

On your side

HCT

TEST REPORT

EMI Test for FCC Certification / ISED of LM-Q630UM Model

APPLICANT

LG Electronics USA, Inc.

REPORT NO.

HCT-EM-2003-FI002-R1

DATE OF ISSUE

April 02, 2020

HCT Co., Ltd.

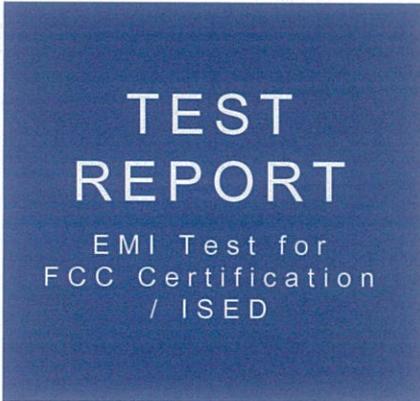
74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 KOREA

Tel. +82 31 645 6300 Fax. +82 31 645 6401



HCT Co., Ltd.

74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, 17383 KOREA
Tel. +82 31 645 6300 Fax. +82 31 645 6401



REPORT NO.
HCT-EM-2003-FI002-R1

DATE OF ISSUE
April 02, 2020

FCC ID / IC
ZNFQ630UM / 2703C-Q630UM

Applicant **LG Electronics USA, Inc.**
1000 Sylvan Avenue, Englewood Cliffs NJ 07632 United States

Product Name Multi-band GSM/WCDMA/LTE phone with Bluetooth, WLAN, NFC
Model Name LM-Q630UM
Series Model Name Refer to the clause 1.1 Description of EUT

Travel Adaptor Information Model name: MCS-V02WR
Manufacturer: SUNLIN

Date of Test February 25, 2020 to February 28, 2020

Test Standard Used FCC CFR 47 PART 15 Subpart B Class B / ICES-003 Issue 6 Class B
ANSI C63.4-2014

Test Results Refer to the present document

Manufacturer LG Electronics Inc.

The result shown in this test report refer only to the sample(s) tested unless otherwise stated.

Tested by
Ki-Min Lee

(signature)

Technical Manager
Jeong-Hyun Choi

(signature)

This report only responds to the tested sample and may not be reproduced, except in full, without written approval of the HCT Co., Ltd.

REVISION HISTORY

The revision history for this test report is shown in table.

Revision No.	Date of Issue	Description
0	March 03, 2020	Initial Release
1	April 02, 2020	Revised the frequency band in clause 1.1

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 C63.4-2014. (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

This Test Report is not related to the accredited test result by KOLAS (Korea Laboratory Accreditation Scheme) / A2LA(American Association for Laboratory Accreditation), which signed the ILAC-MRA.

CONTENTS

1. GENERAL INFORMATION	5
1.1 Description of EUT	5
1.2 Tested System Details	5
1.3 Cable Description	7
1.4 Noise Suppression Parts on Cable. (I/O Cable)	7
1.5 Test Facility	8
1.6 Calibration of Measuring Instrument	8
1.7 Measurement Uncertainty	8
2. DESCRIPTION OF TEST	9
2.1 Measurement of Conducted Emission	9
2.2 Measurement of Radiated Emission	10
2.3 Configuration of Tested System	11
3. PRELIMINARY TEST	12
3.1 Conducted Emission	12
3.2 Radiated Emission	12
4. CONDUCTED EMISSION AND RADIATED EMISSION TEST SUMMARY	13
4.1 Conducted Emission	13
4.2 Radiated Emission Below 1 GHz	20
4.3 Radiated Emission Above 1 GHz	22
5. CONCLUSION	25
6. APPENDIX A. TEST SETUP PHOTO	26

