REPORT FOR A TV INTERFACE DEVICE

Scope – Measurement and determination of electromagnetic emission (EME) of radio frequency devices including intentional and/or unintentional radiators for compliance with the technical rules and regulations of the Federal Communications Commission.

RF MODULATOR

Manufacturer : LG Precision Co.,Ltd

Model No : TADC-H102F

LG Electronics Co.,Ltd. Pyungtaek research Laboratory

19-1, Cheongho-Ri, Jinwuy-Myun, Pyungtaek-Shi, Kyunggi-Do , 451-713 Korea
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PART I

INTRODUCTION

PART II

TEST DATA

PART I

INTRODUCTION

1. GENERAL INFORMATION

1.1 DESCRIPTIONS OF EQUIPMENT UNDER TEST(EUT)

1.1.1	Manufacture	LG ELECTRONICS INC.; 19-1, CHEONGHO-RI JINWUY-MYUN,PYUNGTAEK-SHI,KYUNGGI-DO 451-713, KOREA
1.1.2	Applicant	LG ELECTRONICS INC.; 20, YOIDO-DONG YOUNGDUNGPO-GU, SEOUL, 150-721, KOREA
1.1.3	MODEL NO	VRC421
1.1.4	SERIAL NO	NOT ATTACHED
1.1.5	TRADE NAME	LG
1.1.6	FCC ID NO	BEJ9QKE40010
1.1.7	DESCRIPTIONS	

a) Product Type	Video Cassette Recorder
b) RF Output Channel	Channel 3 and 4
c) RF IN/OUT Terminal Impedance	75ohms (Unbalance F-type coaxial)
d) Number of RF IN/OUT terminal	1EA at each
e) Terminal for signal	Video/Audio in/out with RCA-type jacks
f) Power Supply	120 Vac / 60Hz

1.1.8 Accessories connected to the EUT

a) Video Coaxial cable for RF-OUT terminal provided by manufacture

b) Video/Audio cables

1.2 Regulations appled to the EUT .. FCC Part 15.115

1.3 Measurement Procedure ….MP-3 : ANSI C 63.4

1.4 Measurement site description

- Location of measurement facility

  LG Electronics Inc : Pyungtack plant

  Multimedia Standards Team

  19-1, Cheongho-Ri,Jinwuy-Myun,Pyungtack-shi, 451-713 Korea

Note;

The detailed description of measuring facility was found to be in compliance With Federal Communications Commission requirements of 2.948 according to ANSI C63.4 on August21,1997

2. GENERAL TEST CONDITIONS

The test data contained in this report was obtained by use of the measurement method recommended in FCC Rules, 47 C.F.R. 15.31(a)(3), with equipment and at the test site filed by the Federal Communications Commission (FCC).The technical standard for a TV interface device are set forth in Subpart B of Part 15 of FCC Rules and regulation. The measurement for Radiated Emissions, Power line Conducted Emissions, Output signal levels, Output Terminal Conducted Spurious Emissions and Transfer Switch Isolation were performed in accordance with the procedures described in MP-3 and ANSI C63.4-1992.

2. 1 OPERATING CONDITIONS OF THE EUT

According to the requirements in Subpart B of Part 15, the measurement is made at each function of the EUT being connected with appropriate cables and loads. The model VRC421 has either a video/audio output terminal in RCA-type plugs and antenna input terminal. Therefore, every measurement was investigated in the operation modes, 1)Playing VITS1Vp-p recorded tape,2) Recording 1 &5 Vp-p VITS signal supplied through the video input terminal, 3) Recording NTSC TV signal supplied through the at antenna input terminal at each Ch. 3 or/and 4 for each mode applicable.

2. 2 STABILIZATION OF EUT OPERATION

The EUT was operated for sufficient minutes before testing to make it stabilized in a normal operating condition. The power supplied to the EUT was filtered to meet the requirements.

2. 3 TEMPERATURE

Measurement procedure recommended by FCC requires the test to be performed at the site with ambient temperature within 10 to 40 C (50 to 104 F). The specification for operating temperature of EUT is from 5 to 35 C (41 to 95 F) as described in owner's manual. The measurement data in this report was obtained at the temperature in the range of 25 ~ 29 C

3. TEST SITE

3. 1 OPEN AREA TEST SITE

Measurement of radiated emissions from EUT was made at open area test site, a description of which has been submitted to the FCC pursuant to Part 15 of 47 C.F.R., 2.948.

3 .2 A SHIELDED ENCLOSURE.

All other measurements, including power line conducted emissions, output signal levels, and transfer switch isolation, and transfer switch isolation were made in a shielded enclosure providing sufficient shielding effectiveness.

