**HCT CO., LTD.**

PRODUCT COMPLIANCE DIVISION
SAN 136-1, AMI-RI, BUBAL-EUP, ICHEON-SI, KYOUNGKI-DO, 467-701, KOREA
TEL : +82 31 639 8539 FAX : +82 31 639 8525 www.hct.co.kr

# EMI CERTIFICATION REPORT

**Applicant:**
**LG Electronics Inc.**
**60-39, Gasan-dong, Gumchon-gu, Seoul 153-023, Korea**

**Date of Issue: June 29, 2010**
**Test Report No.: HCTE1006FE22**
**Test Site: HCT CO., LTD.**
**HCT FRN: 0005-8664-21**

**FCC ID:** **BEJC710H**
**IC:** **2703C-C710H**

| | |
|---|---|
| Rule Part(s) / Standard(s) | : FCC PART 15 Subpart B / CISPR 22 Class B |
| | : ICES-003 Issue 4 |
| Equipment Type | : Cellular/PCS GSM/EDGE/WCDMA Phone with Bluetooth&WLAN |
| FCC / IC Model Name | : LG-C710h |
| FCC Listing No | : 90661 |
| IC Recognition No | : IC 5944A-1 |
| Port / Connector(s) | : USB Data Port / Headset Port |

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.

**Report prepared by**
**: Kyoung Hee Yoon**
**Test Engineer of EMC Tech. Part**

**Approved by**
**: Nam Wook Kang**
**Manager of EMC Tech. Part**

This report only responds to the tested sample and may not be reproduced, except in full, without written approval of the HCT Co., Ltd.

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**ATTACHMENT: TEST SETUP PHOTOGRAPHS**

# 1. GENERAL INFORMATION

## 1.1 Product Description

Equipment Under Test (E.U.T) is **Cellular/PCS GSM/EDGE/WCDMA Phone with Bluetooth &WLAN, Model: LG-C710h** manufactured by **LG Electronics Inc.** Its basic purpose is used for communications.

| | |
|---|---|
| **FCC/IC Model** | LG-C710h |
| **FCC ID / IC** | BEJC710H / 2703C-C710H |
| **E.U.T Type** | Cellular/PCS GSM/EDGE/WCDMA Phone with Bluetooth &WLAN |
| **TX Frequency** | 824.20 ㎒ to 848.80 ㎒ (GSM 850)<br>1 850.20 ㎒ to 1 909.80 ㎒ (GSM 1 900)<br>826.40 ㎒ to 846.60 ㎒ (WCDMA 850)<br>1 852.4 ㎒ to 1 907.6 ㎒ (WCDMA 1 900) |
| **RX Frequency** | 869.20 ㎒ to 893.80 ㎒ (GSM 850)<br>1 930.20 ㎒ to 1 989.80 ㎒ (GSM 1 900)<br>871.40 ㎒ to 891.60 ㎒ (WCDMA 850)<br>1 932.4 ㎒ to 1 987.6 ㎒ (WCDMA 1 900) |

## 1.2 Related Submittal(s) / Grant(s)

Original submittal only.

## 1.3 Tested System Details

All equipment descriptions used in the tested system (including inserted cards) are:

| Device Type | Manufacturer | Model Number/ Part Number | FCC ID / DoC | Connected To |
|---|---|---|---|---|
| Cellular/PCS GSM/ EDGE/WCDMA Phone with Bluetooth &WLAN | LG | LG-C710h | BEJC710H | Notebook PC |
| Notebook PC | Compaq 6730b | HP | DoC | E.U.T |
| Notebook PC adaptor | PPP014Y-S | Hipro Electronics Co.,Ltd | - | Notebook PC |
| Mouse | Microsoft | Intellimouse optical USB and PS/2 compatible | DoC | Notebook PC |
| USB Cable | - | - | - | Notebook PC E.U.T |
| Headset | - | - | - | E.U.T |

## 1.4 Cable Description

| Product Name | Port | Power Cord Shielded (Y/N) | I/O Cable Shielded (Y/N) | Length (m) |
|---|---|---|---|---|
| Cellular/PCS GSM/ EDGE/WCDMA Phone with Bluetooth &WLAN | Headset jack | - | N | (D)1.0 |
| | USB data | Y | Y | (P,D)1.2 |
| Notebook PC | USB (Mouse) | - | Y | (D)1.8 |

* The marked "(D)" means the data cable and "(P)" means the power cable.

