



HCT CO., LTD.

CERTIFICATION DIVISION  
105-1, JANGAM-RI, MAJANG-MYEON, ICHEON-SI, KYOUNGKI-DO, REPUBLIC OF KOREA  
TEL: +82 31 645 6300 FAX: +82 31 645 6401

## EMI CERTIFICATION REPORT

**Applicant:**

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

**Date of Issue:** November 20, 2012

**Test Report No.:** HCTE1211FE09

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

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

**FCC ID:**

**ZNFE615F**

Rule Part(s) / Standard(s) : FCC PART 15 Subpart B Class B  
Equipment Type : Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA  
Phone with Bluetooth, WLAN  
Model Name : LG-E615f  
Additional Model Name : LG-E615F, E615f, E615F, LGE615f, LGE615F  
Port / Connector(s) : USB 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 subject to a denial of Federal benefits that includes FCC benefits pursuant to Section 5301 of the Anti-Drug Abuse Act of 1988, 21 U.S.C 862

**Report prepared by**  
**: Jeong-Hyeon Choi**  
**Test Engineer of EMC Team**

**Approved by**  
**: Sang-Jun Lee**  
**Manager of EMC Team**

## DOCUMENT HISTORY

---

The revision history for this document is shown in table.

Version	Date	Description
HCTE1211FE09	November 20, 2012	Initial Release

---

## TABLE OF CONTENTS

---

	<b>PAGE</b>
1. GENERAL INFORMATION .....	4
1.1 Product Description.....	4
1.2 Related Submittal(s) / Grant(s).....	4
1.3 Tested System Details.....	5
1.4 Cable Description .....	6
1.5 Noise Suppression Parts on Cable. (I/O cable) .....	6
1.6 Test Methodology .....	7
1.7 Test Facility .....	7
1.8 Frequency Range of Radiated Measurements .....	7
2. SYSTEM TEST CONFIGURATION.....	8
2.1 Configuration of Test System .....	8
3. PRELIMINARY TEST .....	9
3.1 Conducted Emission Test .....	9
3.2 Radiated Emission Test .....	9
4. CONDUCTED AND RADIATED EMISSION TEST SUMMARY .....	10
4.1 Conducted Emission Test .....	10
4.2 Radiated Emission Test .....	15
5. FIELD STRENGTH CALCULATION .....	17
6. TEST EQUIPMENT .....	18
7. CONCLUSION .....	19

**ATTACHMENT: TEST SETUP PHOTOGRAPHS**

## 1. GENERAL INFORMATION

### 1.1 Product Description

Equipment Under Test is **EUT type: Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN, Model: LG-E615f** manufactured by **LG Electronics MobileComm U.S.A., Inc.** Its basic purpose is used for communications.

<b>Model</b>	LG-E615f
<b>Additional Model Name</b>	LG-E615F, E615f, E615F, LGE615f, LGE615F
<b>FCC ID</b>	ZNFE615F
<b>EUT Type</b>	Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA /HSDPA Phone with Bluetooth, WLAN
<b>TX Frequency</b>	824.20 MHz to 848.80 MHz (GSM 850) 1 850.20 MHz to 1 909.80 MHz (GSM 1 900) 826.40 MHz to 846.60 MHz (WCDMA 850)
<b>RX Frequency</b>	869.20 MHz to 893.80 MHz (GSM 850) 1 930.20 MHz to 1 989.80 MHz (GSM 1 900) 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 Name	FCC ID / DoC	Connected To
EUT	LG	LG-E615f	ZNFE615F	Notebook PC Headset
USB cable	KSD	SGDY0016701	-	EUT Notebook PC
Headset	CRESYN	SGEY0003744	-	EUT
Notebook PC	H.P	ProBook 6560b	DoC	EUT Notebook PC adaptor
Notebook PC adaptor	CHICONY POWER TECHNOLOGY	Series PPP012H-S	-	Notebook PC
Mouse	Radio shack	Series 2-button mouse	FSUGMZE3	Notebook PC
Net hard	LG	N1A1DD1	Doc	Notebook PC Net hard adaptor
Net hard adaptor	Yang Ming Industrial	DA-60M12	-	Net hard
RJ45 cable	-	-	-	Net hard Notebook PC
SD card	SanDisk	8 GB		

