

FCC EVALUATION REPORT FOR CERTIFICATION

Applicant: LG Electronics Inc.

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

Pyeongteak-si, Gyeonggi-do, Korea.

Attn: Mr. Do-Hyung Kim, Chief research engineer

Date of Issue: August 26, 2011

Order Number: GETEC-C1-11-194

Test Report Number: GETEC-E3-11-093

Test Site: Gumi College EMC Center

FCC Registration Number: (100749, 443957)

FCC ID. : BEJ42VS20

Applicant : LG Electronics Inc.

Rule Part(s)	: FCC Part 15 Subpart B
Equipment Class	: Class B computing device peripheral (JBP)
EUT Type	: SIGNAGE DISPLAY
Type of Authority	: Certification
Model Name	: 42VS20
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, 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. Do-Hyung Kim, Chief research engineer

Tel Number: +82-31-610-9623

- **FCC ID.** BEJ42VS20
- **EUT Type** SIGNAGE DISPLAY
- **Model Name** 42VS20
- **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** August 16 ~ 19, 2011
- **Place of Test** **Gumi College EMC Center** (FCC Registration Number: 100749, 443957)
407, Bugok-dong, Gumi-si, Gyeongbuk, Korea.
- **Test Report Number** GETEC-E3-11-093
- **Dates of Issue** August 26, 2011



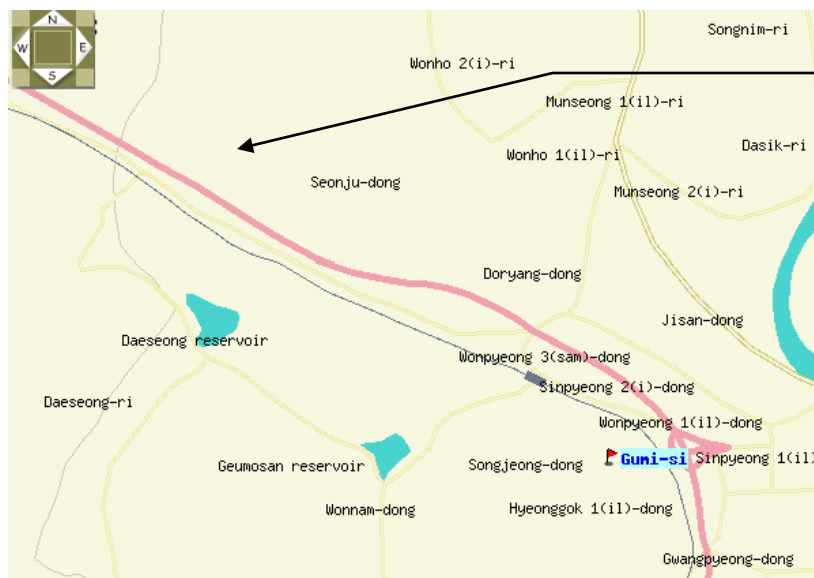
2. Introduction

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. SIGNAGE DISPLAY (Model Name: 42VS20)**

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. SIGNAGE DISPLAY (Model Name: 42VS20) FCC ID.: BEJ42VS20**

LCD Panel	Screen Type	1067.31 mm Wide (42 inch) TFT (Thin Film Transistor) LCD (Liquid Crystal Display) Panel. Visible diagonal size : 1067.31 mm
	Pixel Pitch	0.4845 mm (H) x 0.4845 mm (V)
Video Signal	Max. Resolution	RGB : 1920 x 1080 @ 60 Hz HDMI/DVI : 1920 x 1080 @ 60 Hz - It may not be supported depending on the OS or video card type.
	Recommended Resolution	RGB : 1920 x 1080 @ 60 Hz HDMI/DVI : 1920 x 1080 @ 60 Hz - It may not be supported depending on the OS or video card type.
	Horizontal Frequency	RGB : 30 kHz to 83 kHz HDMI/DVI : 30 kHz to 83 kHz
	Vertical Frequency	RGB : 56 Hz to 75 Hz HDMI/DVI : 56 Hz to 60 Hz
	Synchronization Type	Separate Sync, Composite Sync, Digital
Input Connector		15-pin D-Sub type, HDMI (digital), RS-232C, LAN, DVI, Display port, USB
Power	Rated Voltage	AC 100-240 V~ 50/60 Hz 5 A (100 Vac), 2 A (240 Vac)
	Power Consumption	On Mode : 220 W Typ. Sleep Mode : ≤ 1 W Off Mode : ≤ 0.5 W
Environmental conditions	Operating Temperature	0 °C to 40 °C
	Operating Humidity	10 % to 80 %
	Storage Temperature	-20 °C to 60 °C
	Storage Humidity	5 % to 95 %

-. Max. Clock Frequency : 533 MHz



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: None. FCC ID.: DoC
Video card	ATI	ATI Radeon HD 5770	S/N: None. FCC ID.: DoC
PS2 keyboard	COMPAQ	166516-AD6	S/N: B13BBOR391006D FCC ID.: AQ6-23K15
USB mouse	Great Pleasure Electronics Co., Ltd.	GP-M3100UE	S/N: 14036766 FCC ID.: DoC
LCD monitor	Dell computer corporation	1800FP	S/N: KR-07R477-48324-33J-03WH FCC ID.: DoC
USB memory stick	SAMSUNG	SUM-PSB4	S/N: TBBB202478F 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.
Speaker	LG Electronics Inc.	SP-0000K	S/N: None. FCC ID.: None.
IR remote controller	LG Electronics Inc.	AKB72915219	S/N: None. FCC ID.: None.



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
RGB(Analog) out cable	Connected to the EUT and LCD monitor	1.80 m shielded with two ferrite cores
DVI(Digital) in cable	Connected to the EUT and PC	2.00 m shielded with two ferrite cores
DVI(Digital) out cable	Connected to the EUT and LCD monitor	2.00 m shielded with two ferrite cores
DP(Digital) in cable	Connected to the EUT and PC	1.80 m shielded
Audio(RGB/DVI) in cable	Connected to the EUT and PC	1.50 m shielded
RS-232C in/out cable	Connected to the EUT(in port) and EUT(out port)	1.80 m shielded
Speaker(Left, Right) cable	Connected to the EUT and speaker	0.90 m unshielded
LAN cable	Connected to the EUT and Network	10.00 m unshielded

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 (RGB: Analog, DVI: Digital, HDMI: Digital, DP: Digital)

Conducted emission: 1 920 × 1 080 / 60 Hz (RGB: Analog, DVI: Digital, HDMI: Digital, DP: Digital)

1 024 × 768 / 60 Hz (RGB: Analog), 640 × 480 / 60 Hz (RGB: 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 of 1 kHz audio file with winamp player
- . Settings and control the display via the network from a PC
- . USB memory stick was connected to the USB port



4.2 Conducted Emission

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

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

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

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

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

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

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

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

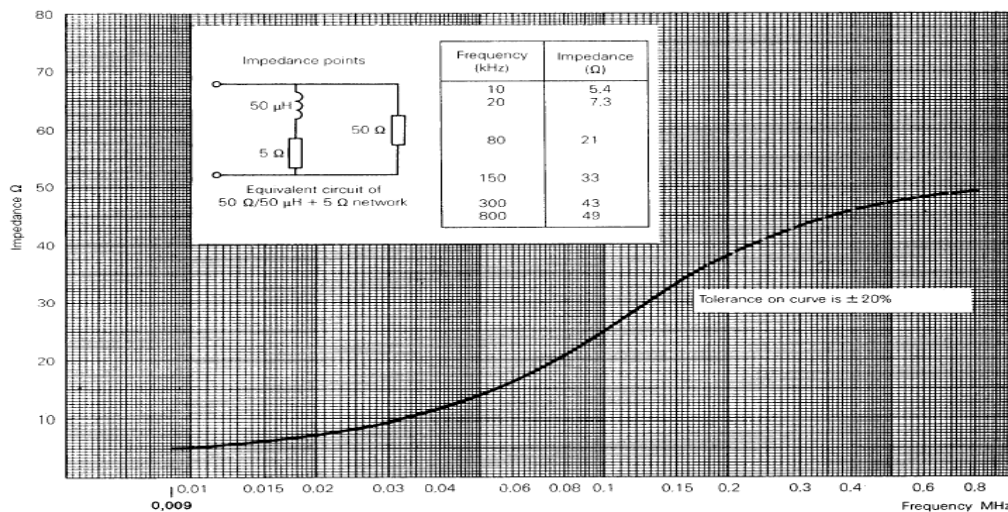


Fig 2. Impedance of LISN



4.3 Radiated Emission

Preliminary measurements were conducted 3 m semi anechoic chamber using broadband antennas to determine the frequency producing the maximum EME. Appropriate precaution was taken to ensure that all EME from the EUT were maximized and investigated. The technology configuration, mode of operation and turntable azimuth with respect to antenna was note for each frequency found.

Final measurements were made 3 m chamber (FCC registration No.: 443957) and/or 10 m OATS (FCC registration No.: 100749).

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

Each frequency found during pre-scan measurements was re-examined and investigated using EMI test receiver. The detector function was set to CISPR quasi-peak mode average mode and the bandwidth of the receiver was set to 120 kHz or 1 MHz depending on the frequency or type of signal.

The EUT, support equipment and interconnecting cables were reconfigured to the setup producing the maximum emission for the frequency and were placed on top of a 0.8 m high non-metallic 1.0 m × 1.5 m table.

The turntable containing the test sample was rotated; the antenna height was varied 1 to 4 meter and stopped at the azimuth or height producing the maximum emission.

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

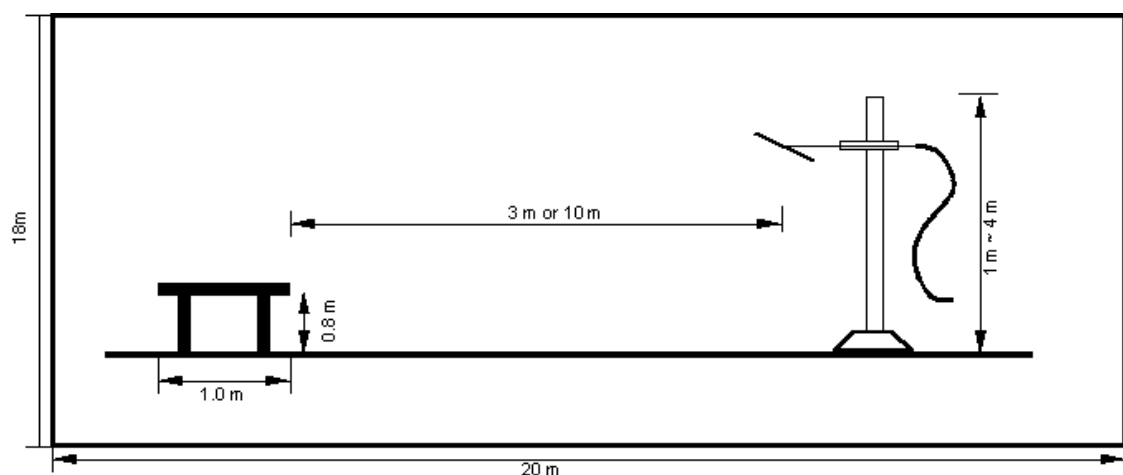


Fig 3. Dimensions of test site



5. Conducted Emission

5.1 Operating Environment

Temperature : 27.0 °C
Relative Humidity : 54.0 % 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)	± 2.71 dB	Confidence levels of 95 % ($k = 2$)
Conducted emission (150 kHz ~ 30 MHz)	± 3.34 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. 2011
■ - ESH3-Z5	Rohde & Schwarz	LISN	838979/020	12. 10. 2011
■ - ESH2-Z5	Rohde & Schwarz	LISN	829991/009	12. 10. 2011
■ - ISN T8	TESEQ. GmbH	ISN	24568	11. 09. 2011

