

FCC EVALUATION REPORT FOR CERTIFICATION

Applicant : LG Electronics Inc.

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

Pyeongteak-si, Gyeonggi-do, Korea.

Attn: Mr. Sang-Wook Lee, Chief research engineer

Date of Issue : January 21, 2010

Order Number: GETEC-C1-10-025

Test Report Number: GETEC-E3-10-006

Test Site: Gumi College EMC Center

FCC Registration Number: (100749, 443957)

FCC ID.: BEJANWL100W

Applicant: LG Electronics Inc.

Rule Part(s)	: FCC Part 15 Subpart B
Equipment Class	: Class B computing device peripheral (JBP)
EUT Type	: Wireless Media Box
Type of Authority	: Certification
Model Name	: AN-WL100W
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,


Hyoungh Seop Kim, Associate Engineer
GUMI College EMC center
Jae-Hoon Jeong, Senior Engineer
GUMI College EMC center



CONTENTS

1. GENERAL INFORMATION	3
2. INTRODUCTION	4
3. PRODUCT INFORMATION	5
3.1 DESCRIPTION OF EUT.....	5
3.2 SUPPORT EQUIPMENT / CABLES USED	6
3.3 MODIFICATION ITEM(S)	7
4. DESCRIPTION OF TESTS.....	8
4.1 TEST CONDITION.....	8
4.2 CONDUCTED EMISSION	9
4.3 RADIATED EMISSION.....	10
5. CONDUCTED EMISSION.....	11
5.1 OPERATING ENVIRONMENT	11
5.2 TEST SET-UP	11
5.3 MEASUREMENT UNCERTAINTY.....	11
5.4 LIMIT	12
5.5 TEST EQUIPMENT USED.....	12
5.6 TEST DATA FOR CONDUCTED EMISSION	12
6. RADIATED EMISSION	25
6.1 OPERATING ENVIRONMENT	25
6.2 TEST SET-UP	25
6.3 MEASUREMENT UNCERTAINTY.....	25
6.4 LIMIT	26
6.5 TEST EQUIPMENT USED.....	26
6.6 TEST DATA FOR RADIATED EMISSION.....	27
7. SAMPLE CALCULATIONS.....	39
7.1 EXAMPLE 1 :	39
7.2 EXAMPLE 2 :	39
8. RECOMMENDATION & CONCLUSION.....	40
 APPENDIX A – ATTESTATION STATEMENT	
APPENDIX B – ID SAMPLE LABEL & LOCATION	
APPENDIX C – BLOCK DIAGRAM	
APPENDIX D – TEST SET-UP PHOTOGRAPHS	
APPENDIX E – EXTERNAL PHOTOGRAPHS	
APPENDIX F – INTERNAL PHOTOGRAPHS	
APPENDIX G – USER’S MANUAL	



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. Sang-Wook Lee, Chief research engineer

Tel Number: +82-31-610-9623

- **FCC ID.** BEJANWL100W
- **EUT Type** Wireless Media Box
- **Model Name** AN-WL100W
- **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** January 14 ~ 19, 2010
- **Place of Test** **Gumi College EMC Center** (FCC Registration Number: 100749, 443957)
407, Bugok-dong, Gumi-si, Gyeongbuk, Korea.
- **Test Report Number** GETEC-E3-10-006
- **Dates of Issue** January 21, 2010



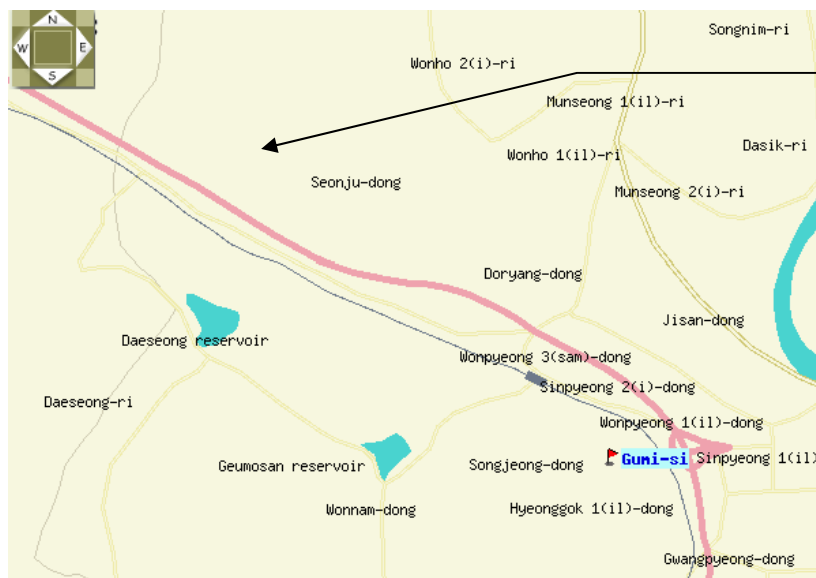
2. Introduction

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. Wireless Media Box (Model Name: AN-WL100W)**

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. Wireless Media Box (Model Name: AN-WL100W)**
FCC ID.: BEJANWL100W

This test report is only for computing device peripheral part (JBP). The RF portion will be certified with another new application.

MODELS	Wireless Media Box (AN-WL100W)
Dimensions (Width x Height x Depth)	326.0 mm x 42.8 mm x 226.0 mm (12.8 inch x 1.7 inch x 8.9 inch)
Weight	1.5 kg (3.3 lb)
Power requirement	DC 12 V 1.1 A
Adapter	In : AC 100-240 V~ 50 / 60 Hz Out : DC 12 V 2.5A (Adaptor model No. : PA-1031-1 (LITE-ON) , EADP-30PB B (DELTA))

-. **Maximum Frequency range** : 333 MHz

-. **Used AC/DC Adapter** : AC/DC Adapter #1
Model name: PA-1031-1
Manufacturer: LITE-ON TECHNOLOGY CORPORATION
Ratings: AC 100 V – 240 V~, 50 Hz – 60 Hz, 1.0 A
DC 12 V, 2.5 A
Serial number: O9DVA609895020025

AC/DC Adapter #2
Model name: EADP-30PB B
Manufacturer: DELTA ELECTRONICS INC.
Ratings: AC 100 V – 240 V~, 50 Hz – 60 Hz
DC 12 V, 2.5 A
Serial number: 20IW9CY000J



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
Keyboard	COMPAQ	166516-AD6	S/N: B13BBOR391006D FCC ID: AQ6-23K15
PS2 mouse	LOGITECH	M-S69	S/N: 334684-108 FCC ID: JNZ211443
Joystick	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
Monitor	LG Electronics Inc.	42LE5500	S/N: N/A FCC ID: -
Wireless Ready Dongle	LG Electronics Inc.	-	S/N: N/A FCC ID: -
IR sensor	LG Electronics Inc.	-	S/N: N/A FCC ID: -

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



3.2.2 Used Cable(s)

Cable Name	Condition	Description
Power cable	Connected to the adapter	1.8 m unshielded
AC/DC Adapter cable	Connected to the EUT	1.75 m shielded with a ferrite core
RGB(Analog) in cable	Connected to the EUT and PC	1.8 m shielded with two ferrite cores
HDMI/DVI(Digital) in cable	Connected to the EUT and PC	1.95 m shielded
Audio(RGB/DVI) in cable	Connected to the EUT and PC	1.8 m shielded
Component	Connected to the EUT and DVD player	2.0 m shielded
Component sound	Connected to the EUT and DVD player	2.0 m shielded
IR blaster cable	Connected to the EUT and IR sensor	3.0 m shielded with a ferrite core

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)

- **PC signal mode**

Radiated emission: Analog signal output mode, HDMI signal output mode

Conducted emission: Analog signal output mode, HDMI signal output mode

- ◆ 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

- **DVD player signal mode**

Radiated emission: Component signal output mode

Conducted emission: Component signal output mode

- ◆ Operating test pattern

- Color bar signal with 1 kHz audio signal.



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

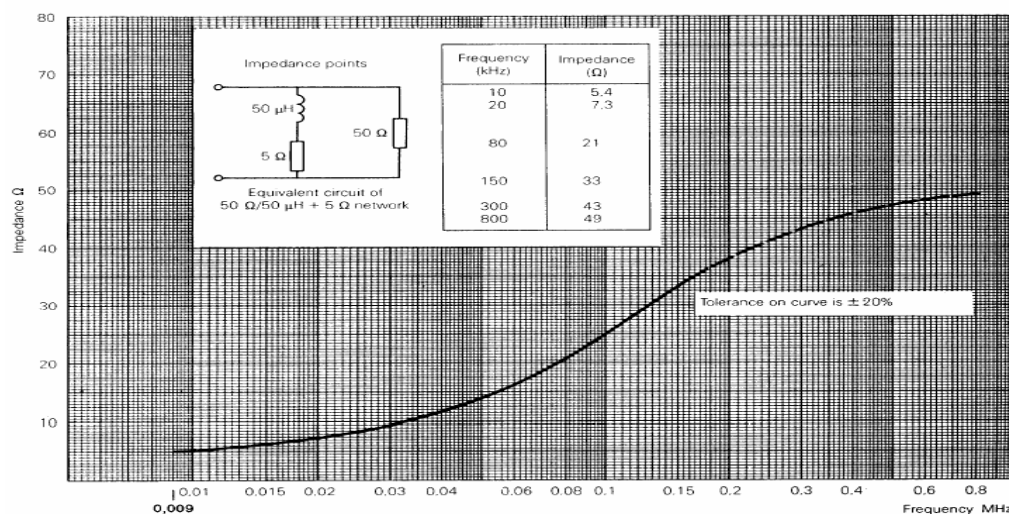


Fig 2. Impedance of LISN



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 $\times$ 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

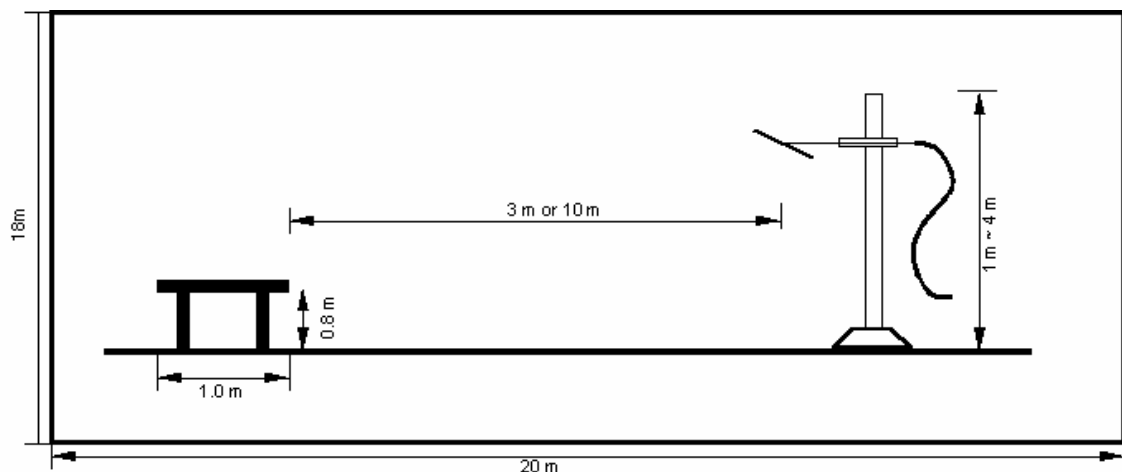


Fig 3. Dimensions of test site.



5. Conducted Emission

5.1 Operating Environment

Temperature : 28 °C
Relative Humidity : 35 % 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) Class B	
Freq. Range	Quasi-Peak	Average
150 kHz ~ 0.5 MHz	66 ~ 56*	56 ~ 46*
0.5 MHz ~ 5 MHz	56	46
5 MHz ~ 30 MHz	60	50
*Limits decreases linearly with the logarithm of frequency.		

5.5 Test Equipment used

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

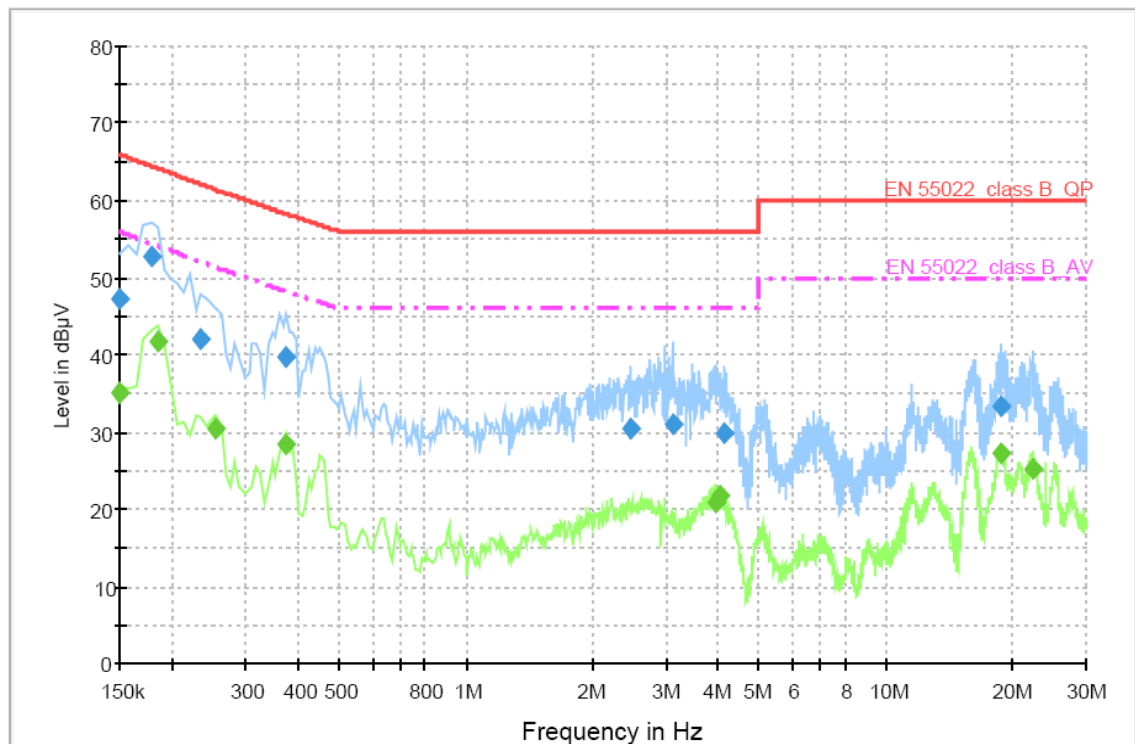
5.6 Test data for Conducted Emission

- . Test Date : January 18, 2010
- . Resolution Bandwidth : 9 kHz
- . Frequency Range : 0.15 MHz ~ 30 MHz



