

EMI CERTIFICATION REPORT

Applicant:

LG Electronics Mobilecomm U.S.A., Inc.
10101 Old Grove Road, San Diego, CA 92131

Date of Issue: December 12, 2011

Test Report No.: HCTE1111FE22-2

Test Site: HCT CO., LTD.

HCT FRN: 0005-8664-21

FCC ID:

ZNFLN272

Rule Part(s) / Standard(s) : FCC PART 15 Subpart B Class B
Equipment Type : Cellular/PCS CDMA/EVDO Phone with Bluetooth
Model(s) Name : LN272, LG-LN272, LGLN272, LG272
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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ATTACHMENT: TEST SETUP PHOTOGRAPHS

1. GENERAL INFORMATION

1.1 Product Description

Equipment Under Test is **Cellular/PCS CDMA/EVDO Phone with Bluetooth, Model: LN272** manufactured by **LG Electronics Mobilecomm U.S.A., Inc.** Its basic purpose is used for communications.

Model	LN272
Additional Model	LG-LN272, LGLN272, LG272
FCC ID	ZNFLN272
E.U.T Type	Cellular/PCS CDMA/EVDO Phone with Bluetooth
TX Frequency	824.70 MHz to 848.31 MHz (CDMA 835) 1 851.25 MHz to 1 908.75 MHz (CDMA 1 900) 817.90 MHz to 823.10 MHz (BC10)
RX Frequency	869.70 MHz to 893.31 MHz (CDMA 835) 1 931.25 MHz to 1 988.75 MHz (CDMA 1 900) 862.00 MHz to 894.00 MHz (BC10)

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 Number	FCC ID / DoC	Connected To
Cellular/PCSCDMA/ EVDO Phone with Bluetooth	LG	LN272	ZNFLN272	Notebook PC
Notebook PC	LG	X140-02	DoC	E.U.T Notebook PC adaptor
Notebook PC adaptor	DELL (JIANGSU)	ADP-40PH AD	-	Notebook PC
Mouse	Microsoft	Intellimouse optical USB and PS/2 compatible	DoC	Notebook PC
USB cable	-	-	-	E.U.T Notebook PC
Headset	-	-	-	E.U.T
SD Card (4G)	SanDisk	-	-	E.U.T
RJ45 cable	-	-	-	Notebook PC

1.4 Cable Description

Product Name	Port	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (m)
Cellular/PCSCDMA/ EVDO Phone with Bluetooth	Micro USB	Y	Y	(P, D)1.2
	Headset Jack	-	N	(D)1.0
Notebook PC	RJ45	N	N	(P, D)2.0
	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
Cellular/PCSCDMA/ EVDO Phone with Bluetooth	Micro USB	N	-	Y	Both End
	Headset Jack	N	-	Y	E.U.T End
Notebook PC	RJ45	N	-	N	Both End
	USB (Mouse)	Y	Notebook PC End	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 10 m semi anechoic chamber used to collect the test data is located at the 105-1, Jangam-Ri, Majang-Myeon, Icheon-Si, Kyungki-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

