



FCC EVALUATION REPORT FOR CERTIFICATION

Applicant : LG Electronics Inc.

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

Pyeongteak-si, Gyeonggi-do, Korea.

Attn: Mr. Do-Hyung Kim, Chief research engineer

Date of Issue : March 10, 2011

Order Number: GETEC-C1-11-046

Test Report Number: GETEC-E3-11-016

Test Site: Gumi College EMC Center

FCC Registration Number: (100749, 443957)

FCC ID. : BEJN1910LZT

Applicant : LG Electronics Inc.

Rule Part(s)	: FCC Part 15 Subpart B
Equipment Class	: Class B computing device peripheral (JBP)
EUT Type	: LED LCD Monitor
Type of Authority	: Certification
Model Name	: N1910LZT
Trade Name	: LG

This equipment has been shown to be in compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2003 / Canadian standard ICES-003

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Tested by,

Reviewed by,

**Soon-Hoon Jeong, Associate Engineer
GUMI College EMC center**

**Jae-Hoon Jeong, Senior Engineer
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	19
6.1 OPERATING ENVIRONMENT	19
6.2 TEST SET-UP	19
6.3 MEASUREMENT UNCERTAINTY.....	19
6.4 LIMIT	20
6.5 TEST EQUIPMENT USED.....	20
6.6 TEST DATA FOR RADIATED EMISSION.....	21
7. SAMPLE CALCULATIONS.....	23
7.1 EXAMPLE 1 :	23
7.2 EXAMPLE 2 :	23
8. RECOMMENDATION & CONCLUSION.....	24
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: 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. Do-Hyung Kim, Chief research engineer

Tel Number: +82-31-610-9623

- **FCC ID.** BEJN1910LZT
- **EUT Type** LED LCD Monitor
- **Model Name** N1910LZT
- **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** February 28 ~ March 9, 2011
- **Place of Test** **Gumi College EMC Center** (FCC Registration Number: 100749, 443957)
407, Bugok-dong, Gumi-si, Gyeongbuk, Korea.
- **Test Report Number** GETEC-E3-11-016
- **Dates of Issue** March 10, 2011

EUT Type: LED LCD Monitor

FCC ID.: BEJN1910LZT



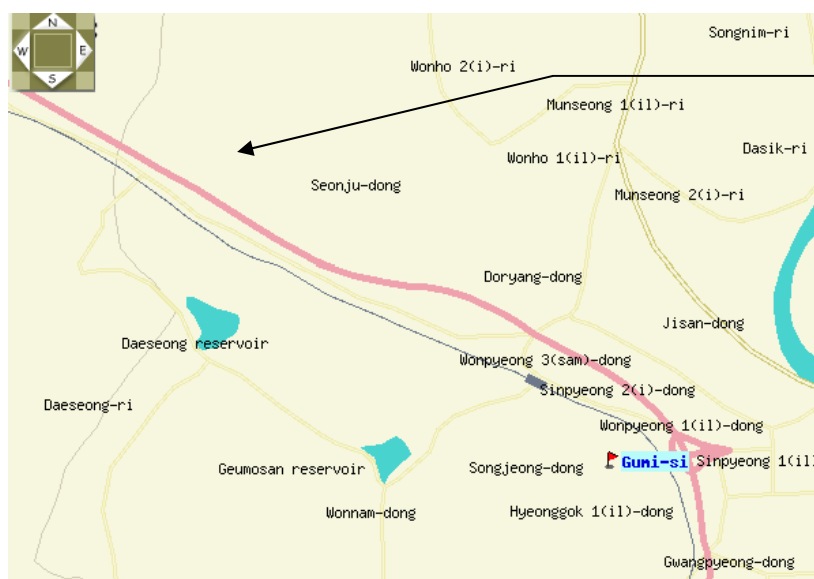
2. Introduction

The measurement procedure described in American National Standard for Methods of Measurement of Radio-Nose Emissions From Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (ASNI C63.4-2003) was used in determining radiated and conducted emissions emanating from **LG Electronics Inc. LED LCD Monitor (Model Name: N1910LZT)**

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)



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. LED LCD Monitor (Model Name: N1910LZT) FCC ID.: BEJN1910LZT**

LCD Screen	Type	481 mm (19 inch) TFT (Thin Film Transistor) LCD (Liquid Crystal Display) Screen Diagonal length of the screen: 481 mm
	Pixel Pitch	0.2835 x 0.2835 mm
Resolution	Maximum Resolution	1280 x 1024 @ 60 Hz
	Recommended Resolution	1280 x 1024 @ 60 Hz
Video Signal	Horizontal Frequency	30 kHz - 66 kHz
	Vertical Frequency	57 Hz - 63 Hz
	Synchronization	Separate Sync/PCoIP
Input Connector	15-pin D-SUB (Analog)	
Power	Rated Voltage	AC 100-240V 50/60Hz 1.2A
	Power Consumption	On Mode: 43 W (Typical) Power Saving Mode ≤ 15 W Off Mode ≤ 1 W
Dimension/ Weight	Monitor Size (Width x Height x Depth)	
	With Stand	408.9 mm x 480.8 mm x 139 mm
	Without Stand	408.9 mm x 338.1 mm x 56.9 mm
Weight (Without Packaging)	3.5 kg	

-. **Maximum Frequency Range** : 699 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
PS2 Keyboard	COMPAQ	166516-AD6	S/N: B13BBOR391006D FCC ID.: AQ6-23K15
PS2 Mouse	LOGITECH	M-S69	S/N: 334684-108 FCC ID.: JNZ211443
Monitor	Dell computer corporation	1800FP	S/N: KR-07R477-48324-33J-03WH FCC ID.:
USB memory stick	LG Electronics Inc.	UM5 2GB	S/N: 003RLRZN37758 FCC ID.: DoC
Joystick	MICROSOFT	X05-92626	S/N: 9262600296169 FCC ID.: DoC
Headset	PHILIPS	SBC HL140	S/N: N/A FCC ID.: DoC
Mike	TMS	TM-808	S/N: N/A FCC ID.: DoC
USB keyboard	SAMSUNG	SDM4510UH	S/N: 4M017826 FCC ID.: DoC
USB mouse	SAMSUNG	M-U48a	S/N: LZA04870121 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.
AC/DC Adapter ¹⁾	LITE-ON TECHNOLOGY CORPORATION	PA-1680-68	S/N: OA93D612314011792 FCC ID.: N/A

