Certification of Compliance

CFR 47 Part 15 Subpart B

Test Report File No.	:	08-IST-0512 **Date of Issue** : September 2, 2008
Model Name(s)	:	C32HDHB, LA32L1, LA32L1B1LM, LA32L1B1SM, LA32L2, LA32L2BKLM
		LA32L2BKSM, LA32L2BRLM, LA32L2BRSM, LA32L2BSLM, LA32L2BSSM
		LA32L2BZLM, LA32L2BZSM
Kind of Product	:	32″ LCD Monitor
FCC ID	:	C5FLA32L1
Applicant	:	Daewoo Electronics Corporation.
Address	:	543, Dangjung-Dong, Kunpo-City, Kyounggi-DO, Korea
Manufacturer	:	Daewoo Electronics Corporation.
Address	:	295, Kongdan-dong, Kumi-city, Kyungsangbuk-do, Korea.

Test Result ■ **Positive** □ **Negative**

Reviewed By

S.J. Cho / EMC Group Manager

Approved By

B.S. Kim / Chief

Comment(s)

- Investigations requested : Measurement to the relevant clauses of FCC rules and regulations Part 15 Subpart B – Unintentional Radiators, Class B.
- The test report with appendix consists of 19 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 2003.

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INFORMATIONS OF TEST LABORATORY

EMC LABORATORY of IST Co., Ltd. ***(FCC Filing Lab.)***

400-19, Singal-Dong, Giheung-Gu, Yongin-Si,

Gyeonggi-Do, 446-599, Korea

TEL : +82 31 326 6700 FAX : +82 31 326 6797

ENVIRONMENTAL CONDITIONS

Temperature	21 ℃
Humidity	46 %
Atmospheric pressure	1016 mbar

POWER SUPPLY SYSTEM USED

Power supply system	120 Vac, 60 Hz (Refer to the product information)

PRODUCT INFORMATION

Power Source	110 ~ 220 V, 60 Hz
Power Consumption	120 W (Max.)
Screen Size	32”
Aspect Ratio	16:9
Resolution	1366 x 768(WXGA)
Pixel Pitch	170.25 um x 510.75 um x RGB
TV System	NTSC, ATSC
Dimension (WxHxD)	806 x 626.5 x 230 mm
Applied LCD panel	LC320WXN (LG Display) LTA320AB02 (Samsung Electronics Inc.)

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

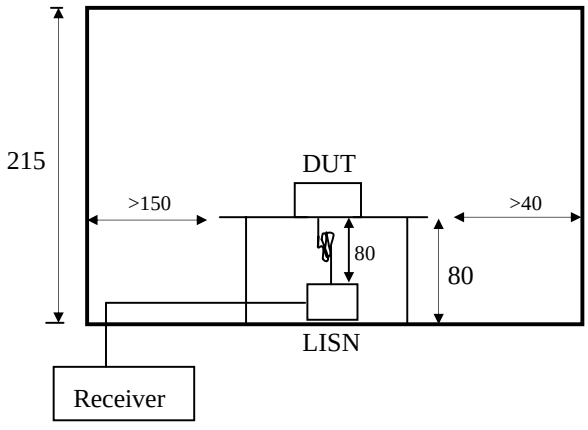
DESCRIPTIONS OF TEST

Conducted Emissions:

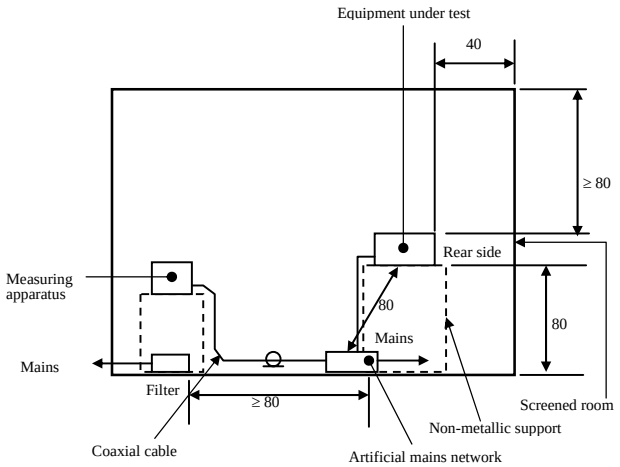
The measurement were performed over the frequency range of 0.15 MHz to 30 MHz using a 50 Ω/50 uH LISN as the input transducer to a Spectrum Analyzer or a Field Intensity Meter. The measurements were made with the detector set for "Peak" amplitude within a bandwidth of 10 KHz or for "quasi-peak" & "Average" within a bandwidth of 9 KHz.

-Procedure of Test

The line-conducted facility is located inside a shielded room No.1. A 1 m X 1.5 m wooden table 80cm height is placed 40 cm away from the vertical wall and 1.5 m away from the other wall of the shielded room. The Hyup-Rip KNW-407 and EMCO 3725/2 LISN are bonded to bottom of the shielded room. The EUT is located on the wooden table with distance more than 80 cm 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 ϕ 1.2 cm. 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 0.15 to 30 MHz. The bandwidth of the receiver was set to 10 kHz. The EUT, peripheral equipment, and interconnecting cables were arranged and manipulated to maximize each EME emission.



