



FCC CFR47 PART 15 SUBPART C

CERTIFICATION TEST REPORT

FOR

GSM/WCDMA BAND PHONE WITH BT, WLAN, AND NFC

MODEL NUMBER: LG-P880g, LGP880g, P880g, LG-P880G, LGP880G, P880G

FCC ID: ZNFP880G

REPORT NUMBER: 12U14550-2

ISSUE DATE: AUGUST 17, 2012

Prepared for
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NVLAP LAB CODE 200065-0

Revision History

Rev.	Issue Date	Revisions	Revised By
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1. ATTESTATION OF TEST RESULTS

COMPANY NAME: LG ELECTRONICS MOBILECOMM U.S.A., INC.
1000 SYLVAN AVE.
ENGLEWOOD CLIFFS, NJ
UNITED STATES 07632

EUT DESCRIPTION: CELL PHONE WITH GSM/CDMA/WCDMA/LTE+BT
LE+802.11ABGN (HT20) W/ WIRELESS BACK COVER

MODEL: LG-P880g, LGP880g, P880g, LG-P880G, LGP880G, P880G

SERIAL NUMBER: 207KPMZ217107

DATE TESTED: AUGUST 08 TO 17, 2012

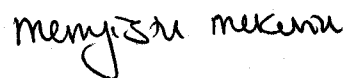
APPLICABLE STANDARDS	
STANDARD	TEST RESULTS
FCC PART 15 SUBPART C	Pass

UL CCS tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL CCS based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL CCS and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL CCS will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For UL CCS By:

Tested By:



TIM LEE
STAFF ENGINEER
UL CCS

MENGISTU MEKURIA
EMC ENGINEER
UL CCS

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.4-2003, FCC CFR 47 Part 2, FCC CFR 47 Part 15, RSS-GEN Issue 3, and RSS-210 Issue 8.

3. FACILITIES AND ACCREDITATION

The test sites and measurement facilities used to collect data are located at 47173 Benicia Street, Fremont, California, USA.

UL CCS is accredited by NVLAP, Laboratory Code 200065-0. The full scope of accreditation can be viewed at <http://www.ccsemc.com>.

4. CALIBRATION AND UNCERTAINTY

4.1. MEASURING INSTRUMENT CALIBRATION

The measuring equipment utilized to perform the tests documented in this report has been calibrated in accordance with the manufacturer's recommendations, and is traceable to recognized national standards.

4.2. SAMPLE CALCULATION

Where relevant, the following sample calculation is provided:

$$\begin{aligned} \text{Field Strength (dBuV/m)} &= \text{Measured Voltage (dBuV)} + \text{Antenna Factor (dB/m)} + \\ &\text{Cable Loss (dB)} - \text{Preamp Gain (dB)} \\ 36.5 \text{ dBuV} + 18.7 \text{ dB/m} + 0.6 \text{ dB} - 26.9 \text{ dB} &= 28.9 \text{ dBuV/m} \end{aligned}$$

4.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	UNCERTAINTY
Conducted Disturbance, 0.15 to 30 MHz	3.52 dB
Radiated Disturbance, 30 to 1000 MHz	4.94 dB

Uncertainty figures are valid to a confidence level of 95%.

5. EQUIPMENT UNDER TEST

5.1. DESCRIPTION OF EUT

The EUT is a GSM/WCDMA Tri-Band Phone that also supports BLUETOOTH, WLAN and NFC operating at 13.56MHz.

The EUT is manufactured by LG Electronics.

5.2. MAXIMUM OUTPUT POWER

The transmitter maximum E-field at 10m distance is 14.56 dBuV/m

5.3. SOFTWARE AND FIRMWARE

The EUT driver software installed during testing was P880G_0311

The test utility software used during testing was NFC FCC Test.

The firmware used during testing was 3.0.8.00001_g114383

5.4. MODEL DIFFERNECE

All models, LG-P880G, LGP880G, and P880G, are identical except for model designation.

5.5. WORST-CASE CONFIGURATION AND MODE

There are three configurations were tested, EUT with Standard cover, EUT with inductive cover, and EUT with inductive charger.

Since the EUT is a portable device, an X, Y, and Z orientations, and worst orientations among X, Y, and Y with Headset and/or AC Adapter were investigated to determine the worst case. After the investigation the worst case turned out to be Y-Orientation with an AC Adapter and Headset.

5.6. MODIFICATIONS

No modifications were made during testing.

