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 : November 2, 2009
Order Number: GETEC-C1-09-216
Test Report Number: GETEC-E3-09-123
Test Site: Gumi College EMC Center
FCC Registration Number: (100749, 443957)

FCC ID.: BEJ19LD350UA

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	: 19LD350-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,

Hyoung Seop Kim, Associate Engineer
GUMI College EMC center

Reviewed by,

Tae-Sig Park, Technical Manager
GUMI College EMC center

This test report only contains the result of a specific sample supplied for the examination.
It is not allowed to copy this report even partly without the approval of 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

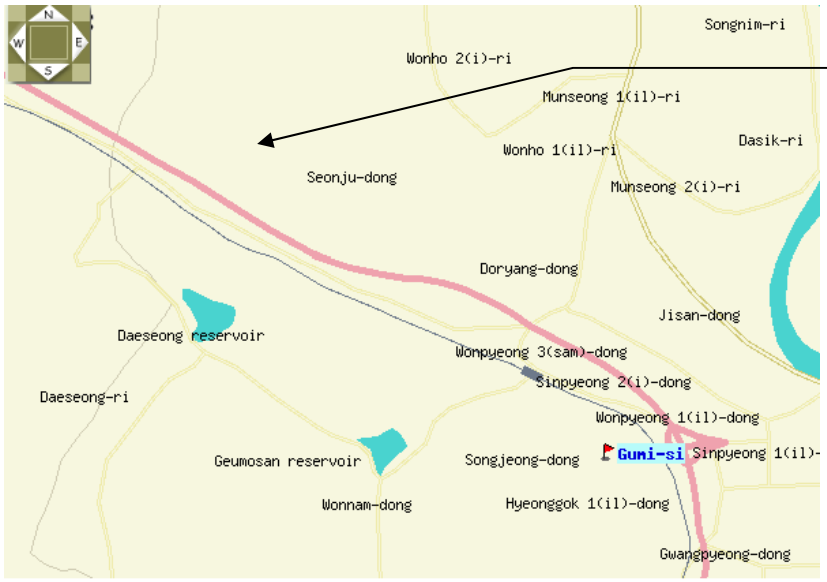
Applicant: LG Electronics Inc.
Applicant Address: 19-1, Cheongho-ri, Jinwi-myeon, Pyeongteak-si, Gyeonggi-do, Korea.
Manufacturer: LG Electronics Inc.
Manufacturer Address: 19-1, Cheongho-ri, Jinwi-myeon, Pyeongteak-si, Gyeonggi-do, Korea.
Contact Person: Mr. Sang-Wook Lee, Chief research engineer
Tel Number: +82-31-610-9623

- **FCC ID.** BEJ19LD350UA
- **EUT Type** LCD TV/Monitor
- **Model Name** 19LD350-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** October 23 ~ 26, 2009
- **Place of Test** **Gumi College EMC Center** (FCC Registration Number: 100749, 443957) 407, Bugok-dong, Gumi-si, Gyeongbuk, Korea.
- **Test Report Number** GETEC-E3-09-123
- **Dates of Issue** November 2, 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: 19LD350-UA)**

These measurement tests were conducted at **Gumi College EMC Center**.
The site address is 407, Bugok-dong, Gumi-si, Gyeongbuk, Korea.
This test site is one of the highest point of Gumi 1 college at about 200 km away from Seoul city and 40 km away from Daegu city. It is located in the valley surrounded by mountains in all directions where ambient radio signal conditions are quiet and a favorable area to measure the radio frequency interference on open field test site for the computing and ISM devices manufactures. The detailed description of the measurement facility was found to be in compliance with the requirements of §2.948 according to ANSI C63.4 on October 19, 1992



GUMI COLLEGE EMC CENTER
407, Bugok-dong, Gumi-si,
Gyeongbuk 730-711, Korea.
Tel: +82-54-440-1195
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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: 19LD350-UA) FCC ID.: BEJ19LD350UA**

MODELS		19LD350 (19LD350-UA)	22LD350 (22LD350-UA)
Dimensions (Width x Height x Depth)	With stand	17.9 x 13.2 x 6.4 inches 457.0 x 336.0 x 164.9 mm	20.7 x 14.8 x 6.4 inches 526.0 x 377.0 x 164.9 mm
	Without stand	17.9 x 11.4 x 3.0 inches 457.0 x 290.0 x 78.4 mm	20.7 x 13.0 x 3.0 inches 526.0 x 331.0 x 78.4 mm
Weight	With stand Without stand	7.4 lbs / 3.4 kg 6.8 lbs / 3.1 kg	9.4 lbs / 4.3 kg 8.8 lbs / 4.0 kg
Power requirement		AC100-240V ~ 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 Operating Humidity	32 ~ 104˚F (0 ~ 40˚C) Less than 80%	
	Storage Temperature Storage Humidity	-4 ~ 140˚F (-20 ~ 60˚C) Less than 85%	

Maximum Frequency range:	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	ARI 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
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

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
Video(RGB) input cable	Connected to the EUT and PC	1.8 m shielded with two ferrite cores
Video(HDMI/DVI) input cable	Connected to the EUT and PC	2.0 m shielded
RS-232C input cable	Connected to the EUT and PC	1.8 m shielded
PC sound input cable	Connected to the EUT and PC	2.0 m shielded
Component input cable	Connected to the EUT and DVD Player	1.8 m shielded
Component sound input cable	Connected to the EUT and DVD Player	3.0 m shielded
AV input cable	Connected to the EUT and DVD Player	3.0 m shielded
Headset cable	Connected to the EUT	2.75 m shielded
Antenna cable	Connected to the EUT and TV signal generator	10.0 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: 1 360 * 768 / 60 Hz (RGB: Analog), 1 360 * 768 / 60 Hz (HDMI/DVI: Digital)
  -. Conducted emission: 1 360 * 768 / 60 Hz (RGB: Analog), 1 360 * 768 / 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

