HCT CO.,LTD.
74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA
TEL: +82-31-645-6300 **FAX: +82-31-645-6401**

FCC NFC REPORT

FCC Certification

Applicant Name:
LG Electronics MobileComm U.S.A., Inc.

Address:
1000 Sylvan Avenue, Englewood Cliffs NJ 07632

Date of Issue:
March 26, 2018
Test Site/Location:
HCT CO., LTD., 74,Seoicheon-ro 578beon-gil,Majang-myeo,Icheon-si, Gyeonggi-do, 17383, Rep. of KOREA
Report No.: HCT-RF-1803-FC020

FCC ID	**: ZNFQ610EA**
APPLICANT	**: LG Electronics MobileComm U.S.A., Inc.**

Model:	LM-Q610EA
Additional model(s):	LMQ610EA, Q610EA, LM-Q610EM, LMQ610EM, Q610EM, LM-Q610ES, LMQ610ES, Q610ES
EUT Type:	GSM/WCDMA/LTE Phone with Bluetooth4.2LE, WIFI802.11 b/g/n, NFC
RF Output Field Strength:	8.54 dBuV/m @30 m
Frequency of Operation:	13.5606 MHz
Modulation type:	ASK
FCC Classification:	Low Power Communication Device – Transmitter
FCC Rule Part(s):	FCC Part 15.225 Subpart C

The measurements shown in this report were made in accordance with the procedures indicated, and the emissions from this equipment were found to be within the limits applicable. I assume full responsibility for the accuracy and completeness of these measurements, and for the qualifications of all persons taking them.

HCT CO., LTD. Certifies that no party to this application has subject to a denial of Federal benefits that includes FCC benefits pursuant to section 5301 of the Anti-Drug Abuse Act of 1998,21 U.S. C.853(a)

Report prepared by : Jung Ki Lim
Engineer of Telecommunication testing center

Approved by : Jong Seok Lee
Manager of Telecommunication testing center

Version

TEST REPORT NO.	DATE	DESCRIPTION
HCT-RF-1803-FC020	March 26, 2018	- First Approval Report

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1. GENERAL INFORMATION

Applicant:	LG Electronics MobileComm U.S.A., Inc.
Address:	1000 Sylvan Avenue, Englewood Cliffs NJ 07632
FCC ID:	ZNFQ610EA
EUT Type:	GSM/WCDMA/LTE Phone with Bluetooth4.2LE, WIFI802.11 b/g/n, NFC
Model:	LM-Q610EA
Additional model(s):	LMQ610EA, Q610EA, LM-Q610EM, LMQ610EM, Q610EM, LM-Q610ES, LMQ610ES, Q610ES
Date(s) of Tests:	February 19, 2018 ~ March 15, 2018
Place of Tests:	HCT Co., Ltd. 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, Korea

2. EUT DESCRIPTION

Model:	LM-Q610EA
Additional model(s):	LMQ610EA, Q610EA, LM-Q610EM, LMQ610EM, Q610EM, LM-Q610ES, LMQ610ES, Q610ES
EUT Type	GSM/WCDMA/LTE Phone with Bluetooth4.2LE, WIFI802.11 b/g/n, NFC
Power Supply	DC 4.00 V
Battery Information	Model: EAC63958401 Type: Li-ion Battery
Frequency of Operation	13.5606 MHz
Transmit Power	8.54 dBuV/m @30 m
Modulation Type	ASK
Antenna Specification	Manufacturer: AT&C Co.LTD Antenna type: FPCB Type Antenna

3. TEST METHODOLOGY

The measurement procedure described in the American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices (ANSI C63.10-2013) is used in the measurement of the test device.

3.1 EUT CONFIGURATION

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

3.2 EUT EXERCISE

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. According to its specifications, the EUT must comply with the requirements of the Section 15.207, 15.209 and 15.225 under the FCC Rules Part 15 Subpart C.

3.3 GENERAL TEST PROCEDURES

Conducted Emissions

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 6.2 of ANSI C63.10. (Version :2013) Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-peak and average detector modes.

Radiated Emissions

The EUT is placed on a turn table, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3 m away from the receiving antenna, which varied from 1 m to 4 m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter (EUT) was rotated through three orthogonal axes according to the requirements in Section 6.3 of ANSI C63.10. (Version: 2013).

3.4 DESCRIPTION OF TEST MODES

The EUT has been tested under operating condition. Test program used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

4. INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipments, which is traceable to recognized national standards.
Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5 (Version : 2006).

5. FACILITIES AND ACCREDITATIONS

5.1 FACILITIES

The 10 m semi anechoic chamber used to collect the Conducted and Radiated 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 (Version: 2014). Detailed description of test facilities was submitted to the Commission and accepted dated July 07, 2015 (Registration Number: 90661)

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of Linearly polarized antennas: tuned loop, dipole, bi-conical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with pre-selectors and quasi-peak detectors are used to perform radiated measurements.
Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers. Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.
All receiving equipment conforms to CISPR Publication 16-1, “Radio Interference Measuring Apparatus and Measurement Methods.”

6. ANTENNA REQUIREMENTS

According to FCC 47 CFR §15.203:

“An intentional radiator antenna shall be designed to ensure that no antenna other than that furnished by the responsible party can be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.”

* The antennas of this E.U.T are permanently attached.
*The E.U.T Complies with the requirement of §15.203

7. MEASUREMENT UNCERTAINTY

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4:2014.

All measurement uncertainty values are shown with a coverage factor of $k = 2$ to indicate a 95 % level of confidence.

Parameter	Expanded Uncertainty (±dB)
Conducted Disturbance (150 kHz ~ 30 MHz)	1.82
Radiated Disturbance (9 kHz ~ 30 MHz)	3.40
Radiated Disturbance (30 MHz ~ 1 GHz)	4.80
Radiated Disturbance (1 GHz ~ 18 GHz)	5.70

8. TEST SUMMARY

The results in this report apply only to sample tested

Regulation	Test Type	Range	Result
Title 47 of the CFR: Part 15 Subpart (c), Clause 15.225(a)	Radiated Electric Field Emissions	13.553MHz to 13.567MHz	Pass
Title 47 of the CFR: Part 15 Subpart (c), Clause 15.225(b)	Radiated Electric Field Emissions	13.410MHz to 13.553MHz and 13.567MHz to 13.710MHz	Pass
Title 47 of the CFR: Part 15 Subpart (c), Clause 15.225(c)	Radiated Electric Field Emission	13.110 MHz to 13.410 MHz and 13.710 MHz to 14.010 MHz	Pass
Title 47 of the CFR: Part 15 Subpart (c), Clause 15.209 (d)	Radiated Electric Field Emissions	9kHz to 30MHz	Pass
Title 47 of the CFR: Part 15 Subpart (c), Clause 15.209	Radiated Electric Field Emissions	30MHz to 1GHz	Pass
Title 47 of the CFR: Part 15 Subpart (c), Clause 15.207	AC power conducted emissions	150kHz to 30MHz	Pass
Title 47 of the CFR: Part 15 Subpart (c), Clause 15.225(e)	Frequency Stability	0.01% of nominal	Pass
Title 47 of the CFR: Part 15 Subpart (c), Clause 15.215(c)	20 dB Bandwidth	-	Pass

