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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: October 19, 2012
Test Report No.: HCTE1210FE12
Test Site: HCT CO., LTD.
HCT FRN: 0005-8664-21

FCC ID:

ZNFL03E

Rule Part(s) / Standard(s) : FCC PART 15 Subpart B Class B
Equipment Type : Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA/HSUPA
Wireless Router with WLAN
Model Name : L-03E
Port / Connector(s) : USB 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.

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DOCUMENT HISTORY

The revision history for this document is shown in table.

Version	Date	Description
HCTE1210FE12	October 19, 2012	Initial Release

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1. GENERAL INFORMATION

1.1 Product Description

Equipment Under Test is **EUT type: Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA /HSUPA Wireless Router with WLAN, Model: L-03E** manufactured by **LG Electronics MobileComm U.S.A., Inc.** Its basic purpose is used for communications.

Model	L-03E
FCC ID	ZNFL03E
E.U.T Type	Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA /HSUPA Wireless Router with 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)
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)

1.2 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	L-03E	ZNFL03E	TA
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	Radio shack	Series 2-button mouse	FSUGMZE3	Notebook PC
USB cable	INTERFACESAMIL	EAD62329301	-	E.U.T Notebook PC
Net hard	LG	N1A1DD1	DoC	Net hard adaptor Notebook PC
Net hard adaptor	Yang Ming Industrial	DA-60M12	-	Net hard
RJ45 cable	-	-	-	Notebook PC Net hard

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)1.0
Notebook PC	RJ 45	-	N	(D)1.5
	Serial (Mouse)	-	N	(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
Notebook PC	RJ 45	N	N/A	N	Both End
	Serial (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 SEP 03, 2010 (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

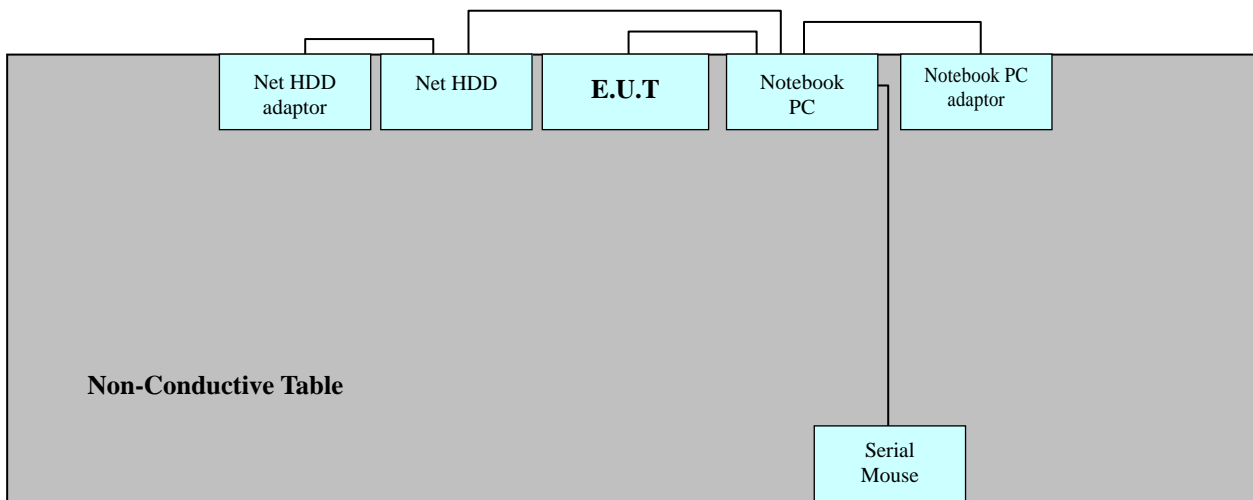
2. SYSTEM TEST CONFIGURATION

2.1 Configuration of Test System

Power Line Conducted test : E.U.T was connected to LISN via Notebook PC.
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

During preliminary tests, the following operating mode was investigated:

Operation Mode: Data Link Mode

3.2 Radiated Emission Test

During preliminary tests, the following operating mode was investigated:

Operation Mode: Data Link 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 Link mode

Temperature : 24.1 °C

Humidity Level : 33.0 %

Test Date : October 18, 2012

Frequency (MHz)	Transd (dB)	Conductor (H/N)	Quasi-Peak			Average		
			Limit (dBuV)	Measurement Level (dBuV)	Result Level (dBuV)	Limit (dBuV)	Measurement Level (dBuV)	Result Level (dBuV)
0.155	9.8	H	66	45.9	55.7	56	40.30	50.10
0.166	9.9	N	65	42.0	51.9	55	-	-
0.334	9.9	N	59	-	-	49	31.80	41.70
0.338	9.9	N	59	35.5	45.4	49	30.70	40.60
0.389	9.8	H	58	-	-	48	27.20	37.00
0.632	9.8	H	56	-	-	46	23.80	33.60

