

FCC EVALUATION REPORT FOR CERTIFICATION

Applicant : LG Electronics Inc.

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

Pyeongteak-si, Gyeonggi-do, Korea.

Attn: Mr. Myoung-Kyu Lee, Chief research engineer

Date of Issue : April 13, 2010

Order Number: GETEC-C1-10-092

Test Report Number: GETEC-E3-10-043

Test Site: Gumi College EMC Center

FCC Registration Number: (100749, 443957)

FCC ID.: BEJ42LD450CUA

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	: 42LD450C-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 vest 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. Myoung-Kyu Lee, Chief research engineer

Tel Number: +82-31-610-9623

- **FCC ID.** BEJ42LD450CUA
- **EUT Type** LCD TV/Monitor
- **Model Name** 42LD450C-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 5, 2010
- **Place of Test** **Gumi College EMC Center** (FCC Registration Number: 100749, 443957)
407, Bugok-dong, Gumi-si, Gyeongbuk, Korea.
- **Test Report Number** GETEC-E3-10-043
- **Dates of Issue** April 13, 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. LCD TV/Monitor (Model Name: 42LD450C-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. LCD TV/Monitor (Model Name: 42LD450C-UA)**
FCC ID.: BEJ42LD450CUA

MODELS		42LD450 (42LD450-UA), 42LD450C (42LD450C-UA)	47LD450 (47LD450-UA), 47LD450C (47LD450C-UA)
Dimensions (Width x Height x Depth)	With stand	1023.0 mm x 685.0 mm x 261.0 mm (40.2 inch x 26.9 inch x 10.2 inch)	1136.0 mm x 757.0 mm x 270.0 mm (44.7 inch x 29.8 inch x 10.6 inch)
	Without stand	1023.0 mm x 635.0 mm x 76.6 mm (40.2 inch x 25.0 inch x 3.0 inch)	1136.0 mm x 698.0 mm x 76.5 mm (44.7 inch x 27.4 inch x 3.0 inch)
Weight	With stand	15.1 kg (33.2 lbs)	19.5 kg (42.9 lbs)
	Without stand	13.5 kg (29.7 lbs)	17.5 kg (38.5 lbs)
Power requirement		AC 100-240 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** : 400 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
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
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 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) in cable	Connected to the EUT and PC	1.80 m shielded with two ferrite cores
HDMI/DVI(Digital) in 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
Remote control in cable	Connected to the EUT and PC	1.80 m shielded
Component in cable	Connected to the EUT and DVD player	2.00 m shielded
Component sound in 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 in cable	Connected to the EUT and TV signal generator	10.00 m shielded
Speaker out cable	Connected to the EUT and DVD player	3.00 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

- . **USB memory stick play mode**

◆ Operating test pattern

- . Continuous playback mode with video files

“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

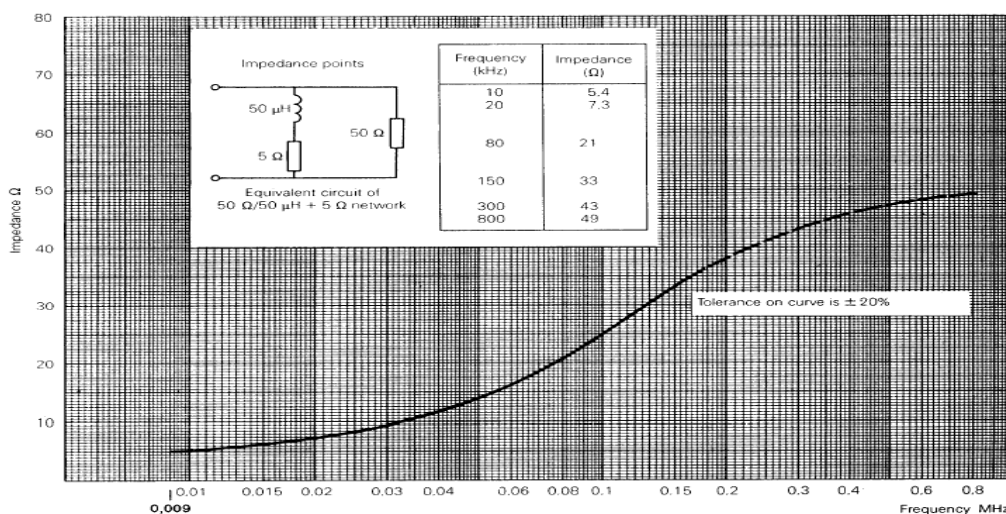


Fig 2. Impedance of LISN



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

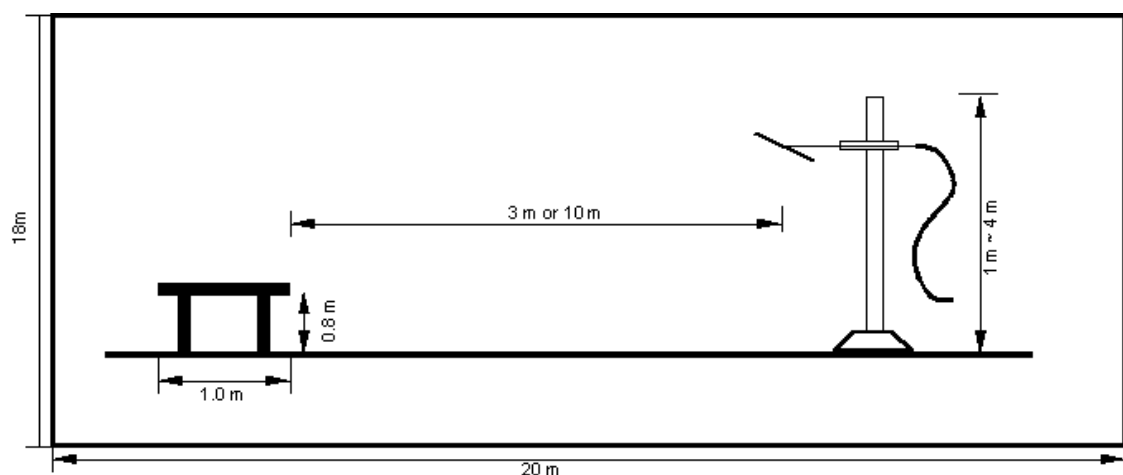


Fig 3. Dimensions of test site.



5. Conducted Emission

5.1 Operating Environment

Temperature : 25 °C
Relative Humidity : 37 % 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

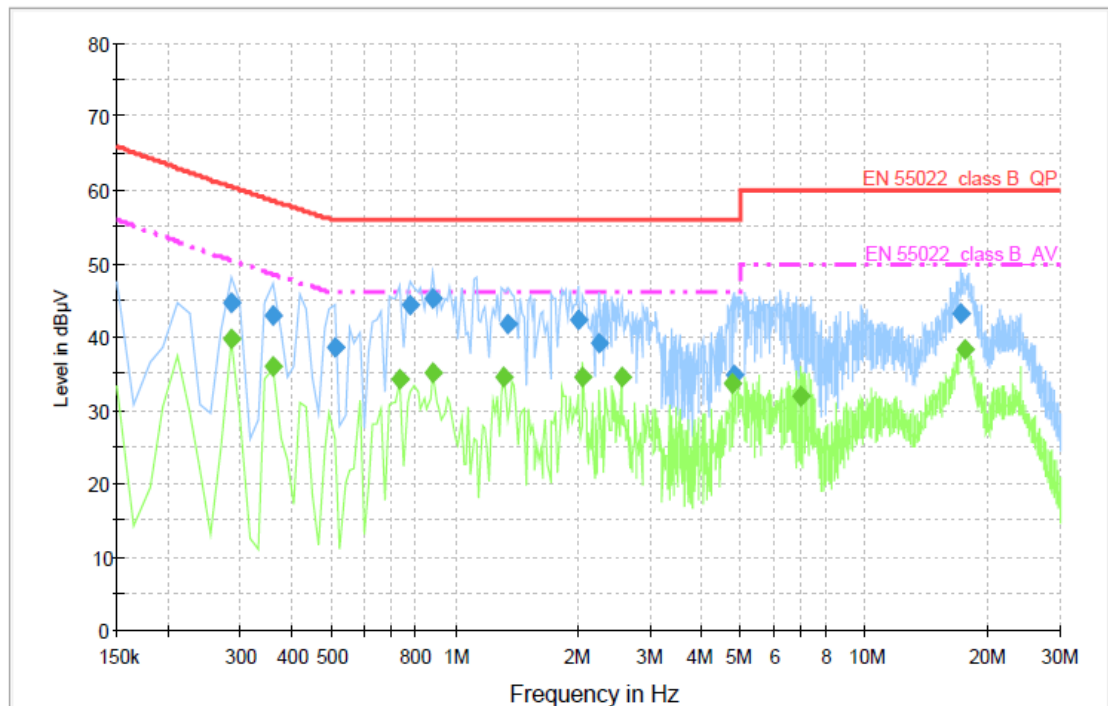
5.6 Test data for Conducted Emission

-. Test Date : April 5, 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
0.285000	44.6	1000.000	9.000	GND	L1	10.0	15.9	60.5	
0.360000	42.9	1000.000	9.000	GND	L1	10.0	15.7	58.6	
0.510000	38.6	1000.000	9.000	GND	L1	10.0	17.4	56.0	
0.780000	44.2	1000.000	9.000	GND	L1	10.0	11.8	56.0	
0.885000	45.1	1000.000	9.000	GND	L1	10.0	10.9	56.0	
1.350000	41.8	1000.000	9.000	GND	L1	10.1	14.2	56.0	
1.995000	42.4	1000.000	9.000	GND	L1	10.1	13.6	56.0	
2.250000	39.2	1000.000	9.000	GND	L1	10.1	16.8	56.0	
4.785000	34.7	1000.000	9.000	GND	L1	10.2	21.3	56.0	
17.175000	43.2	1000.000	9.000	GND	L1	10.9	16.8	60.0	

