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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: August 01, 2012  
Test Report No.: HCTE1208FE04  
Test Site: HCT CO., LTD.  
HCT FRN: 0005-8664-21

**FCC ID:**

**ZNFLS860**

Rule Part(s) / Standard(s) : FCC PART 15 Subpart B Class B  
Equipment Type : Cellular/PCS CDMA/EVDO and PCS LTE Phone with Bluetooth  
RFID and WLAN  
Model Name : LS860  
Additional Model Name : LG-LS860, LGLS860  
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

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The revision history for this document is shown in table.

Version	Date	Description
HCTE1208FE04	August 01, 2012	Initial Release

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**ATTACHMENT: TEST SETUP PHOTOGRAPHS**

## 1. GENERAL INFORMATION

### 1.1 Product Description

Equipment Under Test is **Cellular/PCS CDMA/EVDO and PCS LTE Phone with Bluetooth, RFID and WLAN, Model: LS860** manufactured by **LG Electronics MobileComm U.S.A., Inc.** Its basic purpose is used for communications.

<b>Model</b>	LS860
<b>Additional Model Name</b>	LG-LS860, LGLS860
<b>FCC ID</b>	ZNFLS860
<b>E.U.T Type</b>	Cellular/PCS CDMA/EVDO and PCS LTE Phone with Bluetooth, RFID and WLAN
<b>TX Frequency</b>	824.70 MHz to 848.31 MHz (CDMA 835) 1 851.25 MHz to 1 908.75 MHz (CDMA 1 900) 1 850.00 MHz to 1 915.00 MHz (LTE B25)
<b>RX Frequency</b>	869.70 MHz to 893.31 MHz (CDMA 835) 1 931.25 MHz to 1 988.75 MHz (CDMA 1 900) 1 930.00 MHz to 1 995.00 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
E.U.T	LG	LS860	ZNFLS860	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
SD Card	SanDisk	8GB	-	E.U.T
USB cable	-	-	-	E.U.T Notebook PC
Headset	I-SOUND	EAB62009201	-	E.U.T
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

### 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	(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 <sup>th</sup> harmonic of the highest frequency or 40 GHz, whichever is lower

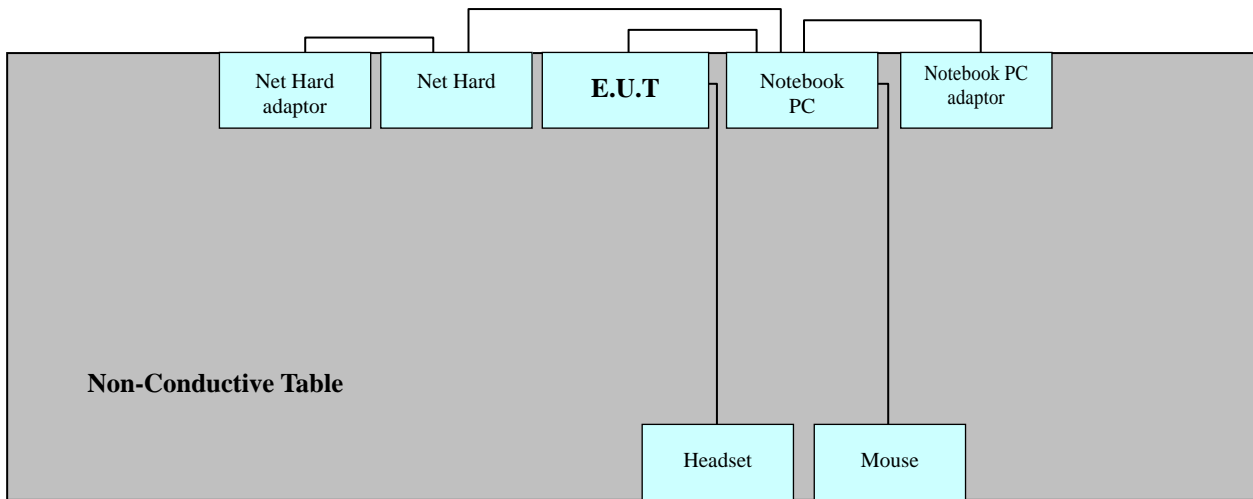
## 2. SYSTEM TEST CONFIGURATION

### 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: 120 VAC



### **3. PRELIMINARY TEST**

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#### **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	: 26.3 °C
Humidity Level	: 48.2 %
Test Date	: August 01, 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)
3.436	10.1	H	56	21.0	31.1	46	8.20	18.30
19.916	11.7	H	60	35.8	47.5	50	-	-
20.024	11.8	H	60	35.8	47.6	50	-	-
20.900	12.1	N	60	34.3	46.4	50	-	-
21.284	12.2	N	60	32.8	45.0	50	-	-
21.460	12.2	N	60	32.6	44.8	50	-	-

