Electromagnetic Emission Compliance Report for FCC Class B Certification

Test Report No.	**: E12NR-036**
AGR No.	**: A12NA-061**
Applicant	**: LG Electronics USA**
Address	**: 1000 Sylvan Avenue Englewood Cliffs, NJ 07632, United States**
Manufacturer	**: LG Electronics Inc.**
Address	**: 19-1 Cheongho-ri, Jinwi-myeon, Pyeongtaek-si, Gyeonggi-do, 451-713, Korea.**
Type of Equipment	**: PLASMA TV/MONITOR (Part 15 Class B Computing Device Peripheral)**
Model Name	**: 60PH6700-UB**
FCC ID.	**: BEJ60PH6700UB**
Serial number	**: N/A**
Total page of Report	**: 21 pages (including this page)**
Date of Incoming	**: September 04, 2012**
Date of Issuing	**: November 19, 2012**

SUMMARY

The equipment complies with the requirement of ***FCC CFR 47 PART 15 SUBPART B, Section 15.101.***

This test report contains only the results of a single test of the sample supplied for the examination. It is not a general valid assessment of the features of the respective products of the mass-production.

Prepared by: Eung-Chan, Kim / Senior Engineer, ONETECH Corp.

Approved by: Gea-Won, Lee / Managing Director, ONETECH Corp.

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EMC Testing Div. : 307-51 Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do 464-862 Korea (TEL: 82-31-765-8289, FAX: 82-31-766-2904)

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Revision History

Issued Report No.	Issued Date	Revisions	Effect Section
E12NR-036	November 19, 2012	Initial Issue	All

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1. VERIFICATION OF COMPLIANCE

APPLICANT	: LG Electronics USA
ADDRESS	: 1000 Sylvan Avenue Englewood Cliffs, NJ 07632, United States
CONTACT PERSON	: Jacob Cho/Director
TELEPHONE NO	: 201-266-2534
FCC ID	: BEJ60PH6700UB
MODEL NO/NAME	: 60PH6700-UB
SERIAL NUMBER	: N/A
DATE	: November 19, 2012

EQUIPMENT CLASS	JBP - Part 15 Class B Computing Device Peripheral
E.U.T. DESCRIPTION	PLASMA TV/MONITOR - Unintentional Radiator
THIS REPORT CONCERNS	ORIGINAL GRANT
MEASUREMENT PROCEDURES	ANSI C63.4: 2009
TYPE OF EQUIPMENT TESTED	PRE-PRODUCTION
KIND OF EQUIPMENT AUTHORIZATION REQUESTED	Certification
EQUIPMENT WILL BE OPERATED UNDER FCC RULES PART(S)	FCC PART 15, SECTION 15.101
MODIFICATIONS ON THE EQUIPMENT TO ACHIEVE COMPLIANCE	No
FINAL TEST WAS CONDUCTED ON	Semi anechoic chamber

-. The above equipment was tested by ONETECH Corp. for compliance with the requirement set forth in the FCC Rules and Regulations. This said equipment in the configuration described in this report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

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2. GENERAL INFORMATION

2.1 Product Description

The LG Electronics USA, Model 60PH6700-UB (referred to as the EUT in this report) is a PLASMA TV/MONITOR. Product specification described herein was obtained from product data sheet or user's manual.

CHASSIS TYPE	Metal & Plastic
LIST OF EACH OSC. OR CRY. FREQ.(FREQ.>=1 MHz)	DDR3: 800 MHz
Electrical Rating	AC 100 ~ 240 V, 50/60 Hz 3.9 A (390 W)
EXTERNAL CONNECTOR	RJ45 Jack, USB IN1, USB IN2, USB IN3, COMPONENT IN, COMPSITE IN, OPTICAL DIGITAL AUDIO OUT, ANTENNA/CABLE IN, HDMI IN1(ARC), HDMI IN2(PC), HDMI IN3(MHL)

2.2 Model Differences

-. None

2.3 Related Submittal(s) / Grant(s)

-. Original submittal only

2.4 Test System Details

The model numbers for all the equipments that were used in the tested system is:

Model	Manufacturer	FCC ID	Description	Connected to
60PH6700-UB	LG Electronics Inc.	BEJ60PH6700UB	PLASMA TV/MONITOR (EUT)	-
P7-1010KR	HP	N/A	Desktop PC	EUT
XPS 14z	DELL	N/A	Notebook PC	EUT
Wired Desktop 600	Microsoft	N/A	USB Keyboard	Desktop PC
MODGUO	HP	505062-001	USB Mouse	Desktop PC
N/A	LG	N/A	USB Memory	EUT
Remote Control	OHSUNG ELECTRONICS Co., LTD.	N/A	AN-MR400G	-

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2.5 Test Methodology

Both conducted and radiated testing was performed according to the procedures in ANSI C63.4: 2009. Radiated testing was performed at a distance of 3 m from EUT to the antenna up to 6 GHz.

2.6 Test Facility

The Electromagnetic compatibility measurement facilities are located on at 301-14, Daessangryung-ri, Chowol-eup, Gwangju-si, Gyeonggi-do, 464-862, Korea. The Onetech Corp. has been accredited as a Conformity Assessment Body (CAB) with designation Number, KR0013.

