

FCC EVALUATION REPORT FOR CERTIFICATION

Applicant : LG Electronics Inc.

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

Pyeongteak-si, Gyeonggi-do, Korea.

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

Date of Issue : November 22, 2010

Order Number: GETEC-C1-10-223

Test Report Number: GETEC-E3-10-114

Test Site: Gumi College EMC Center

FCC Registration Number: (100749, 443957)

FCC ID.: BEJME20CR

Applicant: LG Electronics Inc.

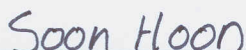
Rule Part(s)	: FCC Part 15 Subpart B
Equipment Class	: Class B computing device peripheral (JBP)
EUT Type	: LCD Monitor
Type of Authority	: Certification
Model Name	: ME20CR
Trade Name	: LG

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

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

Tested by,

Reviewed by,



Soon-Hoon Jeong / Engineer
GUMI College EMC center



Jae-Hoon Jeong / Senior Engineer
GUMI College EMC center



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)	6
4. DESCRIPTION OF TESTS.....	7
4.1 TEST CONDITION.....	7
4.2 CONDUCTED EMISSION	8
4.3 RADIATED EMISSION.....	9
5. CONDUCTED EMISSION.....	10
5.1 OPERATING ENVIRONMENT	10
5.2 TEST SET-UP	10
5.3 MEASUREMENT UNCERTAINTY.....	10
5.4 LIMIT	11
5.5 TEST EQUIPMENT USED.....	11
5.6 TEST DATA FOR CONDUCTED EMISSION	11
6. RADIATED EMISSION	20
6.1 OPERATING ENVIRONMENT	20
6.2 TEST SET-UP	20
6.3 MEASUREMENT UNCERTAINTY.....	20
6.4 LIMIT	21
6.5 TEST EQUIPMENT USED.....	21
6.6 TEST DATA FOR RADIATED EMISSION.....	21
7. SAMPLE CALCULATIONS.....	26
7.1 EXAMPLE 1 :	26
7.2 EXAMPLE 2 :	26
8. RECOMMENDATION & CONCLUSION.....	27
 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. Myoung-Kyu Lee, Chief research engineer

Tel Number: +82-31-610-9623

- **FCC ID.** BEJME20CR
- **EUT Type** LCD Monitor
- **Model Name** ME20CR
- **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** November 11, 2010
- **Place of Test** **Gumi College EMC Center** (FCC Registration Number: 100749, 443957)
407, Bugok-dong, Gumi-si, Gyeongbuk, Korea.
- **Test Report Number** GETEC-E3-10-114
- **Dates of Issue** November 22, 2010



2. Introduction

The measurement procedure described in American National Standard for Methods of Measurement of Radio-Nose Emissions From Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (ASNI C63.4-2003) was used in determining radiated and conducted emissions emanating from **LG Electronics Inc. LCD Monitor (Model Name: ME20CR)**

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. LCD Monitor (Model Name: ME20CR) FCC ID.: BEJME20CR**

Display	51.054 cm (20.1 inch) Flat Panel Active matrix-TFT LCD Anti-Glare coating Visible diagonal size : 51.054 cm 0.255 mm x 0.255 mm (Pixel Pitch)		
Sync Input	Horizontal Freq. Vertical Freq. Input Form	28 kHz to 83 kHz (Automatic) 56 Hz to 60 Hz (Automatic) Separate Sync SOG (Sync On Green) , Digital	
Video Input	Signal Input Input Form	D-SUB Connector (Analog) DVI-D Connector (Digital) RGB Analog (0.7 V p-p), Digital	
Resolution	Max Recommend	VESA 1600 x 1200 @ 60 Hz VESA 1600 x 1200 @ 60 Hz	
Plug&Play	DDC 2B		
Power Consumption	On Mode Sleep Mode Off Mode	: ≤ ≤	58 W (Typ.) 1 W 1 W
Dimensions & Weight	With Stand		Without Stand
	Width	44.40 cm (17.48 inch)	Width 44.40 cm (17.48 inch)
	Height	43.45 cm (17.11 inch) (Min.) 53.45 cm (21.04 inch) (Max.)	Height 34.51 cm (13.59 inch)
	Depth	27.01 cm (10.63 inch)	Depth 7.06 cm (2.78 inch)
	Weight(excl. packing)		8.7 kg (19.1816 lb)
Power Input	AC 100-240 V~ 50 / 60 Hz 1.2 A		
Environmental Conditions	Operating Conditions Temperature 10 °C to 35 °C Humidity 10 % to 80 % non-Condensing Storage Conditions Temperature -20 °C to 60 °C Humidity 5 % to 90 % non-Condensing		
Stand Base	Attached (), Detached (O)		
Power cord	Wall-outlet type or PC-outlet type		

-. Maximum Frequency Range : 162 MHz



3.2 Support Equipment / Cables used

3.2.1 Used Support Equipment

Description	Manufacturer	Model Name	S/N & FCC ID.
PC	Hewlett Packard	D530	S/N: CNG34800PY FCC ID.: DoC
Video card	ATI	ATI RV360(9600)	S/N: SN0402017176 FCC ID.: DoC
Key board	COMPAQ	166516-AD6	S/N: B13BBOR391006D FCC ID.: AQ6-23K15
PS2 mouse	LOGITECH	M-S69	S/N: 334684-108 FCC ID.: JNZ211443
Joy stick	MICROSOFT	X05-92626	S/N: 9262600296169 FCC ID.: DoC
Printer	Hewlett Packard	970CXI	S/N: MY9B01F1FG FCC ID.: DoC

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

3.2.2 System configuration

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

3.2.3 Used Cable(s)

Cable Name	Condition	Description
Power cable	Connected to the EUT	1.80 m unshielded
RGB(Analog) in cable	Connected to the EUT and PC	1.50 m shielded
DVI-D(Digital) in cable	Connected to the EUT and PC	1.50 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: 1 600 × 1 200 / 60 Hz (D-sub: Analog, DVI-D: Digital)

Conducted emission: 1 600 × 1 200 / 60 Hz (D-sub: Analog, DVI-D: Digital)

1 024 × 768 / 60 Hz (D-sub: Analog), 640 × 480 / 60 Hz (D-sub: Analog)

◆ Operating test pattern

- "H" character scrolling mode (Font size: 10)
- Black background white character
- Brightness and contrast was adjusted as maximum level