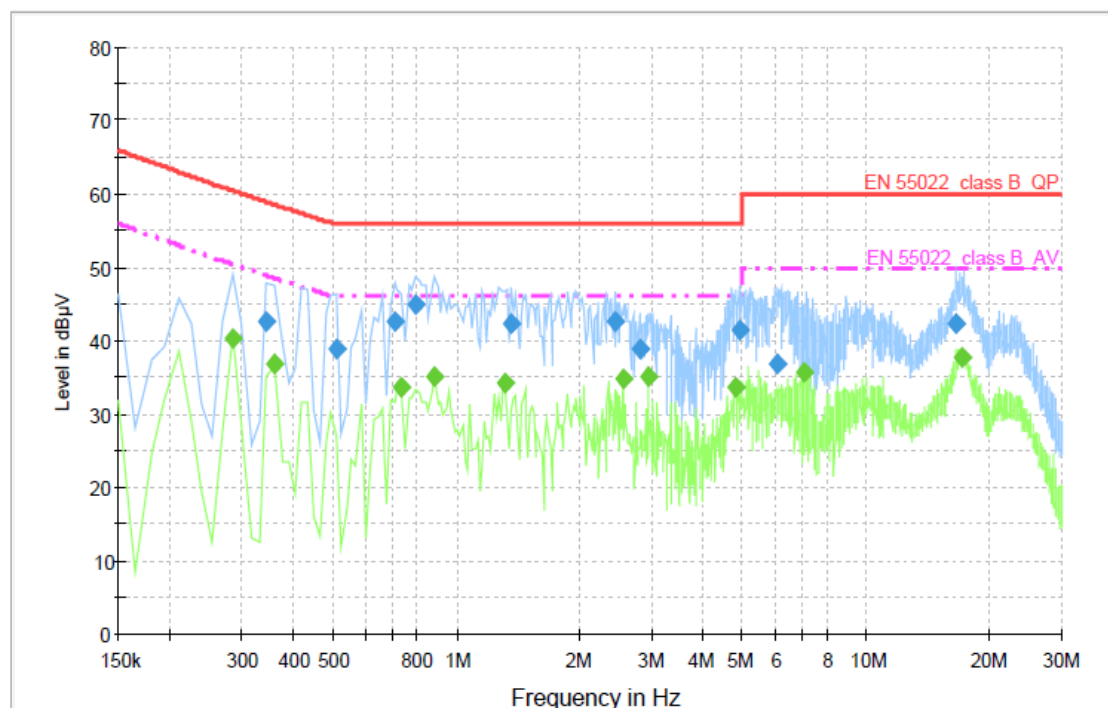
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.285000	39.7	1000.000	9.000	GND	L1	10.0	10.7	50.4	
0.360000	36.0	1000.000	9.000	GND	L1	10.0	12.5	48.5	
0.735000	34.3	1000.000	9.000	GND	L1	10.0	11.7	46.0	
0.885000	35.1	1000.000	9.000	GND	L1	10.0	10.9	46.0	
1.320000	34.5	1000.000	9.000	GND	L1	10.1	11.5	46.0	
2.055000	34.4	1000.000	9.000	GND	L1	10.1	11.6	46.0	
2.550000	34.5	1000.000	9.000	GND	L1	10.1	11.5	46.0	
4.755000	33.5	1000.000	9.000	GND	L1	10.2	12.5	46.0	
6.960000	31.9	1000.000	9.000	GND	L1	10.3	18.1	50.0	
17.595000	38.1	1000.000	9.000	GND	L1	10.9	11.9	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
0.345000	42.7	1000.000	9.000	GND	N	10.0	16.2	58.9	
0.510000	38.8	1000.000	9.000	GND	N	10.0	17.2	56.0	
0.705000	42.6	1000.000	9.000	GND	N	10.0	13.4	56.0	
0.795000	44.9	1000.000	9.000	GND	N	10.0	11.1	56.0	
1.365000	42.3	1000.000	9.000	GND	N	10.1	13.7	56.0	
2.430000	42.5	1000.000	9.000	GND	N	10.1	13.5	56.0	
2.805000	38.7	1000.000	9.000	GND	N	10.1	17.3	56.0	
4.890000	41.4	1000.000	9.000	GND	N	10.2	14.6	56.0	
6.060000	37.0	1000.000	9.000	GND	N	10.2	23.0	60.0	
16.620000	42.3	1000.000	9.000	GND	N	10.6	17.7	60.0	

Final Measurement Detector 2

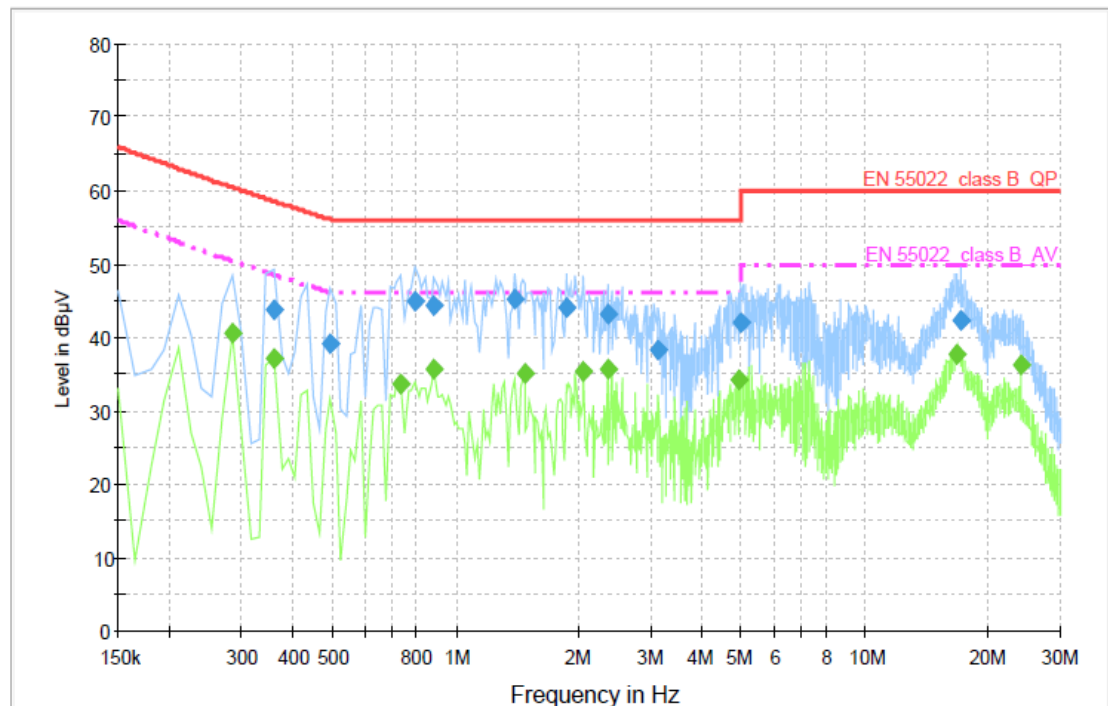
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.285000	40.3	1000.000	9.000	GND	N	10.0	10.1	50.4	
0.360000	36.8	1000.000	9.000	GND	N	10.0	11.7	48.5	
0.735000	33.5	1000.000	9.000	GND	N	10.0	12.5	46.0	
0.885000	35.2	1000.000	9.000	GND	N	10.0	10.8	46.0	
1.320000	34.3	1000.000	9.000	GND	N	10.1	11.7	46.0	
2.550000	34.7	1000.000	9.000	GND	N	10.1	11.3	46.0	
2.940000	35.2	1000.000	9.000	GND	N	10.1	10.8	46.0	
4.815000	33.7	1000.000	9.000	GND	N	10.2	12.3	46.0	
7.080000	35.6	1000.000	9.000	GND	N	10.3	14.4	50.0	
17.205000	37.7	1000.000	9.000	GND	N	10.7	12.3	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
0.360000	43.8	1000.000	9.000	GND	L1	10.0	14.8	58.6	
0.495000	39.2	1000.000	9.000	GND	L1	10.0	16.9	56.1	
0.795000	45.0	1000.000	9.000	GND	L1	10.0	11.0	56.0	
0.885000	44.4	1000.000	9.000	GND	L1	10.0	11.6	56.0	
1.395000	45.3	1000.000	9.000	GND	L1	10.1	10.7	56.0	
1.860000	44.0	1000.000	9.000	GND	L1	10.1	12.0	56.0	
2.355000	43.2	1000.000	9.000	GND	L1	10.1	12.8	56.0	
3.135000	38.3	1000.000	9.000	GND	L1	10.1	17.7	56.0	
4.995000	42.0	1000.000	9.000	GND	L1	10.2	14.0	56.0	
17.115000	42.4	1000.000	9.000	GND	L1	10.8	17.6	60.0	

