

FCC EVALUATION REPORT FOR CERTIFICATION

Applicant : LG Electronics Inc.

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

Pyeongteak-si, Gyeonggi-do, Korea.

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

Date of Issue : November 22, 2010

Order Number: GETEC-C1-10-211

Test Report Number: GETEC-E3-10-109

Test Site: Gumi College EMC Center

FCC Registration Number: (100749, 443957)

FCC ID.: BEJHSTND-3091-G

Applicant: LG Electronics Inc.

Rule Part(s)	: FCC Part 15 Subpart B
Equipment Class	: Class B computing device peripheral (JBP)
EUT Type	: Digital Signage Display
Type of Authority	: Certification
Model Name	: HSTND-3091-G, LD4710
Trade Name	: HP, 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,



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.** BEJHSTND-3091-G

● **EUT Type** Digital Signage Display

● **Model Name** HSTND-3091-G, LD4710

[The differences for all models are as follow:](#)

Model Name	Description
HSTND-3091-G	HP brand model name
LD4710	LG brand model name

● **Trade Name** HP, LG

● **Serial Number** Prototype

● **Rule Part(s)** FCC Part 15 Subpart B

● **Type of Authority** Certification

● **Test Procedure(s)** ANSI C63.4 (2003) / Canadian standard ICES-003

● **Dates of Test** November 8 ~ 9, 2010

● **Place of Test** **Gumi College EMC Center** (FCC Registration Number: 100749, 443957)
407, Bugok-dong, Gumi-si, Gyeongbuk, Korea.

● **Test Report Number** GETEC-E3-10-109

● **Dates of Issue** November 22, 2010



2. Introduction

The measurement procedure described in American National Standard for Methods of Measurement of Radio-Nose Emissions From Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz (ASNI C63.4-2003) was used in determining radiated and conducted emissions emanating from **LG Electronics Inc. Digital Signage Display (Model Name: HSTND-3091-G, LD4710)**

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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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. Digital Signage Display (Model Name: HSTND-3091-G, LD4710) FCC ID.: BEJHSTND-3091-G**

- . **Maximum Frequency Range** : 400 MHz
-. **Serial Number** : Prototype
-. **I/O Port** : RS-232C IN/OUT, HDMI/DVI, RGB IN/OUT, AUDIO (RGB/DVI), DP IN/OUT, LAN, SPEAKER OUT

		HP LD4201	HP LD4210	HP LD4710
Display	Size	106.73 cm (42 in)	106.73 cm (42 in)	119.28 cm (47 in)
	Type	TFT LCD panel	TFT LCD panel	TFT LCD panel
Viewable image size		106.73 cm (42 in) diagonal	106.73 cm (42 in) diagonal	119.28 cm (47 in) diagonal
Pixel pitch		0.4845 x 0.4845 mm (0.0191 x 0.0191 in) X RGB	0.4845 x 0.4845 mm (0.0191 x 0.0191 in) X RGB	0.5415 x 0.5415 mm (0.0213 x 0.0213 in) X RGB
Weight—maximum	Without stand and speaker	18.6 kg (41.01 lbs)	18.6 kg (41.01 lbs)	22.7 kg (50.05 lbs)
	With speaker	19.3 kg (42.55 lbs)	19.3 kg (42.55 lbs)	23.4 kg (51.59 lbs)
	With stand	21.9 kg (48.28 lbs)	21.9 kg (48.28 lbs)	26.0 kg (57.32 lbs)
	With stand and speaker	22.6 kg (49.82 lbs)	22.6 kg (49.82 lbs)	26.7 kg (58.86 lbs)
Dimensions (W x H x D)	Without stand and speaker	96.71 x 55.98 x 12.37 cm (38.07 x 22.04 x 4.87 in)	96.71 x 55.98 x 12.37 cm (38.07 x 22.04 x 4.87 in)	107.95 x 62.46 x 12.29 cm (42.50 x 24.59 x 4.84 in)
	With speaker	96.71 x 55.98 x 12.37 cm (38.07 x 22.04 x 4.87 in)	96.71 x 55.98 x 12.37 cm (38.07 x 22.04 x 4.87 in)	107.95 x 62.46 x 12.29 cm (42.50 x 24.59 x 4.84 in)
	With stand	96.71 x 63.50 x 25.86 cm (38.07 x 25 x 10.18 in)	96.71 x 63.50 x 25.86 cm (38.07 x 25 x 10.18 in)	107.95 x 69.77 x 29.83 cm (42.50 x 27.47 x 11.7 in)
	With stand and speaker	96.71 x 63.50 x 25.86 cm (38.07 x 25 x 10.18 in)	96.71 x 63.50 x 25.86 cm (38.07 x 25 x 10.18 in)	107.95 x 69.77 x 29.83 cm (42.50 x 27.47 x 11.7 in)
Power	Rated voltage	AC 100-240 V~50/60 Hz 2.2 A	AC 100-240 V~50/60 Hz 2.2 A	AC 100-240 V~50/60 Hz 2.2 A



3.2 Support Equipment / Cables used

3.2.1 Used Support Equipment

Description	Manufacturer	Model Name	S/N & FCC ID.
PC	Hewlett Packard	HP Z400	S/N: N/A FCC ID.: DoC
Video card	ATI	ATI Radeon HD 5770	S/N: N/A FCC ID.: DoC
PS2 keyboard	Hewlett Packard	SK-2880	S/N: 434820-002 FCC ID.: DoC
USB mouse	Hewlett Packard	M-UAE96	S/N: 265986-011 FCC ID.: DoC
Joystick	MICROSOFT	X05-92626	S/N: 9262600296169 FCC ID.: DoC
USB memory stick	LG Electronics Inc.	UM5 2GB	S/N: 003RLRN37758 FCC ID.: N/A
Monitor	LG Electronics Inc.	M2762WSK	S/N: N/A FCC ID.: N/A

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.
Speaker	LG Electronics Inc.	HSP0000K	S/N: N/A FCC ID.: N/A
Stand	LG Electronics Inc.	HST1000K	S/N: N/A FCC ID.: N/A



3.2.3 Used Cable(s)

Cable Name	Condition	Description
Power cable	Connected to the EUT	1.80 m unshielded
RGB(Analog) in cable	Connected to the EUT and PC	1.80 m shielded with two ferrite cores
RGB(Analog) out cable	Connected to the EUT and monitor	1.80 m shielded with two ferrite cores
HDMI/DVI(Digital) in cable	Connected to the EUT and PC	2.90 m shielded
Audio(RGB/DVI) in cable	Connected to the EUT and PC	1.80 m shielded
RS232-C cable	Connected to the EUT(in port) and EUT(out port)	1.20 m shielded with two ferrite cores
DP(Digital) in cable	Connected to the EUT and PC	1.80 m shielded
DP(Digital) out cable	Connected to the EUT and monitor	1.80 m shielded
Speaker cable	Connected to the EUT and speaker	0.95 m unshielded with four ferrite cores

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, HDMI/DVI: Digital, DP: Digital)

Conducted emission: 1 920 × 1 080 / 60 Hz (D-sub: Analog, HDMI/DVI: Digital, DP: 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
- . Continuous playback mode of 1 kHz audio file with winamp player
- . Settings and control the display via the network from a PC



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

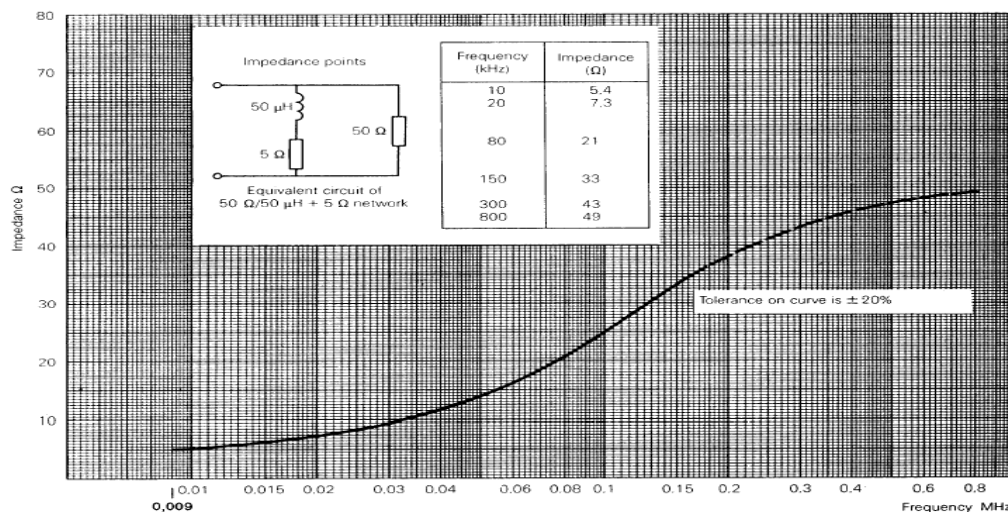


Fig 2. Impedance of LISN



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 : 23 °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 & ISN.

AMN is bonded on horizontal reference ground plane.

