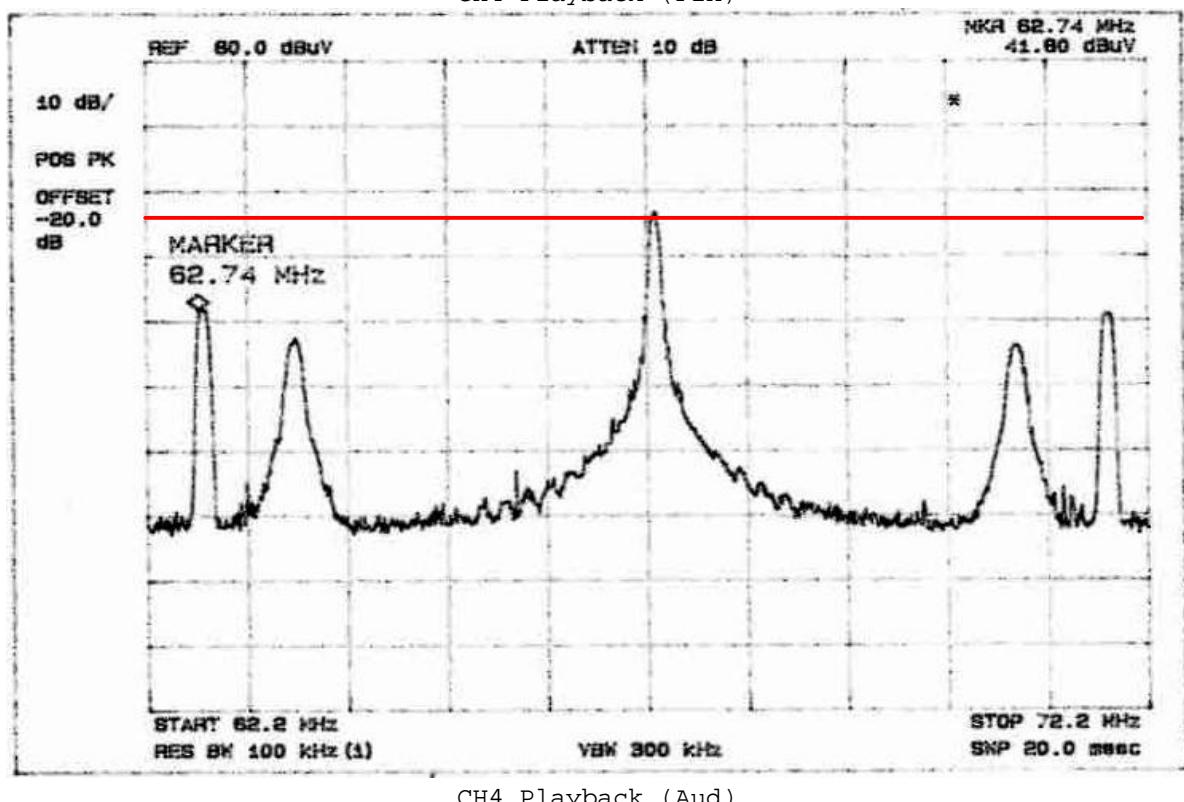
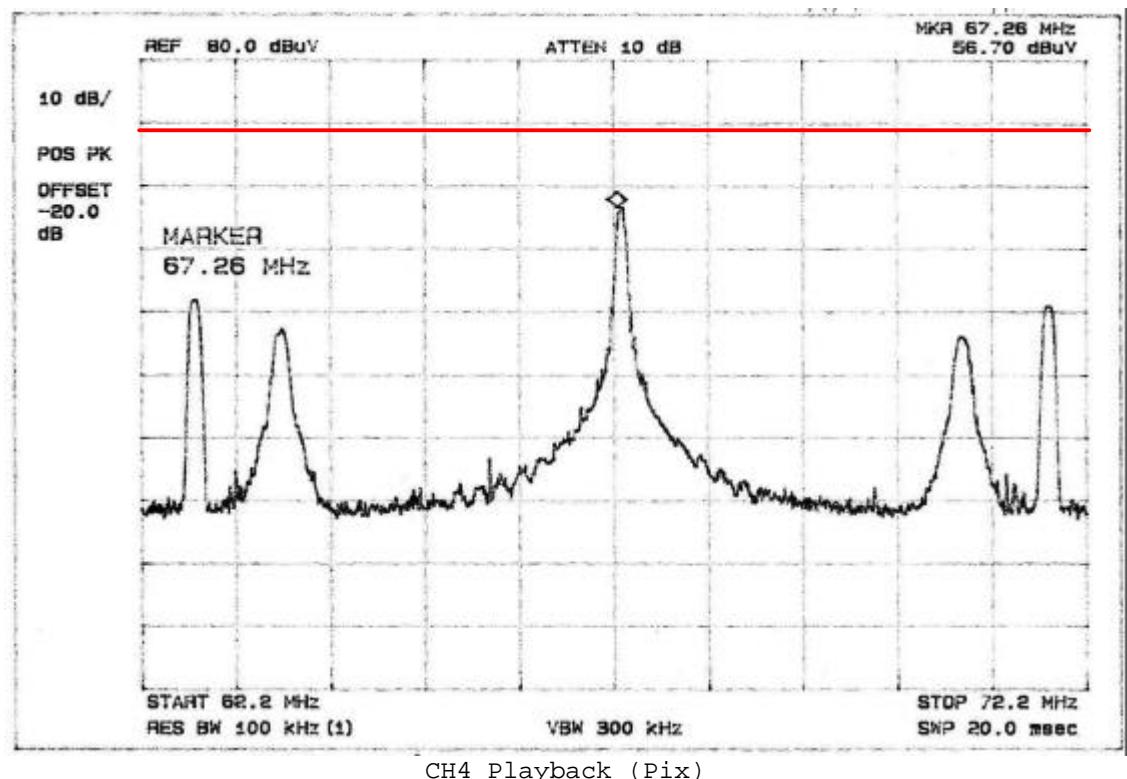
Output Signal Level Measurements

Tuner: ALTMI-US3-S



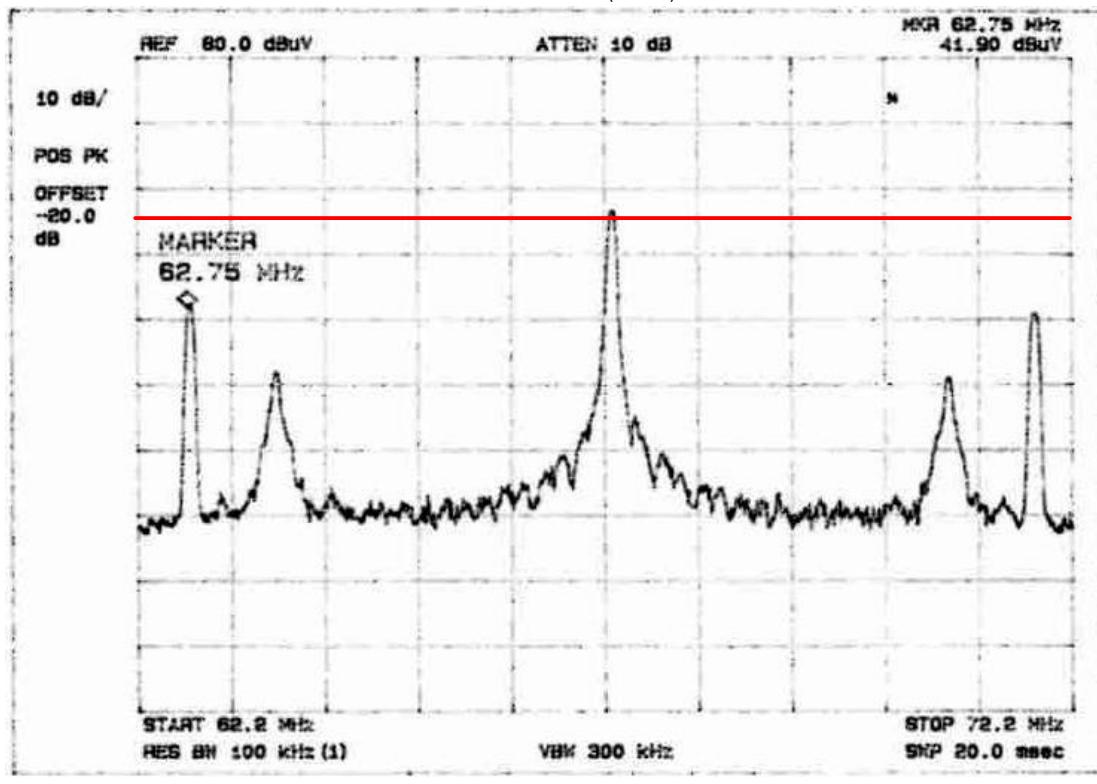
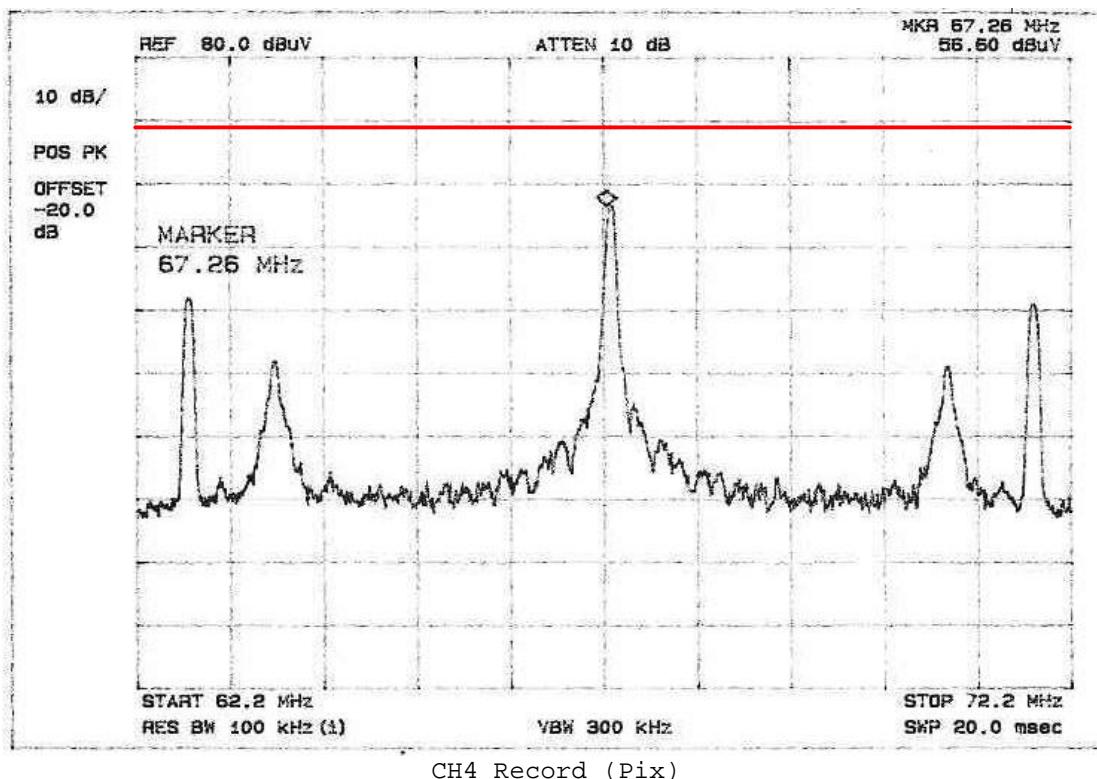
Output Signal Level Measurements