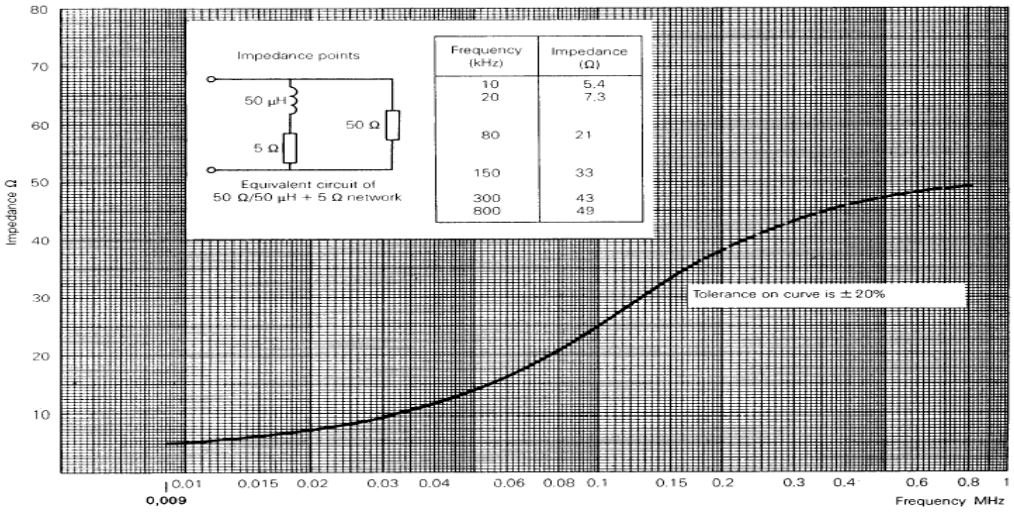


Fig 2. Impedance of LISN

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

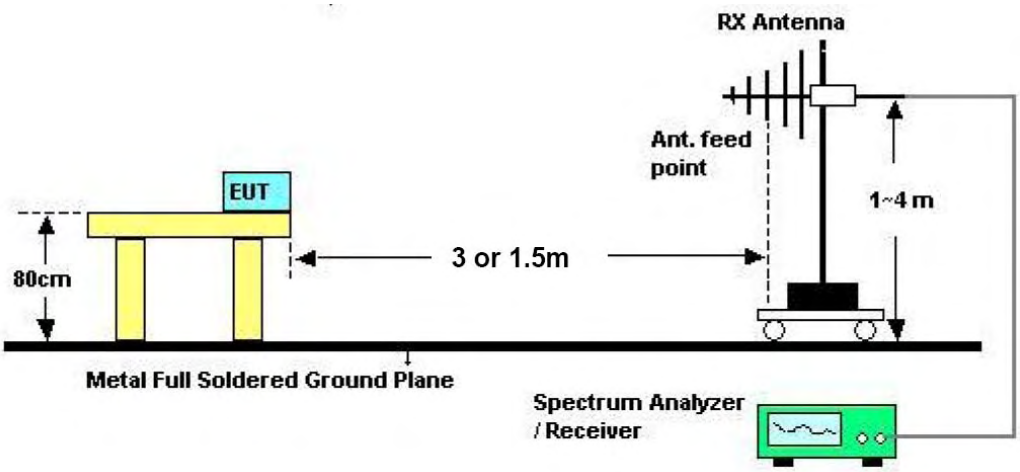


Fig 3. Dimensions of test site.

5. Conducted Emission

5.1 Operating Environment

Temperature : 25 ℃
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)	± 2.97 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

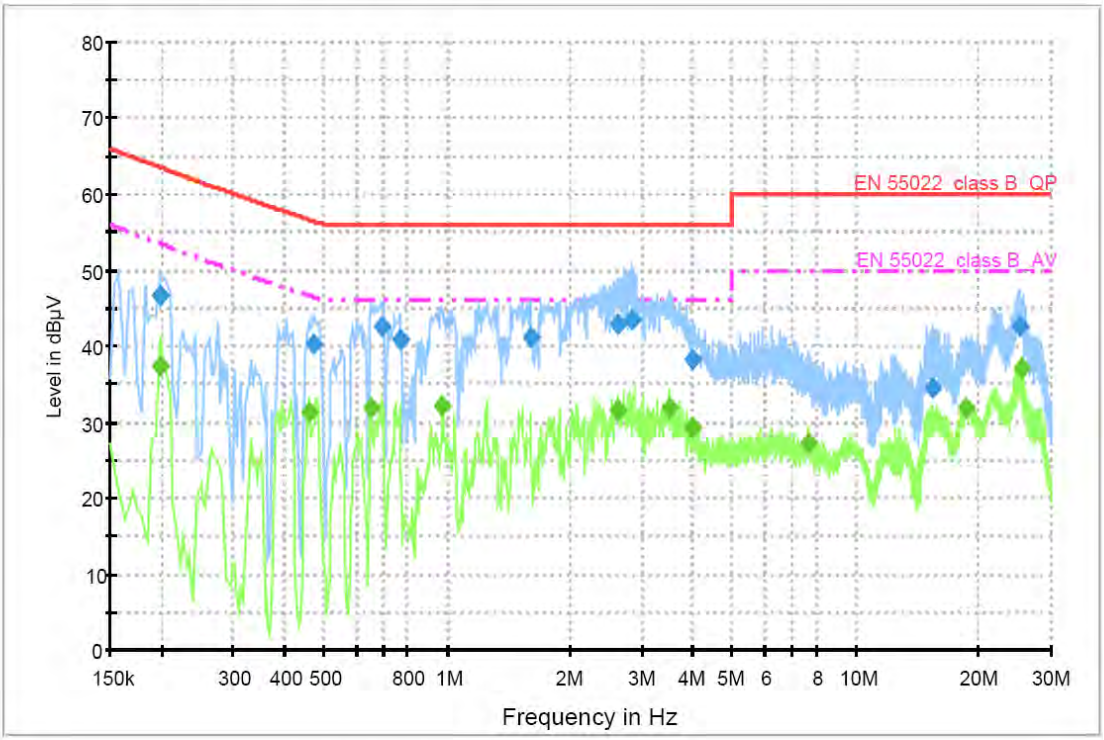
	Model Name	Manufacturer	Description	Serial Number	Due to Calibration
■ -	ESCS30	Rohde & Schwarz	EMI test receiver	839809/003	12. 13. 2009
■ -	ESH3-Z5	Rohde & Schwarz	LISN	838979/020	12. 12. 2009
■ -	ESH2-Z5	Rohde & Schwarz	LISN	829991/009	12. 12. 2009
□ -	ISN T8	TESEQ. GmbH	ISN	24568	10. 16. 2010

5.6 Test data for Conducted Emission

-. Test Date : October 26, 2009
-. Resolution Bandwidth : 9 kHz
-. Frequency Range : 0.15 MHz ~ 30 MHz

♦ **Test resolution: 1 360 * 768 / 60 Hz (RGB: Analog mode)**

Voltage with 4-Line-LISN_L1



Final Measurement Detector 1

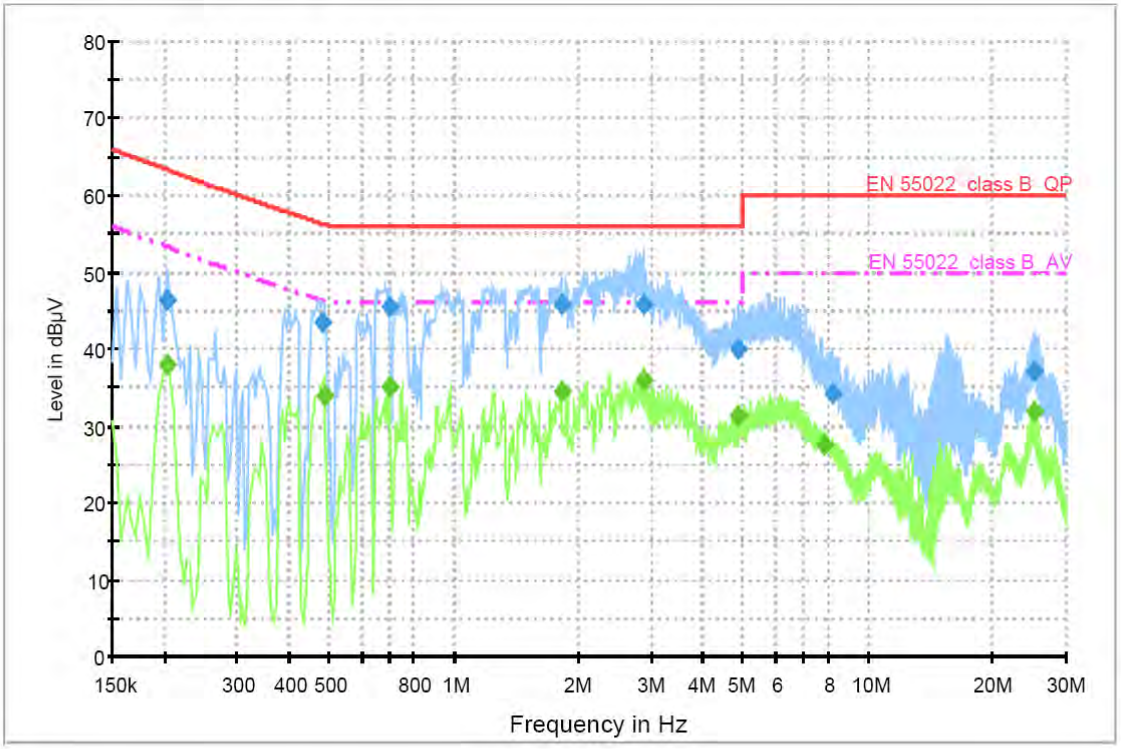
Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.198000	46.8	1000.000	9.000	GND	L1	9.9	16.7	63.5	
0.470000	40.3	1000.000	9.000	GND	L1	10.0	16.2	56.5	
0.694000	42.6	1000.000	9.000	GND	L1	10.0	13.4	56.0	
0.766000	40.8	1000.000	9.000	GND	L1	10.0	15.2	56.0	
1.594000	41.3	1000.000	9.000	GND	L1	10.1	14.7	56.0	
2.618000	43.0	1000.000	9.000	GND	L1	10.1	13.0	56.0	
2.854000	43.5	1000.000	9.000	GND	L1	10.1	12.5	56.0	
3.974000	38.2	1000.000	9.000	GND	L1	10.2	17.8	56.0	
15.418000	34.5	1000.000	9.000	GND	L1	10.6	25.5	60.0	
25.238000	42.5	1000.000	9.000	GND	L1	11.0	17.5	60.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.198000	37.3	1000.000	9.000	GND	L1	9.9	16.2	53.5	
0.458000	31.2	1000.000	9.000	GND	L1	10.0	15.5	46.7	
0.650000	31.9	1000.000	9.000	GND	L1	10.0	14.1	46.0	
0.974000	32.2	1000.000	9.000	GND	L1	10.0	13.8	46.0	
2.606000	31.6	1000.000	9.000	GND	L1	10.1	14.4	46.0	
3.486000	31.8	1000.000	9.000	GND	L1	10.1	14.2	46.0	
3.974000	29.2	1000.000	9.000	GND	L1	10.2	16.8	46.0	
7.614000	27.3	1000.000	9.000	GND	L1	10.3	22.7	50.0	
18.570000	31.9	1000.000	9.000	GND	L1	10.8	18.1	50.0	
25.374000	37.2	1000.000	9.000	GND	L1	11.0	12.8	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
0.202000	46.4	1000.000	9.000	GND	N	9.9	17.0	63.4	
0.482000	43.5	1000.000	9.000	GND	N	10.0	12.8	56.3	
0.698000	45.4	1000.000	9.000	GND	N	10.0	10.6	56.0	
1.814000	45.8	1000.000	9.000	GND	N	10.1	10.2	56.0	
2.858000	45.9	1000.000	9.000	GND	N	10.1	10.1	56.0	
4.886000	40.1	1000.000	9.000	GND	N	10.2	15.9	56.0	
8.242000	34.2	1000.000	9.000	GND	N	10.3	25.8	60.0	
25.178000	37.2	1000.000	9.000	GND	N	10.8	22.8	60.0	

