

EMI CERTIFICATION REPORT

Applicant:

LG Electronics MobileComm U.S.A., Inc.
1000 Sylvan Avenue, Englewood Cliffs NJ 07632

Date of Receipt: July 20, 2015

Date of Issue: August 21, 2015

Test Report No. HCT-E-1508-F007-2

HCT FRN: 0005866421

FCC ID:

ZNFH791

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: Portable Handset
Model Name: LG-H791
Additional Model Name: LGH791, H791
Test Port: USB-Type C / Earphone Port
Date of Test: August 11, 2015

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

Tested By



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Test Engineer
EMC Team
Certification Division

Reviewed By



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DOCUMENT HISTORY

The revision history for this document is shown in table.

Version	Date	Description
HCT-E-1508-F007	August 12, 2015	Initial Release
HCT-E-1508-F007-1	August 18, 2015	The revision of the frequency range
HCT-E-1508-F007-2	August 21, 2015	The revision of a typographical error <i>**Proxy signature due to the absence of tester.</i>



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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-H791
FCC ID	ZNFH791
Additional Model	LGH791, H791
EUT Type	Portable Handset
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 B2) 1712.4 MHz to 1752.6 MHz (WCDMA B4) 826.40 MHz to 846.60 MHz (WCDMA B5) 1 850 MHz to 1 910 MHz (LTE B2) 1 710 MHz to 1 755 MHz (LTE B4) 824 MHz to 849 MHz (LTE B5) 2 496 MHz to 2 570 MHz (LTE B7) 704 MHz to 716 MHz (LTE B17) 814 MHz to 849 MHz (LTE B26) 2 496 MHz to 2 690 MHz (LTE B41)
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 B2) 2 112.4 MHz to 2 152.6 MHz (WCDMA B4) 871.40 MHz to 891.60 MHz (WCDMA B5) 1 930 MHz to 1 990 MHz (LTE B2) 2 110 MHz to 2 155 MHz (LTE B4) 869 MHz to 894 MHz (LTE B5) 2 516 MHz to 2 690 MHz (LTE B7) 734 MHz to 746 MHz (LTE B17) 859 MHz to 894 MHz (LTE B26) 2 496 MHz to 2 690 MHz (LTE B41)

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-H791	LG	ZNFH791	Notebook PC
USB cable	LG0146-White	Ningbo Broad	-	EUT, Notebook PC
USB cable	LG0146-Black	Ningbo Broad	-	EUT, Notebook PC
Earphone	EAB64168701	Foxlink	-	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



1.5 Cable Description

Product Name	Port	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (m)
EUT	USB Type-C	Y	Y	(P,D)1.2
	Earphone	N/A	Y	(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	USB Type-C	N	N/A	Y	Both End
	Earphone	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

※NOTE: This device does not contain the minimum number of ports required for personal computer testing per ANSI C63.4, but the EUT is attached to a computer through its only available port, which represents worst case emissions. All other aspects of ANSI C63.4 testing requirements were maintained.



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).
If the EUT is connected to the PC through USB, the AC power-line adapter of the PC is directly connected to 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 (kHz)	Quasi-Peak (dB μ V)	Average (dB μ V)
0.15 to 0.5	9	66 to 56*	56 to 46*
0.5 to 5	9	56	46
5 to 30	9	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 semi anechoic chamber. 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 ($\mu\text{V/m}$)	Quasi-Peak (dB $\mu\text{V/m}$)
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 $\mu\text{V/m}$)	Average (dB $\mu\text{V/m}$)
Above 1 000	3	74	54

