

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 : May 6, 2009****Order Number: GETEC-C1-09-102****Test Report Number: GETEC-E3-09-049****Test Site: Gumi College EMC Center****FCC Registration Number: (100749)****FCC ID.: BEJ42SL80UA****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	: 42SL80-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,



Hyoung Seop Kim, Associate Engineer
GUMI College EMC center



Tae-Sig Park, Technical Manager
GUMI College EMC center



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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.** BEJ42SL80UA
- **EUT Type** LCD TV/Monitor
- **Model Name** 42SL80-UA
- **Trade Name** LG
- **Serial Number** Prototype
- **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** April 29 ~ May 1, 2009
- **Place of Test** **Gumi College EMC Center** (FCC Registration Number: 100749)
407, Bugok-dong, Gumi-si, Gyeongbuk, Korea
- **Test Report Number** GETEC-E3-09-049
- **Dates of Issue** May 6, 2009



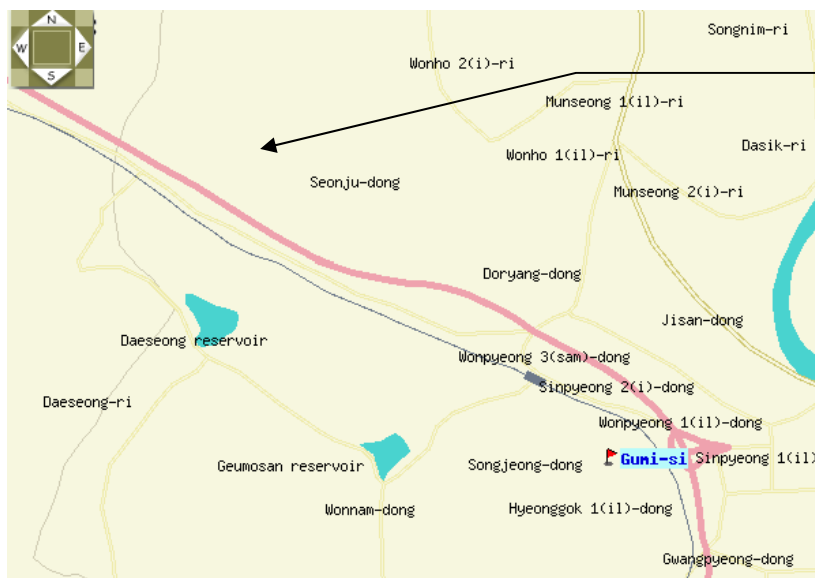
2. Introduction

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: 42SL80-UA)**

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

The site address is 407, Bugok-dong, Gumi-si, Gyeongbuk, 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



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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: 42SL80-UA) FCC ID.: BEJ42SL80UA**

MODELS		32SL80 (32SL80-UA)	37SL80 (37SL80-UA)	42SL80 (42SL80-UA)
Dimensions (Width x Height x Depth)	With stand	41.9 x 30.5 x 14.2 inches 1065.9 x 776.0 x 361.7 mm	46.4 x 33.5 x 15.7 inches 1179.0 x 851.4 x 398.8 mm	54.0 x 37.9 x 17.8 inches 1373.0 x 964.3 x 454.2 mm
	Without stand	41.9 x 28.2 x 3.7 inches 1065.9 x 716.4 x 94.4 mm	46.4 x 30.7 x 4.1 inches 1179.0 x 780.6 x 105.9 mm	54.0 x 34.9 x 4.2 inches 1373.0 x 888.5 x 106.9 mm
Weight	With stand	51.1 lbs / 23.2 kg	60.1 lbs / 27.3 kg	90.1 lbs / 40.9 kg
	Without stand	42.9 lbs / 19.5 kg	51.8 lbs / 23.5 kg	78.2 lbs / 35.5 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%		
Maximum Frequency range:		200 MHz		



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: AQ6-23K15
PS2 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: N/A 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/DVI (Digital)cable	Connected to the EUT and PC	1.95 m shielded
PC sound cable	Connected to the EUT and PC	1.8 m shielded
Component cable	Connected to the EUT and DVD player	3.0 m shielded
Component sound cable	Connected to the EUT and DVD player	3.0 m shielded
AV input cable	Connected to the EUT and DVD player	1.8 m shielded
ANT cable	Connected to the EUT and TV signal generator	10 m shielded
RS-232C cable	Connected to the EUT and PC	1.2 m shielded with two ferrite cores

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/DVI: Digital)
 - . Conducted emission: 1 920 * 1 080 / 60 Hz (RGB: Analog), 1 920 * 1 080 / 60 Hz (HDMI/DVI: 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

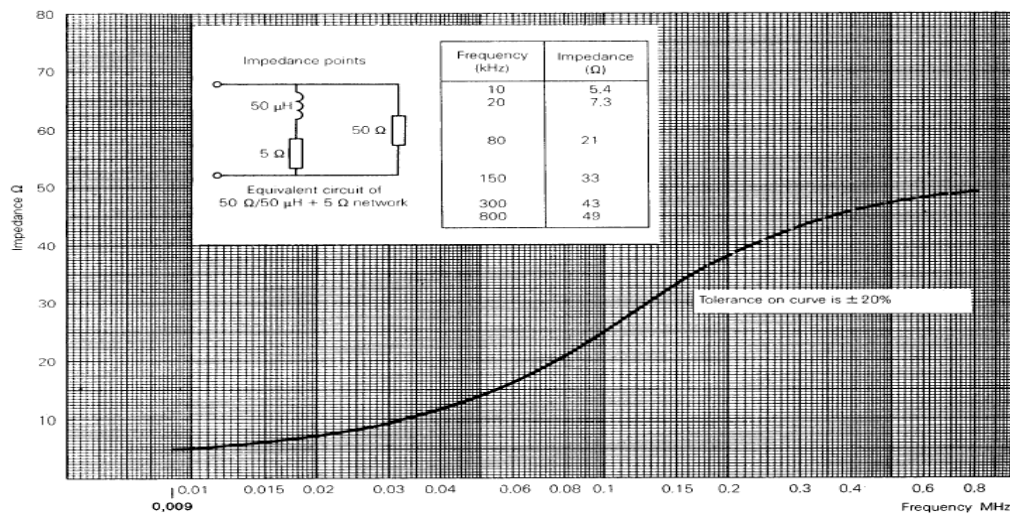


Fig 2. Impedance of LISN



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

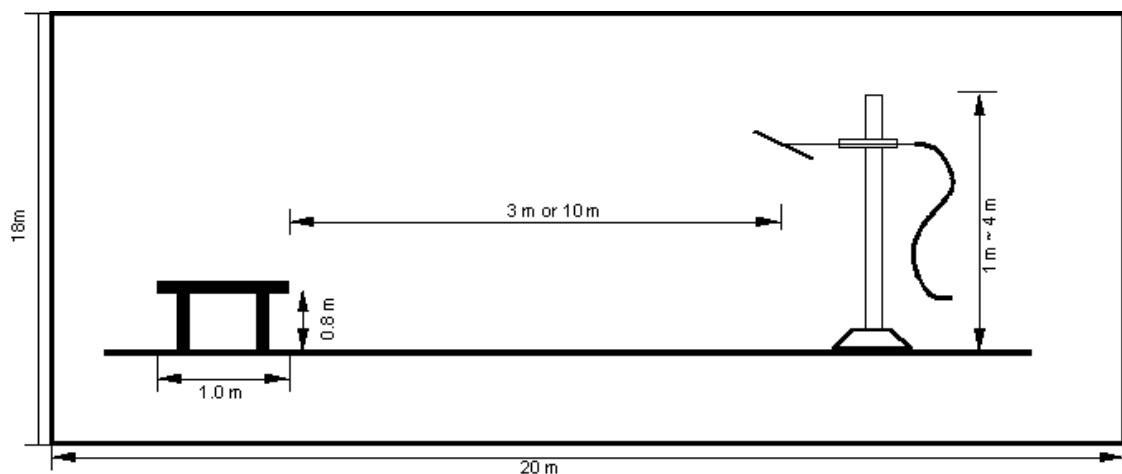


Fig 3. Dimensions of Open Site Test Area



5. Conducted Emission

5.1 Operating Environment

Temperature : 23 °C
Relative Humidity : 39 % 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