9. RADIATED EMISSION MEASUREMENT

Requirement(s): 15.209, 15.225

Except as provided elsewhere in this paragraph the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Minimum Standard: FCC Part 15.225 / 15.209

Rule Part	Frequency (MHz)	Limit
Part 15.209	0.009 ~ 0.490	2400/F(kHz) uV/m@300 m
	0.490 ~1.705	24000/F(kHz) uV/m@30 m
	1.705 ~ 30	30 uV/m@30 m
	30 ~ 88	100 ** uV/m@3 m
	88 ~ 216	150 ** uV/m@3 m
	216 ~ 960	200 ** uV/m@3 m
	Above 960	500 uV/m@3 m

** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

15.225 Operation within the band 13.110 MHz – 14.010 MHz

(a) The field strength of any emissions within the band 13.553 MHz-13.567 MHz shall not exceed 15,848 microvolts/meter (= 84 dBuV/m) at 30 meters.

(b) Within the bands 13.410-13.553 MHz and 13.567 MHz-13.710 MHz, the field strength of any emissions shall not exceed 334 microvolts/meter (=50.5dBuV/m) at 30 meters.

(c) Within the bands 13.110-13.410 MHz and 13.710 MHz-14.010 MHz the field strength of any emissions shall not exceed 106 microvolts/meter (=40.5 dBuV/m) at 30 meters.

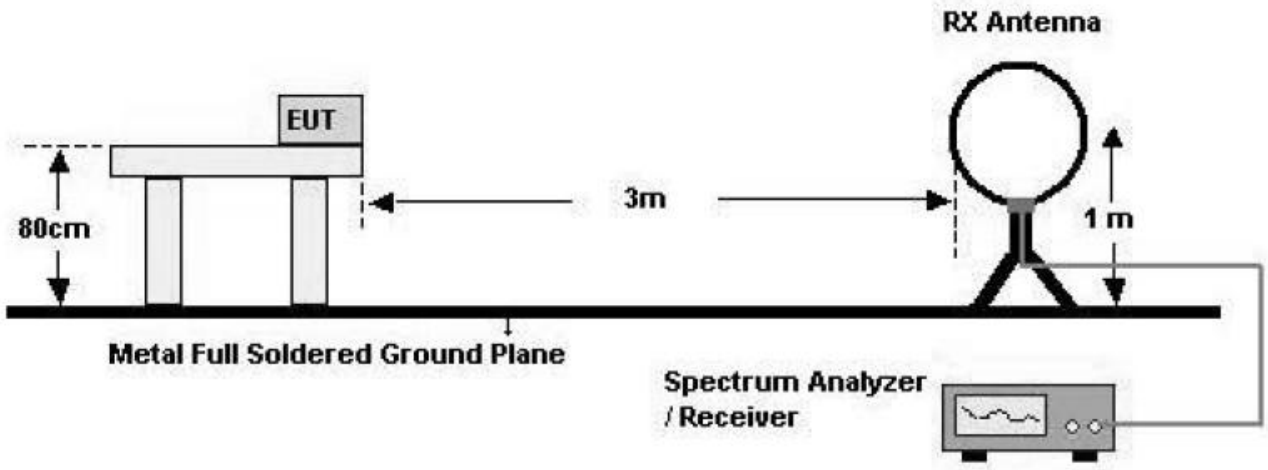
(d) The field strength of any emissions appearing outside of the 13.110 MHz-14.010 MHz band shall not exceed the general radiated emission limits in § 15.209.

(e) The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency over a temperature variation of –20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

(f) In the case of radio frequency powered tags designed to operate with a device authorized under this section, the tag may be approved with the device or be considered as a separate device subject to its own authorization. Powered tags approved with a device under a single application shall be labeled with the same identification number as the device.

9.1. RADIATED EMISSION 9 kHz – 30 MHz

Test Set-up



Test Procedure

The EUT was placed on a non-conductive table located on semi-anechoic chamber.
The loop antenna was placed at a location 3m from the EUT. Radiated emissions were measured with the loop antenna both parallel and perpendicular to the plane of the EUT loop antenna and with x, y, z planes in EUT.

The limit is converted from microvolts/meter to decibel microvolts/meter. Sample Calculation:

Corrected Amplitude = Raw Amplitude(dBμV/m) + ACF(dB) + Cable Loss(dB) – Distance Correction Factor

The spectrum analyzer is set to:
Frequency Range = 9 kHz ~ 1 GHz

RBW = 9 kHz (9 kHz ~ 30 MHz)
= 120 kHz (30 MHz ~ 1 GHz)

Trace Mode = max hold
Detector Mode = peak / Quasi-peak
Sweep time = auto

▣ Test Results (Worst case : Z-H)

13.553 MHz-13.567 MHz						
Frequency (MHz)	Read Level (dBuV/m)@3m	Ant.Factor+Cable Loss (dB/m)	Distance Correction (dB)	Result Level (dBuV/m)@30m	Limit (dBuV/m)@30m	Margin (dB)
13.5606	29.00	19.54	-40	8.54	84	75.46
13.5597	24.07	19.54	-40	3.61	84	80.39

13.410 MHz-13.553 MHz and 13.567 MHz-13.710 MHz						
Frequency (MHz)	Read Level (dBuV/m)@3m	Ant.Factor+Cable Loss (dB/m)	Distance Correction (dB)	Result Level (dBuV/m)@30m	Limit (dBuV/m)@30m	Margin (dB)
13.553	15.82	19.54	-40	-4.64	50.47	55.11
13.567	17.28	19.54	-40	-3.18	50.47	53.65

13.110 MHz – 13.410 MHz and 13.710 MHz-14.010 MHz						
Frequency (MHz)	Read Level (dBuV/m)@3m	Ant.Factor+Cable Loss (dB/m)	Distance Correction (dB)	Result Level (dBuV/m)@30m	Limit (dBuV/m)@30m	Margin (dB)
13.2762	11.09	19.54	-40	-9.37	40.51	49.88
13.938	11.15	19.54	-40	-9.31	40.51	49.82