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3. SYSTEM TEST CONFIGURATION

3.1 Mode of operation during the test

-. The EUT was connected to the HDMI port of desktop PC and to Ethernet of remote notebook PC.

-. “H” Scrolling on the EUT was performed from desktop PC and Ping test was performed from remote notebook PC continuously during the test. Also media play was performed from external USB memory

3.2 Cable Description for the EUT

Cable	Shielded	Ferrite Bead	Metal Shell	Length (m)	Connected to
POWER	N	Y	N/A	1.5	EUT
USB IN_1	N	N/A	Y	-	EUT
USB IN_2	N	N/A	Y	1.5	LINE
USB IN_3	N	N/A	Y	1.5	LINE
COMPONENT IN	N	Y	Y	1.5	LINE
COMPSITE IN	N	Y	Y	1.5	LINE
RJ45 JACK	N	Y	N/A	3.0	NOTEBOOK PC
HDMI IN_1(ARC)	Y	N	Y	1.5	LINE
HDMI IN_2(PC)	Y	N	Y	1.5	DESKTOP PC
HDMI IN_3(MHL)	Y	N	Y	1.5	LINE

3.3 Equipment Modifications

-. None

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3.4 Configuration of Test System

Line Conducted Test : The EUT was connected to LISN. All supporting equipments were connected to another LISN. Preliminary Power line Conducted Emission test was performed by using the procedure in ANSI C63.4: 2009 7.3.3 to determine the worse operating conditions.

Radiated Emission Test : Preliminary radiated emission test was conducted using the procedure in ANSI C63.4: 2009 8.3.1.1 to determine the worse operating conditions. Final radiated emission test was conducted at 3 m semi anechoic chamber.

4. PRELIMINARY TEST

4.1 AC Power line Conducted Emission Test

During Preliminary Test, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
"H" Scrolling + Ping test for Ethernet	X
USB play + Ping test for Ethernet	X

4.2 Radiated Emission Test

During Preliminary Test, the following operating mode was investigated

Operation Mode	The Worse operating condition (Please check one only)
"H" Scrolling + Ping test for Ethernet	X
USB play + Ping test for Ethernet	X

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5. FINAL RESULT OF MEASURMENT

Preliminary test was done in normal operation mode. And the final measurement was selected for the maximized emission level.

5.1 Conducted Emission Test

5.1.1 Test data for H scroll and ping test mode

Humidity Level : 42 % R.H. Temperature: 22 ºC

Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.107(a)

Type of Test : CLASS B

Result : PASSED BY 12.49 dB at 10.98 MHz under peak detector mode

EUT : PLASMA TV/MONITOR Date: November 15, 2012

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

Frequency (MHz)	Line	Peak (dBµV)		Margin (dB)
		Emission level	Q.P Limits	
0.15	H	51.61	66.00	14.39
1.40	H	42.55	56.00	13.45
1.99	H	42.55	56.00	13.45
2.61	H	42.65	56.00	13.35
10.98	H	47.51	56.00	12.49
11.04	N	47.03	60.00	12.97
Frequency (MHz)	**Line**	**Average (dBµV)**		**Margin (dB)**
		Emission level	**Limits**	
0.15	H	44.42	56.00	11.58
2.61	H	24.60	46.00	21.40
10.98	H	37.24	50.00	12.76
11.04	N	37.63	50.00	12.37

Line Conducted Emissions Tabulated Data

Remark: “H”: Hot Line, “N”: Neutral Line.

See next page for an overview sweep performed with peak and average detector.

