

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: October 17, 2011

Order Number: GETEC-C1-11-237

Test Report Number: GETEC-E3-11-121

Test Site: Gumi College EMC Center

FCC Registration Number: (100749, 443957)

FCC ID. : BEJ55VS20

Applicant : LG Electronics Inc.

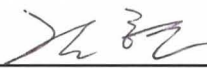
Rule Part(s)	: FCC Part 15 Subpart B
Equipment Class	: Class B computing device peripheral (JBP)
EUT Type	: SIGNAGE DISPLAY
Type of Authority	: Certification
Model Name	: 55VS20
Trade Name	: LG

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,


Hyun Kim, 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

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- **FCC ID.** BEJ55VS20
- **EUT Type** SIGNAGE DISPLAY
- **Model Name** 55VS20
- **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** October 11 ~ 12, 2011
- **Place of Test** **Gumi College EMC Center** (FCC Registration Number: 100749, 443957)
407, Bugok-dong, Gumi-si, Gyeongbuk, Korea.
- **Test Report Number** GETEC-E3-11-121
- **Dates of Issue** October 17, 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: 55VS20)**

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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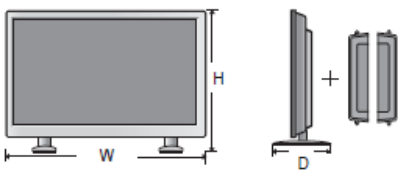
Fig 1. The map above shows the Gumi College in vicinity area.



3. Product Information

3.1 Description of EUT

The Equipment under Test (EUT) is the **LG Electronics Inc. SIGNAGE DISPLAY (Model Name: 55VS20) FCC ID.: BEJ55VS20**

LCD Panel	Screen Type	1387.80 mm Wide (55 inch) TFT (Thin Film Transistor) LCD (Liquid Crystal Display) Panel. Visible diagonal size : 1387.80 mm
	Pixel Pitch	0.630 mm (H) x 0.630 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 2.2 A
	Power Consumption	On Mode : 320 W Typ. Sleep Mode : ≤ 1 W Off Mode : ≤ 0.5 W
Dimensions (Width x Height x Depth) / Weight		
	1251 mm x 795 mm x 298 mm / 36.6 kg	

-. Maximum Frequency Range : 533 MHz



3.2 Support Equipment / Cables used

3.2.1 Used Support Equipment

Description	Manufacturer	Model Name	S/N & FCC ID.
PC (Main board)	ASLOCK	770iCafe	S/N: 0AM0X3097310 FCC ID.: DoC
Video card	Absolute Korea Co., LTD.	HIS6770	S/N: H110838565 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
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	HANSUNG ELECTRONICS	AKB72915219	S/N: None. 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	1.50 m shielded
RGB (Analog) out cable	Connected to the EUT and monitor	1.50 m shielded
DVI (Digital) in cable	Connected to the EUT and PC	1.50 m shielded
DVI (Digital) out cable	Connected to the EUT and monitor	1.50 m shielded
HDMI (Digital) cable	Connected to the EUT and PC	2.00 m shielded
DP (Digital) in cable	Connected to the EUT and PC	3.00 m shielded
RS-232C cable	Connected to the EUT(RS-232C in) and EUT(RS-232C out)	1.80 m shielded
Audio in cable	Connected to the EUT and PC	1.50 m shielded
Speaker (Left) cable	Connected to the EUT and speaker	0.90 m shielded
Speaker (Right) cable	Connected to the EUT and speaker	0.90 m shielded
LAN cable	Connected to the EUT and Network	10.00 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 (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

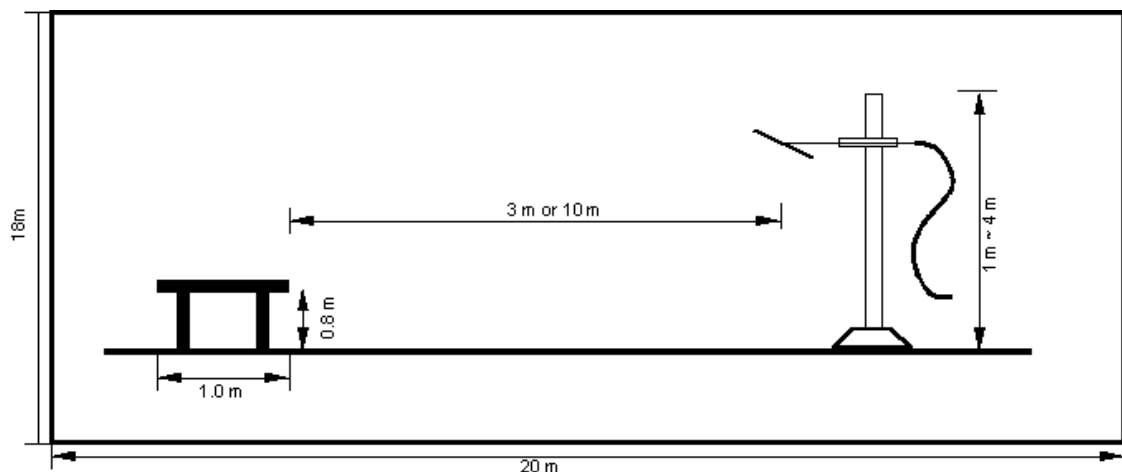


Fig 3. Dimensions of test site



5. Conducted Emission

5.1 Operating Environment

Temperature : 21.0 °C
Relative Humidity : 41.0 % 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	
	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

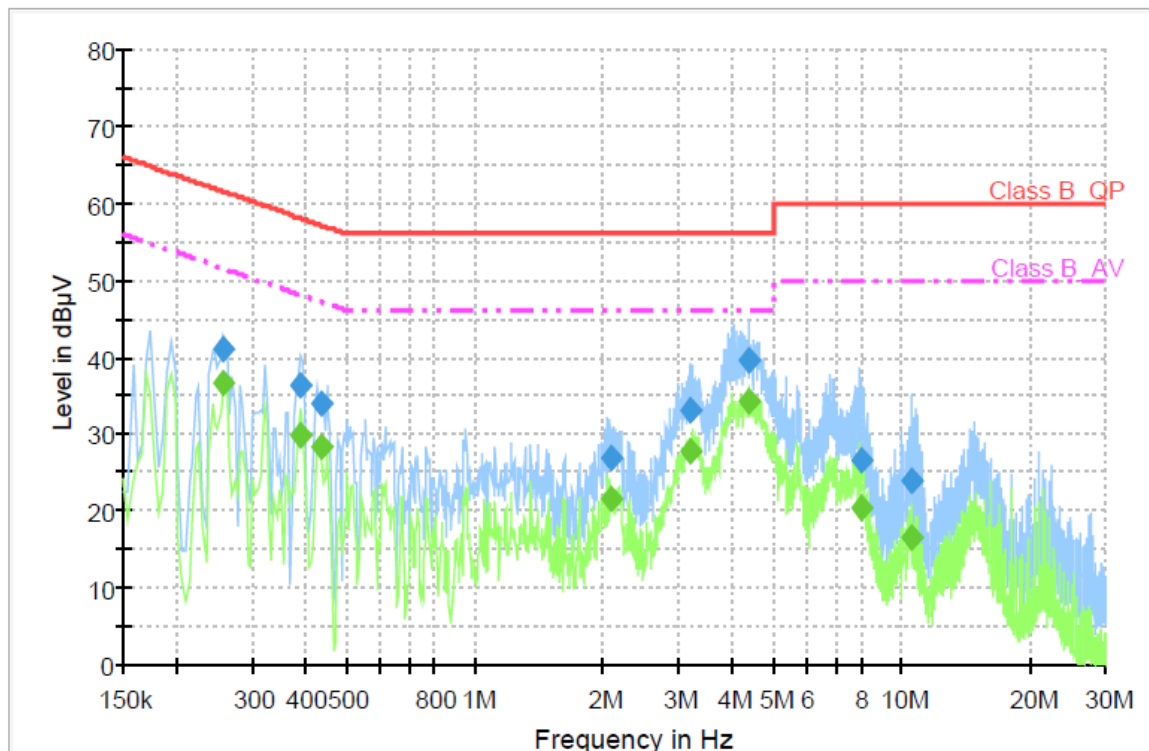
Model Name	Manufacturer	Description	Serial Number	Due to Calibration
■ - ESCS30	Rohde & Schwarz	EMI Test Receiver	839809/003	12. 10. 2011
■ - ESH3-Z5	Rohde & Schwarz	LISN	838979/020	12. 10. 2011
■ - ESH2-Z5	Rohde & Schwarz	LISN	829991/009	12. 10. 2011
■ - ISN T8	TESEQ. GmbH	ISN	24568	11. 09. 2011

5.6 Test data for Conducted Emission

- Test Date : October 13, 2011
- Resolution Bandwidth : 9 kHz
- Frequency Range : 0.15 MHz ~ 30 MHz



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



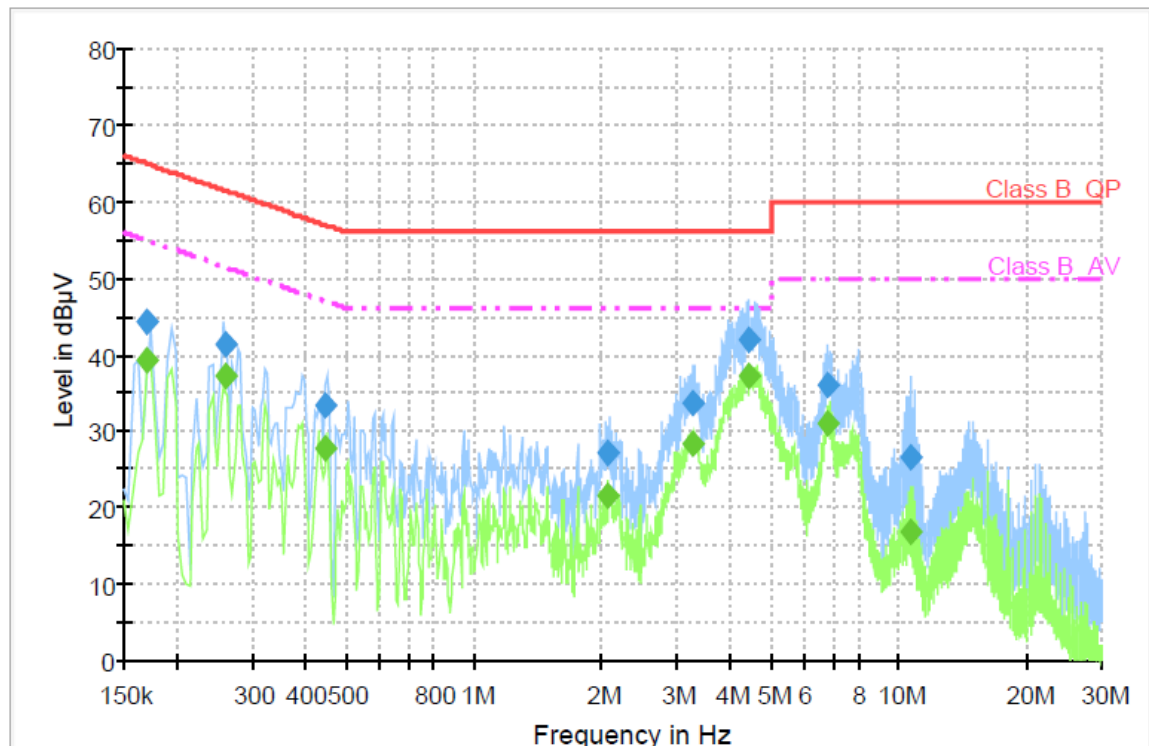
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.256000	40.9	1000.0	9.000	GND	L1	10.1	20.7	61.6	
0.392000	36.3	1000.0	9.000	GND	L1	10.1	21.7	58.0	
0.436000	34.1	1000.0	9.000	GND	L1	10.1	23.1	57.1	
2.088000	26.9	1000.0	9.000	GND	L1	10.2	29.1	56.0	
3.196000	32.9	1000.0	9.000	GND	L1	10.2	23.1	56.0	
4.364000	39.5	1000.0	9.000	GND	L1	10.3	16.5	56.0	
8.000000	26.5	1000.0	9.000	GND	L1	10.5	33.5	60.0	
10.540000	24.0	1000.0	9.000	GND	L1	10.6	36.0	60.0	

