



**HCT CO., LTD.**

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## EMI CERTIFICATION REPORT

**Applicant:**

**LG Electronics Inc.**

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

**Date of Issue: March 25, 2010**

**Test Report No.: HCTE1003FE12**

**Test Site: HCT CO., LTD.**

**HCT FRN: 0005-8664-21**

**FCC ID:**

**BEJGT540F**

Rule Part(s) / Standard(s) : FCC PART 15 Subpart B / CISPR 22 Class B

Equipment (EUT) Type : Cellular/PCS GSM/EDGE/WCDMA Phone with Bluetooth&WLAN

Trade Name / Model(s) : LG Electronics Inc. / GT540f

Port / Connector(s) : Headset Port / USB Data 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  
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Test Engineer of EMC Tech. Part**

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

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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: GT540f** manufactured by **LG Electronics Inc.** Its basic purpose is used for communications.

|                     |                                                                                                                        |
|---------------------|------------------------------------------------------------------------------------------------------------------------|
| <b>Model</b>        | GT540f                                                                                                                 |
| <b>FCC ID</b>       | BEJGT540F                                                                                                              |
| <b>E.U.T Type</b>   | Cellular/PCS GSM/EDGE/WCDMA Phone with Bluetooth & WLAN                                                                |
| <b>TX Frequency</b> | 824.20 MHz to 848.80 MHz (GSM 850)<br>1 850.20 MHz to 1 909.80 MHz (GSM 1 900)<br>826.40 MHz to 846.60 MHz (WCDMA 850) |
| <b>RX Frequency</b> | 869.20 MHz to 893.80 MHz (GSM 850)<br>1 930.20 MHz to 1 989.80 MHz (GSM 1 900)<br>871.40 MHz to 891.60 MHz (WCDMA 850) |

### 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/<br>Part Number                    | FCC ID / DoC | Connected To         |
|-------------------------------------------------------------------|--------------|-------------------------------------------------|--------------|----------------------|
| Cellular/PCS GSM/<br>EDGE/WCDMA<br>Phone with Bluetooth<br>& WLAN | LG           | GT540f                                          | BEJGT540F    | Notebook PC          |
| Notebook PC                                                       | SAMSUNG      | NT-R519                                         | DoC          | E.U.T                |
| Notebook PC adaptor                                               | DELTA        | ADP-60AH D<br>AD-6019R                          | -            | Notebook PC          |
| Mouse                                                             | Microsoft    | Intellimouse optical USB<br>and PS/2 compatible | DoC          | Notebook PC          |
| USB Cable                                                         | -            | -                                               | -            | Notebook PC<br>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/WCDCA 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/WCDCA 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 m

## 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

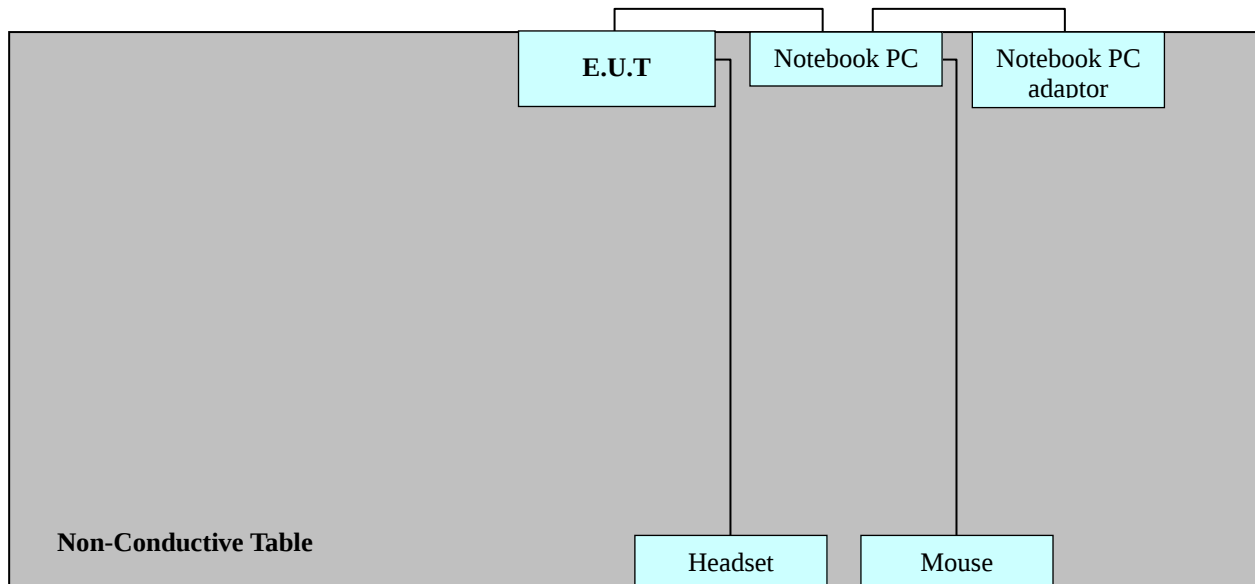
| Highest frequency generated or used in the device<br>or on which the device operates or tunes (MHz) | Upper frequency of measurement range<br>(MHz)                                      |
|-----------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
| 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 <sup>th</sup> harmonic of the highest frequency<br>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 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 10.6 dB                           |
| Operating condition | : Data Communication mode                     |
| Detector            | : Quasi-Peak, Average (6 dB Bandwidth: 9 kHz) |
| Temperature         | : 24.2 °C                                     |
| Humidity level      | : 37.2 %                                      |
| Test date           | : March 24, 2010                              |

