HCT CO., LTD.

CERTIFICATION DIVISION
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EMI CERTIFICATION REPORT

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

Date of Issue: September 09, 2011
Test Report No.: HCTE1109FE07
Test Site: HCT CO., LTD.
HCT FRN: 0005-8664-21

FCC ID: **ZNFLS831**

Rule Part(s) / Standard(s)	: FCC PART 15 Subpart B Class B
Equipment Type	: Cellular/PCS CDMA/EVDO Phone with Bluetooth & WLAN
Model(s) Name	: LS831, LG-LS831, LGLS831
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

Report prepared by
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Test Engineer of EMC Team

Approved by
: Sang-Jun Lee
Manager of EMC Team

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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 & WLAN, Model: LS831** manufactured by **LG Electronics Mobilecomm U.S.A., Inc.** Its basic purpose is used for communications.

Model	LS831
Additional Model	LG-LS831, LGLS831
FCC ID	ZNFLS831
E.U.T Type	Cellular/PCS CDMA/EVDO Phone with Bluetooth & WLAN
TX Frequency	824.70 ㎒ to 848.31 ㎒ (CDMA 850) 1 851.25 ㎒ to 1 908.75 ㎒ (CDMA 1 900) 817.90 ㎒ to 823.10 ㎒ (BC10)
RX Frequency	869.70 ㎒ to 893.31 ㎒ (CDMA 850) 1 931.25 ㎒ to 1 988.75 ㎒ (CDMA 1 900) 862.00 ㎒ to 894.00 ㎒ (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/PCS CDMA/EVDO Phone with Bluetooth & WLAN	LG	LS831	ZNFLS831	Notebook PC
Notebook PC	SAMSUNG	NT-R519	DoC	E.U.T Notebook PC adaptor
Notebook PC adaptor	DELL(JIANGSU)	SADP-90FHBAD-9019S	-	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

1.4 Cable Description

Product Name	Port	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (m)
Cellular/PCS CDMA/EVDO Phone with Bluetooth & WLAN	Micro USB	Y	Y	(P, D)1.6
	Ear Jack	-	Y	(D)1.2
	USB Data	Y	Y	(P, D)1.6
Notebook PC	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/PCS CDMA/EVDO Phone with Bluetooth & WLAN	Micro USB	N	-	Y	Both End
	Ear Jack	N	-	Y	E.U.T End
	USB Data	N	-	Y	Both End
Notebook PC	USB (Mouse)	Y	Notebook PC End	Y	Notebook PC End

1.6 Test Methodology

Both Conducted and Radiated testing was perf ormed 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, Kyoungki-Do, Republic of Korea. T hose 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, includin g a digital device, the spectrum shall be investigated f rom the lowest radio frequency signal generated or used in the device, without going below the low est frequency for which a Radiated E mission 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 (㎒)	**Upper frequency of measurement range** (㎒)
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 ㎓, whichever is lower