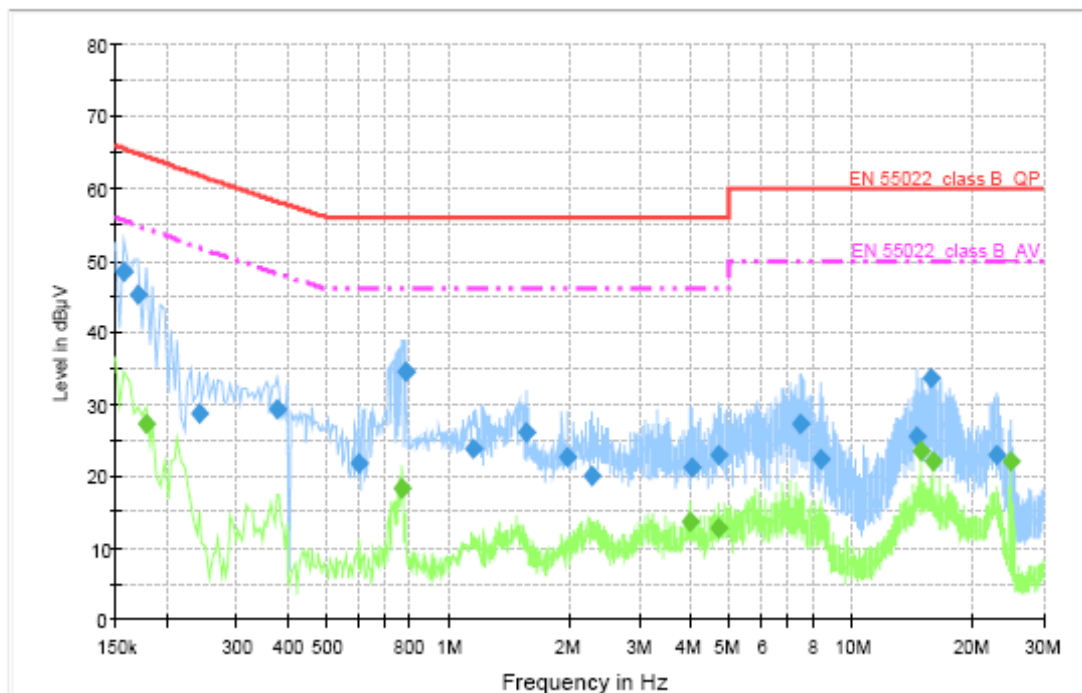


5.6 Test data for Conducted Emission

- Test Date : April 29, 2009
- Resolution Bandwidth : 9 kHz
- Frequency Range : 0.15 MHz ~ 30 MHz

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

Voltage with 4-Line-LISN L1





Final Measurement Detector 1

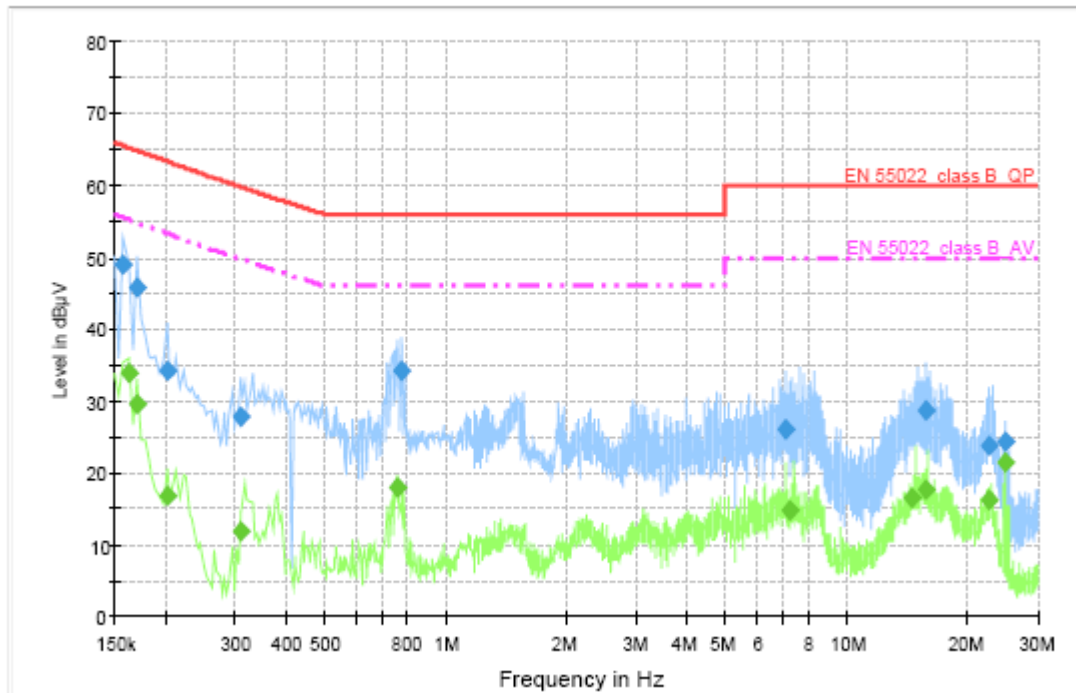
Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.158000	48.5	1000.000	9.000	GND	L1	9.9	17.0	65.5	
0.170000	45.2	1000.000	9.000	GND	L1	9.9	19.7	64.9	
0.242000	28.7	1000.000	9.000	GND	L1	10.0	33.1	61.8	
0.378000	29.3	1000.000	9.000	GND	L1	10.0	28.9	58.2	
0.602000	21.7	1000.000	9.000	GND	L1	10.0	34.3	56.0	
0.786000	34.6	1000.000	9.000	GND	L1	10.0	21.4	56.0	
1.158000	23.9	1000.000	9.000	GND	L1	10.0	32.1	56.0	
1.570000	26.0	1000.000	9.000	GND	L1	10.1	30.0	56.0	
1.982000	22.5	1000.000	9.000	GND	L1	10.1	33.5	56.0	
2.266000	20.1	1000.000	9.000	GND	L1	10.1	35.9	56.0	
4.042000	21.1	1000.000	9.000	GND	L1	10.2	34.9	56.0	
4.678000	23.0	1000.000	9.000	GND	L1	10.2	33.0	56.0	
7.482000	27.4	1000.000	9.000	GND	L1	10.3	32.6	60.0	
8.362000	22.2	1000.000	9.000	GND	L1	10.3	37.8	60.0	
14.634000	25.6	1000.000	9.000	GND	L1	10.6	34.4	60.0	
15.706000	33.6	1000.000	9.000	GND	L1	10.6	17.4	60.0	
23.018000	22.8	1000.000	9.000	GND	L1	11.0	37.2	60.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.178000	27.3	1000.000	9.000	GND	L1	9.9	27.2	54.5	
0.770000	18.2	1000.000	9.000	GND	L1	10.0	27.8	46.0	
4.006000	13.5	1000.000	9.000	GND	L1	10.2	32.5	46.0	
4.678000	12.9	1000.000	9.000	GND	L1	10.2	33.1	46.0	
14.826000	23.6	1000.000	9.000	GND	L1	10.6	26.4	50.0	
16.006000	22.0	1000.000	9.000	GND	L1	10.7	28.0	50.0	
24.770000	22.0	1000.000	9.000	GND	L1	11.0	28.0	50.0	



Voltage with 4-Line-LISN N



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.158000	49.1	1000.000	9.000	GND	N	9.9	16.4	65.5	
0.170000	45.7	1000.000	9.000	GND	N	9.9	19.2	64.9	
0.202000	34.1	1000.000	9.000	GND	N	9.9	29.3	63.4	
0.310000	27.8	1000.000	9.000	GND	N	10.0	32.0	59.8	
0.778000	34.3	1000.000	9.000	GND	N	10.0	21.7	56.0	
7.058000	26.1	1000.000	9.000	GND	N	10.2	33.9	60.0	
15.750000	28.6	1000.000	9.000	GND	N	10.6	31.4	60.0	
22.766000	23.7	1000.000	9.000	GND	N	10.8	36.3	60.0	
24.774000	24.4	1000.000	9.000	GND	N	10.8	35.6	60.0	

