

	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

FCC ID:BEJ60PV450UA

Report Number		ESTF151011-006			
Applicant	Company name	LG Electronics USA			
	Address	1000 Sylvan Avenue Englewood Cliffs, NJ 07632			
	Telephone	847-941-8373			
Product	Product name	PLASMA TV/MONITOR			
	Model name	60PV450-UA	Manufacturer	LG Electronics Inc.	
	Serial number	NONE	Country of origin	KOREA	
Test date	15-Nov-10		Date of issue	16-Nov-10	
Testing location	ESTECH. Co., Ltd. 97-1 Hoiuk-Ri Majang-Myon, Icheon-city, KyungKi-Do, Korea				
Standard	FCC PART 15 (2008) & ICES-003 , ANSI C 63.4 2003				
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.H.KIM (Signature)				
Reviewed by	Engineering Manager J.M.Yang (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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Appendix 1. Spectral diagram

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 : 97-1, Hoeok-ri, Majang-myun, Ichion-city, Kyonggi-do, South Korea

1.3 Official Qualification(s)

KCC : 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 : PLASMA TV/MONITOR
 Model Number : 60PV450-UA
 Serial Number : NONE
 Manufacturer : LG Electronic Inc.
 Country of origin : KOREA
 Rating : AC (100 – 240) V , (50 – 60) Hz
 Receipt Date : 10-Nov-10
 X-tal list(s) : 12 MHz , 25 MHz , 31.875 MHz

2.2 General descriptions of EUT

MODEL		50PV450 (50PV450-UA)	60PV450 (60PV450-UA)
Dimensions (Width x Height x Depth)	With stand	13874 mm x 905.2 mm x 334.7 mm	
	Without stand	1336.8 mm x 756.2 mm x 52.5 mm	
Weight	With stand	42.6 kg	
	Without stand	38.5 kg	
Power requirement Television System Program Coverage External Antenna Impedance		AC 100-240 V ~ 50 / 60 Hz 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%	

3. Test Standards

Test Standard : FCC PART 15 (2008) & 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)

