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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: November 19, 2012

Test Report No.: HCTE1211FE07

Test Site: HCT CO., LTD.

HCT FRN: 0005-8664-21

FCC ID:

IC:

ZNFE960
2703C-E960

Rule Part(s) / Standard(s) : FCC PART 15 Subpart B Class B / ICES-003 Issue 4
FCC Listing No : 90661
IC Recognition No : IC 5944A-3
Equipment Type : Cellular/PCS GSM/GPRS/EDGE and PCS WCDMA HSPA+ with
Bluetooth, RFID and WLAN
Model Name : LG-E960
Additional Model Name : LGE960, E960
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
HCTE1211FE07	November 19, 2012	Initial Release

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ATTACHMENT: TEST SETUP PHOTOGRAPHS

1. GENERAL INFORMATION

1.1 Product Description

Equipment Under Test is **Cellular/PCS GSM/GPRS/EDGE and PCS WCDMA HSPA+ with Bluetooth, RFID and WLAN, Model: LG-E960** manufactured by **LG Electronics MobileComm U.S.A., Inc.** Its basic purpose is used for communications.

Model	LG-E960
Additional Model Name	LGE960, E960
FCC ID	ZNFE960
IC	2703C-E960
E.U.T Type	Cellular/PCS GSM/GPRS/EDGE and PCS WCDMA HSPA+ 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) 1 852.4 MHz to 1 907.6 MHz (WCDMA 1 900)
RX Frequency	869.20 MHz to 893.80 MHz (GSM 850) 1 930.20 MHz to 1 989.80 MHz (GSM 1 900) 1 932.4 MHz to 1 987.6 MHz (WCDMA 1 900)

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-E960	ZNFE960	Notebook PC Headset
Notebook PC	H.P	ProBook 6560b	DoC	E.U.T Notebook PC adaptor
Notebook PC adaptor	CHICONY POWER TECHNOLOGY	Series PPP012H-S	-	Notebook PC
Mouse	PRIMAX ELECTRONICS	MOARUO	DoC	Notebook PC
USB cable	IS	EAD62330101	-	E.U.T Notebook PC
Headset	I-SOUND	EAB62691101	-	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	Y	(P,D)1.2
	Headset jack	-	N	(D)1.2
Notebook PC	RJ 45	-	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	RJ 45	N	N/A	Y	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

Chamber used to collect the test data is located at the 105-1, Jangam-Ri, Majang-Myeon, Icheon-Si, Kyongki-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

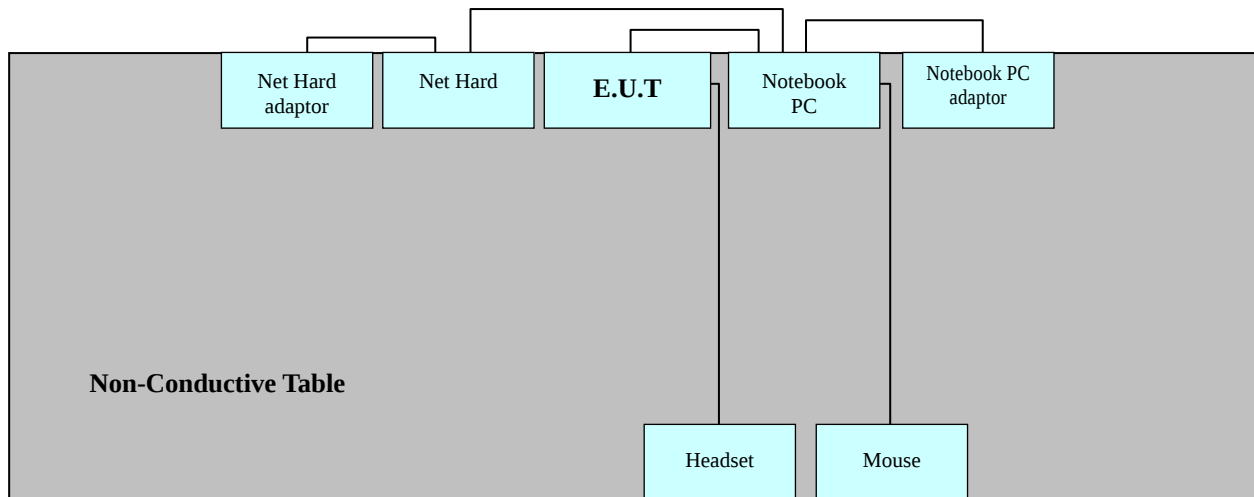
2. SYSTEM TEST CONFIGURATION

2.1 Configuration of Test System

Power Line Conducted test : 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 10 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 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	: 21.8 °C
Humidity Level	: 40.7 %
Test Date	: November 19, 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)
0.150	10.0	N	66	31.2	41.2	56	-	-
0.353	9.7	H	59	-	-	49	13.50	23.20
1.100	9.8	H	56	-	-	46	9.10	18.90
1.424	9.9	H	56	-	-	46	12.50	22.40
1.540	10.1	N	56	-	-	46	11.20	21.30
1.592	10.1	N	56	-	-	46	10.90	21.00

