

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 : May 3, 2010

Order Number: GETEC-C1-10-116

Test Report Number: GETEC-E3-10-055

Test Site: Gumi College EMC Center

FCC Registration Number: (100749, 443957)

FCC ID.: BEJE2380VV

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	: E2380VV, E2380VXV
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



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Scope: Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and / or unintentional radiators for compliance with technical rules and regulations of the Federal Communications Commission.

1. General Information

Applicant: LG Electronics Inc.

Applicant Address: 19-1, Cheongho-ri, Jinwi-myeon, Pyeongteak-si, Gyeonggi-do, Korea.

Manufacturer: LG Electronics Inc.

Manufacturer Address: 19-1, Cheongho-ri, Jinwi-myeon, Pyeongteak-si, Gyeonggi-do, Korea.

Contact Person: Mr. Myoung-Kyu Lee, Chief research engineer

Tel Number: +82-31-610-9623

- **FCC ID.** BEJE2380VV
- **EUT Type** LED LCD Monitor
- **Model Name** E2380VV(basic model), E2380VXV(added with EUT front acrylic panel)
"These model names are given in accordance with customer's requirement that are not effect on EMC performance. All the electrical and mechanical characteristics are the same as basic model except model name designation."
- **Trade Name** LG
- **Serial Number** Prototype
- **Rule Part(s)** FCC Part 15 Subpart B
- **Type of Authority** Certification
- **Test Procedure(s)** ANSI C63.4 (2003) / Canadian standard ICES-003
- **Dates of Test** April 28 ~ 29, 2010
- **Place of Test** **Gumi College EMC Center** (FCC Registration Number: 100749, 443957)
407, Bugok-dong, Gumi-si, Gyeongbuk, Korea.
- **Test Report Number** GETEC-E3-10-055
- **Dates of Issue** May 3, 2010



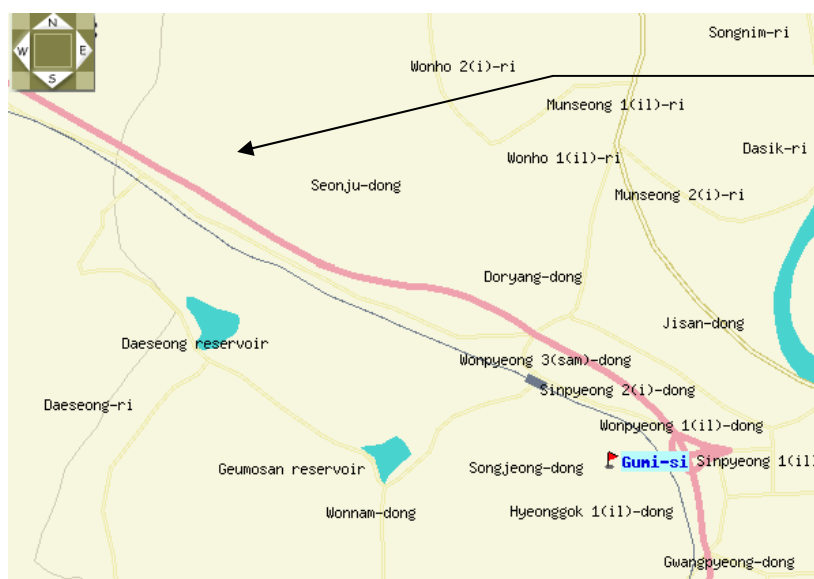
2. Introduction

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. LED LCD Monitor (Model Name: E2380VV, E2380VXV)**

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 on e of the highest point of Gumi 1 college at about 200 km away from Seoul city and 40 km away from Daegu city. It is located in the valley surrounded by mountains in all directions where ambient radio signal conditions are quiet and a favorable area to measure the radio frequency interference on open field test site for the computing and ISM devices manufactures. The detailed description of the measurement facility was found to be in compliance with the requirements of §2.948 according to ANSI C63.4 (2003)



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Gyeongbuk 730-711, Korea.
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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. LED LCD Monitor (Model Name: E2380VV, E2380VXV) FCC ID.: BEJE2380VV**

-. LCD Panel	: 58.42 cm (23 inch) Flat Panel Active matrix-TFT LCD Anti-Glare coating Visible diagonal size: 58.42 cm 0.266 mm × 0.266 mm (Pixel Pitch)
-. Maximum Resolution	: 1 920 × 1 080 @ 60 Hz
-. Sync Input	: Horizontal Freq. Analog, Digital: 30 kHz to 83 kHz (Automatic) HDMI: 30 kHz to 83 kHz (Automatic) Vertical Freq. Analog, Digital: 56 Hz to 75 Hz (Automatic) HDMI: 56 Hz to 61 Hz (Automatic) Input Form Separate Sync., Digital
-. Used AC/DC Adapter	: Model name: LCAP07F Manufacturer: Genmao (Suzhou) Electronic Co., Ltd. Input ratings: (100 – 240) V~, (50 / 60) Hz, 1.0 A Output ratings: DC 12 V, 3.0 A Serial number: EA1OQ320086033770(1.4)
-. Power Consumption	: 28 W
-. Dimensions	: 55.39 cm(W) × 44.84 cm(H) × 19.45 cm(D)
-. Weight	: 3.7 kg
-. Maximum Frequency range	: 148.5 MHz



3.2 Support Equipment / Cables used

3.2.1 Used Support Equipment

Description	Manufacturer	Model Name	S/N & FCC ID.
PC H	ewlett Packard	D530	S/N: CNG34800PY FCC ID.: DoC
Video card	ATI	ATI RV360(9600)	S/N: SN0402017176 FCC ID.: DoC
Key board	COMPAQ	166516-AD6	S/N: B13BBOR391006D FCC ID.: AQ6-23K15
PS2 mouse	LOGITECH	M-S69	S/N: 334684-108 FCC ID.: JNZ211443
Joy stick	MICROSOFT	X05-92626	S/N: 9262600296169 FCC ID.: DoC
DVD player	LG Electronics Inc.	LC-954	S/N: 3850R-Z674K FCC ID.: DoC
Printer Hewlett	Packard	970CXI	S/N: MY9B01F1FG FCC ID.: DoC
Headset G	OWOONSORI	GW-500M	S/N: N/A FCC ID.: -

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

3.2.2 System configuration

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



3.2.3 Used Cable(s)

Cable Name	Condition	Description
Power cable	Connected to the adapter	1.80 m unshielded
Adapter cable	Connected to the EUT	1.25 m shielded with a ferrite core
D-Sub(Analog) in cable	Connected to the EUT and PC	1.80 m shielded with two ferrite cores
DVI-D(Digital) in cable	Connected to the EUT and PC	2.00 m shielded with two ferrite cores
HDMI in cable	Connected to the EUT and DVD player	2.00 m shielded
Headset cable	Connected to the EUT and headset	2.75 m shielded

3.3 Modification Item(s)

- None



4. Description of tests

4.1 Test Condition

The EUT was installed, arranged and operated in a manner that is most representative of equipment as typically used. The measurements were carried out while varying operating modes and cable positions within typically arrangement to determine maximum emission level.

The representative and worst test mode(s) were noted in the test report.

- Test Voltage / Frequency : AC 120 V / 60 Hz

- Test Mode(s)

- . **Monitor mode**

Radiated emission: 1 920 × 1 080 / 60 Hz (D-Sub: Analog, DVI-D: Digital)

Conducted emission: 1 920 × 1 080 / 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

"The verification report for AV mode would be issued by LG Electronics Inc."