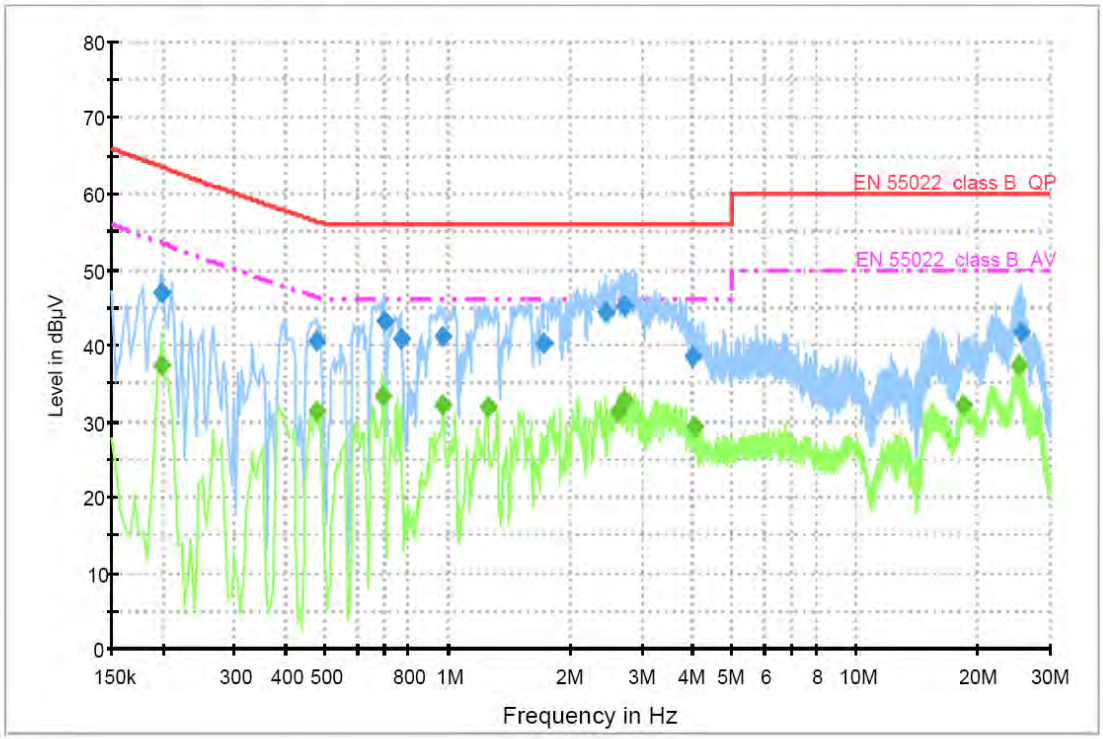
Final Measurement Detector 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.202000	38.1	1000.000	9.000	GND	N	9.9	15.2	53.3	
0.486000	33.9	1000.000	9.000	GND	N	10.0	12.3	46.2	
0.698000	35.2	1000.000	9.000	GND	N	10.0	10.8	46.0	
1.814000	34.5	1000.000	9.000	GND	N	10.1	11.5	46.0	
2.858000	35.9	1000.000	9.000	GND	N	10.1	10.1	46.0	
4.886000	31.3	1000.000	9.000	GND	N	10.2	14.7	46.0	
7.810000	27.6	1000.000	9.000	GND	N	10.3	22.4	50.0	
25.310000	31.7	1000.000	9.000	GND	N	10.8	18.3	50.0	