Tested by: Seung-Hyun, Park / Engineer

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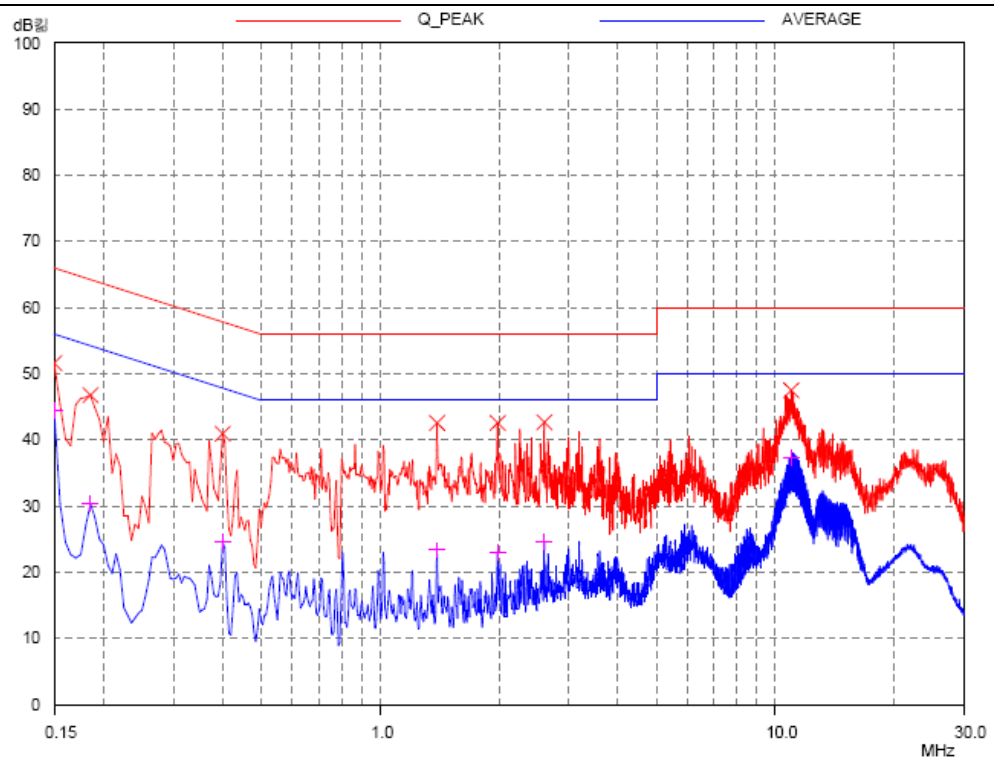
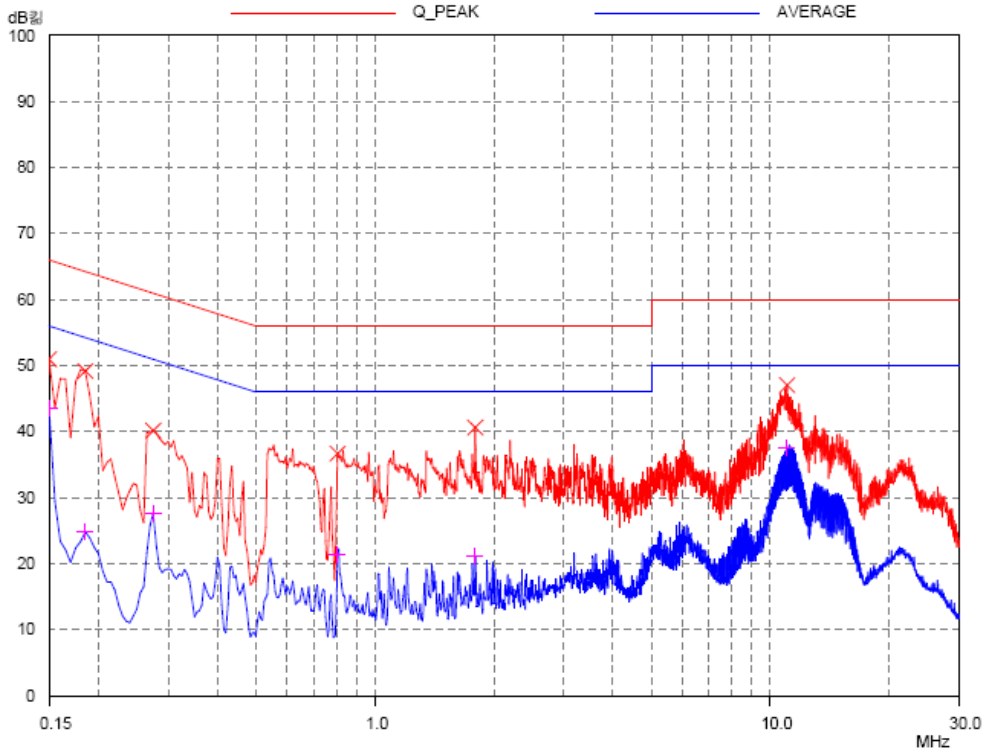


HOT LINE



NEUTRUAL LINE

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5.1.2 Test data for USB playing and ping test mode

Humidity Level : 42 % R.H. Temperature: 22 ºC

Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.107(a)

Type of Test : CLASS B

Result : PASSED BY 12.25 dB at 0.41 MHz under quasi-peak detector mode

EUT : PLASMA TV/MONITOR Date: November 15, 2012

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 9 kHz)

Frequency (MHz)	Line	Q.P (dBµV)		Margin (dB)
		Emission level	Q.P Limits	
0.41	H	45.40	57.65	12.25
0.82	H	41.91	56.00	14.09
1.49	H	41.80	56.00	14.20
1.90	N	42.70	56.00	13.30
3.14	H	43.08	56.00	12.92
10.74	N	47.04	60.00	12.96
Frequency (MHz)	**Line**	**Average (dBµV)**		**Margin (dB)**
		Emission level	**Limits**	
0.15	H	48.07	56.00	7.93
0.41	H	29.16	47.65	18.49
10.74	N	34.71	50.00	15.29
10.98	H	36.50	50.00	13.50

Line Conducted Emissions Tabulated Data

Remark: “H”: Hot Line, “N”: Neutral Line.

See next page for an overview sweep performed with peak and average detector.

