

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 : July 24, 2009

Order Number: GETEC-C1-09-168

Test Report Number: GETEC-E3-09-087

Test Site: Gumi College EMC Center

FCC Registration Number: (100749, 443957)

FCC ID.: BEJ37LG710HUA

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	: 37LG710H-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



CONTENTS

1. GENERAL INFORMATION	3
2. INTRODUCTION	4
3. PRODUCT INFORMATION	5
3.1 DESCRIPTION OF EUT.....	5
3.2 SUPPORT EQUIPMENT / CABLES USED	6
3.3 MODIFICATION ITEM(S)	7
4. DESCRIPTION OF TESTS.....	8
4.1 TEST CONDITION.....	8
4.2 CONDUCTED EMISSION	9
4.3 RADIATED EMISSION	10
5. CONDUCTED EMISSION.....	11
5.1 OPERATING ENVIRONMENT	11
5.2 TEST SET-UP	11
5.3 MEASUREMENT UNCERTAINTY.....	11
5.4 LIMIT	12
5.5 TEST EQUIPMENT USED.....	12
5.6 TEST DATA FOR CONDUCTED EMISSION	12
6. RADIATED EMISSION	21
6.1 OPERATING ENVIRONMENT	21
6.2 TEST SET-UP	21
6.3 MEASUREMENT UNCERTAINTY.....	21
6.4 LIMIT	22
6.5 TEST EQUIPMENT USED.....	22
6.6 TEST DATA FOR RADIATED EMISSION.....	22
7. SAMPLE CALCULATIONS.....	27
7.1 EXAMPLE 1 :	27
7.2 EXAMPLE 2 :	27
8. RECOMMENDATION & CONCLUSION.....	28
APPENDIX A – ATTESTATION STATEMENT	
APPENDIX B – ID SAMPLE LABEL & LOCATION	
APPENDIX C – BLOCK DIAGRAM	
APPENDIX D – TEST SET-UP PHOTOGRAPHS	
APPENDIX E – EXTERNAL PHOTOGRAPHS	
APPENDIX F –INTERNAL PHOTOGRAPHS	
APPENDIX G – USER’S MANUAL	



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.** BEJ37LG710HUA
- **EUT Type** LCD TV/Monitor
- **Model Name** 37LG710H-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** July 13 ~ 14, 2009
- **Place of Test** **Gumi College EMC Center** (FCC Registration No.: 100749, 443957)
407, Bugok-dong, Gumi-si, Gyeongbuk, Korea.
- **Test Report Number** GETEC-E3-09-087
- **Dates of Issue** July 24, 2009



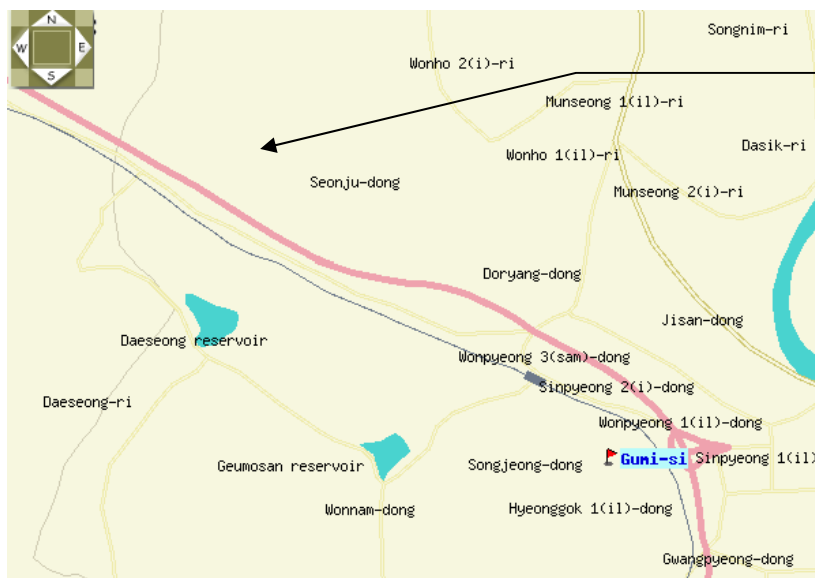
2. Introduction

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: 37LG710H-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 FCC §2.948 according to ANSI C63.4 (2003)



GUMI COLLEGE EMC CENTER
407,Bugok-dong, Gumi-si,
Gyeongbuk 730-711, Korea.
Tel: +82-54-440-1195
Fax: +82-54-440-1199

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: 37LG710H-UA)**
FCC ID.: BEJ37LG710HUA

MODEL		32LG700H/710H (32LG700H/710H-UA) (32LG700H/710H-UB)	37LG700H/710H (37LG700H/710H-UA) (37LG700H/710H-UB)	42LG700H/710H (42LG700H/710H-UA) (42LG700H/710H-UB)
Dimensions (Width x Height x Depth)	With stand	31.3 x 23.5 x 8.9 inches 797 x 597 x 227.3 mm	36.1 x 26.9 x 11.5 inches 918.6 x 684.8 x 293.4 mm	40.4 x 28.8 x 11.5 inches 1026.2 x 734.0 x 293.4 mm
	Without stand	31.3 x 21.9 x 3.9 inches 797 x 558.6 x 100.5 mm	36.1 x 24.9 x 3.4 inches 918.6 x 632.8 x 88 mm	40.4 x 27.0 x 4.4 inches 1026.2 x 687.9 x 111.8 mm
Weight	With stand	21.6 pounds / 9.82 kg	41.6 pounds / 18.8 kg	49.1 pounds / 22.3 kg
	Without stand	18.3 pounds / 8.34 kg	35.2 pounds / 15.9 kg	43.2 pounds / 19.6 kg
Cable Card	MPI card (Width x Height x Depth)	3.1 x 0.9 x 6.3 inches 80.0(+0.6/-0.2) x less than 23.0(including pcb thickness) x less than 162.0(excluding cover thickness) mm		
	Card Bracket Cover (Width x Height)	3.7 x 1.1 inches 94.7(±0.5) x 28.3(±0.5) mm		
Power requirement		AC 100-240V ~ 50/60Hz		
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 ohm		
Environment condition	Operating Temperature	32 ~ 104°F (0 ~ 40°C)		
	Operating Humidity	Less than 80%		
	Storage Temperature	-4 ~ 140°F (-20 ~ 60°C)		
	Storage Humidity	Less than 85%		

Maximum Frequency range:	513 MHz
--------------------------	---------

EUT Type: LCD TV/Monitor

FCC ID.: BEJ37LG710HUA



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
Headset	GOWOONSORI	GW-500M	S/N: N/A FCC ID: DoC

See “Appendix D– 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	10.0 m shielded
Speaker out cable	Connected to the EUT and Head set	2.95 m shielded
Remote control out	Connected to the EUT and PC	1.2 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: 1 280 * 1 024 / 60 Hz (RGB: Analog), 1 280 * 1 024 / 60 Hz (HDMI/DVI: Digital)
 - . Conducted emission: 1 280 * 1 024 / 60 Hz (RGB: Analog), 1 280 * 1 024 / 60 Hz (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

"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

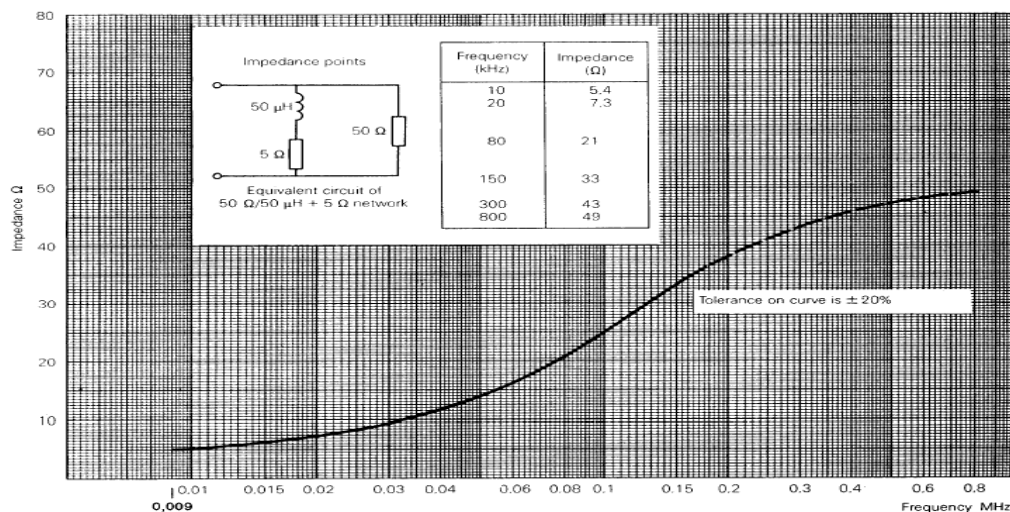


Fig 2. Impedance of LISN



4.3 Radiated Emission

The measurements were conducted 3 m anechoic chamber (FCC Registration No.: 443957) 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 to 1000 MHz, using bicornical log antenna (Schwarzbeck, VULB9160).