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

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

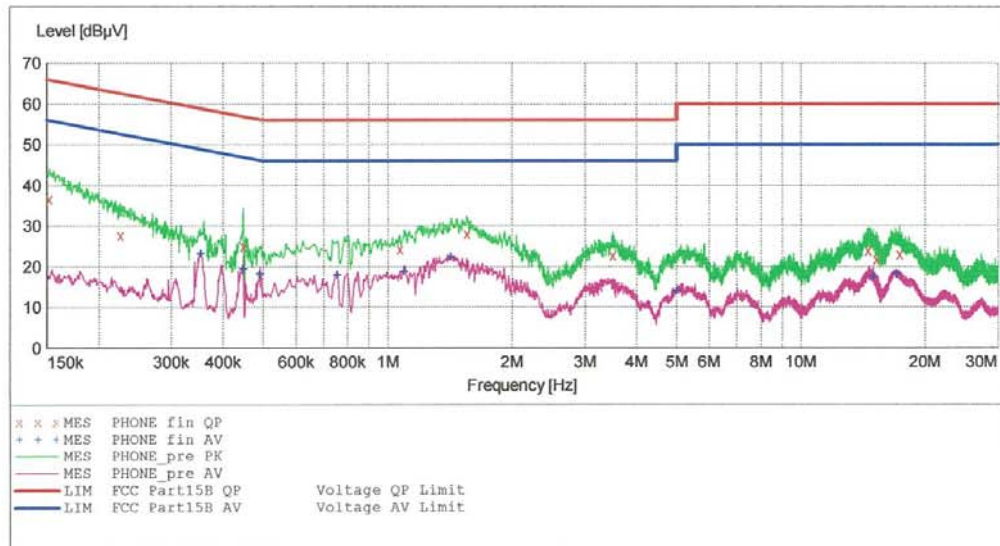
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EUT: E960
Manufacturer: LG
Operating Condition: DATA MODE
Test Site: SHIELD ROOM
Operator: JH CHOI
Test Specification: FCC PART 15 B
Comment: H

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

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

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.152010	36.70	9.8	66	29.2	---	---
0.226010	27.70	9.8	63	34.9	---	---
0.447010	25.10	9.8	57	31.9	---	---
1.072000	24.30	9.8	56	31.7	---	---
1.556000	28.20	9.9	56	27.8	---	---
3.508000	22.80	10.1	56	33.2	---	---
14.584000	23.90	10.9	60	36.1	---	---
15.240000	21.80	11.0	60	38.2	---	---
17.368000	23.00	11.3	60	37.0	---	---

MEASUREMENT RESULT: "PHONE_fin AV"

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Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.353010	23.20	9.7	49	25.7	---	---
0.448010	19.40	9.8	47	27.5	---	---
0.491010	18.20	9.8	46	28.0	---	---
0.756000	18.00	9.8	46	28.0	---	---
1.100000	18.90	9.8	46	27.1	---	---
1.424000	22.40	9.9	46	23.6	---	---
5.000000	14.00	10.2	46	32.0	---	---
14.956000	17.50	11.0	50	32.5	---	---
17.024000	18.20	11.3	50	31.8	---	---

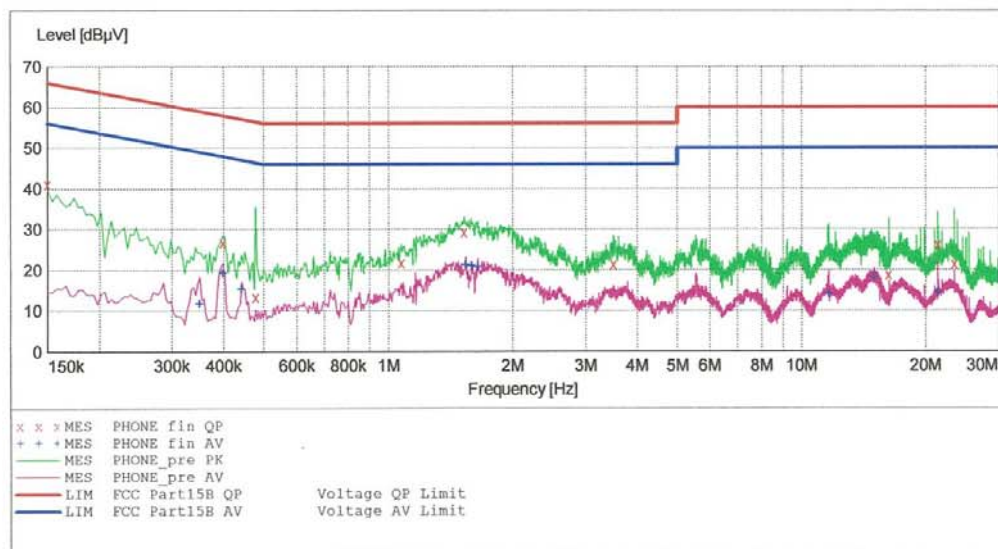
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EMC