4. MEASURING INSTRUMENTATIONS AND CALIBRATIONS.

Measurements of output signal level, output terminal conducted spurious emissions, and transfer switch isolation (if applicable) were made with instruments calibrated according to the recommendation by manufacturer. Measurement of radiated emissions and power line conducted emissions were made with instruments conforming to American National Standard Specification, ANSI C63.4 (1992). The calibration of measuring instrument, including any accessories that may affect test results, was performed according to the recommendation by manufactures.

5. DESCRIPTION OF TEST CONDITION.

5.1 POWERLINE CONDUCTED EMISSION MEASUREMENT.

5 .1. 1 SHIELDED ENCLOSURE.

The measurement for powerline emissions from EUT was made in shielded enclosure which provides sufficient shielding effectiveness enough not to affect test results.

5. 1. 2 DETECTOR FUNCTION SELECTION AND BANDWIDTH.

During conducted emission measurement, a radio noise meter (ESH-3, Rohde & Schwarz) that has a CISPR quasi-peak detector with 9 KHz IF bandwidth of 6 dB was utilized.

5.1.3 FREQUENCY RANGE TO BE SCANNED.

For conducted emissions measurement, frequency range of 450 KHz to 30 MHz, included, was investigated.

5.1.4 UNIT OF MEASUREMENT.

Test results for conducted emissions are reported in micro-volts.

5. 1. 5 LINE IMPEDANCE STABILIZATION NETWORK

A LISN with characteristics that conform to the requirements of Part 15 of FCC Rules was used for the measurement of conducted powerline radio noise; (50 micro-henries /50 ohms). Chassis and earth-points for grounding of the LISN were earth-grounded.

5.1.6 TEST CONDITIONS AND CONFIGURATION OF EUT.

The EUT was configured and operated in all modes of operation so as to find the maximum emanation of emissions from EUT.

The EUT has designed to use the public AC lines with rated AC voltage as specified in OWNER 's MANUAL of EUT and filtered to meet the requirement. AC power was supplied to the EUT through LISN with characteristics described in 5.1.5 of part I of this report.

The EUT was placed on a 1m * 1.5m 80Cm. high wooden table which is place on the earth-grounded conducting surface larger than 2 square-meter. The vertical conducting surface was located 40Cm to the EUT. Length of the power lead in excess of 80 Cm horizontally separating the EUT from LISN was folded back-and-forth form at the center of the power cord not exceeding 40 Cm in length.

Each type of accessory provided by manufacturer or typically used and support equipment were connected to the EUT during measurement to the typical usage and applicable as nearly as practicable.

5.2 RADIATED EMISSIONS MEASUREMENT..

5.2.1 TEST SITE.

Preliminary measurements were performed in the shielded enclosure to determine the emissions characteristics of the EUT. Final measurements were made in outdoors as described at 3.1 of Part I in this report.

5. 2. 2 DETECTOR FUNCTION SELECTION AND BANDWIDTH.

In radiated emissions measurement, a field strength meter (ESVP, Rohde & Schwarz) that has a CISPR quasi-peak detector was used. The 6dB bandwidth of the detector of instrument is 120 KHz over frequency range of 30 to 1000 MHz. Emissions to be scanned above 1000 MHz may be detected in peak mode.

5. 2. 3 UNIT OF MEASUREMENT.

Test results of radiated emissions measurement are reported in micro-volts per meter at the specific distance. Using the unit of dBuV on the test instrument, the indication unit was converted to field strength unit of dBuV as following method;

$$\mathbf{F(uV/m) = 10^{(R+CL+AF)/20} \ (uV/m)}$$

here, F : Field Strength in uV/m
R : Meter Reading Level in dB(uV),
CL : Cable Loss from antenna to meter in dB,
AF : Antenna Factor of receiving antenna in dB(/m)

5. 2. 4 ANTENNAS.

Measurements were made using calibrated half-wave tuned Bi-log antenna in range of 30 to 1000 MHz that are correctable to levels obtained with a tuned dipole antenna.
For emissions above 1000MHz, horn antenna may be used.
Measurements were also made for both horizontal and vertical polarization.

The horizontal distance between the receiving antenna and the closest periphery of the EUT was 3 meters as described in 8.2.3 of ANSI C63.4-1992.

5. 2. 5 FREQUENCY RANGE TO BE SCANNED.

For radiated emissions measurements, the spectrum in the range of 30 to 1000 MHz and above, if found, was investigated. The measurement for powerline emissions from EUT was made in shielded enclosure which provides

5. 2. 6 TEST CONDITIONS AND CONFIGURATION OF EUT.

The EUT was configured and operated in all modes of operation so as to find the maximum emanation of emissions from EUT.

The power was furnished with rated (normal) AC 120 volts, as specified in the OWNER's MANUAL of EUT. The EUT was placed on a 80 Cm high non metallic 1 *1.5 m table. The turn table containing the system was rotated and the antenna height was varied 4 m to find the maximum emanation of emissions from EUT.

Each type of accessory provided by manufacturer or typically used and support equipment were connected to the EUT during measurement to the typical usage and applicable as nearly as practicable.

