

FCC TEST REPORT

Reference No. : G-45-2013-00042

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

Equipment Under Test (EUT) :

Product Name : GSM & WCDMA Phone with Bluetooth and WLAN

Model Name : LG-E455f

Applied Standards : FCC Part 15 : 2010, Subpart B, Class B

ANSI C63.4 : 2003

CISPR 22 : 2006

Date of Receipt : January 03, 2013

Date of Test : February 05, 2013 ~ February 06, 2013

Date of Issue : February 06, 2013

Test Results : Complied

Tested by :



Jerry Jeong

Reviewed by :



Forest Lee

Remarks :

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1. General Information

1.1 Client Information

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

1.2 Test Laboratory

Name and Address : SGS Korea Co., Ltd.
18-34, Sanbon-dong, Gunpo, Gyeonggi-do, Korea
435-040
FCC Registration No. : 367021
IC Company No. : 4620F
Phone : + 82 31 428 5700
Fax : + 82 31 427 2370
e-mail : forest.lee@sgs.com

1.3 General Information of E.U.T.

Product Name	GSM & WCDMA Phone with Bluetooth and WLAN
Model Name	LG-E455f
Serial No.	204KPHG100265
FCC ID	ZNFE455F
EMI Classification	Class B
Hardware Version	Rev.1.0
Software Version	V05e
Highest Internal Frequency	Max. 1 GHz
Test Voltage	120 Va.c., 60 Hz (from Notebook Computer)
Battery	3.8 Vd.c., 1700 mAh, 6.5 Wh

1.4 Operating Modes and Conditions

Operating mode	Operating condition
USB Mode	USB Data Communication

Note : The EUT was exercised through batch file during testing.

1.5 Auxiliary Equipments

Description	Model	Serial No.	Manufacturer	FCC ID
USB Mouse	Basic Optical Mouse 1.0A USB/PS2 Compatible	-	MICROSOFT CORPORATION	DOC
Micro SD Card	Mobile Ultra 16GB	-	SanDisk	DOC
Notebook Computer	7665-AH6	L3-E5323	LENOVO	DOC
Wireless Router	WG602	1PA11C500 0896	NETGEAR	PY3WG602 V4