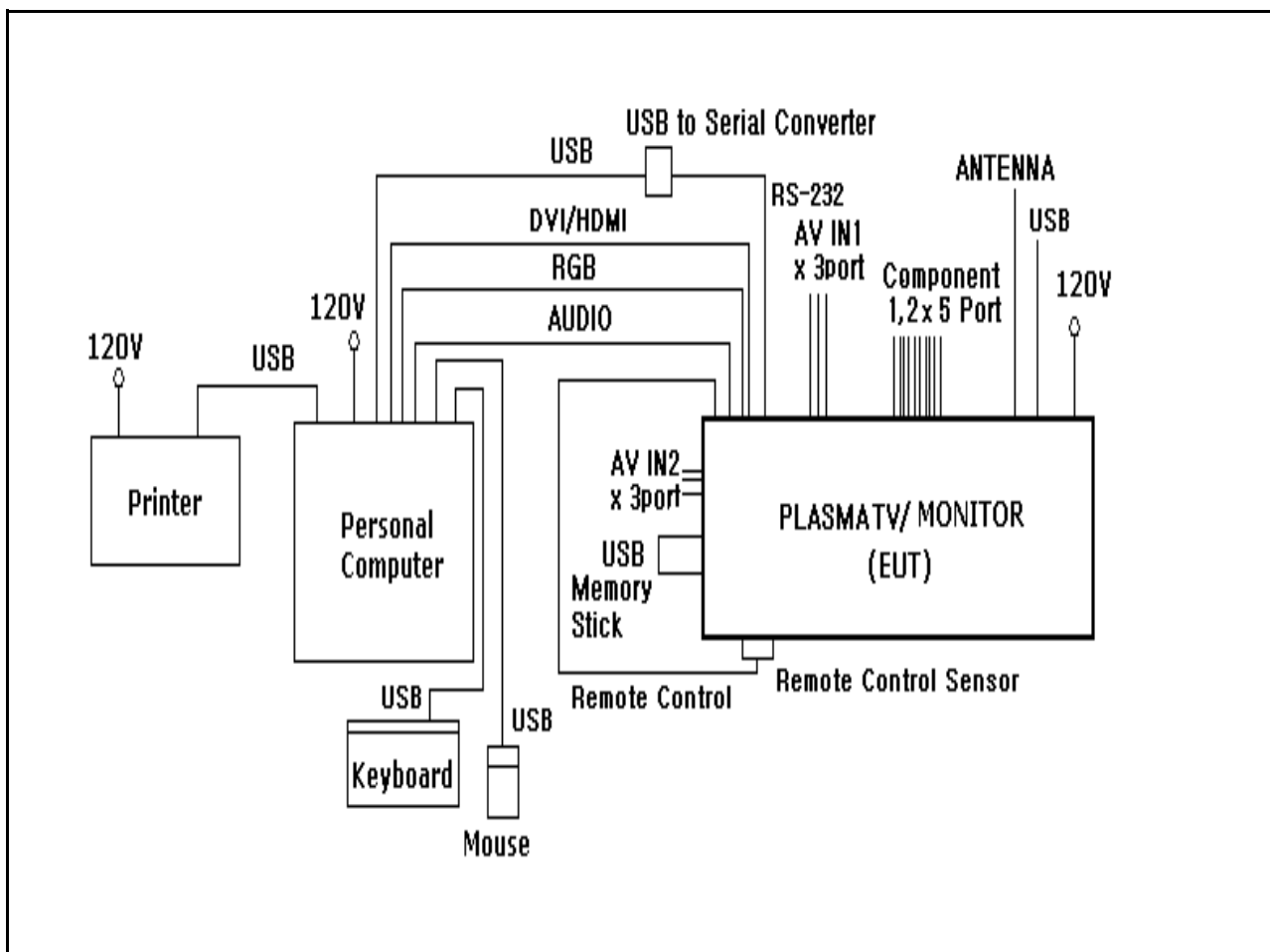
This standard sets forth uniform methods of measurement of radio-frequency (RF) signals and noise emitted from both unintentional and intentional emitters of RF energy in the frequency range 9 kHz to 40 GHz. Methods for the measurement of radiated and AC power-line conducted radio noise are covered and 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	S/N	Manufacturer	Remark (FCC ID)
PLASMA TV/MONITOR	60PV450-UA	NONE	LG Electronics Inc.	EUT
Personal Computer	DCSM	6RDJJ1S	Dell Asia Pacific Sdn.	-
Keyboard	SK-8115	71616-76C	Dell Asia Pacific Sdn.	-
Mouse	PB2-141	NONE	Logitech.	-
USB Memory Stick	NONE	NONE	NONE	-
USB to Serial Converter	NONE	NONE	NONE	-
Remote Control Sensor	NONE	NONE	LG Electronics Inc.	
Printer	K10229	NONE	CANON VIETNAM CO.,LTD.	-

4.4 Cable Connecting

Start Equipment		End Equipment		Cable Standard		Remark
Name	I/O port	Name	I/O port	Length	Shielded	
PLASMA TV/MONITOR	USB	-	-	2	Y	
PLASMA TV/MONITOR	ANTENNA	-	-	2	Y	
PLASMA TV/MONITOR	AV IN1 x 3 Port	-	-	2	N	
PLASMA TV/MONITOR	AV IN2 x 3 Port	-	-	2	N	
PLASMA TV/MONITOR	Component1 x 5 Port	-	-	2	N	
PLASMA TV/MONITOR	Component2 x 5 Port	-	-	2	N	
PLASMA TV/MONITOR	USB	USB Memory Stick	USB	-	-	
PLASMA TV/MONITOR	Remote Control In	Remote Control Sensor	Remote Control Out	0.5	N	
PLASMA TV/MONITOR	RS-232	USB to Serial Converter	RS-232	2	N	
PLASMA TV/MONITOR	Audio In	Personal Computer	Audio Out	2	N	
PLASMA TV/MONITOR	RGB	Personal Computer	RGB	2	Y	
PLASMA TV/MONITOR	HDMI	Personal Computer	DVI	2	Y	
Personal computer	USB	USB to Serial Converter	USB	2	Y	
Personal computer	USB	Keyboard	USB	2	Y	
Personal computer	USB	Mouse	USB	2	Y	
Personal computer	USB	Printer	USB	2	Y	

5. Measurement of radiated disturbance

Above 30 MHz Electric Field strength was measured in accordance with FCC Part 15 (2008) & ICES-003. The test setup was made according to ANSI C 63.4 (2003) on an open test site, which allows a 3 m distance measurement. The EUT was placed in the center of wooden turntable. The height of this table was 0.8 m. 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 Receiver	ESVS10	Rohde & Schwarz	838562/002	2011. 2. 01
Spectrum Analyzer	R3273	ADVANTEST	110600592	2011. 2. 01
LogBicon Antenna	VULB 9160	Schwarzbeck	3142	2011. 5. 19
Amplifier	8447F	HP	2805A02972	2011. 2. 01
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 (3 m)

RGB mode

Temperature (°C) : 2 °C

Humidity (%) : 48 % R.H.