5. 3 OUTPUT SIGNAL MEASUREMENT.

During measurements for output signal levels as the RF-out terminal, a spectrum analyzer was used with characteristics described at 4. and 9.3 of part I in this report.

5. 3. 1 OUTPUT SIGNAL LEVEL MEASUREMENT.

RF-out terminal of EUT is designed to feed modulated signals to a TV broadcast receiver via coaxial cable with 75 ohm of rated output impedance.

The output voltage of video carrier frequency at the RF-output terminal of the EUT was measured at each channel (CH. 3 & 4) connecting directly to a spectrum analyzer with 50 ohm input impedance via 75-to-50 ohm matching pad. Indicated voltage on screen of measuring instrument was converted to the voltage of 75 ohm system.

- Data conversion method.

$$V_{75}[uV] = 10^{(Vr + CF)/20} \quad [uV]$$

here,: V_{75} : Voltage at the RF-out terminal of 75 ohm in uV
Vr : Voltage read at analyzer with 50 ohm input-impedance in dBuV
CF : Conversion Factor of the matching pad in dB.

5. 3. 2 OUTPUT TERMINAL CONDUCTED SPURIOUS EMISSION MEASUREMENT.

Any other spectrum at RF-output terminal appearing on frequencies removed by more than 4.6 MHz below or 7.4 MHz above the video carrier frequency of EUT was searched at each channel.

To clarify the emissions emanated from RF output terminal of the EUT, RF pre-amplifier was utilized. The gain of pre-amplifier at each frequency measured from EUT were obtained after sufficient warm-up for stabilization of gain.

* Data conversion method.

$$V_{75}[uV] = 10^{(Vr + CF-PG+AT)/20} \quad [uV]$$

Where, V_{75} : Voltage at the RF-out terminal of 75 ohm in uV,
Vr : Voltage read at analyzer with 50 ohm input-impedance in dBuV
CF : Conversion Factor of the matching pad in dB,.
PG : Gain of pre-amplifier in dB,
AT : Attenuation of attenuator in dB.

5. 4 TRANSFER SWITCH ISOLATION MEASUREMENT.

As a transfer switch was equiped with EUT as an antenna-in, measurement of isolation were made at RF-input terminal with rated input impedance.

The maximum voltage of video carrier frequency of the EUT at the antenna input (RF-in) terminal of the switch was measured for both channels.

To clarify the emissions emanated from RF output terminal of the EUT, RF pre-amplifier was utilized. The gain of pre-amplifier at each frequency measured from EUT were obtained after sufficient warm-up for stabilization of gain.

* DATA CONVERSION METHOD.

$$V_{75}[uV] = 10^{(Vr + CF - PG + AT)/20} \quad [uV]$$

where, V_{75} : Voltage at the RF-out terminal of 75 ohm in uV
Vr : Voltage read at analyzer with 50 ohm input-impedance in dBuV
CF : Conversion Factor of the matching pad in dB,.
PG : Gain of pre-amplifier in dB,
AT : Attenuation of attenuator in dB.

6. MEASURING INSTRUMENTS AND SET-UP.

6. 1 POWERLINE CONDUCTED EMISSIONS.

6. 1. 1 Radio Noise Meter.

Rohde & Schwarz, Model ESH-3{ 9 KHz to 30 MHz }

Detector function : CISPR Quasi-Peak
IF Bandwidth : 10 KHz

6. 1. 2 Line Impedance Stabilization Network (LISN).

Kyoritsu, Model KNW-407
Impedance Characteristic : 50 uH / 50 ohm

6. 2 RADIATED EMISSIONS.

6 2. 1 Field Strength Meter.

Rohde & Schwarz, Model ESVP { 20 MHz to 1300 MHz }
ESMI { 20 Hz to 26.5 GHz }

Detector function : CISPR Quasi-Peak
IF Bandwidth : 120 KHz

6. 2. 2 Receiving Antennas.

a) Chase, Model CBL611A : Bilog antenna { 30 to 1000 MHz }
b) Schwarzbeck, Model BBA9102-B : Horn antenna { 1 GHz to 2 GHz }

6 . 3 OUTPUT SIGNAL MEASUREMENTS.

6. 3. 1 Spectrum Analyzer.

Hewlett-Packard, Model HP8568B
Span : 10 MHz SWP : 20 msec.
RBW : 100 KHz VBW : 300 KHz

6 . 3 . 2 RF Pre-amplifier.

Hewlett-Packard, Model HP8447F : 25 dB (typical gain)

6 . 3 . 3 Impedance matching pad.

Rohde & Schwarz, Model RAM : 7.5 dB loss , from 75 ohm to 50 ohm

6 . 3 . 4 Attenuator.

Rohde & Schwarz, Model DNF (N type) : 3 dB attenuation

6 . 4 TRANSFER SWITCH ISOLATION MEASUREMENTS.