1. GENERAL INFORMATION

1.1 Description of EUT

FCC ID	ZNFQ630UM
IC	2703C-Q630UM
Model Name	LM-Q630UM
Series Model Name	LMQ630UM, Q630UM
Product Name	Multi-band GSM/WCDMA/LTE phone with Bluetooth, WLAN, NFC
TX Frequency	824.20 MHz to 848.80 MHz (GSM 850) 1 850.20 MHz to 1 909.80 MHz (GSM 1 900) 1 852.4 MHz to 1 907.6 MHz (WCDMA B2) 1712.4 MHz to 1752.6 MHz (WCDMA B4) 826.40 MHz to 846.60 MHz (WCDMA B5) 1 850 MHz to 1 910 MHz (LTE B2) 1 710 MHz to 1 755 MHz (LTE B4) 824 MHz to 849 MHz (LTE B5) 2 496 MHz to 2 570 MHz (LTE B7) 699 MHz to 716 MHz (LTE B12) 777 MHz to 787 MHz (LTE B13) 704 MHz to 716 MHz (LTE B17) 1 850 MHz to 1 915 MHz (LTE B25) 2 305 MHz to 2 315 MHz (LTE B30) 1 710 MHz to 1 780 MHz (LTE B66) 2 402 MHz to 2 480 MHz (Bluetooth) 2 412 MHz to 2 462 MHz (WiFi 2.4 GHz) 5 180 MHz to 5 240 MHz (WiFi 5 GHz_UNII 1) 5 260 MHz to 5 320 MHz (WiFi 5 GHz_UNII 2A) 5 500 MHz to 5 720 MHz (WiFi 5 GHz_UNII 2C) 5 745 MHz to 5 825 MHz (WiFi 5 GHz_UNII 3) 13.56 MHz (NFC)

RX Frequency	869.20 MHz to 893.80 MHz (GSM 850) 1 930.20 MHz to 1 989.80 MHz (GSM 1 900) 1 932.4 MHz to 1 987.6 MHz (WCDMA B2) 2 112.4 MHz to 2 152.6 MHz (WCDMA B4) 871.40 MHz to 891.60 MHz (WCDMA B5) 1 930 MHz to 1 990 MHz (LTE B2) 2 110 MHz to 2 155 MHz (LTE B4) 869 MHz to 894 MHz (LTE B5) 2 516 MHz to 2 690 MHz (LTE B7) 729 MHz to 746 MHz (LTE B12) 746 MHz to 756 MHz (LTE B13) 734 MHz to 746 MHz (LTE B17) 1 925 MHz to 1 990 MHz (LTE B25) 717 MHz to 728 MHz (LTE B29) 2 350 MHz to 2 360 MHz (LTE B30) 2 110 MHz to 2 200 MHz (LTE B66) 2 402 MHz to 2 480 MHz (Bluetooth) 2 412 MHz to 2 462 MHz (WiFi 2.4 GHz) 5 180 MHz to 5 240 MHz (WiFi 5 GHz_UNII 1) 5 260 MHz to 5 320 MHz (WiFi 5 GHz_UNII 2A) 5 500 MHz to 5 720 MHz (WiFi 5 GHz_UNII 2C) 5 745 MHz to 5 825 MHz (WiFi 5 GHz_UNII 3) 13.56 MHz (NFC)
---------------------	---

1.2 Tested System Details

All equipment descriptions used in the tested system (including inserted cards) are:

Device Type	Model Name	Serial Number	Manufacturer
EUT	LM-Q630UM	-	LG
Travel Adaptor	MCS-V02WR	-	SUNLIN
DATA Cable	EAD64746102	-	LUXSHARE
Earphone	EAB64468445	-	BUJEON
Micro SD Card	SAMSUNG EVO+ microSDXC CLASS10 UHS-I (256 GB)	-	SAMSUNG

1.3 Cable Description

Product Name	Port	Power Cord Shielded (Y/N)	I/O Cable Shielded (Y/N)	Length (m)
EUT	USB Type C	Y	N/A	(P) 1.0
	Earphone	N/A	N	(D) 1.2

NOTE. The marked "(D)" means the data cable and "(P)" means the power cable.