◆ Test condition: Analog signal output mode (With #1 AC/DC Adapter: PA-1031-1)

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	47.2	1000.000	9.000	GND	L1	10.0	18.8	66.0	
0.178000	52.7	1000.000	9.000	GND	L1	10.0	11.8	64.5	
0.234000	41.9	1000.000	9.000	GND	L1	10.0	20.2	62.1	
0.374000	39.6	1000.000	9.000	GND	L1	10.0	18.7	58.3	
2.467000	30.6	1000.000	9.000	GND	L1	10.1	25.4	56.0	
3.104000	31.0	1000.000	9.000	GND	L1	10.1	25.0	56.0	
4.147000	29.8	1000.000	9.000	GND	L1	10.2	26.2	56.0	
18.840000	33.2	1000.000	9.000	GND	L1	11.0	26.8	60.0	

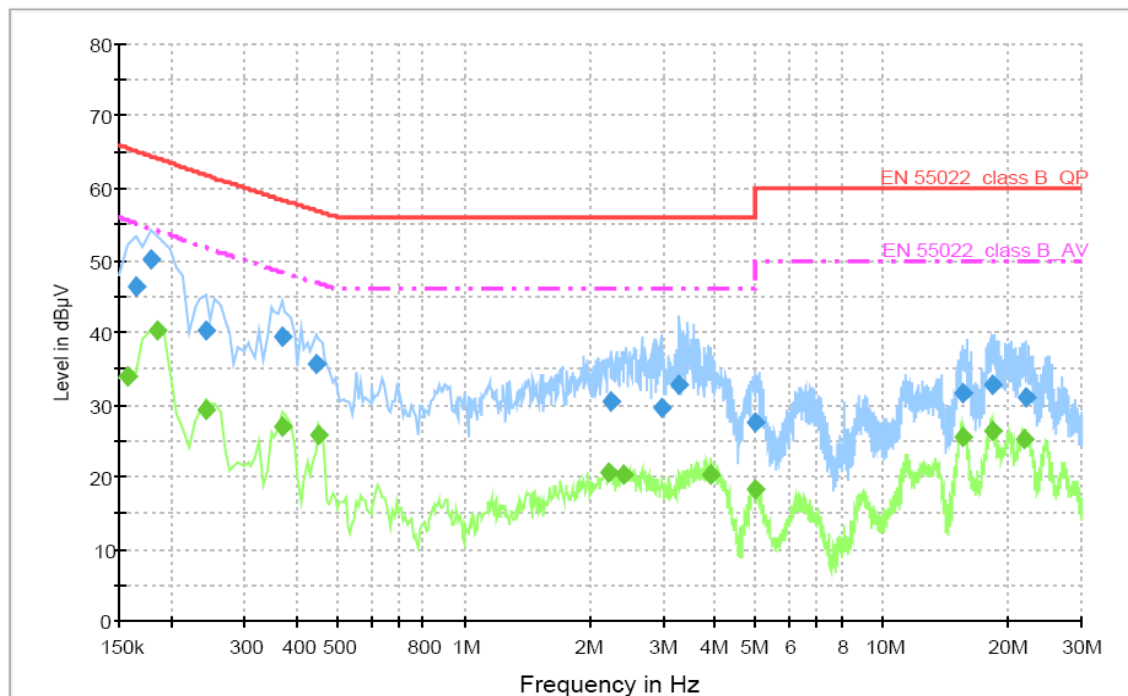
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	35.0	1000.000	9.000	GND	L1	10.0	21.0	56.0	
0.185000	41.8	1000.000	9.000	GND	L1	10.0	12.3	54.1	
0.255000	30.4	1000.000	9.000	GND	L1	10.0	20.9	51.3	
0.374000	28.3	1000.000	9.000	GND	L1	10.0	19.9	48.2	
3.916000	21.0	1000.000	9.000	GND	L1	10.2	25.0	46.0	
4.014000	21.6	1000.000	9.000	GND	L1	10.2	24.4	46.0	
18.742000	27.2	1000.000	9.000	GND	L1	11.0	22.8	50.0	
22.480000	25.1	1000.000	9.000	GND	L1	11.1	24.9	50.0	

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



Voltage with 4-Line-LISN_N



Final Measurement Detector 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.164000	46.4	1000.000	9.000	GND	N	10.0	18.8	65.2	
0.178000	50.3	1000.000	9.000	GND	N	10.0	14.2	64.5	
0.241000	40.2	1000.000	9.000	GND	N	10.0	21.7	61.9	
0.367000	39.4	1000.000	9.000	GND	N	10.0	19.0	58.4	
0.444000	35.5	1000.000	9.000	GND	N	10.0	21.4	56.9	
2.236000	30.4	1000.000	9.000	GND	N	10.1	25.6	56.0	
2.964000	29.7	1000.000	9.000	GND	N	10.1	26.3	56.0	
3.286000	32.9	1000.000	9.000	GND	N	10.1	23.1	56.0	
4.987000	27.6	1000.000	9.000	GND	N	10.2	28.4	56.0	
15.599000	31.5	1000.000	9.000	GND	N	10.6	28.5	60.0	
18.476000	32.9	1000.000	9.000	GND	N	10.7	27.1	60.0	
22.214000	31.0	1000.000	9.000	GND	N	10.8	29.0	60.0	

Final Measurement Detector 2

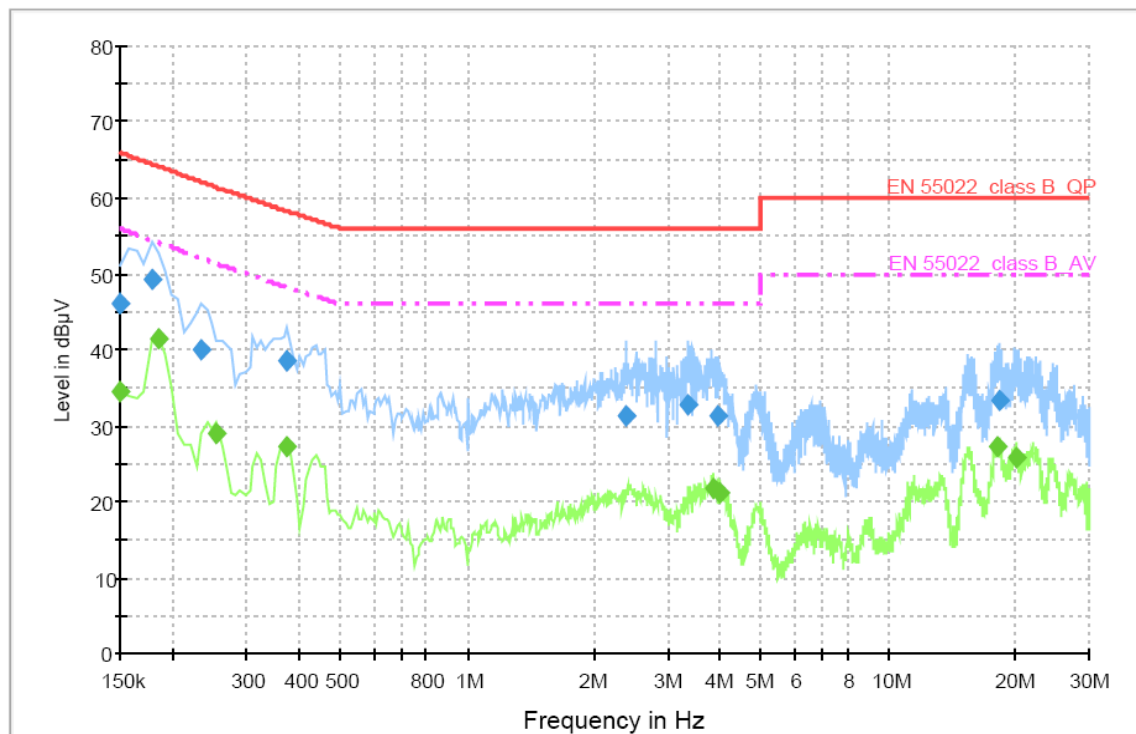
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.157000	33.8	1000.000	9.000	GND	N	10.0	21.8	55.6	
0.185000	40.4	1000.000	9.000	GND	N	10.0	13.7	54.1	
0.241000	29.4	1000.000	9.000	GND	N	10.0	22.4	51.8	
0.367000	26.9	1000.000	9.000	GND	N	10.0	21.5	48.4	
0.451000	25.8	1000.000	9.000	GND	N	10.0	21.0	46.8	
2.229000	20.7	1000.000	9.000	GND	N	10.1	25.3	46.0	
2.425000	20.4	1000.000	9.000	GND	N	10.1	25.6	46.0	
3.902000	20.3	1000.000	9.000	GND	N	10.2	25.7	46.0	
4.966000	18.2	1000.000	9.000	GND	N	10.2	27.8	46.0	
15.620000	25.4	1000.000	9.000	GND	N	10.6	24.6	50.0	
18.357000	26.4	1000.000	9.000	GND	N	10.7	23.6	50.0	
21.913000	25.1	1000.000	9.000	GND	N	10.8	24.9	50.0	

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



◆ Test condition: HDMI signal output mode (With #1 AC/DC Adapter: PA-1031-1)

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	46.1	1000.000	9.000	GND	L1	10.0	19.9	66.0	
0.178000	49.4	1000.000	9.000	GND	L1	10.0	15.1	64.5	
0.234000	39.9	1000.000	9.000	GND	L1	10.0	22.2	62.1	
0.374000	38.4	1000.000	9.000	GND	L1	10.0	19.9	58.3	
2.383000	31.2	1000.000	9.000	GND	L1	10.1	24.8	56.0	
3.335000	32.8	1000.000	9.000	GND	L1	10.1	23.2	56.0	
3.958000	31.4	1000.000	9.000	GND	L1	10.2	24.6	56.0	
18.308000	33.3	1000.000	9.000	GND	L1	10.9	26.7	60.0	

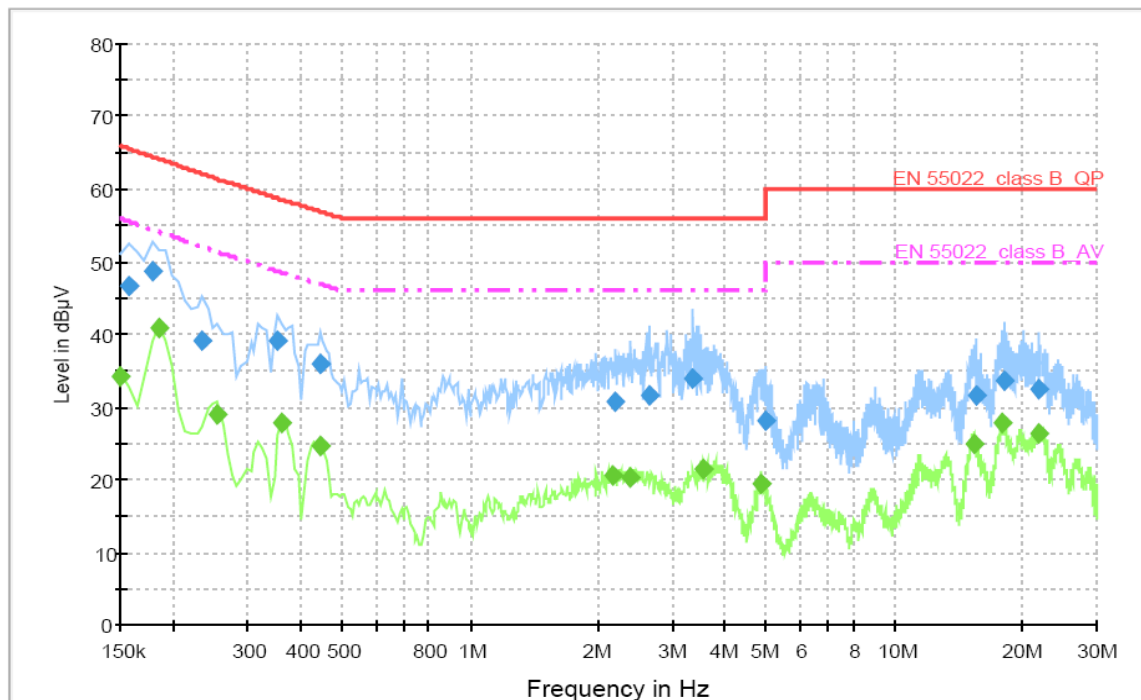
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	34.6	1000.000	9.000	GND	L1	10.0	21.4	56.0	
0.185000	41.3	1000.000	9.000	GND	L1	10.0	12.8	54.1	
0.255000	29.0	1000.000	9.000	GND	L1	10.0	22.3	51.3	
0.374000	27.3	1000.000	9.000	GND	L1	10.0	20.9	48.2	
3.853000	21.8	1000.000	9.000	GND	L1	10.2	24.2	46.0	
3.979000	21.1	1000.000	9.000	GND	L1	10.2	24.9	46.0	
18.175000	27.3	1000.000	9.000	GND	L1	10.9	22.7	50.0	
20.093000	25.8	1000.000	9.000	GND	L1	11.0	24.2	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
0.157000	46.6	1000.000	9.000	GND	N	10.0	19.0	65.6	
0.178000	48.6	1000.000	9.000	GND	N	10.0	15.9	64.5	
0.234000	39.2	1000.000	9.000	GND	N	10.0	22.9	62.1	
0.353000	39.2	1000.000	9.000	GND	N	10.0	19.5	58.7	
0.444000	36.0	1000.000	9.000	GND	N	10.0	20.9	56.9	
2.208000	30.8	1000.000	9.000	GND	N	10.1	25.2	56.0	
2.656000	31.6	1000.000	9.000	GND	N	10.1	24.4	56.0	
3.363000	33.8	1000.000	9.000	GND	N	10.1	22.2	56.0	
4.959000	28.0	1000.000	9.000	GND	N	10.2	28.0	56.0	
15.585000	31.6	1000.000	9.000	GND	N	10.6	28.4	60.0	
18.224000	33.6	1000.000	9.000	GND	N	10.7	26.4	60.0	
22.011000	32.4	1000.000	9.000	GND	N	10.8	27.6	60.0	

