HCT CO., LTD.
Product Compliance Division
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CERTIFICATE OF COMPLIANCE

FCC PART 15.247 Certification

Applicant Name:

LG Electronics Inc.

60-39, Gasan-dong, Gumchon-gu, Seoul 153-023, Korea

Date of Issue:
July 10, 2009

Test Site/Location:
HCT.CO., LTD., San 136-1 Ami-ri, Bubal-eup, Icheon-si, Kyungki-do, Korea

Test Report No.: HCT-RF09-0714

HCT FRN: 0005866421

IC Recognition No.: 5944A-1

FCC ID:	**BEJBL40**
APPLICANT:	**LG Electronics Inc.**

FCC Rule Part(s):	Part 15 Subpart C (15.239)
Application Type:	Certification
EUT Type:	Cellular/ PCS GSM/ EDGE Phone with WLAN, Bluetooth & FM Transmitter
Model(s):	BL40
Frequency Range	88.1 ~ 107.9 MHz
FCC Rule Part(s)	FCC Part 15 Low Power Communication Device TX (DXX)

Engineering Statement:

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

HCT CO., LTD. Certifies that no party to this application has been denied FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998,21 U.S. C.862

Hyo Sun Kwak

Report prepared by
: Hyo Sun Kwak
Test engineer of RF Team

Sang Jun Lee

Approved by
: Sang Jun Lee
Manager of RF Team

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1. GENERAL INFORMATION

Applicant:	LG Electronics Inc.
Address:	60-39, Gasan-dong, Gumchon-gu, Seoul 153-023, Korea
FCC ID:	BEJBL40
Application Type:	Certification
EUT:	Cellular/ PCS GSM/ EDGE Phone with WLAN, Bluetooth & FM Transmitter
Model:	BL40
Date of Test:	June 15, 2009 ~ June 18, 2009
Contact person:	Name: Bong Hyo, Han Phone #: +82-2-2033-1108 Fax #: +82-2-2033-1222

2. EUT DESCRIPTION

Product	Cellular/ PCS GSM/ EDGE Phone with WLAN, Bluetooth & FM Transmitter
Model Name	BL40
Power Supply	DC 3.7 V
Frequency Range	88.1 ~ 107.9 MHz
FCC CLASSIFICATION	FCC Part 15 Low Power Communication Device TX (DXX)
Antenna Specification	Antenna type: mono pole type

3. TEST METHODOLOGY

The measurement procedure described in the American National Standard for Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz(ANSI C63.4-2003)

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.205, 15.207, 15.209 and 15.239 under the FCC Rules Part 15 Subpart C.

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 13.1.4.1 of ANSI C63.4. (Version :2003) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 13.1.4.1 of ANSI C63.4. (Version: 2003)

3.4 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Channel low, mid and high with highest data rate (worst case) is chosen for full testing.

4. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipments, which is traceable to recognized national standards.

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

The open area test site and conducted measurement facility used to collect the radiated data are located at the 254-1,Maekok-Ri, Hobup-Myun, Ichon-Si, Kyoungki-Do, 467-701, KOREA. The site is constructed in conformance with the requirements of ANSI C63.4. (Version :2003) and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated June 10, 2009(Registration Number: 90661)

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements. Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.
All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

6. ANTENNA REQUIREMENTS

According to FCC 47 CFR §15.203:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

* The antennas of this E.U.T are permanently attached.

*The E.U.T Complies with the requirement of §15.203

7. TEST RESULT

Summary

The intentional radiator has been bench tested to demonstrate compliance with the relevant FCC performance and procedural standards. The volume was set to maximum with the cell phone software playing the MP3 file and the FM transmitter was transmitting at full power on the selected frequency. The frequencies tested are high (107.9MHz), middle(98.3MHz) and low (88.1MHz) of the allocated band. Final system data was gathered in a mode that tended to maximize emissions by varying the orientation of the EUT, orientation of antenna and I/O cabing, antenna seach height, and antenna polarization. The unit was tested at the lowest, highest and mid frequency of operation in three orthogonal positions with the worst case reported.

