

FCC EVALUATION REPORT FOR CERTIFICATION

Manufacturer : LG Electronics Inc.

642, Jinpyeong-dong, Gumi-si,

Gyeongbuk, 730-360, Korea

Attn: Mr. Sang-Wook Lee, Chief research engineer

Date of Issue : January 14, 2009

Order Number: GETEC-C1-09-011

Test Report Number: GETEC-E3-09-008

**Test Site: Gumi College EMC Center
(Registration Number: 100749)**

FCC ID.: BEJ37LH55UA

Applicant: LG Electronics Inc.

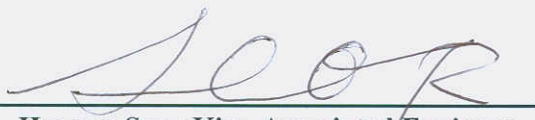
Rule Part(s)	: FCC Part 15 Subpart B
Equipment Class	: Class B computing device peripheral (JBP)
EUT Type	: LCD TV/Monitor
Type of Authority	: Certification
Model Name	: 37LH55-UA
Trade Name	: LG

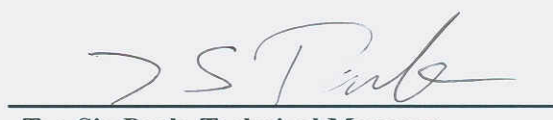
This equipment has been shown to be in compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2003 / Canadian standard ICES-003

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Tested by,

Reviewed by,


Hyeong-Seop Kim, Associated Engineer
GUMI College EMC center


Tae-Sig Park, Technical Manager
GUMI College EMC center



CONTENTS

1. GENERAL INFORMATION	3
2. INTRODUCTION	4
3. PRODUCT INFORMATION	5
3.1 DESCRIPTION OF EUT.....	5
3.2 SUPPORT EQUIPMENT / CABLES USED	6
3.3 MODIFICATION ITEM(S)	7
4. DESCRIPTION OF TESTS.....	8
4.1 TEST CONDITION.....	8
4.2 CONDUCTED EMISSION	9
4.3 RADIATED EMISSION	10
5. CONDUCTED EMISSION.....	11
5.1 OPERATING ENVIRONMENT	11
5.2 TEST SET-UP.....	11
5.3 MEASUREMENT UNCERTAINTY	11
5.4 LIMIT	12
5.5 TEST EQUIPMENT USED	12
5.6 TEST DATA FOR POWER LINE CONDUCTED EMISSION	13
6. RADIATED EMISSION	18
6.1 OPERATING ENVIRONMENT	18
6.2 TEST SET-UP.....	18
6.3 MEASUREMENT UNCERTAINTY	18
6.4 LIMIT	19
6.5 TEST EQUIPMENT USED	19
6.6 TEST DATA FOR RADIATED EMISSION	20
7. SAMPLE CALCULATIONS.....	26
7.1 EXAMPLE 1 :	26
7.2 EXAMPLE 2 :	26
8. RECOMMENDATION & CONCLUSION.....	27
APPENDIX A – ATTESTATION STATEMENT	
APPENDIX B – PLOTS OF CONDUCTED EMISSIONS	
APPENDIX C – ID SAMPLE LABEL & LOCATION	
APPENDIX D – BLOCK DIAGRAM	
APPENDIX E – TEST SET-UP PHOTOGRAPHS	
APPENDIX F – EXTERNAL PHOTOGRAPHS	
APPENDIX G –INTERNAL PHOTOGRAPHS	
APPENDIX H – USER’S MANUAL	



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

1. General Information

Applicant: LG Electronics Inc.

Applicant Address: 642, Jinpyeong-dong, Gumi-si, Gyeongbuk, Korea

Manufacturer: LG Electronics Inc.

Manufacturer Address: 642, Jinpyeong-dong, Gumi-si, Gyeongbuk, Korea

Contact Person: Mr. Sang -Wook Lee, Chief research engineer

Tel Number: +82-54-470-5430

- **FCC ID** BEJ37LH55UA
- **EUT Type** LCD TV/Monitor
- **Model Name** 37LH55-UA
- **Trade Name** LG
- **Serial Number** Proto type
- **Rule Part(s)** FCC Part 15 Subpart B
- **Type of Authority** Certification
- **Test Procedure(s)** ANSI C63.4 (2003) / Canadian standard ICES-003
- **Dates of Test** January 10 ~ 12, 2009
- **Place of Test** **Gumi College EMC Center** (FCC Registration Number: 100749)
407, Bugok-dong, Gumi-si, Gyeongsangbuk-do, Korea
- **Test Report Number** GETEC-E3-09-008
- **Dates of Issue** January 14, 2009



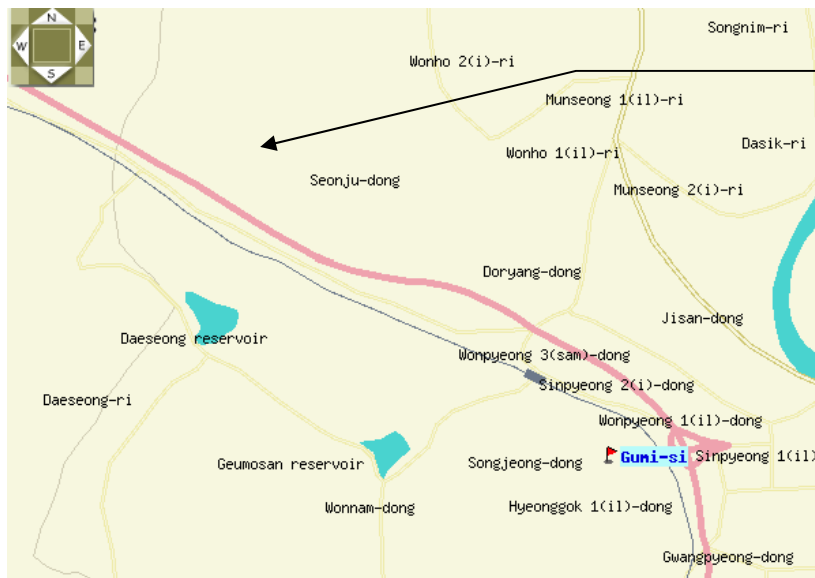
2. Introduction

The measurement procedure described in American National Standard for Methods of Measurement of Radio-Nose Emissions From Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (ASNI C63.4-2003) was used in determining radiated and conducted emissions emanating from **LG Electronics Inc. LCD TV/Monitor (Model Name: 37LH55-UA)**

These measurement tests were conducted at **Gumi College EMC Center**.