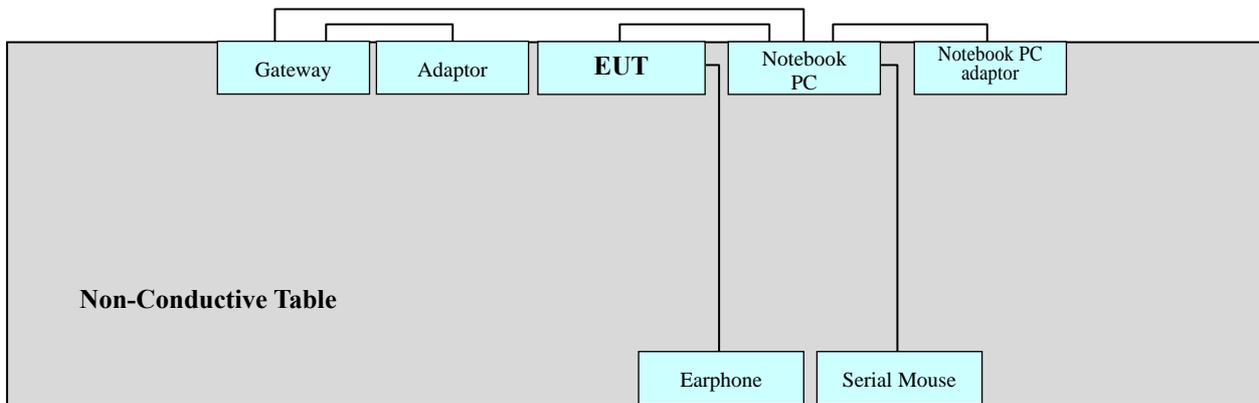


2.2.1 Frequency Range of Radiated Measurements

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
Above 1 000	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 test results of conducted emission at mains ports provide the following information:

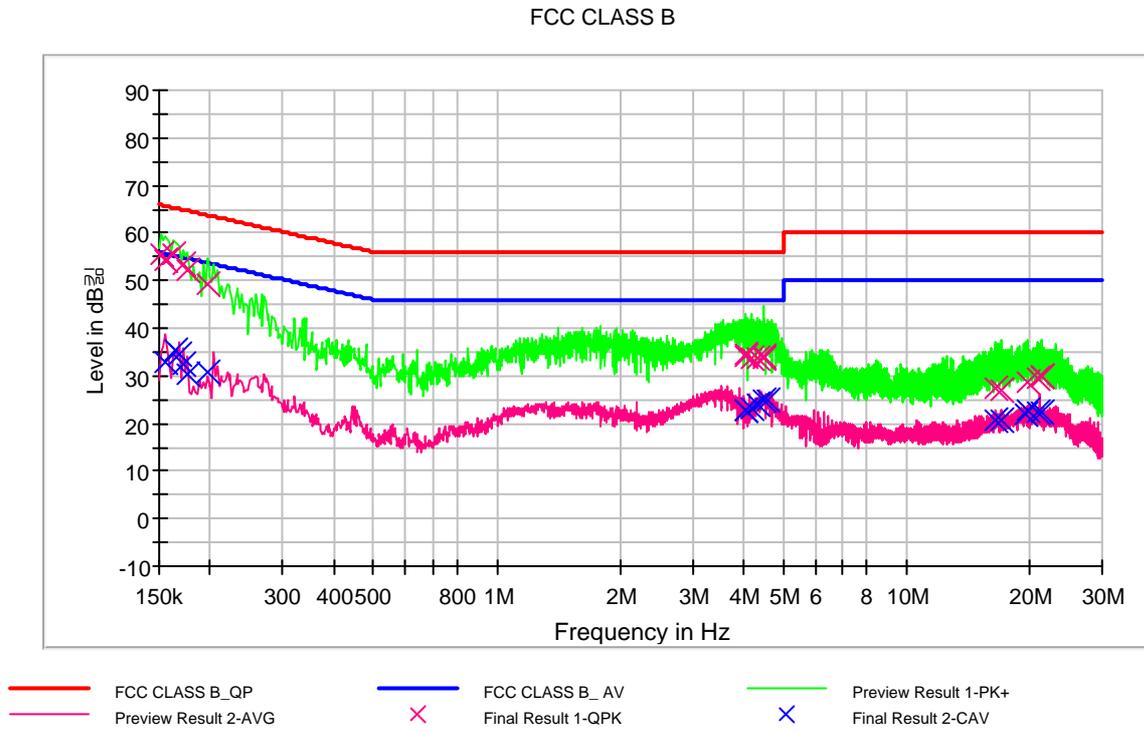
Rule Part / Standard	FCC PART 15 Subpart B Class B
Detector	Quasi-Peak, CISPR-Average
Bandwidth	9 kHz (6 dB)
Operation Mode	Data Communication mode
USB Cable Type	LG0146-White *NOTE: The worst-case emissions are reported.
Kind of Test Site	Shielded Room
Temperature	23.8 °C
Relative Humidity	53.3 %
Test Date	August 11, 2015

- 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



Figure 1: Spectral Diagrams, Conducted Emission, AC Main Port, Line (L1)





