



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 : February 8, 2010

Order Number: GETEC-C1-10-035

Test Report Number: GETEC-E3-10-015

Test Site: Gumi College EMC Center

FCC Registration Number: (100749, 443957)

FCC ID.: BEJT1710BU

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	: T1710BU
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.** BEJT1710BU
- **EUT Type** LCD Monitor
- **Model Name** T1710BU
- **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 3 ~ 4, 2010
- **Place of Test** **Gumi College EMC Center** (FCC Registration Number: 100749, 443957)
407, Bugok-dong, Gumi-si, Gyeongbuk, Korea.
- **Test Report Number** GETEC-E3-10-015
- **Dates of Issue** February 8, 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: T1710BU)**

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)



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: T1710BU) FCC ID.: BEJT1710BU**

Display	43.27 cm (17.0 inch) Flat Panel Active matrix-TFT LCD Anti-Glare coating Visible diagonal size: 43.27 cm 0.264 mm x 0.264 mm (Pixel Pitch)	
Sync Input	Horizontal Freq.	30 kHz to 83 kHz (Automatic)
	Vertical Freq.	56 Hz to 75 Hz (Automatic)
	Input Form	Separate TTL SOG (Sync On Green)
Video Input	Signal Input	15 pin D-Sub Connector
	Input Form	RGB Analog (0.7 Vp-p/ 75 ohm)
Resolution	Max	VESA 1280 x 1024 @75 Hz
	Recommend	VESA 1280 x 1024 @60 Hz
Plug&Play	DDC 2B	
Power Consumption	On Mode	: 20 W(Typ.)
	Sleep Mode	≤ 1 W
	Off Mode	≤ 1 W
Dimensions &Weight	With Stand	
	Width	36.96 cm (14.55 inch)
	Height	39.13 cm (15.41 inch)
	Depth	18.48 cm (7.28 inch)
	Net	3.90 kg (8.60 lb)
	Without Stand	
	Width	36.96 cm (14.55 inch)
	Height	31.51 cm (12.41 inch)
	Depth	6.05 cm (2.38 inch)
	Net	3.90 kg (8.60 lb)
Tilt Range	Tilt	14° to 66°
Power Input	AC 100-240V~ 50/60Hz 0.5A	
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 : 135 MHz



3.2 Support Equipment / Cables used

3.2.1 Used Support Equipment

Description	Manufacturer	Model Name	S/N & FCC ID.
PC	Samsung	DB-P60	S/N: 729W97AP500001M FCC ID.: DoC
Video card	SUMA	Geforce FX 7600GT	S/N: NE/7600GXTD21V407003711 FCC ID.: DoC
Keyboard	COMPAQ	166516-AD6	S/N: B13BBOR391006D FCC ID.: AQ6-23K15
PS2 mouse	LOGITECH	M-S69	S/N: 334684-108 FCC ID.: JNZ211443
Joystick	MICROSOFT	X05-92626	S/N: 9262600296169 FCC ID.: DoC
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 unshielded
Analog (D-sub) cable	Connected to the EUT and PC	1.80 shielded with two ferrite cores
Upstream (USB) cable	Connected to the EUT and PC	1.88 shielded

3.3 Modification Item(s)

- None



4. Description of tests

4.1 Test Condition

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

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

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

- Test Mode(s)

- **Monitor mode**

- Radiated emission: 1 280 × 1 024 / 75 Hz (D-sub: Analog)

- Conducted emission: 1 280 × 1 024 / 75 Hz (D-sub: Analog),

- 1 024 × 768 / 75 Hz (D-sub: Analog), 640 × 480 / 75 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
 - Touch screen activated