Above 1 GHz, horn antenna (Schwarzbeck, BBHA9120D / EMCO 3160) was used.

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 1MHz 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 m to 4 m and stopped at the azimuth or height producing the maximum emission.

Each EME reported was calibrated using the R/S signal generator

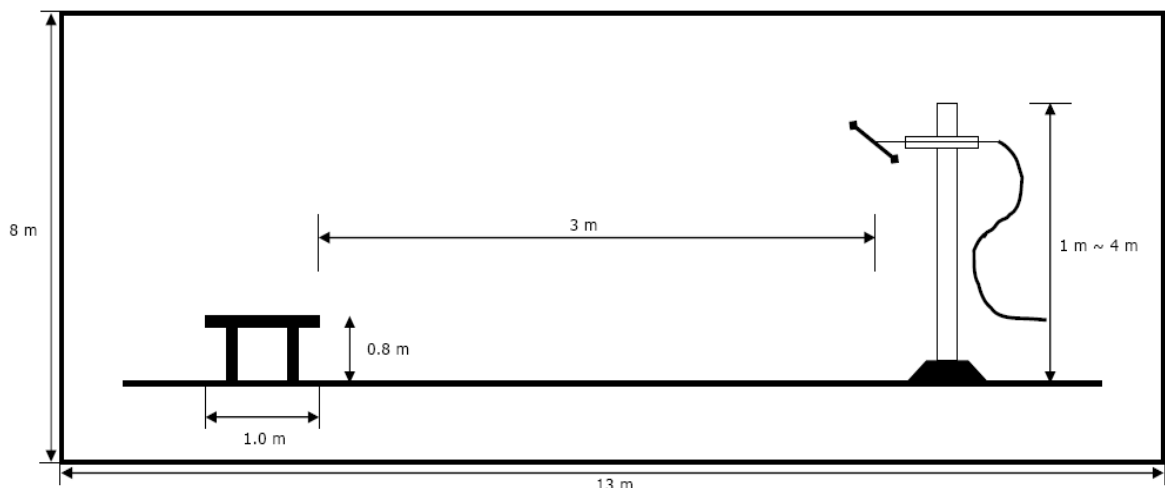


Fig 3. Dimensions of test site.



5. Conducted Emission

5.1 Operating Environment

Temperature : 25.0 °C
Relative Humidity : 53.0 % 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

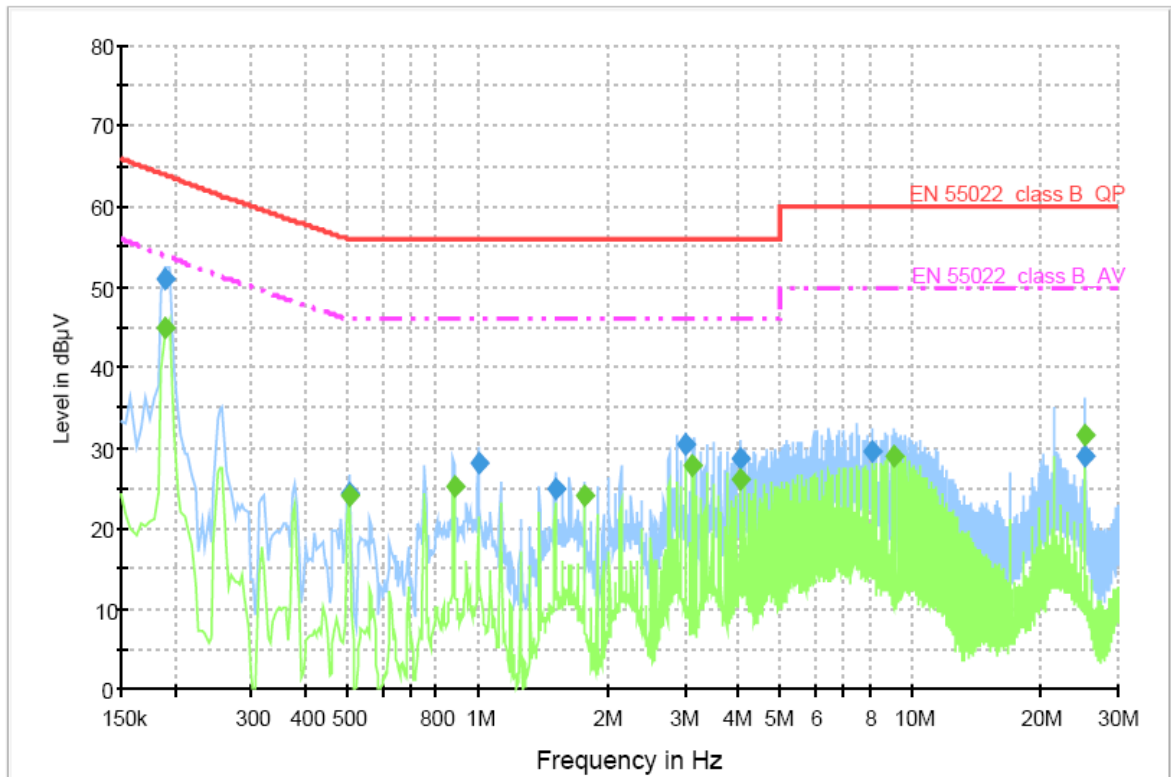
5.6 Test data for Conducted Emission

- . Test Date : July 13, 2009
- . Resolution Bandwidth : 9 kHz
- . Frequency Range : 0.15 MHz ~ 30 MHz



◆ Test resolution: 1 280 * 1 024 / 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
0.190000	51.0	1000.000	9.000	GND	L1	9.9	12.9	63.9	
0.504000	24.4	1000.000	9.000	GND	L1	10.0	31.6	56.0	
1.004000	28.0	1000.000	9.000	GND	L1	10.0	28.0	56.0	
1.508000	24.8	1000.000	9.000	GND	L1	10.1	31.2	56.0	
3.012000	30.5	1000.000	9.000	GND	L1	10.1	25.5	56.0	
4.016000	28.8	1000.000	9.000	GND	L1	10.2	27.2	56.0	
8.096000	29.7	1000.000	9.000	GND	L1	10.3	30.3	60.0	
25.312000	28.9	1000.000	9.000	GND	L1	11.0	31.1	60.0	

