

 ESTECH Co., Ltd. Rm 1015, World Venture Center II, 426-5 Gasan-dong, Guncheon-gu, Seoul, 158-803, Korea	    		Electromagnetic Interference Test Report

Test Report for FCC

Report Number		ESTF150705-008			
Applicant	Company name	LG Electronics USA			
	Address	1000 Sylvan Avenue Englewood Cliffs, NJ 07632			
	Telephone	847-941-8373			
Product	Product name	LCD TV/MONITOR			
	Model name	22LS4D-UA	Manufacturer	LG Electronics Inc.	
	Serial number	NONE	Country of origin	KOREA	
Test date	28-May-07		Date of issue	29-May-07	
Testing location	ESTECH. Co., Ltd. 97-1 Hoiuk-Ri Majang-Myon, Icheon-city, KyungKi-Do, Korea				
Standard	FCC PART 15 2006 , ANSI C 63.4 2003 , ICES-003				
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	Engineer J.H.Kim  (Signature)				
Reviewed by	Manager Engineer J.M.Yang  (Signature)				
Abbreviation	OK, Pass = Passed, Fail = Failed, N/A = not applicable				
* Note - Basic Model : 22LS4D-UA - Additional Models : Z22LS4D-UA, 22LS4D - Basic Model and Addition Models are same product, only model name is different. - 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 : Rm 1015, World Venture Center II, 426-5, Gasan-dong, Geumcheon-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 Name : LCD TV/MONITOR
 Model Number : 22LS4D-UA
 Serial Number : NONE
 Manufacturer : LG Electronics Inc.
 Country of origin : KOREA
 Rating : INPUT:AC100-240V ~ 50 /60Hz
 Receipt Date : 2007-05-28
 X-tal lists : 12MHz, 25MHz, 4MHz

2.2 General descriptions of EUT

MODELS		19LS4D (19LS4D-UA)	22LS4D (22LS4D-UA)	Resolution	Horizontal Frequency(KHz)	Vertical Frequency(Hz)	
Dimensions (Width x Height x Depth)	Including stand	18.0 x 15.6 x 6.8 inches	20.7 x 17.4 x 7.4 inches	640x350	31.469	70.08	●—
		456.8 x 396.6 x 172.0mm	525.4 x 441.6 x 187.4 mm	720x400	31.469	70.08	●—
	Excluding stand	18.0 x 14.5 x 2.8 inches	20.7 x 16.3 x 2.7 inches	640x480	31.469	59.94	
		456.8 x 368.5 x 70.5 mm	525.4 x 413.0 x 68.6 mm	800x600	37.879	60.31	
Weight	including stand	11.5 pounds / 5.2 kg	12.8 pounds / 5.8 kg	1024x768	48.363	60.00	
	excluding stand	10.1 pounds / 4.6 kg	11.5 pounds / 5.2 kg	1280x768	47.776	59.87	
				1360x768	47.712	60.01	
Power requirement		AC100-240V ~ 50/60Hz		1366x768	60.023	60.00	
Television System		NTSC-M, ATSC, 64 & 256 QAM					
Program Coverage		VHF 2-13, UHF 14-69, CATV 1-135, DTV 2-69, CDTV 1-135					
External Antenna Impedance		75 ohm		720x480	31.469 31.500	59.94 60.00	●—
Environment condition	Operating Temperature	32 ~ 104°F (0 ~ 40°C)		1280x720	44.96 45.000	59.94 60.00	●—
	Operating Humidity	Less than 80%					
	Storage Temperature	-4 ~ 140°F (-20 ~ 60°C)		1920x1080	33.72 33.75	59.94 60.00	●—
	Storage Humidity	Less than 85%					

3. Test Standards

Test Standard : FCC PART 15 (2006) & ICES-003

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 (2003)