9 kHz -30 MHz						
Frequency (MHz)	Read Level (dBuV/m)@3m	Ant.Factor+Cable Loss (dB/m)	Distance Correction (dB)	Result Level (dBuV/m)@30m	Limit (dBuV/m)@30m	Margin (dB)
5.1622	21.18	19.54	-40	0.72	29.54	28.82
25.0112	20.13	19.54	-40	-0.33	29.54	29.87
27.226	19.88	19.99	-40	-0.13	29.54	29.67
27.158	19.76	19.99	-40	-0.25	29.54	29.79

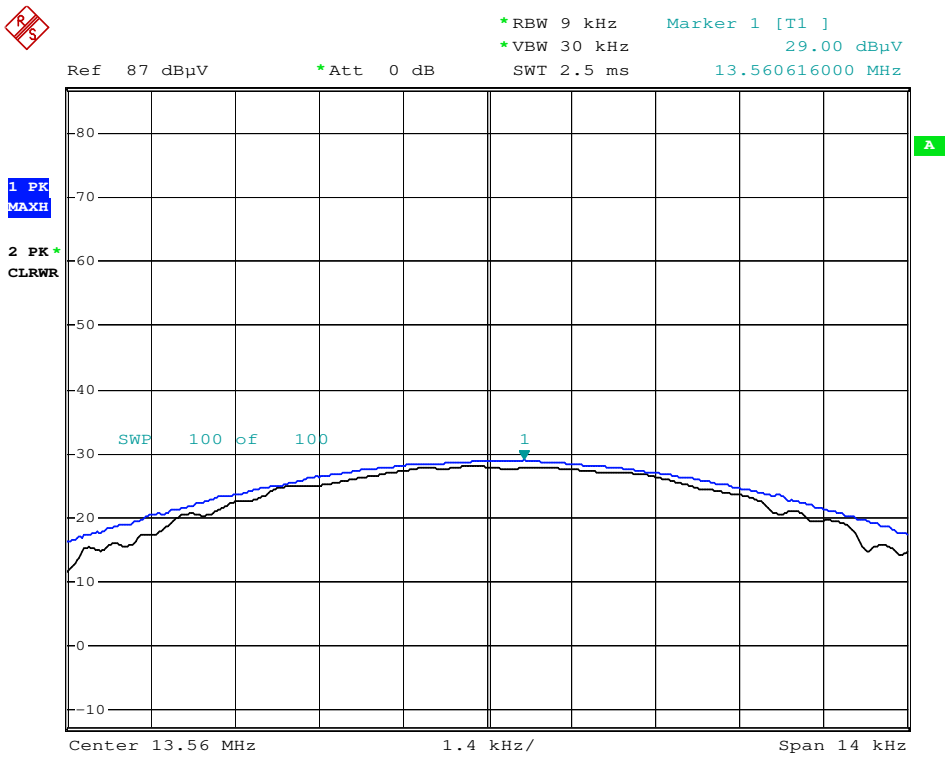
Note : The test results for below 30 MHz is correlated to an open site.

The result on OATS is about 2 dB higher than semi-anechoic chamber(10 m chamber)

1. Distance Correction Below 30 MHz = 40log(3 m/30 m) = - 40 dB
   Measurement Distance : 3 m (Below 30 MHz)
2. Factor = Antenna Factor + Cable Loss
3. Result Level = Read Level + Factor + Distance Correction
4. Margin = Limit – Result Level
5. We have done x, y, z planes in EUT
6. Antenna rotated about its vertical/horizontal axis for maximum response at each azimuth position around the EUT.
7. Worst case of operating mode is type A, analog mode and 106 kbps.

▣ RESULT PLOTS

Worst Plot for Radiated Emissions

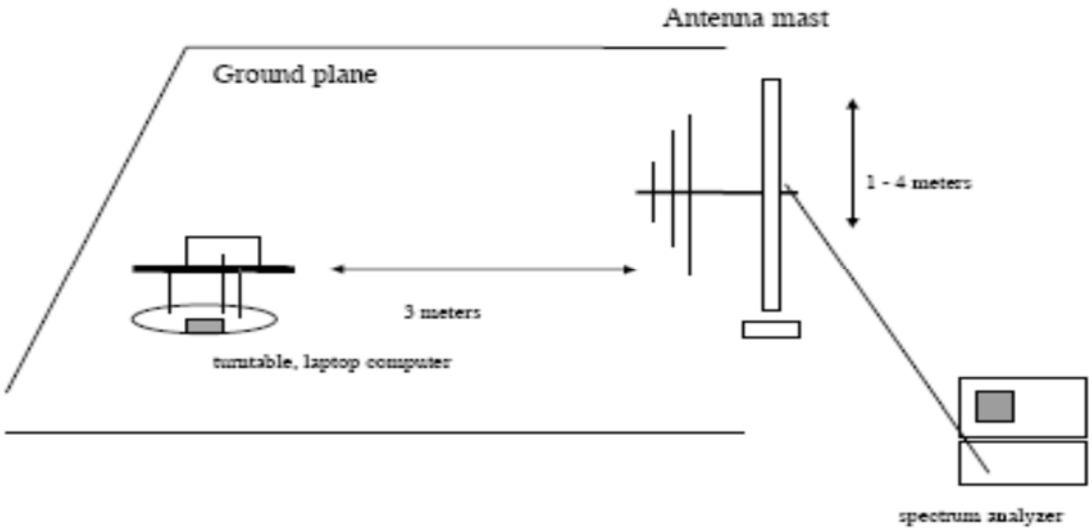


Date: 12.MAR.2018 14:20:26

Note : Only the worst case plots for Radiated Emissions.

9.2. RADIATED EMISSION 30 MHz – 1000 MHz

Test Set-up



Test Procedures: Radiated emissions were measured according to ANSI C63.10.

The EUT was set to transmit at the highest output power.

The EUT was set 3 meter away from the measuring antenna.

