HCT CO., LTD.

Product Compliance Division, EMC Team
SAN 136-1, AMI-RI , BUBAL-EUP, ICHEON-SI, KYOUNKI-DO, 467-701, KOREA
TEL: +82 31 639 8518 FAX: +82 31 639 8525

TEST REPORT(DoC)

Applicant: LG Electronics Inc. **20, Yeouido-dong, Yeongdeungpo-gu, Seoul, Korea** **Manufacturer: : LG Electronics Inc.** **9, No.23 Street HEDA, Hangzhou 310018 China**	**Date of Issue: June 30, 2010** **Test Report No.: HCTE1006FE35** **Test Site: HCT CO., LTD.** **HCT FRN: 0005-8664-21**

EUT TYPE : **Portable Theater Wi-Fi**

MODEL : **DP1W**

Rule Part(s):	**Part 2 & 15 Subpart B**
Equipment Class:	**Class B Personal Computers and Peripherals**
Standard(s):	**FCC Class B: (CISPR 22)**

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

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 off these measurements and vouch for the qualifications of all persons taking them.

Report prepared by	**Approved by**
: Jin Han Park	**: Nam-Wook Kang**
Test engineer of EMC Tech. Part	**Manager of EMC Tech. Part**

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MEASUREMENT REPORT

1. Scope

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

Applicant Name:	**LG Electronics Inc.**
Address:	**20, Yeouido-dong, Yeongdeungpo-gu, Seoul, Korea**

- **Model :** DP1W
- **Equipment Class**: Class B Personal Computers and Peripherals
- **EUT Type**: Portable Theater Wi-Fi
- **Rule Part(s):** FCC Part 15 Subpart B
- **Test Procedure(s):** ANSI C63.4 (2003)
- **Dates of Tests:** May 27, 2010
- **Place of Tests:**
  254-1,MAEKOK-RI,HOBUP-MYUN,ICHON-SI,KYOUNGKI-DO,467-701,KOREA

2. Introduction

The measurement procedure described in American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 ㎑ to 40 ㎓(ANSI C63.4-2003) was used in determining radiated and conducted emissions emanating from **Portable Theater Wi-Fi,** manufactured by **LG Electronics Inc., MODEL: DP1W**

The open area test site and conducted measurement facility used to collect the radiated data are located at the 254-1, MAEKOK-RI, HOBUP-MYUN, ICHON-SI, KYOUNGKI-DO, 467-701, KOREA. The site is constructed in conformance with the requirements of ANSI C63.4and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated June 10, 2009 (Confirmation Number: 90661)

3. Product Information

3.1 Equipment Description

Equipment Under Test (EUT) is **Portable Theater Wi-Fi,** manufactured by **LG Electronics Inc., (MODEL: DP1W)**

Frequency	**Transmit : 802.11b/g/HT20 : 2412 ㎒ ~ 2472 ㎒ ,** **HT40 : 2422 ㎒ ~ 2462 ㎒** **Receive : 802.11b/g/HT20 : 2412 ㎒ ~ 2472 ㎒ ,** **HT40 : 2422 ㎒ ~ 2462 ㎒**
Telephone	**Ethernet 10 / 100 Mbps**
Antenna	**Internal**
DLNA	**ver.1.5 DMP (Digital Multimedia Players)**
Internet Service	**YouTube, Picasa, AccuWeather**
Output Power	**802.11b/g/HT20 : 10 ㎽/㎒ , HT40 : 5 ㎽/㎒** **DC 5.0 V**

4. Description of Tests(Conducted)

Conducted Emissions

The line-conducted facility is located inside a 3.6 m(W) × 4.6 m(L) × 2.2 m(H) shielded enclosure and meets the requirements of ANSI C63.4 The EUT was placed on a non-conducting a 1m × 1.6 m table which is placed 40 ㎝ away from the vertical wall and 1.5 m away from the sidewall of the shielded room. The EUT is powered from a Rohde & Schwarz 50Ω/50μH Line-impedance Stabilization Networks (LISNs) and the peripheral equipment is powered from the Rohde & Schwarz LISN. All interconnecting cables more than 1 meter were shortened to 40 ㎝ length by non-inductive bundling (figure eight fashion). Sufficient time for the EUT, the peripheral equipments and test equipment were allowed in order for them to warm up to their normal operating condition. The RF output of the LISN was connected to the spectrum analyzer to determine the frequency producing the maximum electromagnetic emission from the EUT.