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.256000	36.5	1000.0	9.000	GND	L1	10.1	15.1	51.6	
0.392000	29.7	1000.0	9.000	GND	L1	10.1	18.3	48.0	
0.436000	28.2	1000.0	9.000	GND	L1	10.1	18.9	47.1	
2.088000	21.6	1000.0	9.000	GND	L1	10.2	24.4	46.0	
3.196000	27.8	1000.0	9.000	GND	L1	10.2	18.2	46.0	
4.364000	34.3	1000.0	9.000	GND	L1	10.3	11.7	46.0	
8.000000	20.5	1000.0	9.000	GND	L1	10.5	29.5	50.0	
10.540000	16.6	1000.0	9.000	GND	L1	10.6	33.4	50.0	

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



Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.170000	44.3	1000.0	9.000	GND	N	10.1	20.6	65.0	
0.260000	41.4	1000.0	9.000	GND	N	10.1	20.1	61.4	
0.448000	33.5	1000.0	9.000	GND	N	10.1	23.5	56.9	
2.072000	27.1	1000.0	9.000	GND	N	10.2	28.9	56.0	
3.268000	33.6	1000.0	9.000	GND	N	10.2	22.4	56.0	
4.412000	41.9	1000.0	9.000	GND	N	10.3	14.1	56.0	
6.792000	36.0	1000.0	9.000	GND	N	10.4	24.0	60.0	
10.668000	26.6	1000.0	9.000	GND	N	10.5	33.4	60.0	

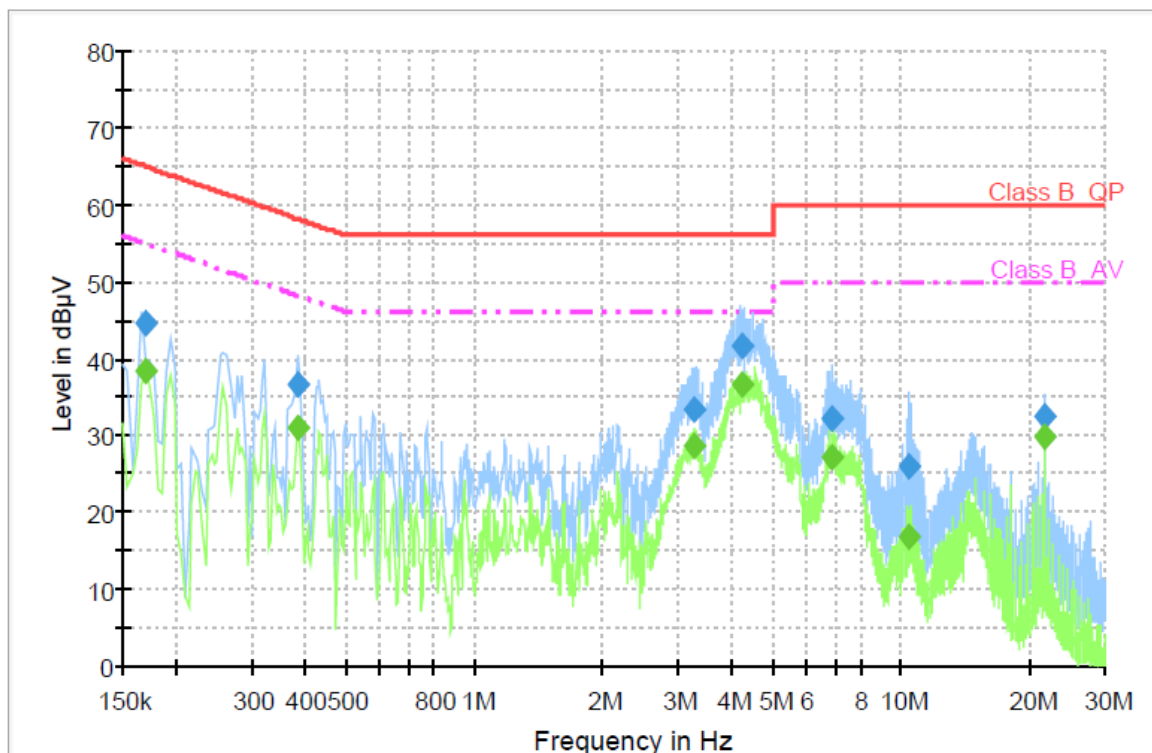
Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.170000	39.4	1000.0	9.000	GND	N	10.1	15.6	55.0	
0.260000	37.1	1000.0	9.000	GND	N	10.1	14.3	51.4	
0.448000	27.7	1000.0	9.000	GND	N	10.1	19.2	46.9	
2.072000	21.5	1000.0	9.000	GND	N	10.2	24.5	46.0	
3.268000	28.5	1000.0	9.000	GND	N	10.2	17.5	46.0	
4.412000	37.3	1000.0	9.000	GND	N	10.3	8.7	46.0	
6.792000	31.0	1000.0	9.000	GND	N	10.4	19.0	50.0	
10.668000	16.8	1000.0	9.000	GND	N	10.5	33.2	50.0	

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



◆ Operating condition: 1 024 × 768 / 60 Hz (RGB: Analog)



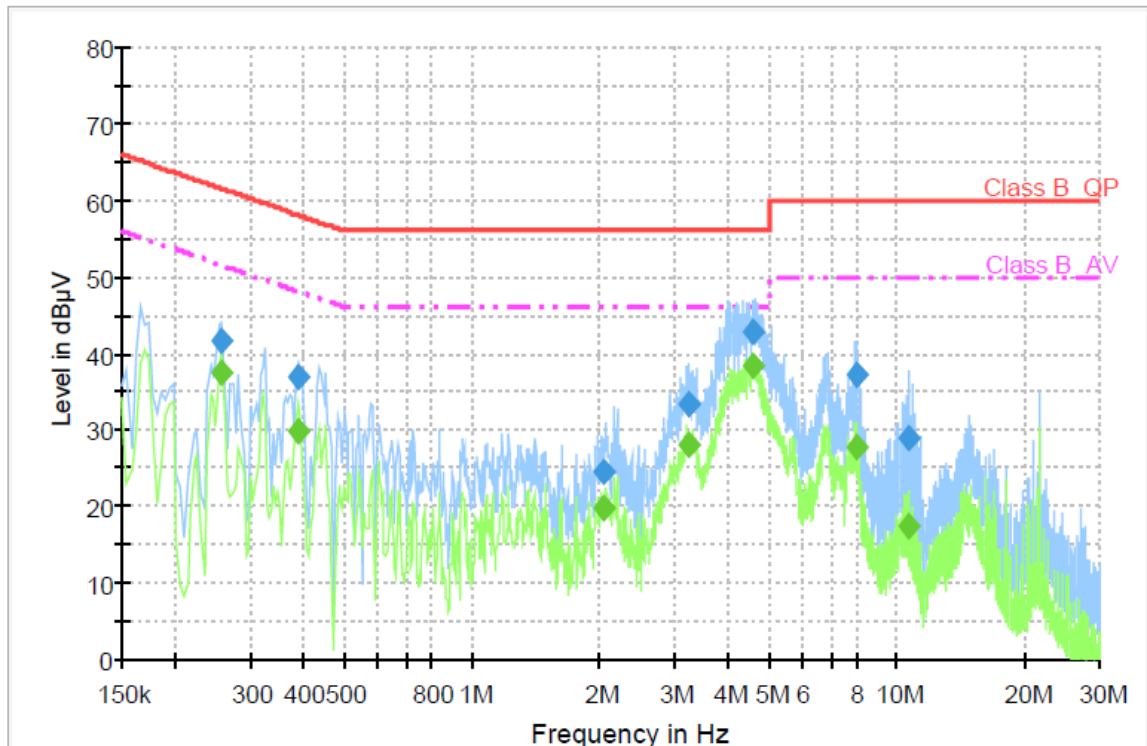
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.170000	44.6	1000.0	9.000	GND	L1	10.1	20.4	65.0	
0.388000	36.5	1000.0	9.000	GND	L1	10.1	21.6	58.1	
3.256000	33.3	1000.0	9.000	GND	L1	10.2	22.7	56.0	
4.236000	41.6	1000.0	9.000	GND	L1	10.3	14.4	56.0	
6.860000	32.3	1000.0	9.000	GND	L1	10.4	27.7	60.0	
10.392000	25.9	1000.0	9.000	GND	L1	10.6	34.1	60.0	
21.668000	32.4	1000.0	9.000	GND	L1	11.1	27.6	60.0	

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.170000	38.3	1000.0	9.000	GND	L1	10.1	16.6	55.0	
0.388000	31.1	1000.0	9.000	GND	L1	10.1	17.0	48.1	
3.256000	28.8	1000.0	9.000	GND	L1	10.2	17.2	46.0	
4.236000	36.6	1000.0	9.000	GND	L1	10.3	9.4	46.0	
6.860000	27.1	1000.0	9.000	GND	L1	10.4	22.9	50.0	
10.392000	16.9	1000.0	9.000	GND	L1	10.6	33.1	50.0	
21.668000	29.9	1000.0	9.000	GND	L1	11.1	20.1	50.0	

