

 ESTECH Co., Ltd. 3rd Fl., Chungdam Bldg., 119-1 Chungdam-dong, Kangnamgu, Seoul	   	Electromagnetic Interference Test Report
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Compliance Test Report for FCC

Report Number		ESTF150409-003			
Applicant	Company name	LG Electronics USA			
	Address	2000 Millbrook Dr Lincolnshire, IL 60069 United states			
	Telephone	847-941-8373			
Product	Product name	PLASMA MONITOR			
	Model No.	MU-60PZ95V	Manufacturer	LG Electronics Inc.	
	Serial No.	NONE	Country of origin	KOREA	
Test date	2004-09-06~2004-09-15		Date of issue	2004-09-15	
Testing location	ESTECH. Co., Ltd. 97-1 Hoiuk-Ri Majang-Myon, Icheon-city, KyungKi-Do, Korea				
Standard	FCC PART 15 2002 , ANSI C 63.4 2001				
Test item	☒ Conducted Emission	☐ Class A	☒ Class B	Test result	OK
	☒ Radiated Emission	☐ Class A	☒ Class B	Test result	OK
Measurement facility registration number		94696			
Tested by	Senior Engineer J.M. Yang		(Signature)		
Reviewed by	Director T.K. Lee		(Signature)		
Abbreviation	OK, Pass = Passed, Fail = Failed, N/A = not applicable				
* Note - This test report is not permitted to copy partly without our permission - This test result is dependent on only equipment to be used - This test result based on a single evaluation of one sample of the above mentioned					

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1. Laboratory Information

1.1 General

This EUT (Equipment Under Test) has been shown to be capable of compliance with the applicable technical standards and is tested in accordance with the measurement procedures as indicated in this report.

ESTECH Lab attests to accuracy of test data. All measurement reported herein were performed by ESTECH Co., Ltd.

ESTECH Lab assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

1.2 Test Lab.

Corporation Name : ESTECH Co. Ltd

Head Office : 3 rd Fl., Chungdam Bldg., 119-1 Chungdam-dong Kangnam-gu , Seoul, Korea
(Safety & Telecom. Test Lab)

EMC Test Lab : 58-1 Osan-Ri, GaNam-Myon, YeoJoo-Gun, KyungKi-Do, Korea
97-1 Hoiuk-Ri Majang-Myon, Icheon-city, KyungKi-Do, Korea

1.3 Official Qualification(s)

MIC : Granted Accreditation from Ministry of Information & Communication for EMC, Safety and Telecommunication

KOLAS : Accredited Lab By Korea Laboratory Accreditation Schema base on CENELEC requirements

FCC : Filed Laboratory at Federal Communications Commission

VCCI : Granted Accreditation from Voluntary Control Council for Interference from ITE

2. Description of EUT

2.1 Summary of Equipment Under Test

Product : PLASMA MONITOR
 Model Number : MU-60PZ95V
 Serial Number : NONE
 Manufacturer : LG Electronics Inc.
 Country of origin : KOREA
 Rating : AC120V / 60Hz
 Receipt Date : 2004-09-06

2.2 General descriptions of EUT

MODELS	MU-60PZ95V
Width (inches / mm)	57.3 / 1455
Height (inches / mm)	84.3 / 883
Depth (inches / mm)	3.9 / 99
Weight (pounds / kg)	144 / 65.3
Power requirement	AC120V, 60Hz
Resolution	1366 x 768 (Dot)
Color	16,770,000 (256 steps of each R, G and B)
Operating Temperature Range	32 ~ 104°F (0 ~ 40°C)
Operating Humidity Range	Less than 80%
Maximum Elevation	6561 feet (2000m)

Monitor Display Specifications (RGB-PC / DVI-PC Mode)

Resolution	Horizontal Frequency(KHz)	Vertical Frequency(Hz)	Resolution	Horizontal Frequency(KHz)	Vertical Frequency(Hz)
640x350	31.468	70.09	852x480	31.500	60.00
	37.861	85.08		35.000	70.00
720x400	31.469	70.08	1024x768	37.500	75.00
	37.927	85.03		48.363	60.00
640x480	31.469	59.94	1152x864	56.476	70.06
	35.000	66.66		60.023	75.02
	37.861	72.80		54.348	60.05
	37.500	75.00		63.995	70.01
800x600	43.269	85.00	1280x960	67.500	75.00
	35.156	56.25		60.000	60.00
	37.879	60.31		1280x1024	63.981
	46.875	75.00		1360x768	47.700
832x624	53.674	85.06	1366x768	59.625	75.02
	49.725	74.55		47.700	60.00
848x480	31.500	60.00		59.625	75.02
	35.000	70.00			
	37.500	75.00			

Using OSC : 13.5Mhz/14.318Mhz/20.250Mhz/18.432Mhz/20Mhz

3. Test Standards

Test Standard : FCC PART 15 (2002)

This Standard sets out the regulations under which an intentional, unintentional, or incidental radiator may be operated without an individual license. It also contains the technical specifications, administrative requirements and other conditions relating to the marketing of Part 15 devices.