1) Input ratings: AC (100 – 240) V~, (50 – 60) Hz, 2.0 A / Output ratings: DC 19 V, 3.42 A



3.2.3 Used Cable(s)

Cable Name	Condition	Description
Power cable	Connected to the adapter	1.50 m unshielded
Adapter cable	Connected to the EUT and adapter	1.80 m shielded with a ferrite core
USB keyboard cable	Connected to the EUT and USB keyboard	1.80 m shielded
USB mouse cable	Connected to the EUT and USB mouse	1.80 m shielded
Mike cable	Connected to the EUT and mike	1.50 m shielded
Audio out cable	Connected to the EUT and PC	1.50 m shielded
D-Sub(Analog) in cable	Connected to the EUT and PC	1.80 m shielded
D-Sub(Analog) out cable	Connected to the EUT and monitor	1.80 m shielded with two ferrite cores
DVI-D(Digital) out cable	Connected to the EUT and monitor	2.00 m shielded with two ferrite cores
LAN cable	Connected to the EUT and Network	10.00 m shielded with two ferrite cores
Headset cable	Connected to the EUT and headset	1.20 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):

- . Dual monitor mode (Monitor (RGB) mode and Network monitor mode)

Radiated emission: 1 280 × 1 024 / 60 Hz (Dual monitor mode)

Conducted emission: 1 280 × 1 024 / 60 Hz (Dual monitor mode)

800 × 600 / 60 Hz (Dual monitor mode), 640 × 480 / 60 Hz (Dual monitor mode)

◆ Operating test pattern

- . "H" character scrolling mode (Font size: 10)
- . Black background white character
- . Brightness and contrast was adjusted as maximum level
- . Continuous playback of 1 kHz audio file with winamp player
- . USB memory stick was connected to the USB port
- . The EUT connected to the host PC on the network was the boot



4.2 Conducted Emission

The Line conducted emission test facility is inside a 4 m × 8 m × 2.5 m shielded enclosure. (FCC Registration No.: 100749)

The EUT was placed on a non-conducting 1.0 m by 1.5 m table, which is 0.8 m in height and 0.4 m away from the vertical wall of the shielded enclosure.

The EUT is powered from the Rohde & Schwarz LISN (ESH2-Z5) and the support equipment is powered from the Rohde & Schwarz LISN (ESH3-Z5). Powers to the LISN are filtered by high-current high insertion loss power line filter.

Sufficient time for EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition.

The RF output of the LISN was connected to the EMI test receiver (Rohde & Schwarz, ESCS30).

The EMI test receiver was scanned from 150 kHz to 30 MHz with 20 ms sweep time to determine the frequency producing the maximum EME from the EUT. The frequency producing the maximum level was re-examined using Quasi-Peak mode of the EMI test receiver.

The bandwidth of Quasi-peak mode was set to 9 kHz. Each emission was maximized consistent with typical applications by varying the configuration of the test sample. Interface cables were connected to the available interface ports of the test unit. The effect of varying the position of cables was investigated to find the configuration that produces maximum diagram emission. Excess cable lengths were bundled at center with 30 cm ~ 40 cm.

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

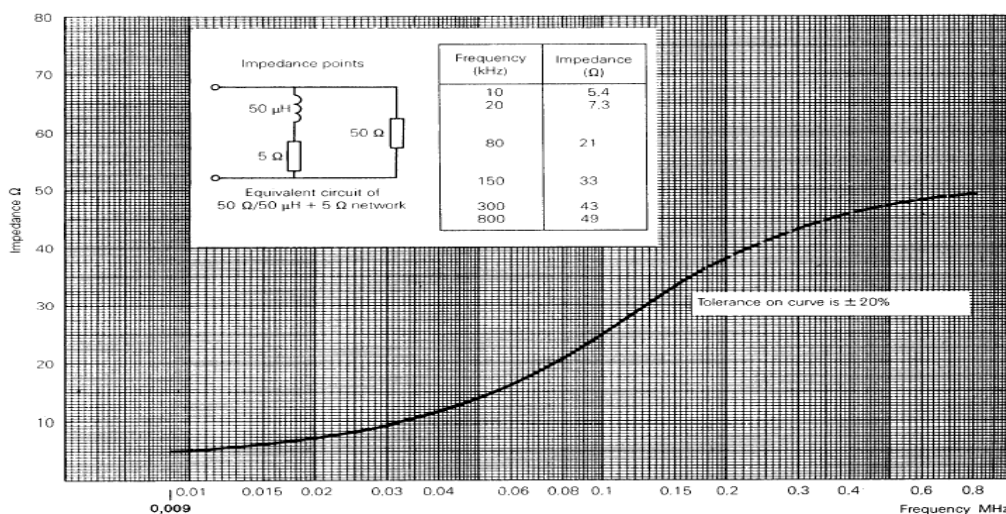


Fig 2. Impedance of LISN



4.3 Radiated Emission

Preliminary measurements were conducted 3 m semi anechoic chamber using broadband antennas to determine the frequency producing the maximum EME. Appropriate precaution was taken to ensure that all EME from the EUT were maximized and investigated. The technology configuration, mode of operation and turntable azimuth with respect to antenna was note for each frequency found.

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

Sufficient time for the EUT, support equipment, and test equipment was allowed in order for them to warm up to their normal operating condition.

Each frequency found during pre-scan measurements was re-examined and investigated using EMI test receiver. The detector function was set to CISPR quasi-peak mode average mode and the bandwidth of the receiver was set to 120 kHz or 1 MHz depending on the frequency or type of signal.

The EUT, support equipment and interconnecting cables were reconfigured to the setup producing the maximum emission for the frequency and were placed on top of a 0.8 m high non-metallic 1.0 m × 1.5 m table.

The turntable containing the test sample was rotated; the antenna height was varied 1 to 4 meter and stopped at the azimuth or height producing the maximum emission.