Tested by: Seung-Hyun, Park / Engineer

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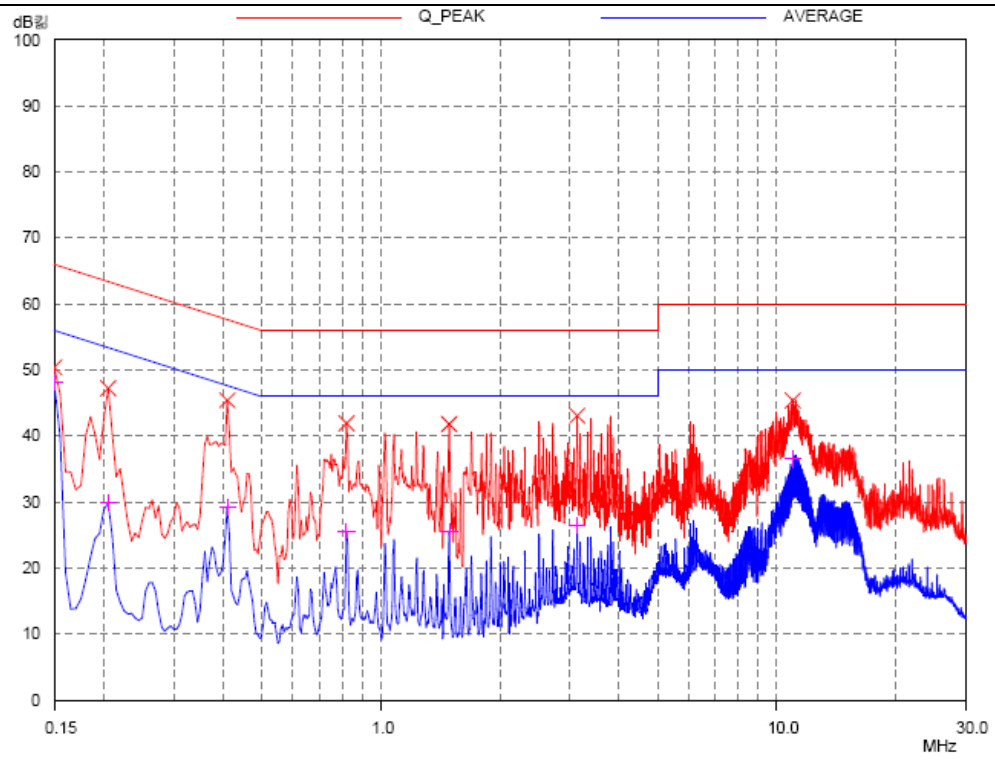
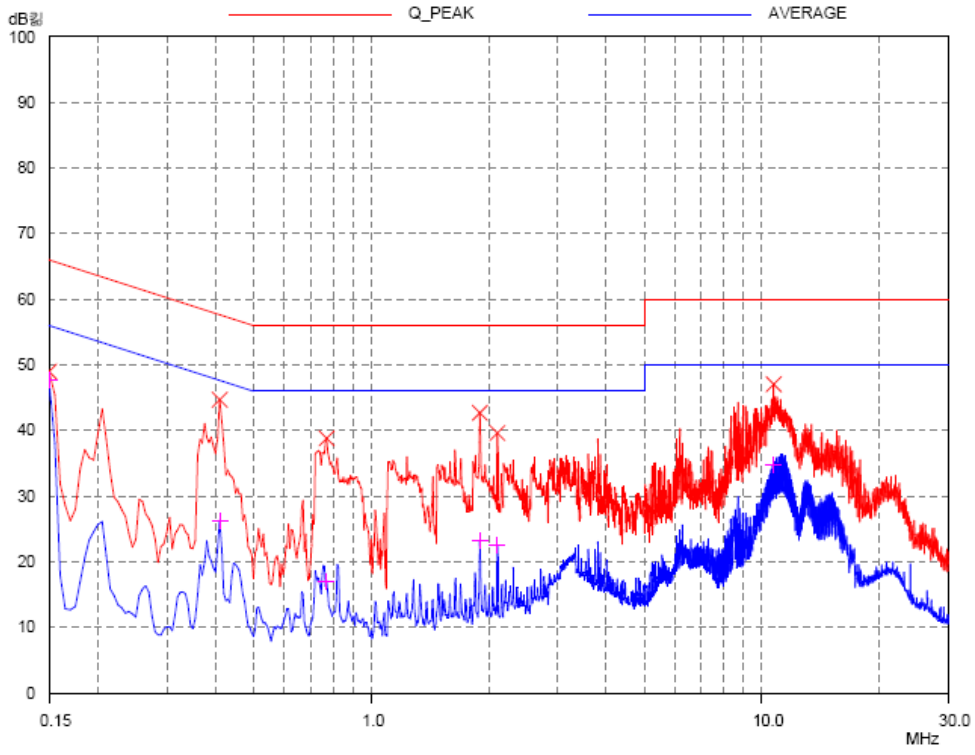


HOT LINE



NEUTRUAL LINE

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5.2 Radiated Emission Tests

5.2.1 Test Data for under 1 GHz

The following table shows the highest levels of radiated emissions on both polarizations of horizontal and vertical.