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



Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.256000	41.7	1000.0	9.000	GND	N	10.1	19.9	61.6	
0.392000	36.8	1000.0	9.000	GND	N	10.1	21.2	58.0	
2.032000	24.5	1000.0	9.000	GND	N	10.2	31.5	56.0	
3.236000	33.3	1000.0	9.000	GND	N	10.2	22.7	56.0	
4.608000	42.9	1000.0	9.000	GND	N	10.3	13.1	56.0	
8.024000	37.3	1000.0	9.000	GND	N	10.4	22.7	60.0	
10.660000	28.8	1000.0	9.000	GND	N	10.5	31.2	60.0	

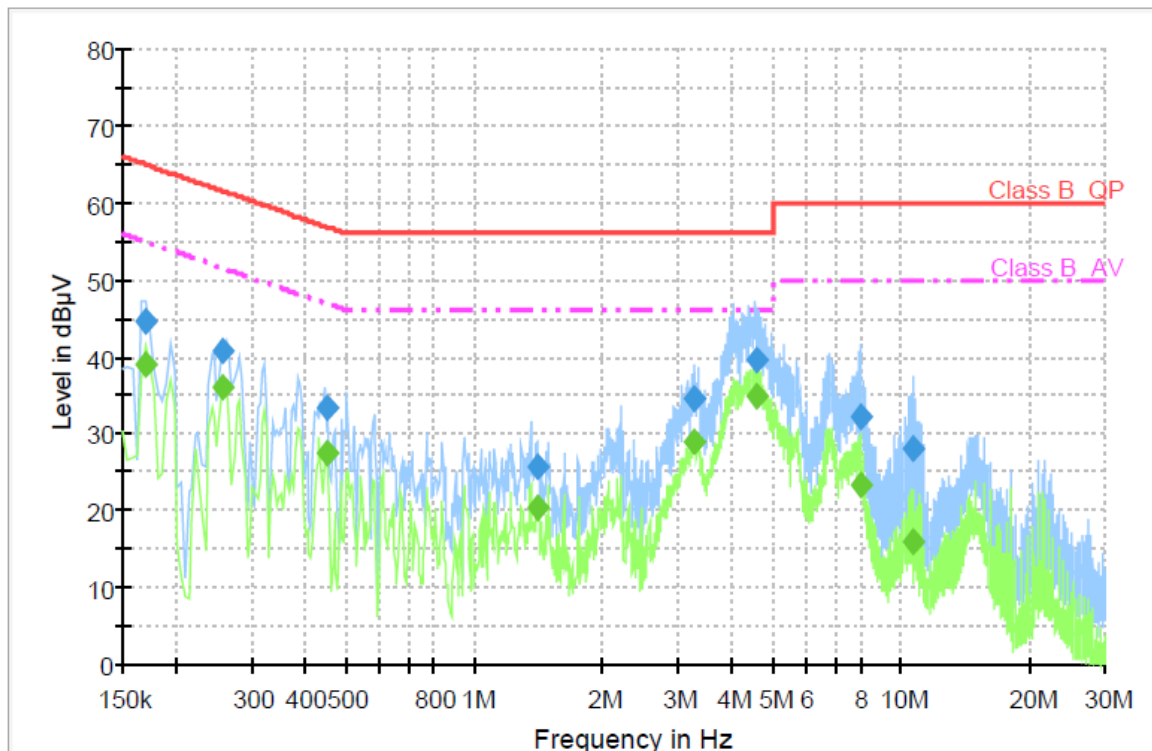
Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.256000	37.4	1000.0	9.000	GND	N	10.1	14.1	51.6	
0.392000	29.8	1000.0	9.000	GND	N	10.1	18.2	48.0	
2.032000	19.6	1000.0	9.000	GND	N	10.2	26.4	46.0	
3.236000	28.2	1000.0	9.000	GND	N	10.2	17.8	46.0	
4.608000	38.3	1000.0	9.000	GND	N	10.3	7.7	46.0	
8.024000	27.8	1000.0	9.000	GND	N	10.4	22.2	50.0	
10.660000	17.3	1000.0	9.000	GND	N	10.5	32.7	50.0	

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



◆ Operating condition: 640 × 480 / 60 Hz (RGB: Analog)



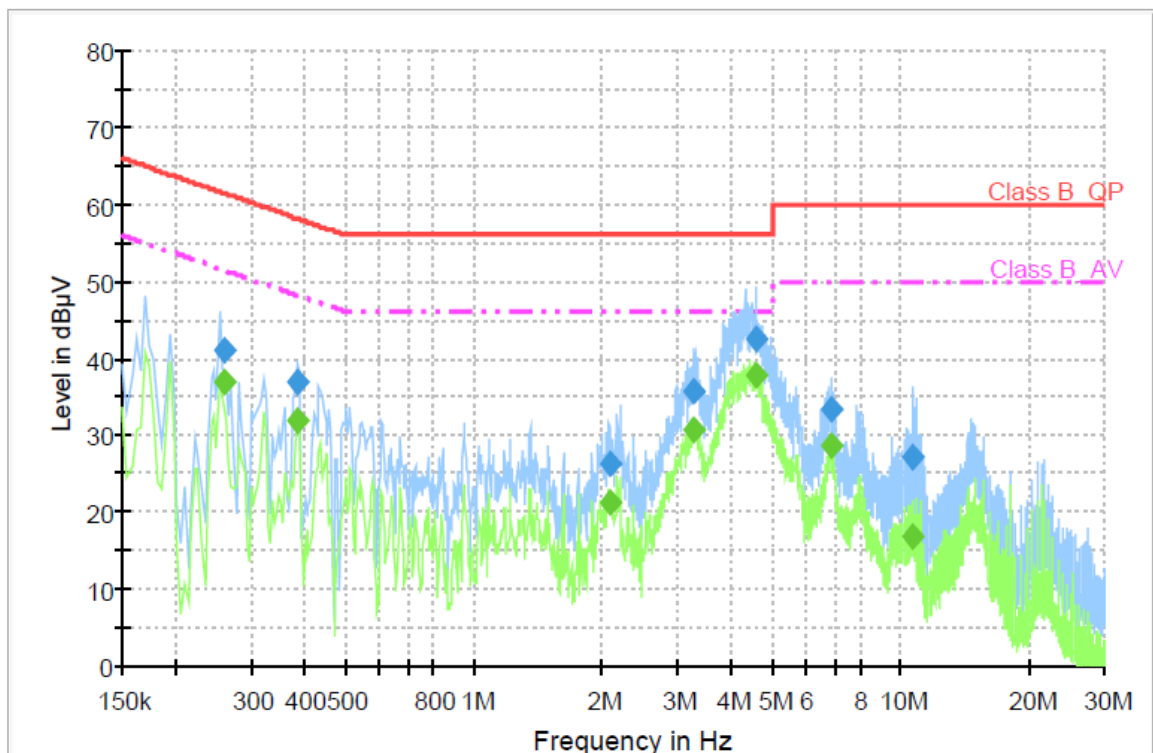
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.170000	44.5	1000.0	9.000	GND	L1	10.1	20.5	65.0	
0.256000	40.7	1000.0	9.000	GND	L1	10.1	20.9	61.6	
0.452000	33.3	1000.0	9.000	GND	L1	10.1	23.6	56.8	
1.400000	25.6	1000.0	9.000	GND	L1	10.1	30.4	56.0	
3.260000	34.4	1000.0	9.000	GND	L1	10.2	21.6	56.0	
4.576000	39.6	1000.0	9.000	GND	L1	10.3	16.4	56.0	
8.040000	32.1	1000.0	9.000	GND	L1	10.5	27.9	60.0	
10.660000	27.9	1000.0	9.000	GND	L1	10.6	32.1	60.0	

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.170000	39.0	1000.0	9.000	GND	L1	10.1	16.0	55.0	
0.256000	36.1	1000.0	9.000	GND	L1	10.1	15.4	51.6	
0.452000	27.5	1000.0	9.000	GND	L1	10.1	19.3	46.8	
1.400000	20.4	1000.0	9.000	GND	L1	10.1	25.6	46.0	
3.260000	28.8	1000.0	9.000	GND	L1	10.2	17.2	46.0	
4.576000	34.8	1000.0	9.000	GND	L1	10.3	11.2	46.0	
8.040000	23.3	1000.0	9.000	GND	L1	10.5	26.7	50.0	
10.660000	16.0	1000.0	9.000	GND	L1	10.6	34.0	50.0	

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



Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.260000	41.1	1000.0	9.000	GND	N	10.1	20.3	61.4	
0.388000	36.8	1000.0	9.000	GND	N	10.1	21.3	58.1	
2.084000	26.3	1000.0	9.000	GND	N	10.2	29.7	56.0	
3.284000	35.7	1000.0	9.000	GND	N	10.2	20.3	56.0	
4.596000	42.6	1000.0	9.000	GND	N	10.3	13.4	56.0	
6.836000	33.5	1000.0	9.000	GND	N	10.4	26.5	60.0	
10.668000	27.2	1000.0	9.000	GND	N	10.5	32.8	60.0	