Test Method : ANSI C 63.4 (2001)

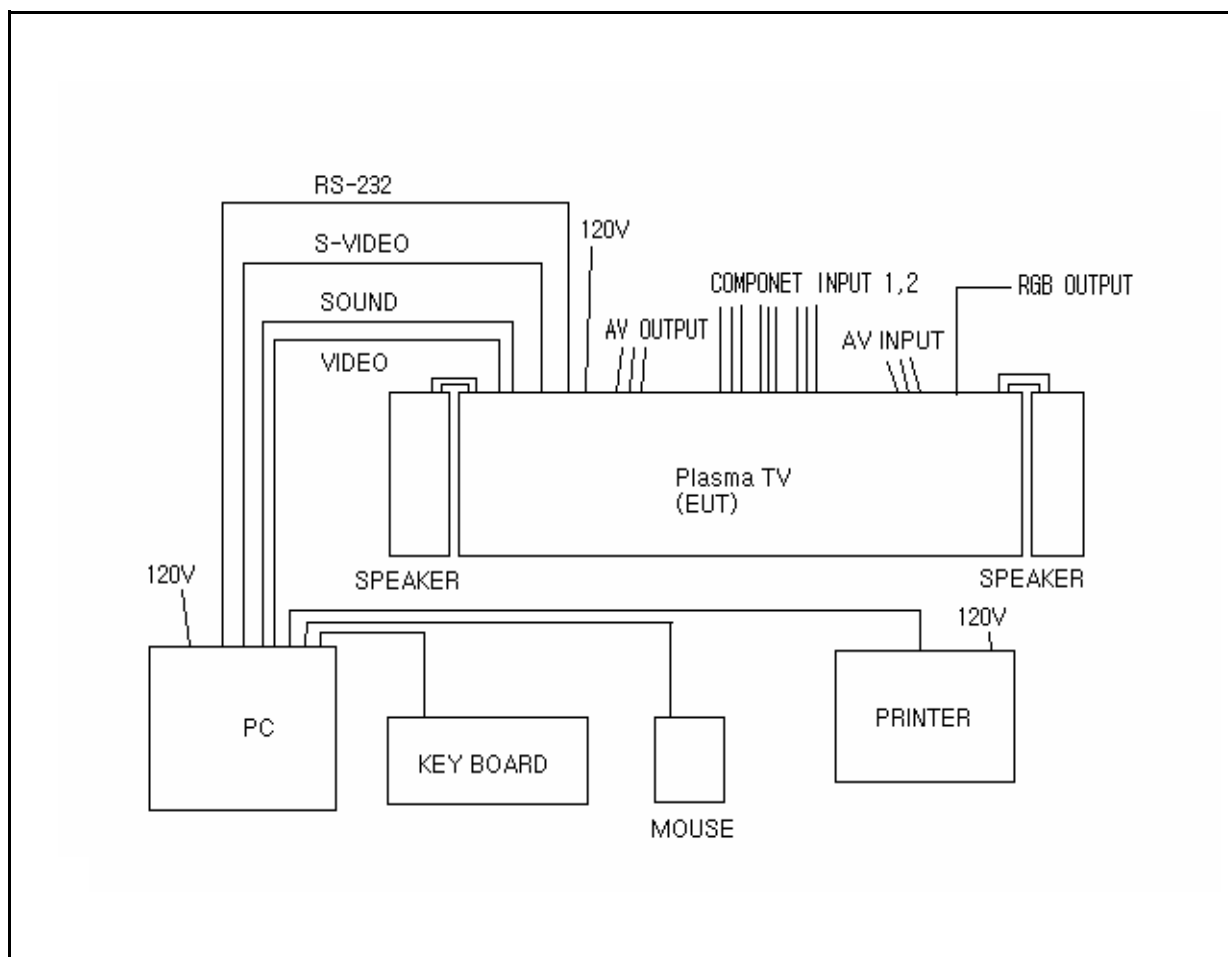
This standard sets forth uniform methods of measurement of radio-frequency (RF) signals and noise emitted from both unintentional and intentional emitters of RF energy in the frequency range 9 kHz to 40 GHz. Methods for the measurement of radiated and AC power-line conducted radio noise are covered and may be applied to any such equipment unless otherwise specified by individual equipment requirements. These methods cover measurement of certain devices that deliberately radiate energy, such as intentional emitters, but does not cover licensed transmitters. This standard is not intended for certification/approval of avionic equipment or for industrial, scientific, and medical (ISM) equipment. These methods apply to the measurement of individual units or systems comprised of multiple units.