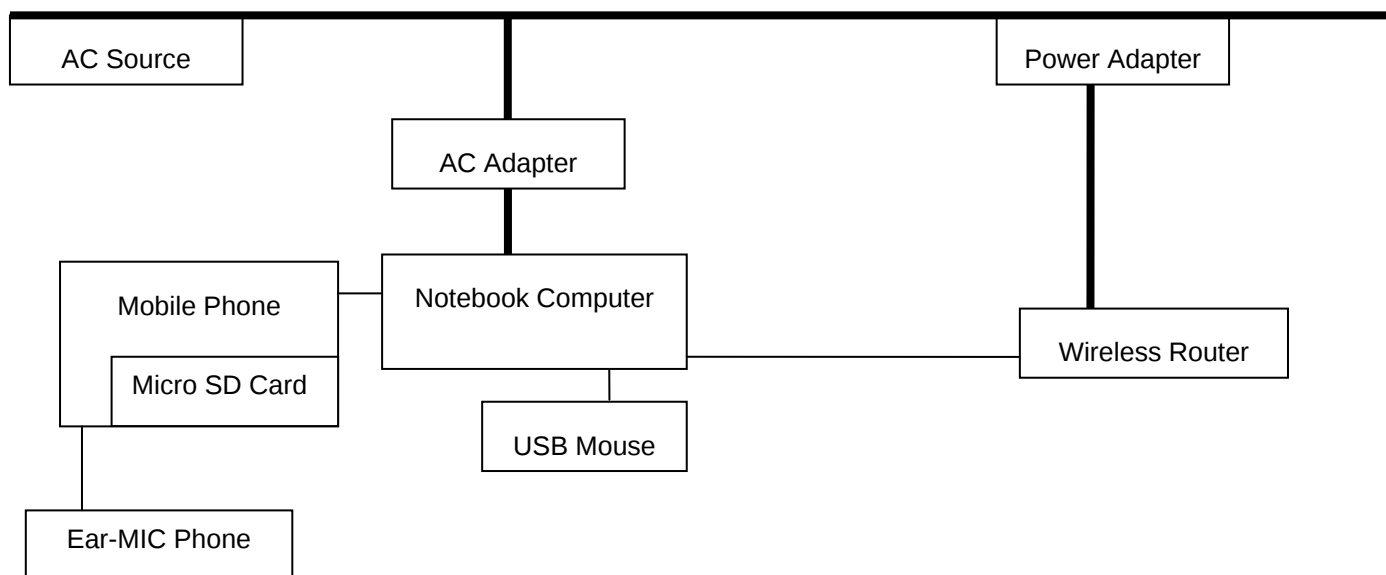
1.6 Cable List

Start		END		Cable Spec.	
Name	I/O Port	Name	I/O Port	Length	Shield
Mobile Phone	USB	Notebook Computer	USB	0.8	Shield
	IO	Ear-MIC Phone	-	1.1	Unshield
	MicroSD Card Slot	Micro SD Card	-	-	-
Notebook Computer	USB	Mobile Phone	USB	0.8	Shield
	USB	USB Mouse	-	1.8	Shield
	DC IN	AC Adapter	DC OUT	1.5	Unshield
	LAN Port	Wireless Router	LAN	1.2	Unshield
AC Adapter	DC OUT	Notebook Computer	DC IN	1.5	Unshield
	AC IN	AC Source	-	1.5	Unshield
Wireless Router	DC IN	Power Adapter	-	1.5	Unshield
Power Adapter	AC IN	AC Source	-	-	-

1.7 System Configurations

Description	Model	Serial No.	Manufacturer
Ear-MIC Phone	EAB62209201	-	-
USB Cable	-	-	-
Battery	BL-44JH	-	LG

1.8 Test System Layout



1.9 Modifications

There was no modified item during the test.

1.10 Applicable Standards for Testing

Standards	Status	Deviation
FCC Part 15 : 2010, Subpart B	Applicable	No Deviation

1.11 Summary of Test Results

Test Item	Basic Standards	Results
Conducted Emission	ANSI C63.4 : 2003	Complied
Radiated Emission	ANSI C63.4 : 2003	Complied

Note : Test methods of all test items are performed according to the basic standards in this table.

EMISSION

2.1 Test Results

Test Items	Basic Standards	Test Results
Conducted Emission	ANSI C63.4 : 2003	Complied
Radiated Emission	ANSI C63.4 : 2003	Complied

2.2 Test Method and Limits

2.2.1 Test Method

Test Items	Measuring Frequency Range	RBW	Measuring Distance
Conducted Emission	0.15 MHz ~ 30 MHz	9 kHz	N/A
Radiated Emission	30 MHz ~ 1 GHz	120 kHz	10 m & 3 m
	Above 1 GHz	1 MHz	3 m

Note : 10 m method of radiated emission measurement is only applied to Class A equipment over the frequency range of 30 MHz ~ 1 GHz. Except this, 3 m method is applied to Class B equipment over the frequency range of 30 MHz ~ 1 GHz and Class A and Class B equipment above 1 GHz.

2.2.2 Test Limits

-Conducted Emission Limits

Frequency Range	Limits(dB(μ V))		Class
	Quasi-peak	Average	
0.15 MHz ~ 0.5 MHz	79	66	Class A
0.5 MHz ~ 30 MHz	73	60	
0.15 MHz ~ 0.5 MHz	66 to 56	56 to 46	Class B
0.5 MHz ~ 5 MHz	56	46	
5 MHz ~ 30 MHz	60	50	

Note : The lower limit shall apply at the transition frequencies. The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

-Radiated Emission Limits below 1 GHz

Frequency Range	Limits(dB(μ V/m))	Class
	Quasi-peak	
30 MHz ~ 88 MHz	39.1	Class A (10 m method)
88 MHz ~ 216 MHz	43.5	
216 MHz ~ 960 MHz	46.4	
960 MHz ~ 1 GHz	49.5	
30 MHz ~ 88 MHz	40	Class B (3 m method)
88 MHz ~ 216 MHz	43.5	
216 MHz ~ 960 MHz	46	

-Radiated Emission Limits above 1 GHz (3m method)

Frequency Range	Limits(dB(μ V/m))		Class
	Average	Peak	
Above 1 GHz	59.5	79.5	Class A
Above 1 GHz	54	74	Class B

Note : The limits of class A equipment is extrapolated using an extrapolation factor of 20 dB/decade because it was measured at 3m distance not 10m distance.

2.3 Conducted Emission

The initial preliminary exploratory scans were performed over the measuring frequency range(0.15 MHz to 30 MHz) using a max hold mode incorporating a Peak detector and Average detector and using the software of ES-K1(Version V1.71 from R&S). The final test data was measured using a Quasi-Peak detector and Average detector.