Method/System: **FM Transmitter**

Number of Channels : **199**

Summary of Test Results

FCC Part Section(s)	RSS Section	Test Description	Test Limit	Test Condition	Test Result
TRANSMITTER MODE (TX)					
15.239(a)	RSS-210 [A.2.8]	20dB Bandwidth	< 200 kHz	Radiated	PASS
15.239(b)	RSS-210 [A.2.8]	Field Strength	< 250 uV/m @ 3 meters		PASS
15.239(a)	RSS-210 [A.2.8]	Number of Channels	200 Channels		PASS
15.205 15.209	RSS-210 [A.2.8]	General Field Strength Limits(Restricted Bands and Radiated Emission Limits)	<FCC 15.209 limits or <RSS-210 table 3limits Emissions in restricted bands must meet the radiated limits detailed in 15.209		PASS
15.207	RSS-GEN [7.2.2]	AC Conducted Emissions 150kHz ~ 30MHz	<FCC 15.207 limits or <RSS-Gen table 2 limits	Line Conducted	PASS

7.1 20dB Bandwidth Measurement

Test Requirements and limit, §15.239(a)

The bandwidth at 20dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the receive antenna while the EUT is operating in transmission mode at the appropriate frequencies. For maximum power and bandwidth the volume was set to maximum with the cell phone software playing the MP3 file.

The maximum permissible 20dB bandwidth is 200 kHz.

▣ TEST PROCEDURE

The spectrum analyzer is set to :

1. Span = 200 kHz
2. RBW = 30 kHz
3. VBW = 100 kHz

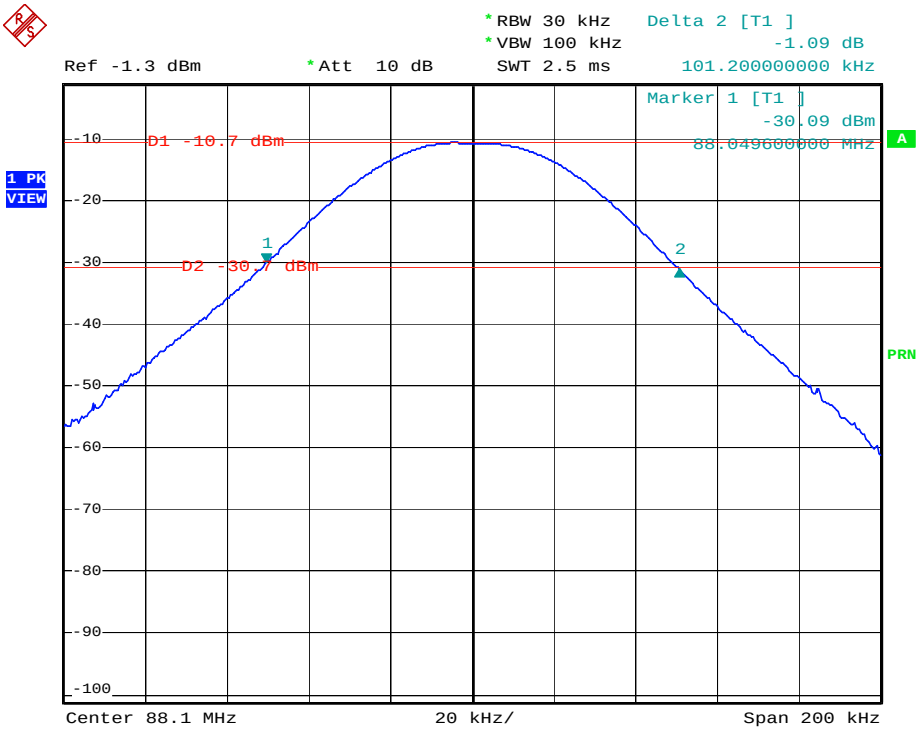
▣ TEST RESULTS

20dB Bandwidth Measurements

FREQUENCY (kHz)	20dB BW (kHz)	Limit (kHz)	Results
88.1	101.2	200	Pass
98.3	100.8	200	Pass
107.5	102.0	200	Pass