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

♦ **Test resolution: 1 360 * 768 / 60 Hz (HDMI/DVI: Digital mode)**

Voltage with 4-Line-LISN_L1



Final Measurement Detector 1

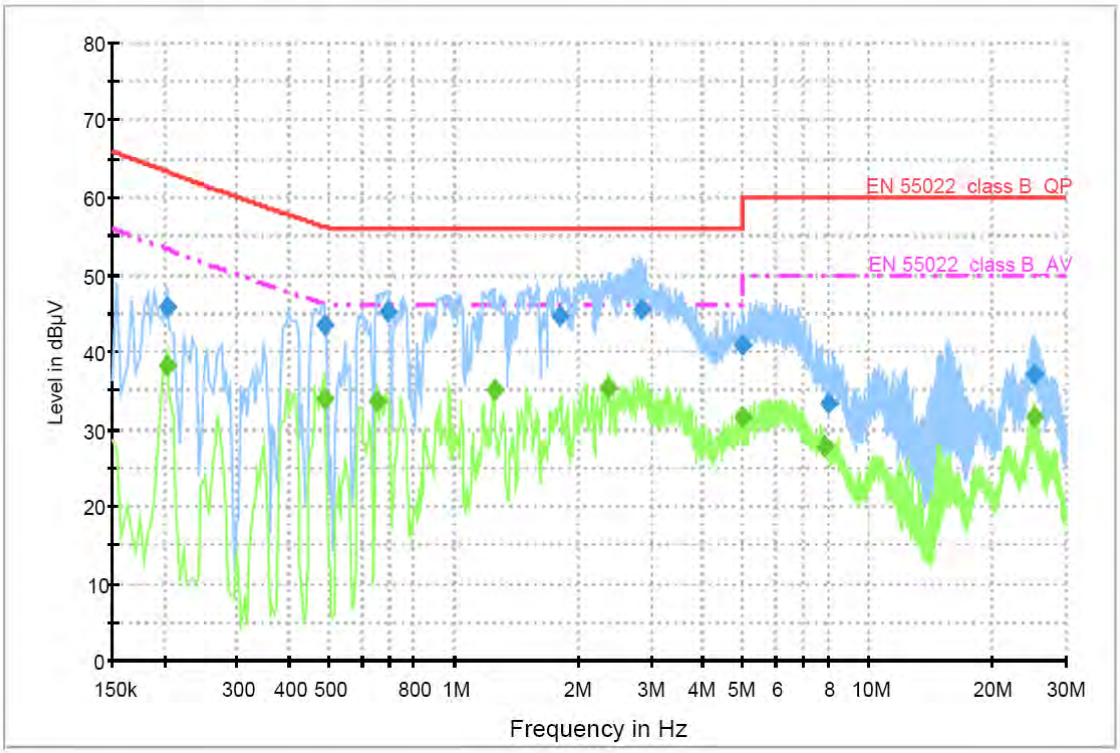
Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.198000	46.9	1000.000	9.000	GND	L1	9.9	16.6	63.5	
0.478000	40.5	1000.000	9.000	GND	L1	10.0	15.8	56.3	
0.698000	43.1	1000.000	9.000	GND	L1	10.0	12.9	56.0	
0.766000	40.8	1000.000	9.000	GND	L1	10.0	15.2	56.0	
0.970000	41.2	1000.000	9.000	GND	L1	10.0	14.8	56.0	
1.710000	40.3	1000.000	9.000	GND	L1	10.1	15.7	56.0	
2.442000	44.5	1000.000	9.000	GND	L1	10.1	11.5	56.0	
2.726000	45.1	1000.000	9.000	GND	L1	10.1	10.9	56.0	
3.974000	38.5	1000.000	9.000	GND	L1	10.2	17.6	56.0	
25.570000	41.8	1000.000	9.000	GND	L1	11.0	18.2	60.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.198000	37.3	1000.000	9.000	GND	L1	9.9	16.2	53.5	
0.474000	31.3	1000.000	9.000	GND	L1	10.0	15.1	46.4	
0.694000	33.5	1000.000	9.000	GND	L1	10.0	12.5	46.0	
0.974000	32.2	1000.000	9.000	GND	L1	10.0	13.8	46.0	
1.254000	31.9	1000.000	9.000	GND	L1	10.0	14.1	46.0	
2.610000	31.4	1000.000	9.000	GND	L1	10.1	14.6	46.0	
2.726000	32.6	1000.000	9.000	GND	L1	10.1	13.4	46.0	
4.050000	29.3	1000.000	9.000	GND	L1	10.2	16.7	46.0	
18.474000	32.3	1000.000	9.000	GND	L1	10.8	17.7	50.0	
25.310000	37.4	1000.000	9.000	GND	L1	11.0	12.6	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
0.202000	45.9	1000.000	9.000	GND	N	9.9	17.5	63.4	
0.486000	43.5	1000.000	9.000	GND	N	10.0	12.7	56.2	
0.694000	45.1	1000.000	9.000	GND	N	10.0	10.9	56.0	
1.810000	44.8	1000.000	9.000	GND	N	10.1	11.2	56.0	
2.846000	45.6	1000.000	9.000	GND	N	10.1	10.4	56.0	
4.958000	41.0	1000.000	9.000	GND	N	10.2	15.0	56.0	
8.034000	33.5	1000.000	9.000	GND	N	10.3	26.5	60.0	
25.314000	37.1	1000.000	9.000	GND	N	10.8	22.9	60.0	

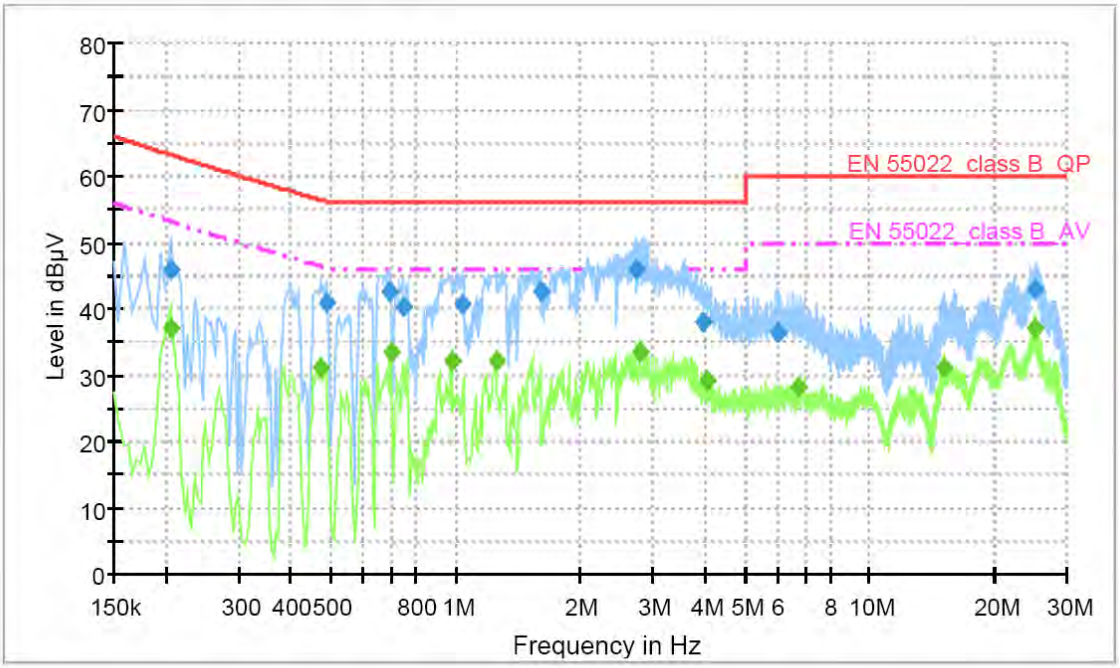
Final Measurement Detector 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.202000	38.2	1000.000	9.000	GND	N	9.9	15.1	53.3	
0.486000	33.9	1000.000	9.000	GND	N	10.0	12.3	46.2	
0.650000	33.6	1000.000	9.000	GND	N	10.0	12.4	46.0	
1.254000	34.9	1000.000	9.000	GND	N	10.0	11.1	46.0	
2.370000	35.3	1000.000	9.000	GND	N	10.1	10.7	46.0	
4.954000	31.6	1000.000	9.000	GND	N	10.2	14.4	46.0	
7.798000	27.8	1000.000	9.000	GND	N	10.3	22.2	50.0	
25.246000	31.7	1000.000	9.000	GND	N	10.8	18.3	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

