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EMI CERTIFICATION REPORT

Applicant:

LG Electronics Mobilecomm U.S.A., Inc.
1000 Sylvan Avenue, Englewood Cliffs NJ 07632

Date of Issue: November 16, 2012

Test Report No.: HCTE1211FE01

Test Site: HCT CO., LTD.
HCT FRN: 0005-8664-21

FCC ID:

ZNFUN160

Rule Part(s) / Standard(s) : FCC PART 15 Subpart B Class B
Equipment Type : Cellular/AWS/PCS CDMA Phone with Bluetooth
Model Name : LG-UN160
Additional Model Name : UN160, LGUN160, LG-UN161, UN161, LGUN161
Port / Connector(s) : USB / 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.

Report prepared by
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DOCUMENT HISTORY

The revision history for this document is shown in table.

| Version | Date | Description |
|--------------|-------------------|-----------------|
| HCTE1211FE01 | November 16, 2012 | Initial Release |

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1. GENERAL INFORMATION

1.1 Product Description

Equipment Under Test is **EUT type: Cellular/AWS/PCS CDMA Phone with Bluetooth, Model: LG-UN160** manufactured by **LG Electronics MobileComm U.S.A., Inc.** Its basic purpose is used for communications.

| | |
|-------------------------|--|
| Model | LG-UN160 |
| Additional Model | UN160, LGUN160, LG-UN161, UN161, LGUN161 |
| FCC ID | ZNFUN160 |
| E.U.T Type | Cellular/AWS/PCS CDMA Phone with Bluetooth |
| TX Frequency | 824.70 MHz to 848.31 MHz (CDMA 835) 1 851.25 MHz to 1 908.75 MHz (CDMA 1 900) 1 711.25 MHz to 1 753.75 MHz (AWS 1 700) |
| RX Frequency | 869.70 MHz to 893.31 MHz (CDMA 835) 1 931.25 MHz to 1 988.75 MHz (CDMA 1 900) 2 111.25 MHz to 2 153.75 MHz (AWS 1 700) |

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 Name | FCC ID / DoC | Connected to |
|---------------------|--------------------------|-----------------------|--------------|------------------------------|
| E.U.T | LG | LG-UN160 | ZNFUN160 | Notebook PC, Headset |
| Notebook PC | H.P | ProBook 6560b | DoC | E.U.T Notebook PC adaptor |
| Notebook PC adaptor | CHICONY POWER TECHNOLOGY | Series PPP012H-S | - | Notebook PC |
| Mouse | Radio shack | Series 2-button mouse | FSUGMZE3 | Notebook PC |
| USB cable | BD | SGDY0018501 | - | E.U.T Notebook PC |
| Headset | CRESYN | SGEY0005596 | - | E.U.T |
| Net hard | LG | N1A1DD1 | DoC | Net hard adaptor Notebook PC |
| Net hard adaptor | Yang Ming Industrial | DA-60M12 | - | Net hard |
| RJ45 cable | - | - | - | Notebook PC Net hard |

1.4 Cable Description

| Product Name | Port | Power Cord Shielded (Y/N) | I/O Cable Shielded (Y/N) | Length (m) |
|--------------|----------------|---------------------------|--------------------------|------------|
| E.U.T | Micro USB | Y | Y | (P,D)1.2 |
| | Headset jack | - | N | (D)1.5 |
| Notebook PC | RJ 45 | - | N | (D)1.5 |
| | Serial (Mouse) | - | N | (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 |
|--------------|----------------|--------------------|----------|------------------|-----------------|
| E.U.T | Micro USB | N | N/A | Y | Both End |
| | Headset jack | N | N/A | Y | EUT End |
| Notebook PC | RJ 45 | N | N/A | N | Both End |
| | Serial (Mouse) | - | - | 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 m

1.7 Test Facility

Chamber used to collect the test data is located at the 105-1, Jangam-Ri, Majang-Myeon, Icheon-Si, Kyoungki-Do, Republic of Korea. Those measurement facilities are constructed in conformance with the requirements of ANSI C63.4.

| Measurement Facilities | Reg. No. |
|--|-----------------------|
| Radiated Field strength measurement facility (3m) | 90661(Mar. 02, 2011) |
| Radiated Field strength measurement facility (10m) | 90661 (Sep. 03, 2010) |