4. Measurement Condition

4.1 EUT Operation.

- * The EUT was in the following operation mode during all testing
- * The operational conditions of the EUT was determined by the manufacturer according to the typical use of the EUT with respect to the expected highest level of emission
- * After setting as test arrangement diagram, we tested the EUT under continuous displaying "H" character and playing Audio out /Video

4.2 Configuration and Peripherals



4.3 EUT and Support equipment

Equipment Name	Model Name	S/N	Manufacturer	Remark (FCC ID)
Plasma TV	RU-60PZ61	NONE	LG Electronics Inc.	EUT
PC	HP PAVILION M000	KRF35200YM	TG	-
KEY BOARD	SEM-DT35	32006557	SAMSUNG ELECTRIC.	-
MOUSE	M-S48a	HCA11804896	LOGITECH	-
PRINTER	LQ-570H+	B1021095782	SAMBO	-
SPEAKER	AP-60SA61	106MJ00034	LG Electronics Inc.	-
SPEAKER	AP-60SA61	106MJ00034	LG Electronics Inc.	-
				-

4.4 Cable Connecting

Start Equipment		End Equipment		Cable Standard		Remark
Name	I/O port	Name	I/O port	Length	Shielded	
Plasma TV	RGB Input	PC	VIDEO-OUTPUT	2.0	Y	-
Plasma TV	Audio Input	PC	AUDIO-OUTPUT	2.0	Y	-
Plasma TV	RS-232C	PC	SERIAL	2.0	N	-
Plasma TV	S-VIDEO INPUT	PC	S-VIDEO-OUTPUT	2.0	Y	-
Plasma TV	EXTERNAL SPEAKER	SPEAK	-	3.0	N	-
Plasma TV	EXTERNAL SPEAKER	SPEAK	-	3.0	N	-
Plasma TV	DVI - INPUT	-	-	2.0	Y	-
Plasma TV	AV - INPUT	-	-	4.0	Y	-
Plasma TV	AV - OUTPUT	-	-	4.0	Y	-
Plasma TV	COMPONET1	-	-	4.0	Y	-
Plasma TV	RGB OUPUT	-	-	2.0	Y	-
Plasma TV	COMPONET2	-	-	4.0	Y	-
PC	PS/2 MOUSE	MOUSE	PS/2 MOUSE	2.0	N	-
PC	PS/2 KEY BOARD	KEY BOARD	PS/2 KEY BOARD	2.0	N	-
PC	PARALLEL	PRINTER	PARALLEL	2.0	Y	-

5. Measurement of radiated disturbance

Above 30 MHz Electric Field strength was measured in accordance with FCC Part 15 (2002) & ANSI C 63.4 (2001). The test setup was made according to FCC Part 15 (2002) & ANSI C 63.4 (2001) on an open test site, which allows a 3m distance measurement. The EUT was placed in the center of wooden turntable. The height of this table was 0.8m. The measurement was conducted with both horizontal and vertical antenna polarization. The turntable has fully rotated. For further description of the configuration refer to the picture of the test set-up.

5.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
Receiver	ESVS10	Rohde & Schwarz	838562/002	2005.1.12
Spectrum Analyzer	R3261B	ADVANTEST	1720302	2005.2.12
LogBicon Antenna	VULB 9160	S/B	3142	2005.7.06
Horn Antenna	BBHA 9120 D	SCHWARZBECK	352	2006.4.06
Turn Table	2087	EMCO	2129	–
Antenna Mast	2070-01	EMCO	9702-203	–
ANT Mast Controller	2090	EMCO	1535	–
Turn Table Controller	2090	EMCO	1535	–

5.2 Environmental Condition

Test Place : Open site(3m)
 Temperature (°C) : 28 °C
 Humidity (%) : 46 %

5.3 Test data

Measurement Distance : 3 m

Frequency (MHz)	Reading (dB μ V)	Position (V/H)	Height (m)	Correction Factor		Result Value		
				Ant Factor (dB)	Cable (dB)	Limit (dB μ V/m)	Result (dB μ V/m)	Margin (dB μ V/m)
31.32	20.60	V	1.0	12.25	0.9	40.0	33.74	-6.26
59.62	17.10	H	2.7	12.45	1.1	40.0	30.67	-9.33
60.80	13.40	V	1.0	12.68	1.2	40.0	27.23	-12.77
110.61	11.30	V	1.0	11.08	1.6	43.5	23.98	-19.52
141.24	11.80	V	1.0	13.37	1.9	43.5	27.03	-16.47
163.90	20.90	H	1.8	13.91	2.0	43.5	36.81	-6.69
188.71	20.80	H	1.6	12.57	2.1	43.5	35.46	-8.04
196.61	22.10	H	1.5	11.24	2.2	43.5	35.54	-7.96
202.41	20.10	V	1.0	10.44	2.2	43.5	32.73	-10.77
237.61	14.10	H	1.3	11.42	2.4	46.0	27.90	-18.10
254.19	10.90	V	1.0	12.01	2.4	46.0	25.30	-20.70
257.39	16.30	H	1.2	12.09	2.4	46.0	30.79	-15.21
288.14	13.20	H	1.0	12.98	2.6	46.0	28.79	-17.21
308.71	9.10	H	1.0	13.38	2.7	46.0	25.21	-20.79
348.33	10.10	V	1.0	14.27	2.9	46.0	27.23	-18.77
400.19	8.30	H	1.0	15.32	3.2	46.0	26.77	-19.23
507.51	12.30	H	1.4	17.16	3.6	46.0	33.01	-12.99
557.60	8.90	H	1.0	18.11	3.7	46.0	30.75	-15.25
624.58	12.30	H	1.0	19.27	4.0	46.0	35.58	-10.42
772.17	15.10	H	1.0	21.53	4.5	46.0	41.17	-4.83
819.53	13.10	H	1.0	21.90	4.7	46.0	39.73	-6.27
Remark	H : Horizontal, V : Vertical TEST MODE ; Resolution 1280 X 1024 (60Hz)							