QuasiPeak Final Result, Line (L1)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	55.6	9.000	L1	9.6	10.3	65.9
0.156000	54.3	9.000	L1	9.6	11.4	65.7
0.162000	55.4	9.000	L1	9.6	10.0	65.4
0.172000	53.5	9.000	L1	9.6	11.4	64.9
0.176000	52.2	9.000	L1	9.6	12.5	64.7
0.196000	49.3	9.000	L1	9.6	14.5	63.8
4.022000	34.5	9.000	L1	9.8	21.5	56.0
4.058000	34.3	9.000	L1	9.8	21.7	56.0
4.188000	33.6	9.000	L1	9.8	22.4	56.0
4.334000	33.6	9.000	L1	9.8	22.4	56.0
4.466000	34.0	9.000	L1	9.8	22.0	56.0
4.496000	33.8	9.000	L1	9.8	22.2	56.0
16.428000	27.3	9.000	L1	10.2	32.7	60.0
17.008000	27.1	9.000	L1	10.2	32.9	60.0
19.758000	28.6	9.000	L1	10.3	31.4	60.0
20.828000	29.5	9.000	L1	10.3	30.5	60.0
21.246000	30.1	9.000	L1	10.3	29.9	60.0
21.320000	30.1	9.000	L1	10.3	29.9	60.0