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

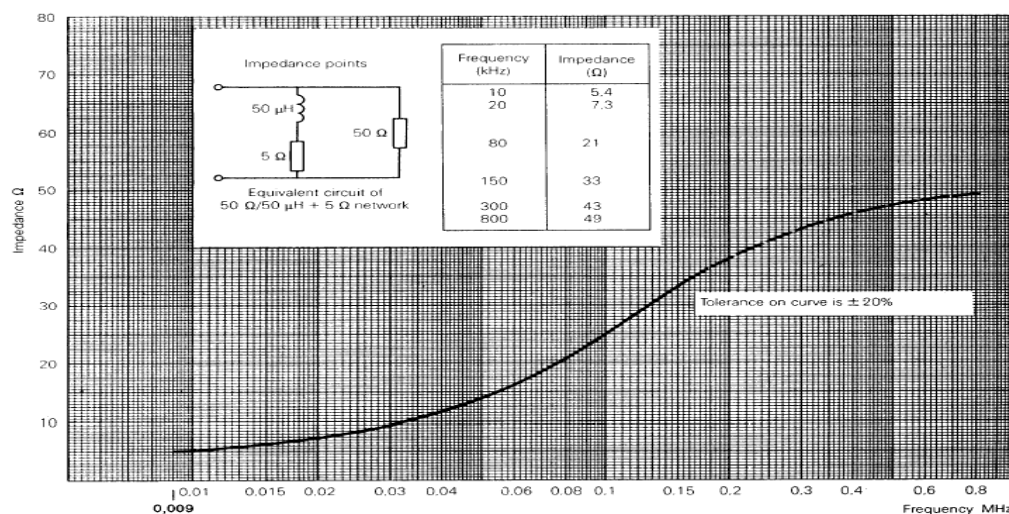


Fig 2. Impedance of LISN



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

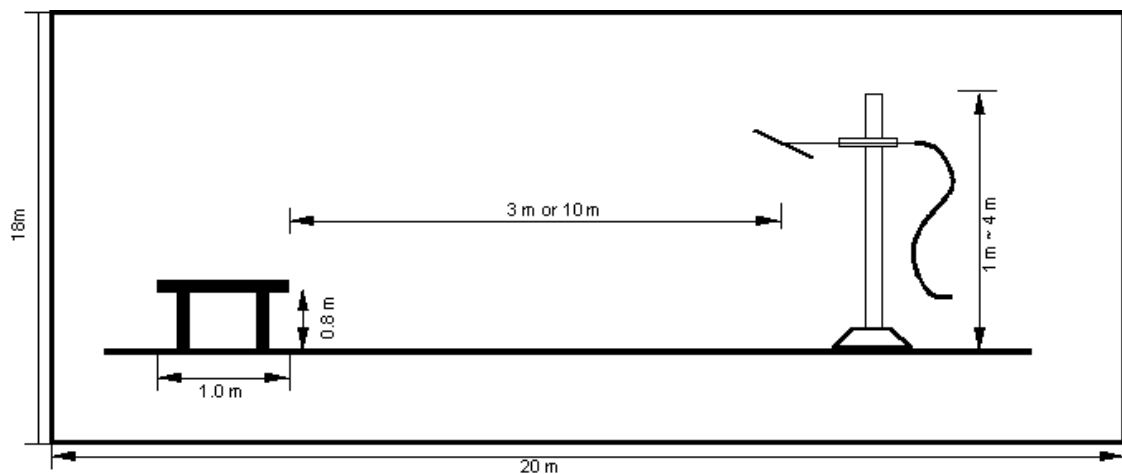


Fig 3. Dimensions of test site.



5. Conducted Emission

5.1 Operating Environment

Temperature : 22 °C
Relative Humidity : 40 % R.H.

5.2 Test Set-up

The conducted emission measurements were performed in the shielded room.

The EUT was placed on wooden table, 0.8 m heights above the floor, 0.4 m from the reference ground plane (GRP) wall and 0.8 m from AMN.

AMN is bonded on horizontal reference ground plane.

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

5.3 Measurement Uncertainty

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

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

Test Items	Uncertainty	Remark
Conducted emission (9 kHz ~ 150 kHz)	± 2.69 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	10. 16. 2010

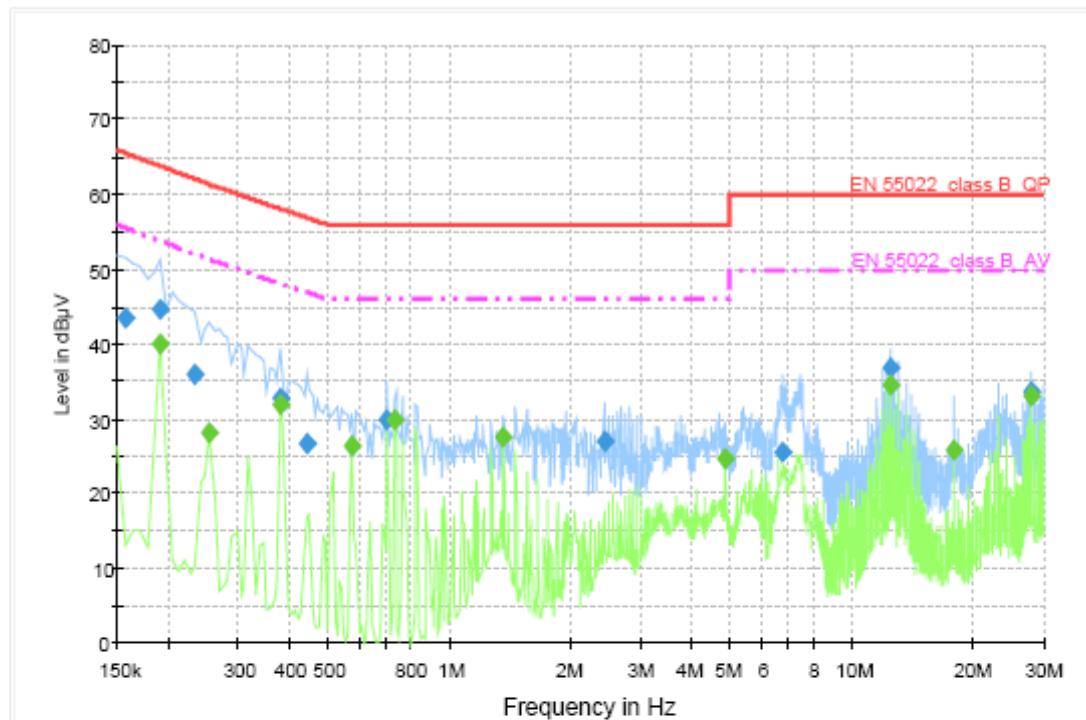
5.6 Test data for Conducted Emission

- . Test Date : February 3, 2010
- . Resolution Bandwidth : 9 kHz
- . Frequency Range : 0.15 MHz ~ 30 MHz



