



HCT CO., LTD.

CERTIFICATION DIVISION

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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: October 07, 2013**

**Test Report No.: HCTE1310FE04**

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

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

**FCC ID:**

**ZNFD959**

Rule Part(s) / Standard(s) : FCC PART 15 Subpart B Class B  
Equipment Type : Multi-Band GSM/EDGE/WCDMA/LTE Phone with WLAN, Bluetooth, and RFID  
Model Name : D959  
Additional Model Name : LG-D959, LGD959, LG-D959BK, LGD959BK, D959BK  
Port / Connector(s) : USB / Earphone Port  
Date of Test : September 30, 2013 - October 01, 2013

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

  
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**Report prepared by**  
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**Test Engineer of EMC Team**

  
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**Approved by**  
**: Jin-Pyo Hong**  
**Manager of EMC Team**

## DOCUMENT HISTORY

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The revision history for this document is shown in table.

Version	Date	Description
HCTE1310FE04	October 07, 2013	Initial Release

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**ATTACHMENT: TEST SETUP PHOTOGRAPHS**

## 1. GENERAL INFORMATION

### 1.1 Product Description

Equipment Under Test is **EUT type: Multi-Band GSM/EDGE/WCDMA/LTE Phone with WLAN, Bluetooth, and RFID, Model: D959** manufactured by **LG Electronics MobileComm U.S.A., Inc.** Its basic purpose is used for communications.

<b>Model Name</b>	D959
<b>FCC ID</b>	ZNFD959
<b>Additional Model Name</b>	LG-D959, LGD959, LG-D959BK, LGD959BK, D959BK
<b>EUT Type</b>	Multi-Band GSM/EDGE/WCDMA/LTE Phone with WLAN, Bluetooth, and RFID
<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) 1 852.4 MHz to 1 907.6 MHz (WCDMA 1 900) 1712.4 MHz to 1752.6 MHz (WCDMA 1 700) 1 850.7 MHz to 1 909.3 MHz (LTE B2) 1 710 MHz to 1 755 MHz (LTE B4) 704 MHz to 716 MHz (LTE B17)
<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) 1 932.4 MHz to 1 987.6 MHz (WCDMA 1 900) 2 112.4 MHz to 2 152.6 MHz (WCDMA 1 700) 1 930.00 MHz to 1 990.00 MHz (LTE B2) 2 110 MHz to 2 155 MHz (LTE B4) 734 MHz to 746 MHz (LTE B17)

## 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	Model Name	Manufacturer	FCC ID / DoC	Connected To
EUT	D959	LG	ZNFD959	Notebook PC Ear-phone
USB cable (USB2.0)	EAD6258801	CRESYN	-	E.U.T Notebook PC
USB cable (USB2.0)	EAD62329305	BROAD	-	E.U.T Notebook PC
USB cable (USB2.0)	EAD62329304	KSD	-	E.U.T Notebook PC
USB cable (USB3.0)	EAD62488701	BROAD	-	E.U.T Notebook PC
Ear-phone	EAB62950101	LG	-	E.U.T
Notebook PC	ProBook6570b	H.P	DoC	EUT, Notebook PC adaptor
Notebook PC adaptor	PPP012D-S	DELTA Electronics (JIANGSU)LTD	-	Notebook PC
Mouse	Serial mouse	Radio shack	FSUGMZE3	Notebook PC
Adaptor	DA-60M12	Yang Ming Industrial	-	Gateway
Gateway	MV440	Axesstel	PH7MV440	Notebook PC, Adaptor
RJ45 cable	-	-	-	Notebook PC, Gateway

### 1.4 Cable Description

Product Name	Port	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (m)
EUT	Micro USB (USB2.0)	Y	Y	(P,D)1.2
	Micro USB (USB3.0)	Y	Y	(P,D)0.1
	Ear-phone	N/A	Y	(D)1.2
Notebook PC	RJ 45	N/A	N	(D)1.5
	Serial (Mouse)	N/A	Y	(D)1.8
	DC in	N	N/A	(P)1.8
Gateway	DC in	N	N/A	(P)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 (USB2.0)	N	N/A	Y	Both End
	Micro USB (USB3.0)	N	N/A	Y	Both End
	Ear-phone	N	N/A	Y	EUT End
Notebook PC	RJ 45	N	N/A	N	N/A
	Serial (Mouse)	N	N/A	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 74, SEOICHEON-RO, 578BEON-GIL, MAJANG-MYEON, ICHEON-SI, GYEONGGI-DO, 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

