

EMI CERTIFICATION REPORT

Applicant:**LG Electronics MobileComm U.S.A., Inc.**

1000 Sylvan Avenue, Englewood Cliffs NJ 07632

Date of Receipt: May 02, 2014**Date of Issue: May 30, 2014****Test Report No. HCT-E-1405-F029-1****HCT FRN: 0005866421****FCC ID:****ZNFD213N**

Rule Part(s) / Standard(s) : FCC CFR 47 PART 15 Subpart B Class B
FCC Classification : JBP (Part 15 B – Class B Computing Device Peripheral)
EUT Type : GSM Phone with Bluetooth4.0, WIFI802.11 b/g/n(2.4GHz_ HT20, HT40), VoIP, Hotspot support, NFC
Model Name : LG-D213n
Additional Model Name : LGD213n, D213n
Port / Connector(s) : USB / Earphone Port
Date of Test : May 19, 2014 - May 21, 2014

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 denied the 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
HCT-E-1405-F029	May 22, 2014	Initial Release
HCT-E-1405-F029-1	May 30, 2014	Revised "Calculation Formula" in the Section 4.1



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ATTACHMENT: TEST SETUP PHOTOGRAPHS



1. GENERAL INFORMATION

1.1 Description of EUT

Equipment Under Test is manufactured by **LG Electronics MobileComm U.S.A., Inc.**
Its basic purpose is used for communications.

Model	LG-D213n
FCC ID	ZNFD213N
Additional Model	LGD213n, D213n
EUT Type	GSM Phone with Bluetooth4.0, WIFI802.11 b/g/n(2.4GHz _HT20, HT40), VoIP, Hotspot support, NFC
TX Frequency	824.20 MHz to 848.80 MHz (GSM 850) 1 850.20 MHz to 1 909.80 MHz (GSM 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)

1.2 Related Submittal(s) / Grant(s)

Original submittal only.



1.3 Test Facility

Test site is located at 74, SEOICHEON-RO, 578BEON-GIL, MAJANG-MYEON, ICHEON-SI, GYEONGGI-DO, SOUTH KOREA. Those measurement facilities are constructed in conformance with the requirements of ANSI C63.4-2003.

Measurement Facilities	Reg. No.
Radiated Field strength measurement facility (3 m)	90661 (February 28, 2014)
Radiated Field strength measurement facility (10 m)	90661 (February 28, 2014)



1.4 Tested System Details

All equipment descriptions used in the tested system (including inserted cards) are:

Device Type	Model Name	Manufacturer	FCC ID / DoC	Connected To
EUT	LG-D213n	LG	ZNFD213N	Notebook PC, Ear-phone
USB cable	EAD62377902	Ningbo Broad	-	EUT, Notebook PC
Ear-phone	EAB62808211	I-Sound	-	EUT
Notebook PC	ProBook6560b	HP	DoC	EUT, Notebook PC adaptor
Notebook PC adaptor	PPP009D	DELTA Electronics (JIANGSU)LTD	-	Notebook PC
Gateway	MV440	Axesstel	PH7MV440	Notebook PC, Adaptor
Serial Mouse	Serial 2 button mouse	Radio shack	FSUGMZE3	Notebook PC
Adaptor	DA-60M12	Yang Ming Industrial	-	Gateway
RJ45 cable	-	-	-	Notebook PC, Gateway
Micro SD card (8 GB)	-	Transcend	-	EUT



1.5 Cable Description

Product Name	Port	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (m)
EUT	Micro USB	Y	Y	(P,D)1.2
	Ear-phone	N/A	N	(D)1.2
Notebook PC	RJ 45	N/A	N	(D)1.5
	Serial (Mouse)	N/A	Y	(D)1.8
	DC in	N	N/A	(P)1.8
Gateway	DC in	N	N/A	(P)1.8

* The marked "(D)" means the data cable and "(P)" means the power cable.