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

5.3 Measurement Uncertainty

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

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

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



5.4 Limit

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

5.5 Test Equipment used

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

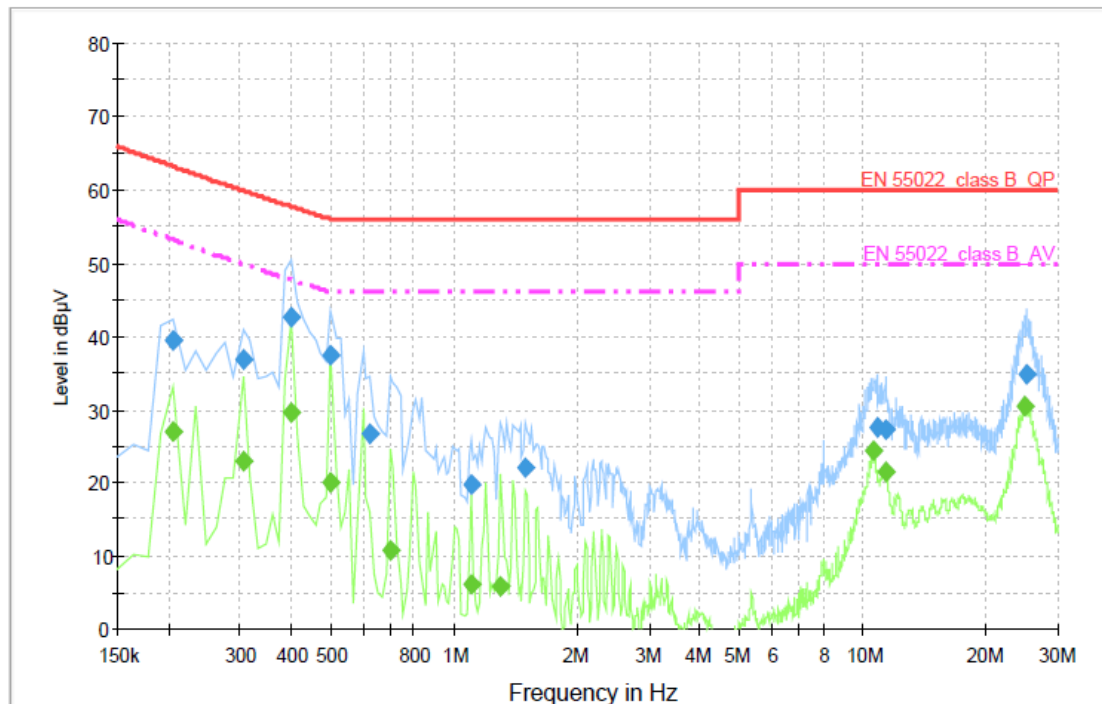
5.6 Test data for Conducted Emission

-. Test Date : November 9, 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
0.206000	39.6	1000.000	9.000	GND	L1	10.0	23.6	63.2	
0.304000	36.8	1000.000	9.000	GND	L1	10.0	23.1	59.9	
0.402000	42.6	1000.000	9.000	GND	L1	10.0	15.1	57.7	
0.500000	37.4	1000.000	9.000	GND	L1	10.0	18.6	56.0	
0.626000	26.5	1000.000	9.000	GND	L1	10.0	29.5	56.0	
1.102000	19.8	1000.000	9.000	GND	L1	10.0	36.2	56.0	
1.494000	22.0	1000.000	9.000	GND	L1	10.1	34.0	56.0	
10.818000	27.7	1000.000	9.000	GND	L1	10.5	32.3	60.0	
11.392000	27.1	1000.000	9.000	GND	L1	10.5	32.9	60.0	
25.140000	34.8	1000.000	9.000	GND	L1	11.2	25.2	60.0	

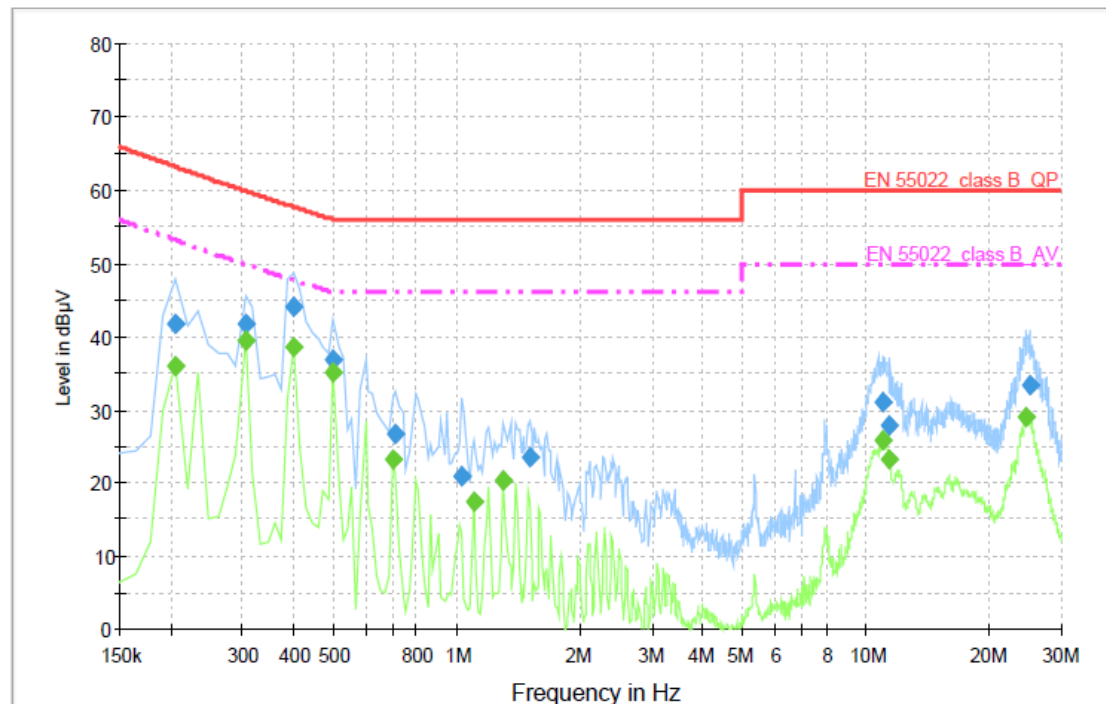
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.206000	27.0	1000.000	9.000	GND	L1	10.0	26.2	53.2	
0.304000	23.0	1000.000	9.000	GND	L1	10.0	26.9	49.9	
0.402000	29.5	1000.000	9.000	GND	L1	10.0	18.2	47.7	
0.500000	19.9	1000.000	9.000	GND	L1	10.0	26.1	46.0	
0.696000	10.7	1000.000	9.000	GND	L1	10.0	35.3	46.0	
1.102000	6.0	1000.000	9.000	GND	L1	10.0	40.0	46.0	
1.298000	5.7	1000.000	9.000	GND	L1	10.1	40.3	46.0	
10.566000	24.4	1000.000	9.000	GND	L1	10.4	25.6	50.0	
11.350000	21.3	1000.000	9.000	GND	L1	10.5	28.7	50.0	
24.986000	30.4	1000.000	9.000	GND	L1	11.2	19.6	50.0	

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



Voltage with 4-Line-LISN_N



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.206000	41.6	1000.000	9.000	GND	N	10.0	21.6	63.2	
0.304000	41.8	1000.000	9.000	GND	N	10.0	18.1	59.9	
0.402000	44.1	1000.000	9.000	GND	N	10.0	13.6	57.7	
0.500000	36.9	1000.000	9.000	GND	N	10.0	19.1	56.0	
0.710000	26.7	1000.000	9.000	GND	N	10.0	29.3	56.0	
1.032000	21.0	1000.000	9.000	GND	N	10.1	35.0	56.0	
1.508000	23.6	1000.000	9.000	GND	N	10.1	32.4	56.0	
11.000000	31.0	1000.000	9.000	GND	N	10.4	29.0	60.0	
11.448000	27.7	1000.000	9.000	GND	N	10.4	32.3	60.0	
25.112000	33.5	1000.000	9.000	GND	N	10.8	26.5	60.0	

Final Measurement Detector 2

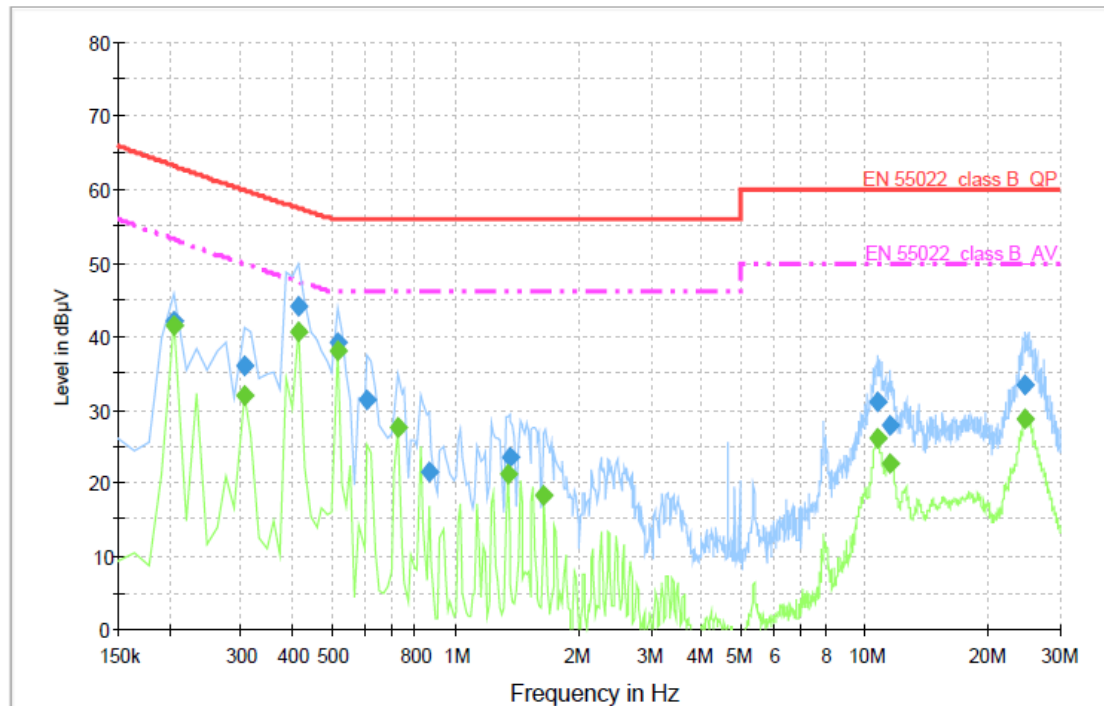
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.206000	36.0	1000.000	9.000	GND	N	10.0	17.2	53.2	
0.304000	39.4	1000.000	9.000	GND	N	10.0	10.5	49.9	
0.402000	38.4	1000.000	9.000	GND	N	10.0	9.3	47.7	
0.500000	35.2	1000.000	9.000	GND	N	10.0	10.8	46.0	
0.696000	23.2	1000.000	9.000	GND	N	10.0	22.8	46.0	
1.102000	17.3	1000.000	9.000	GND	N	10.1	28.7	46.0	
1.298000	20.3	1000.000	9.000	GND	N	10.1	25.7	46.0	
11.042000	25.9	1000.000	9.000	GND	N	10.4	24.1	50.0	
11.364000	23.2	1000.000	9.000	GND	N	10.4	26.8	50.0	
24.692000	29.1	1000.000	9.000	GND	N	10.8	20.9	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
0.206000	42.1	1000.000	9.000	GND	L1	10.0	21.1	63.2	
0.304000	36.1	1000.000	9.000	GND	L1	10.0	23.8	59.9	
0.416000	44.0	1000.000	9.000	GND	L1	10.0	13.4	57.4	
0.514000	39.2	1000.000	9.000	GND	L1	10.0	16.8	56.0	
0.612000	31.4	1000.000	9.000	GND	L1	10.0	24.6	56.0	
0.864000	21.4	1000.000	9.000	GND	L1	10.0	34.6	56.0	
1.354000	23.6	1000.000	9.000	GND	L1	10.1	32.4	56.0	
10.720000	31.0	1000.000	9.000	GND	L1	10.4	29.0	60.0	
11.574000	27.8	1000.000	9.000	GND	L1	10.5	32.2	60.0	
24.636000	33.4	1000.000	9.000	GND	L1	11.2	26.6	60.0	