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

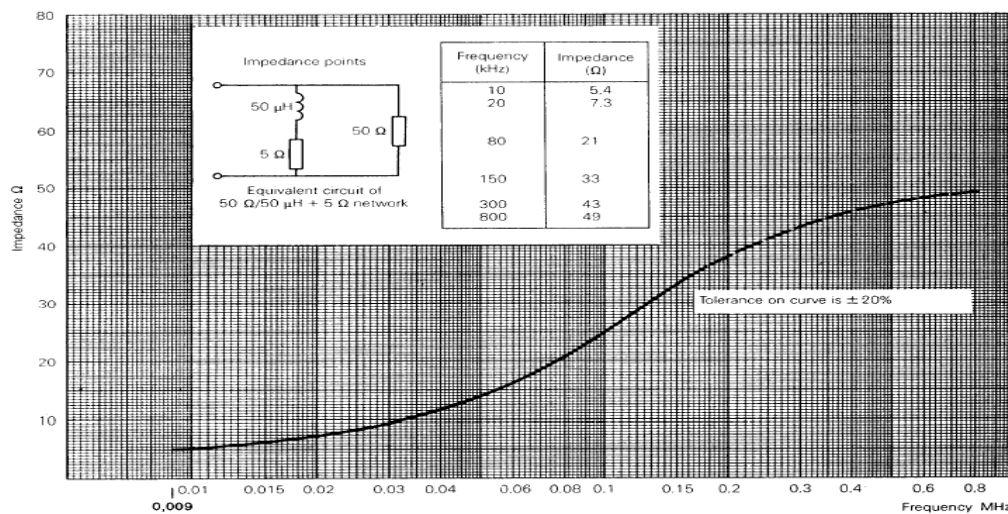


Fig 2. Impedance of LISN



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

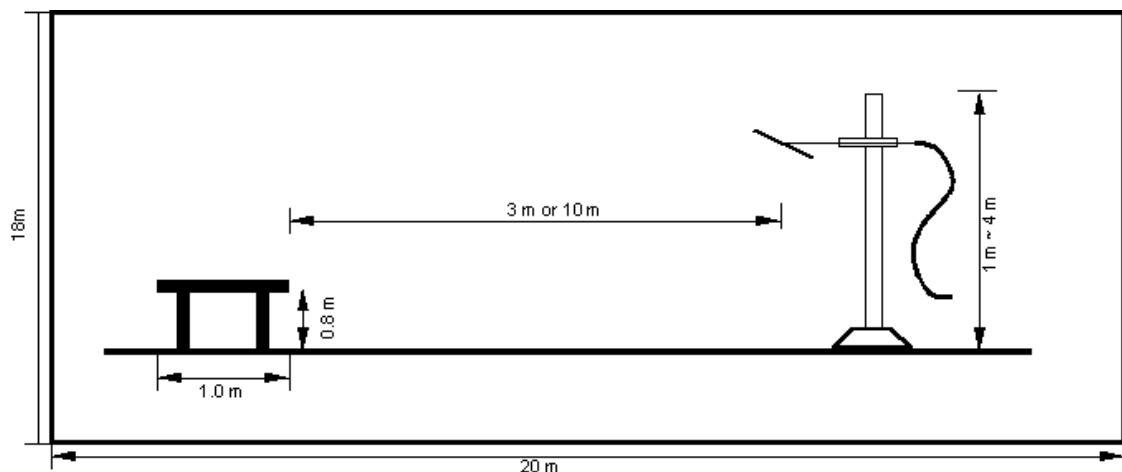


Fig 3. Dimensions of test site.



5. Conducted Emission

5.1 Operating Environment

Temperature : 27 °C
Relative Humidity : 39 % 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)	± 2.69 dB	Confidence levels of 95 % ($k = 2$)
Conducted emission (150 kHz ~ 30 MHz)	± 4.16 dB	Confidence levels of 95 % ($k = 2$)



5.4 Limit

RFI Conducted	FCC Limit(dB μ V/m) Class B	
Freq. Range	Quasi-Peak	Average
150 kHz ~ 0.5 MHz	66 ~ 56*	56 ~ 46*
0.5 MHz ~ 5 MHz	56	46
5 MHz ~ 30 MHz	60	50
*Limits decreases linearly with the logarithm of frequency.		

5.5 Test Equipment used

Model Name	Manufacturer	Description	Serial Number	Due to Calibration
■ - ESCS30	Rohde & Schwarz	EMI Test Receiver	839809/003	12. 10. 2010
■ - ESH3-Z5	Rohde & Schwarz	LISN	838979/020	12. 10. 2010
■ - ESH2-Z5	Rohde & Schwarz	LISN	829991/009	12. 10. 2010
□ - ISN T8	TESEQ. GmbH	ISN	24568	11. 09. 2011

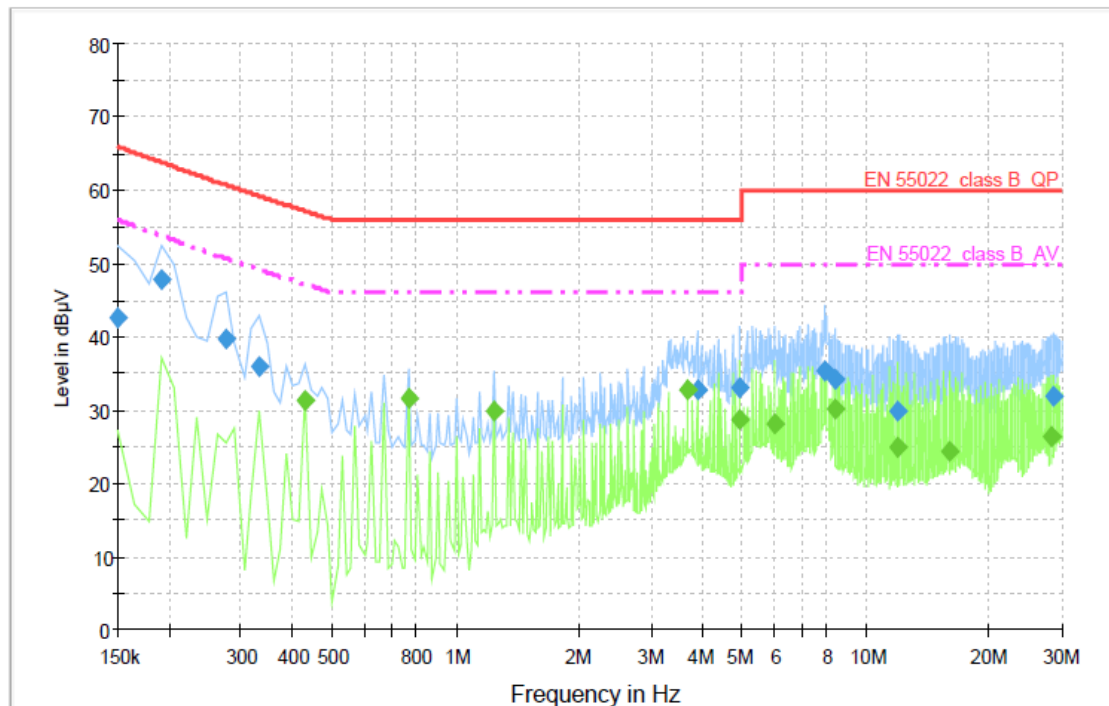
5.6 Test data for Conducted Emission

-. Test Date : November 11, 2010
-. Resolution Bandwidth : 9 kHz
-. Frequency Range : 0.15 MHz ~ 30 MHz



◆ Operating condition: 1 600 × 1 200 / 60 Hz (D-sub: Analog)

Voltage with 4-Line-LISN_L1



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	42.5	1000.000	9.000	GND	L1	10.0	23.5	66.0	
0.192000	47.7	1000.000	9.000	GND	L1	10.0	16.1	63.8	
0.276000	39.8	1000.000	9.000	GND	L1	10.0	20.9	60.7	
0.332000	36.0	1000.000	9.000	GND	L1	10.0	23.2	59.2	
3.874000	32.7	1000.000	9.000	GND	L1	10.2	23.3	56.0	
4.924000	33.0	1000.000	9.000	GND	L1	10.2	23.0	56.0	
7.934000	35.3	1000.000	9.000	GND	L1	10.3	24.7	60.0	
8.410000	34.2	1000.000	9.000	GND	L1	10.3	25.8	60.0	
11.994000	29.9	1000.000	9.000	GND	L1	10.5	30.1	60.0	
28.710000	31.8	1000.000	9.000	GND	L1	11.4	28.2	60.0	

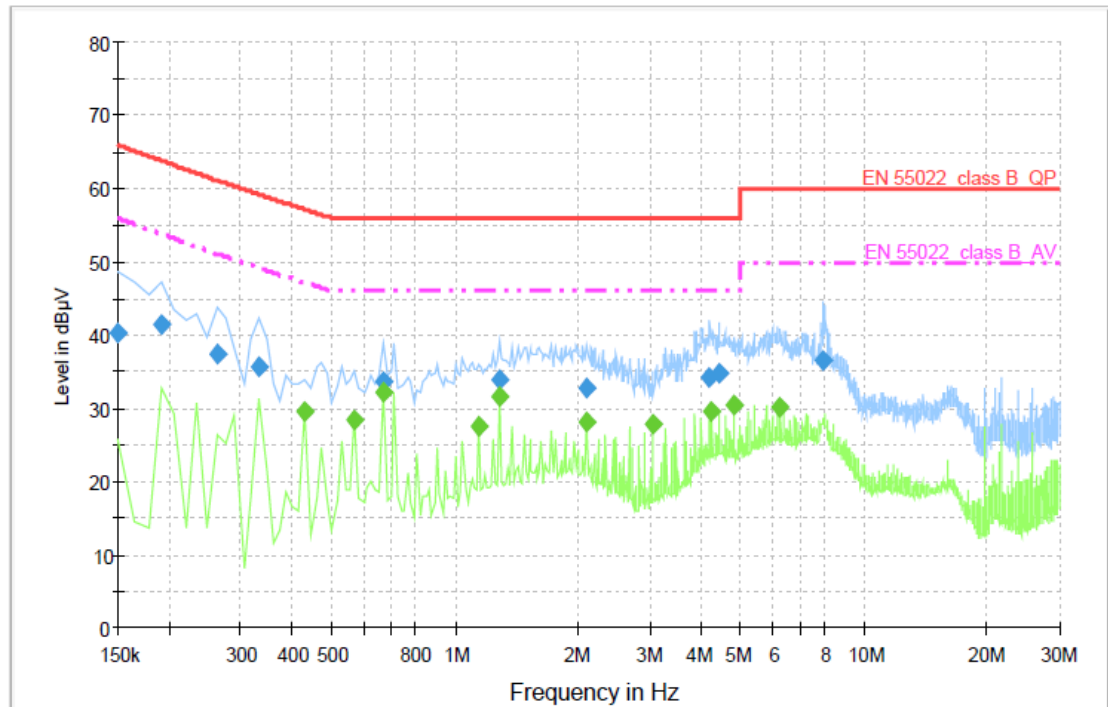
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.430000	31.2	1000.000	9.000	GND	L1	10.0	15.9	47.1	
0.766000	31.5	1000.000	9.000	GND	L1	10.0	14.5	46.0	
1.242000	29.8	1000.000	9.000	GND	L1	10.1	16.2	46.0	
3.678000	32.6	1000.000	9.000	GND	L1	10.2	13.4	46.0	
4.924000	28.7	1000.000	9.000	GND	L1	10.2	17.3	46.0	
5.974000	28.0	1000.000	9.000	GND	L1	10.2	22.0	50.0	
8.410000	30.1	1000.000	9.000	GND	L1	10.3	19.9	50.0	
11.994000	25.0	1000.000	9.000	GND	L1	10.5	25.0	50.0	
16.054000	24.4	1000.000	9.000	GND	L1	10.8	25.6	50.0	
28.136000	26.4	1000.000	9.000	GND	L1	11.4	23.6	50.0	