5.3 Test data

Measurement Distance : 3 m

Frequency (MHz)	Reading (dB μ V)	Position (V/H)	Height (m)	Correction Factor		Result Value		
				Ant Factor (dB)	Cable (dB)	Limit (dB μ V/m)	Result (dB μ V/m)	Margin (dB μ V/m)
31.31	18.40	H	3.0	12.25	0.9	40.0	31.54	-8.46
47.24	16.90	H	3.0	12.77	1.0	40.0	30.68	-9.32
59.62	15.10	V	1.0	12.45	1.1	40.0	28.67	-11.33
110.61	13.40	H	2.4	11.08	1.6	43.5	26.08	-17.42
135.01	13.60	H	2.2	12.69	1.7	43.5	28.01	-15.49
163.91	21.10	H	1.6	13.91	2.0	43.5	37.01	-6.49
190.30	18.20	H	1.4	11.11	2.2	43.5	31.49	-12.01
196.12	19.70	V	1.0	11.23	2.2	43.5	33.13	-10.37
196.61	20.10	H	1.4	11.24	2.2	43.5	33.54	-9.96
202.39	17.20	H	1.4	10.44	2.2	43.5	29.83	-13.67
237.61	13.40	H	1.3	11.42	2.4	46.0	27.20	-18.80
257.38	17.20	H	1.2	12.09	2.4	46.0	31.69	-14.31
288.14	13.20	H	1.0	12.98	2.6	46.0	28.79	-17.21
329.79	9.60	H	1.0	13.86	2.8	46.0	26.25	-19.75
394.36	9.30	V	1.0	15.20	3.1	46.0	27.60	-18.40
405.00	8.40	H	1.0	15.43	3.2	46.0	27.00	-19.00
527.43	10.30	H	1.0	17.46	3.6	46.0	31.35	-14.65
616.75	12.80	H	1.2	19.19	4.0	46.0	35.99	-10.01
662.06	9.30	H	1.0	19.77	4.2	46.0	33.22	-12.78
772.15	15.10	H	1.0	21.53	4.5	46.0	41.17	-4.83
819.52	13.20	V	1.3	21.90	4.7	46.0	39.83	-6.17
Remark	H : Horizontal, V : Vertical TEST MODE ; Resolution 1024 X 768 (75Hz)							

5.3 Test data

Measurement Distance : 3 m

Frequency (MHz)	Reading (dB μ V)	Position (V/H)	Height (m)	Correction Factor		Result Value		
				Ant Factor (dB)	Cable (dB)	Limit (dB μ V/m)	Result (dB μ V/m)	Margin (dB μ V/m)
31.32	19.30	H	2.9	12.25	0.9	40.0	32.44	-7.56
41.52	15.20	H	2.8	12.72	1.0	40.0	28.93	-11.07
59.62	16.30	H	2.8	12.45	1.1	40.0	29.87	-10.13
61.79	14.10	V	1.0	12.69	1.2	40.0	27.95	-12.05
110.69	13.40	V	1.0	11.08	1.6	43.5	26.08	-17.42
137.80	13.40	V	1.0	12.72	1.7	43.5	27.86	-15.64
163.92	19.80	H	1.8	13.91	2.0	43.5	35.71	-7.79
188.76	20.30	H	1.6	12.57	2.1	43.5	34.96	-8.54
196.61	21.10	H	1.5	11.24	2.2	43.5	34.54	-8.96
201.18	21.90	H	1.4	10.41	2.2	43.5	34.49	-9.01
236.89	15.60	H	1.4	11.40	2.4	46.0	29.38	-16.62
288.14	14.10	H	1.2	12.98	2.6	46.0	29.69	-16.31
314.34	9.70	H	1.1	13.50	2.8	46.0	25.96	-20.04
386.57	7.70	H	1.0	15.03	3.1	46.0	25.80	-20.20
507.51	12.30	H	1.0	17.16	3.6	46.0	33.01	-12.99
637.03	11.70	H	1.0	19.46	4.0	46.0	35.20	-10.80
772.17	15.20	H	1.0	21.53	4.5	46.0	41.27	-4.73
819.53	13.10	V	1.3	21.90	4.7	46.0	39.73	-6.27
Remark	H : Horizontal, V : Vertical TEST MODE ; Resolution 800 X 600 (75Hz)							

