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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: March 06, 2013

Test Report No.: HCTE1303FE06

Test Site: HCT CO., LTD.

HCT FRN: 0005-8664-21

FCC ID:

ZNFUS780

Rule Part(s) / Standard(s) : FCC PART 15 Subpart B Class B
Equipment Type : AWS/Cellular/PCS CDMA Phone with AWS/Cellular/PCS LTE
WLAN, Bluetooth and NFC
Model Name : US780
Additional Model Name : LG-US780, LGUS780, AS780, LGAS780, LG-AS780
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
HCTE1303FE06	March 06, 2013	Initial Release

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ATTACHMENT: TEST SETUP PHOTOGRAPHS

1. GENERAL INFORMATION

1.1 Product Description

Equipment Under Test is **EUT type: AWS/Cellular/PCS CDMA Phone with AWS/Cellular/PCS LTE WLAN, Bluetooth and NFC, Model: US780** manufactured by **LG Electronics MobileComm U.S.A., Inc.** Its basic purpose is used for communications.

Model	US780
FCC ID	ZNFUS780
Additional Model(s)	LG-US780, LGUS780, AS780, LGAS780, LG-AS780
EUT Type	AWS/Cellular/PCS CDMA Phone with AWS/Cellular/PCS LTE WLAN, Bluetooth and NFC
TX Frequency	824 MHz to 849 MHz (CDMA BC0) 1 850 MHz to 1 910 MHz (CDMA BC1) 1 710 MHz to 1 755 MHz (CDMA BC15) 1 850 MHz to 1 910 MHz (LTE B2) 1 710 MHz to 1 755 MHz (LTE B4) 824 MHz to 849 MHz (LTE B5) 699 MHz to 716 MHz (LTE B12) 1 850 MHz to 1 915 MHz (LTE B25)
RX Frequency	869 MHz to 894 MHz (CDMA BC0) 1 930 MHz to 1 990 MHz (CDMA BC1) 2 110 MHz to 2 155 MHz (CDMA BC15) 1 930 MHz to 1 990 MHz (LTE B2) 2 110 MHz to 2 155 MHz (LTE B4) 869 MHz to 894 MHz (LTE B5) 729 MHz to 746 MHz (LTE B12) 1 930 MHz to 1 995 MHz (LTE B25)

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
EUT	LG	US780	ZNFUS780	Notebook PC Headset
USB cable	CRESYN	OTB-LGE30DC MUA	-	E.U.T Notebook PC
Headset	I-SOUND	HC-MYD-LG113	-	E.U.T
Notebook PC	H.P	ProBook 6560b	DoC	EUT Notebook PC adaptor
Notebook PC adaptor	CHICONY POWER TECHNOLOGY	Series PPP012H-S	-	Notebook PC
Mouse	Radio shack	Series 2-button mouse	FSUGMZE3	Notebook PC
Net hard	LG	N1A1DD1	Doc	Notebook PC Net hard adaptor
Net hard adaptor	Yang Ming Industrial	DA-60M12	-	Net hard
RJ45 cable	-	-	-	Net hard Notebook PC
Micro SD card	SanDisk	8 GB	-	E.U.T

1.4 Cable Description

Product Name	Port	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (m)
EUT	Micro USB	-	Y	(D)1.2
	Headset jack	-	N	(D)1.1
Notebook PC	RJ 45	-	N	(D)1.5
	Serial (Mouse)	-	Y	(D)1.8
Net hard	DC in	N	-	(P)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
EUT	Micro USB	N	N/A	Y	Both End
	Headset jack	N	N/A	Y	EUT End
Notebook PC	RJ 45	N	N/A	N	N/A
	Serial (Mouse)	N	N/A	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 EUT distance of 3 m

1.7 Test Facility

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.

