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: May 2, 2012

Order Number: GETEC-C1-12-128

Test Report Number: GETEC-E3-12-048

Test Site: GUMI COLLEGE EMC CENTER

FCC Registration Number: (100749, 443957)

FCC ID. : BEJPA70GJE

Applicant : LG Electronics Inc.

Rule Part(s)	**: FCC Part 15 Subpart B**
Equipment Class	**: Class B computing device peripheral (JBP)**
EUT Type	**: DLP PROJECTOR**
Type of Authority	**: Certification**
Model Name	**: PA70G-JE**
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 vest 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,

Soon Hoon

Soon-Hoon Jeong / Associate Engineer
GUMI COLLEGE EMC CENTER

Reviewed by,

Jae-Hoon Jeong, Senior Engineer
GUMI COLLEGE EMC CENTER

CONTENTS

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

1. General Information

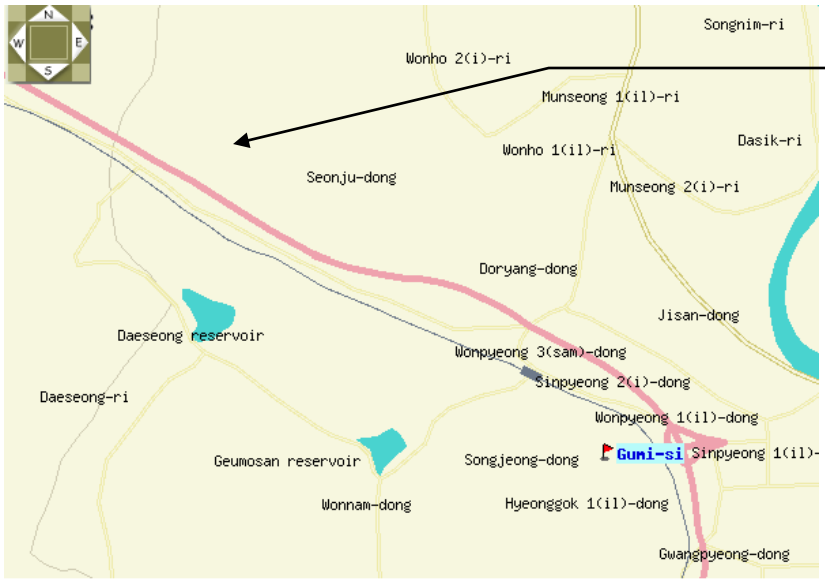
Applicant: LG Electronics Inc.
Applicant Address: 19-1, Cheongho-ri, Jinwi-myeon, Pyeongteak-si, Gyeonggi-do, Korea.
Manufacturer: LG Electronics Inc.
Manufacturer Address: 19-1, Cheongho-ri, Jinwi-myeon, Pyeongteak-si, Gyeonggi-do, Korea.
Contact Person: Mr. Do-Hyung Kim, Chief research engineer
Tel Number: +82-31-610-9623

- **FCC ID.** BEJPA70GJE
- **EUT Type** DLP PROJECTOR
- **Model Name** PA70G-JE
- **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 23 ~ 25, 2012
- **Place of Test** **GUMI COLLEGE EMC CENTER** (FCC Registration Number: 100749, 443957) 407, Bugok-Dong, Gumi-City, Gyungbok, 730-711, Republic of Korea
- **Test Report Number** GETEC-E3-12-048
- **Dates of Issue** May 2, 2012

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.**
DLP PROJECTOR (Model Name: PA70G-JE)

These measurement tests were conducted at **GUMI COLLEGE EMC CENTER**
The site address is 407, Bugok-Dong, Gumi-City, Gyungbok, 730-711, Republic of 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)



GUMI COLLEGE EMC CENTER
407, Bugok-Dong, Gumi-City,
Gyungbok, 730-711, Republic of Korea
Tel.: +82-54-440-1195
Fax: +82-54-440-1199

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.**
DLP PROJECTOR (Model Name: PA70G-JE) FCC ID.: BEJPA70GJE

MODELS	PA70G (PA70G-JE)	
Resolution (Pixel)	1280 (Horizontal) × 800 (Vertical)	
Aspect ratio	16:10 (Horizontal:Vertical)	
Panel size (mm)	11.623	
Projection distance (Video size)	0.64 m - 3.25 m (50.8 cm - 254.0 cm)	
Ratio of upward projection	100 %	
Working range of the remote control	6 m	
Video input	NTSC M / PAL-B, D, G, H, I / PAL M / PAL N / PAL 60	
AC-DC Adaptor	19.5 V ⎓ 7.18 A	
Audio Output	3W + 3W	
Height (mm)	Front Side	56.5 (without foot), 60.0 (with foot)
	Rear Side	44.0 (without foot), 47.5 (with foot)
Width (mm)	230.0	
Depth (mm)	170.0	
Weight (g)	1250	
USB Device	5 V, 0.5 A (Max.)	

-. Maximum Frequency Range : 667 MHz

3.2 Support Equipment / Cables used

3.2.1 Used Support Equipment

Description	Manufacturer	Model Name	S/N & FCC ID.
PC(Main board)	ASUSTEK COMPUTER INC.	P8H61	S/N: 0BG084-02014-MIBFE0-A05 FCC ID.: DoC
Video card	Digital Greentech Co., Ltd.	VX4850	S/N: LG1112056668 FCC ID.: DoC
PS2 keyboard	COMPAQ	166516-AD6	S/N: B13BBOR391006D FCC ID.: AQ6-23K15
USB mouse	Microsoft Corporation	1484	S/N: 0352700289761 FCC ID: DoC
DVD player	ILIKE ELECTRONICS CO., LTD.	CVX-3800 Full-HD	S/N: CVX380020110110493 FCC ID.: Verification
USB memory stick	SAMSUNG	SUM-PSB4	S/N: TBBB202478F FCC ID.: DoC
Headset	PHILIPS	SBC HL140	S/N: None. FCC ID.: N/A

