

## ***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 : January 7, 2010**

**Order Number: GETEC-C1-09-283**

**Test Report Number: GETEC-E3-09-164**

**Test Site: Gumi College EMC Center**

**FCC Registration Number: (100749, 443957)**

**FCC ID.: BEJW2363DV**

**Applicant: LG Electronics Inc.**

<b>Rule Part(s)</b>	<b>: FCC Part 15 Subpart B</b>
<b>Equipment Class</b>	<b>: Class B computing device peripheral (JBP)</b>
<b>EUT Type</b>	<b>: LCD Monitor</b>
<b>Type of Authority</b>	<b>: Certification</b>
<b>Model Name</b>	<b>: W2363DV</b>
<b>Trade Name</b>	<b>: LG</b>

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,**



**Hyoung Seop Kim, Associate 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.** BEJW2363DV
- **EUT Type** LCD Monitor
- **Model Name** W2363DV
- **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** December 28, 2009
- **Place of Test** **Gumi College EMC Center** ( FCC Registration Number: 100749, 443957)  
407, Bugok-dong, Gumi-si, Gyeongbuk, Korea.
- **Test Report Number** GETEC-E3-09-164
- **Dates of Issue** January 7, 2010



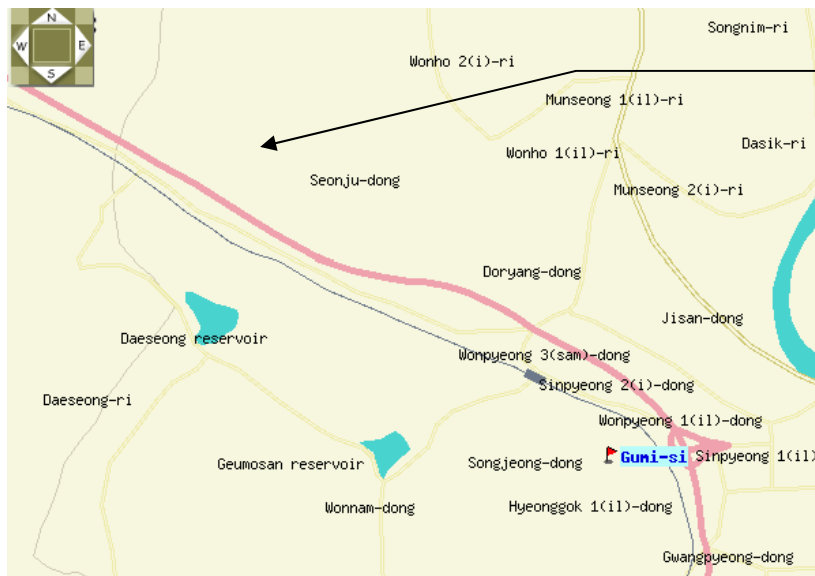
## 2. Introduction

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: W2363DV)**

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)



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407, Bugok-dong, Gumi-si,  
Gyeongbuk 730-711, Korea.  
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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: W2363DV) FCC ID.: BEJW2363DV**

Display	53.3 cm (23.0 inches) Flat Panel Active matrix-TFT LCD Anti-Glare coating Visible diagonal size: 53.3 cm 0.266 mm x 0.266 mm (Pixel Pitch)		
Sync Input	Horizontal Freq.	Digital: 30 - 83 kHz (Automatic) HDMI: 30 - 83 kHz (Automatic)	
	Vertical Freq.	Digital: 56 - 75 Hz (Automatic) HDMI: 56 - 61 Hz (Automatic)	
	Input Form	Separate Sync Digital (HDCP)	
Video Input	Signal Input	DVI-D Connector (Digital) 19 pin HDMI Connector	
	Input Form	Digital, HDMI	
Resolution	Max	VESA 1920 x 1080 @ 60 Hz	
	Recommend	1920 x 1080 @ 60 Hz	
Plug&Play	DDC 2B (Digital, HDMI)		
Power Consumption	On Mode	:	49 W (Typ.)
	Sleep Mode	≤	1.3 W (DVI-D / HDMI)
	Off Mode	≤	0.8 W
Dimensions & Weight	With Stand		Without Stand
	Width	55.55 cm ( 21.87 inches)	55.55 cm ( 21.87 inches)
	Height	419.2 cm ( 1.65 inches)	40.95 cm ( 1.61 inches)
	Depth	20.60 cm ( 0.81 inches)	73.3 cm ( 2.88 inches)
	Net	TBD kg (TBD lbs)	
Tilt Range	Tilt	-5 ° ~ 15 °	
Power Input	AC 100 - 240V ~ 50/60Hz 1.0A		
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		

Maximum Frequency range : 400 MHz

EUT Type: LCD Monitor

FCC ID.: BEJW2363DV



### 3.2 Support Equipment / Cables used

#### 3.2.1 Used Support Equipment

Description	Manufacturer	Model Name	S/N & FCC ID
PC	LG Electronics Inc.	S20MP	S/N: 903SHRC015494 FCC ID: DoC
Video card	NVIDIA	9600GT512M	S/N: EBR57315901--S0901K 12774 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
DVD player	LG Electronics Inc	LC-954	S/N: 3850R-Z674K FCC ID: DoC
Headset	GOWOONSORI	GW-500M	S/N: N/A FCC ID: DoC
GEFORCE 3D VISION	NVIDIA	P701	S/N: 0324608041959 FCC ID: DoC
HASP	NVIDIA	-	S/N: - FCC ID: DoC

*See "Appendix D – Test Setup Photographs" for actual system test set-up*

#### 3.2.2 Used Cable(s)

Cable Name	Condition	Description
Power cable	Connected to the EUT	1.8 m unshielded
Video(DVI-D)input cable	Connected to the EUT and PC	1.9 m shielded with two ferrite cores.
HDMI input cable	Connected to the EUT and DVD player	2.0 m shielded
PC sound cable	Connected to the EUT and PC	1.8 m shielded with a ferrite core
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 (DVI-D: Normal, 3D display)

- Conducted emission: 1 920 \* 1 080 / 60 Hz (DVI-D: Normal, 3D display)

- 1 024 \* 768 / 60 Hz (DVI-D: Normal), 640 \* 480 / 60 Hz (DVI-D: Normal)

- ◆ Operating test pattern

- "H" character scrolling mode (Font size: 10)
    - Black background white character
    - Brightness and contrast was adjusted as maximum level
    - 1 kHz sound tone with winamp player