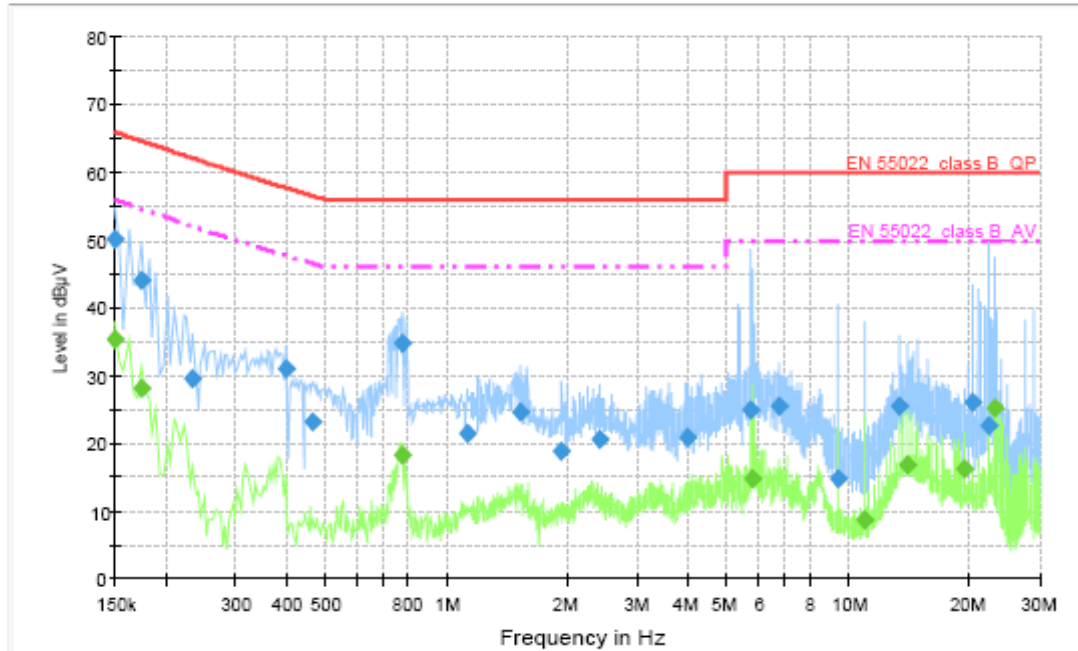
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.162000	33.8	1000.000	9.000	GND	N	9.9	21.5	55.3	
0.170000	29.7	1000.000	9.000	GND	N	9.9	25.2	54.9	
0.202000	16.7	1000.000	9.000	GND	N	9.9	36.6	53.3	
0.310000	11.8	1000.000	9.000	GND	N	10.0	37.9	49.7	
0.758000	18.0	1000.000	9.000	GND	N	10.0	28.0	46.0	
7.266000	14.7	1000.000	9.000	GND	N	10.3	35.3	50.0	
14.494000	16.5	1000.000	9.000	GND	N	10.5	33.5	50.0	
15.750000	17.7	1000.000	9.000	GND	N	10.6	32.3	50.0	
22.766000	16.3	1000.000	9.000	GND	N	10.8	33.7	50.0	
24.774000	21.6	1000.000	9.000	GND	N	10.8	28.4	50.0	



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

Voltage with 4-Line-LISN L1



Final Measurement Detector 1

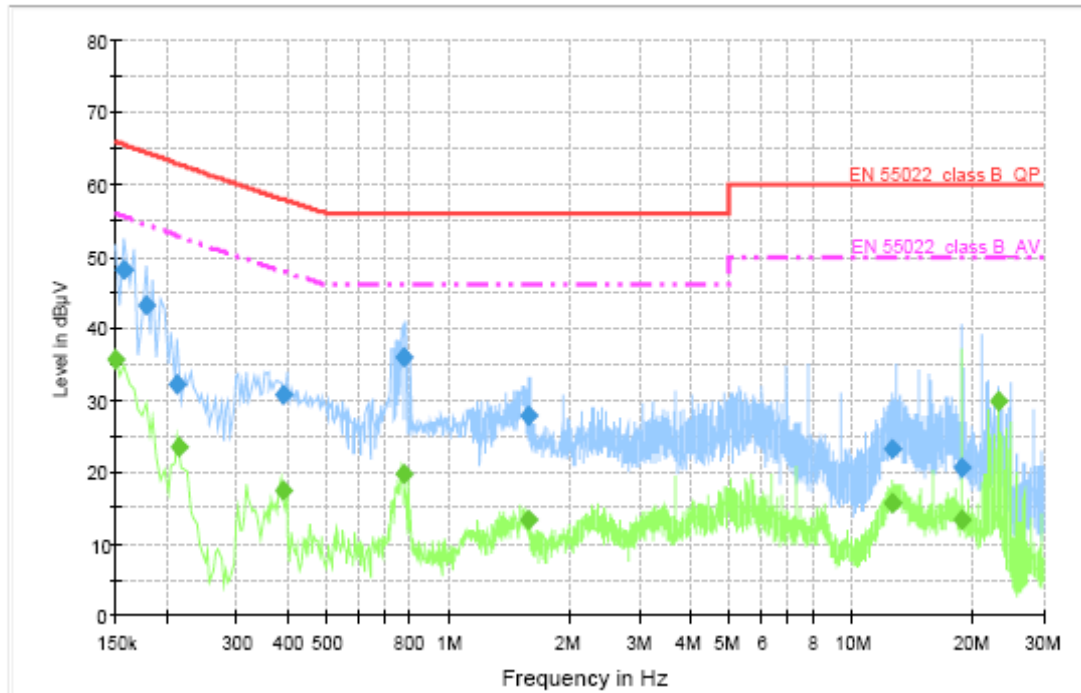
Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	50.2	1000.000	9.000	GND	L1	9.9	15.8	66.0	
0.174000	44.1	1000.000	9.000	GND	L1	9.9	20.6	64.7	
0.234000	29.6	1000.000	9.000	GND	L1	9.9	32.5	62.1	
0.398000	31.0	1000.000	9.000	GND	L1	10.0	26.8	57.8	
0.466000	23.2	1000.000	9.000	GND	L1	10.0	33.3	56.5	
0.782000	34.8	1000.000	9.000	GND	L1	10.0	21.2	56.0	
1.126000	21.5	1000.000	9.000	GND	L1	10.0	34.5	56.0	
1.534000	24.6	1000.000	9.000	GND	L1	10.1	31.4	56.0	
1.942000	18.8	1000.000	9.000	GND	L1	10.1	37.2	56.0	
2.422000	20.4	1000.000	9.000	GND	L1	10.1	35.6	56.0	
3.986000	21.0	1000.000	9.000	GND	L1	10.2	35.0	56.0	
5.694000	24.8	1000.000	9.000	GND	L1	10.2	35.2	60.0	
6.730000	25.6	1000.000	9.000	GND	L1	10.2	34.4	60.0	
9.466000	14.7	1000.000	9.000	GND	L1	10.3	45.3	60.0	
13.350000	25.6	1000.000	9.000	GND	L1	10.5	34.4	60.0	
20.526000	26.0	1000.000	9.000	GND	L1	10.9	34.0	60.0	
22.522000	22.7	1000.000	9.000	GND	L1	10.9	37.3	60.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	35.4	1000.000	9.000	GND	L1	9.9	20.6	56.0	
0.174000	28.1	1000.000	9.000	GND	L1	9.9	26.6	54.7	
0.778000	18.4	1000.000	9.000	GND	L1	10.0	27.6	46.0	
5.814000	14.8	1000.000	9.000	GND	L1	10.2	35.2	50.0	
10.946000	8.6	1000.000	9.000	GND	L1	10.3	41.4	50.0	
14.038000	16.8	1000.000	9.000	GND	L1	10.6	33.2	50.0	
19.530000	16.3	1000.000	9.000	GND	L1	10.8	33.7	50.0	
23.190000	25.3	1000.000	9.000	GND	L1	11.0	24.7	50.0	



Voltage with 4-Line-LISN N



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.158000	48.0	1000.000	9.000	GND	N	9.9	17.5	65.5	
0.178000	43.2	1000.000	9.000	GND	N	9.9	21.3	64.5	
0.214000	32.3	1000.000	9.000	GND	N	9.9	30.7	63.4	
0.392000	30.6	1000.000	9.000	GND	N	10.0	27.4	58.0	
0.774000	35.9	1000.000	9.000	GND	N	10.0	20.1	56.0	
1.589000	27.8	1000.000	9.000	GND	N	10.1	28.2	56.0	
12.702000	23.1	1000.000	9.000	GND	N	10.4	36.9	60.0	
18.802000	20.5	1000.000	9.000	GND	N	10.7	39.5	60.0	