HDMI mode

Temperature (°C) : 4 °C

Humidity (%) : 47 % R.H.

5.3 Test data (RGB MODE)

Test Date : 15-Nov-10

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)
30.00	13.20	V	1.0	10.44	0.9	40.0	24.52	-15.48
41.00	19.10	H	4.0	11.39	1.0	40.0	31.46	-8.54
81.97	20.40	H	4.0	8.22	1.4	40.0	30.00	-10.00
116.92	14.00	V	1.0	10.62	1.7	43.5	26.34	-17.16
146.61	19.60	V	1.0	12.58	2.0	43.5	34.17	-9.33
226.06	9.10	V	1.0	10.70	2.6	46.0	22.37	-23.63
288.02	15.00	V	1.0	13.16	3.1	46.0	31.27	-14.73
362.52	15.70	H	2.1	14.95	3.7	46.0	34.36	-11.64
384.04	12.10	V	1.0	15.43	3.9	46.0	31.43	-14.57
427.52	12.10	H	1.8	16.35	4.3	46.0	32.73	-13.27
500.01	7.20	H	1.4	17.81	4.8	46.0	29.76	-16.24
519.26	6.50	H	1.2	18.26	4.9	46.0	29.67	-16.33

Remark	H : Horizontal, V : Vertical TEST MODE : Resolution 1920 *1080 (60 Hz) at RGB mode (Worse Case) *CL = Cable Loss-Amplifier Gain(In case of above 1000 Mhz) *CL = Cable Loss(In case of below 1000 Mhz) *The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 KHz for Quasi-peak detection at frequency below 1 GHz. *After connect with ferrite cores to RGB cable, tested radiated emission.
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5.3 Test data (HDMI MODE)

Test Date : 15-Nov-10

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)
37.64	16.70	V	1.0	10.97	0.9	40.0	28.61	-11.39
59.93	20.10	H	4.0	11.08	1.2	40.0	32.36	-7.64
111.43	12.10	V	1.0	10.11	1.6	43.5	23.84	-19.66
145.86	19.50	H	3.0	12.55	2.0	43.5	34.05	-9.45
165.85	10.90	V	1.0	12.49	2.1	43.5	25.53	-17.97
230.00	11.40	V	1.0	10.98	2.6	46.0	24.98	-21.02
299.84	9.20	V	1.0	13.53	3.2	46.0	25.91	-20.09
361.04	14.40	H	2.0	14.91	3.7	46.0	33.01	-12.99
387.86	12.40	V	1.0	15.52	3.9	46.0	31.84	-14.16
492.47	7.50	V	1.0	17.66	4.7	46.0	29.85	-16.15
500.00	9.20	V	1.0	17.81	4.8	46.0	31.76	-14.24
569.11	5.40	V	1.0	19.43	5.3	46.0	30.12	-15.88
Remark	H : Horizontal, V : Vertical TEST MODE : Resolution 1920 *1080 (60 Hz) at HDMI mode (Worse Case) *CL = Cable Loss-Amplifier Gain(In case of above 1000 Mhz) *CL = Cable Loss(In case of below 1000 Mhz) *The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 KHz for Quasi-peak detection at frequency below 1 GHz. *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 MHz to 30 MHz was measured in accordance to FCC Part 15 (2008) & 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 0.8 m above the ground plan. A grounded vertical reference plane was positioned in a distance of 0.4 m from the EUT. The distance from the EUT to other metal surfaces was at least 0.8 m. 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 1.0 m. 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	2011. 2. 1
LISN	ENV 216	Rohde & Schwarz	101231	2011. 8.13
TEST Receiver	ESPI7	Rohde & Schwarz	100185	2011. 8. 24
Pulse Limiter	ESH3Z2	Rohde & Schwarz	NONE	2011. 2. 1

6.2 Environmental Condition

Test Place : Shield Room
 Temperature (°C) : 21 °C
 Humidity (%) : 42 % R.H.