4.2 Conducted Emission

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

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

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

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

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

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

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

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

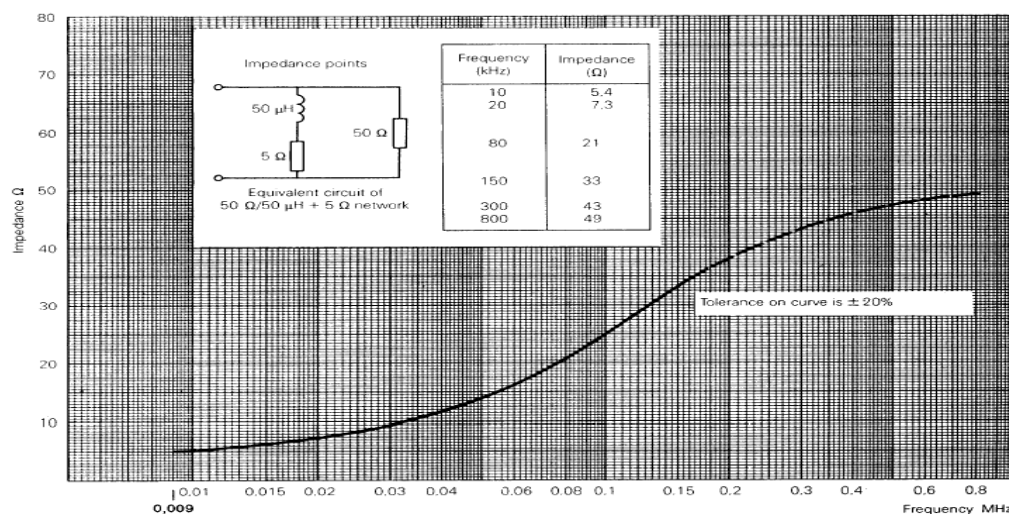


Fig 2. Impedance of LISN



4.3 Radiated Emission

Preliminary measurements were conducted 3 m semi anechoic chamber using broadband antennas to determine the frequency producing the maximum EME. Appropriate precaution was taken to ensure that all EME from the EUT were maximized and investigated. The technology configuration, mode of operation and turn table 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

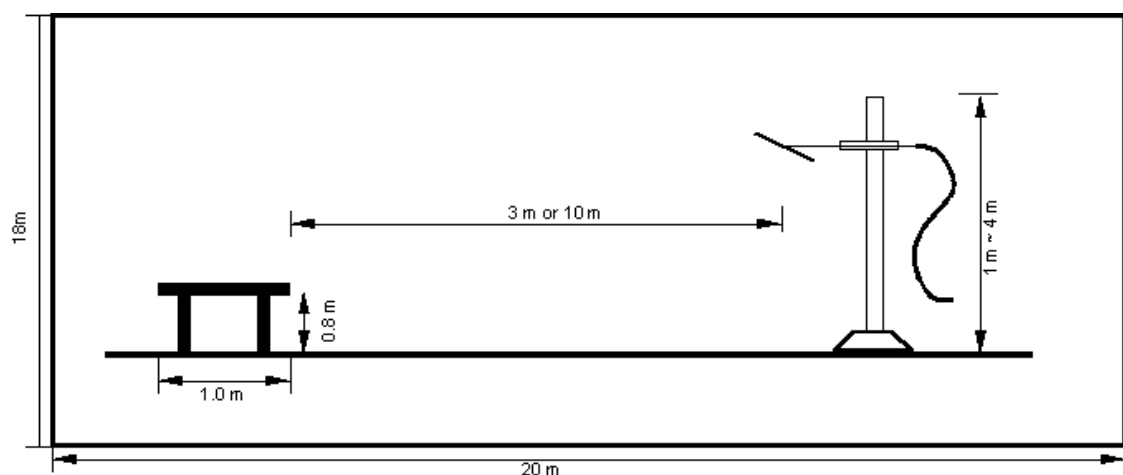


Fig 3. Dimensions of test site.



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 (GR P) wall and 0.8 m from AMN.

AMN is bonded on horizontal reference ground plane.

The ground plane, which was electrically bonded to the shield room, ground system and all power lines entering the shield room, were filtered.

5.3 Measurement Uncertainty

The measurement uncertainty was calculated in accordance with ISO "Guide to the expression of uncertainty in measurement."

The measurement uncertainty was given with a confidence of 95 %.

Test Items	Uncertainty	Remark
Conducted emission (9 kHz ~ 150 kHz)	± 2.69 dB	Confidence levels of 95 % ($k = 2$)
Conducted emission (150 kHz ~ 30 MHz)	± 4.16 dB	Confidence levels of 95 % ($k = 2$)



5.4 Limit

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

5.5 Test Equipment used

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

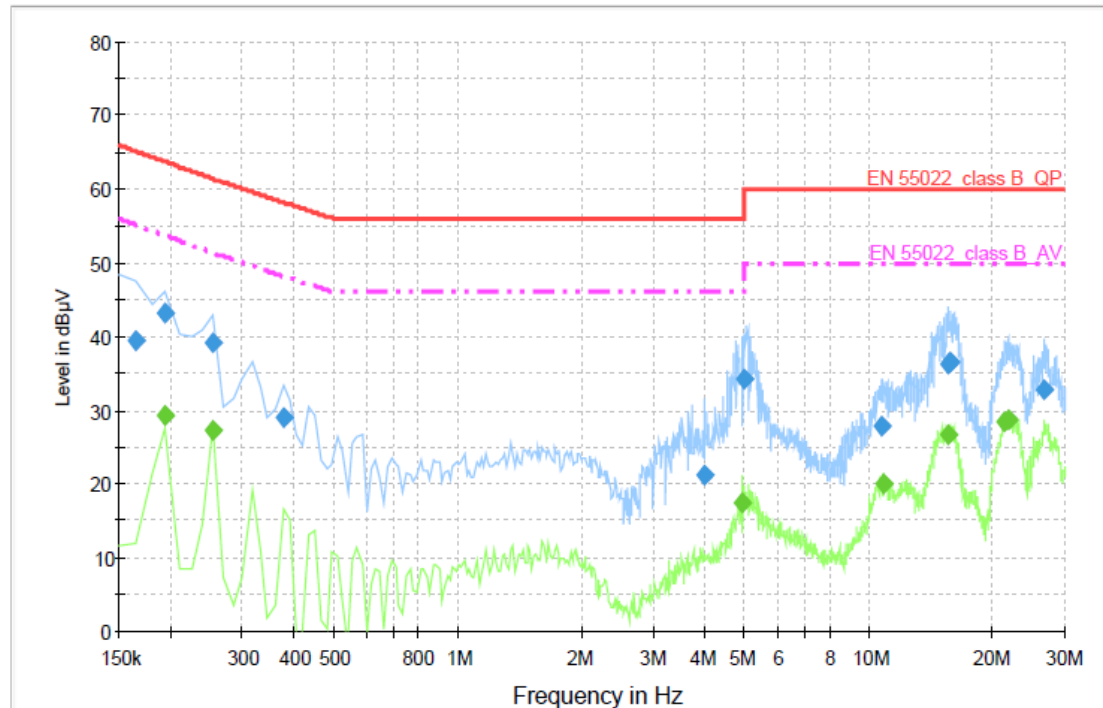
5.6 Test data for Conducted Emission

- Test Date : April 28, 2010
- Resolution Bandwidth : 9 kHz
- Frequency Range : 0.15 MHz ~ 30 MHz



◆ Operating condition: 1 920 × 1 080 / 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
0.165000	39.5	1000.000	9.000	GND	L1	10.0	25.6	65.1	
0.195000	43.2	1000.000	9.000	GND	L1	10.0	20.5	63.7	
0.255000	39.1	1000.000	9.000	GND	L1	10.0	22.3	61.4	
0.375000	28.9	1000.000	9.000	GND	L1	10.0	29.3	58.2	
3.990000	21.1	1000.000	9.000	GND	L1	10.2	34.9	56.0	
4.980000	34.2	1000.000	9.000	GND	L1	10.2	21.8	56.0	
10.740000	27.8	1000.000	9.000	GND	L1	10.4	32.2	60.0	
15.570000	36.2	1000.000	9.000	GND	L1	10.7	23.8	60.0	
15.825000	36.6	1000.000	9.000	GND	L1	10.8	23.4	60.0	
26.685000	32.7	1000.000	9.000	GND	L1	11.3	27.3	60.0	