5.7. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

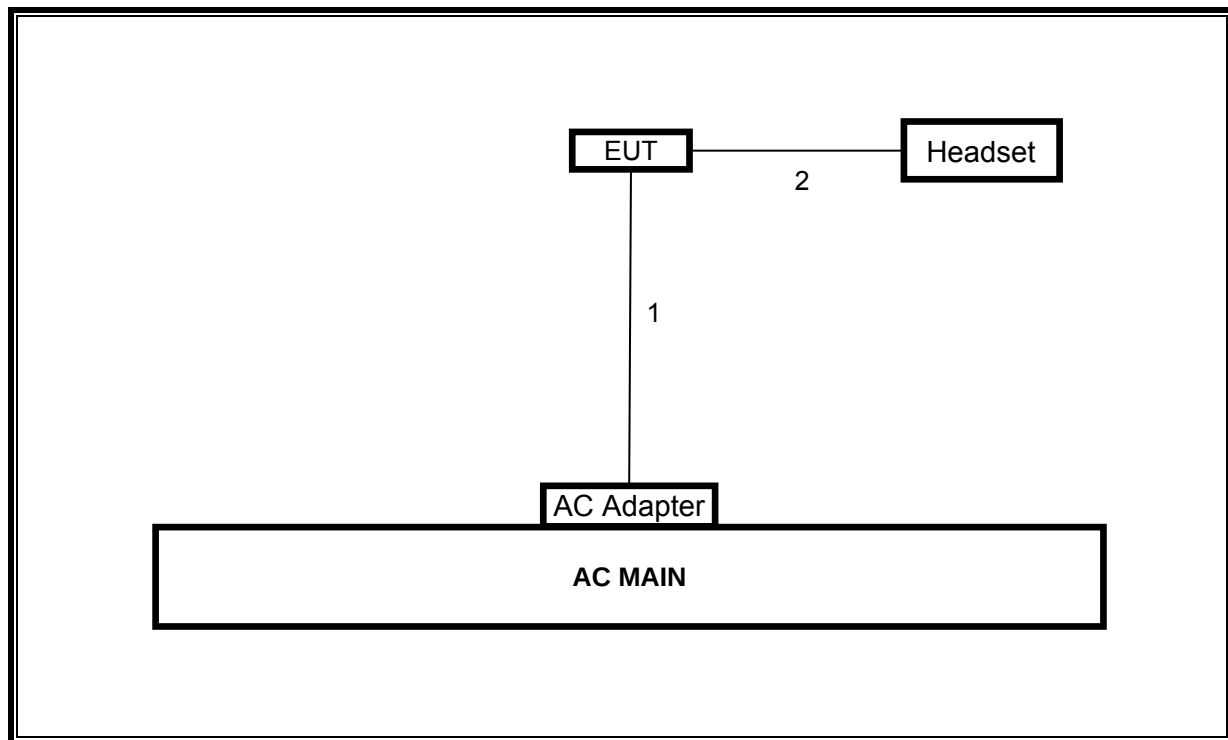
PERIPHERAL SUPPORT EQUIPMENT LIST				
Description	Manufacturer	Model	Serial Number	FCC ID
AC Adapter	LG	MCS-01WD	DA260003271	DoC
Headset	LG	N/A	N/A	N/A

I/O CABLES (RADIATED SETUP)

I/O CABLE LIST						
Cable No.	Port	# of Identical Ports	Connector Type	Cable Type	Cable Length	Remarks
1	DC Power	1	Mini-USB	Shielded	1.2 m	NA
2	Audio	1	Mini-Jack	Un-Shielded	1.5 m	NA

TEST SETUP

The EUT is a stand-alone device during the tests. Test software exercised the radio card.

INDUCTIVE/STANDARD COVER SETUP DIAGRAM FOR RF RADIATED TESTS

TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST				
Description	Manufacturer	Model	Asset	Cal Due
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01012	09/02/12
EMI Receiver, 6.5GHz	Agilent / HP	85462A	N/A	06/19/13
Spectrum Analyzer, 44 GHz	Agilent / HP	E4446A	C01159	08/11/12
Spectrum Analyzer, 26.5 GHz	Agilent / HP	E4440A	C01179	02/16/13
EMI Test Receiver, 30 MHz	R & S	ESHS 20	N02396	08/19/13
Antenna, Loop, 30 MHz	EMCO	6502	C00593	02/10/13
Antenna, Bilog, 2 GHz	Sunol Sciences	JB1	C01171	03/23/13
Preamplifier, 1300 MHz	Agilent / HP	8447D	C00558	11/11/12
LISN, 30 MHz	FCC	50/250-25-2	C00626	12/13/12
Temperature / Humidity Chamber	Thermotron	SE 600-10-10	C00930	10/20/12

Note: Spectrum Analyzer, HP, E4446A, Asset # C01159 was used before August 11, 2012.

6. RADIATED EMISSION TEST RESULTS

6.1. LIMITS AND PROCEDURE

LIMIT

§15.225

IC RSS-210, Section 2.6 (Transmitter)

IC RSS-GEN, Section 6 (Receiver)

(a) The field strength of any emissions within the band 13.553–13.567 MHz shall not exceed 15,848 microvolts/ meter at 30 meters.

(b) Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.

(c) Within the bands 13.110–13.410 MHz and 13.710–14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.

(d) The field strength of any emissions appearing outside of the 13.110– 14.010 MHz and shall not exceed the general radiated emission limits in § 15.209 as follows:

§15.209 (a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Limits for radiated disturbance of an intentional radiator		
Frequency range (MHz)	Limits (µV/m)	Measurement Distance (m)
0.009 – 0.490	2400 / F (kHz)	300
0.490 – 1.705	24000 / F (kHz)	30
1.705 – 30.0	30	30
30 – 88	100**	3
88 - 216	150**	3
216 – 960	200**	3
Above 960	500	3

** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g. §§ 15.231 and 15.241.

§15.209 (b) In the emission table above, the tighter limit applies at the band edges.