5.2.1.1 Test data for H scroll and ping test mode

Humidity Level : 42 % Temperature: 22 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109 (a)

Type of Test : CLASS B

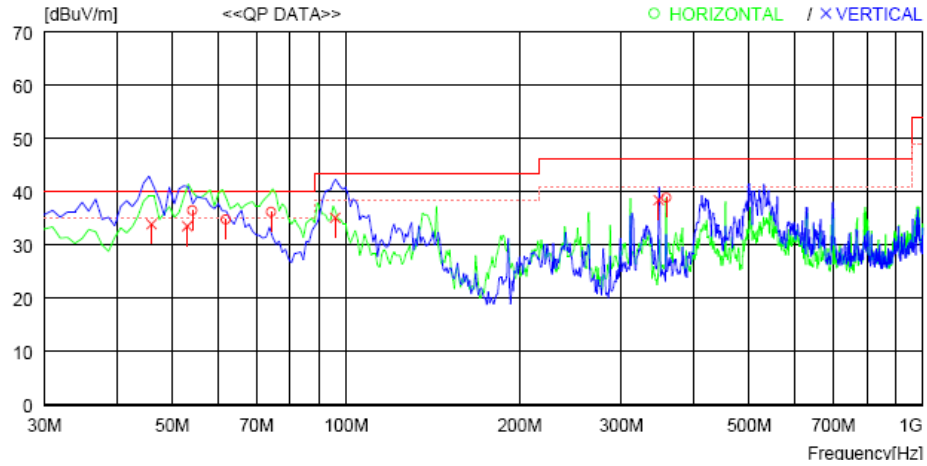
Result : PASSED BY 3.5 dB at 54.101 MHz under quasi-peak detector mode

EUT : PLASMA TV/MONITOR Date: November 14, 2012

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

Distance : 3 Meter

Graphical representation of Radiated Emission



Tabulated Results for Radiated Emission

No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal ------										
1	54.101	53.7	14.7	1.2	33.1	36.5	40.0	3.5	300	358
2	61.845	53.1	13.4	1.3	33.0	34.8	40.0	5.2	300	2
3	74.140	58.2	9.5	1.5	33.0	36.2	40.0	3.8	270	340
4	359.076	52.3	16.0	3.6	33.0	38.9	46.0	7.1	100	220
----- Vertical ------										
5	45.990	50.7	15.2	1.1	33.1	33.9	40.0	6.1	100	151
6	53.041	50.6	14.8	1.2	33.1	33.5	40.0	6.5	100	163
7	95.757	53.7	12.7	1.7	33.0	35.1	43.5	8.4	100	360
8	348.508	52.0	15.8	3.5	32.9	38.4	46.0	7.6	200	359

Remark: Margin (dB) = Limit – Result and Result = Reading Peak + Antenna Factor + Loss – Gain

Loss and Gain in above table means Cable Loss and Pre-amplifier gain.

Tested by: Seung-Hyun, Park / Engineer

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5.2.1.2 Test data for USB Playing and ping test mode

Humidity Level : 42 % Temperature: 22 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109 (a)

Type of Test : CLASS B

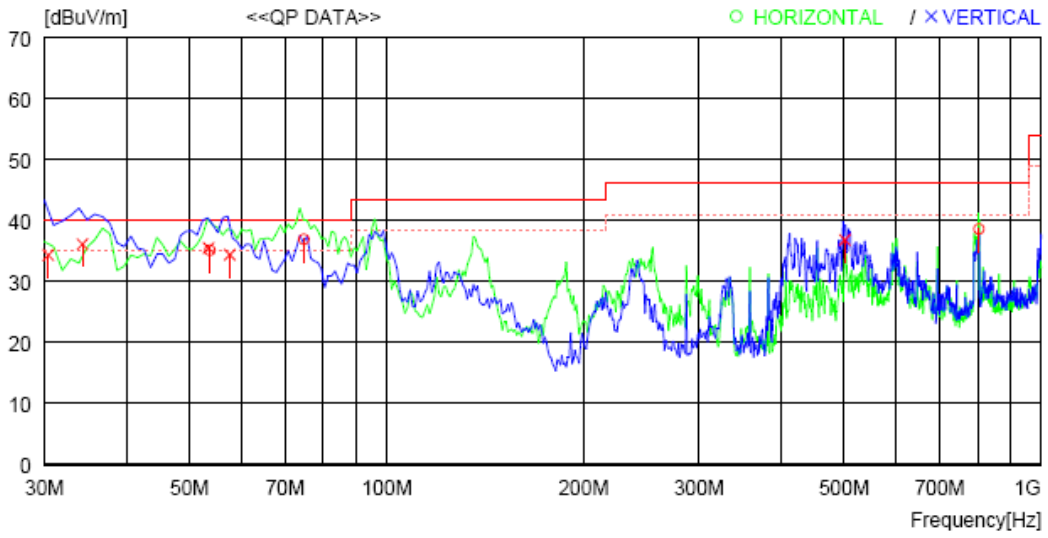
Result : PASSED BY 3.1 dB at 74.737 MHz under quasi-peak detector mode

EUT : PLASMA TV/MONITOR Date: November 14, 2012

Detector : CISPR Quasi-Peak (6 dB Bandwidth: 120 kHz)

Distance : 3 Meter

Graphical representation of Radiated Emission



Tabulated Results for Radiated Emission

No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal ------										
1	53.699	52.3	14.7	1.2	33.1	35.1	40.0	4.9	300	359
2	74.737	59.0	9.4	1.5	33.0	36.9	40.0	3.1	300	359
3	803.690	43.0	22.3	5.8	32.5	38.6	46.0	7.4	100	122
----- Vertical ------										
4	30.408	53.6	12.9	0.9	33.1	34.3	40.0	5.7	100	290
5	34.294	55.0	13.3	0.9	33.1	36.1	40.0	3.9	100	177
6	53.467	52.7	14.7	1.2	33.1	35.5	40.0	4.5	100	140
7	57.601	51.8	14.3	1.3	33.0	34.4	40.0	5.6	100	130
8	501.300	47.1	18.5	4.3	33.1	36.8	46.0	9.2	100	142

Remark: Margin (dB) = Limit – Result and Result = Reading Peak + Antenna Factor + Loss – Gain

Loss and Gain in above table means Cable Loss and Pre-amplifier gain.