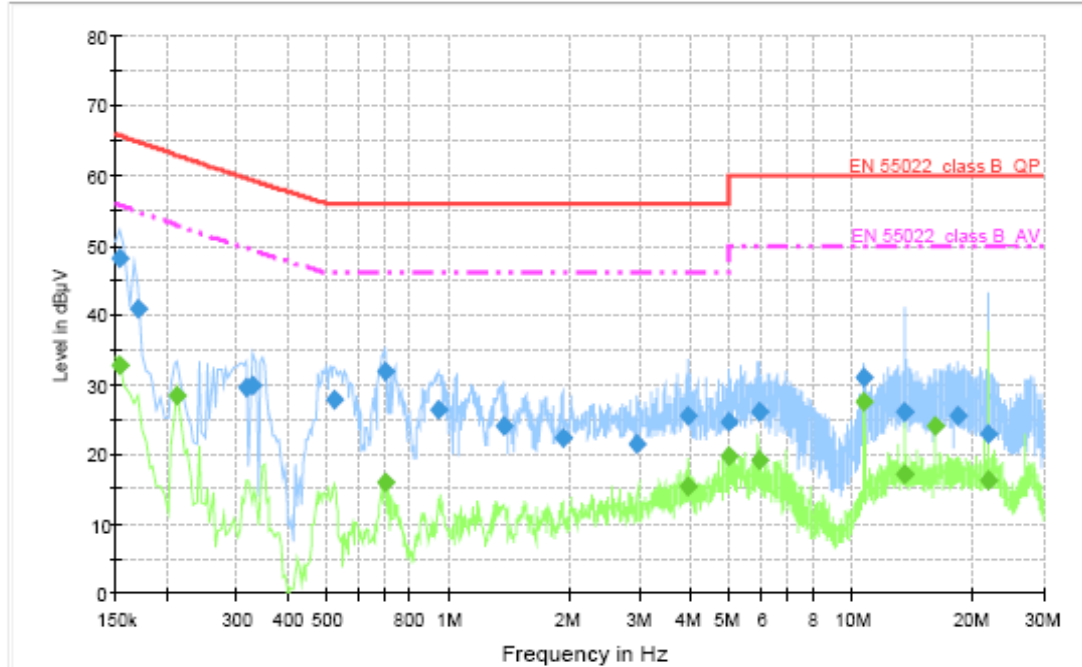
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	35.5	1000.000	9.000	GND	N	9.9	20.5	56.0	
0.215000	23.5	1000.000	9.000	GND	N	10.0	39.5	63.0	
0.392000	17.4	1000.000	9.000	GND	N	10.0	40.6	58.0	
0.774000	19.8	1000.000	9.000	GND	N	10.0	36.2	56.0	
1.589000	13.2	1000.000	9.000	GND	N	10.1	42.8	56.0	
12.705000	15.6	1000.000	9.000	GND	N	10.5	44.4	60.0	
18.826000	13.3	1000.000	9.000	GND	N	10.7	36.7	50.0	
23.190000	29.9	1000.000	9.000	GND	N	10.8	20.1	50.0	



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

Voltage with 4-Line-LISN L1



Final Measurement Detector 1

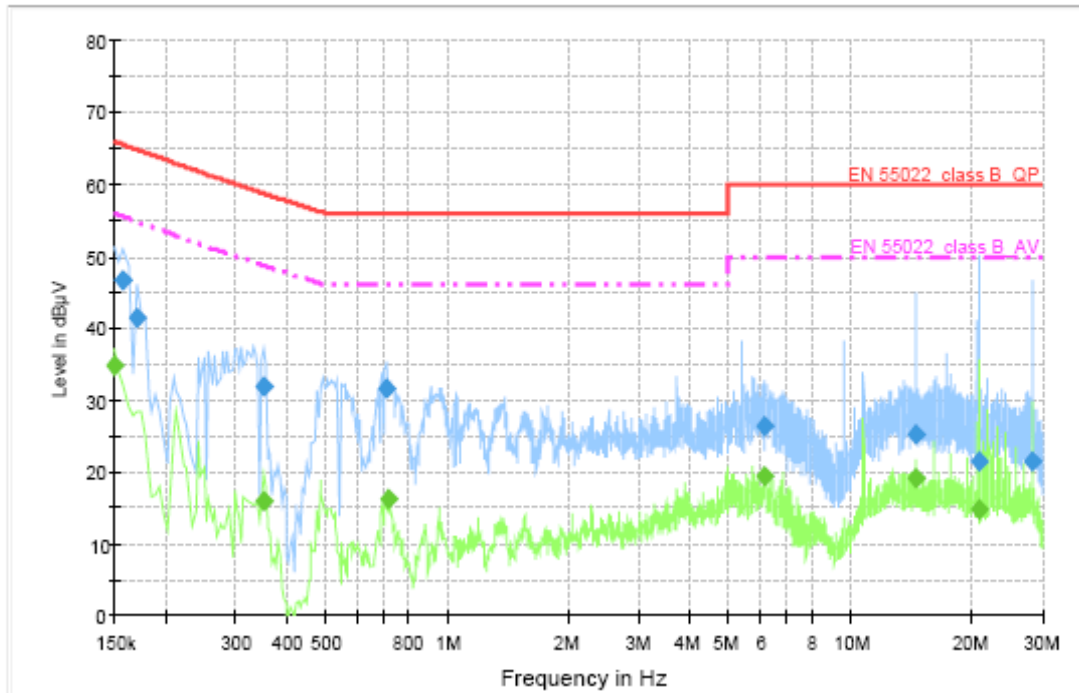
Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.154000	48.1	1000.000	9.000	GND	L1	9.9	17.7	65.8	
0.170000	41.0	1000.000	9.000	GND	L1	9.9	23.9	64.9	
0.318000	29.7	1000.000	9.000	GND	L1	10.0	29.9	59.6	
0.326000	29.9	1000.000	9.000	GND	L1	10.0	29.5	59.4	
0.522000	28.0	1000.000	9.000	GND	L1	10.0	28.0	56.0	
0.702000	31.8	1000.000	9.000	GND	L1	10.0	24.2	56.0	
0.946000	26.3	1000.000	9.000	GND	L1	10.0	29.7	56.0	
1.370000	24.0	1000.000	9.000	GND	L1	10.0	32.0	56.0	
1.922000	22.4	1000.000	9.000	GND	L1	10.1	33.6	56.0	
2.958000	21.3	1000.000	9.000	GND	L1	10.1	34.7	56.0	
3.922000	25.4	1000.000	9.000	GND	L1	10.2	30.6	56.0	
4.974000	24.6	1000.000	9.000	GND	L1	10.2	31.4	56.0	
5.930000	26.1	1000.000	9.000	GND	L1	10.2	33.9	60.0	
10.802000	31.0	1000.000	9.000	GND	L1	10.3	29.0	60.0	
13.510000	26.0	1000.000	9.000	GND	L1	10.5	34.0	60.0	
18.394000	25.6	1000.000	9.000	GND	L1	10.8	36.4	60.0	
21.962000	22.8	1000.000	9.000	GND	L1	10.9	37.2	60.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.154000	32.8	1000.000	9.000	GND	L1	9.9	23.0	55.8	
0.214000	28.5	1000.000	9.000	GND	L1	9.9	24.3	52.8	
0.698000	15.9	1000.000	9.000	GND	L1	10.0	30.1	46.0	
3.958000	15.4	1000.000	9.000	GND	L1	10.2	30.6	46.0	
4.974000	19.8	1000.000	9.000	GND	L1	10.2	26.2	46.0	
5.946000	19.3	1000.000	9.000	GND	L1	10.2	30.7	50.0	
10.802000	27.6	1000.000	9.000	GND	L1	10.3	22.4	50.0	
13.510000	17.2	1000.000	9.000	GND	L1	10.5	32.8	50.0	
16.202000	24.2	1000.000	9.000	GND	L1	10.7	25.8	50.0	
21.918000	16.2	1000.000	9.000	GND	L1	10.9	33.8	50.0	



Voltage with 4-Line-LISN N



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.158000	46.7	1000.000	9.000	GND	N	9.9	18.8	65.5	
0.170000	41.4	1000.000	9.000	GND	N	9.9	23.5	64.9	
0.350000	31.9	1000.000	9.000	GND	N	10.0	26.9	58.8	
0.710000	31.6	1000.000	9.000	GND	N	10.0	24.4	56.0	
6.154000	26.3	1000.000	9.000	GND	N	10.2	33.7	60.0	
14.562000	25.2	1000.000	9.000	GND	N	10.5	34.8	60.0	
20.838000	21.3	1000.000	9.000	GND	N	10.8	38.7	60.0	
28.402000	21.5	1000.000	9.000	GND	N	10.8	38.5	60.0	