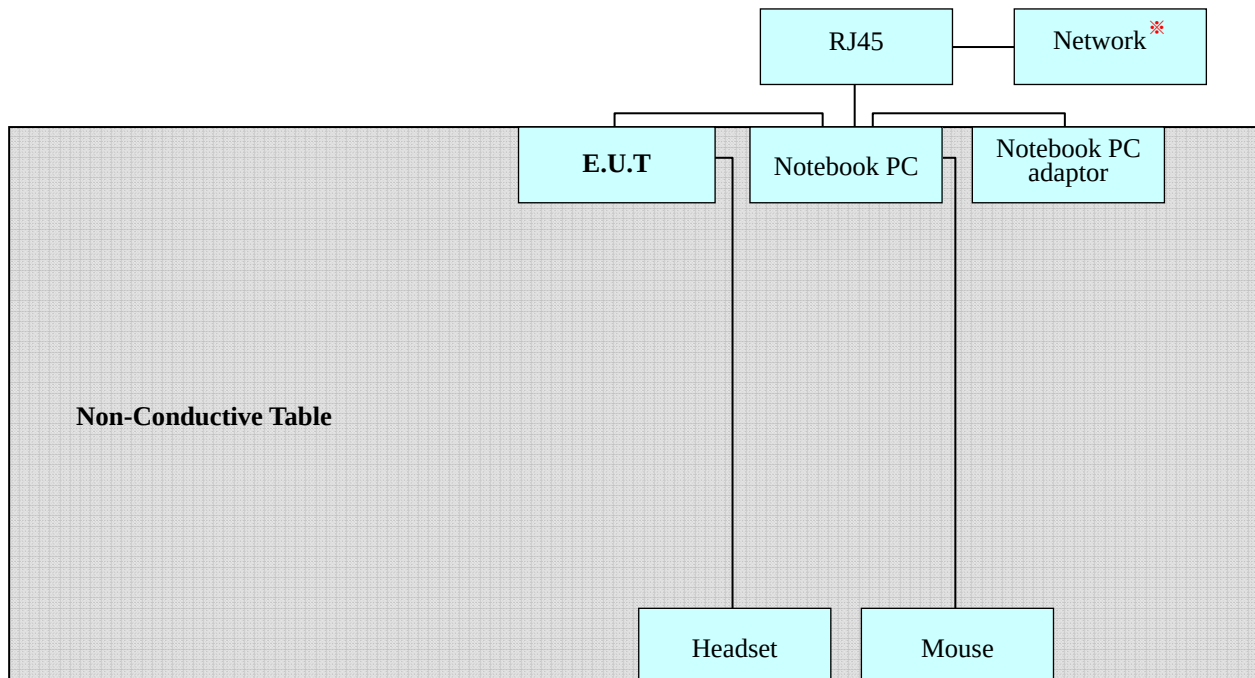
2.1 Configuration of Test System

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

※ **NOTE:** The configuration of network is as follows, RJ45 cable is connected with laptop through fiber-converto. The ping test was performed under the network configuration.

[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	: 22.5 °C
Humidity Level	: 49.0 %
Test Date	: December 07, 2011

※ **NOTE:** Refer to page 10 to page 13 for details.

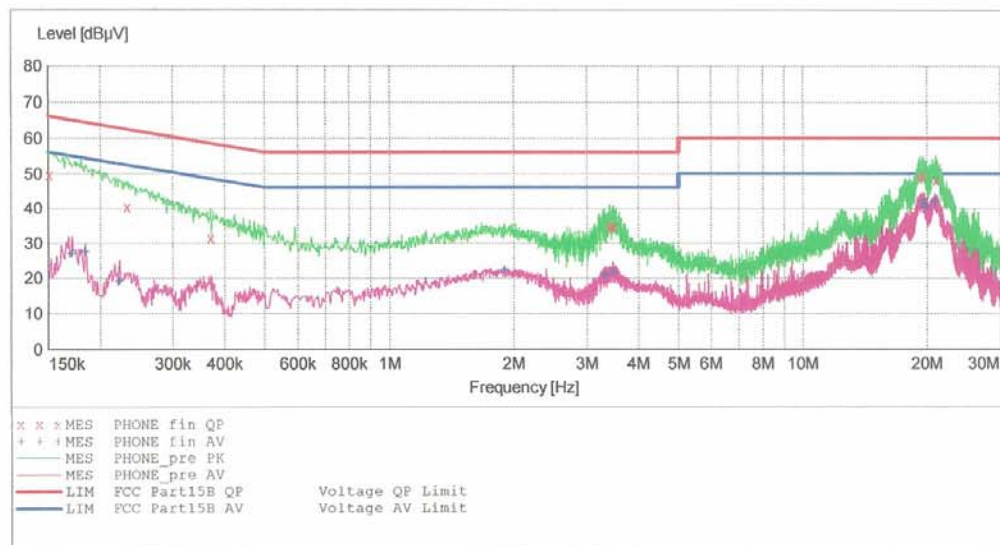
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EUT: LN272
Manufacturer: LG
Operating Condition: DATA MODE
Test Site: SHIELD ROOM
Operator: JH CHOI
Test Specification: FCC PART15 CLASS B
Comment: H

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

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

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Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.151010	49.40	10.1	66	16.6	---	---
0.233010	40.30	10.1	62	22.0	---	---
0.370010	31.50	10.1	59	27.0	---	---
3.408000	34.50	10.3	56	21.5	---	---
3.472000	34.40	10.3	56	21.6	---	---
3.496000	34.70	10.3	56	21.3	---	---
19.208000	48.80	11.8	60	11.2	---	---
19.552000	49.20	11.8	60	10.8	---	---
20.976000	48.20	11.9	60	11.8	---	---

MEASUREMENT RESULT: "PHONE_fin AV"

12/7/2011 4:34PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.171010	26.90	10.1	55	28.0	---	---
0.184010	27.50	10.1	54	26.8	---	---
0.223010	19.10	10.1	53	33.6	---	---
1.896000	22.20	10.2	46	23.8	---	---
3.336000	20.70	10.3	46	25.3	---	---
3.472000	21.50	10.3	46	24.5	---	---
19.600000	41.70	11.8	50	8.3	---	---
19.844000	40.40	11.9	50	9.6	---	---
20.856000	41.90	11.9	50	8.1	---	---