Tuner: ALTMI-US3-S



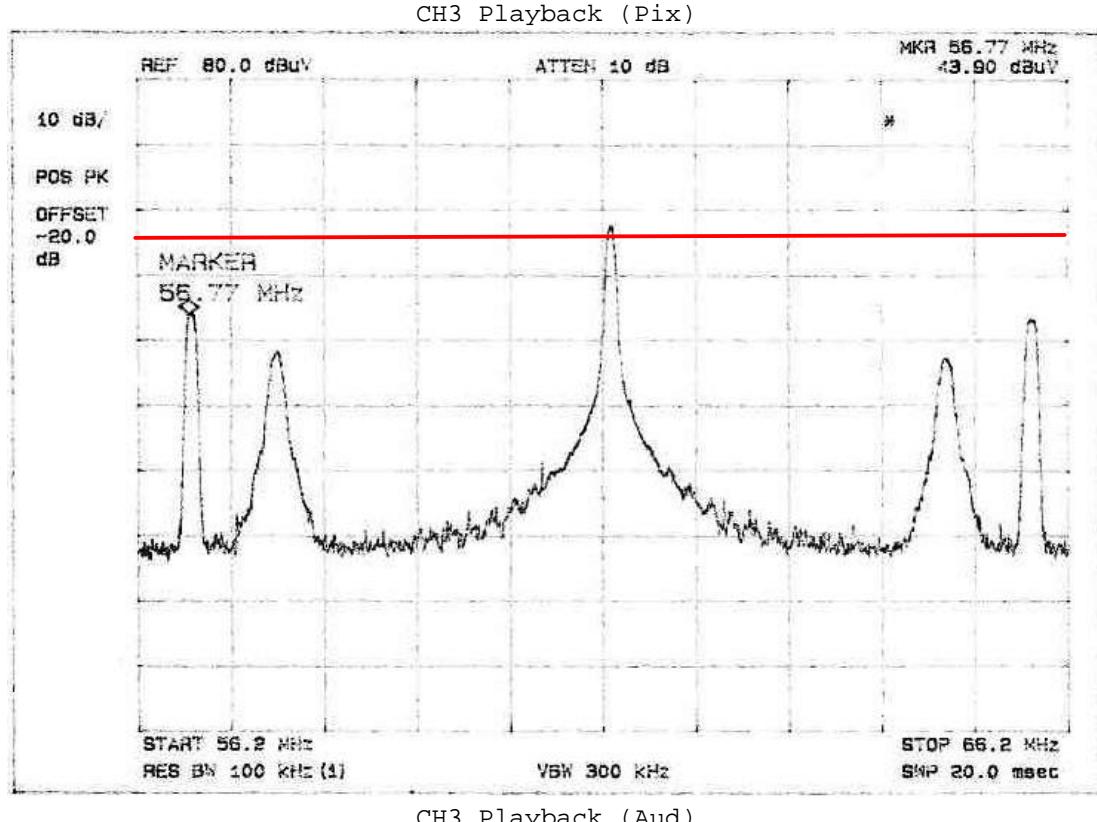
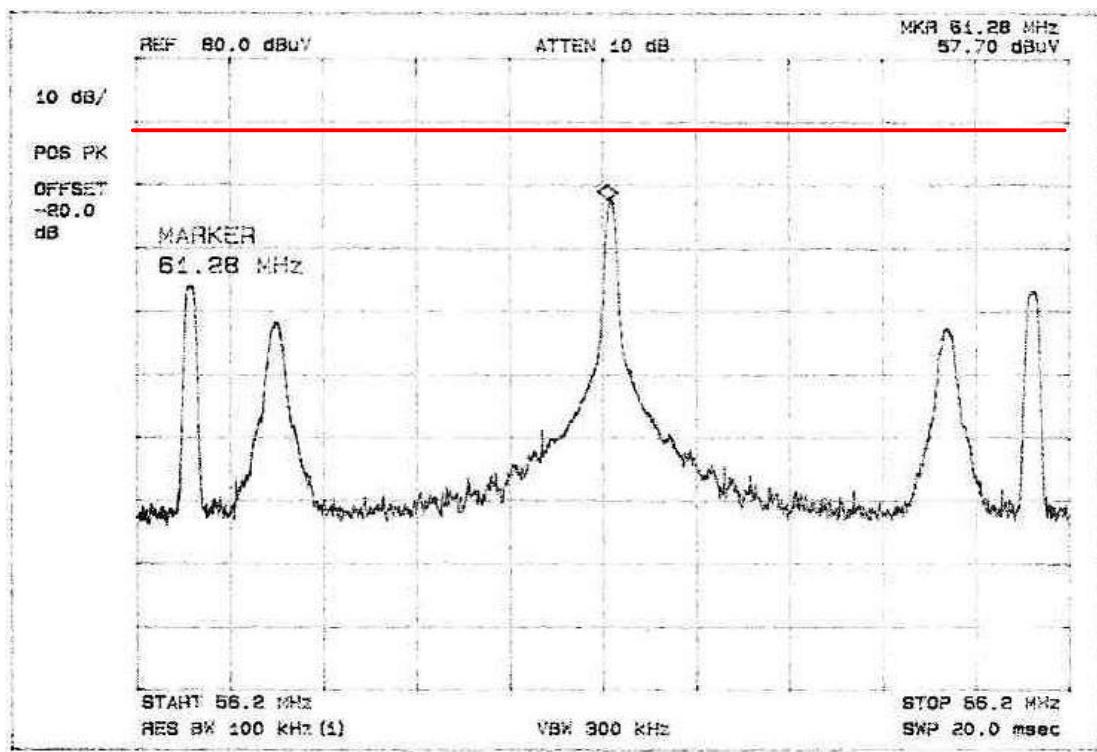
Output Signal Level Measurements

Tuner: ALTMI-US3-S



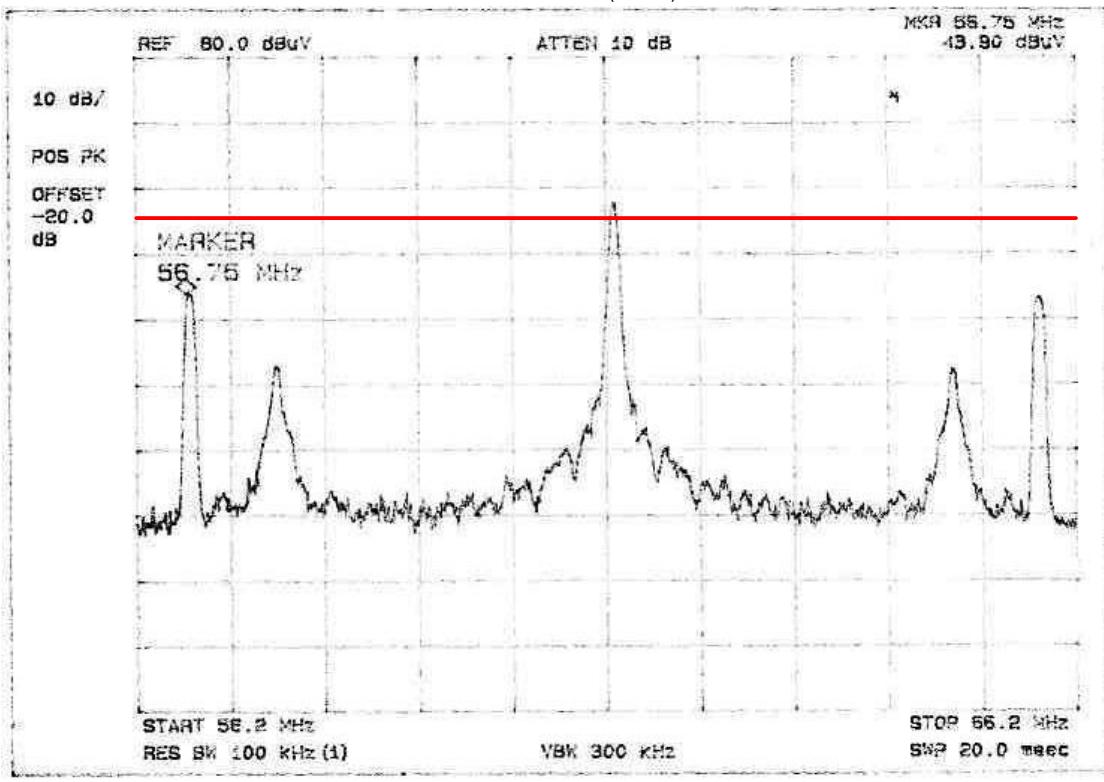
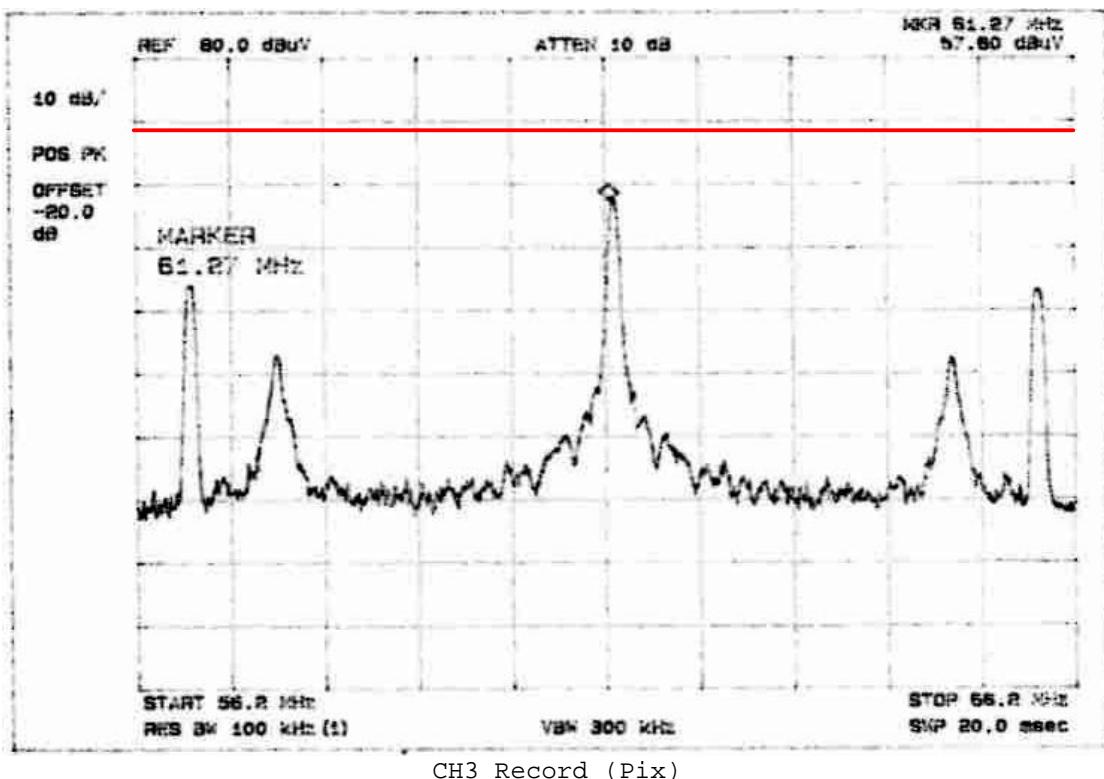
Output Signal Level Measurements