1.4 Noise Suppression Parts on Cable (I/O Cable)

Product Name	Port	Ferrite Bead (Y/N)	Location	Metal Hood (Y/N)	Location
EUT	USB Type C	N	N/A	Y	Both End
	Earphone	N	N/A	Y	EUT End

1.5 Test Facility

Test site is located at 74, Seoicheon-ro 578beon-gil, Majang-myeon, Icheon-si, Gyeonggi-do, South Korea. Those measurement facilities are constructed in conformance with the requirements of ANSI C63.4-2014. The Normalized site attenuations (30 MHz to 1 GHz) and Site validation (1 GHz to 18 GHz) were performed in accordance with the standard in ANSI C63.4-2014

Measurement Facilities	Designation No.
Radiated Field strength measurement facility 3 m Semi Anechoic chamber	KR0032
Radiated Field strength measurement facility 10 m Semi Anechoic chamber #1	
Radiated Field strength measurement facility 10 m Semi Anechoic chamber #2	
Filing the EMI Measurement Facility (3 m Semi Anechoic Chamber and Shielded Room)	IC 5944A-4
Filing the EMI Measurement Facility (10 m Semi-Anechoic Chamber)	IC 5944A-2

1.6 Calibration of Measuring Instrument

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturers recommendations for utilizing calibration equipment, which is traceable to recognized national standards. Especially, all antenna for measurement is calibrated in accordance with the requirements of C63.5:2017

1.7 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. The measurement data shown herein meets or exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and, thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded Uncertainty
Conducted Emission (0.15 MHz to 30 MHz)	1.8 dB
3 m Radiated Emissions (30 MHz to 1 GHz)	4.8 dB
3 m Radiated Emissions (1 GHz to 18 GHz)	5.4 dB
3 m Radiated Emissions (18 GHz to 40 GHz)	5.7 dB

2. DESCRIPTION OF TEST

2.1 Measurement of Conducted Emission

The test procedure was in accordance with ANSI C63.4-2014, Clause 7.3

- a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN).
 If the EUT is connected to the PC through USB, the AC power-line adapter of the PC is directly connected to a line impedance stabilization network (LISN).
 Other support units were connected to the power mains through another LISN. The two LISNs provide 50 Ohm/50uH of coupling impedance for the measuring instrument.
- b. Both conducted lines are measured in Quasi-Peak and Average mode, including the worst-case data points for each tested configuration.
- c. The frequency range from 150 kHz to 30 MHz was searched.

Conducted Emission Limits

Frequency (MHz)	Resolution Bandwidth (kHz)	Class A		Class B	
		Quasi-Peak (dB μ V)	Average (dB μ V)	Quasi-Peak (dB μ V)	Average (dB μ V)
0.15 to 0.5	9	79	66	66 to 56*	56 to 46*
0.5 to 5	9	73	60	56	46
5 to 30	9	73	60	60	50

NOTE. Decreases with the logarithm of the frequency.

2.2 Measurement of Radiated Emission

The test procedure was in accordance with ANSI C63.4-2014, Clause 8.3

- a. The EUT was placed on the top of a turn table 0.8 meters above the ground at a semi-anechoic chamber.
The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 m away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from 1 m to 4 m above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 m to 4 m and the turn table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to Peak and Average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz.
- g. Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response.
(1 GHz to 40 GHz)