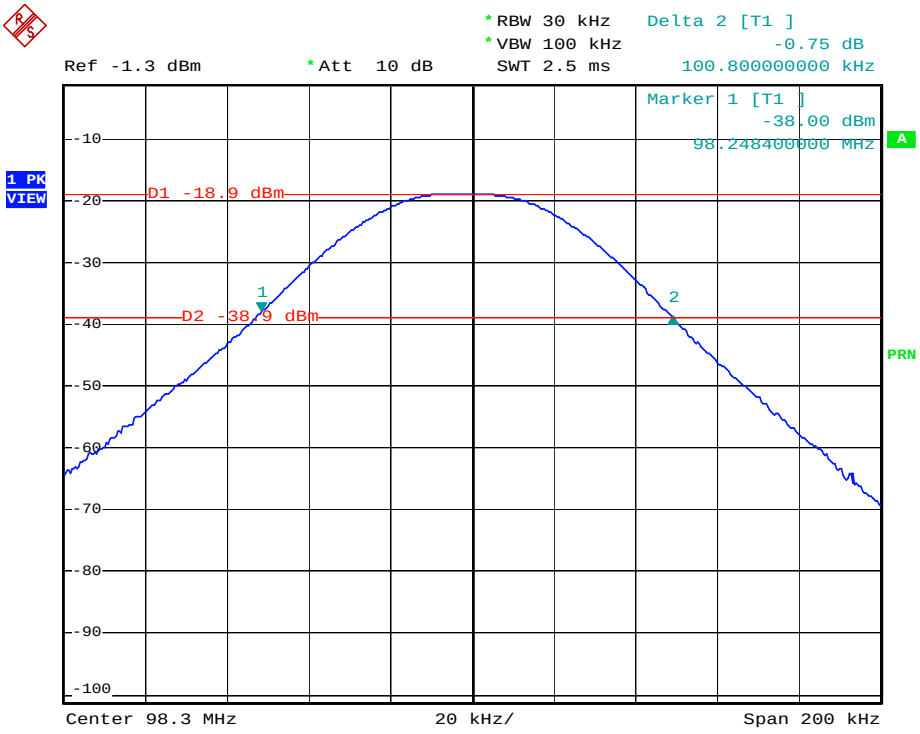
▣ RESULT PLOTS

20dB Bandwidth plot (Low Channel : 88.1MHz)



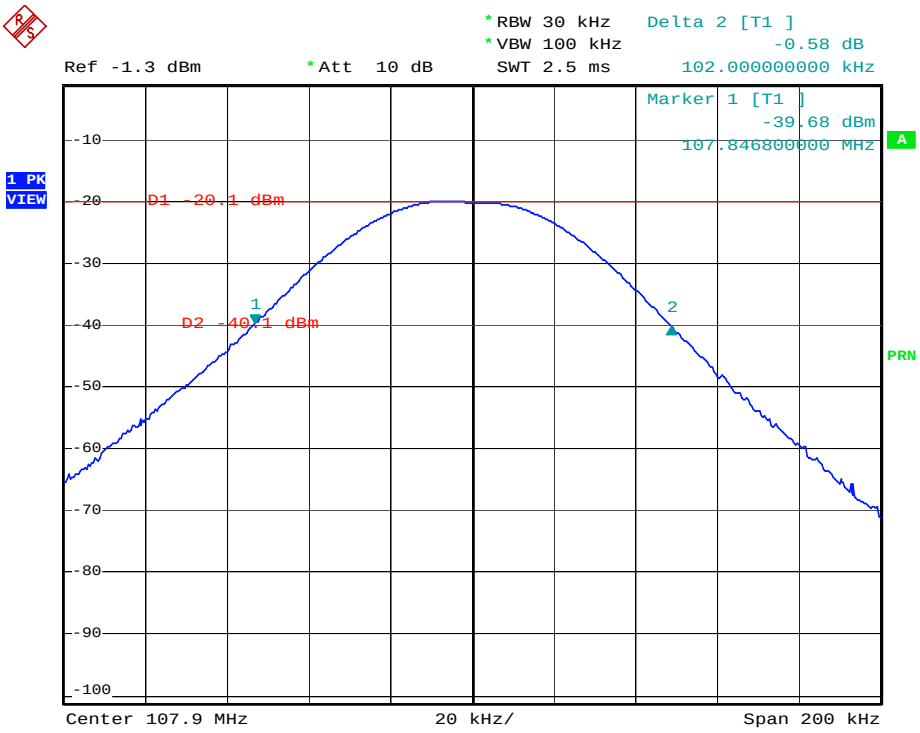
Date: 18.JUN.2009 11:54:06

20dB Bandwidth plot (Mid Channel : 98.3MHz)