▣ Test Results

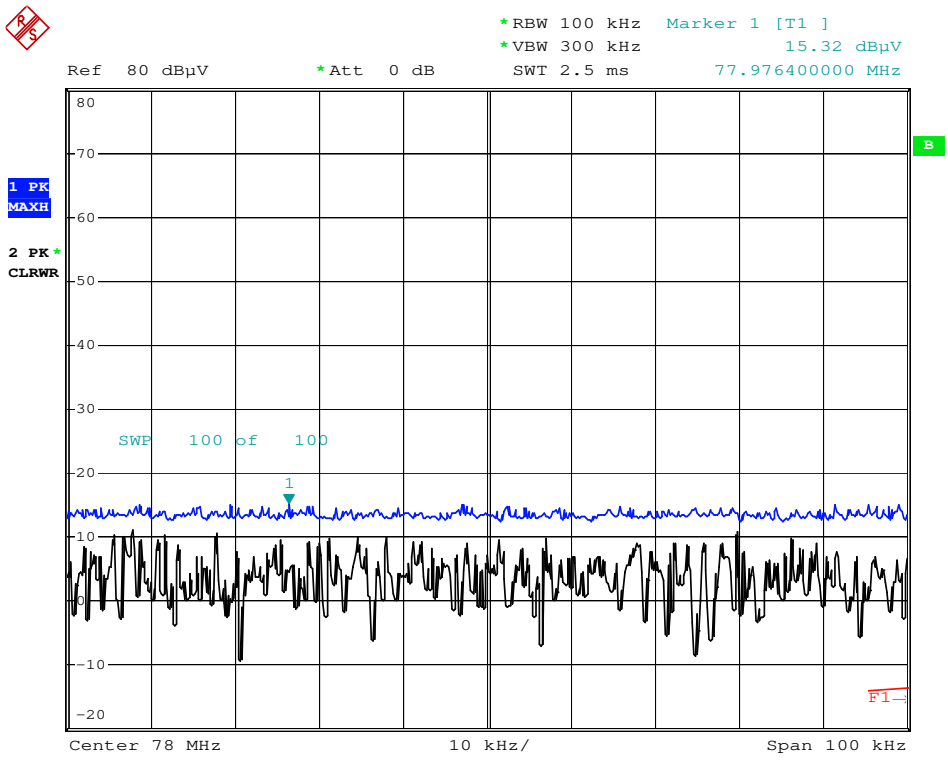
Frequency	Reading	Ant. factor	Cable loss	Ant. POL	Total	Limit	Margin
MHz	dBuV	dB/m	dB	(H/V)	dBuV/m	dBuV/m	dB
37.758	14.86	11.72	0.66	H	27.24	40	12.76
51.5324	14.76	12.38	0.7	H	27.84	40	12.16
77.9764	15.32	8.19	0.78	V	24.29	40	15.71
119.2501	14.3	11.64	0.81	H	26.75	43.5	16.75
146.567	15.2	12.84	0.88	H	28.92	43.5	14.58
168.4321	15.13	13.41	0.95	V	29.49	43.5	14.01

Remark

1. Result Level = Read Level + (Antenna Factor+ Cable Loss)
2. Margin = Limit – Result Level
3. '*' is the result for restricted band.

▣ RESULT PLOTS

Worst Plot for Radiated Emissions



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Note : Only the worst case plots for Radiated Emissions.

10. EMISSION BANDWIDTH PLOT

Requirement(s):

Test Set-up: The EUT was connected to a spectrum analyzer.

Test Procedure: The 20 dB bandwidth was measured by using a spectrum analyzer.

RBW = Auto

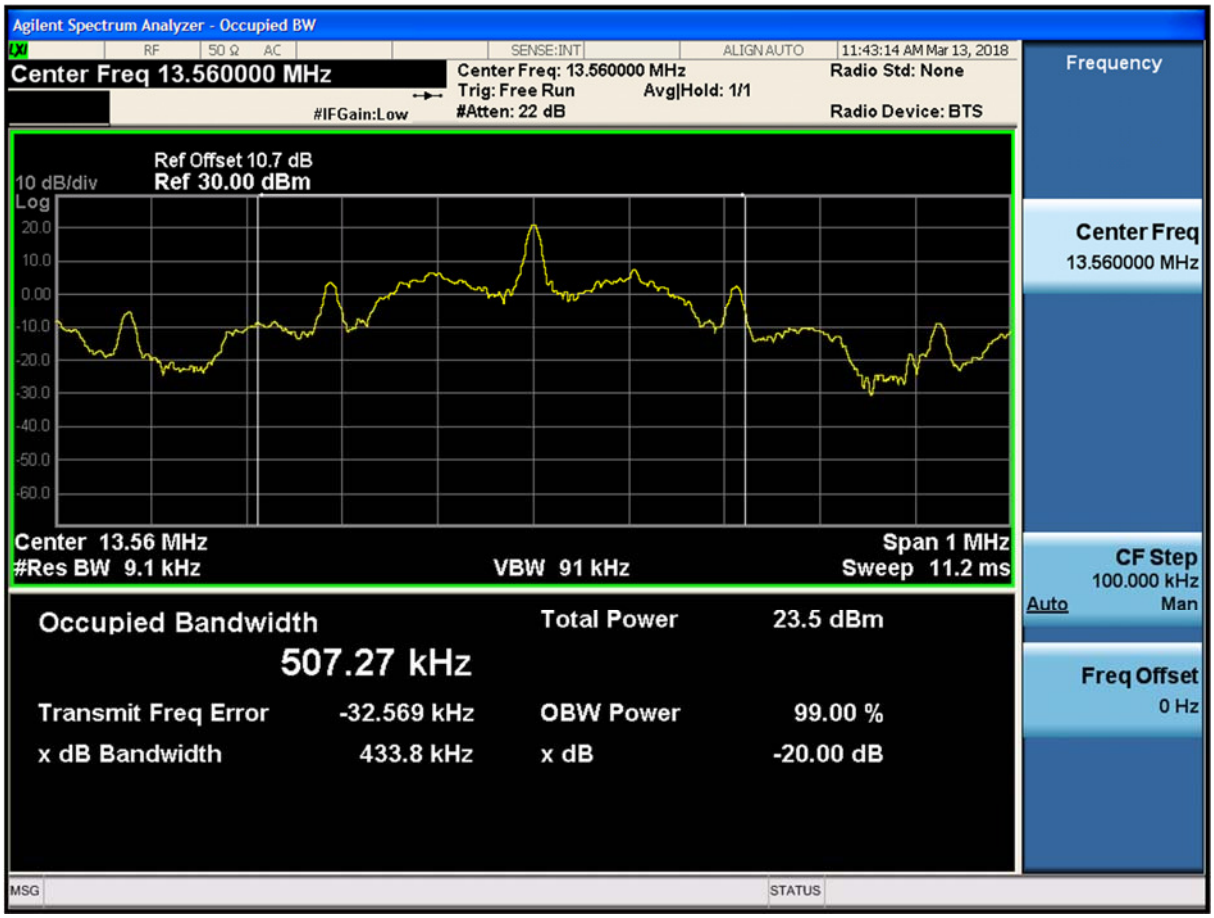
VBW = Auto

Span = Adequately in the operating Tx.