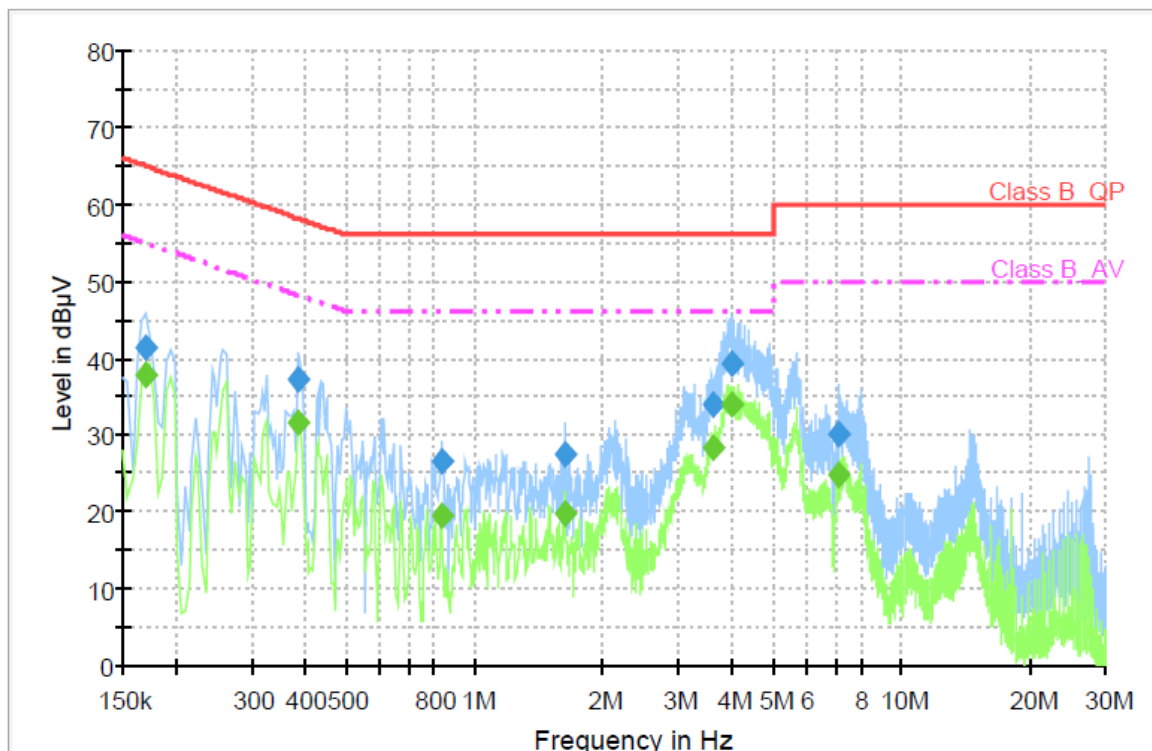
Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.260000	37.0	1000.0	9.000	GND	N	10.1	14.4	51.4	
0.388000	31.9	1000.0	9.000	GND	N	10.1	16.2	48.1	
2.084000	21.2	1000.0	9.000	GND	N	10.2	24.8	46.0	
3.284000	30.7	1000.0	9.000	GND	N	10.2	15.3	46.0	
4.596000	37.9	1000.0	9.000	GND	N	10.3	8.1	46.0	
6.836000	28.6	1000.0	9.000	GND	N	10.4	21.4	50.0	
10.668000	17.0	1000.0	9.000	GND	N	10.5	33.0	50.0	

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



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



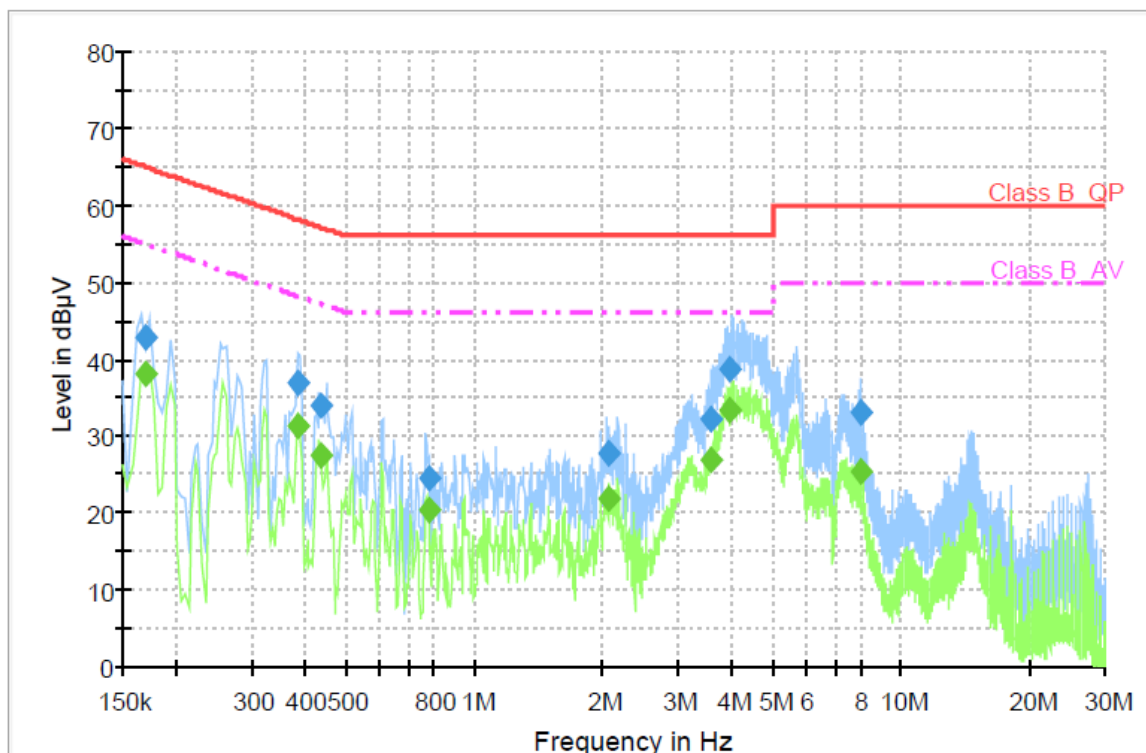
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.170000	41.2	1000.0	9.000	GND	L1	10.1	23.7	65.0	
0.388000	37.3	1000.0	9.000	GND	L1	10.1	20.8	58.1	
0.836000	26.5	1000.0	9.000	GND	L1	10.1	29.5	56.0	
1.632000	27.5	1000.0	9.000	GND	L1	10.1	28.5	56.0	
3.628000	33.9	1000.0	9.000	GND	L1	10.3	22.1	56.0	
3.984000	39.3	1000.0	9.000	GND	L1	10.3	16.7	56.0	
7.116000	30.1	1000.0	9.000	GND	L1	10.4	29.9	60.0	

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.170000	37.9	1000.0	9.000	GND	L1	10.1	17.0	55.0	
0.388000	31.7	1000.0	9.000	GND	L1	10.1	16.4	48.1	
0.836000	19.5	1000.0	9.000	GND	L1	10.1	26.5	46.0	
1.632000	19.7	1000.0	9.000	GND	L1	10.1	26.3	46.0	
3.628000	28.3	1000.0	9.000	GND	L1	10.3	17.7	46.0	
3.984000	33.9	1000.0	9.000	GND	L1	10.3	12.1	46.0	
7.116000	24.7	1000.0	9.000	GND	L1	10.4	25.3	50.0	

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



Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.170000	42.7	1000.0	9.000	GND	N	10.1	22.3	65.0	
0.388000	37.0	1000.0	9.000	GND	N	10.1	21.1	58.1	
0.436000	33.9	1000.0	9.000	GND	N	10.1	23.2	57.1	
0.780000	24.6	1000.0	9.000	GND	N	10.1	31.4	56.0	
2.072000	27.7	1000.0	9.000	GND	N	10.2	28.3	56.0	
3.588000	32.3	1000.0	9.000	GND	N	10.3	23.7	56.0	
3.972000	38.8	1000.0	9.000	GND	N	10.3	17.2	56.0	
8.000000	33.1	1000.0	9.000	GND	N	10.4	26.9	60.0	

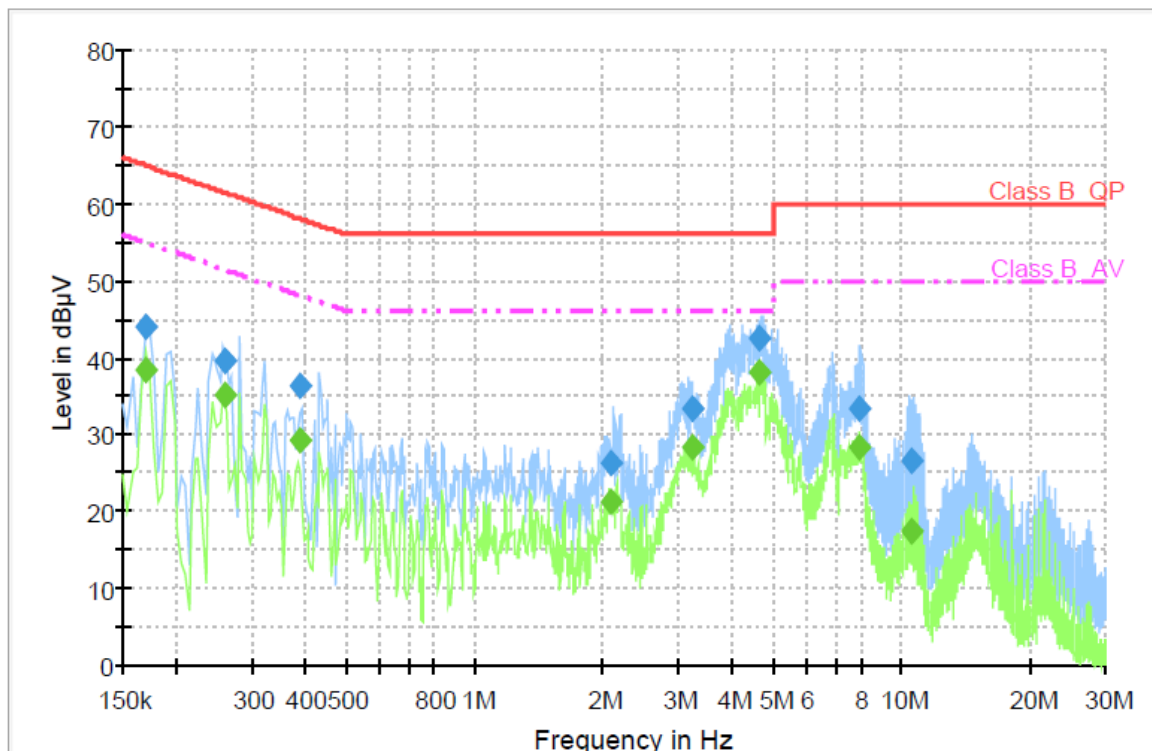
Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.170000	38.1	1000.0	9.000	GND	N	10.1	16.8	55.0	
0.388000	31.4	1000.0	9.000	GND	N	10.1	16.7	48.1	
0.436000	27.4	1000.0	9.000	GND	N	10.1	19.8	47.1	
0.780000	20.4	1000.0	9.000	GND	N	10.1	25.6	46.0	
2.072000	21.8	1000.0	9.000	GND	N	10.2	24.2	46.0	
3.588000	26.7	1000.0	9.000	GND	N	10.3	19.3	46.0	
3.972000	33.5	1000.0	9.000	GND	N	10.3	12.5	46.0	
8.000000	25.5	1000.0	9.000	GND	N	10.4	24.5	50.0	