Formula for converting the field strength from µV/m to dBuV/m is:

Limit (dBuV/m) = 20 log limit (µV/m)

In addition:

§15.209 (d) The emission limits shown the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emissions limits in these three bands are based on measurements employing an average detector.

§15.209 (d) The provisions in §§ 15.225, measuring emissions at distances other than the distances specified in the above table, determining the frequency range over which radiated emissions are to be measured, and limiting peak emissions apply to all devices operated under this part.

TEST PROCEDURE

ANSI C63.4

The EUT is an intentional radiator that incorporates a digital device. The highest fundamental frequency generated or used in the device is 19.2 MHz. The frequency range was investigated from 30 MHz to the 10th harmonic of the highest fundamental frequency, or 1000 MHz, whichever is greater (1000MHz)

RESULTS

No non-compliance noted:

6.2. FUNDAMENTAL AND SPURIOUS EMISSIONS (0.15 – 30 MHz)**FCC Part 15, Subpart B & C 3 Meter Distance Measurement At Open Field**

Company: LG Electronic

Project #: 12J14550

Model #: P880G

Tester: Mengistu Mekuria

Date: 8/09/2012

Frequency (MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	AF dB/m	Distance Correction (dB)	PK Corrected Reading (dBuV/m)	AV Corrected Reading (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	PK Margin (dB)	AV Margin (dB)	Notes
Loop Antenna Face On:												
X-Pos												
13.56	33.99	33.99	N/A	10.56	-40.00	4.55	N/A	84.00	N/A	-79.5	N/A	Fundamental @ 3m Dist
Y-Pos												
13.56	43.61	43.61	N/A	10.56	-40.00	14.17	N/A	84.00	N/A	-69.8	N/A	Fundamental @ 3m Dist
Z-Pos												
13.56	43.59	43.59	N/A	10.56	-40.00	14.15	N/A	84.00	N/A	-69.9	N/A	Fundamental @ 3m Dist
Y-Pow with Headset												
13.56	44.00	44.00	N/A	10.56	-40.00	14.56	N/A	84.00	N/A	-69.4	N/A	Fundamental @ 3m Dist
Y-Pos with Headset and AC Adapter												
13.56	44.52	44.52	N/A	10.56	-40.00	15.08	N/A	84.00	N/A	-68.9	N/A	Fundamental @ 3m Dist
Loop Antenna Face Off:												
X-Pos												
13.56	27.65	27.65	N/A	10.56	-40.00	-1.79	N/A	84.00	N/A	-85.8	N/A	Fundamental @ 3m Dist
Y-Pos												
13.56	38.43	38.43	N/A	10.56	-40.00	8.99	N/A	84.00	N/A	-75.0	N/A	Fundamental @ 3m Dist
Z-Pos												
13.56	38.35	38.35	N/A	10.56	-40.00	8.91	N/A	84.00	N/A	-75.1	N/A	Fundamental @ 3m Dist
Y-Pow with Headset												
13.56	38.69	38.69	N/A	10.56	-40.00	9.25	N/A	84.00	N/A	-74.8	N/A	Fundamental @ 3m Dist
Y-Pos with Headset and AC Adapter												
13.56	42.48	42.48	N/A	10.56	-40.00	13.04	N/A	84.00	N/A	-71.0	N/A	Fundamental @ 3m Dist

* No more emissions were found up to 30MHz

Note: The emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 10000Mhz. Radiated emission limits in these three bands are based on measurements employing an average detector.

P.K. = Peak

Q.P. = Quasi Peak Readings

A.F. = Antenna factor

6.3. TX SPURIOUS EMISSION BELOW 30 MHz (Worst-Case)**FCC Part 15, Subpart B & C 3 Meter Distance Measurement At Open Field**

Company: LG Electronic

Project #: 12J14550

Model #: P880G

Tester: Mengistu Mekuria

Date: 8/09/2012

Frequency (MHz)	PK (dBuV)	QP (dBuV)	AV (dBuV)	AF dB/m	Distance Correction (dB)	PK Corrected Reading (dBuV/m)	AV Corrected Reading (dBuV/m)	QP Limit (dBuV/m)	AV Limit (dBuV/m)	PK Margin (dB)	AV Margin (dB)	Notes
Loop Antenna Face On:												
27.12	14.88	14.88	N/A	9.046	-40.00	-16.07	N/A	29.54	N/A	-45.6	N/A	14.010-30MHz Spurious @ 3m
Loop Antenna Face Off:												
27.12	14.08	14.08	N/A	9.046	-40.00	-16.87	N/A	29.54	N/A	-46.4	N/A	14.010-30MHz Spurious @ 3m

* No more emissions were found up to 30MHz

Note: The emission limits are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9–90 kHz, 110–490 kHz and above 10000MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