Final Measurement Detector 2

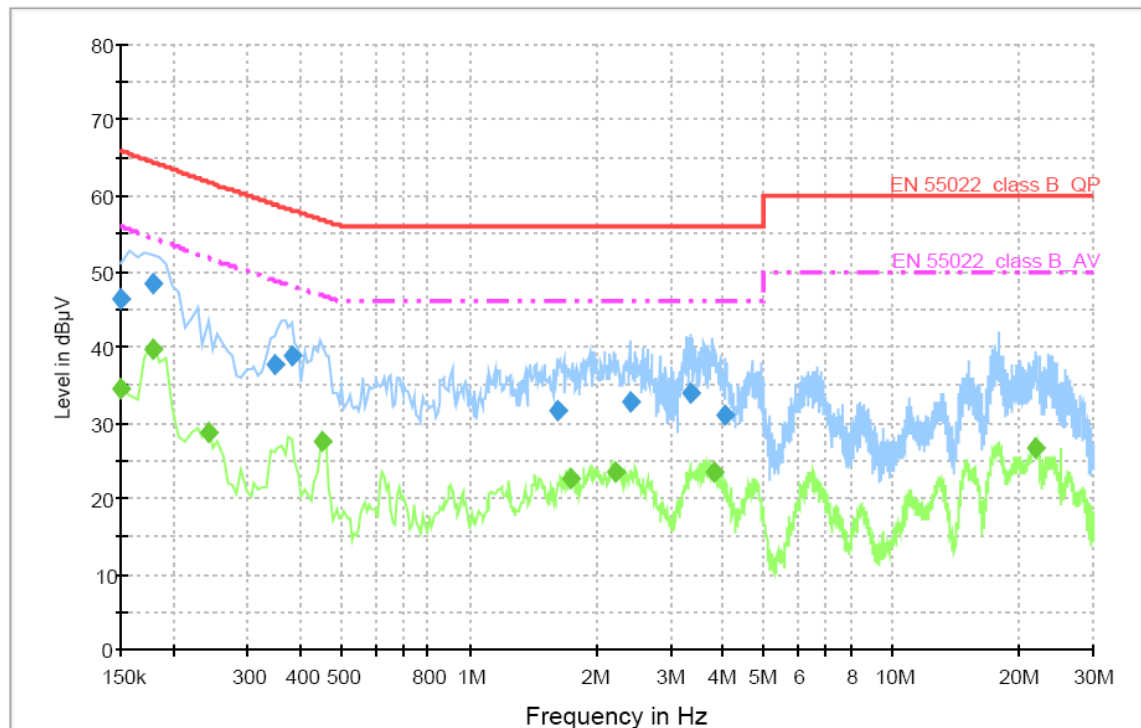
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	34.2	1000.000	9.000	GND	N	10.0	21.8	56.0	
0.185000	40.8	1000.000	9.000	GND	N	10.0	13.3	54.1	
0.255000	28.9	1000.000	9.000	GND	N	10.0	22.4	51.3	
0.360000	27.8	1000.000	9.000	GND	N	10.0	20.7	48.5	
0.444000	24.5	1000.000	9.000	GND	N	10.0	22.4	46.9	
2.173000	20.7	1000.000	9.000	GND	N	10.1	25.3	46.0	
2.397000	20.2	1000.000	9.000	GND	N	10.1	25.8	46.0	
3.559000	21.4	1000.000	9.000	GND	N	10.2	24.6	46.0	
4.875000	19.4	1000.000	9.000	GND	N	10.2	26.6	46.0	
15.473000	24.8	1000.000	9.000	GND	N	10.6	25.2	50.0	
17.986000	27.9	1000.000	9.000	GND	N	10.7	22.1	50.0	
22.011000	26.3	1000.000	9.000	GND	N	10.8	23.7	50.0	

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



◆ Test condition: Component signal output mode (With #1 AC/DC Adapter: PA-1031-1)

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	46.5	1000.000	9.000	GND	L1	10.0	19.5	66.0	
0.178000	48.4	1000.000	9.000	GND	L1	10.0	16.1	64.5	
0.346000	37.6	1000.000	9.000	GND	L1	10.0	21.3	58.9	
0.381000	39.0	1000.000	9.000	GND	L1	10.0	19.1	58.1	
1.613000	31.5	1000.000	9.000	GND	L1	10.1	24.5	56.0	
2.404000	32.9	1000.000	9.000	GND	L1	10.1	23.1	56.0	
3.363000	33.8	1000.000	9.000	GND	L1	10.1	22.2	56.0	
4.035000	31.2	1000.000	9.000	GND	L1	10.2	24.8	56.0	

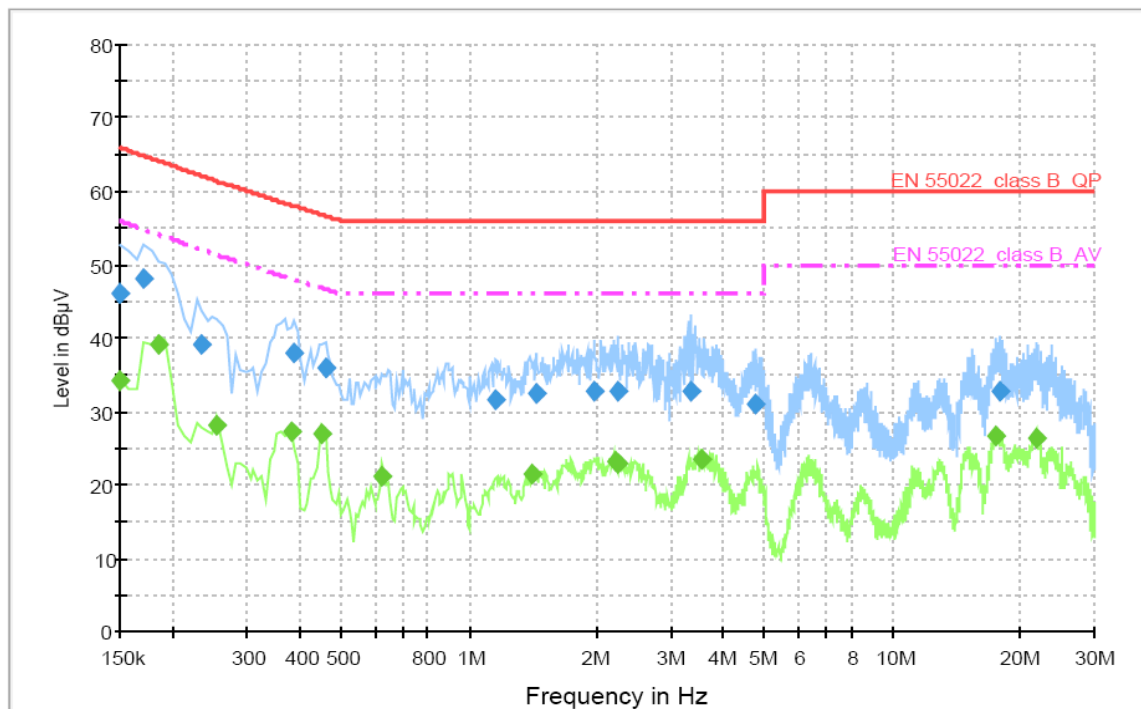
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	34.6	1000.000	9.000	GND	L1	10.0	21.4	56.0	
0.178000	39.6	1000.000	9.000	GND	L1	10.0	14.9	54.5	
0.241000	28.6	1000.000	9.000	GND	L1	10.0	23.2	51.8	
0.451000	27.6	1000.000	9.000	GND	L1	10.0	19.2	46.8	
1.746000	22.7	1000.000	9.000	GND	L1	10.1	23.3	46.0	
2.222000	23.5	1000.000	9.000	GND	L1	10.1	22.5	46.0	
3.797000	23.5	1000.000	9.000	GND	L1	10.2	22.5	46.0	
21.815000	26.7	1000.000	9.000	GND	L1	11.1	23.3	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
0.150000	46.1	1000.000	9.000	GND	N	10.0	19.9	66.0	
0.171000	48.2	1000.000	9.000	GND	N	10.0	16.6	64.8	
0.234000	39.2	1000.000	9.000	GND	N	10.0	22.9	62.1	
0.388000	38.1	1000.000	9.000	GND	N	10.0	19.9	58.0	
0.458000	35.9	1000.000	9.000	GND	N	10.0	20.8	56.7	
1.158000	31.6	1000.000	9.000	GND	N	10.1	24.4	56.0	
1.438000	32.5	1000.000	9.000	GND	N	10.1	23.5	56.0	
1.977000	32.8	1000.000	9.000	GND	N	10.1	23.2	56.0	
2.243000	32.8	1000.000	9.000	GND	N	10.1	23.2	56.0	
3.342000	32.8	1000.000	9.000	GND	N	10.1	23.2	56.0	
4.770000	30.9	1000.000	9.000	GND	N	10.2	25.1	56.0	
17.979000	32.7	1000.000	9.000	GND	N	10.7	27.3	60.0	

Final Measurement Detector 2

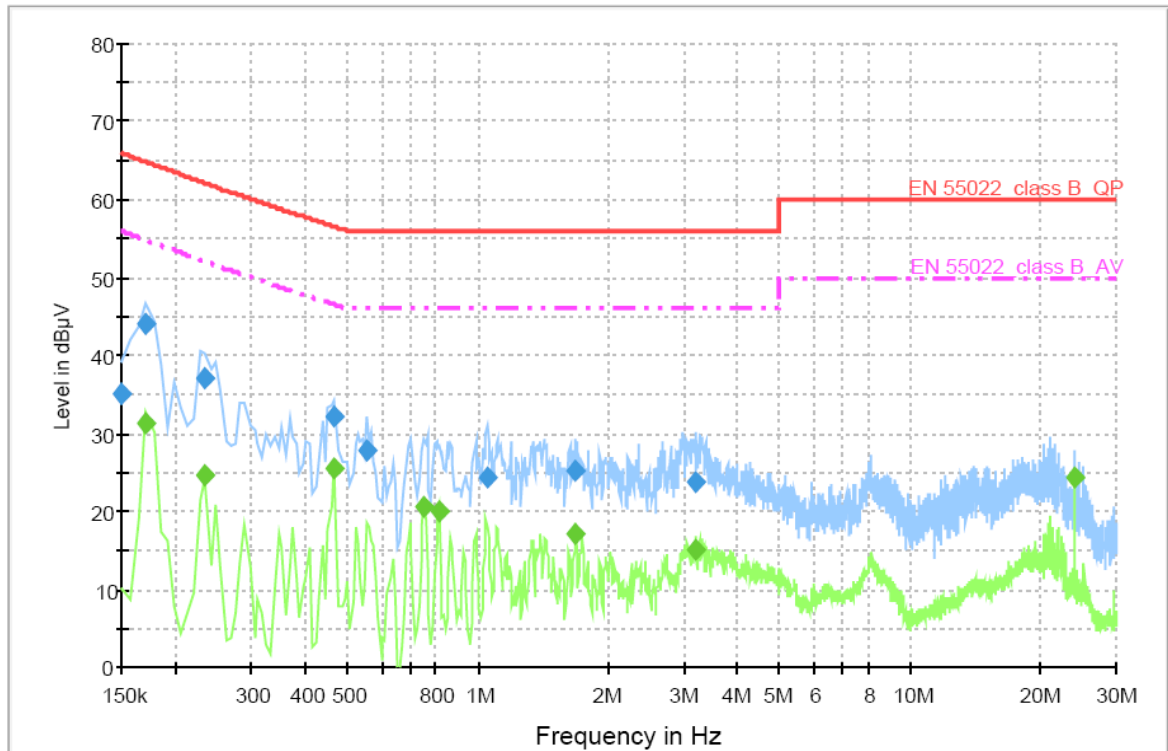
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.150000	34.1	1000.000	9.000	GND	N	10.0	21.9	56.0	
0.185000	39.2	1000.000	9.000	GND	N	10.0	14.9	54.1	
0.255000	28.1	1000.000	9.000	GND	N	10.0	23.2	51.3	
0.381000	27.2	1000.000	9.000	GND	N	10.0	20.9	48.1	
0.451000	26.8	1000.000	9.000	GND	N	10.0	20.0	46.8	
0.626000	21.1	1000.000	9.000	GND	N	10.0	24.9	46.0	
1.410000	21.6	1000.000	9.000	GND	N	10.1	24.4	46.0	
2.222000	23.3	1000.000	9.000	GND	N	10.1	22.7	46.0	
2.250000	23.0	1000.000	9.000	GND	N	10.1	23.0	46.0	
3.552000	23.4	1000.000	9.000	GND	N	10.2	22.6	46.0	
17.552000	26.7	1000.000	9.000	GND	N	10.7	23.3	50.0	
21.766000	26.3	1000.000	9.000	GND	N	10.8	23.7	50.0	

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



◆ Test condition: Analog signal output mode (With #2 AC/DC Adapter: EADP-30PB B)

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	35.0	1000.000	9.000	GND	L1	10.0	31.0	66.0	
0.171000	44.1	1000.000	9.000	GND	L1	10.0	20.7	64.8	
0.234000	37.0	1000.000	9.000	GND	L1	10.0	25.1	62.1	
0.465000	32.0	1000.000	9.000	GND	L1	10.0	24.6	56.6	
0.556000	27.8	1000.000	9.000	GND	L1	10.0	28.2	56.0	
1.053000	24.5	1000.000	9.000	GND	L1	10.0	31.5	56.0	
1.683000	25.1	1000.000	9.000	GND	L1	10.1	30.9	56.0	
3.188000	23.9	1000.000	9.000	GND	L1	10.1	32.1	56.0	