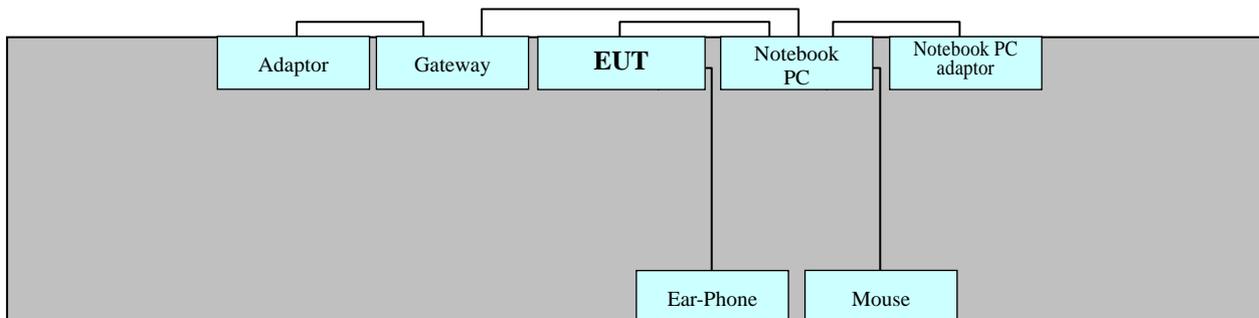
#### 2.1.1 Conducted Emission Test

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.

#### 2.1.2 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 ]



Non-Conductive Table  
Power Line: 120 VAC

### **3. PRELIMINARY TEST**

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

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

**Operation Mode:**       Data Communication mode (USB2.0)  
                                  Data Communication mode (USB3.0)

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

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

**Operation Mode:**       Data Communication mode (USB2.0)  
                                  Data Communication mode (USB3.0)

## 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
USB Type (USB2.0)	: EAD6258801 (CRESYN)
Temperature	: 22.7 °C
Humidity Level	: 50.7 %
Test Date	: September 30, 2013

Frequency (MHz)	Transd (dB)	Conductor	Quasi-Peak			Average		
			Limit (dBuV)	Measurement Level (dBuV)	Result Level (dBuV)	Limit (dBuV)	Measurement Level (dBuV)	Result Level (dBuV)
18.244	10.9	H	60	-	-	50	20.4	31.3
18.244	11.2	N	60	-	-	50	20.5	31.7
19.708	11.2	N	60	-	-	50	20.5	31.7
19.708	10.9	H	60	-	-	50	20.3	31.2
20.260	10.9	H	60	-	-	50	19.9	30.8
20.260	11.3	N	60	-	-	50	20.0	31.3

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

1. The worst-case emissions are reported.
2. Line H = Hot, Line N = Neutral
3. Transd = LISN factor + Cable Loss factor

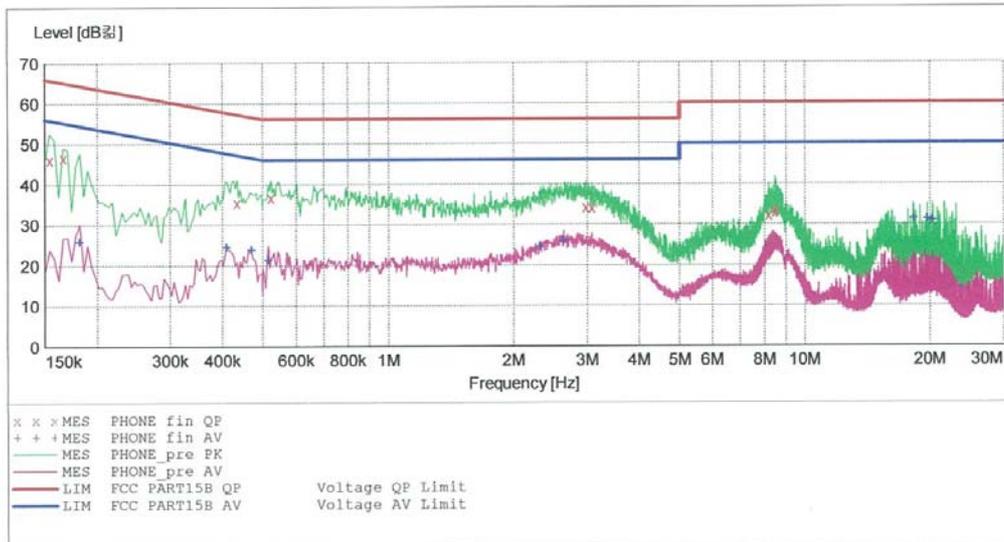
**HCT**

**EMC**

EUT: LG-D959  
 Manufacturer: LG  
 Operating Condition: DATA MODE (DATA CABLE : CRESYN)  
 Test Site: SHIELD ROOM  
 Operator: GC YOON  
 Test Specification: FCC PART15 B  
 Comment: H