◆ Operating condition: 1 280 × 1 024 / 75 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
0.157000	43.6	1000.000	9.000	GND	L1	10.0	22.0	65.6	
0.192000	44.7	1000.000	9.000	GND	L1	10.0	19.1	63.8	
0.234000	36.0	1000.000	9.000	GND	L1	10.0	26.1	62.1	
0.381000	32.8	1000.000	9.000	GND	L1	10.0	25.3	58.1	
0.444000	26.7	1000.000	9.000	GND	L1	10.0	30.2	56.9	
0.703000	29.8	1000.000	9.000	GND	L1	10.0	26.2	56.0	
2.432000	26.9	1000.000	9.000	GND	L1	10.1	29.1	56.0	
6.751000	25.6	1000.000	9.000	GND	L1	10.3	34.4	60.0	
12.505000	36.8	1000.000	9.000	GND	L1	10.6	23.2	60.0	
28.059000	33.5	1000.000	9.000	GND	L1	11.4	26.5	60.0	

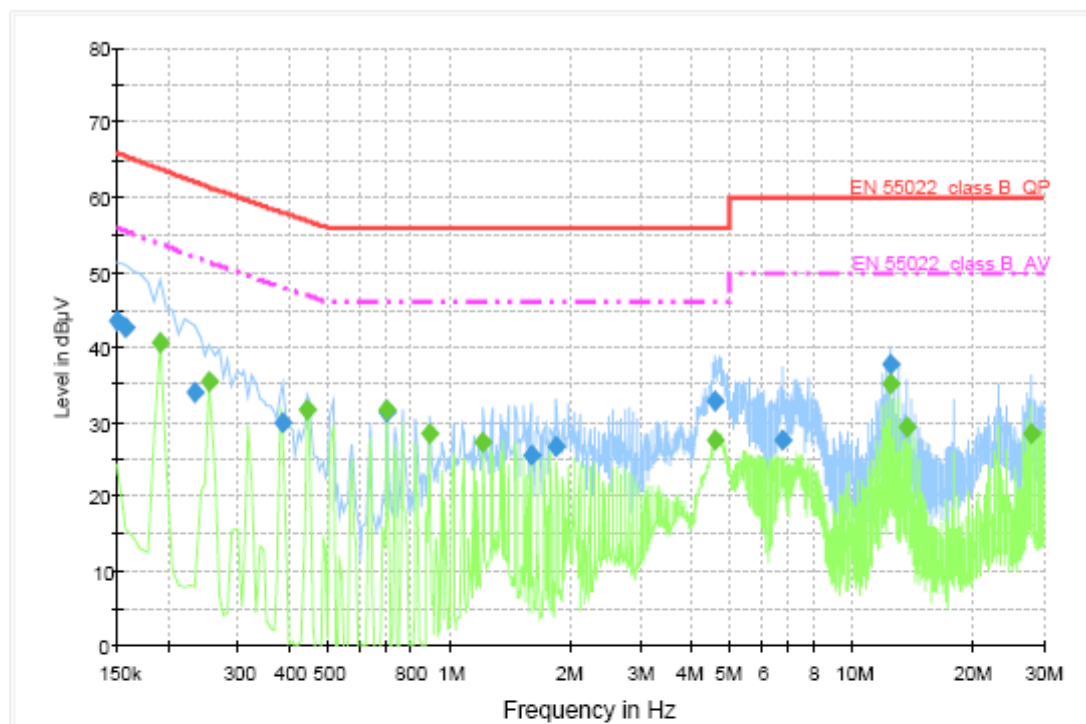
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.192000	40.0	1000.000	9.000	GND	L1	10.0	13.8	53.8	
0.255000	28.2	1000.000	9.000	GND	L1	10.0	23.1	51.3	
0.381000	31.8	1000.000	9.000	GND	L1	10.0	16.3	48.1	
0.577000	26.4	1000.000	9.000	GND	L1	10.0	19.6	46.0	
0.731000	29.8	1000.000	9.000	GND	L1	10.0	16.2	46.0	
1.368000	27.5	1000.000	9.000	GND	L1	10.1	18.5	46.0	
4.882000	24.7	1000.000	9.000	GND	L1	10.2	21.3	46.0	
12.505000	34.5	1000.000	9.000	GND	L1	10.6	15.5	50.0	
17.979000	25.7	1000.000	9.000	GND	L1	10.9	24.3	50.0	
28.059000	33.2	1000.000	9.000	GND	L1	11.4	16.8	50.0	

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



Voltage with 4-Line-LISN N



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	43.4	1000.000	9.000	GND	N	10.0	22.6	66.0	
0.157000	42.6	1000.000	9.000	GND	N	10.0	23.0	65.6	
0.234000	33.9	1000.000	9.000	GND	N	10.0	28.2	62.1	
0.388000	29.9	1000.000	9.000	GND	N	10.0	28.1	58.0	
0.703000	31.4	1000.000	9.000	GND	N	10.0	24.6	56.0	
1.599000	25.4	1000.000	9.000	GND	N	10.1	30.6	56.0	
1.851000	26.5	1000.000	9.000	GND	N	10.1	29.5	56.0	
4.595000	32.6	1000.000	9.000	GND	N	10.2	23.4	56.0	
6.751000	27.6	1000.000	9.000	GND	N	10.3	32.4	60.0	
12.505000	37.6	1000.000	9.000	GND	N	10.5	22.4	60.0	