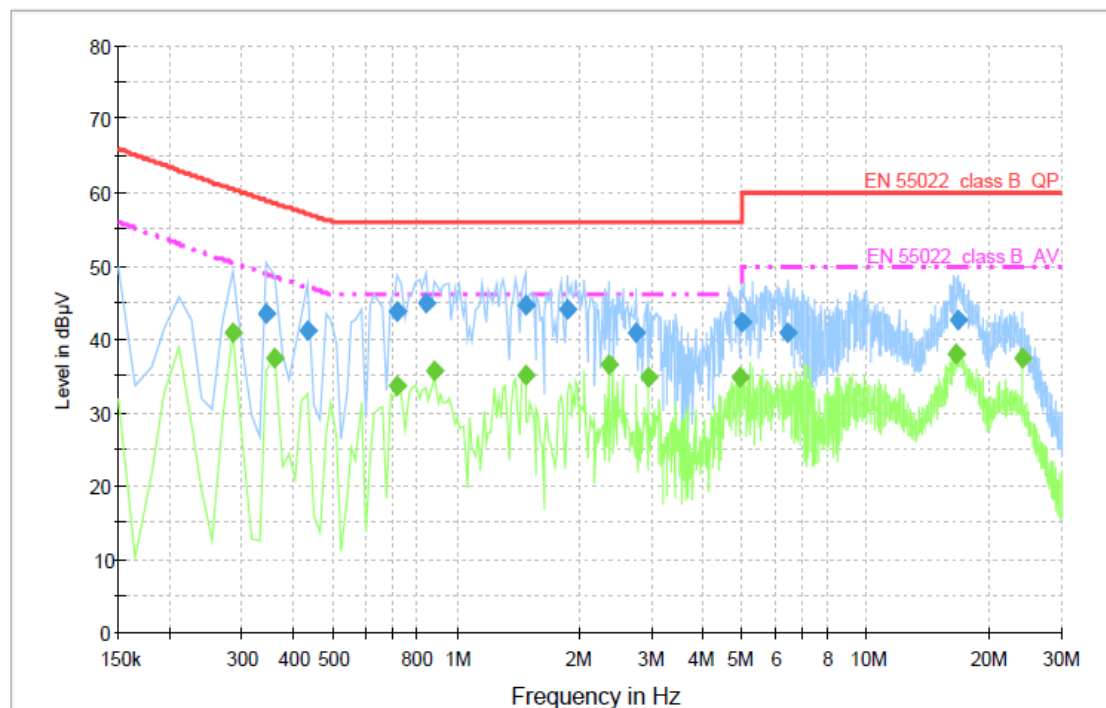
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.285000	40.5	1000.000	9.000	GND	L1	10.0	9.9	50.4	
0.360000	37.1	1000.000	9.000	GND	L1	10.0	11.4	48.5	
0.735000	33.6	1000.000	9.000	GND	L1	10.0	12.4	46.0	
0.885000	35.6	1000.000	9.000	GND	L1	10.0	10.4	46.0	
1.470000	34.9	1000.000	9.000	GND	L1	10.1	11.1	46.0	
2.055000	35.4	1000.000	9.000	GND	L1	10.1	10.6	46.0	
2.355000	35.5	1000.000	9.000	GND	L1	10.1	10.5	46.0	
4.920000	34.3	1000.000	9.000	GND	L1	10.2	11.7	46.0	
16.755000	37.6	1000.000	9.000	GND	L1	10.8	12.4	50.0	
24.000000	36.3	1000.000	9.000	GND	L1	11.2	13.7	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
0.345000	43.4	1000.000	9.000	GND	N	10.0	15.5	58.9	
0.435000	41.3	1000.000	9.000	GND	N	10.0	15.9	57.1	
0.720000	43.7	1000.000	9.000	GND	N	10.0	12.3	56.0	
0.840000	45.0	1000.000	9.000	GND	N	10.0	11.0	56.0	
1.470000	44.7	1000.000	9.000	GND	N	10.1	11.3	56.0	
1.860000	44.1	1000.000	9.000	GND	N	10.1	11.9	56.0	
2.745000	40.7	1000.000	9.000	GND	N	10.1	15.3	56.0	
4.995000	42.4	1000.000	9.000	GND	N	10.2	13.6	56.0	
6.465000	41.0	1000.000	9.000	GND	N	10.3	19.0	60.0	
16.680000	42.6	1000.000	9.000	GND	N	10.6	17.4	60.0	

Final Measurement Detector 2

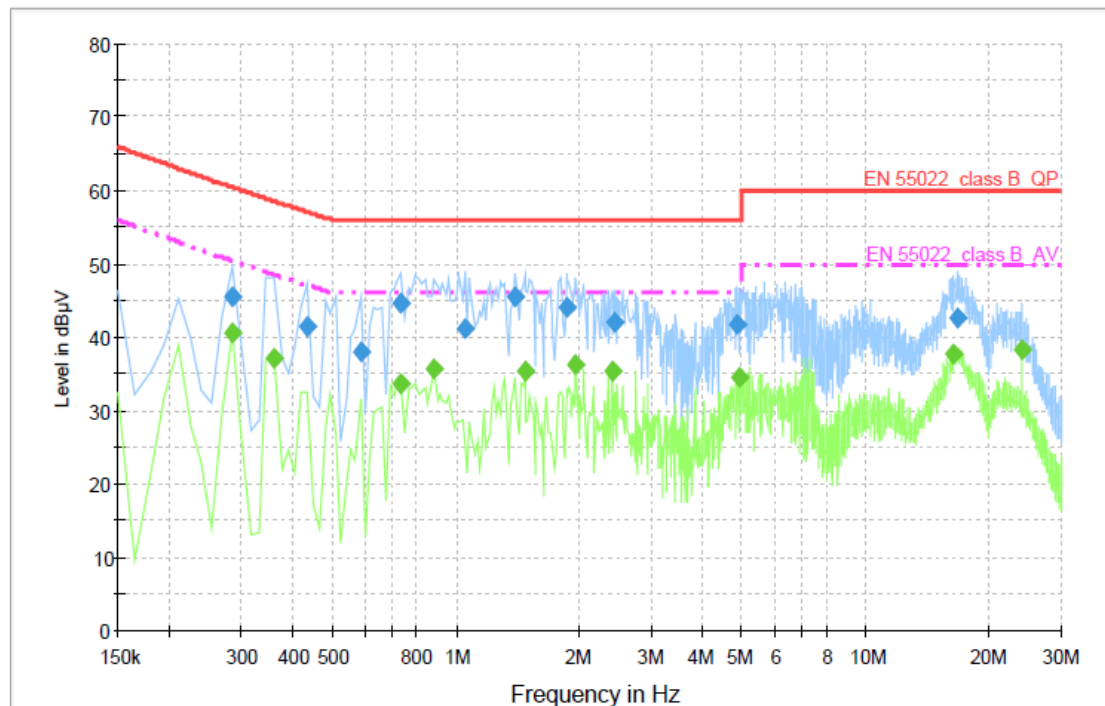
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.285000	40.8	1000.000	9.000	GND	N	10.0	9.6	50.4	
0.360000	37.4	1000.000	9.000	GND	N	10.0	11.1	48.5	
0.720000	33.6	1000.000	9.000	GND	N	10.0	12.4	46.0	
0.885000	35.6	1000.000	9.000	GND	N	10.0	10.4	46.0	
1.470000	35.0	1000.000	9.000	GND	N	10.1	11.0	46.0	
2.355000	36.5	1000.000	9.000	GND	N	10.1	9.5	46.0	
2.940000	34.8	1000.000	9.000	GND	N	10.1	11.2	46.0	
4.920000	34.9	1000.000	9.000	GND	N	10.2	11.1	46.0	
16.515000	37.8	1000.000	9.000	GND	N	10.6	12.2	50.0	
24.000000	37.3	1000.000	9.000	GND	N	10.8	12.7	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
0.285000	45.5	1000.000	9.000	GND	L1	10.0	15.0	60.5	
0.435000	41.3	1000.000	9.000	GND	L1	10.0	15.8	57.1	
0.585000	38.0	1000.000	9.000	GND	L1	10.0	18.0	56.0	
0.735000	44.7	1000.000	9.000	GND	L1	10.0	11.3	56.0	
1.050000	41.1	1000.000	9.000	GND	L1	10.0	14.9	56.0	
1.395000	45.5	1000.000	9.000	GND	L1	10.1	10.5	56.0	
1.860000	44.2	1000.000	9.000	GND	L1	10.1	11.8	56.0	
2.430000	42.1	1000.000	9.000	GND	L1	10.1	13.9	56.0	
4.830000	41.7	1000.000	9.000	GND	L1	10.2	14.3	56.0	
16.740000	42.6	1000.000	9.000	GND	L1	10.8	17.4	60.0	