6. Measurement of conducted disturbance

The continuous disturbance voltage of AC Mains in the frequency from 0.15 to 30 MHz was measured in accordance to FCC Part 15 (2002) & ANSI C 63.4 (2001). The test setup was made according to FCC Part 15 (2002) & ANSI C 63.4 (2001) in a shielded. The EUT was placed on a non-conductive table at least 80 above the ground plane. A grounded vertical reference plane was positioned in a distance of 40cm from the EUT. The distance from the EUT to other metal surfaces was at least 0.8m. The EUT was only earthen by its power cord through the line impedance stabilizing network. The power cord has been bundled to a length of 1.0m.. The test receiver with Quasi Peak detector complies with CISPR 16.

6.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
LISN	ESH3-Z5	Rohde & Schwarz	838979/010	2005. 2. 12
LISN	NNLA8120A	Schwarzbeck	NONE	2005. 2. 12
TEST Receive	ESPC	Rohde & Schwarz	838248/001	2005. 1. 29
Pulse Limiter	ESH3Z2	Rohde & Schwarz	NONE	2005. 6. 15

6.2 Environmental Condition

Test Place : Shield Room
 Temperature (°C) : 24°C
 Humidity (%) : 45 %

6.3 Test data

Frequency (MHz)	Correction Factor		Line (H/N)	Quasi-peak Value			Average Value		
	Lisn (dB)	Cable (dB)		Limit (dB μ V)	Reading (dB μ V)	Result (dB μ V)	Limit (dB μ V)	Reading (dB μ V)	Result (dB μ V)
0.179	0.07	0.0	N	64.54	52.30	52.39	54.54	41.02	41.11
0.186	0.07	0.0	N	64.21	42.80	42.89	54.21		
0.260	0.07	0.1	N	61.43	33.58	33.72	51.43		
0.286	0.07	0.1	H	60.64	28.54	28.70	50.64		
0.322	0.07	0.1	N	59.65	29.58	29.76	49.65		
0.358	0.07	0.1	N	58.79	37.66	37.86	48.79		
0.532	0.07	0.2	N	56.00	40.80	41.07	46.00		
0.537	0.07	0.2	N	56.00	42.56	42.83	46.00		
0.894	0.09	0.2	N	56.00	47.27	47.56	46.00	34.23	33.94
1.249	0.09	0.2	N	56.00	47.74	48.06	46.00	33.80	33.48
1.612	0.10	0.3	N	56.00	38.11	38.47	46.00		
1.967	0.11	0.3	N	56.00	39.90	40.31	46.00		
6.605	0.26	0.4	N	60.00	26.37	27.01	50.00		
7.503	0.29	0.4	N	60.00	25.50	26.23	50.00		
12.394	0.48	0.7	N	60.00	41.00	42.18	50.00		
13.316	0.53	0.7	N	60.00	41.95	43.21	50.00		
18.908	0.68	0.8	N	60.00	28.93	30.41	50.00		
20.476	0.71	0.8	H	60.00	28.35	29.87	50.00		
Remark	H : Hot Line, N : Neutral Line								



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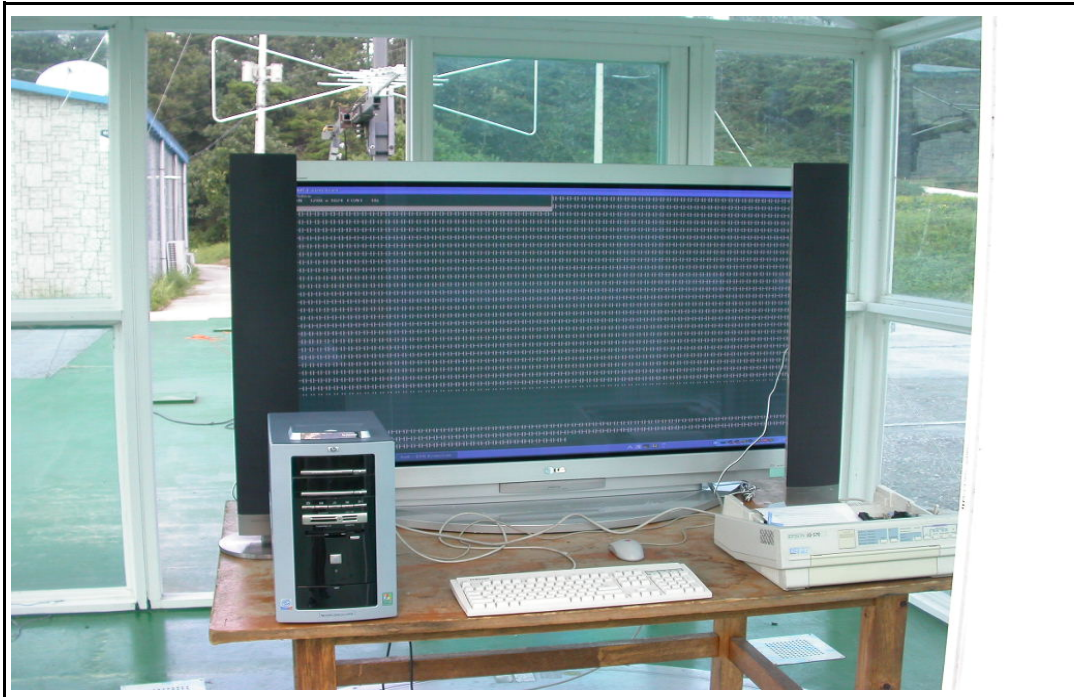


