

# EMC TEST REPORT

Test item : Mobile Handset  
Model No. : LG-D160  
Order No. : DEMC1401-00120  
Date of receipt : 2014-01-13  
Test duration : 2014-01-20  
Use of report : FCC CoC Marking  
Date of Issue : 2014-01-28

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

Test laboratory : Digital EMC Co., Ltd.  
42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 449-935

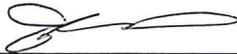
Test specification : ANSI C 63.4:2003  
FCC Part 15 Subpart B  
(Class B personal computers and peripherals)

Test environment : Temperature : (19 ~ 20) °C,  
Humidity : (32 ~ 33) % R.H.

Test result :  Comply  Not Comply

The test results presented in this test report are limited only to the sample supplied by applicant and the use of this test report is inhibited other than its purpose.  
This test report shall not be reproduced except in full, without the written approval of DIGITAL EMC CO., LTD.

Tested by:



Engineer  
HyungJun Kim

Reviewed by:



Manager  
MyungJin Song

**PRESIDENT OF DIGITAL EMC CO., LTD.**

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## 1. General Remarks

This report contains the result of tests performed by:

**DIGITAL EMC CO., LTD.**

Address : 42, Yurim-ro, 154beon-gil, Cheoin-gu, Yongin-si, Gyeonggi-do, Korea 449-935

<http://www.digitalemc.com>

Tel: +82-31-321-2664 Fax: +82-31-321-1664

## 2. Test Laboratory

Digital EMC Co., Ltd. has been accredited / filed / authorized by the agencies listed in the following table;

Certificate	Nation	Agency	Code	Mark
Accreditation	Korea	KOLAS	393	ISO/IEC 17025
Site Filing	USA	FCC	101842 678747 596748	Test Facility list & NSA Data
	Canada	IC	5740A-1 5740A-2	Test Facility list & NSA Data
	Japan	VCCI	C-1427 R-1364, R-3385, R-4076, T-1442, G-338, G754	Test Facility list & NSA Data
Certification	Korea	KC	KR0034	Test Facility list & NSA Data
	Germany	TUV	CARAT 13 11 86721 001	ISO/IEC 17025

Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which is the "General requirements for the competent of calibration and testing laboratory".

### 3. General Information of EUT

Model No.	Mobile Handset
Serial No	NONE
FCC ID	ZNFD160
Supplied Power for Test	AC 120 V, 60 Hz
Clock Frequency	1.2 GHz
Applicant	LG Electronics MobileComm U.S.A., Inc. 1000 Sylvan Avenue, Englewood Cliffs NJ 07632
Manufacturer	LG Electronics MobileComm U.S.A., Inc. 1000 Sylvan Avenue, Englewood Cliffs NJ 07632

**Related Submittal(s) / Grant(s)**

**Original submittal only.**

## 4. Test Summary

### 4.1 Applied standards and test results

Test Items	Applied Standards	Results
Conducted Disturbance	ANSI C63.4:2003	<b>C</b>
Radiated Disturbance	ANSI C63.4:2003	<b>C</b>
C=Comply N/C=Not Comply N/T=Not Tested N/A=Not Applicable		

The data in this test report are traceable to the national or international standards.

### 4.2 Test environment and conditions

Test Items	Test date (YYYY-MM-DD)	Temp (°C)	Humidity (% R.H.)
Conducted Disturbance	2014-01-20	19	33
Radiated Disturbance	2014-01-20	19	32
	2014-01-20	20	33

### 4.3 Test result Summary

#### (1) Conducted Emission

Frequency [MHz]	Phase	Result [dB $\mu$ V]	Detector	Limit [dB $\mu$ V]	Margin [dB]
<b>0.485</b>	<b>N</b>	<b>35.8</b>	Average-Peak	<b>46.3</b>	<b>10.5</b>

#### (2) Radiated Emission

Frequency [MHz]	Pol.	Result [dB( $\mu$ V/m)]	Detector	Limit [dB( $\mu$ V/m)]	Margin [dB]
<b>527.964</b>	<b>V</b>	<b>34.7</b>	Quasi-Peak	<b>46.0</b>	<b>11.3</b>

## 5. Test Set-up and operation mode

### 5.1 Principle of Configuration Selection

**Emission** : The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

### 5.2 Test Operation Mode

- PC link mode (The measurement was made of the maximized by: data exchange speed; moving the cable)