6 . 4 . 1 Spectrum Analyzer.

Hewlett-Packard, Model HP8568B
Span : 1 MHz SWP : 30 msec.
RBW : 10 KHz VBW : 30 KHz

6 . 4 . 2 RF Pre-amplifier.

Hewlett-Packard, Model HP8447F : 25 dB (typical gain)

6 . 4 . 3 Impedance matching pad.

Rohde & Schwarz, Model RAM : 7.5 dB loss , from 75 ohm to 50 ohm

6 . 4 . 4 Attenuator.

Rohde & Schwarz, Model DNF (N type) : 3 dB attenuation

6 . 5 VITS SIGNAL GENERATOR ; COMMONLY USED.

Anritsu, Model MG-318A : VITS 1 Vp-p, 5 Vp-p Generator.

[NOTE] 1) The list of instruments and accessories used the measurements are attached at the end of the report, Appendix A and B

2) In every test results, the margins against the limits are shown.
The margins are calculated as following;

$$MARGIN[dB] = 20\log(R/L)$$

where, R : Corrected Results, [uV] or [uV/m],
L : Corresponding Limit, [uV] or [uV/m]

3) The tight limit is applied at the edge of two frequency band.

Part II

TEST DATA

1.POWER LINE CONDUCTED EMISSIONS (*15.107)

LGP Modulator

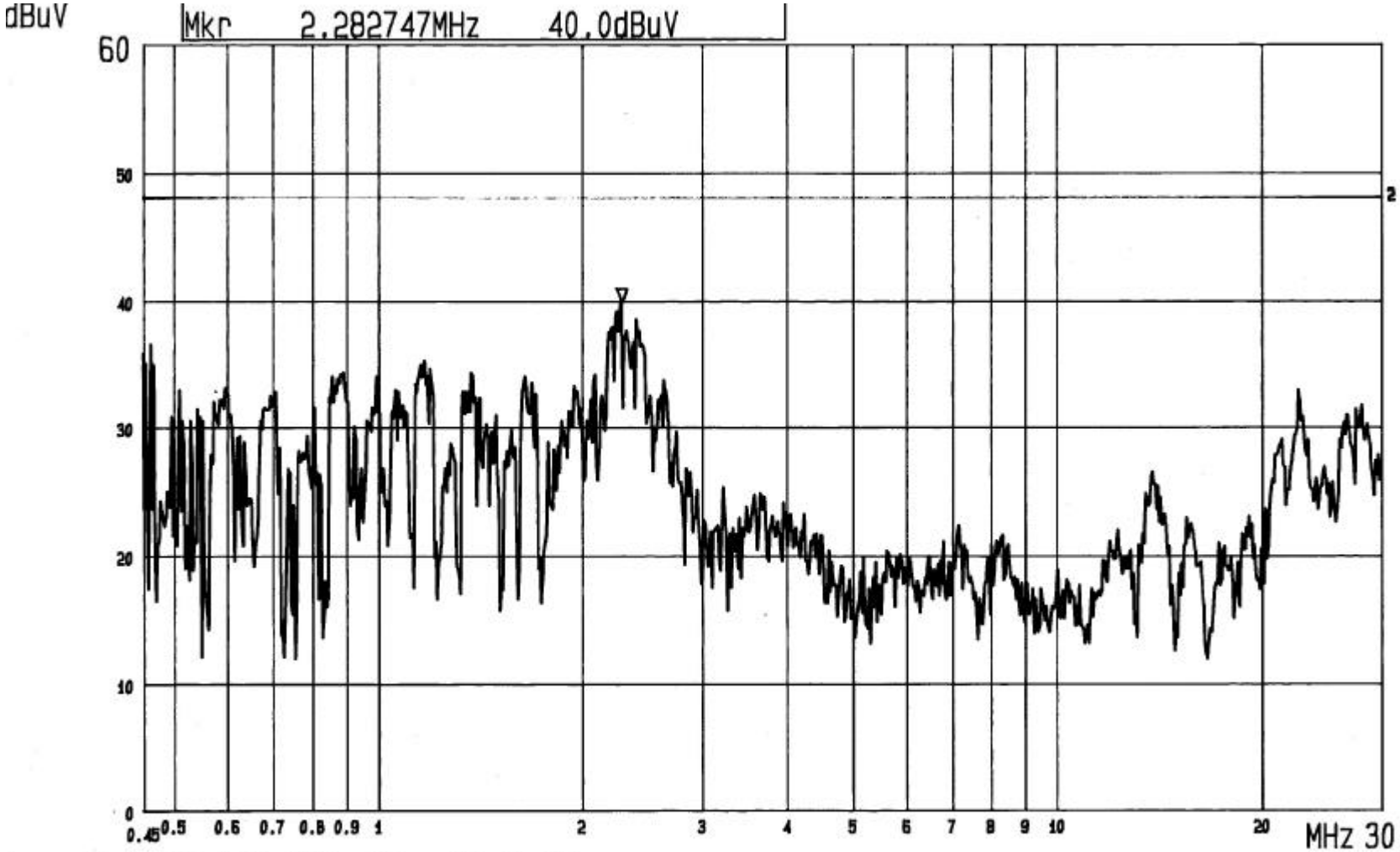
PRODUCT : VCR
MODEL : VRC421
Modulator type : TADC-H102F
TEST DATE : Sep, 27th 1999