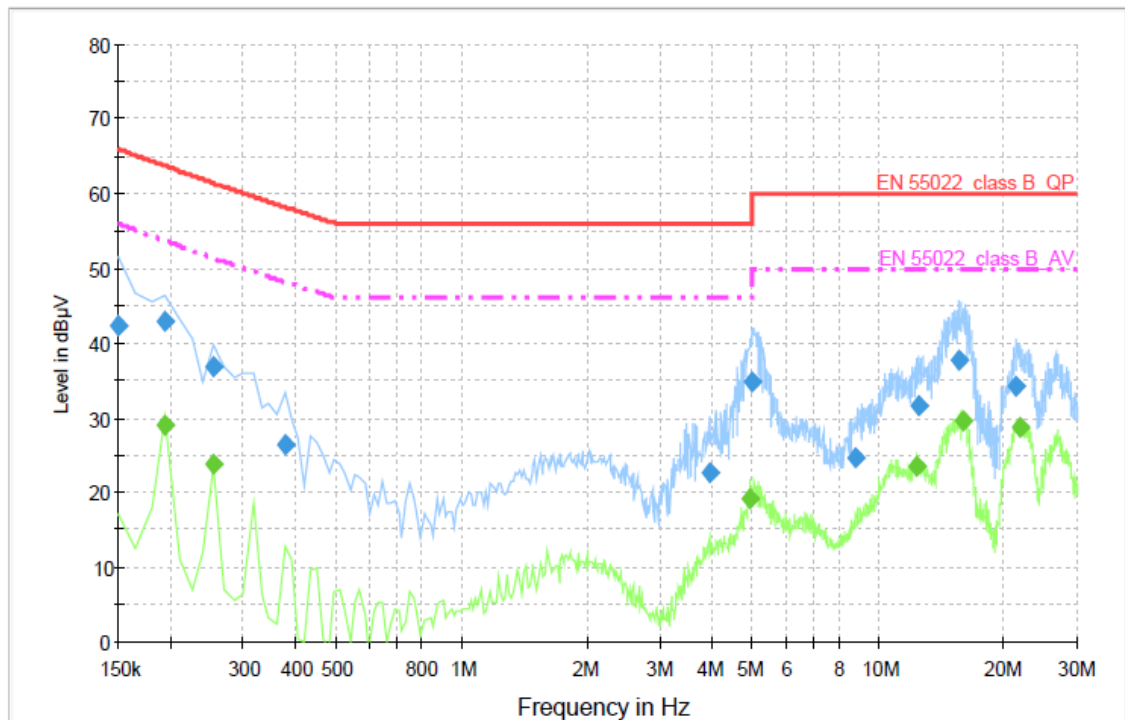
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.195000	29.2	1000.000	9.000	GND	L1	10.0	24.5	53.7	
0.255000	27.2	1000.000	9.000	GND	L1	10.0	24.1	51.3	
4.920000	17.3	1000.000	9.000	GND	L1	10.2	28.7	46.0	
10.845000	19.9	1000.000	9.000	GND	L1	10.5	30.1	50.0	
15.660000	26.7	1000.000	9.000	GND	L1	10.8	23.3	50.0	
21.510000	28.5	1000.000	9.000	GND	L1	11.1	21.5	50.0	
21.780000	28.6	1000.000	9.000	GND	L1	11.1	21.4	50.0	

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



Voltage with 4-Line-LISN_N



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.150000	42.2	1000.000	9.000	GND	N	10.0	23.8	66.0	
0.195000	43.0	1000.000	9.000	GND	N	10.0	20.7	63.7	
0.255000	36.8	1000.000	9.000	GND	N	10.0	24.6	61.4	
0.375000	26.2	1000.000	9.000	GND	N	10.0	32.0	58.2	
3.915000	22.6	1000.000	9.000	GND	N	10.2	33.4	56.0	
4.965000	34.7	1000.000	9.000	GND	N	10.2	21.3	56.0	
8.805000	24.7	1000.000	9.000	GND	N	10.3	35.3	60.0	
12.495000	31.5	1000.000	9.000	GND	N	10.5	28.5	60.0	
15.630000	37.8	1000.000	9.000	GND	N	10.6	22.2	60.0	
21.480000	34.1	1000.000	9.000	GND	N	10.8	25.9	60.0	

Final Measurement Detector 2

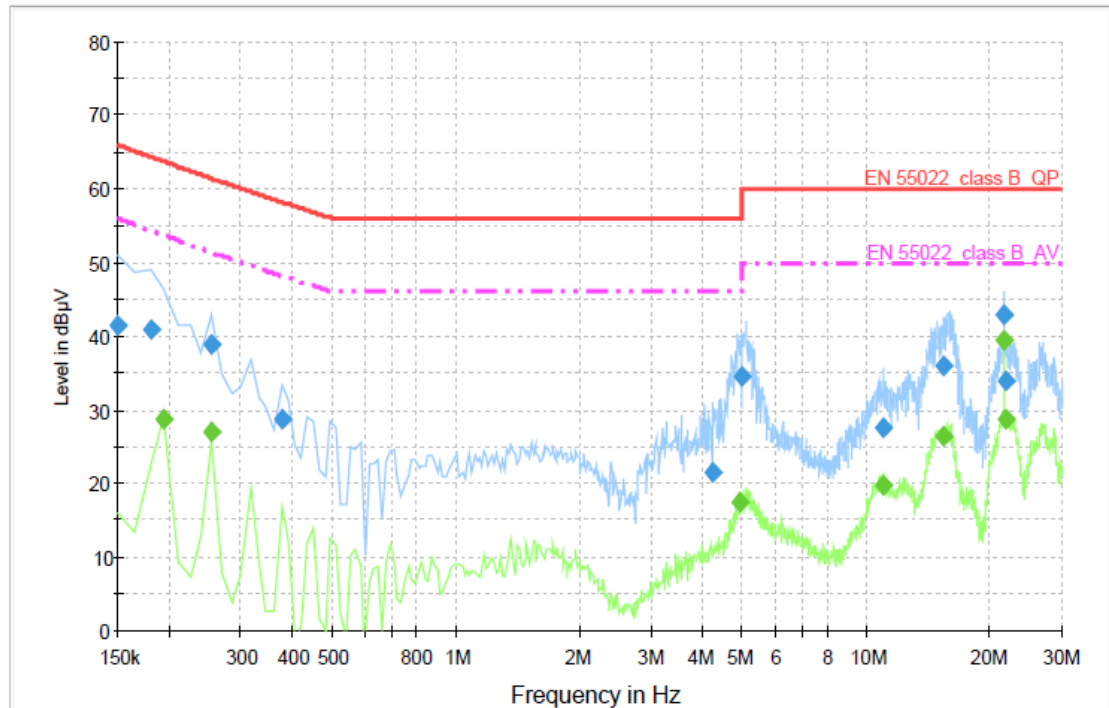
Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.195000	28.8	1000.000	9.000	GND	N	10.0	24.9	53.7	
0.255000	23.7	1000.000	9.000	GND	N	10.0	27.6	51.3	
4.920000	19.1	1000.000	9.000	GND	N	10.2	26.9	46.0	
12.420000	23.5	1000.000	9.000	GND	N	10.5	26.5	50.0	
15.975000	29.7	1000.000	9.000	GND	N	10.6	20.3	50.0	
21.945000	28.6	1000.000	9.000	GND	N	10.8	21.4	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	41.4	1000.000	9.000	GND	L1	10.0	24.6	66.0	
0.180000	41.0	1000.000	9.000	GND	L1	10.0	23.4	64.4	
0.255000	38.8	1000.000	9.000	GND	L1	10.0	22.6	61.4	
0.375000	28.8	1000.000	9.000	GND	L1	10.0	29.4	58.2	
4.230000	21.5	1000.000	9.000	GND	L1	10.2	34.5	56.0	
4.965000	34.6	1000.000	9.000	GND	L1	10.2	21.4	56.0	
10.965000	27.6	1000.000	9.000	GND	L1	10.5	32.4	60.0	
15.465000	35.9	1000.000	9.000	GND	L1	10.7	24.1	60.0	
21.600000	43.0	1000.000	9.000	GND	L1	11.1	17.0	60.0	
21.840000	33.8	1000.000	9.000	GND	L1	11.1	26.2	60.0	