## 1.5 Noise Suppression Parts on Cable. (I/O cable)

| Product Name | Port | Ferrite Bead (Y/N) | Location | Metal Hood (Y/N) | Location |
|---|---|---|---|---|---|
| Cellular/PCS GSM/ EDGE/WCDMA Phone with Bluetooth &WLAN | Headset jack | N | - | Y | E.U.T End |
| | USB data | N | - | Y | Both End |
| Notebook PC | USB (Mouse) | Y | Notebook PC End | Y | Notebook PC End |

## 1.6 Test Methodology

Both Conducted and Radiated testing was performed according to the procedures in ANSI C63.4/2003. Radiated testing was performed at an antenna to E.U.T distance of 3 ㎜

## 1.7 Test Facility

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 and CISPR Publication 22. Detailed description of test facility was submitted to the Commission and accepted dated June 10, 2009. (Registration Number: 90661)

## 1.8 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** (㎒) | **Upper frequency of measurement range** (㎒) |
|---|---|
| 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 ㎓, whichever is lower |

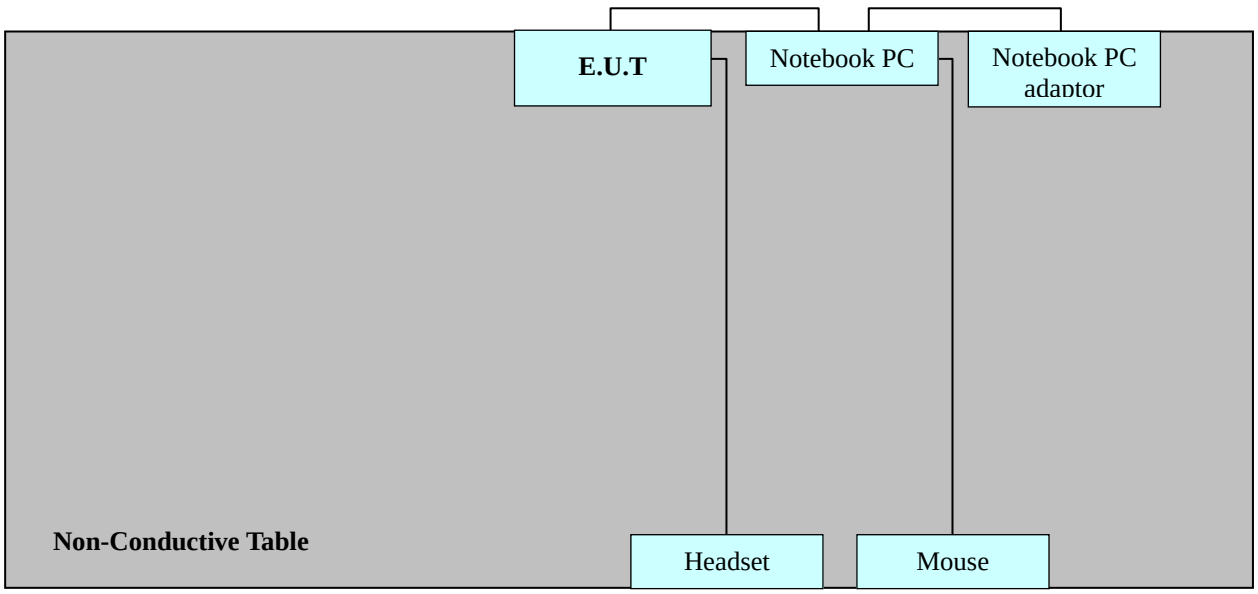
# 2. SYSTEM TEST CONFIGURATION

## 2.1 Configuration of Test System

Power Line Conducted test : E.U.T was connected to LISN via Notebook PC adaptor. Preliminary Power Line Conducted Emission tests were performed by using the procedure in ANSI C63.4/2003 7.2.3 to determine the worst operating conditions.