***"The verification report for 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

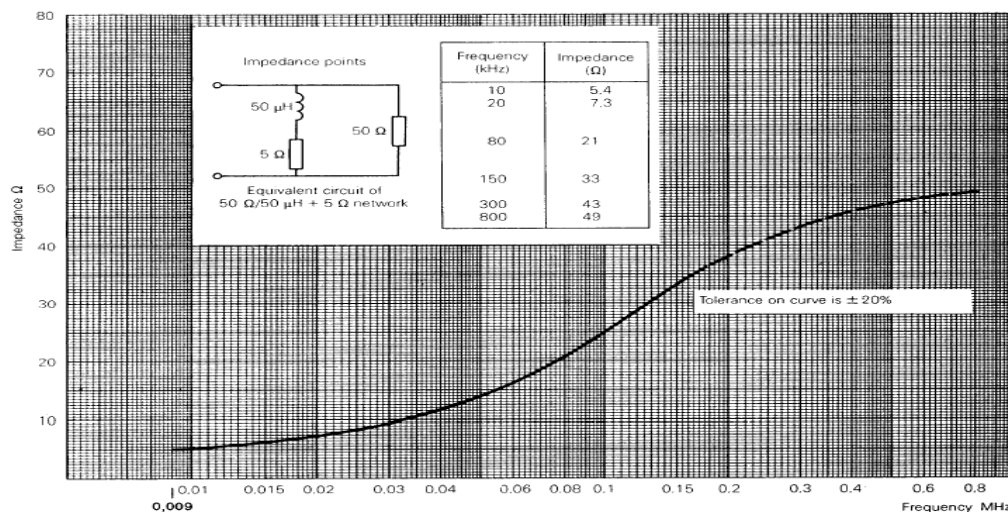


Fig 2. Impedance of LISN





#### 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 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

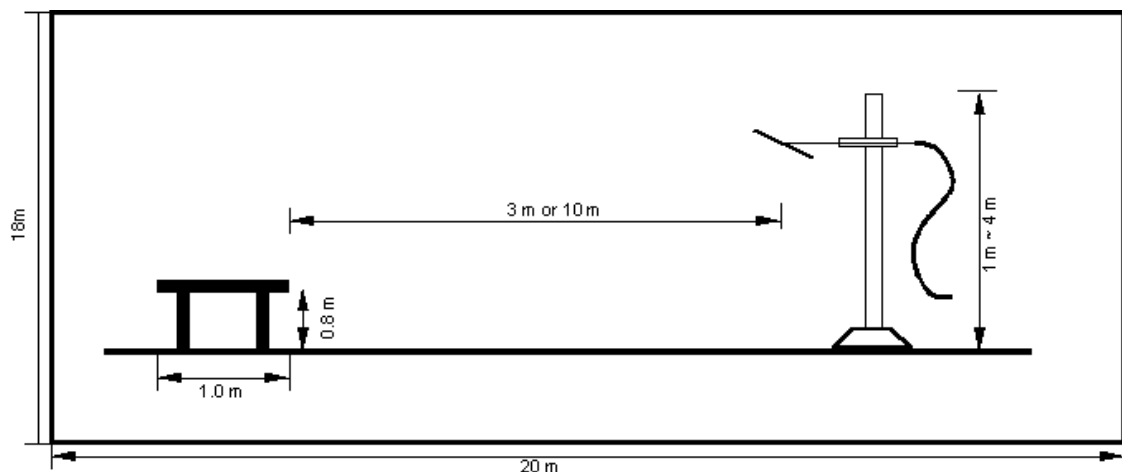


Fig 3. Dimensions of test site.



## 5. Conducted Emission

### 5.1 Operating Environment

Temperature : 24 °C  
Relative Humidity : 42 % 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)	$\pm 2.69$ dB	Confidence levels of 95 % (k=2)
Conducted emission (150 kHz ~ 30 MHz)	$\pm 4.16$ dB	Confidence levels of 95 % (k=2)



#### 5.4 Limit

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

#### 5.5 Test Equipment used

Model Name	Manufacturer	Description	Serial Number	Due to Calibration
■ - ESCS30	Rohde & Schwarz	EMI test receiver	839809/003	12. 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

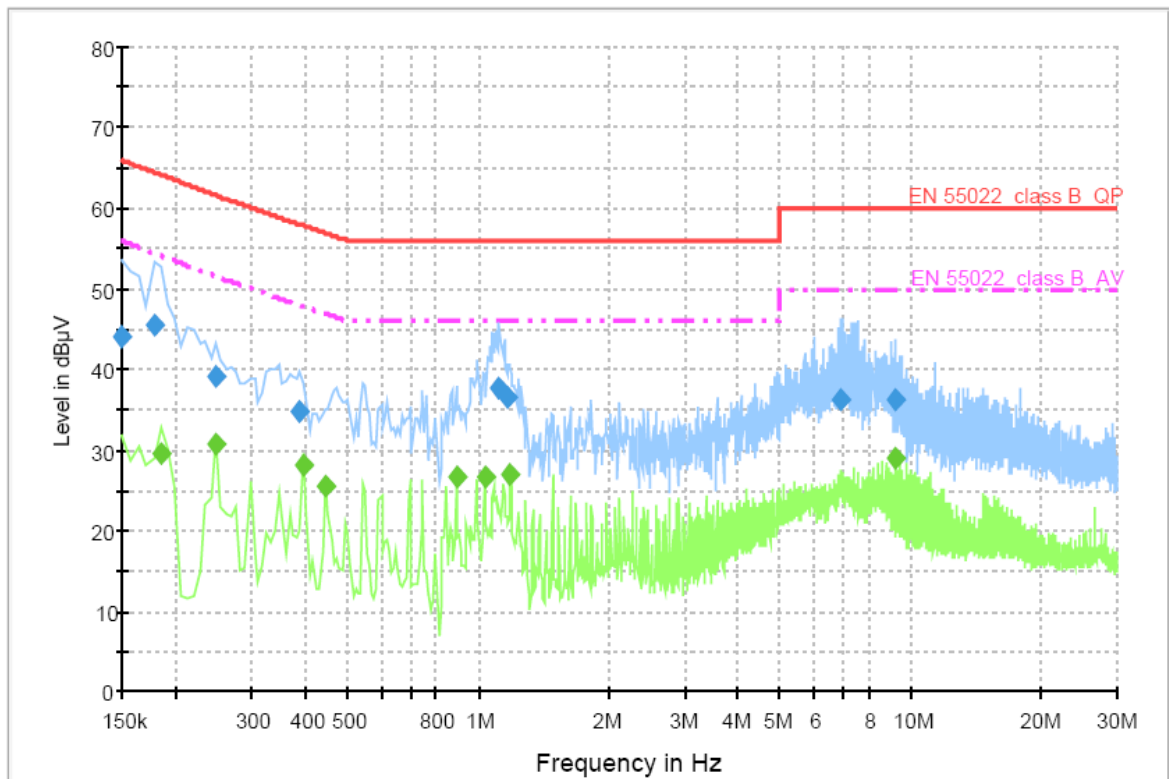
#### 5.6 Test data for Conducted Emission

- . Test Date : December 28, 2009  
- . Resolution Bandwidth : 9 kHz  
- . Frequency Range : 0.15 MHz ~ 30 MHz



◆ Test resolution: 1 920 \* 1 080 / 60 Hz (DVI-D: Normal)

## 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	44.1	1000.000	9.000	GND	L1	10.0	21.9	66.0	
0.178000	45.6	1000.000	9.000	GND	L1	10.0	18.9	64.5	
0.248000	39.0	1000.000	9.000	GND	L1	10.0	22.6	61.6	
0.388000	34.7	1000.000	9.000	GND	L1	10.0	23.3	58.0	
1.123000	37.6	1000.000	9.000	GND	L1	10.0	18.4	56.0	
1.172000	36.4	1000.000	9.000	GND	L1	10.1	19.6	56.0	
6.912000	36.3	1000.000	9.000	GND	L1	10.3	23.7	60.0	
9.215000	36.3	1000.000	9.000	GND	L1	10.4	23.7	60.0	

