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EMI CERTIFICATION REPORT

Applicant:

LG Electronics MobileComm U.S.A., Inc.

1000 Sylvan Avenue, Englewood Cliffs NJ 07632

Date of Issue: July 11, 2012

Test Report No.: HCTE1206FE20-1

Test Site: HCT CO., LTD.

HCT FRN: 0005-8664-21

FCC ID:

ZNFP870

Rule Part(s) / Standard(s) : FCC PART 15 Subpart B Class B
Equipment Type : Cellular/PCS GSM/GPRS/EDGE, WCDMA/HSDPA and LTE
Phone with Bluetooth, RFID and WLAN
Model Name : LG-P870
Additional Model Name : P870, LGP870
Port / Connector(s) : USB Port / Headset Port

The device bearing the trade name and model specified above, has been shown to comply 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. (See Test Report if any modifications were made for compliance)

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.

HCT certifies that no party to application has been subject to a denial of Federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C 862

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DOCUMENT HISTORY

The revision history for this document is shown in table.

Version	Date	Description
HCTE1206FE23	June 15, 2012	Initial Release
HCTE1206FE23-1	July 11, 2012	1. Revised 'Note' on page 15. 2. Added calibration cycle on page 17.

TABLE OF CONTENTS

	PAGE
1. GENERAL INFORMATION	4
1.1 Product Description	4
1.2 Related Submittal(s) / Grant(s)	4
1.3 Tested System Details	5
1.4 Cable Description	6
1.5 Noise Suppression Parts on Cable. (I/O cable)	6
1.6 Test Methodology	7
1.7 Test Facility	7
1.8 Frequency Range of Radiated Measurements	7
2. SYSTEM TEST CONFIGURATION	8
2.1 Configuration of Test System	8
3. PRELIMINARY TEST	9
3.1 Conducted Emission Test	9
3. 2 Radiated Emission Test	9
4. CONDUCTED AND RADIATED EMISSION TEST SUMMARY	10
4.1 Conducted Emission Test	10
4.2 Radiated Emission Test	15
5. FIELD STRENGTH CALCULATION	16
6. TEST EQUIPMENT	17
7. CONCLUSION	18

ATTACHMENT: TEST SETUP PHOTOGRAPHS

1. GENERAL INFORMATION

1.1 Product Description

Equipment Under Test is **Cellular/PCS GSM/GPRS/EDGE, WCDMA/HSDPA and LTE Phone with Bluetooth, RFID and WLAN, Model: LG-P870** manufactured by **LG Electronics MobileComm U.S.A., Inc.** Its basic purpose is used for communications.

Model	LG-P870
Additional Model Name	P870, LGP870
FCC ID	ZNFP870
E.U.T Type	Cellular/PCS GSM/GPRS/EDGE, WCDMA/HSDPA and LTE Phone with Bluetooth, RFID and WLAN
TX Frequency	824.20 MHz to 848.80 MHz (GSM 850) 1 850.20 MHz to 1 909.80 MHz (GSM 1 900) 826.40 MHz to 846.60 MHz (WCDMA 850) 1 852.4 MHz to 1 907.6 MHz (WCDMA 1 900) 1 850.0 MHz to 1 910.0 MHz (LTE B2) 1 710.0 MHz to 1 755.0 MHz (LTE B4) 824.0 MHz to 849.0 MHz (LTE B5) 704 MHz to 716 MHz (LTE B17)
RX Frequency	869.20 MHz to 893.80 MHz (GSM 850) 1 930.20 MHz to 1 989.80 MHz (GSM 1 900) 871.40 MHz to 891.60 MHz (WCDMA 850) 1 932.4 MHz to 1 987.6 MHz (WCDMA 1 900) 1 930.0 MHz to 1 990.0 MHz (LTE B2) 2 110.0 MHz to 2 155.0 MHz (LTE B4) 869.0 MHz to 894.0 MHz (LTE B5) 734 MHz to 746 MHz (LTE B17)

1.2 Related Submittal(s) / Grant(s)

Original submittal only.