Date: 18.JUN.2009 11:58:49

20dB Bandwidth plot (High Channel : 107.9MHz)



Date: 18.JUN.2009 13:25:58

7.2 Field Strength Measurements

Test Requirements and limit, §15.239

Note :

The unit was tested with the lowest, highest and mid channels. Three orthogonal positions were tested with the worst case levels reported.

▣ **TEST RESULTS**

Field Strength Measurements at 3 meters

Frequency [MHz]	Reading dBuV	Ant. Factor dB/m	Cable Loss dB	Pol [H/V]	Height [m]	Azimuth [degrees]	Field Strength [dBuV/m]	Limit dBuV/m	Margin [dB]
88.10	29.4	8.3	2.2	H	1.9	80.8	39.90	47.96	8.06
88.10	32.3	8.3	2.2	V	1.8	319.3	42.84	47.96	5.12
98.30	35.1	8.9	2.4	H	1.4	265.0	46.36	47.96	1.60
98.30	34.8	8.9	2.4	V	1.0	315.8	46.11	47.96	1.85
107.9	25.2	9.7	2.5	H	1.2	118.5	37.35	47.96	10.61
107.9	28.2	9.7	2.5	V	1.0	267.1	40.37	47.96	7.59

NOTES :

1. **The antenna is manipulated through typical positions, polarity and length during the testing.**
2. **The EUT is supplied with the nominal DC voltage or / and new / fully re-charged battery.**
3. **Levels recorded in the above table are average measurements.**

7.2.1 FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor.

The basic equation with a sample calculation is as follows:

FS = RA + AF + CF

where FS = Field Strength

RA = Receiver Amplitude

AF = Antenna Factor

CF = Cable Attenuation Factor

Assume a receiver reading of 25.44 dBuV is obtained. The Antenna Factor of 8.1 dB/m and a Cable Factor of 2.2 dB is added. The 35.74 dBuV/m value is mathematically converted to its corresponding level in uV/m.

FS = 26.4 + 8.1 + 2.2 = 36.7 dBuV/m

7.3 Number of Channels (Tuning Range)

Test Requirements and limit, §15.239

Measurement is made while EUT is operating in transmitting mode.

Frequency / Channel Operations

Ch.	Frequency(MHz)
00	88.1
01	88.2
…	…
102	98.2
103	98.3
104	98.4
…	…
198	107.8
199	107.9