### 5.3 Support Equipment Used

Unit	Model No.	Serial No.	Manufacturer	CABLE			Backshell	FCC ID
				Connect type	Length (m)	shield		
Laptop	LGX14	009QTAF022136	LG	Power	1.6	Non-Shield	Plastic	DOC
				Audio	2.5	Non-Shield		
				USB	1.6	Shield		
				USB	1.8	Shield		
				USB	0.5	Shield		
MOUSE	MS111-T	CN-0KW2YH-71616-245-1S1T	DELL INC.	USB	1.6	Shield	Plastic	DOC
HEADSET	COV909	NONE	COSY	Audio	2.5	Non-Shield	Plastic	DOC
PRINTER	EPSON AcuLaser M1200	LWTZ181070	EPSON	USB	1.8	Shield	Plastic	DOC
				Power	1.6	Non-Shield		
AC ADAPTER	HU10182-12099A	YC60613826059309200	YANG MING INDUSTRIAL	DC Power	1.6	Non-Shield	Plastic	DOC
				AC Power	2.0	Non-Shield		
EARPHONE	N/A	N/A	LG	Audio	1.4	Non-Shield	Plastic	DOC

## 6. Test Results : Emission

### 6.1 Conducted Disturbance

#### 6.1.1 Measurement Procedure

In the range of 0.15 MHz to 30 MHz, the conducted disturbance was measured and set-up was made accordance with **ANSI C63.4**.

If the EUT is table top equipment, it was placed on a wooden table with a height of 0.8 m above the reference ground plane and 0.4 m from the conducting wall of the shielded room.

Also if the EUT is floor-standing equipment, it was placed on a non-conducted support with a height up to 0.15 m above the reference ground plane.

Connect the EUT's power source lines to the appropriate power mains / peripherals through the LISN. All the other peripherals are connected to the 2<sup>nd</sup> LISN, if any.

Unused measuring port of the LISN was resistively terminated by 50 ohm terminator.

The measuring port of the LISN for EUT was connected to spectrum analyzer.

Using conducted emission test software, the emissions were scanned with peak detector mode.

After scanning over the frequency range, suspected emissions were selected to perform final measurement. When performing final measurement, the receiver was used which has Quasi-Peak detector and Average detector.

By varying the configuration of the test sample and the cable routing it was attempted to maximize the emission.

For further description of the configuration refer to the picture of the test set-up.

#### 6.1.2 Limit for Conducted Disturbance

(1) Conducted disturbance at mains ports.

Frequency range (MHz)	Limits dB(μV)			
	Quasi-peak		Average	
	Class A	Class B	Class A	Class B
0.15 to 0.50	79	66 to 56	66	56 to 46
0.50 to 5	73	56	60	46
5 to 30		60		50

Note 1 The lower limit shall apply at the transition frequencies.  
 Note 2 The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz.

- Note) 1. Emission Level = Reading Value + Correction Factor.  
 2. Correction Factor = Cable Loss + Insertion Loss of LISN  
 3. Margin = Limit - Emission level