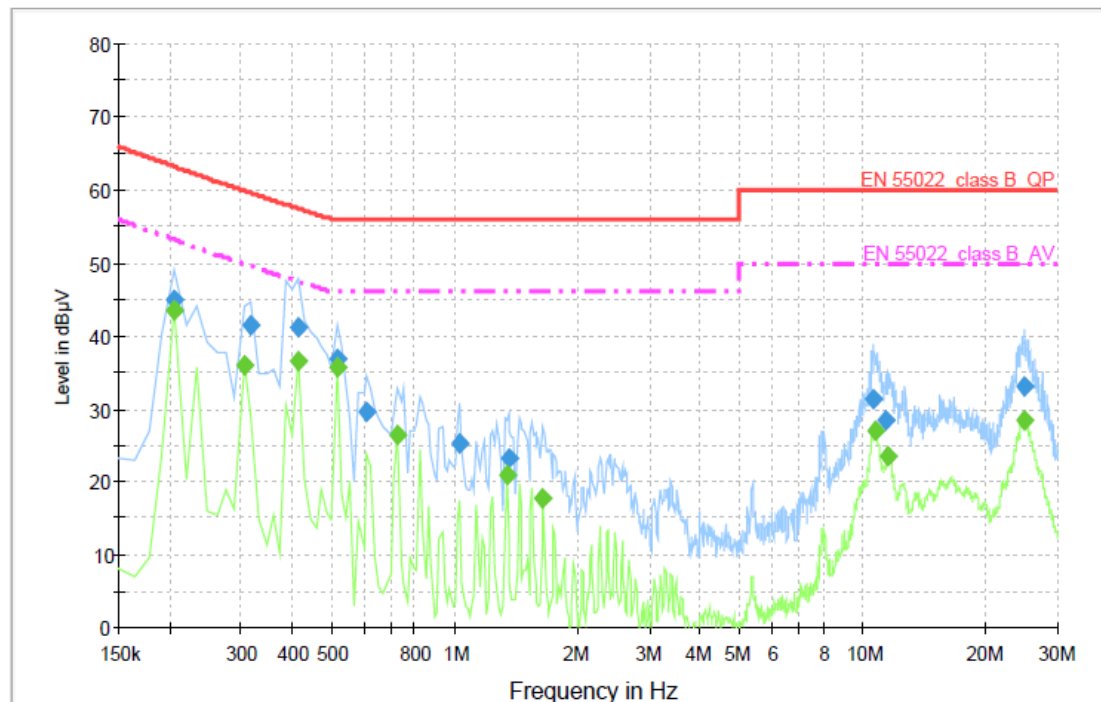
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.206000	41.6	1000.000	9.000	GND	L1	10.0	11.6	53.2	
0.304000	31.8	1000.000	9.000	GND	L1	10.0	18.1	49.9	
0.416000	40.5	1000.000	9.000	GND	L1	10.0	6.9	47.4	
0.514000	37.8	1000.000	9.000	GND	L1	10.0	8.2	46.0	
0.724000	27.5	1000.000	9.000	GND	L1	10.0	18.5	46.0	
1.340000	21.1	1000.000	9.000	GND	L1	10.1	24.9	46.0	
1.648000	18.3	1000.000	9.000	GND	L1	10.1	27.7	46.0	
10.692000	26.1	1000.000	9.000	GND	L1	10.4	23.9	50.0	
11.518000	22.6	1000.000	9.000	GND	L1	10.5	27.4	50.0	
24.720000	28.6	1000.000	9.000	GND	L1	11.2	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
0.206000	44.9	1000.000	9.000	GND	N	10.0	18.3	63.2	
0.318000	41.5	1000.000	9.000	GND	N	10.0	18.1	59.6	
0.416000	41.1	1000.000	9.000	GND	N	10.0	16.3	57.4	
0.514000	36.9	1000.000	9.000	GND	N	10.0	19.1	56.0	
0.612000	29.6	1000.000	9.000	GND	N	10.0	26.4	56.0	
1.032000	25.2	1000.000	9.000	GND	N	10.1	30.8	56.0	
1.354000	23.3	1000.000	9.000	GND	N	10.1	32.7	56.0	
10.636000	31.4	1000.000	9.000	GND	N	10.4	28.6	60.0	
11.448000	28.3	1000.000	9.000	GND	N	10.4	31.7	60.0	
24.846000	33.1	1000.000	9.000	GND	N	10.8	26.9	60.0	

Final Measurement Detector 2

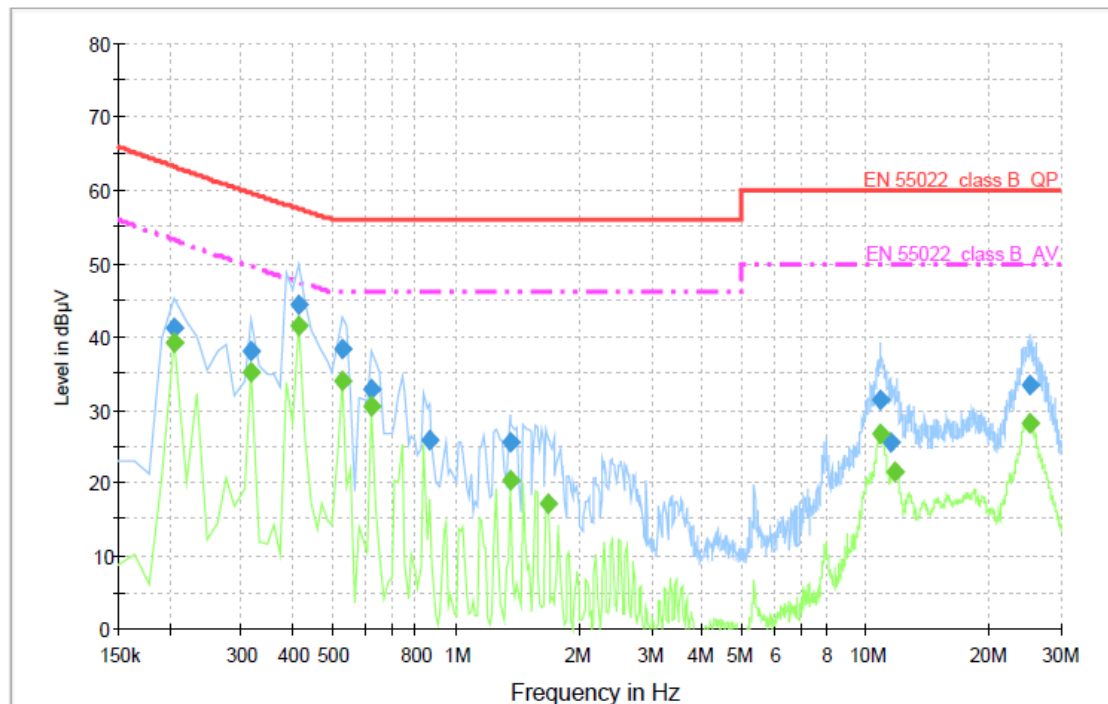
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.206000	43.5	1000.000	9.000	GND	N	10.0	9.7	53.2	
0.304000	35.8	1000.000	9.000	GND	N	10.0	14.1	49.9	
0.416000	36.5	1000.000	9.000	GND	N	10.0	10.9	47.4	
0.514000	35.6	1000.000	9.000	GND	N	10.0	10.4	46.0	
0.724000	26.4	1000.000	9.000	GND	N	10.0	19.6	46.0	
1.340000	21.0	1000.000	9.000	GND	N	10.1	25.0	46.0	
1.648000	17.7	1000.000	9.000	GND	N	10.1	28.3	46.0	
10.692000	27.1	1000.000	9.000	GND	N	10.4	22.9	50.0	
11.588000	23.4	1000.000	9.000	GND	N	10.4	26.6	50.0	
24.748000	28.3	1000.000	9.000	GND	N	10.8	21.7	50.0	

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



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

Voltage with 4-Line-LISN_L1



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.206000	41.1	1000.000	9.000	GND	L1	10.0	22.1	63.2	
0.318000	38.0	1000.000	9.000	GND	L1	10.0	21.6	59.6	
0.416000	44.4	1000.000	9.000	GND	L1	10.0	13.0	57.4	
0.528000	38.3	1000.000	9.000	GND	L1	10.0	17.7	56.0	
0.626000	32.8	1000.000	9.000	GND	L1	10.0	23.2	56.0	
0.864000	25.8	1000.000	9.000	GND	L1	10.0	30.2	56.0	
1.354000	25.4	1000.000	9.000	GND	L1	10.1	30.6	56.0	
10.874000	31.2	1000.000	9.000	GND	L1	10.5	28.8	60.0	
11.462000	25.6	1000.000	9.000	GND	L1	10.5	34.4	60.0	
25.154000	33.3	1000.000	9.000	GND	L1	11.2	26.7	60.0	