7.4 Radiated Spurious Emissions

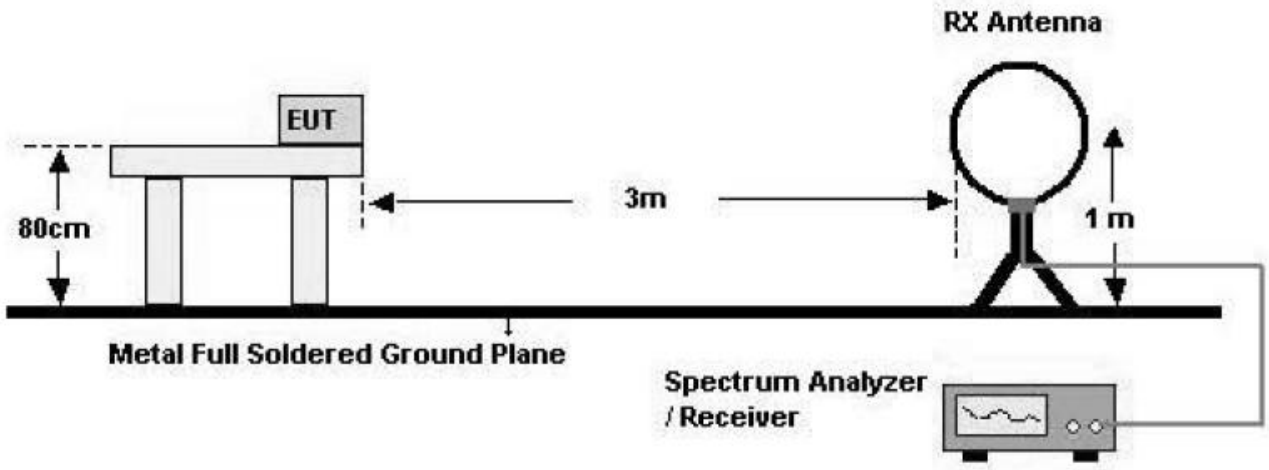
LIMIT

1. 20dBc in any 100 kHz bandwidth outside the operating frequency band. In case the emission fall within the restricted band specified on 15.205(a), then the 15.209(a) limit in the table below has to be followed

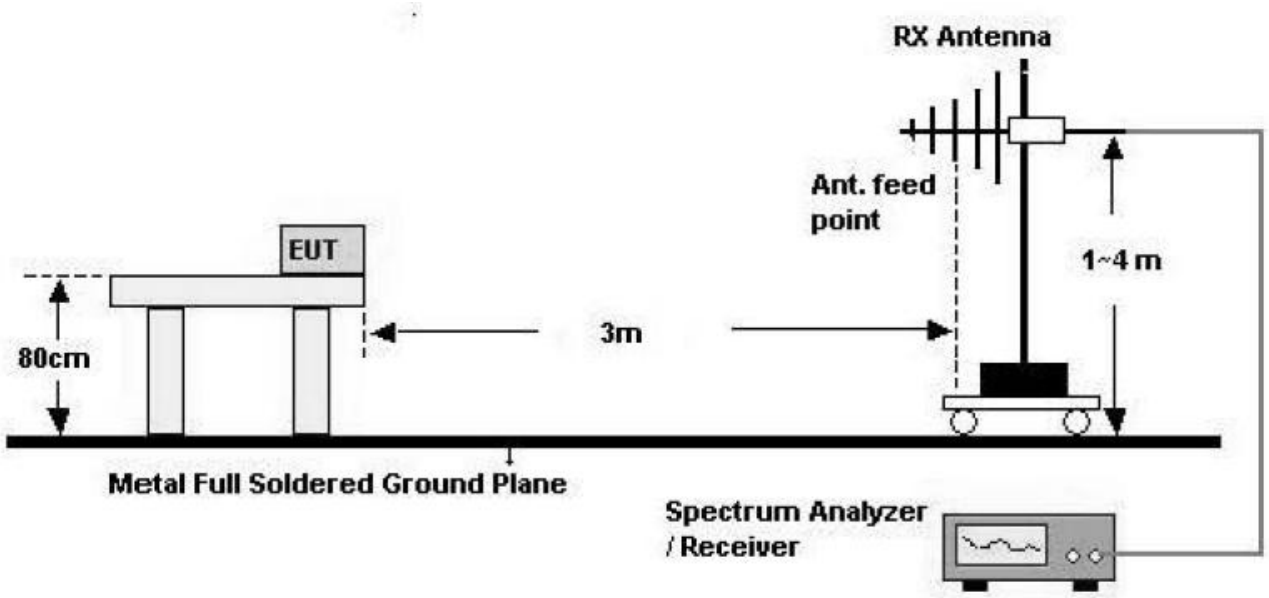
Frequency (MHz)	Field Strength (uV/m)	Measurement Distance (m)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30	30 (29.5 dBuV/m)	30
30-88	100 (40 dBuV/m)	3
88-216	150 (43.5 dBuV/m)	3
216-960	200 (46 dBuV/m)	3
Above 960	500 (54 dBuV/m)	3

Test Configuration

Below 30 MHz



30 MHz - 1 GHz



TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8 m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3 m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.