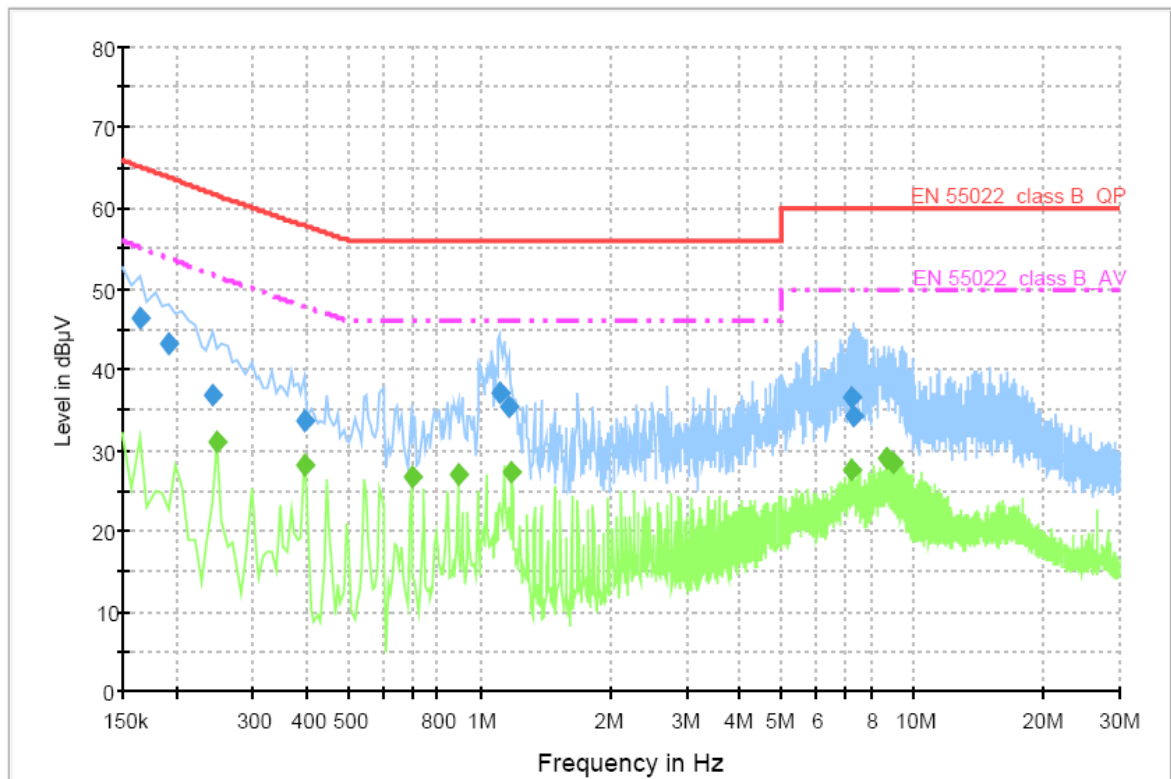
### Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.185000	29.5	1000.000	9.000	GND	L1	10.0	24.6	54.1	
0.248000	30.8	1000.000	9.000	GND	L1	10.0	20.8	51.6	
0.395000	28.1	1000.000	9.000	GND	L1	10.0	19.7	47.8	
0.444000	25.5	1000.000	9.000	GND	L1	10.0	21.5	46.9	
0.892000	26.6	1000.000	9.000	GND	L1	10.0	19.4	46.0	
1.039000	26.7	1000.000	9.000	GND	L1	10.0	19.3	46.0	
1.186000	27.0	1000.000	9.000	GND	L1	10.1	19.0	46.0	
9.215000	28.8	1000.000	9.000	GND	L1	10.4	21.2	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
0.164000	46.3	1000.000	9.000	GND	N	10.0	18.9	65.2	
0.192000	43.2	1000.000	9.000	GND	N	10.0	20.6	63.8	
0.241000	36.9	1000.000	9.000	GND	N	10.0	25.0	61.9	
0.395000	33.7	1000.000	9.000	GND	N	10.0	24.1	57.8	
1.116000	37.2	1000.000	9.000	GND	N	10.1	18.8	56.0	
1.172000	35.4	1000.000	9.000	GND	N	10.1	20.6	56.0	
7.185000	36.5	1000.000	9.000	GND	N	10.3	23.5	60.0	
7.339000	34.1	1000.000	9.000	GND	N	10.3	25.9	60.0	

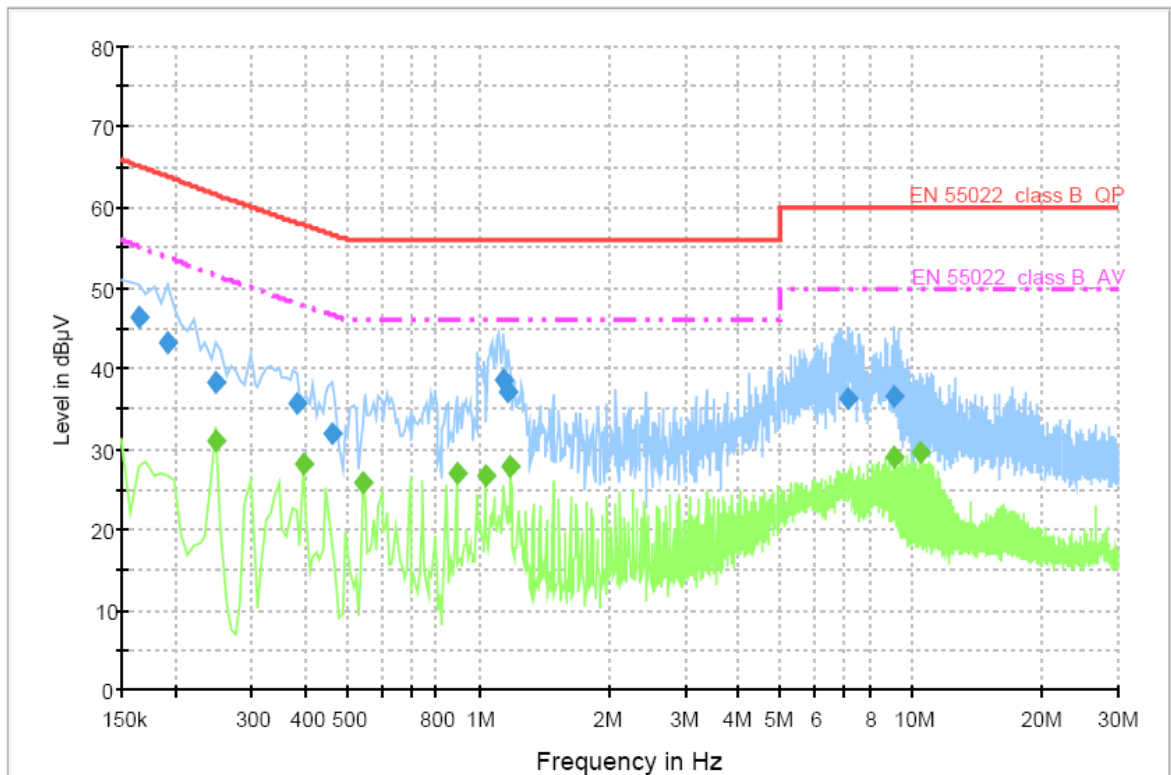
### Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.248000	31.1	1000.000	9.000	GND	N	10.0	20.5	51.6	
0.395000	28.1	1000.000	9.000	GND	N	10.0	19.7	47.8	
0.696000	26.7	1000.000	9.000	GND	N	10.0	19.3	46.0	
0.892000	26.9	1000.000	9.000	GND	N	10.0	19.1	46.0	
1.186000	27.2	1000.000	9.000	GND	N	10.1	18.8	46.0	
7.185000	27.6	1000.000	9.000	GND	N	10.3	22.4	50.0	
8.690000	28.9	1000.000	9.000	GND	N	10.3	21.1	50.0	
9.019000	28.5	1000.000	9.000	GND	N	10.3	21.5	50.0	

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



◆ Test resolution: 1 024 \* 768 / 60 Hz (DVI-D: Normal)  
**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
0.164000	46.3	1000.000	9.000	GND	L1	10.0	18.9	65.2	
0.192000	43.1	1000.000	9.000	GND	L1	10.0	20.7	63.8	
0.248000	38.2	1000.000	9.000	GND	L1	10.0	23.4	61.6	
0.381000	35.7	1000.000	9.000	GND	L1	10.0	22.4	58.1	
0.458000	32.0	1000.000	9.000	GND	L1	10.0	24.7	56.7	
1.137000	38.6	1000.000	9.000	GND	L1	10.0	17.4	56.0	
1.172000	37.0	1000.000	9.000	GND	L1	10.1	19.0	56.0	
7.171000	36.2	1000.000	9.000	GND	L1	10.3	23.8	60.0	
9.082000	36.6	1000.000	9.000	GND	L1	10.4	23.4	60.0	