1.3 Tested System Details

All equipment descriptions used in the tested system (including inserted cards) are:

Device Type	Manufacturer	Model Name	FCC ID / DoC	Connected To
E.U.T	LG	LG-P870	ZNFP870	Notebook PC
Notebook PC	LG	X140-02	DoC	E.U.T Notebook PC adaptor
Notebook PC adaptor	DELTA (JIANG SU)	ADP-40PH AD	-	Notebook PC
Mouse	PRIMAX ELECTRONICS	MOARUO	DoC	Notebook PC
USB cable	-	-	-	E.U.T Notebook PC
SD card	SanDisk	8GB	-	E.U.T
Headset	I-SOUND	EAB62209201	-	E.U.T
Micro SD card	SanDisk	2 GB	-	E.U.T
Net HDD	LG	N1A1DD1	Doc	Notebook PC Net HDD adaptor
Net HDD adaptor	Yang Ming Industrial	DA-60M12	-	Net HDD
RJ45 cable	-	-	-	Net HDD Notebook PC

1.4 Cable Description

Product Name	Port	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (m)
E.U.T	Micro USB	Y	Y	(P,D)1.2
	Headset jack	-	N	(D)1.2
Notebook PC	RJ45	-	N	(D)1.5
	USB (Mouse)	-	Y	(D)1.8

* The marked "(D)" means the data cable and "(P)" means the power cable.

1.5 Noise Suppression Parts on Cable. (I/O cable)

Product Name	Port	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
E.U.T	Micro USB	N	N/A	Y	Both End
	Headset jack	N	N/A	Y	E.U.T End
Notebook PC	RJ45	N	N/A	N	Both End
	USB (Mouse)	-	-	Y	Notebook PC End

1.6 Test Methodology

Both Conducted and Radiated testing was performed according to the procedures in ANSI C63.4/2003. Radiated testing was performed at an antenna to E.U.T distance of 3 m

1.7 Test Facility

The 3 m semi anechoic chamber used to collect the test data is located at the 105-1, Jangam-Ri, Majang-Myeon, Icheon-Si, Kyoungki-Do, Republic of Korea. Those measurement facilities are constructed in conformance with the requirements of ANSI C63.4.

Detailed description of test facilities was submitted to the Commission and accepted dated Mar 02, 2011 (Registration Number: 90661)

1.8 Frequency Range of Radiated Measurements

An unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a Radiated Emission limit is specified, up to the frequency shown in the following table

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 1.705	30
1.705 to 108	1 000
108 to 500	2 000
500 to 1 000	5 000
Above 1 000	5 th harmonic of the highest frequency or 40 GHz, whichever is lower

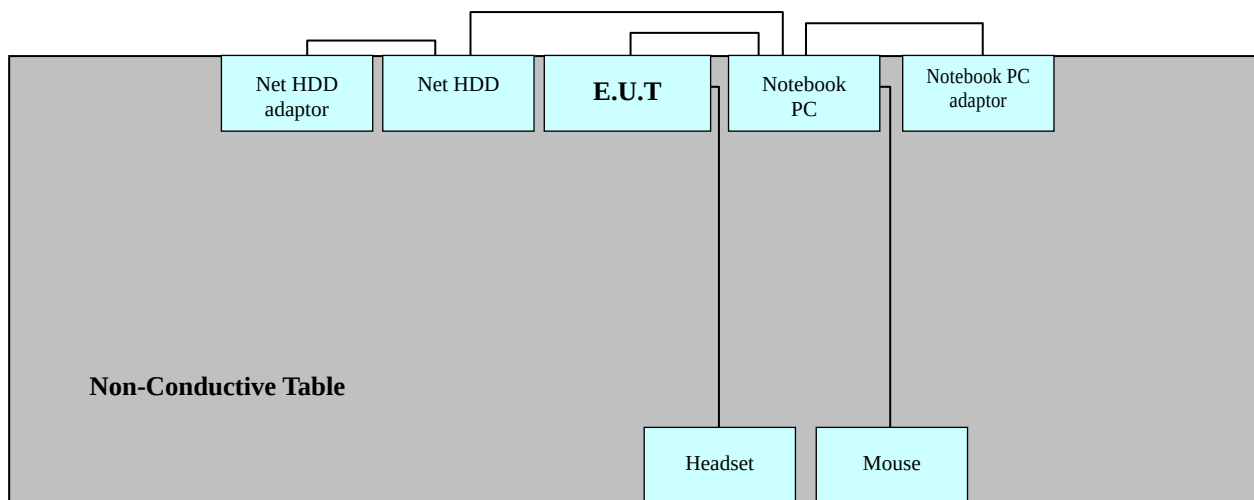
2. SYSTEM TEST CONFIGURATION

2.1 Configuration of Test System

Power Line Conducted test : E.U.T was connected to LISN via Notebook PC adaptor and Base Station. Preliminary Power Line Conducted Emission tests were performed by using the procedure in ANSI C63.4/2003 7.2.3 to determine the worst operating conditions.