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 (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 | 5 th harmonic of the highest frequency or 40 GHz, whichever is lower |

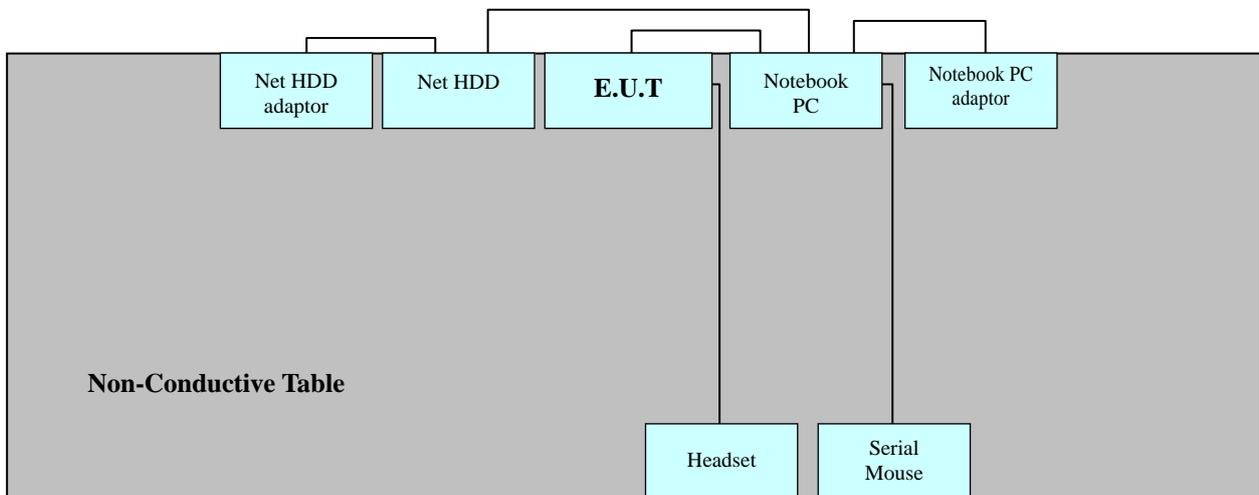
2. SYSTEM TEST CONFIGURATION

2.1 Configuration of Test System

Power Line Conducted test : E.U.T was connected to LISN via Notebook PC.
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 and 10 m semi-anechoic chamber.

[Configuration of Tested System]



Power Line: 120 VAC

3. PRELIMINARY TEST

3.1 Conducted Emission Test

During preliminary tests, the following operating mode was investigated:

Operation Mode: Data Link Mode

3.2 Radiated Emission Test

During preliminary tests, the following operating mode was investigated:

Operation Mode: Data Link Mode

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 : FCC PART 15 Subpart B Class B

Detector : Quasi-Peak, Average (6 dB Bandwidth: 9 kHz)

Operation Mode : Data Link mode

Temperature : 18.9 °C

Humidity Level : 42.0 %

Test Date : November 13, 2012

| Frequency (MHz) | Transd (dB) | Conductor (H/N) | Quasi-Peak | | | Average | | |
|--------------------|----------------|--------------------|-----------------|--------------------------------|---------------------------|-----------------|--------------------------------|---------------------------|
| | | | Limit (dBuV) | Measurement Level (dBuV) | Result Level (dBuV) | Limit (dBuV) | Measurement Level (dBuV) | Result Level (dBuV) |
| 0.636 | 10.0 | N | 56 | 32.6 | 42.6 | 46 | 19.50 | 29.50 |
| 0.508 | 10.0 | N | 56 | 30.1 | 40.1 | 46 | - | - |
| 1.740 | 10.1 | N | 56 | - | - | 46 | 20.00 | 30.10 |
| 1.900 | 9.9 | H | 56 | - | - | 46 | 18.30 | 28.20 |
| 16.116 | 11.1 | H | 60 | - | - | 50 | 19.10 | 30.20 |
| 16.544 | 11.2 | H | 60 | - | - | 50 | 19.10 | 30.30 |

※ **NOTE:** Refer to page 11 to page 14 for details.