Tuner: LGTMI-US4-S



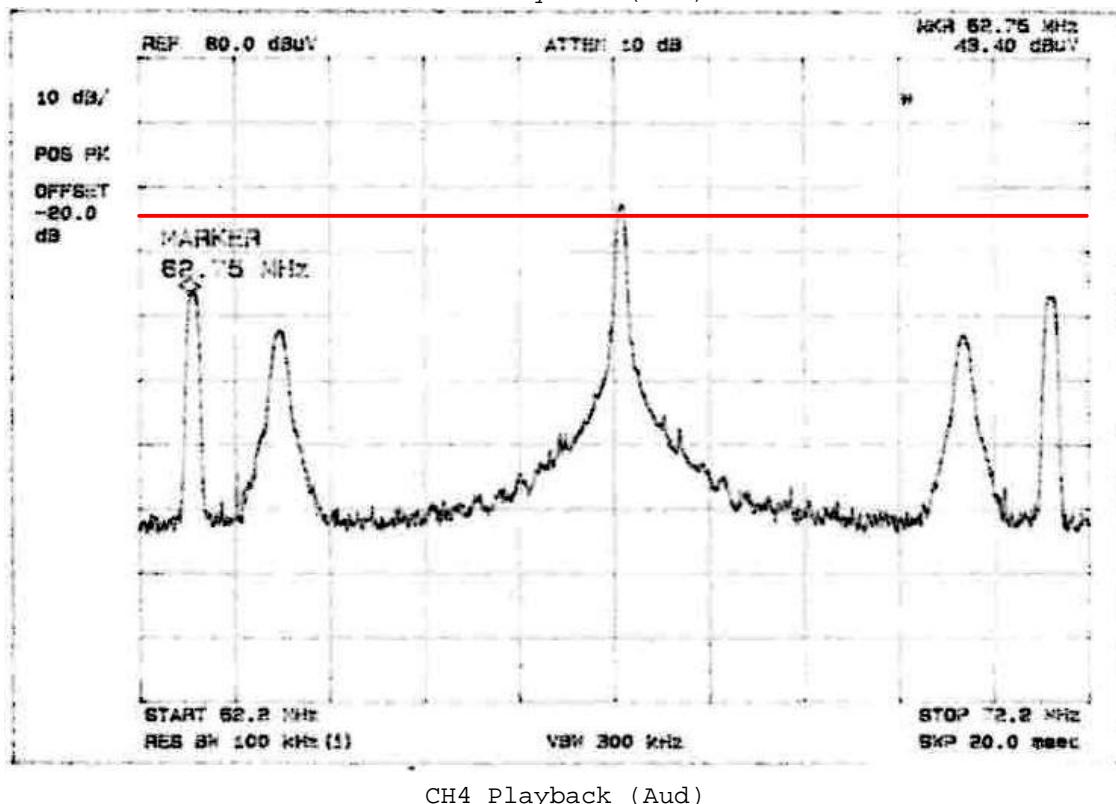
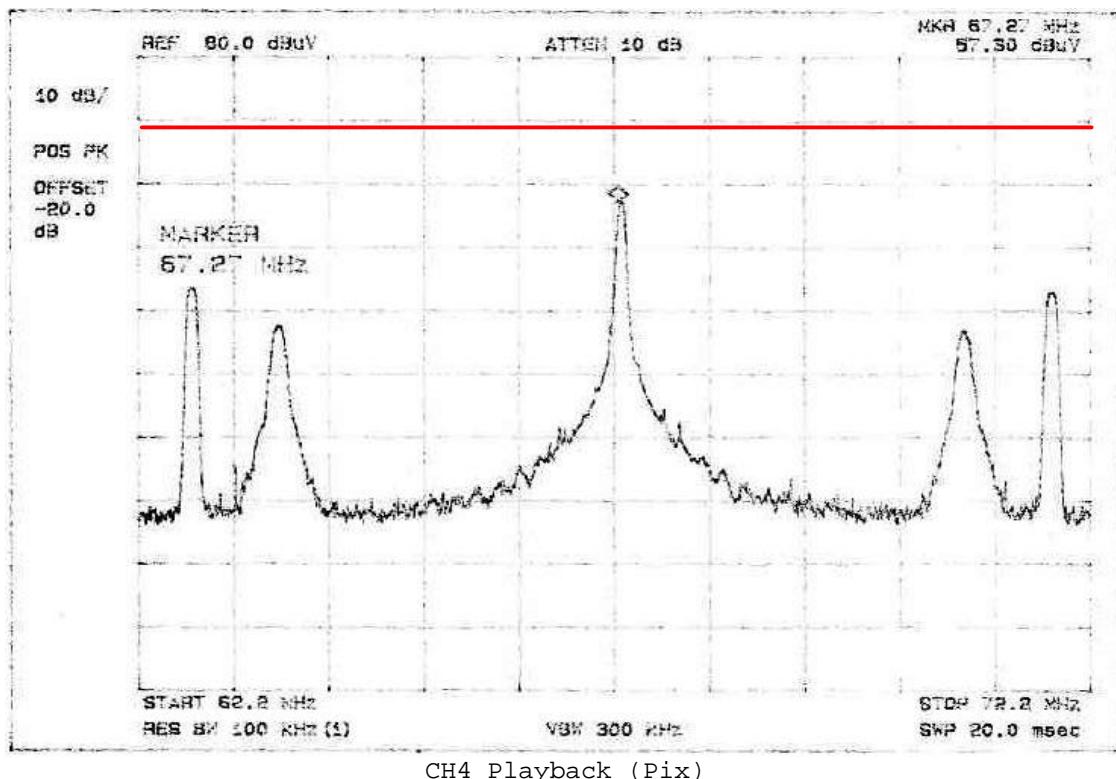
Output Signal Level Measurements

Tuner: LGTMI-US4-S



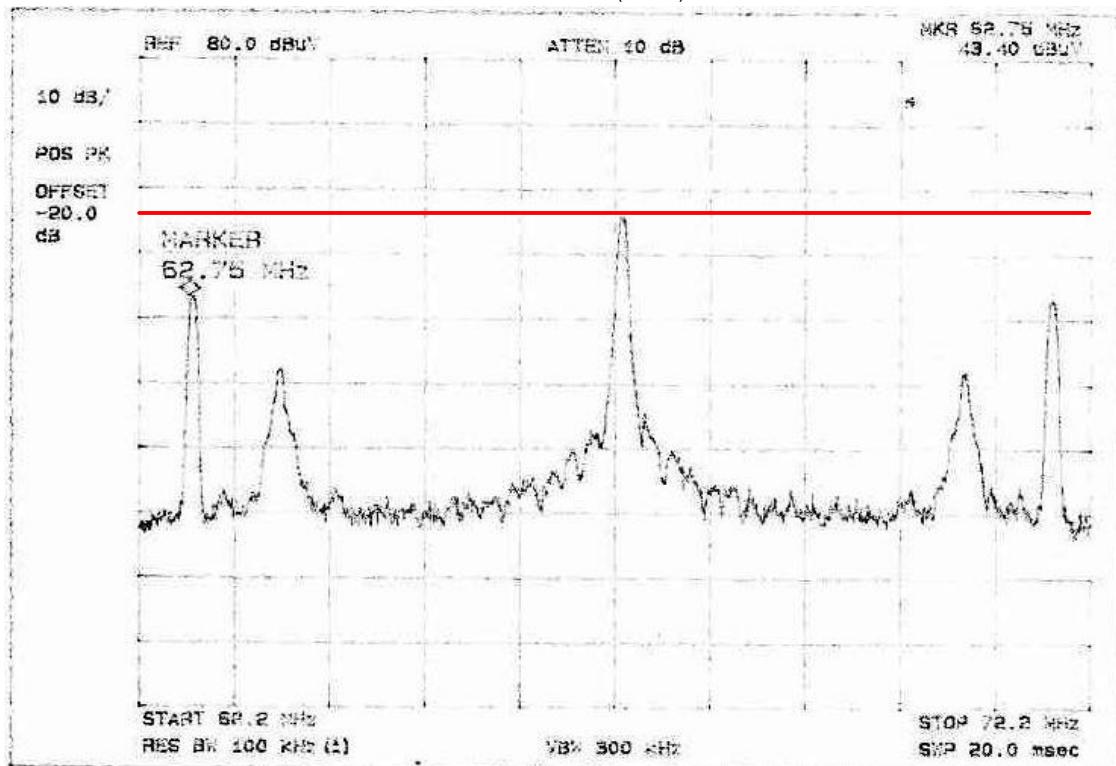
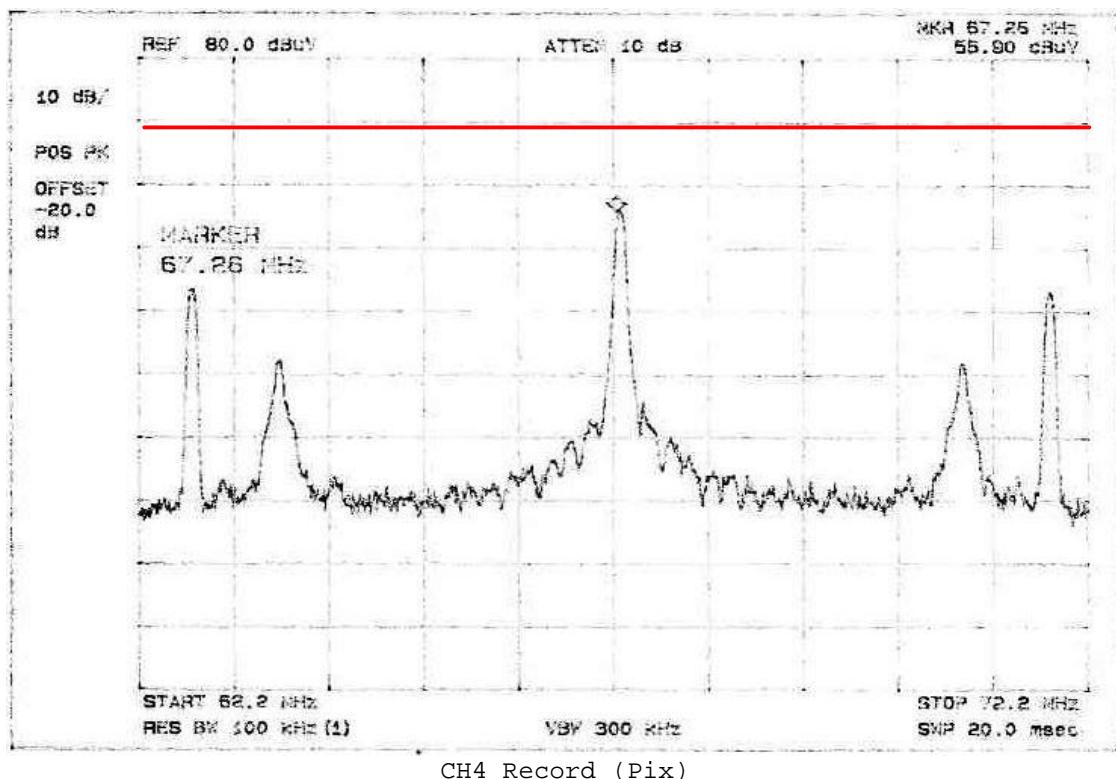
Output Signal Level Measurements

Tuner: LGTMI-US4-S



Output Signal Level Measurements

Tuner: LGTMI-US4-S



TEST CONDITIONS AND DATA

Output Terminal Conducted Spurious Emission

Test Equipment Used

Model Name	Manufacturer	Description	Next Cal. Date
8566B	Hewlett Packard	Spectrum Analyzer	Jul. 13, 2002
85685A	Hewlett Packard	RF preselector	Jul. 13, 2002
RAM	Rohde & Schwarz	Matching Pad	Sep. 21, 2002

External Peripherals

<u>Device Description</u>	<u>Model Name</u>	<u>Manufacture</u>	<u>FCC Compliance Information</u>
TV Receiver	F19430	Daewoo	Verification

Test Program Playback and record mode

Test Area Compact Chamber

Note : Limit Calculation (Sec 15.115(b)(2)(ii))

$$10.95 \times 75^{1/2} \mu V = 95 \mu V = 39.55 \text{ dBuV}$$

$$\text{plus } 30 \text{ dB} = 69.55 \text{ dBuV} = -37.45 \text{ dBm}$$

Above plus 30dB means the test result(Plots) include the modulated video and audio signal. You can see there was no significant emission more than 39.55dBuV in following test plots except the modulated signals.

The test were performed with color bar 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.

Find the test data in following page(s) 38 to 42.

Output Terminal Conducted Spurious Emission

TV CH	Freq. (MHz)	Level (dBuV)	Limit (dBuV)	Mode	Margin (dB)
3	61.00	52.7	69.55	Playback	-16.85
3	61.00	53.1	69.55	Record	-16.45
4	66.90	41.4	69.55	Playback	-28.15
4	66.90	41.2	69.55	Record	-28.35

Spurious Emission Tabulated Data with Tuner

(Korea Alps Model: **ALTMI-US3-S**)

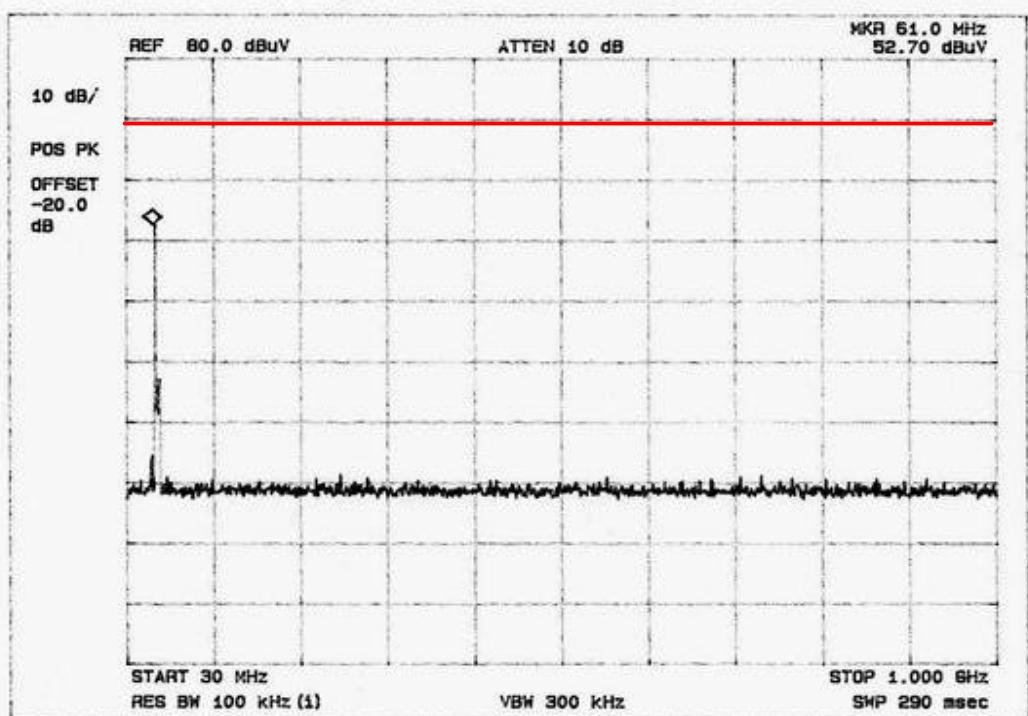
TV CH	Freq. (MHz)	Level (dBuV)	Limit (dBuV)	Mode	Margin (dB)
3	61.00	54.4	69.55	Playback	-15.15
3	61.00	54.9	69.55	Record	-14.65
4	66.90	43.1	69.55	Playback	-26.45
4	66.90	43.1	69.55	Record	-26.45