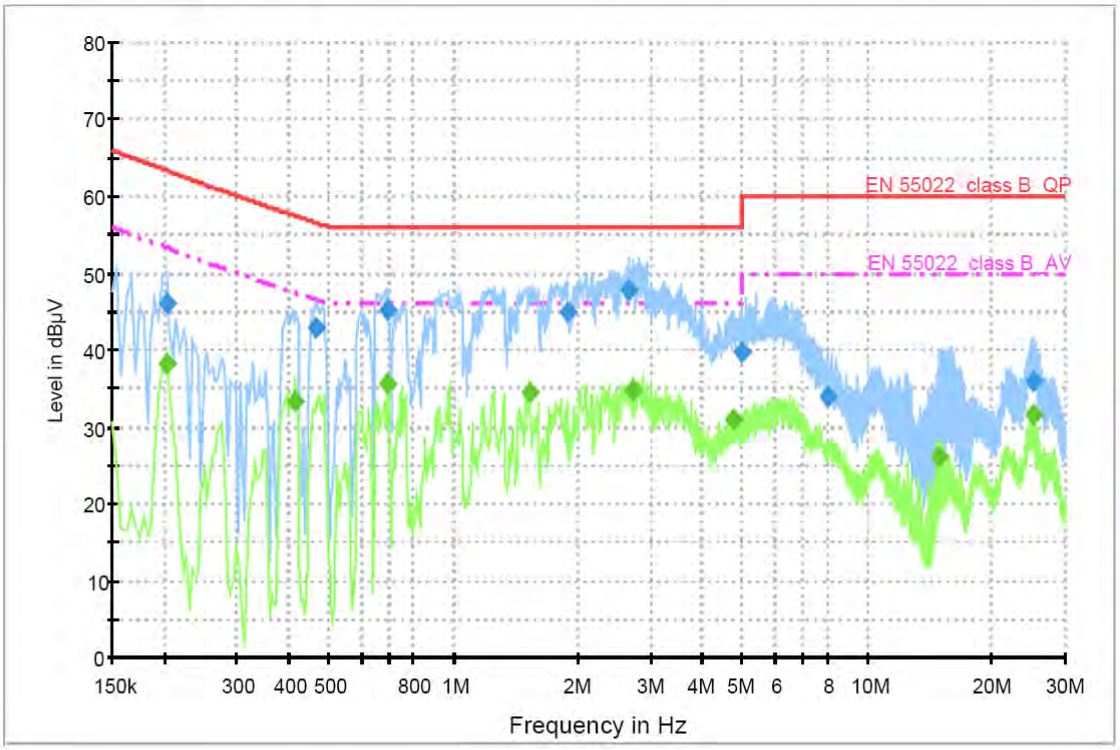
Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.206000	45.8	1000.000	9.000	GND	L1	9.9	17.4	63.2	
0.486000	41.0	1000.000	9.000	GND	L1	10.0	15.2	56.2	
0.694000	42.7	1000.000	9.000	GND	L1	10.0	13.3	56.0	
0.746000	40.2	1000.000	9.000	GND	L1	10.0	15.8	56.0	
1.034000	40.6	1000.000	9.000	GND	L1	10.0	15.4	56.0	
1.606000	42.6	1000.000	9.000	GND	L1	10.1	13.4	56.0	
2.722000	46.0	1000.000	9.000	GND	L1	10.1	10.0	56.0	
3.970000	38.1	1000.000	9.000	GND	L1	10.2	18.0	56.0	
6.006000	36.5	1000.000	9.000	GND	L1	10.2	23.5	60.0	
25.050000	42.9	1000.000	9.000	GND	L1	11.0	17.1	60.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.206000	36.9	1000.000	9.000	GND	L1	9.9	16.3	53.2	
0.470000	31.0	1000.000	9.000	GND	L1	10.0	15.5	46.5	
0.698000	33.4	1000.000	9.000	GND	L1	10.0	12.6	46.0	
0.978000	32.1	1000.000	9.000	GND	L1	10.0	13.9	46.0	
1.254000	32.0	1000.000	9.000	GND	L1	10.0	14.0	46.0	
2.794000	33.6	1000.000	9.000	GND	L1	10.1	12.4	46.0	
4.042000	29.2	1000.000	9.000	GND	L1	10.2	16.8	46.0	
6.702000	28.2	1000.000	9.000	GND	L1	10.2	21.8	50.0	
15.090000	31.1	1000.000	9.000	GND	L1	10.6	18.9	50.0	
25.050000	37.1	1000.000	9.000	GND	L1	11.0	12.9	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
0.202000	46.0	1000.000	9.000	GND	N	9.9	17.4	63.4	
0.466000	43.0	1000.000	9.000	GND	N	10.0	13.5	56.5	
0.694000	45.2	1000.000	9.000	GND	N	10.0	10.8	56.0	
1.882000	44.9	1000.000	9.000	GND	N	10.1	11.1	56.0	
2.654000	47.9	1000.000	9.000	GND	N	10.1	8.1	56.0	
4.954000	39.8	1000.000	9.000	GND	N	10.2	16.2	56.0	
8.034000	34.0	1000.000	9.000	GND	N	10.3	26.0	60.0	
25.190000	35.9	1000.000	9.000	GND	N	10.8	24.1	60.0	

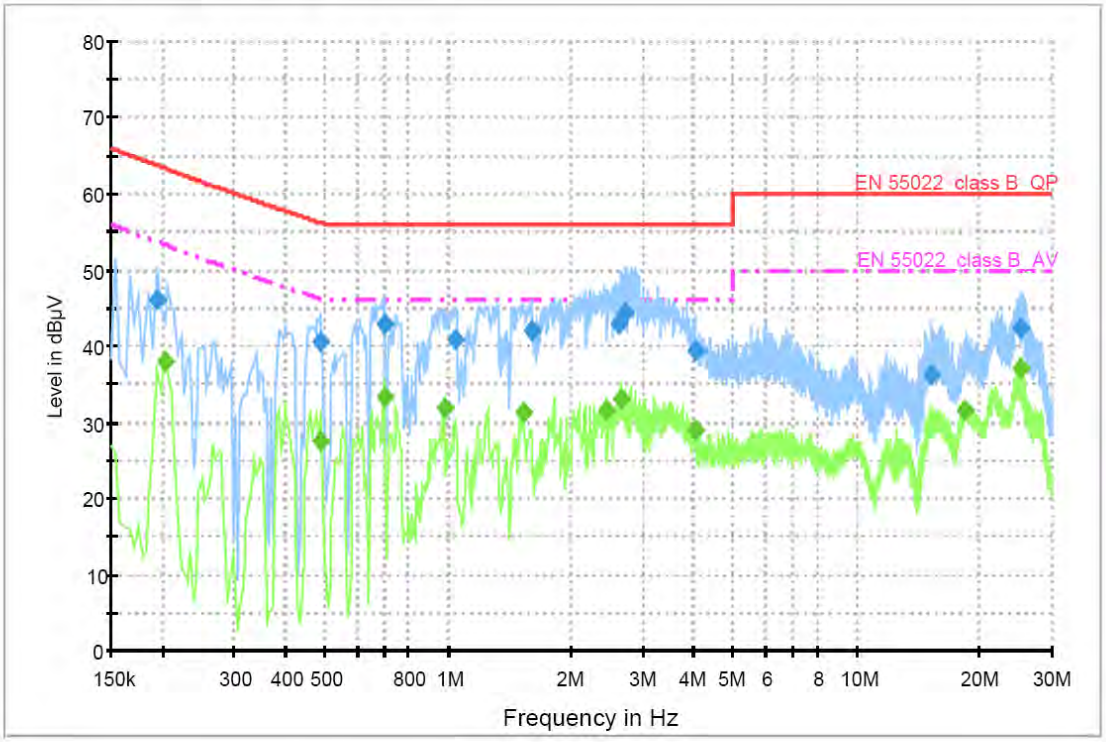
Final Measurement Detector 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.202000	38.2	1000.000	9.000	GND	N	9.9	15.1	53.3	
0.414000	33.2	1000.000	9.000	GND	N	10.0	14.2	47.4	
0.694000	35.8	1000.000	9.000	GND	N	10.0	10.2	46.0	
1.534000	34.4	1000.000	9.000	GND	N	10.1	11.6	46.0	
2.718000	34.8	1000.000	9.000	GND	N	10.1	11.2	46.0	
4.746000	31.1	1000.000	9.000	GND	N	10.2	14.9	46.0	
14.926000	26.1	1000.000	9.000	GND	N	10.6	23.9	50.0	
25.114000	31.6	1000.000	9.000	GND	N	10.8	18.4	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

