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EMI CERTIFICATION REPORT

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

Date of Receipt: January 07, 2015
Date of Issue: January 26, 2015
Test Report No. HCT-E-1501-F032
HCT FRN: 0005866421

FCC ID: **ZNFH440**

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/WCDMA Phone with Bluetooth4.1, WIFI802.11 b/g/n (2.4GHz_HT20), VoIP, Hotspot support
Model Name:	LG-H440
Additional Model Name:	LGH440, H440
Test Port:	USB / Earphone Port
Date of Test:	January 15, 2015 - January 19, 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 denial the FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C 862

Tested By

Sun-Hyeong Lee
Test Engineer
EMC Team
Certification Division

Reviewed By

Jin-Pyo Hong
Technical Manager
EMC Team
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DOCUMENT HISTORY

The revision history for this document is shown in table.

Version	Date	Description
HCT-E-1501-F032	January 26, 2015	Initial Release

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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-H440
FCC ID	ZNFH440
Additional Model	LGH440, H440
EUT Type	GSM/WCDMA Phone with Bluetooth4.1, WIFI802.11 b/g/n(2.4GHz_HT20), VoIP, Hotspot support
TX Frequency	824.20 ㎒ to 848.80 ㎒ (GSM 850) 1 850.20 ㎒ to 1 909.80 ㎒ (GSM 1 900) 826.40 ㎒ to 846.60 ㎒ (WCDMA 850)
RX Frequency	869.20 ㎒ to 893.80 ㎒ (GSM 850) 1 930.20 ㎒ to 1 989.80 ㎒ (GSM 1 900) 871.40 ㎒ to 891.60 ㎒ (WCDMA 850)

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-H440	LG	ZNFH440	Notebook PC, Earphone
USB cable	EAD62377902	Ningbo Broad	-	EUT, Notebook PC
Earphone	EAB62808212	CRESYN	-	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	SanDisk	-	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)1.0
	Earphone	N/A	Y	(D)1.1
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
	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

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(μV))	Average (dB(μV))
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 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]

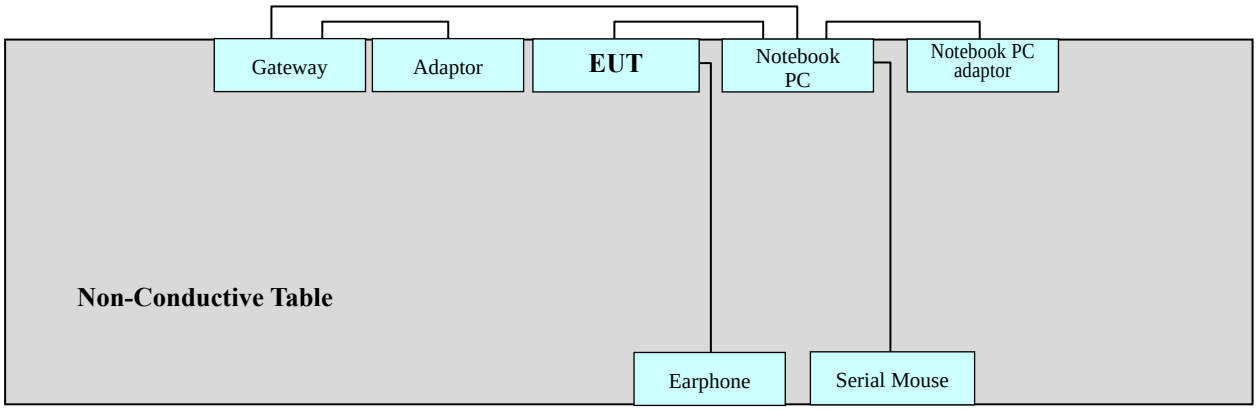
Frequency (MHz)	Antenna Distance (m)	Field Strength (μV/m)	Quasi-Peak (dB(μV)/m)
30 to 88	3	100	40.0
88 to 216	3	150	43.5
216 to 960	3	200	46.0
Above 960	3	500	54.0
Frequency (MHz)	**Antenna Distance (m)**	**Peak (dB(μV)/m)**	**Average (dB(μV)/m)**
Above 1 000	3	74	54

