

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 : May 20, 2010

Order Number: GETEC-C1-10-124

Test Report Number: GETEC-E3-10-065

Test Site: Gumi College EMC Center

FCC Registration Number: (100749, 443957)

FCC ID.: BEJM2280DFM

Applicant: LG Electronics Inc.

Rule Part(s)	: FCC Part 15 Subpart B
Equipment Class	: Class B computing device peripheral (JBP)
EUT Type	: LED LCD TV/Monitor
Type of Authority	: Certification
Model Name	: M2280DFM, M2280DM
Trade Name	: LG

This equipment has been shown to be in compliance with the applicable technical standards as indicated in the measurement report and was tested in accordance with the measurement procedures specified in ANSI C63.4-2003 / Canadian standard ICES-003

I attest to the accuracy of data. All measurements reported herein were performed by me or were made under my supervision and are correct to the best of my knowledge and belief. I assume full responsibility for the completeness of these measurements and vouch for the qualifications of all persons taking them.

Tested by,

Reviewed by,


Soon-Hoon Jeong, Engineer
GUMI College EMC center


Jae-Hoon Jeong, Senior Engineer
GUMI College EMC center



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Scope: Measurement and determination of electromagnetic emissions (EME) of radio frequency devices including intentional and / or unintentional radiators for compliance with technical rules and regulations of the Federal Communications Commission.

1. General Information

Applicant: LG Electronics Inc.

Applicant Address: 19-1, Cheongho-ri, Jinwi-myeon, Pyeongteak-si, Gyeonggi-do, Korea.

Manufacturer: LG Electronics Inc.

Manufacturer Address: 19-1, Cheongho-ri, Jinwi-myeon, Pyeongteak-si, Gyeonggi-do, Korea.

Contact Person: Mr. Myoung-Kyu Lee, Chief research engineer

Tel Number: +82-31-610-9623

- **FCC ID.** BEJM2280DFM
- **EUT Type** LED LCD TV/Monitor
- **Model Name** M2280DFM(basic model), M2280DM(deleted with EUT stand woofer speaker)
"These model names are given in accordance with customer's requirement that are not effect on EMC performance. All the electrical and mechanical characteristics are the same as basic model except model name designation."
- **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** May 14, 2010
- **Place of Test** **Gumi College EMC Center** (FCC Registration Number: 100749, 443957)
407, Bugok-dong, Gumi-si, Gyeongbuk, Korea.
- **Test Report Number** GETEC-E3-10-065
- **Dates of Issue** May 20, 2010



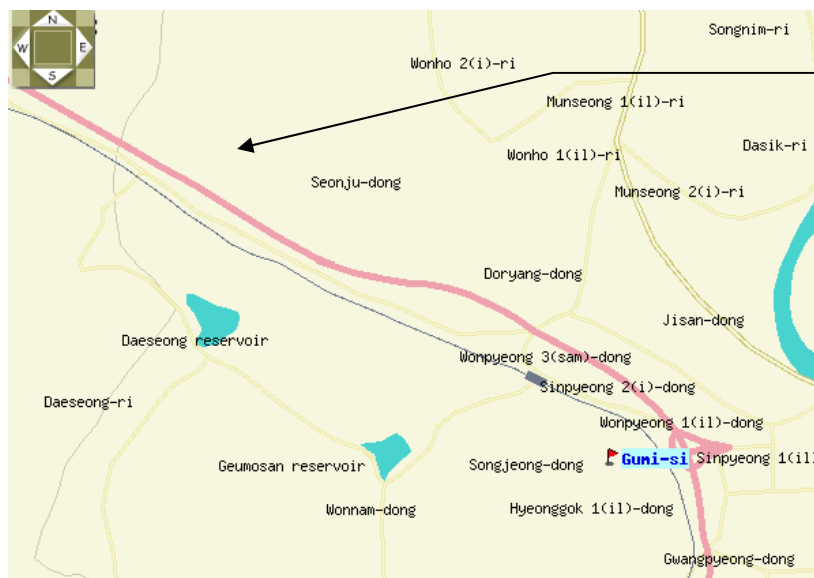
2. Introduction

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. LED LCD TV/Monitor (Model Name: M2280DFM, M2280DM)**

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. LED LCD TV/Monitor (Model Name: M2280DFM, M2280DM) FCC ID.: BEJM2280DFM**

LCD Panel	Screen Type	546.86 mm Wide (21.53 inch) TFT (Thin Film Transistor) LCD (Liquid Crystal Display) Panel Visible diagonal size: 546.86 mm
	Pixel Pitch	0.248 mm (H) x 0.248 mm (V)
Video Signal	Max. Resolution	1920 x 1080 @ 60 Hz
	Recommended Resolution	1920 x 1080 @ 60 Hz
	Horizontal Frequency	30 kHz to 83 kHz
	Vertical Frequency	56 Hz to 75 Hz
	Synchronization Type	Separate Sync, Digital
Input Connector		TV, D-Sub Analog, PC Audio In, component, HDMI*2, CVBS
Power	Rated Voltage	19 V $\pm$ 2.2 A
	Power Consumption	On Mode : 30 W Off Mode $\leq$ 1 W
AC/DC Adapter		Manufacturer: LITE-ON, Model PA-1650-68
Tilt	Tilt Range	-5° to 10°
Dimensions (Width x Height x Depth) Weight		509.6 mm x 407.3 mm x 193.9 mm (20.06 inch x 16.03 inch x 7.63 inch) 3.9 kg (8.6 lb)
Environmental conditions	Operating Temperature	10 °C to 35 °C
	Operating Humidity	20 % to 80 %
	Storage Temperature	-10 °C to 60 °C
	Storage Humidity	5 % to 90 %

-. Maximum Frequency range : 400 MHz

-. Used AC/DC Adapter : Model name: PA-1650-68
Manufacturer: LITE-ON TECHNOLOGY CORPORATION
Input rating: AC (100 – 240) V~, (50 – 60) Hz, 2.0 A
Output rating: DC 19 V, 3.42 A
Serial number: OA421612314010131



3.2 Support Equipment / Cables used

3.2.1 Used Support Equipment

Description	Manufacturer	Model Name	S/N & FCC ID.
PC	Hewlett Packard	D530	S/N: CNG34800PY FCC ID.: DoC
Video card	ATI	ATI RV360(9600)	S/N: SN0402017176 FCC ID.: DoC
Key board	COMPAQ	166516-AD6	S/N: B13BBOR391006D FCC ID.: AQ6-23K15
PS2 mouse	LOGITECH	M-S69	S/N: 334684-108 FCC ID.: JNZ211443
Joy stick	MICROSOFT	X05-92626	S/N: 9262600296169 FCC ID.: DoC
DVD player	LG Electronics Inc.	LC-954	S/N: 3850R-Z674K FCC ID.: DoC
Printer	Hewlett Packard	970CXI	S/N: MY9B01F1FG FCC ID.: DoC
Headset	GOWOONSORI	GW-500M	S/N: N/A FCC ID.: -

See “Appendix D – Test Setup Photographs” for actual system test set-up

3.2.2 System configuration

Description	Manufacturer	Model Name	S/N & FCC ID.
None	-	-	-



3.2.3 Used Cable(s)

Cable Name	Condition	Description
Power cable	Connected to the adapter	1.80 m unshielded
Adapter cable	Connected to the EUT	1.50 m shielded with a ferrite core
RGB(Analog) in cable	Connected to the EUT and PC	1.80 m shielded with two ferrite cores
HDMI/DVI(Digital) in cable	Connected to the EUT and PC	2.00 m shielded
Audio(RGB/DVI) in cable	Connected to the EUT and PC	1.80 m shielded with a ferrite core
RS-232C (Control & Service) in cable	Connected to the EUT and PC	1.80 m shielded
Component in cable	Connected to the EUT and DVD player	2.00 m shielded
Component sound in cable	Connected to the EUT and DVD player	3.00 m shielded
AV in cable	Connected to the EUT and DVD player	3.00 m shielded
Headset cable	Connected to the EUT and headset	2.75 m shielded
Antenna cable	Connected to the EUT and TV signal generator	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, HDMI/DVI: Digital)

Conducted emission: 1 920 × 1 080 / 60 Hz (RGB: Analog, HDMI/DVI: 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
- 1 kHz sound tone with winamp player

-. USB memory stick play mode

◆ Operating test pattern

- Continuous playback mode with 1 kHz audio files

"The verification report for AV mode would be issued by LG Electronics Inc."