### Final Measurement Detector 2

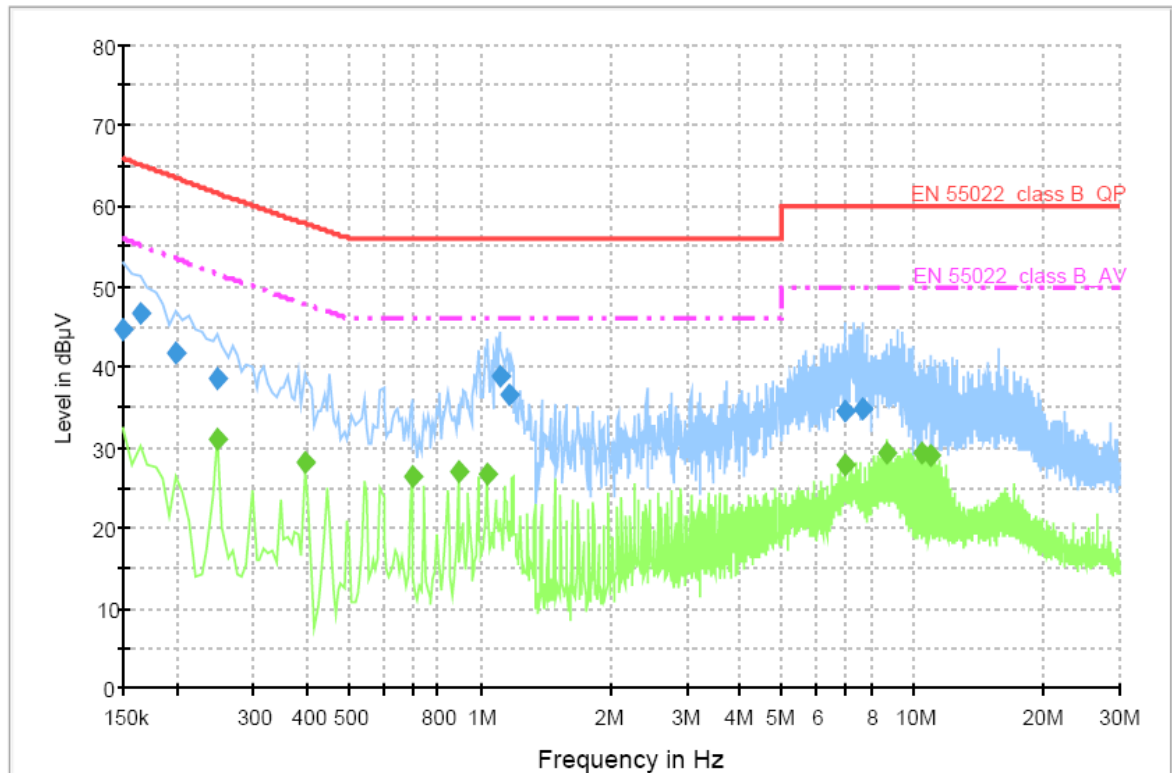
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.248000	31.2	1000.000	9.000	GND	L1	10.0	20.4	51.6	
0.395000	28.1	1000.000	9.000	GND	L1	10.0	19.7	47.8	
0.542000	25.9	1000.000	9.000	GND	L1	10.0	20.1	46.0	
0.892000	26.9	1000.000	9.000	GND	L1	10.0	19.1	46.0	
1.039000	26.8	1000.000	9.000	GND	L1	10.0	19.2	46.0	
1.186000	27.7	1000.000	9.000	GND	L1	10.1	18.3	46.0	
9.145000	29.0	1000.000	9.000	GND	L1	10.4	21.0	50.0	
10.454000	29.5	1000.000	9.000	GND	L1	10.4	20.5	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	44.6	1000.000	9.000	GND	N	10.0	21.4	66.0	
0.164000	46.7	1000.000	9.000	GND	N	10.0	18.5	65.2	
0.199000	41.6	1000.000	9.000	GND	N	10.0	21.9	63.5	
0.248000	38.4	1000.000	9.000	GND	N	10.0	23.2	61.6	
1.116000	38.9	1000.000	9.000	GND	N	10.1	17.1	56.0	
1.172000	36.4	1000.000	9.000	GND	N	10.1	19.6	56.0	
6.968000	34.5	1000.000	9.000	GND	N	10.3	25.5	60.0	
7.668000	34.8	1000.000	9.000	GND	N	10.3	25.2	60.0	

### Final Measurement Detector 2

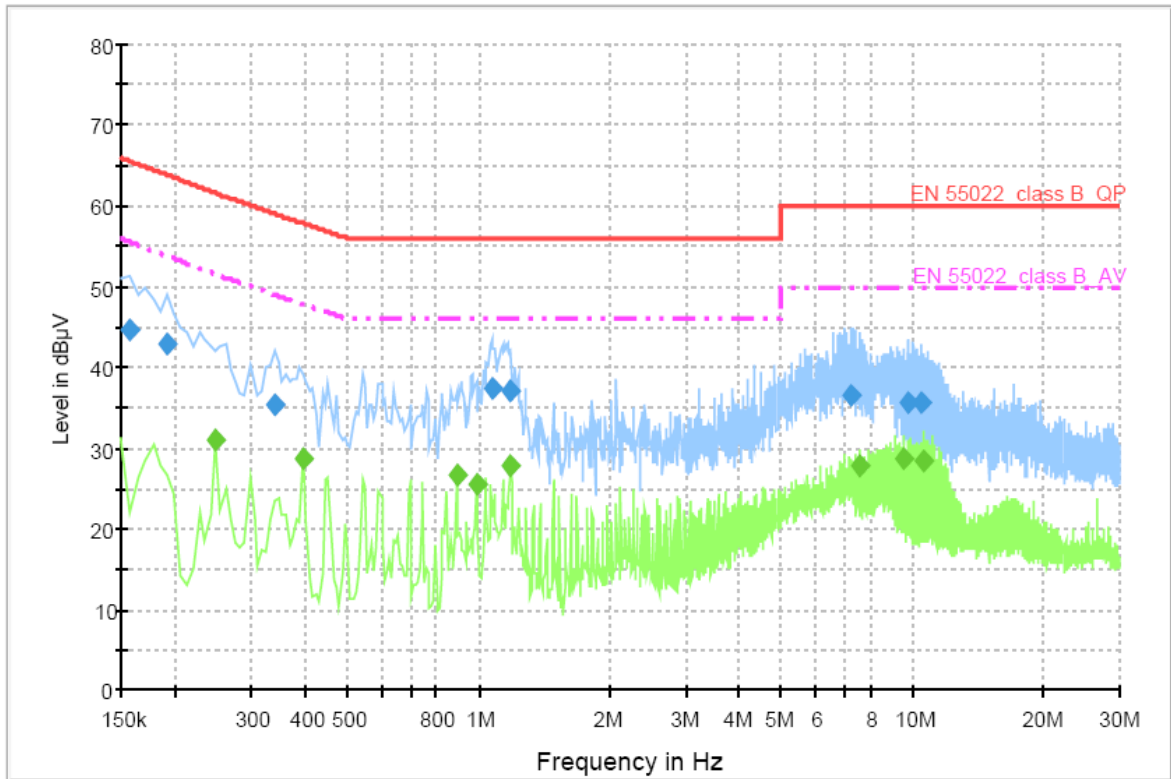
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.248000	31.0	1000.000	9.000	GND	N	10.0	20.6	51.6	
0.395000	28.1	1000.000	9.000	GND	N	10.0	19.7	47.8	
0.696000	26.5	1000.000	9.000	GND	N	10.0	19.5	46.0	
0.892000	27.0	1000.000	9.000	GND	N	10.0	19.0	46.0	
1.039000	26.8	1000.000	9.000	GND	N	10.1	19.2	46.0	
6.989000	27.7	1000.000	9.000	GND	N	10.3	22.3	50.0	
8.690000	29.2	1000.000	9.000	GND	N	10.3	20.8	50.0	
10.454000	29.3	1000.000	9.000	GND	N	10.4	20.7	50.0	
11.042000	29.0	1000.000	9.000	GND	N	10.4	21.0	50.0	

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



◆ Test resolution: 640 \* 480 / 60 Hz (DVI-D: Normal)