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	5th harmonic of the highest frequency or 40 ㎓, 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

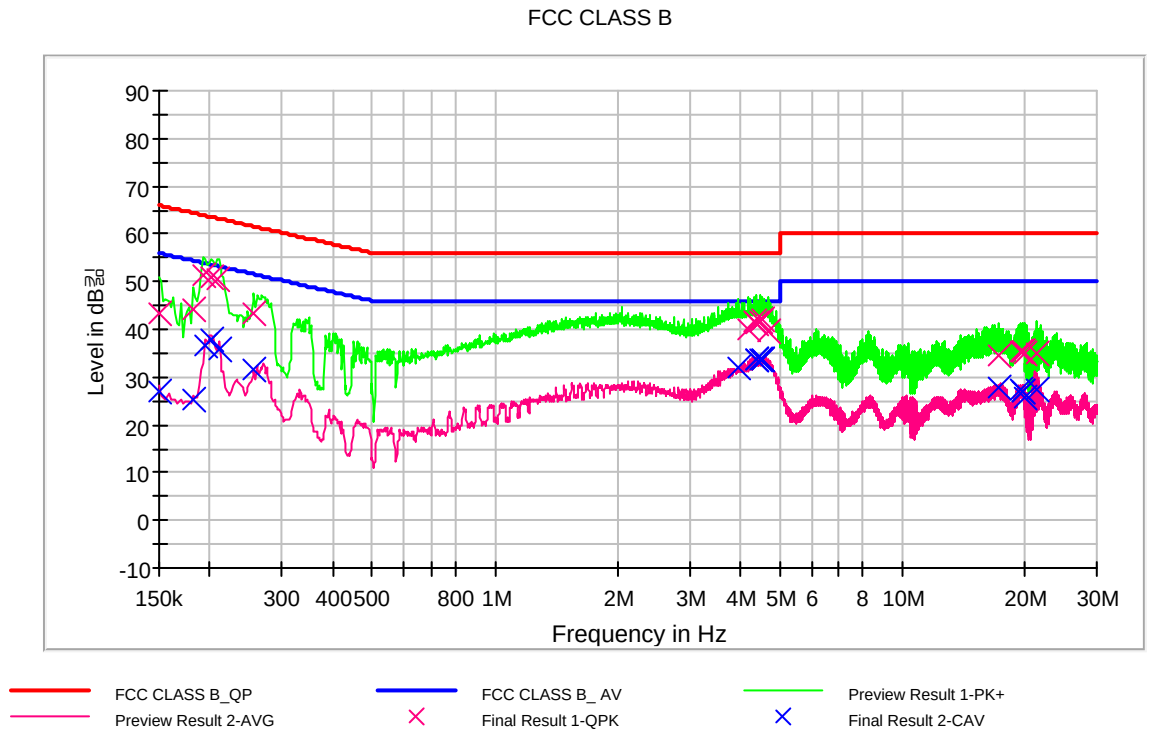
The test results of conducted emission at mains ports provide the following information:

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
Kind of Test Site	Shielded Room
Temperature	20.2 °C
Relative Humidity	27.8 %
Test Date	January 19, 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)