1.6 Noise Suppression Parts on Cable. (I/O Cable)

Product Name	Port	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
EUT	Micro USB	N	N/A	Y	Both End
	Ear-phone	N	N/A	Y	EUT End
Notebook PC	RJ 45	N	N/A	N	N/A
	Serial (Mouse)	N	N/A	Y	Notebook PC End



2. DESCRIPTION OF TEST

2.1 Measurement of Conducted Emission

The test procedure was in accordance with ANSI C63.4-2003, Clause 7

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Both conducted lines are measured in Quasi-Peak and Average mode, including the worst-case data points for each tested configuration.
- c. The frequency range from 150 kHz to 30 MHz was searched.

[Conducted Emission Limits]

Frequency (MHz)	Resolution Bandwidth	Quasi-Peak(dB μ V)	Average(dB μ V)
0.15 to 0.5	9 kHz	66 to 56*	56 to 46*
0.5 to 5	9 kHz	56	46
5 to 30	9 kHz	60	50

**Decreases with the logarithm of the frequency.*



2.2 Measurement of Radiated Emission

The test procedure was in accordance with ANSI C63.4-2003, Clause 8

- a. The EUT was placed on the top of a turn table 0.8 meters above the ground at a 3 m shield room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 m away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from 1 m to 4 m above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 m to 4 m and the turn table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to Peak and Average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.
- g. The antenna height scans apply for both horizontal and vertical polarizations, except that for vertical polarization, the minimum height of the center of the antenna shall be increased so that the lowest point of the bottom of the lowest antenna element clears the site reference ground plane by at least 25 cm. (below 1 GHz)

[Radiated Emission Limits]

Frequency (MHz)	Antenna Distance (m)	Field Strength ($\mu V/m$)	Quasi-Peak (dB $\mu V/m$)
30 to 88	3	100	40.0
88 to 216	3	150	43.5
216 to 960	3	200	46.0
Above 960	3	500	54.0
Frequency (MHz)	Antenna Distance (m)	Peak (dB $\mu V/m$)	Average (dB $\mu V/m$)
Above 1 000	3	74	54

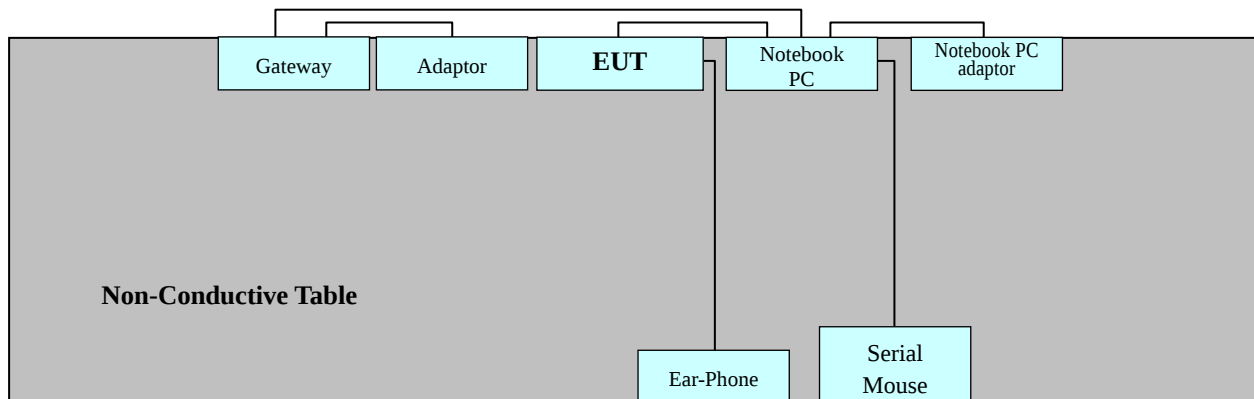


2.2.1 Frequency Range of Radiated Measurements

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
1 000 to 13 000	5 th harmonic of the highest frequency or 40 GHz, whichever is lower