2.3.1 Test Equipments

Description	Model No.	Manufacturer	S/N	Last Cal. Date
Two-Line V-Network	ENV216	R & S	100190	2013.01.04
Artificial Mains Networks	ESH2-Z5	R & S	100280	2012.04.06
Test Receiver	ESHS10	R & S	863365/018	2012.05.31

Note 1 : The calibration period of every equipment is 1 year.

Note 2 : ENV216 is used for the EUT(the AC Adapter of the Notebook Computer) and ESH2-Z5 is used for auxiliary equipments.

2.3.2 Test Site

Shield Room in Gunpo Laboratory

2.3.3 Environment Conditions

Temperature : 22.6 ~ 22.8
Humidity : 32.0 %R.H. ~ 33.0 %R.H.
Atmospheric Pressure : 102.8 kPa

Test Date : February 05, 2013

Freq.	Line	Level (dB μ V)		CL	LISN	Result (dB μ V)		Limit (dB μ V)		Margin (dB)	
(MHz)	(H/N)	Q/P	A/V	(dB)	(dB)	Q/P	A/V	Q/P	A/V	Q/P	A/V
0.15	H	44.90	28.50	0.01	9.57	54.48	38.08	66.00	56.00	11.52	17.92
0.40	H	28.90	24.10	0.02	9.57	38.49	33.69	57.75	47.75	19.26	14.06
0.72	N	30.20	24.00	0.04	9.65	39.89	33.69	56.00	46.00	16.11	12.31
3.99	N	28.40	25.20	0.07	9.66	38.13	34.93	56.00	46.00	17.87	11.07
16.13	N	34.30	28.30	0.18	9.78	44.26	38.26	60.00	50.00	15.74	11.74
16.21	H	33.80	28.10	0.18	9.70	43.68	37.98	60.00	50.00	16.32	12.02

Measurement Uncertainty : ± 4.12 dB (The confidential level is about 95%, K=2)

Note : • Line (H) : Hot • Line (N) : Neutral
• CL: Cable Loss • LISN : LISN Factor
• Result = Level + CL + LISN • Margin = Limit – Result

See Appendix A (Conducted Emission)

2.4 Radiated Emission

The initial preliminary exploratory scans were performed at 3 m distance over the measuring frequency range(30 MHz to 6 GHz) using a max hold mode incorporating a Peak detector and using the software of EP5RE(Version Ver3.10.20 from TOYO). The final test data was measured using a Quasi-Peak detector below 1 GHz at 3 m distance and a Peak and Average detector above 1 GHz at 3 m distance. Measurements were made with the antenna positioned in both the horizontal and vertical planes of polarization. The antenna height was varied from 1 m to 4 m and the EUT was rotated 360° to find the maximum emitting point for each frequency.

2.4.1 Test Equipments

Description	Model No.	Manufacturer	S/N	Last Cal. Date
Horn Antenna	HF906	R & S	100326	2011.11.23
Signal Conditioning Unit	SCU 18	R & S	10117	2013.01.14
Bilog Antenna	VULB9163	SCHWARZBEC K MESS- ELEKTRONIK	396	2012.06.04
Test Receiver	ESU26	R & S	100109	2012.05.31
Amplifier	8447F	HP	2944A03909	2012.07.03

Note : Only the calibration period of Antennas is 2 years but the period of every equipment is 1 year.

2.4.2 Test Site

3 m Semi-Anechoic Chamber in Gunpo Laboratory

2.4.3 Environment Conditions

Below 1 GHz (3 m method)

Temperature : 22.3 ~ 22.4

Humidity : 27.0 %R.H. ~ 28.0 %R.H.

Atmospheric Pressure : 101.8 kPa

Test Date : February 06, 2013

Freq. (MHz)	Level (dB μ V)	Pol. (H/V)	A (°)	H (m)	AF (dB)	CL (dB)	Amp. (dB)	F/S (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
60.22	46.6	V	254.0	1.00	13.74	1.04	27.58	33.80	40.00	6.20
77.20	50.4	V	95.0	3.00	8.73	1.31	27.55	32.89	40.00	7.11
94.36	53.1	V	260.0	1.20	12.36	1.33	27.51	39.28	43.50	4.22
146.40	43.0	V	182.0	2.10	8.80	1.76	27.41	26.15	43.50	17.35
155.64	55.1	V	240.0	1.15	9.14	1.78	27.37	38.65	43.50	4.85
720.00	32.9	H	10.0	3.00	21.02	3.64	28.34	29.22	46.00	16.78

Measurement Uncertainty (Horizontal) : ± 5.44 dB (The confidential level is about 95%, K=2)

Measurement Uncertainty (Vertical) : ± 5.81 dB (The confidential level is about 95%, K=2)

Note: • AF = Antenna Factor

• Pol.(H) = Horizontal

• Margin = Limit – F/S

• A : Angle

• CL = Cable Loss

• Pol.(V) = Vertical

• F/S = Level + AF + CL – Amp.