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

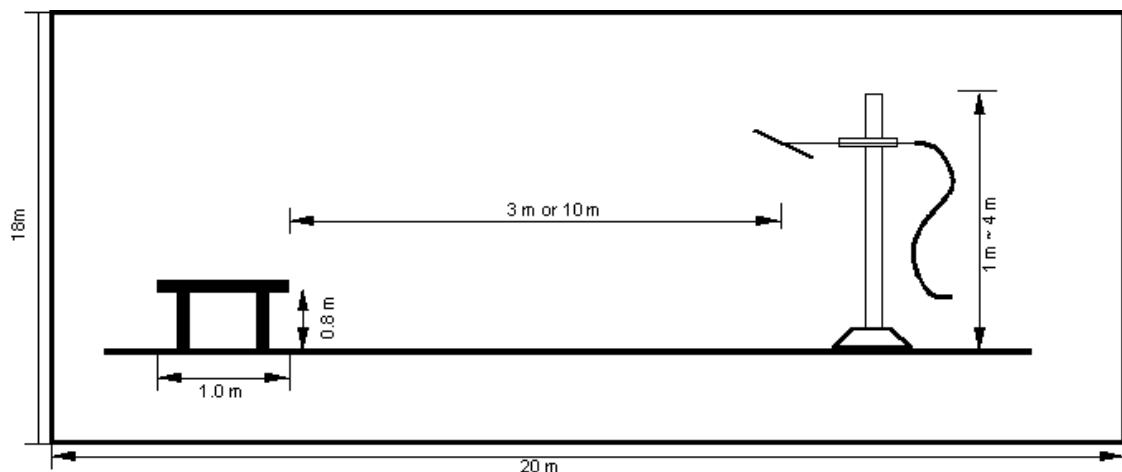


Fig 3. Dimensions of test site



5. Conducted Emission

5.1 Operating Environment

Temperature : 26 °C
Relative Humidity : 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 & ISN.

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)	± 2.71 dB	Confidence levels of 95 % ($k = 2$)
Conducted emission (150 kHz ~ 30 MHz)	± 3.34 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. 2011
■ - ESH3-Z5	Rohde & Schwarz	LISN	838979/020	12. 10. 2011
■ - ESH2-Z5	Rohde & Schwarz	LISN	829991/009	12. 10. 2011
■ - ENY81-CA6	Rohde & Schwarz	ISN	101573	10. 27. 2011

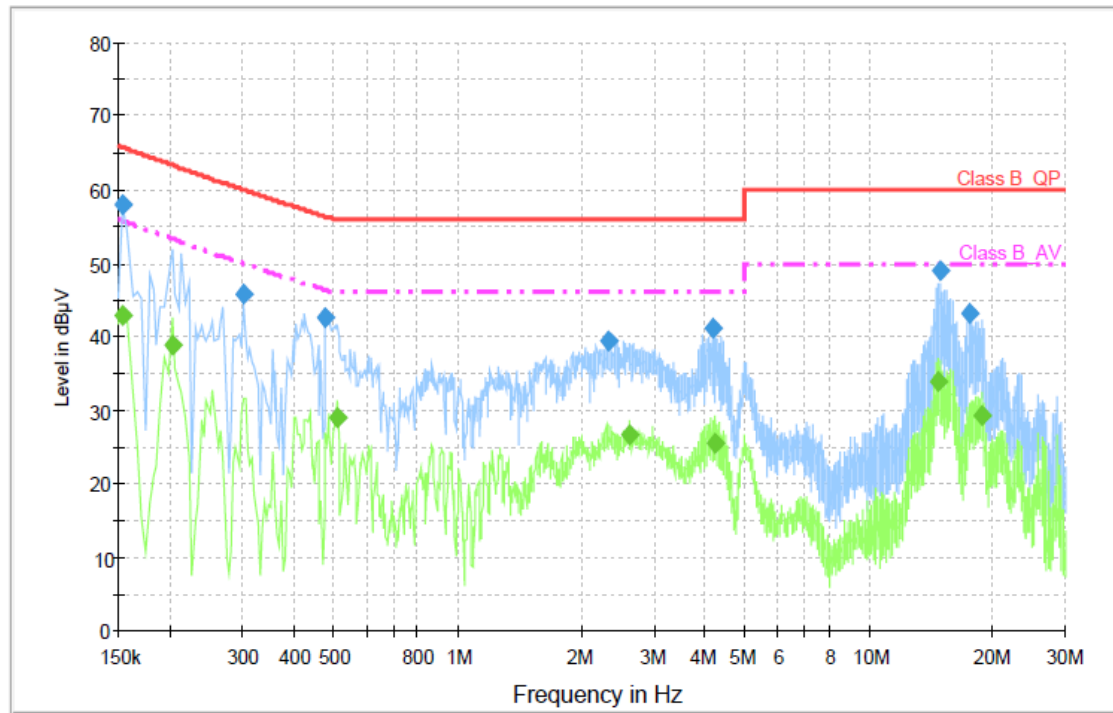
5.6 Test data for Conducted Emission

-. Test Date : February 28, 2011
-. Resolution Bandwidth : 9 kHz
-. Frequency Range : 0.15 MHz ~ 30 MHz



◆ Operating condition: 1 280 × 1 024 / 60 Hz (Dual monitor mode)

Voltage with 4-Line-LISN_L1



Final Measurement Detector 1

Frequency (MHz)	MaxPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.154000	57.9	1000.000	9.000	GND	L1	10.1	7.9	65.8	
0.302000	45.8	1000.000	9.000	GND	L1	10.1	14.2	60.0	
0.478000	42.7	1000.000	9.000	GND	L1	10.1	13.6	56.3	
2.326000	39.4	1000.000	9.000	GND	L1	10.2	16.6	56.0	
4.166000	41.0	1000.000	9.000	GND	L1	10.3	15.0	56.0	
14.862000	48.9	1000.000	9.000	GND	L1	10.9	11.1	60.0	
17.614000	43.1	1000.000	9.000	GND	L1	11.1	16.9	60.0	