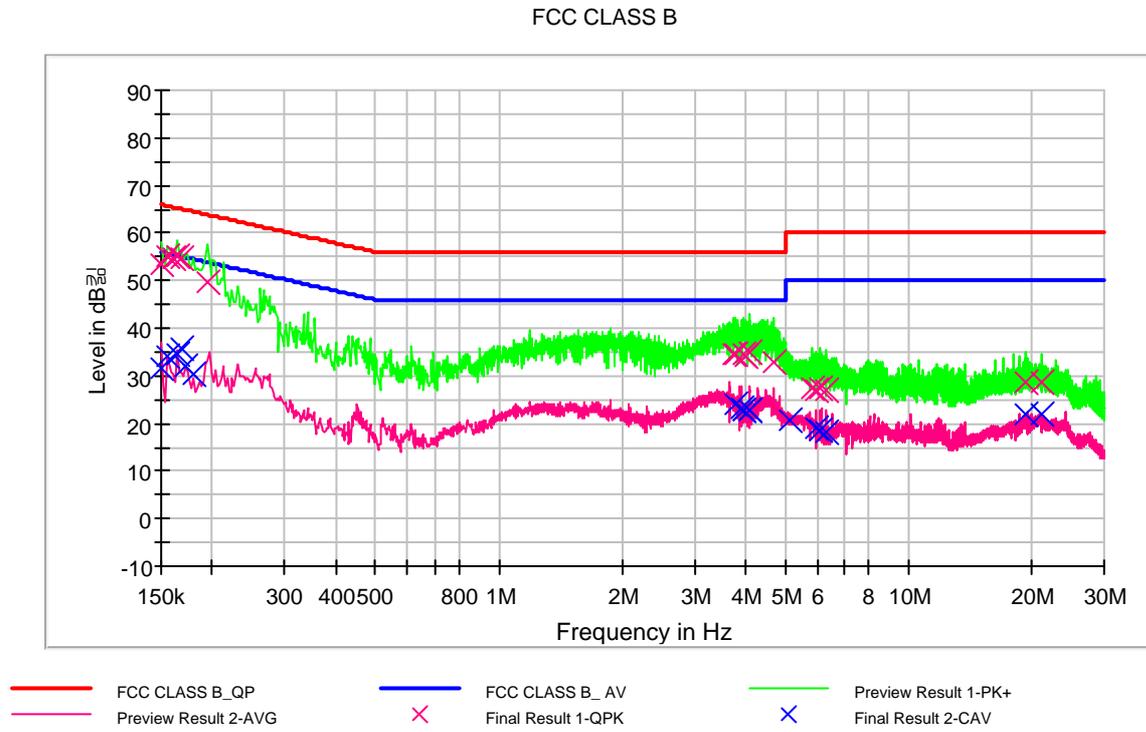


CAverage Final Result, Line (L1)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.156000	32.9	9.000	L1	9.6	22.8	55.7
0.164000	35.3	9.000	L1	9.6	20.0	55.3
0.168000	34.6	9.000	L1	9.6	20.5	55.1
0.172000	32.3	9.000	L1	9.6	22.6	54.9
0.176000	30.3	9.000	L1	9.6	24.4	54.7
0.196000	30.7	9.000	L1	9.6	23.1	53.8
4.022000	22.8	9.000	L1	9.8	23.2	46.0
4.058000	22.9	9.000	L1	9.8	23.1	46.0
4.188000	23.2	9.000	L1	9.8	22.8	46.0
4.334000	24.1	9.000	L1	9.8	21.9	46.0
4.496000	24.7	9.000	L1	9.8	21.3	46.0
4.580000	25.1	9.000	L1	9.8	20.9	46.0
16.428000	20.5	9.000	L1	10.2	29.5	50.0
17.008000	20.5	9.000	L1	10.2	29.5	50.0
19.412000	21.8	9.000	L1	10.3	28.2	50.0
19.758000	22.6	9.000	L1	10.3	27.4	50.0
20.828000	22.6	9.000	L1	10.3	27.4	50.0
21.320000	22.1	9.000	L1	10.3	27.9	50.0



Figure 2: Spectral Diagrams, Conducted Emission, AC Main Port, Line (N)





QuasiPeak Final Result, Line (N)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	53.4	9.000	N	9.6	12.6	66.0
0.156000	55.1	9.000	N	9.6	10.6	65.7
0.160000	54.7	9.000	N	9.6	10.8	65.5
0.164000	55.0	9.000	N	9.6	10.3	65.3
0.168000	54.5	9.000	N	9.6	10.6	65.1
0.194000	49.8	9.000	N	9.6	14.1	63.9
3.750000	34.7	9.000	N	9.8	21.3	56.0
3.784000	34.7	9.000	N	9.8	21.3	56.0
3.962000	34.4	9.000	N	9.8	21.6	56.0
3.988000	34.0	9.000	N	9.8	22.0	56.0
4.108000	35.0	9.000	N	9.8	21.0	56.0
4.668000	33.0	9.000	N	9.8	23.0	56.0
5.804000	27.6	9.000	N	9.8	32.4	60.0
5.944000	27.1	9.000	N	9.8	32.9	60.0
6.088000	27.3	9.000	N	9.9	32.7	60.0
6.300000	27.0	9.000	N	9.9	33.0	60.0
19.270000	28.6	9.000	N	10.3	31.4	60.0
21.064000	28.5	9.000	N	10.3	31.5	60.0



CAverage Final Result, Line (N)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	31.5	9.000	N	9.6	24.5	56.0
0.156000	34.3	9.000	N	9.6	21.4	55.7
0.164000	34.7	9.000	N	9.6	20.6	55.3
0.168000	35.9	9.000	N	9.6	19.2	55.1
0.172000	32.2	9.000	N	9.6	22.7	54.9
0.180000	30.3	9.000	N	9.6	24.2	54.5
3.784000	24.1	9.000	N	9.8	21.9	46.0
3.896000	23.1	9.000	N	9.8	22.9	46.0
3.944000	22.7	9.000	N	9.8	23.3	46.0
3.962000	22.9	9.000	N	9.8	23.1	46.0
4.078000	22.8	9.000	N	9.8	23.2	46.0
4.106000	22.8	9.000	N	9.8	23.2	46.0
5.132000	20.8	9.000	N	9.8	29.2	50.0
5.944000	19.1	9.000	N	9.8	30.9	50.0
6.088000	18.5	9.000	N	9.9	31.5	50.0
6.300000	18.3	9.000	N	9.9	31.7	50.0
19.270000	22.0	9.000	N	10.3	28.0	50.0
21.064000	21.9	9.000	N	10.3	28.1	50.0



4.2 Radiated Emission Test

The test results of radiated emission provide the following information:

-For Measurement Below 1 GHz

Rule Part / Standard	FCC PART 15 Subpart B Class B
Detector	Quasi-Peak
Bandwidth	120 kHz (6 dB)
Operation Mode	Data Communication mode
USB Cable Type	LG0146-Black ※NOTE: The worst-case emissions are reported.
Kind of Test Site	3 m semi anechoic chamber
Temperature	24.7 °C
Relative Humidity	54.9 %
Test Date	August 11, 2015

Frequency (MHz)	Quasi Peak (dBuV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
55.030541	24.5	100.0	V	293.0	15.7	15.5	40.0
86.532745	32.3	350.0	H	230.0	11.5	7.7	40.0
265.570421	33.3	124.0	H	257.0	16.8	12.8	46.0

- Calculation Formula:

1. POL. H = Horizontal, POL. V = Vertical
2. QuasiPeak = Reading (Receiver Reading) + Corr.
3. Corr. (Correction Factor) = Antenna Factor + Cable Loss
4. Margin = Limit - QuasiPeak