Detector = Peak

Trace mode = Max hold

Allow the trace to stabilize



11. FREQUENCY TOLERANCE

Procedure: Part 15.225, ANSI 63.10(Version : 2013)

If required, the operating or transmitting frequency of an intentional radiator should be measured in accordance with the following procedure to ensure that the device operates outside certain precluded frequency bands and within the frequency range. No modulation needs to be supplied to the intentional radiator during these tests, unless modulation is required to produce an output, e.g., single-sideband suppressed carrier transmitters.

The frequency stability of the transmitter is measured by:

a) Temperature: The temperature is varied from -20°C to + 50°C using an environmental chamber.
b) For battery operated equipment, the equipment tests shall be performed using a new battery.
c) Test Procedure
- Turn the EUT OFF and place it inside the environmental temperature chamber. For devices that have oscillator heaters, energize only the heater circuit.
- Set the temperature control on the chamber to the highest specified in the regulatoryrequirements for the type of device and allow the oscillator heater and the chamber temperatureto stabilize.
- While maintaining a constant temperature inside the environmental chamber, turn the EUT ON and record the operating frequency at startup, and at 2 minutes, 5 minutes, and 10 minutes after the EUT is energized. Four measurements in total are made.

d) The frequency tolerance of the carrier signal shall be maintained within +/- 0.01% of the operating frequency.

Note : Below the measurement result is worst value of the operating frequency at startup, and at 2 minutes, 5 minutes, and 10 minutes afterthe EUT is energized

Startup

Measurement Result:

PERATING FREQUENCY: 13.56 MHz

REFERENCE VOLTAGE: 4.0 VDC

DEVIATION LIMIT: 0.01 % = 1356 Hz

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (MHz)	Frequency Dev. (Hz)	Frequency Dev (%)
100%	4	-20	13.560184	184	0.0013569
100%		-10	13.560156	156	0.0011504
100%		0	13.560132	132	0.0009735
100%		+10	13.560127	127	0.0009366
100%		+20(Ref.)	13.560108	108	0.0007965
100%		+30	13.560101	101	0.0007448
100%		+40	13.560089	89	0.0006563
100%		+50	13.560077	77	0.0005678
High	4.3	+20	13.560125	125	0.0009218
Low	3.7	+20	13.560134	134	0.0009882

2 minutes

Measurement Result:

PERATING FREQUENCY: 13.56 MHz

REFERENCE VOLTAGE: 4.0 VDC

DEVIATION LIMIT: 0.01 % = 1356 Hz

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (MHz)	Frequency Dev. (Hz)	Frequency Dev (%)
100%	4	-20	13.560217	217	0.0016003
100%		-10	13.560196	196	0.0014454
100%		0	13.560181	181	0.0013348
100%		+10	13.560149	149	0.0010988
100%		+20(Ref.)	13.560122	122	0.0008997
100%		+30	13.560110	110	0.0008112
100%		+40	13.560099	99	0.0007301
100%		+50	13.560087	87	0.0006416
High	4.3	+20	13.560154	154	0.0011357
Low	3.7	+20	13.560168	168	0.0012389

.

5 minutes

Measurement Result:

PERATING FREQUENCY: 13.56 MHz

REFERENCE VOLTAGE: 4.0 VDC

DEVIATION LIMIT: 0.01 % = 1356 Hz

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (MHz)	Frequency Dev. (Hz)	Frequency Dev (%)
100%	4	-20	13.560197	197	0.0014528
100%		-10	13.560186	186	0.0013717
100%		0	13.560174	174	0.0012832
100%		+10	13.560168	168	0.0012389
100%		+20(Ref.)	13.560143	143	0.0010546
100%		+30	13.560132	132	0.0009735
100%		+40	13.560121	121	0.0008923
100%		+50	13.560103	103	0.0007596
High	4.3	+20	13.560147	147	0.0010841
Low	3.7	+20	13.560159	159	0.0011726

10 minutes

Measurement Result:

PERATING FREQUENCY: 13.56 MHz

REFERENCE VOLTAGE: 4.0 VDC

DEVIATION LIMIT: 0.01 % = 1356 Hz

Voltage (%)	Power (VDC)	Temp. (℃)	Frequency (MHz)	Frequency Dev. (Hz)	Frequency Dev (%)
100%	4	-20	13.560202	202	0.0014897
100%		-10	13.560193	193	0.0014233
100%		0	13.560178	178	0.0013127
100%		+10	13.560161	161	0.0011873
100%		+20(Ref.)	13.560137	137	0.0010103
100%		+30	13.560112	112	0.0008260
100%		+40	13.560120	120	0.0008850
100%		+50	13.560098	98	0.0007227
High	4.3	+20	13.560143	143	0.0010546
Low	3.7	+20	13.560167	167	0.0012316

12. POWERLINE CONDUCTE EMISSIONS

LIMIT

For an intentional radiator which is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed 250 microvolt (The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.50 MHz). The limits at specific frequency range is listed as follows:

Frequency Range (MHz)	Limits (dBμV)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50

Compliance with this provision shall be based on the measurement of the radio frequency voltage between each power line (LINE and NEUTRAL) and ground at the power terminals.

Test Configuration

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

TEST PROCEDURE

1. The EUT is placed on a wooden table 80 cm above the reference ground plane.
2. The EUT is connected via LISN to a test power supply.
3. The measurement results are obtained as described below:
4. Detectors – Quasi Peak and Average Detector.
5. The EUT is the device operating below 30 MHz.
   - For unterminated the Antenna, the AC line conducted tests are performed with the antenna connected
   - For terminated the Antenna, the AC line conducted tests are performed with a dummy load connected to the EUT antenna output terminal.

Sample Calculation

Quasi-peak(Final Result) = Reading Value + Correction Factor

Test Plots

Unterminate the Antenna

Conducted Emissions (Line 1)

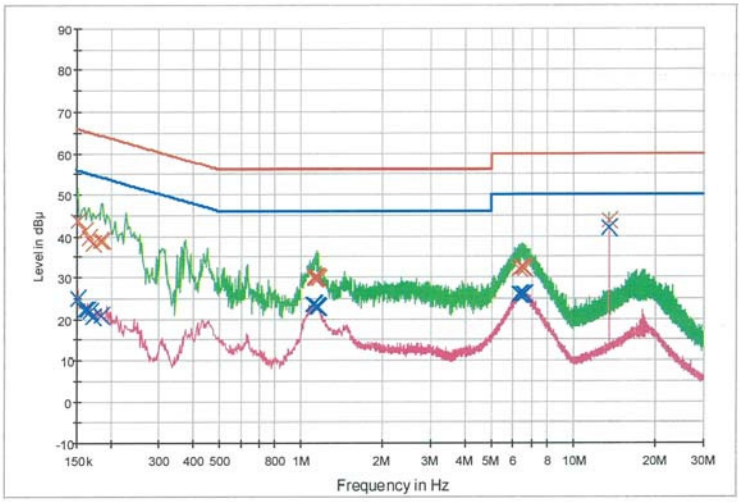
EMI Auto Test(19) 1 / 2

HCT TEST Report

Common Information

EUT:	LM-Q610EA
Manufacturer:	LG
Test Site:	SHIELD ROOM
Operating Conditions:	NFC UNTERMINATION MODE