| Power Line Conducted Emissions |                           |           | CISPR 22 Class B |                       |                |
|--------------------------------|---------------------------|-----------|------------------|-----------------------|----------------|
| Frequency<br>(MHz)             | Amplitude<br>(dB $\mu$ V) | Conductor | Result           | Limit<br>(dB $\mu$ V) | Margin<br>(dB) |
| 0.5360                         | 44.3                      | HOT       | Quasi-Peak       | 56.0                  | 11.7           |
| 0.5480                         | 32.0                      | HOT       | Average          | 46.0                  | 14.0           |
| 0.5760                         | 45.4                      | NEUTRAL   | Quasi-Peak       | 56.0                  | 10.6           |
| 3.0880                         | 31.1                      | NEUTRAL   | Average          | 46.0                  | 14.9           |

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

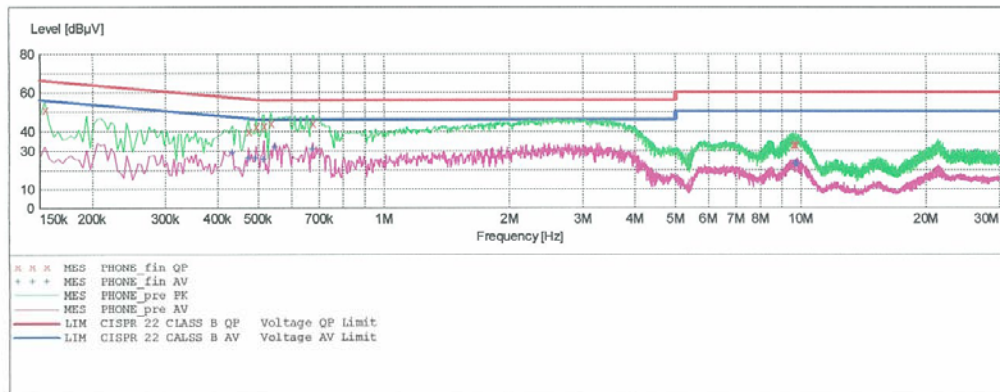
**HCT**

**EMC**

EUT: GT540f  
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              | Stop      | Step            | Detector | Meas. Time | IF Bandw. | Transducer      |
| Frequency          | Frequency | Width           |          |            |           |                 |
| 150.0 kHz          | 500.0 kHz | 4.0 kHz         | MaxPeak  | 10.0 ms    | 9 kHz     | ESH3 (20100210) |
|                    |           |                 | Average  |            |           |                 |
| 500.0 kHz          | 5.0 MHz   | 4.0 kHz         | MaxPeak  | 10.0 ms    | 9 kHz     | ESH3 (20100210) |
|                    |           |                 | Average  |            |           |                 |
| 5.0 MHz            | 30.0 MHz  | 4.0 kHz         | MaxPeak  | 10.0 ms    | 9 kHz     | ESH3 (20100210) |
|                    |           |                 | Average  |            |           |                 |



**MEASUREMENT RESULT: "PHONE\_fin\_QP"**

3/24/2010 1:41PM

| Frequency MHz | Level dBμV | Transd dB | Limit dBμV | Margin dB | Line | PE  |
|---------------|------------|-----------|------------|-----------|------|-----|
| 0.154001      | 50.80      | 10.1      | 66         | 15.0      | ---  | --- |
| 0.474001      | 39.70      | 10.1      | 56         | 16.8      | ---  | --- |
| 0.494001      | 42.20      | 10.1      | 56         | 13.9      | ---  | --- |
| 0.516000      | 42.90      | 10.1      | 56         | 13.1      | ---  | --- |
| 0.536000      | 44.30      | 10.1      | 56         | 11.7      | ---  | --- |
| 0.676000      | 44.10      | 10.1      | 56         | 11.9      | ---  | --- |
| 9.568000      | 32.90      | 10.8      | 60         | 27.1      | ---  | --- |
| 9.640000      | 33.30      | 10.8      | 60         | 26.7      | ---  | --- |
| 9.732000      | 32.90      | 10.8      | 60         | 27.1      | ---  | --- |