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

1. Line H = Hot, Line N = Neutral

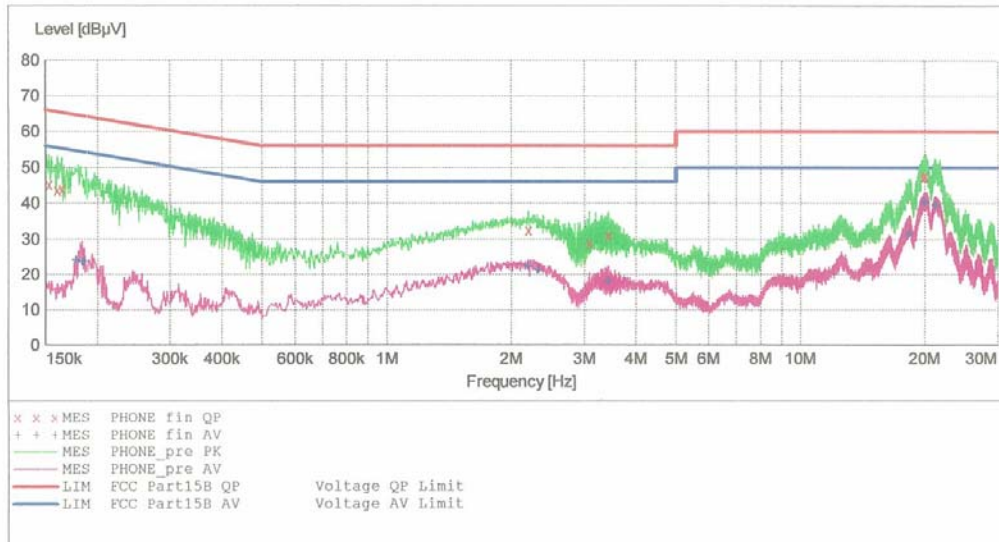
**HCT**

**EMC**

EUT: LS860  
 Manufacturer: LG  
 Operating Condition: DATA MODE  
 Test Site: SHIELD ROOM  
 Operator: JH CHOI  
 Test Specification: FCC PART 15 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.		
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	45.30	9.8	66	20.6	---	---
0.160010	43.70	9.7	66	21.7	---	---
0.164010	44.10	9.7	65	21.1	---	---
2.200000	32.60	9.9	56	23.4	---	---
3.084000	29.10	10.0	56	26.9	---	---
3.436000	31.10	10.1	56	24.9	---	---
19.880000	47.30	11.7	60	12.7	---	---
19.916000	47.50	11.7	60	12.5	---	---
20.024000	47.60	11.8	60	12.4	---	---

**MEASUREMENT RESULT: "PHONE\_fin AV"**

8/1/2012 2:12PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.178010	24.10	9.7	55	30.5	---	---
0.184010	23.80	9.7	54	30.5	---	---
0.186010	23.80	9.7	54	30.4	---	---
2.196000	22.40	9.9	46	23.6	---	---
2.328000	21.40	10.0	46	24.6	---	---
3.436000	18.30	10.1	46	27.7	---	---
18.352000	31.40	11.5	50	18.6	---	---
19.992000	40.40	11.8	50	9.6	---	---
21.224000	39.40	11.8	50	10.6	---	---

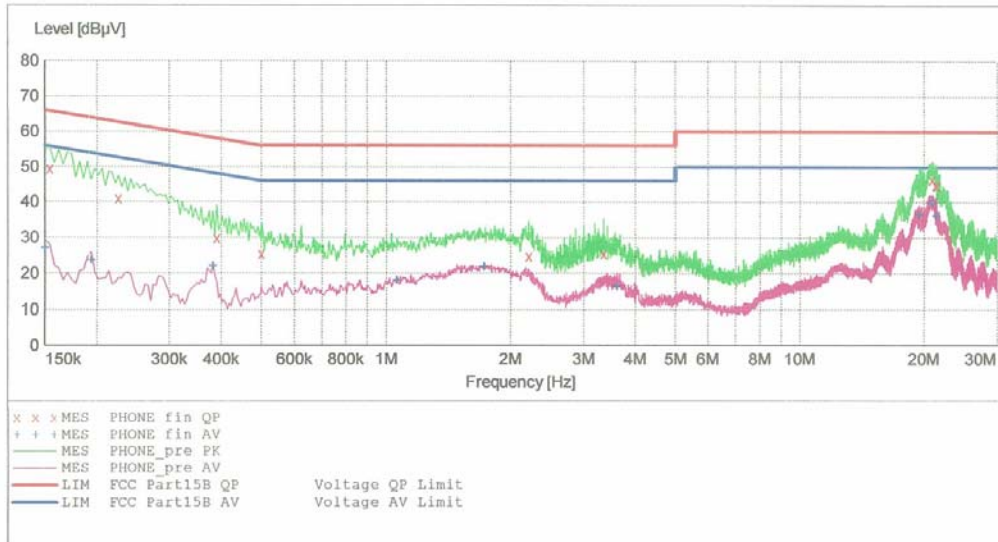
**HCT**

**EMC**

EUT: LS860  
 Manufacturer: LG  
 Operating Condition: DATA MODE  
 Test Site: SHIELD ROOM  
 Operator: JH CHOI  
 Test Specification: FCC PART 15 CLASS B  
 Comment: N