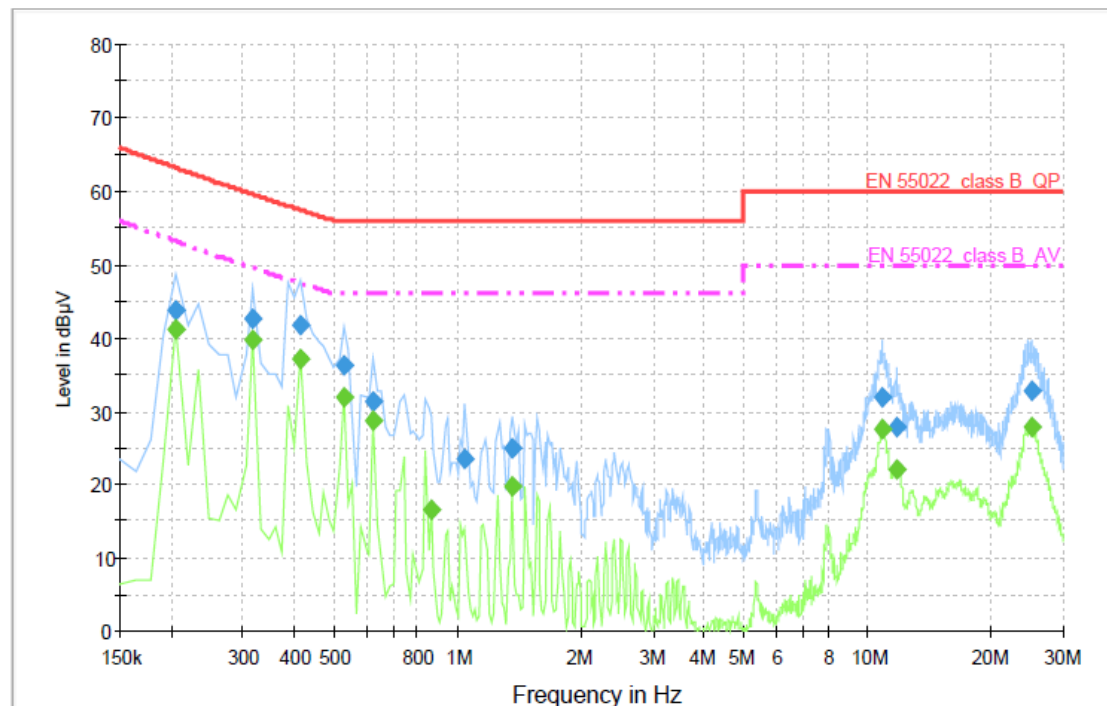
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.206000	39.2	1000.000	9.000	GND	L1	10.0	14.0	53.2	
0.318000	35.0	1000.000	9.000	GND	L1	10.0	14.5	49.5	
0.416000	41.4	1000.000	9.000	GND	L1	10.0	6.0	47.4	
0.528000	34.0	1000.000	9.000	GND	L1	10.0	12.0	46.0	
0.626000	30.3	1000.000	9.000	GND	L1	10.0	15.7	46.0	
1.354000	20.4	1000.000	9.000	GND	L1	10.1	25.6	46.0	
1.676000	17.2	1000.000	9.000	GND	L1	10.1	28.8	46.0	
10.846000	26.6	1000.000	9.000	GND	L1	10.5	23.4	50.0	
11.784000	21.6	1000.000	9.000	GND	L1	10.5	28.4	50.0	
25.154000	28.1	1000.000	9.000	GND	L1	11.2	21.9	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
0.206000	43.7	1000.000	9.000	GND	N	10.0	19.5	63.2	
0.318000	42.6	1000.000	9.000	GND	N	10.0	17.0	59.6	
0.416000	41.7	1000.000	9.000	GND	N	10.0	15.7	57.4	
0.528000	36.2	1000.000	9.000	GND	N	10.0	19.8	56.0	
0.626000	31.3	1000.000	9.000	GND	N	10.0	24.7	56.0	
1.046000	23.4	1000.000	9.000	GND	N	10.1	32.6	56.0	
1.368000	24.8	1000.000	9.000	GND	N	10.1	31.2	56.0	
10.902000	32.0	1000.000	9.000	GND	N	10.4	28.0	60.0	
11.756000	27.8	1000.000	9.000	GND	N	10.4	32.2	60.0	
25.154000	32.9	1000.000	9.000	GND	N	10.8	27.1	60.0	

Final Measurement Detector 2

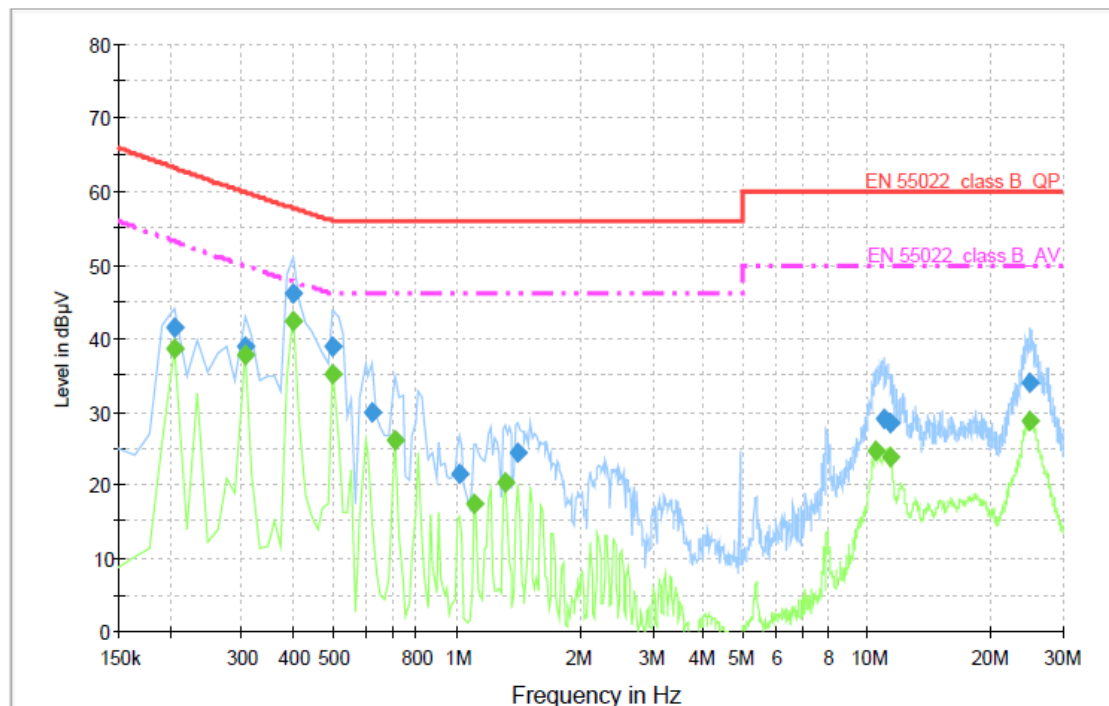
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.206000	41.2	1000.000	9.000	GND	N	10.0	12.0	53.2	
0.318000	39.6	1000.000	9.000	GND	N	10.0	9.9	49.5	
0.416000	37.2	1000.000	9.000	GND	N	10.0	10.2	47.4	
0.528000	31.8	1000.000	9.000	GND	N	10.0	14.2	46.0	
0.626000	28.7	1000.000	9.000	GND	N	10.0	17.3	46.0	
0.864000	16.6	1000.000	9.000	GND	N	10.0	29.4	46.0	
1.354000	19.8	1000.000	9.000	GND	N	10.1	26.2	46.0	
10.846000	27.5	1000.000	9.000	GND	N	10.4	22.5	50.0	
11.840000	22.1	1000.000	9.000	GND	N	10.4	27.9	50.0	
25.042000	27.7	1000.000	9.000	GND	N	10.8	22.3	50.0	

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



◆ Operating condition: 1 920 × 1 080 / 60 Hz (HDMI/DVI: 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
0.206000	41.4	1000.000	9.000	GND	L1	10.0	21.8	63.2	
0.304000	38.8	1000.000	9.000	GND	L1	10.0	21.1	59.9	
0.402000	46.1	1000.000	9.000	GND	L1	10.0	11.6	57.7	
0.500000	38.9	1000.000	9.000	GND	L1	10.0	17.1	56.0	
0.626000	30.0	1000.000	9.000	GND	L1	10.0	26.0	56.0	
1.018000	21.5	1000.000	9.000	GND	L1	10.0	34.5	56.0	
1.410000	24.3	1000.000	9.000	GND	L1	10.1	31.7	56.0	
10.958000	29.1	1000.000	9.000	GND	L1	10.5	30.9	60.0	
11.378000	28.4	1000.000	9.000	GND	L1	10.5	31.6	60.0	
24.860000	33.9	1000.000	9.000	GND	L1	11.2	26.1	60.0	