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

3.2.2 System configuration

Description	Manufacturer	Model Name	S/N & FCC ID.
Adapter[1)]	Ampower Technology Co., Ltd.	AAS-00	S/N: None. FCC ID.: Verification
IR remote controller	LG Electronics Inc.	AKB73616401	S/N: None. FCC ID.: N/A

1) Input ratings: AC (100 – 240) V~, (50 – 60) Hz, 2.0 A / Output ratings: DC 19.5 V, 7.18 A

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	1.80 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
AV in cable	Connected to the EUT and DVD player	3.00 m shielded
Antenna cable	Connected to the EUT and digital TV pattern 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)

-. Projection mode

Radiated emission: 1 680 × 1 050 / 60 Hz (RGB: Analog, HDMI/DVI: Digital)

Conducted emission: 1 680 × 1 050 / 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
-. Continuous playback of 1 kHz audio file with winamp player
-. USB memory stick was connected to the USB port

"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

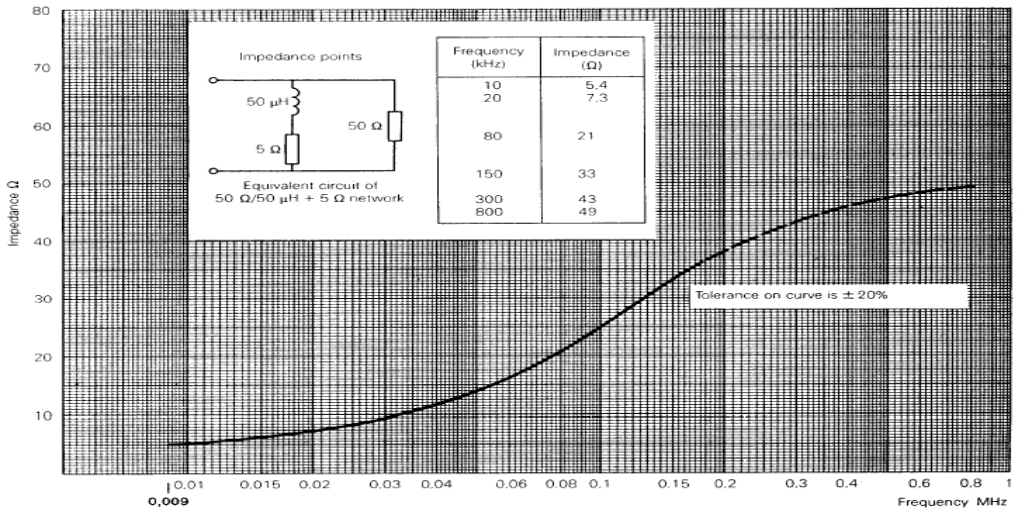


Fig 2. Impedance of LISN

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

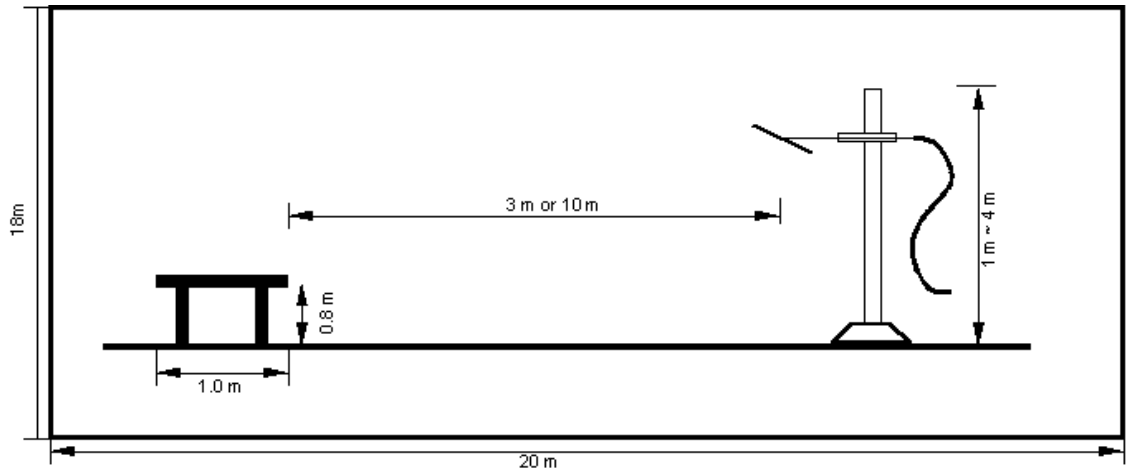


Fig 3. Dimensions of test site

5. Conducted Emission

5.1 Operating Environment

Temperature : 23.0 ℃
Relative Humidity : 40.0 % 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)	± 2.74 dB	Confidence level of approximately 95 % (k = 2)
Conducted emission (150 kHz ~ 30 MHz)	± 4.25 dB	Confidence level of approximately 95 % (k = 2)

5.4 Limit

RFI Conducted	FCC Limit(dB μV/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.		