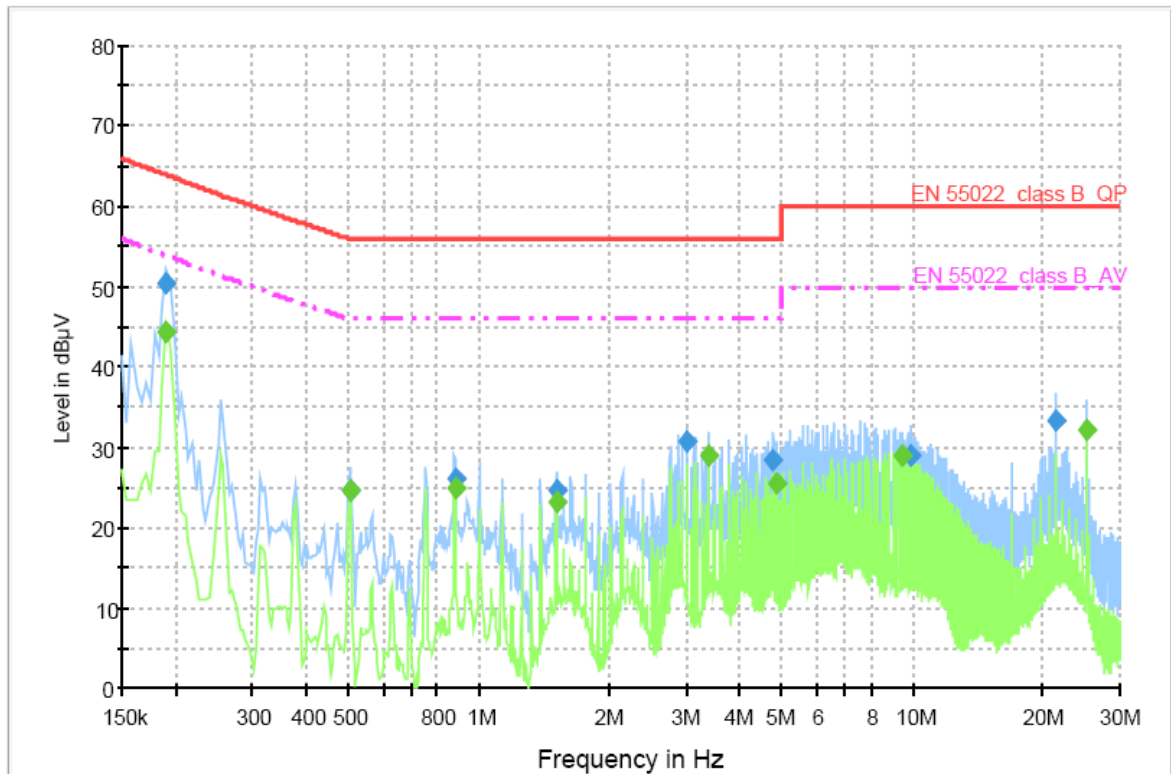
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.190000	44.9	1000.000	9.000	GND	L1	9.9	9.0	53.9	
0.504000	23.9	1000.000	9.000	GND	L1	10.0	22.1	46.0	
0.880000	25.1	1000.000	9.000	GND	L1	10.0	20.9	46.0	
1.756000	23.9	1000.000	9.000	GND	L1	10.1	22.1	46.0	
3.136000	27.7	1000.000	9.000	GND	L1	10.1	18.3	46.0	
4.016000	26.0	1000.000	9.000	GND	L1	10.2	20.0	46.0	
9.100000	29.1	1000.000	9.000	GND	L1	10.3	20.9	50.0	
25.304000	31.6	1000.000	9.000	GND	L1	11.0	18.4	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
0.190000	50.4	1000.000	9.000	GND	N	9.9	13.5	63.9	
0.504000	24.7	1000.000	9.000	GND	N	10.0	31.3	56.0	
0.880000	26.1	1000.000	9.000	GND	N	10.0	29.9	56.0	
1.508000	24.8	1000.000	9.000	GND	N	10.1	31.2	56.0	
3.012000	30.8	1000.000	9.000	GND	N	10.1	25.2	56.0	
4.772000	28.4	1000.000	9.000	GND	N	10.2	27.6	56.0	
9.856000	29.1	1000.000	9.000	GND	N	10.3	30.9	60.0	
21.376000	33.3	1000.000	9.000	GND	N	10.8	26.7	60.0	

Final Measurement Detector 2

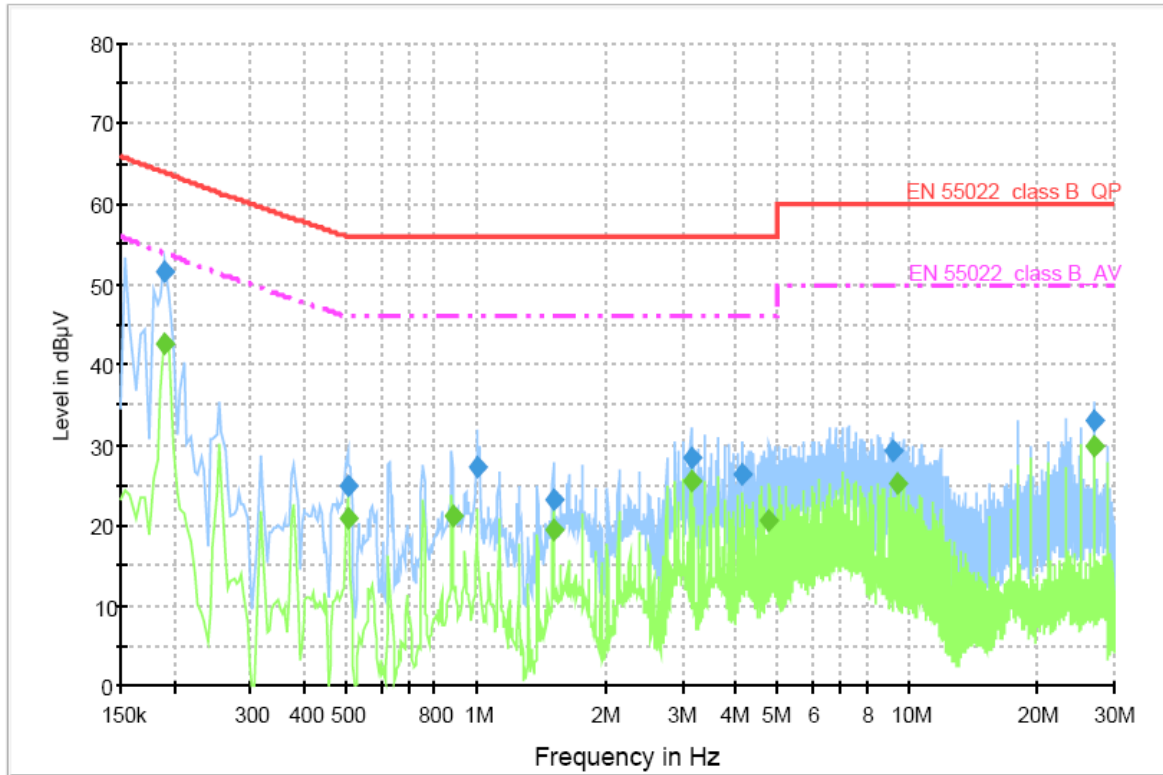
Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.190000	44.4	1000.000	9.000	GND	N	9.9	9.5	53.9	
0.504000	24.8	1000.000	9.000	GND	N	10.0	21.2	46.0	
0.880000	24.9	1000.000	9.000	GND	N	10.0	21.1	46.0	
1.508000	23.1	1000.000	9.000	GND	N	10.1	22.9	46.0	
3.388000	28.8	1000.000	9.000	GND	N	10.1	17.2	46.0	
4.832000	25.5	1000.000	9.000	GND	N	10.2	20.5	46.0	
9.480000	28.9	1000.000	9.000	GND	N	10.3	21.1	50.0	
25.296000	32.1	1000.000	9.000	GND	N	10.8	17.9	50.0	

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



◆ Test resolution: 1 280 * 1 024 / 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
0.190000	51.7	1000.000	9.000	GND	L1	9.9	12.2	63.9	
0.504000	24.8	1000.000	9.000	GND	L1	10.0	31.2	56.0	
1.004000	27.4	1000.000	9.000	GND	L1	10.0	28.6	56.0	
1.508000	23.1	1000.000	9.000	GND	L1	10.1	32.9	56.0	
3.140000	28.4	1000.000	9.000	GND	L1	10.1	27.6	56.0	
4.144000	26.5	1000.000	9.000	GND	L1	10.2	29.5	56.0	
9.232000	29.3	1000.000	9.000	GND	L1	10.3	30.7	60.0	
27.000000	33.2	1000.000	9.000	GND	L1	11.0	26.8	60.0	