-For Measurement Above 1 GHz

Rule Part / Standard	FCC PART 15 Subpart B Class B
Detector	Peak mode: Peak (RBW: 1 MHz, VBW: 3 MHz) CISPR-Average mode: Peak (RBW: 1 MHz, VBW: 10 Hz)
Highest Operating Frequency	1.8 GHz
Testing Frequency Range	1 GHz to 9 GHz
Operation Mode	Data Communication mode
USB Cable Type	LG0146-White ※NOTE: The worst-case emissions are reported.
Kind of Test Site	3 m semi anechoic chamber
Temperature	24.7 °C
Relative Humidity	54.9 %
Test Date	August 11, 2015

Frequency (MHz)	Peak (dBuV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBuV/m)
1327.705411	49.5	100.0	V	0.0	-9.7	24.5	74.0
1993.336673	57.2	100.0	V	29.0	-7.9	16.8	74.0

Frequency (MHz)	CAverage (dBuV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBuV/m)
1327.705411	31.7	100.0	V	0.0	-9.7	22.3	54.0
1993.336673	39.1	100.0	V	29.0	-7.9	14.9	54.0

- Calculation Formula:

1. POL. H = Horizontal, POL. V = Vertical
2. Peak or CAverage = Reading (Receiver Reading) + Corr.
3. Corr. (Correction Factor) = Antenna Factor+ Cable Loss –Amplifier Gain
4. Margin = Limit - Peak or CAverage



5. LIST OF TEST EQUIPMENT

<u>Type</u>	<u>Manufacturer</u>	<u>Model Name</u>	<u>Serial Number</u>	<u>Calibration Cycle</u>	<u>CAL Date</u>
<u>Conducted Emission</u>					
<input checked="" type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESCI	100584	1 year	01.13.2015
<input checked="" type="checkbox"/> LISN	Rohde & Schwarz	ENV216	100073	1 year	01.13.2015
<input checked="" type="checkbox"/> LISN	Rohde & Schwarz	ESH3-Z5	100282	1 year	06.11.2015
<input checked="" type="checkbox"/> Software	Rohde & Schwarz	EMC32	-	-	-
<u>Radiated Emission</u>					
-For measurement below 1 GHz					
<input checked="" type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESI40	831564103	1 year	04.01.2015
<input checked="" type="checkbox"/> Trilog Antenna	Schwarzbeck	VULB9160	3301	2 year	11.17.2014
<input checked="" type="checkbox"/> Antenna master	HD GmbH	MA240	240/520	N/A	-
<input checked="" type="checkbox"/> Antenna master controller	HD GmbH	HD 100	100/637	N/A	-
<input checked="" type="checkbox"/> Turn Table	EMCO	1060-2M	-	N/A	-
<input checked="" type="checkbox"/> Turn Table controller	EMCO	2090	9702-1224	N/A	-
<input type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESU 26	100241	1 year	06.05.2015
<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"/> Software	Rohde & Schwarz	EMC32	-	-	-
-For measurement above 1 GHz					
<input checked="" type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESI40	831564103	1 year	04.01.2015
<input checked="" type="checkbox"/> Antenna master	HD GmbH	MA240	240/520	N/A	-
<input checked="" type="checkbox"/> Antenna master controller	HD GmbH	HD 100	100/637	N/A	-
<input checked="" type="checkbox"/> Turn Table	EMCO	1060-2M	-	N/A	-
<input checked="" type="checkbox"/> Turn Table controller	EMCO	2090	9702-1224	N/A	-
<input type="checkbox"/> Power Amplifier	CERNEX	CBLU1183540	21691	1 year	07.06.2015
<input checked="" type="checkbox"/> Power Amplifier	CERNEX	CBLU5183530	24348	1 year	06.15.2015
<input checked="" type="checkbox"/> Horn Antenna	Schwarzbeck	BBHA 9120D	296	2 year	10.07.2014
<input type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESU 26	100241	1 year	06.05.2015
<input type="checkbox"/> Turn Table	INNCO Systems	DT3000-3T	DT3000/69	N/A	-
<input checked="" type="checkbox"/> Software	Rohde & Schwarz	EMC32	-	-	-



6. CONCLUSION

The data collected shows that the **EUT Type: Portable Handset, FCC ID: ZNFH791, Model: LG-H791** complies with §15.107 and §15.109 of the FCC rules.