The site address is 407, Bugok-dong, Gumi-si, Gyeongsangbuk-do, Korea

This test site is one of the highest point of Gumi 1 college at about 200 km away from Seoul city and 40 km away from Daegu city. It is located in the valley surrounded by mountains in all directions where ambient radio signal conditions are quiet and a favorable area to measure the radio frequency interference on open field test site for the computing and ISM devices manufactures. The detailed description of the measurement facility was found to be in compliance with the requirements of §2.948 according to ANSI C63.4 on October 19, 1992



GUMI COLLEGE EMC CENTER
407, Bugok-dong, Gumi-si,
Gyeongsangbuk-do 730-711, Korea
Tel: +82-54-440-1195
Fax: +82-54-440-1199

Fig 1. The map above shows the Gumi College in vicinity area.



3. Product Information

3.1 Description of EUT

The Equipment under Test (EUT) is the **LG Electronics Inc. LCD TV/Monitor (Model Name: 37LH55-UA) FCC ID.: BEJ37LH55UA**

MODELS		37LH55 (37LH55-UA)	42LH55 (42LH55-UA)
Dimensions (Width x Height x Depth)	With stand	36.6x 27.8 x 14.8 inches 929 x 706.9x 374.7mm	41.5x 28.3 x 11.7 inches 1052.2 x 719.1 x 296.2mm
	Without stand	36.6x 26.1 x 3.9 inches 929 x 665x 98.7mm	41.5 x 25.9 x 3.6 inches 1052.2 x 657.4 x 90.8mm
Weight	With stand	46.3 pound / 21.2 kg	40.4 pound / 18.3 kg
	Without stand	39.9 pound / 18.1 kg	36.4 pound / 16.5 kg
Power requirement Television System Program Coverage External Antenna Impedance		AC100-240V ~ 50/60Hz NTSC-M, ATSC, 64 & 256 QAM VHF 2-13, UHF 14-69, CATV 1-135, DTV 2-69, CADTV 1-135 75 ohm	
Environment condition	Operating Temperature Operating Humidity	32 ~ 104°F (0 ~ 40°C) Less than 80%	
	Storage Temperature Storage Humidity	-4 ~ 140°F (-20 ~ 60°C) Less than 85%	

EUT Type: LCD TV/Monitor

FCC ID: BEJ37LH55UA



3.2 Support Equipment / Cables used

3.2.1 Used Support Equipment

Description	Manufacturer	Model Name	S/N & FCC ID
PC	Hewlett Packard	D530	S/N: CNG34800PY FCC ID: DoC
Video card	ATI	ATI RV360(9600)	S/N: SN0402017176 FCC ID: DoC
Key-board	COMPAQ	166516-AD6	S/N: B13BBOR391006D FCC ID: DoC
Serial mouse	LOGITECH	M-S69	S/N: 334684-108 FCC ID: JNZ211443
Joystick	Microsoft	X05-92626	S/N: 9262600296169 FCC ID: DoC
DVD player	LG Electronics Inc	LC-954	S/N: 3850R-Z674K FCC ID: DoC
Printer	Hewlett Packard	970CXI	S/N: MY9B01F1FG FCC ID: DoC
TV signal generator	FLUKE	54200	S/N: 831011 FCC ID: DoC
USB memory stick	SM Electronics	UDD-32M	S/N:- FCC ID:DoC

See “Appendix E – Test Setup Photographs” for actual system test set-up



3.2.2 Used Cable(s)

Cable Name	Condition	Description
Power cable	Connected to the EUT	1.8 m unshielded
RGB in (Analog)cable	Connected to the EUT and PC	1.8 m shielded with two ferrite cores
HDMI (Digital)cable	Connected to the EUT and PC	1.9 m shielded
Component cable	Connected to the EUT and DVD player	1.8 m shielded
Component sound cable	Connected to the EUT and DVD player	3.0 m shielded
PC audio in cable	Connected to the EUT and PC	1.8 m shielded
AV in cable	Connected to the EUT and DVD player	3.0 m shielded
ANT cable	Connected to the EUT and TV signal generator	10 m shielded

3.3 Modification Item(s)

- None



4. Description of tests

4.1 Test Condition

The EUT was installed, arranged and operated in a manner that is most representative of equipment as typically used. The measurements were carried out while varying operating modes and cable positions within typically arrangement to determine maximum emission level.

The representative and worst test mode(s) were noted in the test report.

- Test Voltage / Frequency : AC 120 V / 60 Hz
- Test Mode(s)
 - . Monitor mode
 - . Radiated emission: 1 920 * 1 080 / 60 Hz (RGB: Analog), 1 920 * 1 080 / 60 Hz (HDMI: Digital)
 - . Conducted emission: 1 920 * 1 080 / 60 Hz (RGB: Analog), 1 920 * 1 080 / 60 Hz (HDMI: Digital)
1 024 * 768 / 60 Hz (RGB: Analog), 640 * 480 / 60 Hz (RGB: Analog)
 - . USB play mode: Continuous play mode of Picture file and 1 kHz audio file.
- Operating test pattern
 - . "H" character scrolling mode (Font size: 10)
 - . Black background white character
 - . Brightness and contrast was adjusted as maximum level
 - . 1 kHz sound tone with winamp player

"The verification report for TV/AV mode would be issued by LG Electronics Inc."



4.2 Conducted Emission

The Line conducted emission test facility is inside a 4 m × 8 m × 2.5 m shielded enclosure.

The EUT was placed on a non-conducting 1.0 m by 1.5 m table, which is 0.8 m in height and 0.4 m away from the vertical wall of the shielded enclosure.

The EUT is powered from the Rohde & Schwarz LISN (ESH2-Z5) and the support equipment is powered from the Rohde & Schwarz LISN (ESH3-Z5). Powers to the LISN are filtered by high-current high insertion loss power line filter.

Sufficient time for EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition.

The RF output of the LISN was connected to the EMI test receiver (Rohde & Schwarz, ESCS30).

The EMI test receiver was scanned from 150 kHz to 30 MHz with 20 ms sweep time to determine the frequency producing the maximum EME from the EUT. The frequency producing the maximum level was re-examined using Quasi-Peak mode of the EMI test receiver.

The bandwidth of Quasi-peak mode was set to 9 kHz. Each emission was maximized consistent with typical applications by varying the configuration of the test sample. Interface cables were connected to the available interface ports of the test unit. The effect of varying the position of cables was investigated to find the configuration that produces maximum diagram emission. Excess cable lengths were bundled at center with 30 cm ~ 40 cm.