1. Transd = LISN Factor + Cable Loss Factor
2. Line H = Hot, Line N = Neutral

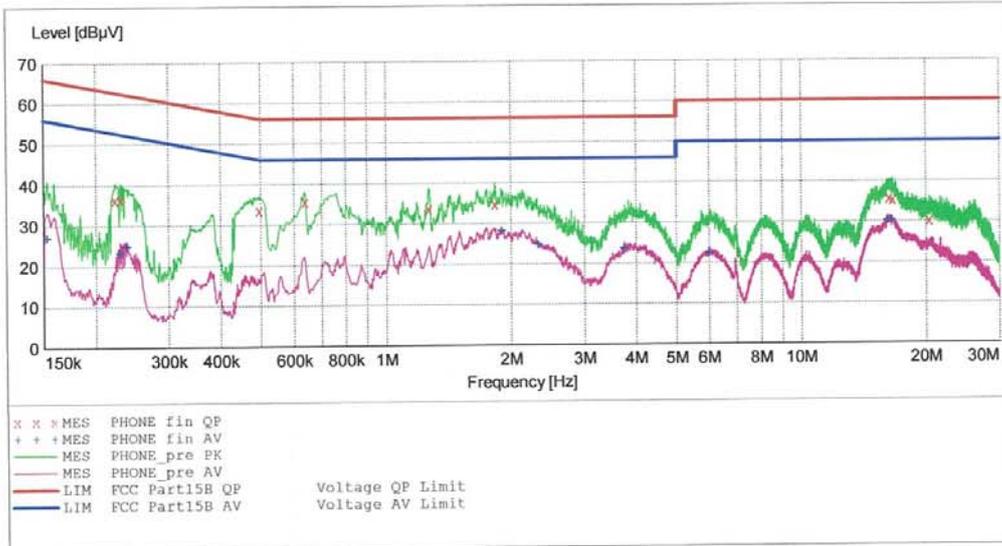
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EMC

EUT: UN160
 Manufacturer: LG
 Operating Condition: DATA LINK MODE
 Test Site: SHIELD ROOM
 Operator: JH CHOI
 Test Specification: FCC PART 15 B
 Comment: H

SCAN TABLE: "FCC PART 15 B(H)"

| Short Description: | | | FCC PART 15 | CLASS B | | | |
|--------------------|-----------|---------|-------------|------------|-----------|------------|--|
| Start | Stop | Step | Detector | Meas. Time | IF Bandw. | Transducer | |
| Frequency | Frequency | Width | | | | | |
| 150.0 kHz | 500.0 kHz | 1.0 kHz | MaxPeak | 10.0 ms | 9 kHz | None | |
| | | | Average | | | | |
| 500.0 kHz | 5.0 MHz | 4.0 kHz | MaxPeak | 10.0 ms | 9 kHz | None | |
| | | | Average | | | | |
| 5.0 MHz | 30.0 MHz | 4.0 kHz | MaxPeak | 10.0 ms | 9 kHz | None | |
| | | | Average | | | | |



MEASUREMENT RESULT: "PHONE_fin QP"

11/13/2012 8:57PM

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Line | PE |
|---------------|------------|-----------|------------|-----------|------|-----|
| 0.223010 | 36.20 | 9.7 | 63 | 26.6 | --- | --- |
| 0.230010 | 36.60 | 9.8 | 62 | 25.8 | --- | --- |
| 0.496010 | 33.70 | 9.8 | 56 | 22.4 | --- | --- |
| 0.640000 | 35.70 | 9.8 | 56 | 20.3 | --- | --- |
| 1.268000 | 33.80 | 9.8 | 56 | 22.2 | --- | --- |
| 1.832000 | 34.80 | 9.9 | 56 | 21.2 | --- | --- |
| 16.292000 | 35.70 | 11.2 | 60 | 24.3 | --- | --- |
| 16.636000 | 35.30 | 11.2 | 60 | 24.7 | --- | --- |
| 20.352000 | 30.10 | 11.8 | 60 | 29.9 | --- | --- |

MEASUREMENT RESULT: "PHONE_fin AV"