P.K. = Peak

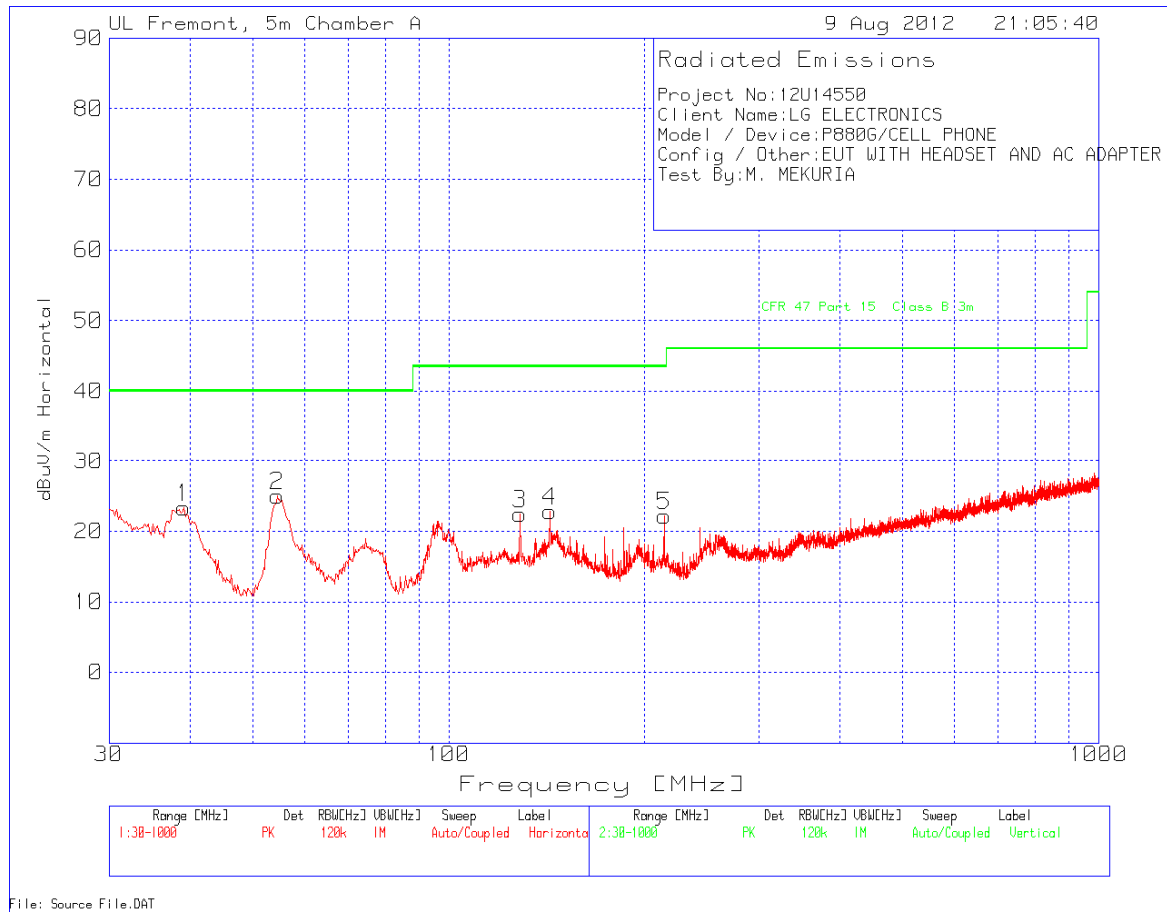
Q.P. = Quasi Peak Reading

A.F. = Antenna factor

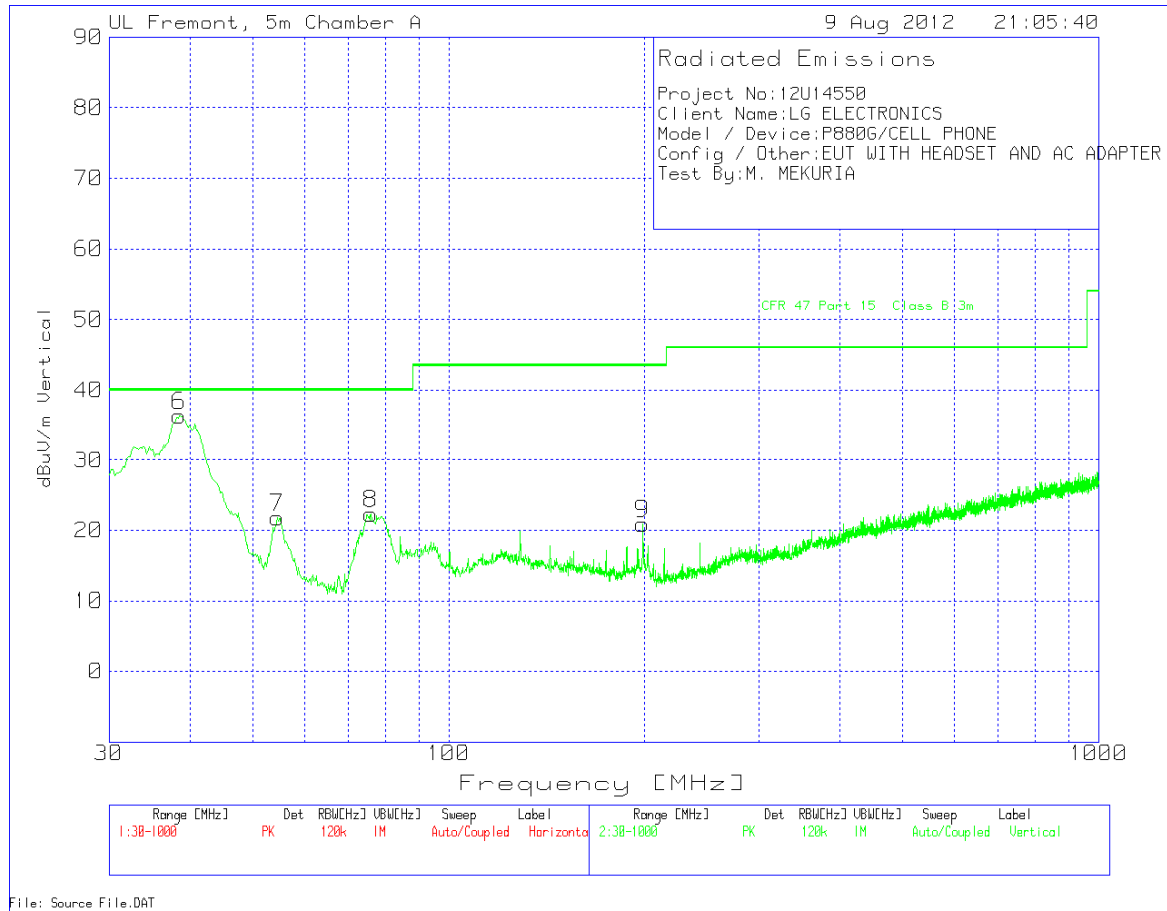
Rev. 10.23.09

6.4. TX SPURIOUS EMISSION 30 TO 1000 MHz (Worst-Case)

HORIZONTAL PLOT



VERTICAL PLOT



HORIZONTAL AND VERTICAL DATA

Project No:12U14550									
Client Name:LG ELECTRONICS									
Model / Device:P880G/CELL PHONE									
Config / Other:EUT WITH HEADSET AND AC ADAPTER									
Test By:M. MEKURIA									
Horizontal 30 - 1000MHz									
Test Frequency	Meter Reading	Detector	25MHz-1GHz ChmbrA Amplified.TX (dB)	T243 Sunol Bilog.TXT (dB)	dBuV/m	CFR 47 Part 15 Class B 3m	Margin	Height [cm]	Polarity
39.1107	36.1	PK	-27.4	14.6	23.3	40	-16.7	400	Horz
54.4245	45.18	PK	-27.3	7.2	25.08	40	-14.92	400	Horz
128.8609	35.5	PK	-26.7	13.7	22.5	43.5	-21	200	Horz
143.0116	36.79	PK	-26.6	12.6	22.79	43.5	-20.71	100	Horz
214.5404	37.91	PK	-26.2	10.5	22.21	43.5	-21.29	100	Horz
Vertical 30 - 1000MHz									
Test Frequency	Meter Reading	Detector	25MHz-1GHz ChmbrA Amplified.TX (dB)	T243 Sunol Bilog.TXT (dB)	dBuV/m	CFR 47 Part 15 Class B 3m	Margin	Height [cm]	Polarity
38.5292	48.74	PK	-27.4	15	36.34	40	-3.66	100	Vert
54.4245	41.94	PK	-27.3	7.2	21.84	40	-18.16	300	Vert