Each EME reported was calibrated using the R/S signal generator

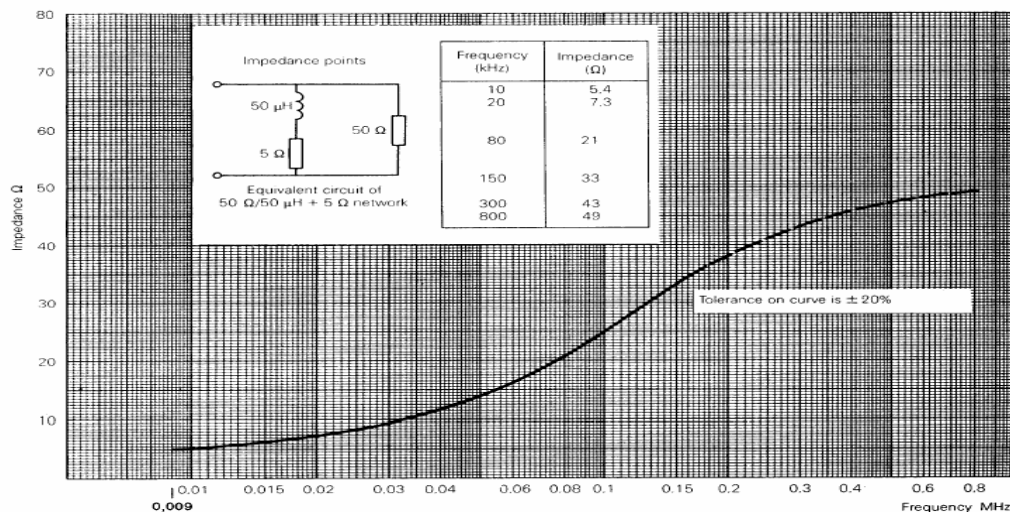


Fig 2. Impedance of LISN



4.3 Radiated Emission

Preliminary measurements were conducted 3 m semi anechoic chamber using broadband antennas to determine the frequency producing the maximum EME. Appropriate precaution was taken to ensure that all EME from the EUT were maximized and investigated. The technology configuration, mode of operation and turntable azimuth with respect to antenna was note for each frequency found.

The spectrum was scanned from 30 MHz to 1 000 MHz using bicornical log antenna (Schwarzbeck, VULB9160). Above 1 GHz, horn antenna (Schwarzbeck, BBHA9120D) was used.

Final measurements were made outdoors at 3 m /10 m test range.

Sufficient time for the EUT, support 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 and investigated using EMI test receiver. The detector function was set to CISPR quasi-peak mode average mode and the bandwidth of the receiver was set to 120 kHz or 1 MHz depending on the frequency or type of signal.

The EUT, support equipment and interconnecting cables were reconfigured to the setup producing the maximum emission for the frequency and were placed on top of a 0.8 m high non-metallic 1.0 m × 1.5 m table.

The turntable containing the test sample was rotated; the antenna height was varied 1 to 4 meter and stopped at the azimuth or height producing the maximum emission.

Each EME reported was calibrated using the R/S signal generator

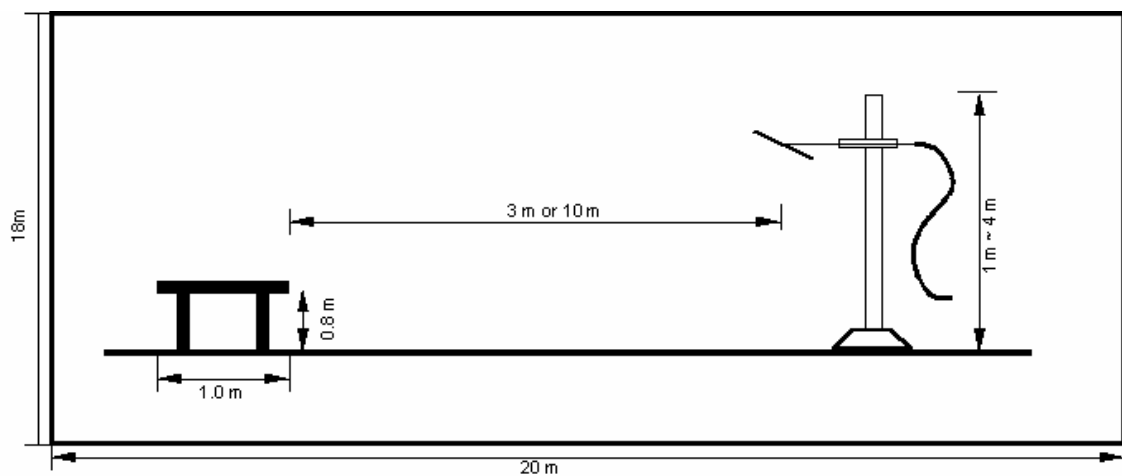


Fig 3. Dimensions of Open Site Test Area



5. Conducted Emission

5.1 Operating environment

Temperature : 23 °C
Relative humidity : 34 % R.H.

5.2 Test set-up

The conducted emission measurements were performed in the shielded room.

The EUT was placed on wooden table, 0.8 m heights above the floor, 0.4 m from the reference ground plane (GRP) wall and 0.8 m from AMN.

AMN is bonded on horizontal reference ground plane.

The ground plane, which was electrically bonded to the shield room, ground system and all power lines entering the shield room, were filtered.

5.3 Measurement uncertainty

The measurement uncertainty was calculated in accordance with ISO "Guide to the expression of uncertainty in measurement."

The measurement uncertainty was given with a confidence of 95 %.

Test items	Uncertainty	Remark
Conducted emission (9 kHz ~ 150 kHz)	± 2.97 dB	Confidence levels of 95 % (k=2)
Conducted emission (150 kHz ~ 30 MHz)	± 4.05 dB	Confidence levels of 95 % (k=2)



5.4 Limit

RFI Conducted	FCC Limit(dB) Class B	
Freq. Range	Quasi-Peak	Average
150 kHz ~ 0.5 MHz	66 ~ 56*	56 ~ 46*
0.5 MHz ~ 5 MHz	56	46
5 MHz ~ 30 MHz	60	50
*Limits decreases linearly with the logarithm of frequency.		

5.5 Test equipment used

Model Name	Manufacturer	Description	Serial Number	Due to Calibration
■ - ESCS30	Rohde & Schwarz	EMI test receiver	839809/003	12. 13. 2009
■ - ESH3-Z5	Rohde & Schwarz	LISN	838979/020	12. 12. 2009
■ - ESH2-Z5	Rohde & Schwarz	LISN	829991/009	12. 12. 2009



5.6 Test data for power line conducted emission

- Test Date : January 12, 2009
- Resolution bandwidth : 9 kHz
- Frequency range : 0.15 MHz ~ 30 MHz

◆ Test resolution: 1 920 * 1 080 / 60 Hz (RGB: Analog mode)