Measurement Facilities	Reg. No.
Radiated Field strength measurement facility (3m)	90661(Mar. 02, 2011)
Radiated Field strength measurement facility (10m)	90661 (Sep. 03, 2010)

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

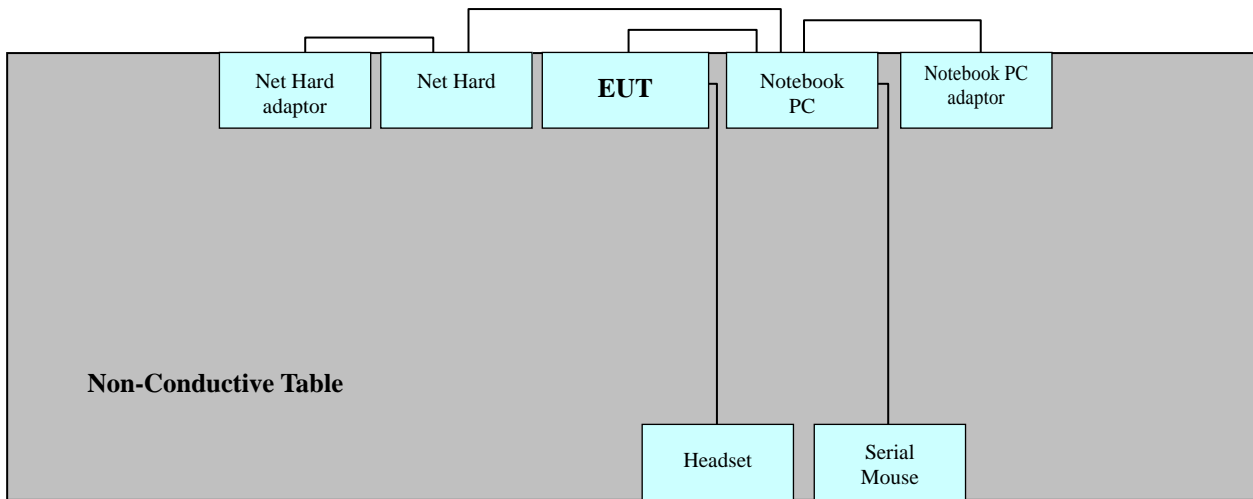
2. SYSTEM TEST CONFIGURATION

2.1 Configuration of Test System

Power Line Conducted test : EUT 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: 120 VAC

3. PRELIMINARY TEST

3.1 Conducted Emission Test

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

Operation Mode: Data mode

3. 2 Radiated Emission Test

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

Operation Mode: Data 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 mode
Temperature	: 21.4 °C
Humidity Level	: 36.0 %
Test Date	: March 01, 2013

Frequency (MHz)	Transd (dB)	Conductor	Quasi-Peak			Average		
			Limit	Measurement Level	Result Level	Limit	Measurement Level	Result Level
			(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dBuV)
0.498	10.0	N	56	25.1	35.1	46	12.20	22.20
0.604	10.0	N	56	25.1	35.1	46	-	-
1.744	10.1	N	56	-	-	46	15.60	25.70
1.904	9.9	H	56	-	-	46	14.60	24.50
3.776	10.1	H	56	-	-	46	10.50	20.60
16.600	11.2	H	60	-	-	50	13.60	24.80

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

1. Line H = Hot, Line N = Neutral
2. Transd = LISN factor + Cable Loss factor

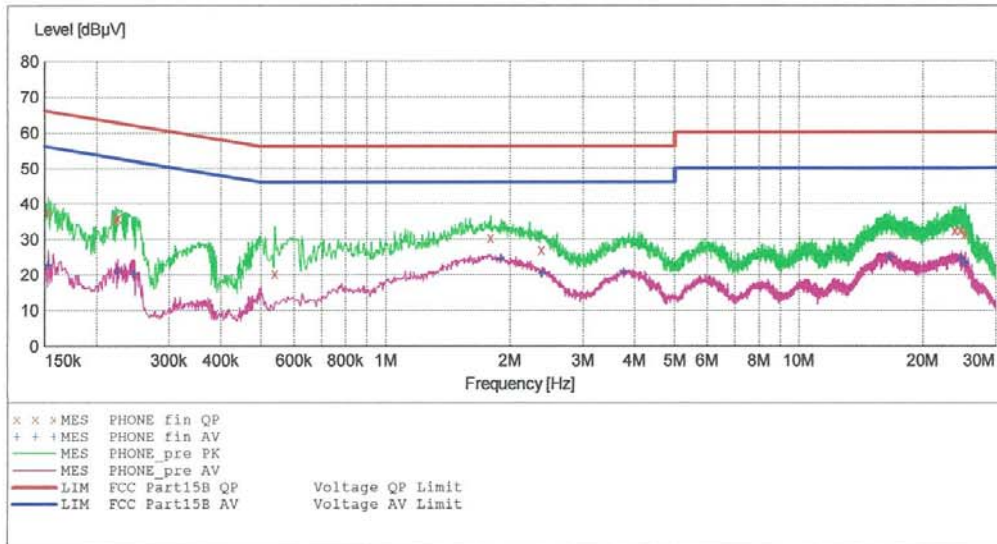
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EUT: US780 CLASS2
 Manufacturer: LG
 Operating Condition: DATA LINK MODE
 Test Site: SHIELD ROOM
 Operator: GC YOON
 Test Specification: FCC PART 15 B
 Comment: H