**SCAN TABLE: "FCC CLASS B(H)"**

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	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"**

2013-09-30 4:06 Ω ㄷ

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.154001	46.10	9.8	66	19.7	---	---
0.166001	46.60	9.8	65	18.5	---	---
0.434001	35.40	9.8	57	21.7	---	---
0.524000	36.70	9.8	56	19.3	---	---
2.984000	34.20	10.0	56	21.8	---	---
3.084000	34.10	10.1	56	21.9	---	---
8.212000	32.20	10.4	60	27.8	---	---
8.508000	33.10	10.4	60	26.9	---	---
8.540000	33.30	10.4	60	26.7	---	---

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

2013-09-30 4:06 오후

Frequency MHz	Level dB <sub>μV</sub>	Transd dB	Limit dB <sub>μV</sub>	Margin dB	Line	PE
0.182001	25.80	9.8	54	28.6	---	---
0.410001	24.50	9.8	48	23.1	---	---
0.470001	23.80	9.8	47	22.7	---	---
0.516000	21.30	9.8	46	24.7	---	---
2.316000	24.50	10.0	46	21.5	---	---
2.640000	26.00	10.0	46	20.0	---	---
18.244000	31.30	10.9	50	18.7	---	---
19.708000	31.20	10.9	50	18.8	---	---
20.260000	30.80	10.9	50	19.2	---	---

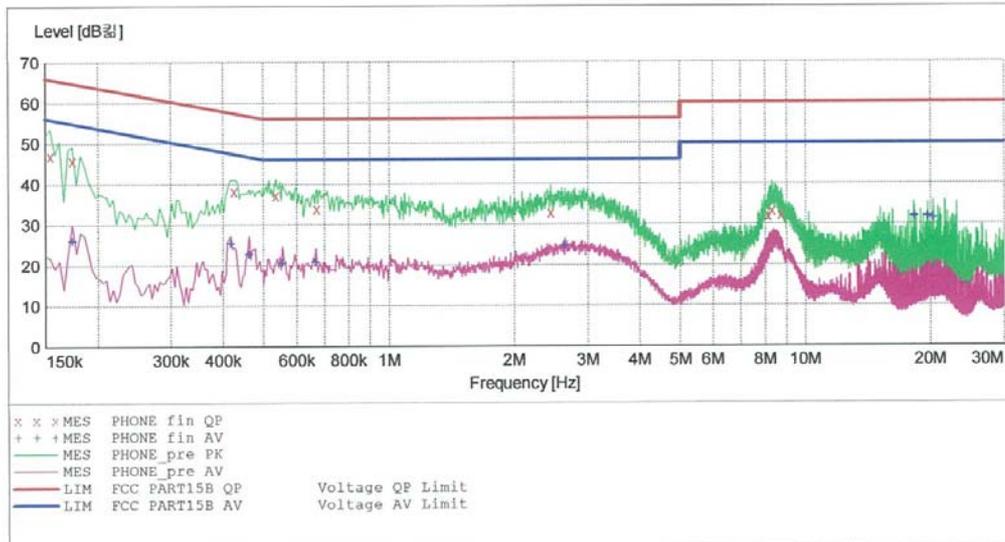
**HCT**

**EMC**

EUT: LG-D959  
 Manufacturer: LG  
 Operating Condition: DATA MODE (DATA CABLE : CRESYN)  
 Test Site: SHIELD ROOM  
 Operator: GC YOON  
 Test Specification: FCC PART15 B  
 Comment: N

**SCAN TABLE: "FCC CLASS B(N)"**

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	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"**

2013-09-30 4:10 오후

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.154001	47.00	10.0	66	18.8	---	---
0.174001	45.80	10.0	65	19.0	---	---
0.426001	38.20	10.0	57	19.1	---	---
0.536000	37.20	10.0	56	18.8	---	---
0.672000	33.90	10.0	56	22.1	---	---
2.452000	32.90	10.2	56	23.1	---	---
8.160000	31.90	10.6	60	28.1	---	---
8.320000	33.20	10.6	60	26.8	---	---
8.752000	32.20	10.6	60	27.8	---	---