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



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



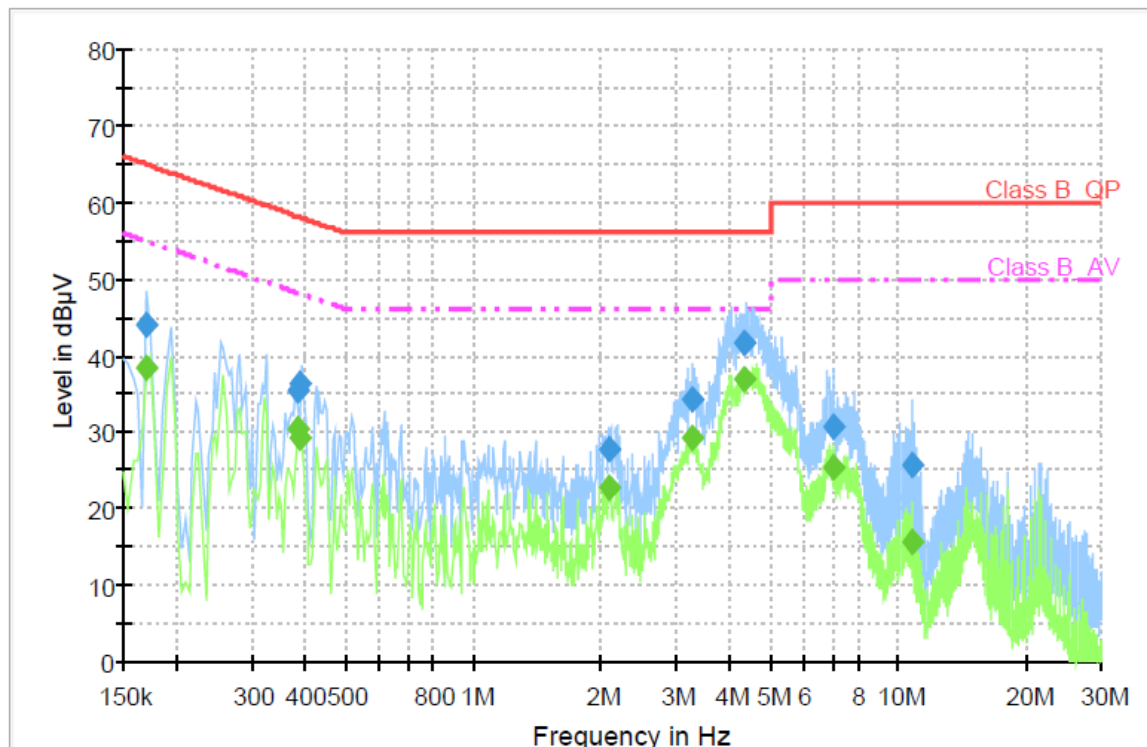
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.170000	44.1	1000.0	9.000	GND	L1	10.1	20.8	65.0	
0.260000	39.7	1000.0	9.000	GND	L1	10.1	21.7	61.4	
0.392000	36.2	1000.0	9.000	GND	L1	10.1	21.8	58.0	
2.092000	26.3	1000.0	9.000	GND	L1	10.2	29.7	56.0	
3.224000	33.3	1000.0	9.000	GND	L1	10.2	22.7	56.0	
4.616000	42.5	1000.0	9.000	GND	L1	10.3	13.5	56.0	
7.984000	33.3	1000.0	9.000	GND	L1	10.5	26.7	60.0	
10.480000	26.5	1000.0	9.000	GND	L1	10.6	33.5	60.0	

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.170000	38.4	1000.0	9.000	GND	L1	10.1	16.6	55.0	
0.260000	35.0	1000.0	9.000	GND	L1	10.1	16.4	51.4	
0.392000	29.3	1000.0	9.000	GND	L1	10.1	18.7	48.0	
2.092000	21.3	1000.0	9.000	GND	L1	10.2	24.7	46.0	
3.224000	28.2	1000.0	9.000	GND	L1	10.2	17.8	46.0	
4.616000	38.0	1000.0	9.000	GND	L1	10.3	8.0	46.0	
7.984000	28.4	1000.0	9.000	GND	L1	10.5	21.6	50.0	
10.480000	17.3	1000.0	9.000	GND	L1	10.6	32.7	50.0	

< Fig 12. Conducted emission result (Live line) >



Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.170000	43.9	1000.0	9.000	GND	N	10.1	21.0	65.0	
0.388000	35.5	1000.0	9.000	GND	N	10.1	22.6	58.1	
0.392000	36.3	1000.0	9.000	GND	N	10.1	21.7	58.0	
2.076000	27.8	1000.0	9.000	GND	N	10.2	28.2	56.0	
3.276000	34.2	1000.0	9.000	GND	N	10.2	21.8	56.0	
4.328000	41.7	1000.0	9.000	GND	N	10.3	14.3	56.0	
6.996000	30.7	1000.0	9.000	GND	N	10.4	29.3	60.0	
10.728000	25.8	1000.0	9.000	GND	N	10.5	34.2	60.0	

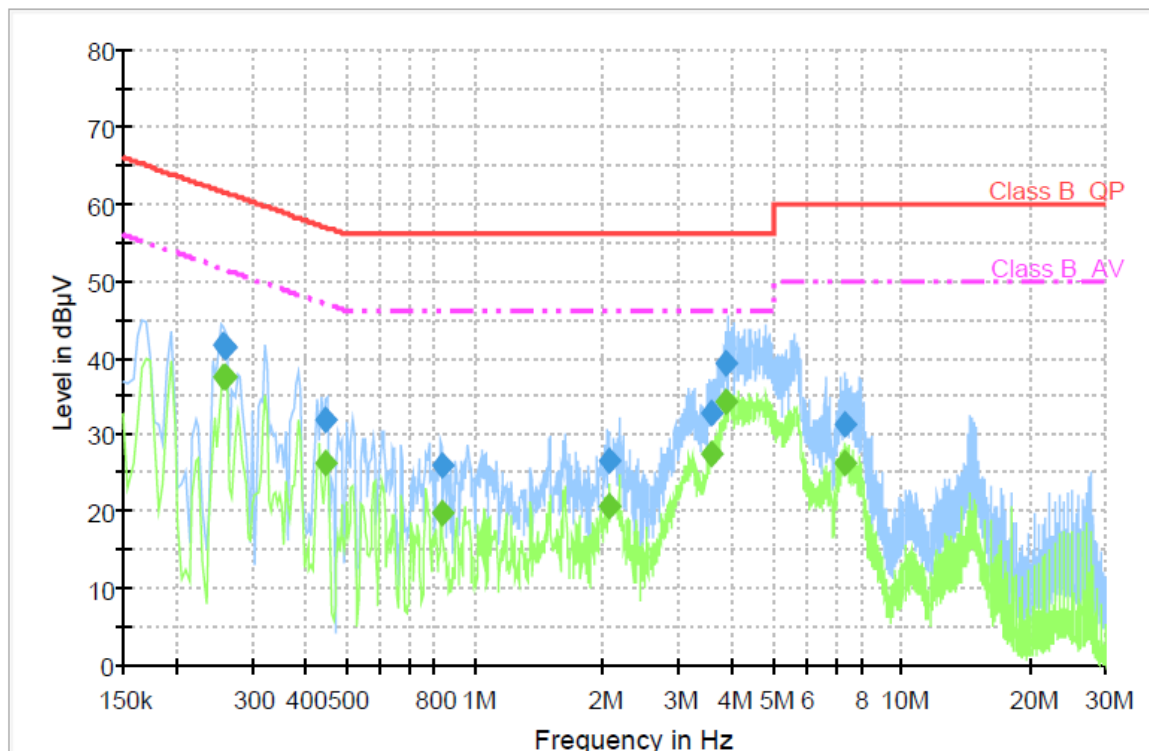
Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.170000	38.5	1000.0	9.000	GND	N	10.1	16.5	55.0	
0.388000	30.3	1000.0	9.000	GND	N	10.1	17.8	48.1	
0.392000	29.3	1000.0	9.000	GND	N	10.1	18.8	48.0	
2.076000	22.7	1000.0	9.000	GND	N	10.2	23.3	46.0	
3.276000	29.1	1000.0	9.000	GND	N	10.2	16.9	46.0	
4.328000	36.9	1000.0	9.000	GND	N	10.3	9.1	46.0	
6.996000	25.3	1000.0	9.000	GND	N	10.4	24.7	50.0	
10.728000	15.7	1000.0	9.000	GND	N	10.5	34.3	50.0	

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



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



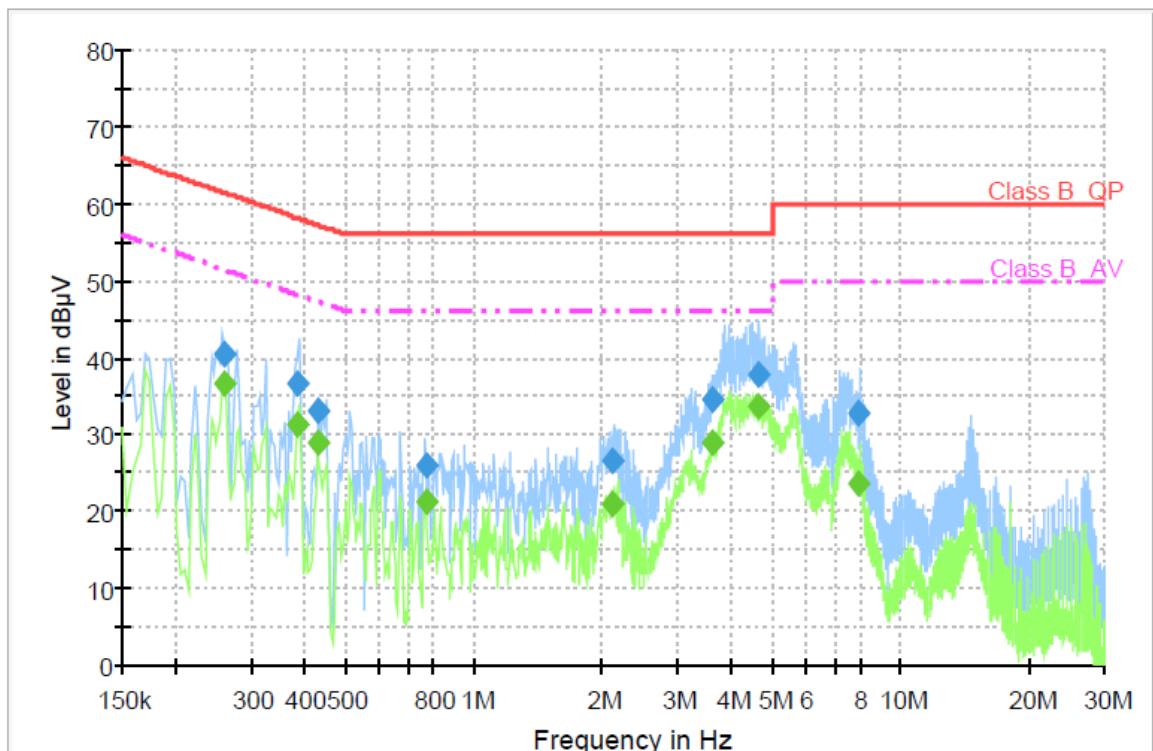
Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.256000	41.6	1000.0	9.000	GND	L1	10.1	20.0	61.6	
0.260000	41.3	1000.0	9.000	GND	L1	10.1	20.2	61.4	
0.448000	31.8	1000.0	9.000	GND	L1	10.1	25.1	56.9	
0.836000	25.9	1000.0	9.000	GND	L1	10.1	30.1	56.0	
2.056000	26.5	1000.0	9.000	GND	L1	10.2	29.5	56.0	
3.564000	32.7	1000.0	9.000	GND	L1	10.3	23.3	56.0	
3.892000	39.4	1000.0	9.000	GND	L1	10.3	16.6	56.0	
7.316000	31.4	1000.0	9.000	GND	L1	10.4	28.6	60.0	