FCC CLASS B_Exten Cable



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.152000	43.4	9.000	Off	N	9.7	22.5	65.9
0.160000	41.1	9.000	Off	N	9.7	24.4	65.5
0.166000	39.4	9.000	Off	N	9.7	25.8	65.2
0.172000	38.2	9.000	Off	N	9.7	26.7	64.9
0.182000	38.8	9.000	Off	N	9.7	25.6	64.4
0.188000	38.9	9.000	Off	N	9.7	25.2	64.1
1.116000	29.8	9.000	Off	N	9.8	26.2	56.0
1.126000	29.9	9.000	Off	N	9.8	26.1	56.0
1.132000	29.7	9.000	Off	N	9.8	26.3	56.0
1.140000	30.1	9.000	Off	N	9.8	25.9	56.0
1.154000	30.0	9.000	Off	N	9.8	26.0	56.0
1.160000	29.7	9.000	Off	N	9.8	26.3	56.0
6.362000	31.9	9.000	Off	N	10.1	28.1	60.0
6.516000	32.2	9.000	Off	N	10.1	27.8	60.0
6.540000	32.2	9.000	Off	N	10.1	27.8	60.0
6.558000	32.2	9.000	Off	N	10.1	27.8	60.0
6.658000	31.9	9.000	Off	N	10.1	28.1	60.0
13.560000	43.5	9.000	Off	N	10.4	16.5	60.0

Final Result 2

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EMI Auto Test(19) 2 / 2

Frequency (MHz)	CAverage (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.152000	24.8	9.000	Off	N	9.7	31.1	55.9
0.160000	22.1	9.000	Off	N	9.7	33.3	55.5
0.164000	22.3	9.000	Off	N	9.7	33.0	55.3
0.168000	21.9	9.000	Off	N	9.7	33.2	55.1
0.172000	20.6	9.000	Off	N	9.7	34.3	54.9
0.186000	20.7	9.000	Off	N	9.7	33.5	54.2
1.114000	23.5	9.000	Off	N	9.8	22.5	46.0
1.126000	23.5	9.000	Off	N	9.8	22.5	46.0
1.148000	23.4	9.000	Off	N	9.8	22.6	46.0
1.154000	23.0	9.000	Off	N	9.8	23.0	46.0
1.160000	23.1	9.000	Off	N	9.8	23.0	46.0
1.164000	23.0	9.000	Off	N	9.8	23.0	46.0
6.362000	26.0	9.000	Off	N	10.1	24.0	50.0
6.444000	25.9	9.000	Off	N	10.1	24.1	50.0
6.536000	25.9	9.000	Off	N	10.1	24.1	50.0
6.540000	26.0	9.000	Off	N	10.1	24.0	50.0
6.658000	25.9	9.000	Off	N	10.1	24.1	50.0
13.560000	42.0	9.000	Off	N	10.4	8.0	50.0

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Conducted Emissions (Line 2)

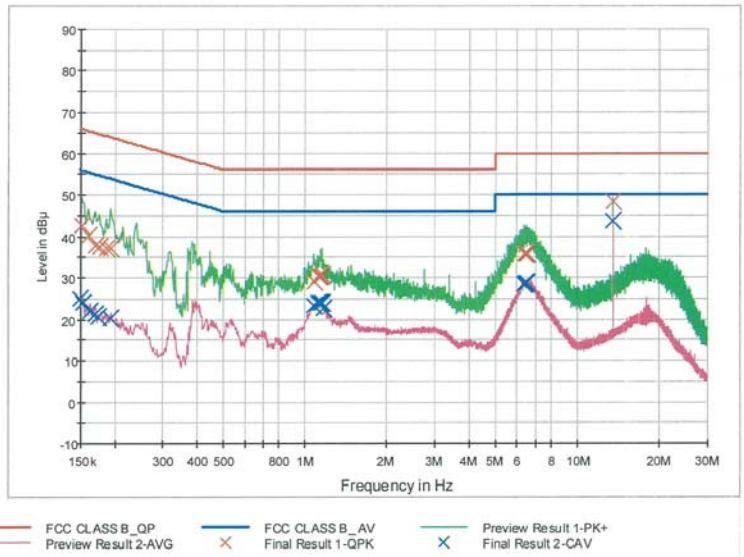
EMI Auto Test(19) 1 / 2

HCT TEST Report

Common Information

EUT:	LM-Q610EA
Manufacturer:	LG
Test Site:	SHIELD ROOM
Operating Conditions:	NFC UNTERMINATION MODE

FCC CLASS B_Exten Cable



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.152000	42.6	9.000	Off	L1	9.7	23.2	65.9
0.160000	40.0	9.000	Off	L1	9.7	25.4	65.5
0.170000	37.7	9.000	Off	L1	9.7	27.3	65.0
0.176000	37.6	9.000	Off	L1	9.7	27.1	64.7
0.188000	37.2	9.000	Off	L1	9.7	26.9	64.1
0.194000	37.1	9.000	Off	L1	9.7	26.8	63.9
1.088000	29.1	9.000	Off	L1	9.8	26.9	56.0
1.124000	30.5	9.000	Off	L1	9.8	25.5	56.0
1.138000	30.4	9.000	Off	L1	9.8	25.6	56.0
1.146000	30.5	9.000	Off	L1	9.8	25.5	56.0
1.152000	30.3	9.000	Off	L1	9.8	25.7	56.0
1.162000	30.6	9.000	Off	L1	9.8	25.4	56.0
6.382000	35.8	9.000	Off	L1	10.0	24.2	60.0
6.400000	35.7	9.000	Off	L1	10.0	24.3	60.0
6.478000	35.8	9.000	Off	L1	10.0	24.2	60.0
6.490000	35.8	9.000	Off	L1	10.0	24.2	60.0
6.528000	35.6	9.000	Off	L1	10.0	24.4	60.0
13.560000	48.4	9.000	Off	L1	10.2	11.6	60.0