4.2 Conducted Emission

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

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

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

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

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

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

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

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

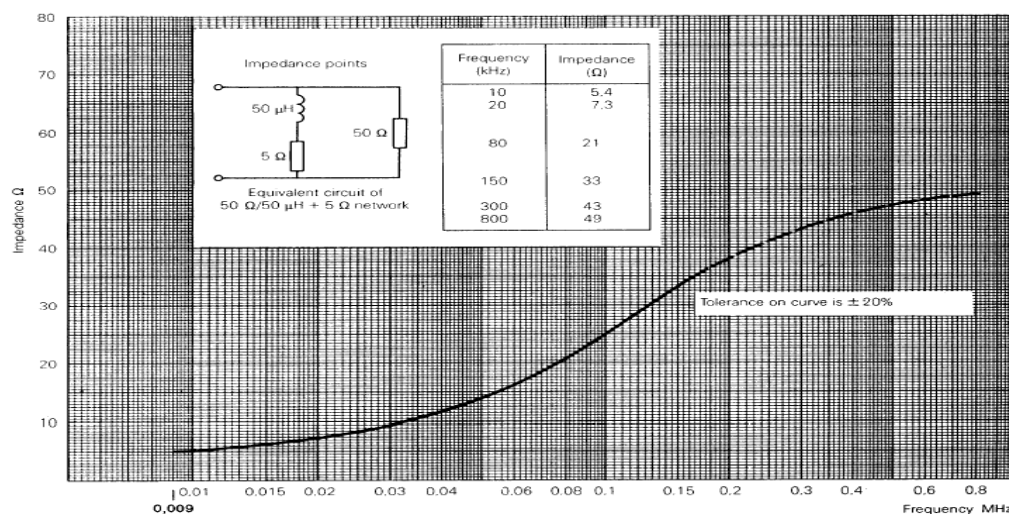


Fig 2. Impedance of LISN



4.3 Radiated Emission

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

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

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

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

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

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

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

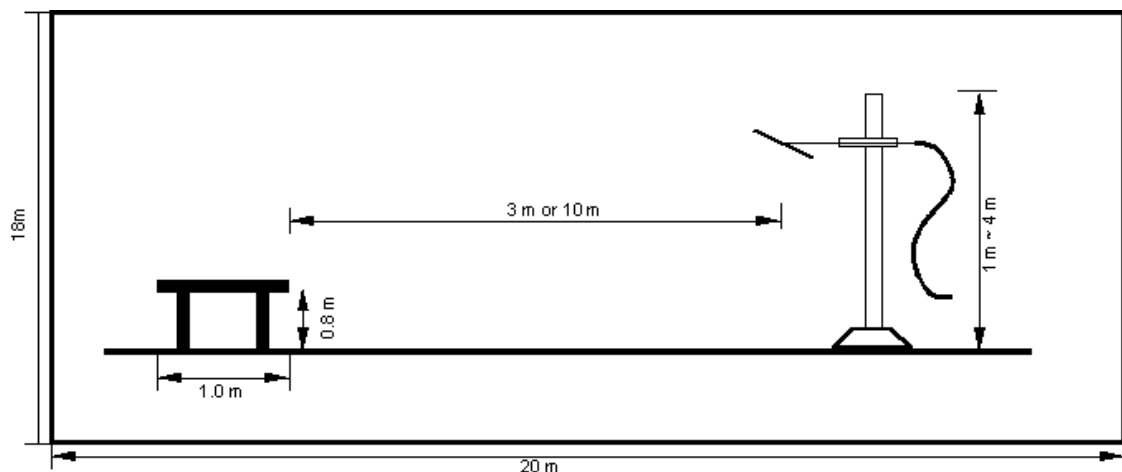


Fig 3. Dimensions of test site.



5. Conducted Emission

5.1 Operating Environment

Temperature : 24 °C
Relative Humidity : 36 % R.H.

5.2 Test Set-up

The conducted emission measurements were performed in the shielded room.

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

AMN is bonded on horizontal reference ground plane.

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

5.3 Measurement Uncertainty

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

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

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



5.4 Limit

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

5.5 Test Equipment used

Model Name	Manufacturer	Description	Serial Number	Due to Calibration
■ - ESCS30	Rohde & Schwarz	EMI Test Receiver	839809/003	12. 10. 2010
■ - ESH3-Z5	Rohde & Schwarz	LISN	838979/020	12. 10. 2010
■ - ESH2-Z5	Rohde & Schwarz	LISN	829991/009	12. 10. 2010
□ - ISN T8	TESEQ. GmbH	Impedance Network	24568	10. 16. 2010

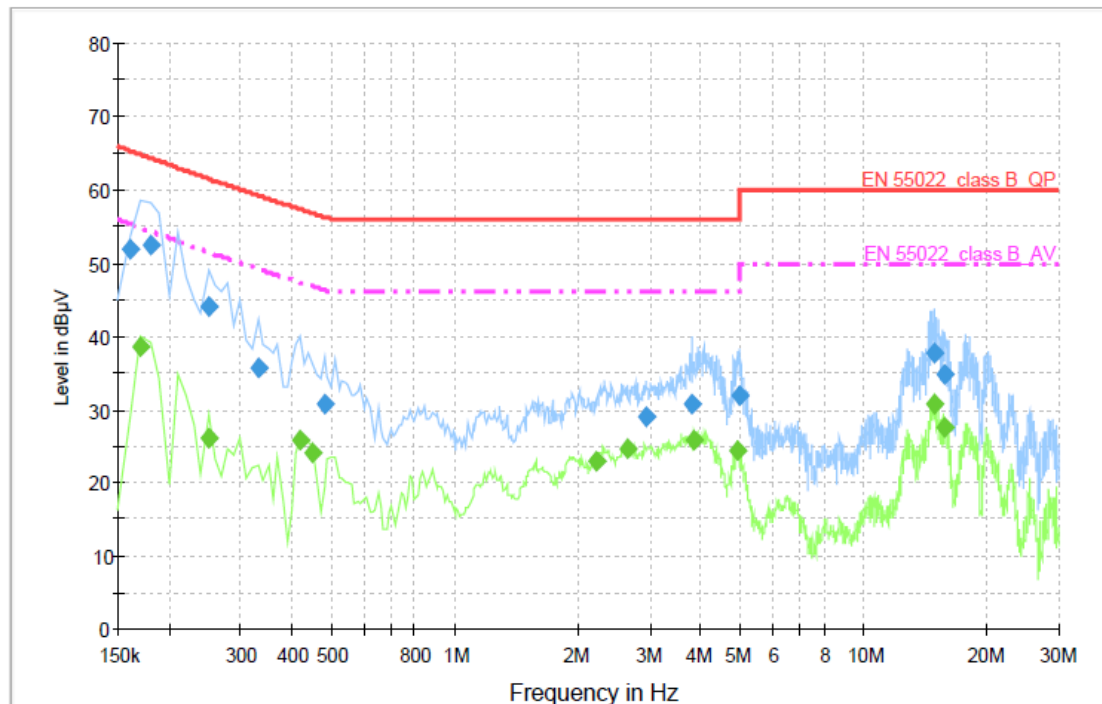
5.6 Test data for Conducted Emission

- . Test Date : May 14, 2010
- . 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
0.160000	51.9	1000.000	9.000	GND	L1	10.0	13.5	65.4	
0.180000	52.3	1000.000	9.000	GND	L1	10.0	12.1	64.4	
0.250000	44.0	1000.000	9.000	GND	L1	10.0	17.6	61.6	
0.330000	35.8	1000.000	9.000	GND	L1	10.0	23.5	59.3	
0.480000	30.8	1000.000	9.000	GND	L1	10.0	25.5	56.3	
2.940000	29.1	1000.000	9.000	GND	L1	10.1	26.9	56.0	
3.810000	30.9	1000.000	9.000	GND	L1	10.2	25.1	56.0	
4.960000	31.9	1000.000	9.000	GND	L1	10.2	24.1	56.0	
14.860000	37.8	1000.000	9.000	GND	L1	10.7	22.2	60.0	
15.750000	34.8	1000.000	9.000	GND	L1	10.8	25.2	60.0	

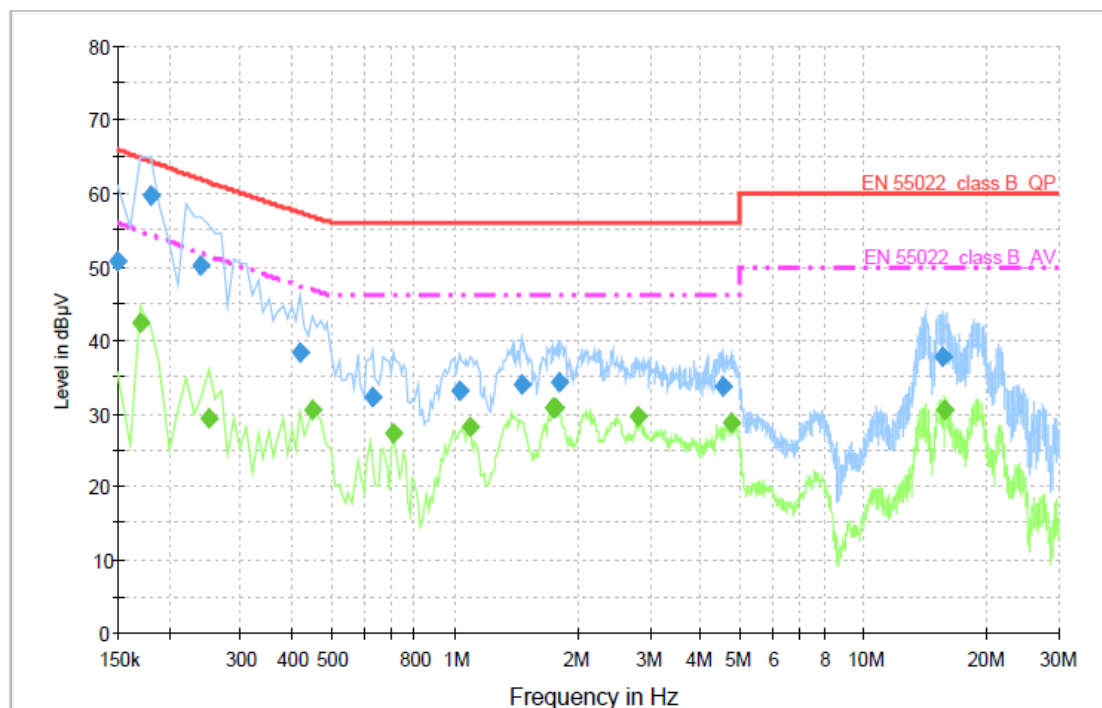
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.170000	38.5	1000.000	9.000	GND	L1	10.0	16.4	54.9	
0.250000	26.1	1000.000	9.000	GND	L1	10.0	25.4	51.5	
0.420000	25.9	1000.000	9.000	GND	L1	10.0	21.4	47.3	
0.450000	23.9	1000.000	9.000	GND	L1	10.0	22.9	46.8	
2.220000	23.0	1000.000	9.000	GND	L1	10.1	23.0	46.0	
2.650000	24.6	1000.000	9.000	GND	L1	10.1	21.4	46.0	
3.860000	25.8	1000.000	9.000	GND	L1	10.2	20.2	46.0	
4.890000	24.5	1000.000	9.000	GND	L1	10.2	21.5	46.0	
14.830000	30.8	1000.000	9.000	GND	L1	10.7	19.2	50.0	
15.710000	27.4	1000.000	9.000	GND	L1	10.8	22.6	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
0.150000	50.8	1000.000	9.000	GND	N	10.0	15.2	66.0	
0.180000	59.6	1000.000	9.000	GND	N	10.0	4.8	64.4	
0.240000	50.2	1000.000	9.000	GND	N	10.0	11.7	61.9	
0.420000	38.2	1000.000	9.000	GND	N	10.0	19.1	57.3	
0.630000	32.1	1000.000	9.000	GND	N	10.0	23.9	56.0	
1.030000	33.2	1000.000	9.000	GND	N	10.1	22.8	56.0	
1.460000	33.8	1000.000	9.000	GND	N	10.1	22.2	56.0	
1.800000	34.2	1000.000	9.000	GND	N	10.1	21.8	56.0	
4.510000	33.6	1000.000	9.000	GND	N	10.2	22.4	56.0	
15.540000	37.6	1000.000	9.000	GND	N	10.6	22.4	60.0	