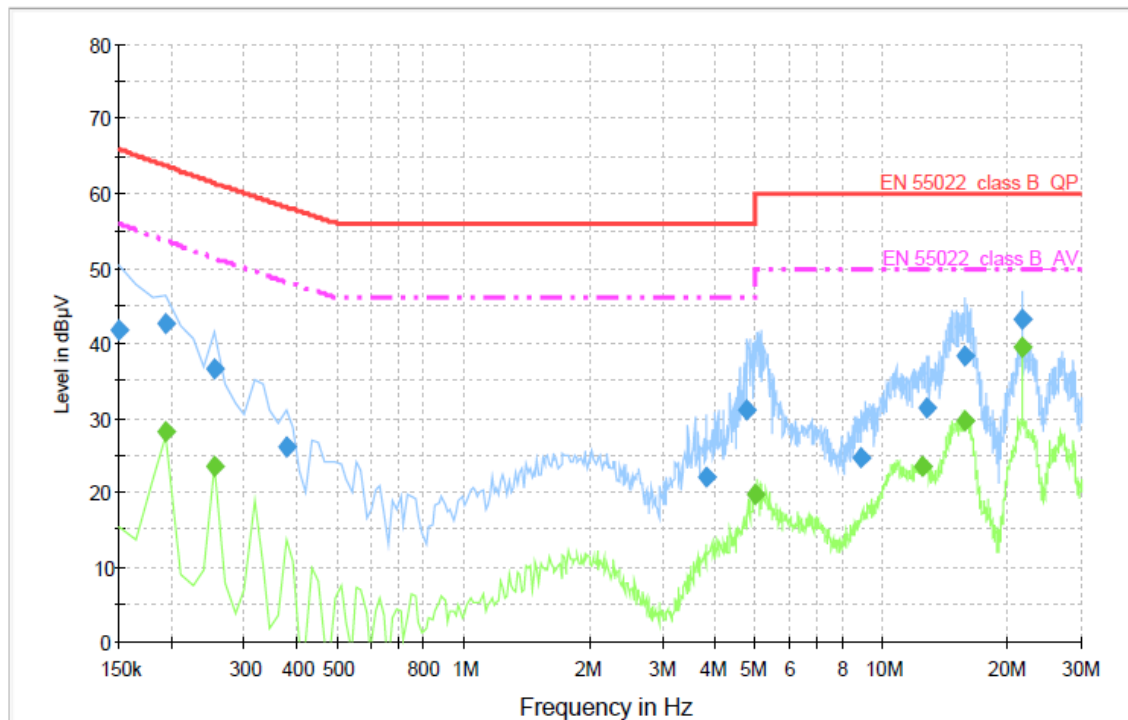
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.195000	28.8	1000.000	9.000	GND	L1	10.0	24.9	53.7	
0.255000	26.9	1000.000	9.000	GND	L1	10.0	24.4	51.3	
4.920000	17.4	1000.000	9.000	GND	L1	10.2	28.6	46.0	
10.965000	19.8	1000.000	9.000	GND	L1	10.5	30.2	50.0	
15.360000	26.5	1000.000	9.000	GND	L1	10.7	23.5	50.0	
21.600000	39.4	1000.000	9.000	GND	L1	11.1	10.6	50.0	
21.840000	28.6	1000.000	9.000	GND	L1	11.1	21.4	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
0.150000	41.8	1000.000	9.000	GND	N	10.0	24.2	66.0	
0.195000	42.7	1000.000	9.000	GND	N	10.0	21.0	63.7	
0.255000	36.6	1000.000	9.000	GND	N	10.0	24.8	61.4	
0.375000	26.0	1000.000	9.000	GND	N	10.0	32.2	58.2	
3.795000	22.1	1000.000	9.000	GND	N	10.2	33.9	56.0	
4.770000	31.2	1000.000	9.000	GND	N	10.2	24.8	56.0	
8.880000	24.5	1000.000	9.000	GND	N	10.3	35.5	60.0	
12.810000	31.2	1000.000	9.000	GND	N	10.5	28.8	60.0	
15.810000	38.4	1000.000	9.000	GND	N	10.6	21.6	60.0	
21.600000	43.1	1000.000	9.000	GND	N	10.8	16.9	60.0	

Final Measurement Detector 2

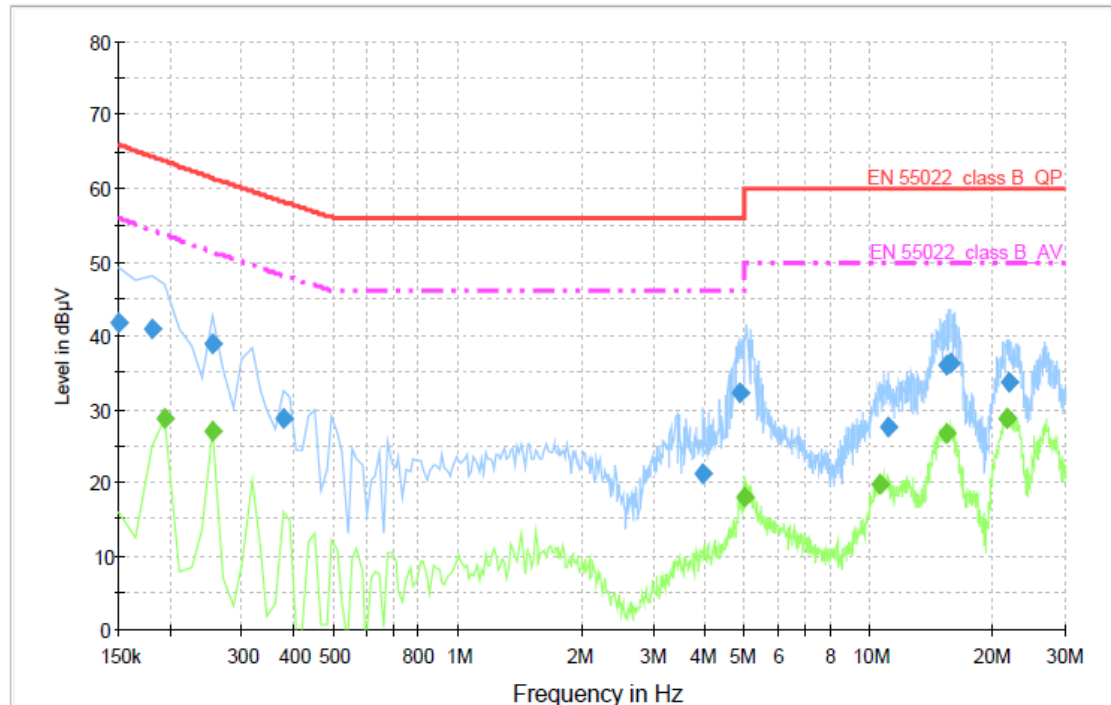
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.195000	28.2	1000.000	9.000	GND	N	10.0	25.5	53.7	
0.255000	23.4	1000.000	9.000	GND	N	10.0	27.9	51.3	
4.965000	19.7	1000.000	9.000	GND	N	10.2	26.3	46.0	
12.480000	23.4	1000.000	9.000	GND	N	10.5	26.6	50.0	
15.720000	29.6	1000.000	9.000	GND	N	10.6	20.4	50.0	
21.600000	39.5	1000.000	9.000	GND	N	10.8	10.5	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	41.7	1000.000	9.000	GND	L1	10.0	24.3	66.0	
0.180000	40.9	1000.000	9.000	GND	L1	10.0	23.5	64.4	
0.255000	38.8	1000.000	9.000	GND	L1	10.0	22.6	61.4	
0.375000	28.7	1000.000	9.000	GND	L1	10.0	29.5	58.2	
3.930000	21.3	1000.000	9.000	GND	L1	10.2	34.7	56.0	
4.860000	32.3	1000.000	9.000	GND	L1	10.2	23.7	56.0	
11.115000	27.5	1000.000	9.000	GND	L1	10.5	32.5	60.0	
15.510000	36.1	1000.000	9.000	GND	L1	10.7	23.9	60.0	
15.705000	36.3	1000.000	9.000	GND	L1	10.8	23.7	60.0	
21.900000	33.8	1000.000	9.000	GND	L1	11.1	26.2	60.0	