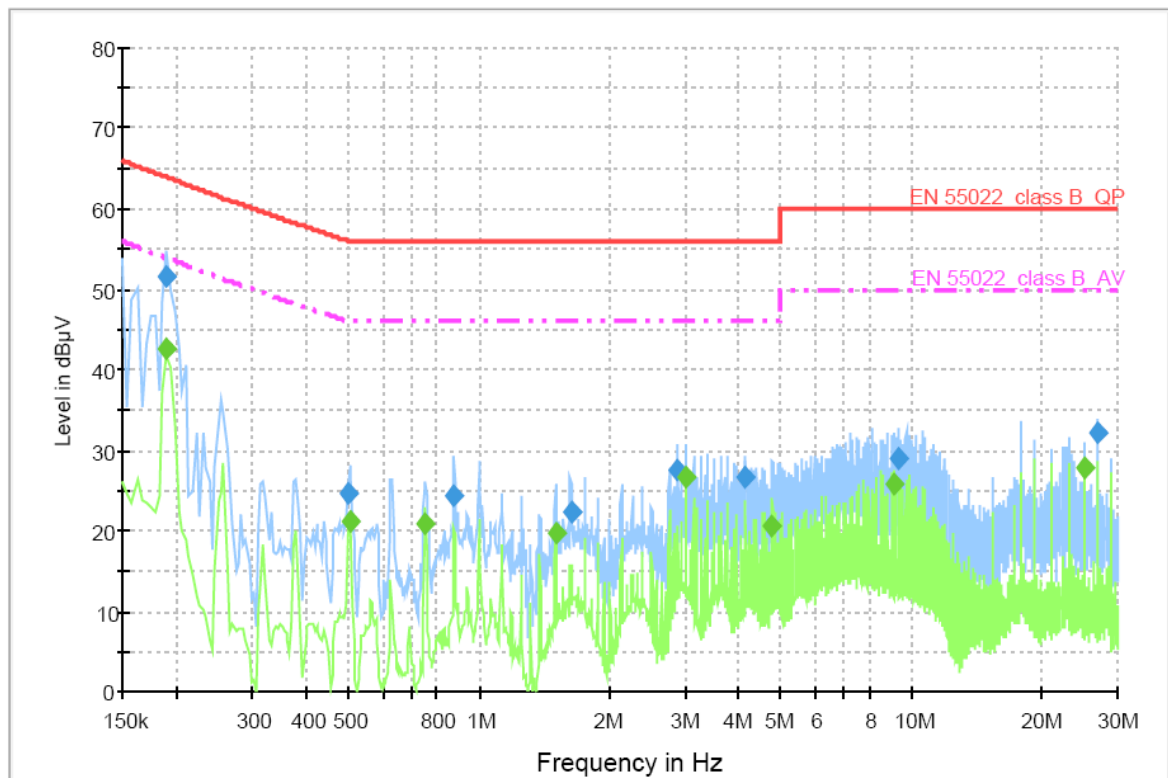
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.190000	42.7	1000.000	9.000	GND	L1	9.9	11.2	53.9	
0.504000	20.8	1000.000	9.000	GND	L1	10.0	25.2	46.0	
0.880000	21.1	1000.000	9.000	GND	L1	10.0	24.9	46.0	
1.508000	19.4	1000.000	9.000	GND	L1	10.1	26.6	46.0	
3.140000	25.6	1000.000	9.000	GND	L1	10.1	20.4	46.0	
4.772000	20.4	1000.000	9.000	GND	L1	10.2	25.6	46.0	
9.480000	25.3	1000.000	9.000	GND	L1	10.3	24.8	50.0	
27.000000	29.8	1000.000	9.000	GND	L1	11.0	20.2	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
0.190000	51.6	1000.000	9.000	GND	N	9.9	12.3	63.9	
0.500000	24.7	1000.000	9.000	GND	N	10.0	31.3	56.0	
0.876000	24.2	1000.000	9.000	GND	N	10.0	31.8	56.0	
1.632000	22.2	1000.000	9.000	GND	N	10.1	33.8	56.0	
2.888000	27.7	1000.000	9.000	GND	N	10.1	28.3	56.0	
4.144000	26.6	1000.000	9.000	GND	N	10.2	29.4	56.0	
9.352000	29.0	1000.000	9.000	GND	N	10.3	31.0	60.0	
27.000000	32.2	1000.000	9.000	GND	N	10.8	27.8	60.0	

Final Measurement Detector 2

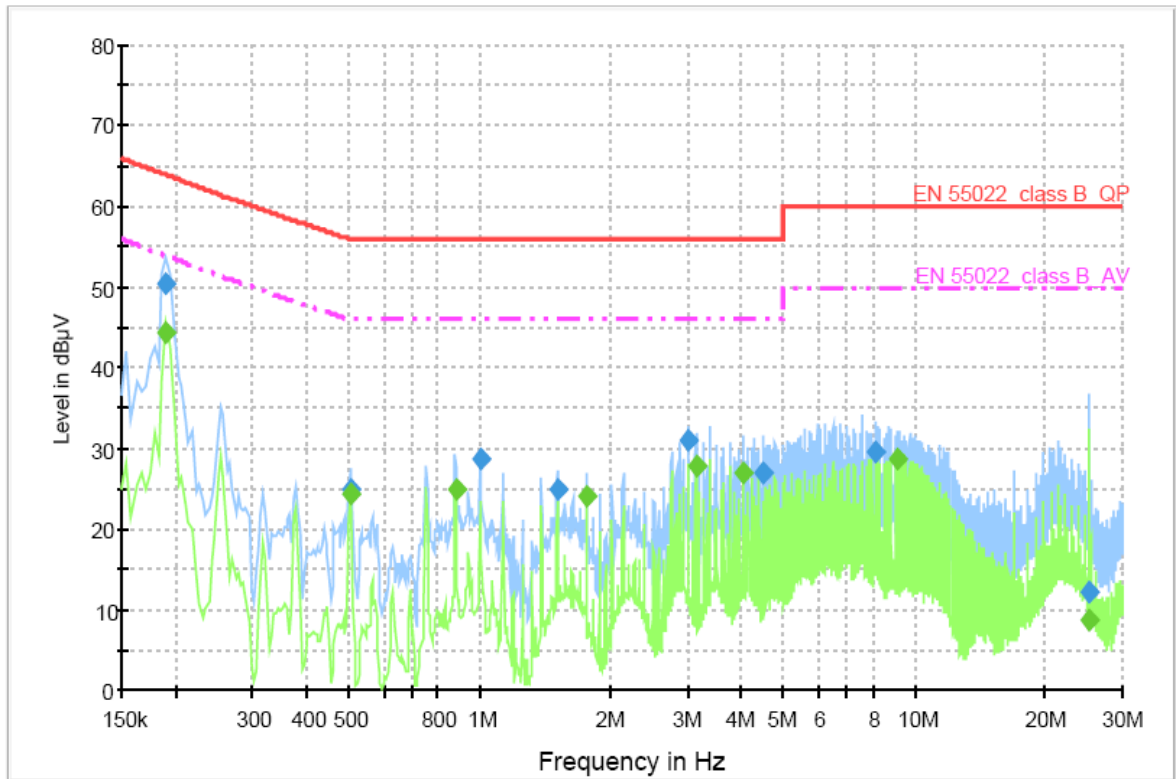
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.190000	42.7	1000.000	9.000	GND	N	9.9	11.2	53.9	
0.504000	21.3	1000.000	9.000	GND	N	10.0	24.7	46.0	
0.752000	20.9	1000.000	9.000	GND	N	10.0	25.1	46.0	
1.508000	19.8	1000.000	9.000	GND	N	10.1	26.2	46.0	
3.012000	26.5	1000.000	9.000	GND	N	10.1	19.5	46.0	
4.772000	20.6	1000.000	9.000	GND	N	10.2	25.4	46.0	
9.104000	25.8	1000.000	9.000	GND	N	10.3	24.2	50.0	
25.060000	27.9	1000.000	9.000	GND	N	10.8	22.1	50.0	