Frequency [MHz]	Insertion Loss [dB]	Cable Loss [dB]	Line	Q.P[dB μ V]			A.V[dB μ V]			Margin[dB]	
				Limit	Reading	Result	Limit	Reading	Result	Q.P	A.V
0.160	0.10	-0.17	L1	65.46	38.17	38.10	55.46	33.47	33.40	27.36	22.06
0.270	0.11	-0.15	L1	61.11	33.54	33.50	51.11	28.44	28.40	27.61	22.71
0.460	0.13	-0.13	L1	56.69	32.20	32.20	46.69	23.30	23.30	24.49	23.39
0.650	0.13	-0.13	L1	56.00	32.10	32.10	46.00	20.60	20.60	23.90	25.40
0.760	0.14	-0.13	L1	56.00	31.49	31.50	46.00	20.99	21.00	24.50	25.00
1.120	0.15	-0.13	L1	56.00	30.38	30.40	46.00	17.18	17.20	25.60	28.80
1.510	0.17	-0.11	N	56.00	31.24	31.30	46.00	18.74	18.80	24.70	27.20
2.330	0.19	-0.10	L1	56.00	29.21	29.30	46.00	15.81	15.90	26.70	30.10
2.510	0.21	-0.10	N	56.00	27.29	27.40	46.00	14.99	15.10	28.60	30.90
3.770	0.24	-0.08	L1	56.00	28.34	28.50	46.00	16.44	16.60	27.50	29.40
9.590	0.36	-0.02	N	60.00	27.96	28.30	50.00	22.06	22.40	31.70	27.60

*Comment : Line : L1(line 1), L2(line2), L3(line 3), N(neutral)
Q.P:Quasi-peak, A.V : Average
Insertion Loss : Insertion Loss of LISN
Cable Loss : Cable Loss + Pulse Limiter Insertion loss value



◆ Test resolution: 1 920 * 1 080 / 60 Hz (HDMI: Digital mode)

Frequency [MHz]	Insertion Loss [dB]	Cable Loss [dB]	Line	Q.P[dB μ V]			A.V[dB μ V]			Margin[dB]	
				Limit	Reading	Result	Limit	Reading	Result	Q.P	A.V
0.200	0.10	-0.17	L1	63.61	37.37	37.30	53.61	34.67	34.60	26.31	19.01
0.390	0.12	-0.14	L1	58.06	32.72	32.70	48.06	24.32	24.30	25.36	23.76
0.450	0.13	-0.13	L1	56.87	31.70	31.70	46.87	22.90	22.90	25.17	23.97
0.620	0.14	-0.13	N	56.00	31.39	31.40	46.00	18.39	18.40	24.60	27.60
0.760	0.14	-0.13	L1	56.00	31.09	31.10	46.00	20.39	20.40	24.90	25.60
0.880	0.15	-0.13	N	56.00	32.18	32.20	46.00	17.98	18.00	23.80	28.00
1.170	0.15	-0.12	L1	56.00	28.57	28.60	46.00	17.87	17.90	27.40	28.10
2.020	0.19	-0.09	N	56.00	29.20	29.30	46.00	16.90	17.00	26.70	29.00
9.700	0.37	-0.02	L1	60.00	28.05	28.40	50.00	23.75	24.10	31.60	25.90
9.890	0.36	-0.02	N	60.00	28.66	29.00	50.00	22.76	23.10	31.00	26.90
25.550	0.85	0.11	L1	60.00	32.94	33.90	50.00	29.04	30.00	26.10	20.00

*Comment : Line : L1(line 1), L2(line2), L3(line 3), N(neutral)
Q.P:Quasi-peak, A.V : Average
Insertion Loss : Insertion Loss of LISN
Cable Loss : Cable Loss + Pulse Limiter Insertion loss value



◆ Test resolution: 1 024 * 768 / 60 Hz (RGB: Analog mode)

Frequency [MHz]	Insertion Loss [dB]	Cable Loss [dB]	Line	Q.P[dB μ V]			A.V[dB μ V]			Margin[dB]	
				Limit	Reading	Result	Limit	Reading	Result	Q.P	A.V
0.200	0.10	-0.17	L1	63.61	35.97	35.90	53.61	33.27	33.20	27.71	20.41
0.260	0.11	-0.15	L1	61.43	35.14	35.10	51.43	27.24	27.20	26.33	24.23
0.380	0.12	-0.14	L1	58.27	32.72	32.70	48.27	24.92	24.90	25.57	23.37
0.630	0.13	-0.13	L1	56.00	31.10	31.10	46.00	21.80	21.80	24.90	24.20
1.040	0.15	-0.13	L1	56.00	31.98	32.00	46.00	17.58	17.60	24.00	28.40
1.130	0.16	-0.13	N	56.00	30.37	30.40	46.00	16.47	16.50	25.60	29.50
1.650	0.18	-0.10	N	56.00	30.22	30.30	46.00	17.32	17.40	25.70	28.60
2.160	0.20	-0.09	N	56.00	29.99	30.10	46.00	15.69	15.80	25.90	30.20
3.770	0.24	-0.08	N	56.00	25.64	25.80	46.00	17.44	17.60	30.20	28.40
3.920	0.24	-0.08	L1	56.00	25.14	25.30	46.00	16.64	16.80	30.70	29.20
9.550	0.37	-0.02	L1	60.00	28.35	28.70	50.00	22.95	23.30	31.30	26.70
9.740	0.36	-0.02	N	60.00	28.56	28.90	50.00	22.66	23.00	31.10	27.00

*Comment : Line : L1(line 1), L2(line2), L3(line 3), N(neutral)
Q.P:Quasi-peak, A.V : Average
Insertion Loss : Insertion Loss of LISN
Cable Loss : Cable Loss + Pulse Limiter Insertion loss value



◆ Test resolution: 640 * 480 / 60 Hz (RGB: Analog mode)

Frequency [MHz]	Insertion Loss [dB]	Cable Loss [dB]	Line	Q.P[dB μ V]			A.V[dB μ V]			Margin[dB]	
				Limit	Reading	Result	Limit	Reading	Result	Q.P	A.V
0.160	0.10	-0.17	L1	65.46	38.27	38.20	55.46	33.17	33.10	27.26	22.36
0.480	0.13	-0.13	N	56.33	30.50	30.50	46.33	19.90	19.90	25.83	26.43
0.660	0.13	-0.13	L1	56.00	31.60	31.60	46.00	19.10	19.10	24.40	26.90
0.760	0.14	-0.13	L1	56.00	32.39	32.40	46.00	22.39	22.40	23.60	23.60
1.040	0.16	-0.13	N	56.00	31.87	31.90	46.00	16.67	16.70	24.10	29.30
1.490	0.16	-0.11	L1	56.00	28.55	28.60	46.00	18.85	18.90	27.40	27.10
1.740	0.17	-0.10	L1	56.00	30.13	30.20	46.00	17.33	17.40	25.80	28.60
1.800	0.18	-0.09	N	56.00	27.31	27.40	46.00	16.01	16.10	28.60	29.90
2.470	0.21	-0.10	N	56.00	27.79	27.90	46.00	18.09	18.20	28.10	27.80
10.000	0.36	-0.02	N	60.00	27.36	27.70	50.00	21.06	21.40	32.30	28.60
25.550	0.85	0.11	L1	60.00	32.14	33.10	50.00	28.24	29.20	26.90	20.80