**MEASUREMENT RESULT: "PHONE\_fin AV"**

3/24/2010 1:41PM

| Frequency<br>MHz | Level<br>dBμV | Transd<br>dB | Limit<br>dBμV | Margin<br>dB | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|------|-----|
| 0.434001         | 29.00         | 10.1         | 47            | 18.2         | ---  | --- |
| 0.474001         | 26.00         | 10.1         | 46            | 20.4         | ---  | --- |
| 0.494001         | 26.20         | 10.1         | 46            | 19.9         | ---  | --- |
| 0.516000         | 25.50         | 10.1         | 46            | 20.5         | ---  | --- |
| 0.548000         | 32.00         | 10.1         | 46            | 14.0         | ---  | --- |
| 0.676000         | 30.90         | 10.1         | 46            | 15.1         | ---  | --- |
| 9.696000         | 23.40         | 10.8         | 50            | 26.6         | ---  | --- |
| 9.776000         | 23.00         | 10.8         | 50            | 27.0         | ---  | --- |
| 9.844000         | 22.90         | 10.8         | 50            | 27.1         | ---  | --- |

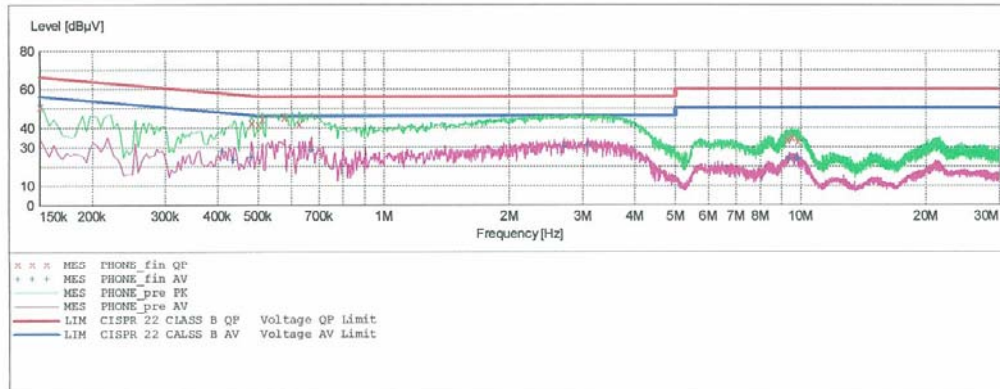
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**EMC**

EUT: GT540f  
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         | 10.0 ms    | 9 kHz     | ESH3 (20100210) |
|                    |                |            | Average         |            |           |                 |
| 500.0 kHz          | 5.0 MHz        | 4.0 kHz    | MaxPeak         | 10.0 ms    | 9 kHz     | ESH3 (20100210) |
|                    |                |            | Average         |            |           |                 |
| 5.0 MHz            | 30.0 MHz       | 4.0 kHz    | MaxPeak         | 10.0 ms    | 9 kHz     | ESH3 (20100210) |
|                    |                |            | Average         |            |           |                 |



**MEASUREMENT RESULT: "PHONE\_fin\_QP"**

3/24/2010 1:44PM

| Frequency MHz | Level dBμV | Transd dB | Limit dBμV | Margin dB | Line | PE  |
|---------------|------------|-----------|------------|-----------|------|-----|
| 0.150001      | 50.60      | 10.1      | 66         | 15.4      | ---  | --- |
| 0.482001      | 42.50      | 10.1      | 56         | 13.8      | ---  | --- |
| 0.500000      | 41.70      | 10.1      | 56         | 14.3      | ---  | --- |
| 0.512000      | 44.40      | 10.1      | 56         | 11.6      | ---  | --- |
| 0.576000      | 45.40      | 10.1      | 56         | 10.6      | ---  | --- |
| 0.628000      | 41.90      | 10.1      | 56         | 14.1      | ---  | --- |
| 9.280000      | 33.70      | 10.7      | 60         | 26.3      | ---  | --- |
| 9.528000      | 34.70      | 10.8      | 60         | 25.3      | ---  | --- |
| 9.836000      | 33.20      | 10.8      | 60         | 26.8      | ---  | --- |