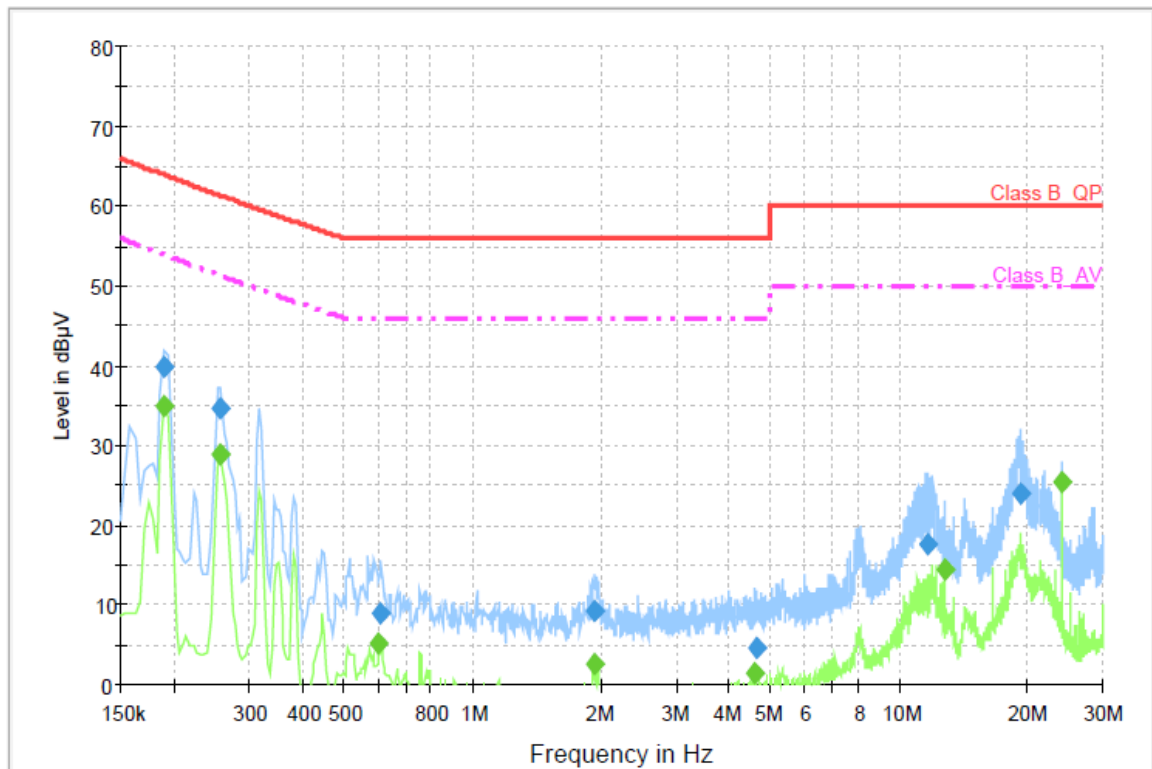
5.6 Test data for Conducted Emission

-. Test Date : August 17, 2011
-. Resolution Bandwidth : 9 kHz
-. Frequency Range : 0.15 MHz ~ 30 MHz



◆ Operating condition: 1 920 × 1 080 / 60 Hz (RGB: 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
0.190000	39.9	1000.000	9.000	GND	L1	10.1	24.0	63.9	
0.256000	34.6	1000.000	9.000	GND	L1	10.1	26.8	61.4	
0.612000	9.1	1000.000	9.000	GND	L1	10.1	46.9	56.0	
1.924000	9.1	1000.000	9.000	GND	L1	10.1	46.9	56.0	
4.612000	4.5	1000.000	9.000	GND	L1	10.3	51.5	56.0	
11.720000	17.6	1000.000	9.000	GND	L1	10.6	42.4	60.0	
19.196000	23.9	1000.000	9.000	GND	L1	11.1	36.1	60.0	

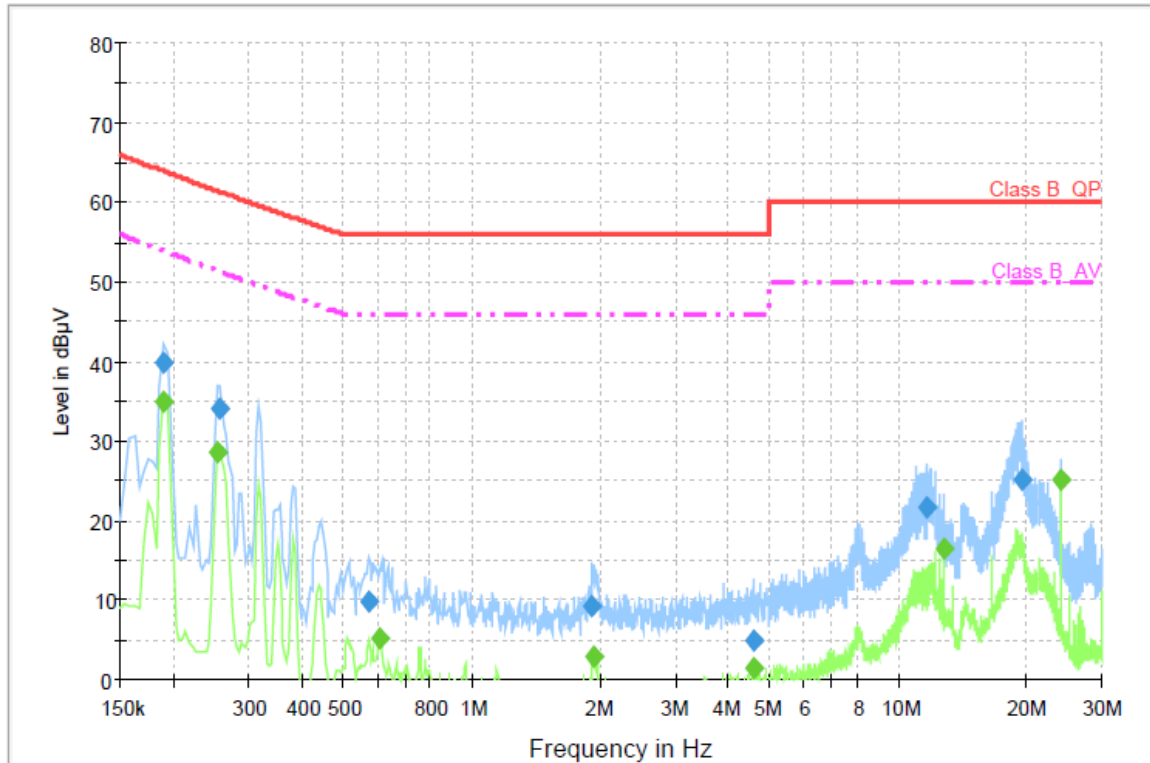
Final Measurement Detector 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.190000	35.0	1000.000	9.000	GND	L1	10.1	18.9	53.9	
0.256000	28.9	1000.000	9.000	GND	L1	10.1	22.4	51.3	
0.604000	5.2	1000.000	9.000	GND	L1	10.1	40.8	46.0	
1.932000	2.6	1000.000	9.000	GND	L1	10.1	43.4	46.0	
4.588000	1.3	1000.000	9.000	GND	L1	10.3	44.7	46.0	
12.748000	14.3	1000.000	9.000	GND	L1	10.7	35.7	50.0	
24.000000	25.4	1000.000	9.000	GND	L1	11.1	24.6	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
0.190000	39.8	1000.000	9.000	GND	N	10.1	24.1	63.9	
0.258000	34.0	1000.000	9.000	GND	N	10.1	27.3	61.3	
0.574000	9.8	1000.000	9.000	GND	N	10.1	46.2	56.0	
1.914000	9.1	1000.000	9.000	GND	N	10.2	46.9	56.0	
4.590000	4.8	1000.000	9.000	GND	N	10.3	51.2	56.0	
11.658000	21.5	1000.000	9.000	GND	N	10.6	38.5	60.0	
19.382000	25.2	1000.000	9.000	GND	N	10.9	34.8	60.0	

Final Measurement Detector 2

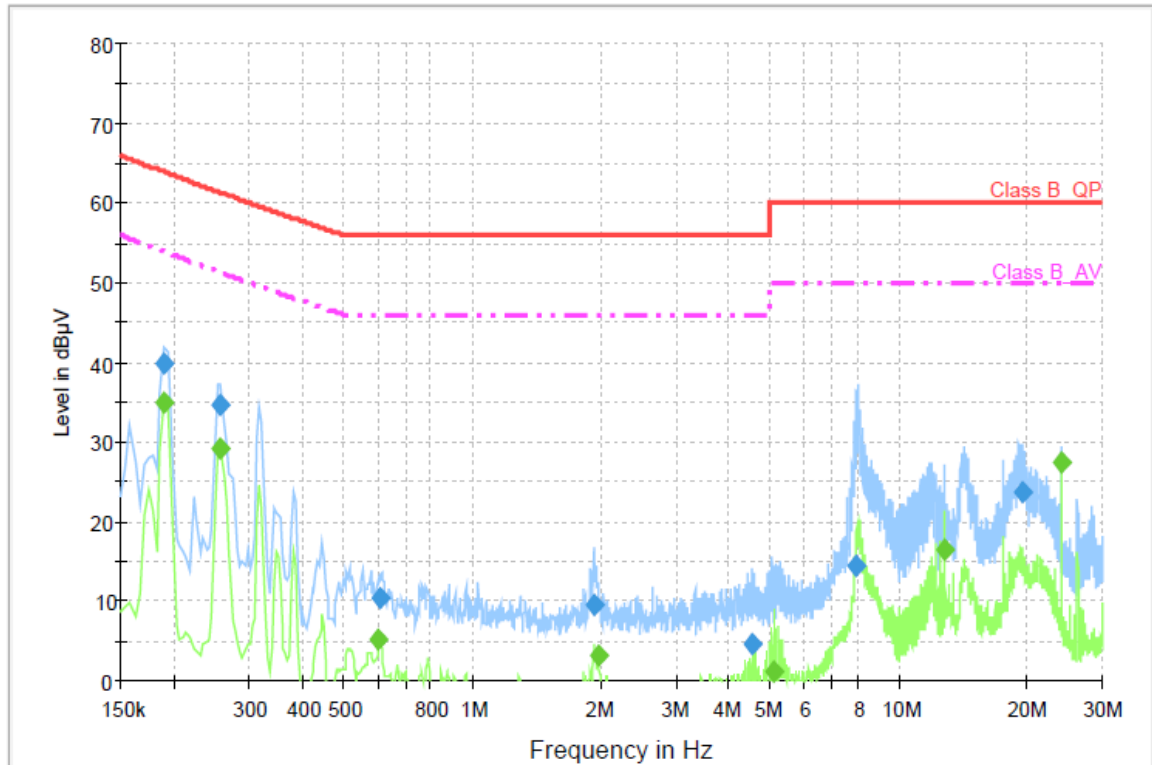
Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.190000	35.0	1000.000	9.000	GND	N	10.1	18.9	53.9	
0.254000	28.6	1000.000	9.000	GND	N	10.1	22.8	51.4	
0.606000	5.3	1000.000	9.000	GND	N	10.1	40.7	46.0	
1.926000	3.0	1000.000	9.000	GND	N	10.2	43.0	46.0	
4.590000	1.3	1000.000	9.000	GND	N	10.3	44.7	46.0	
12.746000	16.5	1000.000	9.000	GND	N	10.6	33.5	50.0	
24.046000	25.1	1000.000	9.000	GND	N	10.7	24.9	50.0	