## 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	44.7	1000.000	9.000	GND	L1	10.0	20.9	65.6	
0.192000	43.0	1000.000	9.000	GND	L1	10.0	20.8	63.8	
0.339000	35.4	1000.000	9.000	GND	L1	10.0	23.6	59.0	
1.074000	37.3	1000.000	9.000	GND	L1	10.0	18.7	56.0	
1.186000	37.1	1000.000	9.000	GND	L1	10.1	18.9	56.0	
7.234000	36.4	1000.000	9.000	GND	L1	10.3	23.6	60.0	
9.733000	35.7	1000.000	9.000	GND	L1	10.4	24.3	60.0	
10.517000	35.7	1000.000	9.000	GND	L1	10.4	24.3	60.0	

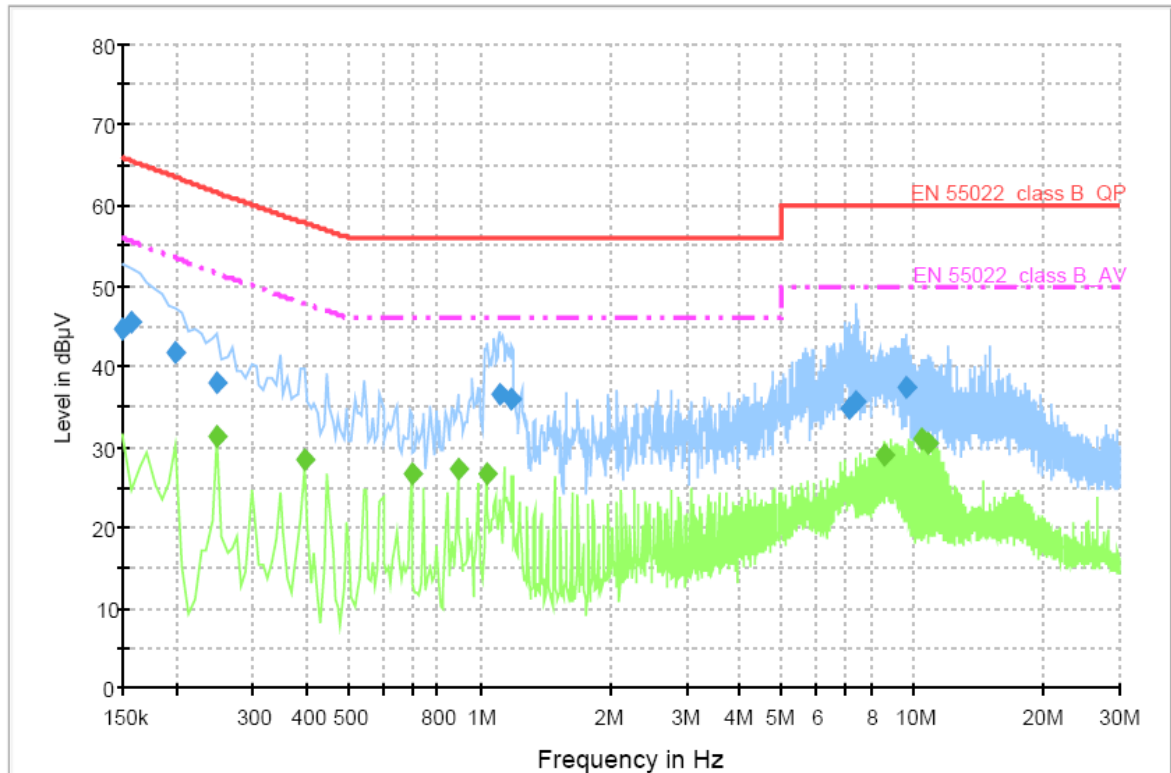
### Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.248000	31.0	1000.000	9.000	GND	L1	10.0	20.6	51.6	
0.395000	28.6	1000.000	9.000	GND	L1	10.0	19.2	47.8	
0.892000	26.8	1000.000	9.000	GND	L1	10.0	19.2	46.0	
0.990000	25.7	1000.000	9.000	GND	L1	10.0	20.4	46.0	
1.186000	27.7	1000.000	9.000	GND	L1	10.1	18.3	46.0	
7.577000	27.7	1000.000	9.000	GND	L1	10.3	22.3	50.0	
9.537000	28.8	1000.000	9.000	GND	L1	10.4	21.2	50.0	
10.650000	28.5	1000.000	9.000	GND	L1	10.4	21.5	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	44.8	1000.000	9.000	GND	N	10.0	21.2	66.0	
0.157000	45.4	1000.000	9.000	GND	N	10.0	20.2	65.6	
0.199000	41.7	1000.000	9.000	GND	N	10.0	21.9	63.5	
0.248000	38.1	1000.000	9.000	GND	N	10.0	23.5	61.6	
1.116000	36.5	1000.000	9.000	GND	N	10.1	19.5	56.0	
1.186000	36.0	1000.000	9.000	GND	N	10.1	20.0	56.0	
7.136000	34.8	1000.000	9.000	GND	N	10.3	25.2	60.0	
7.437000	35.7	1000.000	9.000	GND	N	10.3	24.3	60.0	
9.670000	37.3	1000.000	9.000	GND	N	10.4	22.7	60.0	

### Final Measurement Detector 2

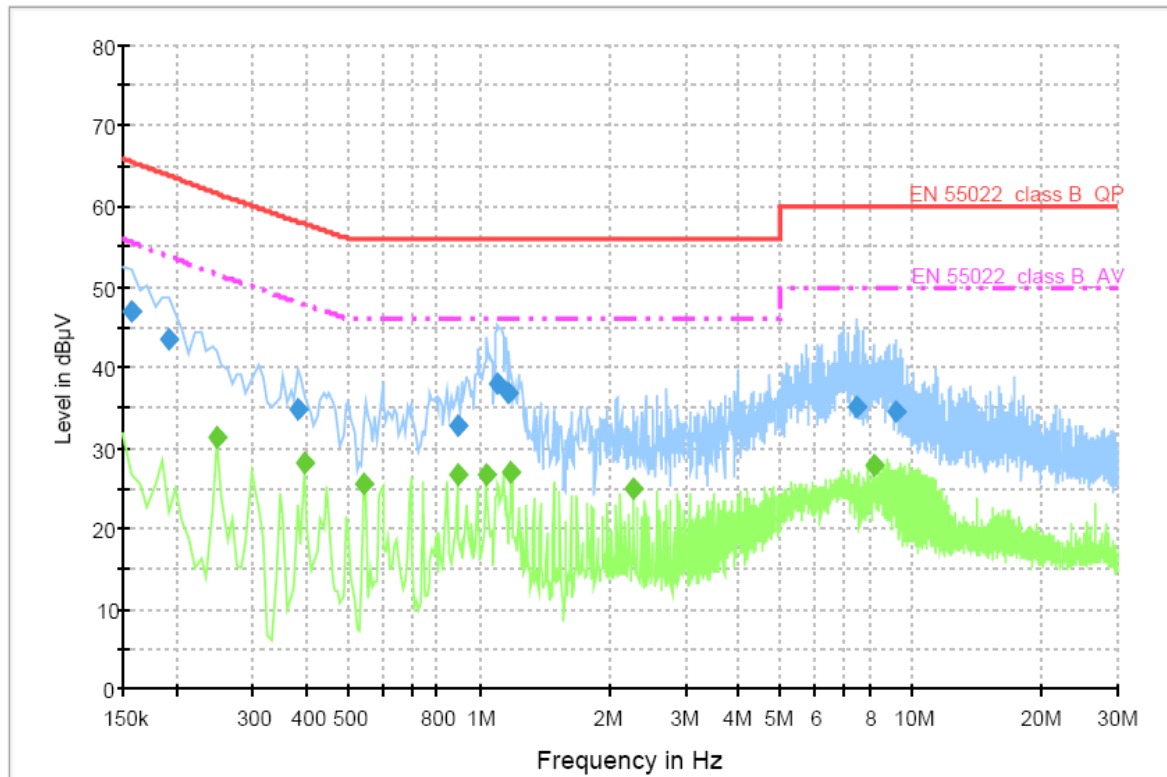
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.248000	31.2	1000.000	9.000	GND	N	10.0	20.4	51.6	
0.395000	28.4	1000.000	9.000	GND	N	10.0	19.4	47.8	
0.696000	26.5	1000.000	9.000	GND	N	10.0	19.5	46.0	
0.892000	27.2	1000.000	9.000	GND	N	10.0	18.8	46.0	
1.039000	26.7	1000.000	9.000	GND	N	10.1	19.3	46.0	
8.557000	29.1	1000.000	9.000	GND	N	10.3	20.9	50.0	
10.517000	31.0	1000.000	9.000	GND	N	10.4	19.0	50.0	
10.909000	30.5	1000.000	9.000	GND	N	10.4	19.5	50.0	