Tested by: Seung-Hyun, Park / Engineer

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5.2.2 Test Data for over 1 GHz (Average detector mode)

The following table shows the highest levels of radiated emissions on both polarizations of horizontal and vertical.

5.2.2.1 Test data for H scroll and ping test mode

Humidity Level : 41 % Temperature: 21 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109 (a)

Type of Test : CLASS B

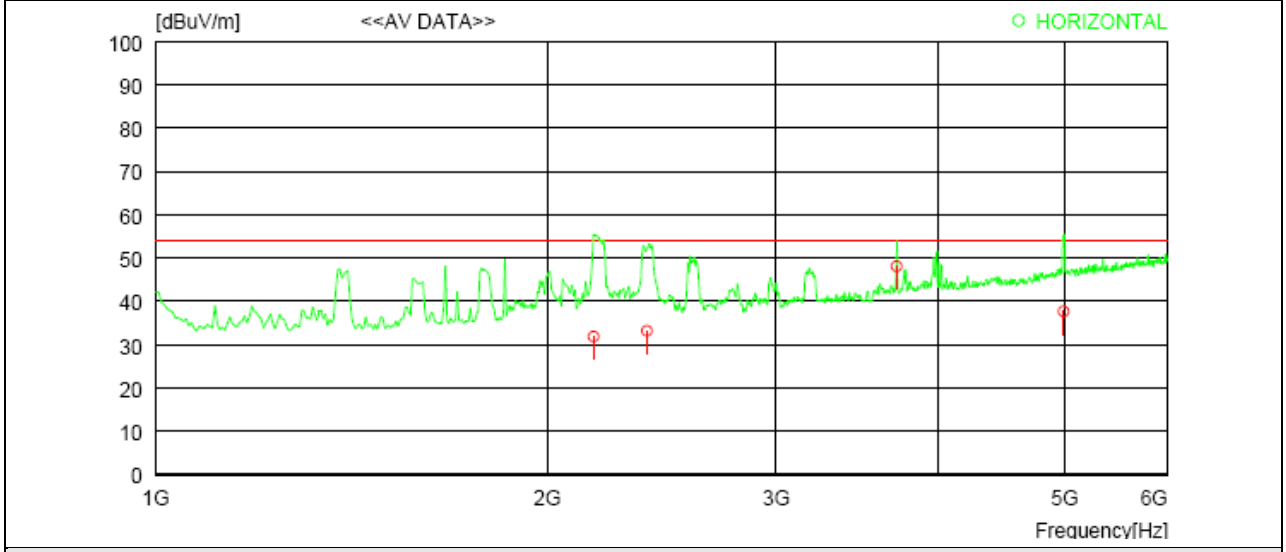
Result : PASSED BY 5.5 dB at 1 856.040 MHz under average detector mode

EUT : PLASMA TV/MONITOR Date: November 19, 2012

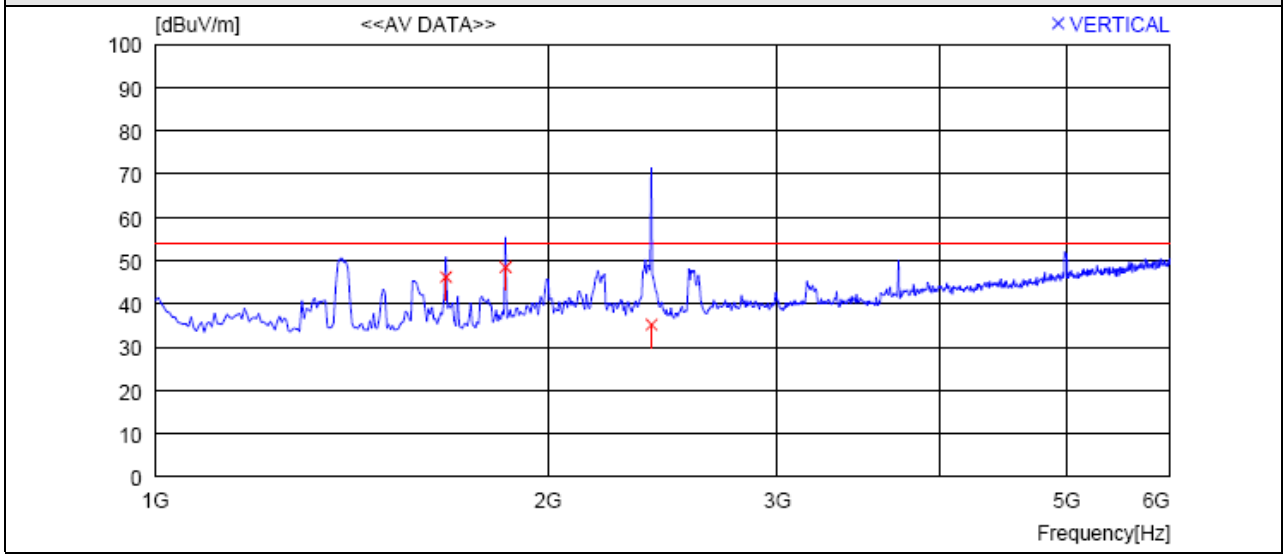
Detector : CISPR Average (6 dB Bandwidth: 1 MHz)