6.3 Test data

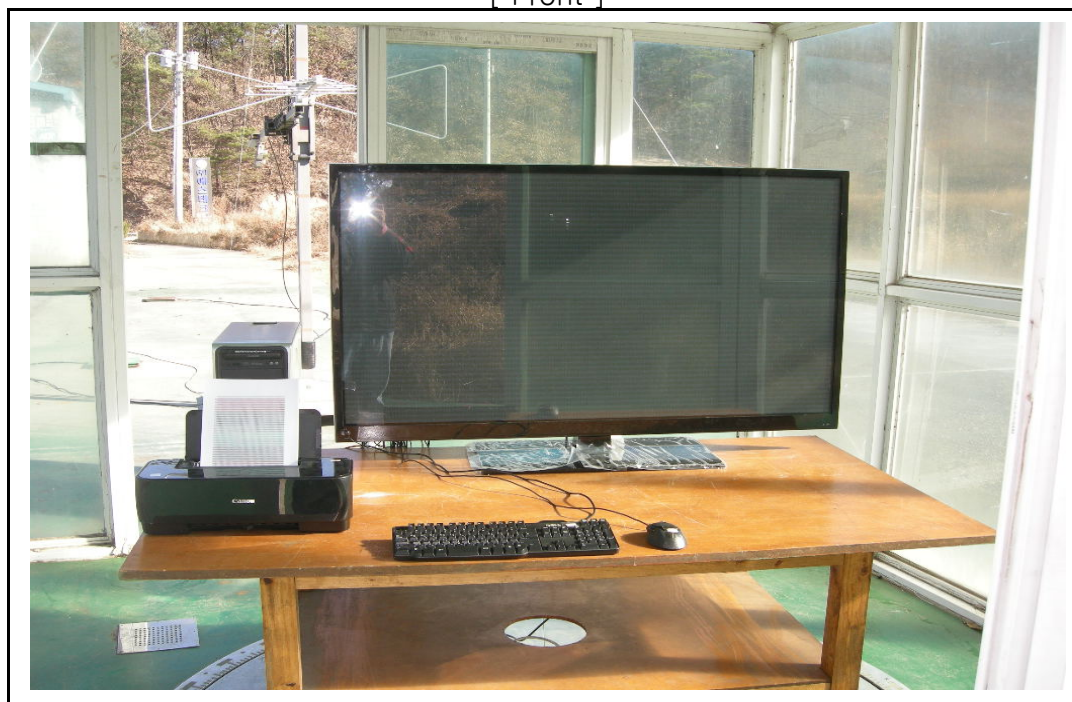
Test Date : 15-Nov-10

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	0.10	0.4	H	66.00	36.21	36.69	56.00	31.38	31.86
0.19	0.10	0.4	H	63.99	42.21	42.70	53.99	36.20	36.69
0.21	0.10	0.4	H	63.28	50.82	51.31	53.28	38.15	38.64
0.26	0.11	0.4	H	61.40	34.70	35.20	51.40	26.38	26.88
0.37	0.11	0.4	N	58.59	36.26	36.79	48.59	24.91	25.44
0.42	0.12	0.4	N	57.51	45.75	46.29	47.51	32.91	33.45
0.83	0.12	0.5	N	56.00	37.50	38.10	46.00	25.51	26.11
0.94	0.12	0.5	H	56.00	41.59	42.20	46.00	32.54	33.15
0.95	0.12	0.5	N	56.00	42.40	43.01	46.00	32.64	33.25
1.15	0.13	0.5	N	56.00	37.90	38.53	46.00	25.32	25.95
1.56	0.15	0.5	N	56.00	40.29	40.96	46.00	27.23	27.90
1.98	0.18	0.5	N	56.00	38.30	39.02	46.00	23.46	24.18
11.86	0.45	1.0	N	60.00	32.35	33.84	50.00	21.45	22.94
12.30	0.47	1.1	H	60.00	34.82	36.35	50.00	22.10	23.63
12.43	0.47	1.1	N	60.00	34.37	35.90	50.00	22.45	23.98
16.54	0.61	1.2	N	60.00	31.82	33.63	50.00	24.05	25.86
17.89	0.66	1.2	N	60.00	31.31	33.19	50.00	21.38	23.26
24.00	0.78	1.4	N	60.00	41.27	43.40	50.00	40.87	43.00
Remark	H : Hot Line, N : Neutral Line								