FREQ. (MHz)	*Reading (dBuV)*	*RF Voltage (uV)*	*Phase (A/B)*	*Limit (uV)*	*Margin (dB)*
0.460	36.6	67.6	A	250	-11.4
0.881	35.1	56.9	B		-12.9
2.282	40.1	101.2	A		-7.9
13.634	28.0	25.1	B		-20.0
22.673	37.0	70.8	B		-11.0
28.100	31.5	37.6	A		-16.5

* Sample Calculation at 0.460z = $10^{(36.6/20)}$ = 67.6 uV

NOTES:

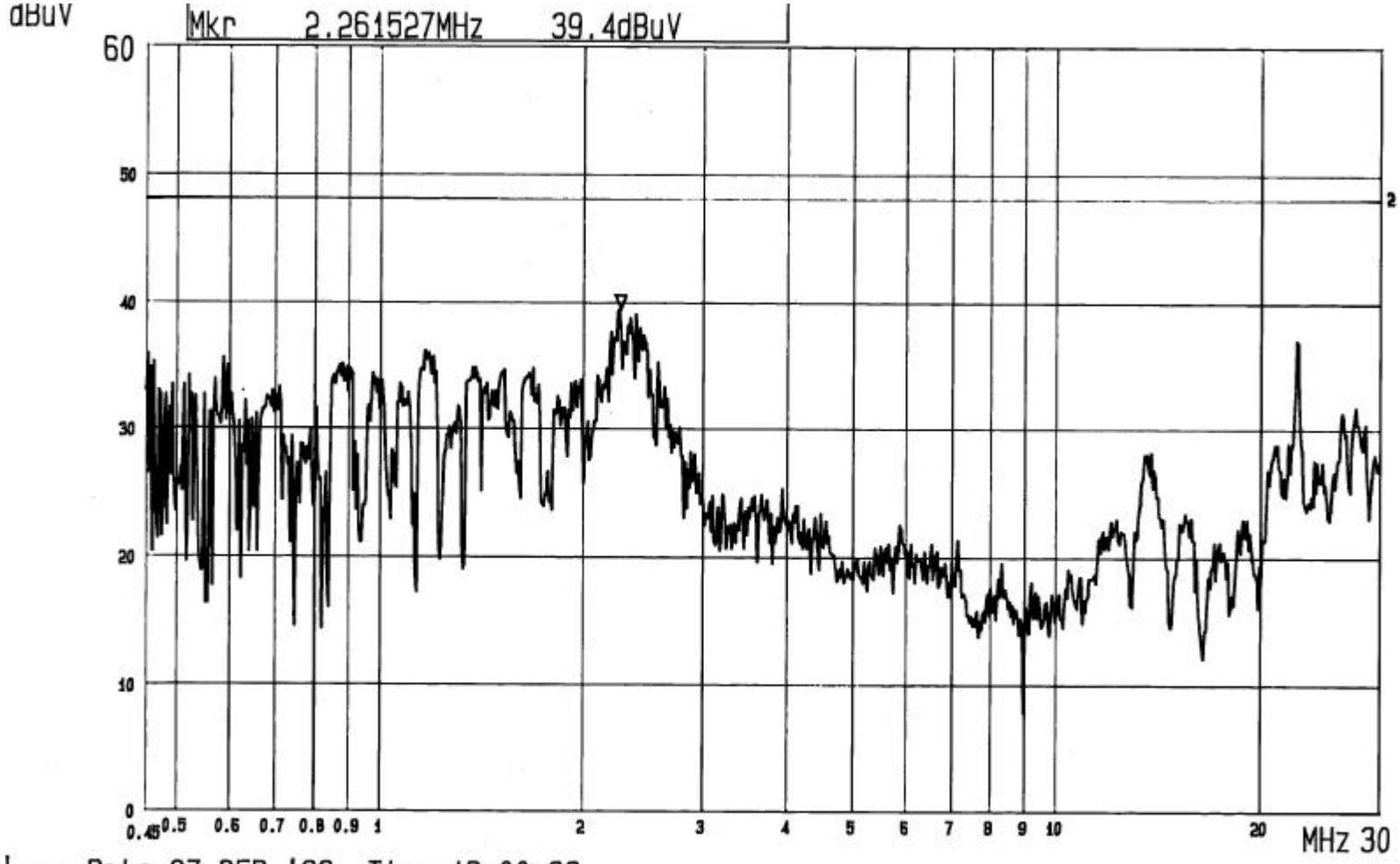
1. ***All modes of operation were investigated. The RF modulator was switched to Chenal 3 or 4 and worst-cast emissions are reported***
2. ***All other emissions are non-significant.***
3. ***Phase A = Hot Phase B = Neutral***



|--- Date 27.SEP.'99 Time 15:51:06

FCC ID : BEJ9QKE40010 MODEL: VRC421

LINE: Va



|--- Date 27.SEP.'99 Time 16:00:39
FCC ID : BEJ9QKE40010 MODEL: VRC421
LINE: Vb

2.RADIATED EMISSIONS (15.109)