**Electromagnetic
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Test Report**

7. Photographs of test setup

7.1 Setup for Radiated Test : 30 ~ 1000 MHz

[Front]

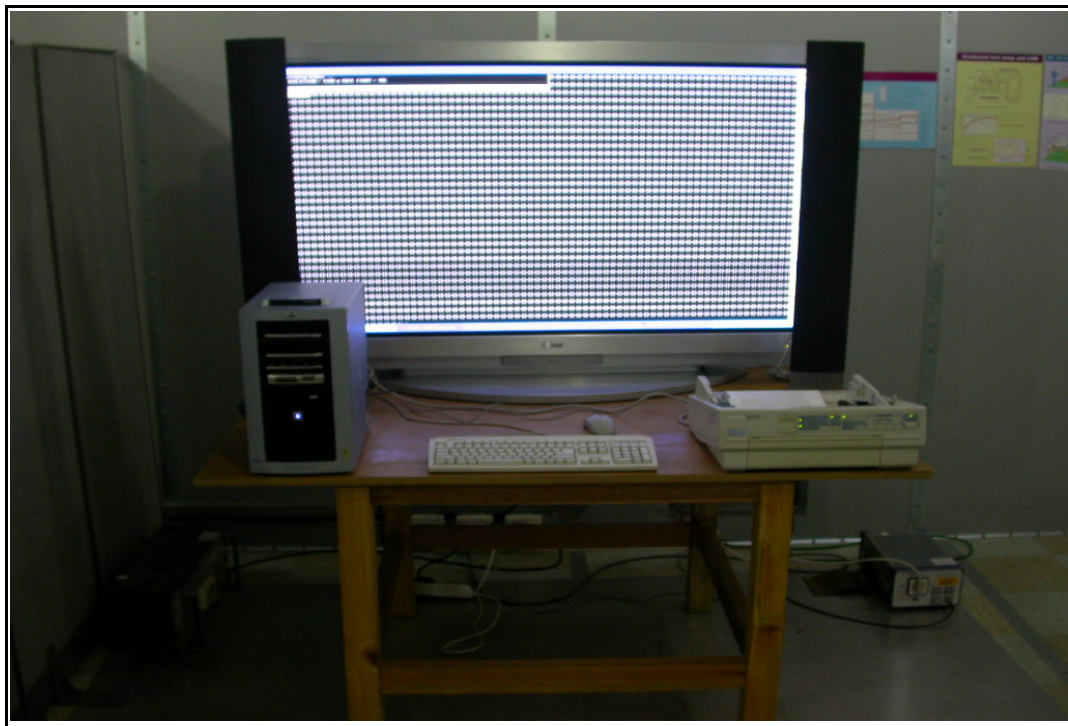


[Rear]



7.2 Setup for Conducted Test : 0.15 ~ 30 MHz

[Front]



[Rear]



8. Photographs of EUT

[Front]



[Rear]