The EUT, peripheral equipment and interconnecting cables were arranged and manipulated to maximize each electromagnetic emission. Each emission was maximized by: switching power lines varying the mode of operation or resolution; scrolling H pattern to the EUT and/or peripheral equipment; whichever determined the worst-case emission. Each electromagnetic emission was listed on Table 1. Conducted FCC Class B.

CONDUCTED EMISSIONS	CISPR 22 CLASS B Limits dB(㎶)	
Freq. Range	Quasi-Peak	Average
150 ㎑ - 0.5 ㎒	66-56**	56-46**
0.5 ㎒ – 5 ㎒	56	46
5 ㎒ – 30 ㎒	60	50
**Limits decreases linearly with the logarithm of frequency		

Table 1. Conducted Limits

5. Description of Tests (Radiated)

Radiated Emissions

Preliminary measurements were made indoors at 3-meter using broadband antennas, broadband amplifiers, and spectrum analyzers to determine the frequency producing the maximum electromagnetic emission. Appropriate precaution was taken to ensure that all electromagnetic emission from the EUT were maximized and investigated. The spectrum was scanned from 30 to 1000 ㎒ using a Tri-log antenna and above 1 ㎓ linearly polarized horn antennas were used.

Final measurements were made outdoors at 3-meter or 10-meter test range using Tri-log antenna. The test equipment was placed on a wooden table situated on a 1.5 m × 2 m area adjacent to the measurement area. Sufficient time for the EUT, peripheral equipment, and test equipment was allowed in order for them to warm up to their normal operating condition. The EMI receiver detector function was set to CISPR quasi-peak mode and the bandwidth of the receiver was set to 120 ㎑.

The EUT, support equipment, and interconnecting cables were re-arranged and manipulated to maximize each electromagnetic emission. The turntable containing the system was rotated and the height of the receive antenna was varied 1 to 4 meters and stopped at the position which is height producing the maximum emission. Each emission was maximized by: varying the mode of operation or resolution; scrolling H pattern to the EUT and/or peripheral equipment; and changing the polarity of the antenna, whichever determined the worst-case emission.

ITE Radiated Limits	
Frequency (㎒)	**CISPR Limit @ 10 m. Quasi-Peak dB[㎶/m]**
30-230	**30.0**
230-1000	**37.0**
> 1000	**No Specified Limit**
*** Limit extrapolated 20 dB/decade**	

Table 2. Radiated @ 10-meters

6. List of Peripheral Equipment

DEVICE TYPE	MANUFACTURER	MODEL NUMBER	FCC ID / DoC	CONNECTED TO
EUT (Portable Theater Wi-Fi)	LG Electronics Inc.	DP1W	-	Notebook PC
Switching Adapter	HONOR ELECTRONIC CO., LTD.	ADS-24RD-12	DoC	EUT
External HDD	WESTERN DIGITAL TECHNOLOGIES, INC.	WDBAAA5000ABK	DoC	EUT
Notebook PC	H.P	Compaq 6730b	DoC	EUT
Notebook PC Adaptor	Hipro Electronics (Suzhou)Co., Ltd.	PPP014Y-S	DoC	Notebook PC
Mouse	Microsoft	Intellimouse optical USB and PS/2 compatible	DoC	Notebook PC
LCD Monitor	LG Electronics Inc.	M1994DJ	DoC	EUT
USB Memory	LG Electronics Inc.	UJ18GB	DoC	EUT
Access Point	3 Com	WL-546	DoC	EUT

6.1 Cable Description

Product Name	Port	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (M)
EUT (DP1W)	DC IN	N	N	1.8(P)
	HDMI	N	Y	1.5(D)
	LAN	N	N	3.0(D)
	A/V	N	Y	1.6(D)
	USB 1	N	Y	0.45(D)
Notebook PC	DC IN	N	N	1.8(P)
	USB	N	Y	1.8(D)
LCD Monitor	AC IN	N	N	1.8(P)

The marked "(D)" means the Data Cable and "(P)" means the Power Cable.)