11/13/2012 8:57PM

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Line | PE |
|------------------|---------------|--------------|---------------|--------------|------|------|
| 0.153010 | 27.00 | 9.8 | 56 | 28.8 | ---- | ---- |
| 0.229010 | 23.20 | 9.8 | 53 | 29.3 | ---- | ---- |
| 0.238010 | 24.80 | 9.8 | 52 | 27.3 | ---- | ---- |
| 1.900000 | 28.20 | 9.9 | 46 | 17.8 | ---- | ---- |
| 2.324000 | 24.60 | 10.0 | 46 | 21.4 | ---- | ---- |
| 3.752000 | 23.70 | 10.1 | 46 | 22.3 | ---- | ---- |
| 6.000000 | 22.40 | 10.2 | 50 | 27.6 | ---- | ---- |
| 16.116000 | 30.20 | 11.1 | 50 | 19.8 | ---- | ---- |
| 16.544000 | 30.30 | 11.2 | 50 | 19.7 | ---- | ---- |

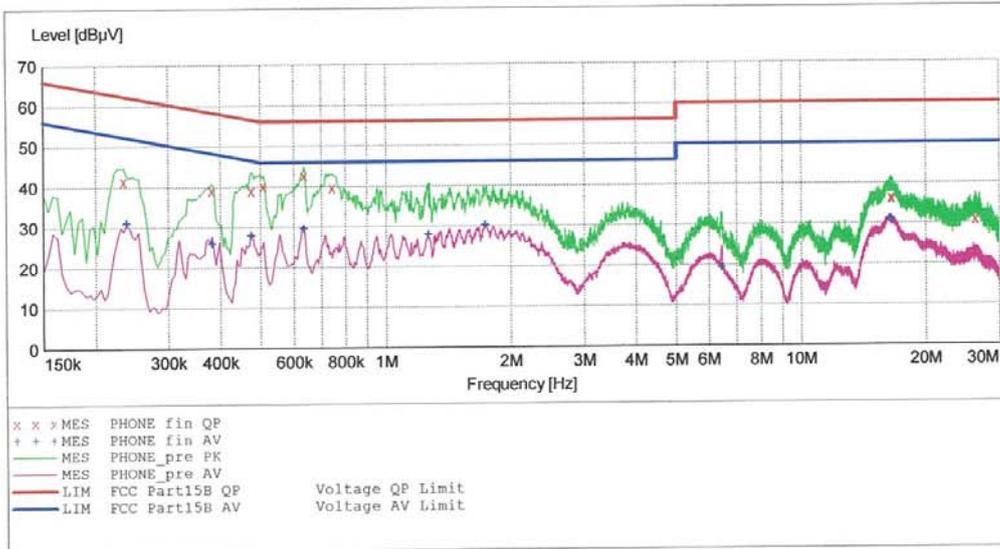
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EMC

EUT: UN160
 Manufacturer: LG
 Operating Condition: DATA LINK MODE
 Test Site: SHIELD ROOM
 Operator: JH CHOI
 Test Specification: FCC PART 15 CLASS B
 Comment: N

SCAN TABLE: "FCC PART 15 B(N)"

| Short Description: | FCC PART 15 | CLASS B | Detector | Meas. Time | IF Bandw. | Transducer |
|--------------------|----------------|------------|----------|------------|-----------|------------|
| Start Frequency | Stop Frequency | Step Width | | | | |
| 150.0 kHz | 500.0 kHz | 4.0 kHz | MaxPeak | 10.0 ms | 9 kHz | None |
| | | | Average | | | |
| 500.0 kHz | 5.0 MHz | 4.0 kHz | MaxPeak | 10.0 ms | 9 kHz | None |
| | | | Average | | | |
| 5.0 MHz | 30.0 MHz | 4.0 kHz | MaxPeak | 10.0 ms | 9 kHz | None |
| | | | Average | | | |



MEASUREMENT RESULT: "PHONE_fin QP"

11/13/2012 9:08PM

| Frequency MHz | Level dBµV | Transd dB | Limit dBµV | Margin dB | Line | PE |
|---------------|------------|-----------|------------|-----------|------|-----|
| 0.234010 | 41.40 | 10.0 | 62 | 20.9 | --- | --- |
| 0.382010 | 39.10 | 10.0 | 58 | 19.1 | --- | --- |
| 0.474010 | 39.00 | 10.0 | 56 | 17.4 | --- | --- |
| 0.508000 | 40.10 | 10.0 | 56 | 15.9 | --- | --- |
| 0.636000 | 42.60 | 10.0 | 56 | 13.4 | --- | --- |
| 0.744000 | 39.60 | 10.0 | 56 | 16.4 | --- | --- |
| 16.476000 | 36.20 | 11.5 | 60 | 23.8 | --- | --- |
| 16.560000 | 36.10 | 11.5 | 60 | 23.9 | --- | --- |
| 26.304000 | 30.80 | 12.5 | 60 | 29.2 | --- | --- |