Test Result



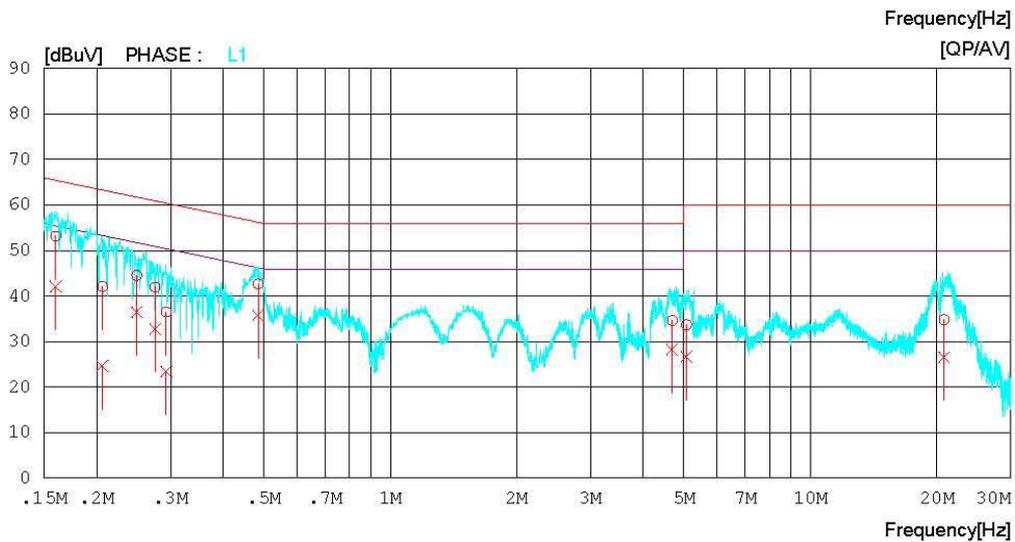
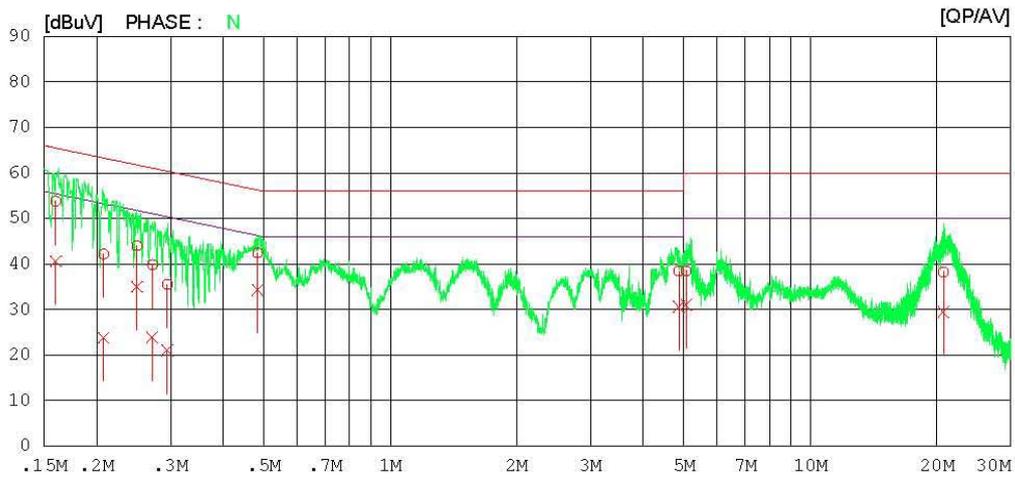
Results of Conducted Emission

Digital EMC  
Date : 2014-01-20

Model No.	: LG-D160	Reference No.	:
Type	:	Power Supply	: 120 V 60 Hz
Serial No.	:	Temp/Humi.	: 19 °C 33 % R.H
Test Condition	:	Operator	:

Memo :

LIMIT : CISPR22\_B\_QP  
CISPR22\_B\_AV



## Results of Conducted Emission

Digital EMC  
 Date : 2014-01-20

Model No. : LG-D160	Reference No. :
Type :	Power Supply : 120 V 60 Hz
Serial No. :	Temp/Humi. : 19 °C 33 % R.H
Test Condition :	Operator :

Memo :

LIMIT : CISPR22\_B QP  
 CISPR22\_B AV

NO	FREQ [MHz]	READING		C. FACTOR [dB]	RESULT		LIMIT		MARGIN		PHASE
		QP [dBuV]	AV [dBuV]		QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	QP [dBuV]	AV [dBuV]	
1	0.15990	53.7	40.5	0.1	53.8	40.6	65.5	55.5	11.7	14.9	N
2	0.20783	42.1	23.7	0.1	42.2	23.8	63.3	53.3	21.1	29.5	N
3	0.24963	43.9	34.9	0.1	44.0	35.0	61.8	51.8	17.8	16.8	N
4	0.27161	39.8	23.7	0.1	39.9	23.8	61.1	51.1	21.2	27.3	N
5	0.29471	35.4	20.9	0.1	35.5	21.0	60.4	50.4	24.9	29.4	N
6	0.48367	42.4	34.2	0.1	42.5	34.3	56.3	46.3	13.8	12.0	N
7	4.86600	37.9	30.1	0.5	38.4	30.6	56.0	46.0	17.6	15.4	N
8	5.06520	38.0	30.5	0.5	38.5	31.0	60.0	50.0	21.5	19.0	N
9	20.74480	37.5	28.7	0.7	38.2	29.4	60.0	50.0	21.8	20.6	N
10	0.15995	53.1	42.0	0.1	53.2	42.1	65.5	55.5	12.3	13.4	L1
11	0.20666	42.0	24.6	0.1	42.1	24.7	63.3	53.3	21.2	28.6	L1
12	0.24933	44.4	36.4	0.1	44.5	36.5	61.8	51.8	17.3	15.3	L1
13	0.27580	41.9	32.7	0.1	42.0	32.8	60.9	50.9	18.9	18.1	L1
14	0.29302	36.4	23.3	0.1	36.5	23.4	60.4	50.4	23.9	27.0	L1
15	0.48500	42.6	35.7	0.1	42.7	35.8	56.3	46.3	13.6	10.5	L1
16	4.69280	34.2	27.8	0.5	34.7	28.3	56.0	46.0	21.3	17.7	L1
17	5.07280	33.2	26.2	0.5	33.7	26.7	60.0	50.0	26.3	23.3	L1
18	20.80760	34.1	25.9	0.7	34.8	26.6	60.0	50.0	25.2	23.4	L1