Radiated Emission test : Preliminary Radiated Emission tests were performed by using the procedure in ANSI C63.4/2003 8.3.1.1 to determine the worst operating condition. Final Radiated Emission tests were performed at 3 m open area test site.

[Configuration of Tested System]




Power Line: 110 VAC

# 3. PRELIMINARY TEST

## 3.1 Conducted Emission Test

■ Test E.U.T with Data Communication mode, after connecting all peripheral devices.

During preliminary tests, the following operating mode was investigated:

| Operation Mode | The Worst Operating Condition |
|---|---|
| Data Communication | ○ |

## 3. 2 Radiated Emission Test

■ Test E.U.T with Data Communication mode, after connecting all peripheral devices.

During preliminary tests, the following operating mode was investigated:

| Operation Mode | The Worst Operating Condition |
|---|---|
| Data Communication | ○ |

# 4. CONDUCTED AND RADIATED EMISSION TEST SUMMARY

## 4.1 Conducted Emission Test

The following table shows the highest levels of conducted emissions on both polarization of hot and neutral line.

| | |
|---|---|
| Limit apply to | : CISPR 22 Class B |
| Result | : Passed by 6.0 dB |
| Operating condition | : Data Communication mode |
| Detector | : Quasi-Peak, Average (6 dB Bandwidth: 9 ㎑) |
| Temperature | : 26.7 °C |
| Humidity level | : 39.8 % |
| Test date | : June 22, 2010 |

| Power Line Conducted Emissions | | | CISPR 22 Class B | | |
|---|---|---|---|---|---|
| **Frequency** (MHz) | **Amplitude** (dB㎶) | **Conductor** | **Detector** | **Limit** (dB㎶) | **Margin** (dB) |
| 13.3640 | 48.9 | NEUTRAL | Quasi-Peak | 60.0 | 11.1 |
| 12.8000 | 49.1 | HOT | Quasi-Peak | 60.0 | 10.9 |
| 13.1320 | 44.0 | HOT | Average | 50.0 | 6.0 |
| 13.1000 | 43.9 | NEUTRAL | Average | 50.0 | 6.1 |

※ **NOTE:** Refer to page 10 to page 13 for details.

***HCT***

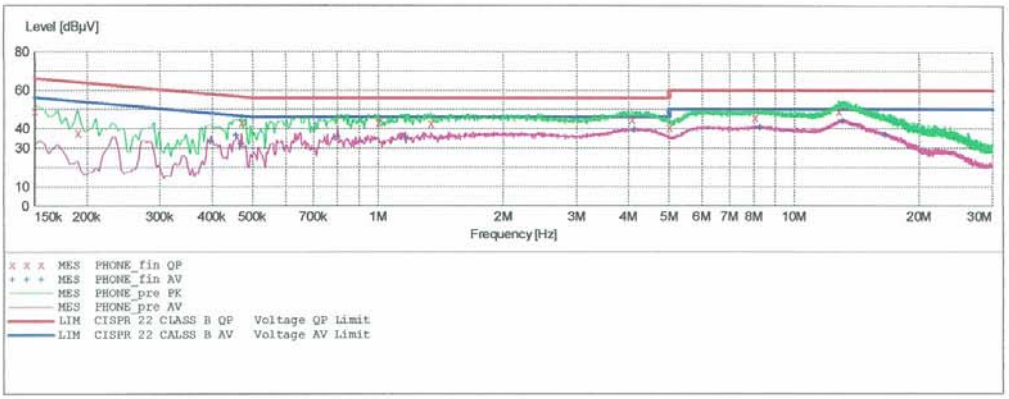
***EMC***

EUT: LG-C710h
Manufacturer: LG
Operating Condition: DATA MODE
Test Site: SHIELD ROOM
Operator: DS-KIM
Test Specification: CISPR22 CLASS B
Comment: H