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



◆ Operating condition: 1 024 × 768 / 60 Hz (RGB: 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
0.190000	39.9	1000.000	9.000	GND	L1	10.1	24.0	63.9	
0.256000	34.6	1000.000	9.000	GND	L1	10.1	26.8	61.4	
0.608000	10.4	1000.000	9.000	GND	L1	10.1	45.6	56.0	
1.924000	9.4	1000.000	9.000	GND	L1	10.1	46.6	56.0	
4.504000	4.7	1000.000	9.000	GND	L1	10.3	51.3	56.0	
7.968000	14.3	1000.000	9.000	GND	L1	10.5	45.7	60.0	
19.496000	23.5	1000.000	9.000	GND	L1	11.1	36.5	60.0	

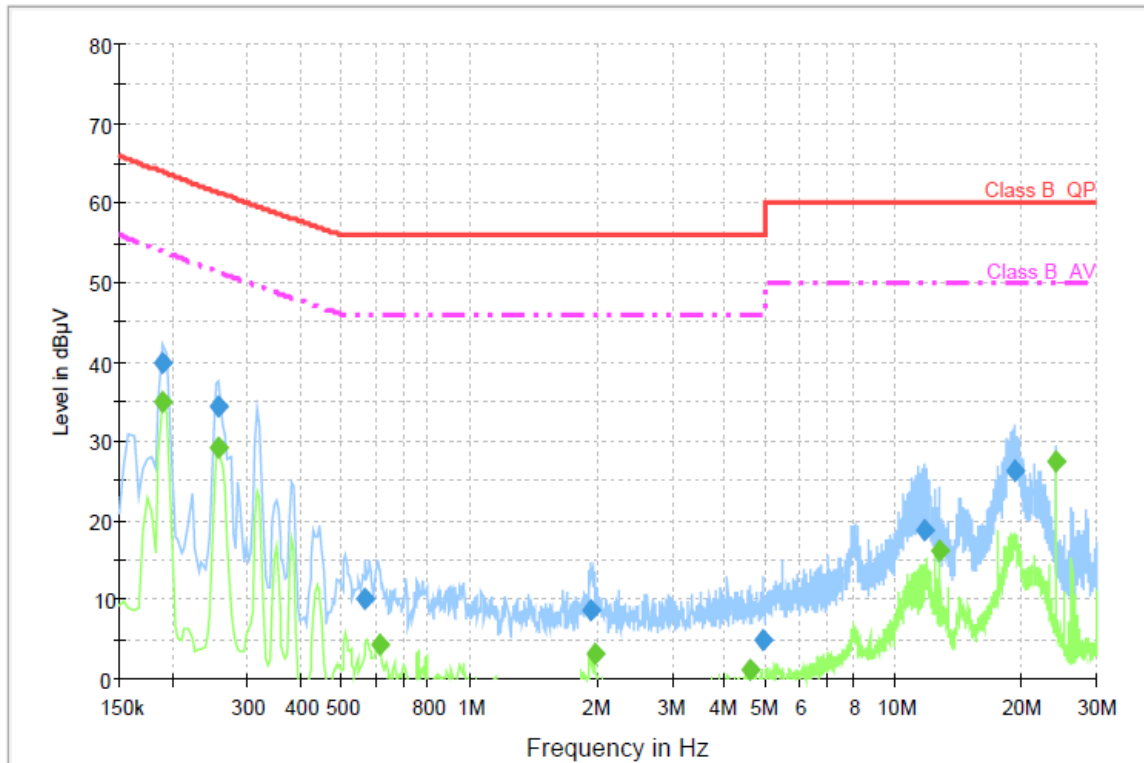
Final Measurement Detector 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.190000	35.0	1000.000	9.000	GND	L1	10.1	18.9	53.9	
0.256000	29.2	1000.000	9.000	GND	L1	10.1	22.1	51.3	
0.604000	5.1	1000.000	9.000	GND	L1	10.1	40.9	46.0	
1.972000	3.1	1000.000	9.000	GND	L1	10.1	42.9	46.0	
5.108000	1.1	1000.000	9.000	GND	L1	10.3	48.9	50.0	
12.748000	16.5	1000.000	9.000	GND	L1	10.7	33.5	50.0	
24.048000	27.4	1000.000	9.000	GND	L1	11.1	22.6	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
0.190000	39.8	1000.000	9.000	GND	N	10.1	24.1	63.9	
0.258000	34.2	1000.000	9.000	GND	N	10.1	27.1	61.3	
0.570000	10.1	1000.000	9.000	GND	N	10.1	45.9	56.0	
1.930000	8.6	1000.000	9.000	GND	N	10.2	47.4	56.0	
4.934000	5.0	1000.000	9.000	GND	N	10.3	51.0	56.0	
11.854000	18.8	1000.000	9.000	GND	N	10.6	41.2	60.0	
19.238000	26.3	1000.000	9.000	GND	N	10.9	33.7	60.0	

Final Measurement Detector 2

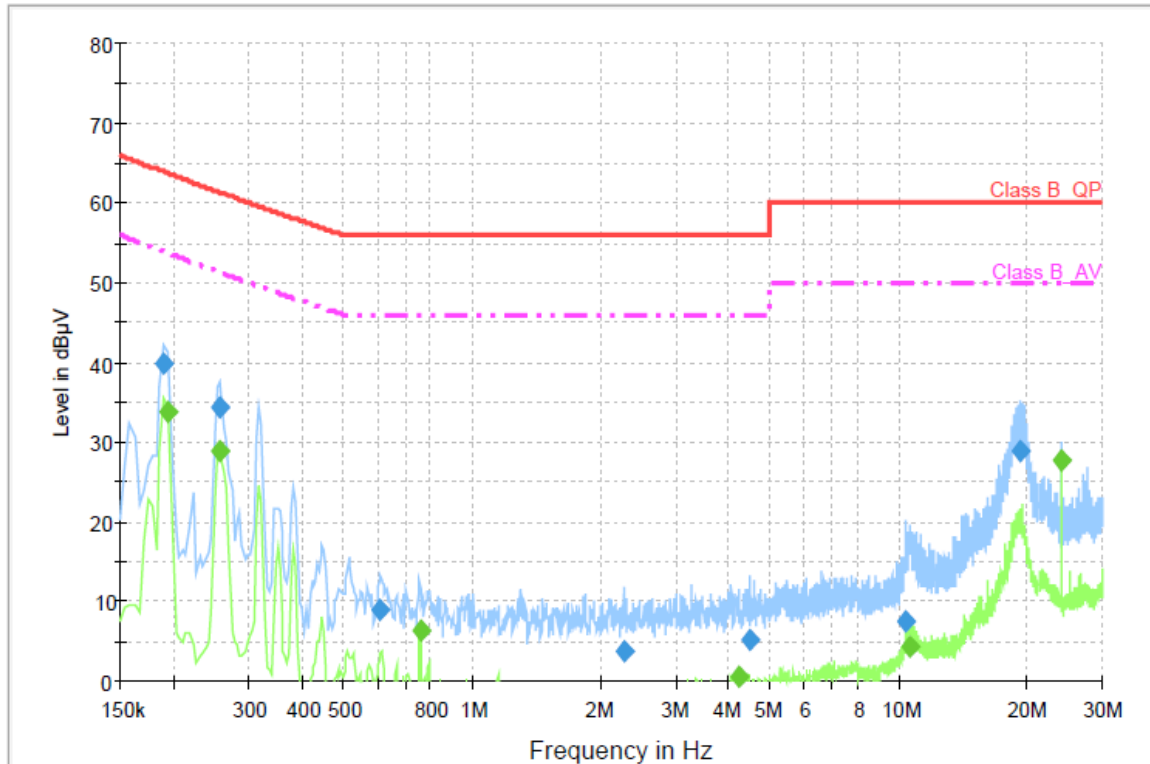
Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.190000	35.0	1000.000	9.000	GND	N	10.1	18.9	53.9	
0.258000	29.0	1000.000	9.000	GND	N	10.1	22.3	51.3	
0.614000	4.5	1000.000	9.000	GND	N	10.1	41.5	46.0	
1.970000	3.3	1000.000	9.000	GND	N	10.2	42.7	46.0	
4.570000	1.1	1000.000	9.000	GND	N	10.3	44.9	46.0	
12.810000	16.3	1000.000	9.000	GND	N	10.6	33.7	50.0	
24.046000	27.5	1000.000	9.000	GND	N	10.7	22.5	50.0	

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



◆ Operating condition: 640 × 480 / 60 Hz (RGB: 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
0.190000	39.8	1000.000	9.000	GND	L1	10.1	24.1	63.9	
0.256000	34.5	1000.000	9.000	GND	L1	10.1	26.9	61.4	
0.608000	9.0	1000.000	9.000	GND	L1	10.1	47.0	56.0	
2.280000	3.8	1000.000	9.000	GND	L1	10.2	52.2	56.0	
4.496000	5.3	1000.000	9.000	GND	L1	10.3	50.7	56.0	
10.412000	7.5	1000.000	9.000	GND	L1	10.5	52.5	60.0	
19.208000	28.9	1000.000	9.000	GND	L1	11.1	31.1	60.0	

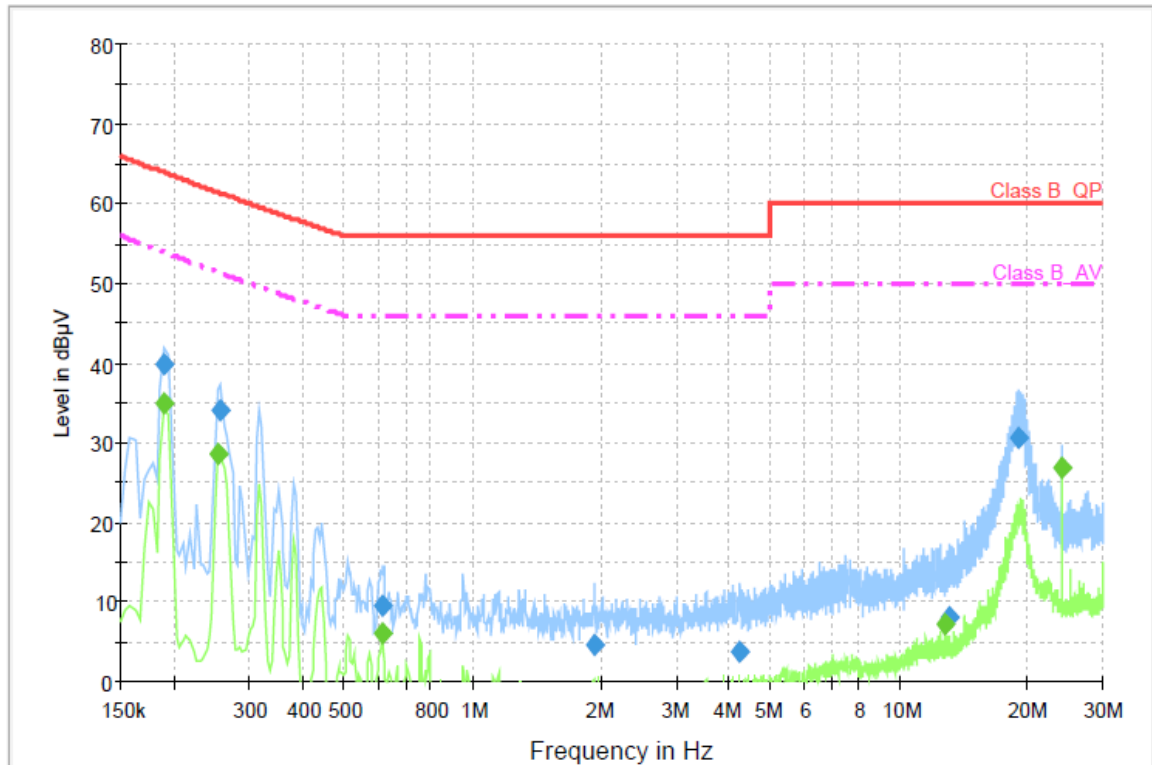
Final Measurement Detector 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.194000	33.9	1000.000	9.000	GND	L1	10.1	19.8	53.7	
0.256000	28.9	1000.000	9.000	GND	L1	10.1	22.4	51.3	
0.756000	6.4	1000.000	9.000	GND	L1	10.1	39.6	46.0	
4.228000	0.7	1000.000	9.000	GND	L1	10.3	45.3	46.0	
10.612000	4.2	1000.000	9.000	GND	L1	10.6	45.8	50.0	
24.000000	27.7	1000.000	9.000	GND	L1	11.1	22.3	50.0	