LGP Modulator

PRODUCT : VCR
MODEL : VRC421
Modulator Type : TADC-H102F
TEST DATE : Sep ,27 1999

FREQ. (MHz)	*Reading (dBuV)*	*AF (dB/m)*	*CL (dB)*	*Pol.*	*F/S (uV/m)*	*Limit (uV)*	*Margin (dB)*
35.70	10.2	11.8	1.5	V	14.9	100	-16.5
50.10	12.0	10.7	1.5	V	16.2	100	-15.8
71.51	14.2	8.5	1.9	V	16.9	100	-15.4
114.5	10.3	14.6	2.3	V	22.9	150	-16.3
136.1	18.1	12.7	2.5	H	46.2	150	-10.2
143.1	16.1	12.8	2.6	V	37.6	150	-12.0
150.3	13.2	13.9	2.6	H	30.5	150	-13.8
164.6	13.4	15.0	2.7	V	35.9	200	-12.4

* Sample Calculation at 35.7 MHz = $10^{[(10.2+11.8+1.5)/20]}$ = 14.9 uV/m

NOTES:

1. ***All modes of operation were investigated. The RF modulator was switched to Channel 3 or 4 and worst-case emissions are reported.***
2. ***All other emissions are non-significant.***
3. ***AF = Antenna factor CL = Cable loss F/S = Field Strength***

3.OUTPUT TERMINAL SIGNAL LEVEL (*15.115)

LGP Modulator

PRODUCT : VCR
MODEL : VRC421
Modulator Type : TADC-H102F
TEST DATE : Sep 27 1999

CH	*Freq. (MHz)*	*Reading (dBuV)*	*M/P loss (dB)*	*Signal Level (uV)*	*Limit (uV)*	*Margin (dB)*
3 (Visual)	61.20	57.69	7.5	1817	3000	-4.4
3 (Aural)	65.75	42.90	7.5	331	671	-6.1
4 (Visual)	67.20	57.45	7.5	1772	3000	-4.6
4 (Aural)	71.73	42.52	7.5	317	671	-6.5

* Sample Calculation at 61.20 MHz = $10^{[(57.69+7.5)/20]}$ = 1817 uV

NOTES:

1. All modes of operation were investigated and worst -case emissions are reported.
2. Output Impedance of RF-Output Terminal : 75 ohm
3. MP = Impedance Matching Pad

4. OUTPUT TERMINAL CONDUCTED SPURIOUS EMISSIONS

LGP Modulator

PRODUCT : VCR
MODEL : VRC421
Modulator Type : TADC-H102F
TEST DATE : Sep , 27 1999

CH	*Freq. (MHz)*	*Reading (dBuV)*	*M/P loss (dB)*	*PreAmp Gain (dB)*	*Attn. (dB)*	*Output Level (uV)*	*Limit (uV)*	*Margin (dB)*
3	48.2	40.0	7.5	26.0	3.0	16.8	95	-15.1
	75.8	35.8		25.5		11.0		-18.7
	127.0	40.4		25.6		18.1		-14.3
	185.1	41.4		25.7		20.4		-13.3
	307.3	33.5		25.5		8.4		-21.0
	368.4	28.7		25.0		5.1		-25.4
4	54.7	31.6	7.5	25.7	3.0	6.6	95	-23.2
	81.7	34.0		25.8		8.6		-20.8
	135.8	32.6		26.0		7.2		-22.4
	202.7	38.2		25.6		14.3		-16.4
	336.7	34.4		25.7		9.1		-20.3
	403.7	29.0		25.5		5.0		-25.6

* Sample Calculation at 54.7.0 MHz = $10^{[(31.6+7.5-25.7+3.0)/20]}$ = 6.6 uV

NOTES:

1. ***Frequency range of 30 MHz to 1000 MHz removed by more than 4.6 MHz below or 7.4 MHz above the video carrier frequency of EUT was investigated at each channel.***

2. ***All other emissions are not significant.***

5.TRANSFER SWITCH ISOLATION (*15.115)