### 1.4 Cable Description

Product Name	Port	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (m)
EUT	Micro USB	Y	Y	(P,D)1.2
	Headset jack	-	N	(D)1.2
Notebook PC	RJ 45	-	N	(D)1.5
	Serial (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
EUT	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 EUT 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, Kyongki-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 <sup>th</sup> harmonic of the highest frequency or 40 GHz, whichever is lower

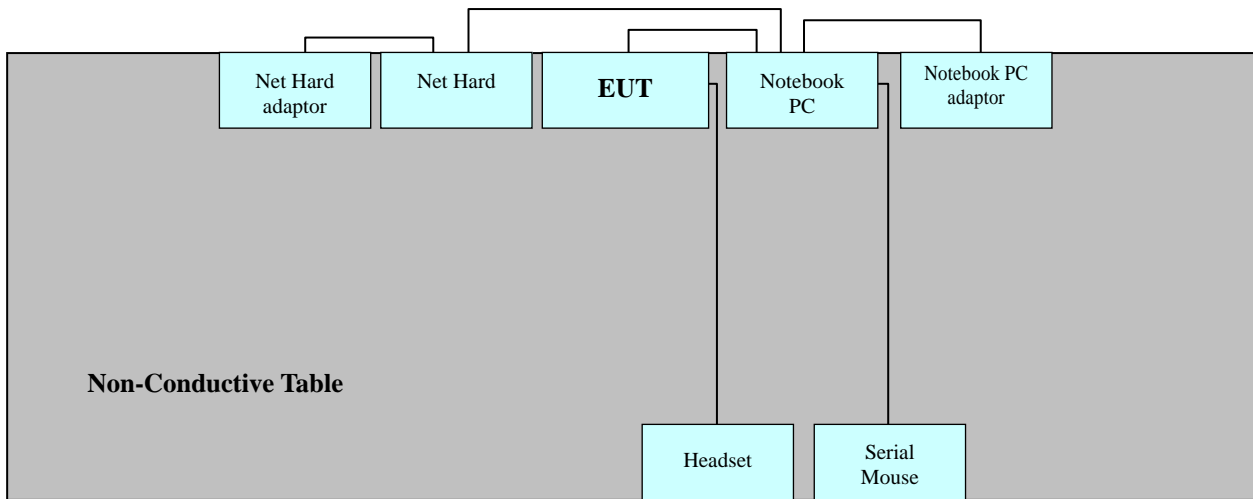
## 2. SYSTEM TEST CONFIGURATION

### 2.1 Configuration of Test System

Power Line Conducted test : EUT was connected to LISN via Notebook PC adaptor and Base Station. 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 semi-anechoic chamber.

[Configuration of Tested System]



Power Line: 120 VAC



### **3. PRELIMINARY TEST**

---

#### **3.1 Conducted Emission Test**

- It was tested Data Communication mode, after connecting all peripheral devices.

**Operation Mode:**         Data communication mode

#### **3. 2 Radiated Emission Test**

- It was tested Data Communication mode, after connecting all peripheral devices.

**Operation Mode:**         Data communication 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 communication mode

Temperature : 21.8 °C

Humidity Level : 40.7 %

Test Date : November 19, 2012

Frequency (MHz)	Transd (dB)	Conductor	Quasi-Peak			Average		
			Limit	Measurement Level	Result Level	Limit	Measurement Level	Result Level
			(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dBuV)
0.499	9.8	H	56	23.3	33.1	46	-	-
0.640	9.8	H	56	24.0	33.8	46	-	-
1.460	9.9	H	56	-	-	46	14.50	24.40
1.692	10.1	N	56	-	-	46	13.50	23.60
2.324	10.2	N	56	-	-	46	9.90	20.10
16.068	11.4	N	60	-	-	50	13.20	24.60