***SCAN TABLE: "CISPR22 CLASS B"***

Short Description: CISPR22 CLASS B

| Start Frequency | Stop Frequency | Step Width | Detector | Meas. Time | IF Bandw. | Transducer |
|---|---|---|---|---|---|---|
| 150.0 kHz | 500.0 kHz | 4.0 kHz | MaxPeak<br>Average | 10.0 ms | 9 kHz | ESH3 (20100210) |
| 500.0 kHz | 5.0 MHz | 4.0 kHz | MaxPeak<br>Average | 10.0 ms | 9 kHz | ESH3 (20100210) |
| 5.0 MHz | 30.0 MHz | 4.0 kHz | MaxPeak<br>Average | 10.0 ms | 9 kHz | ESH3 (20100210) |




***MEASUREMENT RESULT: "PHONE_fin QP"***

6/22/2010 10:30AM

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Line | PE |
|---|---|---|---|---|---|---|
| 0.150001 | 49.20 | 10.1 | 66 | 16.8 | --- | --- |
| 0.190001 | 37.60 | 10.0 | 64 | 26.4 | --- | --- |
| 0.470001 | 43.30 | 10.1 | 57 | 13.2 | --- | --- |
| 1.004000 | 43.50 | 10.1 | 56 | 12.5 | --- | --- |
| 1.340000 | 43.00 | 10.1 | 56 | 13.0 | --- | --- |
| 4.072000 | 44.70 | 10.4 | 56 | 11.3 | --- | --- |
| 5.000000 | 40.80 | 10.4 | 56 | 15.2 | --- | --- |
| 8.048000 | 45.80 | 10.7 | 60 | 14.2 | --- | --- |
| 12.800000 | 49.10 | 11.0 | 60 | 10.9 | --- | --- |

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***MEASUREMENT RESULT: "PHONE_fin AV"***

6/22/2010 10:30AM

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Line | PE |
|---|---|---|---|---|---|---|
| 0.398001 | 33.40 | 10.1 | 48 | 14.5 | --- | --- |
| 0.458001 | 36.50 | 10.1 | 47 | 10.2 | --- | --- |
| 0.470001 | 31.80 | 10.1 | 47 | 14.8 | --- | --- |
| 0.800000 | 36.10 | 10.1 | 46 | 9.9 | --- | --- |
| 1.164000 | 35.40 | 10.1 | 46 | 10.6 | --- | --- |
| 4.144000 | 39.50 | 10.4 | 46 | 6.5 | --- | --- |
| 8.300000 | 40.70 | 10.7 | 50 | 9.3 | --- | --- |
| 13.132000 | 44.00 | 11.1 | 50 | 6.0 | --- | --- |
| 16.604000 | 36.90 | 11.4 | 50 | 13.1 | --- | --- |