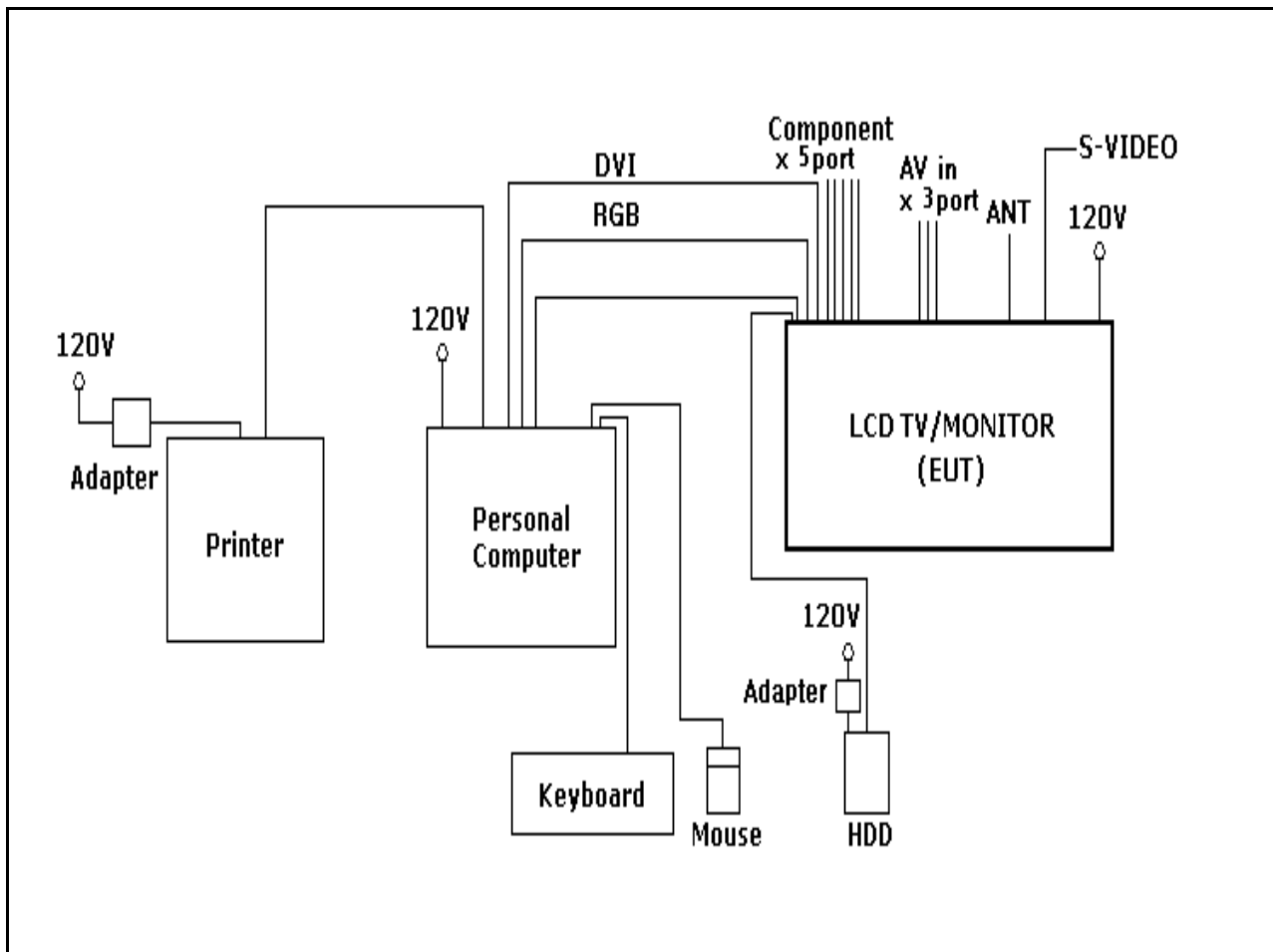
This standard sets forth uniform methods of measurement of radio-frequency (RF) signals and noise emitted from both unintentional and intentional emitters of RF energy in the frequency range 9 kHz to 40 GHz. Methods for the measurement of radiated and AC power-line conducted radio noise are covered and 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)
LCD TV/MONITOR	22LS4D-UA	NONE	LG Electronics Inc.	EUT
Personal Computer	DCSM	6RD11JS	Dell Asia Pacific sdn	-
Keyboard	SEM-DT35US	31001238	Dongguan Samsung Electro Mechanics	-
Mouse	Wheel Mouse Optical	39020693	Microsoft	-
HDD	ST3200823A-RK	4LJ1GF2H	Seagate	-
Adapter	NU25-22120-140A	NONE	Dongguan Leader Electronics Inc.	-
Adapter	PA8040WB	0703016518	Bestec Electronics(Dongguan)Co.,Ltd.	-
Printer	MJC-5750	NA34BFFP313402V	SAMSUNG ELECTRONICS(SHANGHAI)DIGITAL PRINTING Co.,LTD.	-