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



Voltage with 4-Line-LISN_N



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	40.3	1000.000	9.000	GND	N	10.0	25.7	66.0	
0.192000	41.4	1000.000	9.000	GND	N	10.0	22.4	63.8	
0.262000	37.5	1000.000	9.000	GND	N	10.0	23.7	61.2	
0.332000	35.7	1000.000	9.000	GND	N	10.0	23.5	59.2	
0.668000	33.8	1000.000	9.000	GND	N	10.0	22.2	56.0	
1.284000	33.9	1000.000	9.000	GND	N	10.1	22.1	56.0	
2.096000	32.7	1000.000	9.000	GND	N	10.1	23.3	56.0	
4.196000	34.3	1000.000	9.000	GND	N	10.2	21.7	56.0	
4.434000	34.8	1000.000	9.000	GND	N	10.2	21.2	56.0	
7.962000	36.6	1000.000	9.000	GND	N	10.3	23.4	60.0	

Final Measurement Detector 2

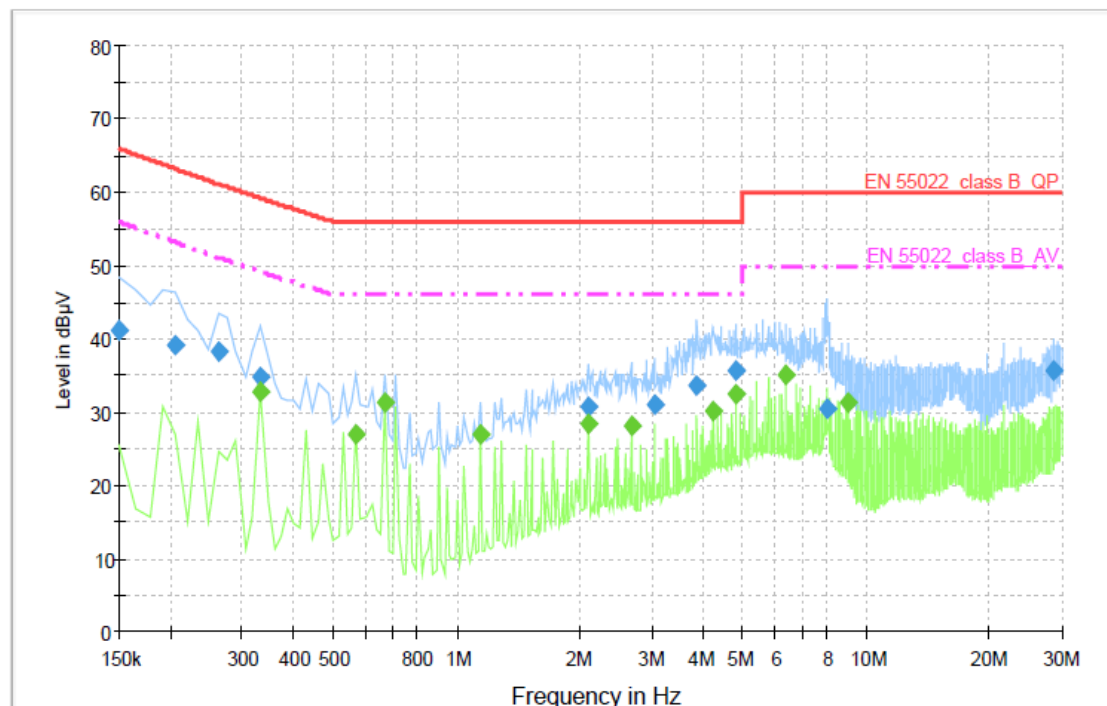
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.430000	29.4	1000.000	9.000	GND	N	10.0	17.7	47.1	
0.570000	28.4	1000.000	9.000	GND	N	10.0	17.6	46.0	
0.668000	32.1	1000.000	9.000	GND	N	10.0	13.9	46.0	
1.144000	27.7	1000.000	9.000	GND	N	10.1	18.3	46.0	
1.284000	31.5	1000.000	9.000	GND	N	10.1	14.5	46.0	
2.096000	28.0	1000.000	9.000	GND	N	10.1	18.0	46.0	
3.048000	27.7	1000.000	9.000	GND	N	10.1	18.3	46.0	
4.238000	29.6	1000.000	9.000	GND	N	10.2	16.4	46.0	
4.812000	30.4	1000.000	9.000	GND	N	10.2	15.6	46.0	
6.240000	30.3	1000.000	9.000	GND	N	10.2	19.7	50.0	

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



◆ Operating condition: 1 024 × 768 / 60 Hz (D-sub: Analog)

Voltage with 4-Line-LISN_L1



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	41.1	1000.000	9.000	GND	L1	10.0	24.9	66.0	
0.206000	39.0	1000.000	9.000	GND	L1	10.0	24.2	63.2	
0.262000	38.1	1000.000	9.000	GND	L1	10.0	23.1	61.2	
0.332000	34.8	1000.000	9.000	GND	L1	10.0	24.4	59.2	
2.096000	30.7	1000.000	9.000	GND	L1	10.1	25.3	56.0	
3.048000	31.0	1000.000	9.000	GND	L1	10.1	25.0	56.0	
3.860000	33.7	1000.000	9.000	GND	L1	10.2	22.3	56.0	
4.812000	35.8	1000.000	9.000	GND	L1	10.2	20.2	56.0	
8.018000	30.4	1000.000	9.000	GND	L1	10.3	29.6	60.0	
28.780000	35.6	1000.000	9.000	GND	L1	11.4	24.4	60.0	