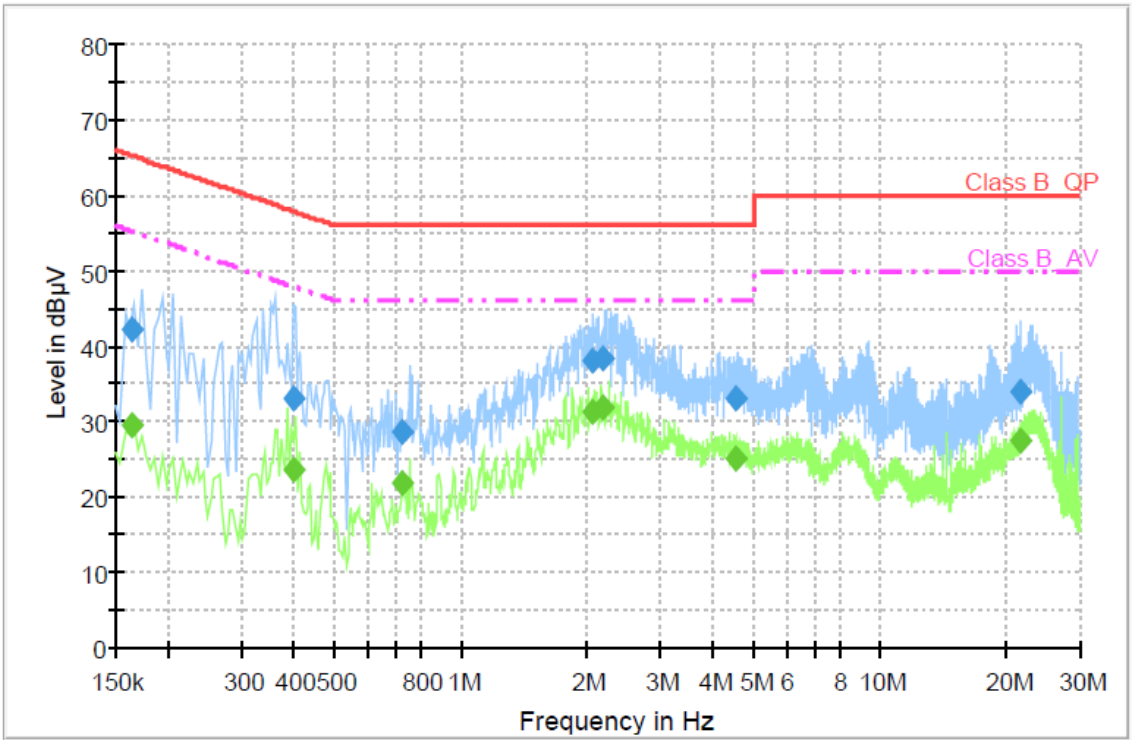
5.5 Test Equipment used

	Model Name	Manufacturer	Description	Serial Number	Due to Calibration
■ -	ESCS30	Rohde & Schwarz	EMI Test Receiver	839809/003	12. 05. 2012
■ -	ESH3-Z5	Rohde & Schwarz	LISN	838979/020	12. 07. 2012
■ -	ESH2-Z5	Rohde & Schwarz	LISN	829991/009	12. 07. 2012
☐ -	ENY81-CA6	Rohde & Schwarz	ISN	101573	10. 19. 2012

5.6 Test data for Conducted Emission

-. Test Date : April 25, 2012
-. Resolution Bandwidth : 9 kHz
-. Frequency Range : 0.15 MHz ~ 30 MHz
-. Line : L1: Live, N: Neutral

♦ Operating condition: 1 680 × 1 050 / 60 Hz(RGB: Analog)



Final Result 1

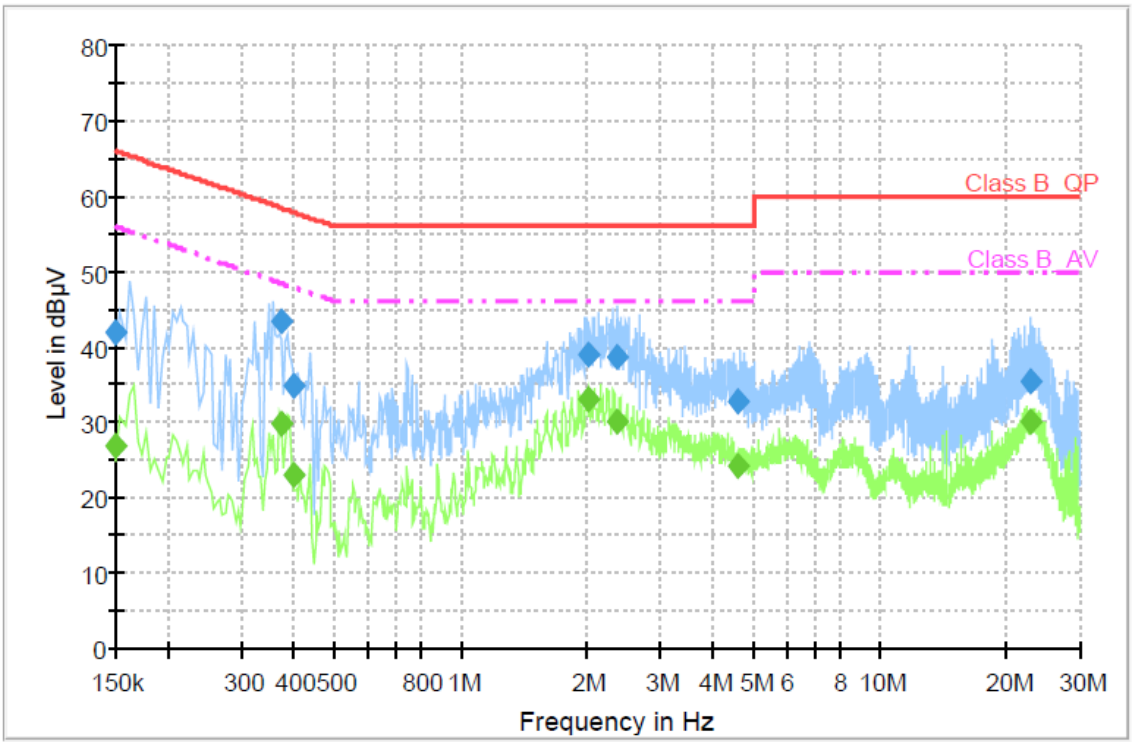
Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.164000	42.3	1000.0	9.000	GND	N	10.1	23.0	65.3	
0.400000	33.0	1000.0	9.000	GND	N	10.1	24.8	57.9	
0.724000	28.7	1000.0	9.000	GND	N	10.1	27.3	56.0	
2.064000	38.1	1000.0	9.000	GND	L1	10.2	17.9	56.0	
2.184000	38.4	1000.0	9.000	GND	L1	10.2	17.6	56.0	
4.524000	33.1	1000.0	9.000	GND	N	10.3	22.9	56.0	
21.620000	33.9	1000.0	9.000	GND	N	10.3	26.1	60.0	