EUT: E960
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			
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
0.150010	41.20	10.0	66	24.8	---	---
0.398010	26.70	10.0	58	31.2	---	---
0.478010	13.30	10.0	56	43.1	---	---
1.076000	21.80	10.0	56	34.2	---	---
1.528000	29.30	10.1	56	26.7	---	---
3.516000	21.40	10.3	56	34.6	---	---
16.244000	18.70	11.4	60	41.3	---	---
21.324000	26.10	12.2	60	33.9	---	---
23.432000	21.40	12.3	60	38.6	---	---

MEASUREMENT RESULT: "PHONE_fin AV"

11/19/2012 4:43AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.350010	11.70	9.9	49	37.3	---	---
0.398010	19.30	10.0	48	28.6	---	---
0.442010	15.30	10.0	47	31.8	---	---
1.540000	21.30	10.1	46	24.7	---	---
1.592000	21.00	10.1	46	25.0	---	---
1.648000	20.70	10.1	46	25.3	---	---
11.632000	14.00	10.9	50	36.0	---	---
14.992000	18.10	11.2	50	31.9	---	---
21.324000	14.40	12.2	50	35.6	---	---

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 : 21.6 °C

Humidity Level : 43.2 %

Test Date : November 19, 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)			
47.40	18.68	V	1.20	12.07	1.15	40.0	31.90	8.10
82.40	20.80	H	1.50	8.36	1.54	40.0	30.70	9.30
144.80	22.23	V	1.00	12.70	2.07	43.5	37.00	6.50
224.30	18.53	H	1.20	10.57	2.61	46.0	31.70	14.30
249.60	20.96	H	1.00	11.78	2.76	46.0	35.50	10.50
792.00	9.42	H	1.00	22.57	5.11	46.0	37.10	8.90

-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)

Temperature : 21.6 °C

Humidity Level : 43.2 %

Test Date : November 19, 2012

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)
1.0700	48.20	74	25.8	H	26.10	54	27.9
1.9900	52.40	74	21.6	V	30.70	54	23.3

※ 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.

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

Type	Manufacturer	Model Name	Serial Number	Calibration Cycle	Next CAL Date
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Conducted Emission

☒	EMI Test Receiver	Rohde & Schwarz	ESCI	100584	1 year	2013.05.02
☐	EMI Test Receiver	Rohde & Schwarz	ESCI	100033	1 year	2013.06.18
☐	LISN	Rohde & Schwarz	ESH3-Z5	100282	1 year	2013.07.04
☒	LISN	EMCO	3816/2SH	9706-1070	1 year	2013.05.02
☒	LISN	Rohde & Schwarz	ENV216	100073	1 year	2013.02.09
☐	Attenuator	Rohde & Schwarz	ESH3-Z2	357.8810.352	1 year	2013.07.31

Radiated Emission

[30 MHz - 12 GHz]

☒	EMI Test Receiver	Rohde & Schwarz	ESU26	100241	1 year	2013.07.30
☒	Antenna master	INNCO Systems	MA4000-EP	MA4000/283	N/A	-
☒	Turn Table	INNCO Systems	DT3000-3T	DT3000/69	N/A	-
☐	EMI Test Receiver	Rohde & Schwarz	ESI40	831564103	1 year	2013.05.03
☐	Antenna master	HD GmbH	MA240	240/520	N/A	-
☐	Turn Table	HD GmbH	2090	9702/1224	N/A	-
☐	Trilog Antenna	Schwarzbeck	VULB9168	185	2 year	2013.02.08
☒	Trilog Antenna	Schwarzbeck	VULB9160	3125	2 year	2013.05.03
☐	Trilog Antenna	Schwarzbeck	VULB9160	3301	2 year	2014.09.20
☐	Horn Antenna	Schwarzbeck	BBHA 9120D	147	2 year	2013.05.15
☐	Horn Antenna	Schwarzbeck	BBHA 9120D	937	2 year	2013.10.17
☒	Horn Antenna	Schwarzbeck	BBHA 9120D	296	2 year	2014.02.20
☒	Power Amplifier	Rohde & Schwarz	SCU-18	10094	1 year	2013.09.11

7. CONCLUSION

The data collected shows that the **E.U.T Type: Cellular/PCS GSM/GPRS/EDGE and PCS WCDMA HSPA+ with Bluetooth, RFID and WLAN, Model: LG-E960, FCC ID: ZNFE960** complies with §15.107 and §15.109 of the FCC rules.

IC Model: LG-E960, IC: 2703C-E960 complies with ICES-003 Issue 4 of the IC rule.