Distance : 3 Meter

Graphical representation of Radiated Emission



Graphical representation of Radiated Emission



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Tabulated Results for Radiated Emission

No.	FREQ	READING AV	ANT FACTOR	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	[dBuV]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal ------										
1	2170.917	41.4	26.7	6.7	42.9	31.9	54.0	22.1	150	220
2	2385.994	42.2	27.1	7.0	43.1	33.2	54.0	20.8	150	220
3	3712.074	53.1	29.4	8.7	43.1	48.1	54.0	5.9	150	359
4	4988.700	38.5	31.4	10.1	42.3	37.7	54.0	16.3	150	223
----- Vertical ------										
5	1670.630	57.2	26.1	5.7	42.8	46.2	54.0	7.8	150	223
6	1856.040	59.1	26.2	6.0	42.8	48.5	54.0	5.5	150	235
7	2401.830	44.0	27.2	7.1	43.1	35.2	54.0	18.8	150	22

Remark: Margin (dB) = Limit – Result and Result = Reading Average + Antenna Factor + Loss – Gain
Loss and Gain in above table means Cable Loss and Pre-amplifier gain.

Tested by: Seung-Hyun, Park / Engineer

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5.2.2.2 Test data for USB playing and ping test mode

Humidity Level : 41 % Temperature: 21 °C

Limits apply to : FCC CFR 47, PART 15, SUBPART B, SECTION 15.109 (a)

Type of Test : CLASS B

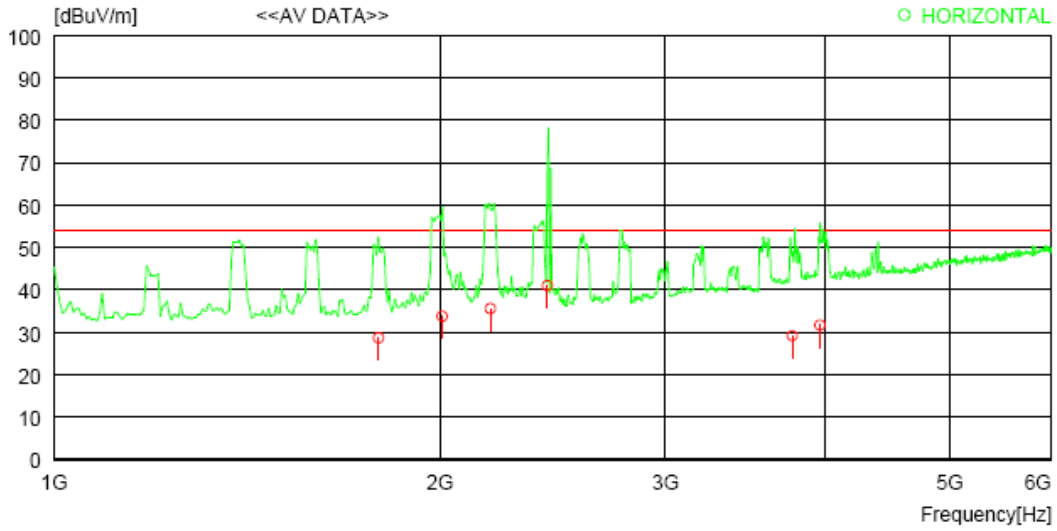
Result : PASSED BY 13.0 dB at 2 425.993 MHz under average detector mode

EUT : PLASMA TV/MONITOR Date: November 19, 2012

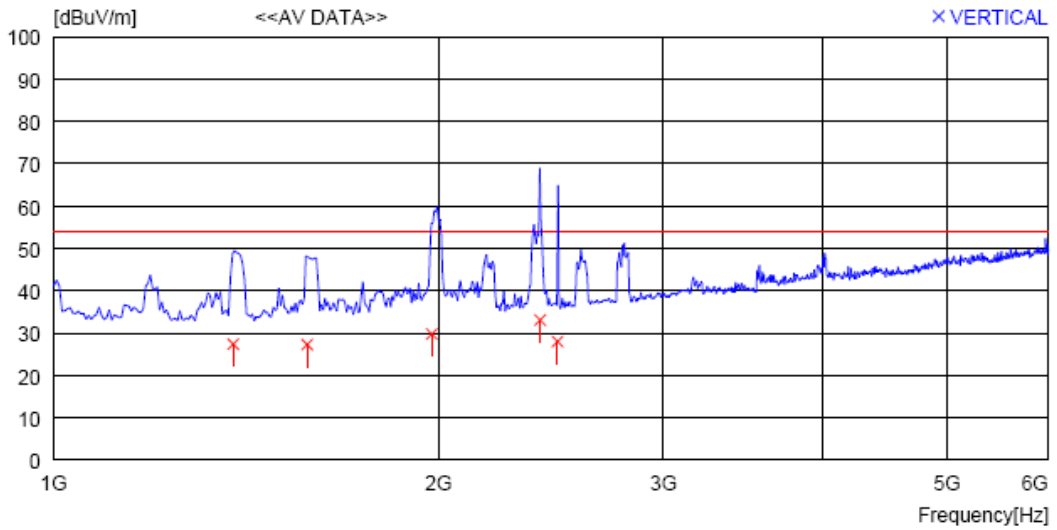
Detector : CISPR Average (6 dB Bandwidth: 1 MHz)