Final Measurement Detector 2

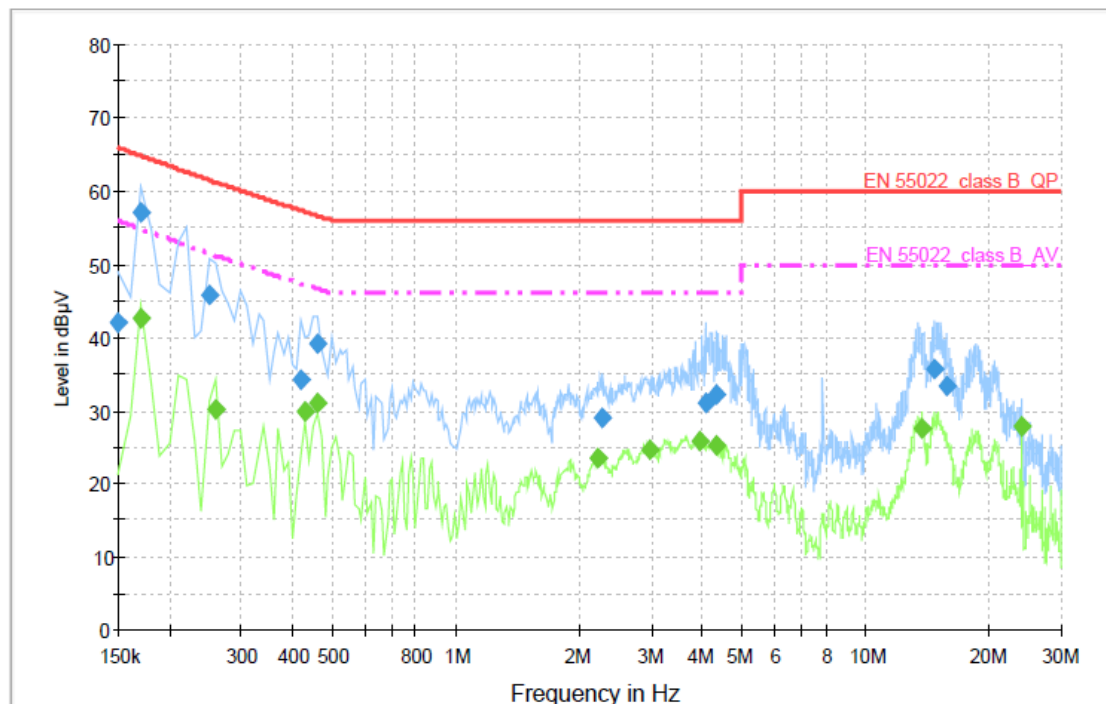
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.170000	42.4	1000.000	9.000	GND	N	10.0	12.5	54.9	
0.250000	29.3	1000.000	9.000	GND	N	10.0	22.2	51.5	
0.450000	30.4	1000.000	9.000	GND	N	10.0	16.4	46.8	
0.710000	27.1	1000.000	9.000	GND	N	10.0	18.9	46.0	
1.090000	28.0	1000.000	9.000	GND	N	10.1	18.0	46.0	
1.730000	30.7	1000.000	9.000	GND	N	10.1	15.3	46.0	
1.770000	30.8	1000.000	9.000	GND	N	10.1	15.2	46.0	
2.810000	29.5	1000.000	9.000	GND	N	10.1	16.5	46.0	
4.750000	28.6	1000.000	9.000	GND	N	10.2	17.4	46.0	
15.840000	30.3	1000.000	9.000	GND	N	10.6	19.7	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
0.150000	41.9	1000.000	9.000	GND	L1	10.0	24.1	66.0	
0.170000	57.0	1000.000	9.000	GND	L1	10.0	7.9	64.9	
0.250000	45.8	1000.000	9.000	GND	L1	10.0	15.8	61.6	
0.420000	34.1	1000.000	9.000	GND	L1	10.0	23.2	57.3	
0.460000	39.3	1000.000	9.000	GND	L1	10.0	17.4	56.6	
2.280000	29.0	1000.000	9.000	GND	L1	10.1	27.0	56.0	
4.060000	31.0	1000.000	9.000	GND	L1	10.2	25.0	56.0	
4.330000	32.1	1000.000	9.000	GND	L1	10.2	23.9	56.0	
14.780000	35.6	1000.000	9.000	GND	L1	10.7	24.4	60.0	
15.710000	33.2	1000.000	9.000	GND	L1	10.8	26.8	60.0	

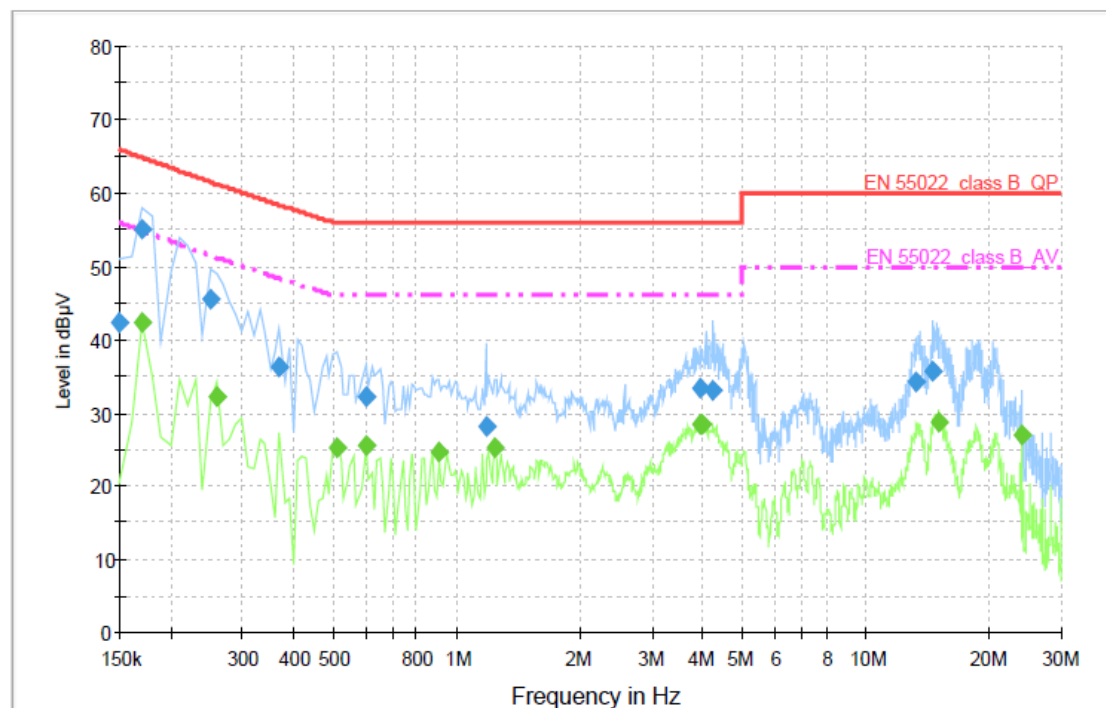
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.170000	42.7	1000.000	9.000	GND	L1	10.0	12.2	54.9	
0.260000	30.3	1000.000	9.000	GND	L1	10.0	20.9	51.2	
0.430000	29.8	1000.000	9.000	GND	L1	10.0	17.3	47.1	
0.460000	31.1	1000.000	9.000	GND	L1	10.0	15.5	46.6	
2.220000	23.4	1000.000	9.000	GND	L1	10.1	22.6	46.0	
2.970000	24.6	1000.000	9.000	GND	L1	10.1	21.4	46.0	
3.930000	25.8	1000.000	9.000	GND	L1	10.2	20.2	46.0	
4.310000	25.1	1000.000	9.000	GND	L1	10.2	20.9	46.0	
13.700000	27.6	1000.000	9.000	GND	L1	10.6	22.4	50.0	
24.010000	27.9	1000.000	9.000	GND	L1	11.2	22.1	50.0	

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



Voltage with 4-Line-LISN_N



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	42.4	1000.000	9.000	GND	N	10.0	23.6	66.0	
0.170000	55.2	1000.000	9.000	GND	N	10.0	9.7	64.9	
0.250000	45.5	1000.000	9.000	GND	N	10.0	16.1	61.6	
0.370000	36.2	1000.000	9.000	GND	N	10.0	22.1	58.3	
0.600000	32.3	1000.000	9.000	GND	N	10.0	23.7	56.0	
1.180000	28.1	1000.000	9.000	GND	N	10.1	27.9	56.0	
3.930000	33.3	1000.000	9.000	GND	N	10.2	22.7	56.0	
4.240000	33.1	1000.000	9.000	GND	N	10.2	22.9	56.0	
13.290000	34.2	1000.000	9.000	GND	N	10.5	25.8	60.0	
14.610000	35.6	1000.000	9.000	GND	N	10.6	24.4	60.0	