Radiated Emission Limits

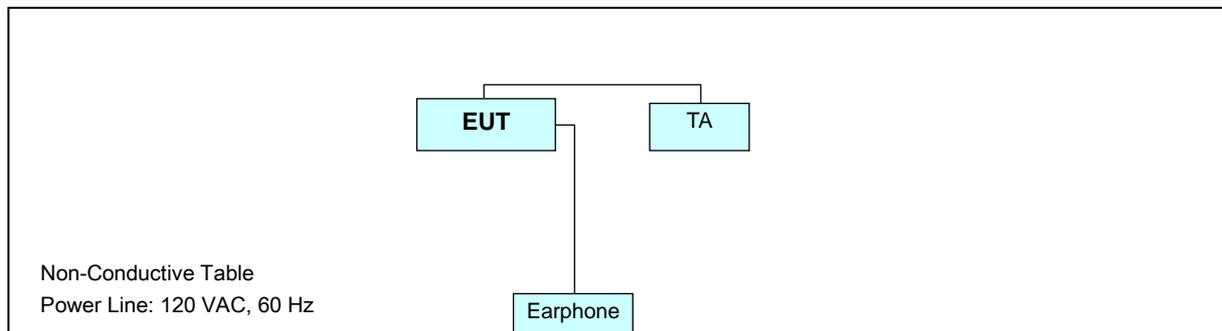
Frequency (MHz)	Class A			Class B		
	Antenna Distance (m)	Field Strength ($\mu\text{V/m}$)	Quasi-Peak (dB $\mu\text{V/m}$)	Antenna Distance (m)	Field Strength ($\mu\text{V/m}$)	Quasi-Peak (dB $\mu\text{V/m}$)
30 to 88	10	90	39.0	3	100	40.0
88 to 216	10	150	43.5	3	150	43.5
216 to 960	10	210	46.4	3	200	46.0
Above 960	10	300	49.5	3	500	54.0
Frequency (MHz)	Antenna Distance (m)	Class A		Class B		
		Peak (dB $\mu\text{V/m}$)	Average (dB $\mu\text{V/m}$)	Peak (dB $\mu\text{V/m}$)	Average (dB $\mu\text{V/m}$)	
Above 1 000	3	80	60	74	54	

2.2.1 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	5th harmonic of the highest frequency or 40 GHz, whichever is lower

2.3 Configuration of Tested System



3. PRELIMINARY TEST

3.1 Conducted Emission

It was tested the following operating mode, after connecting all peripheral devices.

Operating Modes: FRONT CAMERA & MP3 mode
REAR CAMERA & FM RADIO mode
IDLE mode

NOTE. The worst-case emissions are reported.

3.2 Radiated Emission

It was tested the following operating mode, after connecting all peripheral devices.

Operating Modes: FRONT CAMERA & MP3 mode
REAR CAMERA & FM RADIO mode
IDLE mode

NOTE. The worst-case emissions are reported.

4. CONDUCTED EMISSION AND RADIATED EMISSION TEST SUMMARY

4.1 Conducted Emission

4.1.1 Measuring instruments

Type	Manufacturer	Model Name	Serial Number	Calibration Cycle	Calibration Date
<input checked="" type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESCI	100584	1 year	06.18.2019
<input checked="" type="checkbox"/> LISN	Rohde & Schwarz	ENV216	102245	1 year	09.11.2019
<input checked="" type="checkbox"/> Radio communication analyzer	ANRITSU	MT8820C	6201138643	1 year	08.20.2019
<input checked="" type="checkbox"/> Antenna (for Communication)	Schwarzbeck	USLP9142	VSLP 9142-200	-	-
<input checked="" type="checkbox"/> Software	Rohde & Schwarz	EMC32	-	-	-