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

Short Description:			FCC PART 15 CLASS B				Transducer
Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.		
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	49.40	10.0	66	16.4	---	---
0.226010	41.00	10.0	63	21.6	---	---
0.390010	30.00	10.0	58	28.0	---	---
0.500000	25.60	10.0	56	30.4	---	---
2.212000	24.80	10.1	56	31.2	---	---
3.356000	25.70	10.3	56	30.3	---	---
20.900000	46.40	12.1	60	13.6	---	---
21.284000	45.00	12.2	60	15.0	---	---
21.460000	44.80	12.2	60	15.2	---	---

**MEASUREMENT RESULT: "PHONE\_fin AV"**

8/1/2012 2:29PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.150010	27.10	10.0	56	28.9	---	---
0.194010	23.80	9.9	54	30.1	---	---
0.382010	22.10	10.0	48	26.2	---	---
1.064000	18.30	10.0	46	27.7	---	---
1.728000	22.00	10.1	46	24.0	---	---
3.620000	16.50	10.3	46	29.5	---	---
19.484000	36.50	12.0	50	13.5	---	---
20.944000	39.80	12.1	50	10.2	---	---
21.380000	36.20	12.2	50	13.8	---	---

## 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 communication mode

Temperature : 25.9 °C

Humidity Level : 50.8 %

Test Date : August 01, 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)			
45.600	17.22	V	1.0	12.36	3.51	40.0	33.1	6.9
69.100	16.83	V	1.0	10.58	3.69	40.0	31.1	8.9
76.600	22.03	H	1.2	8.81	3.77	40.0	34.6	5.4
129.100	17.31	V	1.5	12.29	4.00	43.5	33.6	9.9
249.900	25.13	H	1.1	11.77	4.50	46.0	41.4	4.6
377.900	16.46	H	1.5	15.13	4.91	46.0	36.5	9.5

**-For measurement above 1 GHz**

Limit Apply to : FCC PART 15 Subpart B Class B

Detector : Peak mode: Peak (RBW: 1 MHz)  
 : Average mode: Peak (RBW: 1 MHz)

Temperature : 25.9 °C  
 Humidity Level : 50.8 %  
 Test Date : August 01, 2012

Frequency (GHz)	Peak			POL	Average		
	Total (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)		Total (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
1.5900	47.00	74	27.0	V	29.50	54	24.5
1.9900	57.00	74	17.0	V	34.00	54	20.0
3.0000	51.50	74	22.5	H	30.00	54	24.0

※ NOTE:

1. Measurement above 1 GHz was performed from 1 GHz to the 5<sup>th</sup> 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 $\mu$ V is obtained. The antenna factor of 7.4 dB/m and a cable factor of 1.1 dB are added. The 30 dB $\mu$ V/m value is mathematically converted to its corresponding level in  $\mu$ 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	
	$\mu$ V/m	dB $\mu$ 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>
<b><u>Conducted Emission</u></b>					
<input checked="" type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESCI	100584	1 year	2013.05.02
<input type="checkbox"/> LISN	Rohde & Schwarz	ESH3-Z5	100282	1 year	2013.07.04
<input checked="" type="checkbox"/> LISN	Rohde & Schwarz	ENV216	100073	1 year	2013.02.09
<input checked="" type="checkbox"/> LISN	EMCO	3816/2SH	9706-1070	1 year	2013.05.02
<input type="checkbox"/> Attenuator	Rohde & Schwarz	ESH3-Z2	357.8810.352	1 year	2013.07.31
<b><u>Radiated Emission</u></b>					
<input checked="" type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESI40	831564103	1 year	2013.05.03
<input type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESU26	100241	1 year	2013.07.30
<input checked="" type="checkbox"/> Trilog Antenna	Schwarzbeck	VULB9160	3301	2 year	2012.09.13
<input type="checkbox"/> Antenna master	INNCO Systems	MA4000-EP	MA4000/283	N/A	-
<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 checked="" type="checkbox"/> Power Amplifier	Rohde & Schwarz	SCU-18	10094	1 year	2012.09.19
<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	2014.02.20

## **7. CONCLUSION**

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The data collected shows that the **Cellular/PCS CDMA/EVDO and PCS LTE Phone with Bluetooth, RFID and WLAN, Model: LS860, FCC ID: ZNFLS860** complies with §15.107 and §15.109 of the FCC rules.