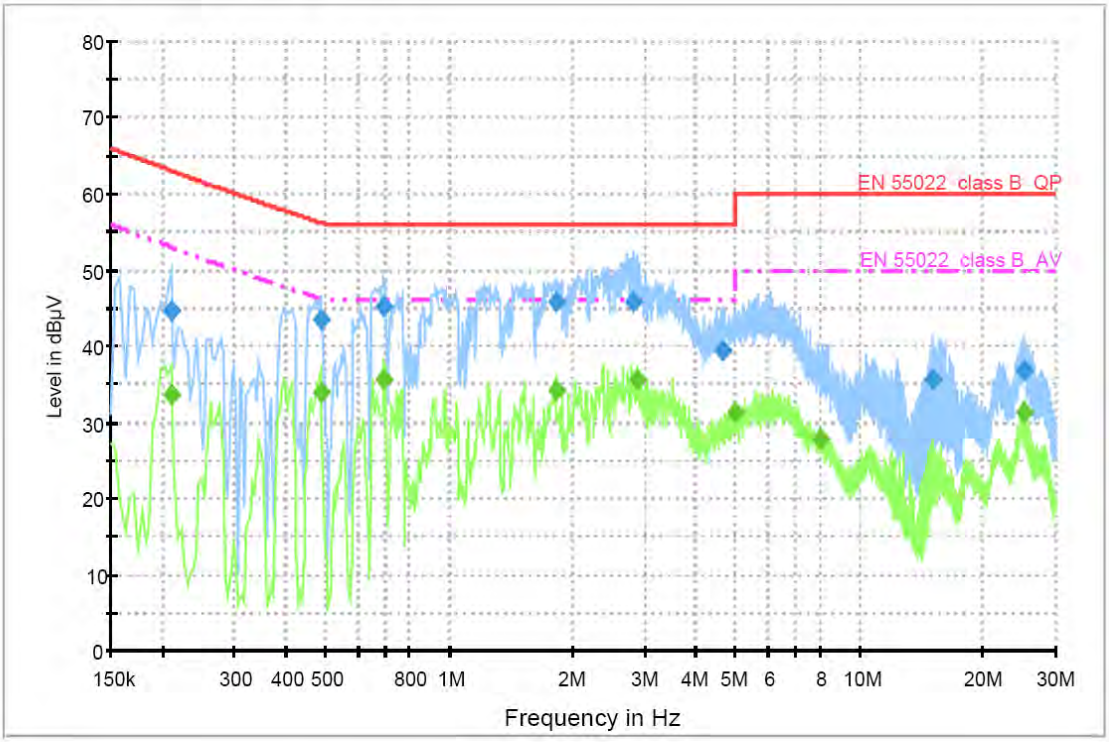
Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.194000	46.0	1000.000	9.000	GND	L1	9.9	17.7	63.7	
0.490000	40.6	1000.000	9.000	GND	L1	10.0	15.6	56.2	
0.698000	43.0	1000.000	9.000	GND	L1	10.0	13.0	56.0	
1.038000	41.0	1000.000	9.000	GND	L1	10.0	15.0	56.0	
1.602000	42.0	1000.000	9.000	GND	L1	10.1	14.0	56.0	
2.618000	43.0	1000.000	9.000	GND	L1	10.1	13.0	56.0	
2.718000	44.4	1000.000	9.000	GND	L1	10.1	11.6	56.0	
4.050000	39.4	1000.000	9.000	GND	L1	10.2	16.6	56.0	
15.206000	36.3	1000.000	9.000	GND	L1	10.6	23.7	60.0	
25.050000	42.5	1000.000	9.000	GND	L1	11.0	17.5	60.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.202000	38.0	1000.000	9.000	GND	L1	9.9	15.3	53.3	
0.490000	27.7	1000.000	9.000	GND	L1	10.0	18.5	46.2	
0.698000	33.3	1000.000	9.000	GND	L1	10.0	12.7	46.0	
0.978000	32.0	1000.000	9.000	GND	L1	10.0	14.0	46.0	
1.534000	31.4	1000.000	9.000	GND	L1	10.1	14.6	46.0	
2.438000	31.5	1000.000	9.000	GND	L1	10.1	14.5	46.0	
2.650000	33.1	1000.000	9.000	GND	L1	10.1	12.9	46.0	
4.050000	29.0	1000.000	9.000	GND	L1	10.2	17.0	46.0	
18.338000	31.6	1000.000	9.000	GND	L1	10.8	18.4	50.0	
25.046000	37.1	1000.000	9.000	GND	L1	11.0	12.9	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
0.210000	44.5	1000.000	9.000	GND	N	9.9	18.5	63.0	
0.486000	43.6	1000.000	9.000	GND	N	10.0	12.6	56.2	
0.694000	45.1	1000.000	9.000	GND	N	10.0	10.9	56.0	
1.814000	45.7	1000.000	9.000	GND	N	10.1	10.3	56.0	
2.822000	45.7	1000.000	9.000	GND	N	10.1	10.3	56.0	
4.610000	39.4	1000.000	9.000	GND	N	10.2	16.6	56.0	
15.090000	35.6	1000.000	9.000	GND	N	10.6	24.4	60.0	
25.242000	36.7	1000.000	9.000	GND	N	10.8	23.3	60.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.210000	33.6	1000.000	9.000	GND	N	9.9	19.4	53.0	
0.486000	34.0	1000.000	9.000	GND	N	10.0	12.2	46.2	
0.694000	35.7	1000.000	9.000	GND	N	10.0	10.3	46.0	
1.814000	34.3	1000.000	9.000	GND	N	10.1	11.7	46.0	
2.862000	35.8	1000.000	9.000	GND	N	10.1	10.2	46.0	
4.958000	31.3	1000.000	9.000	GND	N	10.2	14.7	46.0	
8.030000	27.8	1000.000	9.000	GND	N	10.3	22.2	50.0	
25.114000	31.3	1000.000	9.000	GND	N	10.8	18.7	50.0	

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

6. Radiated Emission

6.1 Operating Environment

Temperature : 22 ℃
Relative Humidity : 47 % R.H.

6.2 Test Set-up

A preliminary scan with peak mode was performed in the semi anechoic chamber and found frequency for open area test site.
The formal radiated emission was measured at 3 m / 10 m distance open area test site.
The EUT was placed on a non-conductive turntable approximately 0.8 m above the ground plane.
The turntable with EUT was rotated 360°, and the antenna was varied in height between 1.0 m and 4.0 m in order to determine the maximum emission levels.
This procedure was performed for both horizontal and vertical polarization of the receiving antenna.

6.3 Measurement Uncertainty

The measurement uncertainty was calculated in accordance with ISO “Guide to the expression of uncertainty in measurement”.
The measurement uncertainty was given with a confidence of 95 %.

Test Items	Uncertainty	Remark
Radiated emission (30 MHz ~ 300 MHz, 3 m, Vertical)	± 3.54 dB	Confidence levels of 95 % (k=2)
Radiated emission (30 MHz ~ 300 MHz, 3 m, Horizontal)	± 3.49 dB	Confidence levels of 95 % (k=2)
Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Vertical)	± 3.85 dB	Confidence levels of 95 % (k=2)
Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Horizontal)	± 3.76 dB	Confidence levels of 95 % (k=2)
Radiated emission (30 MHz ~ 300 MHz, 10 m, Vertical)	± 3.21 dB	Confidence levels of 95 % (k=2)
Radiated emission (30 MHz ~ 300 MHz, 10 m, Horizontal)	± 3.32 dB	Confidence levels of 95 % (k=2)
Radiated emission (300 MHz ~ 1 000 MHz, 10 m, Vertical)	± 3.77 dB	Confidence levels of 95 % (k=2)
Radiated emission (300 MHz ~ 1 000 MHz, 10 m, Horizontal)	± 3.84 dB	Confidence levels of 95 % (k=2)

6.4 Limit

Frequency (MHz)	FCC Limit @ 3 m. dB μV/m	CISPR Limit @ 10 m. dB μV/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

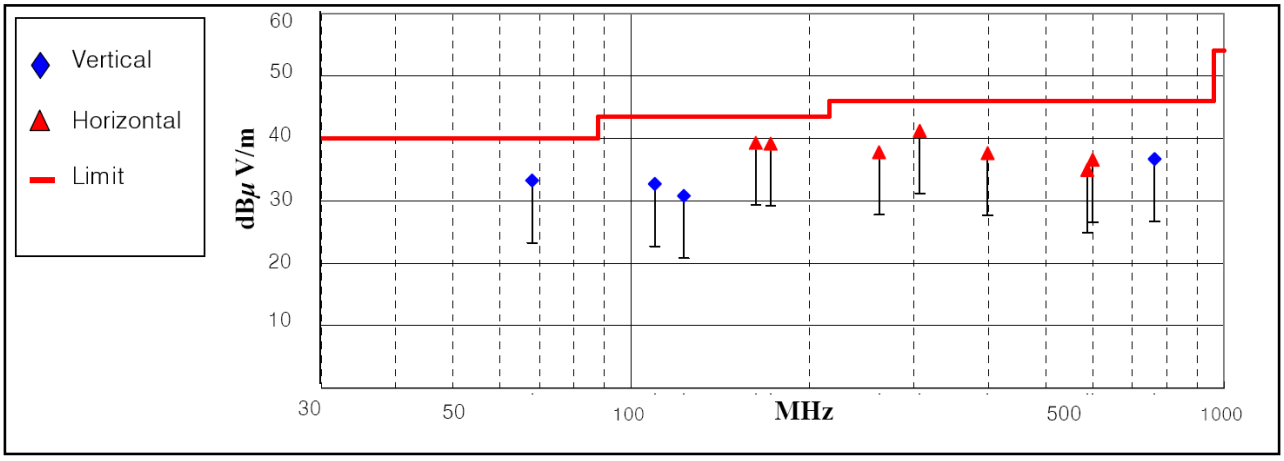
	Model Name	Manufacturer	Description	Serial Number	Due to Calibration
■ -	ESI	Rohde & Schwarz	EMI test receiver	830482/010	12. 14. 2009
■ -	VULB9160	Schwarzbeck	Broadband Test Antenna	3193	12. 11. 2009
■ -	BBHA9120D	Schwarzbeck	Horn ANT	207	12. 26. 2009
■ -	MCU066	maturo GmbH	MCU066	1390306	N/A
■ -	TT2.5SI	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	N/A