Distance : 3 Meter

Graphical representation of Radiated Emission



Graphical representation of Radiated Emission



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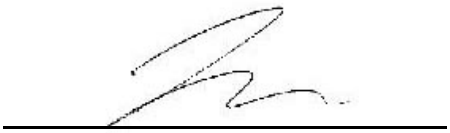
EMC Testing Div. : 307-51 Daessangnyeong-ri, Chowol-eup, Gwangju-si, Gyeonggi-do 464-862 Korea (TEL: 82-31-765-8289, FAX: 82-31-766-2904)

Tabulated Results for Radiated Emission

No.	FREQ	READING AV	ANT FACTOR	LOSS	GAIN	RESULT	LIMIT	MARGIN	ANTENNA	TABLE
	[MHz]	[dBuV]	[dB]	[dB]	[dB]	[dBuV/m]	[dBuV/m]	[dB]	[cm]	[DEG]
----- Horizontal ------										
1	1791.396	39.4	26.2	5.9	42.8	28.7	54.0	25.3	150	226
2	2007.700	44.0	26.3	6.3	42.8	33.8	54.0	20.2	150	206
3	2189.700	45.1	26.7	6.7	42.9	35.6	54.0	18.4	150	214
4	2425.993	49.8	27.2	7.1	43.1	41.0	54.0	13.0	150	0
5	3767.400	34.1	29.4	8.7	43.0	29.2	54.0	24.8	150	0
6	3958.564	36.0	29.7	8.9	42.9	31.7	54.0	22.3	150	0
----- Vertical ------										
7	1381.500	39.0	26.0	5.1	42.7	27.4	54.0	26.6	150	145
8	1578.800	38.5	26.1	5.5	42.8	27.3	54.0	26.7	150	359
9	1975.500	40.1	26.3	6.2	42.8	29.8	54.0	24.2	150	174
10	2401.900	41.9	27.2	7.1	43.1	33.1	54.0	20.9	150	51
11	2478.298	36.7	27.3	7.1	43.1	28.0	54.0	26.0	150	359

Remark: Margin (dB) = Limit – Result and Result = Reading Average + Antenna Factor + Loss – Gain
Loss and Gain in above table means Cable Loss and Pre-amplifier gain.



Tested by: Seung-Hyun, Park / Engineer

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6. FIELD STRENGTH CALCULATION

Meter readings are compared to the specification limit correcting for antenna and cable losses.

+	Meter reading	(dBμV)
+	Cable Loss	(dB)
+	Antenna Factor	(dB/m)
=	Corrected Reading	(dBμV/m)
-	Specification Limit	(dBμV/m)
=	dB Relative to Spec	(± dB)

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7. LIST OF TEST EQUIPMENT

No.	Equipment	Manufacturer	Model Name	Serial No.	Last Cal.	Interval Cal.	Used
1.	Test receiver	Rohde & Schwarz	ESCI	101013	Oct. 14, 2012	One Year	
2.			ESU	100261	Sep. 24, 2012	One Year	■
3.			ESiB26	100296	Apr. 13, 2012	One Year	
4.			ESHS 10	834467/007	Jun. 21, 2012	One Year	■
5.	Amplifier	Sonoma Instrument	310N	312544	May 30, 2012	One Year	■
6.			310N	312545	May 30, 2012	One Year	
7.		Rohde & Schwarz	SCU 18	10041	Jan. 25, 2012	One Year	■
8	TRILOG Broadband Antenna	Schwarzbeck	VULB9163	9163-255	Apr. 24, 2012	Two years	■
9.			VULB9163	9163-420	Mar. 27, 2012	Two years	
10.	Horn Antenna	Schwarzbeck	BBHA9120D	BBHA9120D295	Aug. 23, 2011	Two years	■
11.	LISN	EMCO	3825/2	9109-1867	May 30, 2012	One Year	■
12.				9109-1869	May 30, 2012	One Year	
13.		Schwarzbeck	NSLK 8126	8126-404	Jun. 11, 2012	One Year	■
14.			NSLK 8128	8128-216	Jun. 11, 2012	One Year	
15.	Controller	Innco System	CO2000	619/27030611/L	N/A	N/A	■
16.	Turn Table	Innco System	DT3000	930611	N/A	N/A	■
17.	Antenna Master	Innco System	MA4000-EP	3320611	N/A	N/A	■
18.			MA4000-EP	3350611	N/A	N/A	
19.	Tripod	EMCO	N/A	N/A	N/A	N/A	■

Remark: Mark ■ mean used equipment.

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