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

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

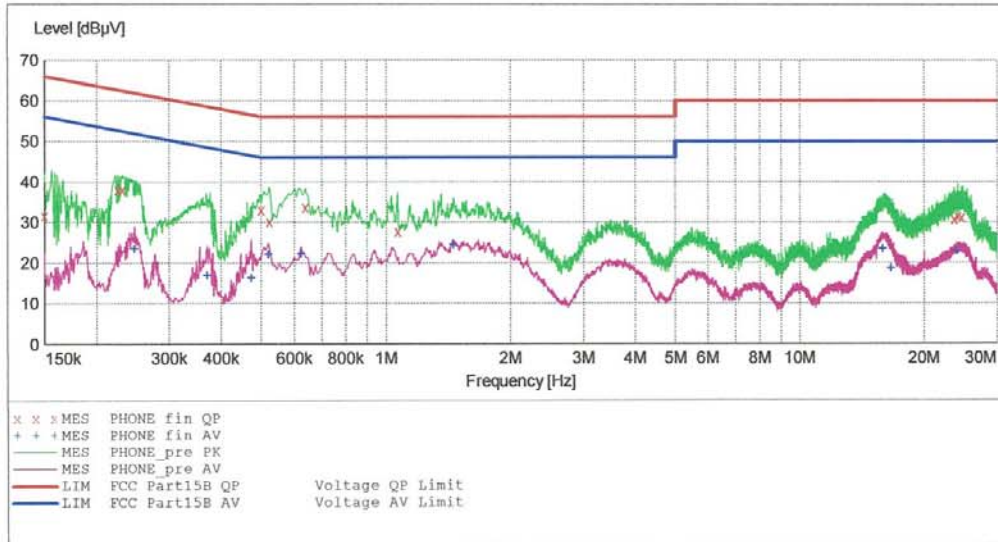
**HCT**

**EMC**

EUT: E615f  
 Manufacturer: LG  
 Operating Condition: DATA 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 Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.	Transducer	
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"**

11/19/2012 4:59PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.150000	31.70	10.0	66	34.3	---	---
0.225010	38.10	9.8	63	24.5	---	---
0.231010	38.10	9.8	62	24.3	---	---
0.499010	33.10	9.8	56	22.9	---	---
0.524000	30.20	9.8	56	25.8	---	---
0.640000	33.80	9.8	56	22.2	---	---
1.068000	27.70	9.8	56	28.3	---	---
23.600000	30.70	11.9	60	29.3	---	---
24.172000	31.40	11.9	60	28.6	---	---
24.620000	31.20	12.0	60	28.8	---	---

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

11/19/2012 4:59PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.247010	23.50	9.8	52	28.4	---	---
0.370010	16.90	9.8	49	31.6	---	---
0.473010	16.20	9.8	47	30.3	---	---
0.520000	22.00	9.8	46	24.0	---	---
0.624000	22.20	9.8	46	23.8	---	---
1.460000	24.40	9.9	46	21.6	---	---
15.860000	23.30	11.1	50	26.7	---	---
16.608000	18.60	11.2	50	31.4	---	---
23.948000	22.80	11.9	50	27.2	---	---

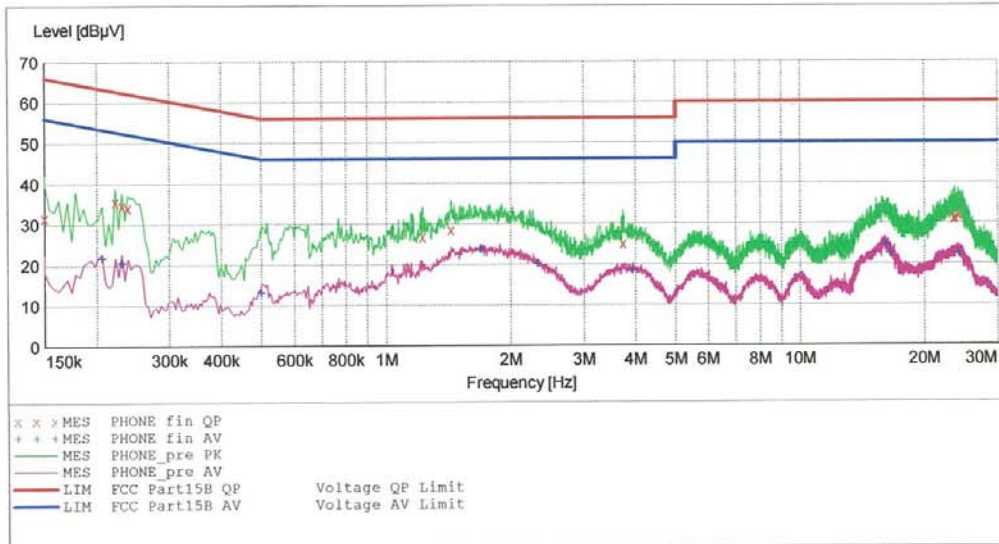
**HCT**

**EMC**

EUT: E615f  
 Manufacturer: LG  
 Operating Condition: DATA 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					Transducer
Start Frequency	Stop Frequency	Step Width	Detector	Meas. Time	IF Bandw.		
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"**