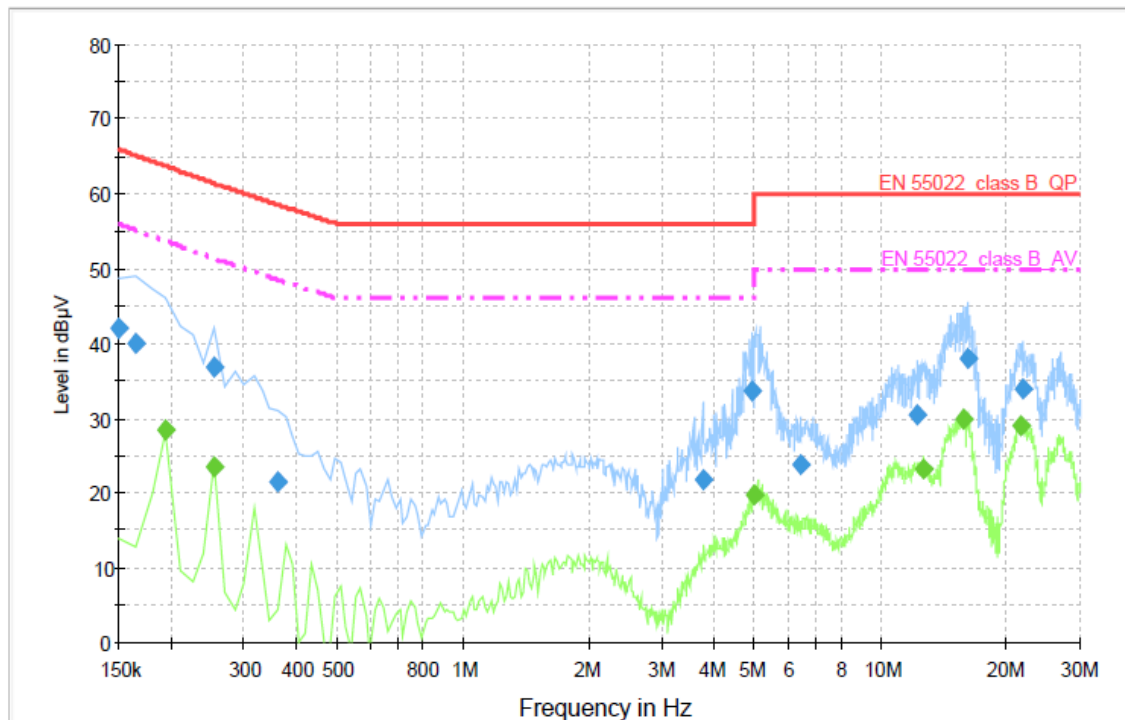
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.195000	28.8	1000.000	9.000	GND	L1	10.0	24.9	53.7	
0.255000	26.9	1000.000	9.000	GND	L1	10.0	24.4	51.3	
4.995000	17.9	1000.000	9.000	GND	L1	10.2	28.1	46.0	
10.680000	19.7	1000.000	9.000	GND	L1	10.4	30.3	50.0	
15.450000	26.6	1000.000	9.000	GND	L1	10.7	23.4	50.0	
21.615000	28.8	1000.000	9.000	GND	L1	11.1	21.2	50.0	
21.720000	28.8	1000.000	9.000	GND	L1	11.1	21.2	50.0	

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



Voltage with 4-Line-LISN_N



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	42.0	1000.000	9.000	GND	N	10.0	24.0	66.0	
0.165000	39.9	1000.000	9.000	GND	N	10.0	25.2	65.1	
0.255000	36.7	1000.000	9.000	GND	N	10.0	24.7	61.4	
0.360000	21.6	1000.000	9.000	GND	N	10.0	37.0	58.6	
3.750000	21.6	1000.000	9.000	GND	N	10.2	34.4	56.0	
4.905000	33.7	1000.000	9.000	GND	N	10.2	22.3	56.0	
6.450000	23.9	1000.000	9.000	GND	N	10.3	36.1	60.0	
12.195000	30.5	1000.000	9.000	GND	N	10.5	29.5	60.0	
16.185000	38.1	1000.000	9.000	GND	N	10.6	21.9	60.0	
21.855000	33.9	1000.000	9.000	GND	N	10.8	26.1	60.0	

Final Measurement Detector 2

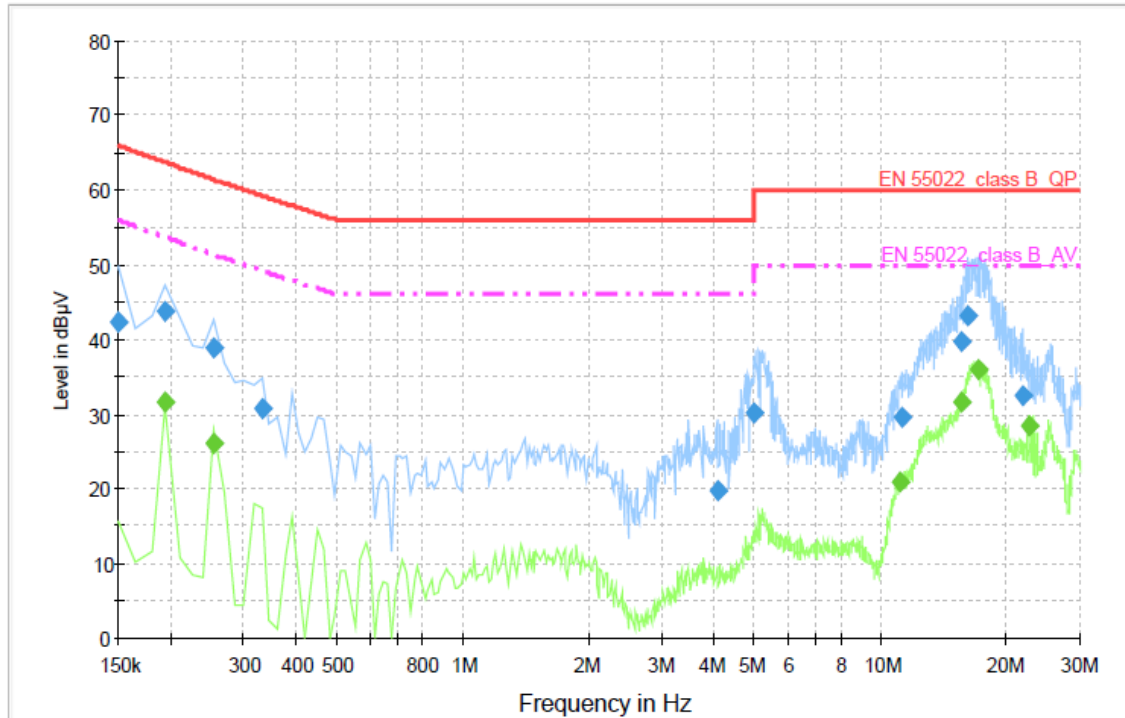
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.195000	28.4	1000.000	9.000	GND	N	10.0	25.3	53.7	
0.255000	23.5	1000.000	9.000	GND	N	10.0	27.8	51.3	
4.995000	19.7	1000.000	9.000	GND	N	10.2	26.3	46.0	
12.645000	23.3	1000.000	9.000	GND	N	10.5	26.7	50.0	
15.720000	29.8	1000.000	9.000	GND	N	10.6	20.2	50.0	
21.660000	29.0	1000.000	9.000	GND	N	10.8	21.0	50.0	