Final Measurement Detector 2

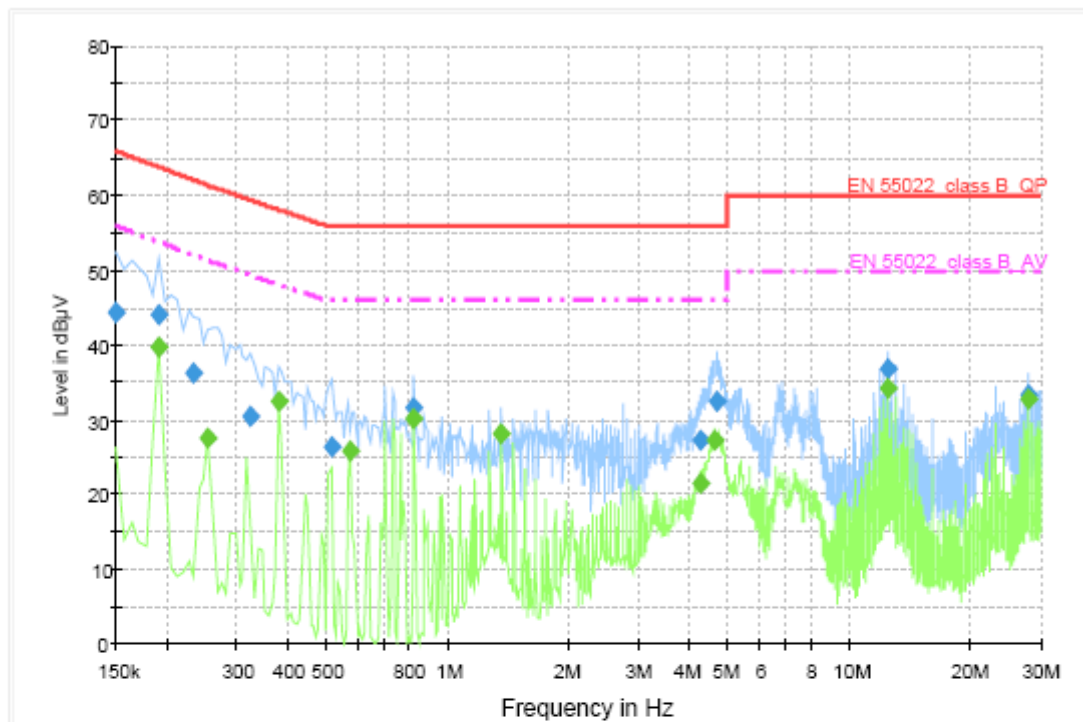
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.192000	40.5	1000.000	9.000	GND	N	10.0	13.3	53.8	
0.255000	35.5	1000.000	9.000	GND	N	10.0	15.8	51.3	
0.444000	31.5	1000.000	9.000	GND	N	10.0	15.4	46.9	
0.703000	31.7	1000.000	9.000	GND	N	10.0	14.3	46.0	
0.892000	28.4	1000.000	9.000	GND	N	10.0	17.6	46.0	
1.214000	27.3	1000.000	9.000	GND	N	10.1	18.7	46.0	
4.609000	27.5	1000.000	9.000	GND	N	10.2	18.6	46.0	
12.505000	35.1	1000.000	9.000	GND	N	10.5	14.9	50.0	
13.723000	29.3	1000.000	9.000	GND	N	10.5	20.7	50.0	
28.059000	28.4	1000.000	9.000	GND	N	10.8	21.6	50.0	

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



◆ Operating condition: 1 024 × 768 / 75 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	44.3	1000.000	9.000	GND	L1	10.0	21.7	66.0	
0.192000	44.2	1000.000	9.000	GND	L1	10.0	19.6	63.8	
0.234000	36.1	1000.000	9.000	GND	L1	10.0	26.0	62.1	
0.325000	30.5	1000.000	9.000	GND	L1	10.0	28.9	59.4	
0.514000	26.4	1000.000	9.000	GND	L1	10.0	29.6	56.0	
0.829000	31.6	1000.000	9.000	GND	L1	10.0	24.4	56.0	
4.273000	27.4	1000.000	9.000	GND	L1	10.2	28.6	56.0	
4.679000	32.6	1000.000	9.000	GND	L1	10.2	23.4	56.0	
12.505000	36.8	1000.000	9.000	GND	L1	10.6	23.2	60.0	
28.059000	33.4	1000.000	9.000	GND	L1	11.4	26.6	60.0	