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

2013-09-30 4:10 오후

Frequency MHz	Level dB <sub>μV</sub>	Transd dB	Limit dB <sub>μV</sub>	Margin dB	Line	PE
0.174001	25.90	10.0	55	28.8	---	---
0.418001	25.30	10.0	48	22.2	---	---
0.462001	22.60	10.0	47	24.0	---	---
0.556000	20.50	10.0	46	25.5	---	---
0.668000	20.70	10.0	46	25.3	---	---
2.652000	24.60	10.2	46	21.4	---	---
18.244000	31.70	11.2	50	18.3	---	---
19.708000	31.70	11.2	50	18.3	---	---
20.260000	31.30	11.3	50	18.7	---	---

Limit Apply to : FCC PART 15 Subpart B Class B

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

Operation Mode : Data Communication mode

USB Type (USB 3.0) : EAD62488701 (BROAD)

Temperature : 22.7 °C

Humidity Level : 50.7 %

Test Date : September 30, 2013

Frequency	Transd	Conductor	Quasi-Peak			Average		
			Limit	Measurement Level	Result Level	Limit	Measurement Level	Result Level
(MHz)	(dB)		(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dBuV]
0.158	9.8	H	66	40.2	50.0	56	-	-
0.150	10.0	N	66	43.5	53.5	56	20.7	30.7
0.162	10.0	N	65	41.2	51.2	55	22.9	32.9
0.170	10.0	N	65	39.6	49.6	55	20.0	30.0
3.000	10.0	H	56	-	-	46	19.7	29.7
23.128	11.1	H	60	-	-	50	21.5	32.6

※ **NOTE:** Refer to page 16 to page 19 for details.

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

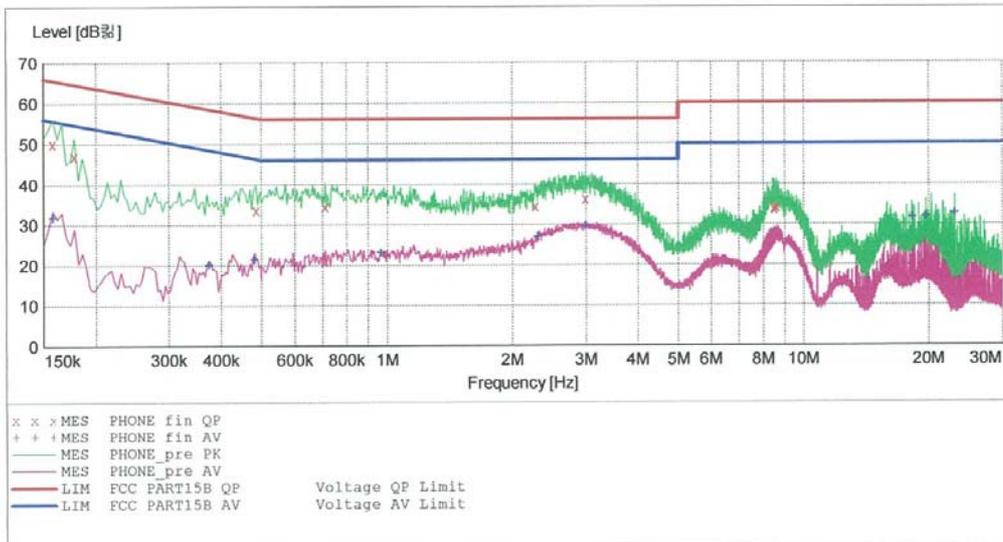
**HCT**

**EMC**

EUT: LG-D959  
 Manufacturer: LG  
 Operating Condition: DATA MODE USB 3.0  
 Test Site: SHIELD ROOM  
 Operator: GC YOON  
 Test Specification: FCC PART15 B  
 Comment: H

**SCAN TABLE: "FCC CLASS B(H)"**

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	10.0 ms	9 kHz	None	
500.0 kHz	5.0 MHz	4.0 kHz	Average	10.0 ms	9 kHz	None	
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None	
			Average	10.0 ms	9 kHz	None	