*Comment : Line : L1(line 1), L2(line2), L3(line 3), N(neutral)
Q.P:Quasi-peak, A.V : Average
Insertion Loss : Insertion Loss of LISN
Cable Loss : Cable Loss + Pulse Limiter Insertion loss value



◆ USB play mode

Frequency [MHz]	Insertion Loss [dB]	Cable Loss [dB]	Line	Q.P[dB μ V]			A.V[dB μ V]			Margin[dB]	
				Limit	Reading	Result	Limit	Reading	Result	Q.P	A.V
0.190	0.11	-0.17	N	64.03	44.06	44.00	54.03	35.46	35.40	20.03	18.63
0.280	0.11	-0.15	L1	60.81	33.04	33.00	50.81	25.64	25.60	27.81	25.21
0.410	0.12	-0.14	L1	57.64	32.02	32.00	47.64	24.72	24.70	25.64	22.94
0.530	0.13	-0.13	L1	56.00	31.20	31.20	46.00	21.40	21.40	24.80	24.60
0.650	0.13	-0.13	L1	56.00	30.30	30.30	46.00	20.30	20.30	25.70	25.70
0.770	0.15	-0.13	N	56.00	31.08	31.10	46.00	18.28	18.30	24.90	27.70
1.090	0.15	-0.13	L1	56.00	29.08	29.10	46.00	15.78	15.80	26.90	30.20
1.480	0.17	-0.11	N	56.00	29.34	29.40	46.00	16.94	17.00	26.60	29.00
2.130	0.19	-0.09	N	56.00	28.80	28.90	46.00	16.70	16.80	27.10	29.20
3.710	0.24	-0.09	L1	56.00	27.15	27.30	46.00	16.55	16.70	28.70	29.30
4.950	0.27	-0.06	N	56.00	24.09	24.30	46.00	16.89	17.10	31.70	28.90
9.590	0.36	-0.02	N	60.00	33.96	34.30	50.00	30.76	31.10	25.70	18.90
9.830	0.37	-0.02	L1	60.00	34.65	35.00	50.00	34.45	34.80	25.00	15.20

*Comment : Line : L1(line 1), L2(line2), L3(line 3), N(neutral)
Q.P:Quasi-peak, A.V : Average
Insertion Loss : Insertion Loss of LISN
Cable Loss : Cable Loss + Pulse Limiter Insertion loss value



6. Radiated Emission

6.1 Operating environment

Temperature : 3 °C
Relative humidity : 36 % R.H.

6.2 Test set-up

A preliminary scan with peak mode was performed in the semi anechoic chamber and found frequency for open area test site.

The formal radiated emission was measured at 3 m / 10 m distance open area test site.

The EUT was placed on a non-conductive turntable approximately 0.8 m above the ground plane.

The turntable with EUT was rotated 360°, and the antenna was varied in height between 1.0 m and 4.0 m in order to determine the maximum emission levels.

This procedure was performed for both horizontal and vertical polarization of the receiving antenna.

6.3 Measurement uncertainty

The measurement uncertainty was calculated in accordance with ISO "Guide to the expression of uncertainty in measurement".

The measurement uncertainty was given with a confidence of 95 %.

Test items	Uncertainty	Remark
Radiated emission (30 MHz ~ 300 MHz, 3 m, Vertical)	± 3.54 dB	Confidence levels of 95 % (k=2)
Radiated emission (30 MHz ~ 300 MHz, 3 m, Horizontal)	± 3.49 dB	Confidence levels of 95 % (k=2)
Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Vertical)	± 3.85 dB	Confidence levels of 95 % (k=2)
Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Horizontal)	± 3.76 dB	Confidence levels of 95 % (k=2)
Radiated emission (30 MHz ~ 300 MHz, 10 m, Vertical)	± 3.21 dB	Confidence levels of 95 % (k=2)
Radiated emission (30 MHz ~ 300 MHz, 10 m, Horizontal)	± 3.32 dB	Confidence levels of 95 % (k=2)
Radiated emission (300 MHz ~ 1 000 MHz, 10 m, Vertical)	± 3.77 dB	Confidence levels of 95 % (k=2)
Radiated emission (300 MHz ~ 1 000 MHz, 10 m, Horizontal)	± 3.84 dB	Confidence levels of 95 % (k=2)



6.4 Limit

Frequency (MHz)	FCC Limit @ 3 m. dB μ V/m	CISPR Limit @ 10 m. dB μ V/m
30 ~ 88	40.0	30.0
88 ~ 216	43.5	30.0
216 ~ 230	46.0	30.0
230 ~ 960	46.0	37.0
960 ~ 1 000	54.0	37.0
> 1 000	54.0	No Specified limit

6.5 Test equipment used

Model Name	Manufacturer	Description	Serial Number	Due to Calibration
■ - ESI	Rohde & Schwarz	EMI test receiver	830482/010	12. 14. 2009
■ - ESCS30	Rohde & Schwarz	EMI test receiver	839809/003	12. 13. 2009
■ - HK116	Rohde & Schwarz	Biconical ANT	832639/007	12. 28. 2009
■ - HL223	Rohde & Schwarz	Log-periodic antenna	835998/004	12. 28. 2009
■ - BBHA9120D	Schwarzbeck	Horn ANT	207	12. 26. 2009
■ - HD100	HD GmbH	Position Controller	100/692/01	N/A
■ - DS415S	HD GmbH	Turntable	415/657/01	N/A
■ - MA240	HD GmbH	Antenna Mast	240/565/01	N/A
■ - AFS 44 00101800-25-10P-44	MITEQ	Preamplifier	1258943	N/A