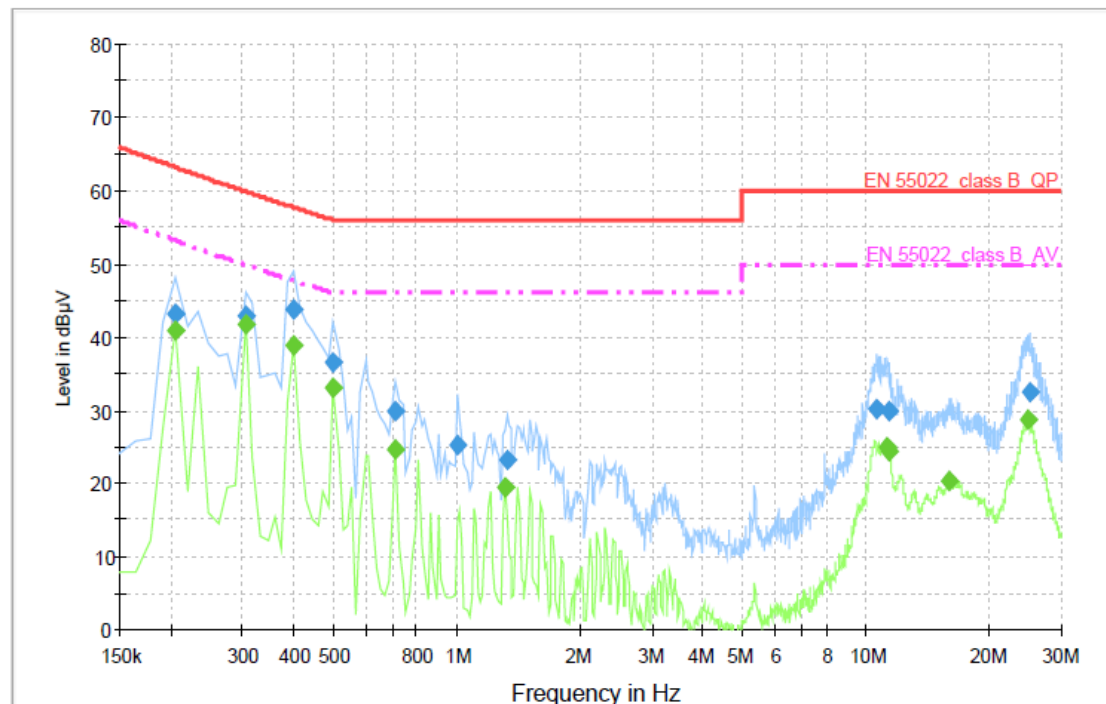
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.206000	38.6	1000.000	9.000	GND	L1	10.0	14.6	53.2	
0.304000	37.7	1000.000	9.000	GND	L1	10.0	12.2	49.9	
0.402000	42.4	1000.000	9.000	GND	L1	10.0	5.3	47.7	
0.500000	35.2	1000.000	9.000	GND	L1	10.0	10.8	46.0	
0.710000	26.1	1000.000	9.000	GND	L1	10.0	20.0	46.0	
1.102000	17.5	1000.000	9.000	GND	L1	10.0	28.5	46.0	
1.312000	20.3	1000.000	9.000	GND	L1	10.1	25.7	46.0	
10.538000	24.5	1000.000	9.000	GND	L1	10.4	25.5	50.0	
11.336000	23.8	1000.000	9.000	GND	L1	10.5	26.2	50.0	
24.902000	28.8	1000.000	9.000	GND	L1	11.2	21.2	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
0.206000	43.2	1000.000	9.000	GND	N	10.0	20.0	63.2	
0.304000	42.8	1000.000	9.000	GND	N	10.0	17.1	59.9	
0.402000	43.7	1000.000	9.000	GND	N	10.0	14.0	57.7	
0.500000	36.6	1000.000	9.000	GND	N	10.0	19.4	56.0	
0.710000	29.9	1000.000	9.000	GND	N	10.0	26.1	56.0	
1.004000	25.3	1000.000	9.000	GND	N	10.1	30.7	56.0	
1.326000	23.1	1000.000	9.000	GND	N	10.1	32.9	56.0	
10.650000	30.1	1000.000	9.000	GND	N	10.4	29.9	60.0	
11.350000	30.0	1000.000	9.000	GND	N	10.4	30.0	60.0	
25.280000	32.4	1000.000	9.000	GND	N	10.8	27.6	60.0	

Final Measurement Detector 2

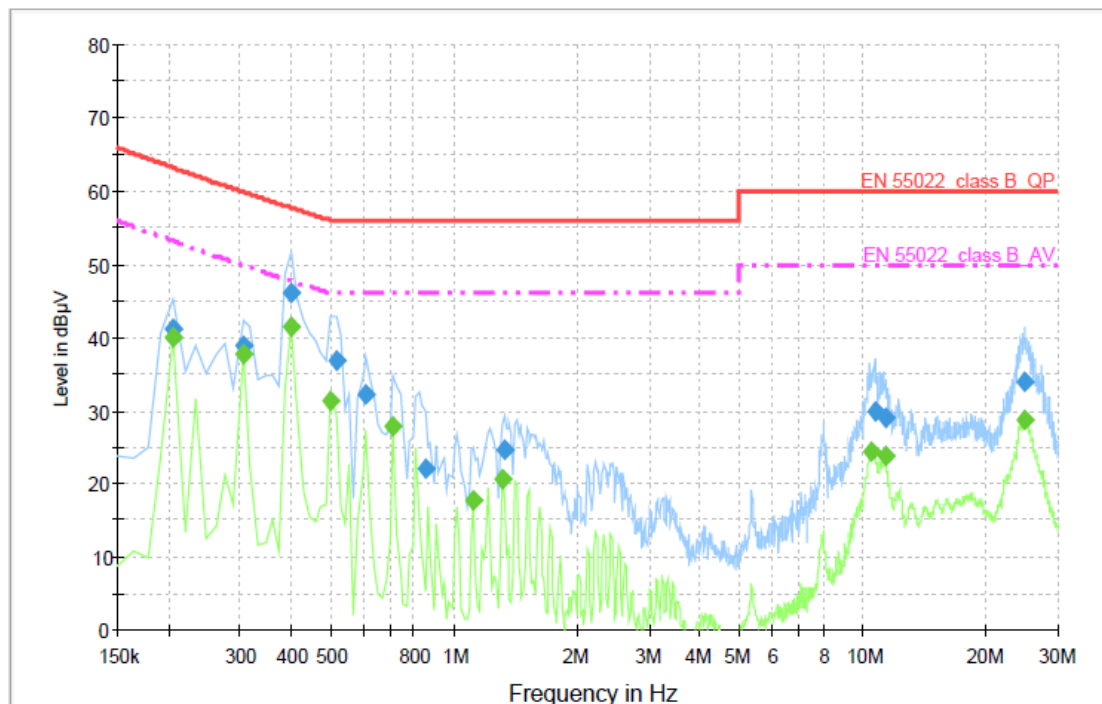
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.206000	40.8	1000.000	9.000	GND	N	10.0	12.4	53.2	
0.304000	41.9	1000.000	9.000	GND	N	10.0	8.0	49.9	
0.402000	38.8	1000.000	9.000	GND	N	10.0	8.9	47.7	
0.500000	33.0	1000.000	9.000	GND	N	10.0	13.0	46.0	
0.710000	24.7	1000.000	9.000	GND	N	10.0	21.3	46.0	
1.312000	19.3	1000.000	9.000	GND	N	10.1	26.7	46.0	
11.196000	25.0	1000.000	9.000	GND	N	10.4	25.0	50.0	
11.336000	24.2	1000.000	9.000	GND	N	10.4	25.8	50.0	
15.998000	20.3	1000.000	9.000	GND	N	10.6	29.7	50.0	
24.832000	28.8	1000.000	9.000	GND	N	10.8	21.2	50.0	

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



◆ Operating condition: 1 920 × 1 080 / 60 Hz (DP: 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
0.206000	41.1	1000.000	9.000	GND	L1	10.0	22.1	63.2	
0.304000	38.7	1000.000	9.000	GND	L1	10.0	21.2	59.9	
0.402000	46.1	1000.000	9.000	GND	L1	10.0	11.6	57.7	
0.514000	36.7	1000.000	9.000	GND	L1	10.0	19.3	56.0	
0.612000	32.2	1000.000	9.000	GND	L1	10.0	23.8	56.0	
0.850000	22.1	1000.000	9.000	GND	L1	10.0	33.9	56.0	
1.326000	24.5	1000.000	9.000	GND	L1	10.1	31.5	56.0	
10.692000	30.0	1000.000	9.000	GND	L1	10.4	30.0	60.0	
11.378000	29.1	1000.000	9.000	GND	L1	10.5	30.9	60.0	
24.944000	33.9	1000.000	9.000	GND	L1	11.2	26.1	60.0	

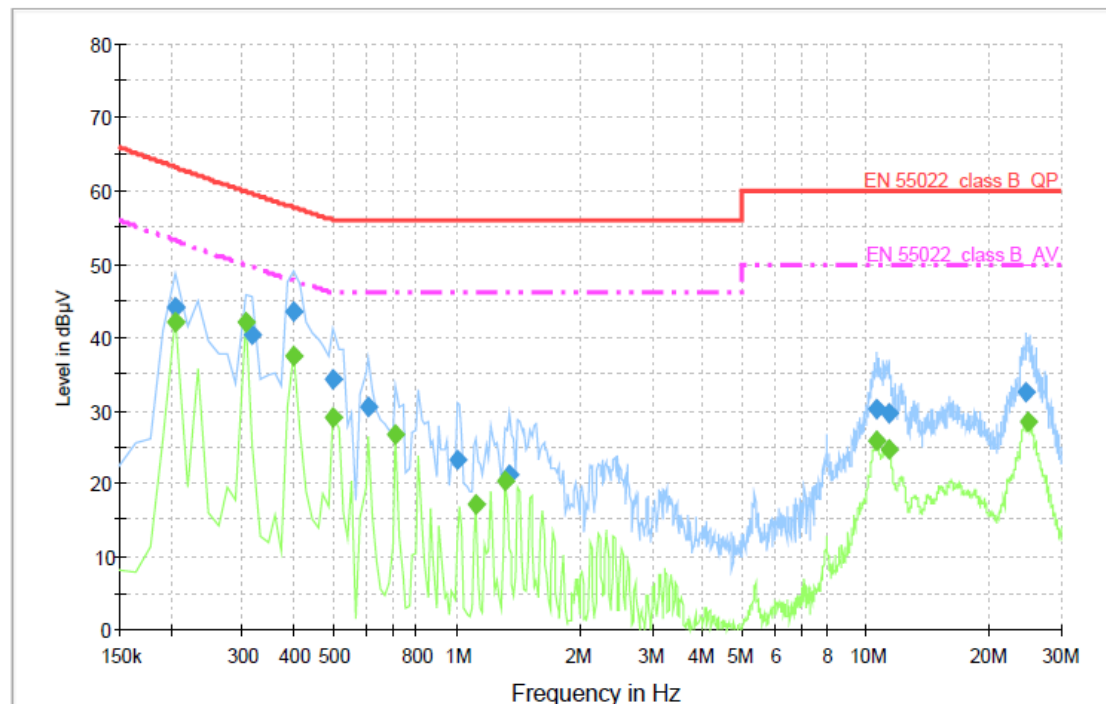
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.206000	39.9	1000.000	9.000	GND	L1	10.0	13.3	53.2	
0.304000	37.7	1000.000	9.000	GND	L1	10.0	12.2	49.9	
0.402000	41.5	1000.000	9.000	GND	L1	10.0	6.2	47.7	
0.500000	31.3	1000.000	9.000	GND	L1	10.0	14.7	46.0	
0.710000	27.7	1000.000	9.000	GND	L1	10.0	18.3	46.0	
1.116000	17.7	1000.000	9.000	GND	L1	10.0	28.3	46.0	
1.312000	20.7	1000.000	9.000	GND	L1	10.1	25.3	46.0	
10.468000	24.3	1000.000	9.000	GND	L1	10.4	25.7	50.0	
11.350000	23.8	1000.000	9.000	GND	L1	10.5	26.2	50.0	
25.000000	28.7	1000.000	9.000	GND	L1	11.2	21.3	50.0	