MEASUREMENT RESULT: "PHONE_fin AV"

11/13/2012 9:08PM

| Frequency MHz | Level dB μ V | Transd dB | Limit dB μ V | Margin dB | Line | PE |
|------------------|---------------------|--------------|---------------------|--------------|------|-----|
| 0.238010 | 31.00 | 10.0 | 52 | 21.2 | --- | --- |
| 0.382010 | 25.80 | 10.0 | 48 | 22.4 | --- | --- |
| 0.474010 | 27.80 | 10.0 | 46 | 18.6 | --- | --- |
| 0.636000 | 29.50 | 10.0 | 46 | 16.5 | --- | --- |
| 1.268000 | 27.80 | 10.0 | 46 | 18.2 | --- | --- |
| 1.740000 | 30.10 | 10.1 | 46 | 15.9 | --- | --- |
| 6.440000 | 19.30 | 10.5 | 50 | 30.7 | --- | --- |
| 16.388000 | 31.10 | 11.5 | 50 | 18.9 | --- | --- |
| 16.548000 | 30.90 | 11.5 | 50 | 19.1 | --- | --- |

4.2 Radiated Emission Test

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

-For measurement below 1 GHz

Limit Apply to : FCC PART 15 Subpart B Class B

Detector : Quasi-Peak (6 dB Bandwidth: 120 kHz)

Operation Mode : Data Link mode

Temperature : 23.2 °C

Humidity Level : 41.7 %

Test Date : November 13, 2012

| Frequency (MHz) | Reading (dBUV) | Polarity (H/V) | Antenna Height (m) | Correction Factor | | Limit (dBUV/m) | Level (dBUV/m) | Margin (dB) |
|-----------------|----------------|----------------|--------------------|-------------------|------------|----------------|----------------|-------------|
| | | | | Antenna (dB/m) | Cable (dB) | | | |
| 41.30 | 8.56 | V | 1.00 | 11.77 | 1.07 | 40.0 | 21.40 | 18.60 |
| 52.90 | 12.88 | V | 1.00 | 11.80 | 1.22 | 40.0 | 25.90 | 14.10 |
| 99.90 | 17.91 | V | 1.20 | 9.28 | 1.71 | 43.5 | 28.90 | 14.60 |
| 117.40 | 17.79 | V | 1.50 | 11.04 | 1.87 | 43.5 | 30.70 | 12.80 |
| 185.50 | 15.48 | H | 1.00 | 10.86 | 2.36 | 43.5 | 28.70 | 14.80 |
| 249.60 | 15.36 | H | 1.20 | 11.78 | 2.76 | 46.0 | 29.90 | 16.10 |

-For measurement above 1 GHz

Limit Apply to : FCC PART 15 Subpart B Class B

Detector : Peak mode: Peak (RBW: 1 MHz, VBW: 1 MHz)
 : Average mode: Peak (RBW: 1 MHz, VBW: 10 Hz)

Operation Mode : Data Link mode

Temperature : 23.6 °C

Humidity Level : 40.4 %

Test Date : November 15, 2012

| Frequency (GHz) | Peak | | | POL | Average | | |
|--------------------|-------------------|-------------------|----------------|-----|-------------------|-------------------|----------------|
| | Total (dBμV/m) | Limit (dBμV/m) | Margin (dB) | | Total (dBμV/m) | Limit (dBμV/m) | Margin (dB) |
| 1.9500 | 52.80 | 74 | 21.2 | H | 29.40 | 54 | 24.6 |
| 2.4500 | 51.50 | 74 | 22.5 | V | 31.40 | 54 | 22.6 |

※ NOTE:

1. Measurement above 1 GHz was performed from 1 GHz to the 5th harmonic of highest fundamental frequency. Test was measured by 12 GHz.