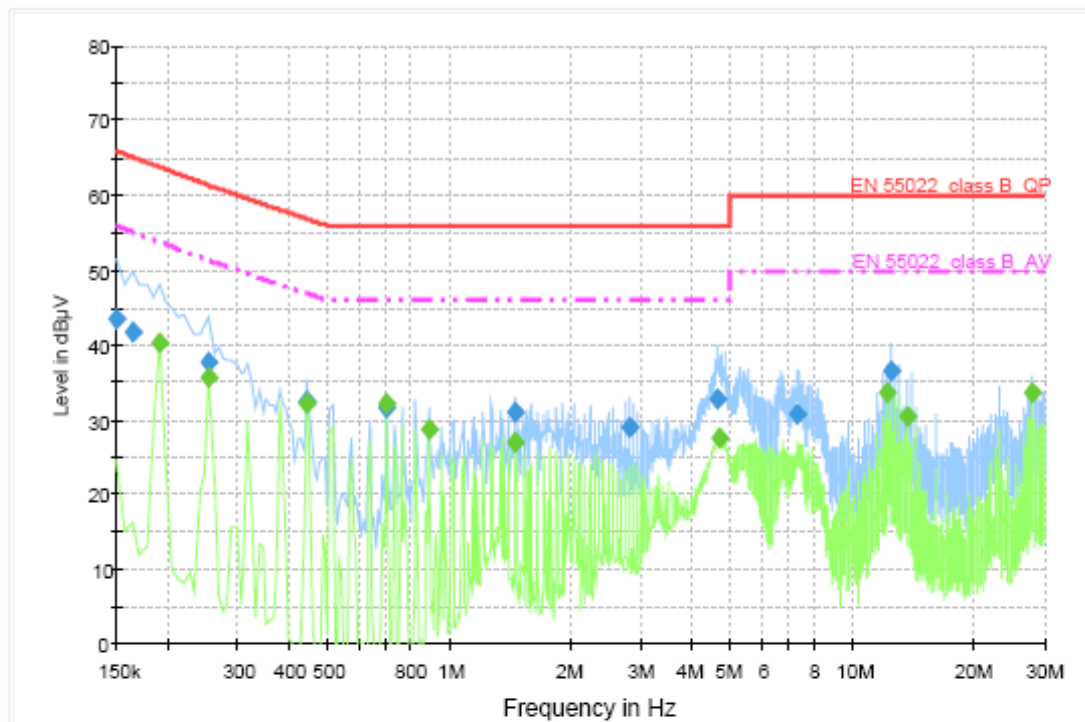
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.192000	39.8	1000.000	9.000	GND	L1	10.0	14.0	53.8	
0.255000	27.5	1000.000	9.000	GND	L1	10.0	23.8	51.3	
0.381000	32.4	1000.000	9.000	GND	L1	10.0	15.7	48.1	
0.577000	25.8	1000.000	9.000	GND	L1	10.0	20.2	46.0	
0.829000	30.2	1000.000	9.000	GND	L1	10.0	15.8	46.0	
1.368000	28.0	1000.000	9.000	GND	L1	10.1	18.0	46.0	
4.273000	21.4	1000.000	9.000	GND	L1	10.2	24.6	46.0	
4.658000	27.3	1000.000	9.000	GND	L1	10.2	18.7	46.0	
12.505000	34.2	1000.000	9.000	GND	L1	10.6	15.8	50.0	
28.059000	32.8	1000.000	9.000	GND	L1	11.4	17.2	50.0	

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



Voltage with 4-Line-LISN N



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	43.5	1000.000	9.000	GND	N	10.0	22.5	66.0	
0.164000	41.9	1000.000	9.000	GND	N	10.0	23.3	65.2	
0.255000	37.6	1000.000	9.000	GND	N	10.0	23.8	61.4	
0.444000	32.4	1000.000	9.000	GND	N	10.0	24.5	56.9	
0.703000	31.5	1000.000	9.000	GND	N	10.0	24.5	56.0	
1.466000	31.1	1000.000	9.000	GND	N	10.1	24.9	56.0	
2.810000	29.1	1000.000	9.000	GND	N	10.1	26.9	56.0	
4.644000	32.8	1000.000	9.000	GND	N	10.2	23.2	56.0	
7.346000	30.8	1000.000	9.000	GND	N	10.3	29.2	60.0	
12.505000	36.4	1000.000	9.000	GND	N	10.5	23.6	60.0	

Final Measurement Detector 2

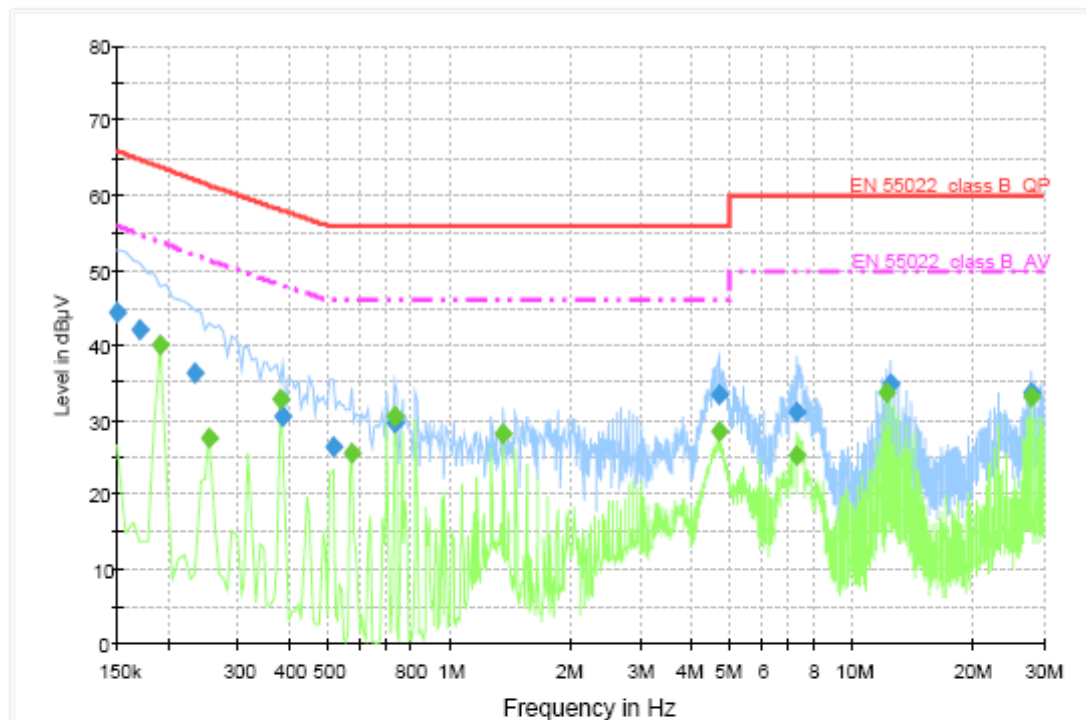
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.192000	40.4	1000.000	9.000	GND	N	10.0	13.4	53.8	
0.255000	35.6	1000.000	9.000	GND	N	10.0	15.7	51.3	
0.444000	32.3	1000.000	9.000	GND	N	10.0	14.6	46.9	
0.703000	32.0	1000.000	9.000	GND	N	10.0	14.0	46.0	
0.892000	28.7	1000.000	9.000	GND	N	10.0	17.3	46.0	
1.466000	27.1	1000.000	9.000	GND	N	10.1	18.9	46.0	
4.672000	27.4	1000.000	9.000	GND	N	10.2	18.6	46.0	
12.197000	33.7	1000.000	9.000	GND	N	10.5	16.3	50.0	
13.723000	30.6	1000.000	9.000	GND	N	10.5	19.4	50.0	
28.052000	33.5	1000.000	9.000	GND	N	10.8	16.5	50.0	