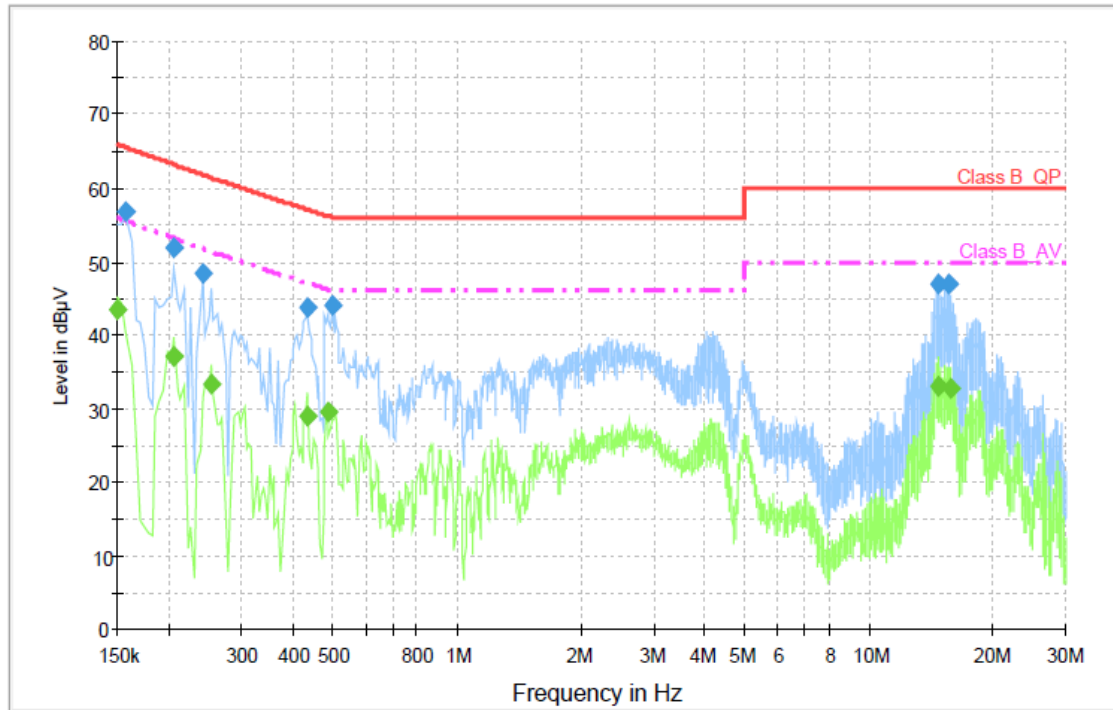
Final Measurement Detector 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.154000	42.9	1000.000	9.000	GND	L1	10.1	12.9	55.8	
0.202000	39.0	1000.000	9.000	GND	L1	10.1	14.3	53.3	
0.510000	29.1	1000.000	9.000	GND	L1	10.1	16.9	46.0	
2.606000	26.6	1000.000	9.000	GND	L1	10.2	19.4	46.0	
4.218000	25.6	1000.000	9.000	GND	L1	10.3	20.4	46.0	
14.690000	33.9	1000.000	9.000	GND	L1	10.9	16.1	50.0	
18.710000	29.4	1000.000	9.000	GND	L1	11.2	20.6	50.0	

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



Voltage with 4-Line-LISN_N



Final Measurement Detector 1

Frequency (MHz)	MaxPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.158000	57.0	1000.000	9.000	GND	N	10.1	8.5	65.5	
0.206000	51.9	1000.000	9.000	GND	N	10.1	11.3	63.2	
0.242000	48.4	1000.000	9.000	GND	N	10.1	13.4	61.8	
0.434000	43.8	1000.000	9.000	GND	N	10.1	13.3	57.1	
0.498000	44.0	1000.000	9.000	GND	N	10.1	12.0	56.0	
14.802000	46.9	1000.000	9.000	GND	N	10.8	13.1	60.0	
15.682000	47.0	1000.000	9.000	GND	N	10.8	13.0	60.0	

Final Measurement Detector 2

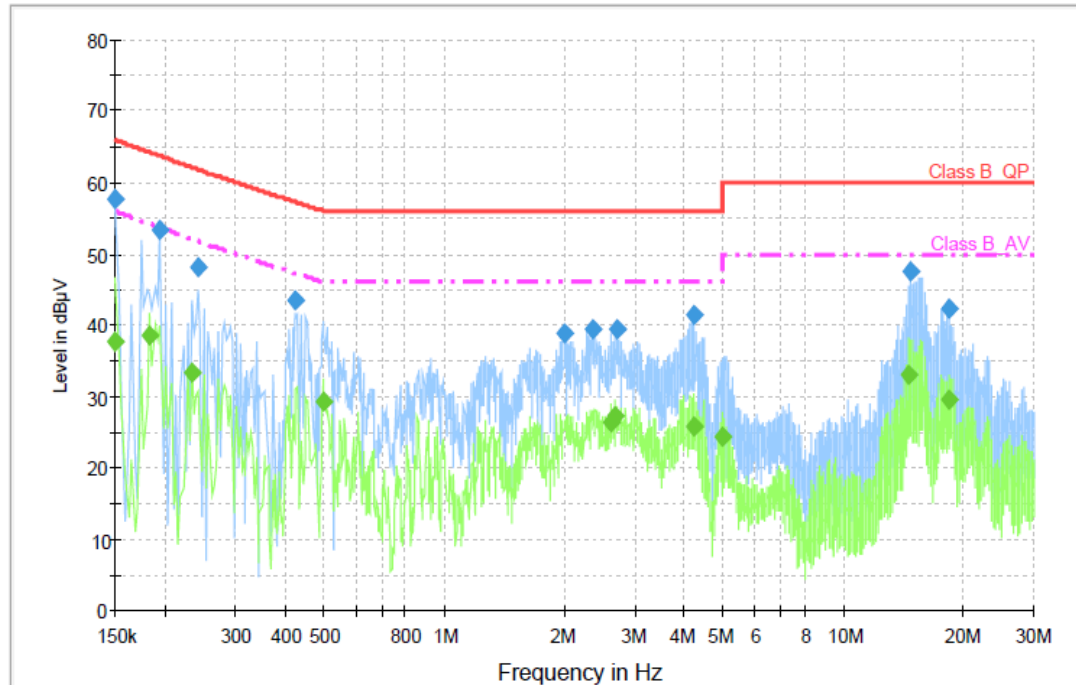
Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	43.6	1000.000	9.000	GND	N	10.1	12.4	56.0	
0.206000	37.2	1000.000	9.000	GND	N	10.1	16.0	53.2	
0.254000	33.2	1000.000	9.000	GND	N	10.1	18.2	51.4	
0.434000	29.0	1000.000	9.000	GND	N	10.1	18.1	47.1	
0.486000	29.6	1000.000	9.000	GND	N	10.1	16.6	46.2	
14.766000	33.1	1000.000	9.000	GND	N	10.8	16.9	50.0	
15.702000	32.6	1000.000	9.000	GND	N	10.8	17.4	50.0	