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 $21.5 \text{ dB}\mu\text{V}$ is obtained. The antenna factor of 7.4 dB/m and a cable factor of 1.1 dB are added. The $30 \text{ dB}\mu\text{V/m}$ value is mathematically converted to its corresponding level in $\mu\text{V/m}$.

$$FS = 21.5 + 7.4 + 1.1 = 30 \text{ dB}\mu\text{V/m}$$

[Radiated Emission Limits]

| Frequency of Emission (MHz) | Field Strength | |
|--------------------------------|-----------------|--------------------------|
| | $\mu\text{V/m}$ | $\text{dB}\mu\text{V/m}$ |
| 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

| <u>Type</u> | <u>Manufacturer</u> | <u>Model Name</u> | <u>Serial Number</u> | <u>Calibration Cycle</u> | <u>Next CAL Date</u> |
|---|---------------------|-------------------|----------------------|--------------------------|----------------------|
| <u>Conducted Emission</u> | | | | | |
| <input checked="" type="checkbox"/> EMI Test Receiver | Rohde & Schwarz | ESCI | 100584 | 1 year | 2013.05.02 |
| <input type="checkbox"/> EMI Test Receiver | Rohde & Schwarz | ESCI | 100033 | 1 year | 2013.06.18 |
| <input type="checkbox"/> LISN | Rohde & Schwarz | ESH3-Z5 | 100282 | 1 year | 2013.07.04 |
| <input checked="" type="checkbox"/> LISN | EMCO | 3816/2SH | 9706-1070 | 1 year | 2013.05.02 |
| <input checked="" type="checkbox"/> LISN | Rohde & Schwarz | ENV216 | 100073 | 1 year | 2013.02.09 |
| <input type="checkbox"/> Attenuator | Rohde & Schwarz | ESH3-Z2 | 357.8810.352 | 1 year | 2013.07.31 |

Radiated Emission

[30 MHz - 1 GHz]

| | | | | | |
|---|-----------------|-----------|------------|--------|------------|
| <input checked="" type="checkbox"/> EMI Test Receiver | Rohde & Schwarz | ESU26 | 100241 | 1 year | 2013.07.30 |
| <input checked="" type="checkbox"/> Trilog Antenna | Schwarzbeck | VULB9160 | 3125 | 2 year | 2013.05.03 |
| <input checked="" type="checkbox"/> Antenna master | INNCO Systems | MA4000-EP | MA4000/283 | N/A | - |
| <input checked="" type="checkbox"/> Turn Table | INNCO Systems | DT3000-3T | DT3000/69 | N/A | - |
| <input type="checkbox"/> EMI Test Receiver | Rohde & Schwarz | ESI40 | 831564103 | 1 year | 2013.05.03 |
| <input type="checkbox"/> Trilog Antenna | Schwarzbeck | VULB9168 | 185 | 2 year | 2013.02.08 |
| <input type="checkbox"/> Antenna master | HD GmbH | MA240 | 240/520 | N/A | - |
| <input type="checkbox"/> Turn Table | HD GmbH | 2090 | 9702/1224 | N/A | - |

[1 GHz - 12 GHz]

| | | | | | |
|---|-----------------|------------|-----------|--------|------------|
| <input checked="" type="checkbox"/> EMI Test Receiver | Rohde & Schwarz | ESI40 | 831564103 | 1 year | 2013.05.03 |
| <input checked="" type="checkbox"/> Antenna master | HD GmbH | MA240 | 240/520 | N/A | - |
| <input checked="" type="checkbox"/> Turn Table | HD GmbH | 2090 | 9702/1224 | N/A | - |
| <input checked="" type="checkbox"/> Power Amplifier | Rohde & Schwarz | SCU-18 | 10094 | 1 year | 2013.09.11 |
| <input type="checkbox"/> Horn Antenna | Schwarzbeck | BBHA 9120D | 147 | 2 year | 2013.05.15 |
| <input type="checkbox"/> Horn Antenna | Schwarzbeck | BBHA 9120D | 937 | 2 year | 2013.10.17 |
| <input checked="" type="checkbox"/> Horn Antenna | Schwarzbeck | BBHA 9120D | 296 | 2 year | 2014.02.20 |

7. CONCLUSION

The data collected shows that the **EUT type: Cellular/AWS/PCS CDMA Phone with Bluetooth, Model: LG-UN160, FCC ID: ZNFUN160** complies with §15.107 and §15.109 of the FCC rules.