75.9412	41.38	PK	-27.1	8	22.28	40	-17.72	100	Vert
198.8389	34.84	PK	-26.2	12.2	20.84	43.5	-22.66	100	Vert

7. FREQUENCY STABILITY

LIMIT

§15.225 (e) The frequency tolerance of the carrier signal shall be maintained within $\pm 0.01\%$ of the operating frequency, over a temperature variation of -20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

TEST PROCEDURE

ANSI / TIA / EIA 603 Clause 2.3.1 and 2.3.2

RESULTS

No non-compliance noted.

Reference Frequency: EUT Channel 13.5605106 MHz @ 20°C				
Limit: ± 100 ppm = 135.605 kHz				
Power Supply (Vdc)	Environment Temperature (°C)	Frequency Deviation Measured with Time Elapse		
		(MHz)	Delta (ppm)	Limit (ppm)
3.80	50	13.5603713	0.103	± 100
3.80	40	13.5604199	0.067	± 100
3.80	30	13.5604688	0.031	± 100
3.8	20	13.56051055	0.000	± 100
3.80	10	13.5606257	-0.085	± 100
3.80	0	13.5605867	-0.056	± 100
3.80	-10	13.5605249	-0.011	± 100
3.80	-20	13.5604524	0.043	± 100
3.23	20	13.5605137	-0.002	± 100
4.37	20	13.5605129	-0.002	± 100

8. AC MAINS LINE CONDUCTED EMISSIONS

TEST PROCEDURE

ANSI C63.4

LIMIT

§15.207 (a) Except for Class A digital devices, for equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the band edges.