Spurious Emission Tabulated Data with Tuner

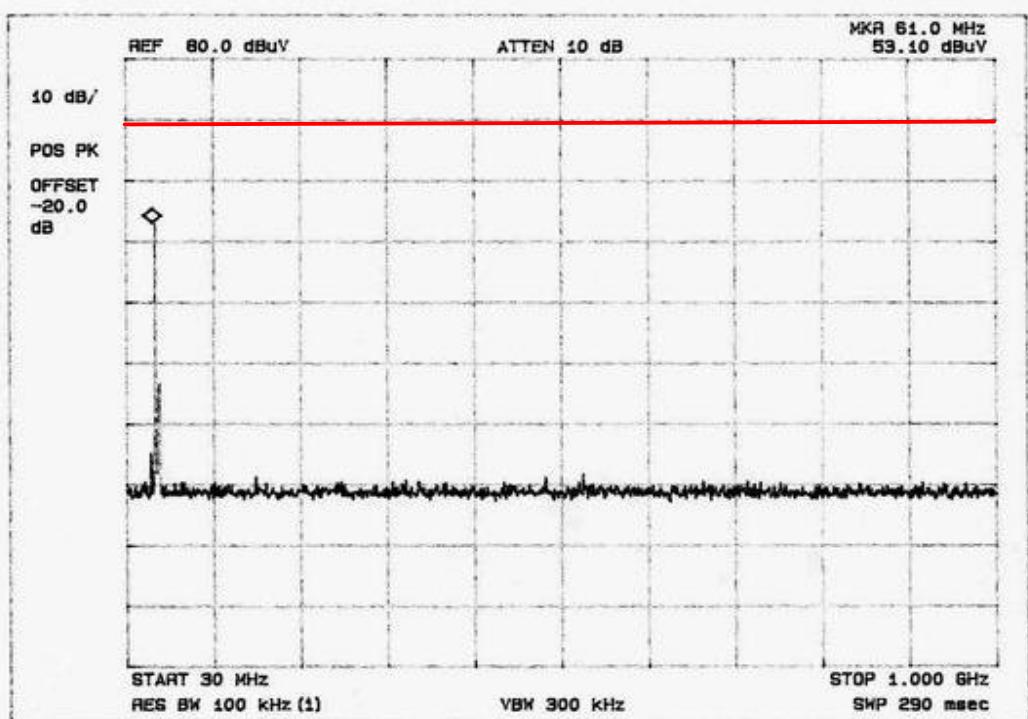
(LG Innotek Co., Ltd. Model: **LGTMI-US4-S**)