< Side View >



< Concept Drawing >

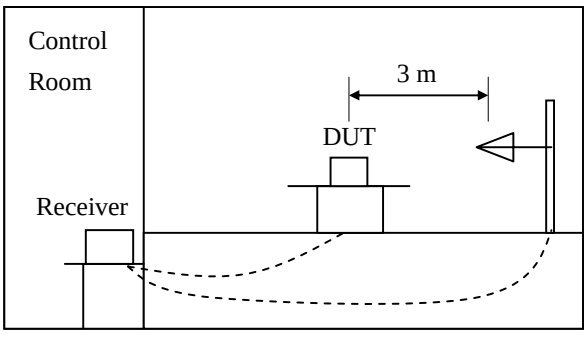
DESCRIPTION OF TEST

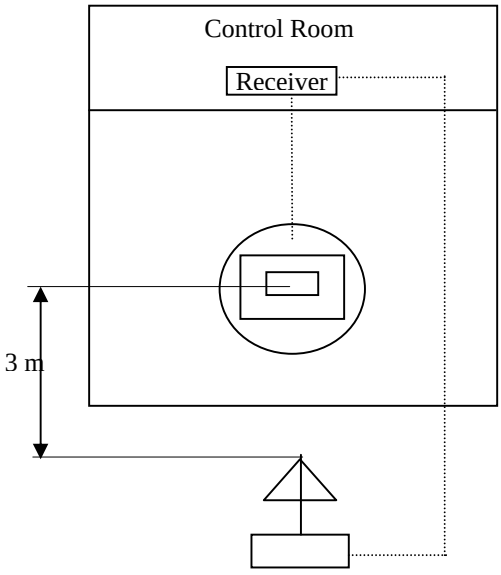
Radiated Emissions:

The measurement was performed over the frequency range of 30 MHz to 1 GHz 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 120 KHz.

-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 30 MHz to 1000 MHz using S/B bi-log 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 attenuation. 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 120 kHz or 1 MHz depending on the frequency of type of signal. The EUT, peripheral equipment and interconnecting cables were re-configured to the set-up producing the max. emission for the frequency and were placed on top of a 0.8-meter high nonmetallic 1 x 1.5 meter table. The EUT, peripheral equipment, and interconnecting cables were re-arranged and manipulated to maximize each emission. The turntable containing the system was rotated; the antenna height was varied 1 to 4 meters and stopped at the azimuth or height producing the maximum emission. Each emission was maximized by: varying the mode of operation to the EUT and/or peripheral equipment and changing the polarity of the antenna, whichever determined the worst-case emission.





Equipment Under Test

EUT Type :

■ Table-Top. ☐ Floor-Standing.

☐ Table-Top and Floor-Standing(Combination).

Operation – mode of the E.U.T. :

The equipment under test was operated during the measurement under following conditions :

☐ Standby Mode

■ Operational Condition : ■ 1280 x 1024, 60 Hz

The test results of followings are the representative of worst case emissions for the available resolution can be adjusted.
It is investigated the emission characteristic for RGB mode.

Configuration of the equipment under test :

Following peripheral devices and interface cables were connected during the measurement :

Equipment	Type	Brand	Serial No.	FCC Compliance Info.
PC	Dx7200 MT	HP	CNG60809T2	DoC
Keyboard	SK-2885	HP	N/A	DoC
PS/2 Mouse	M-UV96	HP	N/A	DoC
Printer	A0302380	Northern Telecom	2516S60951	DS46XU225C-L
Serial Mouse	M-M28	Logitech	LCA53305547	DZL210365
DVD Player	DRH-8105	Daewoo Electronics	N/A	DoC

Connecting Interface Cables :
- Unshielded AC power cable(without ferrite core) : 1.8 m
- Shielded monitor's signal cable (with two ferrite core) : 1.5 m
- Shielded Printer's signal cable (without ferrite core) : 1.8 m
- PC Audio In cable (without ferrite core) 1.5 m

Note :

SUMMARY

Emissions

■ Conducted Emission

The requirements are ● MET ○ Not MET
Minimum limit margin 8.23 dB at 0.202 MHz
Maximum limit exceeding
Remarks : Limits are kept with more 3dB margin.
With average detect mode and live phase(LG Display panel).
Find the test data in following pages 9-12.

■ Radiated Emission

The requirements are ● MET ○ Not MET
Minimum limit margin 3.79 dB at 918.01 MHz
Maximum limit exceeding
Remarks : Limits are kept with more 3dB margin(Samsung panel).
At 1280 x 1024, 60 Hz.
Find the test data in following pages 14-15.