Fig 7. Conducted emission result (Neutral line)>



◆ 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
0.190000	50.4	1000.000	9.000	GND	L1	9.9	13.5	63.9	
0.504000	24.8	1000.000	9.000	GND	L1	10.0	31.2	56.0	
1.004000	28.7	1000.000	9.000	GND	L1	10.0	27.3	56.0	
1.508000	25.0	1000.000	9.000	GND	L1	10.1	31.0	56.0	
3.012000	31.0	1000.000	9.000	GND	L1	10.1	25.0	56.0	
4.456000	26.9	1000.000	9.000	GND	L1	10.2	29.1	56.0	
8.096000	29.5	1000.000	9.000	GND	L1	10.3	30.5	60.0	
25.292000	12.3	1000.000	9.000	GND	L1	11.0	47.7	60.0	

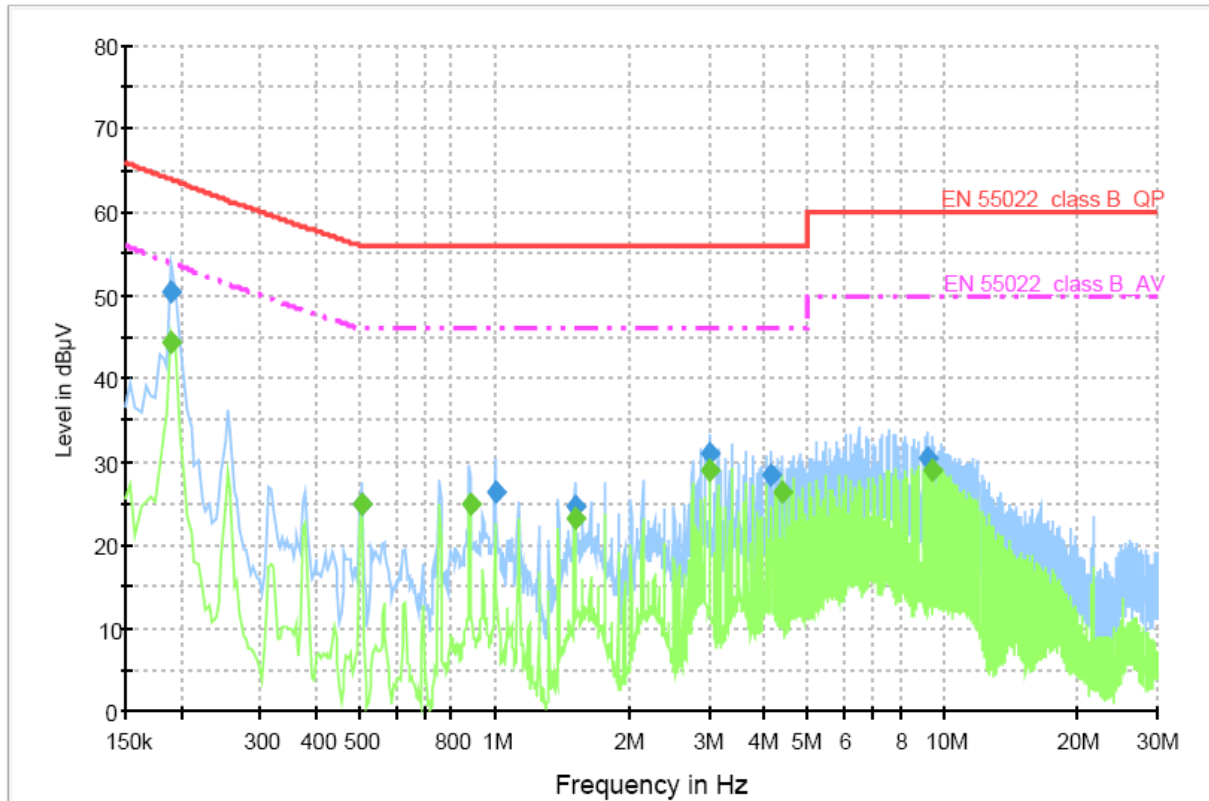
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.190000	44.2	1000.000	9.000	GND	L1	9.9	9.7	53.9	
0.504000	24.3	1000.000	9.000	GND	L1	10.0	21.7	46.0	
0.880000	25.0	1000.000	9.000	GND	L1	10.0	21.0	46.0	
1.756000	23.9	1000.000	9.000	GND	L1	10.1	22.1	46.0	
3.140000	27.7	1000.000	9.000	GND	L1	10.1	18.3	46.0	
4.016000	26.9	1000.000	9.000	GND	L1	10.2	19.1	46.0	
9.104000	28.7	1000.000	9.000	GND	L1	10.3	21.3	50.0	
25.296000	8.8	1000.000	9.000	GND	L1	11.0	41.2	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
0.190000	50.3	1000.000	9.000	GND	N	9.9	13.6	63.9	
0.504000	24.9	1000.000	9.000	GND	N	10.0	31.1	56.0	
1.004000	26.5	1000.000	9.000	GND	N	10.0	29.5	56.0	
1.508000	24.8	1000.000	9.000	GND	N	10.1	31.2	56.0	
3.012000	31.0	1000.000	9.000	GND	N	10.1	25.0	56.0	
4.144000	28.5	1000.000	9.000	GND	N	10.2	27.5	56.0	
9.228000	30.5	1000.000	9.000	GND	N	10.3	29.5	60.0	

Final Measurement Detector 2

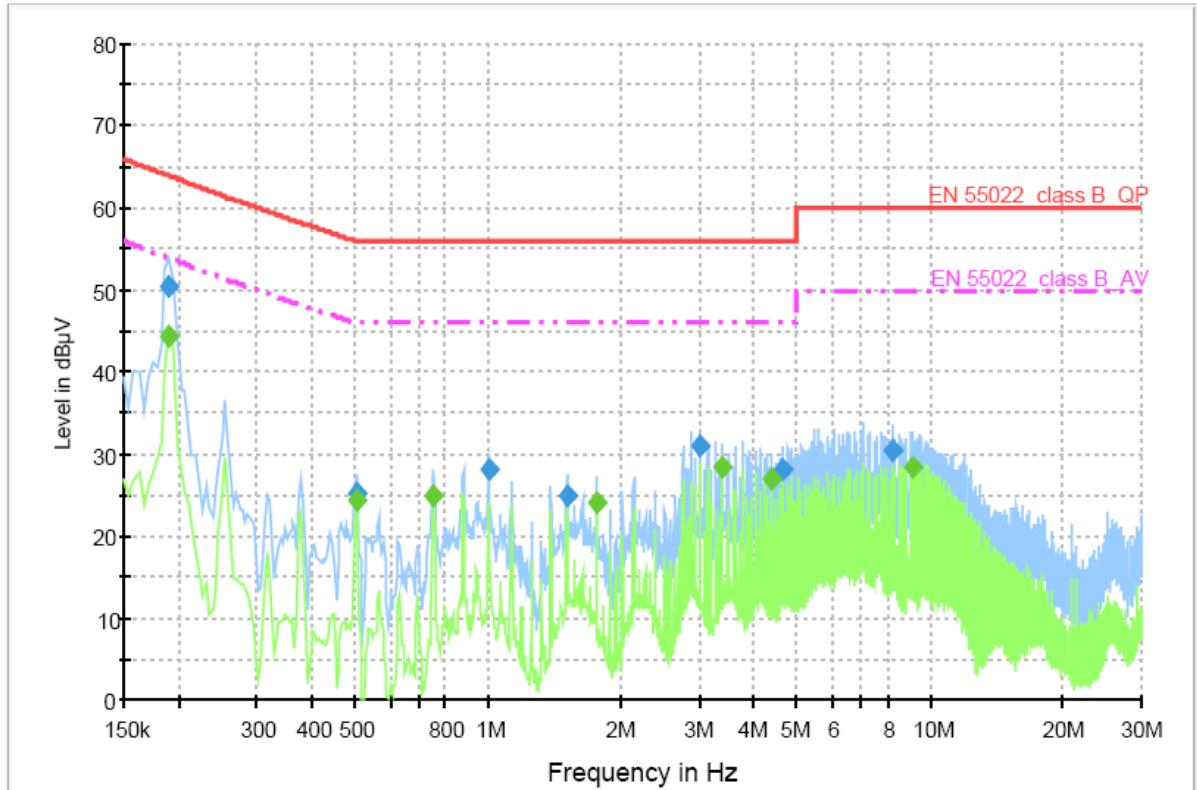
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.190000	44.2	1000.000	9.000	GND	N	9.9	9.7	53.9	
0.504000	24.9	1000.000	9.000	GND	N	10.0	21.1	46.0	
0.880000	25.0	1000.000	9.000	GND	N	10.0	21.0	46.0	
1.508000	23.1	1000.000	9.000	GND	N	10.1	22.9	46.0	
3.012000	29.1	1000.000	9.000	GND	N	10.1	16.9	46.0	
4.396000	26.4	1000.000	9.000	GND	N	10.2	19.6	46.0	
9.480000	28.9	1000.000	9.000	GND	N	10.3	21.1	50.0	