7. Photographs of test setup

7.1 Setup for Radiated Test : 30 MHz ~ 1 000 MHz

[Front]



[Rear]



7.2 Setup for Conducted Test : 0.15 MHz ~ 30 MHz

[Front]



[Rear]



8. Photographs of EUT

[Front]



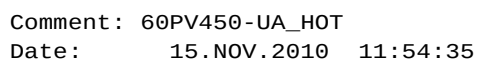
[Rear]



RBW 9 kHz

MT 1 s

Att 10 dB AUTO PREAMP OFF



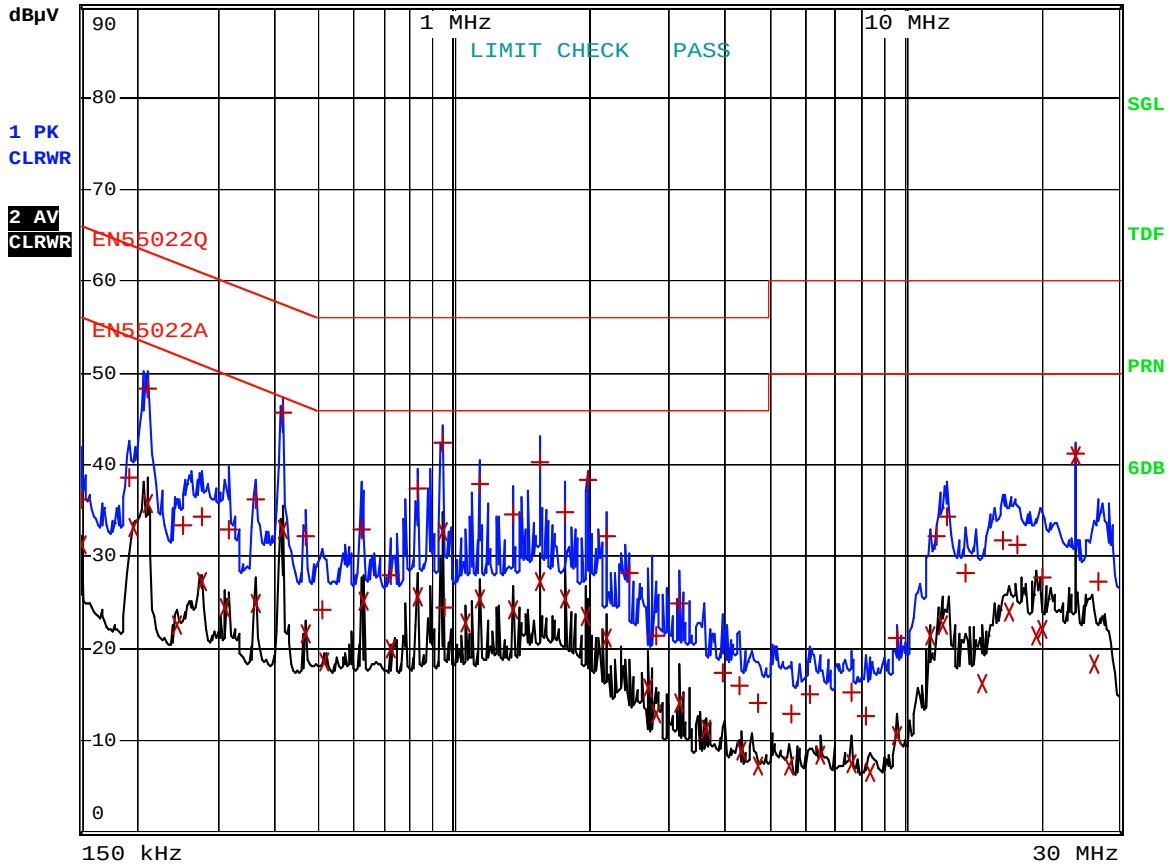
*NEUTRAL



RBW 9 kHz

MT 1 s

Att 10 dB AUTO PREAMP OFF



Comment: 60PV450-UA_NEUTRAL

Date: 15.NOV.2010 11:50:12