Final Measurement Detector 2

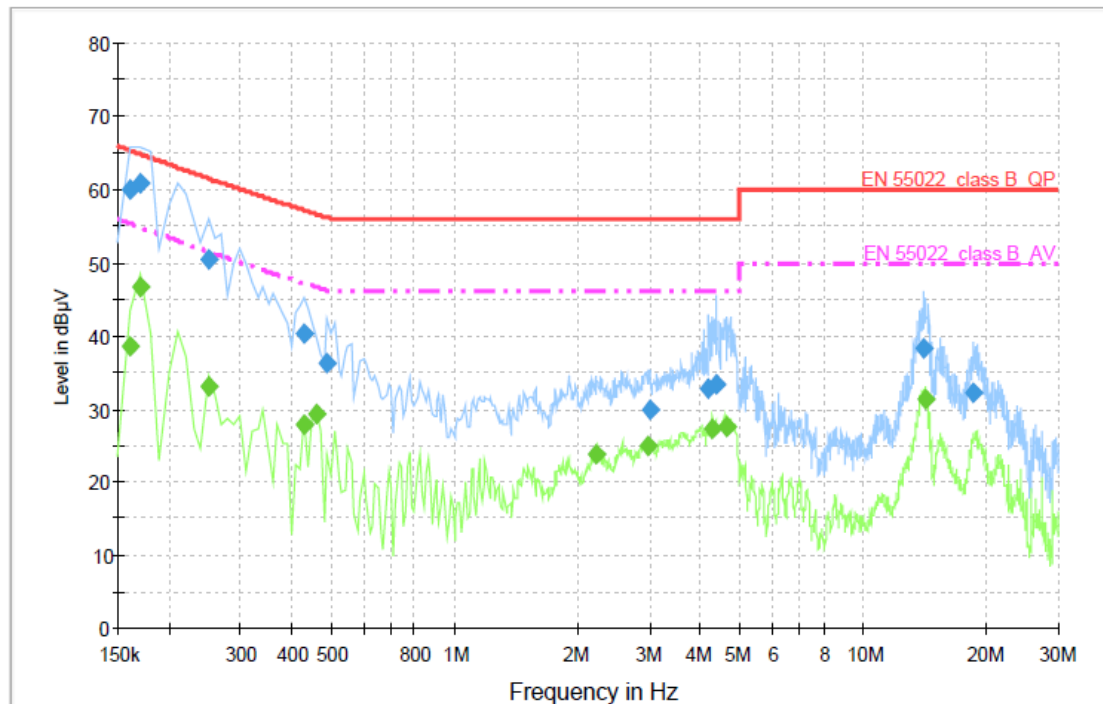
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.170000	42.4	1000.000	9.000	GND	N	10.0	12.5	54.9	
0.260000	32.1	1000.000	9.000	GND	N	10.0	19.1	51.2	
0.510000	25.3	1000.000	9.000	GND	N	10.0	20.7	46.0	
0.600000	25.6	1000.000	9.000	GND	N	10.0	20.4	46.0	
0.910000	24.6	1000.000	9.000	GND	N	10.0	21.4	46.0	
1.240000	25.2	1000.000	9.000	GND	N	10.1	20.8	46.0	
3.930000	28.4	1000.000	9.000	GND	N	10.2	17.6	46.0	
3.980000	28.3	1000.000	9.000	GND	N	10.2	17.7	46.0	
15.110000	28.8	1000.000	9.000	GND	N	10.6	21.2	50.0	
24.010000	27.1	1000.000	9.000	GND	N	10.8	22.9	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
0.160000	59.9	1000.000	9.000	GND	L1	10.0	5.5	65.4	
0.170000	60.8	1000.000	9.000	GND	L1	10.0	4.1	64.9	
0.250000	50.4	1000.000	9.000	GND	L1	10.0	11.2	61.6	
0.430000	40.2	1000.000	9.000	GND	L1	10.0	17.0	57.2	
0.490000	36.3	1000.000	9.000	GND	L1	10.0	19.9	56.2	
3.010000	29.9	1000.000	9.000	GND	L1	10.1	26.1	56.0	
4.190000	32.7	1000.000	9.000	GND	L1	10.2	23.3	56.0	
4.370000	33.2	1000.000	9.000	GND	L1	10.2	22.8	56.0	
14.010000	38.1	1000.000	9.000	GND	L1	10.6	21.9	60.0	
18.610000	32.0	1000.000	9.000	GND	L1	10.9	28.0	60.0	

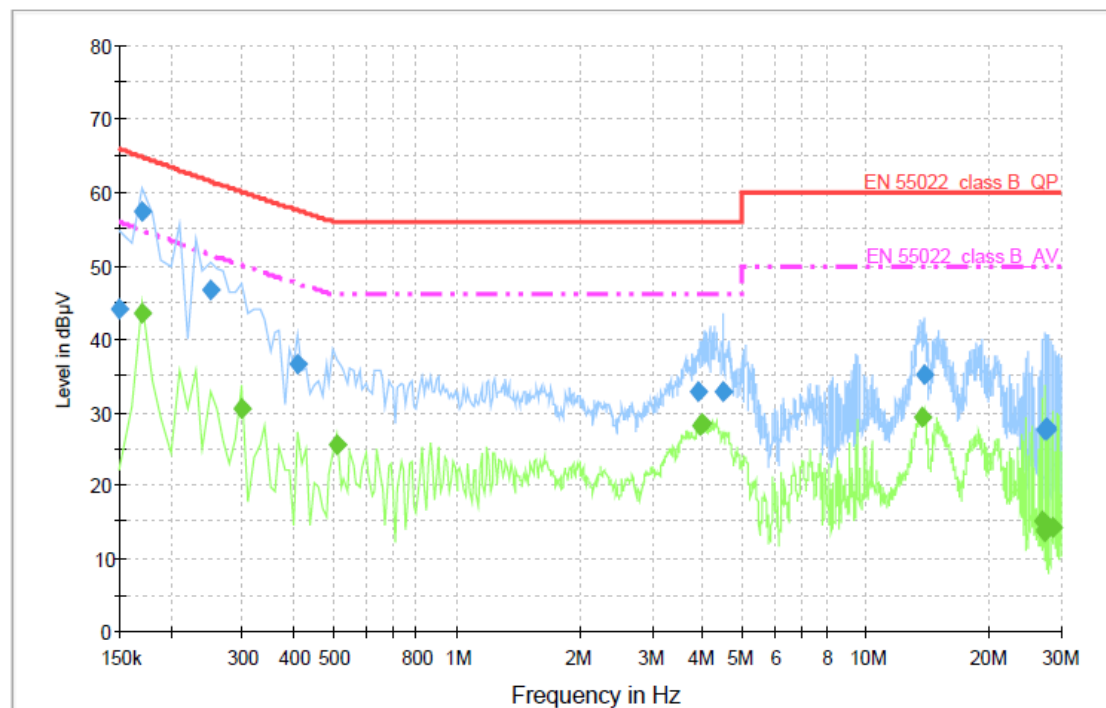
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.160000	38.5	1000.000	9.000	GND	L1	10.0	16.9	55.4	
0.170000	46.6	1000.000	9.000	GND	L1	10.0	8.3	54.9	
0.250000	33.1	1000.000	9.000	GND	L1	10.0	18.4	51.5	
0.430000	27.8	1000.000	9.000	GND	L1	10.0	19.3	47.1	
0.460000	29.2	1000.000	9.000	GND	L1	10.0	17.4	46.6	
2.210000	23.7	1000.000	9.000	GND	L1	10.1	22.3	46.0	
2.970000	25.0	1000.000	9.000	GND	L1	10.1	21.0	46.0	
4.270000	27.3	1000.000	9.000	GND	L1	10.2	18.7	46.0	
4.650000	27.6	1000.000	9.000	GND	L1	10.2	18.4	46.0	
14.150000	31.2	1000.000	9.000	GND	L1	10.7	18.8	50.0	

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



Voltage with 4-Line-LISN_N



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	44.0	1000.000	9.000	GND	N	10.0	22.0	66.0	
0.170000	57.4	1000.000	9.000	GND	N	10.0	7.5	64.9	
0.250000	46.7	1000.000	9.000	GND	N	10.0	14.9	61.6	
0.410000	36.7	1000.000	9.000	GND	N	10.0	20.8	57.5	
3.910000	32.8	1000.000	9.000	GND	N	10.2	23.2	56.0	
4.490000	32.6	1000.000	9.000	GND	N	10.2	23.4	56.0	
13.880000	35.1	1000.000	9.000	GND	N	10.5	24.9	60.0	
27.280000	27.4	1000.000	9.000	GND	N	10.8	32.6	60.0	
27.690000	27.7	1000.000	9.000	GND	N	10.8	32.3	60.0	
27.770000	27.4	1000.000	9.000	GND	N	10.8	32.6	60.0	

Final Measurement Detector 2

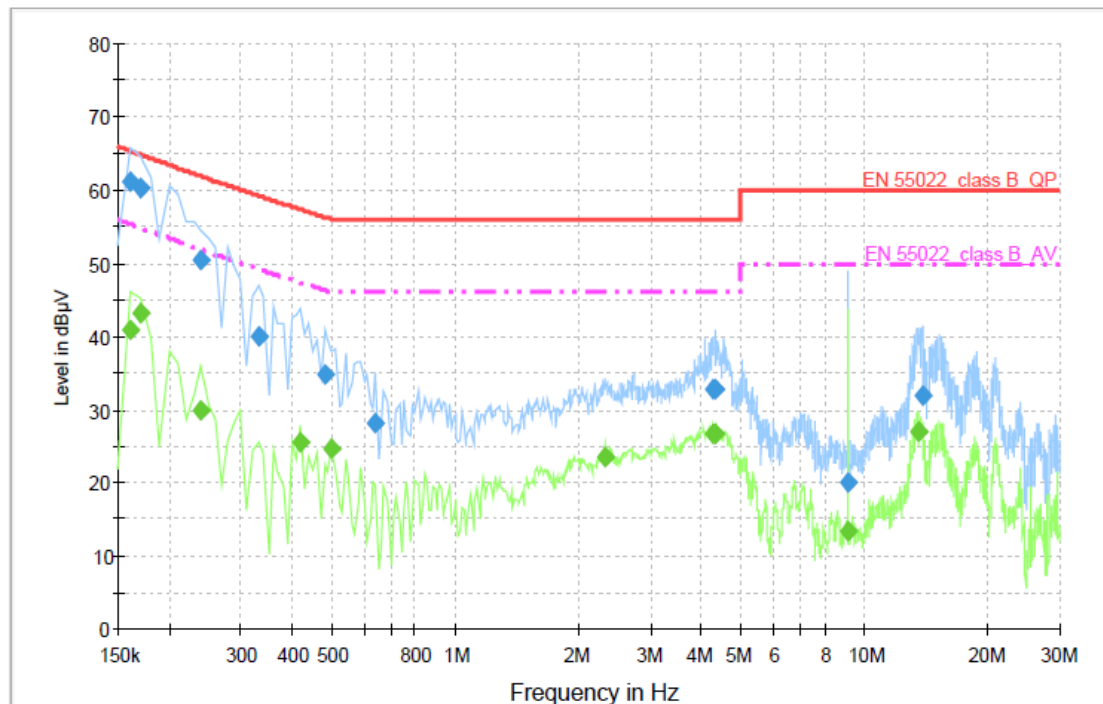
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.170000	43.4	1000.000	9.000	GND	N	10.0	11.5	54.9	
0.300000	30.5	1000.000	9.000	GND	N	10.0	19.5	50.0	
0.510000	25.5	1000.000	9.000	GND	N	10.0	20.6	46.0	
3.920000	28.1	1000.000	9.000	GND	N	10.2	17.9	46.0	
3.980000	28.3	1000.000	9.000	GND	N	10.2	17.7	46.0	
13.730000	29.2	1000.000	9.000	GND	N	10.5	20.8	50.0	
27.120000	15.0	1000.000	9.000	GND	N	10.8	35.0	50.0	
27.280000	14.0	1000.000	9.000	GND	N	10.8	36.0	50.0	
27.460000	13.6	1000.000	9.000	GND	N	10.8	36.4	50.0	
28.480000	14.3	1000.000	9.000	GND	N	10.8	35.7	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
0.160000	61.1	1000.000	9.000	GND	L1	10.0	4.3	65.4	
0.170000	60.4	1000.000	9.000	GND	L1	10.0	4.5	64.9	
0.240000	50.6	1000.000	9.000	GND	L1	10.0	11.3	61.9	
0.330000	39.9	1000.000	9.000	GND	L1	10.0	19.4	59.3	
0.480000	34.7	1000.000	9.000	GND	L1	10.0	21.6	56.3	
0.640000	28.1	1000.000	9.000	GND	L1	10.0	27.9	56.0	
4.260000	32.7	1000.000	9.000	GND	L1	10.2	23.3	56.0	
4.310000	32.8	1000.000	9.000	GND	L1	10.2	23.2	56.0	
9.140000	20.0	1000.000	9.000	GND	L1	10.4	40.0	60.0	
13.810000	31.8	1000.000	9.000	GND	L1	10.6	28.2	60.0	