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



◆ 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
0.190000	50.3	1000.000	9.000	GND	L1	9.9	13.6	63.9	
0.504000	25.1	1000.000	9.000	GND	L1	10.0	30.9	56.0	
1.004000	28.2	1000.000	9.000	GND	L1	10.0	27.8	56.0	
1.508000	25.0	1000.000	9.000	GND	L1	10.1	31.0	56.0	
3.012000	31.1	1000.000	9.000	GND	L1	10.1	24.9	56.0	
4.648000	28.0	1000.000	9.000	GND	L1	10.2	28.0	56.0	
8.224000	30.5	1000.000	9.000	GND	L1	10.3	29.5	60.0	

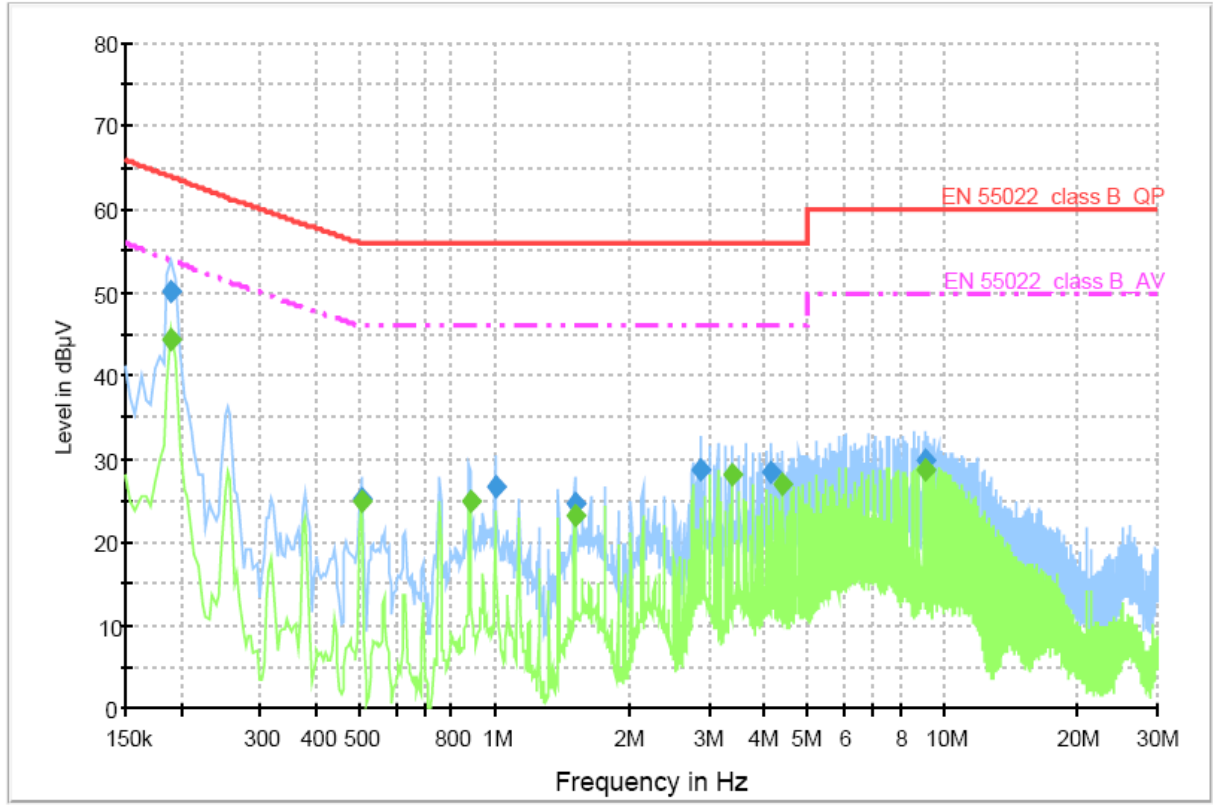
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.190000	44.2	1000.000	9.000	GND	L1	9.9	9.7	53.9	
0.504000	24.3	1000.000	9.000	GND	L1	10.0	21.7	46.0	
0.752000	24.8	1000.000	9.000	GND	L1	10.0	21.2	46.0	
1.756000	24.0	1000.000	9.000	GND	L1	10.1	22.0	46.0	
3.388000	28.5	1000.000	9.000	GND	L1	10.1	17.5	46.0	
4.396000	27.0	1000.000	9.000	GND	L1	10.2	19.0	46.0	
9.104000	28.5	1000.000	9.000	GND	L1	10.3	21.5	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
0.190000	50.3	1000.000	9.000	GND	N	9.9	13.6	63.9	
0.504000	25.1	1000.000	9.000	GND	N	10.0	30.9	56.0	
1.004000	26.7	1000.000	9.000	GND	N	10.0	29.3	56.0	
1.508000	24.8	1000.000	9.000	GND	N	10.1	31.2	56.0	
2.888000	28.7	1000.000	9.000	GND	N	10.1	27.3	56.0	
4.144000	28.4	1000.000	9.000	GND	N	10.2	27.6	56.0	
9.104000	29.9	1000.000	9.000	GND	N	10.3	30.1	60.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.190000	44.2	1000.000	9.000	GND	N	9.9	9.7	53.9	
0.504000	25.0	1000.000	9.000	GND	N	10.0	21.0	46.0	
0.880000	25.0	1000.000	9.000	GND	N	10.0	21.0	46.0	
1.508000	23.1	1000.000	9.000	GND	N	10.1	22.9	46.0	
3.388000	28.2	1000.000	9.000	GND	N	10.1	17.8	46.0	
4.396000	27.1	1000.000	9.000	GND	N	10.2	18.9	46.0	
9.104000	28.7	1000.000	9.000	GND	N	10.3	21.3	50.0	

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



6. Radiated Emission

6.1 Operating Environment

Temperature : 20.0 °C
Relative Humidity : 46.0 % 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	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
■ - VULB9160	Schwarzbeck	Broadband Test ANT	3193	12. 11. 2009
■ - BBHA9120D	Schwarzbeck	Horn ANT	207	12. 26. 2009
■ - MCU066	Maturo GmbH	Position Controller	1390306	N/A
■ - AM 4.0	Maturo GmbH	Antenna Mast	1390308	N/A
■ - TT2.5SI	Maturo GmbH	Turntable	1390307	N/A
■ - AFS 44 00101800- 25-10P-44	MITEQ	Preamplifier	1258943	11. 11. 2009