• H : Height

• F/S = Field Strength

• Amp. = Amplifier Gain

Above 1 GHz (3 m method)

Temperature : 22.4

Humidity : 27.0 %R.H.

Atmospheric Pressure : 101.8 kPa

Test Date : February 06, 2013

Freq. (MHz)	Level (dB μ V)	Pol. (H/V)	A (°)	H (m)	AF (dB)	CL (dB)	Amp. (dB)	F/S (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)
Peak Detector										
1998.82	51.30	V	10.0	1.00	27.94	6.60	43.40	42.45	74.00	31.55
1665.20	46.60	V	51.0	2.00	25.51	5.96	42.77	35.31	74.00	38.69
Average Detector										
1998.82	27.00	V	10.0	1.00	27.94	6.60	43.40	18.15	54.00	35.85
1665.20	25.00	V	51.0	2.00	25.51	5.96	42.77	13.71	54.00	40.29

Measurement Uncertainty (Horizontal) : ± 4.80 dB (The confidential level is about 95%, K=2)

Measurement Uncertainty (Vertical) : ± 4.82 dB (The confidential level is about 95%, K=2)

Note: • AF = Antenna Factor

• CL = Cable Loss

• F/S = Field Strength

• Pol.(H) = Horizontal

• Pol.(V) = Vertical

• Amp. = Amplifier Gain

• Margin = Limit – F/S

• F/S = Level + AF + CL – Amp.