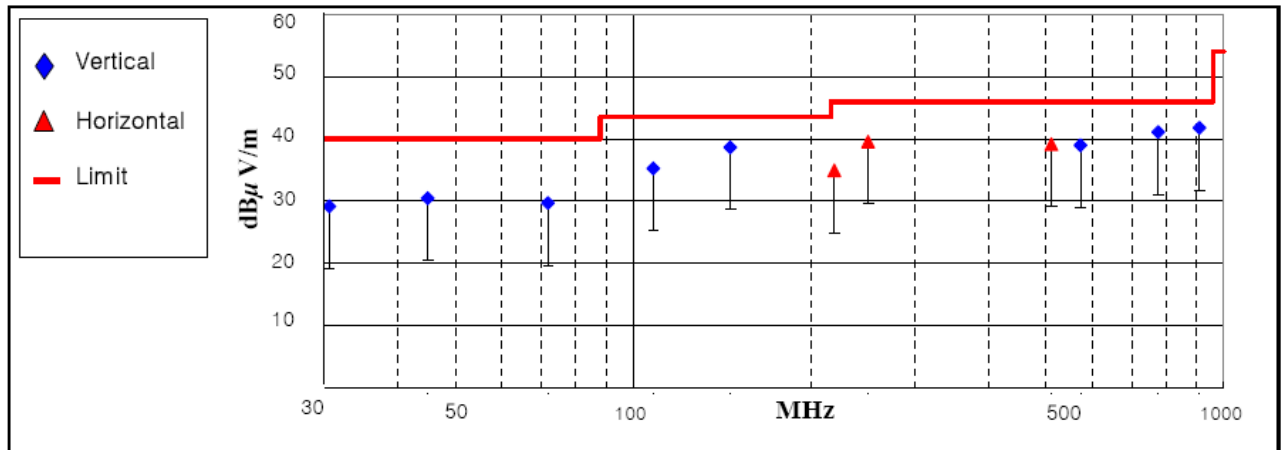


6.6 Test data for Radiated emission

- Test Date : January 10, 2009
- Resolution bandwidth : 120 kHz/ 1 MHz
- Frequency range : 30 MHz ~ 2 000 MHz
- Measurement distance : 3 m

- ◆ Operating Condition: 1 920 * 1 080 / 60 Hz (RGB: Analog mode)
Detector mode: Quasi- peak detector mode

Frequency (MHz)	Measurement Level				Limit (dB μ V/m)	Margin (dB)	Positioning System		
	Reading	Antenna	Cable	Test Result			Pol.	Height	Angle
	Value(dB μ V)	Factor(dB/m)	Loss(dB)	(dB μ V/m)			(H/V)	(cm)	(°)
30.63	14.26	13.21	1.65	29.12	40.00	10.88	V	100	160
44.91	18.91	9.53	2.01	30.45	40.00	9.55	V	110	301
71.73	19.56	7.59	2.53	29.68	40.00	10.32	V	100	330
108.26	22.28	9.99	2.97	35.24	43.50	8.26	V	106	345
146.10	23.60	11.46	3.56	38.62	43.50	4.88	V	132	3
219.30	16.12	14.27	4.52	34.91	46.00	11.09	H	300	121
250.00	19.74	14.89	4.93	39.56	46.00	6.44	H	301	195
510.84	14.84	17.01	7.29	39.14	46.00	6.86	H	321	99
572.13	13.58	17.85	7.53	38.96	46.00	7.04	V	133	172
775.00	11.79	20.52	8.78	41.09	46.00	4.91	V	105	180
910.03	10.39	21.74	9.64	41.77	46.00	4.23	V	100	177

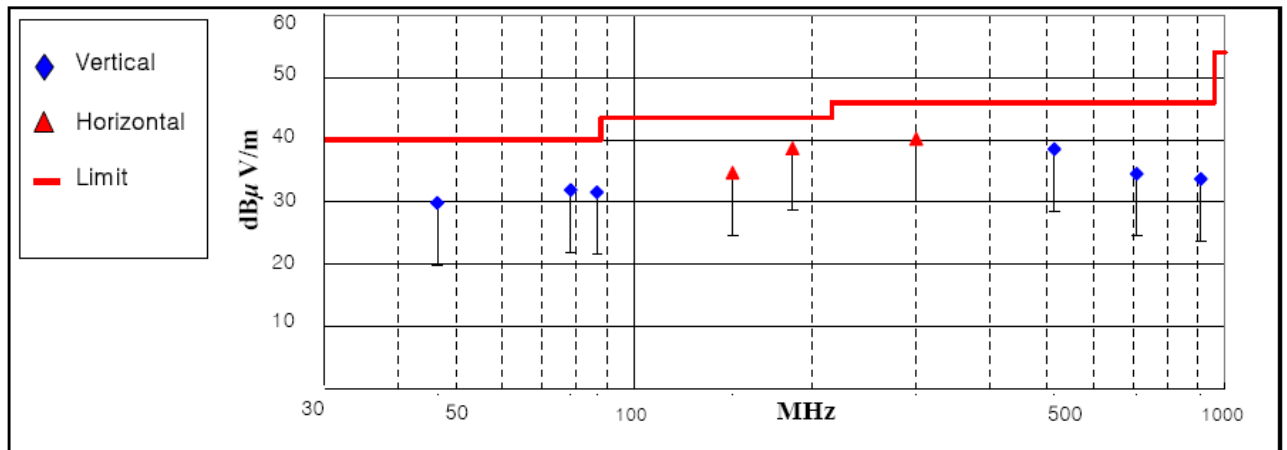


< Fig 4. Radiated emission result (30 MHz ~ 1 000 MHz)>



- ◆ Operating Condition: 1 920 * 1 080 / 60 Hz (HDMI: Digital mode)
Detector mode: Quasi- peak detector mode

Frequency (MHz)	Measurement Level				Limit (dB μ V/m)	Margin (dB)	Positioning System		
	Reading	Antenna	Cable	Test Result			Pol.	Height	Angle
	Value(dB μ V)	Factor(dB/m)	Loss(dB)	(dB μ V/m)			(H/V)	(cm)	(°)
46.55	18.41	9.38	2.06	29.85	40.00	10.15	V	112	292
78.21	21.41	7.88	2.63	31.92	40.00	8.08	V	130	66
86.64	20.40	8.42	2.73	31.55	40.00	8.45	V	144	242
147.00	19.64	11.50	3.57	34.71	43.50	8.79	H	345	132
185.66	21.58	12.99	4.05	38.62	43.50	4.88	H	325	210
300.71	21.67	12.76	5.70	40.13	46.00	5.87	H	300	199
514.50	14.14	17.07	7.29	38.50	46.00	7.50	V	185	162
709.33	5.68	20.44	8.38	34.50	46.00	11.50	V	102	230
910.50	2.34	21.74	9.64	33.72	46.00	12.28	V	100	170