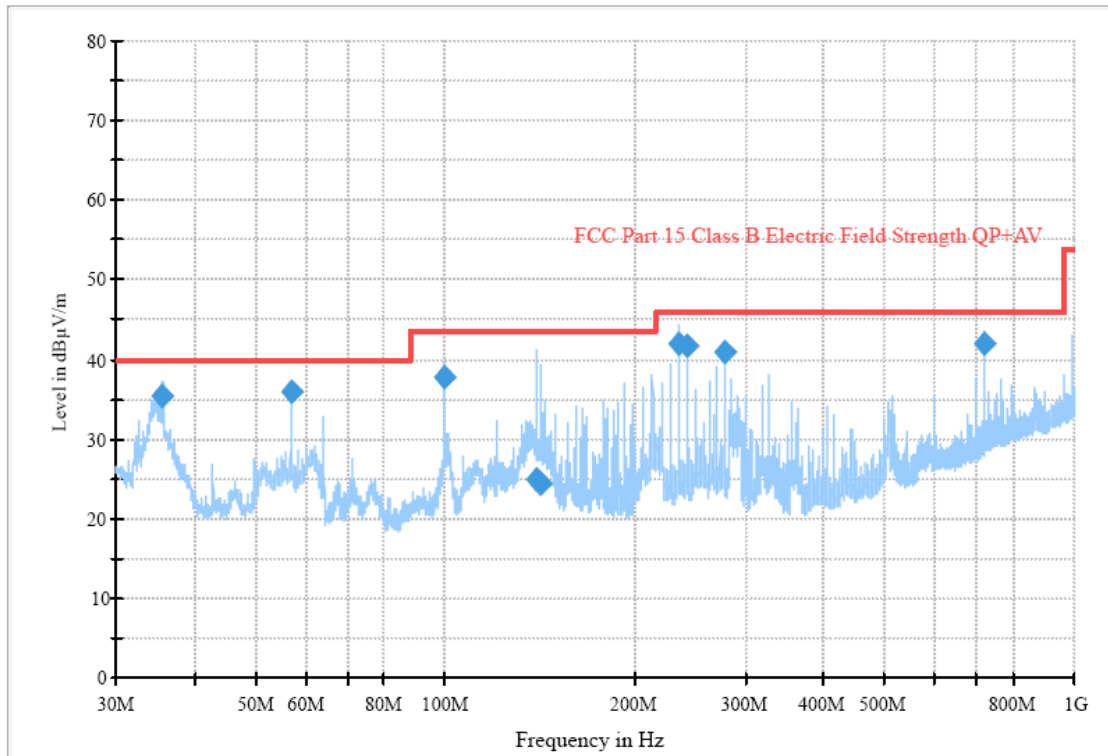
6.6 Test data for Radiated Emission

-. Test Date : July 13, 2009
-. Resolution Bandwidth : 120 kHz/ 1 MHz
-. Frequency Range : 30 MHz ~ 5 000 MHz
-. Measurement Distance : 3 m



- ◆ Operating Condition: 1 280 * 1 024 / 60 Hz (RGB: Analog mode)
Detector mode: Quasi- peak detector mode

FCC_ESIB_Direct_RE with Scans



Final Result 1

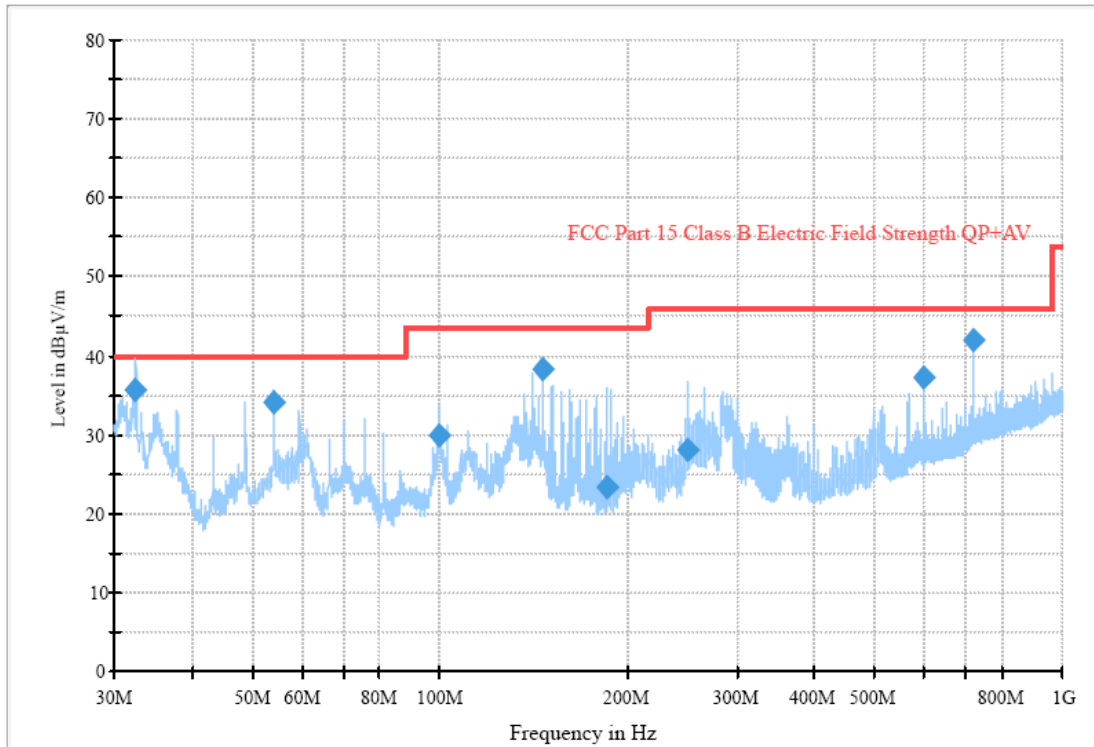
Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
35.600000	35.3	1000.0	120.000	100.0	V	48.0	12.1	4.7	40.0
57.000000	35.9	1000.0	120.000	100.0	V	305.0	13.2	4.1	40.0
99.760000	37.8	1000.0	120.000	119.0	V	272.0	10.7	5.7	43.5
139.520000	25.0	1000.0	120.000	100.0	V	2.0	14.5	18.5	43.5
142.200000	24.3	1000.0	120.000	111.0	V	-2.0	14.6	19.2	43.5
235.120000	42.0	1000.0	120.000	100.0	H	281.0	13.3	4.0	46.0
242.240000	41.8	1000.0	120.000	111.0	H	282.0	13.6	4.2	46.0
277.880000	41.0	1000.0	120.000	168.0	H	175.0	14.9	5.0	46.0
720.000000	41.9	1000.0	120.000	100.0	H	194.0	25.3	4.1	46.0

< Fig 12. Radiated emission result (30 MHz ~ 1 000 MHz)>



- ◆ Operating Condition: 1 280 * 1 024 / 60 Hz (HDMI/DVI: Digital mode)
Detector mode: Quasi- peak detector mode

FCC_ESIB_Direct_RE with Scans



Final Result 1

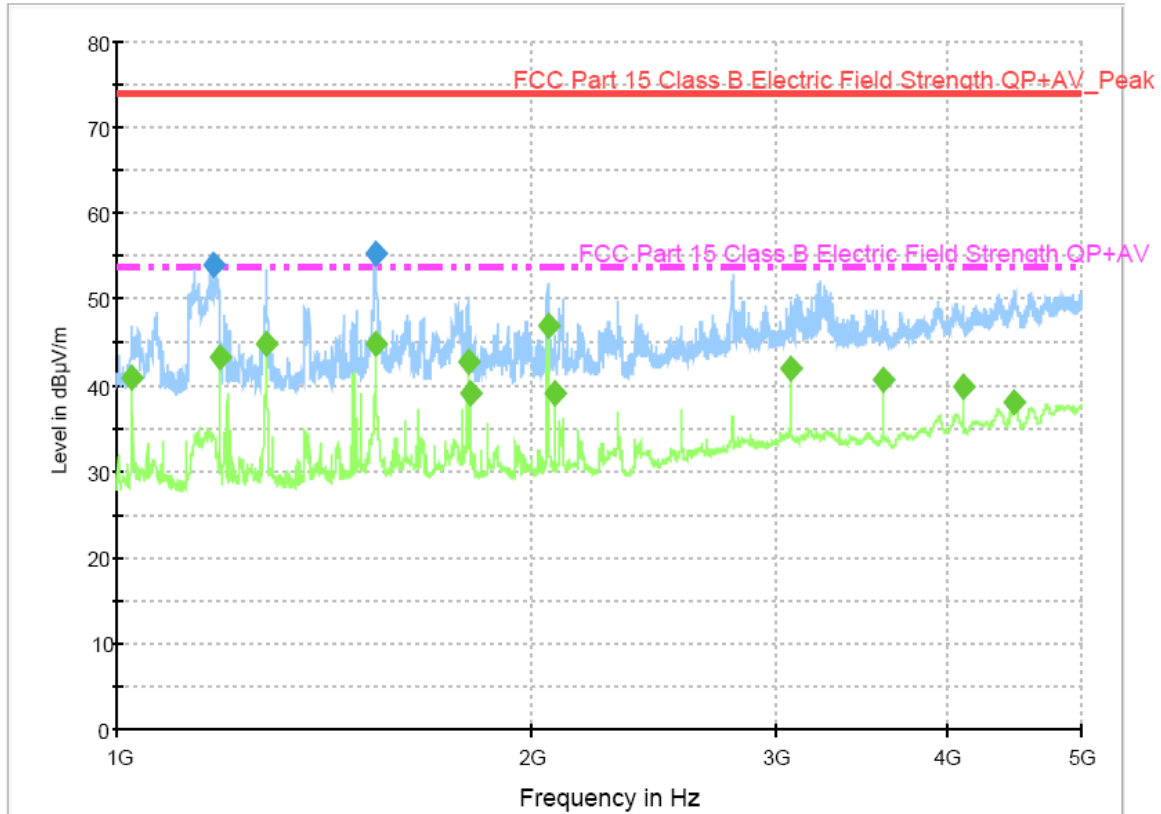
Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
32.480000	35.7	1000.0	120.000	100.0	V	-4.0	12.0	4.3	40.0
54.120000	34.1	1000.0	120.000	100.0	V	301.0	13.4	5.9	40.0
99.560000	29.8	1000.0	120.000	119.0	V	299.0	10.7	13.7	43.5
146.120000	38.4	1000.0	120.000	100.0	V	-18.0	14.7	5.1	43.5
186.000000	23.3	1000.0	120.000	150.0	H	220.0	12.9	20.2	43.5
250.040000	28.1	1000.0	120.000	100.0	V	166.0	13.9	17.9	46.0
600.040000	37.2	1000.0	120.000	100.0	V	153.0	23.4	8.8	46.0
720.000000	41.9	1000.0	120.000	100.0	H	197.0	25.3	4.1	46.0