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



◆ Operating condition: 800 × 600 / 60 Hz (Dual monitor mode)

Voltage with 4-Line-LISN_L1



Final Measurement Detector 1

Frequency (MHz)	MaxPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	57.6	1000.000	9.000	GND	L1	10.1	8.4	66.0	
0.195000	53.3	1000.000	9.000	GND	L1	10.1	10.4	63.7	
0.243000	48.1	1000.000	9.000	GND	L1	10.1	13.7	61.8	
0.423000	43.4	1000.000	9.000	GND	L1	10.1	13.9	57.3	
2.001000	39.0	1000.000	9.000	GND	L1	10.2	17.0	56.0	
2.343000	39.5	1000.000	9.000	GND	L1	10.2	16.5	56.0	
2.721000	39.4	1000.000	9.000	GND	L1	10.2	16.6	56.0	
4.239000	41.4	1000.000	9.000	GND	L1	10.3	14.6	56.0	
14.730000	47.6	1000.000	9.000	GND	L1	10.9	12.4	60.0	
18.408000	42.2	1000.000	9.000	GND	L1	11.2	17.8	60.0	

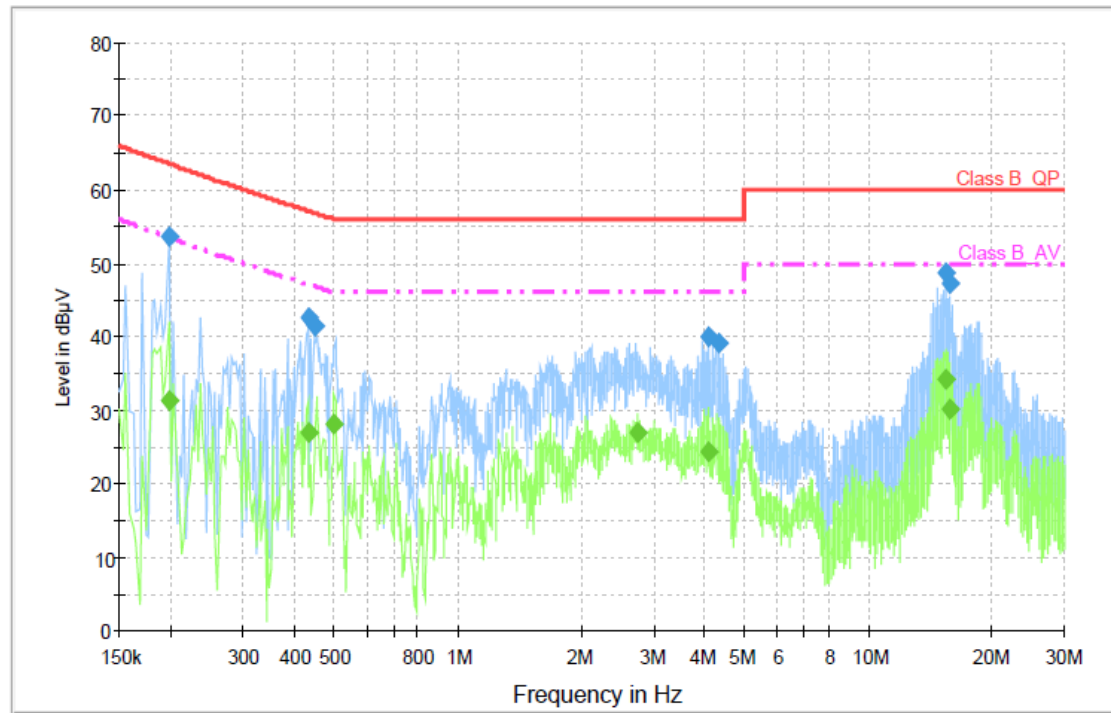
Final Measurement Detector 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	37.6	1000.000	9.000	GND	L1	10.1	18.4	56.0	
0.183000	38.4	1000.000	9.000	GND	L1	10.1	15.8	54.2	
0.234000	33.4	1000.000	9.000	GND	L1	10.1	18.7	52.1	
0.498000	29.3	1000.000	9.000	GND	L1	10.1	16.7	46.0	
2.622000	26.3	1000.000	9.000	GND	L1	10.2	19.7	46.0	
2.682000	27.4	1000.000	9.000	GND	L1	10.2	18.6	46.0	
4.218000	25.9	1000.000	9.000	GND	L1	10.3	20.1	46.0	
4.947000	24.4	1000.000	9.000	GND	L1	10.3	21.6	46.0	
14.634000	33.1	1000.000	9.000	GND	L1	10.9	16.9	50.0	
18.471000	29.5	1000.000	9.000	GND	L1	11.2	20.5	50.0	

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



Voltage with 4-Line-LISN_N



Final Measurement Detector 1

Frequency (MHz)	MaxPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.198000	53.8	1000.000	9.000	GND	N	10.1	9.7	63.5	
0.432000	42.5	1000.000	9.000	GND	N	10.1	14.6	57.1	
0.447000	41.5	1000.000	9.000	GND	N	10.1	15.4	56.9	
4.056000	40.0	1000.000	9.000	GND	N	10.3	16.0	56.0	
4.317000	39.0	1000.000	9.000	GND	N	10.3	17.0	56.0	
15.351000	48.7	1000.000	9.000	GND	N	10.8	11.3	60.0	
15.756000	47.2	1000.000	9.000	GND	N	10.8	12.8	60.0	