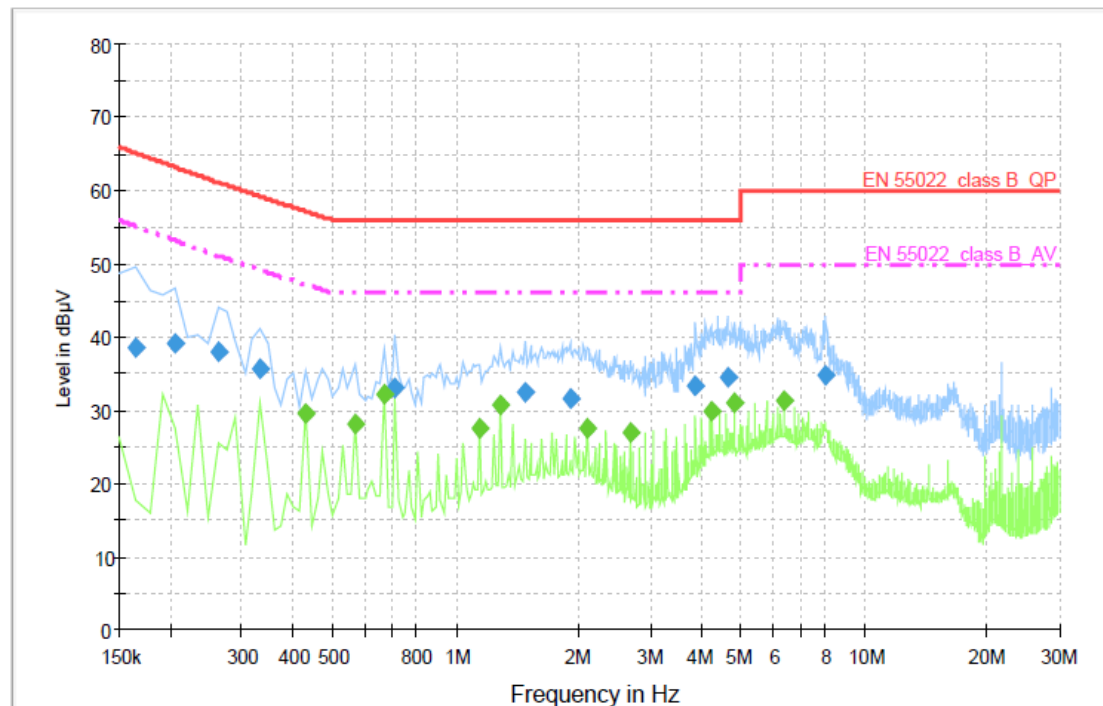
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.332000	32.6	1000.000	9.000	GND	L1	10.0	16.6	49.2	
0.570000	27.0	1000.000	9.000	GND	L1	10.0	19.0	46.0	
0.668000	31.2	1000.000	9.000	GND	L1	10.0	14.8	46.0	
1.144000	27.0	1000.000	9.000	GND	L1	10.1	19.0	46.0	
2.096000	28.3	1000.000	9.000	GND	L1	10.1	17.7	46.0	
2.670000	28.1	1000.000	9.000	GND	L1	10.1	17.9	46.0	
4.238000	30.1	1000.000	9.000	GND	L1	10.2	15.9	46.0	
4.812000	32.6	1000.000	9.000	GND	L1	10.2	13.4	46.0	
6.338000	35.0	1000.000	9.000	GND	L1	10.3	15.0	50.0	
9.054000	31.3	1000.000	9.000	GND	L1	10.4	18.7	50.0	

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



Voltage with 4-Line-LISN_N



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.164000	38.6	1000.000	9.000	GND	N	10.0	26.6	65.2	
0.206000	39.2	1000.000	9.000	GND	N	10.0	24.0	63.2	
0.262000	37.9	1000.000	9.000	GND	N	10.0	23.3	61.2	
0.332000	35.8	1000.000	9.000	GND	N	10.0	23.4	59.2	
0.710000	33.2	1000.000	9.000	GND	N	10.0	22.8	56.0	
1.480000	32.5	1000.000	9.000	GND	N	10.1	23.5	56.0	
1.900000	31.6	1000.000	9.000	GND	N	10.1	24.4	56.0	
3.860000	33.3	1000.000	9.000	GND	N	10.2	22.8	56.0	
4.616000	34.5	1000.000	9.000	GND	N	10.2	21.6	56.0	
8.046000	34.9	1000.000	9.000	GND	N	10.3	25.1	60.0	

Final Measurement Detector 2

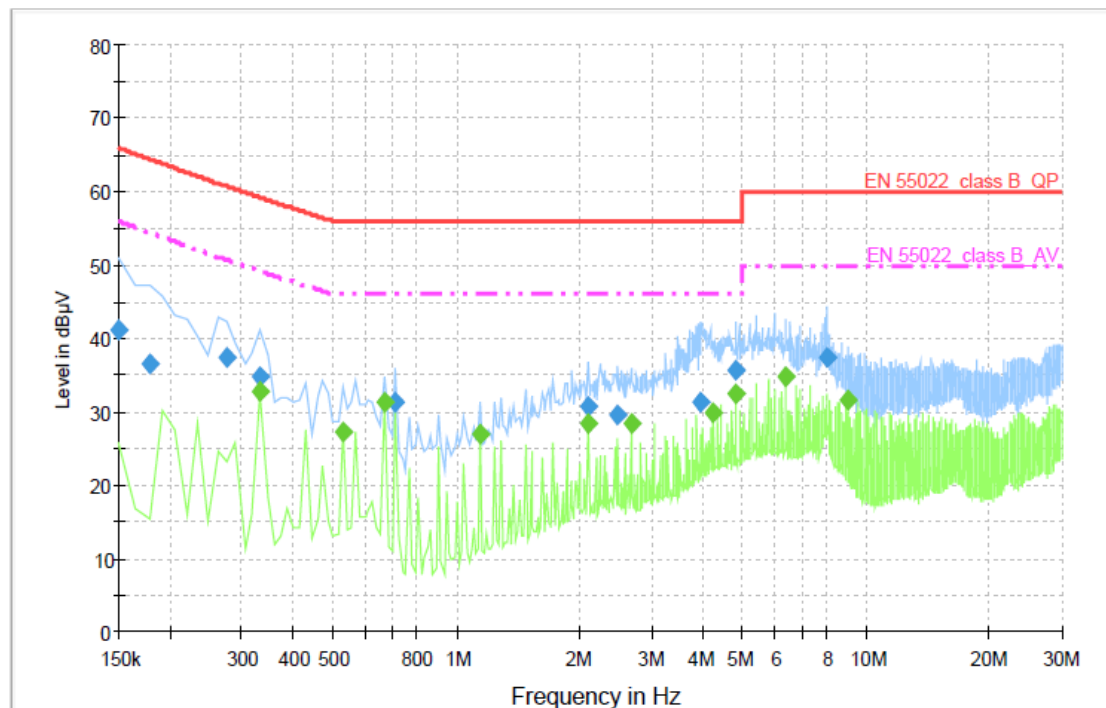
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.430000	29.7	1000.000	9.000	GND	N	10.0	17.4	47.1	
0.570000	28.1	1000.000	9.000	GND	N	10.0	17.9	46.0	
0.668000	32.1	1000.000	9.000	GND	N	10.0	13.9	46.0	
1.144000	27.4	1000.000	9.000	GND	N	10.1	18.6	46.0	
1.284000	30.8	1000.000	9.000	GND	N	10.1	15.2	46.0	
2.096000	27.7	1000.000	9.000	GND	N	10.1	18.3	46.0	
2.670000	26.9	1000.000	9.000	GND	N	10.1	19.1	46.0	
4.238000	29.8	1000.000	9.000	GND	N	10.2	16.2	46.0	
4.812000	31.1	1000.000	9.000	GND	N	10.2	14.9	46.0	
6.338000	31.3	1000.000	9.000	GND	N	10.2	18.7	50.0	

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



◆ Operating condition: 640 × 480 / 60 Hz (D-sub: Analog)

Voltage with 4-Line-LISN_L1



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	41.1	1000.000	9.000	GND	L1	10.0	24.9	66.0	
0.178000	36.5	1000.000	9.000	GND	L1	10.0	28.0	64.5	
0.276000	37.3	1000.000	9.000	GND	L1	10.0	23.4	60.7	
0.332000	34.9	1000.000	9.000	GND	L1	10.0	24.3	59.2	
0.710000	31.4	1000.000	9.000	GND	L1	10.0	24.6	56.0	
2.096000	30.6	1000.000	9.000	GND	L1	10.1	25.4	56.0	
2.474000	29.6	1000.000	9.000	GND	L1	10.1	26.4	56.0	
3.944000	31.4	1000.000	9.000	GND	L1	10.2	24.6	56.0	
4.812000	35.7	1000.000	9.000	GND	L1	10.2	20.3	56.0	
8.018000	37.5	1000.000	9.000	GND	L1	10.3	22.5	60.0	