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

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

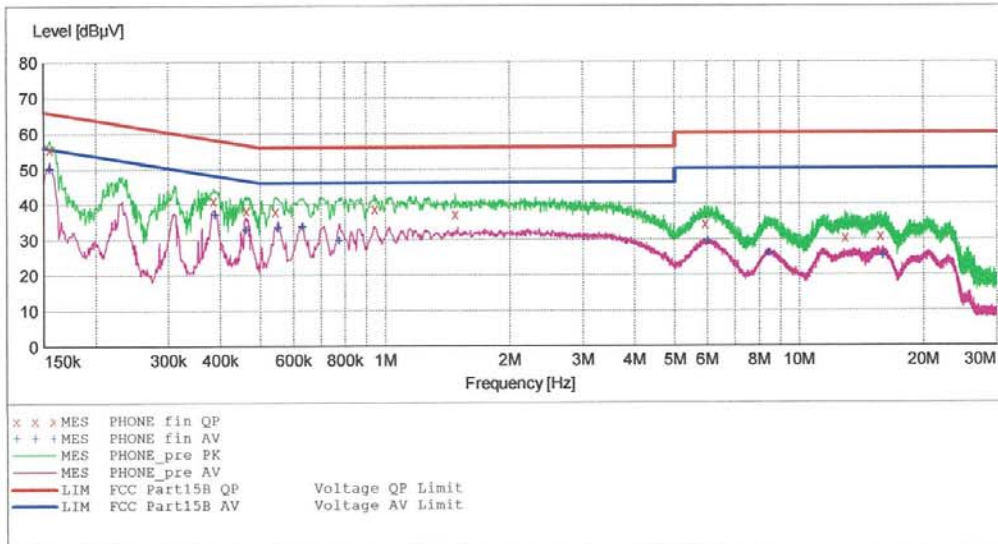
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EUT: L-03E
 Manufacturer: LG
 Operating Condition: DATA LINK MODE
 Test Site: SHIELD ROOM
 Operator: JH CHOI
 Test Specification: FCC PART 15 B
 Comment: H

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

Short Description:		FCC PART 15 CLASS B					Transducer
Start Frequency	Stop Frequency	Step Width	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
0.155010	55.70	9.8	66	10.1	---	---
0.386010	41.10	9.8	58	17.0	---	---
0.462010	38.30	9.8	57	18.3	---	---
0.544000	38.00	9.8	56	18.0	---	---
0.944000	38.70	9.8	56	17.3	---	---
1.480000	37.10	9.9	56	18.9	---	---
5.940000	34.30	10.2	60	25.7	---	---
12.892000	30.50	10.8	60	29.5	---	---
15.720000	30.90	11.1	60	29.1	---	---

MEASUREMENT RESULT: "PHONE_fin AV"

10/18/2012 11:47AM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.155010	50.10	9.8	56	5.6	---	---
0.389010	37.00	9.8	48	11.1	---	---
0.462010	32.80	9.8	47	13.9	---	---
0.552000	33.30	9.8	46	12.7	---	---
0.632000	33.60	9.8	46	12.4	---	---
0.776000	29.70	9.8	46	16.3	---	---
6.020000	29.40	10.2	50	20.6	---	---
8.444000	25.90	10.4	50	24.1	---	---
15.940000	25.10	11.1	50	24.9	---	---