Test Date

Begin of testing : August 5, 2008
End of testing : August 7, 2008

Prepared By

Note :

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

I.Y. Lee / Research Engineer

TEST CONDITIONS AND DATA

Conducted Emissions

[Applicable]

◆ Test Equipment Used

The test equipment used is calibrated in regular for every year.

Model Name	Manufacturer	Descriptions	Calibration Date	Serial Number
ESCI	Rohde & Schwarz	EMI Test Receiver	June 26, 2008	100373
KNW-407	Hyup-Rip	LISN	Oct. 11, 2007	8-833-10
ESH3-Z2	Rohde & Schwarz	Pulse Limiter	May 21, 2008	357.8810.52

◇ Auxiliary Equipment Used

Model Name	Manufacturer	Descriptions

◇ Accessories including cables

Name	Length	Port and Descriptions

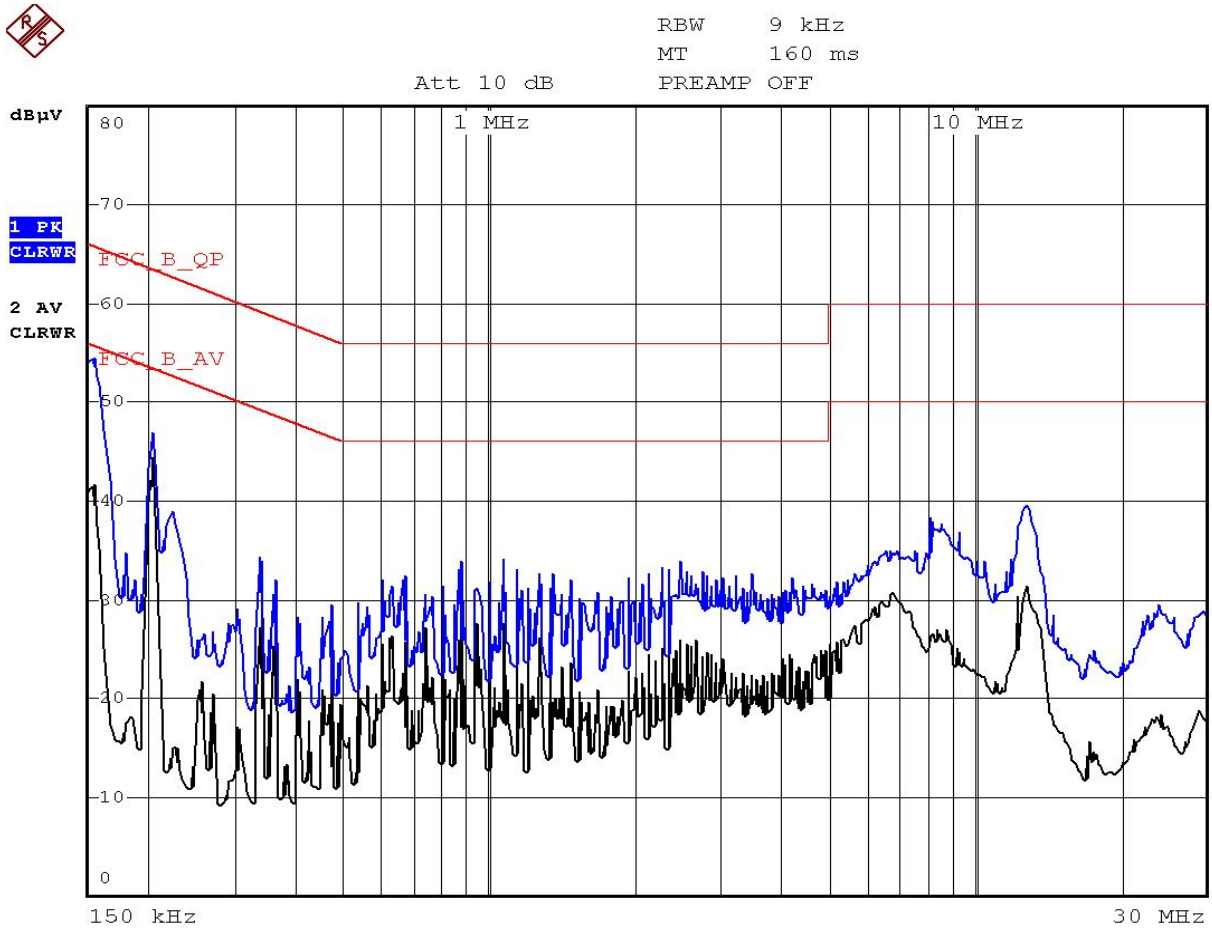
◆ Environmental Conditions

Temperature	21 ℃
Humidity	44 %
Atmosphere pressure	1016 mbar

◆ Test Program — See Test configuration page 6.
◆ Test Date — August 7, 2008
◆ Test Area — Conducted Room #1

Note : The equipment used is calibrated in regular for every year.
The test results of followings are the representative of the worst case emissions for resolutions that are available.