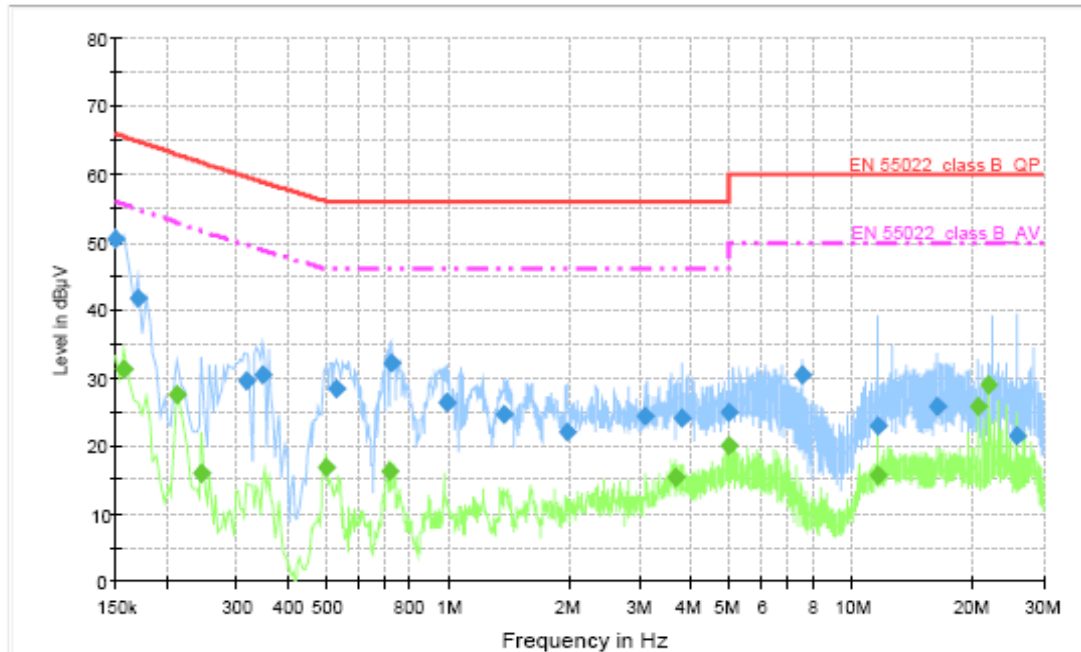
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	34.7	1000.000	9.000	GND	N	9.9	21.3	56.0	
0.350000	15.9	1000.000	9.000	GND	N	---	---	---	
0.718000	16.3	1000.000	9.000	GND	N	---	---	---	
6.154000	19.3	1000.000	9.000	GND	N	---	---	---	
14.560000	19.2	1000.000	9.000	GND	N	---	---	---	
20.838000	14.7	1000.000	9.000	GND	N	10.8	35.3	50.0	



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

Voltage with 4-Line-LISN L1



Final Measurement Detector 1

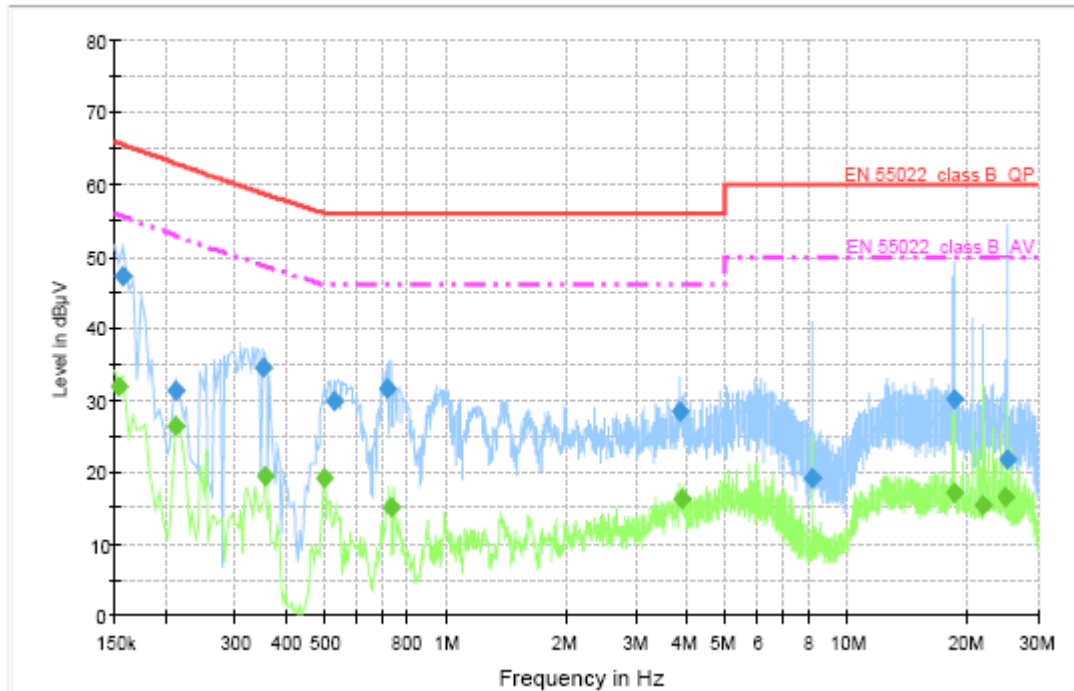
Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.150000	50.5	1000.000	9.000	GND	L1	9.9	15.5	66.0	
0.170000	41.8	1000.000	9.000	GND	L1	9.9	23.1	64.9	
0.318000	29.6	1000.000	9.000	GND	L1	10.0	30.0	59.6	
0.346000	30.5	1000.000	9.000	GND	L1	10.0	28.4	58.9	
0.526000	28.4	1000.000	9.000	GND	L1	10.0	27.6	56.0	
0.722000	32.0	1000.000	9.000	GND	L1	10.0	24.0	56.0	
0.998000	26.5	1000.000	9.000	GND	L1	10.0	29.5	56.0	
1.378000	24.6	1000.000	9.000	GND	L1	10.0	31.4	56.0	
1.970000	22.0	1000.000	9.000	GND	L1	10.1	34.0	56.0	
3.090000	24.2	1000.000	9.000	GND	L1	10.1	31.8	56.0	
3.798000	24.1	1000.000	9.000	GND	L1	10.2	31.9	56.0	
4.970000	25.0	1000.000	9.000	GND	L1	10.2	31.0	56.0	
7.606000	30.6	1000.000	9.000	GND	L1	10.3	29.4	60.0	
11.662000	22.8	1000.000	9.000	GND	L1	10.4	37.2	60.0	
16.314000	25.8	1000.000	9.000	GND	L1	10.7	34.2	60.0	
25.806000	21.4	1000.000	9.000	GND	L1	11.0	38.6	60.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.158000	31.4	1000.000	9.000	GND	L1	9.9	24.1	55.5	
0.214000	27.5	1000.000	9.000	GND	L1	9.9	25.3	52.8	
0.246000	15.9	1000.000	9.000	GND	L1	10.0	35.8	51.7	
0.498000	16.9	1000.000	9.000	GND	L1	10.0	29.1	46.0	
0.718000	16.3	1000.000	9.000	GND	L1	10.0	29.7	46.0	
3.654000	15.4	1000.000	9.000	GND	L1	10.1	30.6	46.0	
4.966000	20.0	1000.000	9.000	GND	L1	10.2	26.0	46.0	
11.662000	15.5	1000.000	9.000	GND	L1	10.4	34.5	50.0	
20.750000	25.9	1000.000	9.000	GND	L1	10.9	24.1	50.0	
21.970000	29.0	1000.000	9.000	GND	L1	10.9	21.0	50.0	



Voltage with 4-Line-LISN N



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.158000	47.3	1000.000	9.000	GND	N	9.9	18.2	65.5	
0.214000	31.2	1000.000	9.000	GND	N	10.0	31.8	63.0	
0.350000	34.5	1000.000	9.000	GND	N	10.0	24.5	58.9	
0.530000	30.0	1000.000	9.000	GND	N	10.0	26.0	56.0	
0.718000	31.5	1000.000	9.000	GND	N	10.0	24.5	56.0	
3.834000	28.4	1000.000	9.000	GND	N	10.2	27.6	56.0	
8.254000	19.3	1000.000	9.000	GND	N	10.3	40.7	60.0	
18.682000	30.2	1000.000	9.000	GND	N	10.7	29.8	60.0	
25.102000	21.8	1000.000	9.000	GND	N	10.8	38.2	60.0	