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.256000	37.4	1000.0	9.000	GND	L1	10.1	14.1	51.6	
0.260000	37.4	1000.0	9.000	GND	L1	10.1	14.1	51.4	
0.448000	26.3	1000.0	9.000	GND	L1	10.1	20.6	46.9	
0.836000	19.8	1000.0	9.000	GND	L1	10.1	26.2	46.0	
2.056000	20.7	1000.0	9.000	GND	L1	10.2	25.3	46.0	
3.564000	27.5	1000.0	9.000	GND	L1	10.3	18.5	46.0	
3.892000	34.2	1000.0	9.000	GND	L1	10.3	11.8	46.0	
7.316000	26.3	1000.0	9.000	GND	L1	10.4	23.7	50.0	

< Fig 14. Conducted emission result (Live line) >



Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.260000	40.5	1000.0	9.000	GND	N	10.1	21.0	61.4	
0.388000	36.7	1000.0	9.000	GND	N	10.1	21.4	58.1	
0.432000	33.1	1000.0	9.000	GND	N	10.1	24.1	57.2	
0.772000	26.0	1000.0	9.000	GND	N	10.1	30.0	56.0	
2.104000	26.4	1000.0	9.000	GND	N	10.2	29.6	56.0	
3.616000	34.4	1000.0	9.000	GND	N	10.3	21.6	56.0	
4.660000	37.7	1000.0	9.000	GND	N	10.3	18.3	56.0	
7.996000	32.8	1000.0	9.000	GND	N	10.4	27.2	60.0	

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.260000	36.6	1000.0	9.000	GND	N	10.1	14.8	51.4	
0.388000	31.4	1000.0	9.000	GND	N	10.1	16.7	48.1	
0.432000	28.8	1000.0	9.000	GND	N	10.1	18.4	47.2	
0.772000	21.4	1000.0	9.000	GND	N	10.1	24.6	46.0	
2.104000	20.9	1000.0	9.000	GND	N	10.2	25.1	46.0	
3.616000	29.0	1000.0	9.000	GND	N	10.3	17.0	46.0	
4.660000	33.7	1000.0	9.000	GND	N	10.3	12.3	46.0	
7.996000	23.7	1000.0	9.000	GND	N	10.4	26.3	50.0	

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



6. Radiated Emission

6.1 Operating Environment

Temperature : 23.0 °C
Relative Humidity : 34.0 % 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	1258942	11. 12. 2011

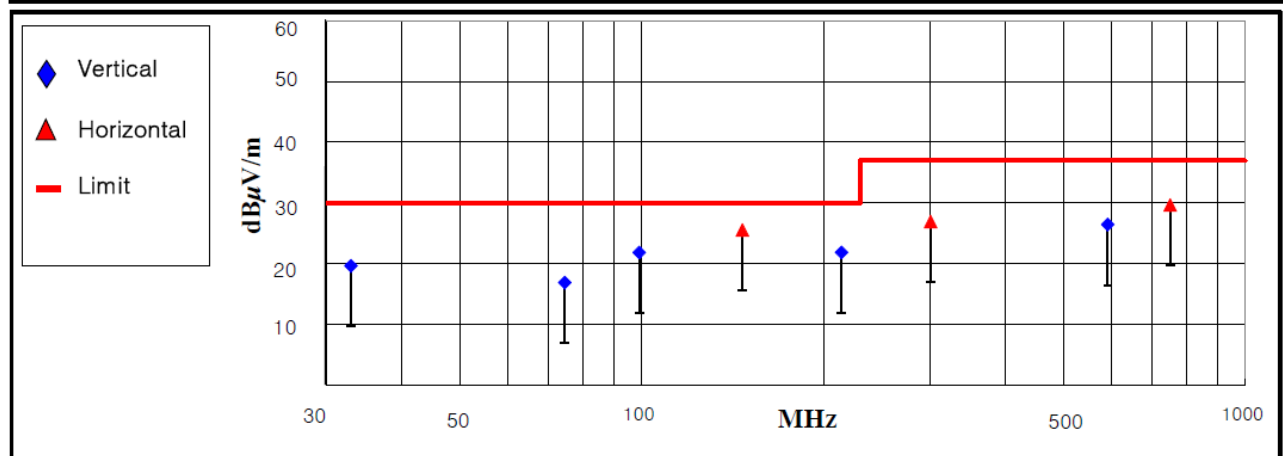


6.6 Test data for Radiated Emission

- Test Date : October 12, 2011
- Resolution Bandwidth : 120 kHz / 1 MHz
- Measurement Distance : 10 m / 3 m
- Frequency Range (Detector mode) : 30 MHz ~ 1 GHz (Quasi-peak detector mode)
1 GHz ~ 5 GHz (Average detector mode, Peak detector mode)
- 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 (dBμV/m)	Margin (dB)	Positioning System		
	Reading Value(dBμV)	Antenna Factor(dB/m)	Cable Loss(dB)	Test Result (dBμV/m)			Pol. (H/V)	Height (cm)	Angle (°)
32.97	5.76	12.51	1.38	19.65	30.00	10.35	V	103	104
74.51	6.15	8.59	2.15	16.89	30.00	13.11	V	102	175
99.05	9.92	9.40	2.52	21.84	30.00	8.16	V	112	152
146.74	10.49	11.92	3.13	25.54	30.00	4.46	H	200	68
214.42	3.78	14.17	3.91	21.86	30.00	8.14	V	104	204
300.95	9.24	12.95	4.73	26.92	37.00	10.08	H	105	210
591.86	0.60	18.89	6.96	26.45	37.00	10.55	V	198	354
750.63	0.86	20.77	8.05	29.68	37.00	7.32	H	102	228

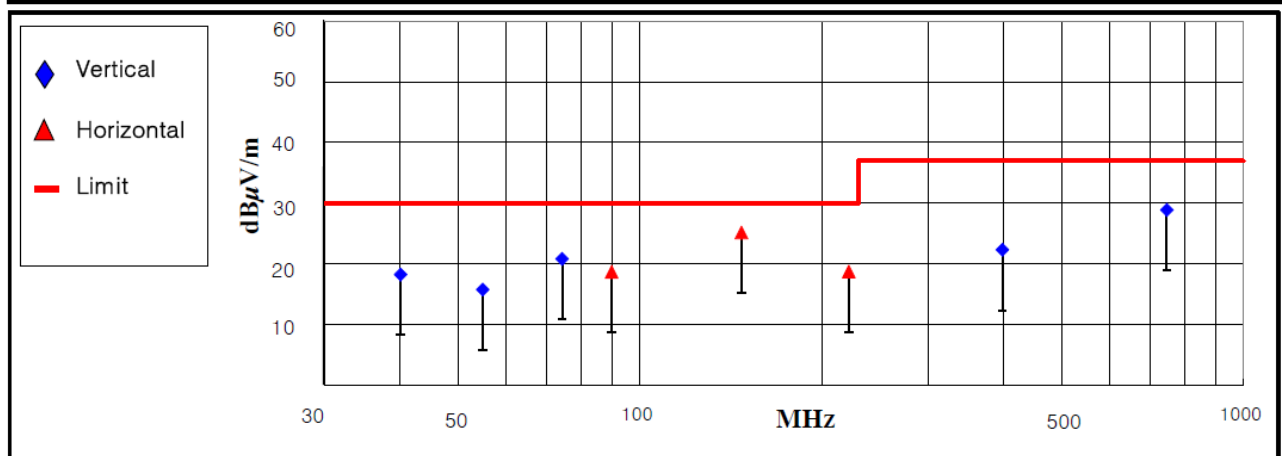


< Fig 16. Radiated emission result (30 MHz ~ 1 000 MHz) >



◆ 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)	(°)
40.12	5.25	11.47	1.52	18.24	30.00	11.76	V	105	66
54.88	5.26	8.71	1.81	15.78	30.00	14.22	V	105	95
74.28	10.11	8.59	2.15	20.85	30.00	9.15	V	104	4
89.79	7.62	8.64	2.40	18.66	30.00	11.34	H	198	354
147.35	10.11	11.93	3.14	25.18	30.00	4.82	H	193	68
221.90	0.75	13.99	3.98	18.72	30.00	11.28	H	135	25
398.45	0.67	16.16	5.52	22.35	37.00	14.65	V	100	154
746.52	0.15	20.72	8.02	28.89	37.00	8.11	V	114	189

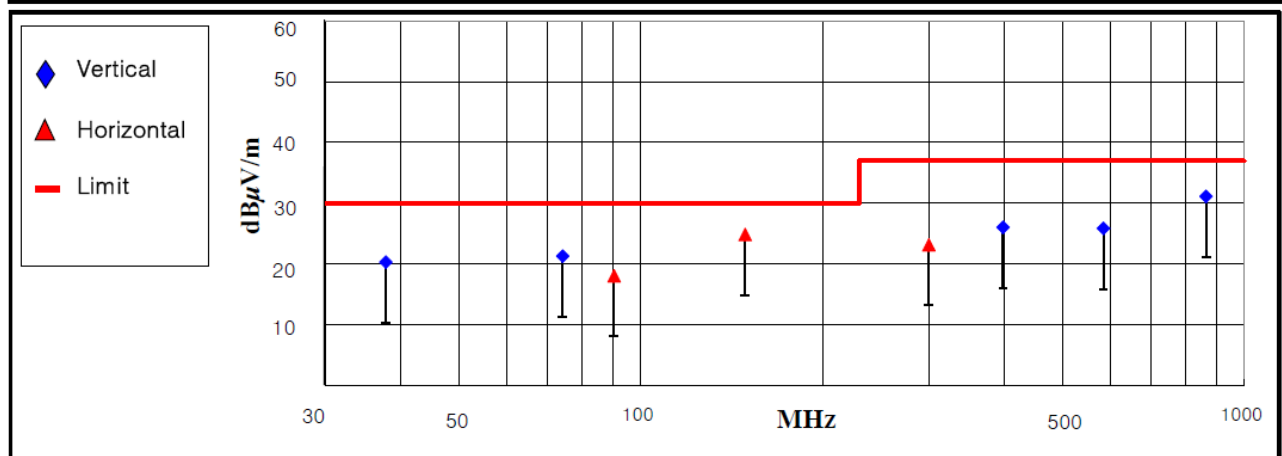


< Fig 17. Radiated emission result (30 MHz ~ 1 000 MHz) >



◆ 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)	(°)
37.80	7.26	11.57	1.48	20.31	30.00	9.69	V	100	135
74.24	10.53	8.60	2.15	21.28	30.00	8.72	V	104	16
90.28	6.98	8.66	2.40	18.04	30.00	11.96	H	200	350
148.85	9.74	11.95	3.16	24.85	30.00	5.15	H	200	45
300.05	5.52	12.92	4.72	23.16	37.00	13.84	H	108	279
398.34	4.36	16.16	5.52	26.04	37.00	10.96	V	104	141
583.97	0.19	18.77	6.91	25.87	37.00	11.13	V	198	358
864.12	0.56	21.79	8.77	31.12	37.00	5.88	V	151	225