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



Voltage with 4-Line-LISN_N



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.190000	39.8	1000.000	9.000	GND	N	10.1	24.1	63.9	
0.258000	33.9	1000.000	9.000	GND	N	10.1	27.4	61.3	
0.618000	9.6	1000.000	9.000	GND	N	10.1	46.4	56.0	
1.926000	4.7	1000.000	9.000	GND	N	10.2	51.3	56.0	
4.246000	3.8	1000.000	9.000	GND	N	10.3	52.2	56.0	
13.098000	8.2	1000.000	9.000	GND	N	10.6	51.8	60.0	
19.078000	30.5	1000.000	9.000	GND	N	10.9	29.5	60.0	

Final Measurement Detector 2

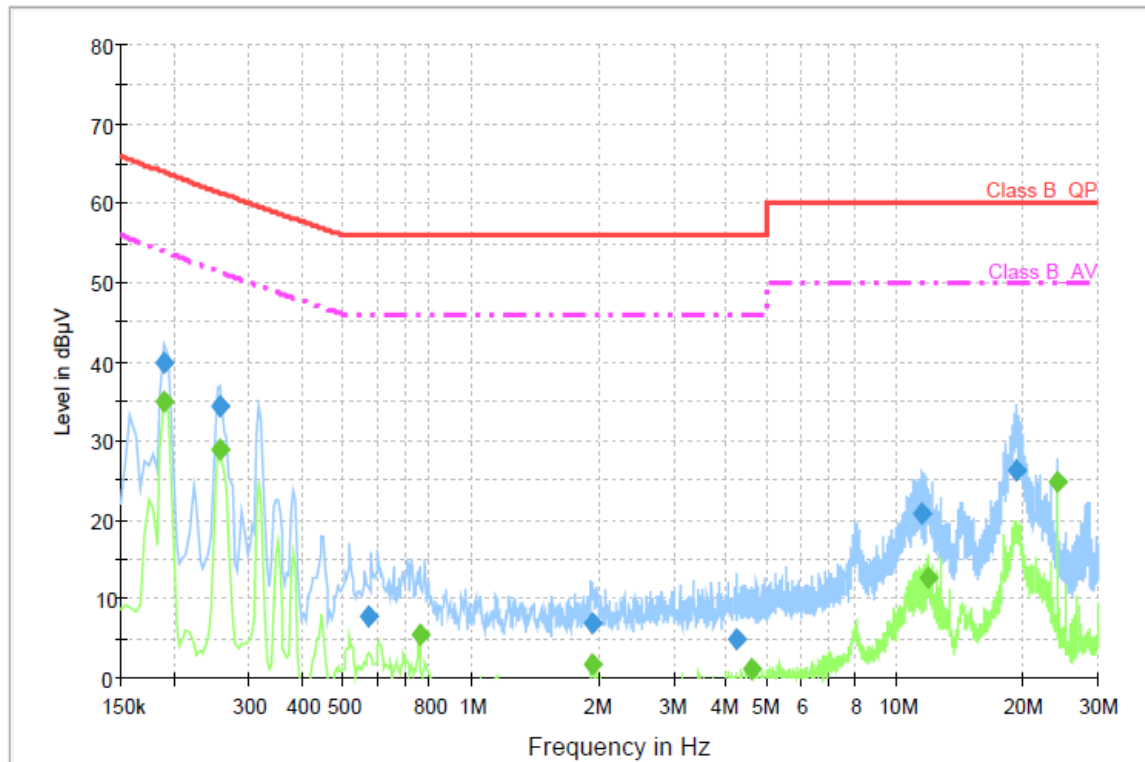
Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.190000	34.9	1000.000	9.000	GND	N	10.1	19.0	53.9	
0.254000	28.6	1000.000	9.000	GND	N	10.1	22.8	51.4	
0.614000	6.0	1000.000	9.000	GND	N	10.1	40.0	46.0	
12.746000	7.1	1000.000	9.000	GND	N	10.6	42.9	50.0	
23.998000	26.8	1000.000	9.000	GND	N	10.7	23.2	50.0	

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



◆ Operating condition: 1 920 × 1 080 / 60 Hz (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
0.190000	39.9	1000.000	9.000	GND	L1	10.1	24.0	63.9	
0.256000	34.3	1000.000	9.000	GND	L1	10.1	27.1	61.4	
0.572000	7.9	1000.000	9.000	GND	L1	10.1	48.1	56.0	
1.932000	6.9	1000.000	9.000	GND	L1	10.1	49.1	56.0	
4.208000	4.9	1000.000	9.000	GND	L1	10.3	51.1	56.0	
11.584000	20.7	1000.000	9.000	GND	L1	10.6	39.3	60.0	
19.208000	26.4	1000.000	9.000	GND	L1	11.1	33.6	60.0	

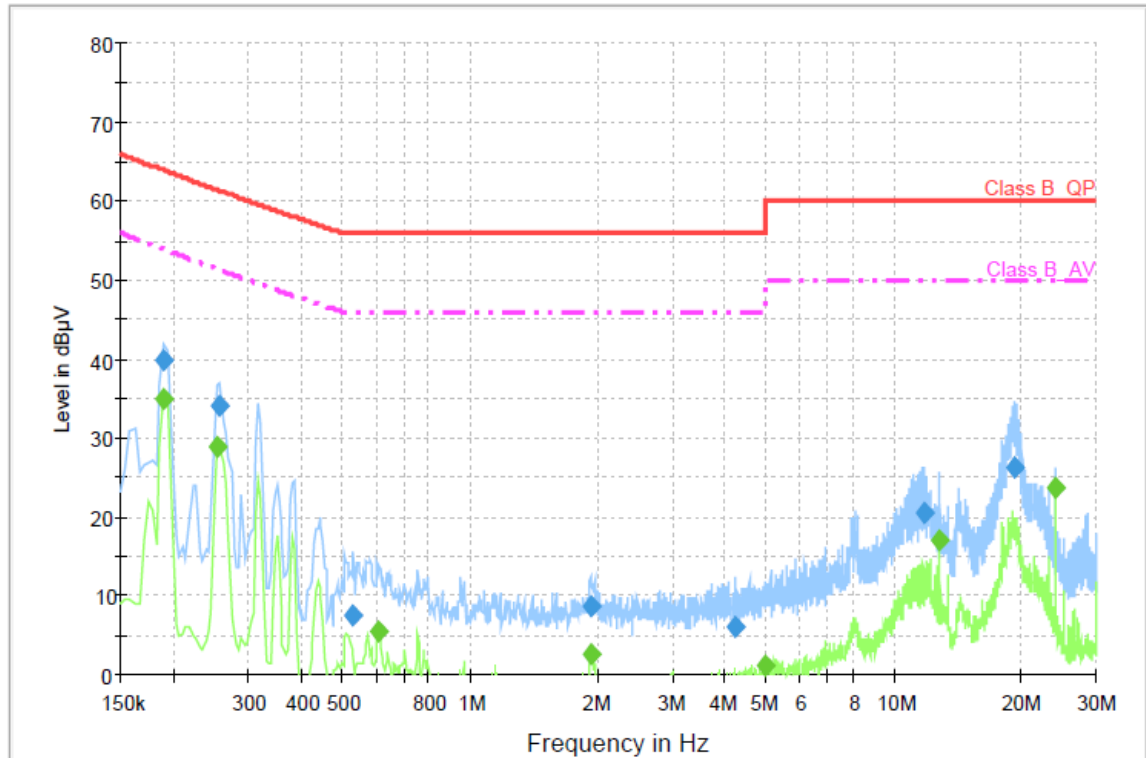
Final Measurement Detector 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.190000	35.0	1000.000	9.000	GND	L1	10.1	18.9	53.9	
0.256000	29.0	1000.000	9.000	GND	L1	10.1	22.3	51.3	
0.756000	5.4	1000.000	9.000	GND	L1	10.1	40.6	46.0	
1.932000	1.8	1000.000	9.000	GND	L1	10.1	44.2	46.0	
4.568000	1.1	1000.000	9.000	GND	L1	10.3	44.9	46.0	
11.892000	12.8	1000.000	9.000	GND	L1	10.6	37.2	50.0	
24.000000	24.9	1000.000	9.000	GND	L1	11.1	25.1	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
0.190000	39.8	1000.000	9.000	GND	N	10.1	24.1	63.9	
0.258000	33.9	1000.000	9.000	GND	N	10.1	27.4	61.3	
0.530000	7.6	1000.000	9.000	GND	N	10.1	48.4	56.0	
1.922000	8.6	1000.000	9.000	GND	N	10.2	47.4	56.0	
4.242000	6.1	1000.000	9.000	GND	N	10.3	49.9	56.0	
11.726000	20.6	1000.000	9.000	GND	N	10.6	39.4	60.0	
19.362000	26.4	1000.000	9.000	GND	N	10.9	33.6	60.0	

Final Measurement Detector 2

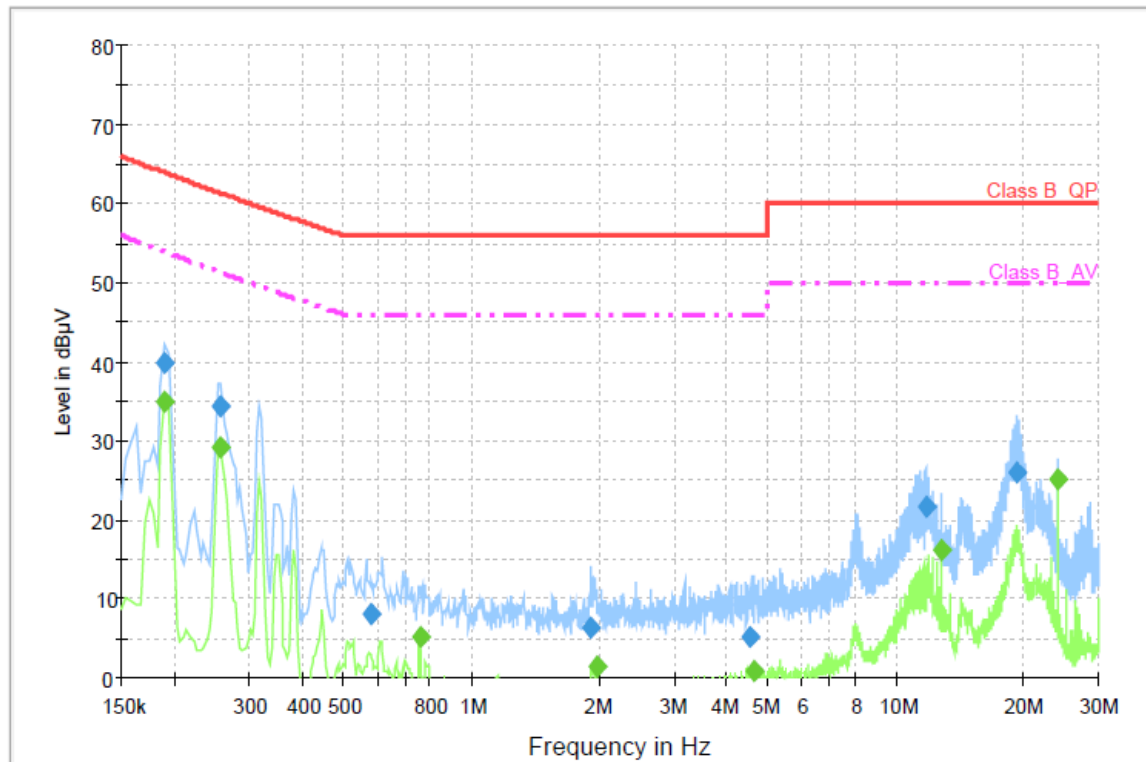
Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.190000	35.1	1000.000	9.000	GND	N	10.1	18.8	53.9	
0.254000	28.8	1000.000	9.000	GND	N	10.1	22.6	51.4	
0.606000	5.5	1000.000	9.000	GND	N	10.1	40.5	46.0	
1.922000	2.7	1000.000	9.000	GND	N	10.2	43.3	46.0	
4.990000	1.2	1000.000	9.000	GND	N	10.3	44.8	46.0	
12.746000	17.1	1000.000	9.000	GND	N	10.6	32.9	50.0	
23.998000	23.6	1000.000	9.000	GND	N	10.7	26.4	50.0	