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



◆ Operating condition: 640 × 480 / 75 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	44.5	1000.000	9.000	GND	L1	10.0	21.6	66.0	
0.171000	42.1	1000.000	9.000	GND	L1	10.0	22.7	64.8	
0.234000	36.2	1000.000	9.000	GND	L1	10.0	25.9	62.1	
0.388000	30.3	1000.000	9.000	GND	L1	10.0	27.7	58.0	
0.514000	26.3	1000.000	9.000	GND	L1	10.0	29.7	56.0	
0.731000	29.6	1000.000	9.000	GND	L1	10.0	26.4	56.0	
4.665000	33.4	1000.000	9.000	GND	L1	10.2	22.6	56.0	
7.318000	31.0	1000.000	9.000	GND	L1	10.3	29.0	60.0	
12.505000	34.8	1000.000	9.000	GND	L1	10.6	25.2	60.0	
28.052000	33.7	1000.000	9.000	GND	L1	11.4	26.3	60.0	

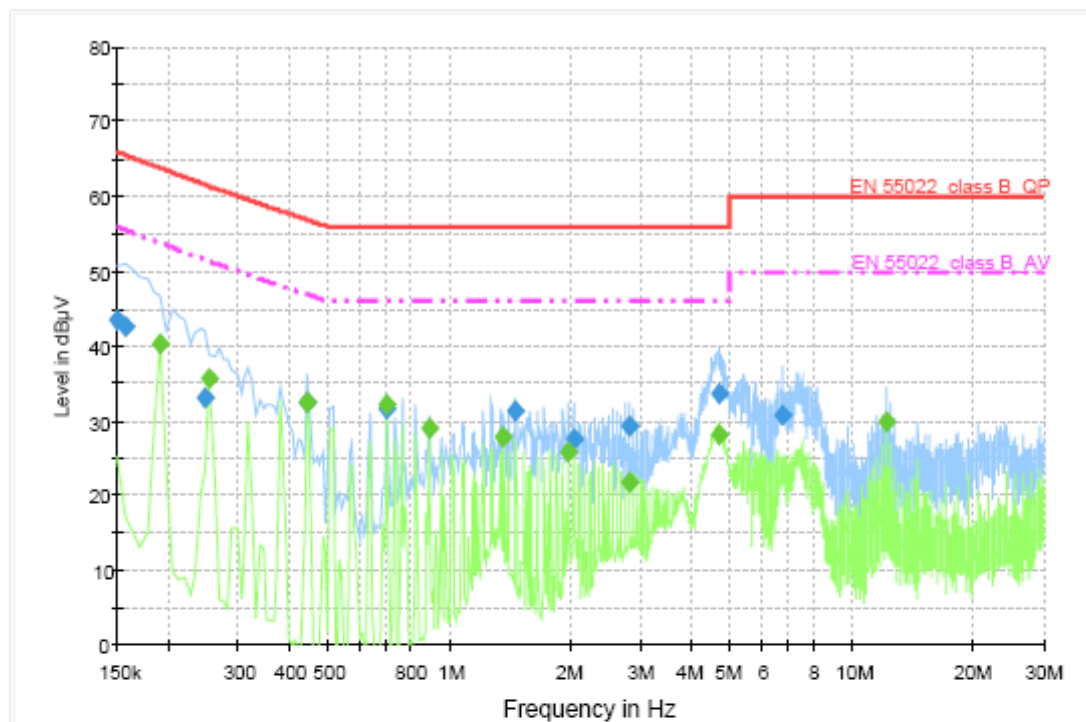
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.192000	39.9	1000.000	9.000	GND	L1	10.0	13.9	53.8	
0.255000	27.6	1000.000	9.000	GND	L1	10.0	23.7	51.3	
0.381000	32.7	1000.000	9.000	GND	L1	10.0	15.4	48.1	
0.577000	25.5	1000.000	9.000	GND	L1	10.0	20.5	46.0	
0.731000	30.3	1000.000	9.000	GND	L1	10.0	15.7	46.0	
1.368000	28.2	1000.000	9.000	GND	L1	10.1	17.8	46.0	
4.700000	28.4	1000.000	9.000	GND	L1	10.2	17.6	46.0	
7.318000	25.3	1000.000	9.000	GND	L1	10.3	24.7	50.0	
12.197000	33.7	1000.000	9.000	GND	L1	10.5	16.3	50.0	
28.052000	33.1	1000.000	9.000	GND	L1	11.4	16.9	50.0	