Output Terminal Conducted Spurious Emission

Tuner: ALTMI-US3-S



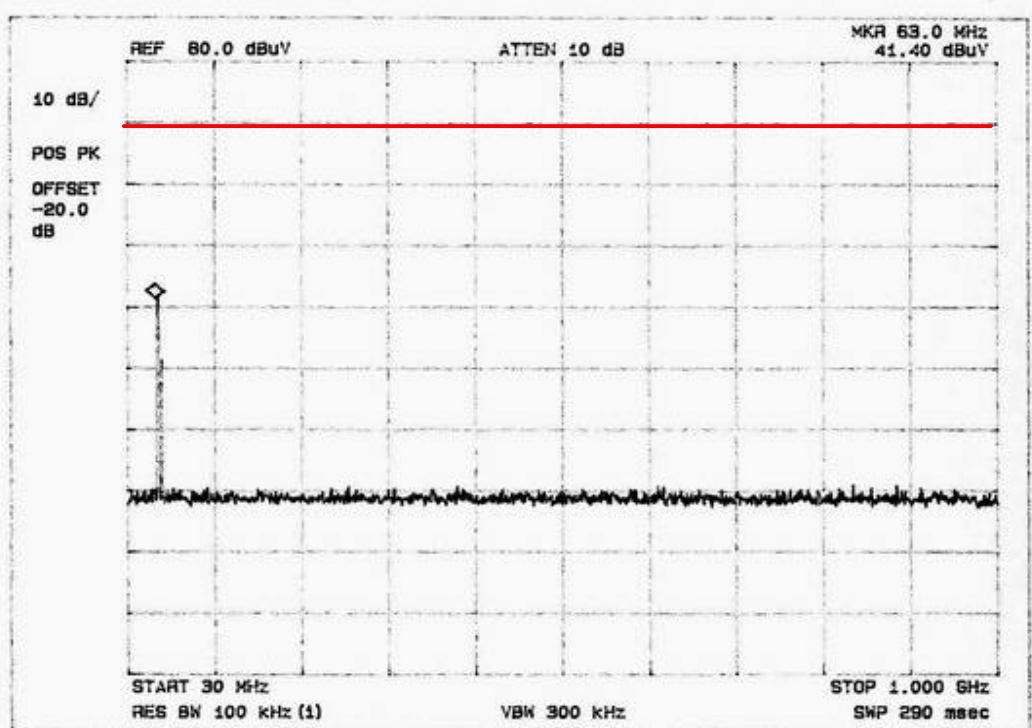
CH3 Playback



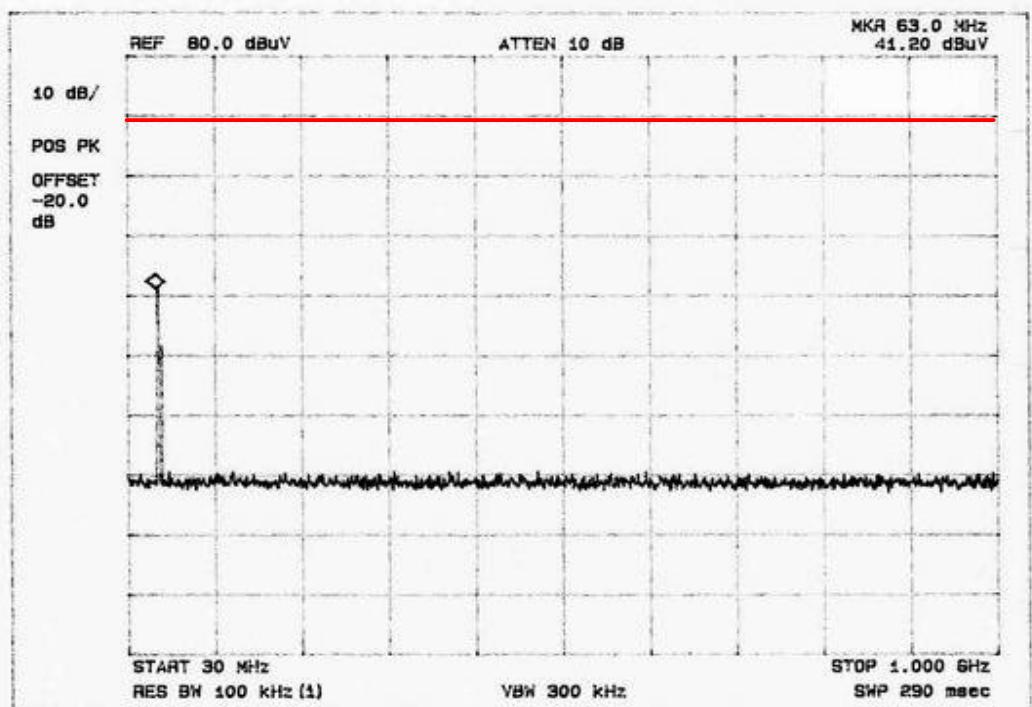
CH3 Record

Output Terminal Conducted Spurious Emission

Tuner: ALTMI-US3-S



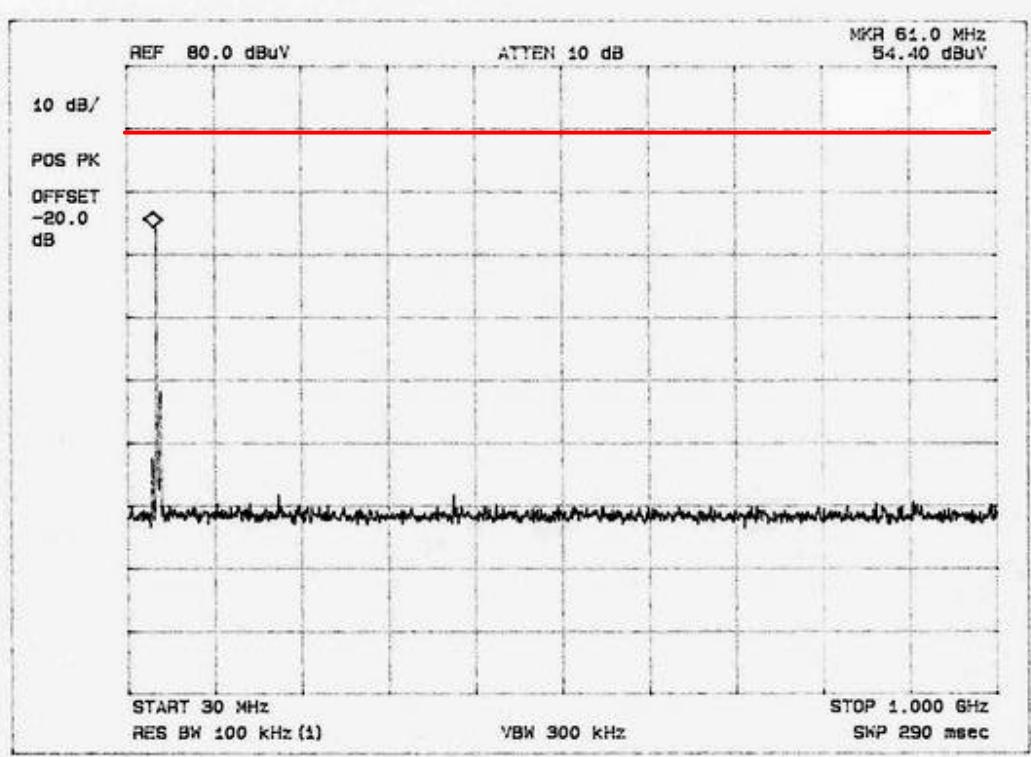
CH4 Playback



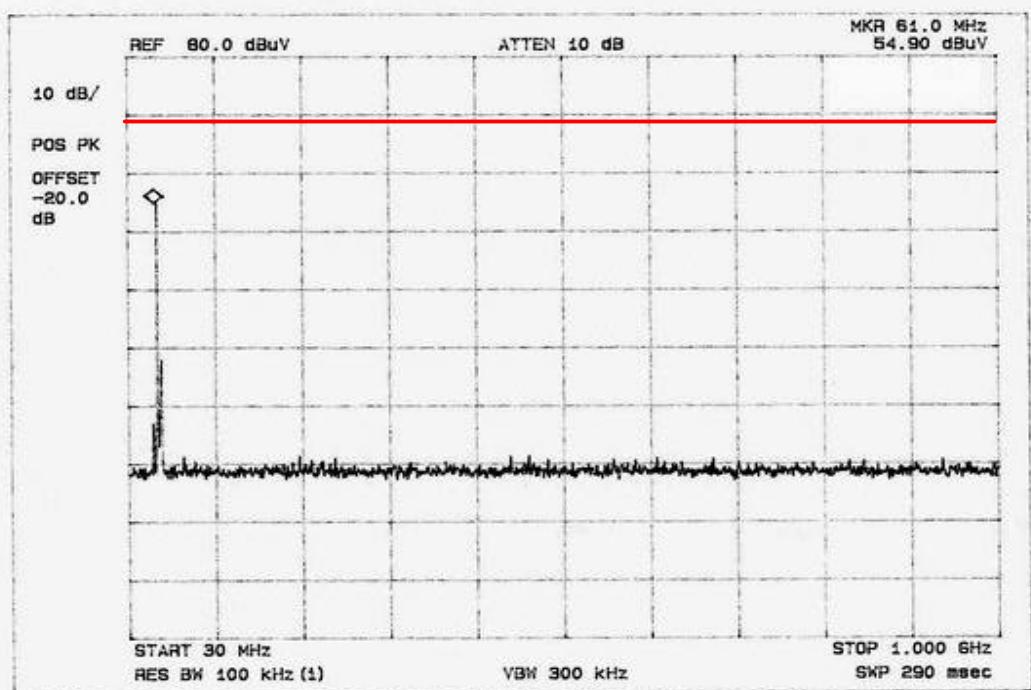
CH4 Record

Output Terminal Conducted Spurious Emission

Tuner: LGTMI-US4-S



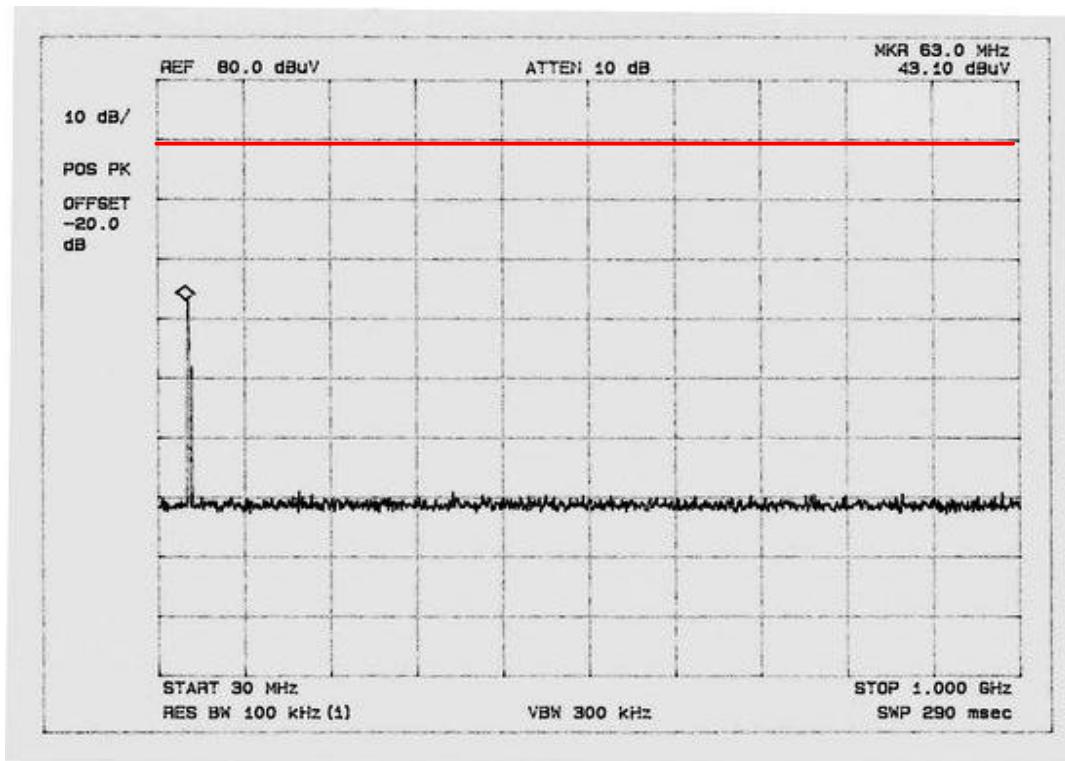
CH3 Playback



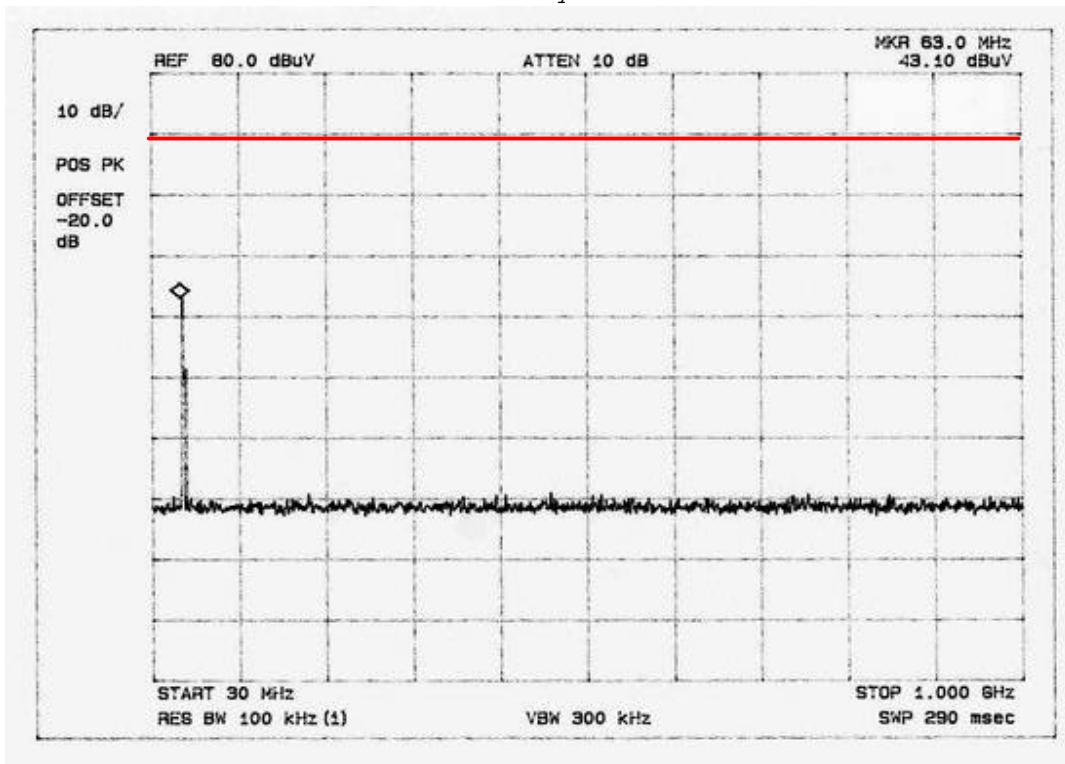
CH3 Record

Output Terminal Conducted Spurious Emission

Tuner: LGTMI-US4-S



CH4 Playback



CH4 Record

TEST CONDITIONS AND DATA

Transfer Switch Isolation Measurement

Test Equipment Used

Model Name	Manufacturer	Description	Next Cal. Date
8566B	Hewlett Packard	Spectrum Analyzer	Jul. 13, 2002
85685A	Hewlett Packard	RF preselector	Jul. 13, 2002
RAM	Rohde & Schwarz	Matching Pad	Sep. 21, 2002

External Peripherals

<u>Device Description</u>	<u>Model Name</u>	<u>Manufacture</u>	<u>FCC Compliance Information</u>
TV Receiver	F19430	Daewoo	Verification

Test Program Playback and record mode

Test Area Compact Chamber

Note : Transfer switch isolation measurements were made on the Channel 3 and 4 video output frequencies of 61.25 and 67.25 MHz and both position of the transfer switch.

Limit calculation(Sec 15.115 (c)(1)(ii))

$$0.346 \times 75^{1/2} = 2.996 \mu V = 9.53 dB \mu V = -97.46 dBm$$

The test were performed with color bar 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.

Find the test data in following page(s) 44 to 48.

Transfer Switch Isolation Measurement

TV CH	Freq. (MHz)	Level (dBuV)	Limit (dBuV)	Mode	Margin (dB)
3	61.25	6.3	9.53	Playback	3.23
3	61.25	6.4	9.53	Record	3.13
4	67.25	5.3	9.53	Playback	4.23
4	67.25	5.4	9.53	Record	4.13

Transfer Switch Tabulated Data with Tuner

(ALPS Electric Model: **ALTMI-US3-S**)

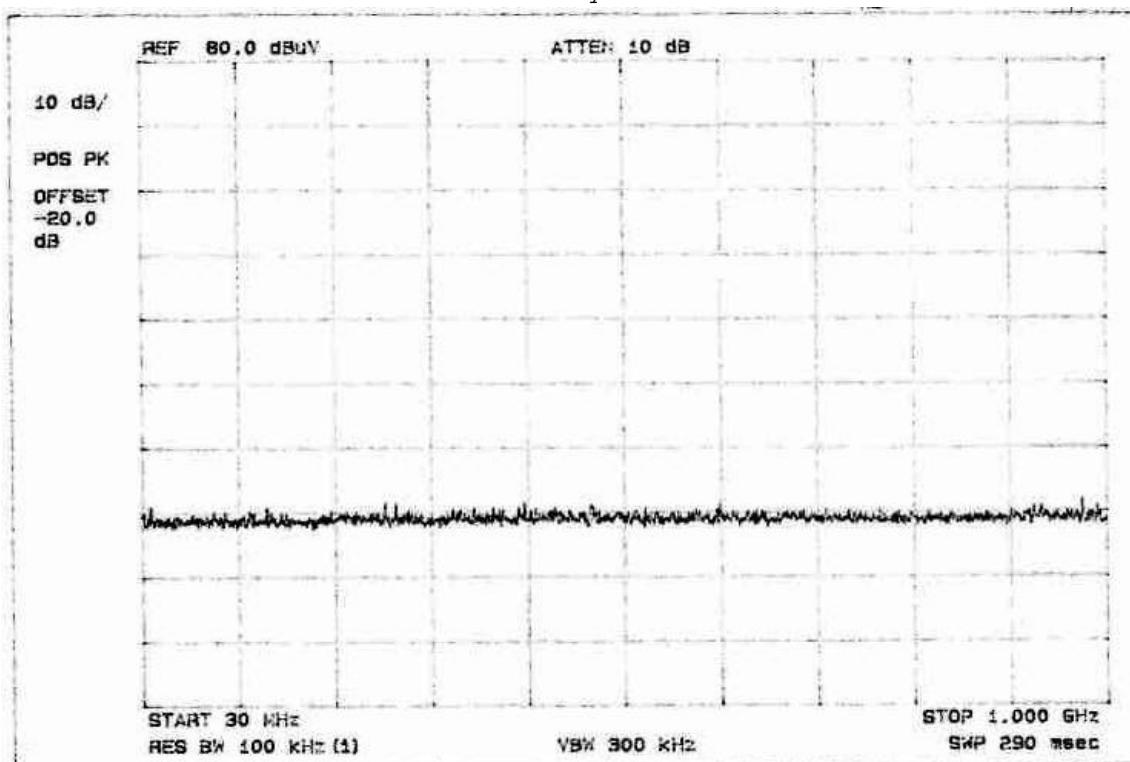
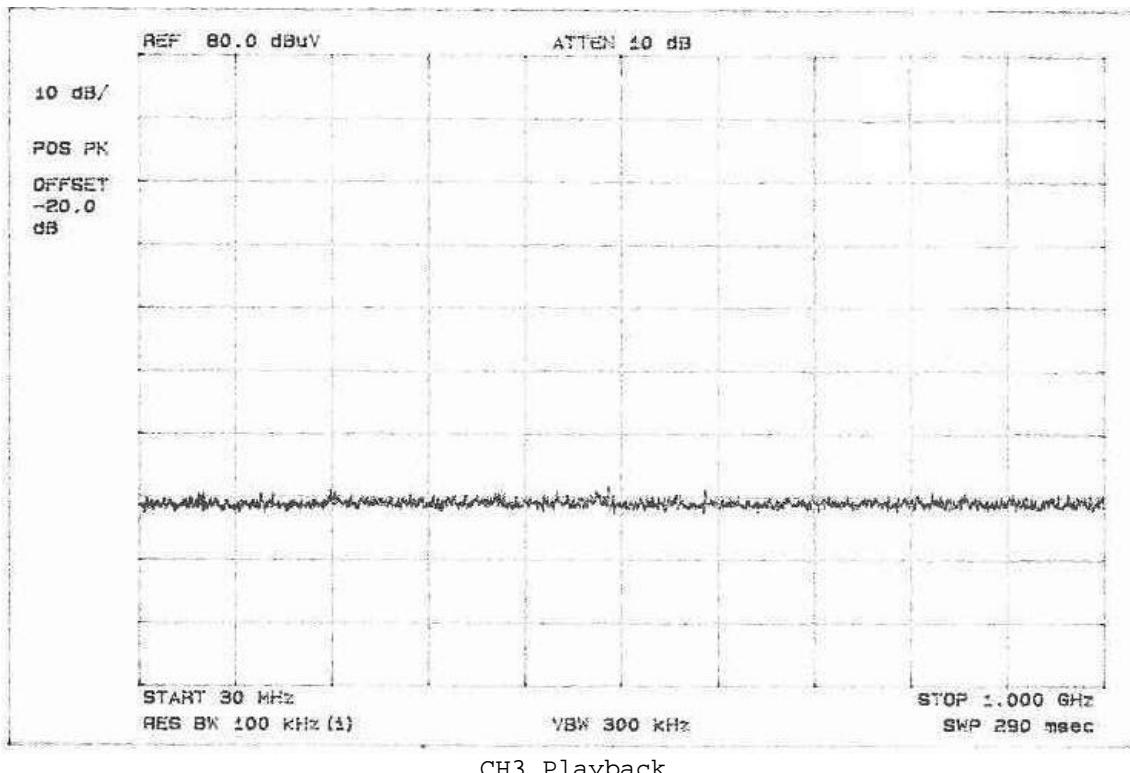
TV CH	Freq. (MHz)	Level (dBuV)	Limit (dBuV)	Mode	Margin (dB)
3	61.25	5.7	9.53	Playback	3.83
3	61.25	5.5	9.53	Record	4.03
4	67.25	5.4	9.53	Playback	4.13
4	67.25	5.2	9.53	Record	4.33