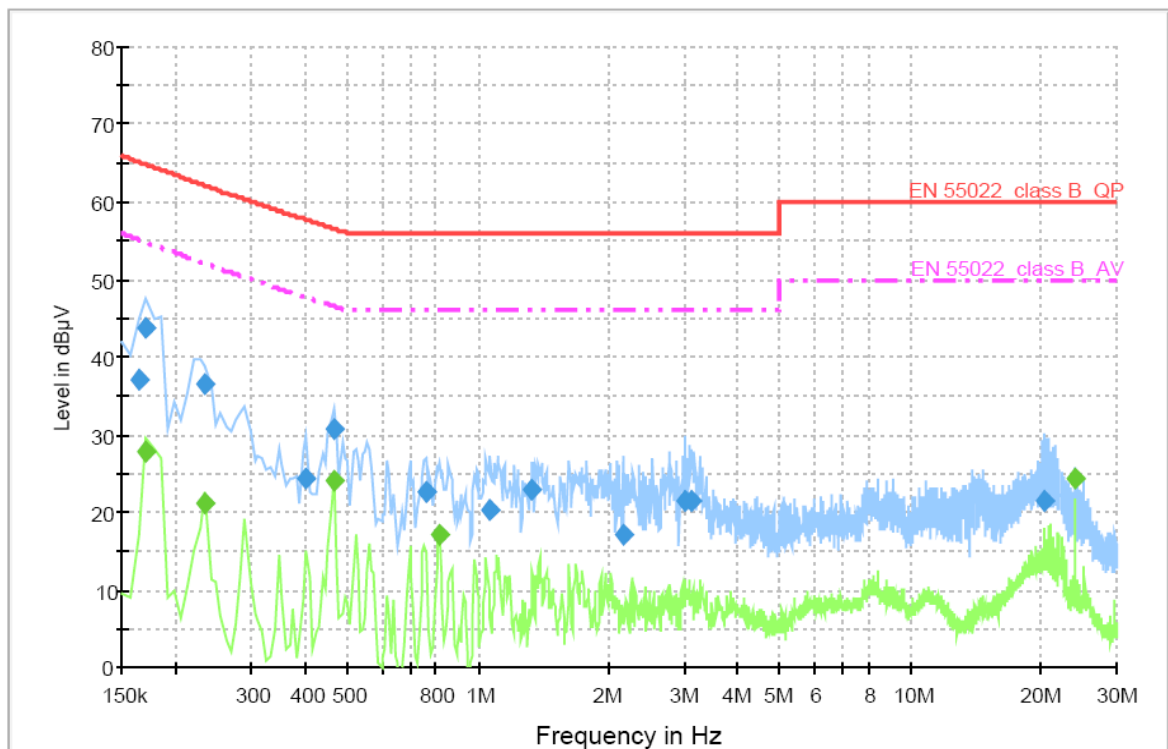
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.171000	31.4	1000.000	9.000	GND	L1	10.0	23.4	54.8	
0.234000	24.6	1000.000	9.000	GND	L1	10.0	27.5	52.1	
0.465000	25.5	1000.000	9.000	GND	L1	10.0	21.0	46.5	
0.752000	20.5	1000.000	9.000	GND	L1	10.0	25.5	46.0	
0.815000	19.9	1000.000	9.000	GND	L1	10.0	26.1	46.0	
1.683000	17.2	1000.000	9.000	GND	L1	10.1	28.8	46.0	
3.188000	15.0	1000.000	9.000	GND	L1	10.1	31.0	46.0	
24.013000	24.4	1000.000	9.000	GND	L1	11.2	25.6	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
0.164000	37.1	1000.000	9.000	GND	N	10.0	28.1	65.2	
0.171000	43.8	1000.000	9.000	GND	N	10.0	21.0	64.8	
0.234000	36.5	1000.000	9.000	GND	N	10.0	25.6	62.1	
0.402000	24.3	1000.000	9.000	GND	N	10.0	33.4	57.7	
0.465000	30.7	1000.000	9.000	GND	N	10.0	25.9	56.6	
0.759000	22.6	1000.000	9.000	GND	N	10.0	33.4	56.0	
1.067000	20.3	1000.000	9.000	GND	N	10.1	35.7	56.0	
1.333000	22.8	1000.000	9.000	GND	N	10.1	33.2	56.0	
2.159000	17.2	1000.000	9.000	GND	N	10.1	38.8	56.0	
3.013000	21.5	1000.000	9.000	GND	N	10.1	34.5	56.0	
3.125000	21.6	1000.000	9.000	GND	N	10.1	34.4	56.0	
20.366000	21.4	1000.000	9.000	GND	N	10.8	38.6	60.0	

Final Measurement Detector 2

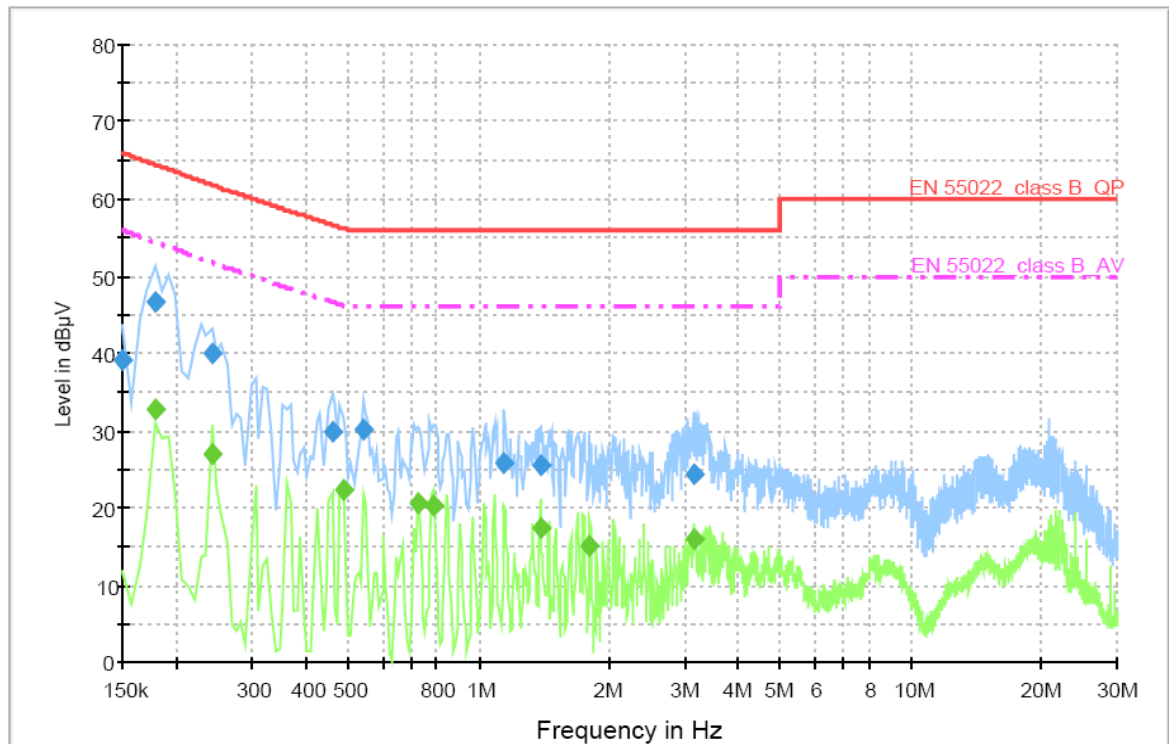
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.171000	27.8	1000.000	9.000	GND	N	10.0	27.0	54.8	
0.234000	21.2	1000.000	9.000	GND	N	10.0	30.9	52.1	
0.465000	24.0	1000.000	9.000	GND	N	10.0	22.5	46.5	
0.815000	17.2	1000.000	9.000	GND	N	10.0	28.8	46.0	
24.013000	24.3	1000.000	9.000	GND	N	10.8	25.7	50.0	

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



◆ Test condition: HDMI signal output mode (With #2 AC/DC Adapter: EADP-30PB B)

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	39.3	1000.000	9.000	GND	L1	10.0	26.7	66.0	
0.178000	46.7	1000.000	9.000	GND	L1	10.0	17.8	64.5	
0.241000	39.9	1000.000	9.000	GND	L1	10.0	22.0	61.9	
0.458000	29.9	1000.000	9.000	GND	L1	10.0	26.8	56.7	
0.542000	30.2	1000.000	9.000	GND	L1	10.0	25.8	56.0	
1.144000	25.8	1000.000	9.000	GND	L1	10.1	30.2	56.0	
1.389000	25.5	1000.000	9.000	GND	L1	10.1	30.5	56.0	
3.139000	24.5	1000.000	9.000	GND	L1	10.1	31.6	56.0	

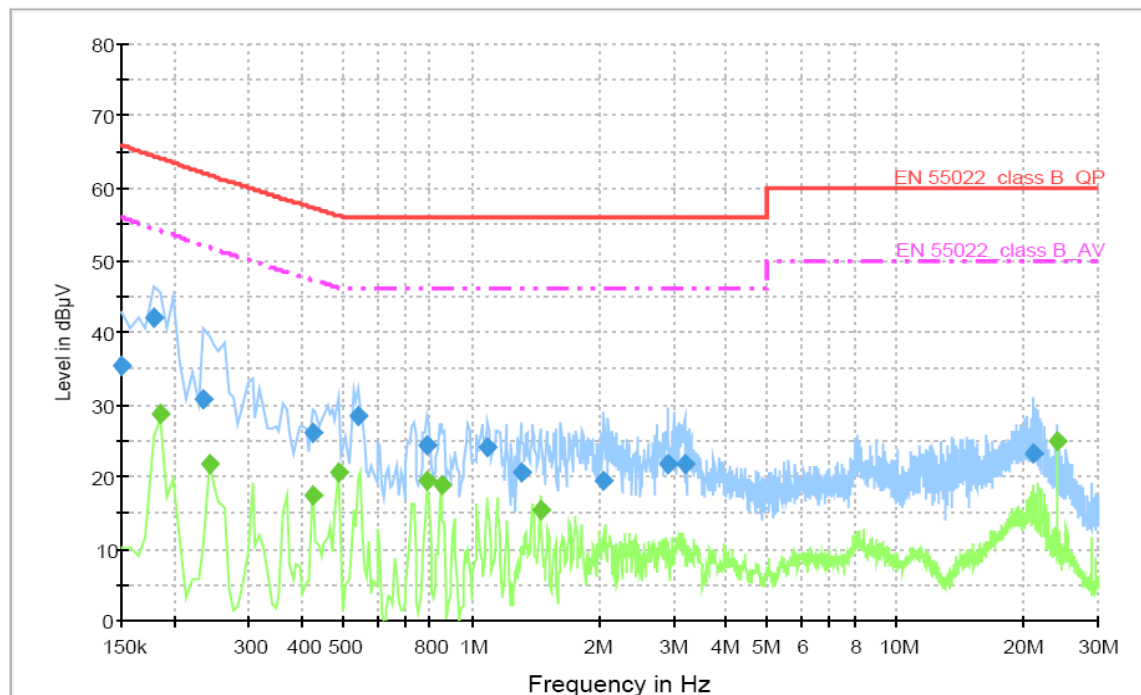
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.178000	32.7	1000.000	9.000	GND	L1	10.0	21.8	54.5	
0.241000	26.9	1000.000	9.000	GND	L1	10.0	24.9	51.8	
0.486000	22.4	1000.000	9.000	GND	L1	10.0	23.8	46.2	
0.724000	20.6	1000.000	9.000	GND	L1	10.0	25.4	46.0	
0.787000	20.2	1000.000	9.000	GND	L1	10.0	25.8	46.0	
1.389000	17.3	1000.000	9.000	GND	L1	10.1	28.7	46.0	
1.809000	15.0	1000.000	9.000	GND	L1	10.1	31.0	46.0	
3.139000	15.8	1000.000	9.000	GND	L1	10.1	30.2	46.0	

< 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
0.150000	35.4	1000.000	9.000	GND	N	10.0	30.6	66.0	
0.178000	42.1	1000.000	9.000	GND	N	10.0	22.4	64.5	
0.234000	30.7	1000.000	9.000	GND	N	10.0	31.4	62.1	
0.423000	26.2	1000.000	9.000	GND	N	10.0	31.1	57.3	
0.542000	28.3	1000.000	9.000	GND	N	10.0	27.7	56.0	
0.787000	24.2	1000.000	9.000	GND	N	10.0	31.8	56.0	
1.095000	24.1	1000.000	9.000	GND	N	10.1	31.9	56.0	
1.312000	20.6	1000.000	9.000	GND	N	10.1	35.4	56.0	
2.054000	19.3	1000.000	9.000	GND	N	10.1	36.7	56.0	
2.908000	21.7	1000.000	9.000	GND	N	10.1	34.3	56.0	
3.174000	21.6	1000.000	9.000	GND	N	10.1	34.4	56.0	
21.150000	23.2	1000.000	9.000	GND	N	10.8	36.8	60.0	