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



◆ Operating condition: 1 920 × 1 080 / 60 Hz (HDMI: 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
0.190000	39.9	1000.000	9.000	GND	L1	10.1	24.0	63.9	
0.256000	34.4	1000.000	9.000	GND	L1	10.1	27.0	61.4	
0.580000	8.2	1000.000	9.000	GND	L1	10.1	47.8	56.0	
1.912000	6.4	1000.000	9.000	GND	L1	10.1	49.6	56.0	
4.508000	5.3	1000.000	9.000	GND	L1	10.3	50.7	56.0	
11.728000	21.6	1000.000	9.000	GND	L1	10.6	38.4	60.0	
19.292000	25.9	1000.000	9.000	GND	L1	11.1	34.1	60.0	

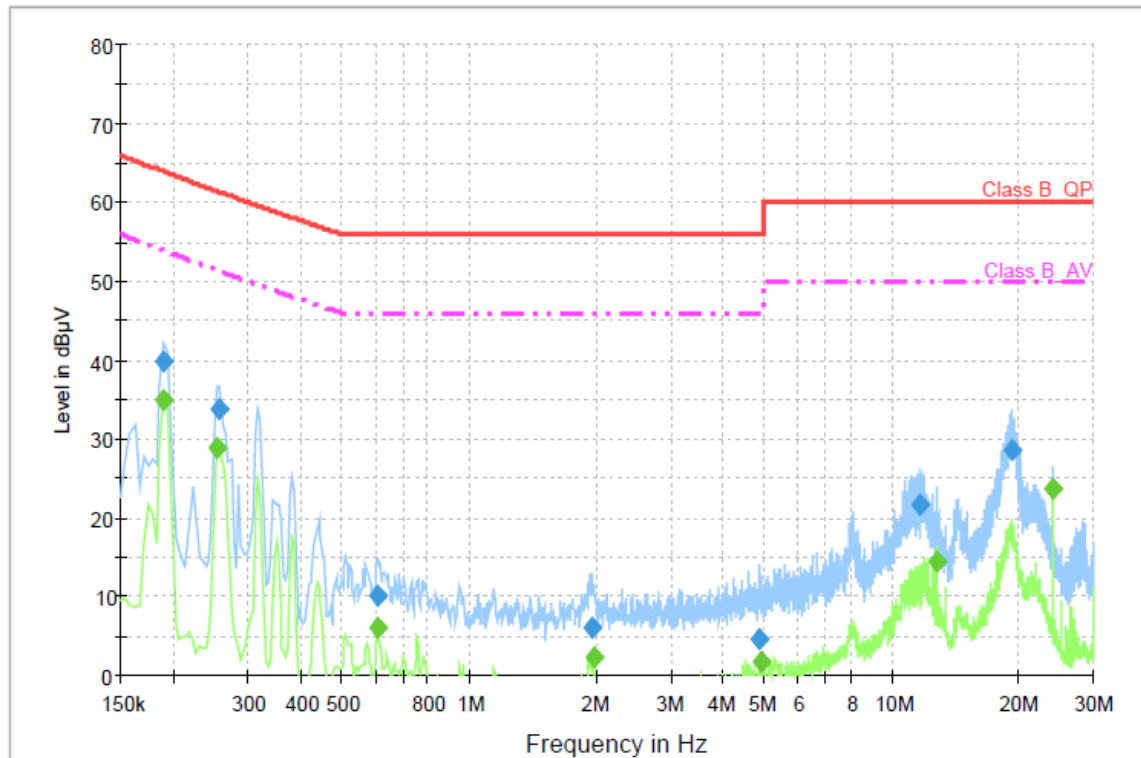
Final Measurement Detector 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.190000	35.1	1000.000	9.000	GND	L1	10.1	18.8	53.9	
0.256000	29.1	1000.000	9.000	GND	L1	10.1	22.2	51.3	
0.756000	5.3	1000.000	9.000	GND	L1	10.1	40.7	46.0	
1.972000	1.5	1000.000	9.000	GND	L1	10.1	44.5	46.0	
4.648000	0.8	1000.000	9.000	GND	L1	10.3	45.2	46.0	
12.748000	16.3	1000.000	9.000	GND	L1	10.7	33.7	50.0	
24.000000	25.0	1000.000	9.000	GND	L1	11.1	25.0	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
0.190000	39.8	1000.000	9.000	GND	N	10.1	24.1	63.9	
0.258000	33.9	1000.000	9.000	GND	N	10.1	27.4	61.3	
0.610000	10.0	1000.000	9.000	GND	N	10.1	46.0	56.0	
1.946000	6.0	1000.000	9.000	GND	N	10.2	50.0	56.0	
4.886000	4.6	1000.000	9.000	GND	N	10.3	51.4	56.0	
11.658000	21.8	1000.000	9.000	GND	N	10.6	38.2	60.0	
19.246000	28.7	1000.000	9.000	GND	N	10.9	31.4	60.0	

Final Measurement Detector 2

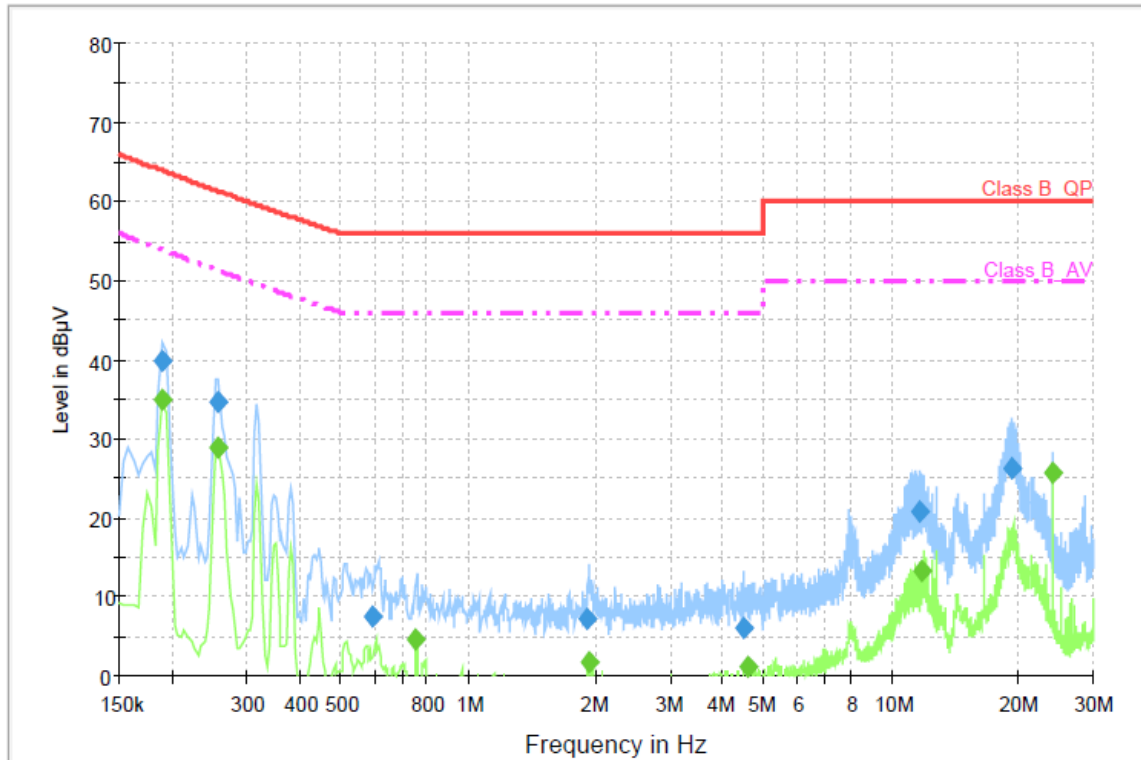
Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.190000	35.0	1000.000	9.000	GND	N	10.1	18.9	53.9	
0.254000	28.8	1000.000	9.000	GND	N	10.1	22.6	51.4	
0.610000	6.0	1000.000	9.000	GND	N	10.1	40.0	46.0	
1.974000	2.4	1000.000	9.000	GND	N	10.2	43.6	46.0	
4.930000	1.6	1000.000	9.000	GND	N	10.3	44.4	46.0	
12.806000	14.5	1000.000	9.000	GND	N	10.6	35.5	50.0	
23.998000	23.6	1000.000	9.000	GND	N	10.7	26.4	50.0	

< Fig 13. 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
0.190000	39.9	1000.000	9.000	GND	L1	10.1	24.0	63.9	
0.256000	34.6	1000.000	9.000	GND	L1	10.1	26.8	61.4	
0.592000	7.5	1000.000	9.000	GND	L1	10.1	48.5	56.0	
1.916000	7.1	1000.000	9.000	GND	L1	10.1	48.9	56.0	
4.484000	6.1	1000.000	9.000	GND	L1	10.3	49.9	56.0	
11.656000	20.9	1000.000	9.000	GND	L1	10.6	39.1	60.0	
19.216000	26.3	1000.000	9.000	GND	L1	11.1	33.7	60.0	