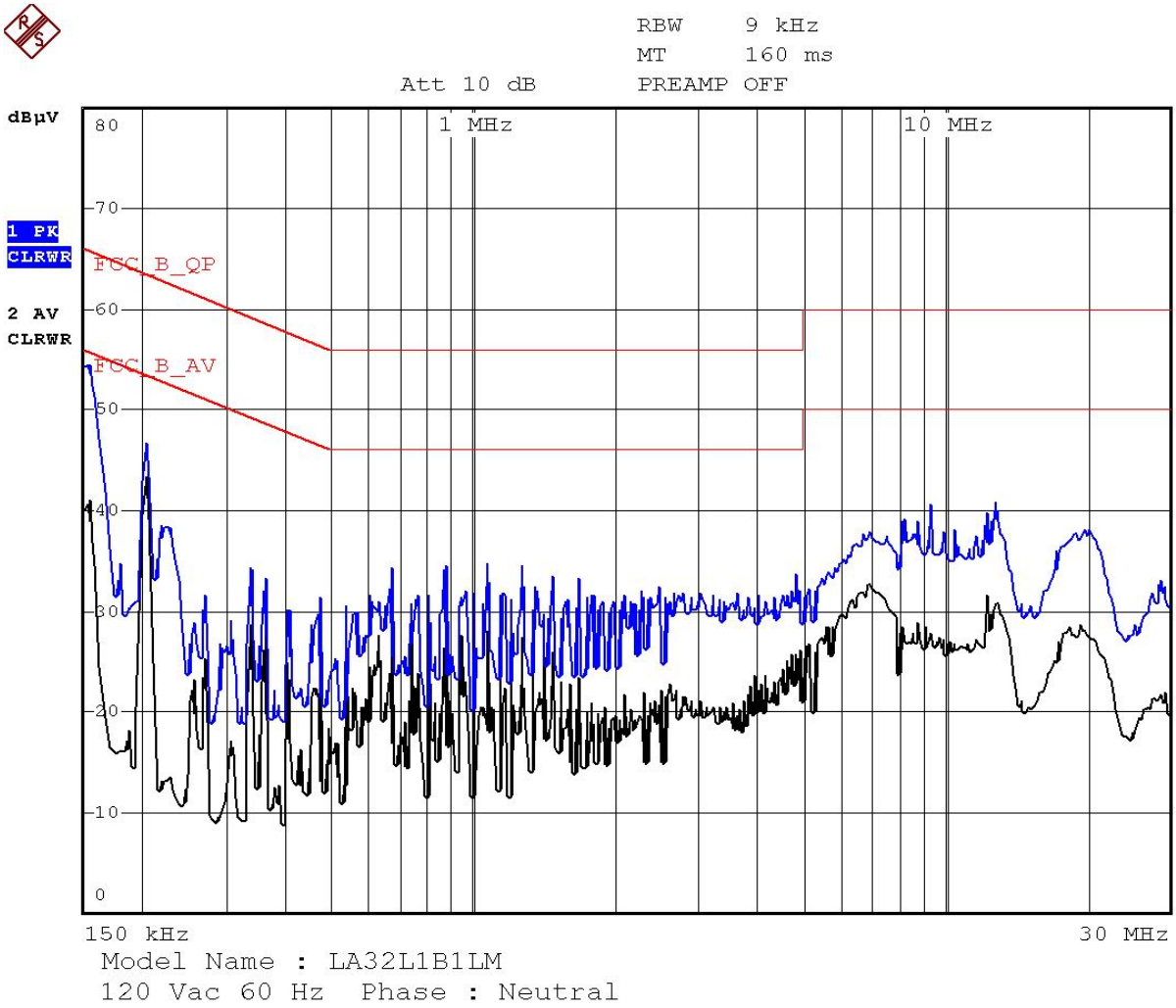
Conducted Emissions



Freq. [MHz]	Measurement [dB µV]		Limit [dB µV]		Insertion Loss	Cable Loss	Result [dB µV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	[dB]	[dB µV]	Q-peak	Average	Q-peak	Average
0.150	52.18	45.46	66.00	56.00	0.12	0.80	53.10	46.38	12.90	9.62
0.202	46.34	44.38	63.53	53.53	0.12	0.80	47.26	45.30	16.27	8.23
0.872	33.64	29.25	56.00	46.00	0.21	0.30	34.15	29.76	21.85	16.24
12.943	35.46	30.37	60.00	50.00	0.64	0.48	36.58	31.49	23.42	18.51