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



◆ Test resolution: 1 920 \* 1 080 / 60 Hz (DVI-D: 3D display)

## 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	47.0	1000.000	9.000	GND	L1	10.0	18.6	65.6	
0.192000	43.6	1000.000	9.000	GND	L1	10.0	20.2	63.8	
0.381000	34.7	1000.000	9.000	GND	L1	10.0	23.4	58.1	
0.892000	32.8	1000.000	9.000	GND	L1	10.0	23.2	56.0	
1.109000	38.1	1000.000	9.000	GND	L1	10.0	17.9	56.0	
1.172000	36.9	1000.000	9.000	GND	L1	10.1	19.1	56.0	
7.465000	35.1	1000.000	9.000	GND	L1	10.3	24.9	60.0	
9.215000	34.5	1000.000	9.000	GND	L1	10.4	25.5	60.0	

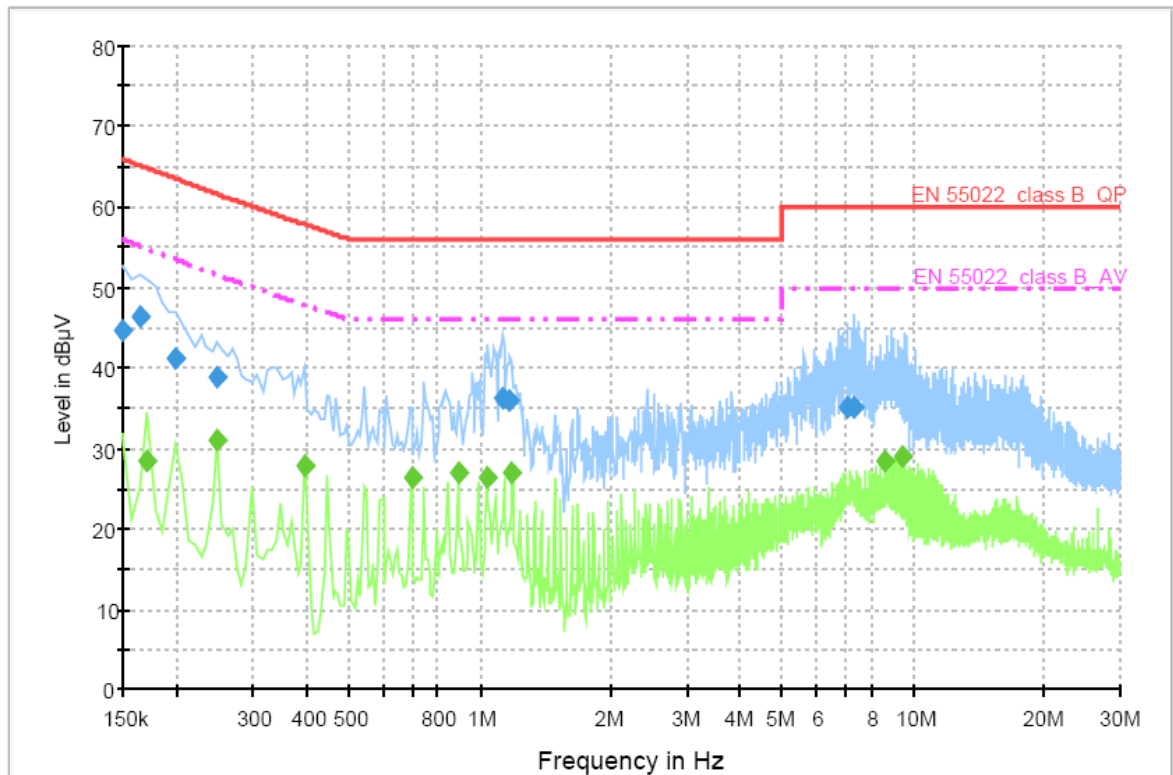
### Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.248000	31.3	1000.000	9.000	GND	L1	10.0	20.3	51.6	
0.395000	28.3	1000.000	9.000	GND	L1	10.0	19.5	47.8	
0.542000	25.5	1000.000	9.000	GND	L1	10.0	20.5	46.0	
0.892000	26.5	1000.000	9.000	GND	L1	10.0	19.5	46.0	
1.039000	26.8	1000.000	9.000	GND	L1	10.0	19.2	46.0	
1.186000	27.1	1000.000	9.000	GND	L1	10.1	18.9	46.0	
2.278000	24.9	1000.000	9.000	GND	L1	10.1	21.1	46.0	
8.172000	27.8	1000.000	9.000	GND	L1	10.3	22.2	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	44.6	1000.000	9.000	GND	N	10.0	21.4	66.0	
0.164000	46.3	1000.000	9.000	GND	N	10.0	18.9	65.2	
0.199000	41.2	1000.000	9.000	GND	N	10.0	22.3	63.5	
0.248000	38.8	1000.000	9.000	GND	N	10.0	22.8	61.6	
1.130000	36.1	1000.000	9.000	GND	N	10.1	19.9	56.0	
1.172000	35.9	1000.000	9.000	GND	N	10.1	20.1	56.0	
7.066000	35.2	1000.000	9.000	GND	N	10.3	24.8	60.0	
7.339000	35.0	1000.000	9.000	GND	N	10.3	25.0	60.0	

### Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.171000	28.3	1000.000	9.000	GND	N	10.0	26.5	54.8	
0.248000	31.2	1000.000	9.000	GND	N	10.0	20.4	51.6	
0.395000	27.9	1000.000	9.000	GND	N	10.0	19.9	47.8	
0.696000	26.5	1000.000	9.000	GND	N	10.0	19.5	46.0	
0.892000	26.8	1000.000	9.000	GND	N	10.0	19.2	46.0	
1.039000	26.5	1000.000	9.000	GND	N	10.1	19.5	46.0	
1.186000	27.0	1000.000	9.000	GND	N	10.1	19.0	46.0	
8.564000	28.4	1000.000	9.000	GND	N	10.3	21.6	50.0	
9.411000	29.0	1000.000	9.000	GND	N	10.4	21.0	50.0	

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



## 6. Radiated Emission

### 6.1 Operating Environment

Temperature : -4 °C  
Relative Humidity : 38 % 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 $\mu$ V/m	CISPR Limit @ 10 m. dB $\mu$ 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
■ - 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 ANT	829228/011	11. 20. 2010
■ - BBHA9120D	Schwarzbeck	Horn ANT	597	12. 18. 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
■ - 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