Radiated Emission test : Preliminary Radiated Emission tests were performed by using the procedure in ANSI C63.4/2003 8.3.1.1 to determine the worst operating condition. Final Radiated Emission tests were performed at 3 m semi-anechoic chamber.

[Configuration of Tested System]



Power Line: 110 VAC

3. PRELIMINARY TEST

3.1 Conducted Emission Test

- It was tested Data Communication mode, after connecting all peripheral devices.

Operation Mode: ☒ Data communication mode

3. 2 Radiated Emission Test

- It was tested Data Communication mode, after connecting all peripheral devices.

Operation Mode: ☒ Data communication mode

4. CONDUCTED AND RADIATED EMISSION TEST SUMMARY

4.1 Conducted Emission Test

The following table shows the highest levels of conducted emissions on both polarization of hot and neutral line.

Limit Apply to	: FCC PART 15 Subpart B Class B
Detector	: Quasi-Peak, Average (6 dB Bandwidth: 9 kHz)
Operation Mode	: Data communication mode
Temperature	: 24.1 °C
Humidity Level	: 47.8 %
Test Date	: June 09, 2012

Frequency (MHz)	Transd (dB)	Conductor	Quasi-Peak			Average		
			Limit	Measurement Level	Result Level	Limit	Measurement Level	Result Level
			(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dBuV)
20.096	11.5	H	60	36.4	47.9	50	-	-
20.548	11.6	H	60	34.0	45.6	50	-	-
20.108	11.4	N	60	36.9	48.3	50	-	-
20.584	11.4	N	60	36.7	48.1	50	-	-
21.452	11.5	N	60	35.1	46.6	50	-	-
21.356	11.6	H	60	34.5	46.1	50	-	-

※ **NOTE:** Refer to page 11 to page 14 for details.

1. Line H = Hot, Line N = Neutral

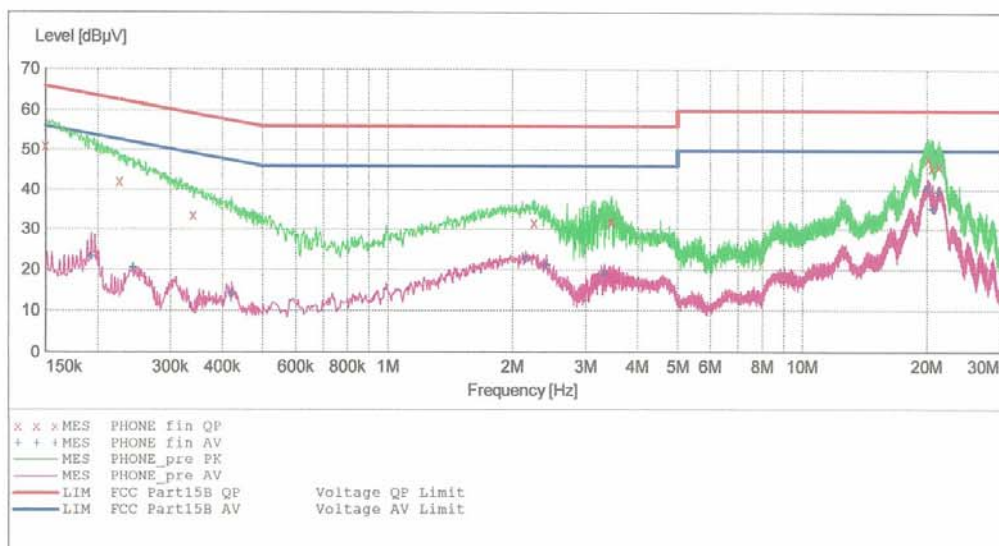
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EUT: P870
Manufacturer: LG
Operating Condition: DATA MODE
Test Site: SHIELD ROOM
Operator: JH CHOI
Test Specification: FCC PART15 CLASS B
Comment: H

SCAN TABLE: "FCC PART 15 B(H)"

Short Description:				FCC PART 15 CLASS B			Transducer
Start	Stop	Step	Detector	Meas. Time	IF Bandw.		
Frequency	Frequency	Width					
150.0 kHz	500.0 kHz	1.0 kHz	MaxPeak	10.0 ms	9 kHz	None	
			Average				
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None	
			Average				
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None	
			Average				



MEASUREMENT RESULT: "PHONE_fin QP"