Note : LG Display panel

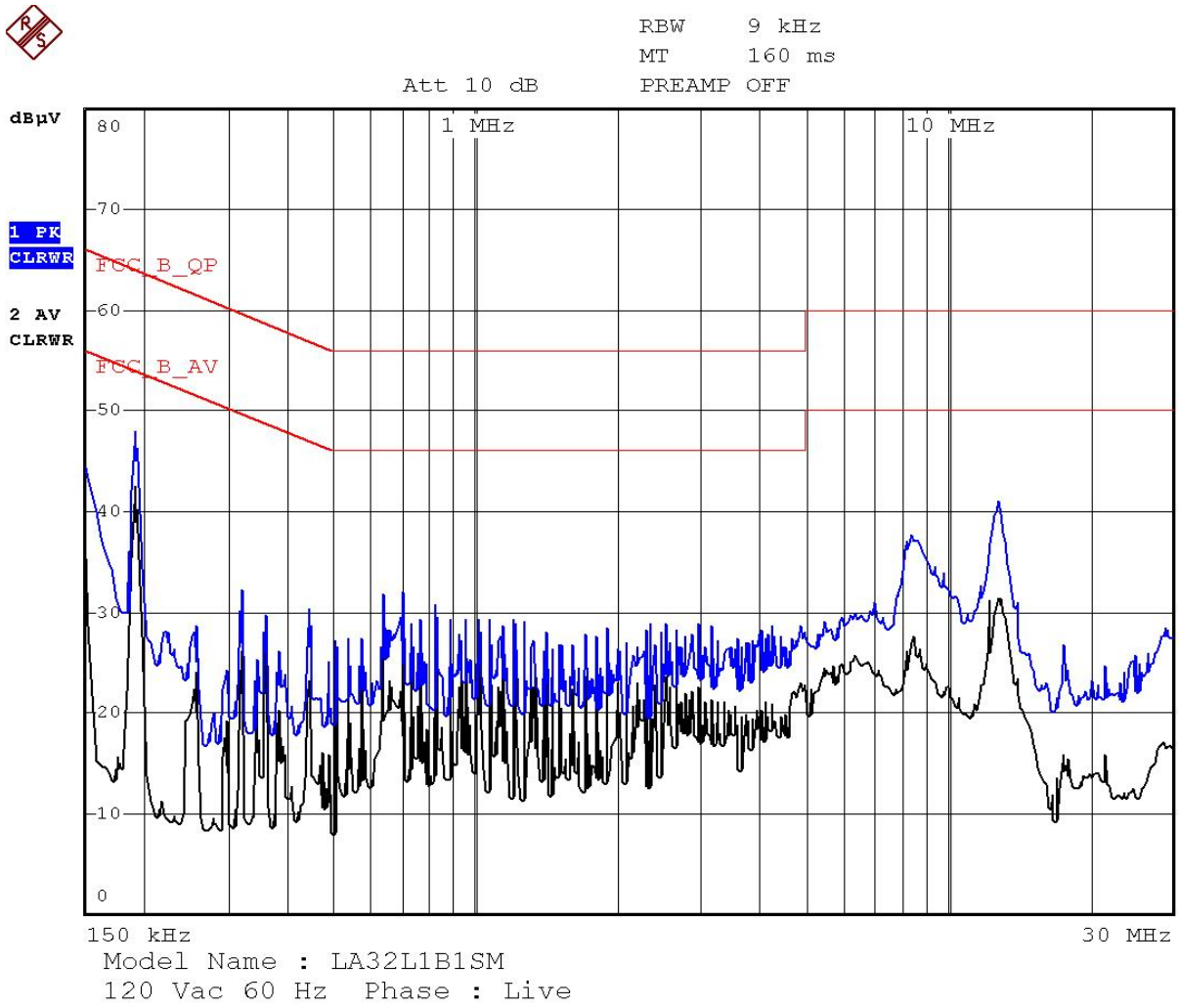
Conducted Emissions



Freq. [MHz]	Measurement [dB µV]		Limit [dB µV]		Insertion Loss	Cable Loss	Result [dB µV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	[dB]	[dB µV]	Q-peak	Average	Q-peak	Average
0.150	52.86	45.66	66.00	56.00	0.12	0.80	53.78	46.58	12.22	9.42
0.202	45.63	44.01	63.53	53.53	0.12	0.80	46.55	44.93	16.98	8.60
0.872	34.29	29.10	56.00	46.00	0.11	0.30	34.70	29.51	21.30	16.49
12.883	36.56	30.58	60.00	50.00	0.44	0.46	37.46	31.48	22.54	18.52