LGP Modulator

PRODUCT : VCR
MODEL : VRC421
Modulator Type : TADC-H102F
TEST DATE : Sep,27 1999

CH	*Freq. (MHz)*	*Meter Reading (dBuV)*	*M/P loss (dB)*	*PreAmp Gain (dB)*	*Attn. (dB)*	*Signal Level (uV)*	*Limit (uV)*	*Margin (dB)*
3	61.23	18.94	7.5	25.6	3.0	1.55	3.0	-5.7
4	67.20	18.14	7.5	25.5	3.0	1.43	3.0	-6.4

* Sample Calculation at 61.23 MHz = $10^{[(18.94+7.5-25.6+3.0)/20]}$ = 1.55 uV

NOTES:

1. ***The transfer switch is internal to the device and is access automatically.***
2. ***The transfer isolation switch provides automatic selection of either antenna/TV or VCR.***

Appendix A

Photograhp of Test Set-up (Power line conducted emissions)

Photograhps of Test Set-up (Radiated emissions)

Appendix B

LIST OF TEST EQIPMEN

Type	Model	Cal. Due Date	S / N
EMI measurenet system	R&S, ESMI	09/04/00	846064/004
Test receiver	R&S,ESVP	07/05/00	860688/020
Test receiver	R&S,ESH-3	07/05/00	860950/013
Spectrum monitor	R&S,EZM	07/05/00	862304/008
Spectrum monitor	R&S,EZM	07/05/00	862304/006
Spectrum Analyzer	HP8568B	07/03/00	3107A01571
Quasi-peak Adaptor	HP85650A	07/03/00	3107A01237
RF Pre-selector	HP85685A	07/03/00	3107A01237
Pre-Amplifier	HP8447F(BNC-	07/03/00	2805A02879
Pre-Amplifier	HP8447F (N-type)	07/01/00	3113A05259
Pre-Amplifier	HP8447C (N-type)	07/03/00	1937A00732
RF Signal Generator	Fluk, 6060B	07/03/00	5655209
IRE STD.signal Generator	Shibasoku,VG 40A	03/05/00	M-56221002
TV CH. Signal Generator	Shibasoku,363US	03/05/00	M-14817005
TV CH. Signal Generator	Shibasoku,363VS	03/05/00	M-12762002
NTSC Pattern Generator	Leader, LCG-400	03/14/00	705008
VITS Generator	Anritsu, MG318A	10/03/99	M11122
VITS Generator	Anritsu, MG318A	02/23/00	M10478
Tuned Dipole Antenna	EMCO, 3121C		9160-620
Tuned Dipole Antenna	EMCO, 3121C		9160-621
VHF Dipole Antenna	S/B, VHA9103		N/A
UHF Dipole Antenna	S/B, UHA9105		N/A
Bilog Antenna	Chase,CBL611A	10/25/99	1838
Biconical Antenna	R&S, HUF-Z2	10/25/99	N/A
Biconical Antenna	S/B, BBA9106	07/21/00	N/A
Biconical Antenna	S/B, BBA9106	07/21/00	N/A
LOg-periodic Antenna	S/B, UHAL9107	10/25/99	N/A
LOg-periodic Antenna	S/B, UHAL9107	07/21/00	N/A
LOg-periodic Antenna	EMCO, 3146	07/21/00	1583
Horn Antenna	S/B, BBA 9102-B	10/25/99	106
Laurel Antenna		07/21/00	
IEC 106 Antenna	HFU2-Z4		N/A
Absorbing Clamp	R&S, MDS21	10/25/99	860846/004
Absorbing Clamp	R&S, MDS21	07/21/00	301116/072
Kyoritsu LISN	KNW-407	07/05/00	8-6555-4
Shibasoku LISN	563	07/03/00	55416001
R & S LISN	ESH3-Z5	07/03/00	862770/013
Schwarzbeck LISN	NSLK8126	07/05/00	8126259

Appendix C

List of Suport Device and Accessories in the test

1. EUT :

VCR Model : VRC421 S / N : N/A

2. Accessories

1.5 m. unshielded RF coaxial cable suppied by manufacturer (1 EA)

1.5 m. unshielded RCA cable for Video/Audio

IEC-106 Antenna

3. Goldstar TV Monitor

Model : CRN-6285 S/N : 30600720

4. VITS Siganal Generator

Anritsu, Model MG-318A : VITS 1 Vp-p, 5 Vp-p Generator.

Appendix D

SAMPLE LABEL :

According to Labelling Reqirements per * 2.295 & * 15.19

The Label shown shall be affixed On the rear of the device. See the attached photograph.

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES.
OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS:
1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE AND
2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

The statement is molded on the bottom of the device.
See the attached photograph

Report of Measurements for TV Broadcast Receiver under FCC Part 15

Manufacture : LG Electronics Inc
19-1, Chongho_Ri, Chinwuy-Myon
Pyungtaek city, Kyongki-Do,451-713, Korea

Model No : VRC421

Serial No : N/A

Description of the equipment under test

Manufacture : LG Precision Co.,Ltd

Model No : TADC-H102F

Frequency range tuned by the receiver

: 54 ~ 806 MHz

This receiver meets FCC Regulations covering comparable systems of VHF and UHF TV tuning .