Transfer Switch Tabulated Data with Tuner

(LG Innotek Co., Ltd. Model: **LGTMI-US4-S**)

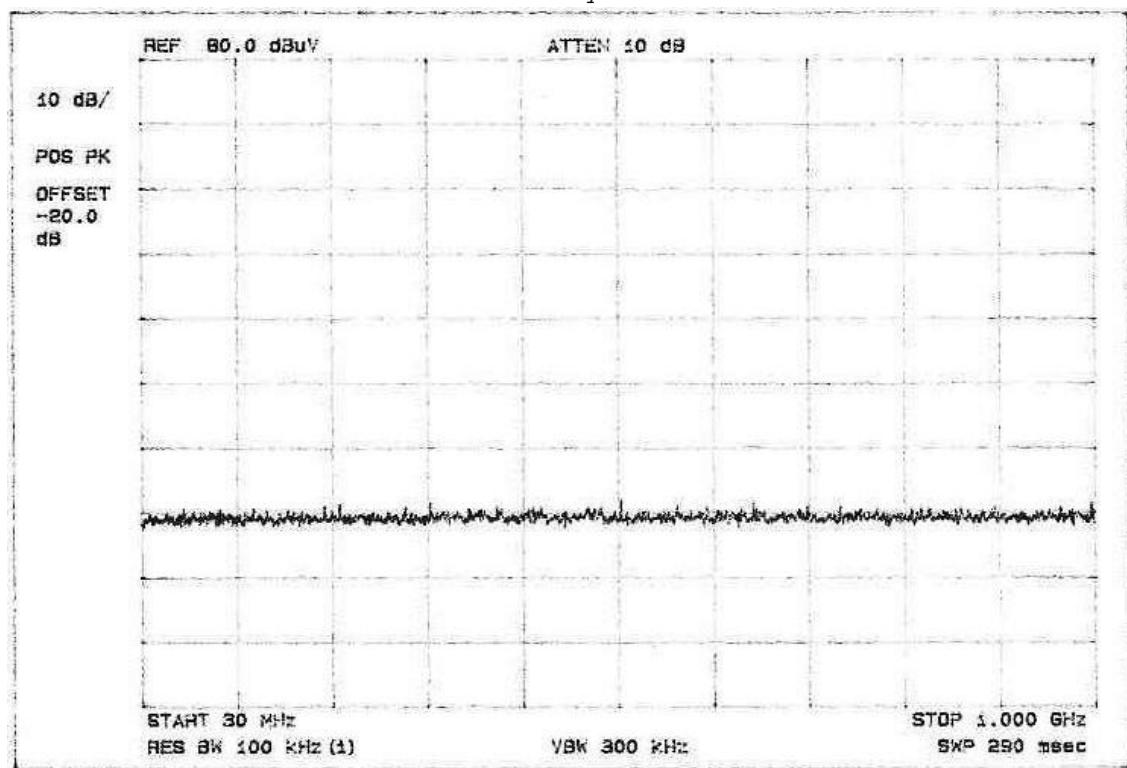
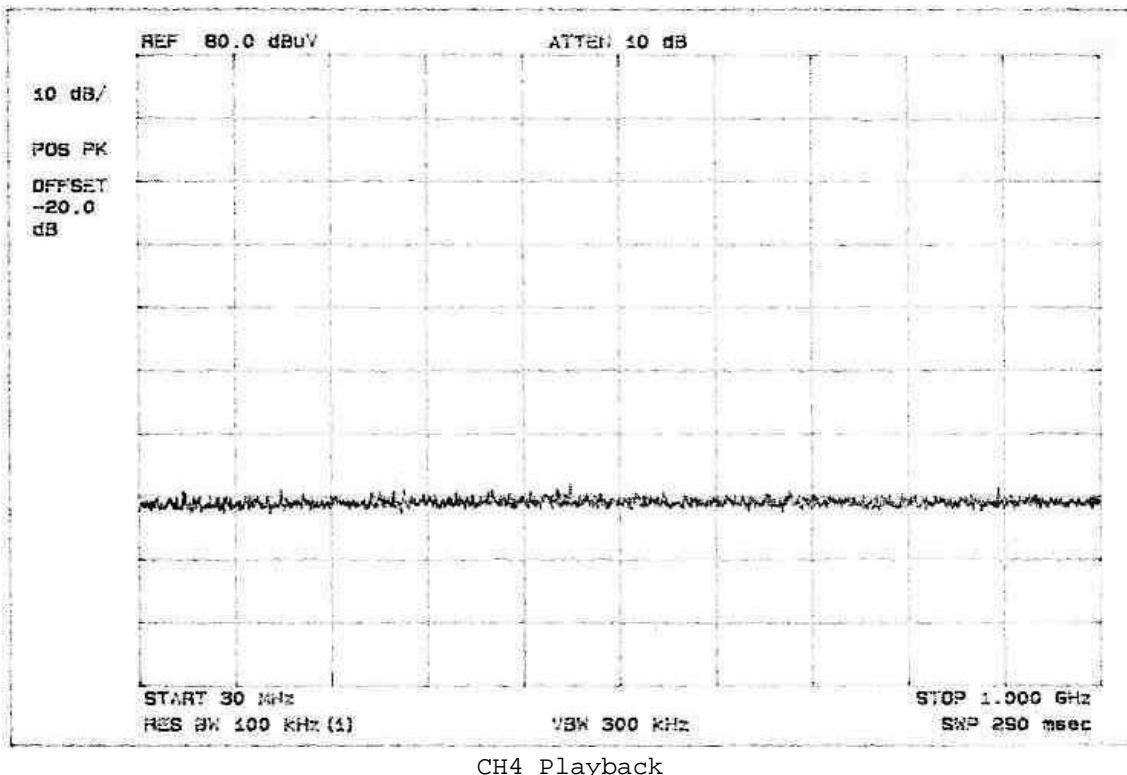
Transfer Switch Isolation Measurement

Tuner: ALTMI-US3-S



Transfer Switch Isolation Measurement

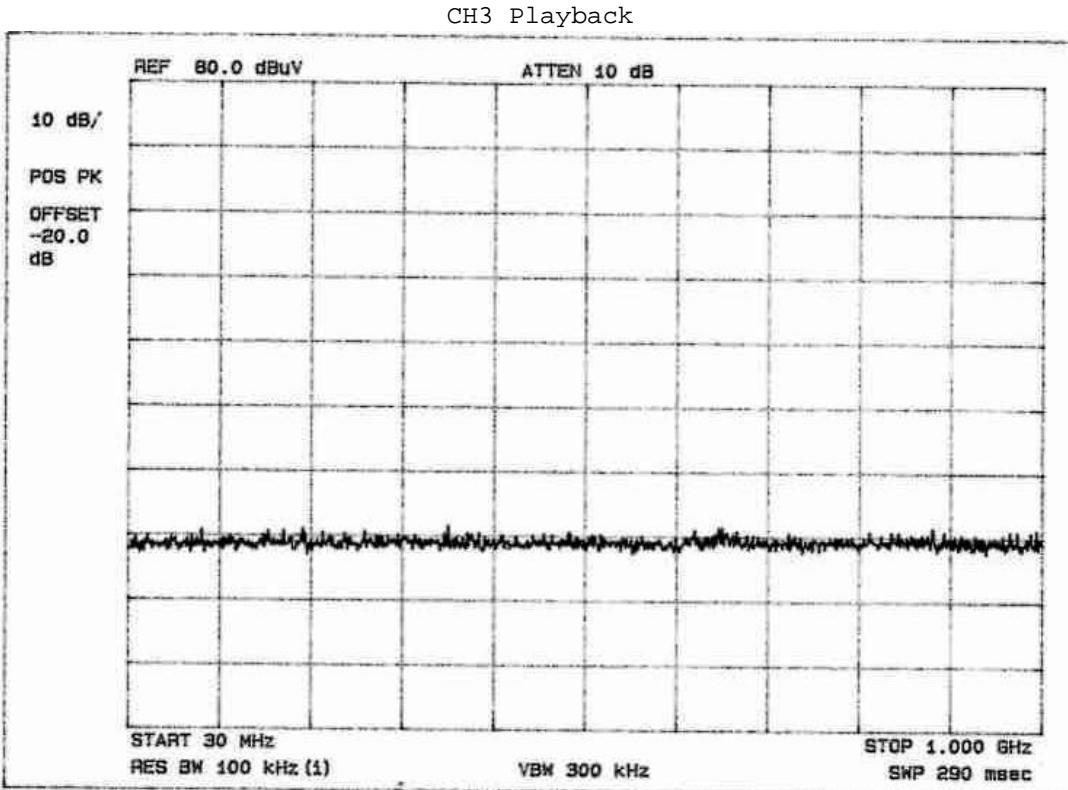
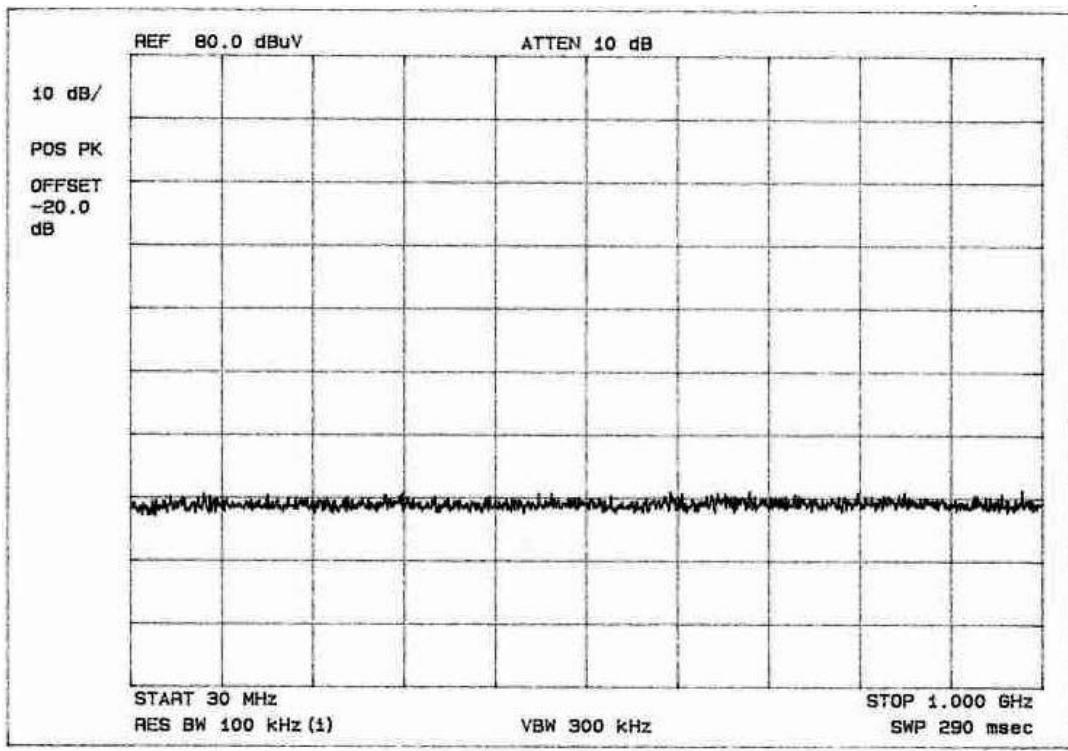
Tuner: ALTMI-US3-S



