

FCC EVALUATION REPORT FOR CERTIFICATION

Applicant : LG Electronics Inc.

19-1, Cheongho-ri, Jinwi-myeon,

Pyeongteak-si, Gyeonggi-do, Korea.

Attn: Mr. Sang-Wook Lee, Chief research engineer

Date of Issue : April 7, 2010

Order Number: GETEC-C1-10-072

Test Report Number: GETEC-E3-10-033

Test Site: Gumi College EMC Center

FCC Registration Number: (100749, 443957)

FCC ID.: BEJ55LX9500UA

Applicant: LG Electronics Inc.

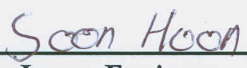
Rule Part(s)	: FCC Part 15 Subpart B
Equipment Class	: Class B computing device peripheral (JBP)
EUT Type	: LED LCD TV/Monitor
Type of Authority	: Certification
Model Name	: 55LX9500-UA
Trade Name	: LG

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,


Soon-Hoon Jeong, Engineer
GUMI College EMC center


Jae-Hoon Jeong, Senior Engineer
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: 19-1, Cheongho-ri, Jinwi-myeon, Pyeongteak-si, Gyeonggi-do, Korea.

Manufacturer: LG Electronics Inc.

Manufacturer Address: 19-1, Cheongho-ri, Jinwi-myeon, Pyeongteak-si, Gyeonggi-do, Korea.

Contact Person: Mr. Sang-Wook Lee, Chief research engineer

Tel Number: +82-31-610-9623

- **FCC ID.** BEJ55LX9500UA
- **EUT Type** LED LCD TV/Monitor
- **Model Name** 55LX9500-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** March 29 ~ 30, 2010
- **Place of Test** **Gumi College EMC Center** (FCC Registration Number: 100749, 443957)
407, Bugok-dong, Gumi-si, Gyeongbuk, Korea.
- **Test Report Number** GETEC-E3-10-033
- **Dates of Issue** April 7, 2010



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. LED LCD TV/Monitor (Model Name: 55LX9500-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 (2003)



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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. LED LCD TV/Monitor (Model Name: 55LX9500-UA) FCC ID.: BEJ55LX9500UA**

MODELS		47LX9500 (47LX9500-UA)	55LX9500 (55LX9500-UA)
Dimensions (Width x Height x Depth)	With stand	1073.7 mm x 692.0 mm x 255.0 mm (44.3 inch x 29.8 inch x 11.1 inch)	1255.8 mm x 805.0 mm x 255.0 mm (51.4 inch x 34.1 inch x 13.5 inch)
	Without stand	1073.7 mm x 647.2 mm x 32.4 mm (44.3 inch x 27.2 inch x 1.1 inch)	1255.8 mm x 749.6 mm x 31.6 mm (51.4 inch x 31.3 inch x 1.2 inch)
Weight	With stand	26.7 kg (50.4 lbs)	32.7 kg (76.0 lbs)
	Without stand	22.1 kg (43.2 lbs)	28.1 kg (63.4 lbs)
Power requirement		AC 120 V - 50 / 60 Hz	
Television System		NTSC-M, ATSC, 64 & 256 QAM	
Program Coverage		VHF 2-13, UHF 14-69, CATV 1-135, DTV 2-69, CADTV 1-135	
External Antenna Impedance		75 Ω	
Environment condition	Operating Temperature	0 °C to 40 °C (32 °F to 104 °F)	
	Operating Humidity	Less than 80 %	
	Storage Temperature	-20 °C to 60 °C (-4 °F to 140 °F)	
	Storage Humidity	Less than 85 %	

-. Maximum Frequency range : 513 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	16516-AD6	S/N: B13BBOR391006D FCC ID.: AQ6-23K15
PS2 mouse	LOGITECH	M-S69	S/N: 334684-108 FCC ID.: JNZ211443
Joy stick	MICROSOFT	X05-92626	S/N: 9262600296169 FCC ID.: DoC
DVD player	LG Electronics Inc.	LC-954	S/N: 3850R-Z674K FCC ID.: DoC
Headset	GOWOONSORI	GW-500M	S/N: N/A 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
Wireless Ready Dongle	LG Electronics Inc.	-	S/N: N/A FCC ID.: -

See “Appendix D – Test Setup Photographs” for actual system test set-up

3.2.2 System configuration

Description	Manufacturer	Model Name	S/N & FCC ID.
None	-	-	-



3.2.3 Used Cable(s)

Cable Name	Condition	Description
Power cable	Connected to the EUT	1.80 m unshielded
RGB(Analog) cable	Connected to the EUT and PC	1.80 m shielded with two ferrite cores
HDMI/DVI(Digital) cable	Connected to the EUT and PC	2.00 m shielded
Audio(RGB/DVI) in cable	Connected to the EUT and PC	1.80 m shielded
RS-232C in (Control & Service) cable	Connected to the EUT and PC	1.80 m shielded
Component cable	Connected to the EUT and DVD player	2.00 m shielded
Component sound cable	Connected to the EUT and DVD player	3.00 m shielded
AV in cable	Connected to the EUT and DVD player	3.00 m shielded
Antenna cable	Connected to the EUT and TV signal generator	10.00 m shielded
Headphone cable	Connected to the EUT and Headset	2.75 m shielded
Component in 3 cable	Connected to the EUT and DVD player	2.10 m shielded
AV in 2 cable	Connected to the EUT and DVD player	3.10 m shielded
LAN cable	Connected to the EUT and network	10.00 m unshielded
Wireless control cable	Connected to the EUT and wireless ready dongle	0.25 m shielded

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, HDMI/DVI: Digital)

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

1 024 × 768 / 60 Hz (RGB: Analog), 640 × 480 / 60 Hz (RGB: Analog)

◆ 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
- . Network connecting

- . **USB memory stick play mode**

◆ Operating test pattern

- . Continuous playback mode with video files
- . 3D video display activated

“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. (FCC Registration No.: 100749)

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

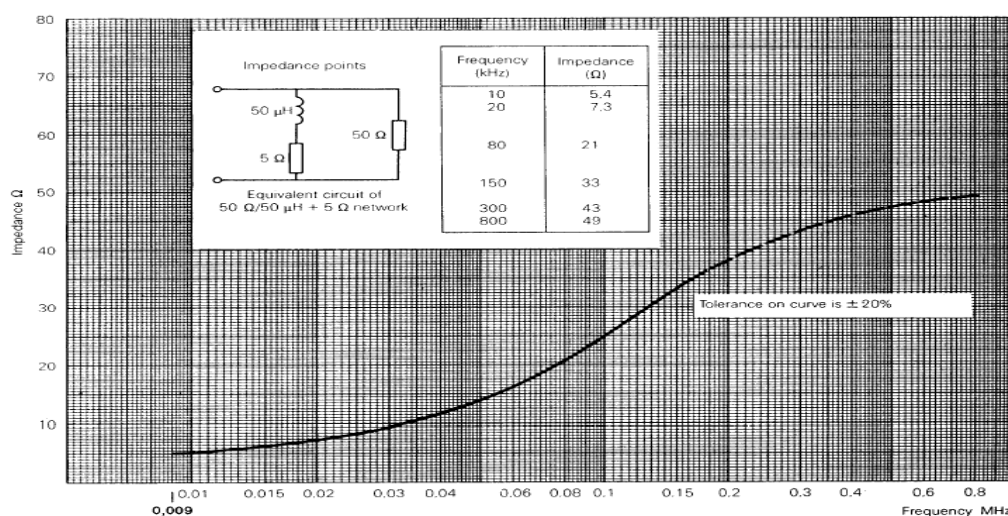


Fig 2. Impedance of LISN



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.

Final measurements were made 3 m chamber (FCC registration No.: 443957) and/or 10 m OATS (FCC registration No.: 100749).

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

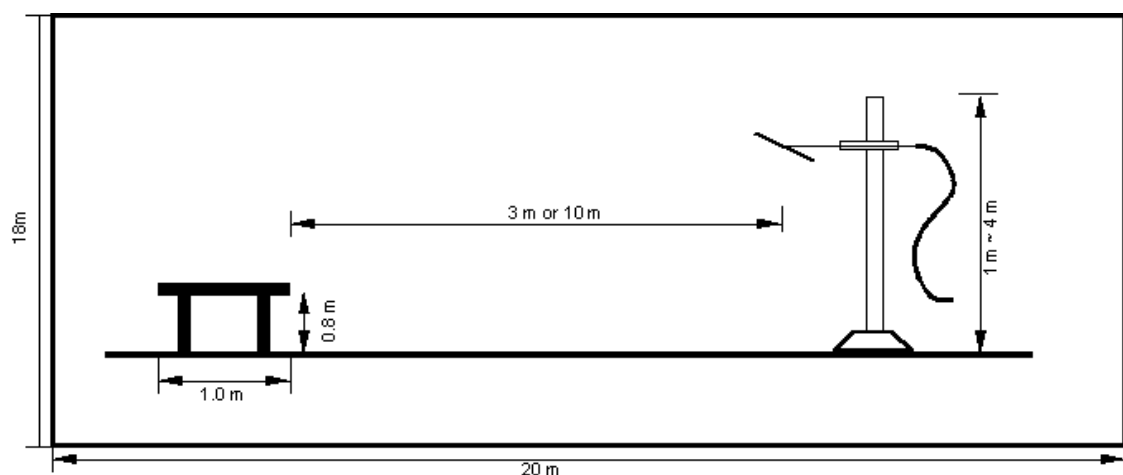


Fig 3. Dimensions of test site.