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.164000	29.6	1000.0	9.000	GND	N	10.1	25.7	55.3	
0.400000	23.5	1000.0	9.000	GND	N	10.1	24.3	47.9	
0.724000	21.7	1000.0	9.000	GND	N	10.1	24.3	46.0	
2.064000	31.2	1000.0	9.000	GND	L1	10.2	14.8	46.0	
2.184000	31.9	1000.0	9.000	GND	L1	10.2	14.1	46.0	
4.524000	25.2	1000.0	9.000	GND	N	10.3	20.8	46.0	
21.620000	27.6	1000.0	9.000	GND	N	10.3	22.4	50.0	

< Fig 4. Conducted emission result >

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



Final Result 1

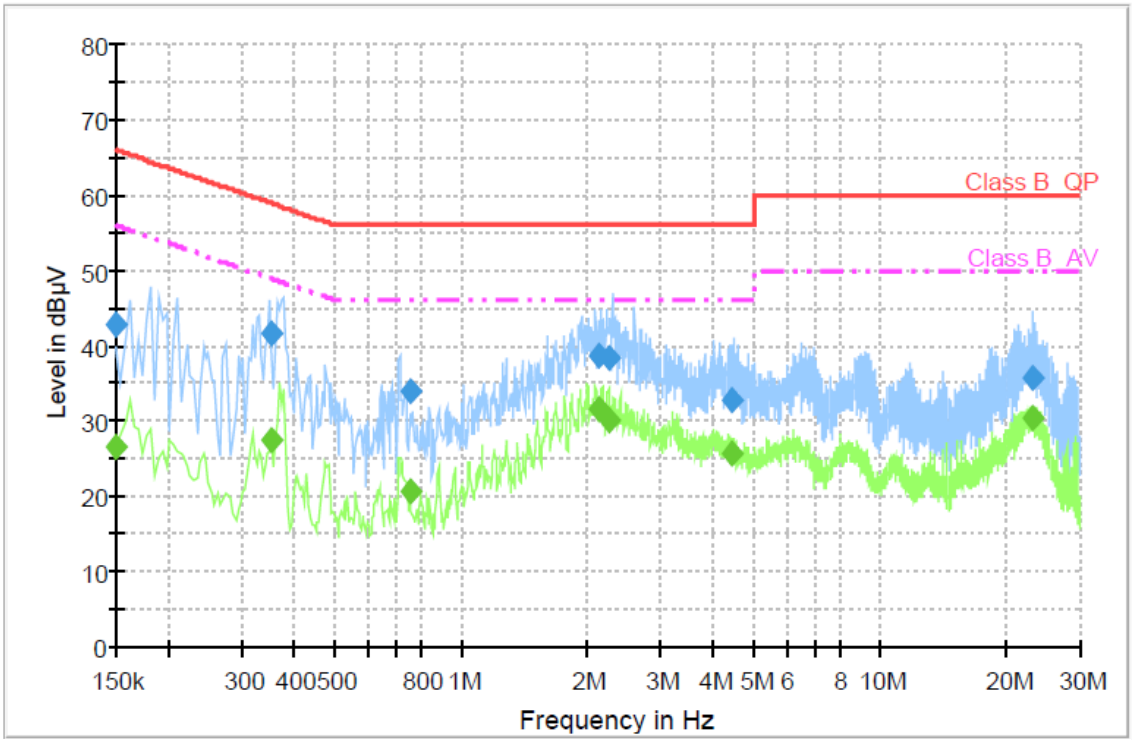
Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.150000	41.8	1000.0	9.000	GND	N	10.1	24.2	66.0	
0.372000	43.4	1000.0	9.000	GND	N	10.1	15.1	58.5	
0.400000	34.8	1000.0	9.000	GND	N	10.1	23.0	57.9	
2.008000	39.1	1000.0	9.000	GND	L1	10.2	16.9	56.0	
2.356000	38.5	1000.0	9.000	GND	L1	10.2	17.5	56.0	
4.596000	32.7	1000.0	9.000	GND	L1	10.3	23.3	56.0	
22.836000	35.4	1000.0	9.000	GND	L1	10.4	24.6	60.0	

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.150000	26.8	1000.0	9.000	GND	N	10.1	29.2	56.0	
0.372000	29.8	1000.0	9.000	GND	N	10.1	18.7	48.5	
0.400000	23.0	1000.0	9.000	GND	N	10.1	24.9	47.9	
2.008000	33.1	1000.0	9.000	GND	L1	10.2	12.9	46.0	
2.356000	30.1	1000.0	9.000	GND	L1	10.2	15.9	46.0	
4.596000	24.3	1000.0	9.000	GND	L1	10.3	21.7	46.0	
22.836000	30.3	1000.0	9.000	GND	L1	10.4	19.7	50.0	