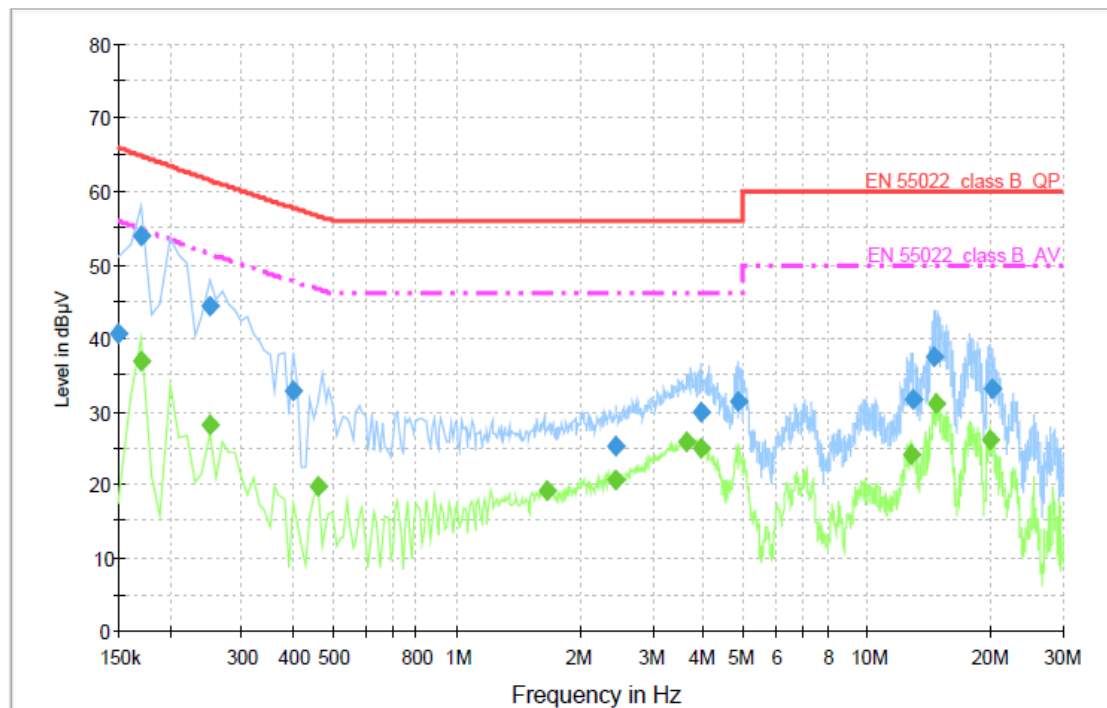
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.160000	40.9	1000.000	9.000	GND	L1	10.0	14.6	55.4	
0.170000	43.3	1000.000	9.000	GND	L1	10.0	11.6	54.9	
0.240000	30.0	1000.000	9.000	GND	L1	10.0	21.9	51.9	
0.420000	25.5	1000.000	9.000	GND	L1	10.0	21.8	47.3	
0.500000	24.6	1000.000	9.000	GND	L1	10.0	21.4	46.0	
2.320000	23.6	1000.000	9.000	GND	L1	10.1	22.4	46.0	
4.260000	26.6	1000.000	9.000	GND	L1	10.2	19.4	46.0	
4.320000	26.8	1000.000	9.000	GND	L1	10.2	19.2	46.0	
9.140000	13.2	1000.000	9.000	GND	L1	10.4	36.8	50.0	
13.510000	27.1	1000.000	9.000	GND	L1	10.6	22.9	50.0	

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



Voltage with 4-Line-LISN_N



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	40.5	1000.000	9.000	GND	N	10.0	25.5	66.0	
0.170000	53.9	1000.000	9.000	GND	N	10.0	11.0	64.9	
0.250000	44.5	1000.000	9.000	GND	N	10.0	17.1	61.6	
0.400000	32.8	1000.000	9.000	GND	N	10.0	24.9	57.7	
2.440000	25.2	1000.000	9.000	GND	N	10.1	30.8	56.0	
3.930000	29.9	1000.000	9.000	GND	N	10.2	26.1	56.0	
4.860000	31.2	1000.000	9.000	GND	N	10.2	24.8	56.0	
12.890000	31.5	1000.000	9.000	GND	N	10.5	28.5	60.0	
14.620000	37.5	1000.000	9.000	GND	N	10.6	22.5	60.0	
20.130000	33.0	1000.000	9.000	GND	N	10.8	27.0	60.0	

Final Measurement Detector 2

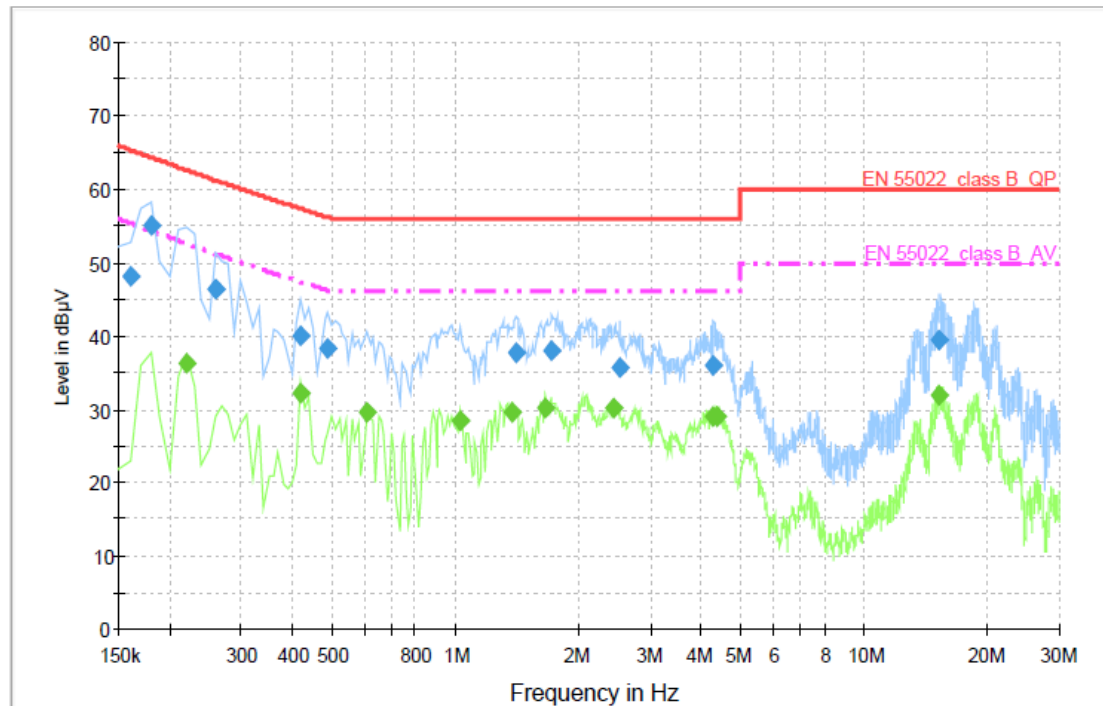
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.170000	36.7	1000.000	9.000	GND	N	10.0	18.2	54.9	
0.250000	28.0	1000.000	9.000	GND	N	10.0	23.5	51.5	
0.460000	19.7	1000.000	9.000	GND	N	10.0	26.9	46.6	
1.660000	19.1	1000.000	9.000	GND	N	10.1	26.9	46.0	
2.440000	20.6	1000.000	9.000	GND	N	10.1	25.4	46.0	
3.630000	25.8	1000.000	9.000	GND	N	10.2	20.2	46.0	
3.960000	25.0	1000.000	9.000	GND	N	10.2	21.0	46.0	
12.730000	24.1	1000.000	9.000	GND	N	10.5	25.9	50.0	
14.750000	31.0	1000.000	9.000	GND	N	10.6	19.0	50.0	
20.030000	26.0	1000.000	9.000	GND	N	10.8	24.0	50.0	

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



◆ Operating condition: USB memory stick play mode

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
0.160000	48.1	1000.000	9.000	GND	L1	10.0	17.3	65.4	
0.180000	55.2	1000.000	9.000	GND	L1	10.0	9.2	64.4	
0.260000	46.5	1000.000	9.000	GND	L1	10.0	14.7	61.2	
0.420000	40.1	1000.000	9.000	GND	L1	10.0	17.2	57.3	
0.490000	38.4	1000.000	9.000	GND	L1	10.0	17.8	56.2	
1.410000	37.7	1000.000	9.000	GND	L1	10.1	18.3	56.0	
1.720000	38.1	1000.000	9.000	GND	L1	10.1	17.9	56.0	
2.530000	35.7	1000.000	9.000	GND	L1	10.1	20.3	56.0	
4.290000	35.8	1000.000	9.000	GND	L1	10.2	20.2	56.0	
15.260000	39.3	1000.000	9.000	GND	L1	10.7	20.7	60.0	