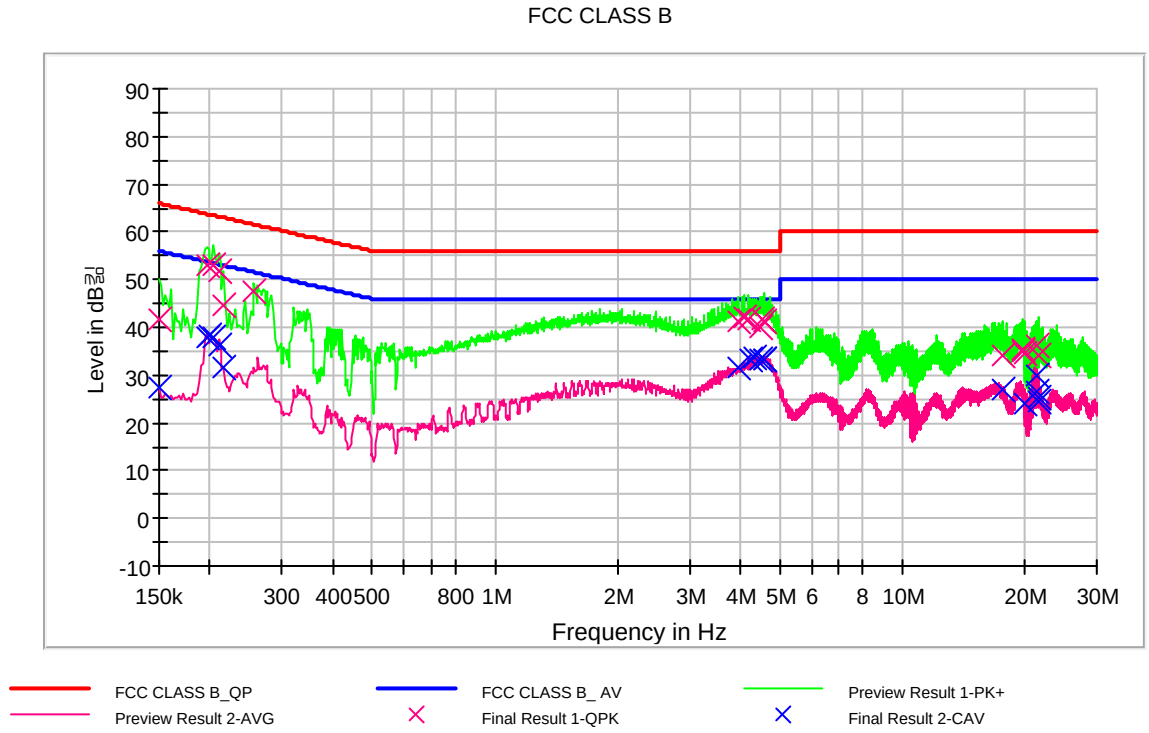
QuasiPeak Final Result, Line (L1)

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	43.4	9.000	L1	9.6	22.6	66.0
0.182000	44.1	9.000	L1	9.6	20.3	64.4
0.192000	51.2	9.000	L1	9.6	12.7	63.9
0.202000	51.1	9.000	L1	9.7	12.4	63.5
0.208000	50.4	9.000	L1	9.7	12.9	63.3
0.256000	43.5	9.000	L1	9.7	18.1	61.6
4.176000	40.0	9.000	L1	9.9	16.0	56.0
4.314000	41.7	9.000	L1	9.9	14.3	56.0
4.386000	41.1	9.000	L1	9.9	14.9	56.0
4.456000	41.9	9.000	L1	9.9	14.1	56.0
4.526000	42.0	9.000	L1	9.9	14.0	56.0
4.672000	39.7	9.000	L1	9.9	16.3	56.0
17.258000	34.4	9.000	L1	10.2	25.6	60.0
19.494000	35.3	9.000	L1	10.3	24.7	60.0
19.660000	35.3	9.000	L1	10.3	24.7	60.0
19.822000	35.3	9.000	L1	10.3	24.7	60.0
19.874000	35.1	9.000	L1	10.3	24.9	60.0
21.426000	35.1	9.000	L1	10.3	24.9	60.0