Final Measurement Detector 2

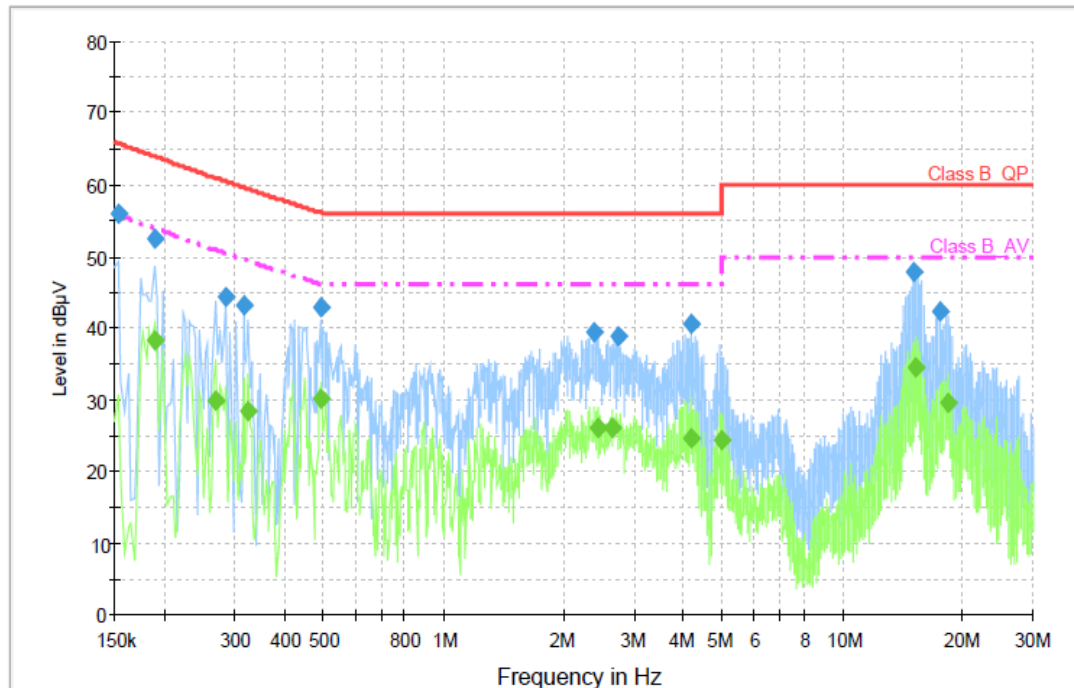
Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.198000	31.4	1000.000	9.000	GND	N	10.1	22.1	53.5	
0.432000	27.1	1000.000	9.000	GND	N	10.1	20.0	47.1	
0.501000	28.1	1000.000	9.000	GND	N	10.1	17.9	46.0	
2.733000	27.0	1000.000	9.000	GND	N	10.2	19.0	46.0	
4.056000	24.4	1000.000	9.000	GND	N	10.3	21.6	46.0	
15.417000	34.1	1000.000	9.000	GND	N	10.8	15.9	50.0	
15.834000	30.2	1000.000	9.000	GND	N	10.8	19.8	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)	MaxPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.153000	55.8	1000.000	9.000	GND	L1	10.1	10.0	65.8	
0.189000	52.6	1000.000	9.000	GND	L1	10.1	11.4	64.0	
0.285000	44.5	1000.000	9.000	GND	L1	10.1	16.0	60.5	
0.315000	43.2	1000.000	9.000	GND	L1	10.1	16.4	59.6	
0.492000	42.9	1000.000	9.000	GND	L1	10.1	13.2	56.1	
2.376000	39.3	1000.000	9.000	GND	L1	10.2	16.7	56.0	
2.730000	38.9	1000.000	9.000	GND	L1	10.2	17.1	56.0	
4.191000	40.5	1000.000	9.000	GND	L1	10.3	15.5	56.0	
15.141000	47.8	1000.000	9.000	GND	L1	10.9	12.2	60.0	
17.616000	42.3	1000.000	9.000	GND	L1	11.1	17.7	60.0	

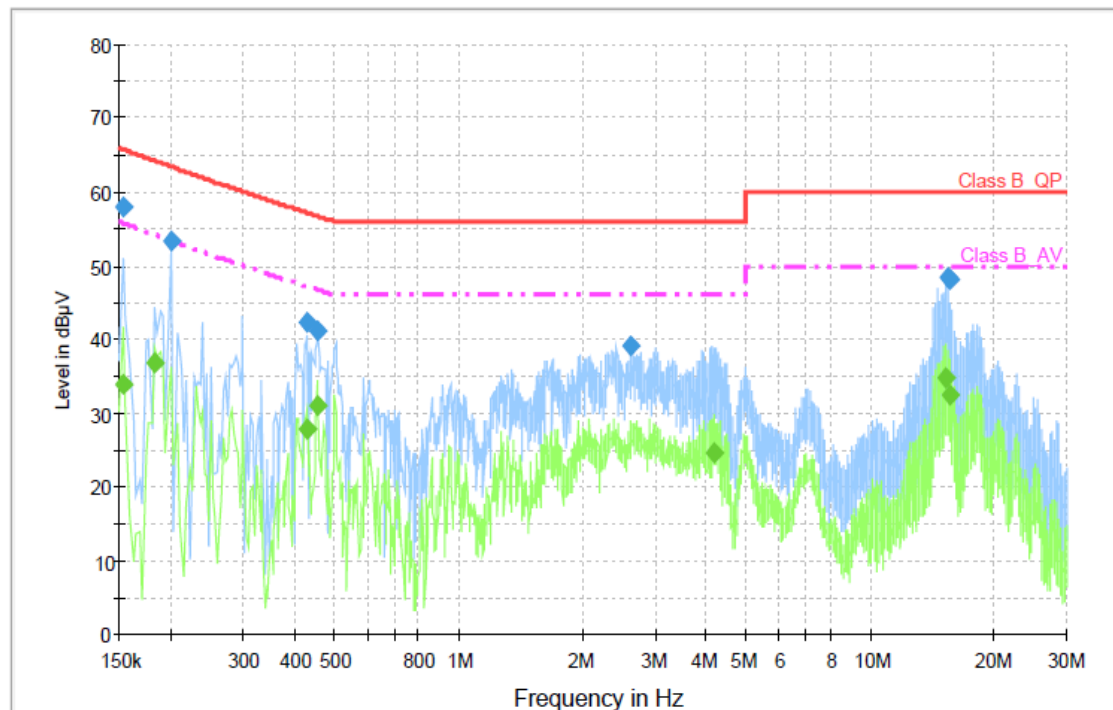
Final Measurement Detector 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.189000	38.4	1000.000	9.000	GND	L1	10.1	15.5	53.9	
0.270000	29.8	1000.000	9.000	GND	L1	10.1	21.1	50.9	
0.324000	28.5	1000.000	9.000	GND	L1	10.1	20.9	49.4	
0.495000	30.2	1000.000	9.000	GND	L1	10.1	15.9	46.1	
2.427000	26.2	1000.000	9.000	GND	L1	10.2	19.8	46.0	
2.655000	26.2	1000.000	9.000	GND	L1	10.2	19.8	46.0	
4.191000	24.7	1000.000	9.000	GND	L1	10.3	21.3	46.0	
4.944000	24.4	1000.000	9.000	GND	L1	10.3	21.6	46.0	
15.267000	34.5	1000.000	9.000	GND	L1	10.9	15.5	50.0	
18.342000	29.5	1000.000	9.000	GND	L1	11.2	20.5	50.0	