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***HCT***

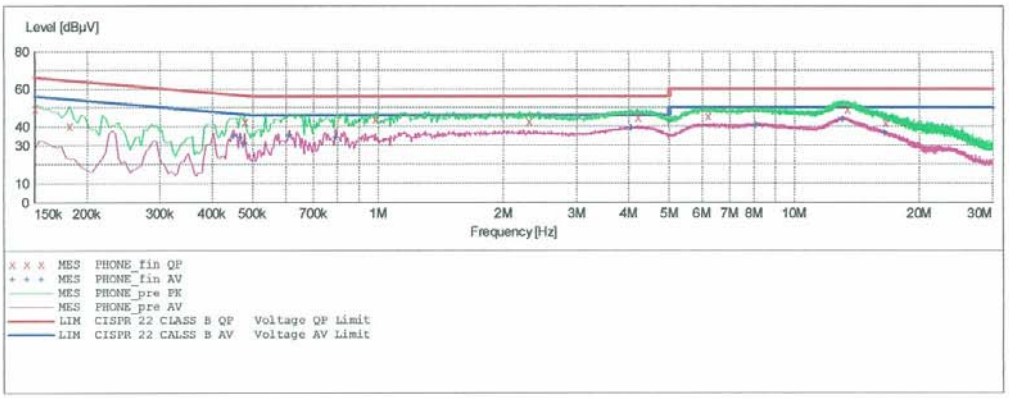
***EMC***

EUT: LG-C710h
Manufacturer: LG
Operating Condition: DATA MODE
Test Site: SHIELD ROOM
Operator: DS-KIM
Test Specification: CISPR22 CLASS B
Comment: N

***SCAN TABLE: "CISPR22 CLASS B"***

Short Description: CISPR22 CLASS B

| Start Frequency | Stop Frequency | Step Width | Detector | Meas. Time | IF Bandw. | Transducer |
|---|---|---|---|---|---|---|
| 150.0 kHz | 500.0 kHz | 4.0 kHz | MaxPeak<br>Average | 10.0 ms | 9 kHz | ESH3 (20100210) |
| 500.0 kHz | 5.0 MHz | 4.0 kHz | MaxPeak<br>Average | 10.0 ms | 9 kHz | ESH3 (20100210) |
| 5.0 MHz | 30.0 MHz | 4.0 kHz | MaxPeak<br>Average | 10.0 ms | 9 kHz | ESH3 (20100210) |




***MEASUREMENT RESULT: "PHONE_fin QP"***

6/22/2010 10:27AM

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Line | PE |
|---|---|---|---|---|---|---|
| 0.150001 | 49.40 | 10.1 | 66 | 16.6 | --- | --- |
| 0.182001 | 40.40 | 10.0 | 64 | 24.0 | --- | --- |
| 0.478001 | 42.50 | 10.1 | 56 | 13.9 | --- | --- |
| 0.984000 | 44.00 | 10.1 | 56 | 12.0 | --- | --- |
| 2.308000 | 42.60 | 10.2 | 56 | 13.4 | --- | --- |
| 4.208000 | 44.60 | 10.4 | 56 | 11.4 | --- | --- |
| 6.192000 | 45.70 | 10.5 | 60 | 14.3 | --- | --- |
| 13.364000 | 48.90 | 11.1 | 60 | 11.1 | --- | --- |
| 16.576000 | 42.00 | 11.4 | 60 | 18.0 | --- | --- |

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***MEASUREMENT RESULT: "PHONE_fin AV"***

6/22/2010 10:27AM

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Line | PE |
|---|---|---|---|---|---|---|
| 0.450001 | 35.00 | 10.1 | 47 | 11.9 | --- | --- |
| 0.466001 | 34.20 | 10.1 | 47 | 12.4 | --- | --- |
| 0.478001 | 31.20 | 10.1 | 46 | 15.1 | --- | --- |
| 0.612000 | 35.60 | 10.1 | 46 | 10.4 | --- | --- |
| 0.792000 | 34.40 | 10.1 | 46 | 11.6 | --- | --- |
| 4.060000 | 39.30 | 10.4 | 46 | 6.7 | --- | --- |
| 8.120000 | 40.70 | 10.7 | 50 | 9.3 | --- | --- |
| 13.100000 | 43.90 | 11.1 | 50 | 6.1 | --- | --- |
| 16.548000 | 36.60 | 11.4 | 50 | 13.4 | --- | --- |

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## 4.2 Radiated Emission Test

The following table shows the highest levels of Radiated Emissions on both polarization of horizontal and vertical.