5. Conducted Emission

5.1 Operating Environment

Temperature : 26 °C
Relative Humidity : 42 % 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)	± 2.69 dB	Confidence levels of 95 % ($k = 2$)
Conducted emission (150 kHz ~ 30 MHz)	± 4.16 dB	Confidence levels of 95 % ($k = 2$)



5.4 Limit

RFI Conducted	FCC Limit(dB μ V/m) 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. 10. 2010
■ - ESH3-Z5	Rohde & Schwarz	LISN	838979/020	12. 10. 2010
■ - ESH2-Z5	Rohde & Schwarz	LISN	829991/009	12. 10. 2010
■ - ISN T8	TESEQ. GmbH	Impedance Network	24568	10. 16. 2010

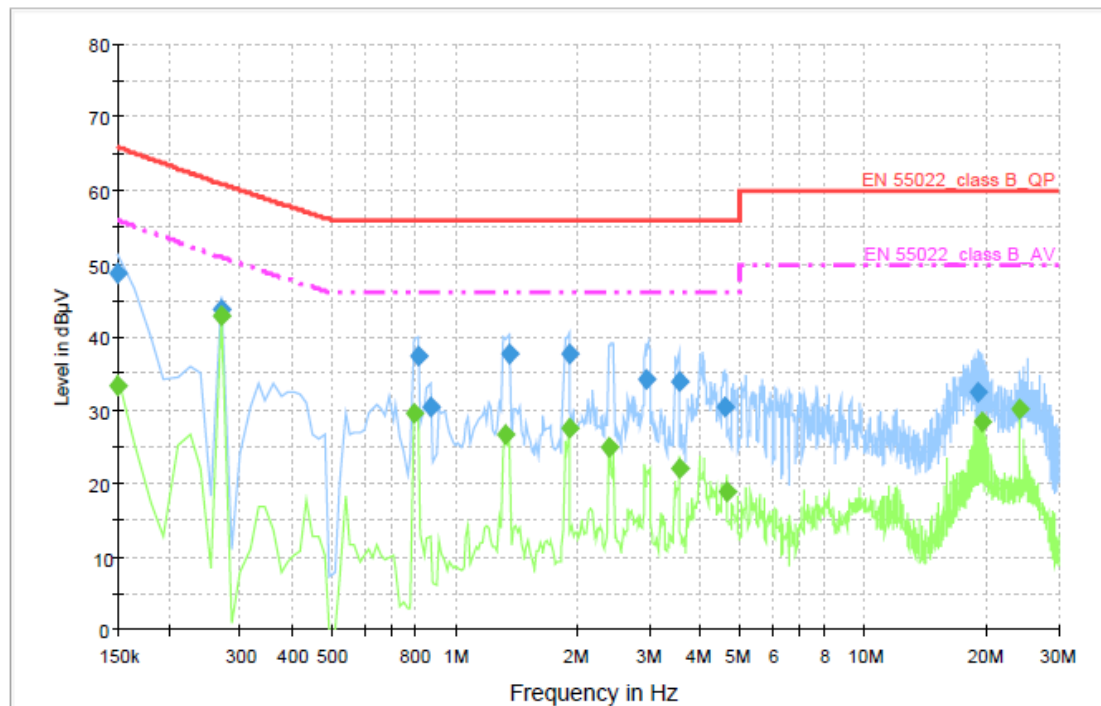
5.6 Test data for Conducted Emission

-. Test Date : March 29, 2010
-. Resolution Bandwidth : 9 kHz
-. Frequency Range : 0.15 MHz ~ 30 MHz



◆ Operating condition: 1 920 × 1 080 / 60 Hz (RGB: Analog)

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	48.6	1000.000	9.000	GND	L1	10.0	17.4	66.0	
0.270000	43.6	1000.000	9.000	GND	L1	10.0	17.3	60.9	
0.810000	37.4	1000.000	9.000	GND	L1	10.0	18.6	56.0	
0.870000	30.5	1000.000	9.000	GND	L1	10.0	25.5	56.0	
1.365000	37.8	1000.000	9.000	GND	L1	10.1	18.2	56.0	
1.905000	37.7	1000.000	9.000	GND	L1	10.1	18.3	56.0	
2.925000	34.2	1000.000	9.000	GND	L1	10.1	21.8	56.0	
3.525000	33.8	1000.000	9.000	GND	L1	10.2	22.2	56.0	
4.590000	30.6	1000.000	9.000	GND	L1	10.2	25.4	56.0	
18.960000	32.6	1000.000	9.000	GND	L1	11.0	27.4	60.0	

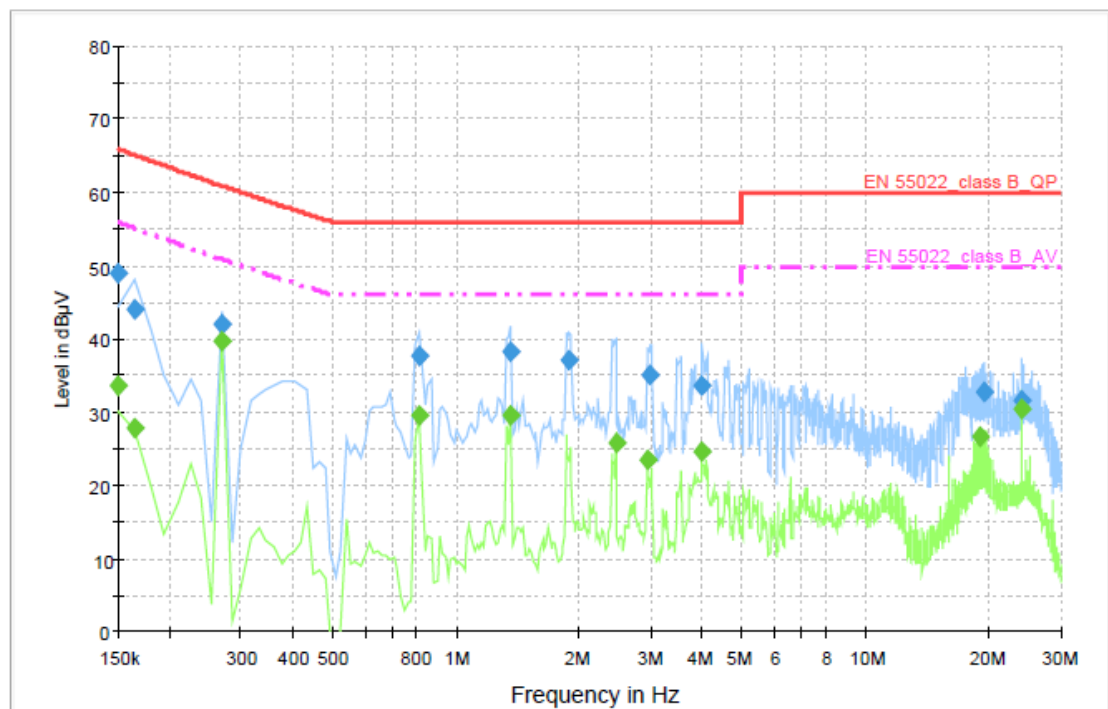
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	33.5	1000.000	9.000	GND	L1	10.0	22.5	56.0	
0.270000	43.0	1000.000	9.000	GND	L1	10.0	7.9	50.9	
0.795000	29.5	1000.000	9.000	GND	L1	10.0	16.5	46.0	
1.335000	26.6	1000.000	9.000	GND	L1	10.1	19.4	46.0	
1.905000	27.4	1000.000	9.000	GND	L1	10.1	18.6	46.0	
2.385000	25.1	1000.000	9.000	GND	L1	10.1	20.9	46.0	
3.540000	22.1	1000.000	9.000	GND	L1	10.2	23.9	46.0	
4.620000	18.8	1000.000	9.000	GND	L1	10.2	27.2	46.0	
19.440000	28.5	1000.000	9.000	GND	L1	11.0	21.5	50.0	
24.015000	30.2	1000.000	9.000	GND	L1	11.2	19.8	50.0	

< Fig 4. Conducted emission result (Live line)>



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
0.150000	48.9	1000.000	9.000	GND	N	10.0	17.1	66.0	
0.165000	44.2	1000.000	9.000	GND	N	10.0	20.9	65.1	
0.270000	41.9	1000.000	9.000	GND	N	10.0	19.0	60.9	
0.810000	37.6	1000.000	9.000	GND	N	10.0	18.4	56.0	
1.365000	38.3	1000.000	9.000	GND	N	10.1	17.7	56.0	
1.890000	37.2	1000.000	9.000	GND	N	10.1	18.8	56.0	
2.985000	35.1	1000.000	9.000	GND	N	10.1	20.9	56.0	
3.990000	33.7	1000.000	9.000	GND	N	10.2	22.3	56.0	
19.440000	32.6	1000.000	9.000	GND	N	10.8	27.4	60.0	
24.015000	31.7	1000.000	9.000	GND	N	10.8	28.3	60.0	

Final Measurement Detector 2

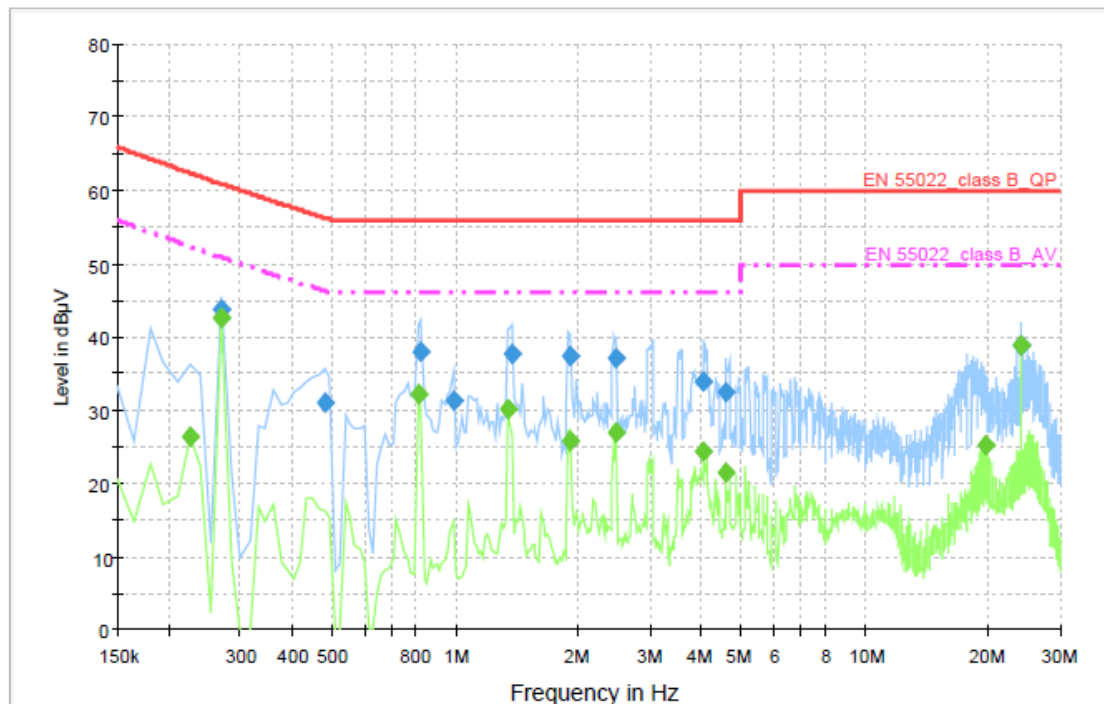
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	33.5	1000.000	9.000	GND	N	10.0	22.5	56.0	
0.165000	27.8	1000.000	9.000	GND	N	10.0	27.3	55.1	
0.270000	39.8	1000.000	9.000	GND	N	10.0	11.1	50.9	
0.810000	29.6	1000.000	9.000	GND	N	10.0	16.4	46.0	
1.365000	29.7	1000.000	9.000	GND	N	10.1	16.3	46.0	
2.460000	25.8	1000.000	9.000	GND	N	10.1	20.2	46.0	
2.925000	23.6	1000.000	9.000	GND	N	10.1	22.4	46.0	
3.990000	24.7	1000.000	9.000	GND	N	10.2	21.3	46.0	
19.035000	26.5	1000.000	9.000	GND	N	10.7	23.5	50.0	
24.015000	30.5	1000.000	9.000	GND	N	10.8	19.5	50.0	