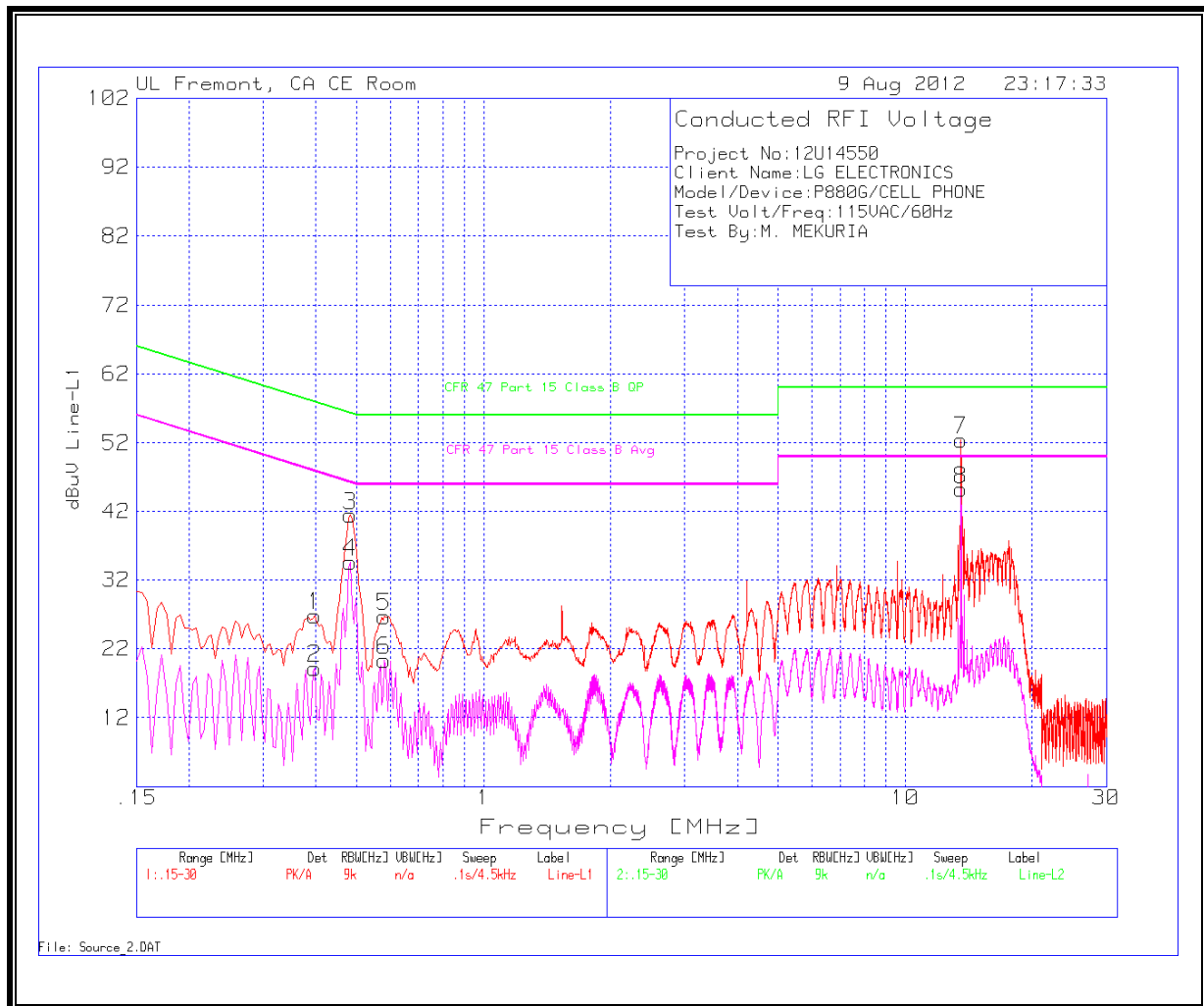
Frequency range (MHz)	Limits (dB μ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Notes: 1. The lower limit shall apply at the transition frequencies 2. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz.		