11/19/2012 4:42PM

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.150000	31.70	10.0	66	34.3	---	---
0.222010	35.70	9.9	63	27.1	---	---
0.230010	34.80	10.0	62	27.6	---	---
0.238010	34.10	10.0	62	28.0	---	---
1.228000	26.80	10.0	56	29.2	---	---
1.440000	28.60	10.0	56	27.4	---	---
3.740000	25.10	10.3	56	30.9	---	---
23.492000	31.10	12.3	60	28.9	---	---
23.720000	31.30	12.3	60	28.7	---	---
24.140000	31.90	12.3	60	28.1	---	---

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

11/19/2012 4:42PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.206010	21.80	9.9	53	31.6	---	---
0.230010	20.40	10.0	52	32.1	---	---
0.500000	13.10	10.0	46	32.9	---	---
1.692000	23.60	10.1	46	22.4	---	---
2.324000	20.10	10.2	46	25.9	---	---
3.956000	18.40	10.3	46	27.6	---	---
16.068000	24.60	11.4	50	25.4	---	---
16.536000	22.40	11.5	50	27.6	---	---
24.196000	22.40	12.3	50	27.6	---	---

## 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 communication mode

Temperature : 21.6 °C

Humidity Level : 43.2 %

Test Date : November 19, 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)			
41.600	12.79	V	1.0	13.31	3.50	40.0	29.6	10.4
134.900	20.79	V	1.2	12.01	4.00	43.5	36.8	6.7
143.100	20.58	V	1.5	12.39	4.03	43.5	37.0	6.5
250.000	24.50	H	1.2	12.20	4.50	46.0	41.2	4.8
480.900	10.37	H	1.0	17.49	5.24	46.0	33.1	12.9
784.200	9.56	H	1.0	22.14	5.70	46.0	37.4	8.6

**-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)

Temperature : 21.6 °C

Humidity Level : 43.2 %

Test Date : November 19, 2012

Frequency (GHz)	Peak			POL	Average		
	Total (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)		Total (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)
2.4500	50.20	74	23.8	V	28.30	54	25.7
2.9900	48.70	74	25.3	H	27.10	54	26.9

※ NOTE:

1. Measurement above 1 GHz was performed from 1 GHz to the 5<sup>th</sup> 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 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 (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 Name</u>	<u>Serial Number</u>	<u>Calibration Cycle</u>	<u>Next CAL Date</u>
<b><u>Conducted Emission</u></b>					
<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 - 12 GHz ]

<input type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESU26	100241	1 year	2013.07.30
<input type="checkbox"/> Antenna master	INNCO Systems	MA4000-EP	MA4000/283	N/A	-
<input type="checkbox"/> Turn Table	INNCO Systems	DT3000-3T	DT3000/69	N/A	-
<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"/> Trilog Antenna	Schwarzbeck	VULB9168	185	2 year	2013.02.08
<input type="checkbox"/> Trilog Antenna	Schwarzbeck	VULB9160	3125	2 year	2013.05.03
<input type="checkbox"/> Trilog Antenna	Schwarzbeck	VULB9160	3301	2 year	2014.09.20
<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
<input checked="" type="checkbox"/> Power Amplifier	Rohde & Schwarz	SCU-18	10094	1 year	2013.09.11

## **7. CONCLUSION**

---

The data collected shows that the **EUT type: Cellular/PCS GSM/GPRS/EDGE(RX Only) Cellular/WCDMA/HSDPA Phone with Bluetooth, WLAN, Model: LG-E615f, FCC ID: ZNFE615F** complies with §15.107 and §15.109 of the FCC rules.