< Fig 5. Conducted emission result (Neutral line)>



◆ Operating condition: 1 024 × 768 / 60 Hz (RGB: Analog)

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
0.270000	43.8	1000.000	9.000	GND	L1	10.0	17.1	60.9	
0.480000	31.0	1000.000	9.000	GND	L1	10.0	25.3	56.3	
0.825000	38.0	1000.000	9.000	GND	L1	10.0	18.0	56.0	
0.990000	31.3	1000.000	9.000	GND	L1	10.0	24.7	56.0	
1.380000	37.8	1000.000	9.000	GND	L1	10.1	18.2	56.0	
1.920000	37.4	1000.000	9.000	GND	L1	10.1	18.6	56.0	
2.475000	37.1	1000.000	9.000	GND	L1	10.1	18.9	56.0	
4.035000	33.9	1000.000	9.000	GND	L1	10.2	22.1	56.0	
4.590000	32.4	1000.000	9.000	GND	L1	10.2	23.6	56.0	
24.015000	38.8	1000.000	9.000	GND	L1	11.2	21.2	60.0	

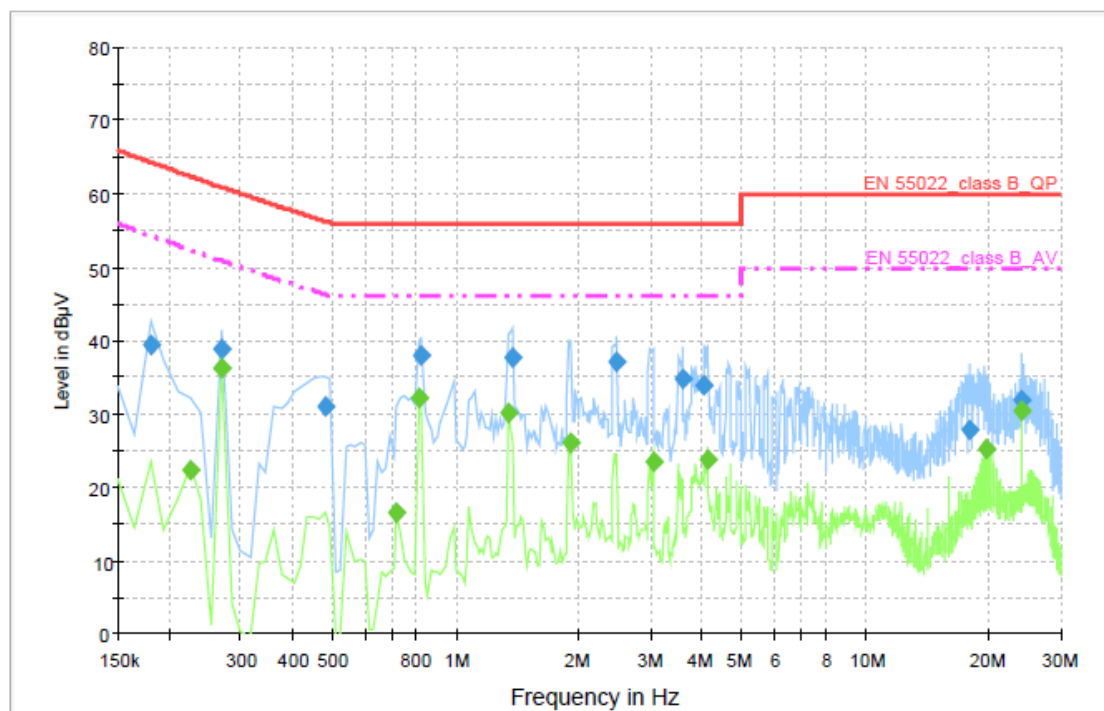
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.225000	26.3	1000.000	9.000	GND	L1	10.0	26.1	52.4	
0.270000	42.6	1000.000	9.000	GND	L1	10.0	8.3	50.9	
0.810000	32.3	1000.000	9.000	GND	L1	10.0	13.7	46.0	
1.350000	30.1	1000.000	9.000	GND	L1	10.1	15.9	46.0	
1.920000	25.7	1000.000	9.000	GND	L1	10.1	20.3	46.0	
2.475000	27.0	1000.000	9.000	GND	L1	10.1	19.0	46.0	
4.035000	24.4	1000.000	9.000	GND	L1	10.2	21.6	46.0	
4.575000	21.5	1000.000	9.000	GND	L1	10.2	24.5	46.0	
19.710000	25.3	1000.000	9.000	GND	L1	11.0	24.7	50.0	
24.015000	38.9	1000.000	9.000	GND	L1	11.2	11.1	50.0	

< Fig 6. Conducted emission result (Live line)>



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
0.180000	39.5	1000.000	9.000	GND	N	10.0	24.9	64.4	
0.270000	38.9	1000.000	9.000	GND	N	10.0	22.0	60.9	
0.480000	31.0	1000.000	9.000	GND	N	10.0	25.3	56.3	
0.825000	38.0	1000.000	9.000	GND	N	10.0	18.0	56.0	
1.380000	37.8	1000.000	9.000	GND	N	10.1	18.2	56.0	
2.475000	37.2	1000.000	9.000	GND	N	10.1	18.8	56.0	
3.585000	34.9	1000.000	9.000	GND	N	10.2	21.1	56.0	
4.050000	33.8	1000.000	9.000	GND	N	10.2	22.2	56.0	
17.880000	27.7	1000.000	9.000	GND	N	10.7	32.3	60.0	
24.015000	31.8	1000.000	9.000	GND	N	10.8	28.2	60.0	

Final Measurement Detector 2

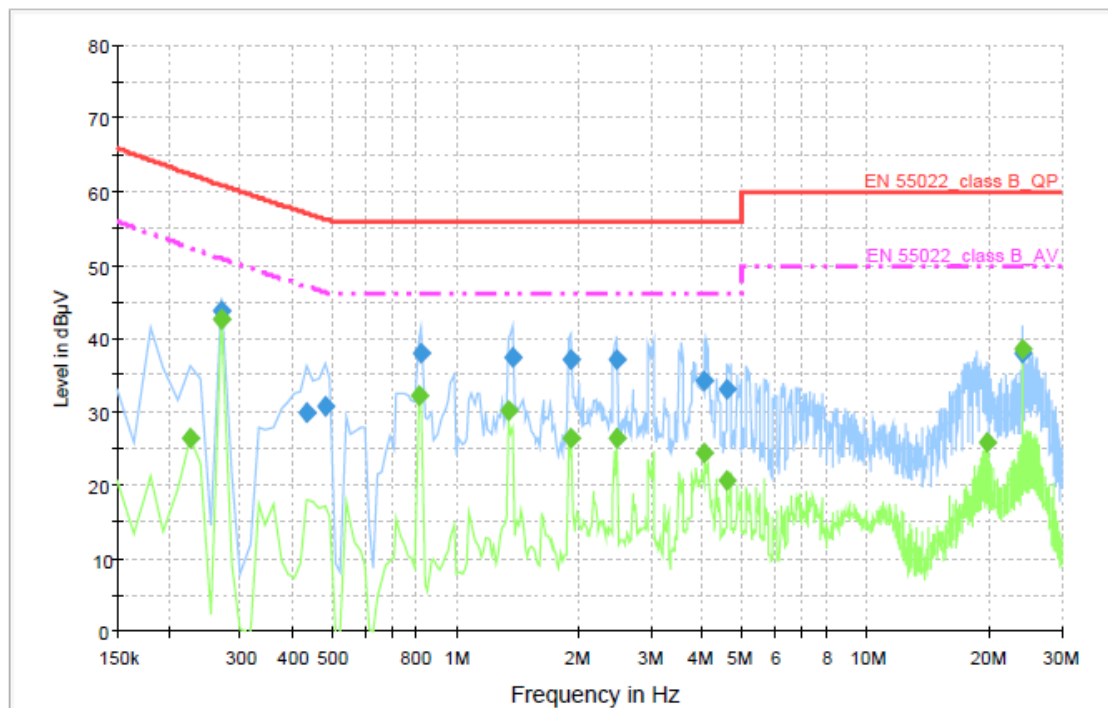
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.225000	22.4	1000.000	9.000	GND	N	10.0	30.0	52.4	
0.270000	36.2	1000.000	9.000	GND	N	10.0	14.7	50.9	
0.720000	16.4	1000.000	9.000	GND	N	10.0	29.6	46.0	
0.810000	32.3	1000.000	9.000	GND	N	10.0	13.7	46.0	
1.350000	30.1	1000.000	9.000	GND	N	10.1	15.9	46.0	
1.920000	26.2	1000.000	9.000	GND	N	10.1	19.8	46.0	
3.030000	23.4	1000.000	9.000	GND	N	10.1	22.6	46.0	
4.125000	23.9	1000.000	9.000	GND	N	10.2	22.1	46.0	
19.710000	25.3	1000.000	9.000	GND	N	10.8	24.7	50.0	
24.015000	30.5	1000.000	9.000	GND	N	10.8	19.5	50.0	

< Fig 7. Conducted emission result (Neutral line)>



◆ Operating condition: 640 × 480 / 60 Hz (RGB: Analog)