Note : LG Display panel

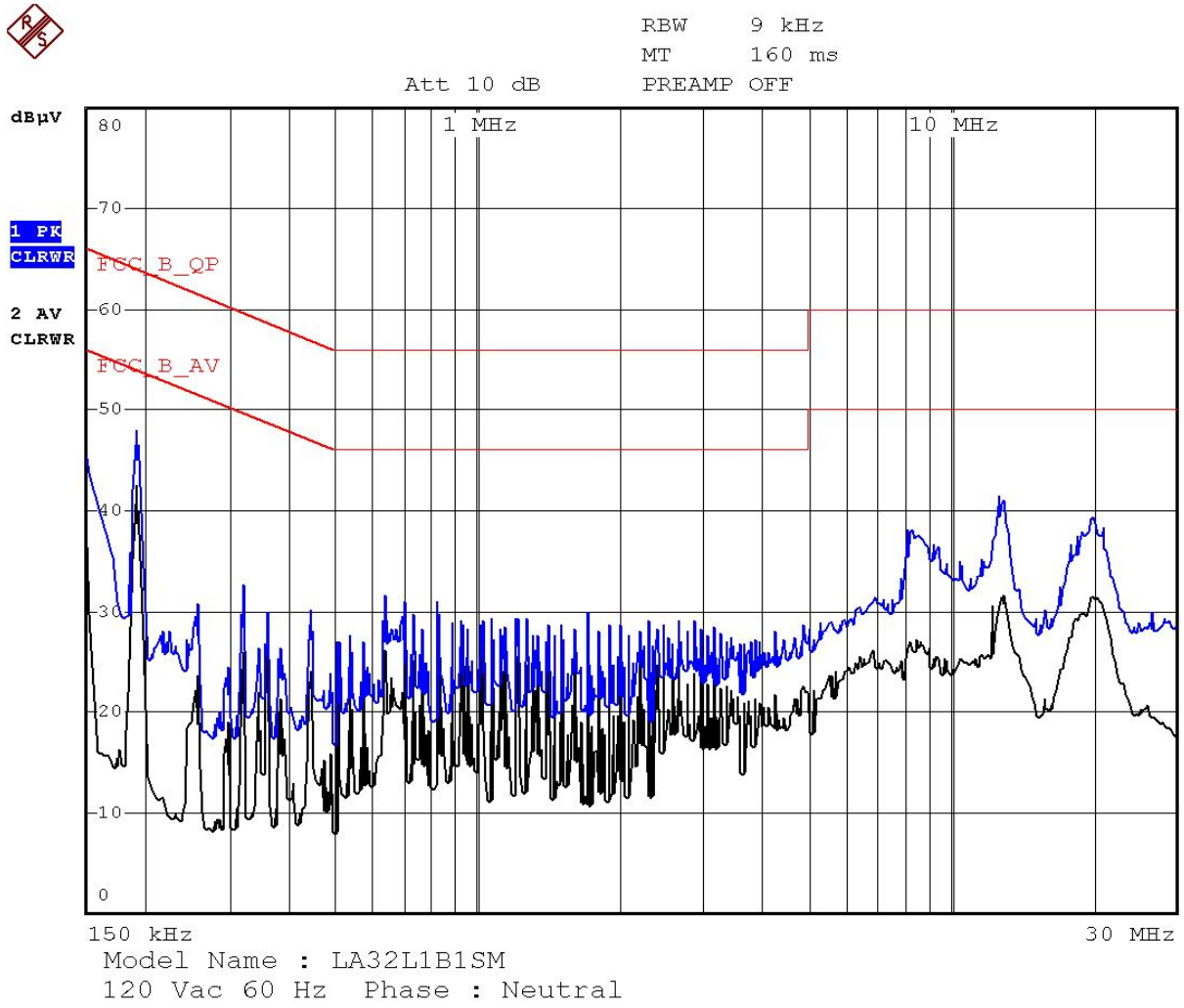
Conducted Emissions



Freq. [MHz]	Measurement [dB µV]		Limit [dB µV]		Insertion Loss	Cable Loss	Result [dB µV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	[dB]	[dB µV]	Q-peak	Average	Q-peak	Average
0.150	53.76	43.25	66.00	56.00	0.12	0.80	54.68	44.17	11.32	11.83
0.190	46.80	41.91	64.04	54.04	0.12	0.80	47.72	42.83	16.32	11.21
8.426	34.61	26.35	60.00	50.00	0.49	0.45	35.55	27.29	24.45	22.71
12.883	36.03	30.53	60.00	50.00	0.64	0.46	37.13	31.63	22.87	18.37

Note : Samsung panel

Conducted Emissions



Freq. [MHz]	Measurement [dB µV]		Limit [dB µV]		Insertion Loss	Cable Loss	Result [dB µV]		Margin [dB]	
	Q-peak	Average	Q-peak	Average	[dB]	[dB µV]	Q-peak	Average	Q-peak	Average
0.150	53.95	43.14	66.00	56.00	0.12	0.80	54.87	44.06	11.13	11.94
0.190	46.67	41.57	64.04	54.04	0.12	0.80	47.59	42.49	16.45	11.55
12.937	38.43	30.97	60.00	50.00	0.44	0.47	39.34	31.88	20.66	18.12
19.982	35.03	30.98	60.00	50.00	0.51	0.40	35.94	31.89	24.06	18.11

Note : Samsung panel

TEST CONDITIONS AND DATA

Radiated Emissions

[Applicable]

◆ Test Equipment Used

The test equipment used is calibrated in regular for every year.