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



Voltage with 4-Line-LISN_N



Final Measurement Detector 1

Frequency (MHz)	MaxPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.153000	57.9	1000.000	9.000	GND	N	10.1	7.9	65.8	
0.201000	53.3	1000.000	9.000	GND	N	10.1	10.1	63.4	
0.429000	42.4	1000.000	9.000	GND	N	10.1	14.8	57.2	
0.456000	41.3	1000.000	9.000	GND	N	10.1	15.4	56.7	
2.622000	39.1	1000.000	9.000	GND	N	10.2	16.9	56.0	
15.348000	48.5	1000.000	9.000	GND	N	10.8	11.5	60.0	
15.690000	48.1	1000.000	9.000	GND	N	10.8	11.9	60.0	

Final Measurement Detector 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.153000	33.8	1000.000	9.000	GND	N	10.1	22.0	55.8	
0.183000	36.9	1000.000	9.000	GND	N	10.1	17.3	54.2	
0.429000	27.7	1000.000	9.000	GND	N	10.1	19.5	47.2	
0.453000	30.9	1000.000	9.000	GND	N	10.1	15.8	46.7	
4.152000	24.8	1000.000	9.000	GND	N	10.3	21.2	46.0	
15.192000	34.8	1000.000	9.000	GND	N	10.8	15.2	50.0	
15.690000	32.5	1000.000	9.000	GND	N	10.8	17.5	50.0	

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



6. Radiated Emission

6.1 Operating Environment

Temperature : 9 °C
Relative Humidity : 32 % R.H.

6.2 Test Set-up

A preliminary scan with peak mode was performed in the semi anechoic chamber and found frequency for test site. The formal radiated emission was measured at 10 m distance open area test site and 3 m distance 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(Open Area Test Site)	Uncertainty	Remark
Radiated emission (30 MHz ~ 300 MHz, 10 m, Vertical)	± 4.03 dB	Confidence levels of 95 % ($k = 2$)
Radiated emission (30 MHz ~ 300 MHz, 10 m, Horizontal)	± 3.96 dB	Confidence levels of 95 % ($k = 2$)
Radiated emission (300 MHz ~ 1 000 MHz, 10 m, Vertical)	± 4.01 dB	Confidence levels of 95 % ($k = 2$)
Radiated emission (300 MHz ~ 1 000 MHz, 10 m, Horizontal)	± 3.88 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
■ - ESCS30	Rohde & Schwarz	EMI Test Receiver	839809/003	12. 10. 2011
■ - HK116	Rohde & Schwarz	Biconical Antenna	832639/007	03. 15. 2012
■ - HL223	Rohde & Schwarz	Log Periodic Antenna	835998/004	03. 15. 2012
■ - HD100	HD GmbH	Position Controller	100/692/01	N/A
■ - DS415S	HD GmbH	Turntable	415/657/01	N/A
■ - MA240	HD GmbH	Antenna Mast	240/565/01	N/A
■ - ESIB26	Rohde & Schwarz	EMI Test Receiver	830482/010	12. 11. 2011
■ - BBHA9120D	Schwarzbeck	Horn Antenna	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. 2011



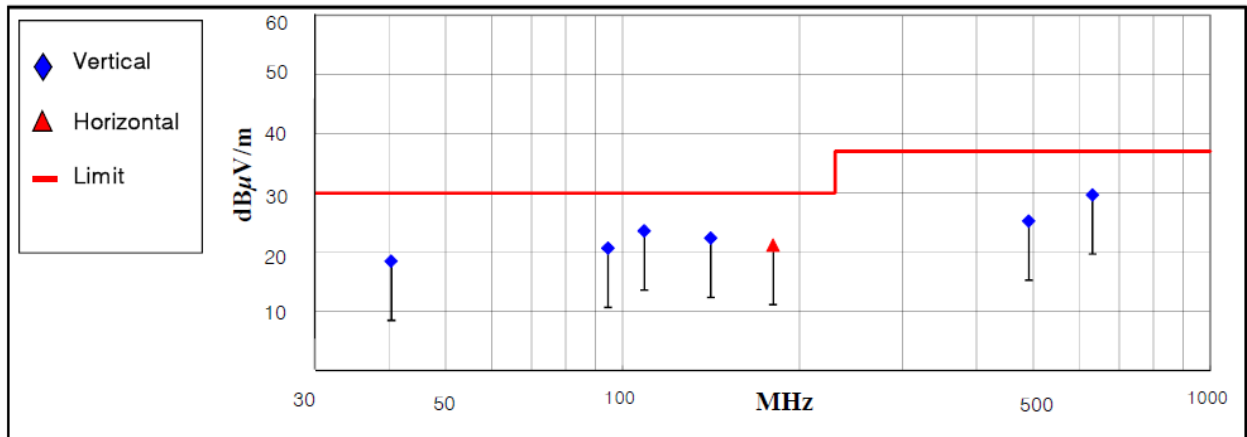
6.6 Test data for Radiated Emission

- Test Date : February 25 ~ March 9, 2011
- Resolution Bandwidth : 120 kHz/1 MHz
- Frequency Range : 30 MHz ~ 5 000 MHz
- Measurement Distance : 10 m/3 m
- Note : The highest frequency of the internal source of the EUT is between 500 MHz and 1 000 MHz (699 MHz). The measurement was made up to 5 000 MHz