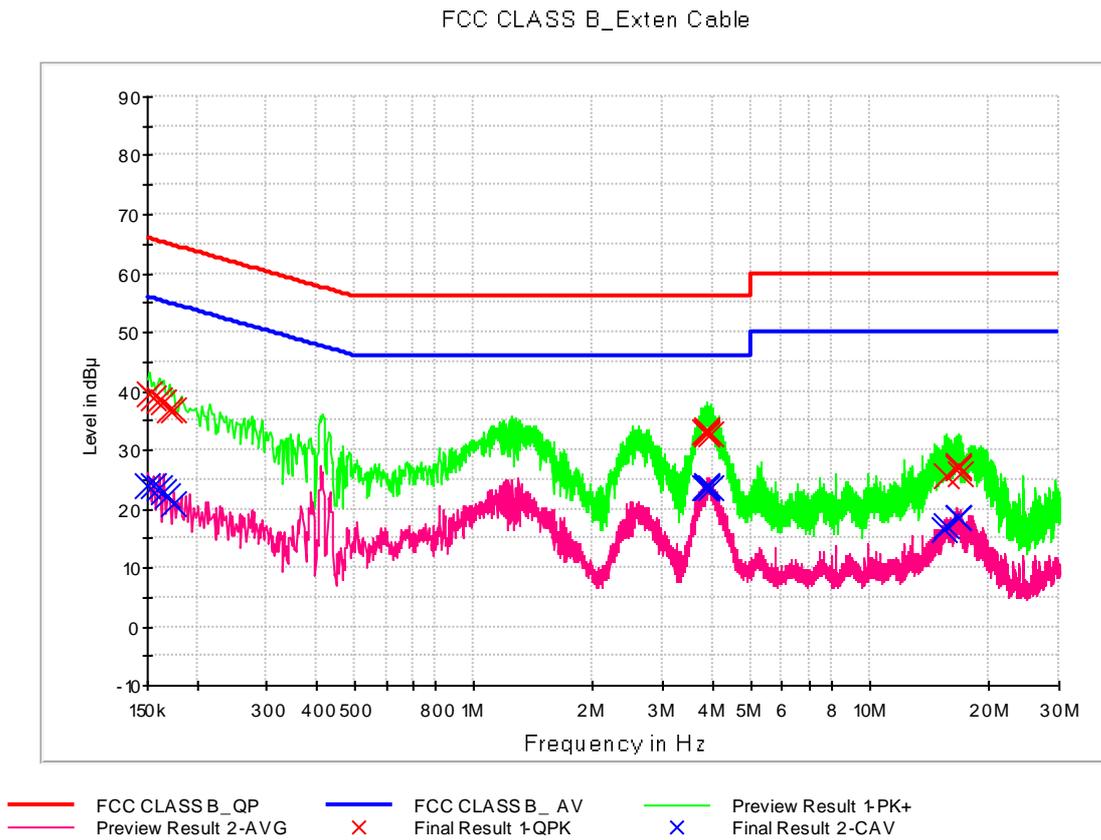
4.1.2 Operating Condition

The test results of conducted emission at mains ports provide the following information:

Test Standard Used	FCC CFR 47 PART 15 Subpart B Class B ICES-003 Issue 6 Class B ANSI C63.4-2014
Frequency Range	150 kHz to 30 MHz
Detector	Quasi-Peak, CISPR-Average
Bandwidth	9 kHz (6 dB)
Worst Case of Operating Mode	FRONT CAMERA & MP3 mode
Kind of Test Site	EMI Shielded Room
Temperature	24.4 °C
Relative Humidity	42.8 %
Test Date	February 26, 2020

4.1.3 Measuring Data

Figure 1: Conducted Emission (150 kHz to 30 MHz), Line (L1)



QuasiPeak Final Result, Line (L1)

Frequency (MHz)	QuasiPeak (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.152000	39.5	9.000	L1	9.8	26.4	65.9
0.156000	38.9	9.000	L1	9.8	26.8	65.7
0.160000	38.6	9.000	L1	9.8	26.9	65.5
0.164000	38.3	9.000	L1	9.8	27.0	65.3
0.170000	36.7	9.000	L1	9.8	28.3	65.0
0.174000	36.6	9.000	L1	9.8	28.1	64.8
3.844000	33.1	9.000	L1	10.0	22.9	56.0
3.854000	33.0	9.000	L1	10.0	23.0	56.0
3.866000	33.2	9.000	L1	10.0	22.8	56.0
3.882000	32.8	9.000	L1	10.0	23.2	56.0
3.890000	32.8	9.000	L1	10.0	23.2	56.0
3.964000	32.6	9.000	L1	10.0	23.4	56.0
15.558000	25.5	9.000	L1	10.4	34.5	60.0
16.632000	27.1	9.000	L1	10.4	32.9	60.0
16.682000	27.0	9.000	L1	10.4	33.0	60.0
16.686000	27.3	9.000	L1	10.4	32.7	60.0
16.694000	27.4	9.000	L1	10.4	32.6	60.0
16.844000	25.9	9.000	L1	10.4	34.1	60.0