4.4 Cable Connecting

Start Equipment		End Equipment		Cable Standard		Remark
Name	I/O port	Name	I/O port	Length	Shielded	
LCD TV/MONITOR	RGB	Personal Computer	RGB	2	Y	
LCD TV/MONITOR	DVI	Personal Computer	DVI	2	Y	
LCD TV/MONITOR	Line-in	Personal Computer	Line-out	2	N	
LCD TV/MONITOR	S-Video	-	-	2	Y	
LCD TV/MONITOR	ANT	-	-	2	N	
LCD TV/MONITOR	AV IN x 3port	-	-	2	N	
LCD TV/MONITOR	Component x 5port	-	-	2	N	
LCD TV/MONITOR	USB	External HDD	USB	2	Y	
Personal Computer	USB	Keyboard	USB	2	Y	
Personal Computer	USB	Mouse	USB	2	Y	
Personal Computer	USB	Printer	USB	2	Y	
External HDD	POWER	Adapter	-	2	N	
Printer	POWER	Adapter	-	2	N	

5. Measurement of radiated disturbance

Above 30 MHz Electric Field strength was measured in accordance with FCC Part 15 (2006) & ICES-003. The test setup was made according to ANSI C 63.4 (2003) 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 setup.

5.1 Measurement equipments

Equipment Name	Type	Manufacturer	Serial No.	Next Calibration date
TEST Receive	ESPI7	Rohde & Schwarz	100005	2008. 1. 12
Spectrum Analyzer	R3261C	ADVANTEST	61720116	2008. 4. 20
LogBicon Antenna	VULB 9160	Schwarzbeck	3142	2008. 5. 07
Amplifier	8447F	HP	2805A02972	2007. 6 . 26
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) : 23 °C
 Humidity (%) : 50 %

5.3 Test data

Test Date : 28-May-07

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)
35.97	21.10	V	1.0	12.41	1.0	40.0	34.55	-5.45
71.48	9.40	V	1.0	11.01	1.3	40.0	21.76	-18.24
109.81	10.10	V	1.0	10.41	1.6	43.5	22.16	-21.34
162.82	11.40	V	1.0	13.90	2.0	43.5	27.27	-16.23
202.41	13.70	V	1.0	10.44	2.2	43.5	26.30	-17.20
216.03	11.84	H	1.6	10.72	2.3	46.0	24.84	-21.16
230.00	8.90	V	1.0	11.24	2.4	46.0	22.57	-23.44
244.99	10.00	H	1.4	11.82	2.5	46.0	24.29	-21.71
276.99	6.60	H	1.2	12.62	2.8	46.0	22.03	-23.97
356.87	7.40	H	1.0	14.45	3.2	46.0	25.02	-20.98
361.92	16.10	H	1.0	14.43	3.1	46.0	33.67	-12.33
565.41	6.80	V	1.0	18.29	4.1	46.0	29.23	-16.77
650.01	6.00	V	1.0	19.63	4.5	46.0	30.16	-15.84
800.00	8.90	H	1.0	21.76	5.2	46.0	35.82	-10.18
965.18	6.00	H	1.0	23.43	5.9	54.0	35.29	-18.71
Remark	H : Horizontal, V : Vertical TEST MODE ; Resolution 1360 * 768 (60Hz) at RGB mode (Worse Case) *CL = Cable Loss-Amplifier Gain(In case of above1000Mhz) *CL = Cable Loss(In case of below1000Mhz) *The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120KHz for Quasi-peak detection at frequency below 1GHz. *After connect with ferrite cores to RGB cable, tested radiated emission.							