Final Result 2

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EMI Auto Test(19) 2 / 2

Frequency (MHz)	CAverage (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	25.1	9.000	Off	L1	9.7	30.9	56.0
0.154000	23.9	9.000	Off	L1	9.7	31.9	55.8
0.162000	21.9	9.000	Off	L1	9.7	33.5	55.4
0.170000	21.0	9.000	Off	L1	9.7	33.9	55.0
0.174000	20.3	9.000	Off	L1	9.7	34.4	54.8
0.194000	20.1	9.000	Off	L1	9.7	33.8	53.9
1.088000	23.3	9.000	Off	L1	9.8	22.7	46.0
1.124000	24.0	9.000	Off	L1	9.8	22.0	46.0
1.136000	24.1	9.000	Off	L1	9.8	21.9	46.0
1.152000	23.9	9.000	Off	L1	9.8	22.1	46.0
1.162000	23.8	9.000	Off	L1	9.8	22.2	46.0
1.176000	22.6	9.000	Off	L1	9.8	23.4	46.0
6.400000	28.5	9.000	Off	L1	10.0	21.5	50.0
6.462000	28.7	9.000	Off	L1	10.0	21.3	50.0
6.490000	28.7	9.000	Off	L1	10.0	21.3	50.0
6.528000	28.7	9.000	Off	L1	10.0	21.3	50.0
6.560000	28.7	9.000	Off	L1	10.1	21.3	50.0
13.562000	43.6	9.000	Off	L1	10.2	6.4	50.0

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Terminate the Antenna

Conducted Emissions (Line 1)

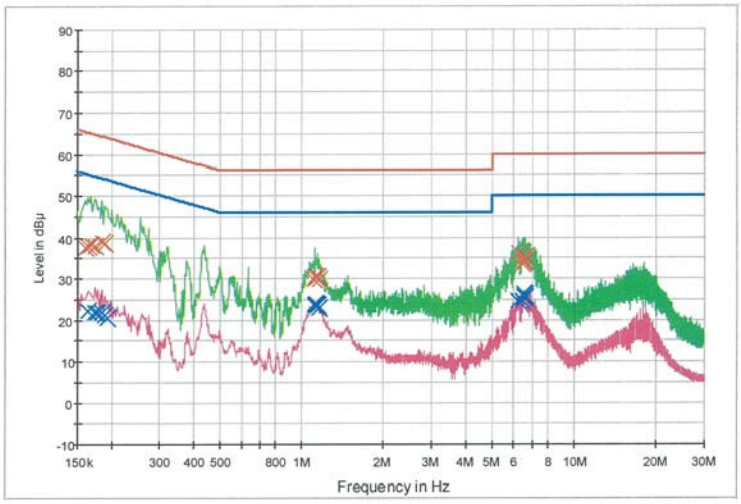
EMI Auto Test(19) 1 / 2

HCT TEST Report

Common Information

EUT:	LM-Q610EA
Manufacturer:	LG
Test Site:	SHIELD ROOM
Operating Conditions:	NFC TERMINATION MODE

FCC CLASS B_Exten Cable



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.160000	37.6	9.000	Off	N	9.7	27.9	65.5
0.164000	38.0	9.000	Off	N	9.7	27.3	65.3
0.168000	38.1	9.000	Off	N	9.7	26.9	65.1
0.174000	37.9	9.000	Off	N	9.7	26.9	64.8
0.186000	38.7	9.000	Off	N	9.7	25.5	64.2
0.190000	38.5	9.000	Off	N	9.7	25.5	64.0
1.104000	29.6	9.000	Off	N	9.8	26.4	56.0
1.122000	30.4	9.000	Off	N	9.8	25.6	56.0
1.132000	30.1	9.000	Off	N	9.8	25.9	56.0
1.148000	30.3	9.000	Off	N	9.8	25.7	56.0
1.152000	30.4	9.000	Off	N	9.8	25.6	56.0
1.164000	29.5	9.000	Off	N	9.8	26.5	56.0
6.290000	36.2	9.000	Off	N	10.1	23.8	60.0
6.446000	33.4	9.000	Off	N	10.1	26.6	60.0
6.520000	34.0	9.000	Off	N	10.1	26.0	60.0
6.580000	33.8	9.000	Off	N	10.1	26.2	60.0
6.590000	35.2	9.000	Off	N	10.1	24.8	60.0
6.602000	35.2	9.000	Off	N	10.1	24.8	60.0

Final Result 2

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EMI Auto Test(19) 2 / 2

Frequency (MHz)	CAverage (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.164000	22.3	9.000	Off	N	9.7	32.9	55.3
0.174000	22.0	9.000	Off	N	9.7	32.8	54.8
0.178000	21.8	9.000	Off	N	9.7	32.8	54.6
0.186000	21.8	9.000	Off	N	9.7	32.4	54.2
0.190000	21.1	9.000	Off	N	9.7	33.0	54.0
0.194000	20.5	9.000	Off	N	9.7	33.3	53.9
1.120000	23.7	9.000	Off	N	9.8	22.3	46.0
1.128000	23.8	9.000	Off	N	9.8	22.2	46.0
1.132000	23.7	9.000	Off	N	9.8	22.3	46.0
1.136000	23.9	9.000	Off	N	9.8	22.1	46.0
1.152000	23.5	9.000	Off	N	9.8	22.5	46.0
1.164000	23.0	9.000	Off	N	9.8	23.0	46.0
6.226000	24.4	9.000	Off	N	10.1	25.6	50.0
6.446000	24.7	9.000	Off	N	10.1	25.3	50.0
6.580000	25.6	9.000	Off	N	10.1	24.4	50.0
6.592000	26.2	9.000	Off	N	10.1	23.8	50.0
6.602000	25.8	9.000	Off	N	10.1	24.2	50.0
6.606000	25.3	9.000	Off	N	10.1	24.7	50.0

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Conducted Emissions (Line 2)

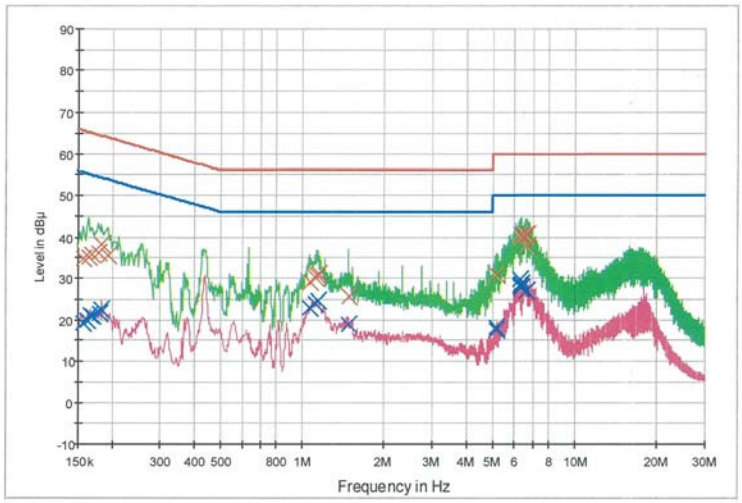
EMI Auto Test(19) 1 / 2

HCT TEST Report

Common Information

EUT:	LM-Q610EA
Manufacturer:	LG
Test Site:	SHIELD ROOM
Operating Conditions:	NFC TERMINATION MODE