< Fig 12. 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
0.206000	44.1	1000.000	9.000	GND	N	10.0	19.1	63.2	
0.318000	40.3	1000.000	9.000	GND	N	10.0	19.3	59.6	
0.402000	43.5	1000.000	9.000	GND	N	10.0	14.2	57.7	
0.500000	34.1	1000.000	9.000	GND	N	10.0	21.9	56.0	
0.612000	30.5	1000.000	9.000	GND	N	10.0	25.5	56.0	
1.004000	23.1	1000.000	9.000	GND	N	10.1	32.9	56.0	
1.340000	21.0	1000.000	9.000	GND	N	10.1	35.0	56.0	
10.664000	30.2	1000.000	9.000	GND	N	10.4	29.8	60.0	
11.378000	29.6	1000.000	9.000	GND	N	10.4	30.4	60.0	
24.692000	32.6	1000.000	9.000	GND	N	10.8	27.4	60.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.206000	42.2	1000.000	9.000	GND	N	10.0	11.0	53.2	
0.304000	42.0	1000.000	9.000	GND	N	10.0	7.9	49.9	
0.402000	37.4	1000.000	9.000	GND	N	10.0	10.3	47.7	
0.500000	29.1	1000.000	9.000	GND	N	10.0	16.9	46.0	
0.710000	26.6	1000.000	9.000	GND	N	10.0	19.4	46.0	
1.116000	17.0	1000.000	9.000	GND	N	10.1	29.0	46.0	
1.312000	20.2	1000.000	9.000	GND	N	10.1	25.8	46.0	
10.580000	25.8	1000.000	9.000	GND	N	10.4	24.2	50.0	
11.336000	24.5	1000.000	9.000	GND	N	10.4	25.5	50.0	
24.930000	28.5	1000.000	9.000	GND	N	10.8	21.5	50.0	

< Fig 13. Conducted emission result (Neutral line)>



6. Radiated Emission

6.1 Operating Environment

Temperature : 24 °C
Relative Humidity : 45 % R.H.

6.2 Test Set-up

A preliminary and final measurement was at 3 m anechoic chamber.

The EUT was placed on a non-conductive turntable approximately 0.8 m above the ground plane.

The turntable with EUT was rotated 360°, and the antenna was varied in height between 1.0 m and 4.0 m in order to determine the maximum emission levels.

This procedure was performed for both horizontal and vertical polarization of the receiving antenna.

6.3 Measurement Uncertainty

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

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

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



6.4 Limit

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

6.5 Test Equipment used

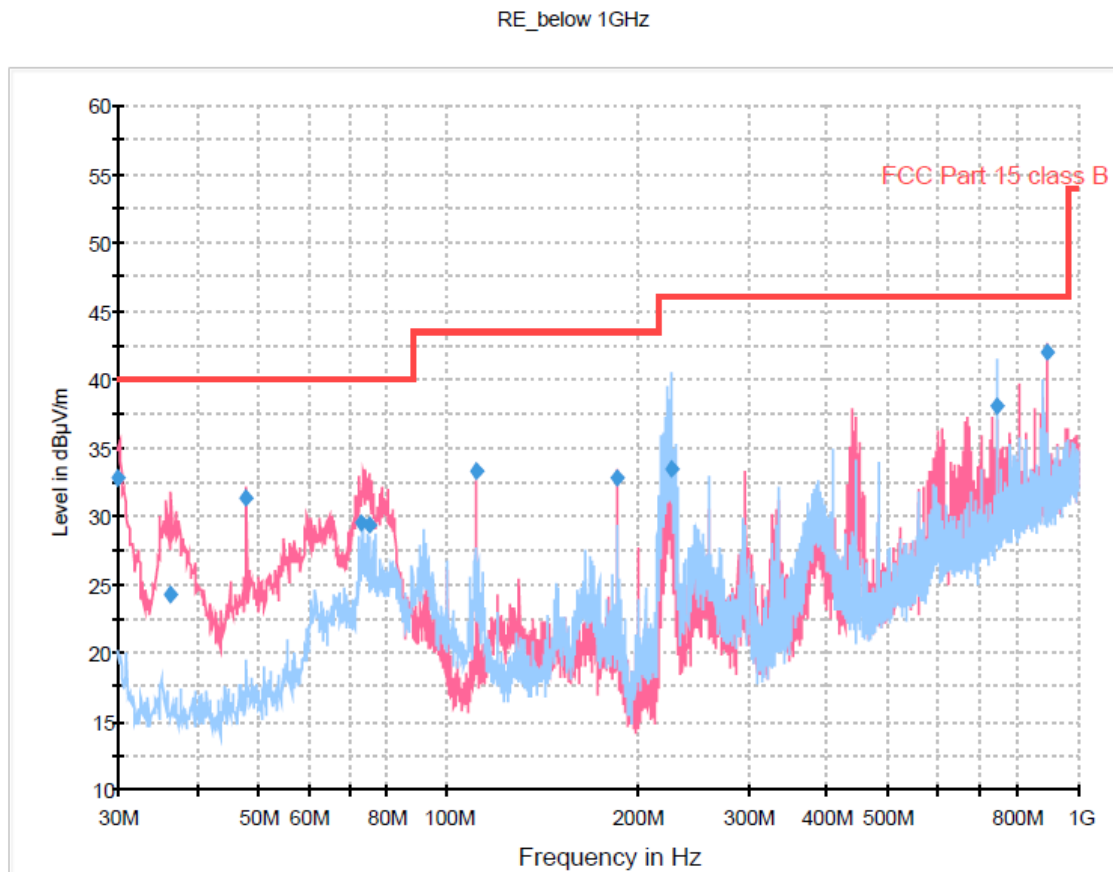
Model Name	Manufacturer	Description	Serial Number	Due to Calibration
■ - ESIB26	Rohde & Schwarz	EMI Receiver	830482/010	12. 11. 2010
■ - VULB9160	Schwarzbeck	Broadband Test Antenna	3193	03. 15. 2012
■ - BBHA9120D	Schwarzbeck	Horn ANT	207	12. 22. 2011
■ - MCU066	maturo GmbH	Position Controller	1390306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

6.6 Test data for Radiated Emission

- Test Date : November 8 ~ 9, 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 (400 MHz). The measurement was made up to 2 000 MHz



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



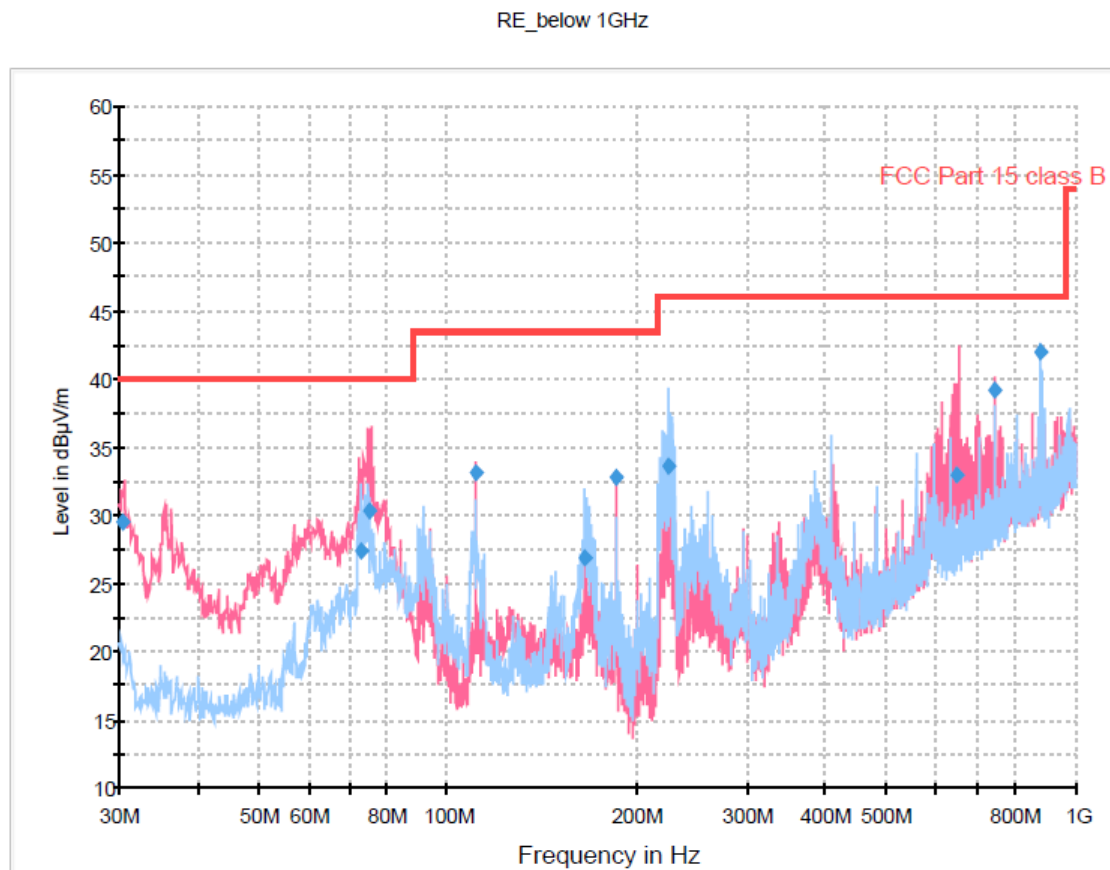
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
30.000000	32.8	1000.0	120.000	100.0	V	195.0	11.2	7.20	40.00
36.366250	24.3	1000.0	120.000	100.0	V	45.0	11.9	15.80	40.00
47.925000	31.3	1000.0	120.000	100.0	V	265.0	13.0	8.70	40.00
72.647500	29.5	1000.0	120.000	100.0	V	183.0	10.9	10.50	40.00
75.036250	29.4	1000.0	120.000	100.0	V	0.0	10.3	10.60	40.00
111.378750	33.3	1000.0	120.000	100.0	V	206.0	12.7	10.20	43.50
185.623750	32.7	1000.0	120.000	100.0	V	31.0	12.8	10.80	43.50
225.732500	33.5	1000.0	120.000	100.0	H	0.0	13.1	5.50	46.00
742.486250	38.0	1000.0	120.000	100.0	H	198.0	27.6	8.00	46.00
890.976250	42.0	1000.0	120.000	100.0	V	183.0	29.6	4.00	46.00