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

2013-09-30 3:40 Ω ㄸ

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.158001	50.00	9.8	66	15.5	---	---
0.178001	47.00	9.8	65	17.6	---	---
0.486001	33.60	9.8	56	22.7	---	---
0.712000	34.50	9.8	56	21.5	---	---
2.276000	34.50	10.0	56	21.5	---	---
3.000000	36.30	10.0	56	19.7	---	---
8.492000	34.10	10.4	60	25.9	---	---
8.536000	33.80	10.4	60	26.2	---	---
8.624000	34.20	10.4	60	25.8	---	---

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

2013-09-30 3:40 Ω-φ

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.158001	31.70	9.8	56	23.8	---	---
0.374001	20.00	9.8	48	28.4	---	---
0.482001	21.30	9.8	46	25.0	---	---
0.968000	23.00	9.8	46	23.0	---	---
2.304000	27.00	10.0	46	19.0	---	---
3.000000	29.70	10.0	46	16.3	---	---
18.244000	31.60	10.9	50	18.4	---	---
19.708000	31.70	10.9	50	18.3	---	---
23.128000	32.60	11.1	50	17.4	---	---

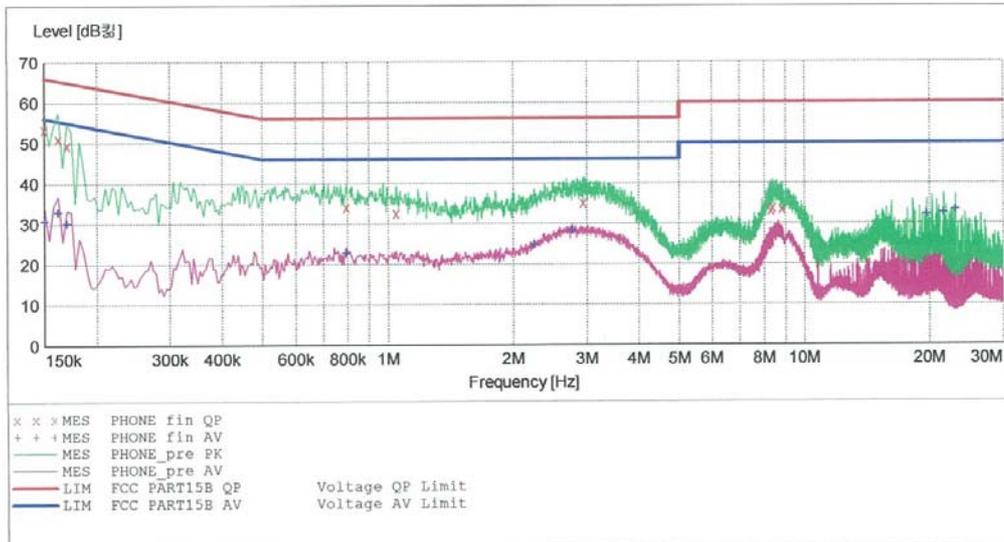
**HCT**

**EMC**

EUT: LG-D959  
 Manufacturer: LG  
 Operating Condition: DATA MODE USB 3.0  
 Test Site: SHIELD ROOM  
 Operator: GC YOON  
 Test Specification: FCC PART15 B  
 Comment: N

**SCAN TABLE: "FCC CLASS B(N)"**

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	10.0 ms	9 kHz	None	
500.0 kHz	5.0 MHz	4.0 kHz	Average	10.0 ms	9 kHz	None	
5.0 MHz	30.0 MHz	4.0 kHz	MaxPeak	10.0 ms	9 kHz	None	
			Average				



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

2013-09-30 3:36 Ω ㄷ

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Line	PE
0.150001	53.50	10.0	66	12.5	---	---
0.162001	51.20	10.0	65	14.1	---	---
0.170001	49.60	10.0	65	15.4	---	---
0.796000	34.10	10.0	56	21.9	---	---
1.048000	32.60	10.1	56	23.4	---	---
2.952000	35.10	10.2	56	20.9	---	---
8.312000	33.20	10.6	60	26.8	---	---
8.420000	33.90	10.6	60	26.1	---	---
8.864000	33.70	10.6	60	26.3	---	---