2.3 Configuration of Tested System



Power Line: 120 VAC, 60 Hz



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

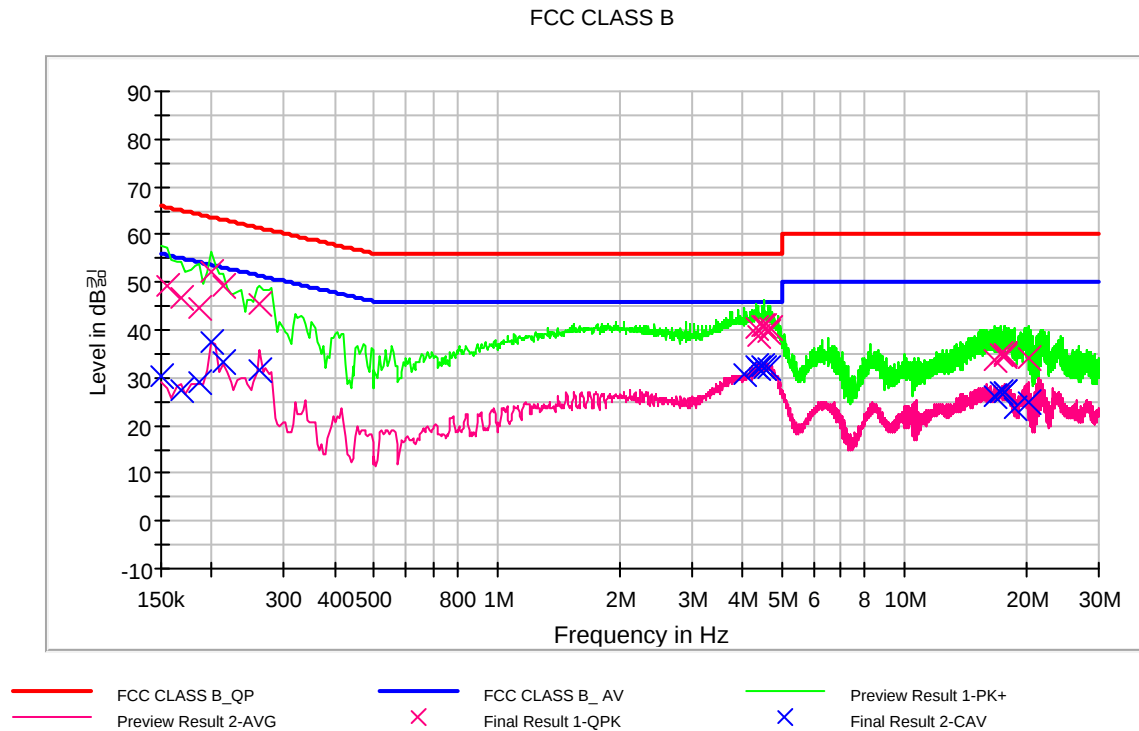
The following table shows the highest levels of conducted emissions on both polarization of hot and neutral line.

Limit Apply to	: FCC PART 15 Subpart B Class B
Detector	: Quasi-Peak, CISPR-Average (6 dB Bandwidth: 9 kHz)
Operation Mode	: Data Communication mode
Temperature	: 24.2°C
Humidity Level	: 41.9 %
Test Date	: May 20, 2014

※ NOTE: Refer to page 13 to page 18 for Measurement Test Data



Figure 1: Spectral Diagrams, Conducted Emission, Phase (L1), Data Mode



※ Calculation Formula:

1. Conductor L1 = Hot, Conductor N = Neutral
2. Corr. = LISN Factor + Cable Loss
3. QuasiPeak or CAverage= Receiver Reading + Corr.
4. Margin = Limit – QuasiPeak or CAverage



Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.154500	49.0	9.000	L1	9.7	16.8	65.8
0.168000	46.8	9.000	L1	9.7	18.3	65.1
0.186000	44.8	9.000	L1	9.7	19.4	64.2
0.199500	52.3	9.000	L1	9.7	11.3	63.6
0.213000	49.3	9.000	L1	9.7	13.8	63.1
0.262500	45.4	9.000	L1	9.7	16.0	61.4
4.320500	40.3	9.000	L1	10.1	15.7	56.0
4.397000	38.8	9.000	L1	10.1	17.2	56.0
4.460000	40.7	9.000	L1	10.1	15.3	56.0
4.532000	40.7	9.000	L1	10.1	15.3	56.0
4.622000	39.5	9.000	L1	10.1	16.5	56.0
4.671500	40.3	9.000	L1	10.1	15.7	56.0
16.574000	33.7	9.000	L1	10.7	26.3	60.0
17.280500	34.8	9.000	L1	10.8	25.2	60.0
17.636000	34.8	9.000	L1	10.8	25.2	60.0
17.649500	34.5	9.000	L1	10.8	25.5	60.0
17.712500	34.8	9.000	L1	10.8	25.2	60.0
20.250500	34.3	9.000	L1	10.9	25.7	60.0