◆ Operating Condition: 1 280 × 1 024 / 60 Hz (Dual monitor mode)

Detector mode: Quasi-peak detector mode

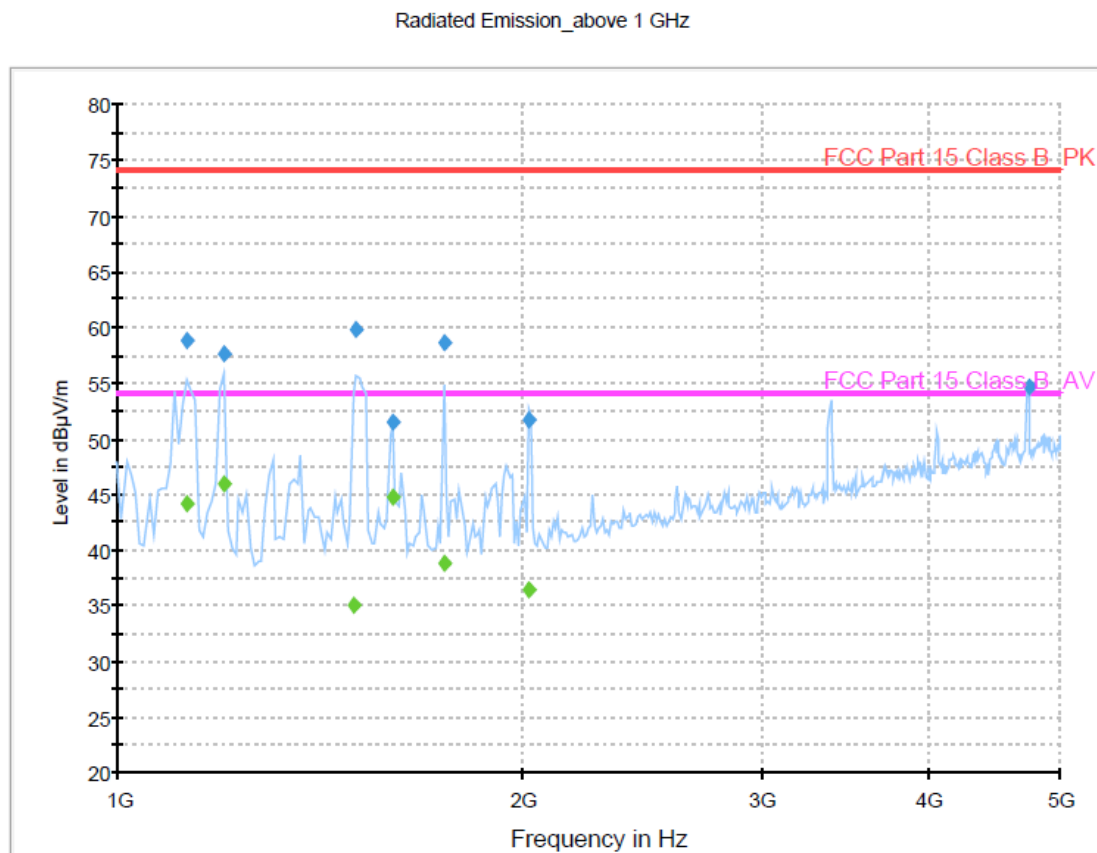
Frequency (MHz)	Measurement Level				Limit (dB μ V/m)	Margin (dB)	Positioning System		
	Reading Value(dB μ V)	Antenna Factor(dB/m)	Cable Loss(dB)	Test Result (dB μ V/m)			Pol. (H/V)	Height (cm)	Angle (°)
40.37	5.58	11.39	1.53	18.50	30.00	11.50	V	100	133
94.41	9.23	9.01	2.46	20.70	30.00	9.30	V	225	89
108.83	10.71	10.25	2.64	23.60	30.00	6.40	V	100	105
141.21	7.49	11.85	3.06	22.40	30.00	7.60	V	105	103
180.24	4.09	13.58	3.53	21.20	30.00	8.80	H	202	109
490.89	1.62	17.41	6.24	25.27	37.00	11.73	V	100	195
630.01	3.10	19.37	7.23	29.70	37.00	7.30	V	100	351



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



- ◆ Operating Condition: 1 280 × 1 024 / 60 Hz (Dual monitor mode)
Green trace: Average detector, Blue trace: Peak detector



Final Result [1]

Frequency (MHz)	MaxPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1127.656513	58.9	100.0	1000.000	100.0	V	242.0	-14.0	15.1	74.0
1199.800802	57.6	100.0	1000.000	100.0	V	226.0	-13.7	16.4	74.0
1503.610020	59.8	100.0	1000.000	128.0	V	154.0	-13.0	14.2	74.0
1600.202405	51.4	100.0	1000.000	100.0	V	226.0	-12.6	22.6	74.0
1750.090982	58.6	100.0	1000.000	129.0	V	211.0	-12.3	15.4	74.0
2022.636072	51.7	100.0	1000.000	100.0	V	352.0	-11.5	22.3	74.0
4738.070942	54.7	100.0	1000.000	100.0	H	307.0	-1.8	23.3	74.0

Final Result [2]

Frequency (MHz)	CAverage (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1127.256513	44.2	100.0	1000.000	100.0	V	242.0	-14.0	9.8	54.0
1200.200802	45.9	100.0	1000.000	100.0	V	226.0	-13.7	8.1	54.0
1500.010020	35.1	100.0	1000.000	187.0	V	154.0	-13.0	18.9	54.0
1600.202405	44.8	100.0	1000.000	100.0	V	226.0	-12.6	9.2	54.0
1750.090982	38.8	100.0	1000.000	150.0	V	211.0	-12.3	15.2	54.0
2022.636072	36.5	100.0	1000.000	100.0	V	352.0	-11.5	17.5	54.0

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



7. Sample Calculations

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

7.1 Example 1 :

■ 20.3 MHz

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

7.2 Example 2 :

■ 66.7 MHz

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



8. Recommendation & Conclusion

The data collected shows that the **LG Electronics Inc. LED LCD Monitor (Model Name: N1910LZT)** was complies with §15.107 and 15.109 of the FCC Rules.