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



◆ Operating condition: 1 920 × 1 080 / 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	42.3	1000.000	9.000	GND	L1	10.0	23.7	66.0	
0.195000	43.9	1000.000	9.000	GND	L1	10.0	19.8	63.7	
0.255000	38.9	1000.000	9.000	GND	L1	10.0	22.5	61.4	
0.330000	30.9	1000.000	9.000	GND	L1	10.0	28.4	59.3	
4.065000	19.7	1000.000	9.000	GND	L1	10.2	36.3	56.0	
4.980000	30.1	1000.000	9.000	GND	L1	10.2	25.9	56.0	
11.205000	29.6	1000.000	9.000	GND	L1	10.5	30.4	60.0	
15.555000	39.7	1000.000	9.000	GND	L1	10.7	20.3	60.0	
16.155000	43.3	1000.000	9.000	GND	L1	10.8	16.7	60.0	
21.900000	32.4	1000.000	9.000	GND	L1	11.1	27.6	60.0	

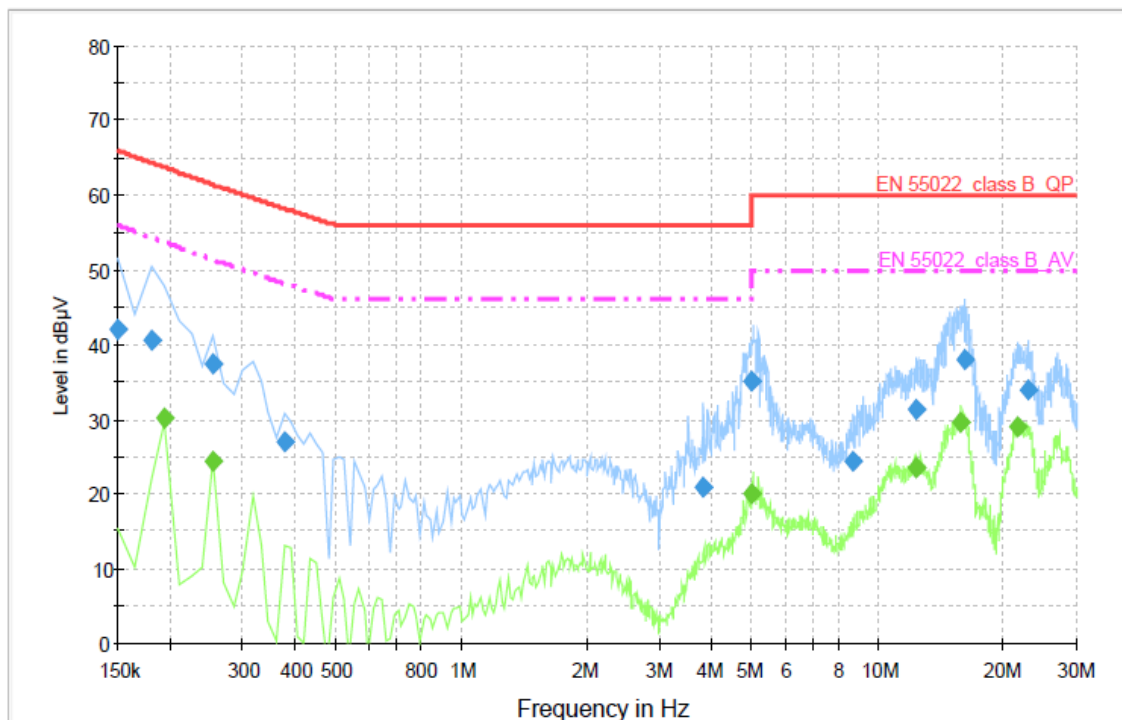
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.195000	31.5	1000.000	9.000	GND	L1	10.0	22.2	53.7	
0.255000	26.1	1000.000	9.000	GND	L1	10.0	25.2	51.3	
11.175000	20.8	1000.000	9.000	GND	L1	10.5	29.2	50.0	
15.630000	31.7	1000.000	9.000	GND	L1	10.8	18.3	50.0	
17.055000	35.9	1000.000	9.000	GND	L1	10.8	14.1	50.0	
22.740000	28.5	1000.000	9.000	GND	L1	11.1	21.5	50.0	

< Fig 10. Conducted emission result (Live line)>



Voltage with 4-Line-LISN_N



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	42.2	1000.000	9.000	GND	N	10.0	23.8	66.0	
0.180000	40.5	1000.000	9.000	GND	N	10.0	23.9	64.4	
0.255000	37.5	1000.000	9.000	GND	N	10.0	23.9	61.4	
0.375000	26.9	1000.000	9.000	GND	N	10.0	31.3	58.2	
3.810000	21.0	1000.000	9.000	GND	N	10.2	35.0	56.0	
4.995000	35.1	1000.000	9.000	GND	N	10.2	21.0	56.0	
8.730000	24.2	1000.000	9.000	GND	N	10.3	35.8	60.0	
12.360000	31.3	1000.000	9.000	GND	N	10.5	28.7	60.0	
16.230000	38.0	1000.000	9.000	GND	N	10.6	22.0	60.0	
22.920000	34.0	1000.000	9.000	GND	N	10.8	26.0	60.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.195000	30.2	1000.000	9.000	GND	N	10.0	23.5	53.7	
0.255000	24.3	1000.000	9.000	GND	N	10.0	27.0	51.3	
4.980000	20.0	1000.000	9.000	GND	N	10.2	26.0	46.0	
12.375000	23.5	1000.000	9.000	GND	N	10.5	26.6	50.0	
15.765000	29.6	1000.000	9.000	GND	N	10.6	20.4	50.0	
21.720000	29.1	1000.000	9.000	GND	N	10.8	20.9	50.0	

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



6. Radiated Emission

6.1 Operating Environment

Temperature : 23 °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(Chamber)	Uncertainty	Remark
Radiated emission (30 MHz ~ 300 MHz, 3 m, Vertical)	± 4.32 dB	Confidence levels of 95 % ($k = 2$)
Radiated emission (30 MHz ~ 300 MHz, 3 m, Horizontal)	± 4.21 dB	Confidence levels of 95 % ($k = 2$)
Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Vertical)	± 3.96 dB	Confidence levels of 95 % ($k = 2$)
Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Horizontal)	± 3.97 dB	Confidence levels of 95 % ($k = 2$)



6.4 Limit

Frequency (MHz)	FCC Limit @ 3 m. dB μ V/m	CISPR Limit @ 10 m. dB μ V/m
30 ~ 88	40.0 30	.0
88 ~ 216	43.5 30	.0
216 ~ 230	46.0 30	.0
230 ~ 960	46.0 37	.0
960 ~ 1 000	54.0 37	.0
> 1 000	54.0	No Specified limit