7.4.1 Radiated Spurious Measurements

Test Requirements and limit, §15.239

Mode : TX

Measurement Distance : 3 Meters

Operating Frequency : 107.9 MHz

Radiated Spurious Measurements at 3 – meters

Frequency [MHz]	Reading dBuv	Ant. Factor dB/m	Cable Loss dB	ANT Pol [H/V]	Height [m]	Azimuth [degrees]	Field Strength [dBuV/m]	Limit dBuV/m	Margin [dB]
215.80	7.1	10.4	1.6	H	**1.2**	**157.0**	**19.07**	43.5	24.4
323.69	7.6	13.5	1.9	H	**1.4**	**214.8**	**23.02**	46.0	23.0
215.80	7.4	10.4	1.6	V	**1.3**	**265.1**	**19.41**	43.5	24.1
323.69	6.5	13.5	1.9	V	**1.6**	**316.1**	**21.87**	46.0	24.1

NOTES :

1.The antenna is manipulated through typical positions, polarity and length during the testing

2. The EUT is supplied with the nominal DC voltage or/and a new/fully re-charged battery.

3. The spectrum is measured from 9kHz up to the 10th harmonic and the worst-case emissions are reported.

4. There is detected level above reference noise floor spectrum analyzer. Except above frequency

Radiated Spurious Measurements(cont.)

Test Requirements and limit, §15.239

Mode : TX

Measurement Distance : 3 Meters

Operating Frequency : 98.3 MHz

Radiated Spurious Measurements at 3 – meters

Frequency [MHz]	Reading dBuV	Ant. Factor dB/m	Cable Loss dB	Pol [H/V]	Height [m]	Azimuth [degrees]	Field Strength [dBuV/m]	Limit dBuV/m	Margin [dB]
196.60	7.3	10.2	1.5	**H**	**1.6**	**261.2**	**19.04**	43.5	24.5
294.90	7.1	12.9	1.9	**H**	**1.4**	**35.4**	**21.85**	46.0	24.2
196.60	7.5	10.2	1.5	**V**	**1.2**	**294.8**	**19.23**	43.5	24.3
294.90	6.5	12.9	1.9	**V**	**1.1**	**214.3**	**21.25**	46.0	24.8

NOTES :

1.The antenna is manipulated through typical positions, polarity and length during the testing

2. The EUT is supplied with the nominal DC voltage or/and a new/fully re-charged battery.

3. The spectrum is measured from 9kHz up to the 10th harmonic and the worst-case emissions are reported.

4. There is detected level above reference noise floor spectrum analyzer. Except above frequency

Radiated Spurious Measurements(cont.)

Test Requirements and limit, §15.239

Mode : TX

Measurement Distance : 3 Meters

Operating Frequency : 88.1 MHz

Radiated Spurious Measurements at 3 – meters

Frequency [MHz]	Reading dBuV	Ant. Factor dB/m	Cable Loss dB	Pol [H/V]	Height [m]	Azimuth [degrees]	Field Strength [dBuV/m]	Limit dBuV/m	Margin [dB]
176.2	5.3	11.8	1.4	H	**1.0**	**145.0**	**18.46**	43.5	25.0
264.3	6.5	11.9	1.8	H	**1.2**	**215.0**	**20.24**	46.0	25.8
176.2	6.7	11.8	1.4	V	**1.1**	**204.7**	**19.94**	43.5	23.6
264.3	7.2	11.9	1.8	V	**1.5**	**158.9**	**20.86**	46.0	25.1

NOTES :

1.The antenna is manipulated through typical positions, polarity and length during the testing

2. The EUT is supplied with the nominal DC voltage or/and a new/fully re-charged battery.

3. The spectrum is measured from 9kHz up to the 10th harmonic and the worst-case emissions are reported.

4. There is detected level above reference noise floor spectrum analyzer. Except above frequency

7.5 POWERLINE CONDUCTED EMISSIONS

Test Requirements and limit, §15.207

For an intentional radiator which 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 250 microvolts (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range (MHz)	Limits (dBμV)	
	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

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

Test Configuration

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

TEST PROCEDURE

1. The EUT is placed on a wooden table 80 cm above the reference groundplane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors – Quasi Peak and Average Detector.