## 6.2 Radiated Disturbance

### 6.2.1 Measurement Procedure

The radiated disturbance was measured and set-up was made accordance with **ANSI C63.4**.

If the EUT is tabletop equipment, it was placed on a wooden table with a height of 0.8 m above the reference ground plane and 3 m or 10 m away from the interference receiving antenna in the **10m semi-anechoic chamber**.

Also if the EUT is floor-standing equipment, it was placed on a non-conducted support with a height up to 0.15 m above the reference ground plane.

Rotate the EUT from (0 - 360)° and position the receiving antenna at heights from (1 - 4) m above the reference ground plane continuously to determine associated with higher emission levels and record them.

The measurement was made in both the vertical and horizontal polarization, and the maximum value is presented in the report.

For below 1 GHz frequency range, Quasi-Peak detector with 120 kHz RBW was used.

Also Peak and Average detector with 1 MHz RBW were used for above 1 GHz frequency range.

For further description of the configuration refer to the picture of the test set-up.

## 6.2.2 Limit for Radiated Disturbance

- The test frequency range of Radiated Disturbance measurements are listed below.

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency of measurement range (MHz)
Below 108	1 000
108 – 500	2 000
500 – 1 000	5 000
Above 1 000	5 <sup>th</sup> harmonic of the highest frequency or 40 GHz, whichever is lower

### (1) Limit for Radiated Emission below 1 000MHz

Frequency range (MHz)	Class A Equipment (10 m distance)	Class B Equipment (3 m distance)
	Quasi-peak (dB $\mu$ V/m)	Quasi-peak (dB $\mu$ V/m)
30 to 88	39.1	40
88 to 216	43.5	43.5
216 to 960	46.4	46
960 to 1 000	49.5	54

Note 1 The lower limit shall apply at the transition frequency.

Note 2 Additional provisions may be required for cases where interference occurs.

Note 3 According to 15.109(g), as an alternative to the radiated emission limit shown above, digital devices may be shown to comply with the standards(CISPR), Pub. 22 shown as below.

Frequency range (MHz)	Class A Equipment (10 m distance)	Class B Equipment (10 m distance)
	Quasi-peak (dB $\mu$ V/m)	Quasi-peak (dB $\mu$ V/m)
30 to 230	40	30
230 to 1 000	47	37

### (2) Limits for Radiated Emission above 1 000MHz at a measuring distance of 3 m

Frequency (GHz)	Class A Equipment		Class B Equipment	
	Peak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)	Peak (dB $\mu$ V/m)	Average (dB $\mu$ V/m)
1 to 40	80	60	74	54

Note) 1. Emission Level = Reading Value + Correction Factor.