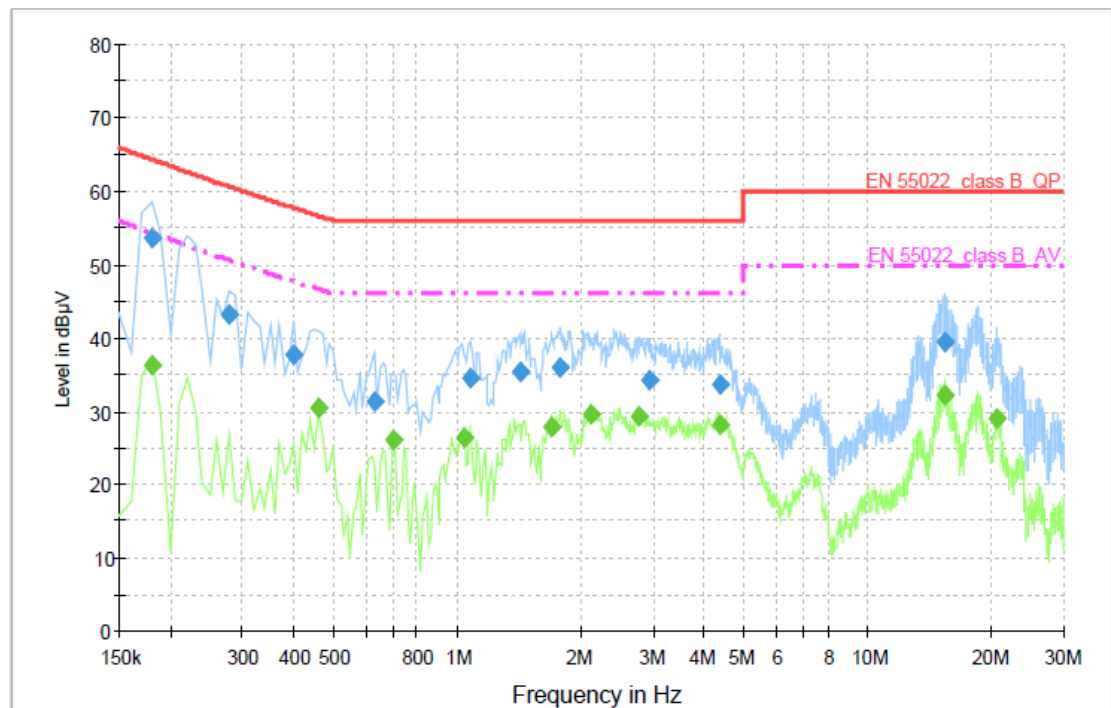
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.220000	36.2	1000.000	9.000	GND	L1	10.0	16.4	52.6	
0.420000	32.0	1000.000	9.000	GND	L1	10.0	15.3	47.3	
0.610000	29.4	1000.000	9.000	GND	L1	10.0	16.6	46.0	
1.030000	28.5	1000.000	9.000	GND	L1	10.0	17.5	46.0	
1.370000	29.7	1000.000	9.000	GND	L1	10.1	16.3	46.0	
1.660000	30.0	1000.000	9.000	GND	L1	10.1	16.0	46.0	
2.440000	30.3	1000.000	9.000	GND	L1	10.1	15.7	46.0	
4.280000	29.1	1000.000	9.000	GND	L1	10.2	16.9	46.0	
4.370000	29.1	1000.000	9.000	GND	L1	10.2	16.9	46.0	
15.260000	31.9	1000.000	9.000	GND	L1	10.7	18.1	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
0.180000	53.6	1000.000	9.000	GND	N	10.0	10.8	64.4	
0.280000	43.3	1000.000	9.000	GND	N	10.0	17.3	60.6	
0.400000	37.5	1000.000	9.000	GND	N	10.0	20.2	57.7	
0.630000	31.4	1000.000	9.000	GND	N	10.0	24.6	56.0	
1.080000	34.6	1000.000	9.000	GND	N	10.1	21.4	56.0	
1.420000	35.4	1000.000	9.000	GND	N	10.1	20.6	56.0	
1.790000	35.9	1000.000	9.000	GND	N	10.1	20.1	56.0	
2.950000	34.1	1000.000	9.000	GND	N	10.1	21.9	56.0	
4.350000	33.5	1000.000	9.000	GND	N	10.2	22.5	56.0	
15.380000	39.4	1000.000	9.000	GND	N	10.6	20.6	60.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.180000	36.2	1000.000	9.000	GND	N	10.0	18.2	54.4	
0.460000	30.4	1000.000	9.000	GND	N	10.0	16.2	46.6	
0.700000	26.0	1000.000	9.000	GND	N	10.0	20.0	46.0	
1.040000	26.5	1000.000	9.000	GND	N	10.1	19.5	46.0	
1.700000	27.7	1000.000	9.000	GND	N	10.1	18.3	46.0	
2.130000	29.6	1000.000	9.000	GND	N	10.1	16.4	46.0	
2.790000	29.4	1000.000	9.000	GND	N	10.1	16.6	46.0	
4.360000	28.2	1000.000	9.000	GND	N	10.2	17.8	46.0	
15.400000	32.2	1000.000	9.000	GND	N	10.6	17.8	50.0	
20.650000	29.0	1000.000	9.000	GND	N	10.8	21.0	50.0	

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



6. Radiated Emission

6.1 Operating Environment

Temperature : 23 °C
Relative Humidity : 38 % 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(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

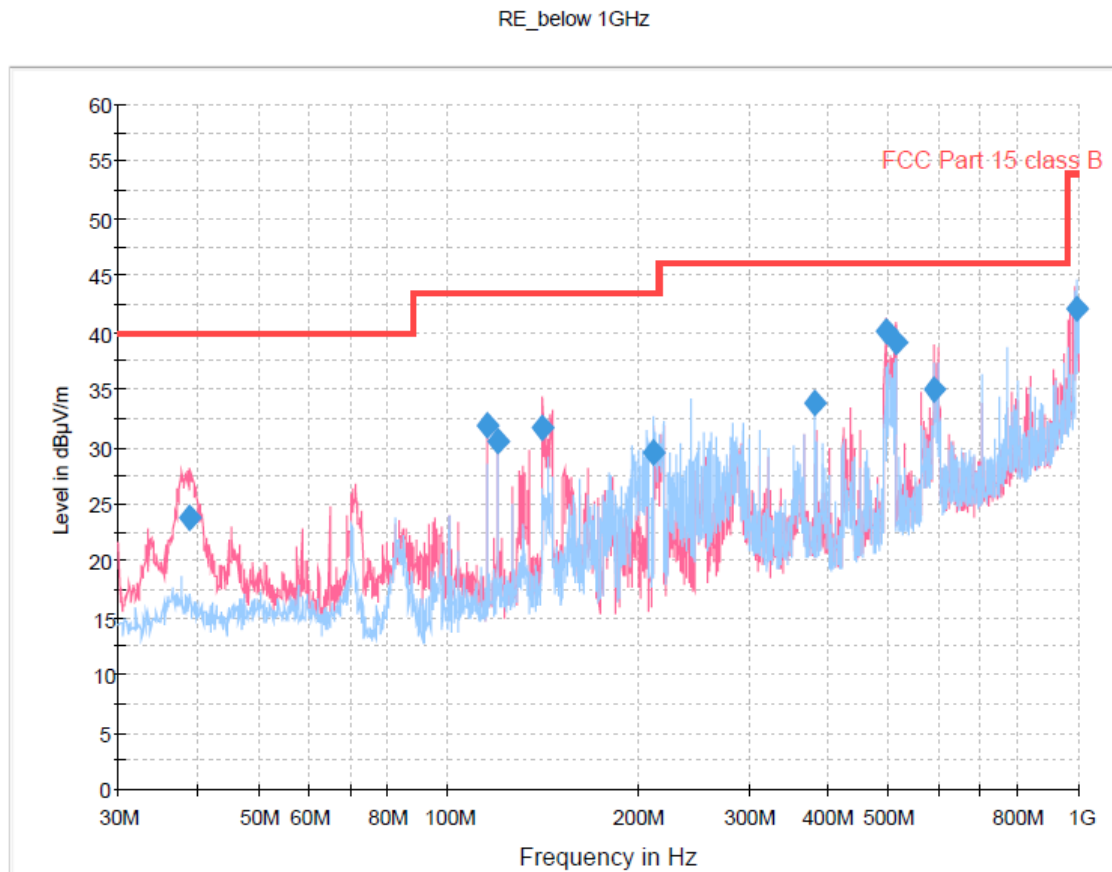
Model Name	Manufacturer	Description	Serial Number	Due to Calibration
■ - ESIB26	Rohde & Schwarz	EMI Test Receiver	830482/010	12. 11. 2010
■ - VULB9160	Schwarzbeck	Broadband Test Antenna	3193	03. 11. 2012
■ - BBHA9120D	Schwarzbeck	Horn ANT	207	12. 22. 2011
■ - MCU066	maturo GmbH	Position Controller	1390306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

6.6 Test data for Radiated Emission

- Test Date : May 14, 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 (RGB: Analog)
Red trace: Vertical polarization, Blue trace: Horizontal polarization