CAverage Final Result, Line (L1)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	26.9	9.000	L1	9.6	29.1	56.0
0.182000	25.2	9.000	L1	9.6	29.2	54.4
0.194000	36.7	9.000	L1	9.6	17.2	53.9
0.202000	37.9	9.000	L1	9.7	15.6	53.5
0.210000	35.8	9.000	L1	9.7	17.4	53.2
0.256000	31.4	9.000	L1	9.7	20.2	51.6
3.962000	31.9	9.000	L1	9.9	14.1	46.0
4.360000	33.6	9.000	L1	9.9	12.4	46.0
4.386000	33.6	9.000	L1	9.9	12.4	46.0
4.458000	33.6	9.000	L1	9.9	12.4	46.0
4.526000	33.8	9.000	L1	9.9	12.2	46.0
4.550000	33.7	9.000	L1	9.9	12.3	46.0
17.258000	27.7	9.000	L1	10.2	22.3	50.0
19.494000	27.3	9.000	L1	10.3	22.7	50.0
19.742000	26.8	9.000	L1	10.3	23.2	50.0
19.822000	27.1	9.000	L1	10.3	22.9	50.0
19.874000	25.8	9.000	L1	10.3	24.2	50.0
21.426000	27.5	9.000	L1	10.3	22.5	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	41.8	9.000	N	9.6	24.2	66.0
0.196000	53.1	9.000	N	9.6	10.7	63.8
0.204000	52.9	9.000	N	9.6	10.5	63.4
0.210000	51.7	9.000	N	9.6	11.5	63.2
0.216000	44.6	9.000	N	9.6	18.4	63.0
0.256000	47.6	9.000	N	9.7	14.0	61.6
3.958000	41.1	9.000	N	9.8	14.9	56.0
4.100000	42.1	9.000	N	9.8	13.9	56.0
4.170000	41.7	9.000	N	9.8	14.3	56.0
4.458000	39.9	9.000	N	9.9	16.1	56.0
4.522000	41.8	9.000	N	9.9	14.2	56.0
4.596000	41.1	9.000	N	9.9	14.9	56.0
17.530000	34.3	9.000	N	10.2	25.7	60.0
19.720000	35.4	9.000	N	10.3	24.6	60.0
19.726000	35.1	9.000	N	10.3	24.9	60.0
19.934000	34.4	9.000	N	10.3	25.6	60.0
21.276000	36.4	9.000	N	10.3	23.6	60.0
21.630000	34.0	9.000	N	10.3	26.0	60.0

CAverage Final Result, Line (N)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	27.3	9.000	N	9.6	28.7	56.0
0.196000	37.7	9.000	N	9.6	16.1	53.8
0.200000	38.2	9.000	N	9.6	15.4	53.6
0.204000	37.8	9.000	N	9.6	15.6	53.4
0.210000	36.1	9.000	N	9.6	17.1	53.2
0.216000	31.4	9.000	N	9.6	21.6	53.0
3.958000	31.6	9.000	N	9.8	14.4	46.0
4.246000	33.4	9.000	N	9.8	12.6	46.0
4.314000	33.8	9.000	N	9.8	12.2	46.0
4.458000	33.1	9.000	N	9.9	12.9	46.0
4.592000	33.4	9.000	N	9.9	12.6	46.0
4.596000	33.5	9.000	N	9.9	12.5	46.0
17.530000	27.1	9.000	N	10.2	22.9	50.0
19.934000	24.1	9.000	N	10.3	25.9	50.0
21.276000	30.0	9.000	N	10.3	20.0	50.0
21.420000	26.8	9.000	N	10.3	23.2	50.0
21.630000	25.3	9.000	N	10.3	24.7	50.0
21.704000	24.5	9.000	N	10.3	25.6	50.0

4.2 Radiated Emission Test

The test results of radiated emission provide the following information:

-For Measurement Below 1 ㎓

Rule Part / Standard	FCC PART 15 Subpart B Class B
Detector	Quasi-Peak
Bandwidth	120 kHz (6 dB)
Operation Mode	Data Communication mode
Kind of Test Site	3 m semi anechoic chamber
Temperature	22.4 °C
Relative Humidity	28.3 %
Test Date	January 15, 2015

Frequency (MHz)	Quasi Peak (dBuV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
93.868297	29.1	193.0	H	274.0	12.0	14.4	43.5
266.554309	35.1	124.0	H	293.0	16.9	10.9	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 ㎓