CH4 Record

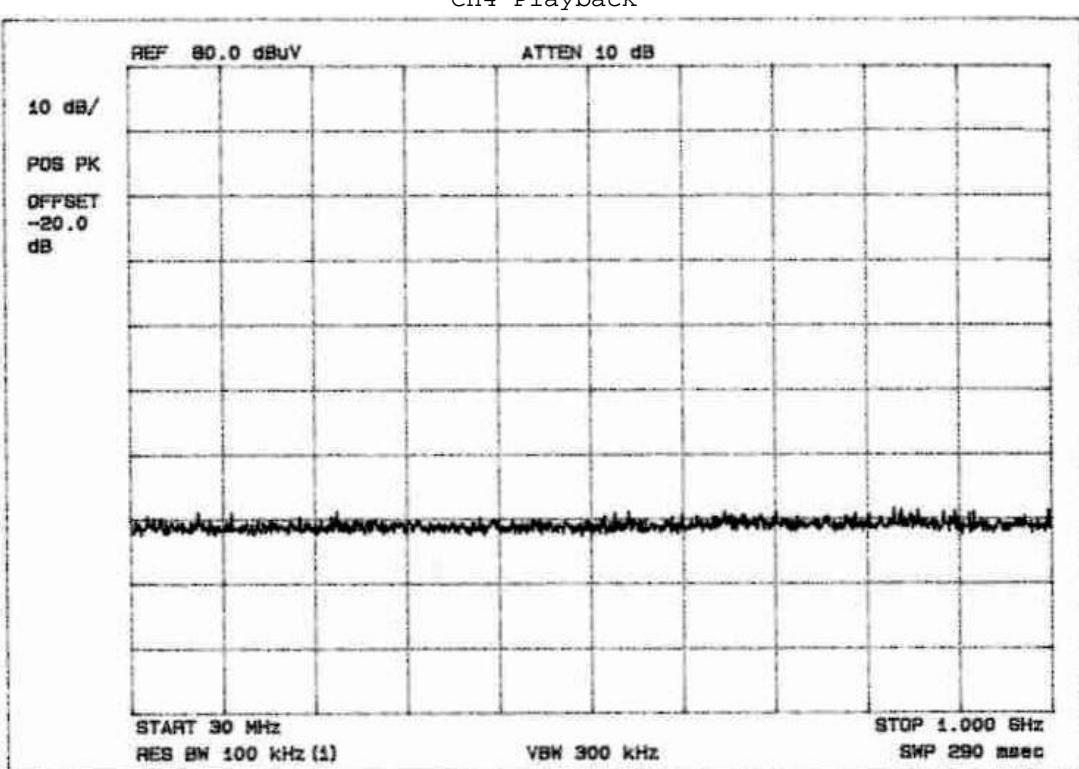
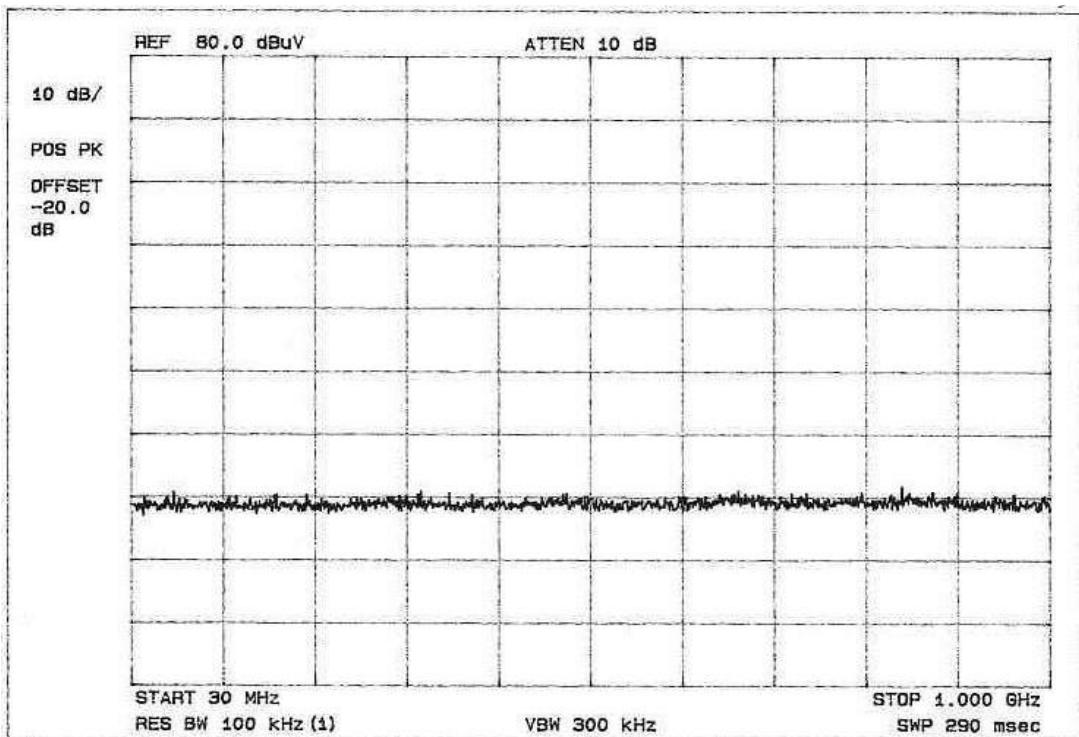
Transfer Switch Isolation Measurement

Tuner: LGTMI-US4-S



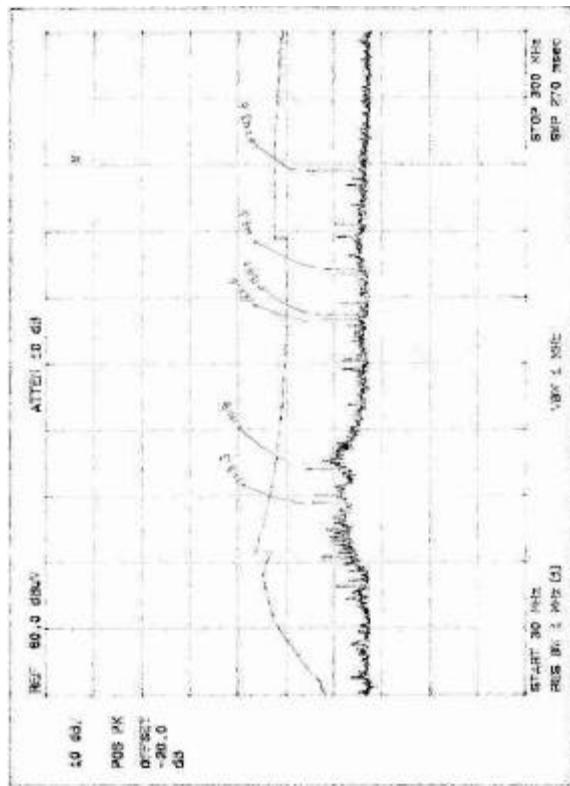
Transfer Switch Isolation Measurement

Tuner: LGTMI-US4-S

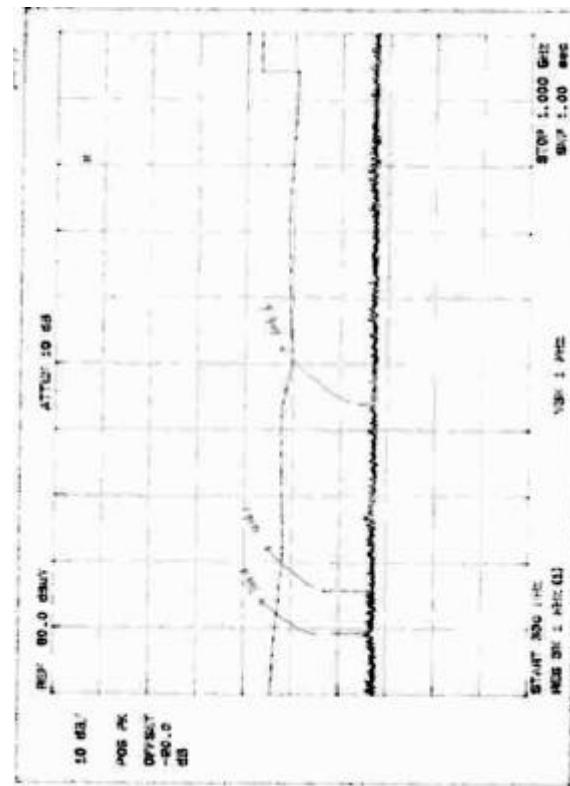


CH4 Record

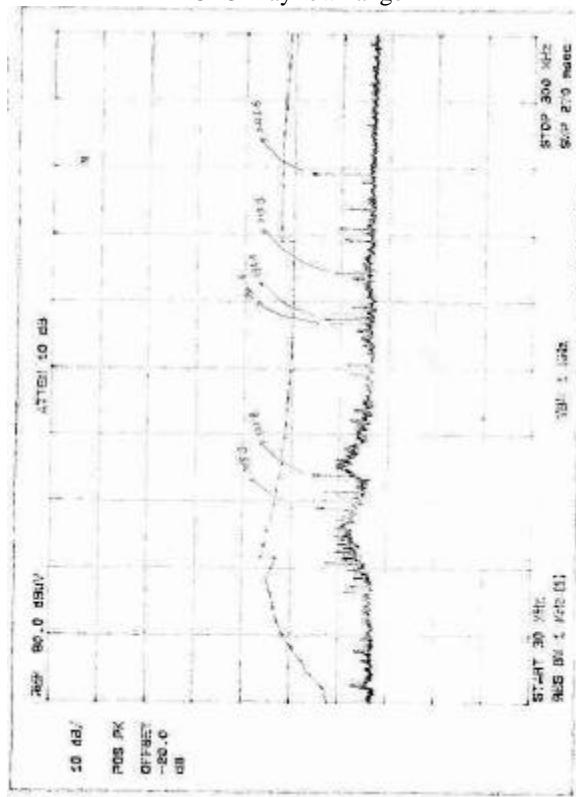
Appendix A. Preliminary Test Data (Tuner: ALTMI-US3-S)