< Fig 5. Conducted emission result >

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



Final Result 1

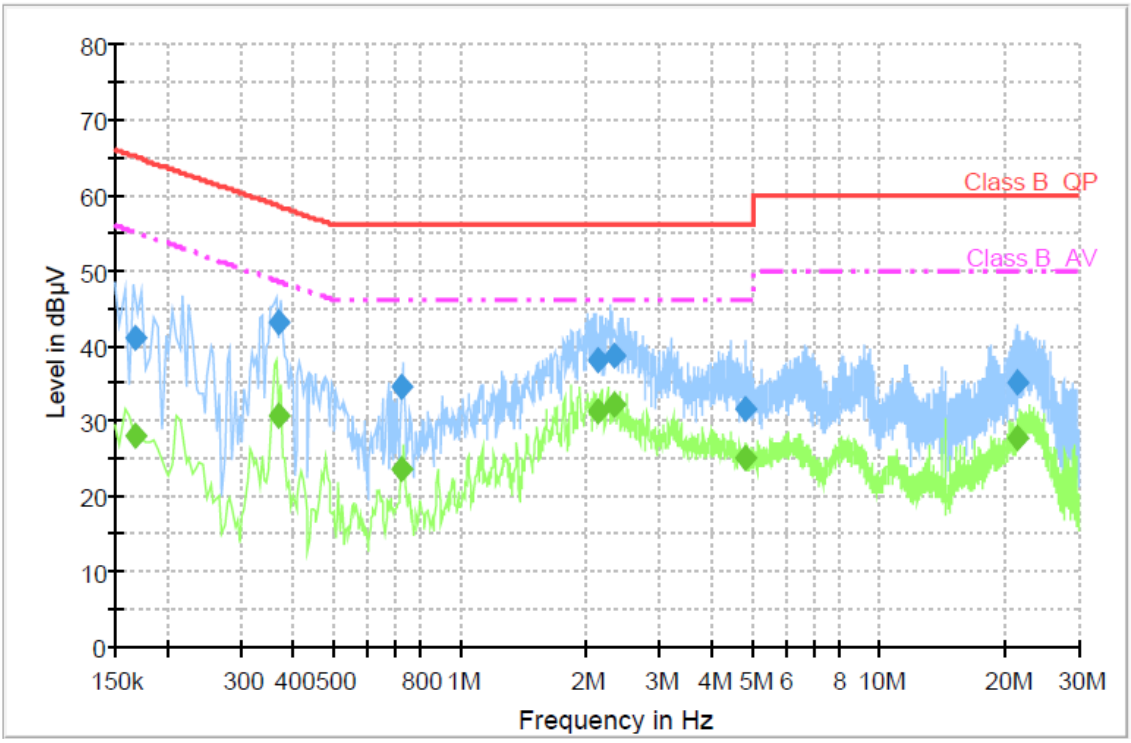
Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.150000	42.8	1000.0	9.000	GND	N	10.1	23.2	66.0	
0.352000	41.8	1000.0	9.000	GND	N	10.1	17.2	58.9	
0.756000	33.9	1000.0	9.000	GND	N	10.1	22.1	56.0	
2.144000	38.6	1000.0	9.000	GND	L1	10.2	17.4	56.0	
2.268000	38.4	1000.0	9.000	GND	L1	10.2	17.6	56.0	
4.420000	32.8	1000.0	9.000	GND	L1	10.3	23.2	56.0	
23.052000	35.8	1000.0	9.000	GND	L1	10.4	24.2	60.0	

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.150000	26.5	1000.0	9.000	GND	N	10.1	29.5	56.0	
0.352000	27.5	1000.0	9.000	GND	N	10.1	21.4	48.9	
0.756000	20.8	1000.0	9.000	GND	N	10.1	25.2	46.0	
2.144000	31.5	1000.0	9.000	GND	L1	10.2	14.5	46.0	
2.268000	30.1	1000.0	9.000	GND	L1	10.2	15.9	46.0	
4.420000	25.7	1000.0	9.000	GND	L1	10.3	20.3	46.0	
23.052000	30.4	1000.0	9.000	GND	L1	10.4	19.6	50.0	

< Fig 6. Conducted emission result >

♦ Operating condition: 1 680 × 1 050 / 60 Hz(HDMI/DVI: Digital)



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.168000	41.1	1000.0	9.000	GND	N	10.1	24.0	65.1	
0.368000	43.0	1000.0	9.000	GND	N	10.1	15.5	58.5	
0.724000	34.5	1000.0	9.000	GND	N	10.1	21.5	56.0	
2.144000	38.1	1000.0	9.000	GND	L1	10.2	17.9	56.0	
2.336000	38.8	1000.0	9.000	GND	L1	10.2	17.2	56.0	
4.812000	31.7	1000.0	9.000	GND	N	10.3	24.3	56.0	
21.316000	35.1	1000.0	9.000	GND	L1	10.4	24.9	60.0	

Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)	Comment
0.168000	27.9	1000.0	9.000	GND	N	10.1	27.2	55.1	
0.368000	30.7	1000.0	9.000	GND	N	10.1	17.9	48.5	
0.724000	23.5	1000.0	9.000	GND	N	10.1	22.5	46.0	
2.144000	31.2	1000.0	9.000	GND	L1	10.2	14.8	46.0	
2.336000	32.3	1000.0	9.000	GND	L1	10.2	13.7	46.0	
4.812000	25.0	1000.0	9.000	GND	N	10.3	21.0	46.0	
21.316000	27.8	1000.0	9.000	GND	L1	10.4	22.2	50.0	

< Fig 7. Conducted emission result >

6. Radiated Emission

6.1 Operating Environment

Temperature : 20.0 ℃
Relative Humidity : 58.0 % 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)	± 3.96 dB	Confidence level of approximately 95 % (k = 2)
Radiated emission (30 MHz ~ 300 MHz, 10 m, Horizontal)	± 3.44 dB	Confidence level of approximately 95 % (k = 2)
Radiated emission (300 MHz ~ 1 000 MHz, 10 m, Vertical)	± 3.74 dB	Confidence level of approximately 95 % (k = 2)
Radiated emission (300 MHz ~ 1 000 MHz, 10 m, Horizontal)	± 3.88 dB	Confidence level of approximately 95 % (k = 2)

6.4 Limit

Frequency (MHz)	FCC Limit @ 3 m. dB μV/m	CISPR Limit @ 10 m. dB μV/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. 05. 2012
■ -	HK116	Rohde & Schwarz	Biconical Antenna	826861/018	01. 29. 2014
■ -	HL223	Rohde & Schwarz	Log Periodic Antenna	829228/011	01. 29. 2014
■ -	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. 05. 2012
■ -	BBHA9120D	Schwarzbeck	Horn ANT	597	01. 23. 2013
■ -	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. 2012