2. Correction Factor = Cable loss - Amp gain + Antenna Factor

3. Margin = Limit - Emission level

**Test Result**

< 30 MHz ~ 1 GHz >

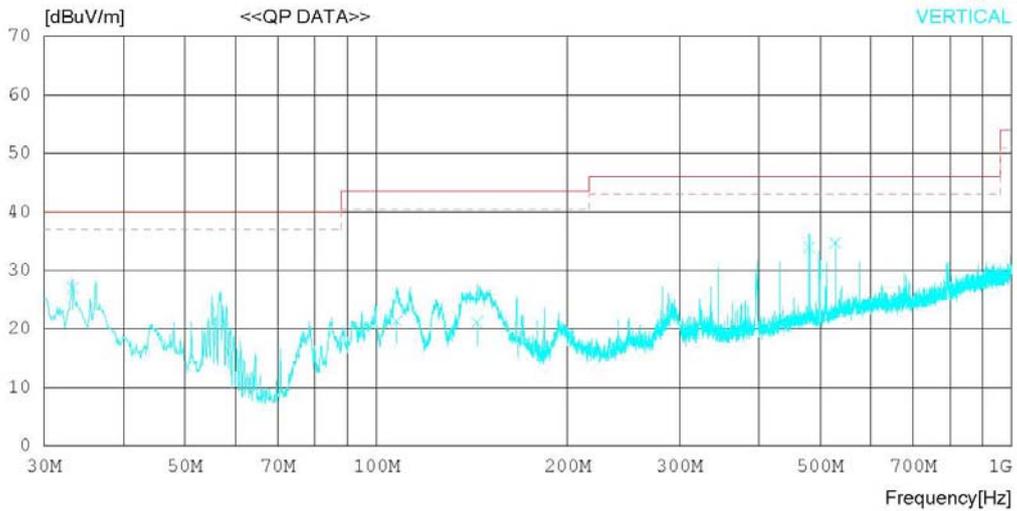
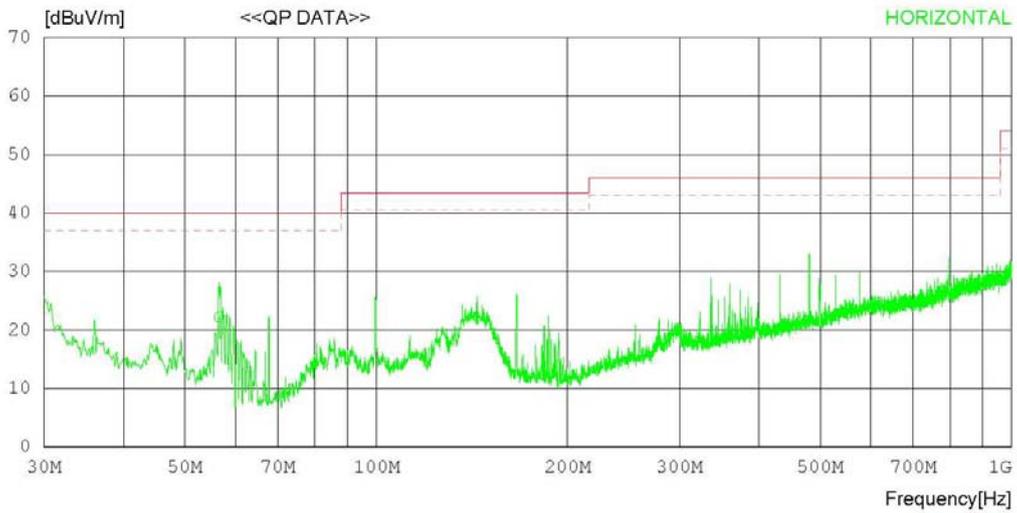
**RADIATED EMISSION**

Date : 2014-01-20

Model Name	: LG-D160	Reference No.	:
Model No.	:	Power Supply	: 120 V 60 Hz
Serial No.	:	Temp/Humi	: 20 °C 33 % R.H
Test Condition	: PC LINK	Operator	:

Memo :

LIMIT : FCC Part15 Subpart.B Class B (3m)  
MARGIN: 3 dB



## RADIATED EMISSION

Date : 2014-01-20

Model Name : LG-D160	Reference No. :
Model No. :	Power Supply : 120 V 60 Hz
Serial No. :	Temp/Humi : 20 °C 33 % R.H
Test Condition : PC LINK	Operator :

Memo :

LIMIT : FCC Part15 Subpart B Class B (3m)  
 MARGIN: 3 dB

No.	FREQ [MHz]	READING QP [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Horizontal -----										
1	56.554	36.2	6.4	2.2	22.6	22.2	40.0	17.8	400	287
----- Vertical -----										
2	33.274	31.5	16.2	1.9	22.6	27.0	40.0	13.0	100	30
3	107.720	30.5	11.0	2.5	22.7	21.3	43.5	22.2	100	268
4	143.973	30.2	10.7	3.0	22.8	21.1	43.5	22.4	100	358
5	480.068	35.5	17.1	5.8	24.4	34.0	46.0	12.0	100	0
6	527.964	35.2	17.7	6.2	24.4	34.7	46.0	11.3	100	358