6.6 Test data for Radiated Emission

-. Test Date : October 23, 2009
-. 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: 1 360 * 768 / 60 Hz (RGB: Analog mode)
Detector mode: Quasi- peak detector mode

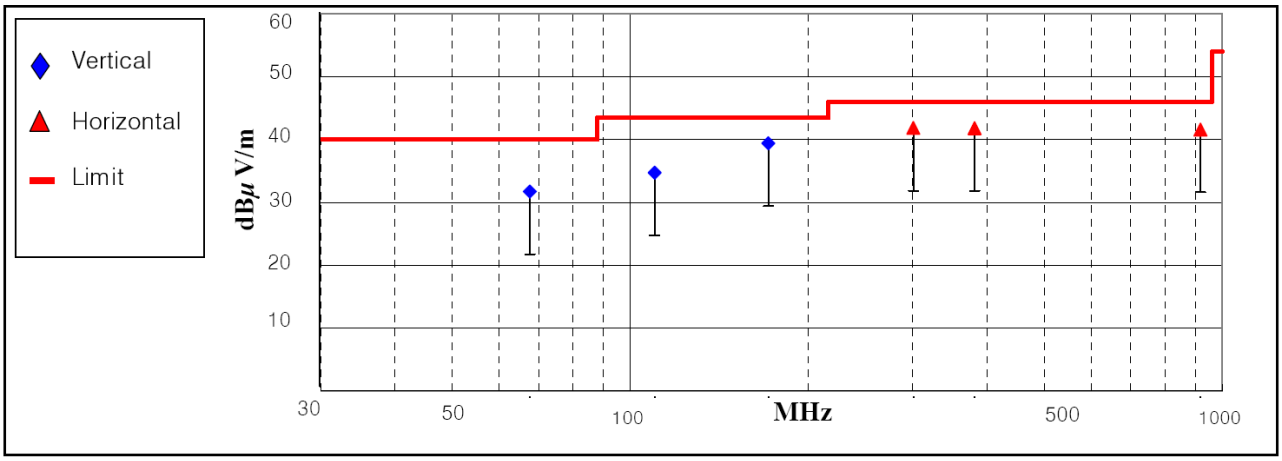
Frequency (MHz)	Measurement Level				Limit (dBμ V/m)	Margin (dB)	Positioning System		
	Reading Value(dBμ V)	Antenna Factor(dB/m)	Cable Loss(dB)	Test Result (dBμ V/m)			Pol. (H/V)	Height (cm)	Angle (°)
68.04	21.56	10.02	1.68	33.26	40.00	6.74	V	108	177
109.62	20.86	10.07	1.76	32.69	43.50	10.81	V	103	5
122.64	17.61	11.37	1.78	30.76	43.50	12.74	V	110	4
162.10	24.56	12.47	2.24	39.27	43.50	4.23	H	194	86
171.80	25.15	11.66	2.30	39.11	43.50	4.39	H	197	91
261.60	23.40	11.53	2.82	37.75	46.00	8.25	H	101	182
306.70	25.28	12.87	3.03	41.18	46.00	4.82	H	107	181
399.18	19.47	14.78	3.37	37.62	46.00	8.38	H	195	176
587.82	11.97	18.91	4.04	34.92	46.00	11.08	H	102	177
600.06	13.21	19.23	4.12	36.56	46.00	9.44	H	104	180
763.02	10.29	21.48	4.89	36.66	46.00	9.34	V	182	182



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

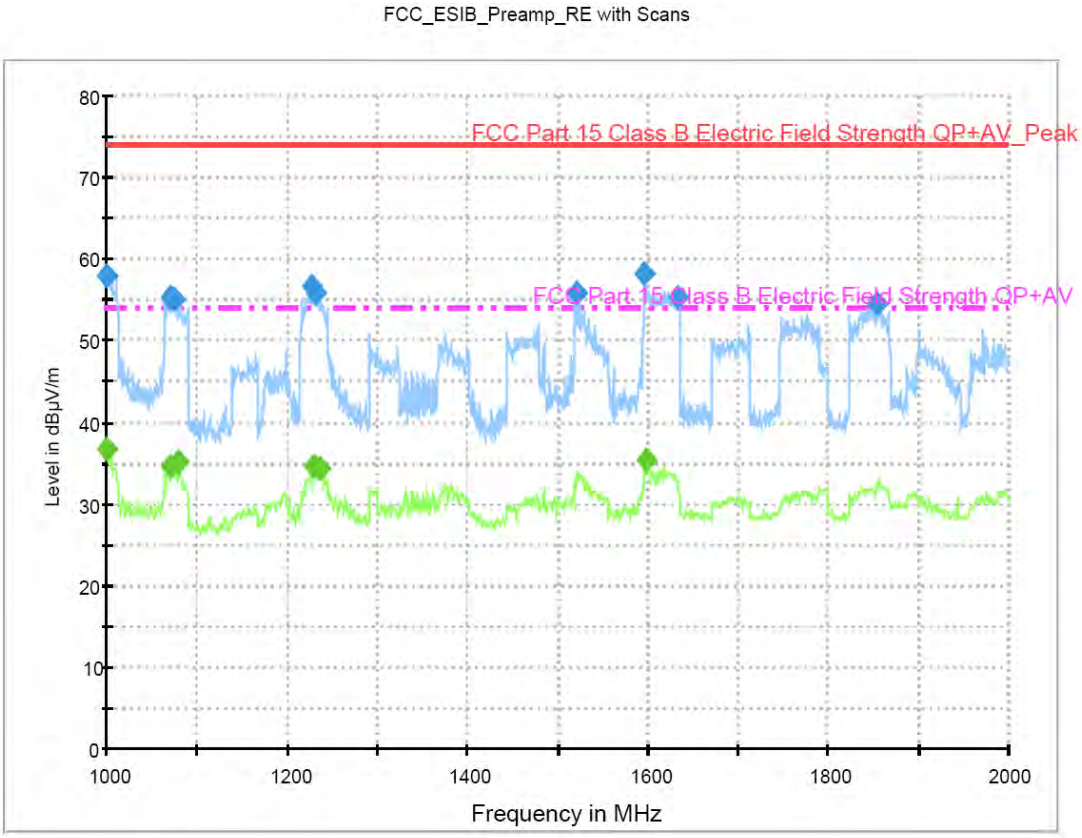
♦ Operating Condition: 1 360 * 768 / 60 Hz (HDMI/DVI: Digital mode)
Detector mode: Quasi- peak detector mode

Frequency (MHz)	Measurement Level				Limit (dBμ V/m)	Margin (dB)	Positioning System		
	Reading Value(dBμ V)	Antenna Factor(dB/m)	Cable Loss(dB)	Test Result (dBμ V/m)			Pol. (H/V)	Height (cm)	Angle (°)
67.68	19.99	10.08	1.68	31.75	40.00	8.25	V	101	212
109.98	22.88	10.11	1.76	34.75	43.50	8.75	V	100	3
171.00	25.39	11.73	2.29	39.41	43.50	4.09	V	113	14
300.72	26.13	12.75	3.01	41.89	46.00	4.11	H	102	290
381.42	24.13	14.43	3.29	41.85	46.00	4.15	H	108	178
917.88	13.40	22.70	5.49	41.59	46.00	4.41	H	122	211