Final Measurement Detector 2

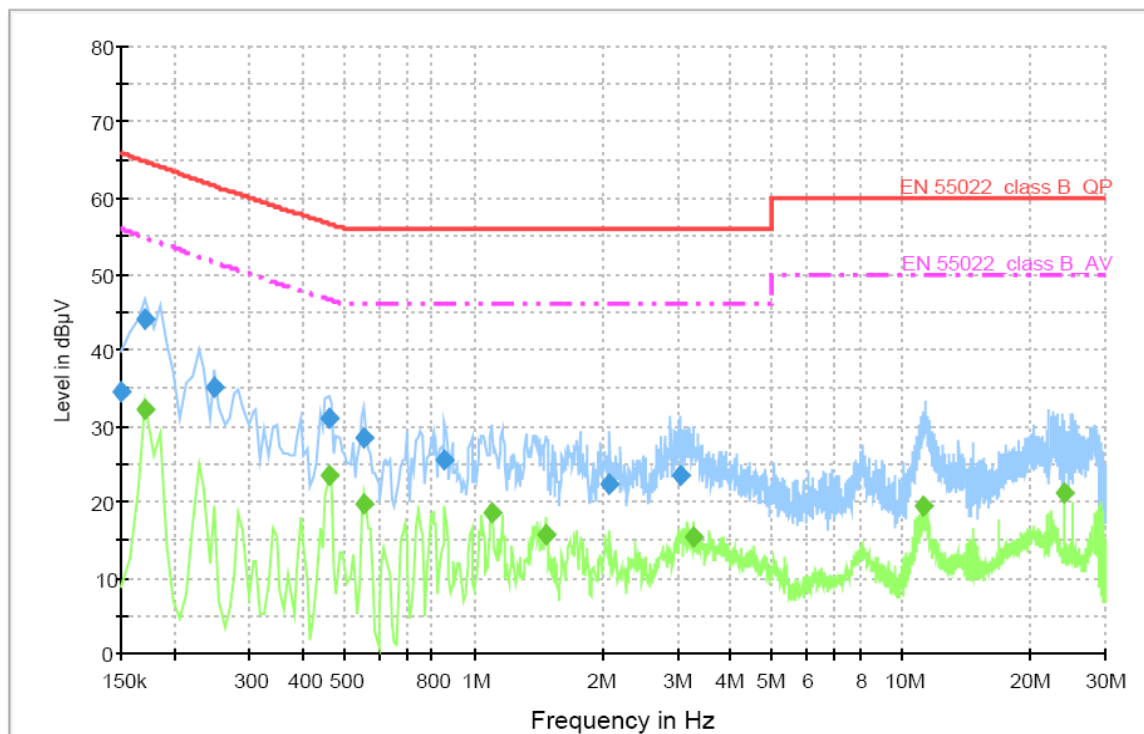
Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.185000	28.6	1000.000	9.000	GND	N	10.0	25.5	54.1	
0.241000	21.7	1000.000	9.000	GND	N	10.0	30.1	51.8	
0.423000	17.4	1000.000	9.000	GND	N	10.0	29.9	47.3	
0.486000	20.6	1000.000	9.000	GND	N	10.0	25.6	46.2	
0.787000	19.3	1000.000	9.000	GND	N	10.0	26.7	46.0	
0.850000	18.8	1000.000	9.000	GND	N	10.0	27.2	46.0	
1.452000	15.4	1000.000	9.000	GND	N	10.1	30.6	46.0	
24.013000	25.0	1000.000	9.000	GND	N	10.8	25.0	50.0	

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



◆ Test condition: Component signal output mode (With #2 AC/DC Adapter: EADP-30PB B)

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	34.5	1000.000	9.000	GND	L1	10.0	31.6	66.0	
0.171000	44.1	1000.000	9.000	GND	L1	10.0	20.7	64.8	
0.248000	35.0	1000.000	9.000	GND	L1	10.0	26.6	61.6	
0.458000	31.0	1000.000	9.000	GND	L1	10.0	25.7	56.7	
0.556000	28.5	1000.000	9.000	GND	L1	10.0	27.5	56.0	
0.857000	25.6	1000.000	9.000	GND	L1	10.0	30.4	56.0	
2.082000	22.2	1000.000	9.000	GND	L1	10.1	33.8	56.0	
3.034000	23.6	1000.000	9.000	GND	L1	10.1	32.4	56.0	

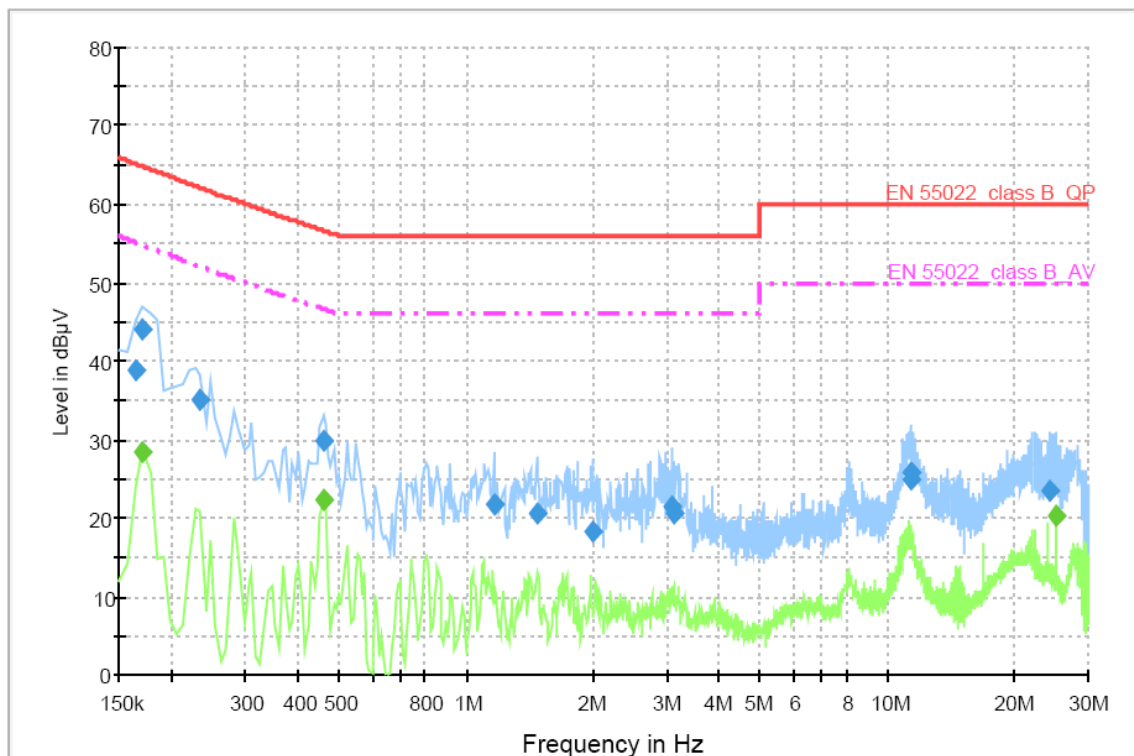
Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.171000	32.1	1000.000	9.000	GND	L1	10.0	22.8	54.8	
0.458000	23.4	1000.000	9.000	GND	L1	10.0	23.3	46.7	
0.556000	19.8	1000.000	9.000	GND	L1	10.0	26.2	46.0	
1.102000	18.5	1000.000	9.000	GND	L1	10.0	27.5	46.0	
1.473000	15.6	1000.000	9.000	GND	L1	10.1	30.4	46.0	
3.258000	15.4	1000.000	9.000	GND	L1	10.1	30.6	46.0	
11.280000	19.4	1000.000	9.000	GND	L1	10.5	30.6	50.0	
24.013000	21.3	1000.000	9.000	GND	L1	11.2	28.7	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
0.164000	38.7	1000.000	9.000	GND	N	10.0	26.5	65.2	
0.171000	44.0	1000.000	9.000	GND	N	10.0	20.8	64.8	
0.234000	35.0	1000.000	9.000	GND	N	10.0	27.1	62.1	
0.458000	29.9	1000.000	9.000	GND	N	10.0	26.8	56.7	
1.165000	21.6	1000.000	9.000	GND	N	10.1	34.4	56.0	
1.473000	20.5	1000.000	9.000	GND	N	10.1	35.5	56.0	
2.005000	18.3	1000.000	9.000	GND	N	10.1	37.7	56.0	
3.090000	21.4	1000.000	9.000	GND	N	10.1	34.6	56.0	
3.125000	20.7	1000.000	9.000	GND	N	10.1	35.3	56.0	
11.322000	24.8	1000.000	9.000	GND	N	10.4	35.2	60.0	
11.343000	25.7	1000.000	9.000	GND	N	10.4	34.3	60.0	
24.454000	23.4	1000.000	9.000	GND	N	10.8	36.6	60.0	

Final Measurement Detector 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)	Comment
0.171000	28.5	1000.000	9.000	GND	N	10.0	26.3	54.8	
0.458000	22.2	1000.000	9.000	GND	N	10.0	24.5	46.7	
25.315000	20.4	1000.000	9.000	GND	N	10.8	29.6	50.0	

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



6. Radiated Emission

6.1 Operating Environment

Temperature : 20 °C
Relative Humidity : 46 % 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	Uncertainty	Remark
Radiated emission (30 MHz ~ 300 MHz, 3 m, Vertical)	± 3.54 dB	Confidence levels of 95 % (k=2)
Radiated emission (30 MHz ~ 300 MHz, 3 m, Horizontal)	± 3.49 dB	Confidence levels of 95 % (k=2)
Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Vertical)	± 3.85 dB	Confidence levels of 95 % (k=2)
Radiated emission (300 MHz ~ 1 000 MHz, 3 m, Horizontal)	± 3.76 dB	Confidence levels of 95 % (k=2)
Radiated emission (30 MHz ~ 300 MHz, 10 m, Vertical)	± 3.21 dB	Confidence levels of 95 % (k=2)
Radiated emission (30 MHz ~ 300 MHz, 10 m, Horizontal)	± 3.32 dB	Confidence levels of 95 % (k=2)
Radiated emission (300 MHz ~ 1 000 MHz, 10 m, Vertical)	± 3.77 dB	Confidence levels of 95 % (k=2)
Radiated emission (300 MHz ~ 1 000 MHz, 10 m, Horizontal)	± 3.84 dB	Confidence levels of 95 % (k=2)



6.4 Limit

Frequency (MHz)	FCC Limit @ 3 m. dB 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
■ - ESI	Rohde & Schwarz	EMI test receiver	830482/010	12. 11. 2010
■ - VULB9160	Schwarzbeck	Broadband Test Antenna	3099	07. 21. 2011
■ - BBHA9120D	Schwarzbeck	Horn ANT	597	12. 18. 2010
■ - 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

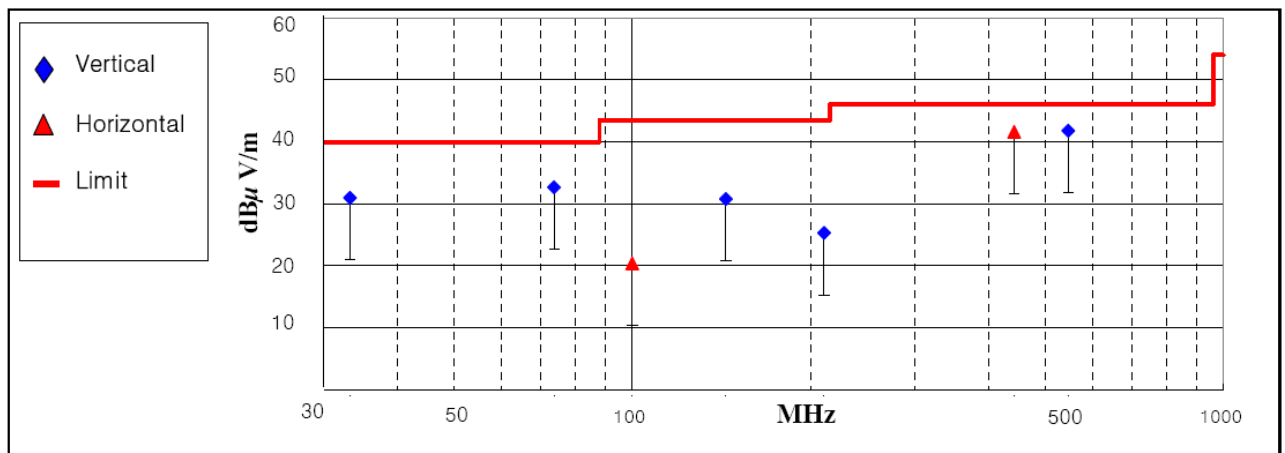


6.6 Test data for Radiated Emission

- Test Date : January 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 500 MHz and 1 000 MHz (333 MHz). The measurement was made up to 2 000 MHz.

- ◆ Operating Condition: Analog signal output mode (With #1 AC/DC Adapter: PA-1031-1)
Detector mode: Quasi- peak detector mode

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)	(°)
33.30	17.15	11.88	1.95	30.98	40.00	9.02	V	100	140
73.71	20.51	9.40	2.73	32.64	40.00	7.36	V	100	179
100.01	7.90	9.45	3.06	20.41	43.50	23.09	H	200	270
144.01	14.42	12.72	3.62	30.76	43.50	12.74	V	100	0
211.11	11.09	9.77	4.44	25.30	43.50	18.20	V	100	29
442.25	17.53	16.87	7.20	41.60	46.00	4.40	H	200	133
546.00	16.16	18.51	7.13	41.80	46.00	4.20	V	104	264

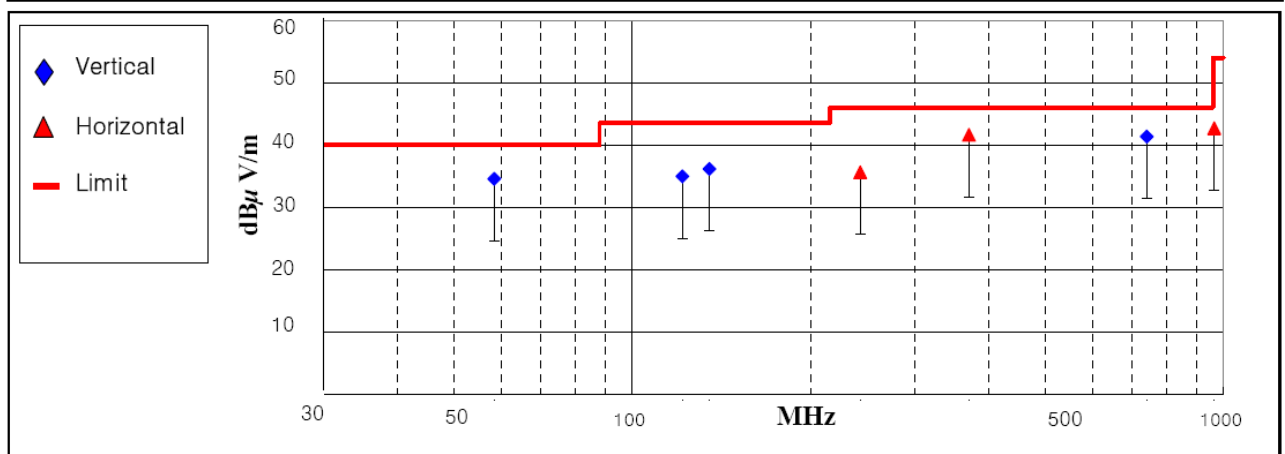


< Fig 16. Radiated emission result (30 MHz ~ 1 000 MHz)>



- ◆ Operating Condition: HDMI signal output mode (With #1 AC/DC Adapter: PA-1031-1)
Detector mode: Quasi- peak detector mode