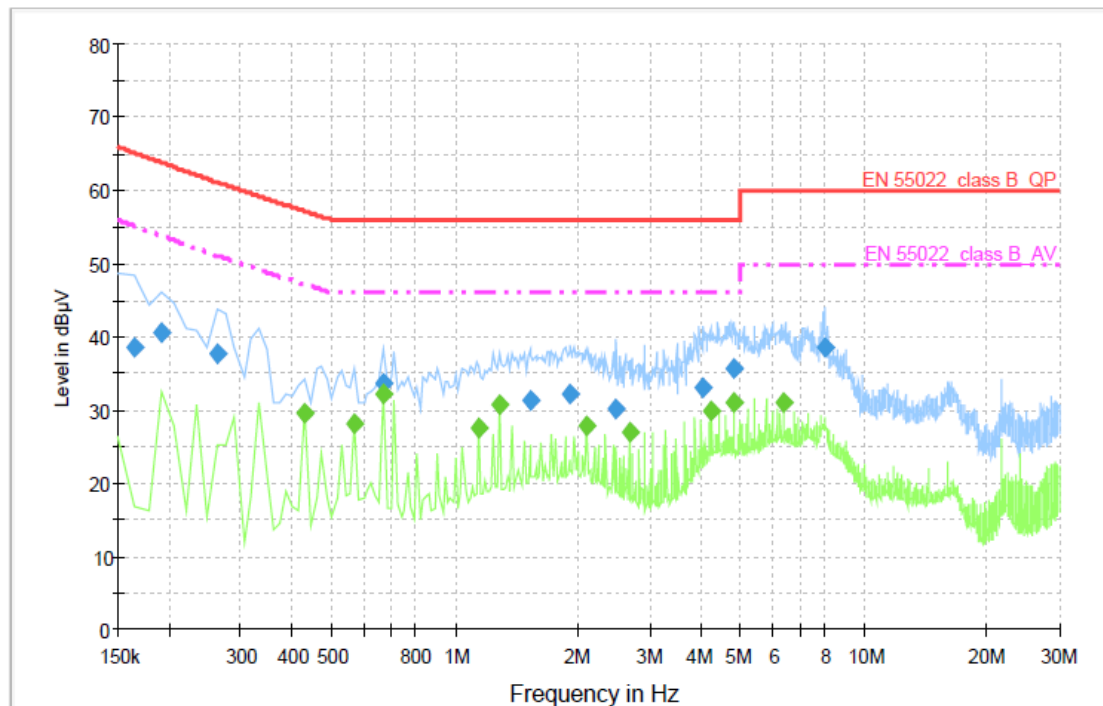
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.332000	32.7	1000.000	9.000	GND	L1	10.0	16.5	49.2	
0.528000	27.2	1000.000	9.000	GND	L1	10.0	18.8	46.0	
0.668000	31.2	1000.000	9.000	GND	L1	10.0	14.8	46.0	
1.144000	27.0	1000.000	9.000	GND	L1	10.1	19.0	46.0	
2.096000	28.3	1000.000	9.000	GND	L1	10.1	17.7	46.0	
2.670000	28.3	1000.000	9.000	GND	L1	10.1	17.7	46.0	
4.238000	29.9	1000.000	9.000	GND	L1	10.2	16.1	46.0	
4.812000	32.5	1000.000	9.000	GND	L1	10.2	13.5	46.0	
6.338000	34.8	1000.000	9.000	GND	L1	10.3	15.2	50.0	
9.054000	31.7	1000.000	9.000	GND	L1	10.4	18.3	50.0	

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



Voltage with 4-Line-LISN_N



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.164000	38.4	1000.000	9.000	GND	N	10.0	26.8	65.2	
0.192000	40.6	1000.000	9.000	GND	N	10.0	23.2	63.8	
0.262000	37.8	1000.000	9.000	GND	N	10.0	23.4	61.2	
0.668000	33.7	1000.000	9.000	GND	N	10.0	22.3	56.0	
1.522000	31.2	1000.000	9.000	GND	N	10.1	24.8	56.0	
1.914000	32.1	1000.000	9.000	GND	N	10.1	23.9	56.0	
2.474000	30.1	1000.000	9.000	GND	N	10.1	25.9	56.0	
4.042000	33.0	1000.000	9.000	GND	N	10.2	23.0	56.0	
4.812000	35.6	1000.000	9.000	GND	N	10.2	20.4	56.0	
8.018000	38.7	1000.000	9.000	GND	N	10.3	21.3	60.0	

Final Measurement Detector 2

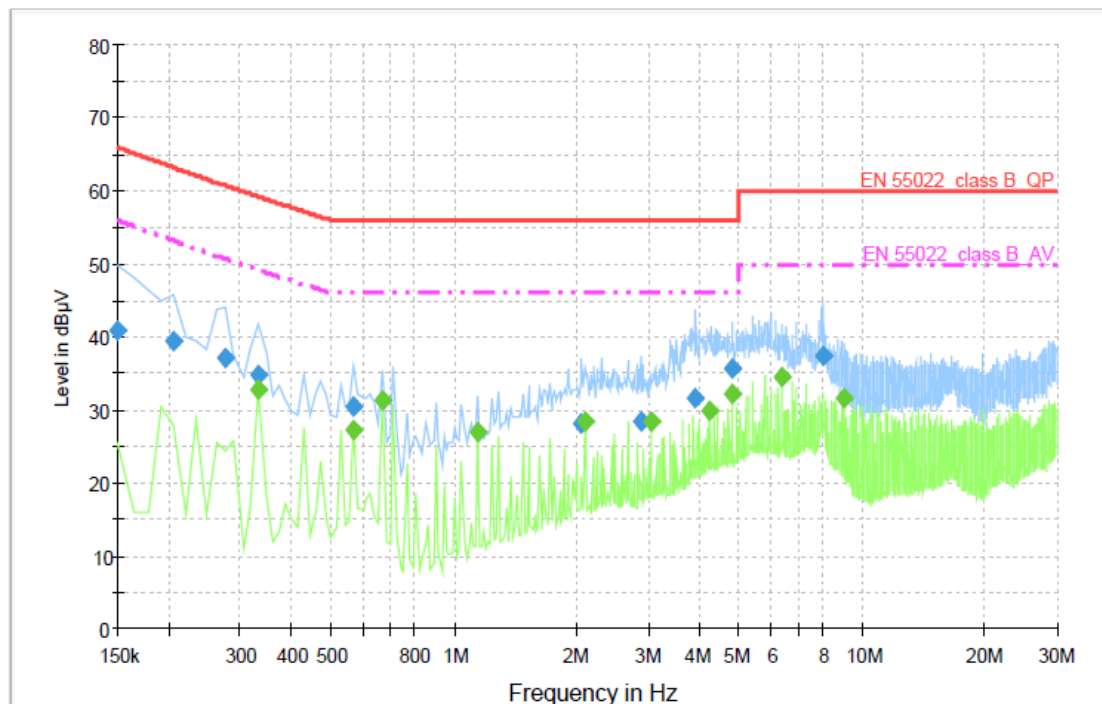
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.430000	29.7	1000.000	9.000	GND	N	10.0	17.4	47.1	
0.570000	28.1	1000.000	9.000	GND	N	10.0	18.0	46.0	
0.668000	32.1	1000.000	9.000	GND	N	10.0	13.9	46.0	
1.144000	27.5	1000.000	9.000	GND	N	10.1	18.5	46.0	
1.284000	30.8	1000.000	9.000	GND	N	10.1	15.2	46.0	
2.096000	27.7	1000.000	9.000	GND	N	10.1	18.3	46.0	
2.670000	27.0	1000.000	9.000	GND	N	10.1	19.0	46.0	
4.238000	29.8	1000.000	9.000	GND	N	10.2	16.2	46.0	
4.812000	31.0	1000.000	9.000	GND	N	10.2	15.0	46.0	
6.338000	31.1	1000.000	9.000	GND	N	10.2	18.9	50.0	

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



◆ Operating condition: 1 600 × 1 200 / 60 Hz (DVI-D: Digital)

Voltage with 4-Line-LISN_L1



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	40.9	1000.000	9.000	GND	L1	10.0	25.2	66.0	
0.206000	39.3	1000.000	9.000	GND	L1	10.0	23.9	63.2	
0.276000	37.1	1000.000	9.000	GND	L1	10.0	23.6	60.7	
0.332000	34.9	1000.000	9.000	GND	L1	10.0	24.3	59.2	
0.570000	30.3	1000.000	9.000	GND	L1	10.0	25.7	56.0	
2.054000	28.1	1000.000	9.000	GND	L1	10.1	27.9	56.0	
2.866000	28.5	1000.000	9.000	GND	L1	10.1	27.5	56.0	
3.902000	31.6	1000.000	9.000	GND	L1	10.2	24.4	56.0	
4.812000	35.7	1000.000	9.000	GND	L1	10.2	20.3	56.0	
8.032000	37.4	1000.000	9.000	GND	L1	10.3	22.6	60.0	