6.6 Test data for Radiated Emission

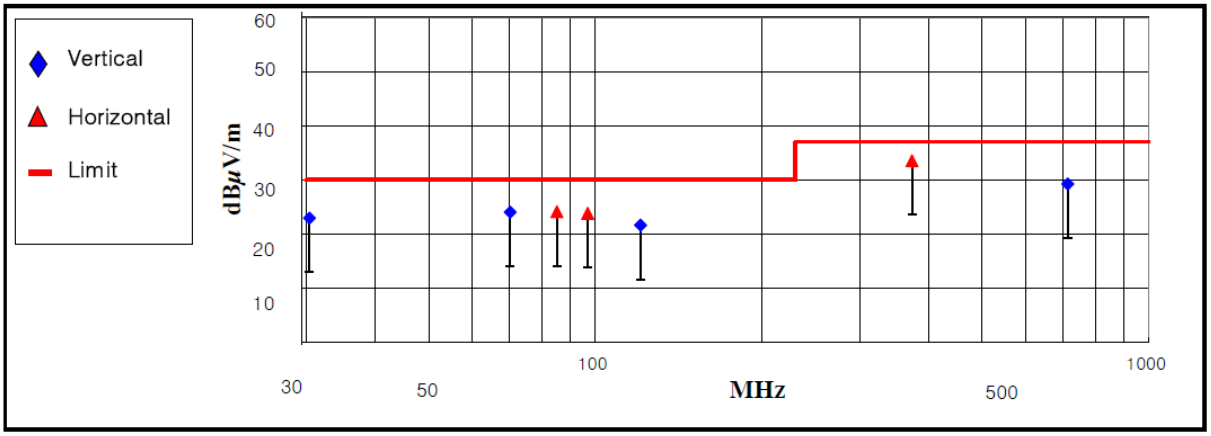
-. Test Date : April 23 ~ 24, 2012
-. Measurement Distance : 3 m
-. Note : The highest frequency of the internal source of the EUT is between 500 MHz and 1 000 MHz (667 MHz). The measurement was made up to 5 000 MHz

-. Measurement

Frequency range	30 MHz ~ 1 GHz	Above 1 GHz
Detector mode	Quasi peak	Peak / Average
Resolution bandwidth	120 kHz	1 MHz

♦ Operating condition: 1 680 × 1 050 / 60 Hz(RGB: Analog)

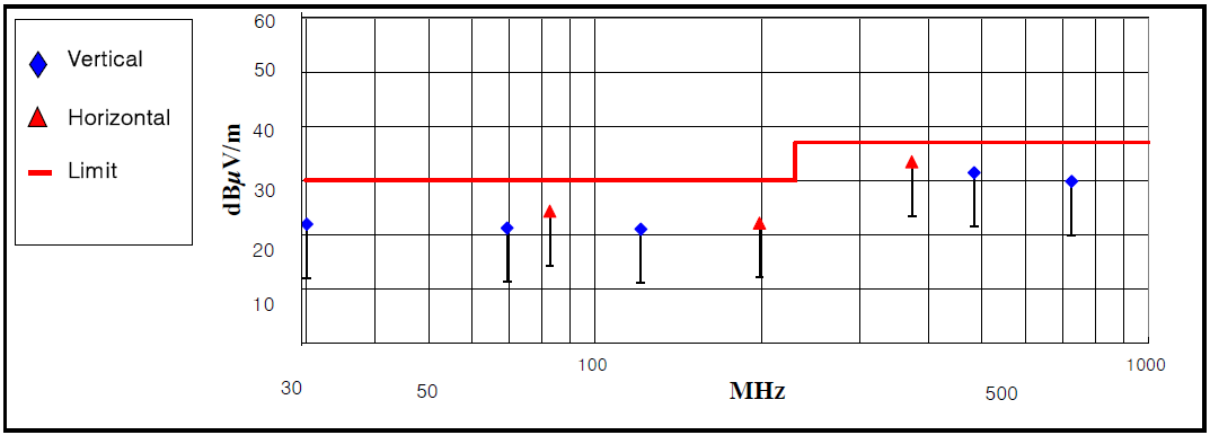
Frequency (MHz)	Measurement Level				Limit (dBμ V/m)	Margin (dB)	Positioning System		
	Reading Value(dBμ V)	Antenna Factor(dB/m)	Cable Loss(dB)	Test Result (dBμ V/m)			Pol. (H/V)	Height (cm)	Angle (°)
30.44	8.52	13.15	1.23	22.90	30.00	7.10	V	100	22
70.19	14.30	7.68	2.02	24.00	30.00	6.00	V	100	163
85.23	12.94	8.88	2.28	24.10	30.00	5.90	H	221	94
96.84	12.23	9.10	2.47	23.80	30.00	6.20	H	213	125
120.69	7.87	10.88	2.85	21.60	30.00	8.40	V	128	276
373.32	12.89	15.22	5.39	33.50	37.00	3.50	H	100	115
713.99	0.68	20.80	7.72	29.20	37.00	7.80	V	100	25