6.2 Noise Suppression Parts on Cable. (I/O CABLE)

Product Name	Port	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
EUT (DP1W)	DC IN	N	Not Applicable	Y	EUT END
	HDMI	N	Not Applicable	Y	Both END
	LAN	N	Not Applicable	Not Applicable	-
	A/V	N	Not Applicable	Y	Both END
	USB 1	N	Not Applicable	Y	Both END
Notebook PC	DC IN	Y	Not Applicable	Y	Both END
	USB	Y	Not Applicable	Y	Notebook PC
LCD Monitor	AC IN	N	Not Applicable	Y	Power END

7. Preliminary Test

7.1 AC Power line Conducted Emissions Test & Radiated Emission Test

During Preliminary Tests, the following operating mode was investigated

Operation Mode	The worst operating condition
Standby Mode	O

8. Conducted Test Data

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EUT:                    DP1W
Manufacturer:           LG ELECTRONICS
Operating Condition:    NORMAL MODE
Test Site:              SHIELD ROOM
Operator:               JH-PARK
Test Specification:     CISPR22 CLASS B
Comment:                H
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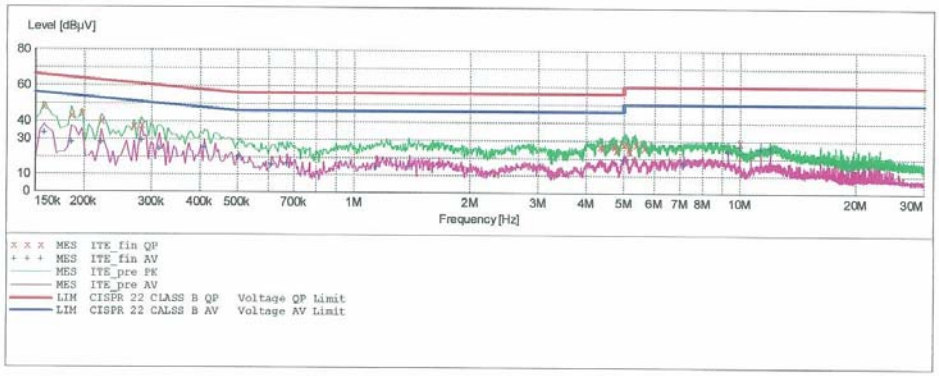
SCAN TABLE: "CISPR22 CLASS B"

Short Description: CISPR22 CLASS B

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	ESH3 (20100210)
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	ESH3 (20100210)
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	ESH3 (20100210)



MEASUREMENT RESULT: "ITE_fin QP"

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Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.158001	48.20	10.1	66	17.4	---	---
0.186001	43.40	10.0	64	20.8	---	---
0.198001	44.40	10.0	64	19.3	---	---
0.222001	40.20	10.0	63	22.5	---	---
0.270001	37.40	10.0	61	23.7	---	---
0.282001	37.90	10.0	61	22.8	---	---
4.340000	26.50	10.4	56	29.5	---	---
4.396000	26.10	10.4	56	29.9	---	---
4.700000	27.60	10.4	56	28.4	---	---
4.724000	26.50	10.4	56	29.5	---	---
4.784000	24.60	10.4	56	31.4	---	---
4.988000	27.90	10.4	56	28.1	---	---
5.076000	28.50	10.4	60	31.5	---	---
5.152000	25.40	10.4	60	34.6	---	---
5.176000	24.00	10.4	60	36.0	---	---

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MEASUREMENT RESULT: "ITE_fin AV"