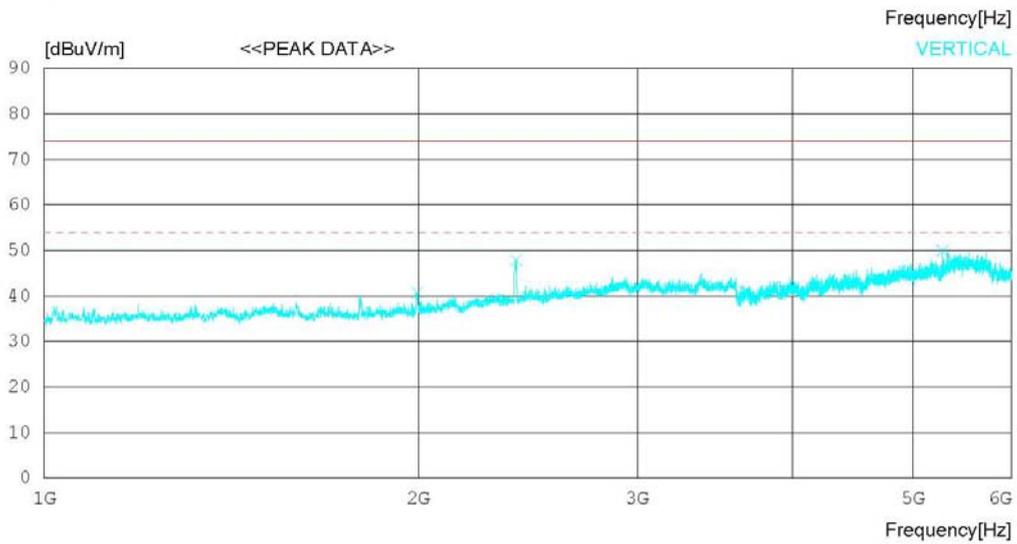
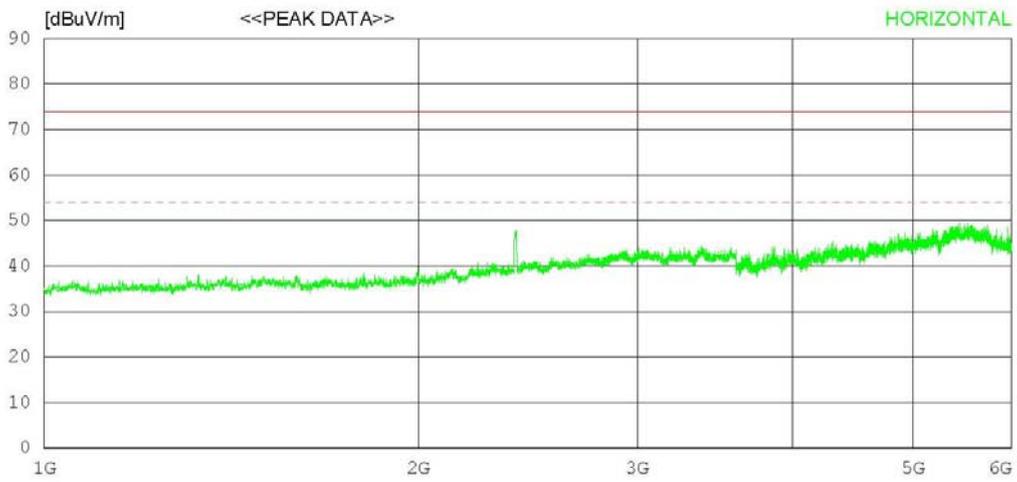
< (1 ~ 6) GHz\_Peak >

## RADIATED EMISSION

Date : 2014-01-20

Model Name	: LG-D160	Reference No.	:
Model No.	:	Power Supply	: 120 V 60 Hz
Serial No.	:	Temp/Humi	: 19 °C 32 % R.H
Test Condition	: PC LINK	Operator	:
Memo	:		

LIMIT : FCC Part15 Subpart.B Class B (3m) - 18G(Peak)  
 FCC Part15 Subpart.B Class B (3m) - 18G(Avg)



## RADIATED EMISSION

Date : 2014-01-20

Model Name : LG-D160	Reference No. :
Model No. :	Power Supply : 120 V 60 Hz
Serial No. :	Temp/Humi : 19 °C 32 % R.H
Test Condition : PC LINK	Operator :

Memo :

LIMIT : FCC Part15 Subpart B Class B (3m) - 18G(Peak)  
 FCC Part15 Subpart B Class B (3m) - 18G(Avg)

No.	FREQ [MHz]	READING PEAK [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Vertical -----										
1	1996.250	51.0	24.6	4.7	39.5	40.8	74.0	33.2	100	357
2	2397.500	55.2	26.9	5.1	39.3	47.9	74.0	26.1	100	359
3	5281.250	46.7	33.9	7.9	38.5	50.0	74.0	24	100	135