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
0.270000	43.7	1000.000	9.000	GND	L1	10.0	17.2	60.9	
0.435000	29.8	1000.000	9.000	GND	L1	10.0	27.3	57.1	
0.480000	30.8	1000.000	9.000	GND	L1	10.0	25.5	56.3	
0.825000	38.0	1000.000	9.000	GND	L1	10.0	18.0	56.0	
1.380000	37.3	1000.000	9.000	GND	L1	10.1	18.7	56.0	
1.905000	37.2	1000.000	9.000	GND	L1	10.1	18.8	56.0	
2.475000	37.2	1000.000	9.000	GND	L1	10.1	18.8	56.0	
4.035000	34.2	1000.000	9.000	GND	L1	10.2	21.8	56.0	
4.575000	33.1	1000.000	9.000	GND	L1	10.2	22.9	56.0	
24.015000	38.0	1000.000	9.000	GND	L1	11.2	22.0	60.0	

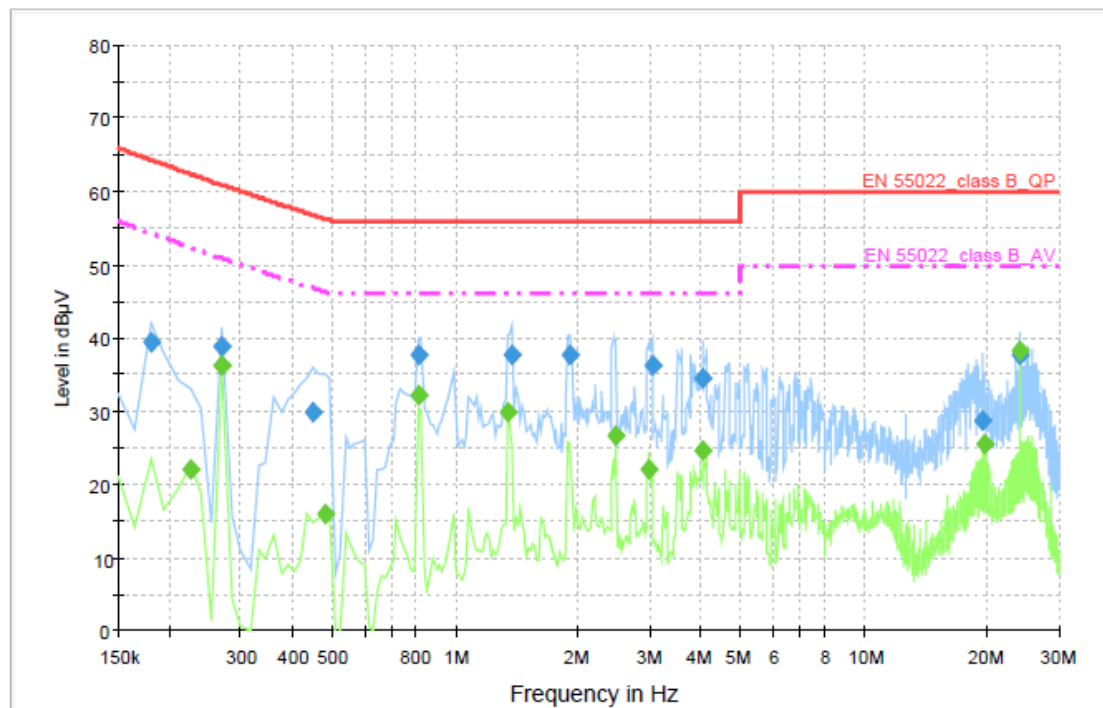
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.225000	26.4	1000.000	9.000	GND	L1	10.0	26.0	52.4	
0.270000	42.6	1000.000	9.000	GND	L1	10.0	8.3	50.9	
0.810000	32.3	1000.000	9.000	GND	L1	10.0	13.7	46.0	
1.350000	30.1	1000.000	9.000	GND	L1	10.1	15.9	46.0	
1.920000	26.3	1000.000	9.000	GND	L1	10.1	19.7	46.0	
2.475000	26.5	1000.000	9.000	GND	L1	10.1	19.5	46.0	
4.035000	24.3	1000.000	9.000	GND	L1	10.2	21.7	46.0	
4.575000	20.6	1000.000	9.000	GND	L1	10.2	25.4	46.0	
19.710000	25.9	1000.000	9.000	GND	L1	11.0	24.1	50.0	
24.015000	38.7	1000.000	9.000	GND	L1	11.2	11.3	50.0	

< Fig 8. Conducted emission result (Live line)>



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
0.180000	39.5	1000.000	9.000	GND	N	10.0	24.9	64.4	
0.270000	38.8	1000.000	9.000	GND	N	10.0	22.1	60.9	
0.450000	30.0	1000.000	9.000	GND	N	10.0	26.8	56.8	
0.810000	37.6	1000.000	9.000	GND	N	10.0	18.4	56.0	
1.380000	37.7	1000.000	9.000	GND	N	10.1	18.3	56.0	
1.920000	37.6	1000.000	9.000	GND	N	10.1	18.4	56.0	
3.030000	36.2	1000.000	9.000	GND	N	10.1	19.8	56.0	
4.035000	34.4	1000.000	9.000	GND	N	10.2	21.6	56.0	
19.515000	28.7	1000.000	9.000	GND	N	10.8	31.3	60.0	
24.015000	37.7	1000.000	9.000	GND	N	10.8	22.3	60.0	

Final Measurement Detector 2

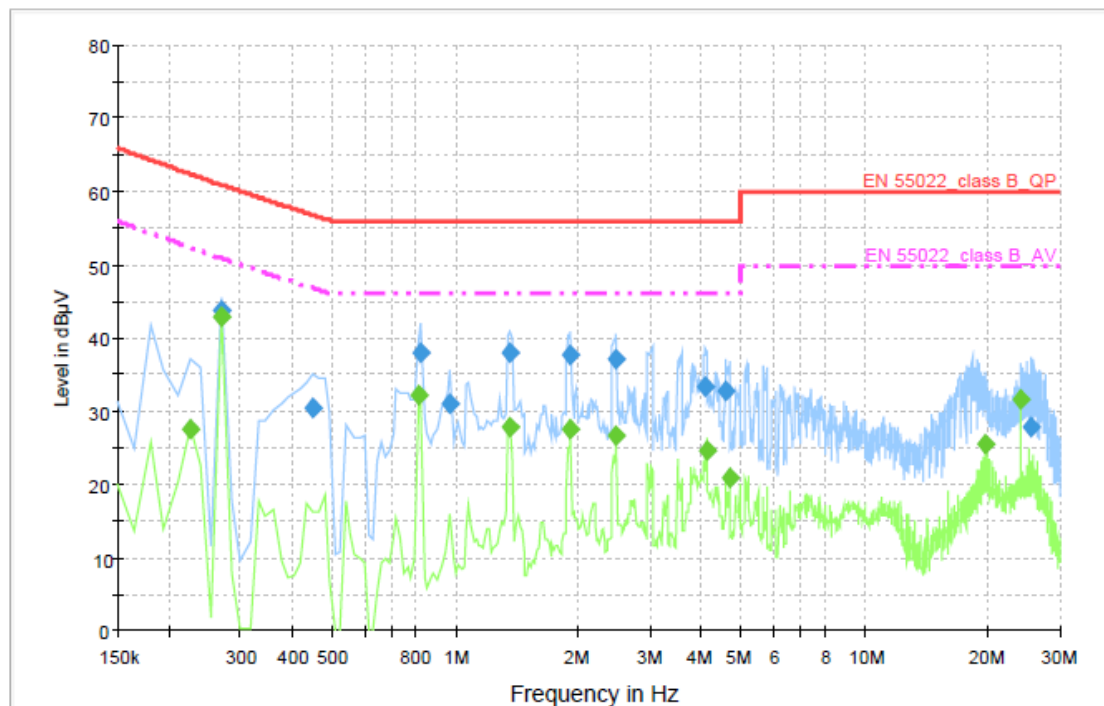
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.225000	22.0	1000.000	9.000	GND	N	10.0	30.4	52.4	
0.270000	36.2	1000.000	9.000	GND	N	10.0	14.7	50.9	
0.480000	15.8	1000.000	9.000	GND	N	10.0	30.5	46.3	
0.810000	32.2	1000.000	9.000	GND	N	10.0	13.8	46.0	
1.350000	29.8	1000.000	9.000	GND	N	10.1	16.2	46.0	
2.475000	26.8	1000.000	9.000	GND	N	10.1	19.2	46.0	
2.970000	22.1	1000.000	9.000	GND	N	10.1	23.9	46.0	
4.035000	24.7	1000.000	9.000	GND	N	10.2	21.3	46.0	
19.710000	25.4	1000.000	9.000	GND	N	10.8	24.6	50.0	
24.015000	38.2	1000.000	9.000	GND	N	10.8	11.8	50.0	

< Fig 9. Conducted emission result (Neutral line)>



◆ Operating condition: 1 920 × 1 080 / 60 Hz (HDMI/DVI: Digital)

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
0.270000	43.8	1000.000	9.000	GND	L1	10.0	17.1	60.9	
0.450000	30.3	1000.000	9.000	GND	L1	10.0	26.5	56.8	
0.825000	38.0	1000.000	9.000	GND	L1	10.0	18.0	56.0	
0.975000	31.0	1000.000	9.000	GND	L1	10.0	25.0	56.0	
1.365000	38.0	1000.000	9.000	GND	L1	10.1	18.0	56.0	
1.920000	37.5	1000.000	9.000	GND	L1	10.1	18.5	56.0	
2.475000	37.0	1000.000	9.000	GND	L1	10.1	19.0	56.0	
4.095000	33.3	1000.000	9.000	GND	L1	10.2	22.7	56.0	
4.575000	32.8	1000.000	9.000	GND	L1	10.2	23.2	56.0	
25.485000	27.7	1000.000	9.000	GND	L1	11.3	32.3	60.0	