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



Voltage with 4-Line-LISN N



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	43.4	1000.000	9.000	GND	N	10.0	22.6	66.0	
0.157000	42.7	1000.000	9.000	GND	N	10.0	22.9	65.6	
0.248000	33.2	1000.000	9.000	GND	N	10.0	28.4	61.6	
0.444000	32.5	1000.000	9.000	GND	N	10.0	24.4	56.9	
0.703000	31.7	1000.000	9.000	GND	N	10.0	24.3	56.0	
1.466000	31.2	1000.000	9.000	GND	N	10.1	24.8	56.0	
2.040000	27.6	1000.000	9.000	GND	N	10.1	28.4	56.0	
2.810000	29.3	1000.000	9.000	GND	N	10.1	26.7	56.0	
4.679000	33.5	1000.000	9.000	GND	N	10.2	22.5	56.0	
6.758000	30.6	1000.000	9.000	GND	N	10.3	29.4	60.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.192000	40.4	1000.000	9.000	GND	N	10.0	13.4	53.8	
0.255000	35.6	1000.000	9.000	GND	N	10.0	15.7	51.3	
0.444000	32.6	1000.000	9.000	GND	N	10.0	14.3	46.9	
0.703000	32.1	1000.000	9.000	GND	N	10.0	13.9	46.0	
0.892000	28.9	1000.000	9.000	GND	N	10.0	17.1	46.0	
1.368000	27.9	1000.000	9.000	GND	N	10.1	18.1	46.0	
1.977000	25.7	1000.000	9.000	GND	N	10.1	20.3	46.0	
2.810000	21.6	1000.000	9.000	GND	N	10.1	24.4	46.0	
4.665000	28.0	1000.000	9.000	GND	N	10.2	18.0	46.0	
12.197000	29.9	1000.000	9.000	GND	N	10.5	20.1	50.0	

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



6. Radiated Emission

6.1 Operating Environment

Temperature : -5 °C
Relative Humidity : 20 % 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	Uncertainty	Remark
Radiated emission (30 MHz ~ 300 MHz, 3 m, Vertical)	± 3.54 dB	Confidence levels of 95 % (k=2)
Radiated emission (30 MHz ~ 300 MHz, 3 m, Horizontal)	± 3.49 dB	Confidence levels of 95 % (k=2)
Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Vertical)	± 3.85 dB	Confidence levels of 95 % (k=2)
Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Horizontal)	± 3.76 dB	Confidence levels of 95 % (k=2)
Radiated emission (30 MHz ~ 300 MHz, 10 m, Vertical)	± 3.21 dB	Confidence levels of 95 % (k=2)
Radiated emission (30 MHz ~ 300 MHz, 10 m, Horizontal)	± 3.32 dB	Confidence levels of 95 % (k=2)
Radiated emission (300 MHz ~ 1 000 MHz, 10 m, Vertical)	± 3.77 dB	Confidence levels of 95 % (k=2)
Radiated emission (300 MHz ~ 1 000 MHz, 10 m, Horizontal)	± 3.84 dB	Confidence levels of 95 % (k=2)



6.4 Limit

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

6.5 Test Equipment used

Model Name	Manufacturer	Description	Serial Number	Due to Calibration
■ - ESI	Rohde & Schwarz	EMI test receiver	830482/010	12. 11. 2010
■ - VULB9160	Schwarzbeck	Broadband Test Antenna	3099	07. 21. 2011
■ - BBHA9120D	Schwarzbeck	Horn ANT	597	12. 18. 2010
■ - 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. 2010
■ - ESCS30	Rohde & Schwarz	EMI test receiver	839809/003	12. 10. 2010
■ - HK116	Rohde & Schwarz	Biconical ANT	826861/018	11. 20. 2010
■ - HL223	Rohde & Schwarz	Log-periodic antenna	829228/011	11. 20. 2010
■ - 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



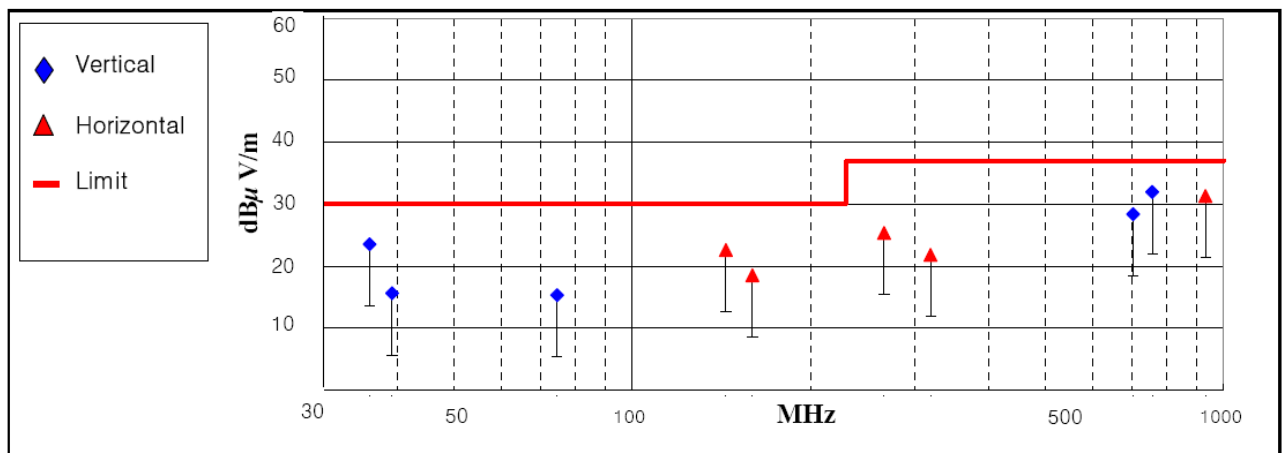
6.6 Test data for Radiated Emission

- Test Date : February 3, 2010
- Resolution Bandwidth : 120 kHz / 1 MHz
- Frequency Range : 30 MHz ~ 2 000 MHz
- Measurement Distance : 10 m / 3 m
- Note : The highest frequency of the internal source of the EUT is between 108 MHz and 500 MHz (135 MHz). The measurement was made up to 2 000 MHz.