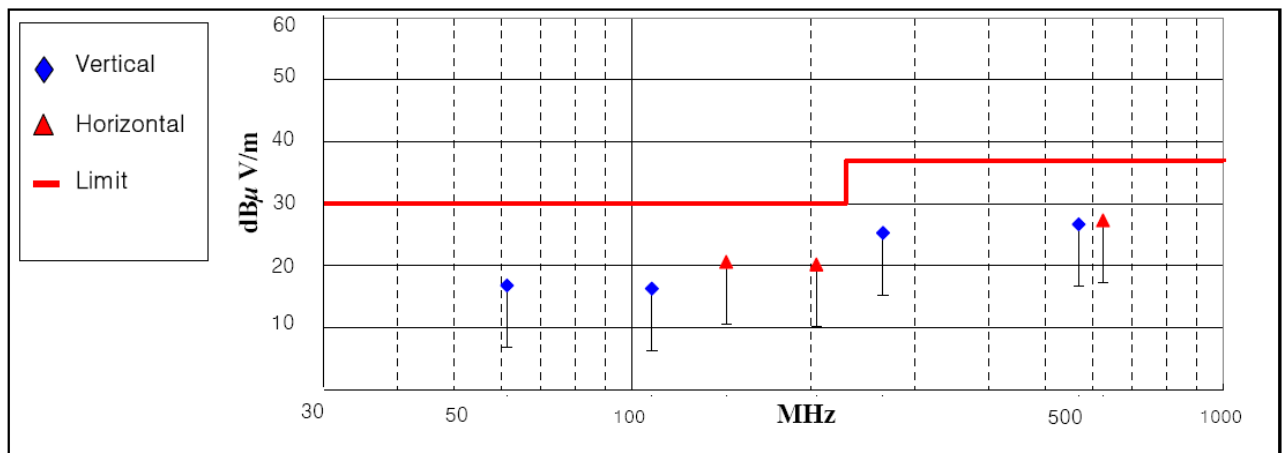
## 6.6 Test data for Radiated Emission

- Test Date : December 28, 2009
- 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 (400 MHz). The measurement was made up to 2 000 MHz

◆ Operating Condition: 1 920 \* 1 080 / 60 Hz (DVI-D: Normal)

Detector mode: Quasi- peak detector mode

Frequency (MHz)	Measurement Level				Limit (dB $\mu$ V/m)	Margin (dB)	Positioning System		
	Reading	Antenna	Cable	Test Result			Pol.	Height	Angle
	Value(dB $\mu$ V)	Factor(dB/m)	Loss(dB)	(dB $\mu$ V/m)			(H/V)	(cm)	(°)
61.43	6.26	8.06	2.53	16.85	30.00	13.15	V	100	301
107.91	3.21	9.94	3.17	16.32	30.00	13.68	V	119	13
144.08	5.15	11.85	3.62	20.62	30.00	9.38	H	212	255
204.85	1.46	14.44	4.35	20.25	30.00	9.75	H	117	267
265.49	1.32	18.84	5.16	25.32	37.00	11.68	V	101	96
568.61	1.29	18.18	7.24	26.71	37.00	10.29	V	100	215
625.20	1.05	18.71	7.56	27.32	37.00	9.68	H	189	185

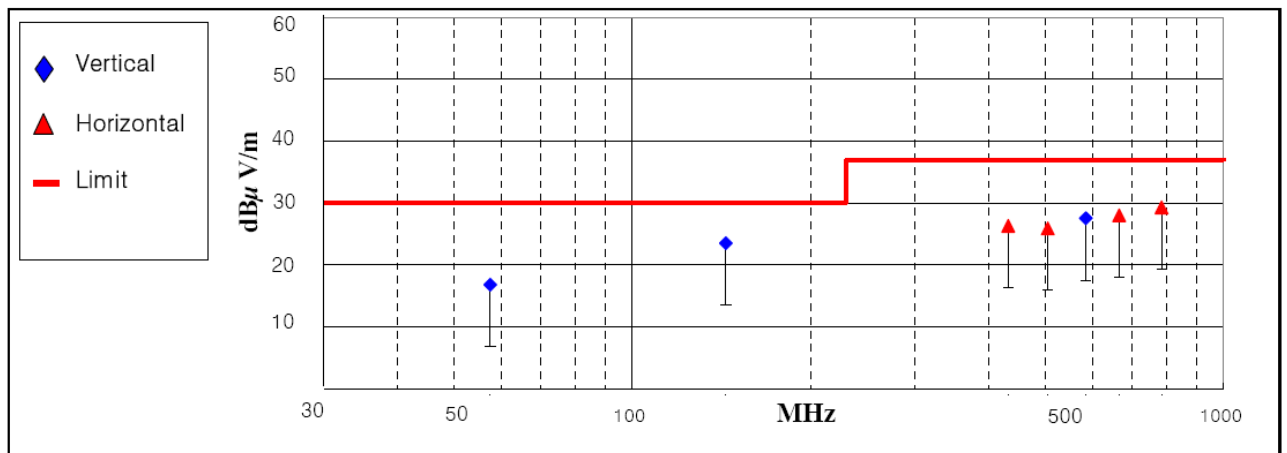


< Fig 12. Radiated emission result (30 MHz ~ 1 000 MHz)>



- ◆ Operating Condition: 1 920 \* 1 080 / 60 Hz (DVI-D: 3D display)  
Detector mode: Quasi- peak detector mode

Frequency (MHz)	Measurement Level				Limit (dB $\mu$ V/m)	Margin (dB)	Positioning System		
	Reading	Antenna	Cable	Test Result			Pol.	Height	Angle
	Value(dB $\mu$ V)	Factor(dB/m)	Loss(dB)	(dB $\mu$ V/m)			(H/V)	(cm)	(°)
57.50	5.90	8.46	2.46	16.82	30.00	13.18	V	100	191
143.98	8.04	11.85	3.62	23.51	30.00	6.49	V	111	32
432.01	2.30	16.79	7.23	26.32	37.00	10.68	H	102	177
503.97	1.34	17.55	7.02	25.91	37.00	11.09	H	215	85
585.05	1.90	18.33	7.33	27.56	37.00	9.44	V	115	191
665.89	1.13	19.09	7.79	28.01	37.00	8.99	H	100	91
785.53	1.05	19.75	8.51	29.31	37.00	7.69	H	107	99

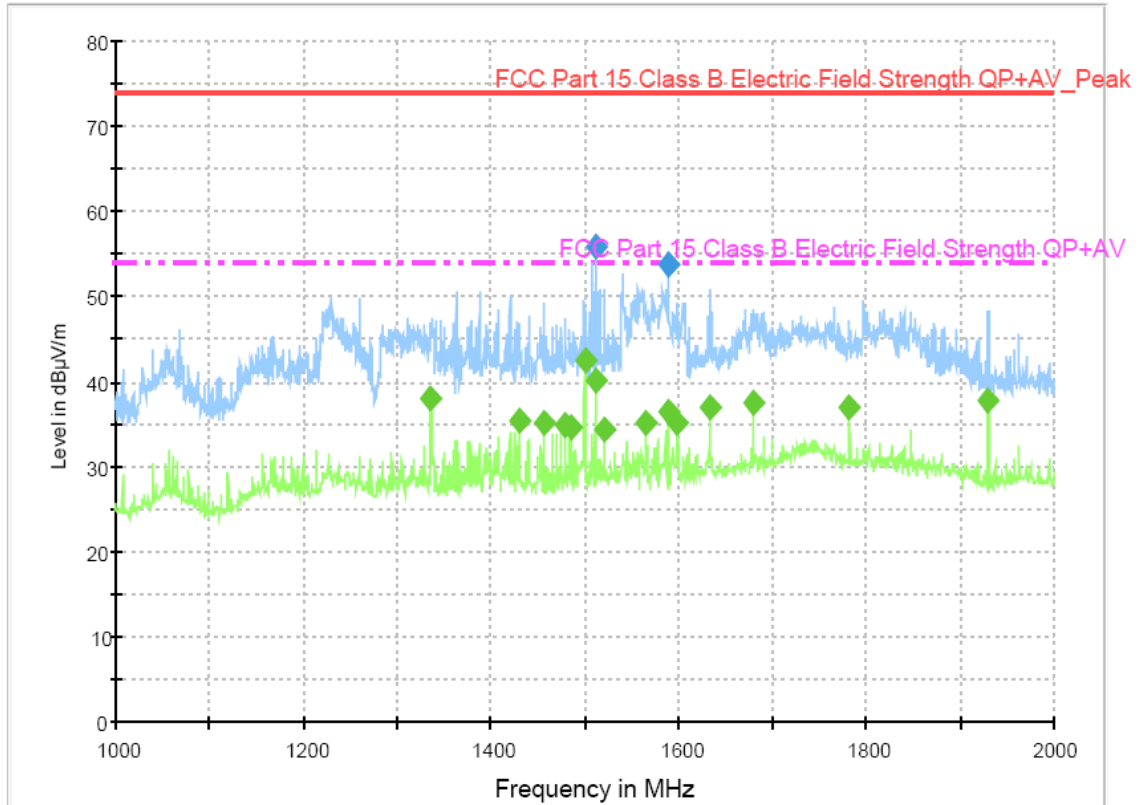


< Fig 13. Radiated emission result (30 MHz ~ 1 000 MHz)>



- ◆ Operating Condition: 1 920 \* 1 080 / 60 Hz (DVI-D: Normal)  
Detector mode: Peak detector mode / Average detector mode