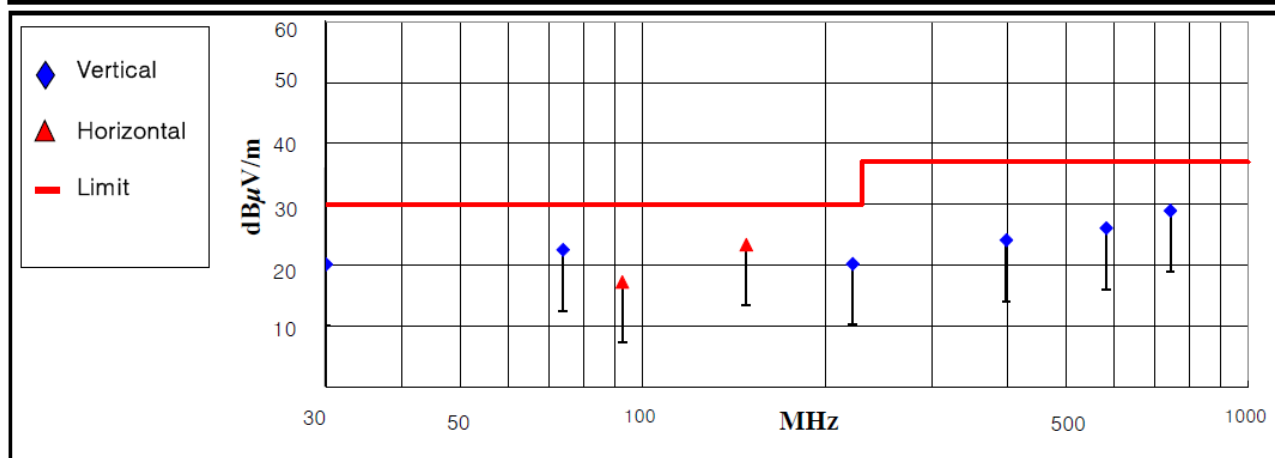


< Fig 18. Radiated emission result (30 MHz ~ 1 000 MHz) >



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

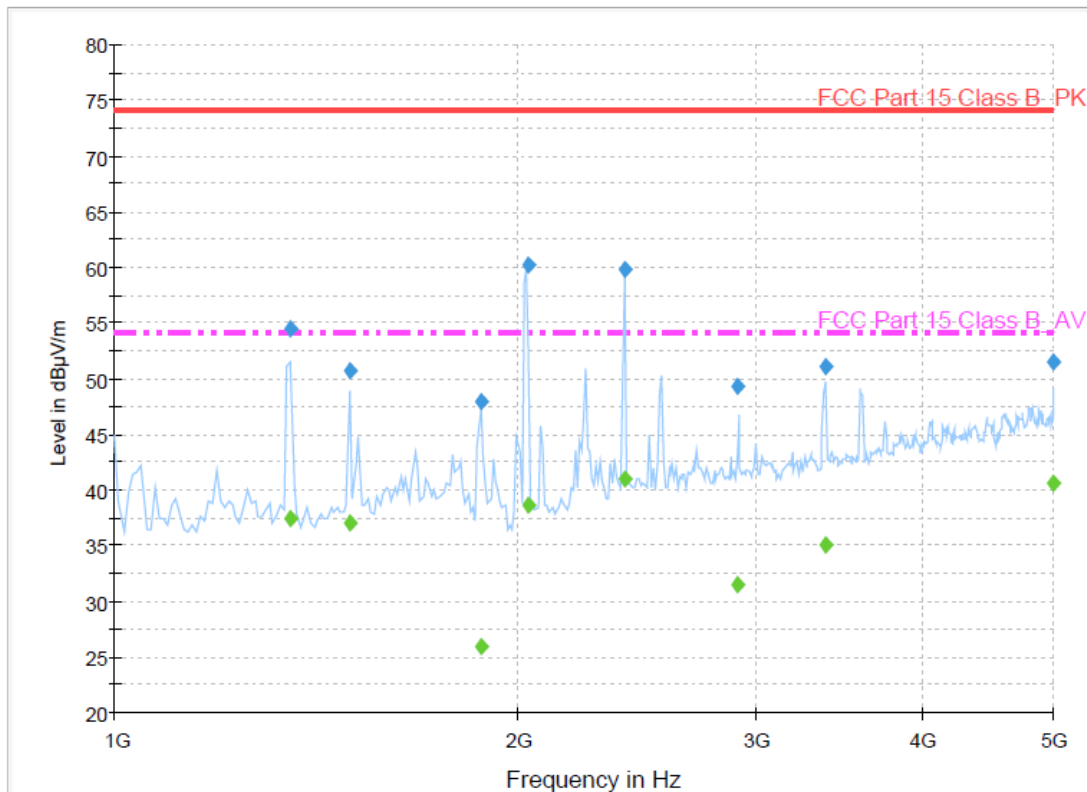
Frequency (MHz)	Measurement Level				Limit (dBμ V/m)	Margin (dB)	Positioning System		
	Reading	Antenna	Cable	Test Result			Pol.	Height	Angle
	Value(dBμ V)	Factor(dB/m)	Loss(dB)	(dBμ V/m)			(H/V)	(cm)	(°)
30.00	5.06	13.78	1.32	20.16	30.00	9.84	V	101	321
73.85	11.79	8.61	2.14	22.54	30.00	7.46	V	100	355
92.54	6.00	8.85	2.43	17.28	30.00	12.72	H	200	15
148.22	8.31	11.94	3.15	23.40	30.00	6.60	H	200	60
222.16	2.26	13.99	3.99	20.24	30.00	9.76	V	105	32
398.34	2.44	16.16	5.52	24.12	37.00	12.88	V	108	154
582.59	0.43	18.75	6.90	26.08	37.00	10.92	V	143	358
743.28	0.27	20.68	8.00	28.95	37.00	8.05	V	100	25



< 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



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)
1353.705411	54.4	1000.0	1000.000	115.0	H	310.0	-13.4	19.6	74.0
1500.393988	50.7	1000.0	1000.000	100.0	H	36.0	-13.2	23.3	74.0
1873.947495	47.9	1000.0	1000.000	200.0	V	349.0	-11.9	26.1	74.0
2031.052104	60.2	1000.0	1000.000	100.0	H	220.0	-11.3	13.8	74.0
2400.189579	59.9	1000.0	1000.000	100.0	H	282.0	-9.4	14.1	74.0
2912.431663	49.3	1000.0	1000.000	100.0	V	274.0	-7.1	24.7	74.0
3383.761523	51.1	1000.0	1000.000	100.0	V	221.0	-5.4	22.9	74.0
4999.800000	51.4	1000.0	1000.000	100.0	V	205.0	-0.8	22.6	74.0

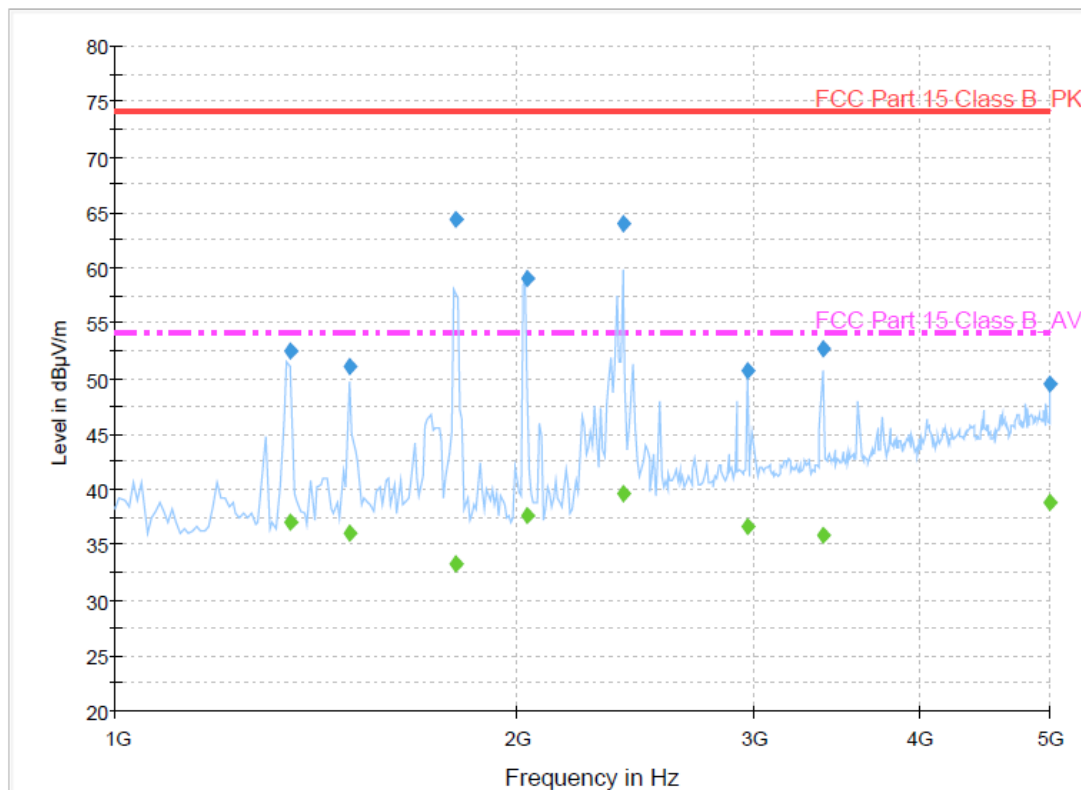
Final Result 2

Frequency (MHz)	CAverage (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1353.705411	37.5	1000.0	1000.000	115.0	H	310.0	-13.4	16.5	54.0
1500.393988	37.0	1000.0	1000.000	100.0	H	36.0	-13.2	17.0	54.0
1873.947495	26.0	1000.0	1000.000	200.0	V	349.0	-11.9	28.0	54.0
2031.052104	38.7	1000.0	1000.000	100.0	H	220.0	-11.3	15.3	54.0
2400.189579	41.1	1000.0	1000.000	100.0	H	282.0	-9.4	12.9	54.0
2912.431663	31.6	1000.0	1000.000	100.0	V	274.0	-7.1	22.4	54.0
3383.761523	35.0	1000.0	1000.000	100.0	V	221.0	-5.4	19.0	54.0
4999.800000	40.6	1000.0	1000.000	100.0	V	205.0	-0.8	13.4	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