Appendix 1. Spectral diagram

*HOT

13 Sep 2004 18:51

ESTECH

HOT

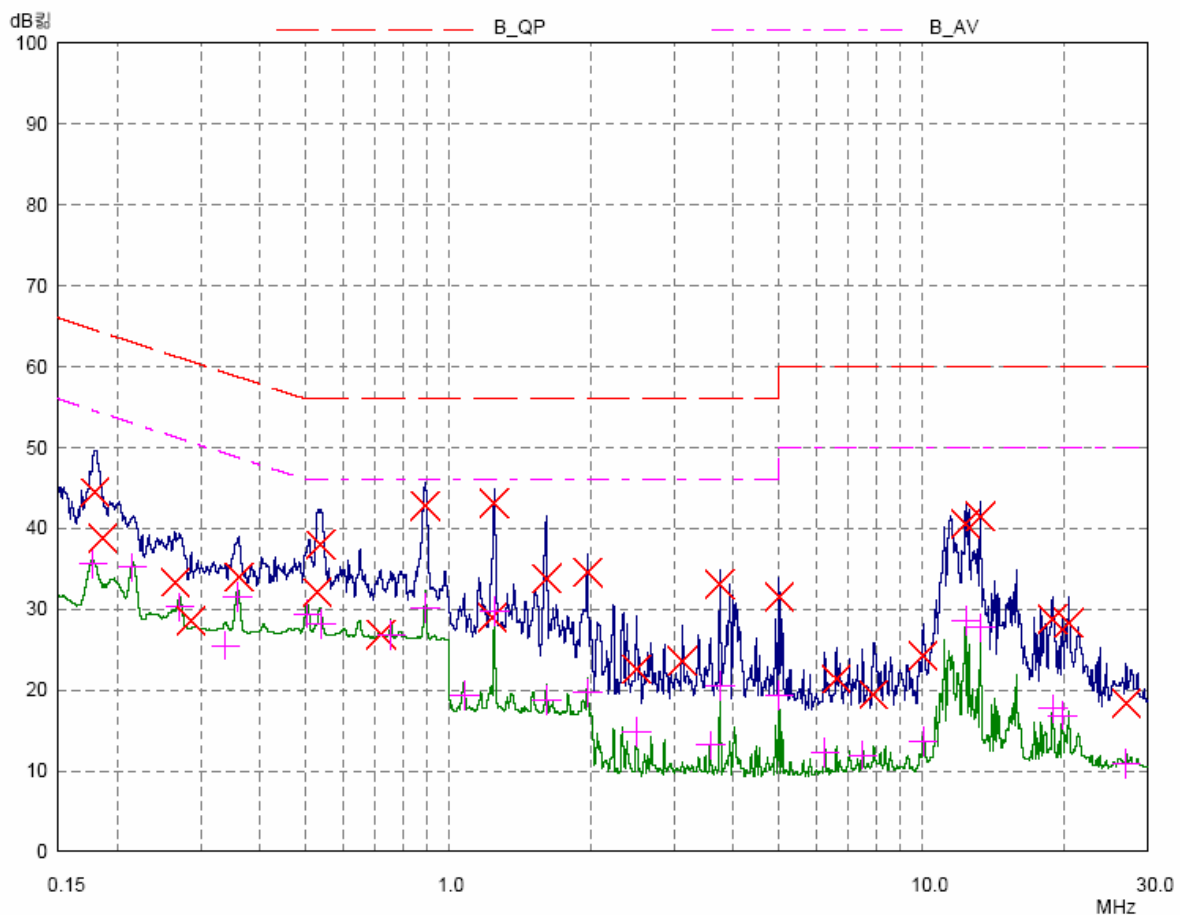
EUT: MU-60PZ95V
Manuf: LG Electronics USA
Op Cond: 120V
Operator: Senior Engineer J.M. Yang
Test Spec: CLASS B
Comment:

File: 1065_h.dat : LG Electronics USA

Scan Settings (1 Range)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	OpRge
150kHz	30MHz	0.8%	10kHz	PK+AV	20msec	Auto	60dB