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

Short Description:	FCC PART 15	CLASS B	Detector	Meas. Time	IF Bandw.	Transducer
Start Frequency	Stop Frequency	Step 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"

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Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.153010	37.50	9.8	66	28.3	---	---
0.223010	35.60	9.7	63	27.1	---	---
0.225010	36.00	9.7	63	26.6	---	---
0.540000	20.40	9.8	56	35.6	---	---
1.796000	30.30	9.9	56	25.7	---	---
2.384000	27.00	10.0	56	29.0	---	---
23.804000	32.40	11.9	60	27.6	---	---
24.604000	32.60	12.0	60	27.4	---	---
25.268000	31.60	12.0	60	28.4	---	---

MEASUREMENT RESULT: "PHONE_fin AV"

3/1/2013 3:12PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.153010	22.60	9.8	56	33.3	---	---
0.225010	21.00	9.7	53	31.6	---	---
0.247010	20.20	9.8	52	31.7	---	---
1.904000	24.50	9.9	46	21.5	---	---
2.400000	20.30	10.0	46	25.7	---	---
3.776000	20.60	10.1	46	25.4	---	---
16.600000	24.80	11.2	50	25.2	---	---
24.652000	24.30	12.0	50	25.7	---	---
25.268000	23.20	12.0	50	26.8	---	---

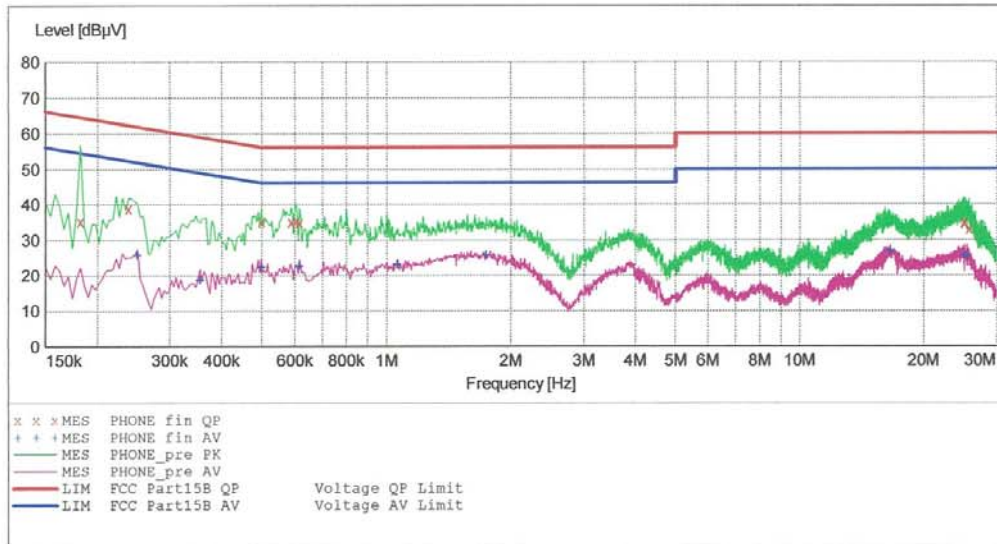
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EMC

EUT: US780 CLASS2
 Manufacturer: LG
 Operating Condition: DATA LINK MODE
 Test Site: SHIELD ROOM
 Operator: GC YOON
 Test Specification: FCC PART 15 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	Level	Transd	Limit	Margin	Line	PE
MHz	dBµV	dB	dBµV	dB		
0.182010	35.10	9.9	64	29.3	---	---
0.238010	38.80	10.0	62	23.4	---	---
0.498010	35.10	10.0	56	21.0	---	---
0.588000	35.00	10.0	56	21.0	---	---
0.604000	35.10	10.0	56	20.9	---	---
0.616000	34.90	10.0	56	21.1	---	---
24.980000	34.90	12.4	60	25.1	---	---
25.040000	34.60	12.4	60	25.4	---	---
25.752000	33.10	12.4	60	26.9	---	---