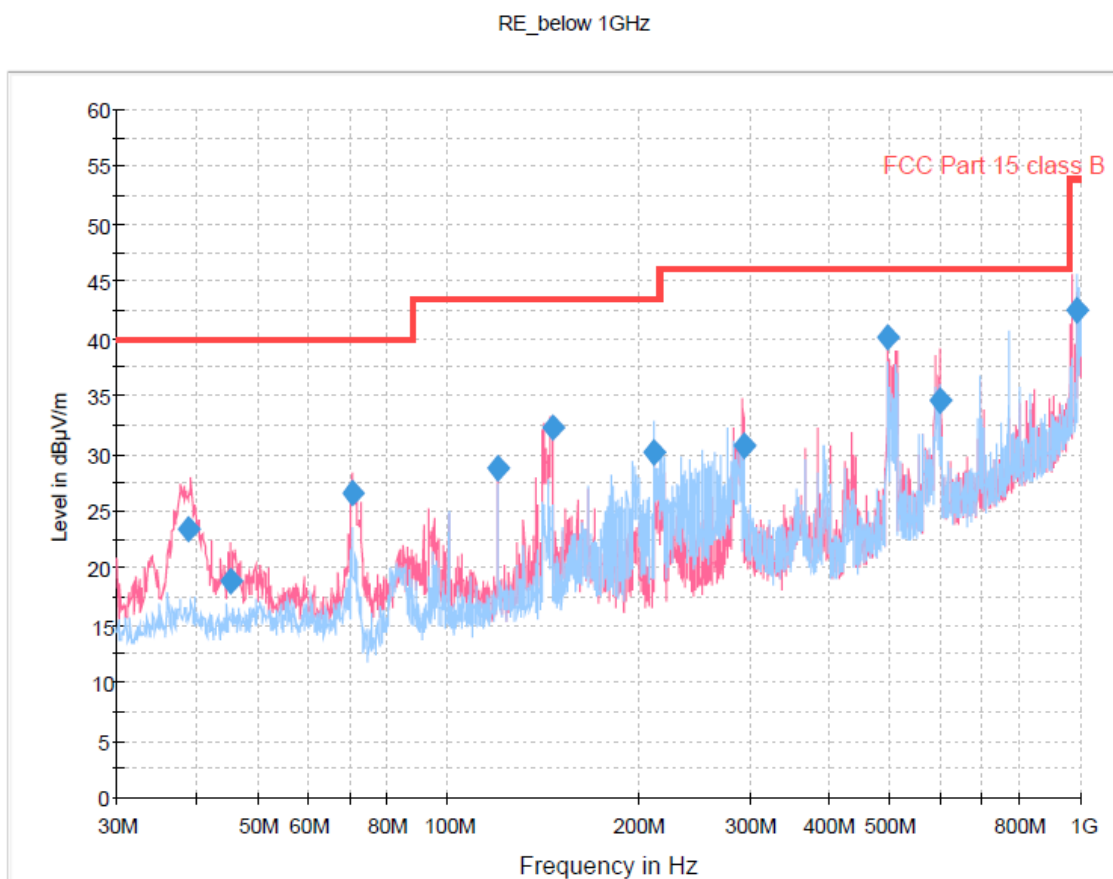
Final Result [1]

Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
38.792500	23.9	1000.0	120.000	111.0	V	109.0	12.4	16.11	40.00
115.300000	31.8	1000.0	120.000	100.0	V	260.0	13.1	11.68	43.50
120.027500	30.5	1000.0	120.000	100.0	V	109.0	13.7	13.02	43.50
141.007500	31.7	1000.0	120.000	100.0	V	214.0	14.4	11.78	43.50
211.413750	29.6	1000.0	120.000	191.0	H	250.0	12.4	13.95	43.50
380.513750	33.8	1000.0	120.000	100.0	H	217.0	17.7	12.17	46.00
492.992500	40.2	1000.0	120.000	100.0	V	179.0	20.8	5.78	46.00
511.948750	39.2	1000.0	120.000	100.0	V	214.0	21.2	6.80	46.00
587.656250	35.0	1000.0	120.000	100.0	V	237.0	22.6	11.02	46.00
989.275000	42.2	1000.0	120.000	111.0	H	217.0	31.3	11.83	54.00

< 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



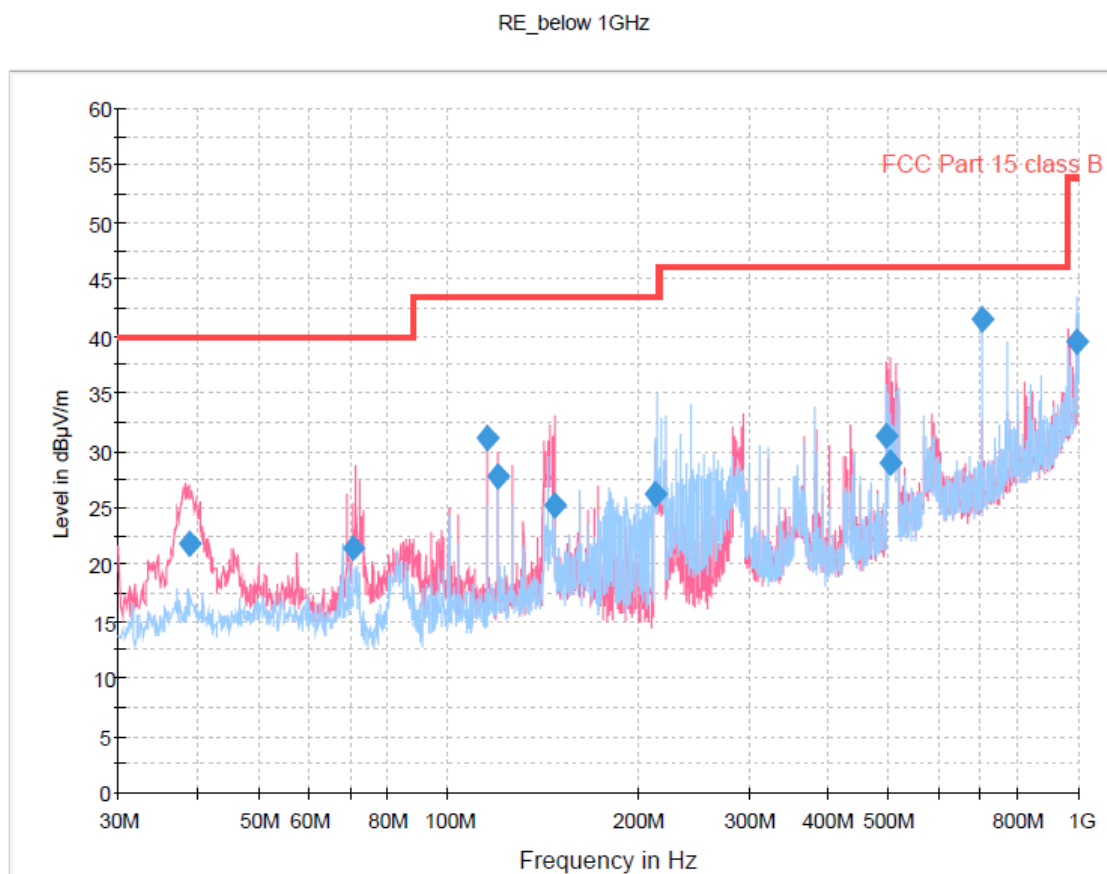
Final Result [1]

Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
38.996250	23.4	1000.0	120.000	100.0	V	151.0	12.4	16.65	40.00
45.458750	18.9	1000.0	120.000	100.0	V	105.0	12.6	21.05	40.00
70.597500	26.6	1000.0	120.000	171.0	V	252.0	11.3	13.36	40.00
120.027500	28.8	1000.0	120.000	100.0	V	82.0	13.7	14.75	43.50
146.258750	32.3	1000.0	120.000	100.0	V	210.0	14.7	11.15	43.50
211.491250	30.1	1000.0	120.000	174.0	H	205.0	12.4	13.39	43.50
292.646250	30.6	1000.0	120.000	181.0	V	340.0	16.5	15.36	46.00
493.281250	40.2	1000.0	120.000	100.0	V	174.0	20.8	5.79	46.00
600.502500	34.6	1000.0	120.000	100.0	V	244.0	22.8	11.39	46.00
986.452500	42.5	1000.0	120.000	108.0	H	230.0	31.1	11.46	54.00

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



- ◆ Operating Condition: USB memory stick play mode
Red trace: Vertical polarization, Blue trace: Horizontal polarization



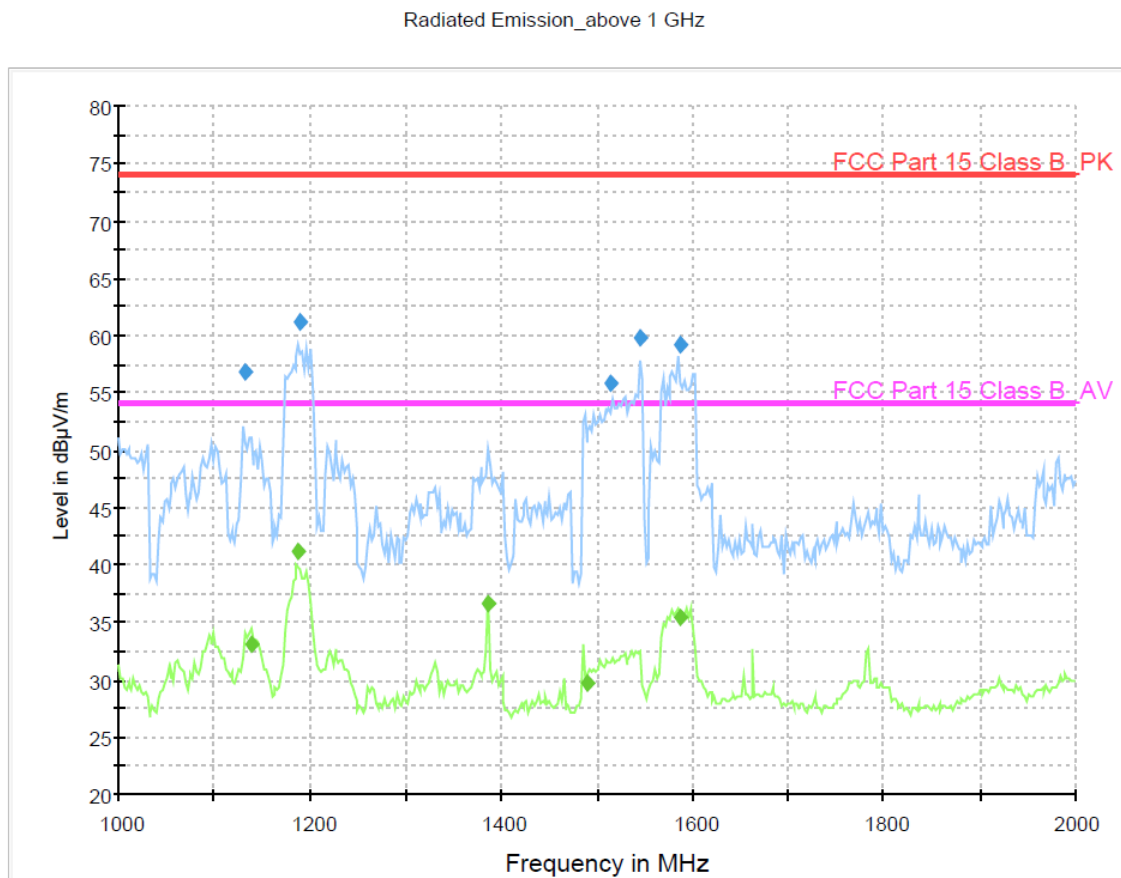
Final Result [1]