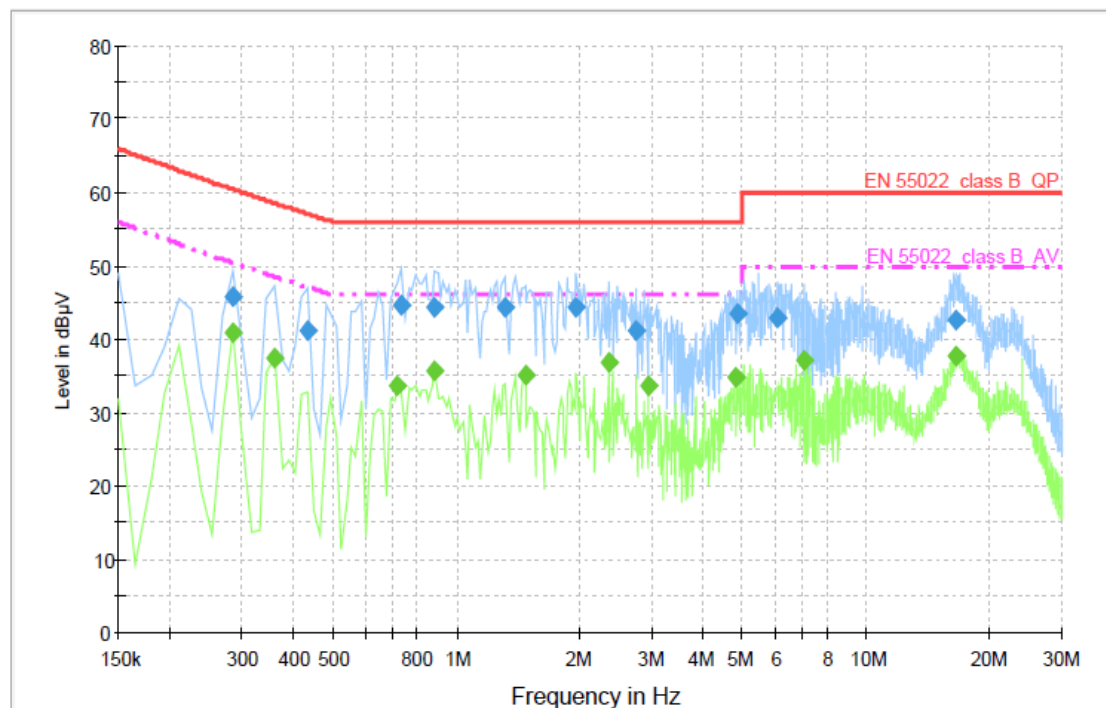
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.285000	40.6	1000.000	9.000	GND	L1	10.0	9.8	50.4	
0.360000	37.2	1000.000	9.000	GND	L1	10.0	11.3	48.5	
0.735000	33.6	1000.000	9.000	GND	L1	10.0	12.4	46.0	
0.885000	35.6	1000.000	9.000	GND	L1	10.0	10.4	46.0	
1.470000	35.5	1000.000	9.000	GND	L1	10.1	10.5	46.0	
1.965000	36.4	1000.000	9.000	GND	L1	10.1	9.6	46.0	
2.400000	35.3	1000.000	9.000	GND	L1	10.1	10.7	46.0	
4.920000	34.5	1000.000	9.000	GND	L1	10.2	11.5	46.0	
16.305000	37.7	1000.000	9.000	GND	L1	10.8	12.3	50.0	
24.000000	38.2	1000.000	9.000	GND	L1	11.2	11.8	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
0.285000	45.7	1000.000	9.000	GND	N	10.0	14.8	60.5	
0.435000	41.3	1000.000	9.000	GND	N	10.0	15.8	57.1	
0.735000	44.7	1000.000	9.000	GND	N	10.0	11.3	56.0	
0.885000	44.3	1000.000	9.000	GND	N	10.0	11.7	56.0	
1.320000	44.2	1000.000	9.000	GND	N	10.1	11.8	56.0	
1.965000	44.5	1000.000	9.000	GND	N	10.1	11.5	56.0	
2.745000	41.1	1000.000	9.000	GND	N	10.1	14.9	56.0	
4.845000	43.5	1000.000	9.000	GND	N	10.2	12.5	56.0	
6.045000	43.0	1000.000	9.000	GND	N	10.2	17.0	60.0	
16.515000	42.6	1000.000	9.000	GND	N	10.6	17.4	60.0	

Final Measurement Detector 2

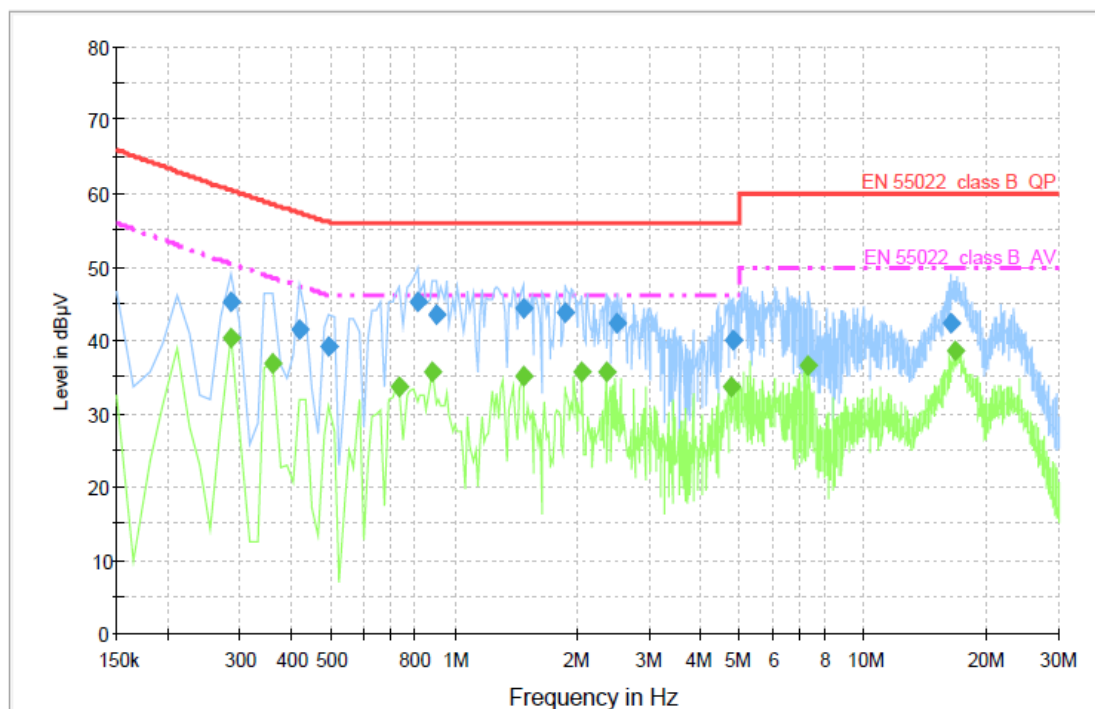
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.285000	40.9	1000.000	9.000	GND	N	10.0	9.5	50.4	
0.360000	37.4	1000.000	9.000	GND	N	10.0	11.1	48.5	
0.720000	33.6	1000.000	9.000	GND	N	10.0	12.4	46.0	
0.885000	35.8	1000.000	9.000	GND	N	10.0	10.2	46.0	
1.470000	35.2	1000.000	9.000	GND	N	10.1	10.8	46.0	
2.355000	36.8	1000.000	9.000	GND	N	10.1	9.2	46.0	
2.940000	33.6	1000.000	9.000	GND	N	10.1	12.4	46.0	
4.800000	34.9	1000.000	9.000	GND	N	10.2	11.1	46.0	
7.065000	37.2	1000.000	9.000	GND	N	10.3	12.8	50.0	
16.530000	37.7	1000.000	9.000	GND	N	10.6	12.3	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
0.285000	45.1	1000.000	9.000	GND	L1	10.0	15.4	60.5	
0.420000	41.5	1000.000	9.000	GND	L1	10.0	15.8	57.3	
0.495000	39.2	1000.000	9.000	GND	L1	10.0	16.9	56.1	
0.810000	45.3	1000.000	9.000	GND	L1	10.0	10.7	56.0	
0.900000	43.5	1000.000	9.000	GND	L1	10.0	12.5	56.0	
1.470000	44.4	1000.000	9.000	GND	L1	10.1	11.6	56.0	
1.860000	43.8	1000.000	9.000	GND	L1	10.1	12.2	56.0	
2.505000	42.3	1000.000	9.000	GND	L1	10.1	13.7	56.0	
4.785000	40.0	1000.000	9.000	GND	L1	10.2	16.0	56.0	
16.395000	42.4	1000.000	9.000	GND	L1	10.8	17.6	60.0	