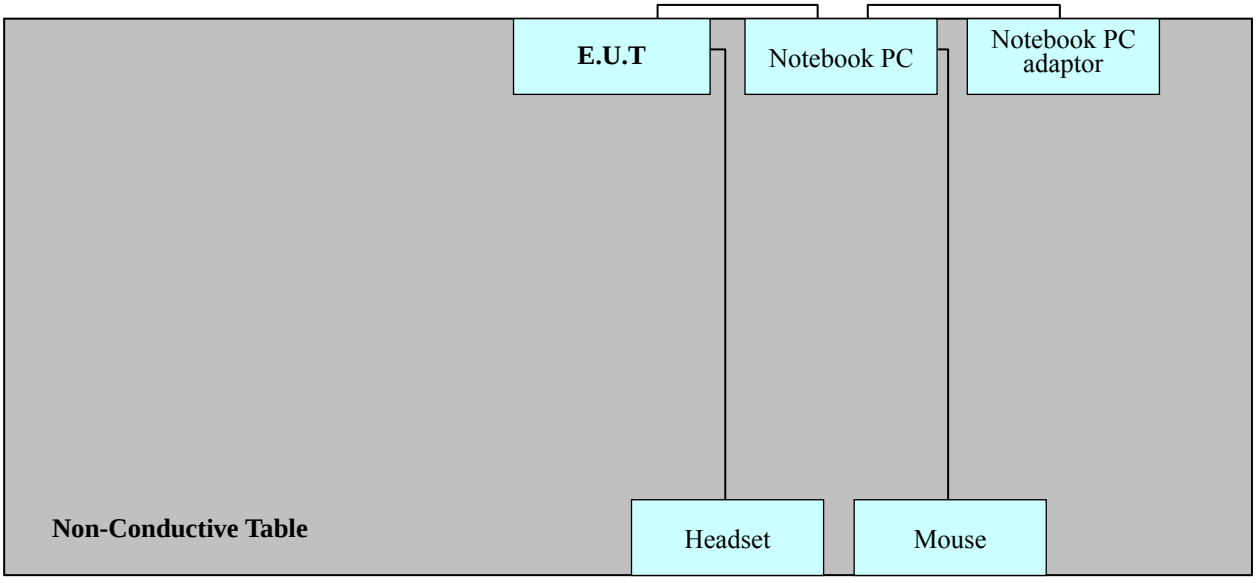
2. SYSTEM TEST CONFIGURATION

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 perfor med by using the procedure in ANS I C63.4/2003 7.2.3 to determ ine 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: 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 ㎑)
Operation Mode	: Data Communication mode
Temperature	: 22.7 °C
Humidity Level	: 44.5 %
Test Date	: September 08, 2011

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

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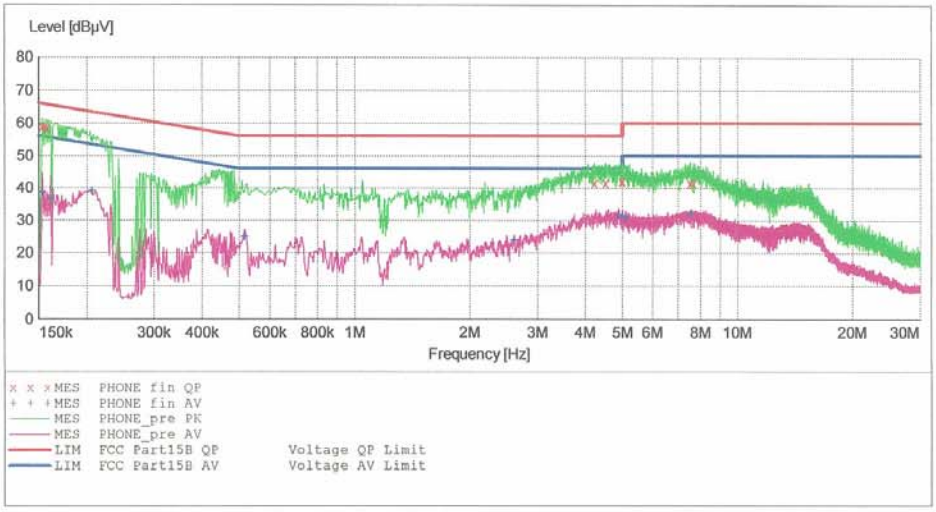
EUT: LS831
Manufacturer: LG
Operating Condition: DATA MODE
Test Site: SHIELD ROOM
Operator: JH-CHOI
Test Specification: FCC PART15 CLASS B
Comment: H

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

Short Description: FCC PART 15 CLASS B

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	1.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None



MEASUREMENT RESULT: "PHONE_fin QP"

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Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.153010	58.90	10.1	66	7.0	---	---
0.155010	58.70	10.1	66	7.0	---	---
0.157010	58.30	10.1	66	7.3	---	---
4.236000	41.60	10.4	56	14.4	---	---
4.516000	41.60	10.5	56	14.4	---	---
4.992000	42.00	10.5	56	14.0	---	---
5.000000	42.00	10.5	56	14.0	---	---
7.528000	41.50	10.8	60	18.5	---	---
7.688000	41.40	10.8	60	18.6	---	---

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MEASUREMENT RESULT: "PHONE_fin AV"

9/8/2011 6:56PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.153010	38.50	10.1	56	17.4	---	---
0.161010	36.50	10.1	55	18.9	---	---
0.206010	39.00	10.1	53	14.4	---	---
0.516000	24.80	10.1	46	21.2	---	---
2.608000	23.90	10.2	46	22.1	---	---
4.896000	31.50	10.5	46	14.5	---	---
5.000000	31.40	10.5	46	14.6	---	---
5.096000	30.60	10.5	50	19.4	---	---
7.564000	31.80	10.8	50	18.2	---	---