RESULTS**EUT WITH ANTENNA****6 WORST EMISSIONS**

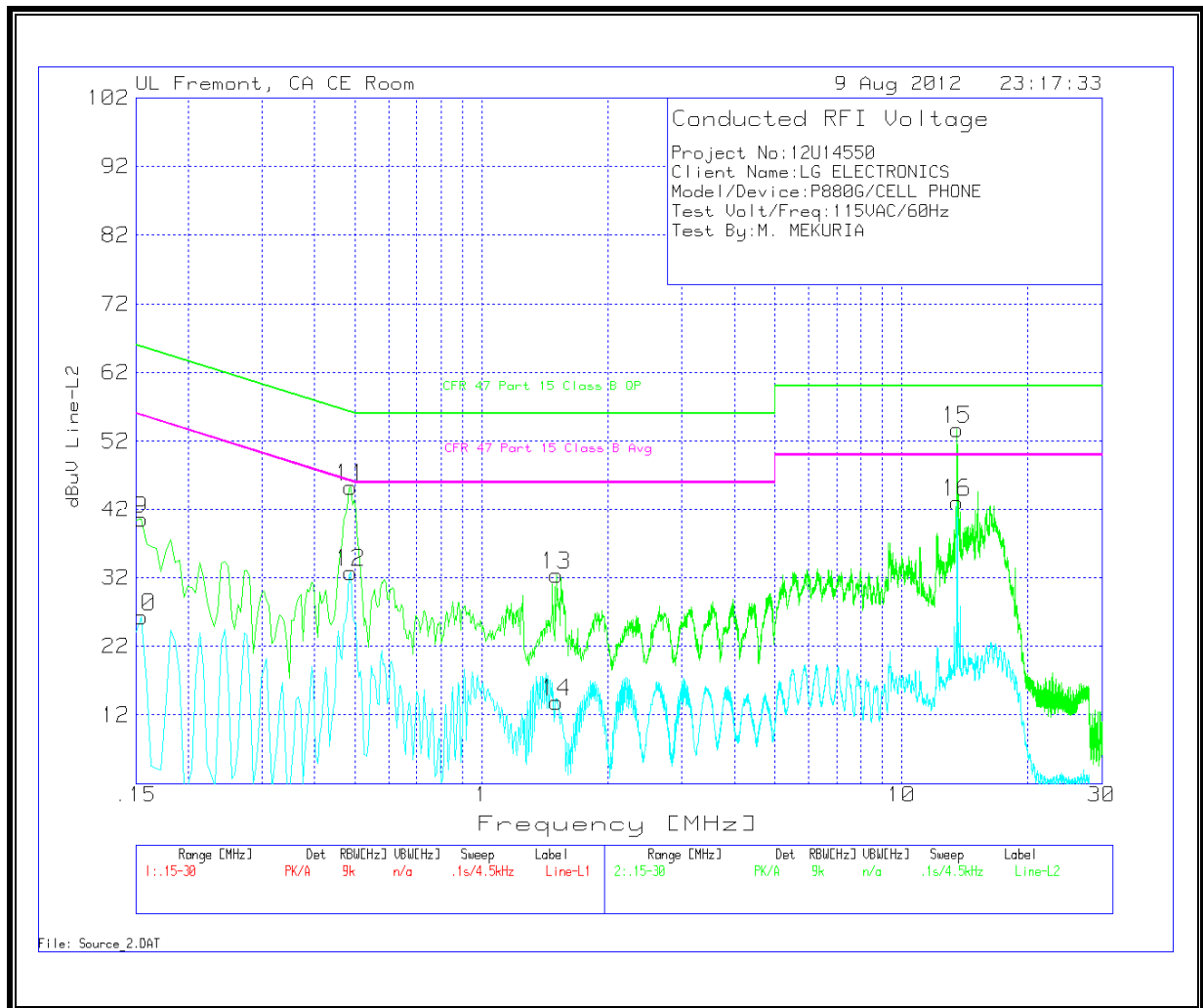
Project No:12U14550									
Client Name:LG ELECTRONICS									
Model/Device:P880G/CELL PHONE									
Test Volt/Freq:115VAC/60Hz									
Test By:M. MEKURIA									
Line-L1 .15 - 30MHz									
Test Frequency	Meter Reading	Detector	T24 IL L1.TXT (dB)	LC Cables 1&3.TXT (dB)	dBuV	CFR 47 Part 15 Class B QP	Margin	CFR 47 Part 15 Class B Avg	Margin
0.3975	26.65	PK	0.1	0	26.75	57.9	-31.15	47.9	-21.15
0.3975	19.02	Av	0.1	0	19.12	57.9	-38.78	47.9	-28.78
0.483	41.31	PK	0.1	0	41.41	56.3	-14.89	46.3	-4.89
0.483	34.48	Av	0.1	0	34.58	56.3	-21.72	46.3	-11.72
0.582	26.59	PK	0.1	0	26.69	56	-29.31	46	-19.31
0.582	20.19	Av	0.1	0	20.29	56	-35.71	46	-25.71
13.56	52.04	PK	0.2	0.2	52.44	60	-7.56	50	2.44
13.56	44.84	Av	0.2	0.2	45.24	60	-14.76	50	-4.76
Line-L2 .15 - 30MHz									
Test Frequency	Meter Reading	Detector	T24 IL L2.TXT (dB)	LC Cables 2&3.TXT (dB)	dBuV	CFR 47 Part 15 Class B QP	Margin	CFR 47 Part 15 Class B Avg	Margin
0.1545	40.47	PK	0.1	0	40.57	65.8	-25.23	55.8	-15.23
0.1545	26.21	Av	0.1	0	26.31	65.8	-39.49	55.8	-29.49
0.4875	45.22	PK	0.1	0	45.32	56.2	-10.88	46.2	-0.88
0.4875	32.7	Av	0.1	0	32.8	56.2	-23.4	46.2	-13.4
1.509	32.16	PK	0.1	0.1	32.36	56	-23.64	46	-13.64
1.509	13.68	Av	0.1	0.1	13.88	56	-42.12	46	-32.12
13.56	53.31	PK	0.2	0.2	53.71	60	-6.29	50	3.71
13.56	42.67	Av	0.2	0.2	43.07	60	-16.93	50	-6.93

Note: 13.56 MHz is the transmission frequency of the EUT. The unit complies with the AC Conducted Emission at 13.56 MHz test when the NFC antenna is terminated with a 50 ohm load.