6.5 Test Equipment used

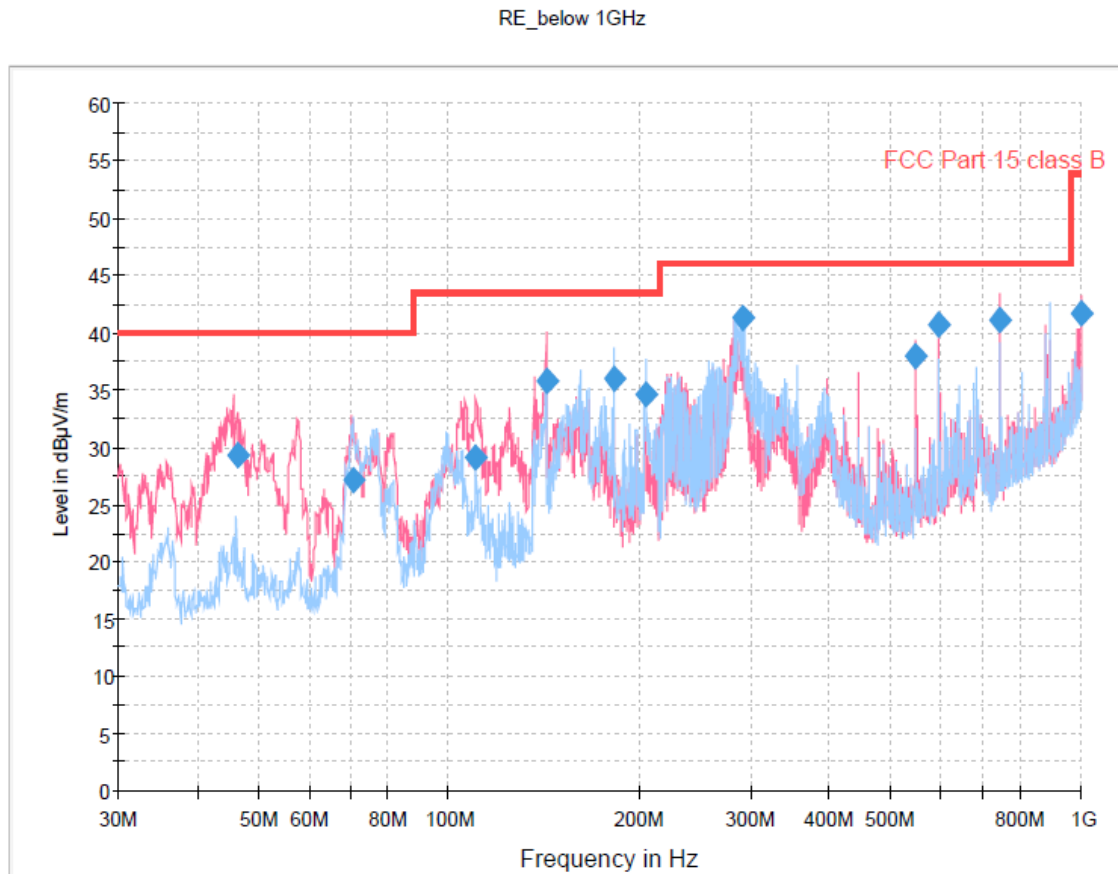
Model Name	Manufacturer	Description	Serial Number	Due to Calibration
■ - ESIB26	Rohde & Schwarz	EMI Test Receiver	830482/010	12. 11. 2010
■ - VULB9160	Schwarzbeck	Broadband Test Antenna	3193	03. 11. 2012
■ - BBHA9120D	Schwarzbeck	Horn ANT	207	12. 22. 2011
■ - MCU066	matur GmbH	Position Controller	1390306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

6.6 Test data for Radiated Emission

- Test Date : April 28, 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 (148.5 MHz). The measurement was made up to 2 000 MHz



- ◆ Operating Condition: 1 920 × 1 080 / 60 Hz (D-Sub: Analog)
Re d trace: Vertical polarization, Blue trace: Horizontal polarization



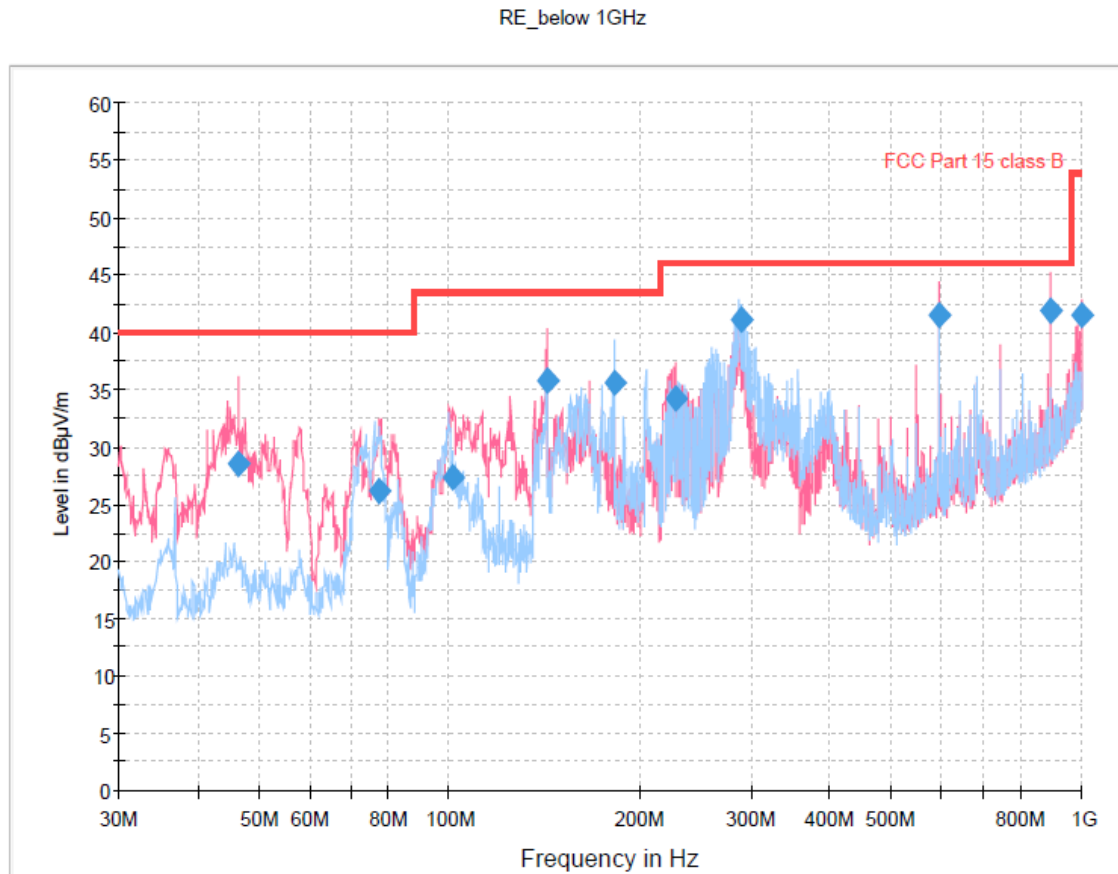
Final Result [1]

Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
46.301250	29.4	1000.0	120.000	100.0	V	270.0	12.7	10.64	40.00
70.473750	27.2	1000.0	120.000	150.0	V	226.0	11.4	12.78	40.00
110.168750	29.2	1000.0	120.000	113.0	V	236.0	12.5	14.35	43.50
142.581250	35.8	1000.0	120.000	100.0	V	13.0	14.5	7.70	43.50
182.268750	36.0	1000.0	120.000	150.0	H	264.0	13.1	7.50	43.50
204.257500	34.6	1000.0	120.000	100.0	H	284.0	12.0	8.93	43.50
292.012500	41.3	1000.0	120.000	100.0	H	188.0	16.5	4.70	46.00
593.995000	40.8	1000.0	120.000	100.0	V	282.0	22.7	5.25	46.00
742.526250	41.1	1000.0	120.000	100.0	V	201.0	24.5	4.90	46.00
997.837500	41.7	1000.0	120.000	100.0	V	68.0	31.6	12.30	54.00