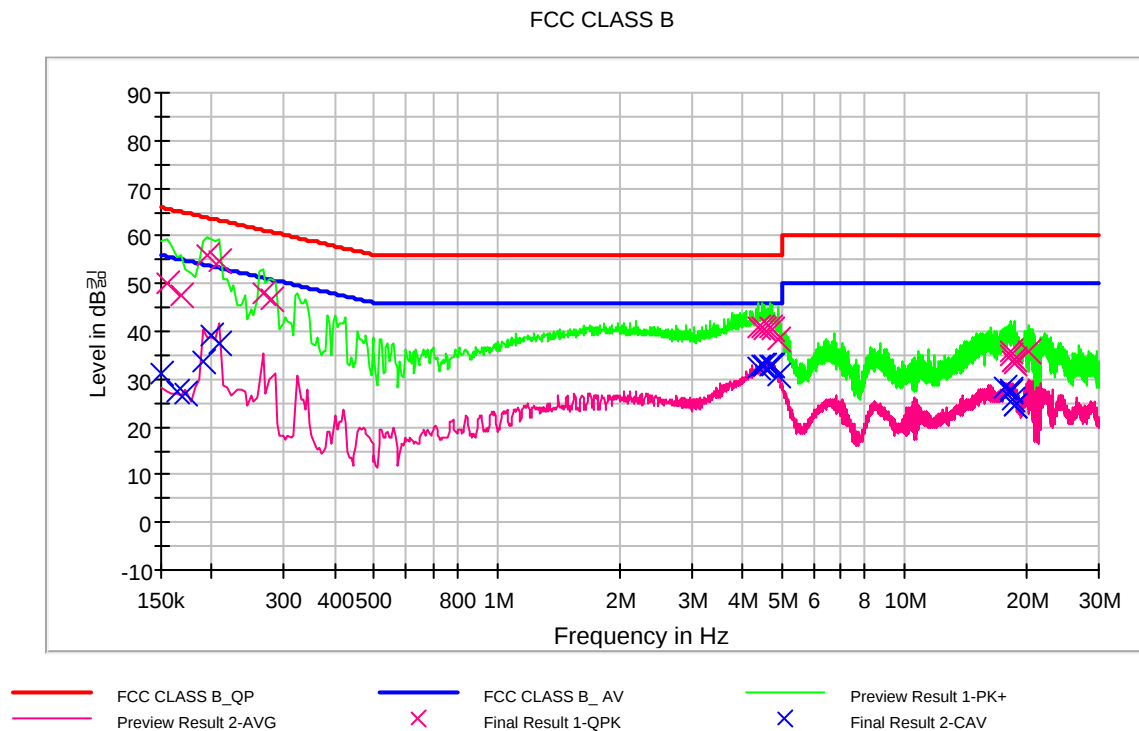


Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	30.3	9.000	L1	9.7	25.7	56.0
0.168000	27.5	9.000	L1	9.7	27.6	55.1
0.186000	29.2	9.000	L1	9.7	25.0	54.2
0.199500	37.5	9.000	L1	9.7	16.1	53.6
0.213000	33.4	9.000	L1	9.7	19.7	53.1
0.262500	31.6	9.000	L1	9.7	19.8	51.4
4.037000	30.8	9.000	L1	10.1	15.2	46.0
4.320500	32.3	9.000	L1	10.1	13.7	46.0
4.392500	31.9	9.000	L1	10.1	14.1	46.0
4.460000	32.3	9.000	L1	10.1	13.7	46.0
4.554500	32.1	9.000	L1	10.1	13.9	46.0
4.622000	32.1	9.000	L1	10.1	13.9	46.0
16.574000	26.2	9.000	L1	10.7	23.8	50.0
17.280500	27.2	9.000	L1	10.8	22.8	50.0
17.636000	27.2	9.000	L1	10.8	22.8	50.0
17.712500	27.1	9.000	L1	10.8	22.9	50.0
18.693500	23.5	9.000	L1	10.8	26.5	50.0
20.250500	25.0	9.000	L1	10.9	25.0	50.0