< Fig 14. Radiated emission result (30 MHz ~ 1 000 MHz)>



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



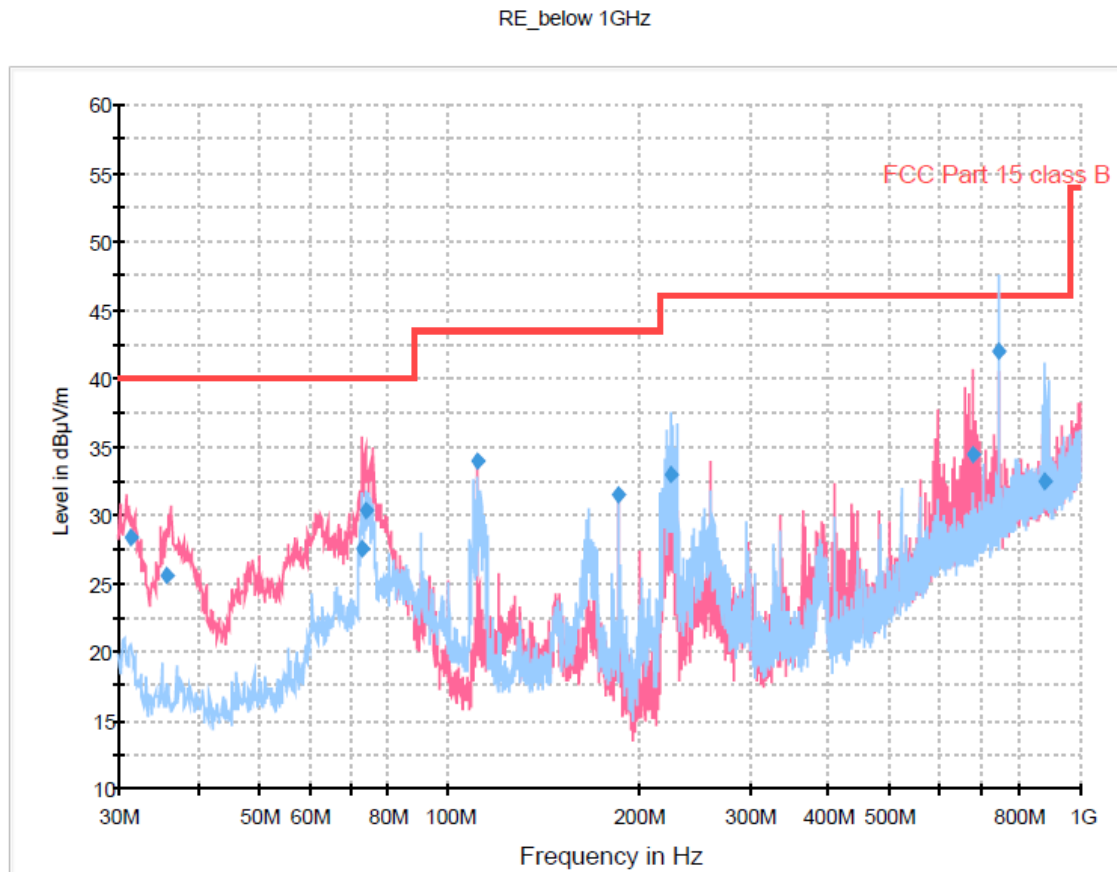
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
30.400000	29.5	1000.0	120.000	100.0	V	189.0	11.3	10.50	40.00
72.892500	27.5	1000.0	120.000	200.0	V	210.0	10.8	12.50	40.00
75.132500	30.3	1000.0	120.000	100.0	V	0.0	10.3	9.70	40.00
111.378750	33.1	1000.0	120.000	100.0	V	210.0	12.7	10.40	43.50
165.578750	26.9	1000.0	120.000	100.0	H	336.0	14.9	16.60	43.50
185.623750	32.8	1000.0	120.000	100.0	V	37.0	12.8	10.70	43.50
225.186250	33.6	1000.0	120.000	100.0	H	310.0	13.1	5.40	46.00
647.722500	32.9	1000.0	120.000	200.0	V	0.0	25.7	13.10	46.00
742.486250	39.3	1000.0	120.000	100.0	V	83.0	27.6	6.70	46.00
880.432500	42.0	1000.0	120.000	200.0	H	201.0	29.6	4.00	46.00

< Fig 15. Radiated emission result (30 MHz ~ 1 000 MHz)>



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



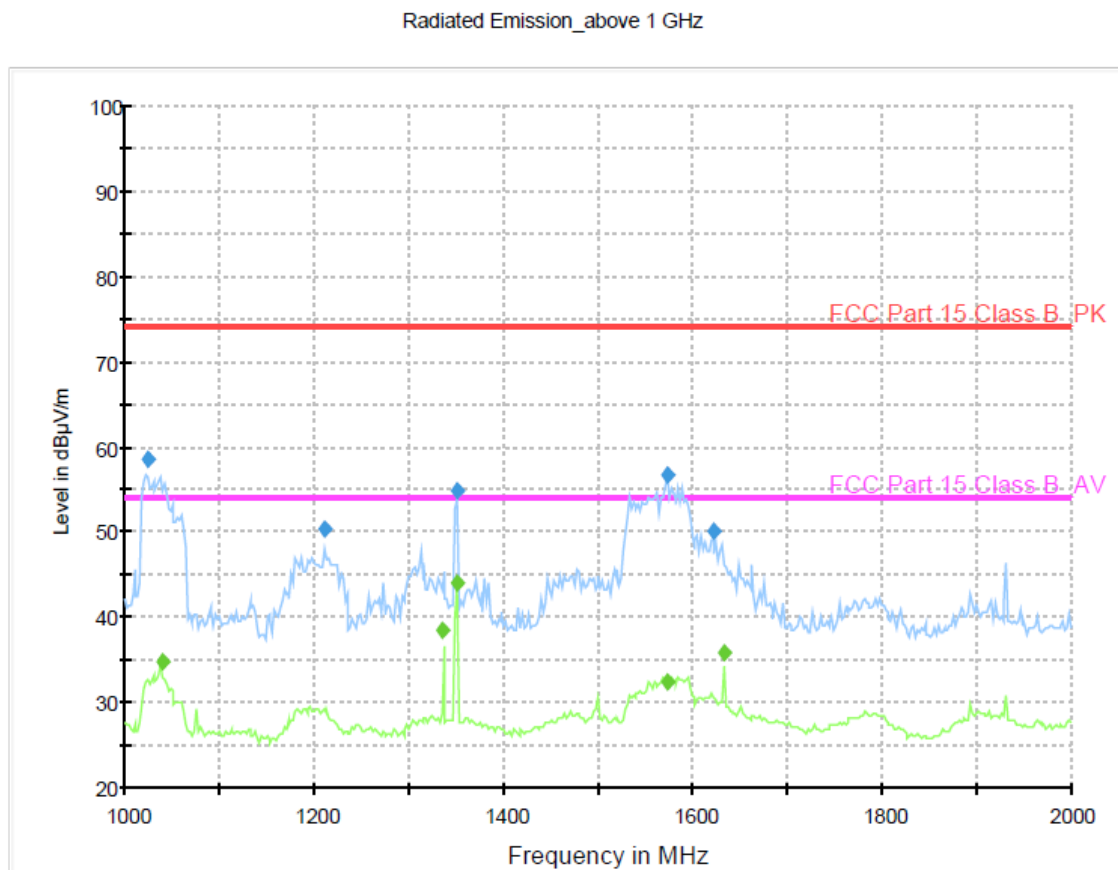
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
31.360000	28.3	1000.0	120.000	100.0	V	190.0	11.3	11.70	40.00
35.805000	25.5	1000.0	120.000	100.0	V	167.0	11.8	14.50	40.00
72.893750	27.5	1000.0	120.000	200.0	V	0.0	10.8	12.50	40.00
73.823750	30.4	1000.0	120.000	100.0	V	11.0	10.6	9.60	40.00
111.378750	34.0	1000.0	120.000	100.0	V	201.0	12.7	9.50	43.50
185.623750	31.4	1000.0	120.000	200.0	H	255.0	12.8	12.10	43.50
225.221250	32.9	1000.0	120.000	100.0	H	322.0	13.1	6.10	46.00
675.795000	34.5	1000.0	120.000	200.0	V	0.0	26.2	11.50	46.00
742.486250	42.0	1000.0	120.000	200.0	H	123.0	27.6	4.00	46.00
880.395000	32.5	1000.0	120.000	100.0	H	241.0	29.6	13.50	46.00