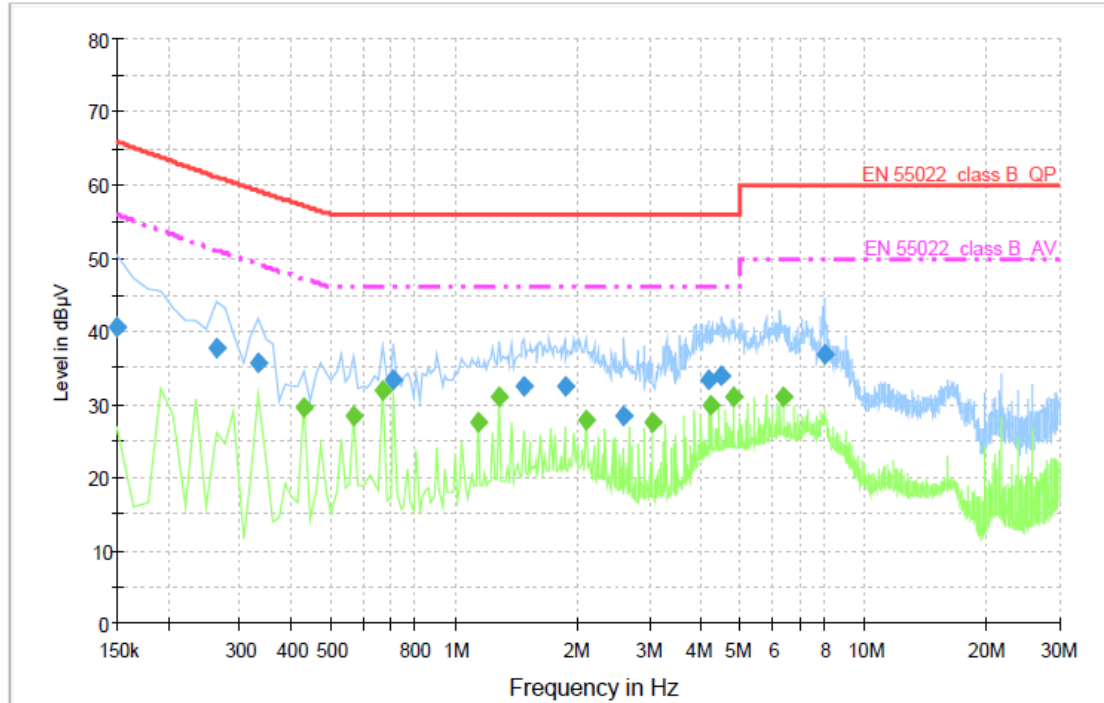
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.332000	32.8	1000.000	9.000	GND	L1	10.0	16.4	49.2	
0.570000	27.2	1000.000	9.000	GND	L1	10.0	18.8	46.0	
0.668000	31.3	1000.000	9.000	GND	L1	10.0	14.7	46.0	
1.144000	27.0	1000.000	9.000	GND	L1	10.1	19.0	46.0	
2.096000	28.3	1000.000	9.000	GND	L1	10.1	17.7	46.0	
3.048000	28.4	1000.000	9.000	GND	L1	10.1	17.6	46.0	
4.238000	29.8	1000.000	9.000	GND	L1	10.2	16.2	46.0	
4.812000	32.3	1000.000	9.000	GND	L1	10.2	13.7	46.0	
6.338000	34.6	1000.000	9.000	GND	L1	10.3	15.4	50.0	
9.054000	31.6	1000.000	9.000	GND	L1	10.4	18.4	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
0.150000	40.6	1000.000	9.000	GND	N	10.0	25.4	66.0	
0.262000	37.8	1000.000	9.000	GND	N	10.0	23.4	61.2	
0.332000	35.6	1000.000	9.000	GND	N	10.0	23.6	59.2	
0.710000	33.4	1000.000	9.000	GND	N	10.0	22.6	56.0	
1.480000	32.5	1000.000	9.000	GND	N	10.1	23.5	56.0	
1.858000	32.3	1000.000	9.000	GND	N	10.1	23.7	56.0	
2.600000	28.3	1000.000	9.000	GND	N	10.1	27.7	56.0	
4.182000	33.2	1000.000	9.000	GND	N	10.2	22.8	56.0	
4.490000	33.8	1000.000	9.000	GND	N	10.2	22.2	56.0	
8.032000	36.8	1000.000	9.000	GND	N	10.3	23.2	60.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.430000	29.6	1000.000	9.000	GND	N	10.0	17.5	47.1	
0.570000	28.3	1000.000	9.000	GND	N	10.0	17.7	46.0	
0.668000	32.0	1000.000	9.000	GND	N	10.0	14.0	46.0	
1.144000	27.5	1000.000	9.000	GND	N	10.1	18.5	46.0	
1.284000	31.0	1000.000	9.000	GND	N	10.1	15.0	46.0	
2.096000	27.8	1000.000	9.000	GND	N	10.1	18.2	46.0	
3.048000	27.4	1000.000	9.000	GND	N	10.1	18.6	46.0	
4.238000	29.9	1000.000	9.000	GND	N	10.2	16.1	46.0	
4.812000	31.0	1000.000	9.000	GND	N	10.2	15.0	46.0	
6.338000	31.0	1000.000	9.000	GND	N	10.2	19.0	50.0	

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



6. Radiated Emission

6.1 Operating Environment

Temperature : 24 °C
Relative Humidity : 44 % 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(Anechoic Chamber)	Uncertainty	Remark
Radiated emission (30 MHz ~ 300 MHz, 3 m, Vertical)	± 4.32 dB	Confidence levels of 95 % ($k = 2$)
Radiated emission (30 MHz ~ 300 MHz, 3 m, Horizontal)	± 4.21 dB	Confidence levels of 95 % ($k = 2$)
Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Vertical)	± 3.96 dB	Confidence levels of 95 % ($k = 2$)
Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Horizontal)	± 3.97 dB	Confidence levels of 95 % ($k = 2$)



6.4 Limit

Frequency (MHz)	FCC Limit @ 3 m. dB μ V/m	CISPR Limit @ 10 m. dB μ V/m
30 ~ 88	40.0	30.0
88 ~ 216	43.5	30.0
216 ~ 230	46.0	30.0
230 ~ 960	46.0	37.0
960 ~ 1 000	54.0	37.0
> 1 000	54.0	No Specified limit

6.5 Test Equipment used

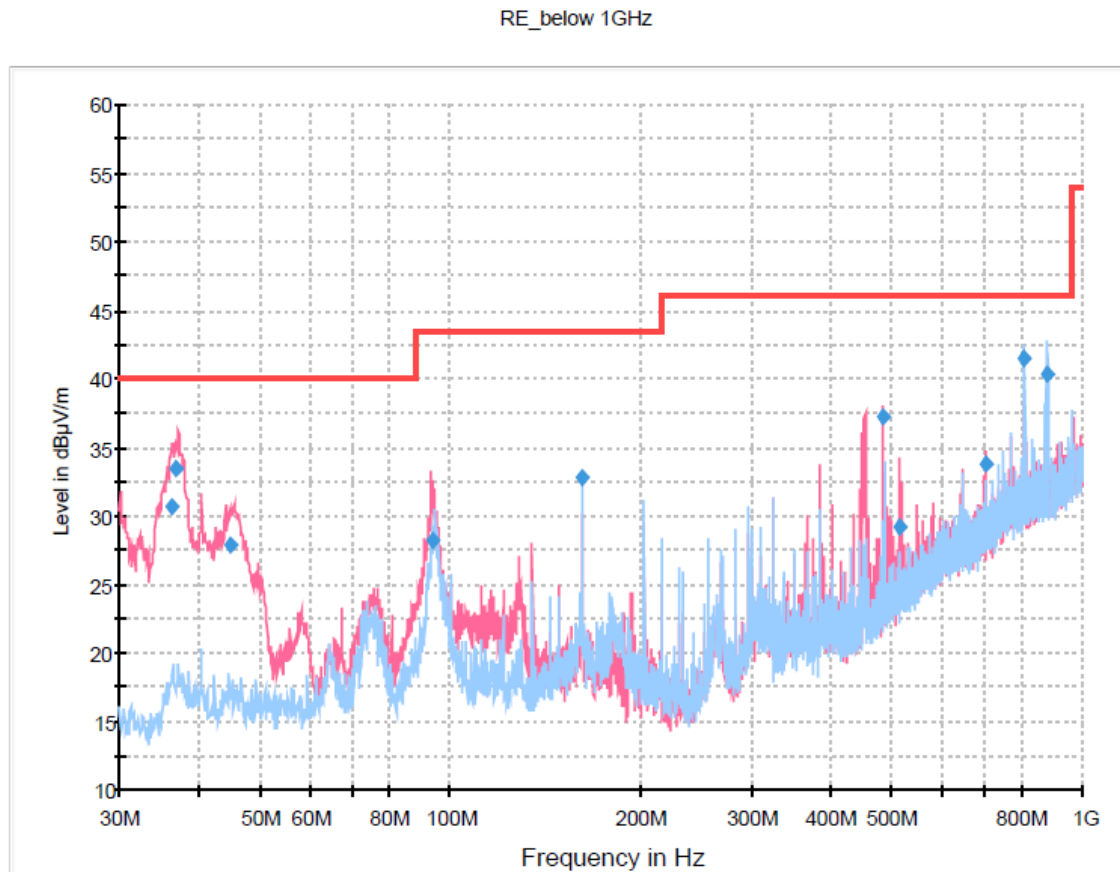
Model Name	Manufacturer	Description	Serial Number	Due to Calibration
■ - ESIB26	Rohde & Schwarz	EMI Test Receiver	830482/010	12. 11. 2010
■ - VULB9160	Schwarzbeck	Broadband Test Antenna	3193	03. 15. 2012
■ - BBHA9120D	Schwarzbeck	Horn ANT	207	12. 22. 2011
■ - MCU066	maturo GmbH	Position Controller	1390306	N/A
■ - TT2.5SI	maturo GmbH	Turntable	1390307	N/A
■ - AM 4.0	maturo GmbH	Antenna Mast	1390308	N/A
■ - AFS44-00101800-25-10P-44	MITEQ	Preamplifier(inside rack)	1258943	11. 12. 2011