MEASUREMENT RESULT: "PHONE_fin AV"

3/1/2013 3:17PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.250010	25.70	10.0	52	26.1	---	---
0.354010	18.70	9.9	49	30.2	---	---
0.498010	22.20	10.0	46	23.8	---	---
0.616000	22.50	10.0	46	23.5	---	---
1.064000	23.00	10.0	46	23.0	---	---
1.744000	25.70	10.1	46	20.3	---	---
16.556000	26.60	11.5	50	23.4	---	---
25.040000	25.70	12.4	50	24.3	---	---
25.456000	25.10	12.4	50	24.9	---	---

4.2 Radiated Emission Test

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

-For measurement below 1 GHz

Limit Apply to : FCC PART 15 Subpart B Class B

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

Operation Mode : Data mode

Temperature : 21.4 °C

Humidity Level : 35.4 %

Test Date : March 01, 2013

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)			
45.700	14.74	V	1.0	12.42	3.54	40.0	30.7	9.3
57.200	14.61	V	1.0	11.97	3.62	40.0	30.2	9.8
61.000	14.87	V	1.0	11.68	3.65	40.0	30.2	9.8
70.700	17.75	V	1.0	10.43	3.72	40.0	31.9	8.1
127.400	15.55	V	1.0	12.13	4.02	43.5	31.7	11.8
317.000	13.51	H	1.0	13.79	4.70	46.0	32.0	14.0

-For measurement above 1 GHz

Limit Apply to : FCC PART 15 Subpart B Class B

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

Operation Mode : Data mode

Temperature : 24.4 °C

Humidity Level : 31.9 %

Test Date : March 05, 2013

Frequency (GHz)	Peak			POL	Average		
	Total (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)		Total (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
2.9833	48.10	74	25.9	H	33.70	54	20.3
3.8055	49.20	74	24.8	V	38.10	54	15.9

※ 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.

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>					
<input checked="" type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESCI	100584	1 year	2013.05.02
<input type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESCI	100033	1 year	2013.06.18
<input type="checkbox"/> LISN	Rohde & Schwarz	ESH3-Z5	100282	1 year	2013.07.04
<input checked="" type="checkbox"/> LISN	EMCO	3816/2SH	9706-1070	1 year	2013.05.02
<input checked="" type="checkbox"/> LISN	Rohde & Schwarz	ENV216	100073	1 year	2014.02.06
<input type="checkbox"/> Attenuator	Rohde & Schwarz	ESH3-Z2	357.8810.352	1 year	2013.07.31
<u>Radiated Emission</u>					
<input type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESU26	100241	1 year	2013.07.30
<input type="checkbox"/> Antenna master	INNCO Systems	MA4000-EP	MA4000/283	N/A	-
<input type="checkbox"/> Turn Table	INNCO Systems	DT3000-3T	DT3000/69	N/A	-
<input checked="" type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESI40	831564103	1 year	2013.05.03
<input checked="" type="checkbox"/> Antenna master	HD GmbH	MA240	240/520	N/A	-
<input checked="" type="checkbox"/> Turn Table	HD GmbH	2090	9702/1224	N/A	-
<input type="checkbox"/> Trilog Antenna	Schwarzbeck	VULB9160	3125	2 year	2013.05.03
<input checked="" type="checkbox"/> Trilog Antenna	Schwarzbeck	VULB9160	3301	2 year	2014.12.17
<input type="checkbox"/> Horn Antenna	Schwarzbeck	BBHA 9120D	147	2 year	2013.05.15
<input type="checkbox"/> Horn Antenna	Schwarzbeck	BBHA 9120D	937	2 year	2013.10.17
<input checked="" type="checkbox"/> Horn Antenna	Schwarzbeck	BBHA 9120D	296	2 year	2014.12.13
<input checked="" type="checkbox"/> Power Amplifier	Rohde & Schwarz	SCU-18	10094	1 year	2013.09.11

7. CONCLUSION

The data collected shows that the **EUT type: AWS/Cellular/PCS CDMA Phone with AWS/Cellular/PCS LTE WLAN, Bluetooth and NFC, Model: US780, FCC ID: ZNFUS780** complies with §15.107 and §15.109 of the FCC rules.