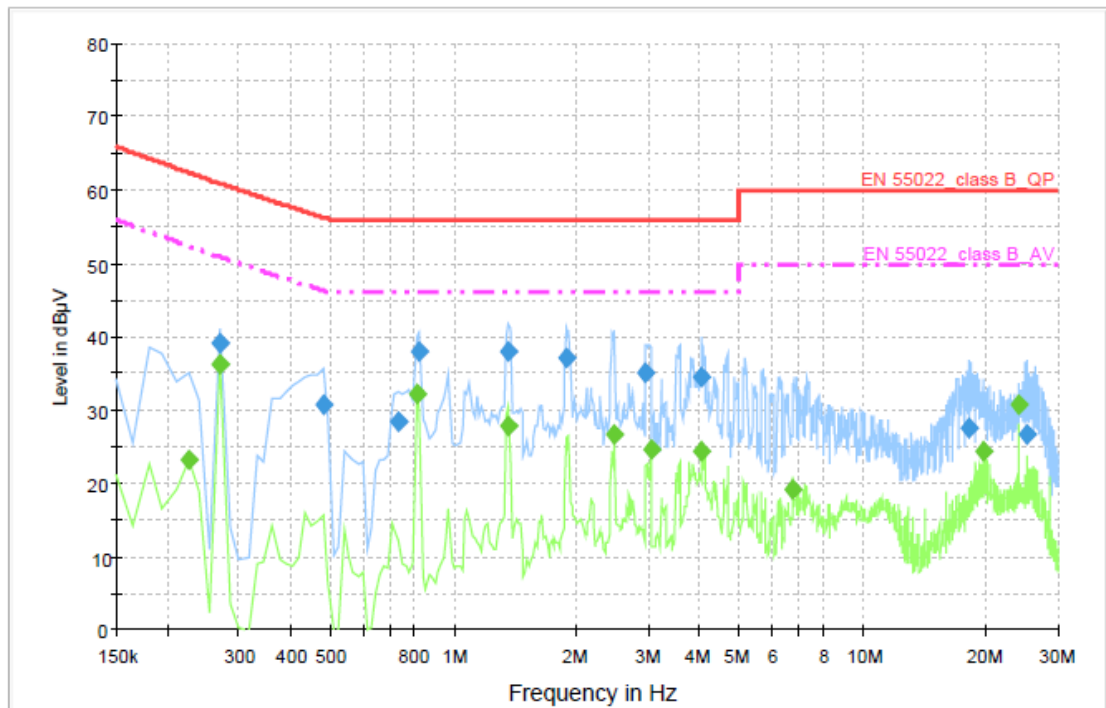
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.225000	27.6	1000.000	9.000	GND	L1	10.0	24.8	52.4	
0.270000	42.8	1000.000	9.000	GND	L1	10.0	8.1	50.9	
0.810000	32.3	1000.000	9.000	GND	L1	10.0	13.7	46.0	
1.365000	27.9	1000.000	9.000	GND	L1	10.1	18.1	46.0	
1.920000	27.5	1000.000	9.000	GND	L1	10.1	18.5	46.0	
2.475000	26.7	1000.000	9.000	GND	L1	10.1	19.3	46.0	
4.125000	24.7	1000.000	9.000	GND	L1	10.2	21.3	46.0	
4.680000	20.9	1000.000	9.000	GND	L1	10.2	25.1	46.0	
19.710000	25.6	1000.000	9.000	GND	L1	11.0	24.4	50.0	
24.015000	31.7	1000.000	9.000	GND	L1	11.2	18.3	50.0	

< Fig 10. Conducted emission result (Live line)>



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
0.270000	39.1	1000.000	9.000	GND	N	10.0	21.8	60.9	
0.480000	30.8	1000.000	9.000	GND	N	10.0	25.5	56.3	
0.735000	28.4	1000.000	9.000	GND	N	10.0	27.6	56.0	
0.825000	38.0	1000.000	9.000	GND	N	10.0	18.0	56.0	
1.365000	38.0	1000.000	9.000	GND	N	10.1	18.0	56.0	
1.890000	37.2	1000.000	9.000	GND	N	10.1	18.8	56.0	
2.955000	35.1	1000.000	9.000	GND	N	10.1	20.9	56.0	
4.035000	34.4	1000.000	9.000	GND	N	10.2	21.6	56.0	
18.090000	27.5	1000.000	9.000	GND	N	10.7	32.5	60.0	
25.185000	26.7	1000.000	9.000	GND	N	10.8	33.3	60.0	

Final Measurement Detector 2

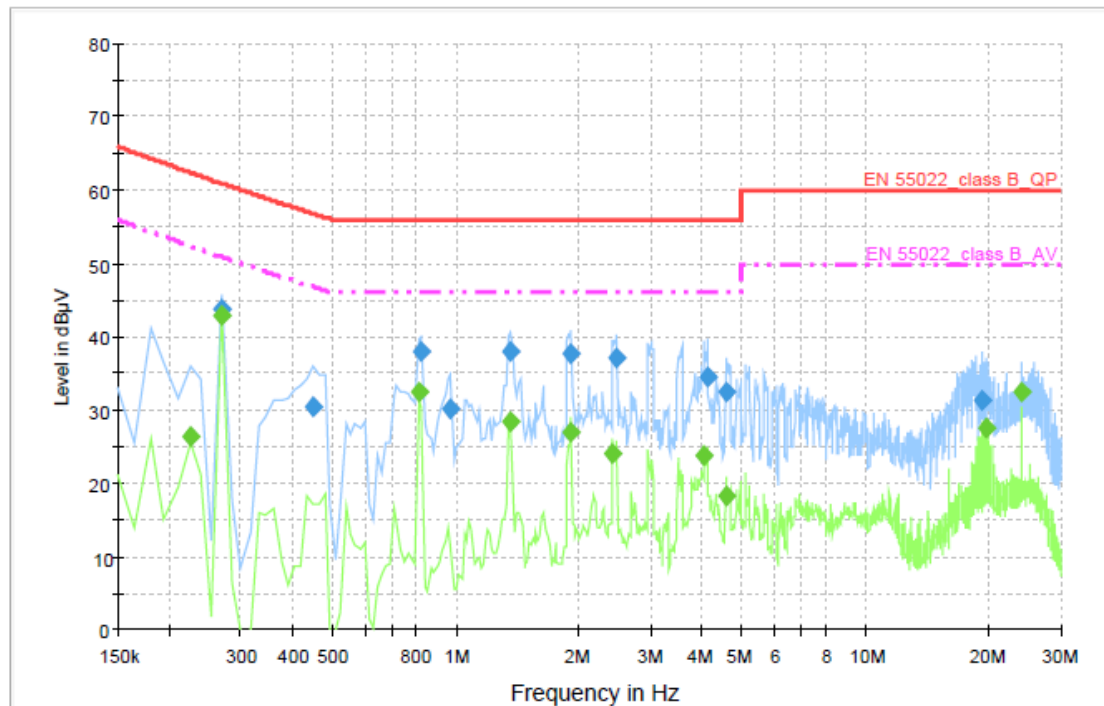
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.225000	23.2	1000.000	9.000	GND	N	10.0	29.2	52.4	
0.270000	36.4	1000.000	9.000	GND	N	10.0	14.5	50.9	
0.810000	32.3	1000.000	9.000	GND	N	10.0	13.7	46.0	
1.365000	28.0	1000.000	9.000	GND	N	10.1	18.0	46.0	
2.475000	26.7	1000.000	9.000	GND	N	10.1	19.3	46.0	
3.030000	24.7	1000.000	9.000	GND	N	10.1	21.3	46.0	
4.035000	24.5	1000.000	9.000	GND	N	10.2	21.5	46.0	
6.720000	19.2	1000.000	9.000	GND	N	10.3	30.8	50.0	
19.710000	24.5	1000.000	9.000	GND	N	10.8	25.5	50.0	
24.015000	30.7	1000.000	9.000	GND	N	10.8	19.3	50.0	

< Fig 11. Conducted emission result (Neutral line)>



◆ Operating condition: 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
0.270000	43.9	1000.000	9.000	GND	L1	10.0	17.0	60.9	
0.450000	30.4	1000.000	9.000	GND	L1	10.0	26.4	56.8	
0.825000	37.9	1000.000	9.000	GND	L1	10.0	18.1	56.0	
0.975000	30.2	1000.000	9.000	GND	L1	10.0	25.8	56.0	
1.365000	38.0	1000.000	9.000	GND	L1	10.1	18.0	56.0	
1.920000	37.7	1000.000	9.000	GND	L1	10.1	18.3	56.0	
2.475000	37.1	1000.000	9.000	GND	L1	10.1	18.9	56.0	
4.125000	34.6	1000.000	9.000	GND	L1	10.2	21.4	56.0	
4.575000	32.4	1000.000	9.000	GND	L1	10.2	23.6	56.0	
19.320000	31.2	1000.000	9.000	GND	L1	11.0	28.8	60.0	

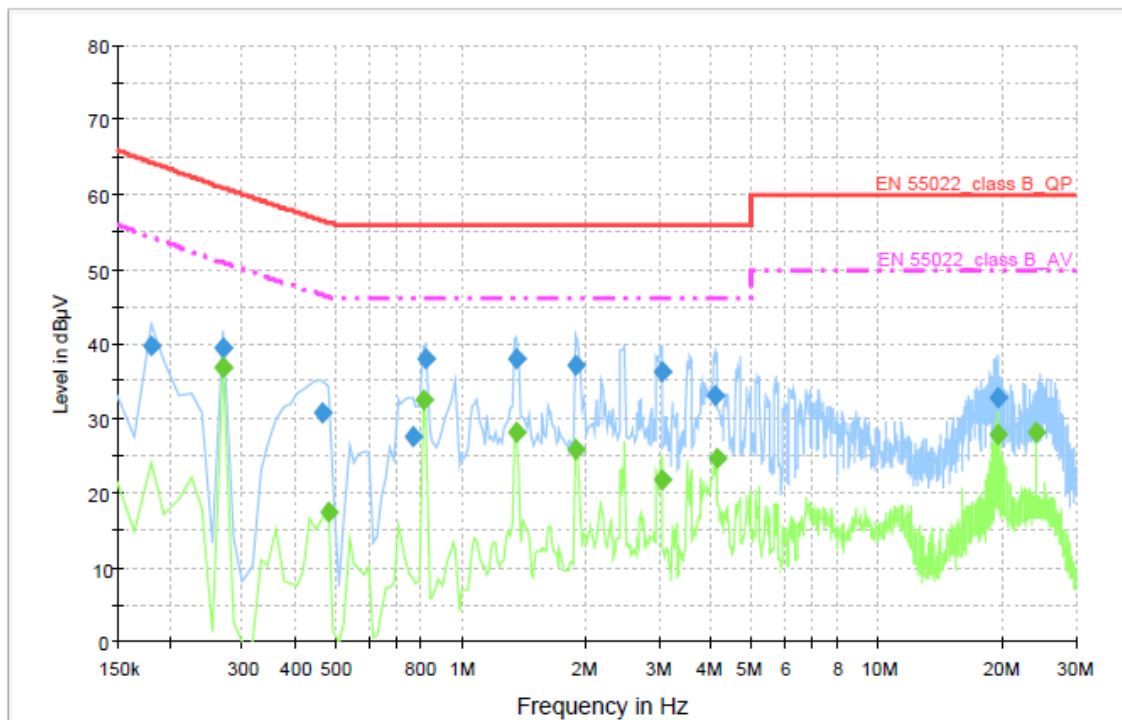
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.225000	26.3	1000.000	9.000	GND	L1	10.0	26.1	52.4	
0.270000	43.0	1000.000	9.000	GND	L1	10.0	7.9	50.9	
0.810000	32.4	1000.000	9.000	GND	L1	10.0	13.6	46.0	
1.365000	28.3	1000.000	9.000	GND	L1	10.1	17.7	46.0	
1.920000	26.9	1000.000	9.000	GND	L1	10.1	19.1	46.0	
2.415000	24.2	1000.000	9.000	GND	L1	10.1	21.8	46.0	
4.035000	23.8	1000.000	9.000	GND	L1	10.2	22.2	46.0	
4.590000	18.3	1000.000	9.000	GND	L1	10.2	27.7	46.0	
19.635000	27.4	1000.000	9.000	GND	L1	11.0	22.6	50.0	
24.015000	32.4	1000.000	9.000	GND	L1	11.2	17.6	50.0	