6.6 Test data for Radiated Emission

- Test Date : November 11 ~ 13, 2010
- Resolution Bandwidth : 120 kHz/1 MHz
- Frequency Range : 30 MHz ~ 2 000 MHz
- Measurement Distance : 3 m
- Note : The highest frequency of the internal source of the EUT is between 108 MHz and 500 MHz (162 MHz). The measurement was made up to 2 000 MHz



- ◆ Operating Condition: 1 600 × 1 200 / 60 Hz (D-sub: Analog)
Red trace: Vertical polarization, Blue trace: Horizontal polarization



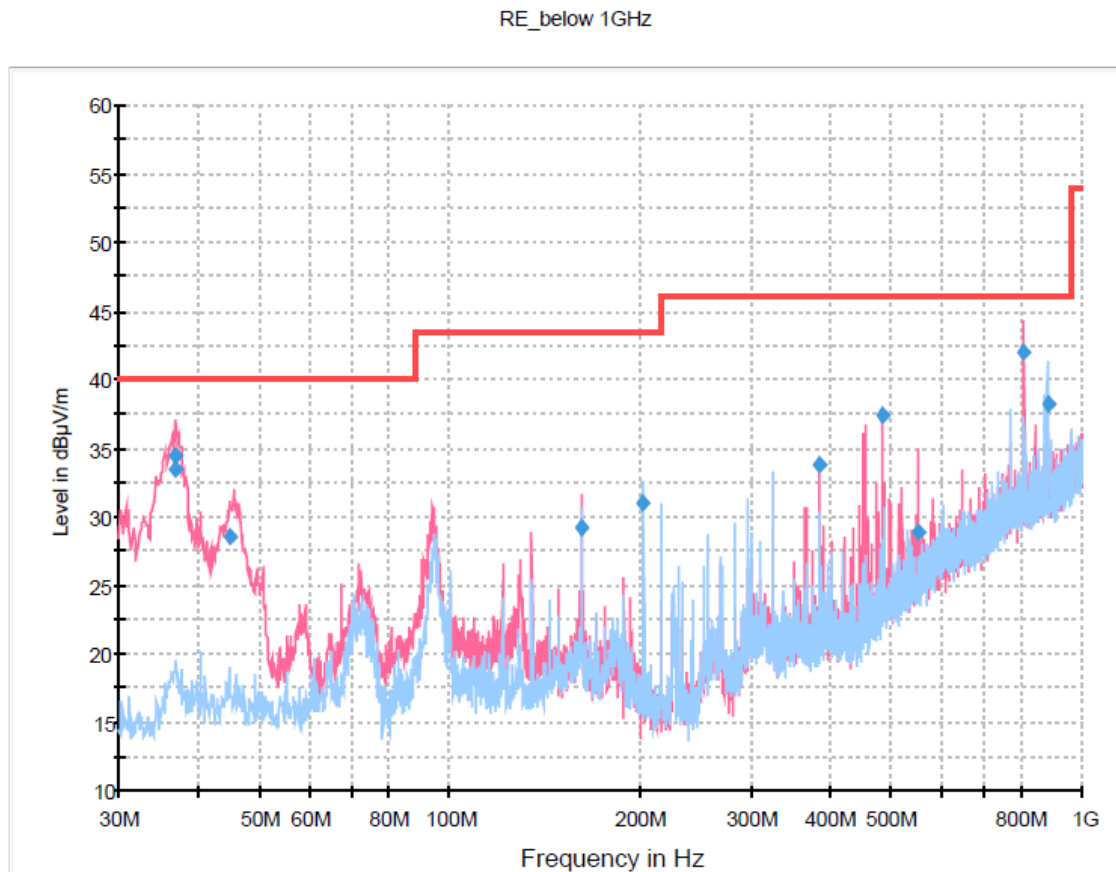
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
36.438750	30.7	1000.0	120.000	200.0	V	200.0	11.9	9.30	40.00
36.815000	33.4	1000.0	120.000	100.0	V	219.0	12.0	6.60	40.00
45.046250	27.9	1000.0	120.000	100.0	V	188.0	12.5	12.10	40.00
94.152500	28.3	1000.0	120.000	200.0	V	158.0	10.1	15.20	43.50
162.020000	32.7	1000.0	120.000	200.0	H	273.0	15.3	10.80	43.50
483.252500	37.1	1000.0	120.000	100.0	V	108.0	21.4	8.90	46.00
514.813750	29.2	1000.0	120.000	100.0	V	20.0	22.6	16.80	46.00
702.028750	33.8	1000.0	120.000	100.0	V	0.0	26.7	12.20	46.00
810.022500	41.5	1000.0	120.000	100.0	H	148.0	29.0	4.50	46.00
880.907500	40.4	1000.0	120.000	100.0	H	33.0	29.6	5.60	46.00

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



- ◆ Operating Condition: 1 600 × 1 200 / 60 Hz (DVI-D: Digital)
Red trace: Vertical polarization, Blue trace: Horizontal polarization