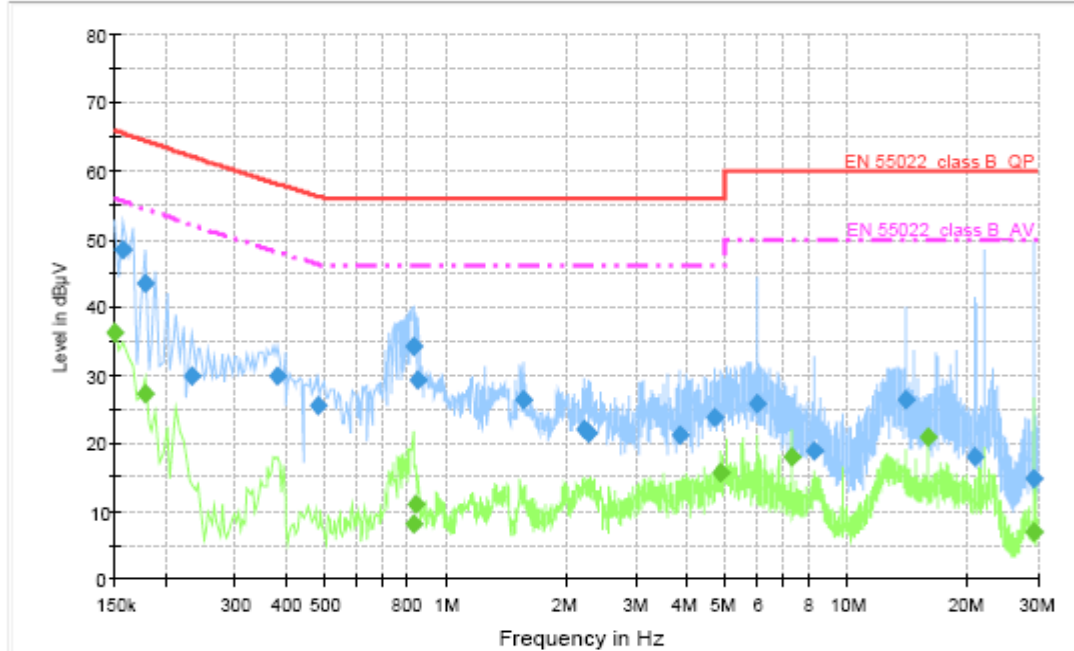
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.154000	32.0	1000.000	9.000	GND	N	10.0	55.8	55.8	
0.214000	26.4	1000.000	9.000	GND	N	10.0	53.1	53.0	
0.354000	19.5	1000.000	9.000	GND	N	10.0	48.9	48.9	
0.498000	19.2	1000.000	9.000	GND	N	10.0	46.0	46.0	
0.730000	15.1	1000.000	9.000	GND	N	10.0	46.0	46.0	
3.870000	16.1	1000.000	9.000	GND	N	10.2	45.8	46.0	
18.700000	17.1	1000.000	9.000	GND	N	10.7	49.3	50.0	
21.910000	15.5	1000.000	9.000	GND	N	10.8	34.5	50.0	
25.000000	16.4	1000.000	9.000	GND	N	10.8	49.2	50.0	



◆ USB play mode

Voltage with 4-Line-LISN L1



Final Measurement Detector 1

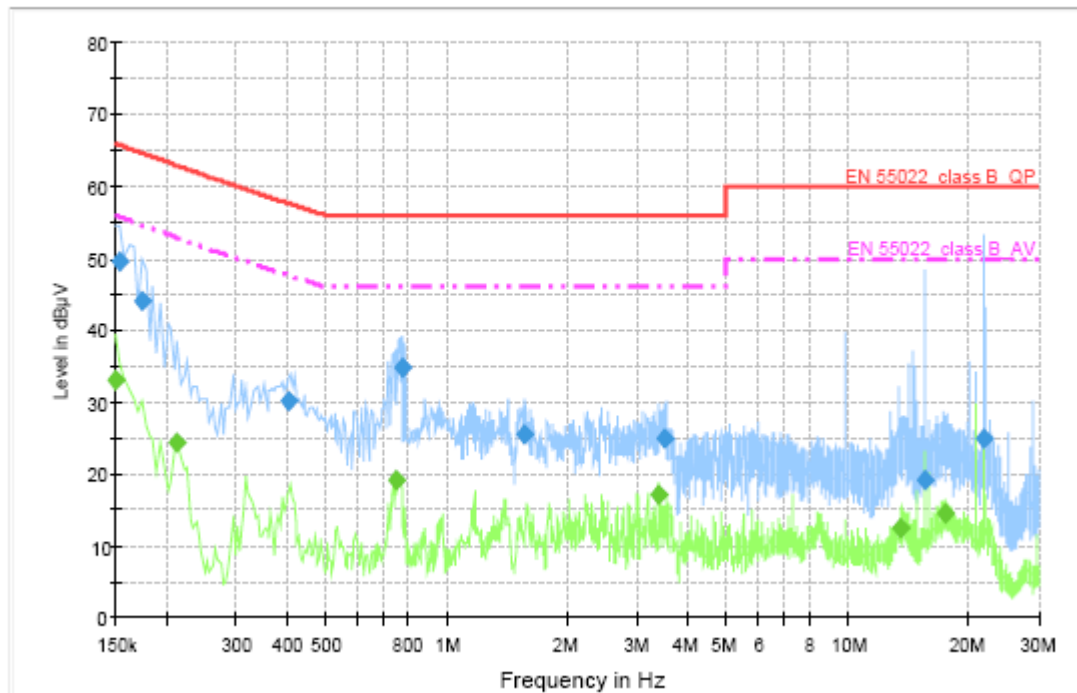
Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.158000	48.4	1000.000	9.000	GND	L1	9.9	17.1	65.5	
0.178000	43.3	1000.000	9.000	GND	L1	9.9	21.2	64.5	
0.234000	29.8	1000.000	9.000	GND	L1	9.9	32.3	62.1	
0.382000	29.9	1000.000	9.000	GND	L1	10.0	28.2	58.1	
0.482000	25.6	1000.000	9.000	GND	L1	10.0	30.7	56.3	
0.830000	34.1	1000.000	9.000	GND	L1	10.0	21.9	56.0	
0.858000	29.4	1000.000	9.000	GND	L1	10.0	26.6	56.0	
1.574000	26.3	1000.000	9.000	GND	L1	10.1	29.7	56.0	
2.218000	21.9	1000.000	9.000	GND	L1	10.1	34.1	56.0	
2.262000	21.4	1000.000	9.000	GND	L1	10.1	34.6	56.0	
3.834000	21.2	1000.000	9.000	GND	L1	10.2	34.8	56.0	
4.718000	23.6	1000.000	9.000	GND	L1	10.2	32.4	56.0	
5.970000	25.7	1000.000	9.000	GND	L1	10.2	34.3	60.0	
8.334000	18.8	1000.000	9.000	GND	L1	10.3	41.2	60.0	
14.046000	26.3	1000.000	9.000	GND	L1	10.6	33.7	60.0	
20.922000	18.0	1000.000	9.000	GND	L1	10.9	42.0	60.0	
29.250000	14.8	1000.000	9.000	GND	L1	11.1	45.2	60.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	36.1	1000.000	9.000	GND	L1	9.9	19.9	56.0	
0.178000	27.1	1000.000	9.000	GND	L1	9.9	27.4	54.5	
0.830000	8.2	1000.000	9.000	GND	L1	10.0	37.8	46.0	
0.846000	11.0	1000.000	9.000	GND	L1	10.0	35.0	46.0	
4.838000	15.8	1000.000	9.000	GND	L1	10.2	30.2	46.0	
7.326000	17.9	1000.000	9.000	GND	L1	10.3	32.1	50.0	
16.010000	20.8	1000.000	9.000	GND	L1	10.7	29.2	50.0	
29.250000	6.8	1000.000	9.000	GND	L1	11.1	43.2	50.0	