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### Final Result 1

Frequency (MHz)	MaxPeak-MaxHold (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
1512.000000	55.8	100.0	H	180.0	-14.7	18.2	74.0	
1590.000000	53.9	100.0	V	0.0	-14.4	18.1	74.0	

### Final Result 2

Frequency (MHz)	Average-MaxHold (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
1336.400000	38.0	100.0	H	180.0	-14.9	16.0	54.0	
1430.000000	35.3	100.0	H	180.0	-14.8	18.7	54.0	
1457.600000	35.3	100.0	V	90.0	-14.8	18.7	54.0	
1478.800000	34.9	100.0	V	90.0	-14.8	19.1	54.0	
1485.200000	34.7	100.0	H	180.0	-14.8	19.3	54.0	
1500.000000	42.6	100.0	V	0.0	-14.8	11.4	54.0	
1511.600000	40.2	100.0	H	180.0	-14.7	13.8	54.0	
1520.800000	34.3	100.0	H	180.0	-14.7	19.7	54.0	
1565.600000	35.1	100.0	V	0.0	-14.5	18.9	54.0	
1590.000000	36.5	100.0	V	0.0	-14.4	17.5	54.0	
1598.800000	35.1	100.0	V	0.0	-14.4	18.9	54.0	
1633.600000	37.0	100.0	V	180.0	-14.4	17.0	54.0	
1680.000000	37.5	100.0	V	180.0	-14.4	16.5	54.0	
1782.000000	37.0	100.0	V	180.0	-14.0	17.0	54.0	
1930.400000	37.7	100.0	V	180.0	-13.3	16.3	54.0	

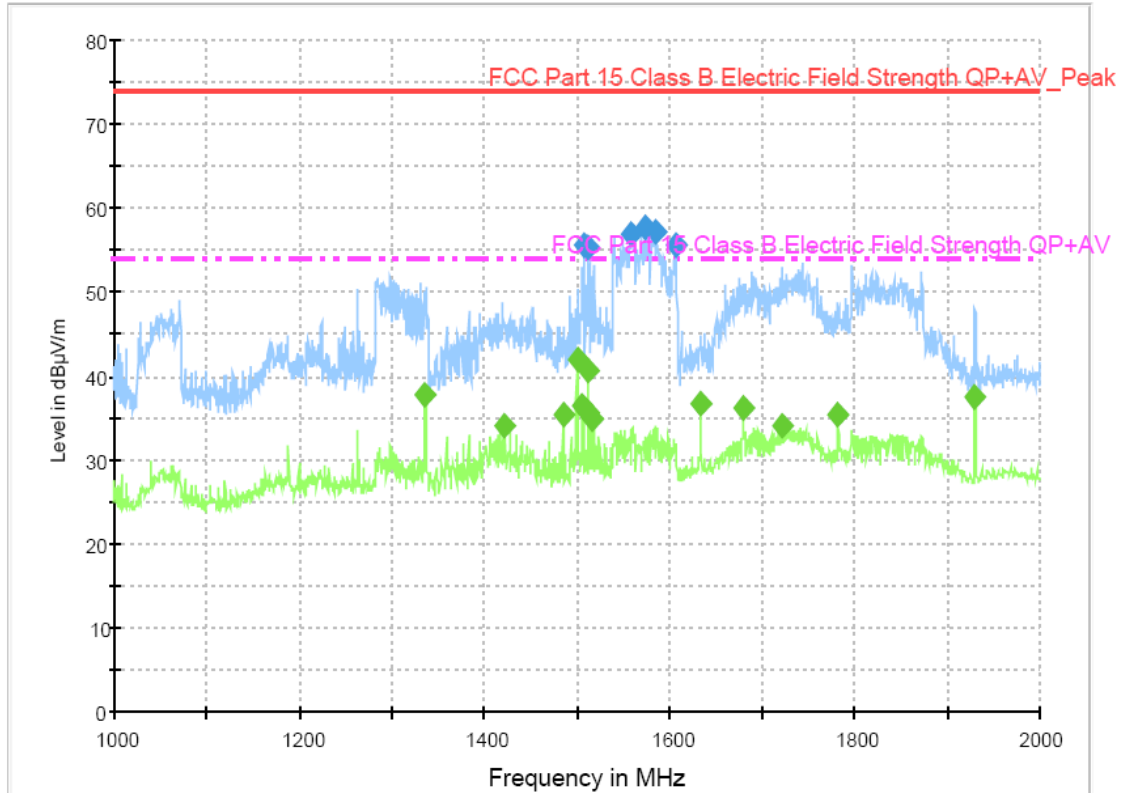
< Fig 14. Radiated emission result (1 000 MHz ~ 2 000 MHz)>



◆ Operating Condition: 1 920 \* 1 080 / 60 Hz (DVI-D: 3D display)

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
1507.600000	55.6	100.0	H	180.0	-14.8	18.4	74.0	
1511.600000	55.3	100.0	H	180.0	-14.7	18.7	74.0	
1559.600000	56.8	200.0	V	180.0	-14.5	17.2	74.0	
1574.800000	57.7	200.0	V	180.0	-14.5	16.3	74.0	
1584.800000	57.2	200.0	V	180.0	-14.4	16.8	74.0	
1606.400000	55.7	200.0	V	180.0	-14.4	18.3	74.0	

## Final Result 2

Frequency (MHz)	Average-MaxHold (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
1336.400000	37.8	100.0	H	180.0	-14.9	16.2	54.0	
1422.400000	34.2	100.0	V	0.0	-14.8	19.8	54.0	
1485.200000	35.5	100.0	H	180.0	-14.8	18.5	54.0	
1500.000000	42.0	100.0	V	0.0	-14.8	12.0	54.0	
1505.600000	36.4	100.0	H	180.0	-14.8	17.6	54.0	
1511.600000	40.6	100.0	H	180.0	-14.7	13.4	54.0	
1513.200000	35.8	100.0	V	0.0	-14.7	18.2	54.0	
1516.400000	34.9	100.0	V	180.0	-14.7	19.1	54.0	
1633.600000	36.7	200.0	H	180.0	-14.4	17.3	54.0	
1680.000000	36.3	100.0	V	180.0	-14.4	17.7	54.0	
1721.600000	34.1	100.0	V	180.0	-14.3	19.9	54.0	
1782.000000	35.3	100.0	V	180.0	-14.0	18.7	54.0	
1930.400000	37.6	100.0	V	180.0	-13.3	16.4	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 $\mu\text{V}$ = 48 dB $\mu\text{V}$
Reading	= 39.2 dB $\mu\text{V}$
$10^{(39.2\text{dB}\mu\text{V}/20)}$	= 91.2 $\mu\text{V}$
Margin	= 48 dB $\mu\text{V}$ - 39.2 dB $\mu\text{V}$ = 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 $\mu\text{V}$
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: W2363DV)** was complies with §15.107 and 15.109 of the FCC Rules.