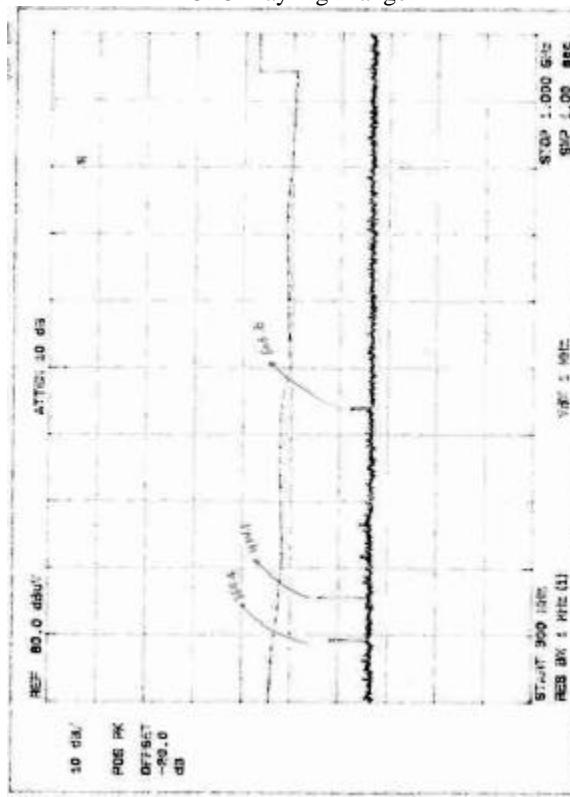
CH3 Play low-range



CH3 Play high-range

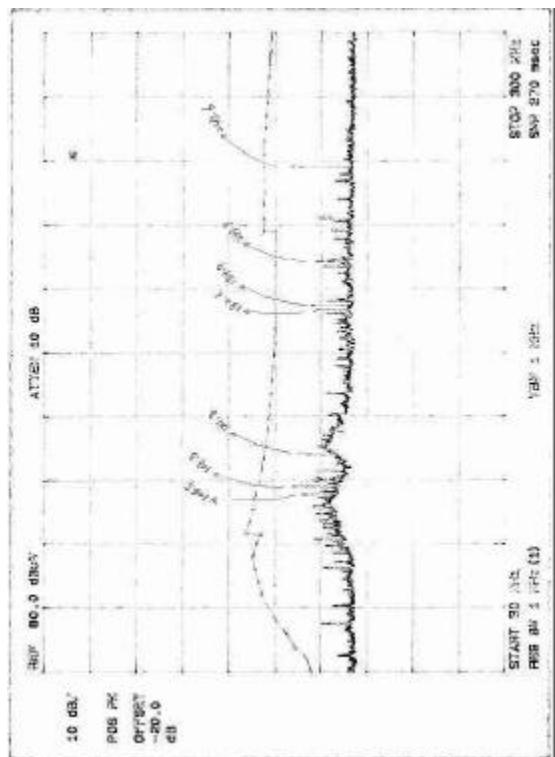


CH4 Record low-range

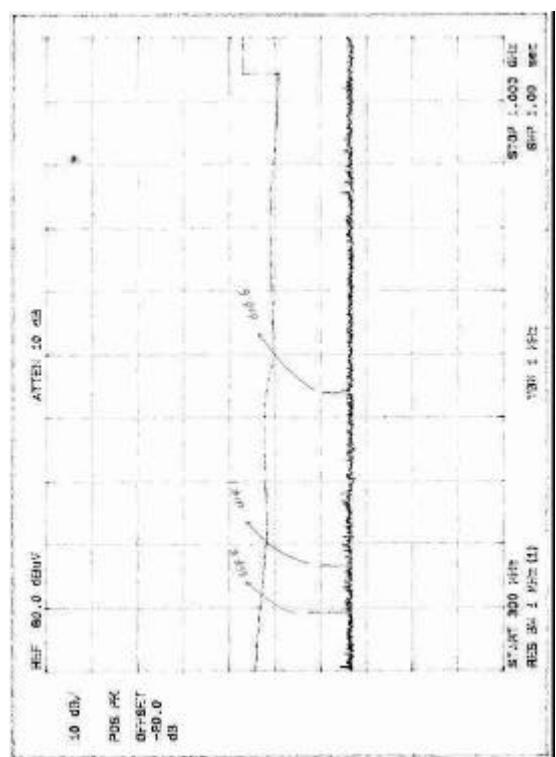


CH4 Record high-range

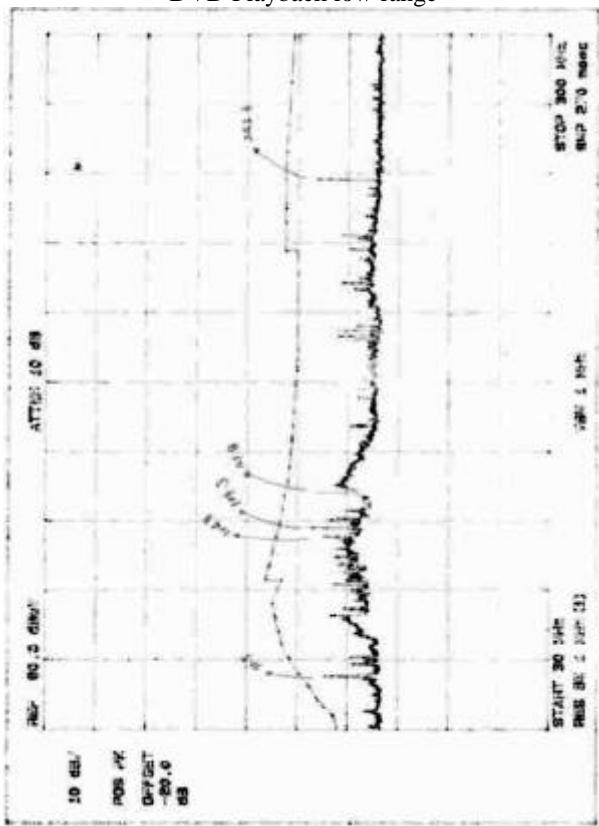
Appendix A. Preliminary Test Data (Tuner: ALTMI-US3-S)



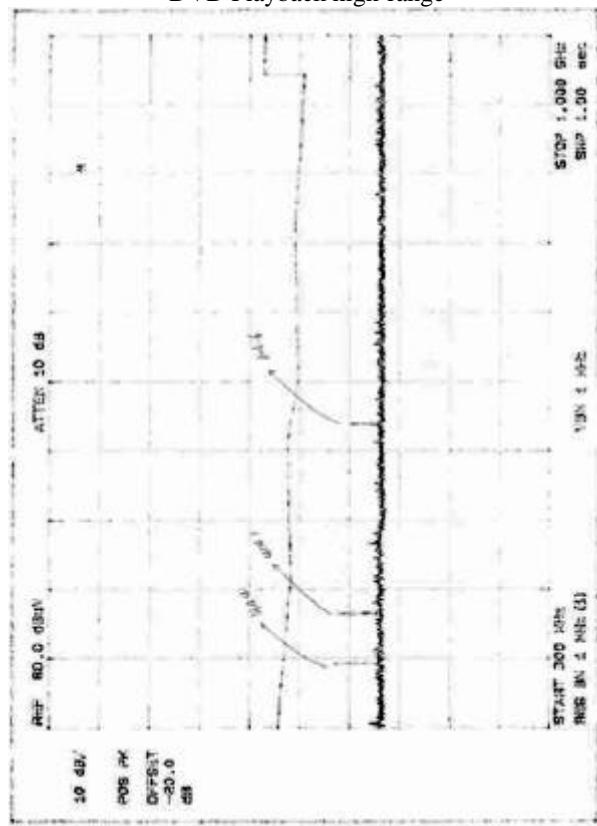
DVD Playback low-range



DVD Playback high-range

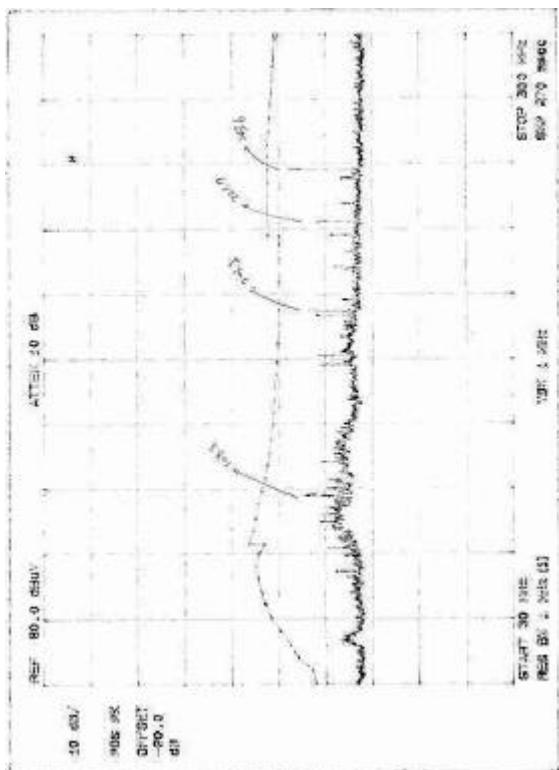


DVD Playback and VCR Record low-range

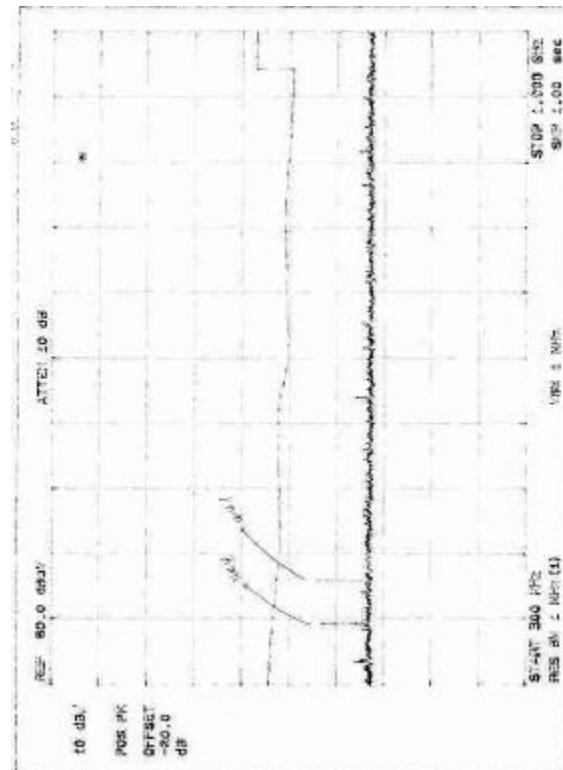


DVD Playback and VCR Record high-range

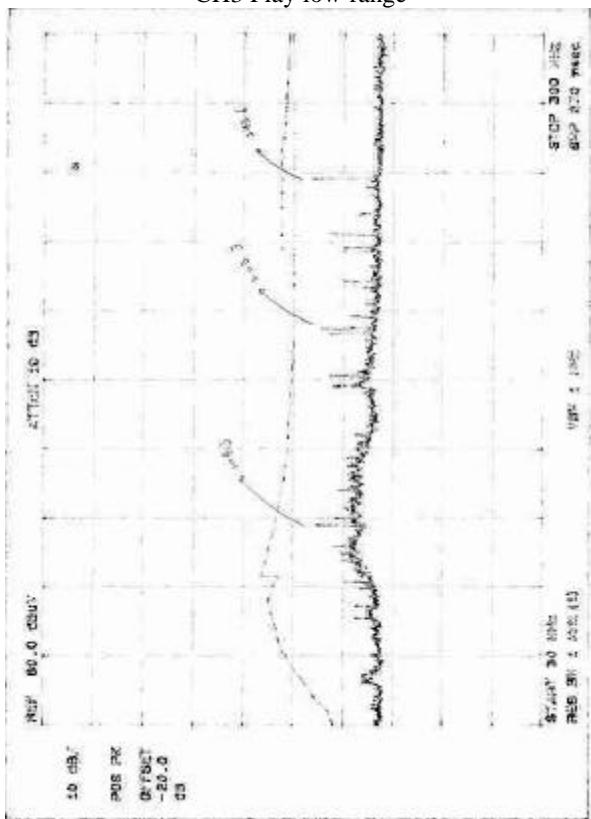
Appendix A. Preliminary Test Data (Tuner: LGTMI-US4-S)



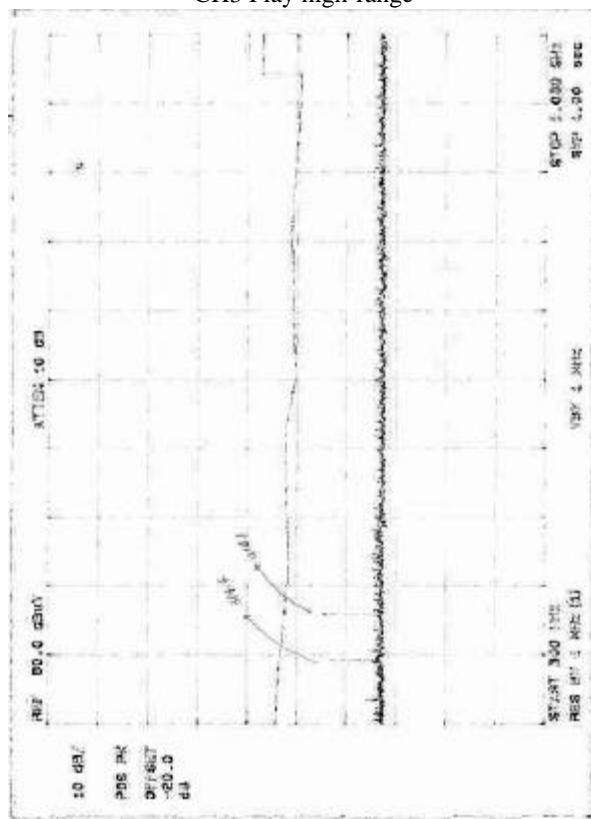
CH3 Play low-range



CH3 Play high-range



CH4 Record low-range



CH4 Record high-range

Appendix A. Preliminary Test Data (Tuner: LGTMI-US4-S)