**MEASUREMENT RESULT: "PHONE\_fin AV"**

3/24/2010 1:44PM

| Frequency<br>MHz | Level<br>dBµV | Transd<br>dB | Limit<br>dBµV | Margin<br>dB | Line | PE  |
|------------------|---------------|--------------|---------------|--------------|------|-----|
| 0.410001         | 27.70         | 10.1         | 48            | 19.9         | ---  | --- |
| 0.438001         | 23.50         | 10.1         | 47            | 23.6         | ---  | --- |
| 0.482001         | 24.80         | 10.1         | 46            | 21.5         | ---  | --- |
| 0.672000         | 28.50         | 10.1         | 46            | 17.5         | ---  | --- |
| 2.712000         | 30.40         | 10.3         | 46            | 15.6         | ---  | --- |
| 3.088000         | 31.10         | 10.3         | 46            | 14.9         | ---  | --- |
| 9.392000         | 23.80         | 10.8         | 50            | 26.2         | ---  | --- |
| 9.796000         | 23.80         | 10.8         | 50            | 26.2         | ---  | --- |
| 9.876000         | 23.40         | 10.8         | 50            | 26.6         | ---  | --- |

## 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 10.3 dB                    |
| Operating condition | : Data Communication mode              |
| Detector            | : Quasi-Peak (6 dB Bandwidth: 120 kHz) |
| Temperature         | : 11.0 °C                              |
| Humidity level      | : 41.0 %                               |
| Test date           | : March 24, 2010                       |

| Frequency | Reading    | Ant. Factor | Cable Loss | Ant. POL | Total        | Limit        | Margin |
|-----------|------------|-------------|------------|----------|--------------|--------------|--------|
| MHz       | dB $\mu$ V | dB/m        | dB         | (H/V)    | dB $\mu$ V/m | dB $\mu$ V/m | dB     |
| 47.4      | 16.5       | 12.5        | 0.7        | V        | 29.7         | 40.0         | 10.3   |
| 87.2      | 19.4       | 8.3         | 1.0        | V        | 28.7         | 40.0         | 11.3   |
| 113.4     | 18.9       | 10.2        | 1.2        | H        | 30.3         | 43.5         | 13.2   |
| 269.5     | 19.5       | 12.1        | 1.8        | H        | 33.4         | 46.0         | 12.6   |
| 466.5     | 15.2       | 16.8        | 2.3        | H        | 34.3         | 46.0         | 11.7   |
| 664.3     | 11.2       | 20.2        | 2.8        | V        | 34.2         | 46.0         | 11.8   |

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

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

### [Radiated Emission Limits]

| Frequency of Emission<br>(MHz) | Field Strength |              |
|--------------------------------|----------------|--------------|
|                                | $\mu$ V/m      | dB $\mu$ 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 Number</u>           | <u>Next CAL Date</u> |
|-------------------------------------------------------|---------------------|-------------------------------|----------------------|
| <b><u>Conducted Emission</u></b>                      |                     |                               |                      |
| <input checked="" type="checkbox"/> EMI Test Receiver | Rohde & Schwarz     | ESCI                          | 2010.06.02           |
| <input checked="" type="checkbox"/> LISN              | Rohde & Schwarz     | ESH3-Z5                       | 2011.02.05           |
| <input type="checkbox"/> LISN                         | Rohde & Schwarz     | ENV216                        | 2011.04.01           |
| <input checked="" type="checkbox"/> Attenuator        | Rohde & Schwarz     | ESH3-Z2                       | 2010.10.30           |
| <b><u>Radiated Emission</u></b>                       |                     |                               |                      |
| <input checked="" type="checkbox"/> EMI Test Receiver | Rohde & Schwarz     | ESI40                         | 2010.10.30           |
| <input checked="" type="checkbox"/> Trilog Antenna    | Schwarzbeck         | VULB9160                      | 2010.12.18           |
| <input checked="" type="checkbox"/> Antenna Master    | HD                  | MA240                         | -                    |
| <input checked="" type="checkbox"/> Turn Table        | EMCO                | 1060                          | -                    |
| <input type="checkbox"/> Communication Antenna        | TDK                 | LPDA-0802                     | -                    |
| <input type="checkbox"/> Antenna Position Tower       | HD                  | 240/520/00                    | -                    |
| <input type="checkbox"/> Base Station                 | Rohde & Schwarz     | CMU 200                       | 2011.02.17           |
| <input checked="" type="checkbox"/> Horn Antenna      | Schwarzbeck         | BBHA 9120D                    | 2011.03.26           |
| <input checked="" type="checkbox"/> RF-Amplifier      | MITEQ               | AMF-6D-00101800<br>-35.20P.PS | 2010.04.25           |
| <input type="checkbox"/> Bluetooth Base Station       | TESCOM              | TC-3000A                      | 2011.01.07           |

## **7. CONCLUSION**

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The data collected shows that the **LG Electronics Inc. Model: GT540f. Cellular/ PCS GSM/EDGE/WCDMA Phone with Bluetooth & WLAN. FCC ID: BEJGT540F** complies with §15.107 and §15.109 of the FCC rules.