5.4 Test data

Test Date : 28-May-07

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)
35.74	20.90	V	1.0	12.41	1.0	40.0	34.34	-5.66
41.96	11.50	V	1.0	12.73	1.1	40.0	25.33	-14.67
71.52	13.10	H	2.8	11.01	1.3	40.0	25.46	-14.54
112.46	9.60	V	1.0	11.11	1.7	43.5	22.36	-21.14
140.05	10.81	H	2.2	13.36	1.9	43.5	26.02	-17.48
159.76	12.40	H	1.8	13.98	2.0	43.5	28.33	-15.17
192.51	10.20	V	1.0	11.15	2.1	43.5	23.50	-20.00
202.60	13.30	V	1.0	10.44	2.2	43.5	25.91	-17.59
216.01	11.78	H	1.4	10.72	2.3	46.0	24.78	-21.22
264.00	10.80	H	1.4	12.22	2.7	46.0	25.67	-20.33
301.62	9.70	H	1.0	13.22	2.9	46.0	25.80	-20.20
361.94	12.21	H	1.5	14.43	3.1	46.0	29.78	-16.22
565.34	7.10	H	1.3	18.29	4.1	46.0	29.53	-16.47
619.75	9.15	H	1.0	19.20	4.4	46.0	32.76	-13.24
800.00	7.00	V	1.2	21.76	5.2	46.0	33.92	-12.08
Remark	H : Horizontal, V : Vertical TEST MODE ; Resolution 1920 *1080 (60Hz) at DVI mode (Worse Case) *CL = Cable Loss-Amplifier Gain(In case of above1000Mhz) *CL = Cable Loss(In case of below1000Mhz) *The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120KHz for Quasi-peak detection at frequency below 1GHz. *After connect with ferrite cores to RGB cable, tested radiated emission.							

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 (2006) & ICES-003. The test setup was made according to ANSI C 63.4 (2003) in a shielded. The EUT was placed on a non-conductive table at least 80 above the ground plan. 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	NNLA8120A	Schwarzbeck	8120161	2008. 2. 28
LISN	ESH3-Z5	Schwarzbeck	838979/010	2008. 2. 28
TEST Receive	ESP17	Rohde & Schwarz	100185	2007. 8. 24
Pulse Limiter	ESH3Z2	Rohde & Schwarz	NONE	2007. 6. 15

6.2 Environmental Condition

Test Place : Shield Room
 Temperature (°C) : 21 °C
 Humidity (%) : 49 %

6.3 Test data

Test Date : 28-May-07

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)
0.15	0.17	0.0	H	66.00	45.61	45.78	56.00	33.19	33.36
0.17	0.15	0.0	H	64.82	42.60	42.79	54.82		
0.18	0.14	0.1	N	64.35	40.77	40.97	54.35		
0.20	0.12	0.1	H	63.74	39.88	40.10	53.74		
0.23	0.12	0.1	H	62.56	36.99	37.22	52.56		
0.26	0.13	0.1	H	61.53	37.20	37.44	51.53		
0.54	0.15	0.2	N	56.00	28.79	29.14	46.00	25.34	25.69
0.76	0.18	0.2	N	56.00	30.96	31.34	46.00		
1.18	0.26	0.2	H	56.00	26.48	26.96	46.00		
1.24	0.26	0.2	N	56.00	34.58	35.06	46.00	25.80	26.28
1.30	0.26	0.2	N	56.00	34.27	34.76	46.00		
1.54	0.27	0.3	N	56.00	31.37	31.90	46.00	24.34	24.87
5.94	0.42	0.3	N	60.00	23.49	24.25	50.00		
12.71	0.75	0.7	N	60.00	24.31	25.77	50.00		
14.38	0.81	0.8	H	60.00	23.58	25.16	50.00		
21.29	0.93	0.8	H	60.00	30.56	32.32	50.00		
23.84	0.93	0.9	H	60.00	40.81	42.62	50.00		
26.82	0.94	0.9	N	60.00	23.17	25.01	50.00	20.95	22.79
Remark	H : Hot Line, N : Neutral Line *After connect with ferrite cores to RGB cable, tested conducted emission.								