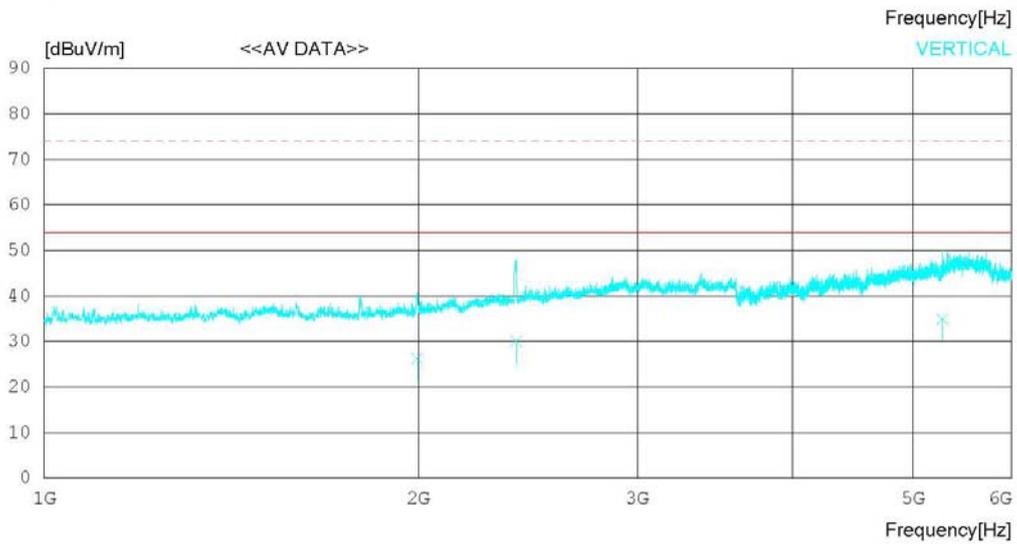
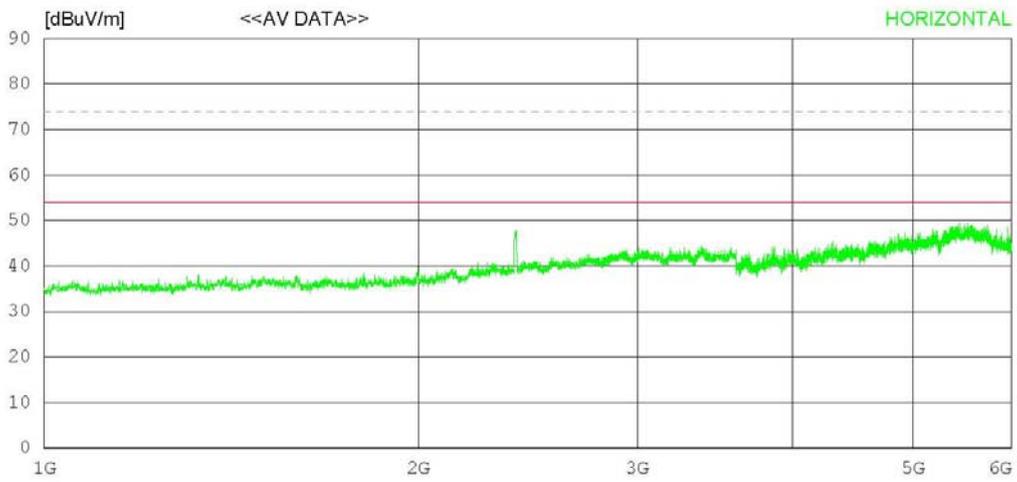
< (1 ~ 6) GHz\_Average >

**RADIATED EMISSION**

Date : 2014-01-20

Model Name	: LG-D160	Reference No.	:
Model No.	:	Power Supply	: 120 V 60 Hz
Serial No.	:	Temp/Humi	: 19 °C 32 % R.H
Test Condition	: PC LINK	Operator	:
Memo	:		

LIMIT : FCC Part15 Subpart.B Class B (3m) - 18G(Avg)  
FCC Part15 Subpart.B Class B (3m) - 18G(Peak)



## RADIATED EMISSION

Date : 2014-01-20

Model Name : LG-D160	Reference No. :
Model No. :	Power Supply : 120 V 60 Hz
Serial No. :	Temp/Humi : 19 °C 32 % R.H
Test Condition : PC LINK	Operator :

Memo :