▣ RESULT PLOTS

HCT

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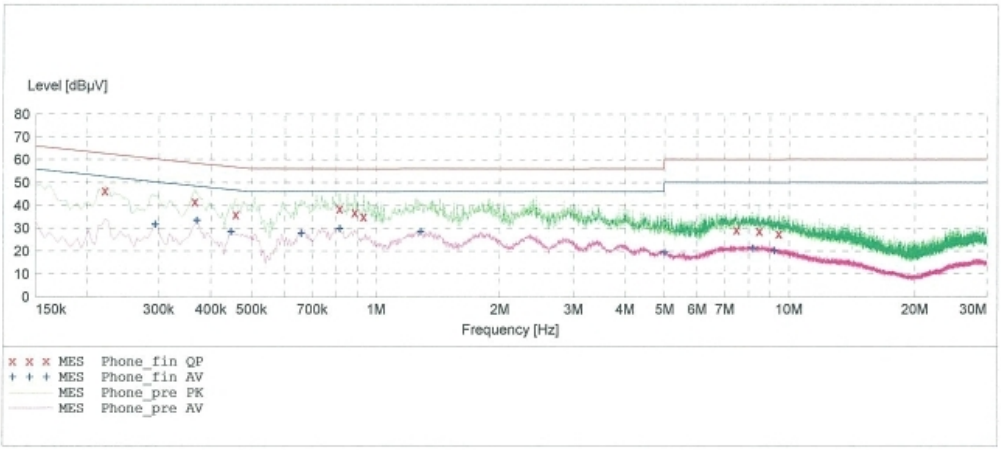
EUT:                    BL40
Manufacturer:           LG Electronics Inc
Operating Condition:    FMT Mode
Test Site:              SHIELD ROOM
Operator:               HSKWAK
Test Specification:     CISPR22 CLASS B
Comment:                N
```

SCAN TABLE: "CISPR22 CLASS B"

Short Description: KN22 CLASS B

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None



MEASUREMENT RESULT: "Phone_fin QP"

6/15/2009 11:59AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.222000	46.50	10.1	63	16.2	---	---
0.366000	41.80	10.1	59	16.8	---	---
0.458000	36.00	10.1	57	20.7	---	---
0.816000	38.70	10.1	56	17.3	---	---
0.888000	37.00	10.1	56	19.0	---	---
0.932000	35.10	10.1	56	20.9	---	---
7.476000	29.40	10.5	60	30.6	---	---
8.484000	28.90	10.6	60	31.1	---	---
9.456000	27.80	10.7	60	32.2	---	---

MEASUREMENT RESULT: "Phone_fin AV"

6/15/2009 11:59AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.294000	31.90	10.1	50	18.5	---	---
0.370000	33.60	10.1	49	14.9	---	---

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MEASUREMENT RESULT: "Phone_fin AV"

(continued)

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.446000	28.70	10.1	47	18.2	---	---
0.656000	27.90	10.1	46	18.1	---	---
0.816000	30.00	10.1	46	16.0	---	---
1.284000	28.60	10.1	46	17.4	---	---
5.000000	19.60	10.3	46	26.4	---	---
8.188000	21.40	10.6	50	28.6	---	---
9.220000	20.40	10.6	50	29.6	---	---

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HCT

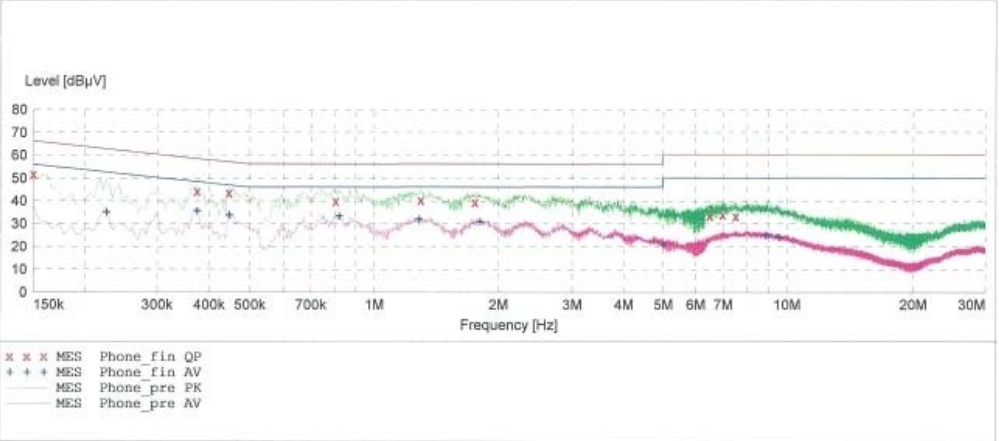
EMC