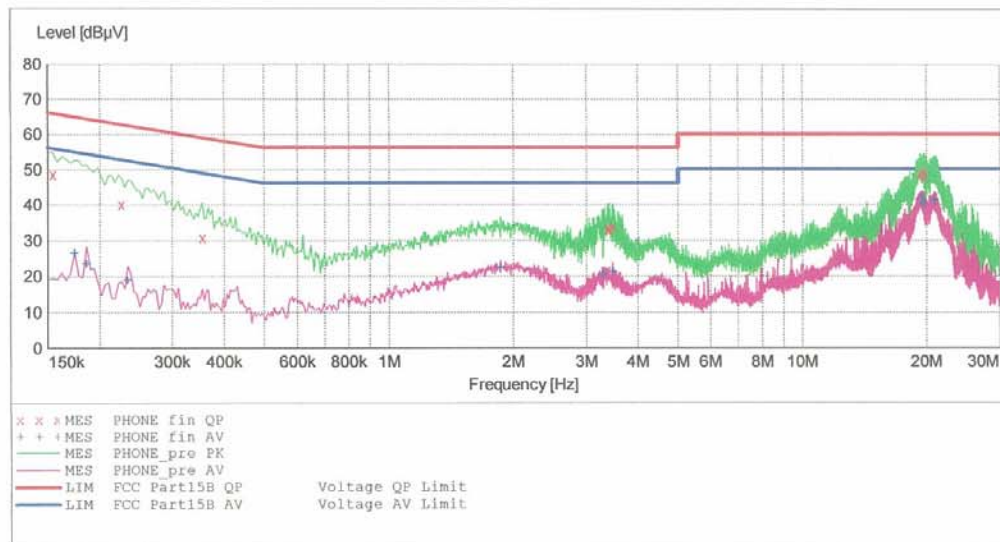
HCT

EMC

EUT: LN272
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	48.40	10.3	66	17.4	---	---
0.226010	39.90	10.3	63	22.7	---	---
0.354010	30.70	10.3	59	28.2	---	---
3.376000	33.20	10.5	56	22.8	---	---
3.404000	33.10	10.6	56	22.9	---	---
3.492000	33.70	10.6	56	22.3	---	---
19.280000	48.60	11.7	60	11.4	---	---
19.652000	49.20	11.7	60	10.8	---	---
19.700000	47.70	11.7	60	12.3	---	---

MEASUREMENT RESULT: "PHONE_fin AV"

12/7/2011 4:38PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.174010	26.30	10.3	55	28.4	---	---
0.186010	23.40	10.3	54	30.8	---	---
0.234010	18.90	10.3	52	33.4	---	---
1.864000	22.40	10.4	46	23.6	---	---
3.284000	20.40	10.5	46	25.6	---	---
3.480000	21.30	10.6	46	24.7	---	---
19.468000	41.70	11.7	50	8.3	---	---
19.676000	40.20	11.7	50	9.8	---	---
20.896000	41.20	11.7	50	8.8	---	---

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

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

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

Temperature : 22.7 °C

Humidity Level : 49.5 %

Test Date : December 08, 2011

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)			
30.3	14.65	V	1.2	11.45	3.40	40.0	29.5	10.5
69.0	15.01	V	1.0	10.60	3.69	40.0	29.3	10.7
129.2	19.01	V	1.0	12.29	4.00	43.5	35.3	8.2
344.9	13.83	H	2.0	14.39	4.78	46.0	33.0	13.0
420.7	12.79	H	2.0	16.05	5.06	46.0	33.9	12.1
757.0	8.77	H	2.0	21.83	5.70	46.0	36.3	9.7

※ NOTE:

1. Measurement above 1 GHz was performed from 1 GHz to the 5th harmonic of highest fundamental frequency. The highest fundamental frequency is CDMA 1 900 center frequency.
2. For measurement above 1 GHz, Emission noise was not founded over the ambient noise.

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 Number</u>	<u>Serial Number</u>	<u>Next CAL Date</u>
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Conducted Emission

☒ EMI Test Receiver	Rohde & Schwarz	ESCI	100584	2012.05.03
☒ LISN	Rohde & Schwarz	ESH3-Z5	100282	2012.02.01
☐ LISN	Rohde & Schwarz	ENV216	100073	2012.04.01
☒ Attenuator	Rohde & Schwarz	ESH3-Z2	357.8810.352	2012.08.01

Radiated Emission

☒ EMI Test Receiver	Rohde & Schwarz	ESI40	831564103	2012.05.26
☐ EMI Test Receiver	Rohde & Schwarz	ESU26	100241	2012.08.02
☐ Trilog Antenna	Schwarzbeck	VULB9160	3125	2013.05.03
☒ Trilog Antenna	Schwarzbeck	VULB9160	3301	2012.09.13
☒ Antenna controller	INNCO Systems	HD100	-	-
☒ Turn Table controller	EMCO	2090	-	-
☐ Communication Antenna	Schwarzbeck	USLP9142	9142-248	-
☒ Horn Antenna	Schwarzbeck	BBHA 9120D	-	2012.04.13
☒ Power Amplifier	Rohde & Schwarz	SCU-18	10094	2012.09.19
☐ Base Station	Rohde & Schwarz	CMU 200	1100000802	2012.02.16

7. CONCLUSION

The data collected shows that the **Cellular/PCS CDMA/EVDO Phone with Bluetooth, Model: LN272, FCC ID: ZNFLN272** complies with §15.107 and §15.109 of the FCC rules.