Frequency (MHz)	QuasiPeak (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
38.865000	21.9	1000.0	120.000	102.0	V	173.0	12.4	18.12	40.00
70.885000	21.4	1000.0	120.000	150.0	V	185.0	11.3	18.59	40.00
115.300000	31.0	1000.0	120.000	100.0	V	277.0	13.1	12.51	43.50
120.028750	27.7	1000.0	120.000	100.0	V	233.0	13.7	15.78	43.50
147.108750	25.2	1000.0	120.000	100.0	V	299.0	14.8	18.27	43.50
212.917500	26.2	1000.0	120.000	150.0	H	187.0	12.4	17.35	43.50
495.538750	31.2	1000.0	120.000	100.0	V	220.0	20.8	14.80	46.00
501.168750	28.9	1000.0	120.000	111.0	V	208.0	21.0	17.11	46.00
702.027500	41.4	1000.0	120.000	200.0	H	163.0	23.5	4.58	46.00
992.172500	39.6	1000.0	120.000	100.0	H	233.0	31.4	14.42	54.00

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



- ◆ Operating Condition: 1 920 × 1 080 / 60 Hz (RGB: 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)
1132.460521	56.8	100.0	1000.000	130.0	V	166.0	-15.3	17.2	74.0
1188.976754	61.2	100.0	1000.000	213.0	V	166.0	-15.1	12.8	74.0
1515.226052	55.8	100.0	1000.000	164.0	H	133.0	-14.2	18.2	74.0
1545.290180	59.8	100.0	1000.000	162.0	H	133.0	-14.0	14.2	74.0
1586.170341	59.2	100.0	1000.000	100.0	V	143.0	-13.7	14.8	74.0

Final Result 2

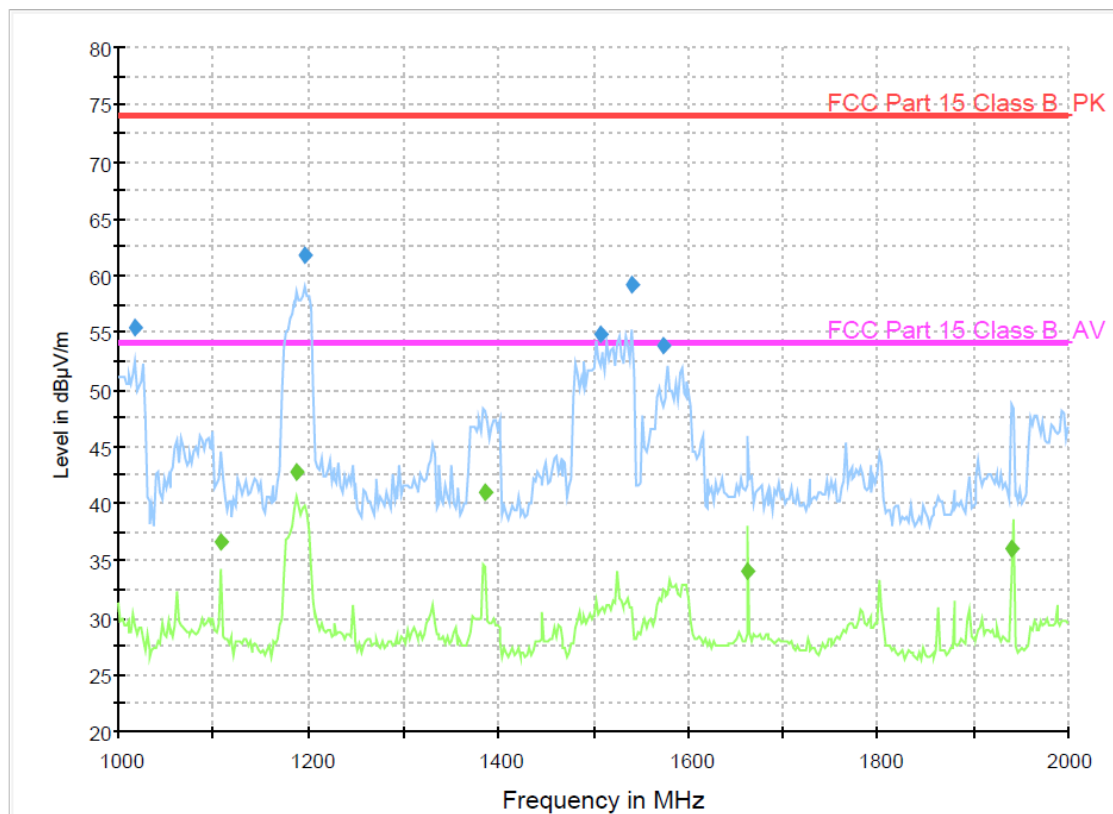
Frequency (MHz)	Average (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1138.476553	33.0	100.0	1000.000	130.0	V	166.0	-15.2	21.0	54.0
1188.172746	41.1	100.0	1000.000	207.0	V	187.0	-15.1	12.9	54.0
1386.173547	36.6	100.0	1000.000	100.0	H	199.0	-14.4	17.4	54.0
1489.969940	29.6	100.0	1000.000	100.0	V	166.0	-14.3	24.4	54.0
1586.570341	35.4	100.0	1000.000	100.0	V	143.0	-13.7	18.6	54.0

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



- ◆ Operating Condition: 1 920 × 1 080 / 60 Hz (HDMI/DVI: Digital)
Green trace: Average detector, Blue trace: Peak detector

Radiated Emission_above 1 GHz



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)
1017.836072	55.5	100.0	1000.000	195.0	H	134.0	-15.8	18.5	74.0
1196.192786	61.8	100.0	1000.000	204.0	V	201.0	-15.0	12.2	74.0
1507.206012	54.8	100.0	1000.000	122.0	H	134.0	-14.2	19.2	74.0
1540.482164	59.1	100.0	1000.000	122.0	H	126.0	-14.0	14.9	74.0
1574.558317	53.9	100.0	1000.000	113.0	H	134.0	-13.8	20.1	74.0

Final Result 2

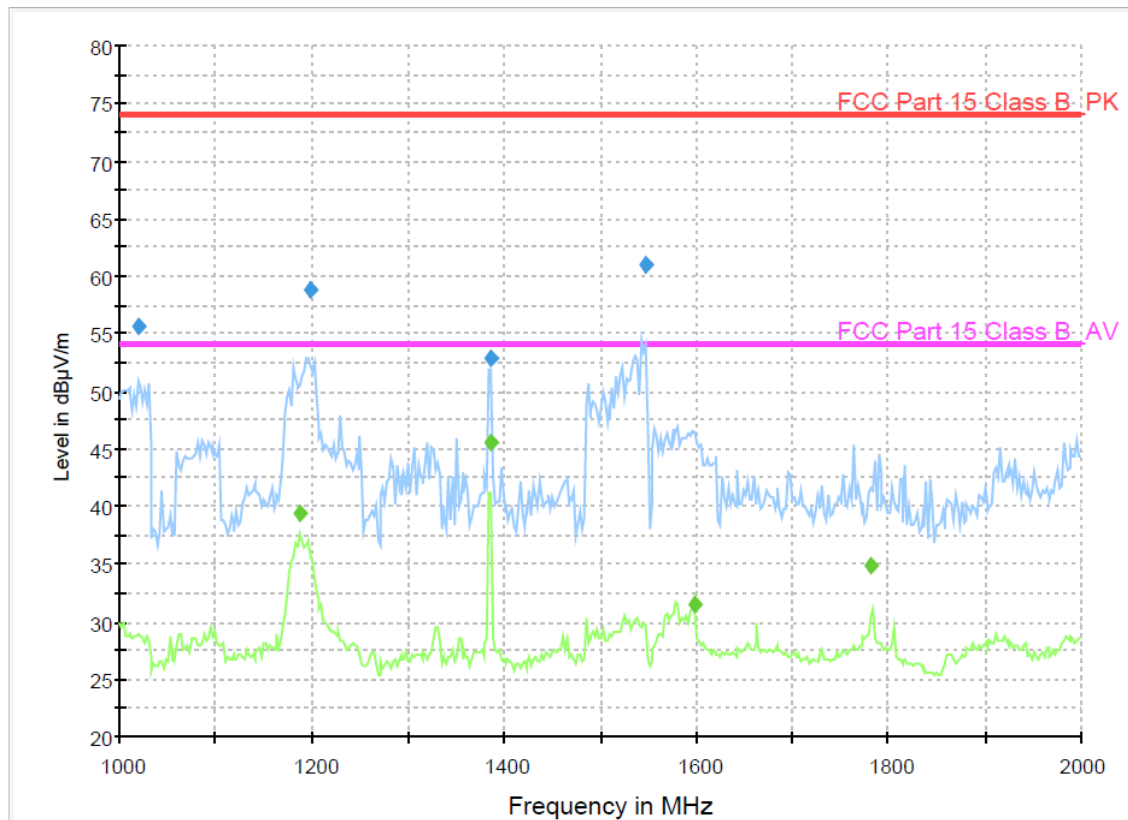
Frequency (MHz)	Average (dBμV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1108.816433	36.6	100.0	1000.000	100.0	V	192.0	-15.3	17.4	54.0
1188.176754	42.8	100.0	1000.000	210.0	V	201.0	-15.1	11.2	54.0
1386.169539	41.1	100.0	1000.000	100.0	H	201.0	-14.4	12.9	54.0
1663.126653	34.0	100.0	1000.000	122.0	V	186.0	-13.6	20.0	54.0
1940.483768	36.0	100.0	1000.000	130.0	V	158.0	-13.0	18.0	54.0

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



- ◆ Operating Condition: USB memory stick play mode
Green trace: Average detector, Blue trace: Peak detector

Radiated Emission_above 1 GHz



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)
1019.840080	55.6	100.0	1000.000	181.0	H	139.0	-15.8	18.4	74.0
1197.792786	58.7	100.0	1000.000	213.0	V	202.0	-15.0	15.3	74.0
1385.773547	52.9	100.0	1000.000	100.0	H	202.0	-14.4	21.1	74.0
1546.486172	60.9	100.0	1000.000	122.0	H	133.0	-14.0	13.1	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)
1188.176754	39.3	100.0	1000.000	138.0	H	227.0	-15.1	14.7	54.0
1386.169539	45.6	100.0	1000.000	100.0	H	202.0	-14.4	9.4	54.0
1598.994389	31.5	100.0	1000.000	100.0	V	145.0	-13.7	22.5	54.0
1782.167134	34.9	100.0	1000.000	100.0	V	207.0	-13.2	19.1	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. LED LCD TV/Monitor (Model Name: M2280DFM, M2280DM)** complies with §15.107 and 15.109 of the FCC Rules.