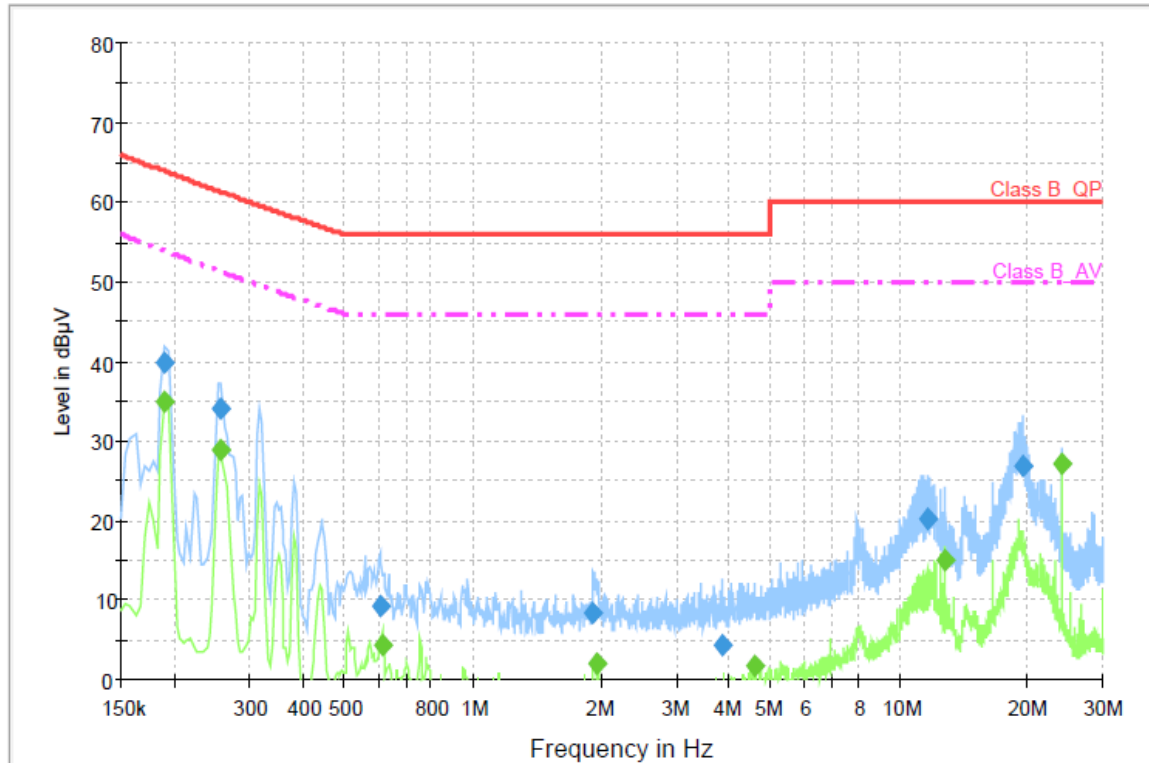
Final Measurement Detector 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.190000	35.1	1000.000	9.000	GND	L1	10.1	18.8	53.9	
0.256000	29.0	1000.000	9.000	GND	L1	10.1	22.3	51.3	
0.752000	4.5	1000.000	9.000	GND	L1	10.1	41.5	46.0	
1.928000	1.6	1000.000	9.000	GND	L1	10.1	44.4	46.0	
4.596000	1.1	1000.000	9.000	GND	L1	10.3	44.9	46.0	
11.860000	13.4	1000.000	9.000	GND	L1	10.6	36.6	50.0	
24.048000	25.6	1000.000	9.000	GND	L1	11.1	24.4	50.0	

< Fig 14. 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
0.190000	39.8	1000.000	9.000	GND	N	10.1	24.1	63.9	
0.258000	34.0	1000.000	9.000	GND	N	10.1	27.3	61.3	
0.606000	9.3	1000.000	9.000	GND	N	10.1	46.7	56.0	
1.918000	8.3	1000.000	9.000	GND	N	10.2	47.7	56.0	
3.842000	4.3	1000.000	9.000	GND	N	10.3	51.7	56.0	
11.662000	20.3	1000.000	9.000	GND	N	10.6	39.7	60.0	
19.414000	26.9	1000.000	9.000	GND	N	10.9	33.1	60.0	

Final Measurement Detector 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.190000	35.0	1000.000	9.000	GND	N	10.1	18.9	53.9	
0.258000	28.9	1000.000	9.000	GND	N	10.1	22.4	51.3	
0.614000	4.3	1000.000	9.000	GND	N	10.1	41.7	46.0	
1.966000	2.1	1000.000	9.000	GND	N	10.2	43.9	46.0	
4.586000	1.6	1000.000	9.000	GND	N	10.3	44.4	46.0	
12.746000	15.0	1000.000	9.000	GND	N	10.6	35.0	50.0	
24.046000	27.0	1000.000	9.000	GND	N	10.7	23.0	50.0	

< Fig 15. Conducted emission result (Neutral line) >



6. Radiated Emission

6.1 Operating Environment

Temperature : 29.0 °C
Relative Humidity : 60.0 % 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(Open area test site)	Uncertainty	Remark
Radiated emission (30 MHz ~ 300 MHz, 10 m, Vertical)	± 4.03 dB	Confidence levels of 95 % ($k = 2$)
Radiated emission (30 MHz ~ 300 MHz, 10 m, Horizontal)	± 3.96 dB	Confidence levels of 95 % ($k = 2$)
Radiated emission (300 MHz ~ 1 000 MHz, 10 m, Vertical)	± 4.01 dB	Confidence levels of 95 % ($k = 2$)
Radiated emission (300 MHz ~ 1 000 MHz, 10 m, Horizontal)	± 3.88 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
■ - ESCS30	Rohde & Schwarz	EMI Test Receiver	839809/003	12. 10. 2011
■ - HK116	Rohde & Schwarz	Biconical Antenna	832639/007	03. 15. 2012
■ - HL223	Rohde & Schwarz	Log Periodic Antenna	835998/004	03. 15. 2012
■ - 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
■ - ESIB26	Rohde & Schwarz	EMI Test Receiver	830482/010	12. 11. 2011
■ - BBHA9120D	Schwarzbeck	Horn Antenna	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
■ - AFS 44 00101800-25-10P-44	MITEQ	Preamplifier	1258943	11. 12. 2011

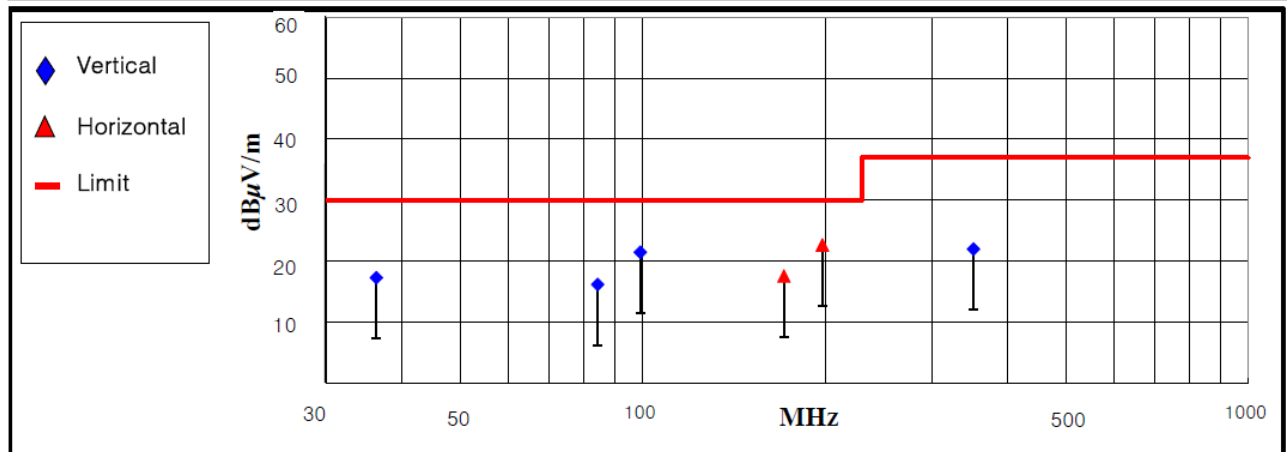


6.6 Test data for Radiated Emission

- Test Date : August 16 ~ 19, 2011
- Resolution Bandwidth : 120 kHz/1 MHz
- Frequency Range (Detector mode) : 30 MHz ~ 1 GHz (Quasi-peak detector mode)
1 GHz ~ 5 GHz (Average detector mode, Peak detector mode)
- Measurement Distance : 10 m / 3 m
- Note : The highest frequency of the internal source of the EUT is between 500 MHz and 1 000 MHz (533 MHz). The measurement was made up to 5 000 MHz

◆ Operating Condition: 1 920 × 1 080 / 60 Hz (RGB: Analog)

Frequency (MHz)	Measurement Level				Limit (dBμ V/m)	Margin (dB)	Positioning System		
	Reading Value(dBμ V)	Antenna Factor(dB/m)	Cable Loss(dB)	Test Result (dBμ V/m)			Pol. (H/V)	Height (cm)	Angle (°)
36.29	4.24	11.61	1.45	17.30	30.00	12.70	V	100	256
84.20	5.37	8.52	2.31	16.20	30.00	13.80	V	107	330
99.02	9.58	9.40	2.52	21.50	30.00	8.50	V	126	145
171.05	1.27	12.90	3.43	17.60	30.00	12.40	H	162	250
198.00	4.54	14.42	3.74	22.70	30.00	7.30	H	188	219
351.57	2.22	14.62	5.16	22.00	37.00	15.00	V	100	230

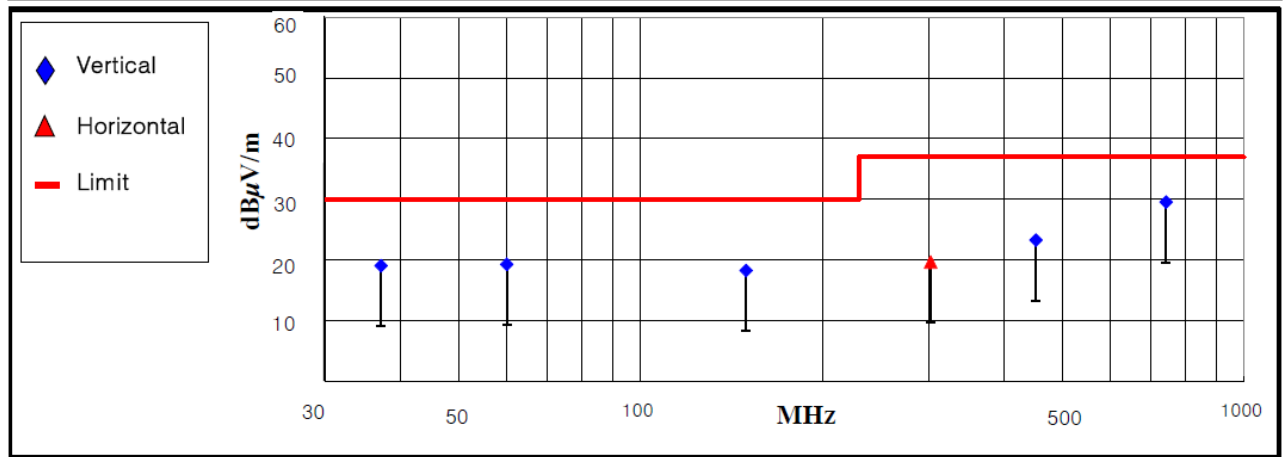


< Fig 16. Radiated emission result (30 MHz ~ 1 000 MHz) >



◆ Operating Condition: 1 920 × 1 080 / 60 Hz (DVI: Digital)

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)	(°)
37.15	6.05	11.59	1.46	19.10	30.00	10.90	V	100	306
59.99	9.35	8.04	1.91	19.30	30.00	10.70	V	100	114
149.59	3.18	11.96	3.16	18.30	30.00	11.70	V	104	36
302.46	1.96	13.00	4.74	19.70	37.00	17.30	H	233	180
451.95	0.45	16.90	5.95	23.30	37.00	13.70	V	176	220
742.52	0.92	20.68	8.00	29.60	37.00	7.40	V	131	196