| | |
|---|---|
| Limit apply to | : FCC PART 15 Subpart B |
| Result | : Passed by 6.9 dB |
| Operating condition | : Data Communication mode |
| Detector | : Quasi-Peak (6 dB Bandwidth: 120 ㎑) |
| Temperature | : 26.5 °C |
| Humidity level | : 53.6 % |
| Test date | : June 23, 2010 |

| Frequency | Reading | Ant. Factor | Cable Loss | Ant. POL | Total | Limit | Margin |
|---|---|---|---|---|---|---|---|
| ㎒ | dB㎶ | dB/m | dB | (H/V) | dB㎶/m | dB㎶/m | dB |
| 40.6 | 20.3 | 12.1 | 0.7 | V | 33.1 | 40.0 | 6.9 |
| 87.2 | 20.2 | 8.3 | 1.0 | V | 29.5 | 40.0 | 10.5 |
| 144.4 | 15.0 | 12.5 | 1.3 | H | 28.8 | 43.5 | 14.7 |
| 233.7 | 19.8 | 10.9 | 1.6 | H | 32.3 | 46.0 | 13.7 |
| 268.6 | 20.7 | 12.0 | 1.8 | H | 34.5 | 46.0 | 11.5 |
| 431.5 | 15.6 | 16.1 | 2.2 | V | 33.9 | 46.0 | 12.1 |

## 5. 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 21.5 dBμV is obtained. The antenna factor of 7.4 dB/m and a cable factor of 1.1 dB are added. The 30 dBμV/m value is mathematically converted to its corresponding level in μV/m.

FS = 21.5 + 7.4 + 1.1 = 30 dBμV/m

[Radiated Emission Limits]

| Frequency of Emission (㎒) | Field Strength | |
|---|---|---|
| | μV/m | dBμV/m |
| 30 to 88 | 100 | 40.0 |
| 88 to 216 | 150 | 43.5 |
| 216 to 960 | 200 | 46.0 |
| Above 960 | 500 | 54.0 |

# 6. TEST EQUIPMENT

| Type | Manufacturer | Model Number | Serial Number | Next CAL Date |
|---|---|---|---|---|
| **Conducted Emission** | | | | |
| EMI Test Receiver | Rohde & Schwarz | ESCI | 100033 | 2011.02.19 |
| EMI Test Receiver | Rohde & Schwarz | ESU26 | 100214 | 2011.04.29 |
| LISN | Rohde & Schwarz | ESH3-Z5 | 100282 | 2011.02.05 |
| LISN | Rohde & Schwarz | ENV216 | 3560.6550.02 | 2011.04.06 |
| Attenuator | Rohde & Schwarz | ESH3-Z2 | 357.8810.52 | 2010.10.30 |
| **Radiated Emission** | | | | |
| EMI Test Receiver | Rohde & Schwarz | ESI40 | 831564103 | 2010.10.30 |
| EMI Test Receiver | Rohde & Schwarz | ESU26 | 100214 | 2011.04.29 |
| Trilog Antenna | Schwarzbeck | VULB9160 | 9160-3150 | 2010.12.18 |
| Antenna Master | HD | MA240 | 240/520/00 | - |
| Turn Table | EMCO | 1060 | - | - |
| Communication Antenna | Schwarzbeck | USLP9142 | 9142-248 | - |
| Base Station | Rohde & Schwarz | CMU 200 | 1100000802 | 2011.02.17 |
| Horn Antenna | Schwarzbeck | BBHA 9120D | - | 2012.04.13 |
| RF-Amplifier | MITEQ | AMF-6D-00101800 -35.20P.PS | - | 2011.05.20 |
| Bluetooth Base Station | TESCOM | TC-3000A | - | 2011.01.07 |

# 7. CONCLUSION

The data collected shows that the **LG Electronics Inc. Cellular/PCS GSM/EDGE/WCDMA Phone with Bluetooth&WLAN. Model: LG-C710h, FCC ID: BEJC710H** complies with §15.107 and §15.109 of the FCC rules and **IC Model: LG-C710h, IC: 2703C-C710H** complies with ICES-003 Issue 4 of the IC rule.