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

2013-09-30 3:36 오후

Frequency MHz	Level dB <sub>μV</sub>	Transd dB	Limit dB <sub>μV</sub>	Margin dB	Line	PE
0.150001	30.70	10.0	56	25.3	---	---
0.162001	32.90	10.0	55	22.4	---	---
0.170001	30.00	10.0	55	24.9	---	---
0.796000	22.70	10.0	46	23.3	---	---
2.252000	24.70	10.2	46	21.3	---	---
2.776000	28.30	10.2	46	17.7	---	---
19.708000	32.10	11.2	50	17.9	---	---
21.664000	32.50	11.3	50	17.5	---	---
23.128000	33.20	11.4	50	16.8	---	---

## 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

USB Type (USB 2.0) : EAD62329304 (KSD)

Temperature : 25.0 °C

Humidity Level : 54.0 %

Test Date : October 01, 2013

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)			
125.0	13.08	V	1.0	12.01	4.02	43.5	29.11	14.4
215.5	22.65	H	1.5	10.40	4.39	43.5	37.44	6.1
265.8	21.59	H	1.2	12.29	4.54	46.0	38.42	7.6
360.0	16.32	H	1.2	14.74	4.86	46.0	35.92	10.1
500.0	8.37	H	1.5	17.63	5.25	46.0	31.25	14.8
624.0	8.85	H	1.5	19.96	5.51	46.0	34.32	11.7

※ NOTE:

1. The worst-case emissions are reported.

**-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

USB Type (USB 3.0) : EAD62488701 (BROAD)

Temperature : 25.0 °C

Humidity Level : 54.0 %

Test Date : October 01, 2013

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)			
125.0	10.59	V	1.0	12.01	4.02	43.5	26.62	16.9
213.9	20.40	H	1.5	10.34	4.38	43.5	35.12	8.4
270.1	19.13	V	1.9	12.43	4.56	46.0	36.12	9.9
345.2	17.16	V	1.8	14.41	4.80	46.0	36.37	9.6
360.0	15.37	V	1.9	14.74	4.86	46.0	34.97	11.0
624.0	9.80	V	1.0	19.96	5.51	46.0	35.27	10.7

**-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 Communication mode

USB Type (USB 2.0) : EAD62329304 (KSD)

Temperature : 25.0 °C

Humidity Level : 54.0 %

Test Date : October 01, 2013

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)
2.2488	53.40	74	20.6	V	38.70	54	15.3
2.3897	52.00	74	22.0	V	31.50	54	22.5

※ **NOTE:**

1. The worst-case emissions are reported.
2. 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.

**-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 Communication mode

USB Type (USB 3.0) : EAD62488701 (BROAD)

Temperature : 25.0 °C

Humidity Level : 54.0 %

Test Date : October 01, 2013

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)
2.2412	53.10	74	20.9	V	37.70	54	16.3
2.3973	51.80	74	22.2	V	32.00	54	22.0

※ **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.

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

### [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	2014.04.25
<input type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESCI	100033	1 year	2014.06.23
<input type="checkbox"/> LISN	Rohde & Schwarz	ESH3-Z5	100282	1 year	2014.07.03
<input checked="" type="checkbox"/> LISN	EMCO	3816/2SH	9706-1070	1 year	2014.04.26
<input checked="" type="checkbox"/> LISN	Rohde & Schwarz	ENV216	100073	1 year	2014.02.06
<input type="checkbox"/> Attenuator	Rohde & Schwarz	ESH3-Z2	357.8810.352	1 year	2014.07.03
<b><u>Radiated Emission</u></b>					
<b>-For measurement below 1 GHz</b>					
<input checked="" type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESI40	831564103	1 year	2014.04.16
<input checked="" type="checkbox"/> Trilog Antenna	Schwarzbeck	VULB9160	3301	2 year	2014.12.17
<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 type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESU 26	100241	1 year	2014.07.01
<input type="checkbox"/> Trilog Antenna	Schwarzbeck	VULB9168	185	2 year	2015.04.16
<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	-
<b>-For measurement above 1 GHz</b>					
<input checked="" type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESI40	831564103	1 year	2014.04.16
<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 type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESU 26	100241	1 year	2014.07.01
<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"/> Power Amplifier	CERNEX	CBLU1183540	21690	1 year	2014.07.12
<input checked="" type="checkbox"/> Horn Antenna	Schwarzbeck	BBHA 9120D	296	2 year	2014.12.13

## 7. CONCLUSION

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The data collected shows that the **EUT type: Multi-Band GSM/EDGE/WCDMA/LTE Phone with WLAN, Bluetooth, and RFID, FCC ID: ZNFD959, Model: D959** complies with §15.107 and §15.109 of the FCC rules.