Model Name	Manufacturer	Descriptions	Calibration Date	Serial Number
ESCS 30	Rohde & Schwarz	Test Receiver	Nov. 13, 2007	828985/023
VULB9160	Schwarzbeck	Antenna	Aug. 10, 2007	3048

◇ Auxiliary Equipment Used

Model Name	Manufacturer	Descriptions

◇ Accessories including cables

Name	Length	Port and Descriptions

◆ Environmental Conditions

Temperature	28 ℃
Humidity	45 %
Atmosphere pressure	1016 mbar

◆ Test Program — See test configuration page 6.
◆ Test Date — August 5, 2008
◆ Test Area — Open Area Test Site #2

Note : The equipment used is calibrated in regular for every year.
The test results of followings are the representative of the worst case emissions for resolutions that are available.

Radiated Emissions

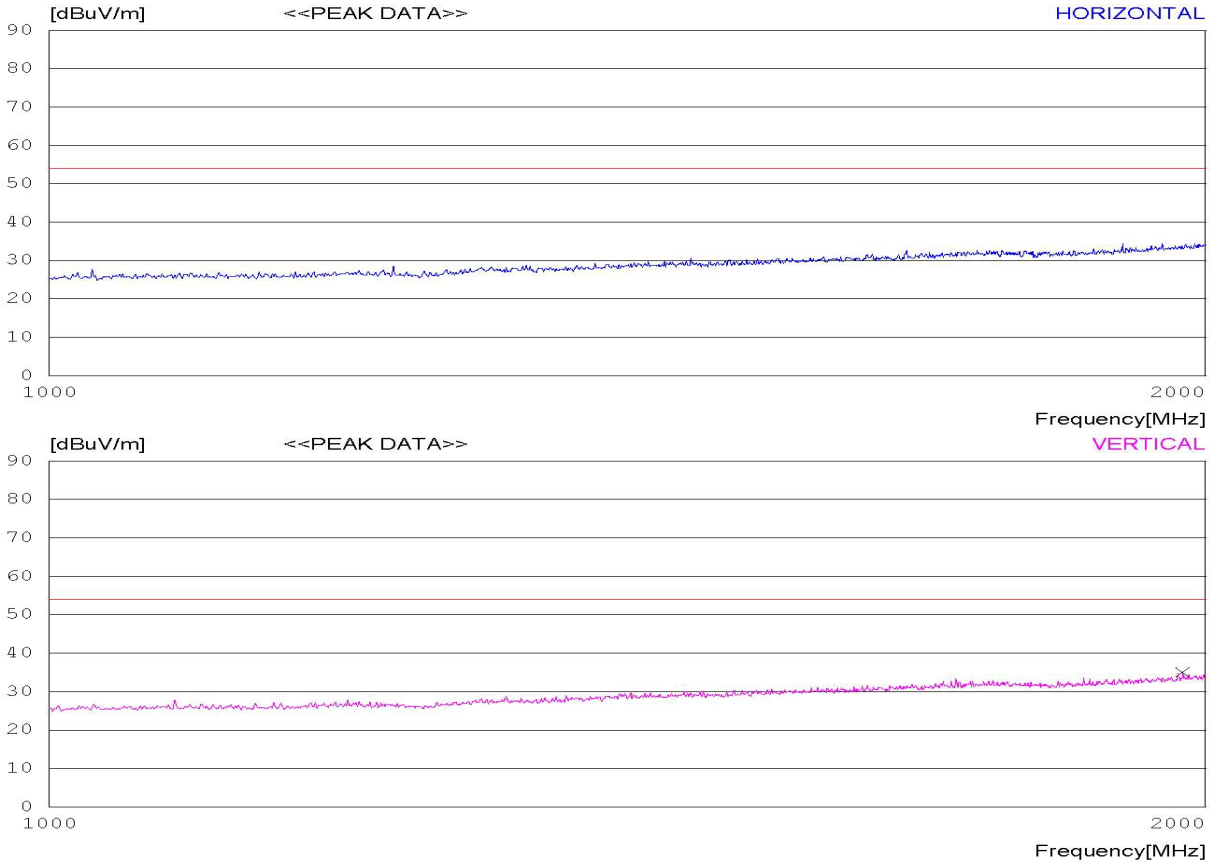
Mode	Freq. [MHz]	Reading [dBuV]	Antenna Factor [dB/m]	Cable Loss [dB]	Polar. [H/V]	Result [dBuV/m]	Limit [dBuV/m]	Margin [dB]
LG Display panel	125.90	23.00	11.71	1.52	H	36.23	43.50	7.27
	227.94	18.40	10.10	2.22	V	30.72	46.00	15.28
	297.02	19.30	12.39	2.49	H	34.18	46.00	11.82
	431.33	22.50	15.67	3.06	H	41.23	46.00	4.77
	567.04	18.5	18.41	3.66	H	40.57	46.00	5.43
	621.05	12.3	19.24	3.88	H	35.42	46.00	10.58
	648.02	11.7	19.71	3.99	H	35.40	46.00	10.60
	945.01	12.8	23.38	5.09	H	41.27	46.00	4.73
	972.01	12.1	23.55	5.18	H	40.83	54.00	13.17
	999.01	11.8	23.66	5.29	H	40.75	54.00	13.25
Samsung panel	119.05	26.3	11.30	1.48	H	39.08	43.50	4.42
	227.93	17.9	10.10	2.22	H	30.22	46.00	15.78
	297.01	18.6	12.39	2.49	H	33.48	46.00	12.52
	351.03	21.5	13.61	2.80	V	37.91	46.00	8.09
	431.32	18.4	15.67	3.06	V	37.13	46.00	8.87
	567.03	16.9	18.41	3.66	H	38.97	46.00	7.03
	918.01	14.2	22.98	5.03	H	42.21	46.00	3.79
	972.02	11.6	23.55	5.18	H	40.33	54.00	13.67
	999.03	14.4	23.66	5.29	H	43.35	54.00	10.65