FCC CLASS B_Exten Cable



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	34.6	9.000	Off	L1	9.7	30.9	65.6
0.164000	35.0	9.000	Off	L1	9.7	30.3	65.3
0.168000	35.7	9.000	Off	L1	9.7	29.4	65.1
0.178000	36.2	9.000	Off	L1	9.7	28.3	64.6
0.184000	38.0	9.000	Off	L1	9.7	26.3	64.3
0.194000	35.5	9.000	Off	L1	9.7	28.3	63.9
1.064000	29.0	9.000	Off	L1	9.8	27.0	56.0
1.118000	30.0	9.000	Off	L1	9.8	26.0	56.0
1.136000	30.8	9.000	Off	L1	9.8	25.2	56.0
1.148000	31.0	9.000	Off	L1	9.8	25.0	56.0
1.490000	25.7	9.000	Off	L1	9.8	30.3	56.0
5.170000	30.7	9.000	Off	L1	10.0	29.3	60.0
6.346000	40.4	9.000	Off	L1	10.0	19.6	60.0
6.358000	40.6	9.000	Off	L1	10.0	19.4	60.0
6.420000	39.9	9.000	Off	L1	10.0	20.1	60.0
6.666000	40.4	9.000	Off	L1	10.1	19.6	60.0
6.682000	37.8	9.000	Off	L1	10.1	22.2	60.0
6.736000	40.6	9.000	Off	L1	10.1	19.4	60.0

Final Result 2

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EMI Auto Test(19) 2 / 2

Frequency (MHz)	CAverage (dBµV)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.158000	19.3	9.000	Off	L1	9.7	36.3	55.6
0.162000	19.9	9.000	Off	L1	9.7	35.4	55.4
0.166000	21.2	9.000	Off	L1	9.7	33.9	55.2
0.170000	20.8	9.000	Off	L1	9.7	34.1	55.0
0.180000	21.7	9.000	Off	L1	9.7	32.8	54.5
0.184000	22.4	9.000	Off	L1	9.7	31.9	54.3
1.064000	22.7	9.000	Off	L1	9.8	23.3	46.0
1.118000	23.9	9.000	Off	L1	9.8	22.1	46.0
1.148000	24.6	9.000	Off	L1	9.8	21.4	46.0
1.490000	18.9	9.000	Off	L1	9.8	27.1	46.0
5.166000	17.5	9.000	Off	L1	10.0	32.5	50.0
5.170000	18.1	9.000	Off	L1	10.0	31.9	50.0
6.346000	29.7	9.000	Off	L1	10.0	20.3	50.0
6.358000	28.3	9.000	Off	L1	10.0	21.7	50.0
6.362000	27.9	9.000	Off	L1	10.0	22.1	50.0
6.416000	28.7	9.000	Off	L1	10.0	21.3	50.0
6.420000	27.7	9.000	Off	L1	10.0	22.3	50.0
6.682000	26.8	9.000	Off	L1	10.1	23.2	50.0

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13. LIST OF TEST EQUIPMENT

13.1 LIST OF TEST EQUIPMENT(Conducted Test)

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Rohde & Schwarz	ENV216 / LISN	12/20/2017	Annual	102245
Rohde & Schwarz	ESCI / Test Receiver	06/27/2017	Annual	100033
ESPAC	SU-642 /Temperature Chamber	03/31/2017	Annual	0093008124
Agilent	N9020A / Signal Analyzer	06/13/2017	Annual	MY51110085
Agilent	N9030A / Signal Analyzer	11/22/2017	Annual	MY49431210
Hewlett Packard	E3632A / DC Power Supply	06/30/2017	Annual	KR75303960
Agilent	8493C / Attenuator(10 dB)	07/10/2017	Annual	07560
Rohde & Schwarz	EMC32 / Software	N/A	N/A	N/A

13.2 LIST OF TEST EQUIPMENT(Radiated Test)

Manufacturer	Model / Equipment	Calibration Date	Calibration Interval	Serial No.
Innco system	CO3000 / Controller(Antenna mast)	N/A	N/A	CO3000-4p
Innco system	MA4000-EP / Antenna Position Tower	N/A	N/A	N/A
Audix	EM1000 / Controller	N/A	N/A	060520
Audix	Turn Table	N/A	N/A	N/A
Rohde & Schwarz	Loop Antenna	04/19/2017	Biennial	1513-175
Schwarzbeck	VULB 9168 / Hybrid Antenna	04/06/2017	Biennial	760
Schwarzbeck	BBHA 9120D / Horn Antenna	05/02/2017	Biennial	9120D-937
Schwarzbeck	BBHA9170 / Horn Antenna(15 GHz ~ 40 GHz)	12/04/2017	Biennial	BBHA9170541
Rohde & Schwarz	FSP(9 kHz ~ 30 GHz) / Spectrum Analyzer	09/06/2017	Annual	100688
Rohde & Schwarz	FSV40-N / Spectrum Analyzer	09/27/2017	Annual	101068-SZ
Wainwright Instruments	WHK3.0/18G-10EF / High Pass Filter	06/12/2017	Annual	8
Wainwright Instruments	WHFX7.0/18G-8SS / High Pass Filter	05/15/2017	Annual	29
Wainwright Instruments	WRCJV2400/2483.5-2370/2520-60/12SS / Band Reject Filter	06/30/2017	Annual	2
Wainwright Instruments	WRCJV5100/5850-40/50-8EEK / Band Reject Filter	01/03/2018	Annual	2
Api tech.	18B-03 / Attenuator (3 dB)	06/12/2017	Annual	1
Agilent	8493C-10 / Attenuator(10 dB)	07/19/2017	Annual	08285
CERNEX	CBLU1183540 / Power Amplifier	07/11/2017	Annual	22964
CERNEX	CBL06185030 / Power Amplifier	07/11/2017	Annual	22965
CERNEX	CBL18265035 / Power Amplifier	01/10/2018	Annual	22966
CERNEX	CBL26405040 / Power Amplifier	06/30/2017	Annual	25956