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

♦ Operating Condition: 1 360 * 768 / 60 Hz (RGB: Analog mode)
Detector mode: Peak detector mode / Average detector mode



Final Result 1

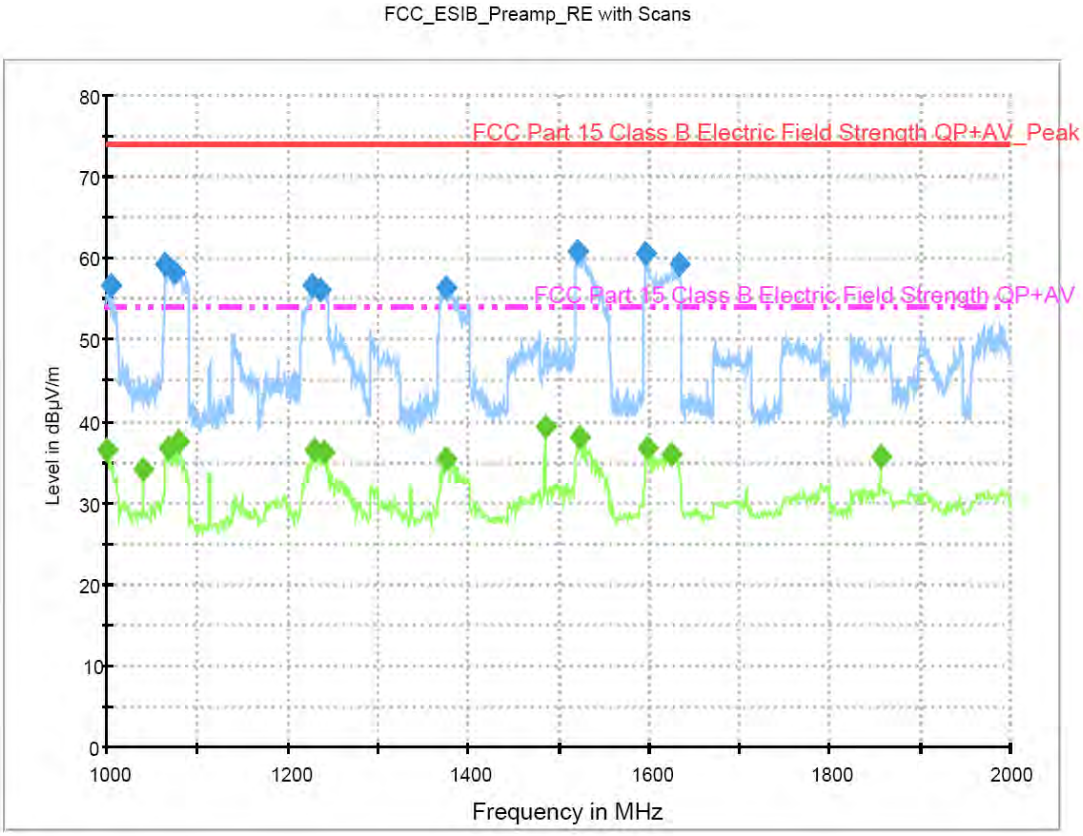
Frequency (MHz)	MaxPeak-MaxHold (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
1000.000000	58.0	100.0	V	180.0	-15.9	16.0	74.0	
1070.000000	55.4	100.0	V	180.0	-15.6	18.6	74.0	
1076.000000	55.1	100.0	V	180.0	-15.6	18.9	74.0	
1226.800000	56.6	100.0	H	180.0	-15.0	17.4	74.0	
1231.600000	55.8	100.0	H	180.0	-15.0	18.2	74.0	
1520.400000	55.9	100.0	V	180.0	-14.1	18.1	74.0	
1596.000000	58.2	150.0	H	270.0	-13.7	15.8	74.0	
1634.400000	55.4	100.0	H	180.0	-13.6	18.6	74.0	
1854.400000	54.5	200.0	V	180.0	-13.0	19.5	74.0	

Final Result 2

Frequency (MHz)	Average-MaxHold (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
1000.000000	36.8	100.0	V	180.0	-15.9	17.2	54.0	
1069.600000	34.6	100.0	V	180.0	-15.6	19.4	54.0	
1080.000000	35.1	100.0	V	180.0	-15.5	18.9	54.0	
1229.200000	34.6	100.0	H	180.0	-15.0	19.4	54.0	
1235.200000	34.2	100.0	H	180.0	-14.9	19.8	54.0	
1598.800000	35.4	150.0	H	270.0	-13.7	18.6	54.0	

< Fig 14. Radiated emission result (1 000 MHz ~ 2 000 MHz)>

♦ Operating Condition: 1 360 * 768 / 60 Hz (HDMI/DVI: Digital mode)
Detector mode: Peak detector mode / Average detector mode



Final Result 1

Frequency (MHz)	MaxPeak-MaxHold (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
1004.400000	56.6	100.0	V	180.0	-15.9	17.4	74.0	
1064.000000	59.3	100.0	V	180.0	-15.6	14.7	74.0	
1076.000000	58.3	100.0	V	180.0	-15.6	15.7	74.0	
1227.200000	56.7	100.0	H	180.0	-15.0	17.3	74.0	
1236.000000	56.0	100.0	H	180.0	-14.9	18.0	74.0	
1374.800000	56.5	100.0	H	180.0	-14.4	17.5	74.0	
1520.000000	60.7	100.0	V	180.0	-14.1	13.3	74.0	
1596.400000	60.6	150.0	H	270.0	-13.7	13.4	74.0	
1634.000000	59.2	150.0	V	180.0	-13.6	14.8	74.0	

Final Result 2

Frequency (MHz)	Average-MaxHold (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)	Comment
1000.000000	36.5	100.0	V	180.0	-15.9	17.5	54.0	
1039.600000	34.1	150.0	V	180.0	-15.7	19.9	54.0	
1069.200000	36.6	100.0	V	180.0	-15.6	17.4	54.0	
1080.000000	37.6	100.0	V	180.0	-15.5	16.4	54.0	
1229.200000	36.5	100.0	H	180.0	-15.0	17.5	54.0	
1241.200000	36.1	100.0	H	180.0	-14.9	17.9	54.0	
1375.600000	35.5	100.0	H	180.0	-14.4	18.5	54.0	
1485.200000	39.3	150.0	V	180.0	-14.2	14.7	54.0	
1522.800000	37.9	100.0	V	180.0	-14.0	16.1	54.0	
1598.800000	36.6	150.0	H	270.0	-13.7	17.4	54.0	
1624.800000	35.9	150.0	V	180.0	-13.6	18.1	54.0	
1856.400000	35.7	100.0	V	180.0	-13.0	18.3	54.0	

< Fig 15. Radiated emission result (1 000 MHz ~ 2 000 MHz)>

7. Sample Calculations

$dB\mu V = 20 \text{ Log}_{10}(\mu V/m)$
$dB\mu V = dBm + 107$
$\mu V = 10^{(dB\mu V/20)}$

7.1 Example 1 :

■ **20.3 MHz**

Class B Limit	**= 250 μV = 48 dBμV**
Reading	**= 39.2 dBμV**
$10^{(39.2dB\mu V/20)}$	**= 91.2 μV**
Margin	**= 48 dBμV - 39.2 dBμV**
	= 8.8 dB

7.2 Example 2 :

■ **66.7 MHz**

Class B Limit	**= 100 μV/m = 40.0 dBμV/m**
Reading	**= 31.0 dBμV**
Antenna Factor + Cable Loss = 5.8 dB	
Total	**= 36.8 dBμV/m**
Margin	**= 40.0 dBμV/m – 36.8 dBμV/m**
	= 3.2 dB

8. Recommendation & Conclusion

The data collected shows that the **LG Electronics Inc. LCD TV/Monitor (Model Name: 19LD350-UA)** was complies with §15.107 and 15.109 of the FCC Rules.