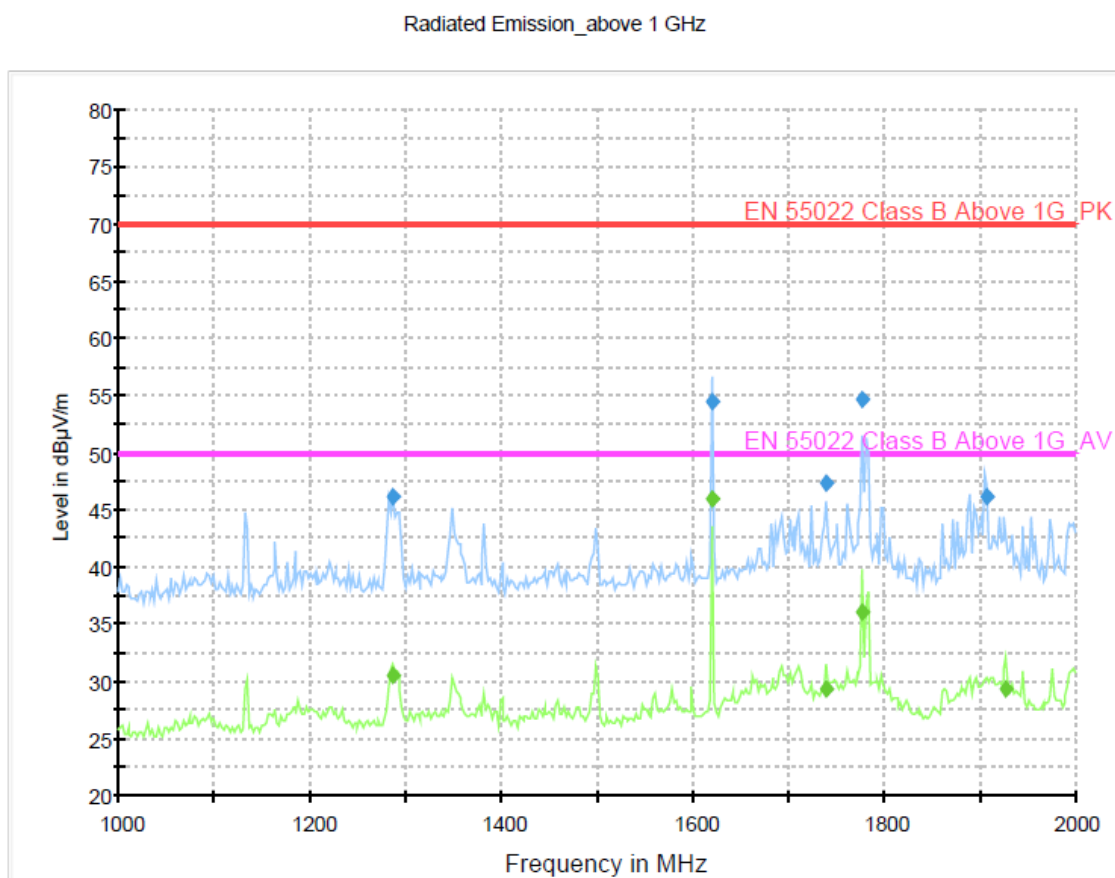
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
36.796250	34.4	1000.0	120.000	100.0	V	203.0	12.0	5.60	40.00
36.851250	33.5	1000.0	120.000	100.0	V	312.0	12.0	6.50	40.00
45.021250	28.5	1000.0	120.000	100.0	V	182.0	12.5	11.50	40.00
161.980000	29.1	1000.0	120.000	100.0	V	7.0	15.3	14.40	43.50
202.517500	31.0	1000.0	120.000	100.0	H	249.0	11.9	12.50	43.50
383.990000	33.7	1000.0	120.000	200.0	V	0.0	17.7	12.30	46.00
483.252500	37.4	1000.0	120.000	100.0	V	76.0	21.4	8.60	46.00
548.941250	28.8	1000.0	120.000	100.0	V	0.0	23.4	17.20	46.00
810.022500	42.0	1000.0	120.000	200.0	V	149.0	29.0	4.00	46.00
881.397500	38.2	1000.0	120.000	100.0	H	305.0	29.6	7.80	46.00

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



- ◆ Operating Condition: 1 600 × 1 200 / 60 Hz (D-sub: Analog)
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)
1286.773146	46.2	100.0	1000.000	139.0	H	234.0	-14.4	23.8	70.0
1619.842485	54.4	100.0	1000.000	100.0	H	173.0	-13.6	15.6	70.0
1740.078958	47.3	100.0	1000.000	150.0	H	284.0	-13.4	22.7	70.0
1776.955110	54.6	100.0	1000.000	145.0	V	141.0	-13.2	15.4	70.0
1907.211623	46.1	100.0	1000.000	150.0	H	290.0	-13.1	23.9	70.0

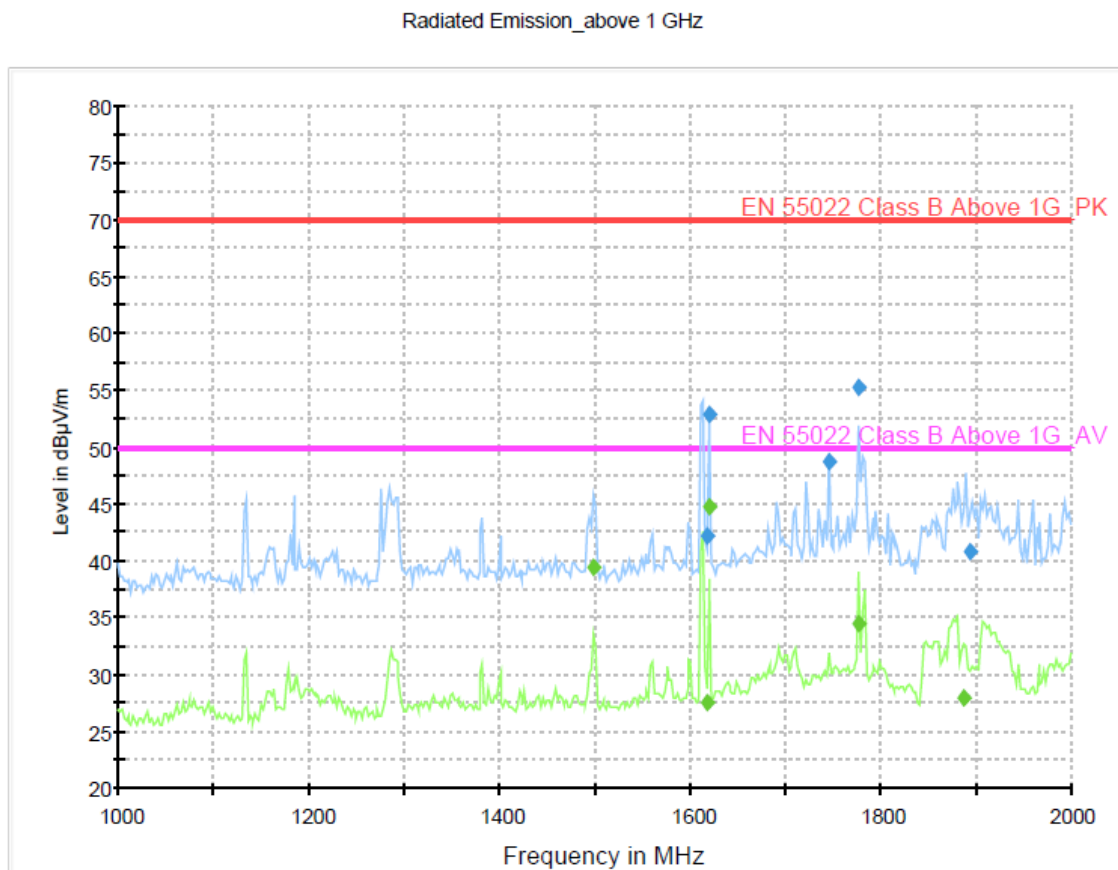
Final Result 2

Frequency (MHz)	Average (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1286.373146	30.6	100.0	1000.000	139.0	H	234.0	-14.4	19.4	50.0
1620.242485	46.0	100.0	1000.000	100.0	H	173.0	-13.6	4.0	50.0
1740.078958	29.4	100.0	1000.000	150.0	H	284.0	-13.4	20.6	50.0
1776.955110	36.0	100.0	1000.000	173.0	V	141.0	-13.2	14.0	50.0
1926.055711	29.4	100.0	1000.000	113.0	H	221.0	-13.0	20.6	50.0

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



- ◆ Operating Condition: 1 600 × 1 200 / 60 Hz (DVI-D: Digital)
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)
1618.226453	42.2	100.0	1000.000	163.0	V	0.0	-13.6	27.8	70.0
1620.238477	52.9	100.0	1000.000	150.0	H	180.0	-13.6	17.1	70.0
1746.890982	48.6	100.0	1000.000	150.0	H	302.0	-13.4	21.4	70.0
1776.955110	55.3	100.0	1000.000	100.0	H	21.0	-13.2	14.7	70.0
1894.379559	40.8	100.0	1000.000	157.0	V	276.0	-13.1	29.2	70.0

Final Result 2

Frequency (MHz)	Average (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1499.997996	39.4	100.0	1000.000	100.0	V	17.0	-14.3	10.6	50.0
1618.226453	27.5	100.0	1000.000	150.0	V	0.0	-13.6	22.5	50.0
1620.242485	44.8	100.0	1000.000	150.0	H	180.0	-13.6	5.2	50.0
1776.955110	34.4	100.0	1000.000	100.0	H	21.0	-13.2	15.6	50.0
1886.763527	28.0	100.0	1000.000	192.0	V	48.0	-13.1	22.0	50.0

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



7. Sample Calculations

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

7.1 Example 1 :

■ 20.3 MHz

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

7.2 Example 2 :

■ 66.7 MHz

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



8. Recommendation & Conclusion

The data collected shows that the **LG Electronics Inc. LCD Monitor (Model Name: ME20CR)** was complies with §15.107 and 15.109 of the FCC Rules.