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HCT

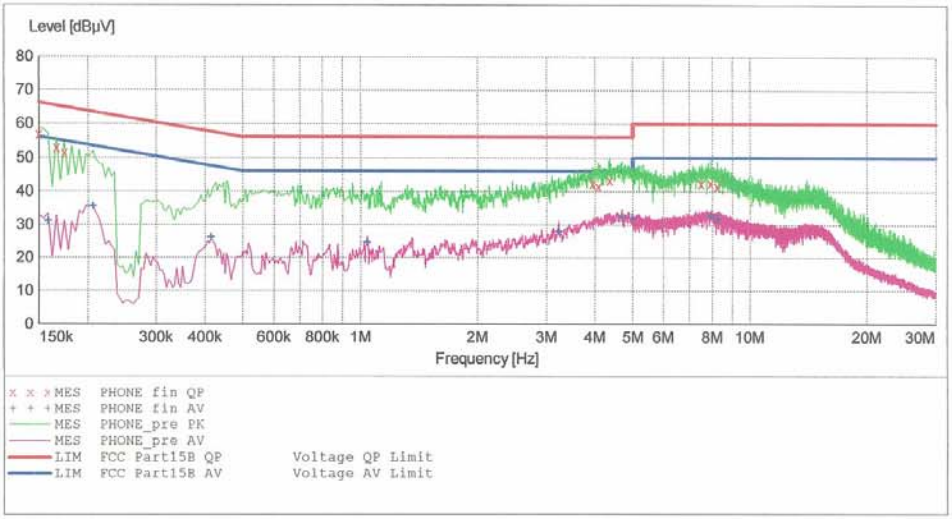
EMC

EUT: LS831
Manufacturer: LG
Operating Condition: DATA
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 Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None



MEASUREMENT RESULT: "PHONE_fin QP"

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Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.150010	56.70	10.3	66	9.3	---	---
0.166010	52.80	10.3	65	12.3	---	---
0.174010	51.40	10.3	65	13.4	---	---
3.956000	42.30	10.6	56	13.7	---	---
4.084000	41.40	10.6	56	14.6	---	---
4.376000	43.40	10.7	56	12.6	---	---
7.520000	42.30	11.0	60	17.7	---	---
7.940000	42.40	11.0	60	17.6	---	---
8.256000	41.40	11.0	60	18.6	---	---

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MEASUREMENT RESULT: "PHONE_fin AV"

9/8/2011 6:53PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.158010	31.00	10.3	56	24.6	---	---
0.206010	35.50	10.3	53	17.9	---	---
0.414010	26.20	10.3	48	21.4	---	---
1.044000	24.60	10.4	46	21.4	---	---
3.232000	28.00	10.5	46	18.0	---	---
4.692000	32.30	10.7	46	13.7	---	---
5.000000	32.00	10.7	46	14.0	---	---
7.940000	32.50	11.0	50	17.5	---	---
8.268000	31.60	11.0	50	18.4	---	---

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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 ㎓

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

Operation Mode : Data Communication mode

-For measurement above 1 ㎓

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

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

Temperature : 23.3 °C

Humidity Level : 45.0 %

Test Date :September 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)			
79.3	13.59	H	1.0	8.61	1.50	40.0	23.7	16.3
132.7	17.31	V	1.0	12.10	1.99	43.5	31.4	12.1
183.3	13.18	H	1.2	11.08	2.34	43.5	26.6	16.9
258.4	15.32	V	1.0	12.07	2.81	46.0	30.2	15.8
401.1	17.78	H	1.0	15.67	3.55	46.0	37.0	9.0
500.8	9.48	H	2.0	18.03	3.99	46.0	31.5	14.5
505.6	18.86	V	1.0	18.13	4.01	46.0	41.0	5.0

※ **NOTE:**

1. Measurement above 1 ㎓ was performed from 1 ㎓ to the 5th harmonic of highest fundamental frequency. The highest fundamental frequency is CDMA 1 900 center frequency.
2. For measurement above 1 ㎓, 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 dBμV is obtained. The antenna factor of 7.4 dB/m and a cable factor of 1.1 dB are added. The 30 dBμV/m value is mathematically converted to its corresponding level in μV/m.

FS = 21.5 + 7.4 + 1.1 = 30 dBμV/m

[Radiated Emission Limits]

Frequency of Emission (㎒)	Field Strength	
	μV/m	dBμV/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 Number	Serial Number	Next CAL Date
	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	2011.10.29
☒	EMI Test Receiver	Rohde & Schwarz	ESU26	100241	2012.08.02
☒	Trilog Antenna	Schwarzbeck	VULB9160	3125	2013.05.03
☒	Antenna master	INNCO Systems	MA4000-EP	MA4000/283	-
☒	Turn Table	INNCO Systems	DT3000-3T	DT3000/69	-
☐	Communication Antenna	Schwarzbeck	USLP9142	9142-248	-
☒	Horn Antenna	Schwarzbeck	BBHA 9120D	-	2012.04.13
☒	Power Amplifier	Rohde & Schwarz	SCU-18	10094	2011.09.29
☐	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 & WLAN , Model: LS831, FCC ID: ZNFLS831** complies with §15.107 and §15.109 of the FCC rules.