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



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



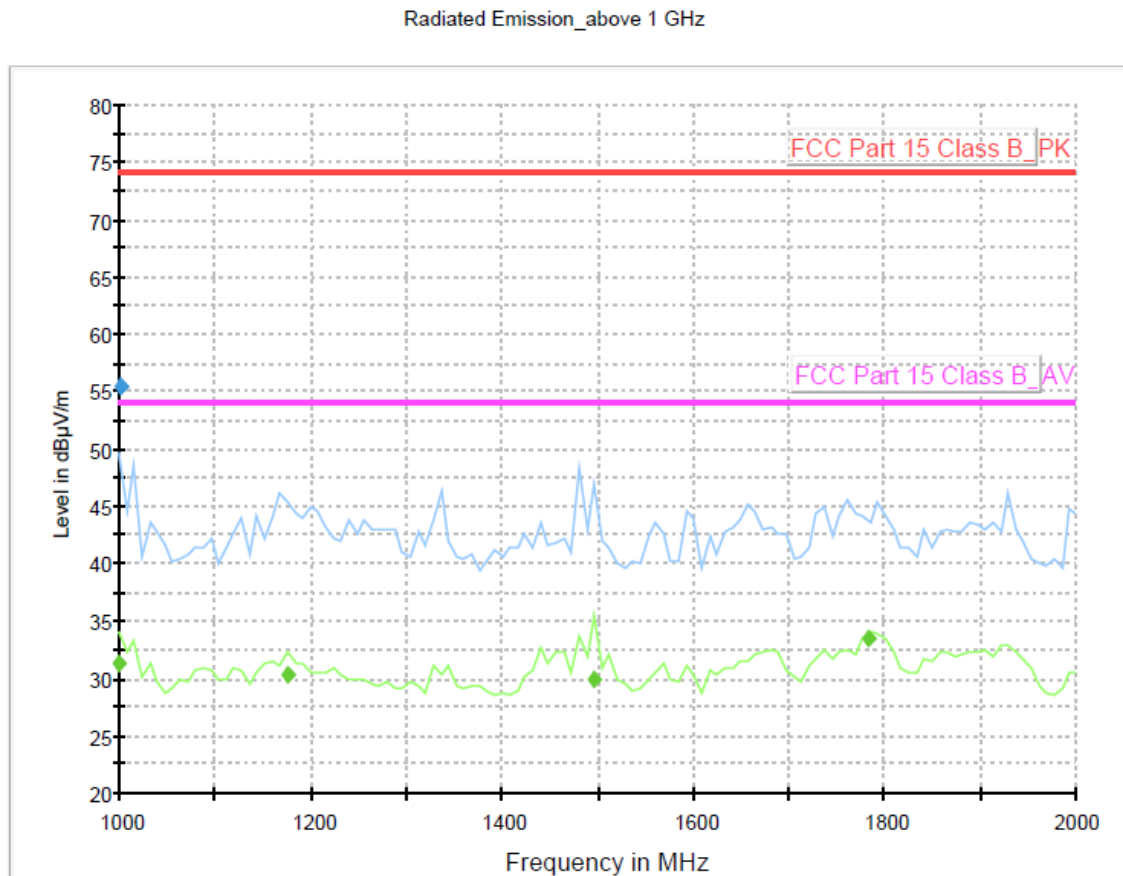
Final Result [1]

Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
46.268750	28.6	1000.0	120.000	111.0	V	304.0	12.7	11.39	40.00
77.675000	26.1	1000.0	120.000	121.0	V	129.0	9.7	13.89	40.00
101.382500	27.4	1000.0	120.000	100.0	V	259.0	11.5	16.12	43.50
142.621250	35.9	1000.0	120.000	100.0	V	40.0	14.5	7.60	43.50
182.270000	35.7	1000.0	120.000	150.0	H	293.0	13.1	7.80	43.50
228.668750	34.2	1000.0	120.000	100.0	V	66.0	13.3	11.77	46.00
288.721250	41.1	1000.0	120.000	100.0	H	180.0	16.3	4.88	46.00
593.995000	41.6	1000.0	120.000	100.0	V	213.0	22.7	4.40	46.00
891.017500	42.0	1000.0	120.000	100.0	V	236.0	27.4	4.00	46.00
998.095000	41.5	1000.0	120.000	100.0	V	53.0	31.6	12.50	54.00

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



- ◆ Operating Condition: 1 920 × 1 080 / 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)
1001.600000	55.4	100.0	1000.000	297.0	V	0.0	-15.9	18.6	74.0

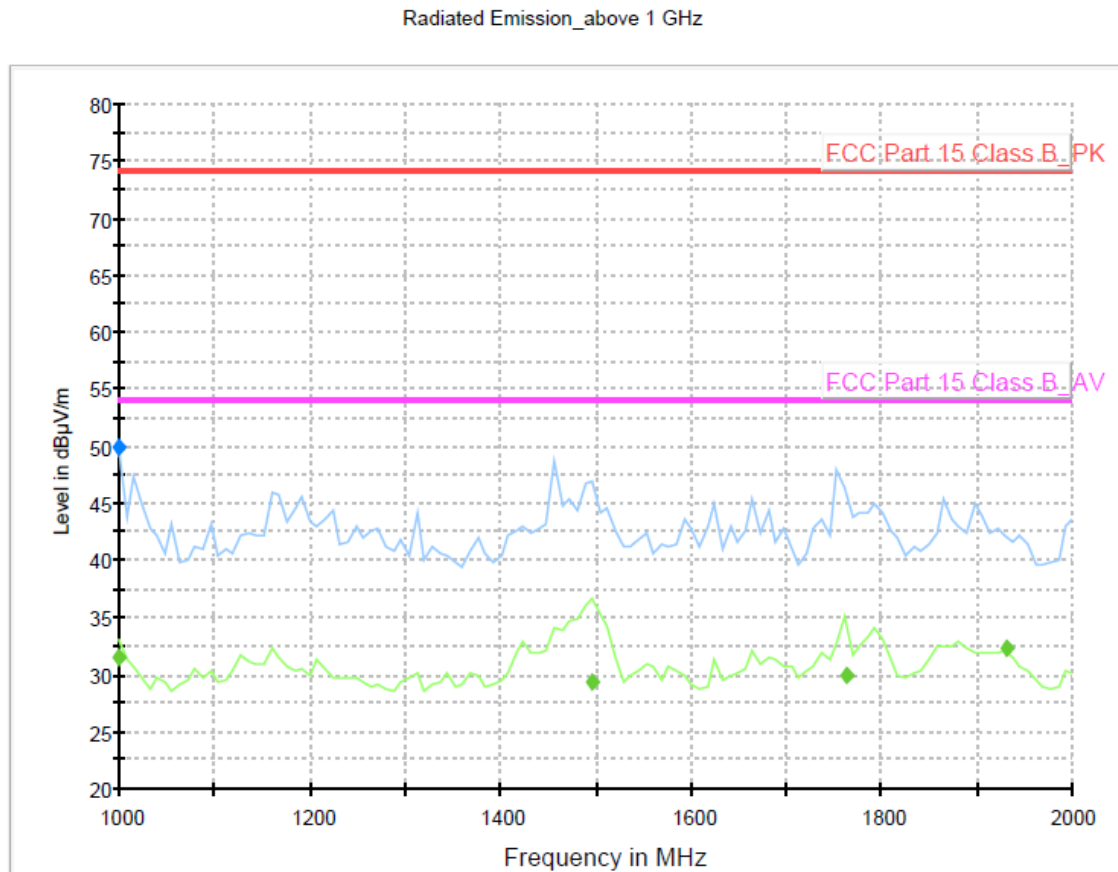
Final Result 2

Frequency (MHz)	Average (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1000.000000	31.3	100.0	1000.000	272.0	V	0.0	-15.9	22.8	54.0
1177.352706	30.3	100.0	1000.000	146.0	V	170.0	-15.1	23.7	54.0
1496.393988	29.8	100.0	1000.000	130.0	H	37.0	-14.3	24.2	54.0
1783.771142	33.4	100.0	1000.000	100.0	V	16.0	-13.2	20.6	54.0

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



- ◆ Operating Condition: 1 920 × 1 080 / 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)
1000.000000	49.9	100.0	1000.000	246.0	V	0.0	-15.9	24.1	74.0

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)
1000.000000	31.4	100.0	1000.000	271.0	V	0.0	-15.9	22.6	54.0
1497.193988	29.2	100.0	1000.000	146.0	V	171.0	-14.3	24.8	54.0
1764.123046	29.8	100.0	1000.000	138.0	V	148.0	-13.3	24.2	54.0
1931.659720	32.4	100.0	1000.000	122.0	V	0.0	-13.0	21.6	54.0

< 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. LED LCD Monitor (Model Name: E2380VV, E2380VXV)** was complies with §15.107 and 15.109 of the FCC Rules.