Measurement Procedure : EIA RS – 378 , MP – 2 , ANSI C 63.4

Date of Measurements : Sep, 27 1999

Measurements Results :The results obtained from the measuring of this device
Are as shown in the attached sheets.
And comply with new rules adapted under Docket 87-389

1. Peak Picture Sensitivity : UHF – VHF < 8.0 dBuV

2. UHF Noise figure : Meet noise figure of 14 dB

3. Radiation of VHF/UHF Portion : Highest 46.4 dBuV/m at 1694 MHz

4. Antenna Power conduction : Highest 39.7 dBuV at 1034 MHz

Hwanjong LEE

H.J.Lee
Research engineer
Multimedia standards team

1. Peak Picture Sensitivity : Limit UHF-VHF < 8 dBuV

Result : O . K

2. UHF Noise Figure

Channels (UHF)	Reading (dB)	Matching Loss(dB)	Noise Figure (dB)	Limit (dB)
14	10.4	1.75	8.15	14.0
19	10.2		7.95	
28	10.3		8.05	
36	10.3		8.05	
44	10.4		8.15	
53	10.3		8.05	
61	11.0		8.75	
69	11.8		9.55	
4.0dB substrated for power splitter < 0.3 dB added for IF amp contribution				

3. Radiated Emission Measurements

Frequency to which tuned		Frequency of the emission (MHz)	Result at 3 m (dBuV/m)	Limit at 3 m (dBuV/m)
Channel	(MHz)			
2	55.25	101	<20	43.5
3	61.25	107	<20	43.5
4	67.25	113	<20	43.5
5	77.25	123	<20	43.5
6	83.25	129	<20	43.5
7	175.25	221	<30	46.0
8	181.25	227	<30	46.0
9	187.25	233	<30	46.0
10	193.25	239	<30	46.0
11	199.25	245	<30	46.0
12	205.25	251	<30	46.0
13	211.25	257	<30	46.0
14	471.25	517 1034	37.1 38.1	46.0 54.0
19	501.25	547 1094	38.9 40.1	46.0 54.0
28	555.25	601 1202	38.0 44.5	46.0 54.0
36	603.25	649 1298	32.1 40.1	46.0 54.0
44	651.25	697 1394	32.9 40.9	46.0 54.0
53	705.25	751 1502	35.1 40.7	46.0 54.0
61	753.25	799 1598	36.5 43.2	46.0 54.0
69	801.25	847 1694	35.8 46.4	46.0 54.0

4. Antenna Power Conduction Measurements

Frequency to which tuned		Frequency of the emission (MHz)	Result (dBuV)	Limit (dBuV)
Channel	(MHz)			
2	55.25	101	<25.0	51.8
3	61.25	107	<25.0	
4	67.25	113	<25.0	
5	77.25	123	<25.0	
6	83.25	129	<25.0	
7	175.25	221	<25.0	
8	181.25	227	<25.0	
9	187.25	233	<25.0	
10	193.25	239	<25.0	
11	199.25	245	<25.0	
12	205.25	251	<25.0	
13	211.25	257	<25.0	
14	471.25	517 1034	<20 39.7	
19	501.25	547 1094	<20 24.6	
28	555.25	601 1202	24.5 24.9	
36	603.25	649 1298	23.08 24.8	
44	651.25	697 1394	26.7 <20	
53	705.25	751 1502	25.7 27.9	
61	753.25	799 1598	<20 <24.5	
69	801.25	847 1694	25.3 27.0	

CERTIFICATE

Issued date : September 28,1999

Model No. : VRC421 Serial No. : N / A

FCC ID No. : BEJ9QKE40010

Manufacture : LG ELECTRONICS INC. Trade name : LG

Applicant& address : LG Electronics INC, 20 Yoido-Dong Youngdungpo-Gu, Seoul, 150-721 Korea

Regulation : Subpart B of Part 15, 47 C.F.R; FCC Rules (Docket 87-389)

Procedure : MP-3 ; ANSI C63.4

Test Location : LG Electronics Multimedia Research Lab. Measurement facility (3 & 10 m site)

I hereby certify that the measurements shown in Part II of this report were made in accordance with the procedures indicated and energy emitted by this equipment was found to be within the limits applicable.

I further certify that on the basis of the measurements, the equipment tested is capable of operation in accordance with the requirements set forth in Part 15 of the FCC rules & Regulations under normal use and maintenance.

LG Electronics Inc. hereby assumes responsibility for the certification of compliance to applicable FCC limits in every measurements.

ISSUED BY

Hwanjong LEE

H.J.LEE

RESEARCH ENGINEER

REVIEWED BY

T,K.LEE

TEAM LEADER

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