6/9/2012 8:49PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.150010	51.00	10.0	66	15.0	---	---
0.226010	42.20	10.1	63	20.4	---	---
0.339010	33.70	10.1	59	25.5	---	---
2.256000	31.80	10.2	56	24.2	---	---
3.460000	31.90	10.3	56	24.1	---	---
3.472000	31.90	10.3	56	24.1	---	---
20.096000	47.90	11.5	60	12.1	---	---
20.548000	45.60	11.6	60	14.4	---	---
21.356000	46.10	11.6	60	13.9	---	---

MEASUREMENT RESULT: "PHONE_fin AV"

6/9/2012 8:49PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.193010	23.20	10.1	54	30.7	---	---
0.243010	20.40	10.1	52	31.6	---	---
0.420010	14.30	10.1	47	33.2	---	---
2.152000	22.50	10.2	46	23.5	---	---
2.420000	21.10	10.3	46	24.9	---	---
3.336000	19.00	10.3	46	27.0	---	---
19.996000	40.30	11.5	50	9.7	---	---
20.628000	35.10	11.6	50	14.9	---	---
21.292000	39.50	11.6	50	10.5	---	---

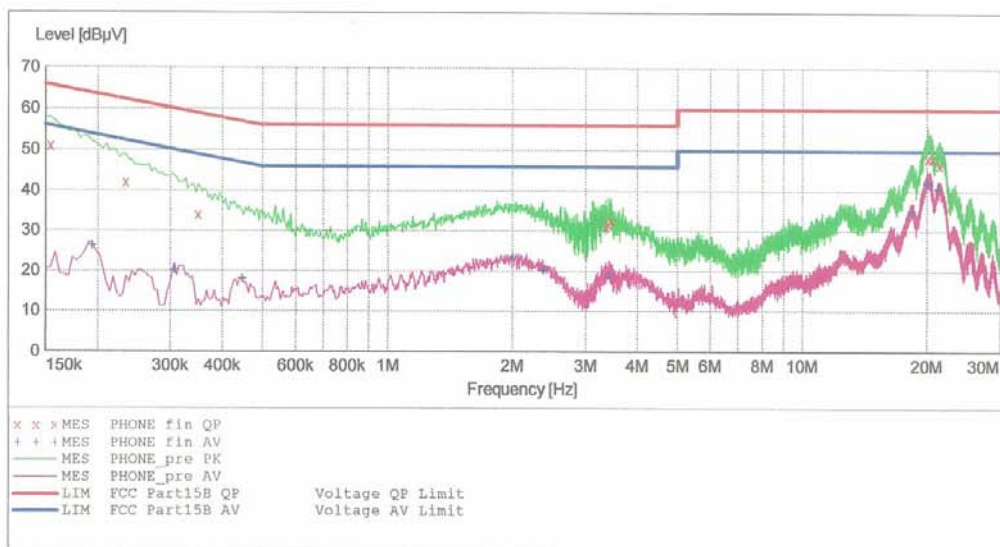
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EMC

EUT: P870
Manufacturer: LG
Operating Condition: DATA MODE
Test Site: SHIELD ROOM
Operator: JH CHOI
Test Specification: FCC PART15 CLASS B
Comment: N

SCAN TABLE: "FCC PART 15 B(N)"

Short Description:				FCC PART 15 CLASS B			
Start	Stop	Step	Detector	Meas. Time	IF Bandw.	Transducer	
Frequency	Frequency	Width					
150.0 kHz	500.0 kHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None	
			Average				
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None	
			Average				
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None	
			Average				



MEASUREMENT RESULT: "PHONE_fin QP"

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Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.154010	51.10	10.0	66	14.7	---	---
0.234010	42.20	10.1	62	20.1	---	---
0.350010	34.10	10.1	59	24.9	---	---
3.356000	31.00	10.3	56	25.0	---	---
3.408000	31.80	10.3	56	24.2	---	---
3.456000	32.70	10.3	56	23.3	---	---
20.108000	48.30	11.4	60	11.7	---	---
20.584000	48.10	11.4	60	11.9	---	---
21.452000	46.60	11.5	60	13.4	---	---

MEASUREMENT RESULT: "PHONE_fin AV"

6/9/2012 8:45PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.194010	26.30	10.1	54	27.5	---	---
0.306010	20.30	10.0	50	29.8	---	---
0.446010	18.10	10.1	47	28.8	---	---
2.004000	23.40	10.2	46	22.6	---	---
2.368000	20.30	10.2	46	25.7	---	---
3.412000	19.00	10.3	46	27.0	---	---
18.380000	35.00	11.3	50	15.0	---	---
20.060000	42.00	11.4	50	8.0	---	---
21.300000	40.60	11.5	50	9.4	---	---

4.2 Radiated Emission Test

The following table shows the highest levels of Radiated Emissions on both polarization of horizontal and vertical.