Rule Part / Standard	FCC PART 15 Subpart B Class B
Detector	Peak mode: Peak (RBW: 1 ㎒, VBW: 3 ㎒) CISPR-Average mode: Peak (RBW: 1 ㎒, VBW: 10 ㎐)
Highest Operating Frequency	1.2 GHz
Testing Frequency Range	1 GHz to 6 GHz
Operation Mode	Data Communication mode
Kind of Test Site	3 m semi anechoic chamber
Temperature	22.4 °C
Relative Humidity	28.3 %
Test Date	January 15, 2015

Frequency (MHz)	Peak (dBuV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1328.507014	49.9	100.0	V	297.0	-9.3	24.1	74.0
1997.945892	56.0	100.0	V	29.0	-7.8	18.0	74.0
2660.270541	47.1	124.0	V	203.0	-4.8	26.9	74.0

Frequency (MHz)	CAverage (dBuV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1328.507014	31.7	100.0	V	297.0	-9.3	22.3	54.0
1997.945892	38.1	100.0	V	29.0	-7.8	15.9	54.0
2660.270541	32.6	124.0	V	203.0	-4.8	21.4	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

Type	Manufacturer	Model Name	Serial Number	Calibration Cycle	CAL Date
Conducted Emission					
☒ EMI Test Receiver	Rohde & Schwarz	ESCI	100584	1 year	01.13.2015
☒ LISN	EMCO	3816/2SH	9706-1070	1 year	04.07.2014
☒ LISN	Rohde & Schwarz	ENV216	100073	1 year	01.13.2015
☒ Software	Rohde & Schwarz	EMC32	-	-	-
Radiated Emission					
-For measurement below 1 GHz					
☒ EMI Test Receiver	Rohde & Schwarz	ESI40	831564103	1 year	04.07.2014
☒ Trilog Antenna	Schwarzbeck	VULB9160	3301	2 year	11.17.2014
☒ Antenna master	HD GmbH	MA240	240/520	N/A	-
☒ Antenna master controller	HD GmbH	HD 100	100/637	N/A	-
☒ Turn Table	EMCO	1060-2M	-	N/A	-
☒ Turn Table controller	EMCO	2090	9702-1224	N/A	-
☐ EMI Test Receiver	Rohde & Schwarz	ESU 26	100241	1 year	06.18.2014
☐ 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	04.07. 2014
☒ Antenna master	HD GmbH	MA240	240/520	N/A	-
☒ Antenna master controller	HD GmbH	HD 100	100/637	N/A	-
☒ Turn Table	EMCO	1060-2M	-	N/A	-
☒ Turn Table controller	EMCO	2090	9702-1224	N/A	-
☐ Power Amplifier	CERNEX	CBLU1183540	21691	1 year	07.11.2014
☒ Power Amplifier	CERNEX	CBLU5183530	24348	1 year	06.11.2014
☒ Horn Antenna	Schwarzbeck	BBHA 9120D	296	2 year	10.07.2014
☐ Horn Antenna	Schwarzbeck	BBHA 9120D	1151	2 year	07.05.2013
☐ EMI Test Receiver	Rohde & Schwarz	ESU 26	100241	1 year	06.18.2014
☐ Turn Table	INNCO Systems	DT3000-3T	DT3000/69	N/A	-
☐ Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170124	2 year	10.30.2013
☐ Power Amplifier	CERNEX	CBL18265035	22966	1 year	07.23.2014
☐ Power Amplifier	CERNEX	CBL26405040	19660	1 year	04.04.2014
☒ Software	Rohde & Schwarz	EMC32	-	-	-

6. CONCLUSION

The data collected shows that the **EUT Type: GSM/WCDMA Phone with Bluetooth4.1, WIFI802.11 b/g/n(2.4GHz_HT20), VoIP, Hotspot support, FCC ID: ZNFH440, Model: LG-H440** complies with §15.107 and §15.109 of the FCC rules.