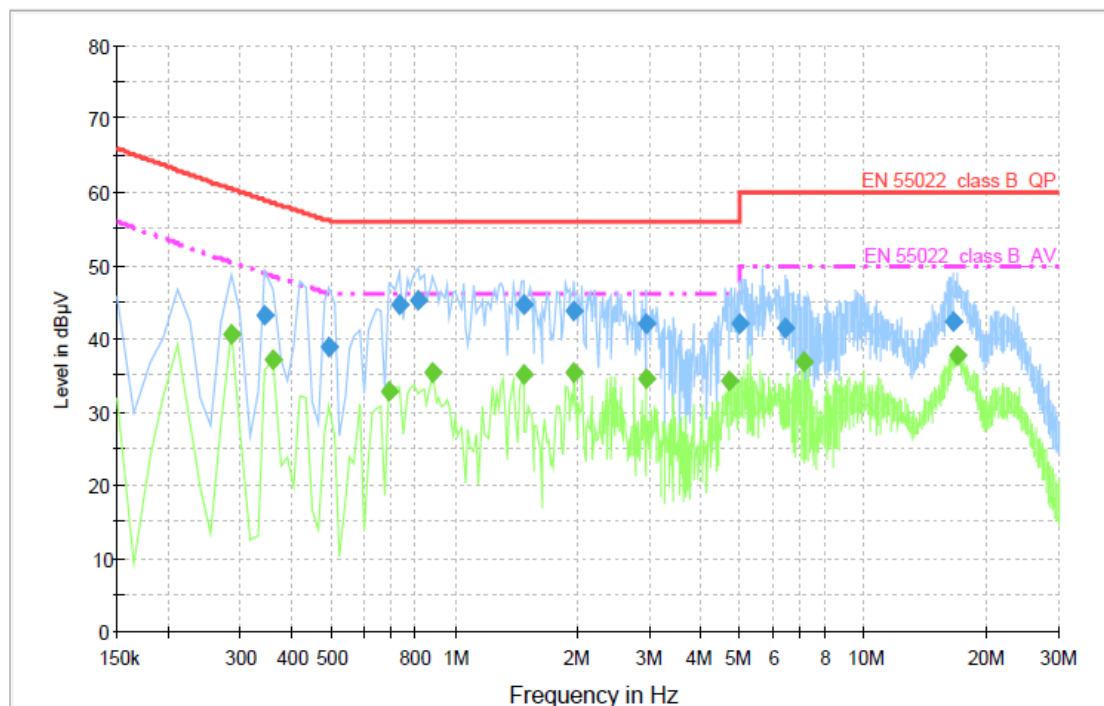
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.285000	40.4	1000.000	9.000	GND	L1	10.0	10.0	50.4	
0.360000	37.0	1000.000	9.000	GND	L1	10.0	11.5	48.5	
0.735000	33.7	1000.000	9.000	GND	L1	10.0	12.3	46.0	
0.885000	35.6	1000.000	9.000	GND	L1	10.0	10.4	46.0	
1.470000	35.2	1000.000	9.000	GND	L1	10.1	10.8	46.0	
2.055000	35.7	1000.000	9.000	GND	L1	10.1	10.3	46.0	
2.355000	35.8	1000.000	9.000	GND	L1	10.1	10.2	46.0	
4.740000	33.7	1000.000	9.000	GND	L1	10.2	12.3	46.0	
7.350000	36.6	1000.000	9.000	GND	L1	10.3	13.4	50.0	
16.815000	38.5	1000.000	9.000	GND	L1	10.8	11.5	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
0.345000	43.2	1000.000	9.000	GND	N	10.0	15.7	58.9	
0.495000	38.7	1000.000	9.000	GND	N	10.0	17.4	56.1	
0.735000	44.7	1000.000	9.000	GND	N	10.0	11.3	56.0	
0.810000	45.2	1000.000	9.000	GND	N	10.0	10.8	56.0	
1.470000	44.6	1000.000	9.000	GND	N	10.1	11.4	56.0	
1.965000	43.7	1000.000	9.000	GND	N	10.1	12.3	56.0	
2.940000	42.1	1000.000	9.000	GND	N	10.1	13.9	56.0	
4.980000	42.1	1000.000	9.000	GND	N	10.2	13.9	56.0	
6.420000	41.3	1000.000	9.000	GND	N	10.3	18.7	60.0	
16.530000	42.3	1000.000	9.000	GND	N	10.6	17.7	60.0	

Final Measurement Detector 2

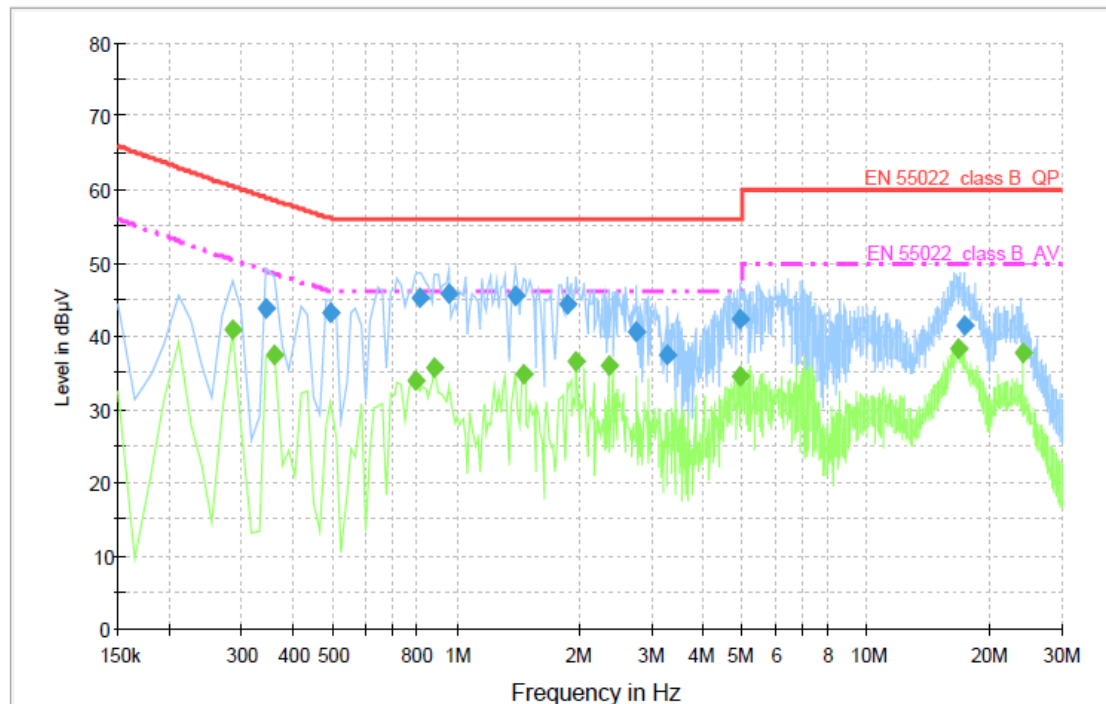
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.285000	40.6	1000.000	9.000	GND	N	10.0	9.8	50.4	
0.360000	37.2	1000.000	9.000	GND	N	10.0	11.3	48.5	
0.690000	32.8	1000.000	9.000	GND	N	10.0	13.2	46.0	
0.885000	35.3	1000.000	9.000	GND	N	10.0	10.7	46.0	
1.470000	35.1	1000.000	9.000	GND	N	10.1	10.9	46.0	
1.965000	35.3	1000.000	9.000	GND	N	10.1	10.7	46.0	
2.940000	34.5	1000.000	9.000	GND	N	10.1	11.5	46.0	
4.665000	34.2	1000.000	9.000	GND	N	10.2	11.8	46.0	
7.140000	36.8	1000.000	9.000	GND	N	10.3	13.2	50.0	
16.890000	37.8	1000.000	9.000	GND	N	10.6	12.2	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
0.345000	43.8	1000.000	9.000	GND	L1	10.0	15.1	58.9	
0.495000	43.2	1000.000	9.000	GND	L1	10.0	12.9	56.1	
0.810000	45.2	1000.000	9.000	GND	L1	10.0	10.8	56.0	
0.960000	45.8	1000.000	9.000	GND	L1	10.0	10.2	56.0	
1.395000	45.6	1000.000	9.000	GND	L1	10.1	10.4	56.0	
1.860000	44.4	1000.000	9.000	GND	L1	10.1	11.6	56.0	
2.745000	40.7	1000.000	9.000	GND	L1	10.1	15.4	56.0	
3.285000	37.4	1000.000	9.000	GND	L1	10.1	18.6	56.0	
4.905000	42.3	1000.000	9.000	GND	L1	10.2	13.7	56.0	
17.400000	41.5	1000.000	9.000	GND	L1	10.9	18.5	60.0	