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]

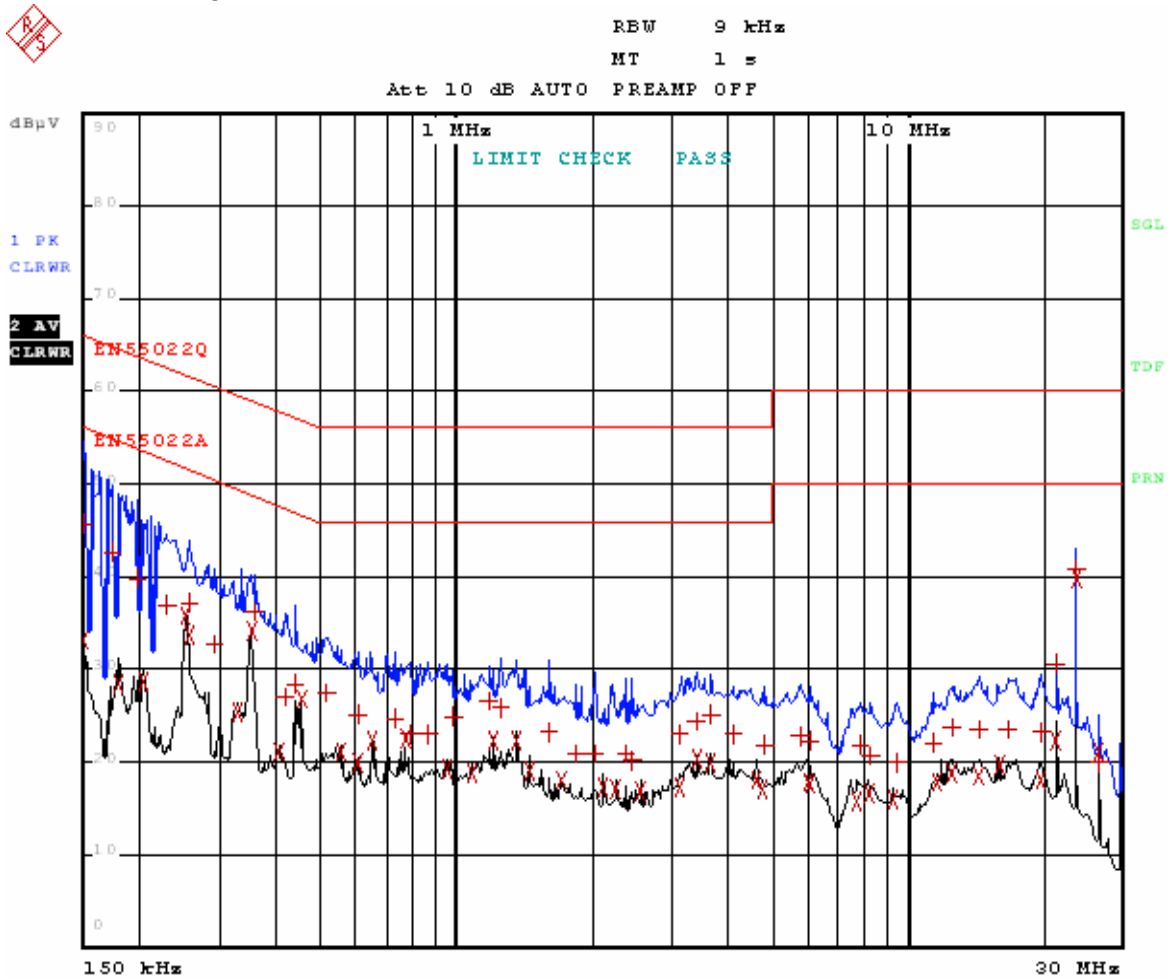


[Rear]