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)	(°)
58.40	19.93	12.13	2.48	34.54	40.00	5.46	V	100	76
121.50	20.10	11.48	3.35	34.93	43.50	8.57	V	100	160
135.00	20.26	12.36	3.51	36.13	43.50	7.37	V	100	136
243.00	19.49	11.24	4.86	35.59	46.00	10.41	H	200	98
370.90	19.57	14.89	7.14	41.60	46.00	4.40	H	113	83
741.75	10.56	22.54	8.25	41.35	46.00	4.65	V	100	179
964.40	7.48	25.58	9.62	42.68	54.00	11.32	H	100	111

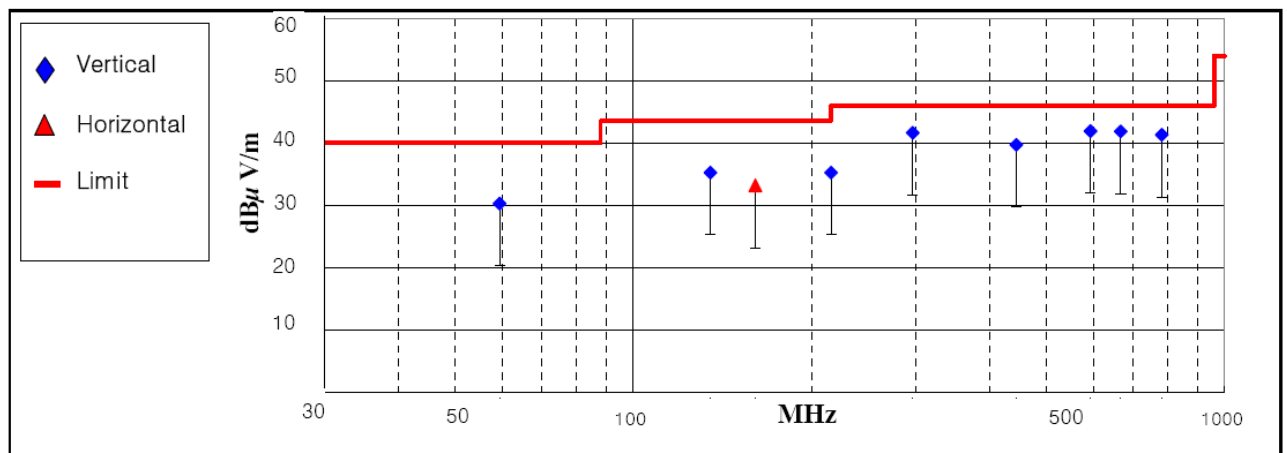


< Fig 17. Radiated emission result (30 MHz ~ 1 000 MHz)>



- ◆ Operating Condition: Component signal output mode (With #1 AC/DC Adapter: PA-1031-1)
Detector mode: Quasi- peak detector mode

Frequency (MHz)	Measurement Level				Limit (dB μ V/m)	Margin (dB)	Positioning System		
	Reading	Antenna	Cable	Test Result			Pol.	Height	Angle
	Value(dB μ V)	Factor(dB/m)	Loss(dB)	(dB μ V/m)			(H/V)	(cm)	(°)
59.40	15.66	12.09	2.50	30.25	40.00	9.75	V	100	270
135.00	19.34	12.36	3.51	35.21	43.50	8.29	V	100	0
160.90	16.55	12.79	3.83	33.17	43.50	10.33	H	250	90
216.00	20.71	10.00	4.50	35.21	46.00	10.79	V	103	180
297.00	22.84	13.18	5.58	41.60	46.00	4.40	V	110	180
444.45	15.56	16.94	7.19	39.69	46.00	6.31	V	150	180
593.45	14.41	20.11	7.38	41.90	46.00	4.10	V	110	175
667.60	12.81	21.22	7.80	41.83	46.00	4.17	V	110	270
783.00	9.76	23.04	8.50	41.30	46.00	4.70	V	100	150

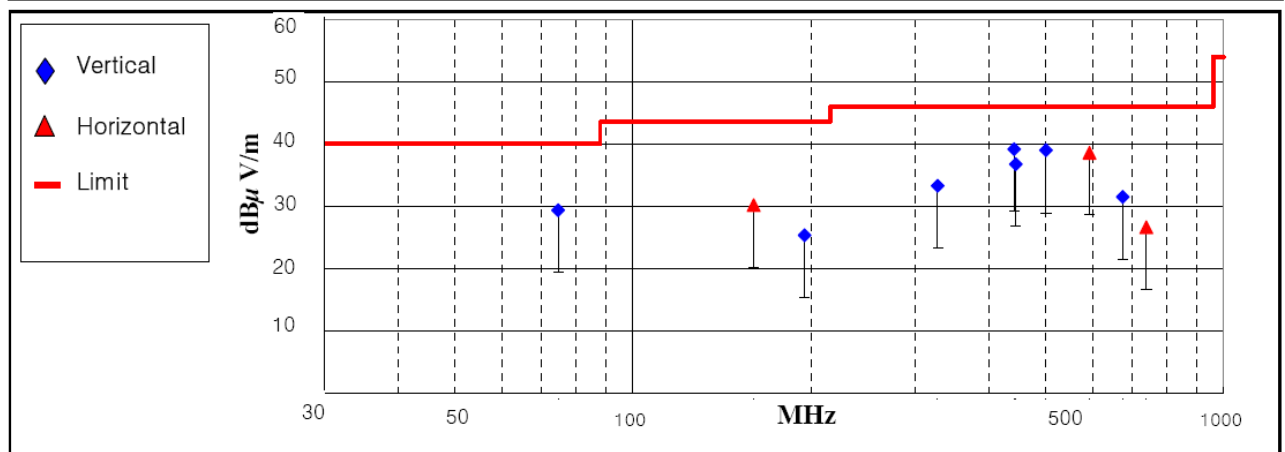


< Fig 18. Radiated emission result (30 MHz ~ 1 000 MHz)>



- ◆ Operating Condition: Analog signal output mode (With #2 AC/DC Adapter: EADP-30PB B)
Detector mode: Quasi- peak detector mode

Frequency (MHz)	Measurement Level				Limit (dB μ V/m)	Margin (dB)	Positioning System		
	Reading	Antenna	Cable	Test Result			Pol.	Height	Angle
	Value(dB μ V)	Factor(dB/m)	Loss(dB)	(dB μ V/m)			(H/V)	(cm)	(°)
74.75	17.39	9.18	2.75	29.32	40.00	10.68	V	100	180
160.09	13.52	12.84	3.82	30.18	43.50	13.32	H	269	165
195.36	11.27	9.84	4.22	25.33	43.50	18.17	V	100	90
328.14	12.91	13.94	6.40	33.25	46.00	12.75	V	175	124
441.78	15.10	16.85	7.20	39.15	46.00	6.85	V	195	100
444.61	12.61	16.95	7.19	36.75	46.00	9.25	V	100	145
500.05	14.40	17.54	7.01	38.95	46.00	7.05	V	150	95
592.68	11.10	20.08	7.37	38.55	46.00	7.45	H	200	247
674.59	2.37	21.29	7.83	31.49	46.00	14.51	V	132	50
740.05	-4.16	22.50	8.24	26.58	46.00	19.42	H	199	112

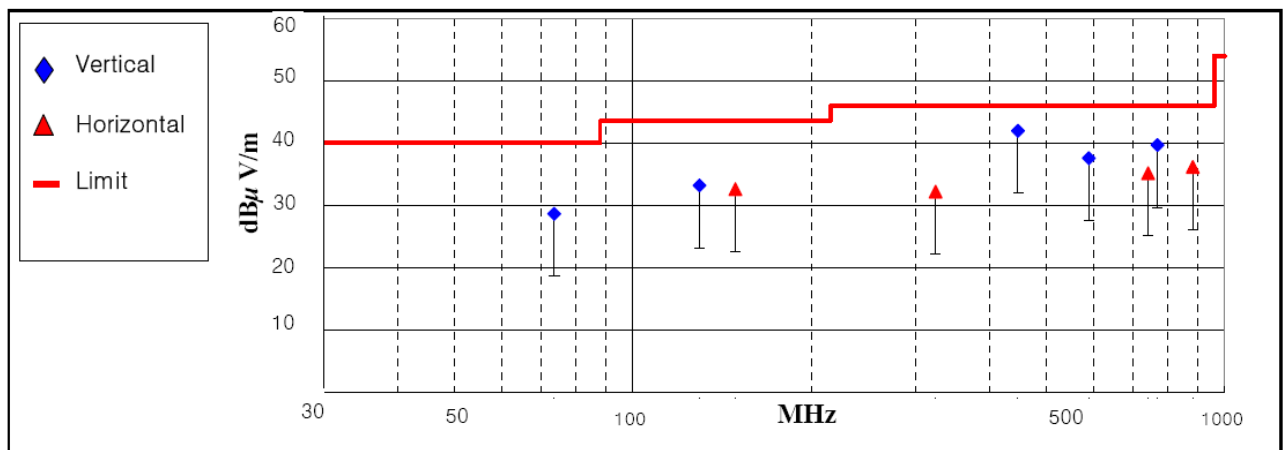


< Fig 19. Radiated emission result (30 MHz ~ 1 000 MHz)>



- ◆ Operating Condition: HDMI signal output mode (With #2 AC/DC Adapter: EADP-30PB B)
Detector mode: Quasi- peak detector mode

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)	(°)
73.63	16.44	9.42	2.73	28.59	40.00	11.41	V	120	180
129.58	17.69	12.01	3.45	33.15	43.50	10.35	V	100	30
149.06	16.13	12.76	3.68	32.57	43.50	10.93	H	200	100
324.69	12.00	13.86	6.31	32.17	46.00	13.83	H	219	90
447.25	17.73	17.03	7.19	41.95	46.00	4.05	V	132	10
589.36	10.23	19.97	7.36	37.56	46.00	8.44	V	112	145
742.01	4.33	22.55	8.26	35.14	46.00	10.86	H	254	28
769.52	8.29	22.92	8.42	39.63	46.00	6.37	V	100	347
883.47	3.02	24.03	9.07	36.12	46.00	9.88	H	212	41

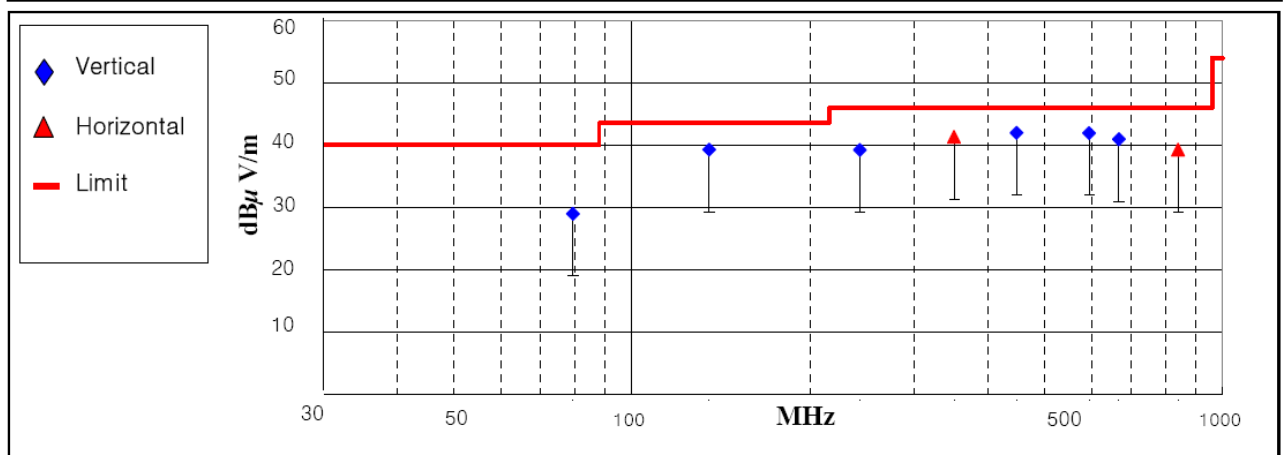


< Fig 20. Radiated emission result (30 MHz ~ 1 000 MHz)>



- ◆ Operating Condition: Component signal output mode (With #2 AC/DC Adapter: EADP 30PB B)
Detector mode: Quasi- peak detector mode

Frequency (MHz)	Measurement Level				Limit (dB μ V/m)	Margin (dB)	Positioning System		
	Reading	Antenna	Cable	Test Result			Pol.	Height	Angle
	Value(dB μ V)	Factor(dB/m)	Loss(dB)	(dB μ V/m)			(H/V)	(cm)	(°)
79.51	17.98	8.13	2.84	28.95	40.00	11.05	V	121	82
135.12	23.37	12.37	3.51	39.25	43.50	4.25	V	100	157
243.11	23.08	11.24	4.86	39.18	46.00	6.82	V	142	100
351.01	19.79	14.48	7.01	41.28	46.00	4.72	H	259	355
447.65	17.73	17.04	7.18	41.95	46.00	4.05	V	100	120
593.75	14.40	20.12	7.38	41.90	46.00	4.10	V	124	60
667.63	11.93	21.22	7.80	40.95	46.00	5.05	V	180	90
840.12	6.86	23.58	8.81	39.25	46.00	6.75	H	260	145