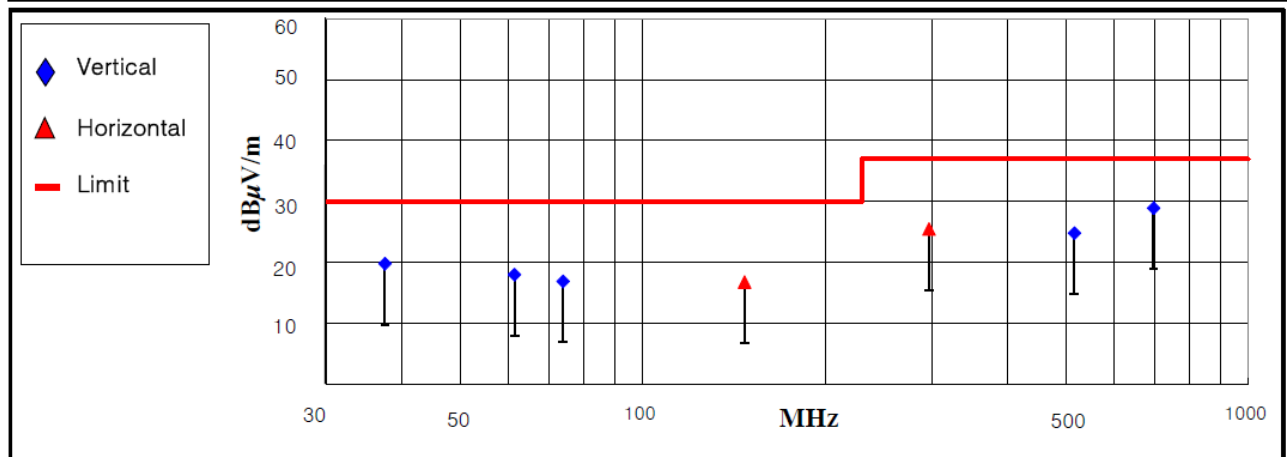


< Fig 17. Radiated emission result (30 MHz ~ 1 000 MHz) >



◆ Operating Condition: 1 920 × 1 080 / 60 Hz (HDMI: Digital)

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)	(°)
37.52	6.76	11.57	1.47	19.80	30.00	10.20	V	100	207
61.40	7.94	8.13	1.93	18.00	30.00	12.00	V	100	166
73.89	6.16	8.60	2.14	16.90	30.00	13.10	V	108	329
147.33	1.73	11.93	3.14	16.80	30.00	13.20	H	231	341
297.00	3.39	17.42	4.69	25.50	37.00	11.50	H	127	153
516.09	0.61	17.77	6.42	24.80	37.00	12.20	V	100	162
697.21	1.02	20.17	7.71	28.90	37.00	8.10	V	103	150

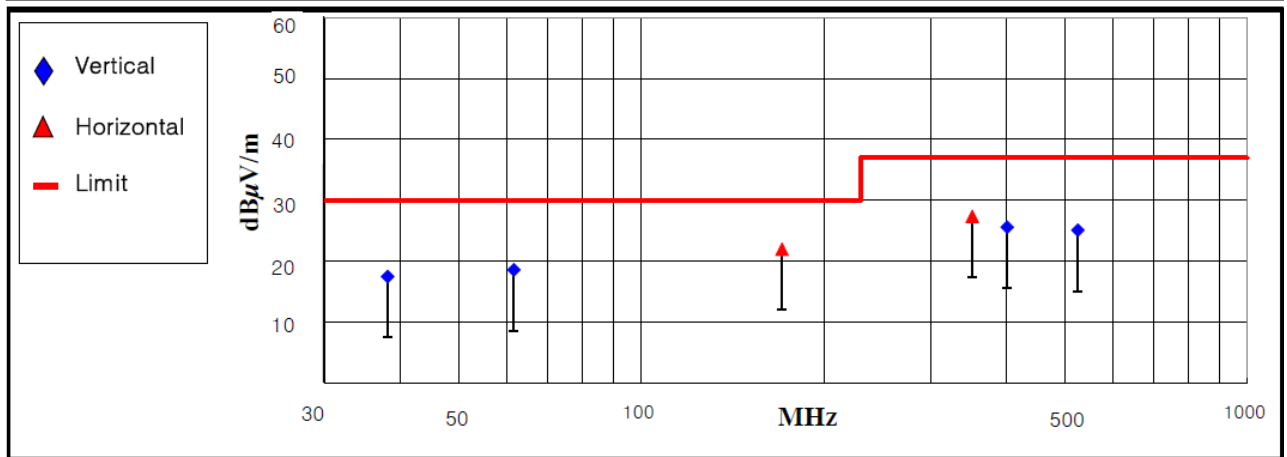


< Fig 18. Radiated emission result (30 MHz ~ 1 000 MHz) >



◆ Operating Condition: 1 920 × 1 080 / 60 Hz (DP: Digital)

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)	(°)
38.11	4.46	11.56	1.48	17.50	30.00	12.50	V	102	287
61.59	8.51	8.15	1.94	18.60	30.00	11.40	V	106	177
170.72	5.69	12.88	3.43	22.00	30.00	8.00	H	179	246
351.58	7.62	14.62	5.16	27.40	37.00	9.60	H	118	27
401.56	3.83	16.23	5.54	25.60	37.00	11.40	V	142	199
525.26	0.72	17.90	6.49	25.11	37.00	11.89	V	100	168



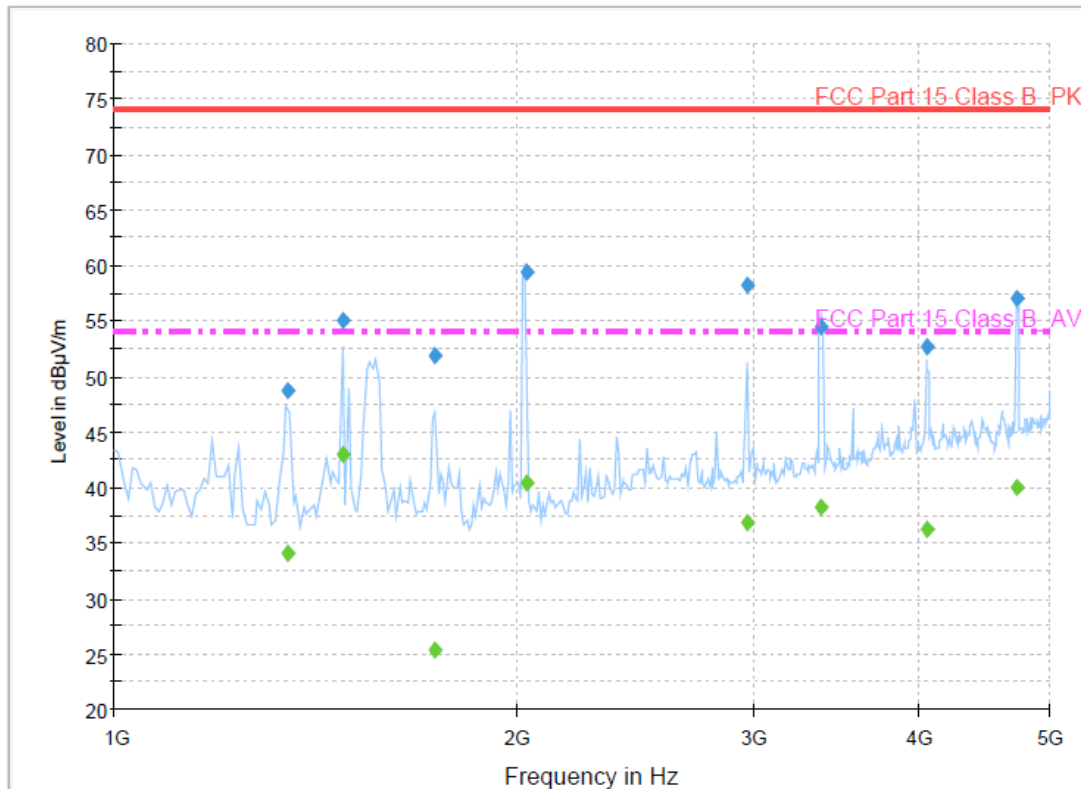
< Fig 19. Radiated emission result (30 MHz ~ 1 000 MHz) >



◆ Operating Condition: 1 920 × 1 080 / 60 Hz (RGB: Analog)

Green marker: Average detector, Blue marker: Peak detector

Radiated emission_above 1GHz-6GHz



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)
1348.489379	48.7	1000.0	1000.000	138.0	H	216.0	-13.4	25.3	74.0
1484.761924	55.0	1000.0	1000.000	100.0	V	226.0	-13.2	19.0	74.0
1734.074950	51.8	1000.0	1000.000	150.0	H	206.0	-12.3	22.2	74.0
2030.652104	59.3	1000.0	1000.000	100.0	V	226.0	-11.3	14.7	74.0
2970.543888	58.1	1000.0	1000.000	137.0	H	243.0	-6.8	15.9	74.0
3370.945491	54.4	1000.0	1000.000	100.0	V	198.0	-5.4	19.6	74.0
4046.692184	52.6	1000.0	1000.000	100.0	H	43.0	-2.8	21.4	74.0
4720.038878	56.9	1000.0	1000.000	127.0	H	225.0	-1.4	17.1	74.0

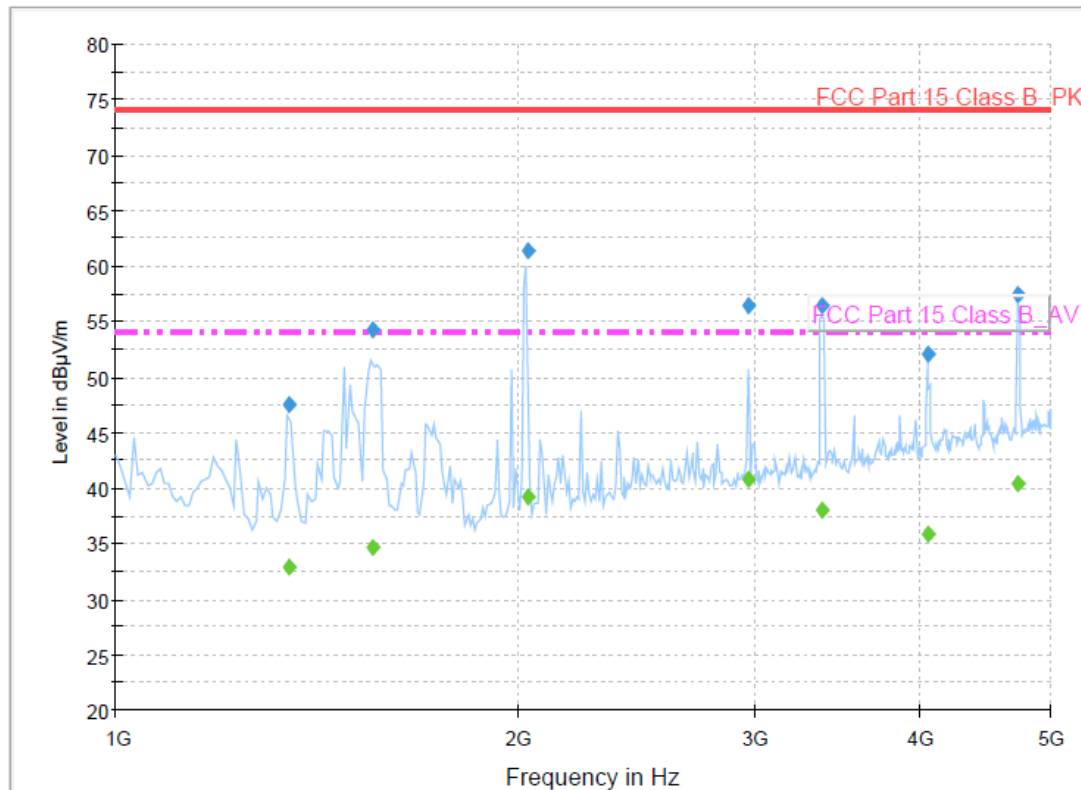
Final Result 2

Frequency (MHz)	CAverage (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1348.489379	34.1	1000.0	1000.000	138.0	H	216.0	-13.4	19.9	54.0
1484.761924	43.0	1000.0	1000.000	100.0	V	226.0	-13.2	11.0	54.0
1734.074950	25.3	1000.0	1000.000	150.0	H	206.0	-12.3	28.7	54.0
2030.652104	40.4	1000.0	1000.000	100.0	V	226.0	-11.3	13.6	54.0
2970.543888	36.8	1000.0	1000.000	137.0	H	243.0	-6.8	17.2	54.0
3370.945491	38.1	1000.0	1000.000	100.0	V	198.0	-5.4	15.9	54.0
4046.692184	36.2	1000.0	1000.000	100.0	H	43.0	-2.8	17.8	54.0
4720.038878	40.0	1000.0	1000.000	127.0	H	225.0	-1.4	14.0	54.0