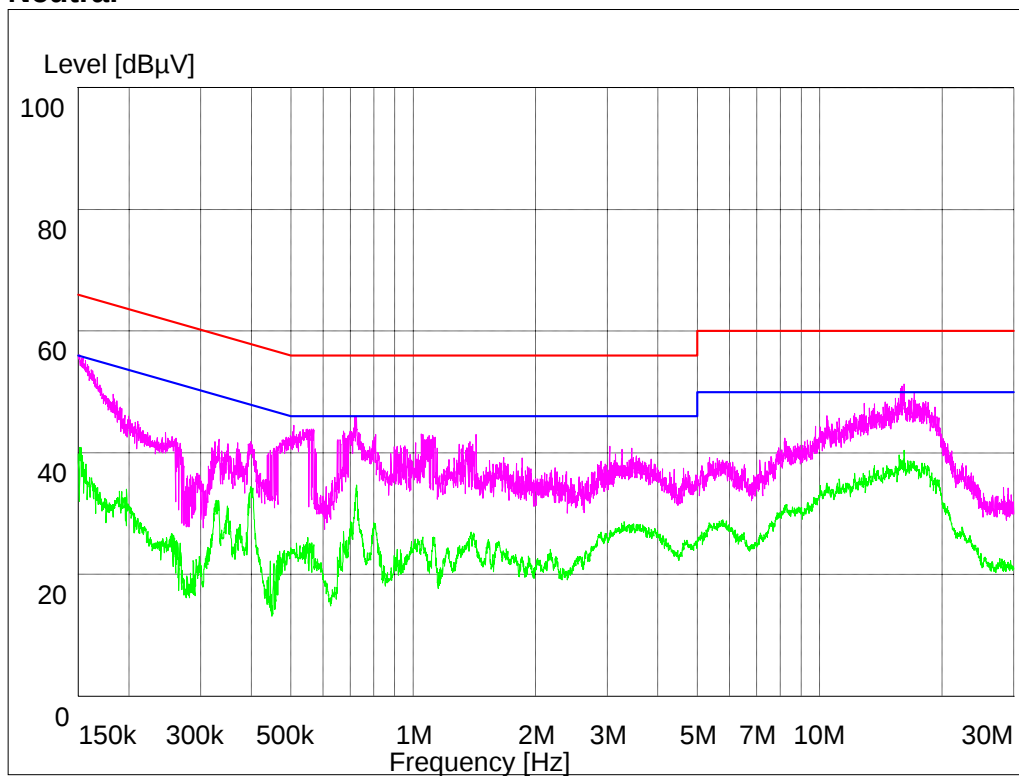
• A : Angle

• H : Height

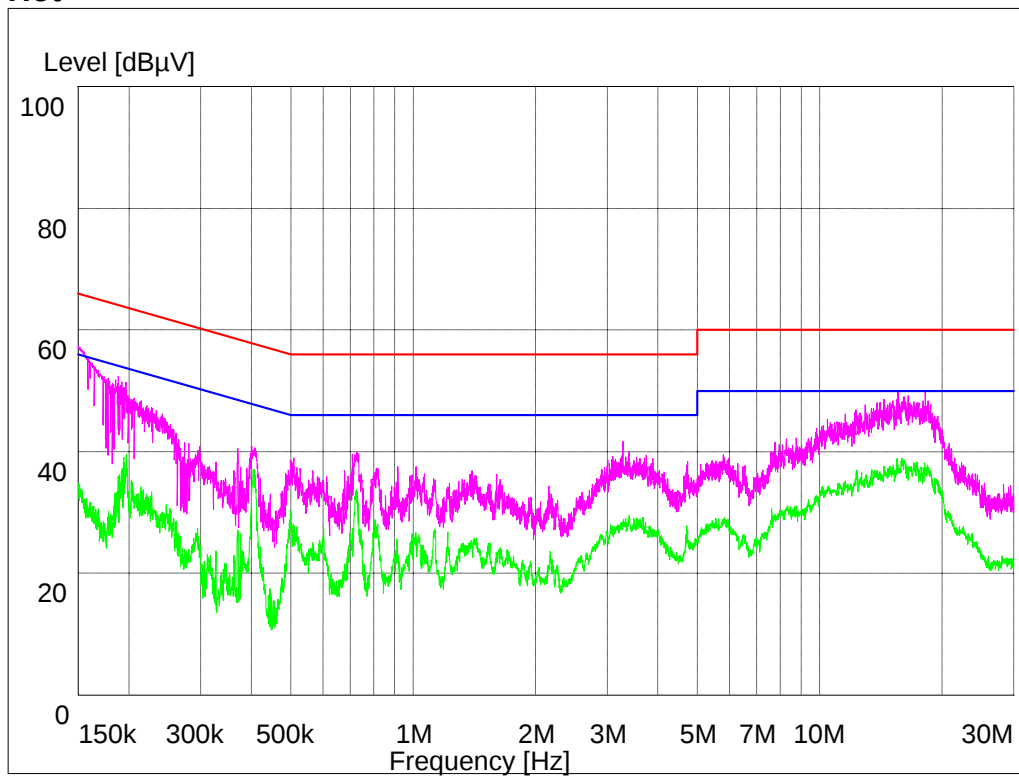
See Appendix B (Radiated Emission)

Appendix A : Conducted Emission

Neutral

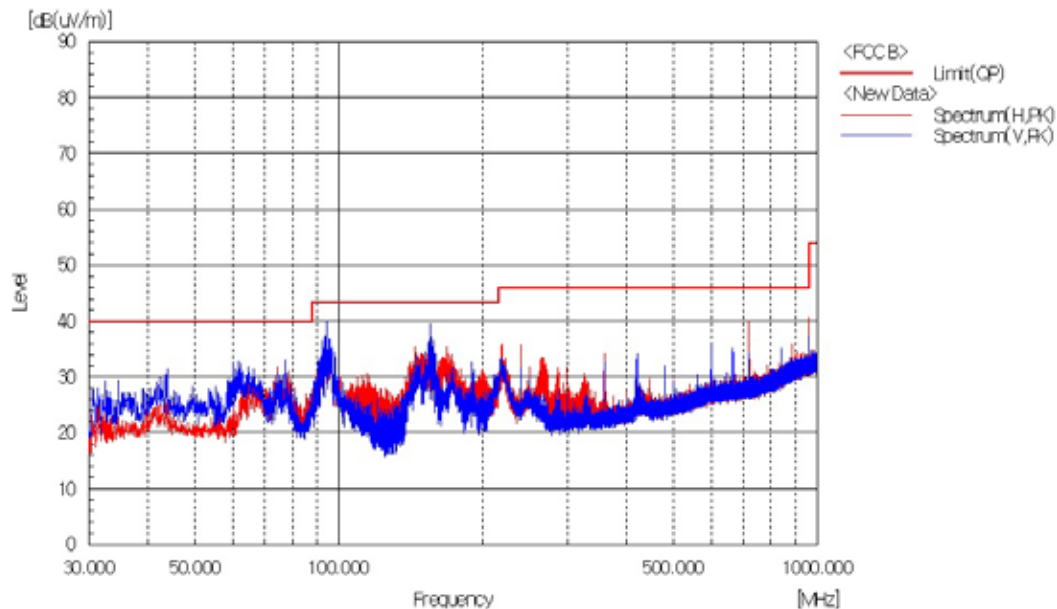


Hot



Appendix B : Radiated Emission

Below 1 GHz



Above 1 GHz