Figure 2: Spectral Diagrams, Conducted Emission, Phase (N), Data Mode



※ Calculation Formula:

1. Conductor L1 = Hot, Conductor N = Neutral
2. Corr. = LISN Factor + Cable Loss
3. QuasiPeak or CAverage= Receiver Reading + Corr.
4. Margin = Limit – QuasiPeak or CAverage



Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.154500	50.0	9.000	N	9.7	15.8	65.8
0.168000	47.5	9.000	N	9.7	17.6	65.1
0.195000	56.0	9.000	N	9.7	7.8	63.8
0.208500	54.7	9.000	N	9.7	8.6	63.3
0.267000	48.0	9.000	N	9.7	13.2	61.2
0.280500	46.5	9.000	N	9.7	14.3	60.8
4.392500	40.9	9.000	N	10.1	15.1	56.0
4.464500	40.8	9.000	N	10.1	15.2	56.0
4.536500	40.5	9.000	N	10.1	15.5	56.0
4.676000	40.8	9.000	N	10.1	15.2	56.0
4.748000	40.5	9.000	N	10.1	15.5	56.0
4.887500	38.5	9.000	N	10.1	17.5	56.0
18.140000	35.7	9.000	N	10.7	24.3	60.0
18.248000	35.0	9.000	N	10.7	25.0	60.0
18.540500	33.9	9.000	N	10.8	26.1	60.0
18.698000	34.2	9.000	N	10.8	25.8	60.0
18.707000	33.3	9.000	N	10.8	26.7	60.0
20.264000	35.7	9.000	N	10.8	24.3	60.0



Final Result 2

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	31.0	9.000	N	9.7	25.0	56.0
0.163500	27.4	9.000	N	9.7	27.9	55.3
0.172500	26.9	9.000	N	9.7	27.9	54.8
0.190500	33.8	9.000	N	9.7	20.2	54.0
0.199500	39.3	9.000	N	9.7	14.3	53.6
0.208500	37.6	9.000	N	9.7	15.7	53.3
4.392500	32.5	9.000	N	10.1	13.5	46.0
4.464500	32.7	9.000	N	10.1	13.3	46.0
4.536500	32.9	9.000	N	10.1	13.1	46.0
4.676000	33.0	9.000	N	10.1	13.0	46.0
4.748000	33.0	9.000	N	10.1	13.0	46.0
4.887500	30.8	9.000	N	10.1	15.2	46.0
17.717000	28.1	9.000	N	10.7	21.9	50.0
18.140000	27.9	9.000	N	10.7	22.1	50.0
18.212000	27.5	9.000	N	10.7	22.5	50.0
18.540500	25.9	9.000	N	10.8	24.1	50.0
18.698000	24.7	9.000	N	10.8	25.3	50.0
18.707000	24.5	9.000	N	10.8	25.5	50.0



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: RBW 120 kHz, VBW 300 kHz
Operation Mode	: Data Communication mode
Temperature	: 23.6°C
Humidity Level	: 38.3 %
Test Date	: May 19, 2014

Frequency (MHz)	Reading (dBuV)	Polarity (H/V)	Antenna Height (m)	Correction Factor		Limit (dBuV/m)	Total Level (dBuV/m)	Margin (dB)
				Antenna (dB/m)	Cable (dB)			
99.8	13.3	H	1.9	9.2	3.8	43.5	26.2	17.3
266.5	17.6	H	1.0	12.3	4.4	46.0	34.3	11.7
275.9	14.1	H	1.2	12.6	4.5	46.0	31.2	14.8
365.1	8.0	V	1.1	14.9	4.8	46.0	27.6	18.4

※ Calculation Formula:

1. Polarity H = Horizontal, Polarity V = Vertical
2. Reading (Receiver Reading) = Total Level – Correction Factor
3. Margin = Limit - Total Level
4. Total Level = Quasi-Peak