< Fig 13. Radiated emission result (30 MHz ~ 1 000 MHz)>



- ◆ Operating Condition: 1 280 * 1 024 / 60 Hz (RGB: Analog mode)
Detector mode: Peak detector mode / Average detector mode

FCC_ESIB_Preamplifier with Scans



Final Result 1

Frequency (MHz)	MaxPeak-MaxHold (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
1176.800000	54.0	100.0	V	180.0	-15.3	19.9	73.9	
1539.200000	55.2	100.0	H	180.0	-14.0	18.7	73.9	

Final Result 2

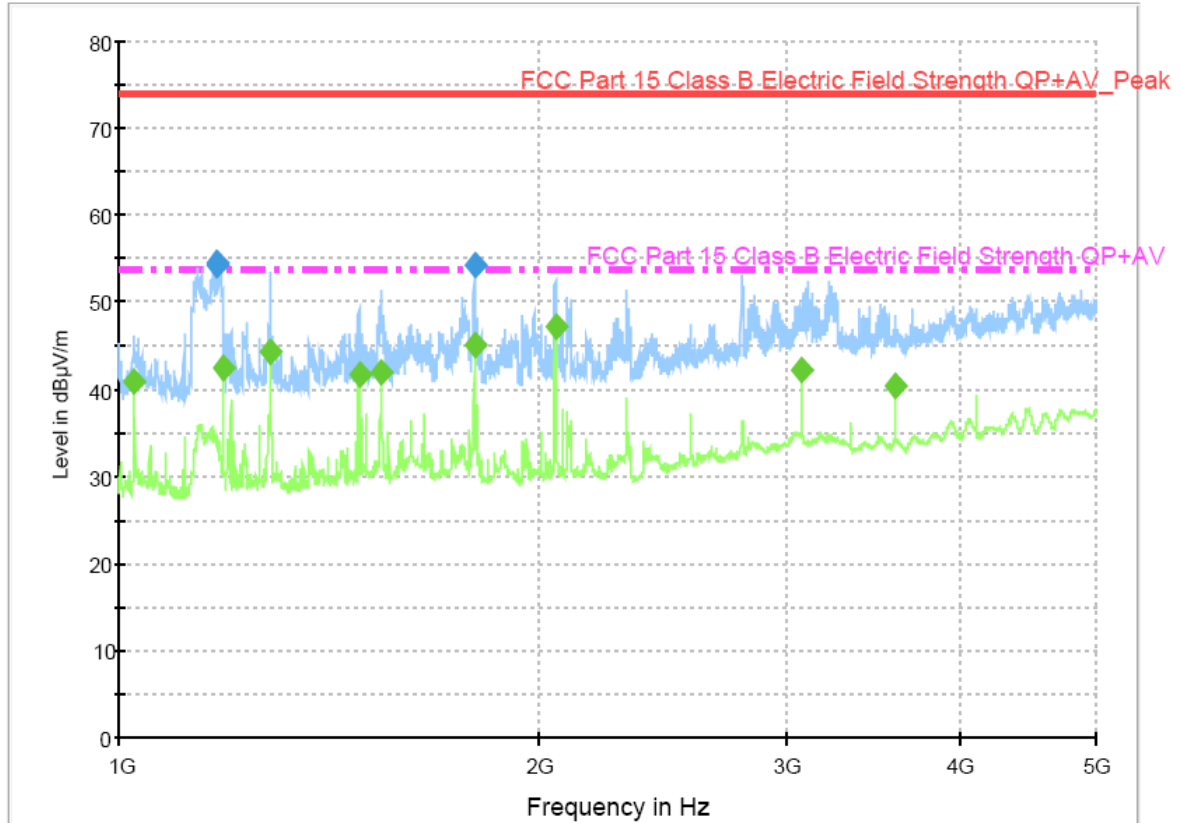
Frequency (MHz)	Average-MaxHold (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
1026.000000	40.9	150.0	H	180.0	-15.8	13.0	53.9	
1188.000000	43.3	250.0	V	0.0	-15.2	10.6	53.9	
1282.400000	44.9	100.0	V	180.0	-14.6	9.0	53.9	
1539.200000	44.9	100.0	H	180.0	-14.0	9.0	53.9	
1795.600000	42.7	100.0	H	180.0	-13.1	11.2	53.9	
1804.000000	39.1	150.0	V	0.0	-13.1	14.8	53.9	
2052.000000	47.1	150.0	H	180.0	-12.3	6.8	53.9	
2079.200000	39.2	100.0	V	180.0	-12.1	14.7	53.9	
3078.000000	41.8	150.0	H	180.0	-7.9	12.1	53.9	
3591.200000	40.6	100.0	V	180.0	-7.0	13.3	53.9	
4104.000000	39.9	100.0	V	180.0	-4.9	14.0	53.9	
4461.600000	37.9	150.0	V	180.0	-3.6	16.0	53.9	

< Fig 14. Radiated emission result (1 000 MHz ~ 5 000 MHz)>



- ◆ Operating Condition: 1 280 * 1 024 / 60 Hz (HDMI/DVI: Digital mode)
Detector mode: Peak detector mode / Average detector mode

FCC_ESIB_Preamplifier with Scans



Final Result 1

Frequency (MHz)	MaxPeak-MaxHold (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
1174.400000	54.2	100.0	V	180.0	-15.3	19.7	73.9	
1174.800000	54.7	100.0	V	180.0	-15.3	19.2	73.9	
1795.600000	54.3	100.0	H	180.0	-13.1	19.6	73.9	

Final Result 2

Frequency (MHz)	Average-MaxHold (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
1026.000000	40.8	150.0	H	180.0	-15.8	13.1	53.9	
1188.000000	42.6	250.0	V	0.0	-15.2	11.3	53.9	
1282.400000	44.5	100.0	H	180.0	-14.6	9.4	53.9	
1485.200000	41.7	100.0	V	0.0	-14.2	12.2	53.9	
1539.200000	42.0	100.0	H	180.0	-14.0	11.9	53.9	
1795.600000	45.1	100.0	H	180.0	-13.1	8.8	53.9	
2052.000000	47.2	150.0	H	180.0	-12.3	6.7	53.9	
3078.000000	42.3	150.0	H	180.0	-7.9	11.6	53.9	
3591.200000	40.5	100.0	V	180.0	-7.0	13.4	53.9	

< Fig 15. 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. LCD TV/Monitor (Model Name: 37LG710H-UA)** was complies with §15.107 and 15.109 of the FCC Rules.