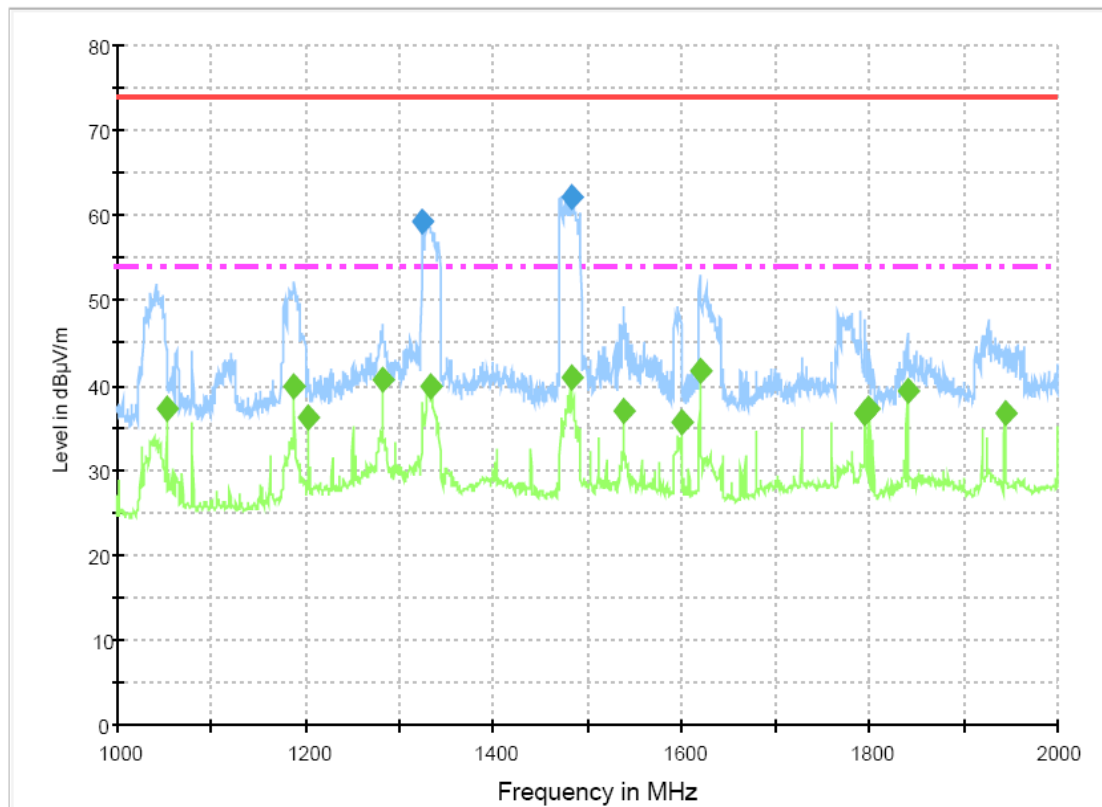


< Fig 21. Radiated emission result (30 MHz ~ 1 000 MHz)>



- ◆ Operating Condition: Analog signal output mode (With #1 AC/DC Adapter: PA-1031-1)
Detector mode: Peak detector mode / Average detector mode

FCC_ESIB_Preamplifier_RE with Scans



Final Result 1

Frequency (MHz)	MaxPeak-MaxHold (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
1324.800000	59.3	100.0	V	180.0	-14.9	14.7	74.0	
1482.400000	62.1	100.0	H	180.0	-14.8	11.9	74.0	

Final Result 2

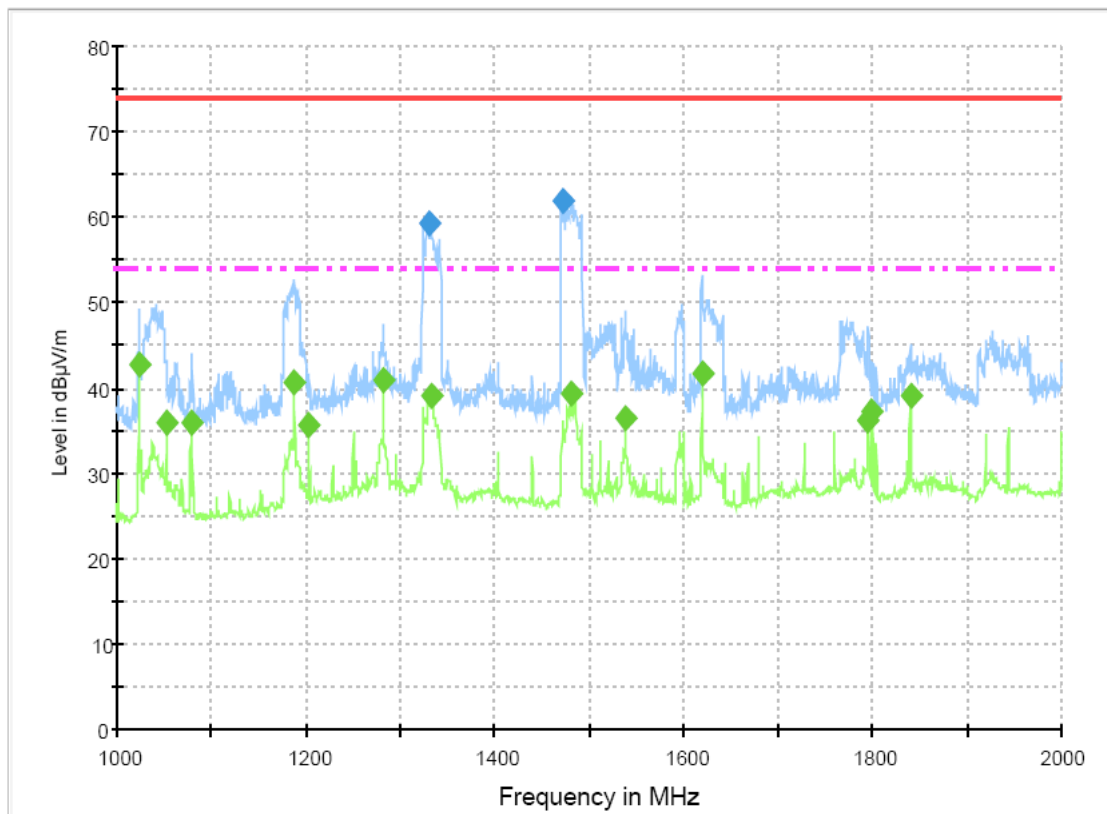
Frequency (MHz)	Average-MaxHold (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
1052.400000	37.3	200.0	H	270.0	-16.4	16.7	54.0	
1188.000000	40.0	100.0	H	90.0	-15.9	14.0	54.0	
1202.800000	36.2	100.0	V	90.0	-15.8	17.8	54.0	
1282.400000	40.6	100.0	V	180.0	-15.1	13.4	54.0	
1334.000000	39.9	100.0	V	180.0	-14.9	14.1	54.0	
1482.400000	40.9	100.0	H	180.0	-14.8	13.1	54.0	
1539.200000	37.1	200.0	V	0.0	-14.6	16.9	54.0	
1600.000000	35.6	100.0	H	180.0	-14.4	18.4	54.0	
1620.000000	41.7	100.0	V	0.0	-14.4	12.3	54.0	
1795.600000	36.8	200.0	V	0.0	-13.9	17.2	54.0	
1800.000000	37.3	100.0	V	180.0	-13.9	16.7	54.0	
1840.000000	39.2	200.0	H	180.0	-13.7	14.8	54.0	
1944.000000	36.8	100.0	H	180.0	-13.2	17.2	54.0	

< Fig 22. Radiated emission result (1 000 MHz ~ 2 000 MHz)>



- ◆ Operating Condition: HDMI signal output mode (With #1 AC/DC Adapter: PA-1031-1)
Detector mode: Peak detector mode / Average detector mode

FCC_ESIB_Preamplifier with Scans



Final Result 1

Frequency (MHz)	MaxPeak-MaxHold (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
1331.200000	59.4	100.0	V	180.0	-14.9	14.6	74.0	
1472.000000	61.8	200.0	H	180.0	-14.8	12.2	74.0	

Final Result 2

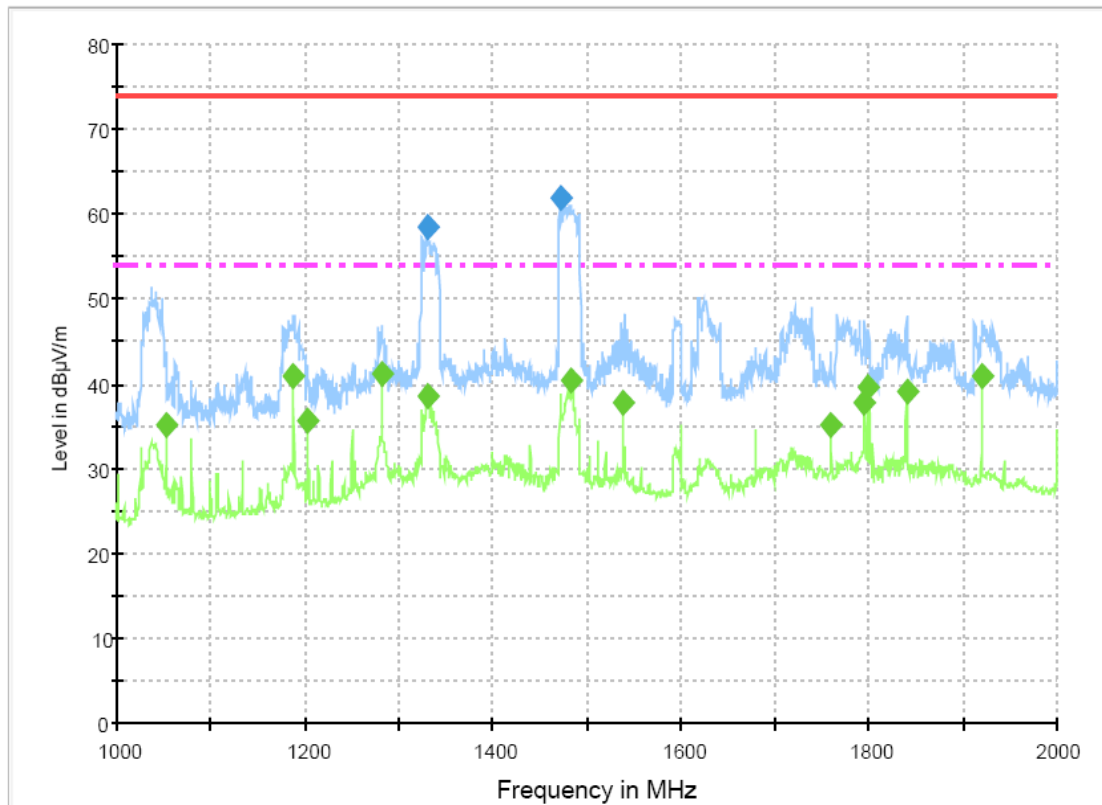
Frequency (MHz)	Average-MaxHold (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
1023.600000	42.8	200.0	V	0.0	-16.5	11.2	54.0	
1052.400000	36.0	200.0	H	180.0	-16.4	18.0	54.0	
1080.000000	35.9	100.0	V	180.0	-16.2	18.1	54.0	
1188.000000	40.6	100.0	H	90.0	-15.9	13.4	54.0	
1202.800000	35.7	100.0	V	90.0	-15.8	18.3	54.0	
1282.400000	40.8	100.0	V	180.0	-15.1	13.2	54.0	
1334.000000	39.1	100.0	V	180.0	-14.9	14.9	54.0	
1482.000000	39.3	100.0	H	270.0	-14.8	14.7	54.0	
1539.200000	36.5	200.0	V	0.0	-14.6	17.5	54.0	
1620.000000	41.6	200.0	V	0.0	-14.4	12.4	54.0	
1795.600000	36.1	200.0	V	0.0	-13.9	17.9	54.0	
1800.000000	37.3	100.0	V	180.0	-13.9	16.7	54.0	
1840.000000	39.2	200.0	H	180.0	-13.7	14.8	54.0	

< Fig 23. Radiated emission result (1 000 MHz ~ 2 000 MHz)>



- ◆ Operating Condition: Component signal output mode (With #1 AC/DC Adapter: PA-1031-1)
Detector mode: Peak detector mode / Average detector mode

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Final Result 1

Frequency (MHz)	MaxPeak-MaxHold (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
1331.600000	58.6	100.0	V	180.0	-14.9	15.4	74.0	
1472.000000	61.9	100.0	H	180.0	-14.8	12.1	74.0	