< Fig 12. Conducted emission result (Live line)>



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
0.180000	39.6	1000.000	9.000	GND	N	10.0	24.8	64.4	
0.270000	39.4	1000.000	9.000	GND	N	10.0	21.5	60.9	
0.465000	30.7	1000.000	9.000	GND	N	10.0	25.9	56.6	
0.765000	27.4	1000.000	9.000	GND	N	10.0	28.6	56.0	
0.825000	38.0	1000.000	9.000	GND	N	10.0	18.0	56.0	
1.365000	38.0	1000.000	9.000	GND	N	10.1	18.0	56.0	
1.890000	37.2	1000.000	9.000	GND	N	10.1	18.8	56.0	
3.030000	36.2	1000.000	9.000	GND	N	10.1	19.8	56.0	
4.065000	33.2	1000.000	9.000	GND	N	10.2	22.8	56.0	
19.515000	32.8	1000.000	9.000	GND	N	10.8	27.2	60.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.270000	36.8	1000.000	9.000	GND	N	10.0	14.1	50.9	
0.480000	17.3	1000.000	9.000	GND	N	10.0	29.0	46.3	
0.810000	32.3	1000.000	9.000	GND	N	10.0	13.7	46.0	
1.365000	28.2	1000.000	9.000	GND	N	10.1	17.8	46.0	
1.890000	25.9	1000.000	9.000	GND	N	10.1	20.1	46.0	
3.030000	21.7	1000.000	9.000	GND	N	10.1	24.3	46.0	
4.125000	24.6	1000.000	9.000	GND	N	10.2	21.4	46.0	
19.515000	27.8	1000.000	9.000	GND	N	10.8	22.2	50.0	
24.015000	28.2	1000.000	9.000	GND	N	10.8	21.8	50.0	

< Fig 13. Conducted emission result (Neutral line)>



6. Radiated Emission

6.1 Operating Environment

Temperature : 23 °C
Relative Humidity : 40 % R.H.

6.2 Test Set-up

A preliminary and final measurement was at 3 m anechoic chamber.

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(Chamber)	Uncertainty	Remark
Radiated emission (30 MHz ~ 300 MHz, 3 m, Vertical)	± 4.32 dB	Confidence levels of 95 % ($k = 2$)
Radiated emission (30 MHz ~ 300 MHz, 3 m, Horizontal)	± 4.21 dB	Confidence levels of 95 % ($k = 2$)
Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Vertical)	± 3.96 dB	Confidence levels of 95 % ($k = 2$)
Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Horizontal)	± 3.97 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

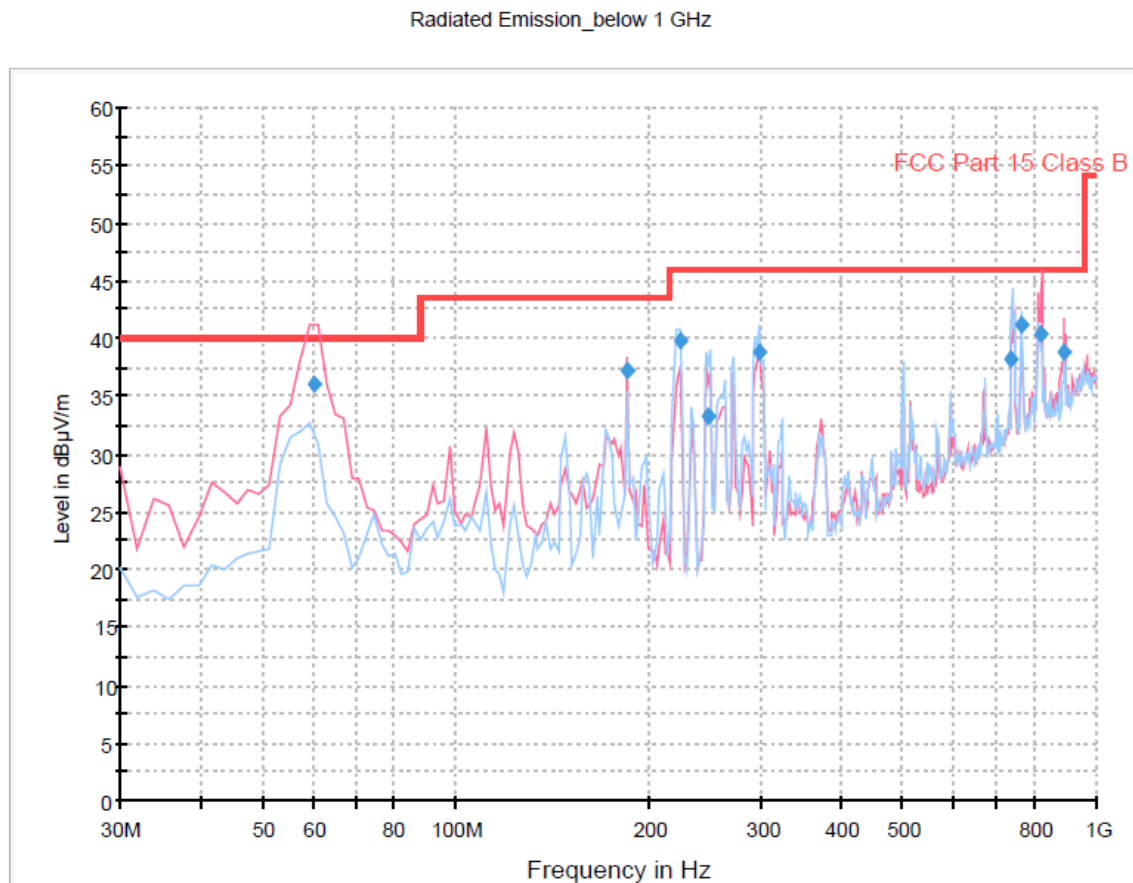
Model Name	Manufacturer	Description	Serial Number	Due to Calibration
■ - ESIB26	Rohde & Schwarz	EMI Test Receiver	830482/010	12. 11. 2010
■ - VULB9160	Schwarzbeck	Broadband Test Antenna	3193	03. 11. 2012
■ - BBHA9120D	Schwarzbeck	Horn ANT	207	12. 22. 2011
■ - MCU066	maturo GmbH	Position Controller	1390306	N/A
■ - TT2.5SI	maturo GmbH	Turntable	1390307	N/A
■ - AM 4.0	maturo GmbH	Antenna Mast	1390308	N/A
■ - AFS 44 00101800-25-10P-44	MITEQ	Preamplifier	1258943	11. 12. 2010

6.6 Test data for Radiated Emission

- . Test Date : March 30, 2010
- . Resolution Bandwidth : 120 kHz/1 MHz
- . Frequency Range : 30 MHz ~ 5 000 MHz
- . Measurement Distance : 3 m
- . Note : The highest frequency of the internal source of the EUT is between 500 MHz and 1 000 MHz (513 MHz). The measurement was made up to 5 000 MHz.



- ◆ Operating Condition: 1 920 × 1 080 / 60 Hz (RGB: Analog)
Red trace: Vertical polarization, Blue trace: Horizontal polarization



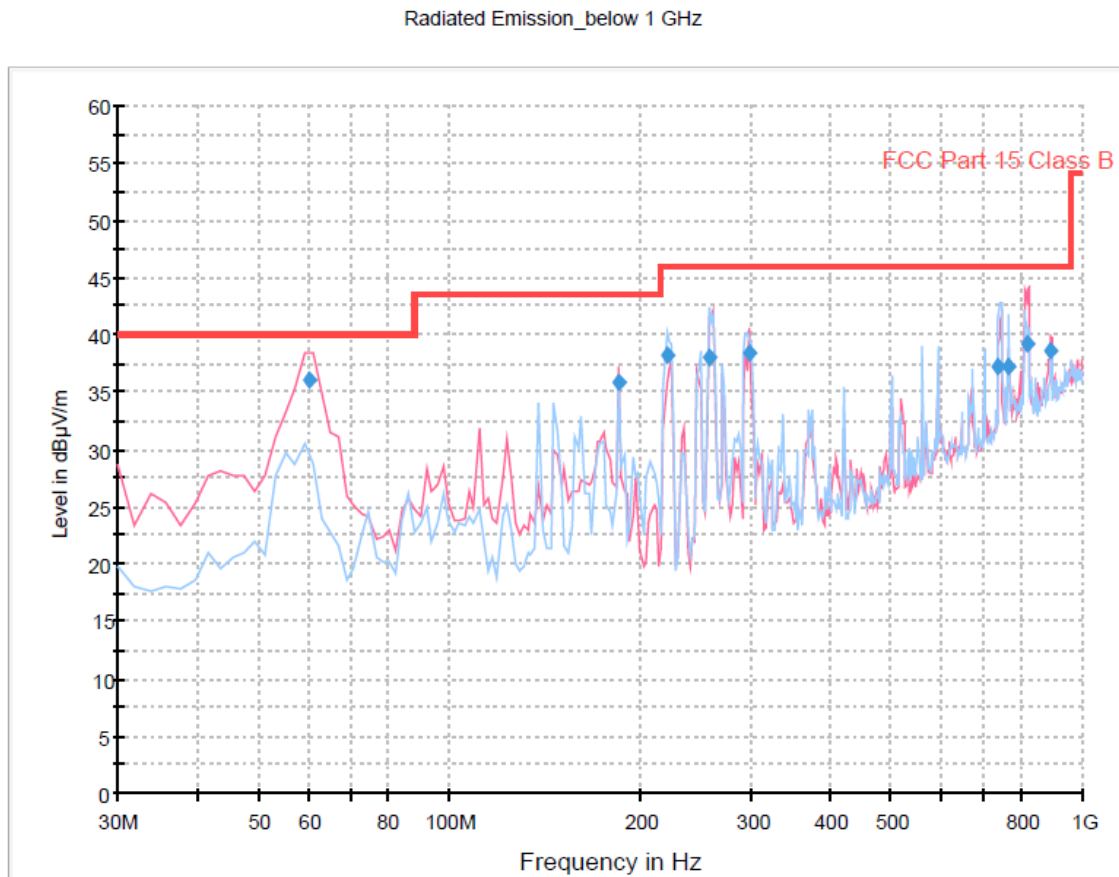
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
60.002204	36.0	1000.0	120.000	104.0	V	78.0	13.4	4.0	40.0
185.611022	37.2	1000.0	120.000	100.0	V	59.0	13.4	6.3	43.5
224.088778	39.8	1000.0	120.000	260.0	H	60.0	12.9	6.2	46.0
248.999319	33.3	1000.0	120.000	100.0	H	327.0	14.2	12.7	46.0
298.836513	38.9	1000.0	120.000	158.0	H	286.0	16.2	7.1	46.0
738.139038	38.2	1000.0	120.000	100.0	H	169.0	27.2	7.8	46.0
766.313467	41.2	1000.0	120.000	146.0	H	208.0	27.7	4.8	46.0
821.886212	40.3	1000.0	120.000	249.0	V	0.0	28.4	5.7	46.0
891.002285	38.8	1000.0	120.000	256.0	V	345.0	29.2	7.2	46.0