< Fig 8. Radiated emission result (30 MHz ~ 1 000 MHz) >

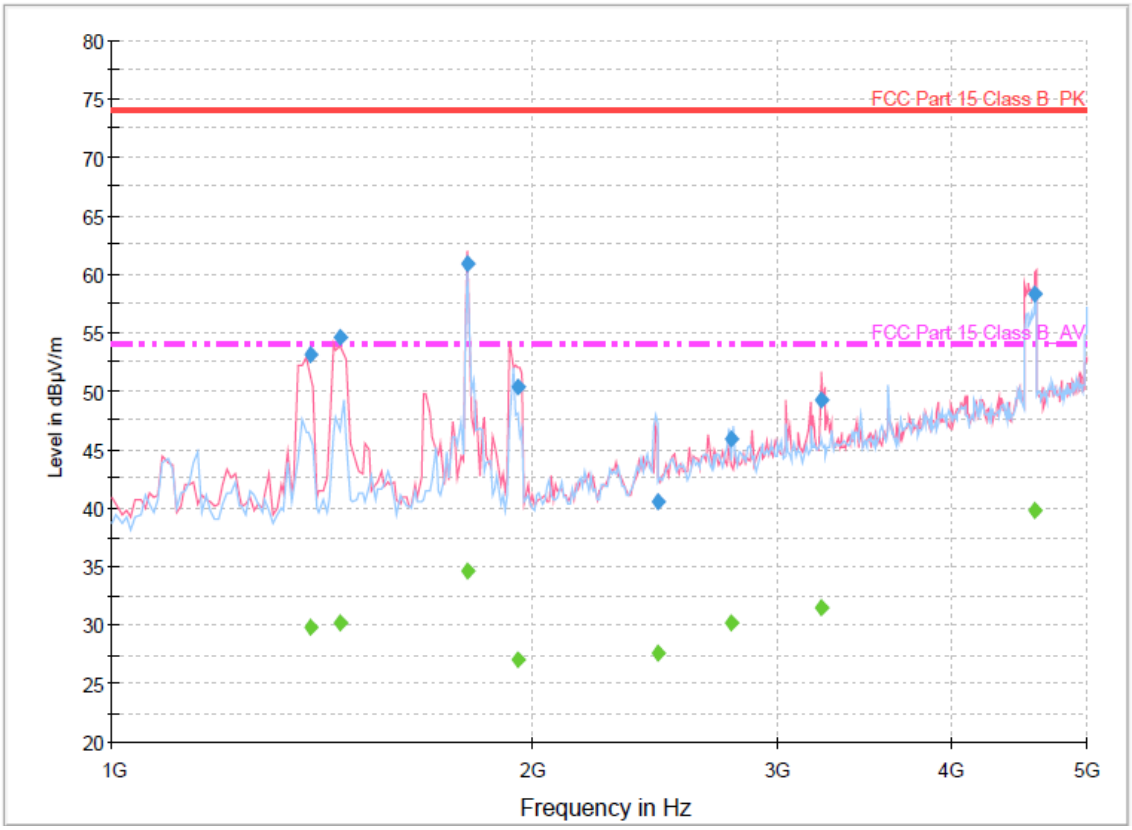
♦ Operating condition: 1 680 × 1 050 / 60 Hz(HDMI/DVI: Digital)

Frequency (MHz)	Measurement Level				Limit (dBμ V/m)	Margin (dB)	Positioning System		
	Reading Value(dBμ V)	Antenna Factor(dB/m)	Cable Loss(dB)	Test Result (dBμ V/m)			Pol. (H/V)	Height (cm)	Angle (°)
30.12	7.42	13.24	1.24	21.90	30.00	8.10	V	166	30
69.31	11.51	7.68	2.01	21.20	30.00	8.80	V	100	126
82.77	13.30	8.76	2.24	24.30	30.00	5.70	H	195	89
120.91	7.26	10.89	2.85	21.00	30.00	9.00	V	100	96
198.07	4.34	14.08	3.68	22.10	30.00	7.90	H	129	155
373.32	12.79	15.22	5.39	33.40	37.00	3.60	H	100	116
483.94	7.60	17.59	6.21	31.40	37.00	5.60	V	113	184
726.08	1.20	20.80	7.80	29.80	37.00	7.20	V	218	23



< Fig 9. Radiated emission result (30 MHz ~ 1 000 MHz) >

♦ Operating condition: 1 680 × 1 050 / 60 Hz(RGB: Analog)
Green marker: Average detector, Blue marker: Peak detector