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)
1350.889379	52.5	1000.0	1000.000	100.0	H	309.0	-13.4	21.5	74.0
1500.393988	51.1	1000.0	1000.000	100.0	H	36.0	-13.2	22.9	74.0
1799.387174	64.3	1000.0	1000.000	100.0	V	318.0	-11.9	9.7	74.0
2031.052104	59.0	1000.0	1000.000	100.0	H	221.0	-11.3	15.0	74.0
2398.189579	64.0	1000.0	1000.000	100.0	V	183.0	-9.4	10.0	74.0
2969.743888	50.8	1000.0	1000.000	100.0	V	191.0	-6.8	23.2	74.0
3382.961523	52.8	1000.0	1000.000	116.0	H	223.0	-5.4	21.2	74.0
5000.000000	49.6	1000.0	1000.000	100.0	V	280.0	-0.8	24.4	74.0

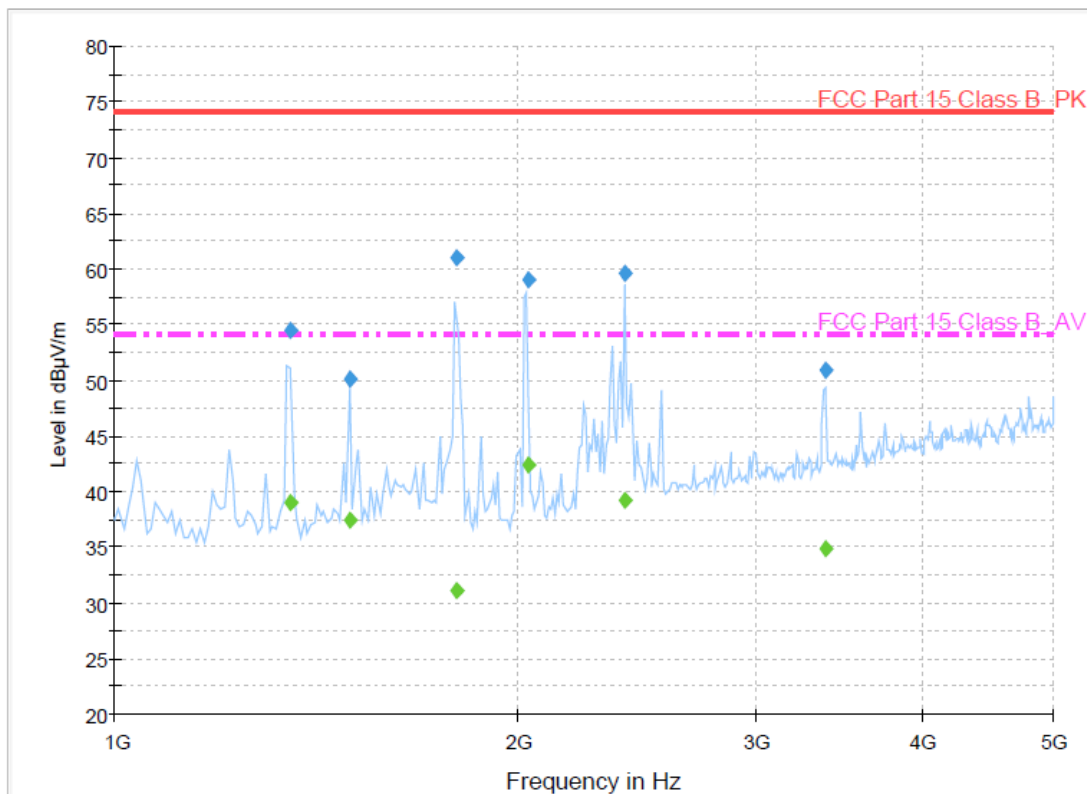
Final Result 2

Frequency (MHz)	CAverage (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1350.889379	37.1	1000.0	1000.000	100.0	H	309.0	-13.4	16.9	54.0
1500.393988	36.0	1000.0	1000.000	100.0	H	36.0	-13.2	18.0	54.0
1799.387174	33.2	1000.0	1000.000	100.0	V	318.0	-11.9	20.8	54.0
2031.052104	37.7	1000.0	1000.000	100.0	H	221.0	-11.3	16.3	54.0
2398.189579	39.6	1000.0	1000.000	100.0	V	183.0	-9.4	14.4	54.0
2969.743888	36.7	1000.0	1000.000	100.0	V	191.0	-6.8	17.3	54.0
3382.961523	35.9	1000.0	1000.000	116.0	H	223.0	-5.4	18.1	54.0
5000.000000	38.7	1000.0	1000.000	100.0	V	280.0	-0.8	15.3	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



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)
1350.489379	54.4	1000.0	1000.000	115.0	H	310.0	-13.4	19.6	74.0
1500.393988	50.2	1000.0	1000.000	100.0	H	314.0	-13.2	23.8	74.0
1797.787174	61.1	1000.0	1000.000	209.0	V	2.0	-12.0	12.9	74.0
2030.252104	59.1	1000.0	1000.000	100.0	H	241.0	-11.3	14.9	74.0
2397.789579	59.7	1000.0	1000.000	100.0	H	282.0	-9.4	14.3	74.0
3382.161523	51.0	1000.0	1000.000	115.0	H	225.0	-5.4	23.0	74.0

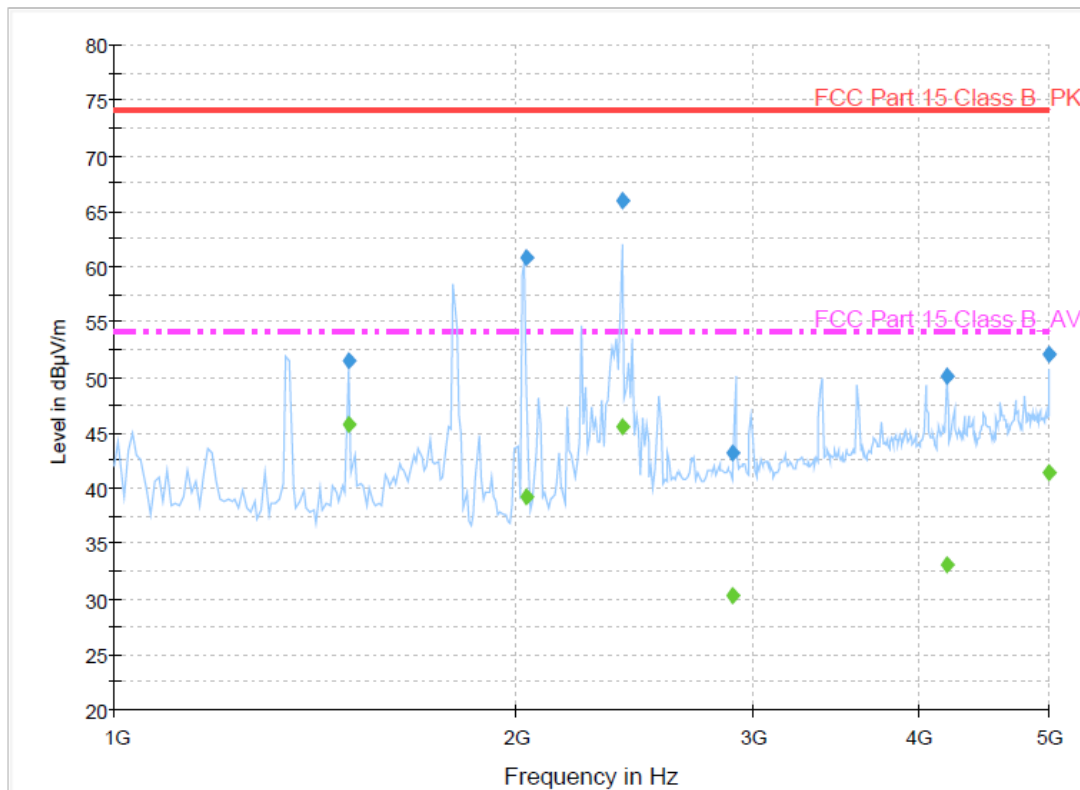
Final Result 2

Frequency (MHz)	CAverage (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1350.489379	39.0	1000.0	1000.000	115.0	H	310.0	-13.4	15.0	54.0
1500.393988	37.4	1000.0	1000.000	100.0	H	314.0	-13.2	16.6	54.0
1797.787174	31.0	1000.0	1000.000	209.0	V	2.0	-12.0	23.0	54.0
2030.252104	42.4	1000.0	1000.000	100.0	H	241.0	-11.3	11.6	54.0
2397.789579	39.2	1000.0	1000.000	100.0	H	282.0	-9.4	14.8	54.0
3382.161523	34.8	1000.0	1000.000	115.0	H	225.0	-5.4	19.2	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



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)
1500.393988	51.5	1000.0	1000.000	100.0	V	344.0	-13.2	22.5	74.0
2031.052104	60.8	1000.0	1000.000	100.0	H	288.0	-11.3	13.2	74.0
2399.805611	65.9	1000.0	1000.000	100.0	H	229.0	-9.4	8.1	74.0
2900.031663	43.2	1000.0	1000.000	100.0	V	235.0	-7.1	30.8	74.0
4194.996794	50.0	1000.0	1000.000	100.0	V	132.0	-2.5	24.0	74.0
5000.000000	52.0	1000.0	1000.000	100.0	V	-1.0	-0.8	22.0	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)
1500.393988	45.7	1000.0	1000.000	100.0	V	344.0	-13.2	8.3	54.0
2031.052104	39.3	1000.0	1000.000	100.0	H	288.0	-11.3	14.7	54.0
2399.805611	45.5	1000.0	1000.000	100.0	H	229.0	-9.4	8.5	54.0
2900.031663	30.3	1000.0	1000.000	100.0	V	235.0	-7.1	23.7	54.0
4194.996794	33.1	1000.0	1000.000	100.0	V	132.0	-2.5	20.9	54.0
5000.000000	41.3	1000.0	1000.000	100.0	V	-1.0	-0.8	12.7	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: 55VS20)** was complies with §15.107 and 15.109 of the FCC Rules.