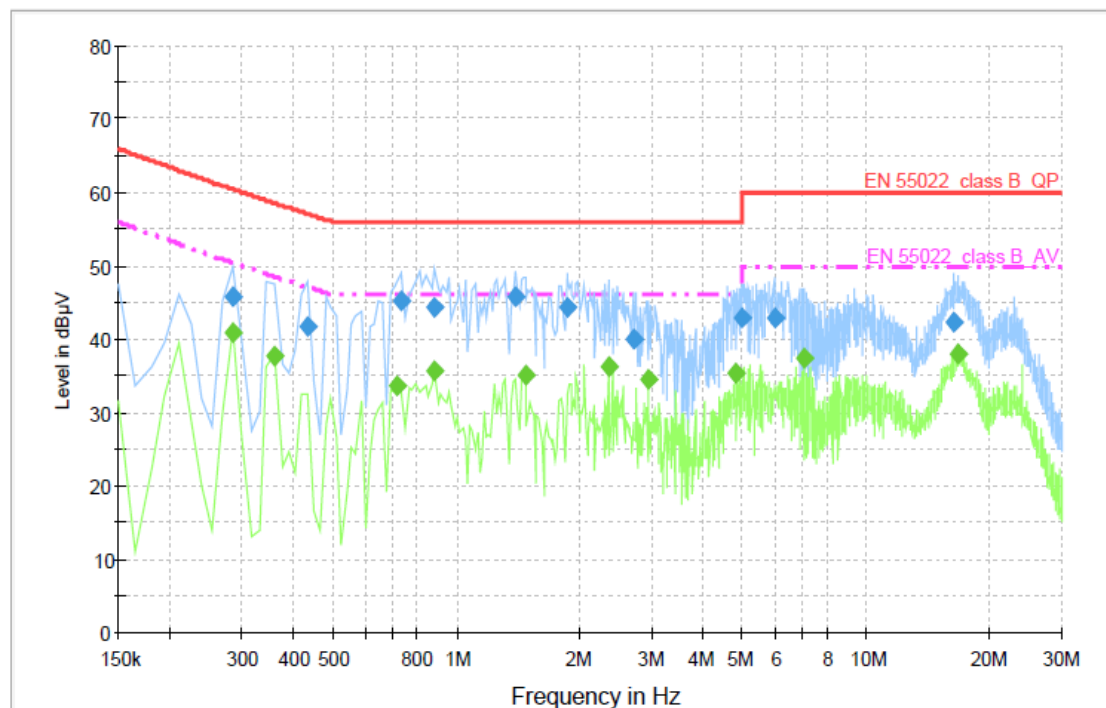
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.285000	40.8	1000.000	9.000	GND	L1	10.0	9.6	50.4	
0.360000	37.5	1000.000	9.000	GND	L1	10.0	11.0	48.5	
0.795000	34.0	1000.000	9.000	GND	L1	10.0	12.0	46.0	
0.885000	35.7	1000.000	9.000	GND	L1	10.0	10.3	46.0	
1.455000	34.7	1000.000	9.000	GND	L1	10.1	11.3	46.0	
1.965000	36.6	1000.000	9.000	GND	L1	10.1	9.4	46.0	
2.355000	35.9	1000.000	9.000	GND	L1	10.1	10.1	46.0	
4.920000	34.4	1000.000	9.000	GND	L1	10.2	11.6	46.0	
16.725000	38.2	1000.000	9.000	GND	L1	10.8	11.8	50.0	
24.000000	37.6	1000.000	9.000	GND	L1	11.2	12.4	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
0.285000	45.8	1000.000	9.000	GND	N	10.0	14.7	60.5	
0.435000	41.6	1000.000	9.000	GND	N	10.0	15.5	57.1	
0.735000	45.1	1000.000	9.000	GND	N	10.0	10.9	56.0	
0.885000	44.3	1000.000	9.000	GND	N	10.0	11.7	56.0	
1.395000	45.8	1000.000	9.000	GND	N	10.1	10.2	56.0	
1.860000	44.3	1000.000	9.000	GND	N	10.1	11.7	56.0	
2.700000	39.9	1000.000	9.000	GND	N	10.1	16.1	56.0	
4.965000	42.8	1000.000	9.000	GND	N	10.2	13.2	56.0	
5.970000	43.0	1000.000	9.000	GND	N	10.2	17.0	60.0	
16.380000	42.2	1000.000	9.000	GND	N	10.6	17.8	60.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.285000	40.9	1000.000	9.000	GND	N	10.0	9.5	50.4	
0.360000	37.7	1000.000	9.000	GND	N	10.0	10.8	48.5	
0.720000	33.8	1000.000	9.000	GND	N	10.0	12.2	46.0	
0.885000	35.5	1000.000	9.000	GND	N	10.0	10.5	46.0	
1.470000	35.1	1000.000	9.000	GND	N	10.1	10.9	46.0	
2.355000	36.2	1000.000	9.000	GND	N	10.1	9.8	46.0	
2.940000	34.5	1000.000	9.000	GND	N	10.1	11.5	46.0	
4.800000	35.5	1000.000	9.000	GND	N	10.2	10.5	46.0	
7.065000	37.4	1000.000	9.000	GND	N	10.3	12.6	50.0	
16.800000	37.9	1000.000	9.000	GND	N	10.6	12.1	50.0	

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



6. Radiated Emission

6.1 Operating Environment

Temperature : 24 °C
Relative Humidity : 43 % 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

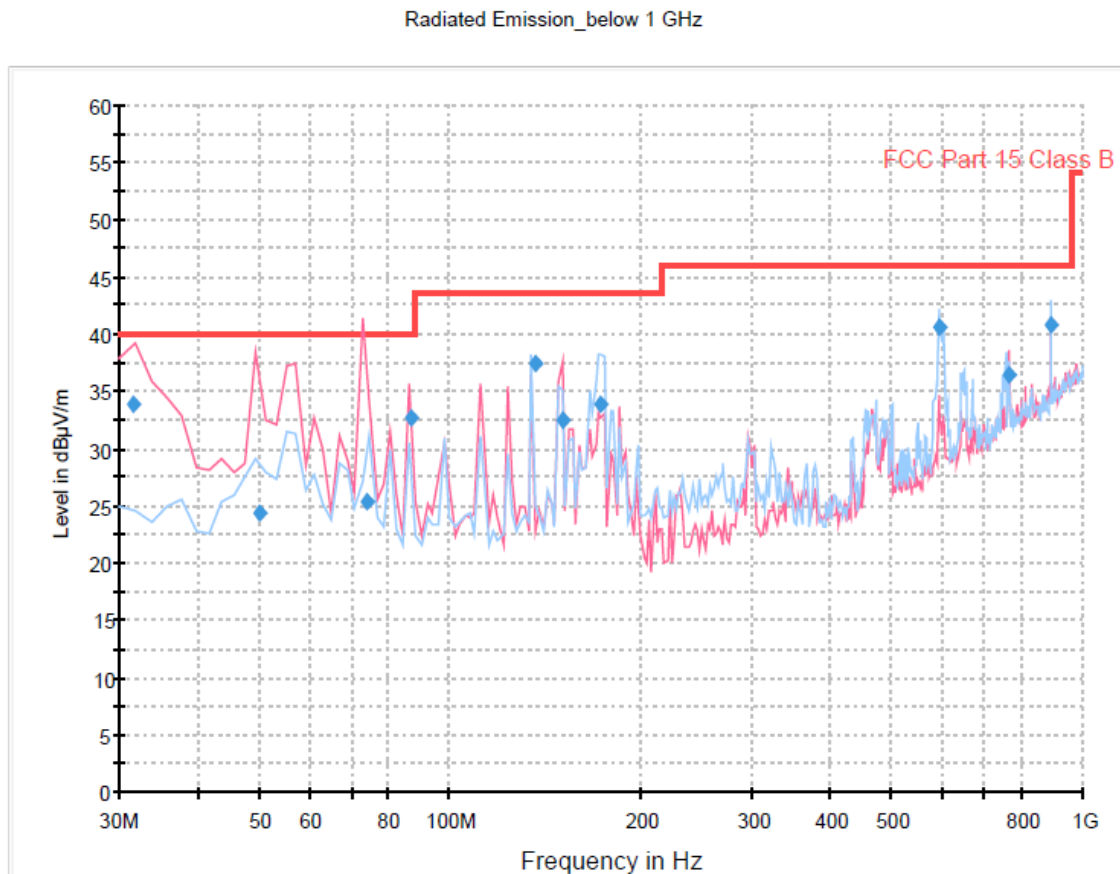
Model Name	Manufacturer	Description	Serial Number	Due to Calibration
■ - ESIB26	Rohde & Schwarz	EMI Test Receiver	830482/010	12. 11. 2010
■ - VULB9160	Schwarzbeck	Broadband Test Antenna	3193	03. 11. 2012
■ - BBHA9120D	Schwarzbeck	Horn ANT	207	12. 22. 2011
■ - MCU066	maturo GmbH	Position Controller	1390306	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 : April 5, 2010
- Resolution Bandwidth : 120 kHz/1 MHz
- Frequency Range : 30 MHz ~ 2 000 MHz
- Measurement Distance : 3 m
- Note : The highest frequency of the internal source of the EUT is between 108 MHz and 500 MHz (400 MHz). The measurement was made up to 2 000 MHz