-For Measurement Above 1 GHz

Limit Apply to : FCC PART 15 Subpart B Class B

Detector : Peak mode: Peak (RBW: 1 MHz, VBW: 3 MHz)
Average mode: Peak (RBW: 1 MHz, VBW: 10 Hz)

Operation Mode : Data Communication mode

Temperature : 23.5°C

Humidity Level : 43.8 %

Test Date : May 21, 2014

Frequency (GHz)	Polarity (H/V)	Antenna Height (m)	Peak			Average		
			Total Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Total Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
1.3289	V	1.0	51.3	74	22.7	32.6	54	21.4
1.9974	V	1.1	55.1	74	18.9	37.7	54	16.3
2.6613	V	1.0	50.7	74	23.3	33.7	54	20.3

※ Calculation Formula:

1. Polarity H = Horizontal, Polarity V = Vertical
2. Margin = Limit - Total Level



5. LIST OF 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>					
☒ EMI Test Receiver	Rohde & Schwarz	ESCI	100584	1 year	2015.01.24
☒ LISN	EMCO	3816/2SH	9706-1070	1 year	2015.04.07
☒ LISN	Rohde & Schwarz	ENV216	100073	1 year	2015.01.29
☐ EMI Test Receiver	Rohde & Schwarz	ESCI	100033	1 year	2014.06.23
☐ LISN	Rohde & Schwarz	ESH3-Z5	100282	1 year	2014.07.03
☐ Attenuator	Rohde & Schwarz	ESH3-Z2	357.8810.352	1 year	2014.07.03
☒ Software	Rohde & Schwarz	EMC32	-	-	-

Radiated Emission

-For measurement below 1 GHz

☒ EMI Test Receiver	Rohde & Schwarz	ESI40	831564103	1 year	2015.04.07
☒ Trilog Antenna	Schwarzbeck	VULB9160	3301	2 year	2014.12.17
☒ Antenna master	HD GmbH	MA240	240/520	N/A	-
☒ Turn Table	HD GmbH	2090	9702/1224	N/A	-
☐ EMI Test Receiver	Rohde & Schwarz	ESU 26	100241	1 year	2014.07.01
☐ Trilog Antenna	Schwarzbeck	VULB9168	185	2 year	2015.04.16
☐ Antenna master	INNCO Systems	MA4000-EP	MA4000/283	N/A	-
☐ Turn Table	INNCO Systems	DT3000-3T	DT3000/69	N/A	-
☒ Software	Rohde & Schwarz	EMC32	-	-	-

-For measurement above 1 GHz

☒ EMI Test Receiver	Rohde & Schwarz	ESI40	831564103	1 year	2015.04.07
☒ Antenna master	HD GmbH	MA240	240/520	N/A	-
☒ Turn Table	HD GmbH	2090	9702/1224	N/A	-
☒ Power Amplifier	CERNEX	CBLU1183540	21691	1 year	2014.07.24
☐ Power Amplifier	CERNEX	CBLU1183540	21690	1 year	2014.07.12
☒ Horn Antenna	Schwarzbeck	BBHA 9120D	296	2 year	2014.12.13
☐ EMI Test Receiver	Rohde & Schwarz	ESU 26	100241	1 year	2014.07.01
☐ Turn Table	INNCO Systems	DT3000-3T	DT3000/69	N/A	-
☐ Antenna master	INNCO Systems	MA4000-EP	MA4000/283	N/A	-
☐ Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170124	2 year	2014.10.30
☐ Power Amplifier	CERNEX	CBL18265035	22966	1 year	2014.07.24
☐ Power Amplifier	CERNEX	CBL26405040	19660	1 year	2015.04.04
☒ Software	Rohde & Schwarz	EMC32	-	-	-



6. CONCLUSION

The data collected shows that the **EUT type: GSM Phone with Bluetooth4.0, WIFI802.11 b/g/n(2.4GHz_HT20, HT40), VoIP, Hotspot support, NFC, FCC ID: ZNFD213N, Model: LG-D213n** complies with §15.107 and §15.109 of the FCC rules.