LINE 1 RESULT



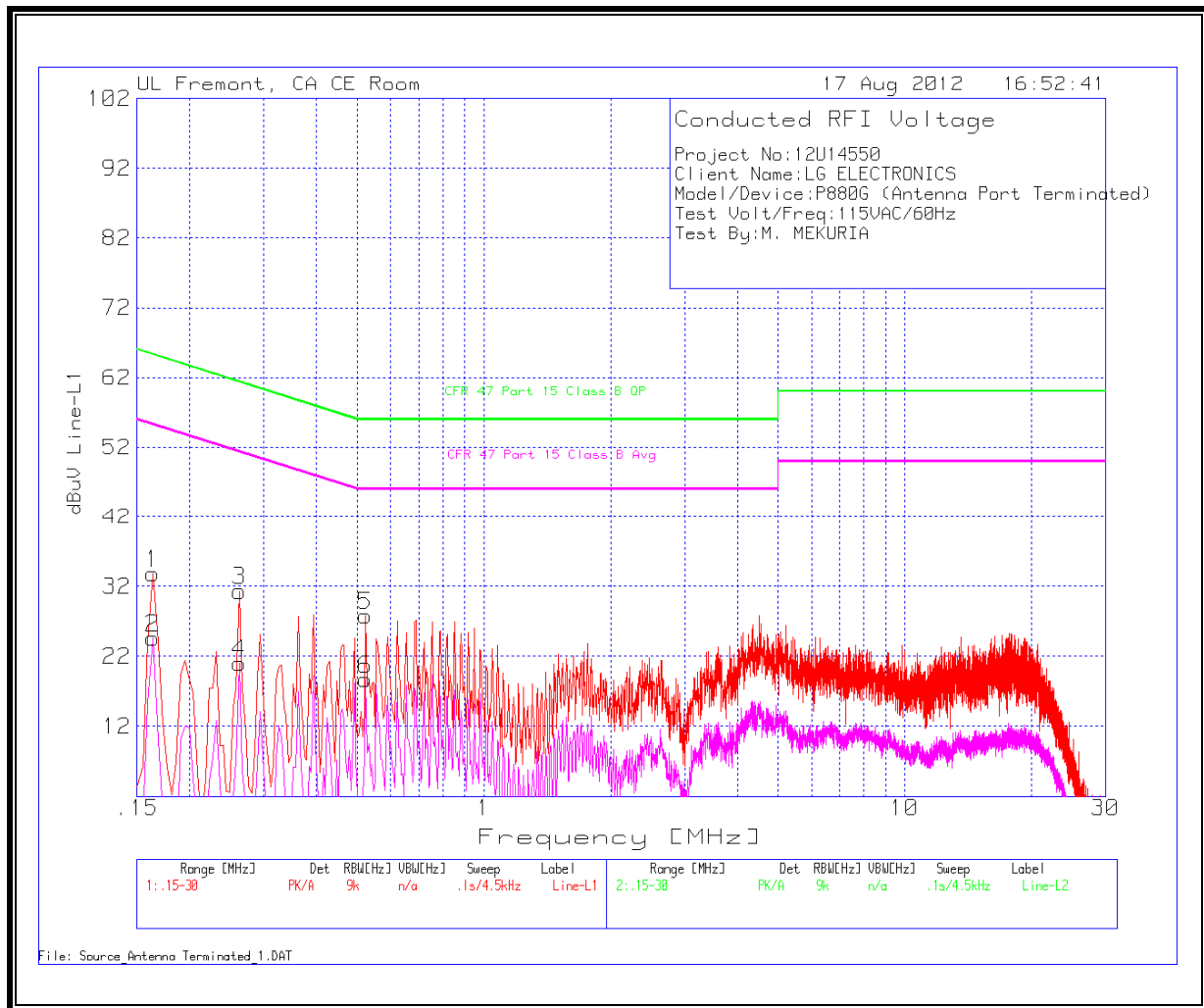
LINE 2 RESULTS



EUT WITH ANTENNA TERMINAL TERMINATED**6 WORST EMISSIONS**

Project No:12U14550									
Client Name:LG ELECTRONICS									
Model/Device:P880G (Antenna Port Terminated)									
Test Volt/Freq:115VAC/60Hz									
Test By:M. MEKURIA									
Line-L1 .15 - 30MHz									
Test Frequency	Meter Reading	Detector	T24 IL L1.TXT (dB)	LC Cables 1&3.TXT (dB)	dBuV	CFR 47 Part 15 Class B QP	Margin	CFR 47 Part 15 Class B Avg	Margin
0.1635	33.76	PK	0.1	0	33.86	65.3	-31.44	55.3	-21.44
0.1635	24.47	Av	0.1	0	24.57	65.3	-40.73	55.3	-30.73
0.2625	31.22	PK	0.1	0	31.32	61.4	-30.08	51.4	-20.08
0.2625	20.91	Av	0.1	0	21.01	61.4	-40.39	51.4	-30.39
0.5235	27.73	PK	0.1	0	27.83	56	-28.17	46	-18.17
0.5235	18.6	Av	0.1	0	18.7	56	-37.3	46	-27.3
Line-L2 .15 - 30MHz									
Test Frequency	Meter Reading	Detector	T24 IL L2.TXT (dB)	LC Cables 2&3.TXT (dB)	dBuV	CFR 47 Part 15 Class B QP	Margin	CFR 47 Part 15 Class B Avg	Margin
0.1995	28.5	PK	0.1	0	28.6	63.6	-35	53.6	-25
0.1995	20.97	Av	0.1	0	21.07	63.6	-42.53	53.6	-32.53
0.366	28.8	PK	0.1	0	28.9	58.6	-29.7	48.6	-19.7
0.366	18.98	Av	0.1	0	19.08	58.6	-39.52	48.6	-29.52
0.5325	27.93	PK	0.1	0	28.03	56	-27.97	46	-17.97
0.5325	19.02	Av	0.1	0	19.12	56	-36.88	46	-26.88

LINE 1 RESULT



LINE 2 RESULTS