Final Result 1

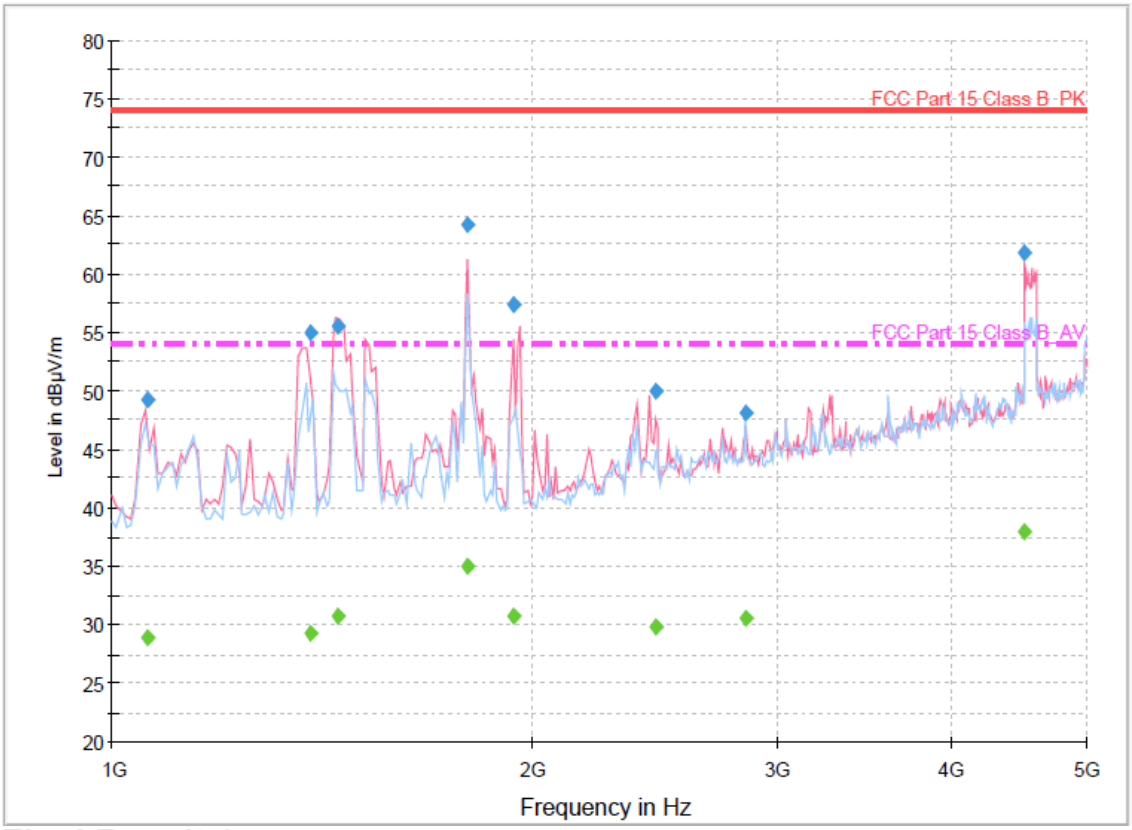
Frequency (MHz)	MaxPeak (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1386.153507	53.2	1000.0	1000.000	100.0	V	46.0	-12.8	20.8	74.0
1457.881764	54.6	1000.0	1000.000	100.0	V	49.0	-12.7	19.4	74.0
1799.803206	60.9	1000.0	1000.000	100.0	V	175.0	-11.6	13.1	74.0
1954.059720	50.4	1000.0	1000.000	100.0	V	-3.0	-11.4	23.6	74.0
2460.301804	40.6	1000.0	1000.000	125.0	H	122.0	-8.8	33.4	74.0
2777.775150	46.0	1000.0	1000.000	100.0	H	211.0	-7.3	28.0	74.0
3219.456914	49.3	1000.0	1000.000	176.0	V	136.0	-5.6	24.7	74.0
4583.398397	58.4	1000.0	1000.000	100.0	V	337.0	-1.3	15.6	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)
1386.153507	29.7	1000.0	1000.000	100.0	V	46.0	-12.8	24.3	54.0
1457.881764	30.2	1000.0	1000.000	100.0	V	49.0	-12.7	23.8	54.0
1799.803206	34.6	1000.0	1000.000	100.0	V	175.0	-11.6	19.4	54.0
1954.059720	27.0	1000.0	1000.000	100.0	V	-3.0	-11.4	27.0	54.0
2460.301804	27.5	1000.0	1000.000	125.0	H	122.0	-8.8	26.5	54.0
2777.775150	30.2	1000.0	1000.000	100.0	H	211.0	-7.3	23.8	54.0
3219.456914	31.5	1000.0	1000.000	176.0	V	136.0	-5.6	22.5	54.0
4583.398397	39.7	1000.0	1000.000	100.0	V	337.0	-1.3	14.3	54.0

< Fig 10. Radiated emission result (1 000 MHz ~ 5 000 MHz) >

♦ Operating condition: 1 680 × 1 050 / 60 Hz(HDMI/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)
1059.512225	49.3	1000.0	1000.000	136.0	V	21.0	-14.0	24.7	74.0
1386.553507	54.9	1000.0	1000.000	100.0	V	71.0	-12.8	19.1	74.0
1450.697796	55.6	1000.0	1000.000	100.0	V	-2.0	-12.7	18.4	74.0
1799.803206	64.3	1000.0	1000.000	100.0	V	174.0	-11.6	9.7	74.0
1941.323848	57.4	1000.0	1000.000	115.0	V	338.0	-11.5	16.6	74.0
2451.053707	50.0	1000.0	1000.000	100.0	V	158.0	-8.8	24.0	74.0
2846.687375	48.1	1000.0	1000.000	100.0	H	266.0	-7.0	25.9	74.0
4506.022044	61.9	1000.0	1000.000	100.0	V	340.0	-1.5	12.1	74.0

Final Result 2

Frequency (MHz)	CAverage (dBµV/m)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
1059.512225	28.9	1000.0	1000.000	136.0	V	21.0	-14.0	25.1	54.0
1386.553507	29.3	1000.0	1000.000	100.0	V	71.0	-12.8	24.7	54.0
1450.697796	30.8	1000.0	1000.000	100.0	V	-2.0	-12.7	23.2	54.0
1799.803206	35.0	1000.0	1000.000	100.0	V	174.0	-11.6	19.0	54.0
1941.323848	30.7	1000.0	1000.000	115.0	V	338.0	-11.5	23.4	54.0
2451.053707	29.8	1000.0	1000.000	100.0	V	158.0	-8.8	24.2	54.0
2846.687375	30.6	1000.0	1000.000	100.0	H	266.0	-7.0	23.4	54.0
4506.022044	37.9	1000.0	1000.000	100.0	V	340.0	-1.5	16.1	54.0

< Fig 11. Radiated emission result (1 000 MHz ~ 5 000 MHz) >

7. Sample Calculations

$$dB\mu V = 20 \text{ Log }_{10}(\mu V/m)$$
$$dB\mu V = dBm + 107$$
$$\mu V = 10^{(dB\mu V/20)}$$

7.1 Example 1 :

■ **20.3 MHz**

Class B Limit = 250 μV = 48 dBμV

Reading = 39.2 dBμV

$10^{(39.2dB\mu V/20)}$ = 91.2 μV

Margin = 48 dBμV - 39.2 dBμV

= 8.8 dB

7.2 Example 2 :

■ **66.7 MHz**

Class B Limit = 100 μV/m = 40.0 dBμV/m

Reading = 31.0 dBμV

Antenna Factor + Cable Loss = 5.8 dB

Total = 36.8 dBμV/m

Margin = 40.0 dBμV/m – 36.8 dBμV/m

= 3.2 dB

8. Recommendation & Conclusion

The data collected shows that the **LG Electronics Inc. DLP PROJECTOR (Model Name: PA70G-JE)** was complies with §15.107 and 15.109 of the FCC Rules.

- The end -