5/27/2010 9:56AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.158001	33.40	10.1	56	22.1	---	---
0.186001	28.30	10.0	54	25.9	---	---
0.222001	28.40	10.0	53	24.3	---	---
0.282001	29.40	10.0	51	21.4	---	---
0.314001	24.70	10.0	50	25.2	---	---
0.410001	25.40	10.1	48	22.3	---	---
0.504000	20.30	10.1	46	25.7	---	---
0.612000	15.80	10.1	46	30.2	---	---
0.672000	16.40	10.1	46	29.6	---	---
1.144000	14.60	10.1	46	31.4	---	---
1.396000	15.00	10.1	46	31.0	---	---
5.000000	19.30	10.4	46	26.7	---	---
5.000000	19.10	10.4	46	26.9	---	---
7.172000	17.00	10.6	50	33.0	---	---
9.336000	23.80	10.8	50	26.2	---	---

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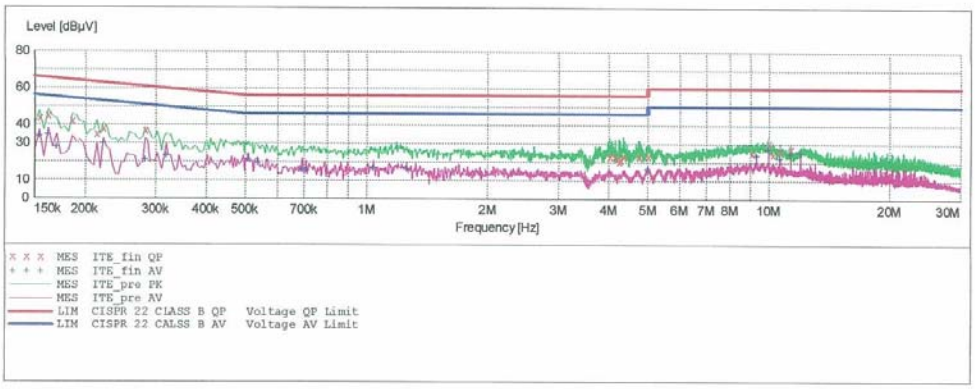
EUT: DP1W
Manufacturer: LG ELECTRONICS
Operating Condition: NORMAL MODE
Test Site: SHIELD ROOM
Operator: JH-PARK
Test Specification: CISPR22 CLASS B
Comment: N

SCAN TABLE: "CISPR22 CLASS B"

Short Description: CISPR22 CLASS B

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	ESH3 (20100210)
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	ESH3 (20100210)
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	ESH3 (20100210)



MEASUREMENT RESULT: "ITE_fin QP"

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Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.154001	43.60	10.1	66	22.2	---	---
0.162001	44.90	10.1	65	20.4	---	---
0.186001	41.90	10.0	64	22.3	---	---
0.214001	35.10	10.0	63	27.9	---	---
0.222001	38.00	10.0	63	24.7	---	---
0.282001	36.80	10.0	61	24.0	---	---
4.028000	23.20	10.4	56	32.8	---	---
4.152000	22.90	10.4	56	33.1	---	---
4.240000	20.50	10.4	56	35.5	---	---
4.272000	21.10	10.4	56	34.9	---	---
4.348000	23.00	10.4	56	33.0	---	---
4.748000	23.20	10.4	56	32.8	---	---
5.000000	23.20	10.4	56	32.8	---	---
9.060000	25.00	10.7	60	35.0	---	---
10.004000	30.30	10.8	60	29.7	---	---

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MEASUREMENT RESULT: "ITE_fin AV"

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Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.154001	33.70	10.1	56	22.1	---	---
0.162001	34.30	10.1	55	21.1	---	---
0.170001	27.80	10.1	55	27.1	---	---
0.222001	29.70	10.0	53	23.0	---	---
0.282001	20.80	10.0	51	29.9	---	---
0.318001	23.40	10.0	50	26.3	---	---
0.508000	21.40	10.1	46	24.6	---	---
0.536000	19.70	10.1	46	26.3	---	---
0.692000	15.40	10.1	46	30.6	---	---
0.708000	15.40	10.1	46	30.6	---	---
1.040000	16.60	10.1	46	29.4	---	---
1.256000	16.50	10.1	46	29.5	---	---
5.000000	15.90	10.4	46	30.1	---	---
9.336000	23.70	10.8	50	26.3	---	---
10.004000	27.00	10.8	50	23.0	---	---