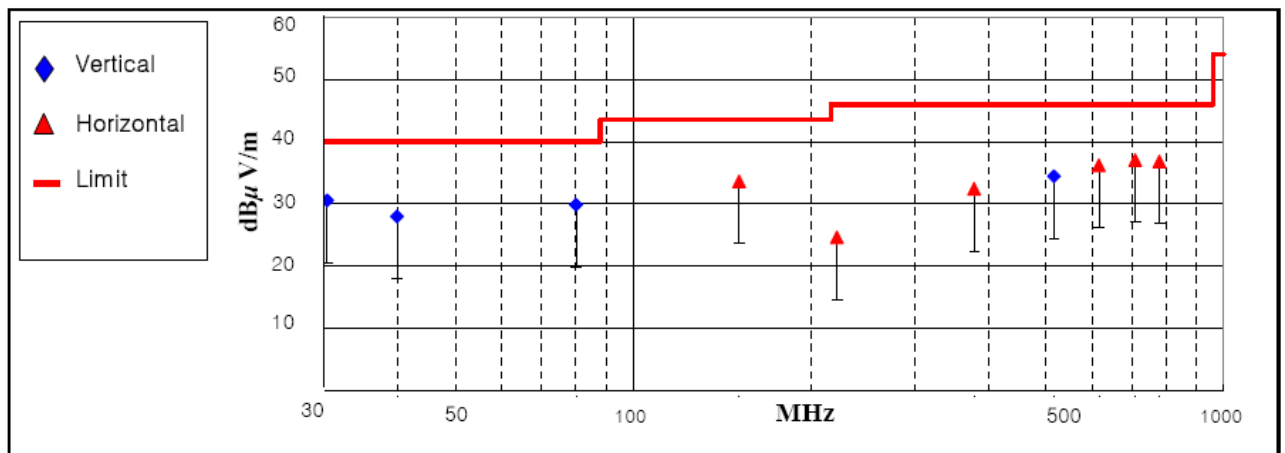


< Fig 5. Radiated emission result (30 MHz ~ 1 000 MHz)>



- ◆ Operating Condition: USB play mode
Detector mode: Quasi- peak detector mode

Frequency (MHz)	Measurement Level				Limit (dB μ V/m)	Margin (dB)	Positioning System		
	Reading	Antenna	Cable	Test Result			Pol.	Height	Angle
	Value(dB μ V)	Factor(dB/m)	Loss(dB)	(dB μ V/m)			(H/V)	(cm)	(°)
30.35	15.61	13.30	1.64	30.55	40.00	9.45	V	116	170
39.86	15.64	10.44	1.88	27.96	40.00	12.04	V	120	230
80.10	19.23	7.97	2.66	29.86	40.00	10.14	V	100	215
151.17	18.30	11.67	3.64	33.61	43.50	9.89	H	362	330
221.40	5.73	14.34	4.55	24.62	46.00	21.38	H	301	130
377.95	9.67	15.00	7.77	32.44	46.00	13.56	H	340	190
516.30	10.05	17.10	7.28	34.43	46.00	11.57	V	160	201
615.16	9.96	18.48	7.75	36.19	46.00	9.81	H	295	220
708.60	8.23	20.44	8.38	37.05	46.00	8.95	H	332	192
778.75	7.42	20.54	8.83	36.79	46.00	9.21	H	200	210



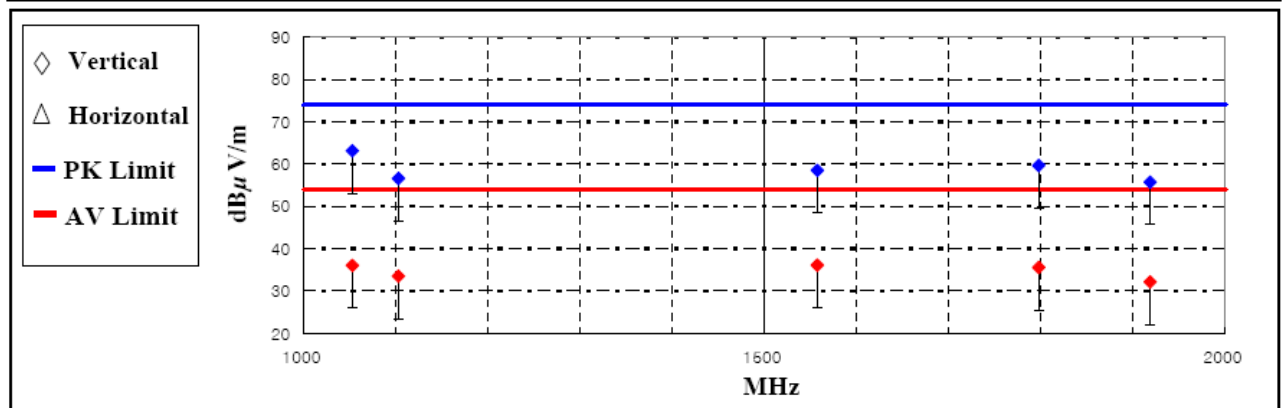
< Fig 6. Radiated emission result (30 MHz ~ 1 000 MHz)>



◆ Operating Condition: 1 920 * 1 080 / 60 Hz (RGB: Analog mode)

Detector mode: Peak detector mode / Average detector mode

Frequency (MHz)	Measurement Level						Limit (dBμ V/m)		Margin (dB)		Positioning System		
	Reading Value (dBμ V/m)		AF	AMP / CL	Test Result (dBμ V/m)						Pol.	Height	Angle
	Peak	Average	(dB/m)	(dB)	Peak	Average	Peak	Average	Peak	Average	(H/V)	(cm)	(°)
1052.40	79.08	51.98	24.96	-40.94	63.10	36.00	74.00	54.00	10.90	18.00	V	106	280
1102.40	72.42	49.32	25.05	-40.87	56.60	33.50	74.00	54.00	17.40	20.50	V	200	301
1557.20	72.66	50.26	25.81	-39.97	58.50	36.10	74.00	54.00	15.50	17.90	V	113	177
1797.60	73.13	49.03	26.03	-39.56	59.60	35.50	74.00	54.00	14.40	18.50	V	127	180
1918.40	68.93	45.33	26.15	-39.38	55.70	32.10	74.00	54.00	18.30	21.90	V	100	180



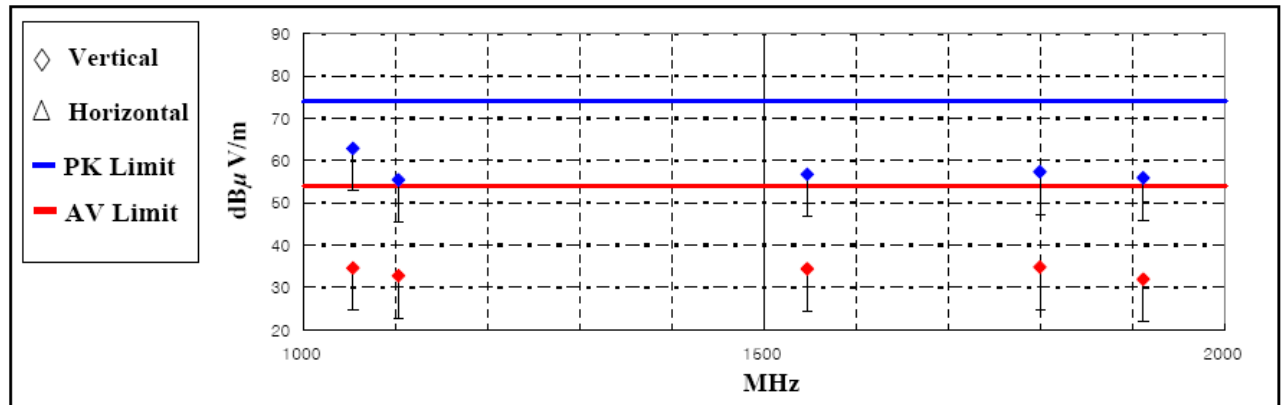
*Comment : AMP/CL_Cable loss value + AMP gain value
AF : Antenna factor value
Pol. : H(Horizontal), V(Vertical)