Voltage with 4-Line-LISN N



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.154000	49.5	1000.000	9.000	GND	N	9.9	16.3	65.8	
0.174000	44.0	1000.000	9.000	GND	N	9.9	20.7	64.7	
0.406000	30.2	1000.000	9.000	GND	N	10.0	27.5	57.7	
0.774000	34.8	1000.000	9.000	GND	N	10.0	21.2	56.0	
1.574000	25.4	1000.000	9.000	GND	N	10.1	30.6	56.0	
3.490000	25.0	1000.000	9.000	GND	N	10.2	31.0	56.0	
15.526000	19.2	1000.000	9.000	GND	N	10.6	40.8	60.0	
21.890000	25.1	1000.000	9.000	GND	N	10.8	34.9	60.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.150000	33.2	1000.000	9.000	GND	N	9.9	22.8	56.0	
0.214000	24.3	1000.000	9.000	GND	N	10.0	38.7	63.0	
0.750000	19.2	1000.000	9.000	GND	N	10.0	36.8	56.0	
3.402000	17.2	1000.000	9.000	GND	N	10.1	38.8	56.0	
13.558000	12.4	1000.000	9.000	GND	N	10.5	47.6	60.0	
17.458000	14.4	1000.000	9.000	GND	N	10.6	45.6	60.0	



6. Radiated Emission

6.1 Operating Environment

Temperature : 21 °C
Relative Humidity : 43 % 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	11. 11. 2009

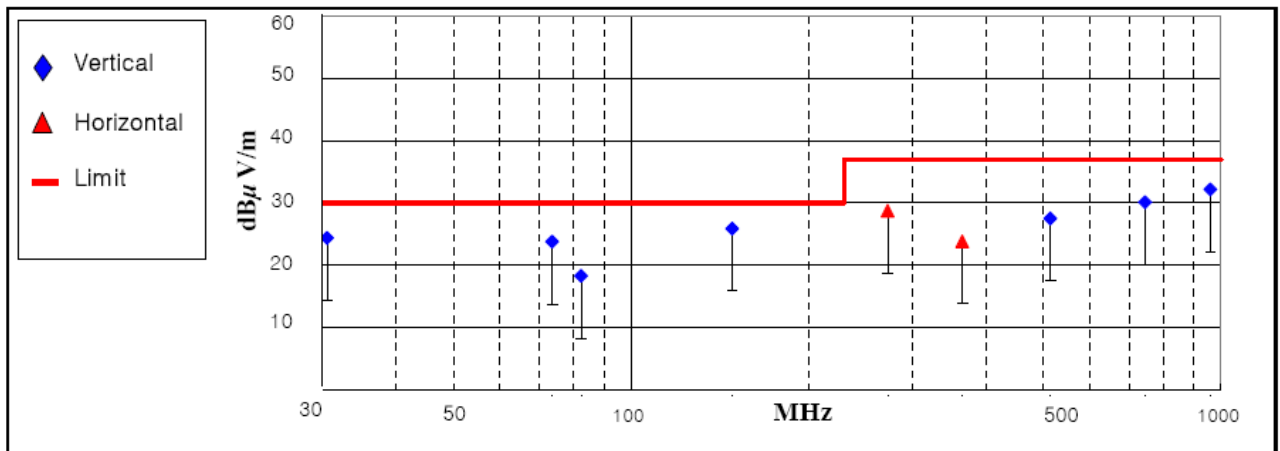


6.6 Test data for Radiated Emission

- Test Date : April 29, 2009
- Resolution Bandwidth : 120 kHz/ 1 MHz
- Frequency Range : 30 MHz ~ 2 000 MHz
- Measurement Distance : 10 m/ 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)	(°)
30.56	9.47	13.23	1.64	24.34	30.00	5.66	V	100	213
73.53	13.53	7.67	2.56	23.76	30.00	6.24	V	148	37
82.33	7.46	8.12	2.68	18.26	30.00	11.74	V	161	260
148.50	10.67	11.56	3.60	25.83	30.00	4.17	V	110	22
272.27	7.55	16.03	5.13	28.71	37.00	8.29	H	210	296
364.52	1.53	14.64	7.60	23.77	37.00	13.23	H	201	152
514.01	3.15	17.07	7.29	27.51	37.00	9.49	V	193	180
744.26	1.16	20.41	8.53	30.10	37.00	6.90	V	110	199
959.85	0.41	21.81	9.91	32.13	37.00	4.87	V	159	201

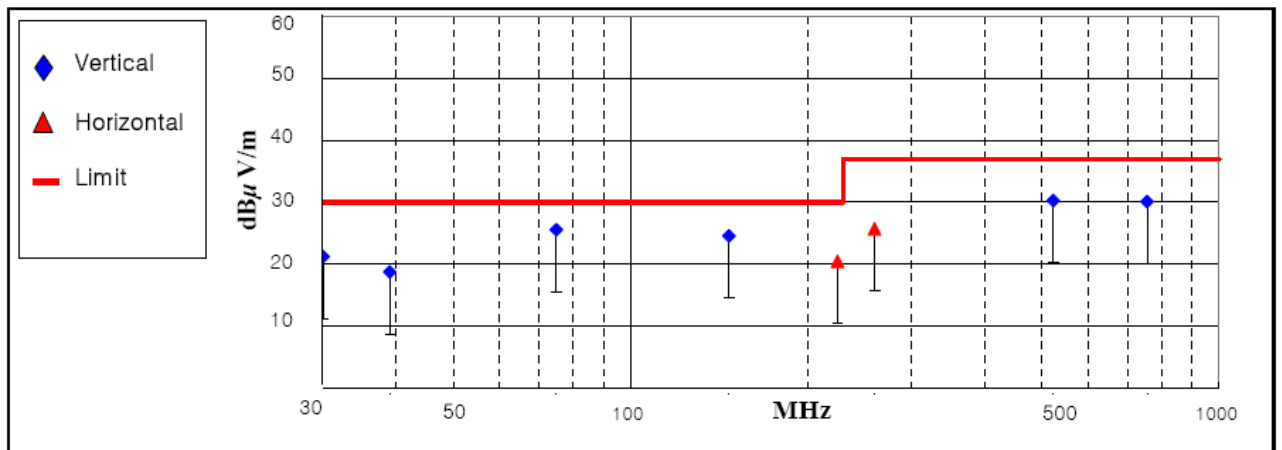


< Fig 4. Radiated emission result (30 MHz ~ 1 000 MHz)>



- ◆ Operating Condition: 1 920 * 1 080 / 60 Hz (HDMI/DVI: 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)	(°)
30.09	6.18	13.39	1.63	21.20	30.00	8.80	V	123	203
39.03	6.19	10.66	1.86	18.71	30.00	11.29	V	105	132
74.81	15.22	7.73	2.58	25.53	30.00	4.47	V	187	320
147.08	9.44	11.50	3.57	24.51	30.00	5.49	V	105	352
224.83	1.39	14.45	4.59	20.43	30.00	9.57	H	213	266
259.90	5.26	15.40	5.00	25.66	37.00	11.34	H	200	283
523.14	5.73	17.22	7.27	30.22	37.00	6.78	V	110	185
754.77	1.00	20.42	8.68	30.10	37.00	6.90	V	105	177