< Fig 20. Radiated emission result (1 000 MHz ~ 5 000 MHz) >



- ◆ Operating Condition: 1 920 × 1 080 / 60 Hz (DVI: Digital)
Green marker: Average detector, Blue marker: Peak detector
Radiated emission_above 1GHz-6GHz



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)
1349.689379	47.5	1000.0	1000.000	210.0	H	94.0	-13.4	26.5	74.0
1555.306213	54.2	1000.0	1000.000	200.0	V	148.0	-12.9	19.8	74.0
2031.052104	61.3	1000.0	1000.000	100.0	V	231.0	-11.3	12.7	74.0
2970.143888	56.5	1000.0	1000.000	100.0	V	187.0	-6.8	17.5	74.0
3377.745491	56.5	1000.0	1000.000	100.0	H	237.0	-5.4	17.5	74.0
4046.692184	52.1	1000.0	1000.000	100.0	H	42.0	-2.8	21.9	74.0
4722.454910	57.4	1000.0	1000.000	150.0	H	238.0	-1.4	16.6	74.0

Final Result 2

Frequency (MHz)	CAverage (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1349.689379	32.8	1000.0	1000.000	210.0	H	94.0	-13.4	21.2	54.0
1555.306213	34.7	1000.0	1000.000	200.0	V	148.0	-12.9	19.3	54.0
2031.052104	39.2	1000.0	1000.000	100.0	V	231.0	-11.3	14.8	54.0
2970.143888	40.7	1000.0	1000.000	100.0	V	187.0	-6.8	13.3	54.0
3377.745491	38.1	1000.0	1000.000	100.0	H	237.0	-5.4	16.0	54.0
4046.692184	35.8	1000.0	1000.000	100.0	H	42.0	-2.8	18.2	54.0
4722.454910	40.3	1000.0	1000.000	150.0	H	238.0	-1.4	13.7	54.0

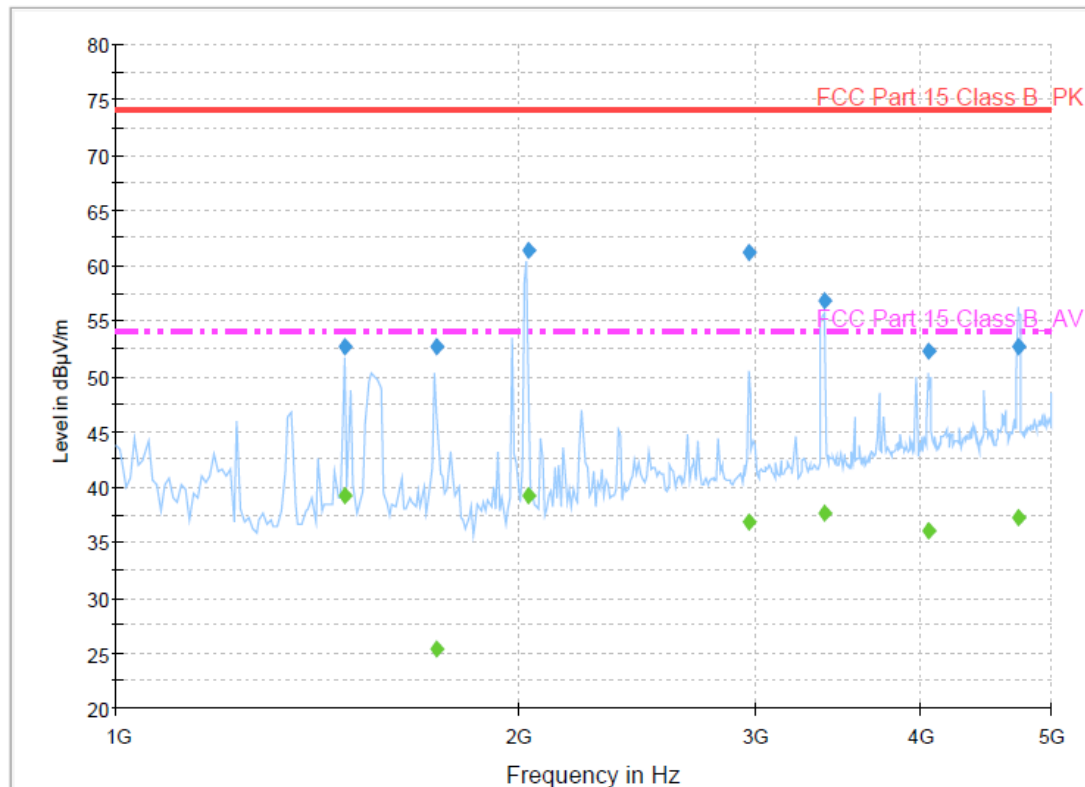
< Fig 21. Radiated emission result (1 000 MHz ~ 5 000 MHz) >



◆ Operating Condition: 1 920 × 1 080 / 60 Hz (HDMI: Digital)

Green marker: Average detector, Blue marker: Peak detector

Radiated emission_above 1GHz-6GHz



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)
1484.761924	52.7	1000.0	1000.000	100.0	V	212.0	-13.2	21.3	74.0
1733.658918	52.7	1000.0	1000.000	100.0	H	271.0	-12.3	21.3	74.0
2031.052104	61.5	1000.0	1000.000	100.0	V	230.0	-11.3	12.5	74.0
2971.743888	61.2	1000.0	1000.000	138.0	V	212.0	-6.8	12.8	74.0
3384.177555	56.8	1000.0	1000.000	116.0	H	236.0	-5.4	17.2	74.0
4044.692184	52.3	1000.0	1000.000	100.0	H	45.0	-2.8	21.7	74.0
4719.638878	52.6	1000.0	1000.000	127.0	H	220.0	-1.4	21.4	74.0

Final Result 2

Frequency (MHz)	CAverage (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1484.761924	39.2	1000.0	1000.000	100.0	V	212.0	-13.2	14.8	54.0
1733.658918	25.3	1000.0	1000.000	100.0	H	271.0	-12.3	28.7	54.0
2031.052104	39.3	1000.0	1000.000	100.0	V	230.0	-11.3	14.7	54.0
2971.743888	36.9	1000.0	1000.000	138.0	V	212.0	-6.8	17.1	54.0
3384.177555	37.7	1000.0	1000.000	116.0	H	236.0	-5.4	16.3	54.0
4044.692184	36.1	1000.0	1000.000	100.0	H	45.0	-2.8	17.9	54.0
4719.638878	37.2	1000.0	1000.000	127.0	H	220.0	-1.4	16.8	54.0

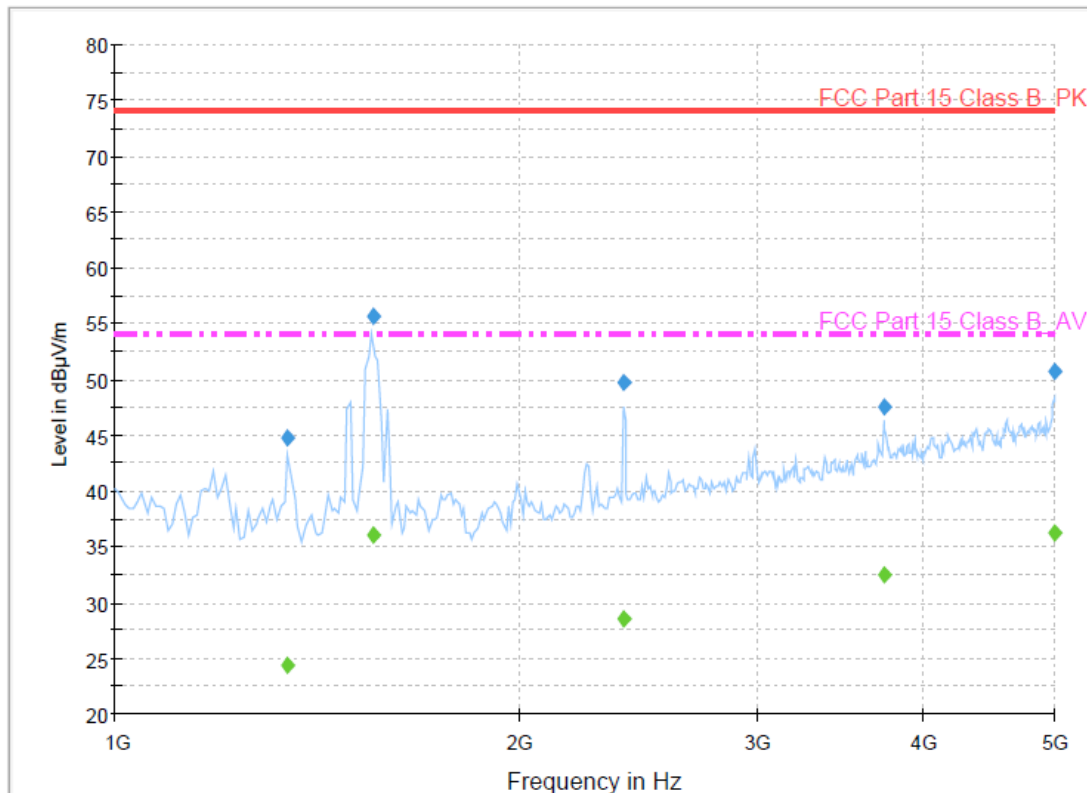
< Fig 22. Radiated emission result (1 000 MHz ~ 5 000 MHz) >



◆ Operating Condition: 1 920 × 1 080 / 60 Hz (DP: Digital)

Green marker: Average detector, Blue marker: Peak detector

Radiated emission_above 1GHz-6GHz



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)
1345.689379	44.7	1000.0	1000.000	146.0	V	56.0	-13.4	29.3	74.0
1555.706213	55.7	1000.0	1000.000	100.0	H	208.0	-12.9	18.3	74.0
2389.373547	49.7	1000.0	1000.000	166.0	V	-1.0	-9.5	24.3	74.0
3732.466934	47.4	1000.0	1000.000	100.0	H	124.0	-4.0	26.6	74.0
4996.983968	50.8	1000.0	1000.000	100.0	V	169.0	-0.8	23.2	74.0

Final Result 2

Frequency (MHz)	CAverage (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1345.689379	24.3	1000.0	1000.000	146.0	V	56.0	-13.4	29.7	54.0
1555.706213	36.0	1000.0	1000.000	100.0	H	208.0	-12.9	19.0	54.0
2389.373547	28.6	1000.0	1000.000	166.0	V	-1.0	-9.5	25.4	54.0
3732.466934	32.5	1000.0	1000.000	100.0	H	124.0	-4.0	21.5	54.0
4996.983968	36.3	1000.0	1000.000	100.0	V	169.0	-0.8	17.7	54.0

< Fig 23. Radiated emission result (1 000 MHz ~ 5 000 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. SIGNAGE DISPLAY (Model Name: 42VS20)** was complies with §15.107 and 15.109 of the FCC Rules.