◆ Operating Condition: 1 280 × 1 024 / 75 Hz (D-sub: Analog)

Detector mode: Quasi- peak detector mode

Frequency (MHz)	Measurement Level				Limit (dBμ V/m)	Margin (dB)	Positioning System		
	Reading	Antenna	Cable	Test Result			Pol.	Height	Angle
	Value(dBμ V)	Factor(dB/m)	Loss(dB)	(dBμ V/m)			(H/V)	(cm)	(°)
35.98	9.88	11.67	2.00	23.55	30.00	6.45	V	100	223
39.25	2.73	10.82	2.07	15.62	30.00	14.38	V	106	13
74.65	4.36	8.21	2.75	15.32	30.00	14.68	V	117	350
144.00	7.14	11.85	3.62	22.61	30.00	7.39	H	215	185
159.70	2.03	12.69	3.81	18.53	30.00	11.47	H	196	63
266.51	1.26	18.93	5.17	25.36	37.00	11.64	H	102	153
319.26	1.22	14.47	6.16	21.85	37.00	15.15	H	113	240
702.80	1.01	19.42	7.98	28.41	37.00	8.59	V	134	199
757.15	3.97	19.64	8.35	31.96	37.00	5.04	V	128	170
931.80	1.29	20.65	9.39	31.33	37.00	5.67	H	115	212

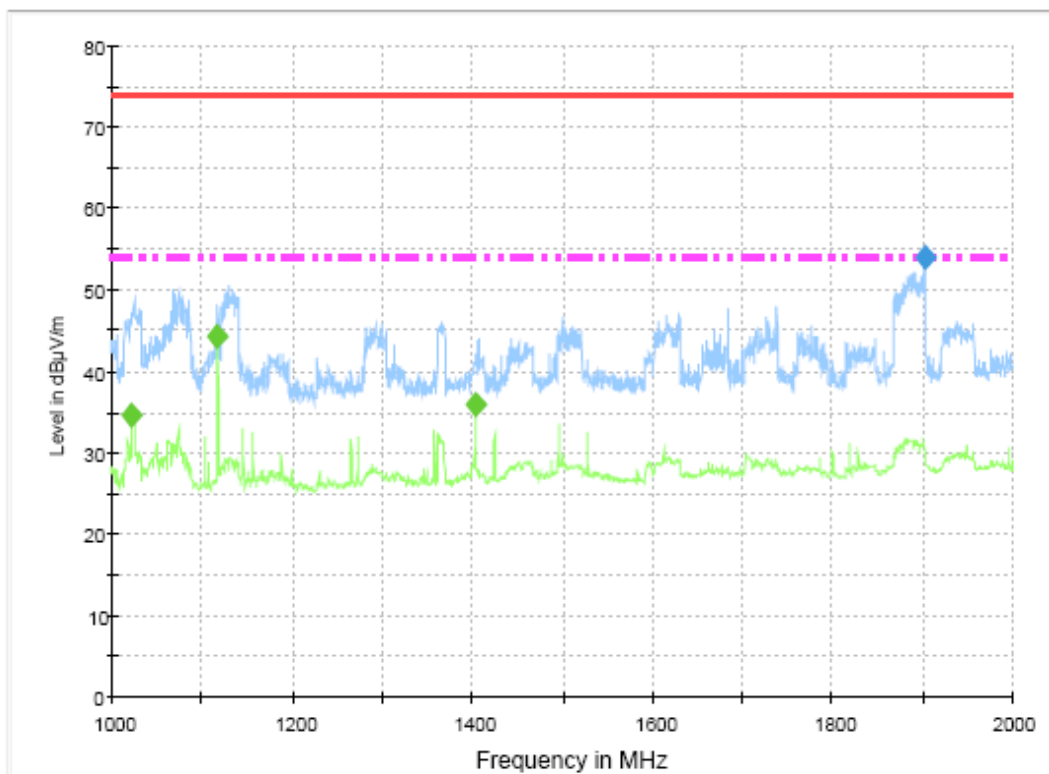


< Fig 10. Radiated emission result (30 MHz ~ 1 000 MHz)>



- ◆ Operating Condition: 1 280 × 1 024 / 75 Hz (D-sub: Analog)
Detector mode: Peak detector mode / Average detector mode

FCC_ESIB_Preamplifier_RE with Scans



Final Result 1

Frequency (MHz)	MaxPeak-MaxHold (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
1902.000000	54.0	100.0	V	180.0	-13.5	20.0	74.0	

Final Result 2

Frequency (MHz)	Average-MaxHold (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
1022.400000	34.6	100.0	V	0.0	-16.5	19.4	54.0	
1118.000000	44.2	100.0	V	270.0	-16.1	9.8	54.0	
1404.000000	36.0	100.0	V	0.0	-14.8	18.0	54.0	

< Fig 11. 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: T1710BU)** was complies with §15.107 and 15.109 of the FCC Rules.