< Fig 14. Radiated emission result (30 MHz ~ 1 000 MHz)>



- ◆ Operating Condition: 1 920 × 1 080 / 60 Hz (HDMI/DVI: Digital)
Red trace: Vertical polarization, Blue trace: Horizontal polarization



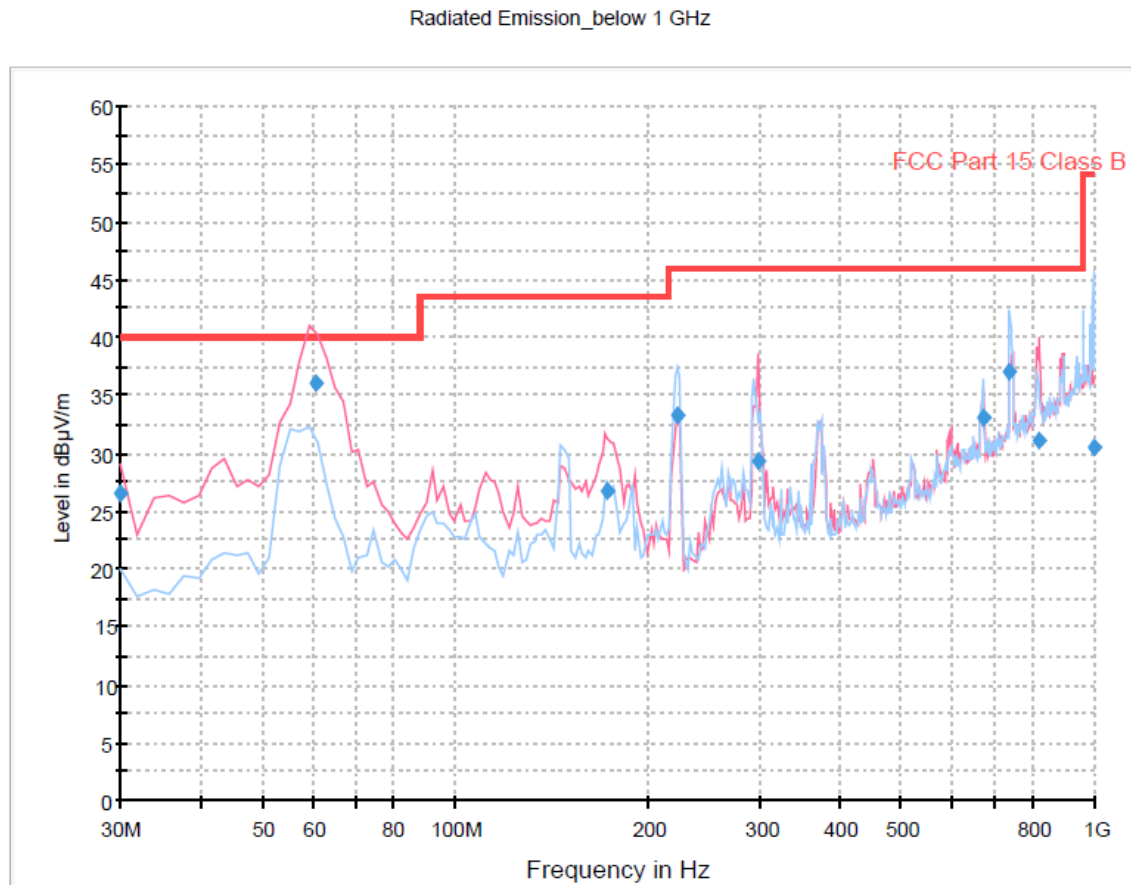
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
60.418317	36.0	1000.0	120.000	105.0	V	139.0	13.3	4.0	40.0
185.611022	35.9	1000.0	120.000	100.0	V	51.0	13.4	7.6	43.5
221.401002	38.2	1000.0	120.000	262.0	H	310.0	12.8	7.8	46.0
258.254870	38.0	1000.0	120.000	143.0	H	328.0	14.6	8.0	46.0
298.796513	38.4	1000.0	120.000	152.0	V	0.0	16.2	7.6	46.0
738.299038	37.2	1000.0	120.000	263.0	H	123.0	27.2	8.8	46.0
765.833467	37.2	1000.0	120.000	100.0	H	195.0	27.7	8.8	46.0
821.886212	39.2	1000.0	120.000	255.0	V	345.0	28.4	6.8	46.0
891.002285	38.6	1000.0	120.000	100.0	V	192.0	29.2	7.4	46.0

< Fig 15. Radiated emission result (30 MHz ~ 1 000 MHz)>



- ◆ Operating Condition: USB play mode
Red trace: Vertical polarization, Blue trace: Horizontal polarization



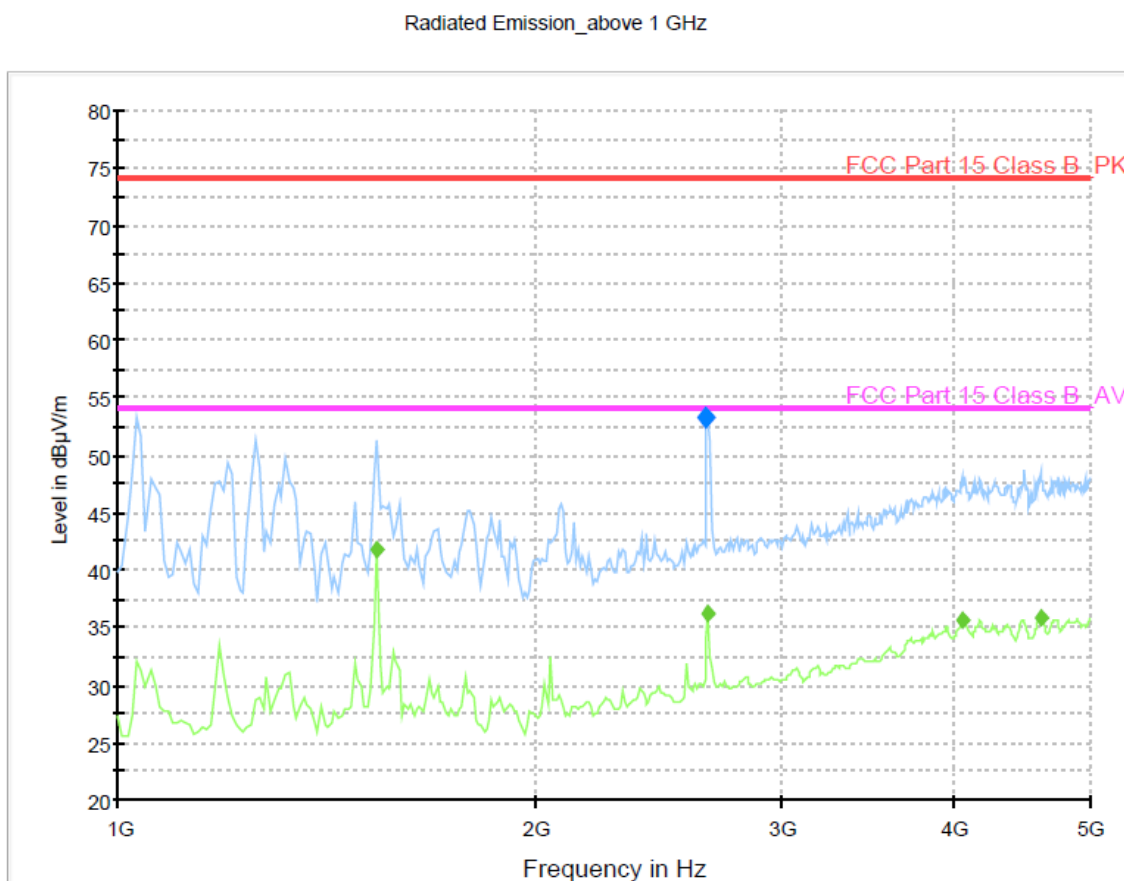
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
30.000000	26.5	1000.0	120.000	106.0	V	260.0	12.9	13.5	40.0
60.458317	36.0	1000.0	120.000	100.0	V	42.0	13.3	4.0	40.0
172.563808	26.7	1000.0	120.000	100.0	V	295.0	14.4	16.8	43.5
222.704890	33.2	1000.0	120.000	263.0	H	313.0	12.8	12.8	46.0
298.356513	29.3	1000.0	120.000	148.0	V	0.0	16.2	16.7	46.0
669.839078	33.1	1000.0	120.000	152.0	H	130.0	25.7	12.9	46.0
737.275150	37.0	1000.0	120.000	163.0	H	130.0	27.1	9.0	46.0
820.902325	31.0	1000.0	120.000	150.0	V	201.0	28.4	15.0	46.0
999.516112	30.5	1000.0	120.000	104.0	H	249.0	31.3	23.4	53.9