Final Measurement: X QP / + AV
Meas Time: 1sec
Subranges: 25
Acc Margin: 60 dB



*NETRUL

13 Sep 2004 18:43

ESTECH NEUTRAL

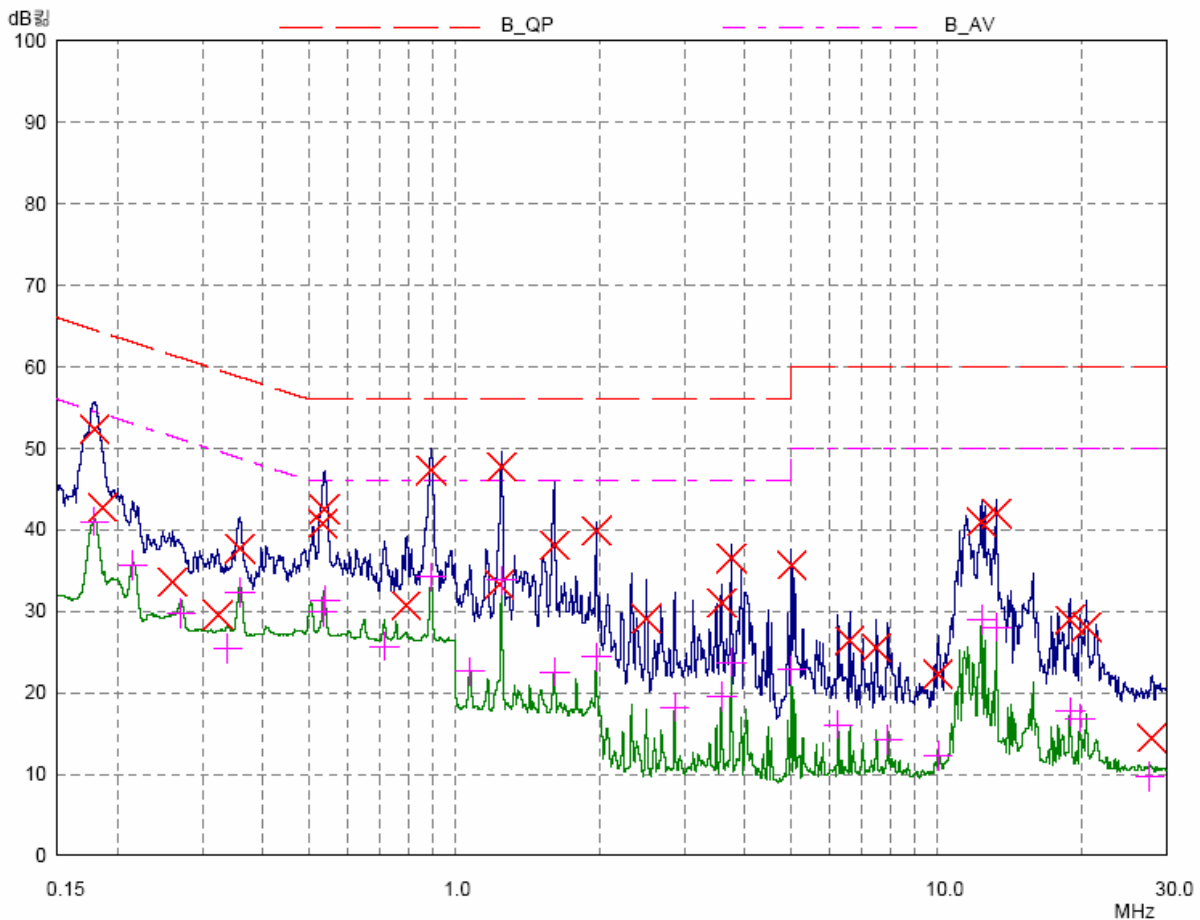
EUT: MU-60PZ95V
Manuf: LG Electronics USA
Op Cond: 120V
Operator: Senior Engineer J.M. Yang
Test Spec: CLASS B
Comment:

File: 1065_n.dat : LG Electronics USA

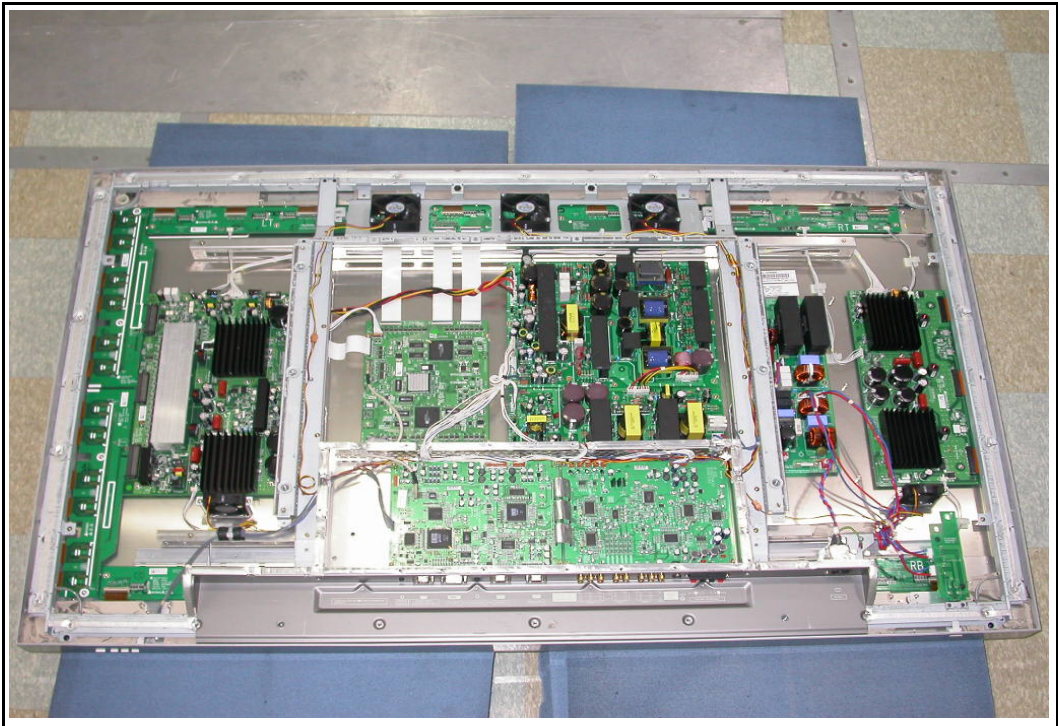
Scan Settings (1 Range)

Frequencies			Receiver Settings				
Start	Stop	Step	IF BW	Detector	M-Time	Atten	OpRge
150kHz	30MHz	0.8%	10kHz	PK+AV	20msec	Auto	60dB

Final Measurement: X QP / + AV
Meas Time: 1sec
Subranges: 25
Acc Margin: 60 dB



Appendix 2. Phorographs of EUT in side PCB



Appendix 4. Circuit Diagram