Limit Apply to : FCC PART 15 Subpart B Class B

-For measurement below 1 GHz

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

Operation Mode : Data communication mode

-For measurement above 1 GHz

Detector : Peak mode: Peak (RBW: 1 MHz / VBW: 1 MHz)

: Average mode: Peak (RBW: 1 MHz / VBW: 10 Hz)

Operation Mode : Data communication mode

Temperature : 24.0 °C

Humidity Level : 47.2 %

Test Date : June 08, 2012

Frequency (MHz)	Reading (dBuV)	Polarity (H/V)	Antenna Height (m)	Correction Factor		Limit (dBuV/m)	Level (dBuV/m)	Margin (dB)
				Antenna (dB/m)	Cable (dB)			
31.400	11.09	V	2.7	11.51	3.40	40.0	26.0	14.0
55.200	15.86	V	1.0	12.14	3.60	40.0	31.6	8.4
80.900	12.38	H	2.2	7.92	3.80	40.0	24.1	15.9
144.600	14.15	V	1.0	12.91	4.05	43.5	31.1	12.4
191.300	16.83	H	1.2	10.62	4.26	43.5	31.7	11.8
500.400	11.70	H	1.0	17.70	5.30	46.0	34.7	11.3

※ NOTE:

1. Measurement above 1 GHz was performed from 1 GHz to the 5th harmonic of highest fundamental frequency. Test was measured by 12 GHz.
2. For measurement above 1 GHz, Emission noise was not founded over the ambient noise. The highest frequency measured: 1.6513 GHz, Peak level: 45.2 dBuV/m

5. FIELD STRENGTH CALCULATION

The field strength is calculated by adding the antenna factor and cable factor.
The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CF$$

Where FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor

CF = Cable Attenuation Factor

Assume a receiver reading of 21.5 dB μ V is obtained. The antenna factor of 7.4 dB/m and a cable factor of 1.1 dB are added. The 30 dB μ V/m value is mathematically converted to its corresponding level in μ V/m.

$$FS = 21.5 + 7.4 + 1.1 = 30 \text{ dB}\mu\text{V/m}$$

[Radiated Emission Limits]

Frequency of Emission (MHz)	Field Strength	
	μ V/m	dB μ V/m
30 to 88	100	40.0
88 to 216	150	43.5
216 to 960	200	46.0
Above 960	500	54.0

6. TEST EQUIPMENT

<u>Type</u>	<u>Manufacturer</u>	<u>Model Name</u>	<u>Serial Number</u>	<u>Calibration Cycle</u>	<u>Next CAL Date</u>
<u>Conducted Emission</u>					
☒ EMI Test Receiver	Rohde & Schwarz	ESCI	100584	1 year	2013.05.02
☒ LISN	Rohde & Schwarz	ESH3-Z5	100282	1 year	2013.02.03
☒ LISN	EMCO	3816/2SH	9706-1070	1 year	2013.05.02
☒ Attenuator	Rohde & Schwarz	ESH3-Z2	357.8810.352	1 year	2012.08.01
<u>Radiated Emission</u>					
☒ EMI Test Receiver	Rohde & Schwarz	ESI40	831564103	1 year	2013.05.03
☒ Trilog Antenna	Schwarzbeck	VULB9160	3301	2 year	2012.09.13
☐ Antenna master	INNCO Systems	MA4000-EP	MA4000/283	N/A	-
☒ Antenna master	HD GmbH	MA240	240/520	N/A	-
☒ Turn Table	HD GmbH	2090	9702/1224	N/A	-
☒ Power Amplifier	Rohde & Schwarz	SCU-18	10094	1 year	2012.09.19
☒ Horn Antenna	Schwarzbeck	BBHA 9120D	937	2 year	2013.10.17

7. CONCLUSION

The data collected shows that the **Cellular/PCS GSM/GPRS/EDGE, WCDMA/HSDPA and LTE Phone with Bluetooth, RFID and WLAN, Model: LG-P870** complies with §15.107 and §15.109 of the FCC rules.