End of Data

Note:

Radiated Emissions

(Disturbance Radiation)



Radiated Emission Test 1GHz – 2GHz

Measured Data from 1GHz to 2GHz

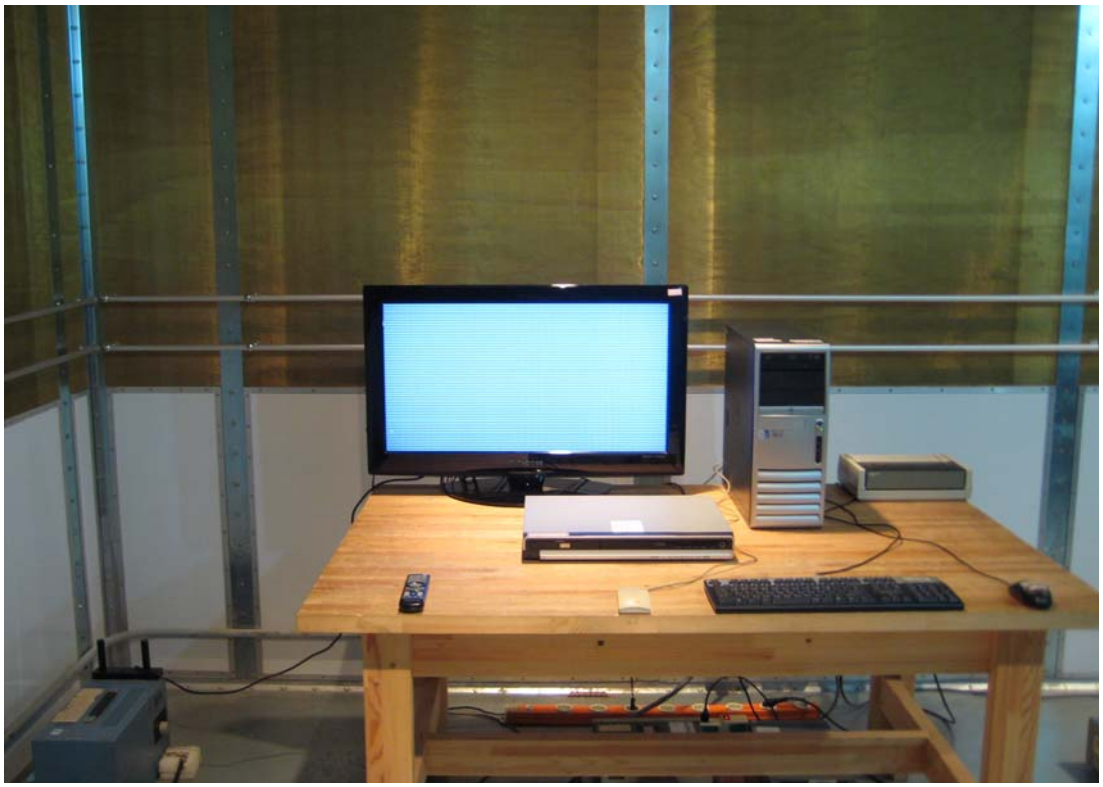
The following graphs show that all data of full frequencies are met with the limit.
We automatically change our antenna polarity, when measure radiated emission.
The spectrum plot was obtained with peak detect mode and maximum hold mode. It was used for plot the ESCI EMI Test Receiver, EMCO 3115 Horn antenna.(Section 15.35)
The peak value evaluation at the frequency of 1973.0 GHz is

17.4 dB(measured) + 27.8 dB(antenna factor) + 9.8 dB(cable loss)
– 20 dB(corrective factor)
= 35.0 dB(less than average limit 54.0 dB)

The peak value evaluation is less than the average limit, EUT have the margin relative to peak value more than 10 dB for radiated emission for the above 1 GHz.

Note :

Appendix A. The Photos of Test Setup



Conducted Emissions - Front View

Conducted Emissions - Rear View

Appendix A. The Photos of Test Setup

Radiated Emissions - Front View

Radiated Emissions - Rear View

Appendix B. The Photos of EUT

Front View

Rear View

Appendix B. The Photos of EUT

Left View

Right View