< Fig 7. Radiated emission result (1 000 MHz ~ 2 000 MHz)>



- ◆ Operating Condition: 1 920 * 1 080 / 60 Hz (HDMI: Digital mode)
Detector mode: Peak detector mode / Average detector mode

Frequency (MHz)	Measurement Level						Limit (dBμ V/m)		Margin (dB)		Positioning System		
	Reading Value (dBμ V/m)		AF	AMP / CL	Test Result (dBμ V/m)						Pol.	Height	Angle
	Peak	Average	(dB/m)	(dB)	Peak	Average	Peak	Average	Peak	Average	(H/V)	(cm)	(°)
1053.20	78.78	50.58	24.96	-40.94	62.80	34.60	74.00	54.00	11.20	19.40	V	100	192
1102.40	71.22	48.52	25.05	-40.87	55.40	32.70	74.00	54.00	18.60	21.30	V	200	246
1546.40	70.88	48.58	25.80	-39.98	56.70	34.40	74.00	54.00	17.30	19.60	V	134	177
1798.80	70.82	48.32	26.04	-39.56	57.30	34.80	74.00	54.00	16.70	19.20	V	116	180
1910.80	69.16	45.16	26.14	-39.40	55.90	31.90	74.00	54.00	18.10	22.10	V	100	192



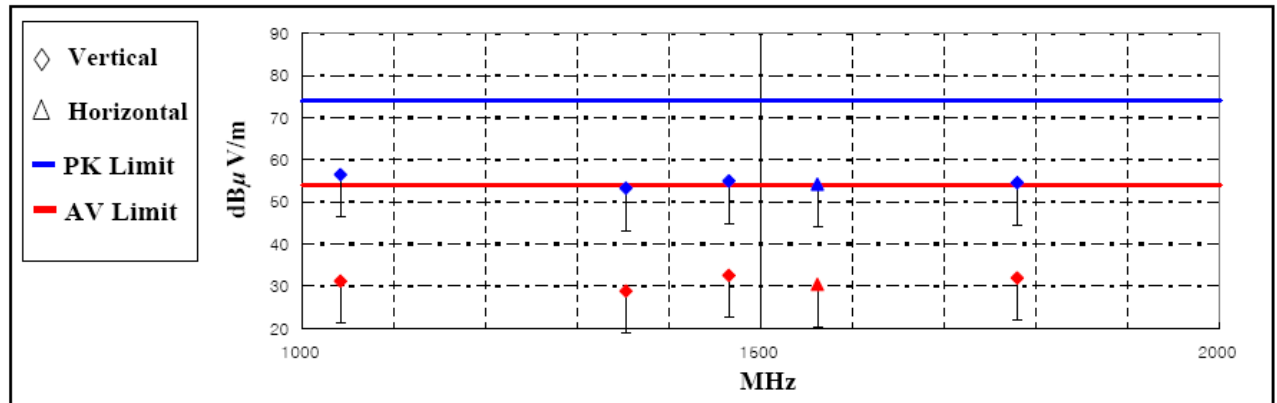
*Comment : AMP/CL_Cable loss value + AMP gain value
AF : Antenna factor value
Pol. : H(Horizontal), V(Vertical)

< Fig 8. Radiated emission result (1 000 MHz ~ 2 000 MHz)>



- ◆ Operating Condition: USB play mode
Detector mode: Peak detector mode / Average detector mode

Frequency (MHz)	Measurement Level						Limit (dBμ V/m)		Margin (dB)		Positioning System		
	Reading Value (dBμ V/m)		AF	AMP / CL	Test Result (dBμ V/m)						Pol.	Height	Angle
	Peak	Average	(dB/m)	(dB)	Peak	Average	Peak	Average	Peak	Average	(H/V)	(cm)	(°)
1041.20	72.42	47.22	24.94	-40.96	56.40	31.20	74.00	54.00	17.60	22.80	V	199	192
1352.40	68.12	43.72	25.49	-40.41	53.20	28.80	74.00	54.00	20.80	25.20	V	183	188
1464.80	69.32	46.92	25.69	-40.11	54.90	32.50	74.00	54.00	19.10	21.50	V	100	195
1561.20	68.36	44.56	25.81	-39.97	54.20	30.40	74.00	54.00	19.80	23.60	H	310	201
1779.20	68.06	45.46	26.02	-39.58	54.50	31.90	74.00	54.00	19.50	22.10	V	100	180



*Comment : AMP/CL_Cable loss value + AMP gain value
AF : Antenna factor value
Pol. : H(Horizontal), V(Vertical)

< Fig 9. Radiated emission result (1 000 MHz ~ 2 000 MHz)>



7. Sample Calculations

$$\begin{aligned} \text{dB}\mu\text{V} &= 20 \text{ Log}_{10}(\mu\text{V}/\text{m}) \\ \text{dB}\mu\text{V} &= \text{dBm} + 107 \\ \mu\text{V} &= 10^{(\text{dB}\mu\text{V}/20)} \end{aligned}$$

7.1 Example 1 :

■ 20.3 MHz

Class B Limit	=	250 μV	=	48 dB μV
Reading	=	- 67.8 dBm(Calibrated level)		
Convert to dB μV	=	- 67.8 dBm + 107	=	39.2 dB μV
$10^{(39.2\text{dB}\mu\text{V}/20)}$	=	91.2 μV		
Margin	=	39.2 – 48	=	-8.8
	=	8.8 dB below Limit		

7.2 Example 2 :

■ 66.7 MHz

Class B Limit	=	100 $\mu\text{V}/\text{m}$	=	40.0 dB $\mu\text{V}/\text{m}$
Reading	=	- 76.0 dBm(Calibrated level)		
Convert to dB $\mu\text{V}/\text{m}$	=	- 76.0 dBm + 107	=	31.0 dB $\mu\text{V}/\text{m}$
Antenna Factor + Cable Loss	=	5.8 dB		
Total	=	36.8 dB $\mu\text{V}/\text{m}$		
Margin	=	36.8 – 40.0	=	-3.2
	=	3.2 dB below Limit		



8. Recommendation & conclusion

The data collected shows that the **LG Electronics Inc. LCD TV/Monitor (Model Name: 37LH55-UA)** was complies with §15.107 and 15.109 of the FCC Rules.