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



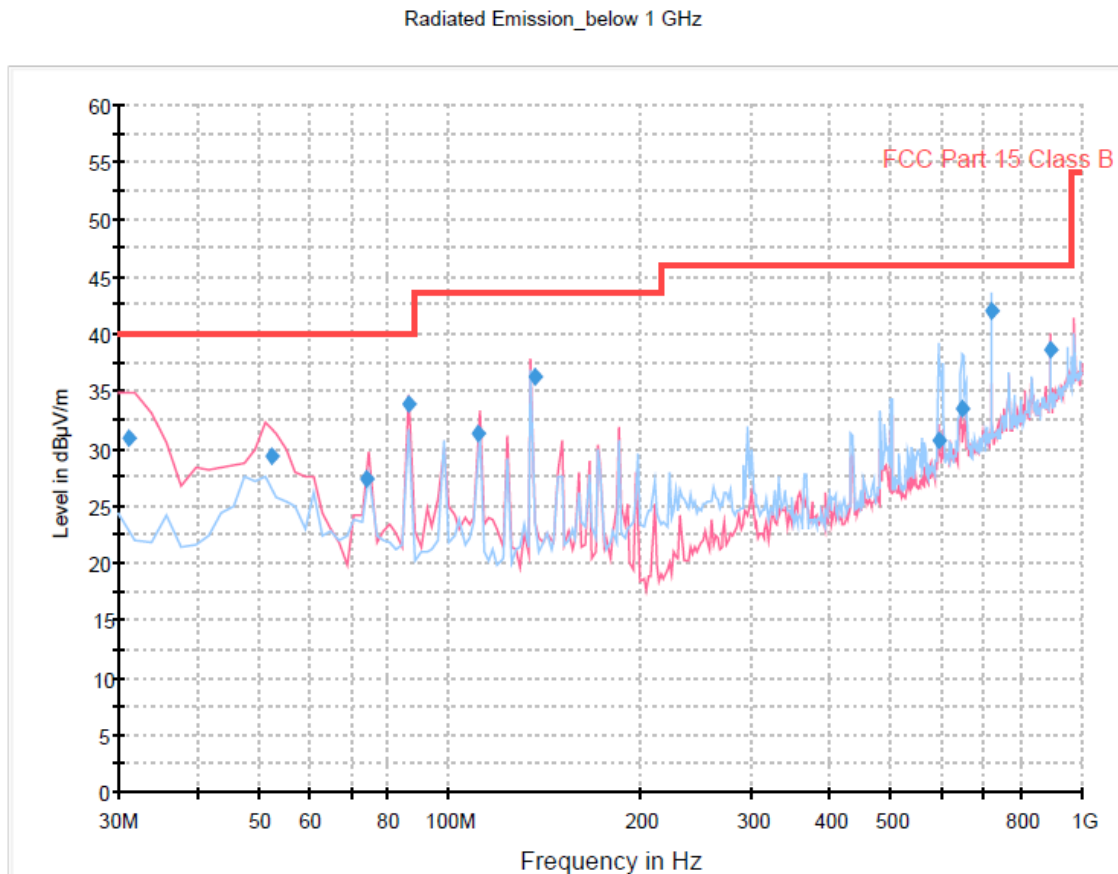
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
31.683888	33.9	1000.0	120.000	100.0	V	183.0	12.9	6.1	40.0
49.938878	24.5	1000.0	120.000	243.0	V	142.0	13.6	15.5	40.0
74.225531	25.3	1000.0	120.000	260.0	V	195.0	10.7	14.7	40.0
86.632745	32.7	1000.0	120.000	100.0	V	0.0	9.7	7.3	40.0
136.109940	37.3	1000.0	120.000	145.0	H	114.0	14.4	6.2	43.5
151.141042	32.4	1000.0	120.000	162.0	V	166.0	14.9	11.1	43.5
173.267695	33.9	1000.0	120.000	100.0	H	147.0	14.3	9.6	43.5
594.267455	40.7	1000.0	120.000	110.0	H	227.0	24.4	5.3	46.0
766.289579	36.5	1000.0	120.000	142.0	V	229.0	27.7	9.5	46.0
891.002285	40.8	1000.0	120.000	258.0	H	359.0	29.2	5.2	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



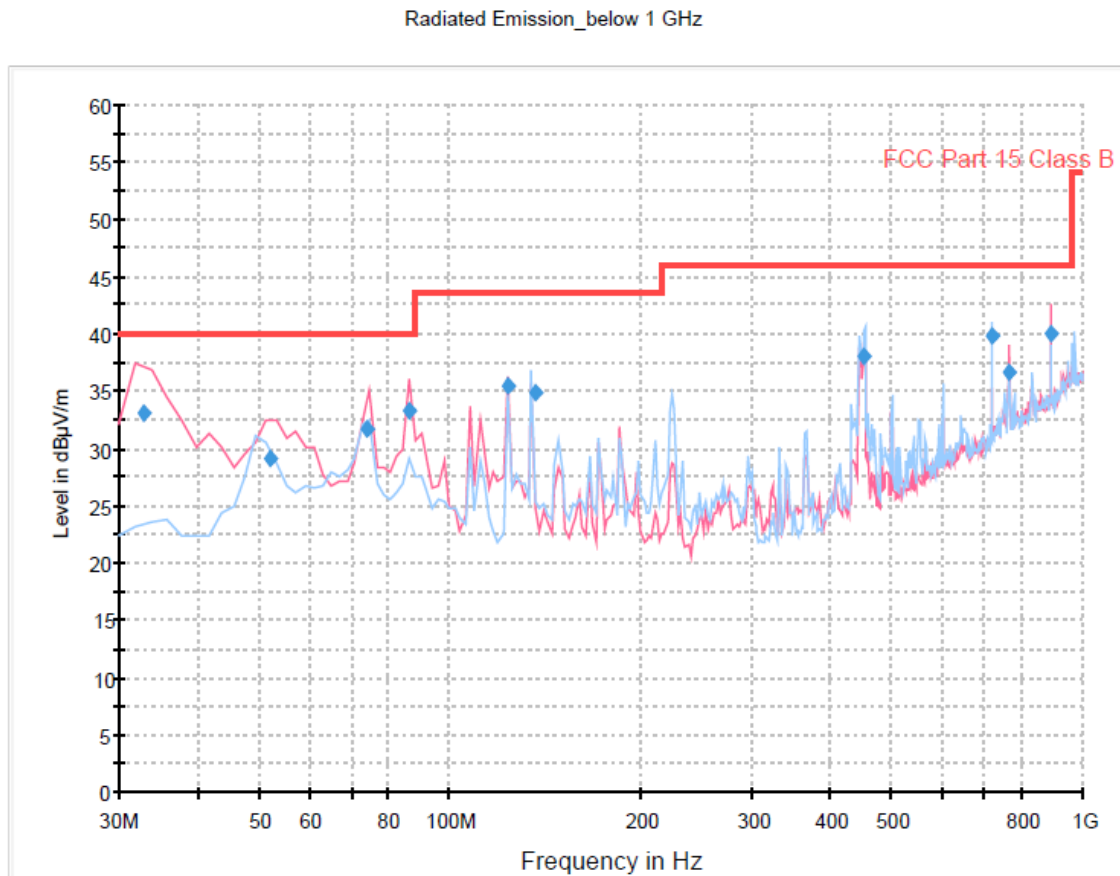
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
31.200000	30.8	1000.0	120.000	100.0	V	183.0	12.9	9.2	40.0
52.322766	29.3	1000.0	120.000	120.0	V	342.0	13.6	10.7	40.0
74.249419	27.3	1000.0	120.000	100.0	V	280.0	10.7	12.7	40.0
86.592745	33.9	1000.0	120.000	158.0	V	185.0	9.7	6.1	40.0
111.343287	31.3	1000.0	120.000	100.0	V	34.0	12.3	12.2	43.5
136.109940	36.3	1000.0	120.000	106.0	V	0.0	14.4	7.2	43.5
594.347455	30.7	1000.0	120.000	100.0	H	138.0	24.4	15.3	46.0
647.096313	33.5	1000.0	120.000	156.0	H	241.0	25.4	12.5	46.0
720.020160	42.0	1000.0	120.000	164.0	H	241.0	26.7	4.0	46.0
890.962285	38.7	1000.0	120.000	253.0	V	328.0	29.2	7.3	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



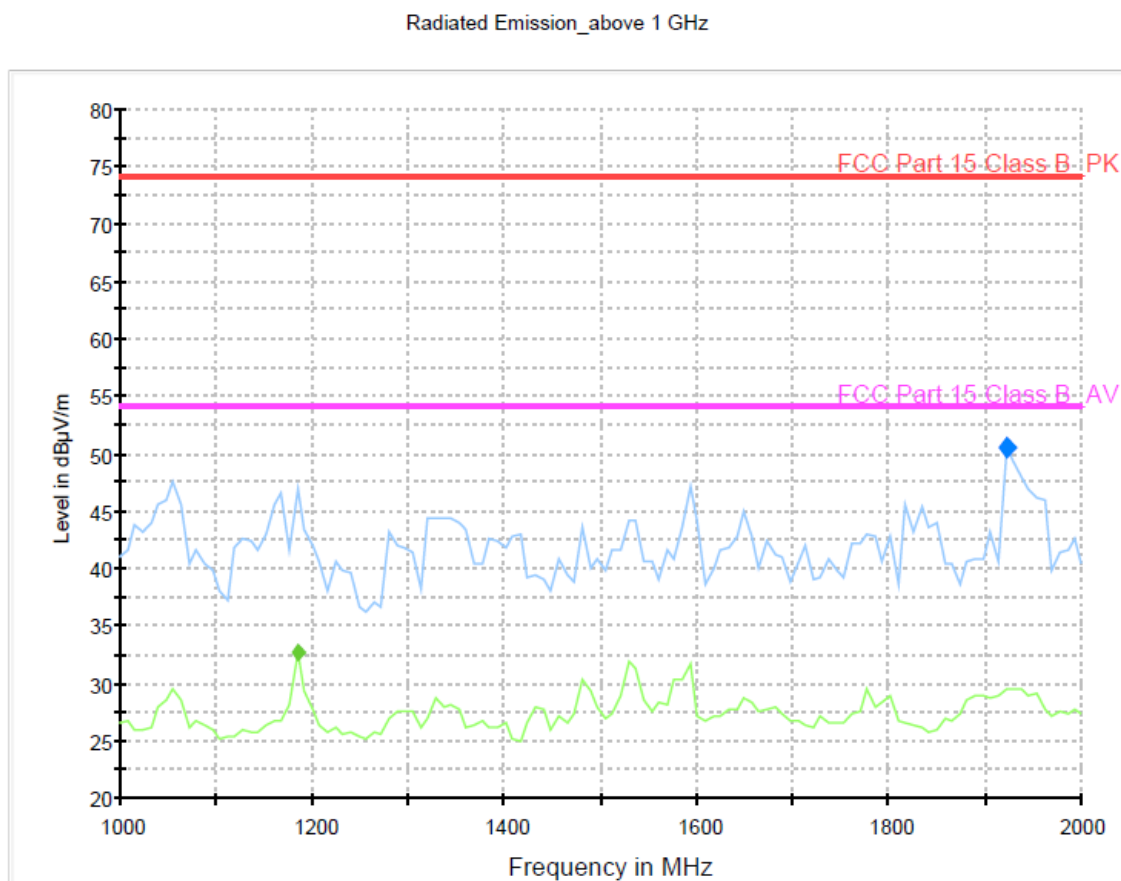
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
33.003888	33.1	1000.0	120.000	100.0	V	16.0	12.9	6.9	40.0
51.962766	29.1	1000.0	120.000	100.0	V	34.0	13.6	10.9	40.0
74.249419	31.7	1000.0	120.000	106.0	V	0.0	10.7	8.3	40.0
86.592745	33.4	1000.0	120.000	100.0	V	228.0	9.7	6.6	40.0
123.726613	35.4	1000.0	120.000	110.0	V	43.0	13.5	8.1	43.5
136.109940	34.8	1000.0	120.000	257.0	H	131.0	14.4	8.7	43.5
452.467535	38.0	1000.0	120.000	143.0	H	228.0	20.8	8.0	46.0
720.020160	39.9	1000.0	120.000	100.0	H	184.0	26.7	6.1	46.0
766.353467	36.7	1000.0	120.000	100.0	V	140.0	27.7	9.3	46.0
891.002285	40.1	1000.0	120.000	119.0	V	325.0	29.2	5.9	46.0