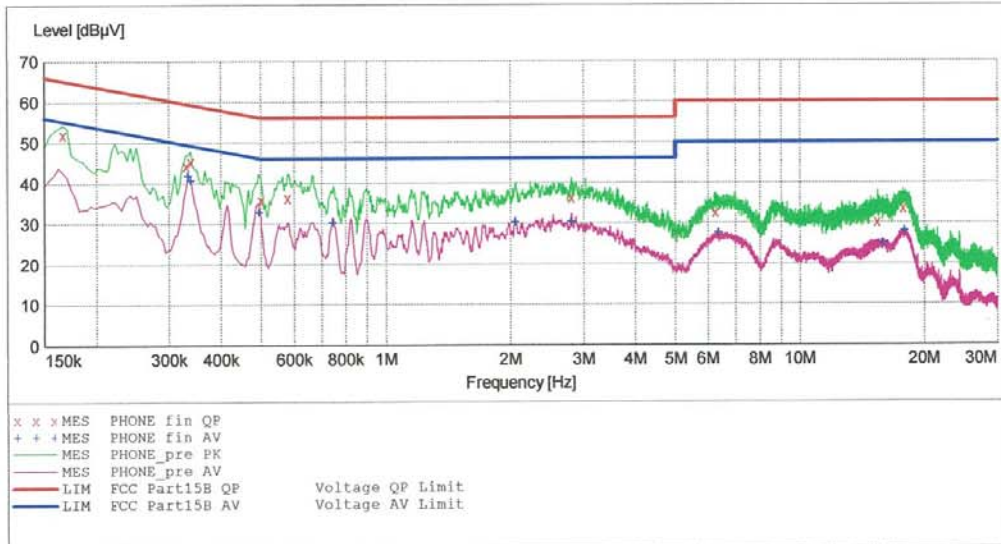
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EMC

EUT: L-03E
 Manufacturer: LG
 Operating Condition: DATA LINK 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 Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
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
0.166010	51.90	9.9	65	13.3	---	---
0.330010	44.40	9.9	60	15.0	---	---
0.338010	45.40	9.9	59	13.9	---	---
0.500000	35.80	10.0	56	20.2	---	---
0.580000	36.20	10.0	56	19.8	---	---
2.808000	36.10	10.2	56	19.9	---	---
6.244000	32.60	10.4	60	27.4	---	---
15.376000	30.10	11.3	60	29.9	---	---
17.744000	33.50	11.7	60	26.5	---	---

MEASUREMENT RESULT: "PHONE_fin AV"

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Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.334010	41.70	9.9	49	7.6	---	---
0.338010	40.60	9.9	49	8.7	---	---
0.494010	32.70	10.0	46	13.4	---	---
0.744000	30.10	10.0	46	15.9	---	---
2.056000	30.10	10.1	46	15.9	---	---
2.812000	30.30	10.2	46	15.7	---	---
6.348000	27.50	10.5	50	22.5	---	---
15.872000	24.80	11.4	50	25.2	---	---
17.880000	27.90	11.7	50	22.1	---	---

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 Link mode

Temperature : 22.2 °C

Humidity Level : 36.0 %

Test Date : October 18, 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)			
39.700	15.28	V	2.0	13.23	3.49	40.0	32.0	8.0
43.600	9.61	V	1.5	13.39	3.50	40.0	26.5	13.5
66.500	8.67	H	3.2	12.66	3.66	40.0	25.0	15.0
80.500	13.82	V	1.2	10.18	3.80	40.0	27.8	12.2
123.300	14.48	V	1.0	11.52	4.00	43.5	30.0	13.5
146.600	13.45	V	1.0	12.58	4.07	43.5	30.1	13.4

-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 Link mode

Temperature : 27.1 °C

Humidity Level : 37.7 %

Test Date : October 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)
2.1600	50.20	74	23.8	V	26.30	54	27.7

※ 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 $21.5 \text{ dB}\mu\text{V}$ is obtained. The antenna factor of 7.4 dB/m and a cable factor of 1.1 dB are added. The $30 \text{ dB}\mu\text{V/m}$ value is mathematically converted to its corresponding level in $\mu\text{V/m}$.

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

[Radiated Emission Limits]

Frequency of Emission (MHz)	Field Strength	
	$\mu\text{V/m}$	$\text{dB}\mu\text{V/m}$
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	2013.02.09
<input type="checkbox"/> Attenuator	Rohde & Schwarz	ESH3-Z2	357.8810.352	1 year	2013.07.31

Radiated Emission

[30 MHz - 1 GHz]

<input type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESU26	100241	1 year	2013.07.30
<input type="checkbox"/> Trilog Antenna	Schwarzbeck	VULB9160	3125	2 year	2013.05.03
<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"/> Trilog Antenna	Schwarzbeck	VULB9168	185	2 year	2013.02.08
<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	-

[1 GHz - 12 GHz]

<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 checked="" type="checkbox"/> Power Amplifier	Rohde & Schwarz	SCU-18	10094	1 year	2013.09.11
<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	2014.02.20

7. CONCLUSION

The data collected shows that the **EUT type: Cellular/PCS GSM/GPRS and Cellular WCDMA/HSDPA/HSUPA Wireless Router with WLAN, Model: L-03E, FCC ID: ZNFL03E** complies with §15.107 and §15.109 of the FCC rules.