Appendix 1. Spectral diagram

*HOT



Comment: 22L34D-UA_HOT

Date: 28.MAY.2007 18:18:12

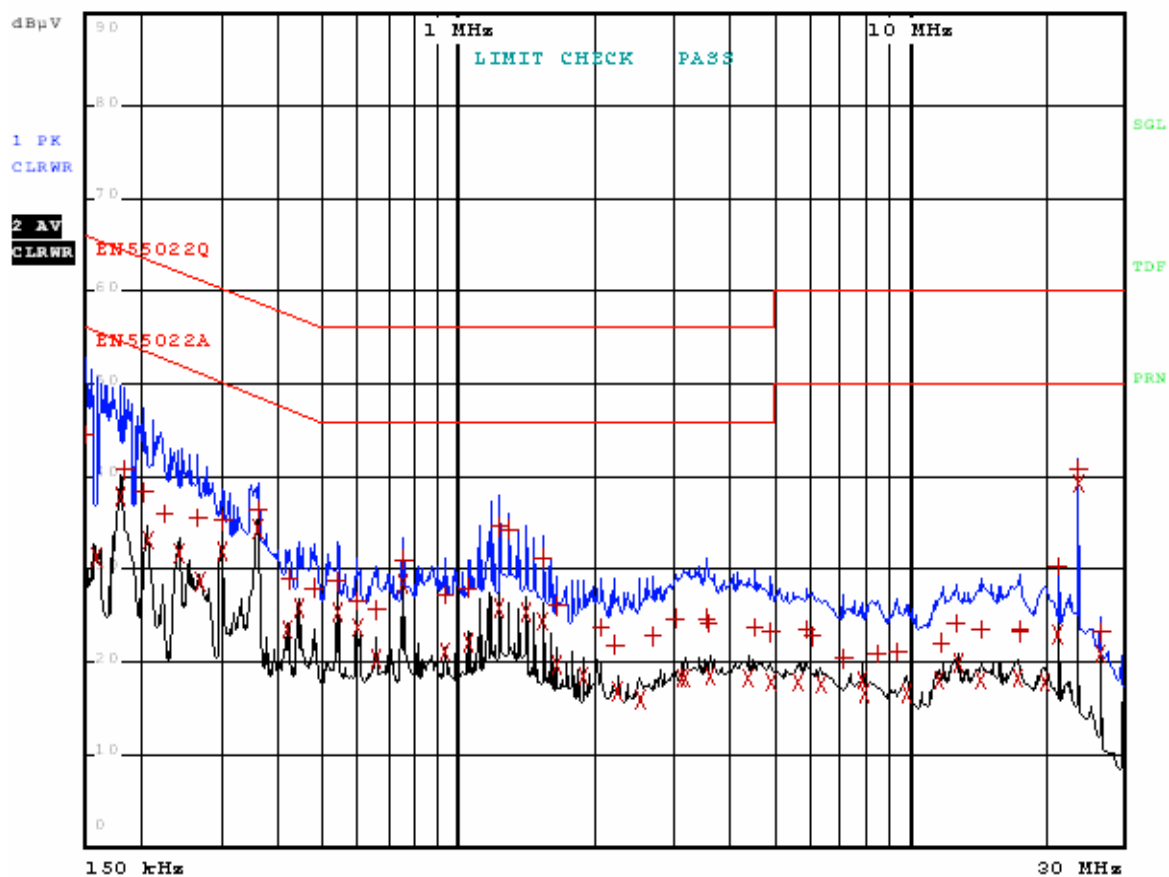
*NEUTRAL



RBW 9 kHz

MT 1 s

Att 10 dB AUTO PREAMP OFF



Comment: 22L34D-UA_NEUTRAL

Date: 28.MAY.2007 18:13:32