< Fig 16. Radiated emission result (30 MHz ~ 1 000 MHz)>



- ◆ Operating Condition: 1 920 × 1 080 / 60 Hz (RGB: Analog)
Green trace: Average detector, Blue trace: Peak detector



Final Result 1

Frequency (MHz)	MaxPeak-MaxHold (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
2651.302605	53.3	100.0	H	126.0	-9.8	20.5	73.9	

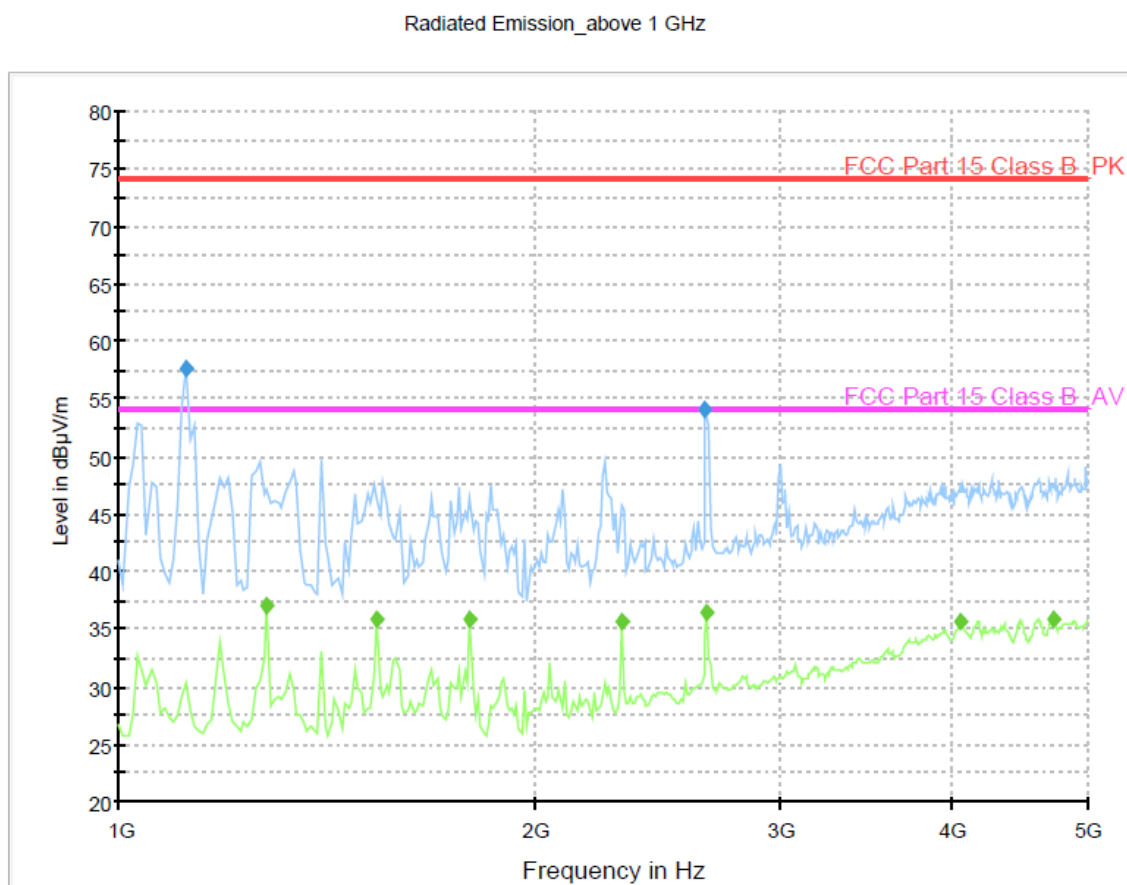
Final Result 2

Frequency (MHz)	Average-MaxHold (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
1537.074148	41.9	100.0	H	200.0	-14.0	12.0	53.9	
2659.318637	36.1	100.0	H	0.0	-9.7	17.8	53.9	
4046.092184	35.7	148.0	V	229.0	-3.1	18.2	53.9	
4607.214429	35.8	155.0	V	0.0	-3.1	18.1	53.9	

< Fig 17. Radiated emission result (1 000 MHz ~ 5 000 MHz)>



- ◆ Operating Condition: 1 920 × 1 080 / 60 Hz (HDMI/DVI: Digital)
Green trace: Average detector, Blue trace: Peak detector



Final Result 1

Frequency (MHz)	MaxPeak-MaxHold (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
1120.240481	57.6	275.0	V	189.0	-15.3	16.3	73.9	
2651.302605	54.1	179.0	H	126.0	-9.8	19.8	73.9	

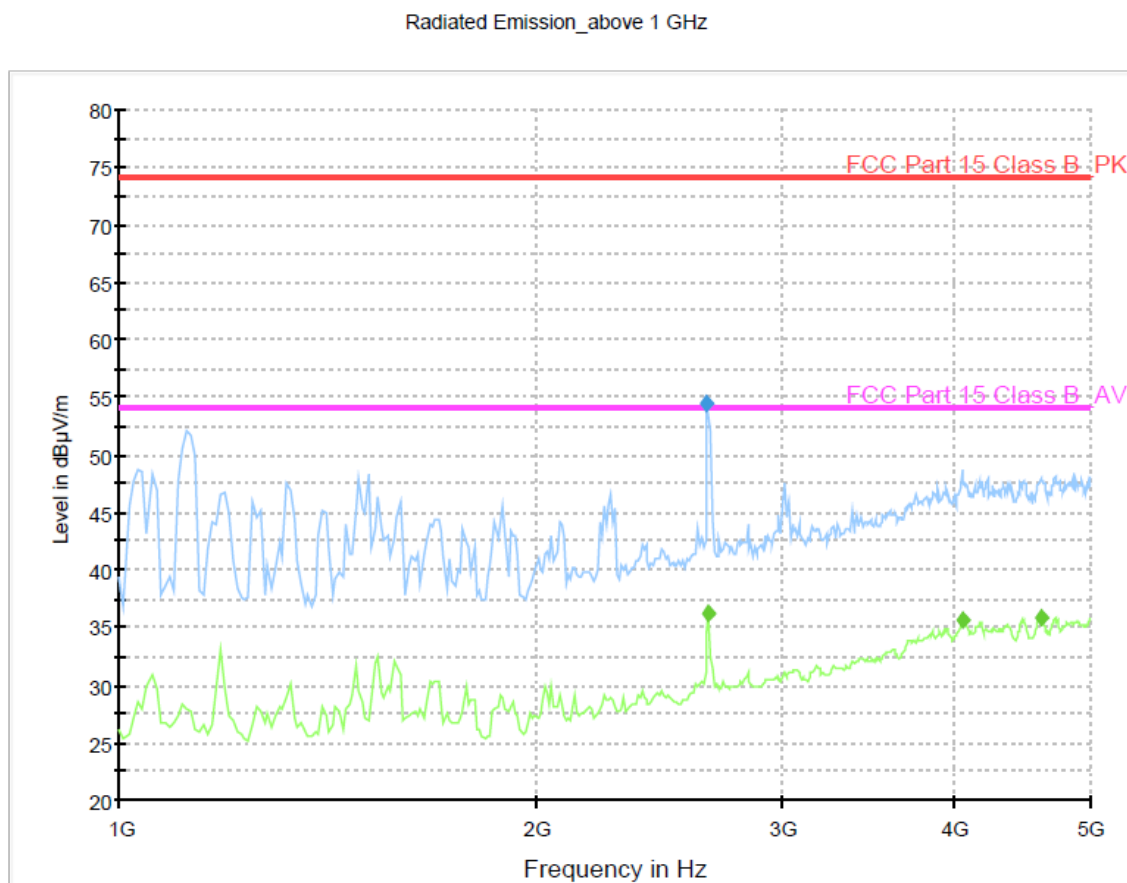
Final Result 2

Frequency (MHz)	Average-MaxHold (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
1280.561122	36.9	100.0	H	159.0	-14.5	17.0	53.9	
1537.074148	35.9	100.0	H	119.0	-14.0	18.0	53.9	
1793.587174	35.9	183.0	H	213.0	-13.1	18.0	53.9	
2306.613227	35.7	100.0	V	197.0	-11.3	18.2	53.9	
2659.318637	36.5	179.0	H	146.0	-9.7	17.4	53.9	
4054.108216	35.7	223.0	V	75.0	-3.1	18.2	53.9	
4719.438878	35.9	230.0	V	209.0	-2.9	18.0	53.9	

< Fig 18. Radiated emission result (1 000 MHz ~ 5 000 MHz)>



- ◆ Operating Condition: USB play mode
Green trace: Average detector, Blue trace: Peak detector



Final Result 1

Frequency (MHz)	MaxPeak-MaxHold (dB μ V/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
2651.302605	54.4	100.0	H	127.0	-9.8	19.5	73.9	

Final Result 2

Frequency (MHz)	Average-MaxHold (dB μ V/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)	Comment
2659.318637	36.1	100.0	H	127.0	-9.7	17.8	53.9	
4054.108216	35.7	116.0	V	124.0	-3.1	18.2	53.9	
4615.230461	35.9	233.0	V	0.0	-3.1	18.0	53.9	

< Fig 19. Radiated emission result (1 000 MHz ~ 5 000 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 dB μV
Reading	= 39.2 dB μV
$10^{(39.2\text{dB}\mu\text{V}/20)}$	= 91.2 μV
Margin	= 48 dB μV - 39.2 dB μV = 8.8 dB

7.2 Example 2 :

■ 66.7 MHz

Class B Limit	= 100 $\mu\text{V}/\text{m}$ = 40.0 dB $\mu\text{V}/\text{m}$
Reading	= 31.0 dB μV
Antenna Factor + Cable Loss = 5.8 dB	
Total	= 36.8 dB $\mu\text{V}/\text{m}$
Margin	= 40.0 dB $\mu\text{V}/\text{m}$ – 36.8 dB $\mu\text{V}/\text{m}$ = 3.2 dB



8. Recommendation & Conclusion

The data collected shows that the **LG Electronics Inc. LED LCD TV/Monitor (Model Name: 55LX9500-UA)** was complies with §15.107 and 15.109 of the FCC Rules.