NOTES:

1. **All modes of operation were investigated, and the worst-case emissions are reported.**
2. **The conducted limits are listed on Table 1 (Page 6).**
3. **Line H = Hot Line N = Neutral**

** Measurements using CISPR quasi-peak mode.

9. Radiated Test Data

1.PRODUCT	: Portable Theater Wi-Fi	**6.TEST DATE**	: 05.27.2010
2.MODEL	: DP1W	**7.TESTED BY**	: Jin Han Park
3.CLIENT	: LG Electronics Inc.	**8.TEMPERATURE**	: 26.0 ℃
4.COMMENT	: Normal Mode	**9.HUMIDITY**	: 41.0 %
5.STANDARD	: CISPR22 Class B	**10.ATOMSPHERE**	: 101.1 kPa

Frequency MHz	Reading dBμV	Ant. Factor dB/m	Cable Loss dB	Ant. POL (H/V)	Total dBμV/m	Limit dBμV/m	Margin dB
47.8	12.2	12.5	1.2	V	25.9	30.0	4.1
125.0	13.2	11.1	2.0	V	26.3	30.0	3.7
196.4	11.8	10.2	2.5	V	24.5	30.0	5.5
333.0	16.0	13.7	3.3	H	33.0	37.0	4.0
445.1	11.8	16.5	3.8	H	32.1	37.0	4.9
741.8	5.8	21.8	5.0	H	32.6	37.0	4.4

Radiated Measurements at 10-meters.

NOTES:

1. All modes of operation were investigated, and the worst-case emissions are reported.
2. The radiated limits are listed on Table 2 (Page 7).
3. We have tested for above 1 ㎓ and margin was more than 10 dB.

10. Sample Calculations

$$dB\ \mu V = \mathbf{20\ log_{10}(\mu V)}$$

$$dB\ \mu V = \mathbf{dBm + 107}$$

10.1 Example 1:

@ 0.158 ㎒

Class B limit	=	66.0 dB μV
Reading	=	48.6 dB μV (calibrated level)
Margin	=	48.6 – 66.0 = -17.4 dB μV
		= 17.4 dB below limit

10.2 Example 2:

@ 125.0 ㎒

Class B limit	=	30.0 dB μV/ m
Reading	=	13.2 dB μV /m (calibrated level)
Antenna Factor + Cable Loss	=	13.1 dB
Total	=	26.3 dB μV/ m
Margin	=	26.3 – 30.0 = -3.7 dB μV/ m
		= 3.7 dB below limit

11. Test Equipment

Type	Manufacturer	Model Number	CAL Due Date
Conducted Emission			
EMI Test Receiver	**Rohde & Schwarz**	**ESCI**	**2011.02.19**
LISN	**Rohde & Schwarz**	**ESH3-Z5**	**2011.02.05**
LISN	**Rohde & Schwarz**	**ENV216**	**2011.04.06**
Attenuator	**Rohde & Schwarz**	**ESH3-Z2**	**2010.10.30**
Radiated Emission			
EMI Test Receiver	**Rohde & Schwarz**	**ESI40**	**2010.10.30**
TRILOG Antenna	**Schwarzbeck**	**VULB9160**	**2010.12.18**
Antenna Position Tower	**HD**	**MA240**	**Not Applicable**
Turn Table	**EMCO**	**1050**	**Not Applicable**
Controller	**HD GmbH**	**HD 100**	**Not Applicable**
Slide Bar	**HD GmbH**	**KMS 560**	**Not Applicable**

12. Test Software Used

■ Connect EUT to Notebook PC and LCD monitor, and then play a video and executed ping test by radio.

NOTE: This is a sample of the basic program used during the test. However, during testing, a different software program may be used; whichever determines the worst-case condition. In addition, the program used also depends on the number and type of devices being tested.

13. Conclusion

The data collected shows that **Portable Theater Wi-Fi,** manufactured by **LG Electronics Inc., (MODEL: DP1W)** complies with §15.107 and §15.109 of the FCC Rules.