```
EUT:                    BL40
Manufacturer:           LG Electronics Inc
Operating Condition:    FMT Mode
Test Site:              SHIELD ROOM
Operator:               HSKWAK
Test Specification:     CISPR22 CLASS B
Comment:                H
```

SCAN TABLE: "CISPR22 CLASS B"

Short Description: KN22 CLASS B

Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer
150.0 kHz	500.0 kHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
500.0 kHz	5.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak Average	10.0 ms	9 kHz	None



MEASUREMENT RESULT: "Phone_fin QP"

6/15/2009 11:55AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.150000	51.60	10.1	66	14.4	---	---
0.374000	44.20	10.1	58	14.2	---	---
0.446000	43.40	10.1	57	13.5	---	---
0.804000	39.90	10.1	56	16.1	---	---
1.300000	40.20	10.1	56	15.8	---	---
1.756000	39.40	10.1	56	16.6	---	---
6.492000	33.40	10.5	60	26.6	---	---
6.984000	34.00	10.5	60	26.0	---	---
7.504000	33.30	10.5	60	26.7	---	---

MEASUREMENT RESULT: "Phone_fin AV"

6/15/2009 11:55AM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.226000	35.10	10.1	53	17.5	---	---
0.374000	35.70	10.1	48	12.7	---	---

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MEASUREMENT RESULT: "Phone_fin AV"

(continued)

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.446000	33.90	10.1	47	13.1	---	---
0.820000	33.50	10.1	46	12.5	---	---
1.288000	32.00	10.1	46	14.0	---	---
1.808000	30.90	10.2	46	15.1	---	---
5.000000	20.90	10.3	46	25.1	---	---
8.904000	25.00	10.6	50	25.0	---	---
9.552000	24.10	10.7	50	25.9	---	---

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8. CONCLUSION

The data collected relate only the item(s) tested and show that the LG Electronics Inc. Portable Navigation FCC ID : BEJBL40 is in compliance with Part 15 Subpart C 15.239) of the FCC Rules.

9. LIST OF TEST EQUIPMENT

Manufacturer	Model / Equipment	Cal Interval	Calibration Due	Serial No.
Rohde & Schwarz	ESH2-Z5/ LISN	Annual	04/10/2010	861741/013
Rohde & Schwarz	ESH3-Z6/ LISN	Annual	06/13/2010	100329
Schwarzbeck	VULB 9160/ TRILOG Antenna	Biennial	12/18/2010	9160-3150
HD	MA240/ Antenna Position Tower	N/A	N/A	556
EMCO	1050/ Turn Table	N/A	N/A	114
HD GmbH	HD 100/ Controller	N/A	N/A	13
HD GmbH	KMS 560/ SlideBar	N/A	N/A	12
Rohde & Schwarz	ESH3-Z2/ PULSE LIMITER	Annual	10/30/2009	375.8810.352
MITEQ	AMF-60-0010 1800-35-20P/AMP	Annual	05/20/2010	1200937
Schwarzbeck	BBHA 9120D/ Horn Antenna	Biennial	03/26/2010	147
Rohde & Schwarz	6502/Loop Antenna	Biennial	12/26/2009	9009-2536
Rohde & Schwarz	FSP30/Spectrum Analyzer	Annual	07/31/2009	839117/011
Agilent	E4416A /Power Meter	Annual	01/21/2010	GB41291412
Wainwright Instrument	WHF3.3/18G-10EF / High Pass Filter	Annual	06/29/2010	1
Hewlett Packard	11636B/Power Divider	Annual	12/24/2009	11377
DIGITAL	EP-3010 /DC POWER SUPPLY	Annual	01/07/2010	3110117