< Fig 16. Radiated emission result (30 MHz ~ 1 000 MHz)>



- ◆ Operating Condition: 1 920 × 1080 / 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)
1024.244088	58.5	100.0	1000.000	173.0	V	0.0	-15.8	15.5	74.0
1212.220842	50.3	100.0	1000.000	150.0	V	20.0	-14.9	23.7	74.0
1350.101403	54.9	100.0	1000.000	100.0	V	38.0	-14.4	19.1	74.0
1572.946293	56.7	100.0	1000.000	100.0	V	356.0	-13.8	17.3	74.0
1621.850501	50.0	100.0	1000.000	100.0	V	0.0	-13.6	24.0	74.0

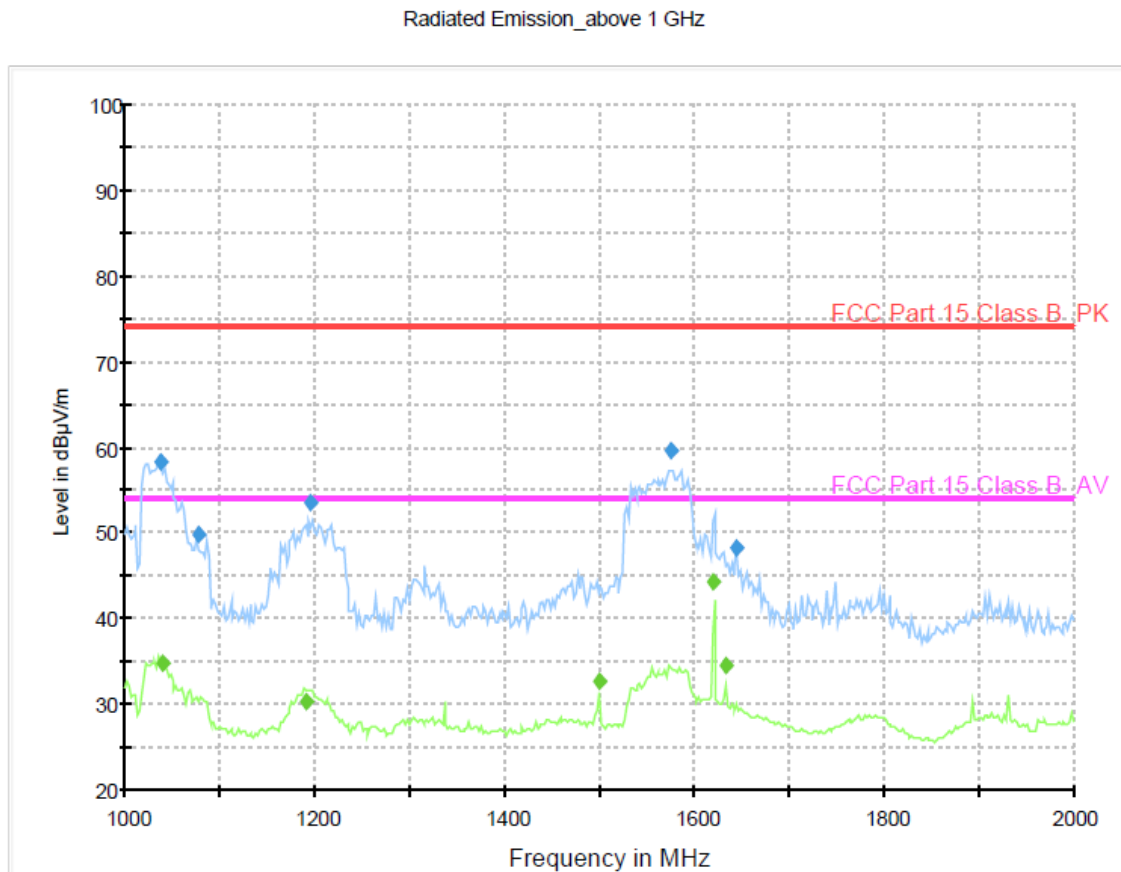
Final Result 2

Frequency (MHz)	Average (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1039.476152	34.7	100.0	1000.000	219.0	V	0.0	-15.7	19.3	54.0
1336.473347	38.6	100.0	1000.000	100.0	V	336.0	-14.4	15.4	54.0
1350.101403	43.9	100.0	1000.000	100.0	V	38.0	-14.4	10.1	54.0
1573.746293	32.4	100.0	1000.000	100.0	V	356.0	-13.8	21.6	54.0
1633.466533	35.9	100.0	1000.000	150.0	V	0.0	-13.6	18.1	54.0

< Fig 17. Radiated emission result (1 000 MHz ~ 2 000 MHz)>



- ◆ Operating Condition: 1 920 × 1080 / 60 Hz (HDMI/DVI: 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)
1036.672144	58.2	100.0	1000.000	100.0	V	10.0	-15.7	15.8	74.0
1076.752305	49.8	100.0	1000.000	150.0	V	0.0	-15.5	24.2	74.0
1195.796794	53.6	100.0	1000.000	150.0	V	24.0	-15.0	20.4	74.0
1574.554309	59.6	100.0	1000.000	122.0	V	358.0	-13.8	14.4	74.0
1643.490581	48.3	100.0	1000.000	100.0	V	10.0	-13.6	25.7	74.0

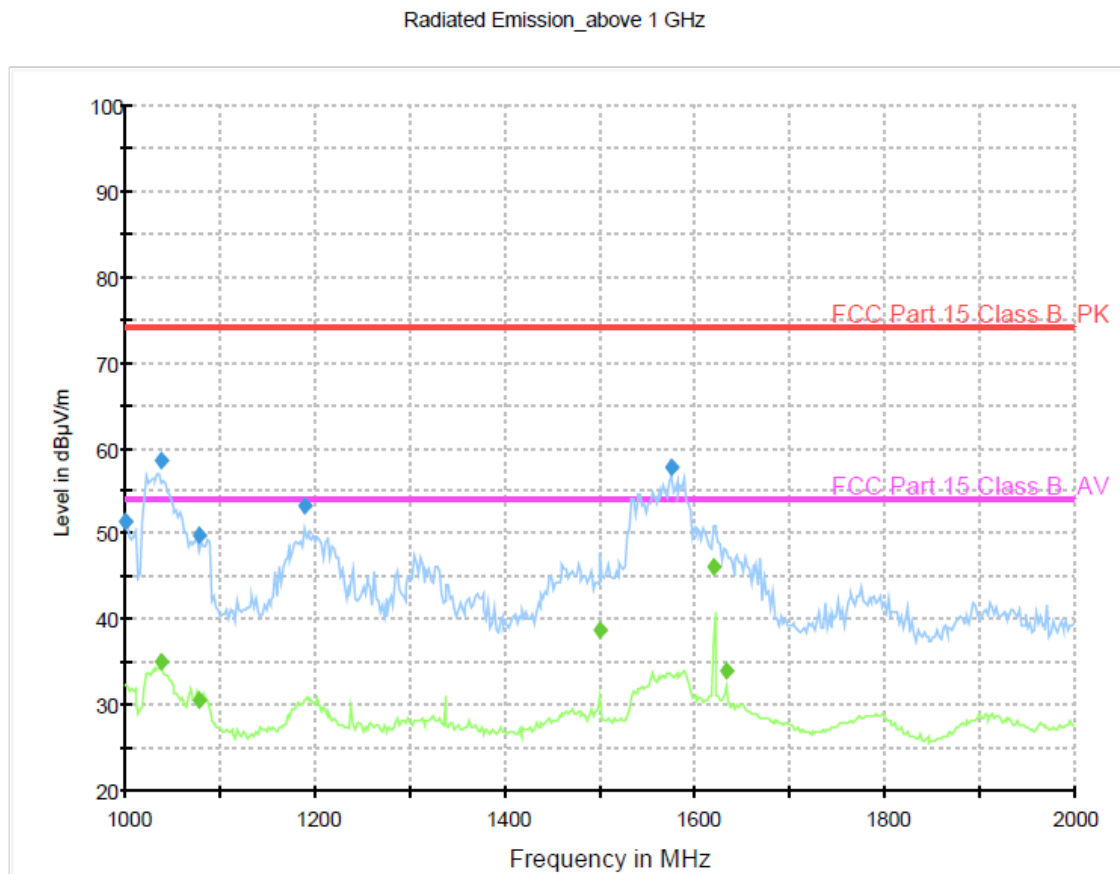
Final Result 2

Frequency (MHz)	Average (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1039.472144	34.8	100.0	1000.000	100.0	V	10.0	-15.7	19.2	54.0
1190.176754	30.4	100.0	1000.000	150.0	V	17.0	-15.1	23.6	54.0
1499.997996	32.6	100.0	1000.000	150.0	H	314.0	-14.3	21.4	54.0
1620.242485	44.4	100.0	1000.000	130.0	V	31.0	-13.6	9.6	54.0
1633.466533	34.6	100.0	1000.000	100.0	V	354.0	-13.6	19.4	54.0

< Fig 18. Radiated emission result (1 000 MHz ~ 2 000 MHz) >



- ◆ Operating Condition: 1 920 × 1080 / 60 Hz (DP: 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)
1000.800000	51.3	100.0	1000.000	100.0	V	5.0	-15.9	22.7	74.0
1038.672144	58.6	100.0	1000.000	172.0	V	0.0	-15.7	15.4	74.0
1076.752305	49.9	100.0	1000.000	150.0	V	0.0	-15.5	24.1	74.0
1189.376754	53.2	100.0	1000.000	150.0	V	29.0	-15.1	20.8	74.0
1574.950301	57.7	100.0	1000.000	122.0	V	0.0	-13.8	16.3	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)
1036.676152	35.1	100.0	1000.000	100.0	V	5.0	-15.7	18.9	54.0
1076.752305	30.7	100.0	1000.000	150.0	V	0.0	-15.5	23.3	54.0
1499.997996	38.8	100.0	1000.000	163.0	H	317.0	-14.3	15.2	54.0
1620.242485	46.0	100.0	1000.000	122.0	V	359.0	-13.6	8.0	54.0
1633.466533	33.9	100.0	1000.000	100.0	V	0.0	-13.6	20.1	54.0

< Fig 19. 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. Digital Signage Display (Model Name: HSTND-3091-G, LD4710)** was complies with §15.107 and 15.109 of the FCC Rules.