LIMIT : FCC Part15 Subpart B Class B (3m) - 18G(Avg)  
 FCC Part15 Subpart B Class B (3m) - 18G(Peak)

No.	FREQ [MHz]	READING AV [dBuV]	ANT FACTOR [dB]	LOSS [dB]	GAIN [dB]	RESULT [dBuV/m]	LIMIT [dBuV/m]	MARGIN [dB]	ANTENNA [cm]	TABLE [DEG]
----- Vertical -----										
1	1996.250	36.5	24.6	4.7	39.5	26.3	54.0	27.7	100	357
2	2397.500	37.4	26.9	5.1	39.3	30.1	54.0	23.9	100	359
3	5281.250	31.6	33.9	7.9	38.5	34.9	54.0	19.1	100	135

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## Appendix 1

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### List of Test and Measurement Instruments

To facilitate inclusion on each page of the test equipment used for related tests, each item of test equipment is identified by the Test Laboratory.

### 1. Conducted Disturbance

Name of Instrument	Model No.	Manufacturer	Serial No.	Cal. Date	Next Cal. Date
<input type="checkbox"/> SPECTRUM ANALYZER	8591E	H/P	3649A05889	2013.02.28	2014.02.28
<input type="checkbox"/> RFI/FIELD INTENSITY METER	KNM-2402	KYORITSU	4N-170-3	2013.06.28	2014.06.28
<input type="checkbox"/> LISN	KNW-407	KYORITSU	8-317-8	2014.01.08	2015.01.08
<input type="checkbox"/> LISN	PMM L2-16B	NARDA S.T.S. / PMM	000WX20305	2013.06.27	2014.06.27
<input type="checkbox"/> 50 OHM TERMINATOR	CT-01	TME	N/A	2014.01.08	2015.01.08
<input checked="" type="checkbox"/> EMI TEST RECEIVER	ESCI	ROHDE & SCHWARZ	100364	2013.02.27	2014.02.27
<input checked="" type="checkbox"/> LISN	ESH2-Z5	ROHDE & SCHWARZ	828739/006	2013.09.12	2014.09.12
<input checked="" type="checkbox"/> LISN	LISN1600	TTI	197204	2013.06.28	2014.06.28
<input checked="" type="checkbox"/> 50 OHM TERMINATOR	CT-01	TME	N/A	2014.01.08	2015.01.08

### 2. Radiated Disturbance

Name of Instrument	Model No.	Manufacturer	Serial No.	Cal. Date	Next Cal. Date
<input checked="" type="checkbox"/> EMI TEST RECEIVER	ESU	ROHDE & SCHWARZ	100014	2014.01.08	2015.01.08
<input checked="" type="checkbox"/> BILOG ANTENNA	CBL6112B	SCHAFFNER	2737	2012.11.06	2014.11.06
<input checked="" type="checkbox"/> HORN ANTENNA	BBHA9120A	SCHWARZBECK	322	2012.05.15	2014.05.15
<input checked="" type="checkbox"/> AMPLIFIER	8447E	H/P	2945A02865	2014.01.08	2015.01.08
<input checked="" type="checkbox"/> AMPLIFIER	8447B	AGILENT	3008A01590	2013.02.27	2014.02.27
<input type="checkbox"/> SPECTRUM ANALYZER	E4411B	AGILENT	US41062735	2013.06.27	2014.06.27
<input type="checkbox"/> AMPLIFIER	8447D	AGILENT	2443A03690	2013.06.28	2014.06.28
<input type="checkbox"/> EMI TEST RECEIVER	ESCI	ROHDE & SCHWARZ	100364	2013.02.27	2014.02.27
<input type="checkbox"/> BICONICAL ANT.	VHA 9103	SCHWARZBECK	91032789	2012.04.10	2014.04.10
<input type="checkbox"/> LOG-PERIODIC ANT.	UHALP 9108A	SCHWARZBECK	590	2012.10.04	2014.10.04
<input type="checkbox"/> BICONICAL ANT.	VHA 9103	SCHWARZBECK	91031946	2013.05.16	2015.05.16
<input type="checkbox"/> LOG-PERIODIC ANT.	UHALP 9108-A1	SCHWARZBECK	0411	2013.05.16	2015.05.16
<input type="checkbox"/> AMPLIFIER	MLA-100K01-B01-26	TSJ	1252741	2013.02.28	2014.02.28

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**Appendix 2**

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**Report Revision History**

Revision Date	Description	Revised By	Revision Reviewed By
None	Original	N/A	N/A