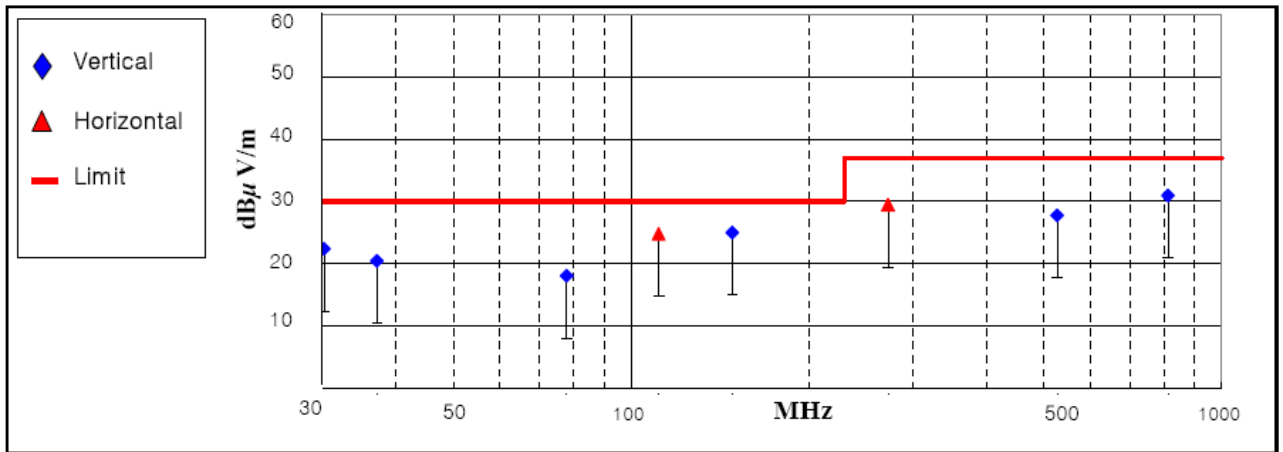


< Fig 5. Radiated emission result (30 MHz ~ 1 000 MHz)>



- ◆ 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)	(°)
30.22	7.40	13.35	1.64	22.39	30.00	7.61	V	107	201
37.13	7.44	11.18	1.81	20.43	30.00	9.57	V	100	196
77.79	7.55	7.86	2.62	18.03	30.00	11.97	V	100	12
111.41	11.55	10.19	3.02	24.76	30.00	5.24	H	296	77
148.51	9.83	11.56	3.60	24.99	30.00	5.01	V	116	312
272.26	8.27	16.03	5.13	29.43	37.00	7.57	H	200	265
526.30	3.19	17.27	7.25	27.71	37.00	9.29	V	100	179
811.36	1.06	20.94	8.91	30.91	37.00	6.09	V	120	180

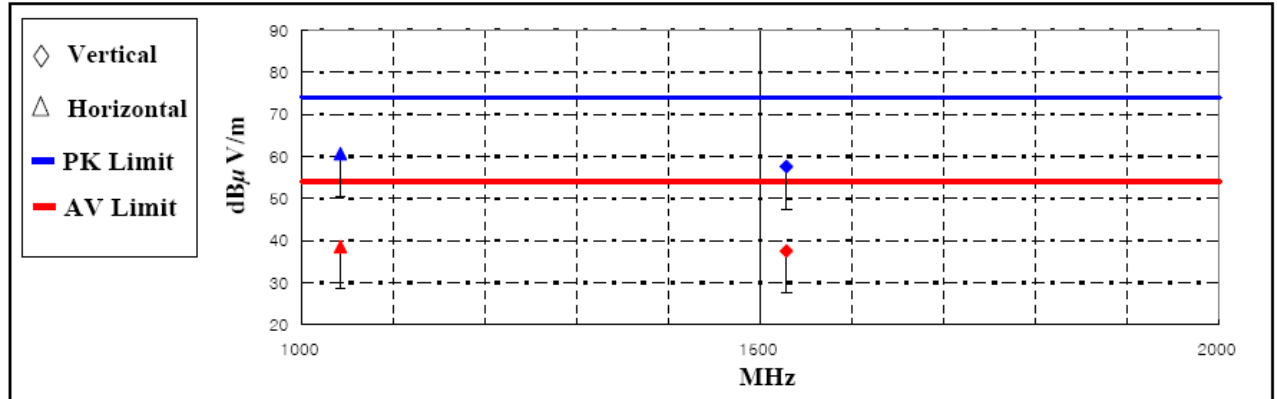


< Fig 6. Radiated emission result (30 MHz ~ 1 000 MHz)>



- ◆ 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	(H/V)	(cm)	(°)				
1042.00	76.62	54.52	24.94	-40.96	60.60	38.50	74.00	54.00	13.40	15.50	H	200	195
1528.00	71.72	51.72	25.78	-40.00	57.50	37.50	74.00	54.00	16.50	16.50	V	115	32



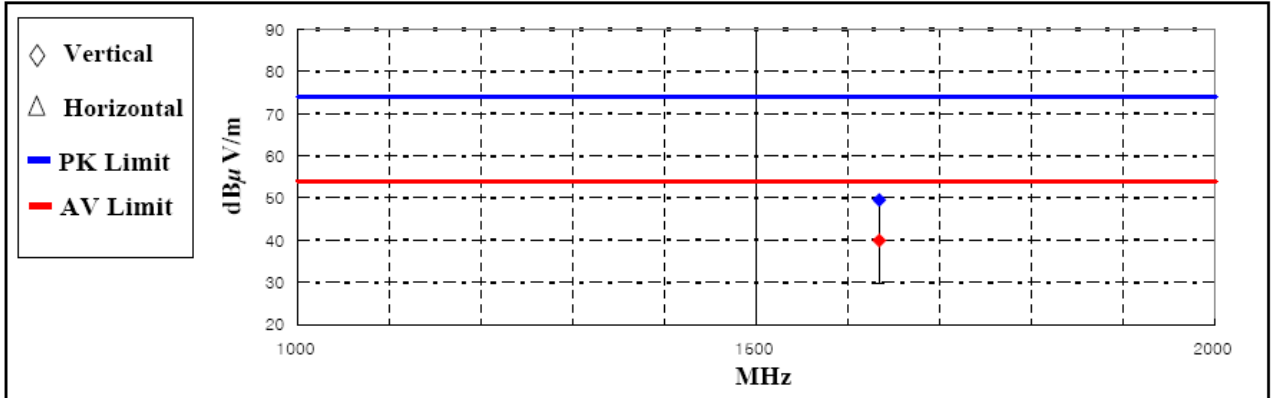
*Comment : AMP/CL_Cable loss value + AMP gain value
AF : Antenna factor value
Pol. : H(Horizontal), V(Vertical)

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



- ◆ Operating Condition: 1 920 * 1 080 / 60 Hz (HDMI/DVI: 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)	(°)
1633.60	63.46	53.86	25.88	-39.84	49.50	39.90	74.00	54.00	24.50	14.10	V	200	160



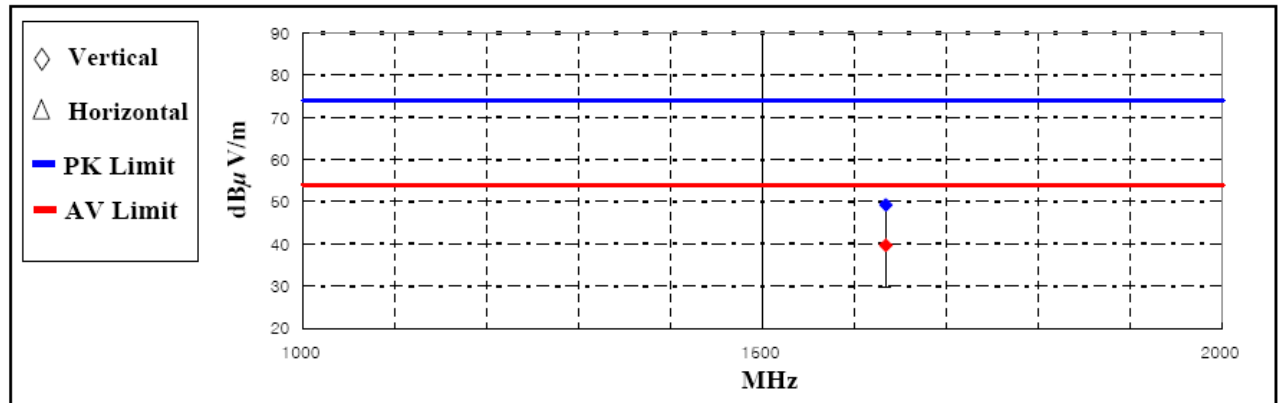
*Comment : AMP/CL_Cable loss value + AMP gain value
AF : Antenna factor value
Pol. : H(Horizontal), V(Vertical)

< 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	(H/V)	(cm)	(°)		
	1633.60	63.16	53.56	25.88	-39.84	49.20	39.60	74.00	54.00	24.80	14.40	V	199



*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 $\text{dB}\mu\text{V}$
Reading	=	- 67.8 dBm (Calibrated level)		
Convert to $\text{dB}\mu\text{V}$	=	- 67.8 $\text{dBm} + 107$	=	39.2 $\text{dB}\mu\text{V}$
$10^{(39.2\text{dB}\mu\text{V}/20)}$	=	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 $\text{dB}\mu\text{V}/\text{m}$
Reading	=	- 76.0 dBm (Calibrated level)		
Convert to $\text{dB}\mu\text{V}/\text{m}$	=	- 76.0 $\text{dBm} + 107$	=	31.0 $\text{dB}\mu\text{V}/\text{m}$
Antenna Factor + Cable Loss	=	5.8 dB		
Total	=	36.8 $\text{dB}\mu\text{V}/\text{m}$		
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: 42SL80-UA)** was complies with §15.107 and 15.109 of the FCC Rules.