Final Result 2

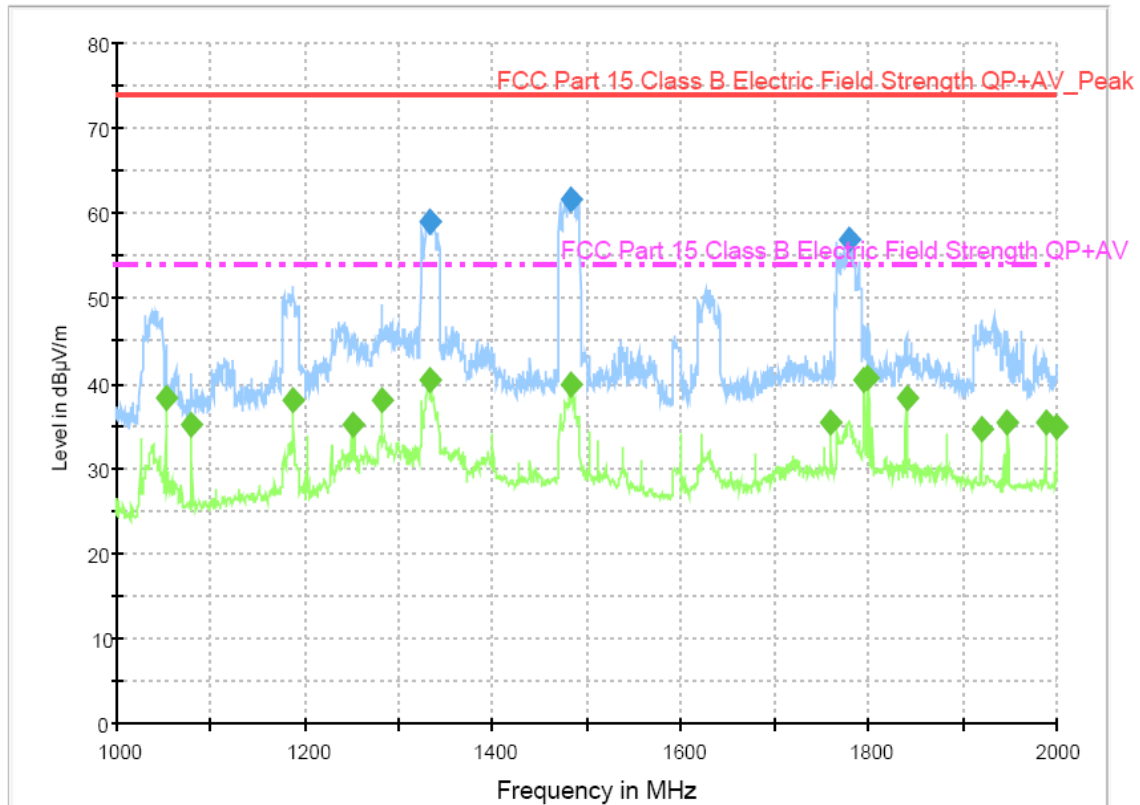
Frequency (MHz)	Average-MaxHold (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
1052.400000	35.3	200.0	H	180.0	-16.4	18.7	54.0	
1188.000000	40.9	100.0	H	90.0	-15.9	13.1	54.0	
1202.800000	35.6	100.0	V	90.0	-15.8	18.4	54.0	
1282.400000	41.3	100.0	V	180.0	-15.1	12.7	54.0	
1331.200000	38.6	100.0	V	180.0	-14.9	15.4	54.0	
1482.400000	40.4	100.0	H	180.0	-14.8	13.6	54.0	
1538.800000	37.7	200.0	V	0.0	-14.6	16.3	54.0	
1760.000000	35.2	100.0	V	180.0	-14.1	18.8	54.0	
1795.600000	37.7	200.0	V	0.0	-13.9	16.3	54.0	
1800.000000	39.5	100.0	V	180.0	-13.9	14.5	54.0	
1840.000000	39.0	200.0	H	180.0	-13.7	15.0	54.0	
1920.400000	40.9	200.0	V	0.0	-13.3	13.1	54.0	

< Fig 24. Radiated emission result (1 000 MHz ~ 2 000 MHz)>



- ◆ Operating Condition: Analog signal output mode (With #2 AC/DC Adapter: EADP-30PB B)
Detector mode: Peak detector mode / Average detector mode

FCC_ESIB_Preamplifier_RE with Scans



Final Result 1

Frequency (MHz)	MaxPeak-MaxHold (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
1333.600000	59.0	100.0	H	180.0	-14.9	15.0	74.0	
1482.800000	61.7	100.0	V	270.0	-14.8	12.3	74.0	
1780.000000	57.0	100.0	H	180.0	-14.0	17.0	74.0	

Final Result 2

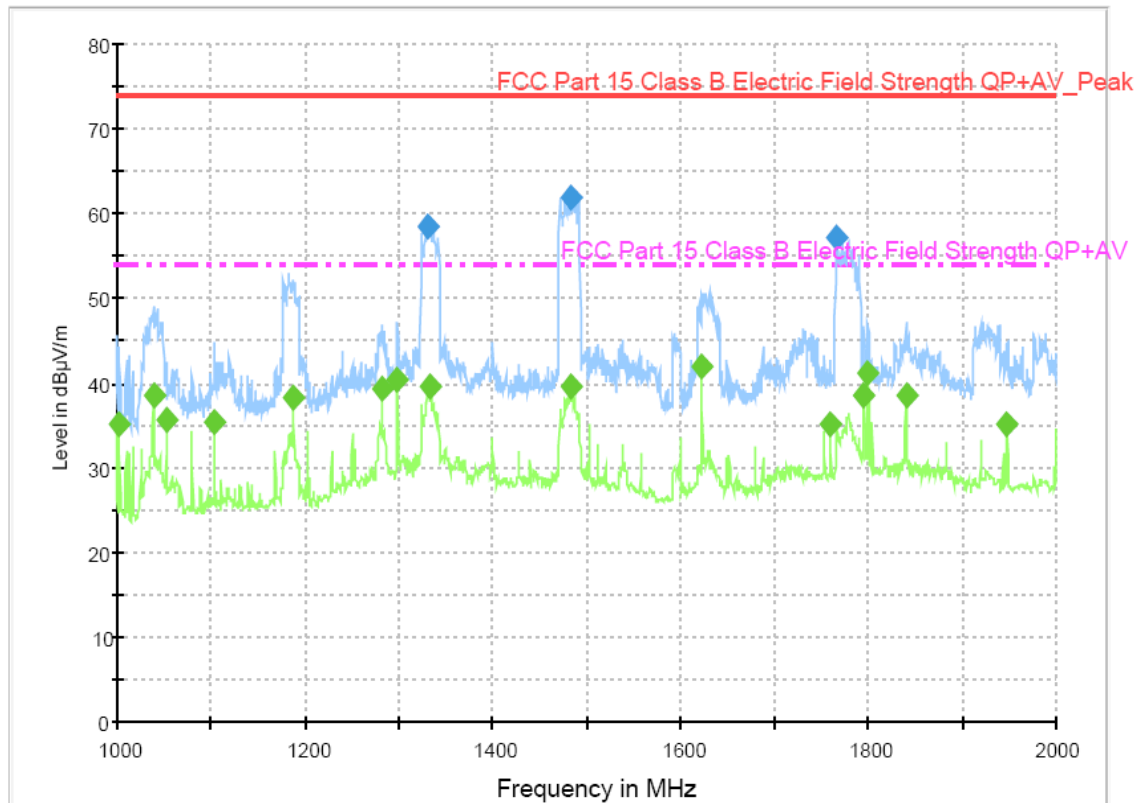
Frequency (MHz)	Average-MaxHold (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
1052.400000	38.2	200.0	V	270.0	-16.4	15.8	54.0	
1080.000000	35.0	200.0	V	270.0	-16.2	19.0	54.0	
1188.000000	38.1	100.0	V	90.0	-15.9	15.9	54.0	
1250.800000	35.1	100.0	V	180.0	-15.4	18.9	54.0	
1282.400000	38.0	100.0	H	180.0	-15.1	16.0	54.0	
1334.000000	40.3	100.0	H	180.0	-14.9	13.7	54.0	
1482.400000	39.8	100.0	V	270.0	-14.8	14.2	54.0	
1760.000000	35.5	200.0	V	180.0	-14.1	18.5	54.0	
1795.600000	40.3	100.0	H	0.0	-13.9	13.7	54.0	
1800.000000	40.6	100.0	H	180.0	-13.9	13.4	54.0	
1840.000000	38.4	200.0	V	180.0	-13.7	15.6	54.0	
1920.000000	34.5	100.0	V	180.0	-13.3	19.5	54.0	
1948.000000	35.4	100.0	H	180.0	-13.1	18.6	54.0	
1988.400000	35.3	100.0	H	0.0	-12.8	18.7	54.0	
2000.000000	34.9	100.0	V	180.0	-12.7	19.1	54.0	

< Fig 25. Radiated emission result (1 000 MHz ~ 2 000 MHz)>



- ◆ Operating Condition: HDMI signal output mode (With #2 AC/DC Adapter: EADP-30PB B)
Detector mode: Peak detector mode / Average detector mode

FCC_ESIB_Preamplifier_RE with Scans



Final Result 1

Frequency (MHz)	MaxPeak-MaxHold (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
1331.600000	58.6	100.0	H	180.0	-14.9	15.4	74.0	
1483.600000	61.8	100.0	V	180.0	-14.8	12.2	74.0	
1766.400000	57.2	100.0	H	180.0	-14.0	16.8	74.0	

Final Result 2

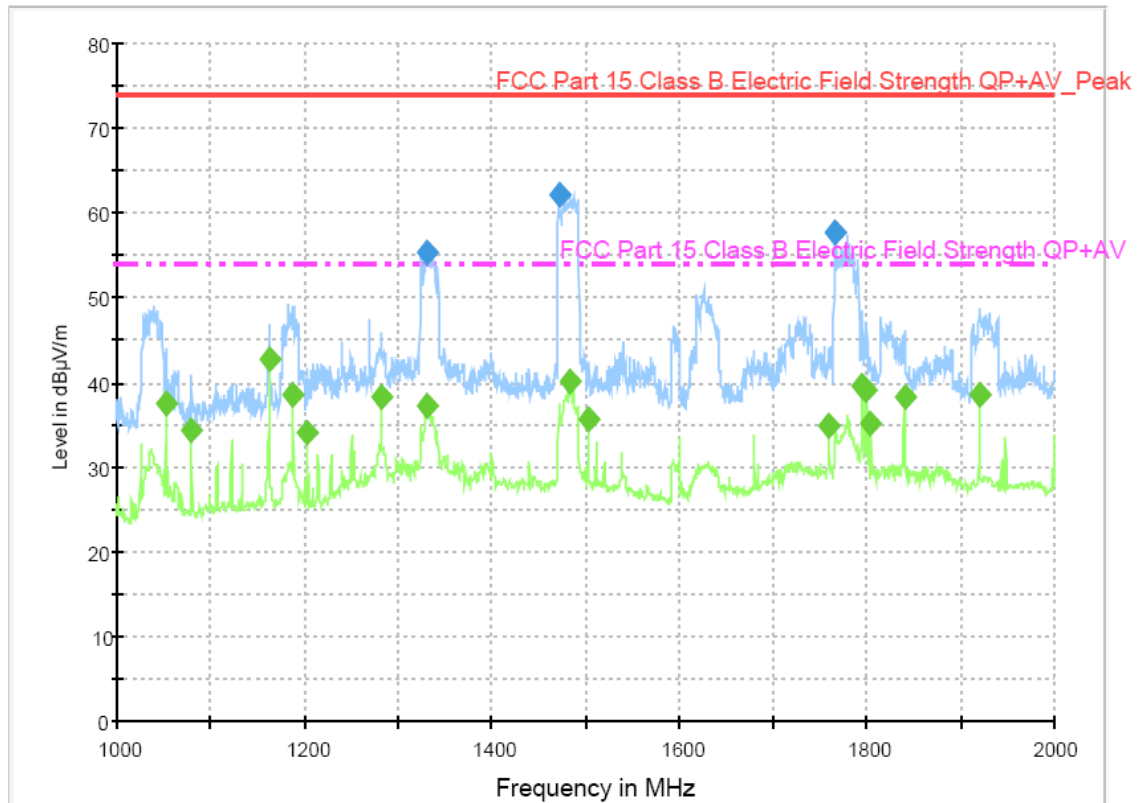
Frequency (MHz)	Average-MaxHold (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
1002.800000	35.3	200.0	H	0.0	-16.6	18.7	54.0	
1038.800000	38.7	200.0	H	180.0	-16.4	15.3	54.0	
1052.400000	35.7	200.0	V	270.0	-16.4	18.3	54.0	
1103.600000	35.5	200.0	H	0.0	-16.1	18.5	54.0	
1188.000000	38.3	100.0	V	90.0	-15.9	15.7	54.0	
1282.400000	39.4	100.0	V	180.0	-15.1	14.6	54.0	
1298.800000	40.4	200.0	H	180.0	-14.9	13.6	54.0	
1334.400000	39.6	100.0	H	180.0	-14.9	14.4	54.0	
1482.800000	39.5	100.0	V	180.0	-14.8	14.5	54.0	
1623.200000	42.0	200.0	H	0.0	-14.4	12.0	54.0	
1760.000000	35.1	200.0	V	180.0	-14.1	18.9	54.0	
1795.600000	38.6	100.0	H	0.0	-13.9	15.4	54.0	
1800.000000	41.2	100.0	H	180.0	-13.9	12.8	54.0	
1840.000000	38.5	200.0	V	180.0	-13.7	15.5	54.0	
1948.000000	35.2	100.0	H	90.0	-13.1	18.8	54.0	

< Fig 26. Radiated emission result (1 000 MHz ~ 2 000 MHz)>



- ◆ Operating Condition: Component signal output mode (With #2 AC/DC Adapter: EADP-30PB B)
Detector mode: Peak detector mode / Average detector mode

FCC_ESIB_Preamplifier with Scans



Final Result 1

Frequency (MHz)	MaxPeak-MaxHold (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
1331.200000	55.4	100.0	H	180.0	-14.9	18.6	74.0	
1472.000000	62.1	100.0	V	180.0	-14.8	11.9	74.0	
1766.800000	57.6	100.0	H	180.0	-14.0	16.4	74.0	

Final Result 2

Frequency (MHz)	Average-MaxHold (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)	Comment
1052.400000	37.6	200.0	V	270.0	-16.4	16.4	54.0	
1080.000000	34.5	100.0	V	270.0	-16.2	19.5	54.0	
1162.800000	42.6	200.0	V	270.0	-16.0	11.4	54.0	
1188.000000	38.6	100.0	V	90.0	-15.9	15.4	54.0	
1202.800000	34.0	200.0	H	0.0	-15.8	20.0	54.0	
1282.400000	38.3	100.0	V	180.0	-15.1	15.7	54.0	
1330.800000	37.3	100.0	H	180.0	-14.9	16.7	54.0	
1482.800000	40.1	100.0	V	180.0	-14.8	13.9	54.0	
1503.600000	35.8	200.0	H	180.0	-14.8	18.2	54.0	
1760.000000	34.8	200.0	V	180.0	-14.1	19.2	54.0	
1795.600000	39.7	100.0	H	0.0	-13.9	14.3	54.0	
1800.000000	39.1	100.0	H	180.0	-13.9	14.9	54.0	
1804.400000	35.2	200.0	H	0.0	-13.9	18.8	54.0	
1840.000000	38.2	200.0	V	180.0	-13.7	15.8	54.0	
1920.400000	38.7	200.0	H	0.0	-13.3	15.3	54.0	

< Fig 27. 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. Wireless Media Box (Model Name: AN-WL100W)** was complies with §15.107 and 15.109 of the FCC Rules.