< 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)	Peak-MaxHold (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
1921.843600	50.5	100.0	H	38.0	-9.7	23.4	73.9	

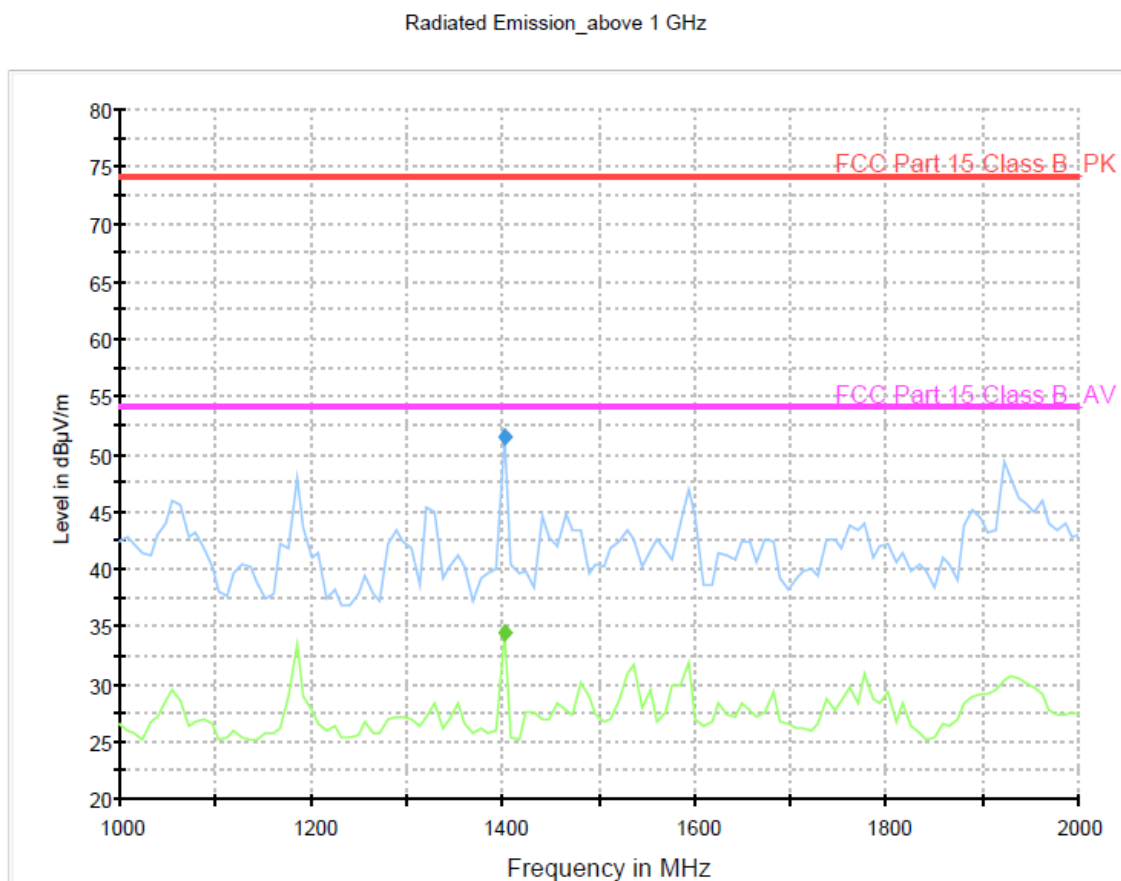
Final Result 2

Frequency (MHz)	Average-MaxHold (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
1184.368000	32.7	100.0	H	38.0	-9.7	21.2	53.9	

< Fig 17. Radiated emission result (1 000 MHz ~ 2 000 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
1400.801600	51.4	162.0	H	151.0	-9.8	22.5	73.9	

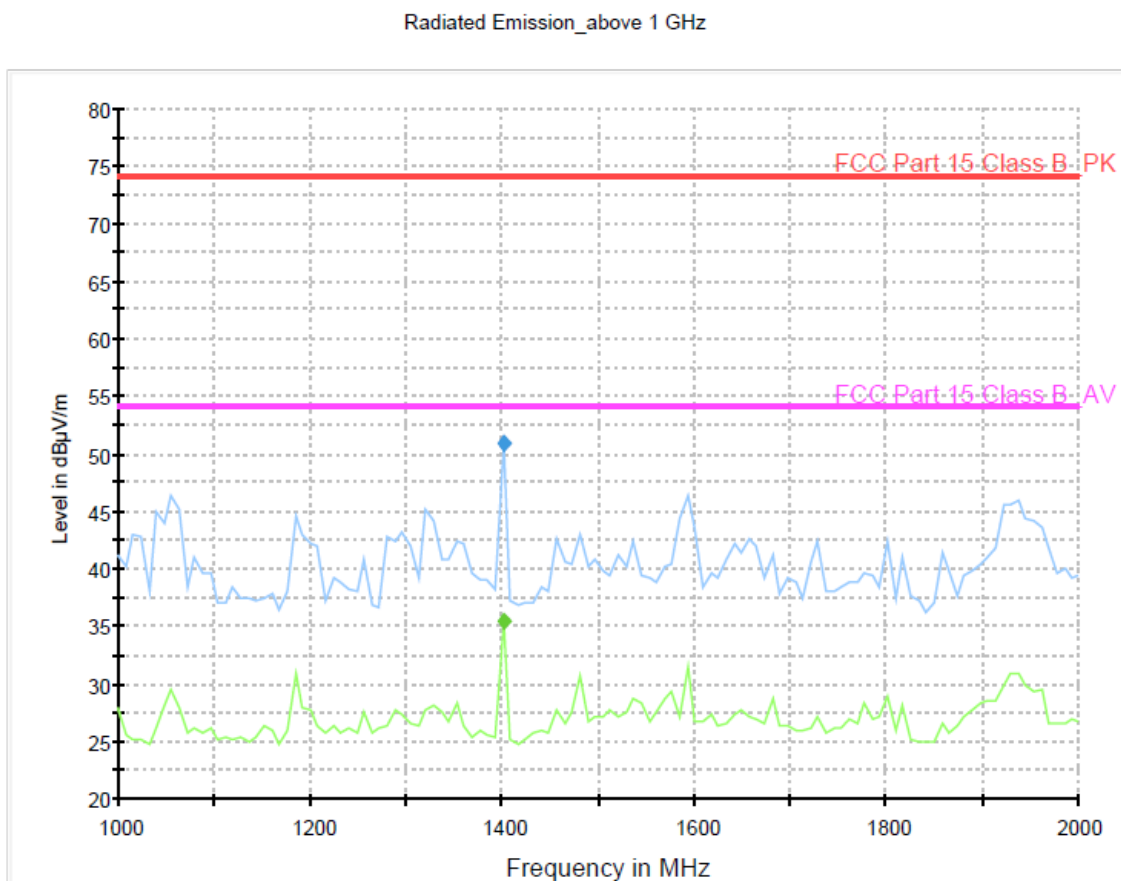
Final Result 2

Frequency (MHz)	Average-MaxHold (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
1400.801603	34.4	100.0	H	198.0	-14.5	19.5	53.9	

< Fig 18. Radiated emission result (1 000 MHz ~ 2 000 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
1400.801600	50.9	138.0	H	147.0	-9.8	23.0	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
1400.801603	35.4	142.0	H	200.0	-14.5	18.5	53.9	

< Fig 19. 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 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. LCD TV/Monitor (Model Name: 42LD450C-UA)** was complies with §15.107 and 15.109 of the FCC Rules.