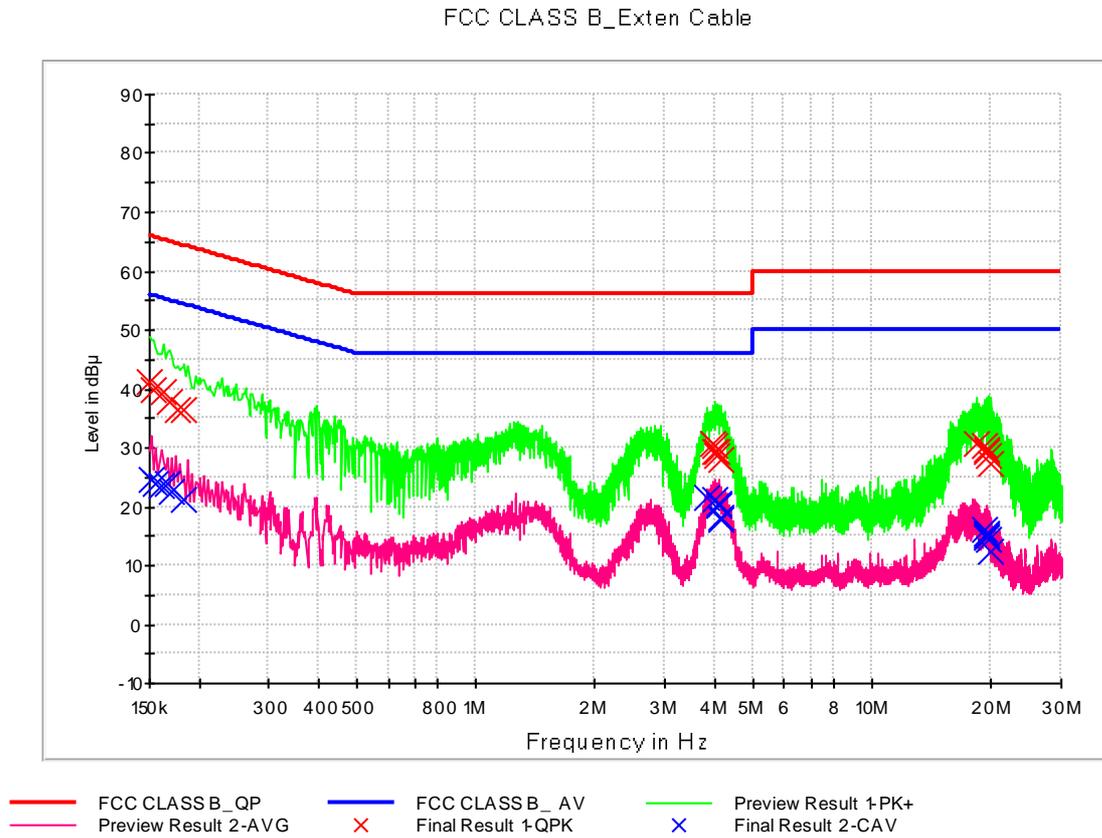
Calculation Formula:

1. Conductor L1 = Hot, Conductor N = Neutral
2. Corr. = LISN Factor + Cable Loss
3. QuasiPeak or CAverage= Receiver Reading + Corr.
4. Margin = Limit – QuasiPeak or CAverage

CAverage Final Result, Line (L1)

Frequency (MHz)	CAverage (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.150000	23.7	9.000	L1	9.8	32.3	56.0
0.156000	23.9	9.000	L1	9.8	31.8	55.7
0.160000	23.6	9.000	L1	9.8	31.9	55.5
0.164000	22.9	9.000	L1	9.8	32.4	55.3
0.168000	22.3	9.000	L1	9.8	32.8	55.1
0.174000	20.9	9.000	L1	9.8	33.8	54.8
3.844000	23.7	9.000	L1	10.0	22.3	46.0
3.854000	23.7	9.000	L1	10.0	22.4	46.0
3.882000	23.6	9.000	L1	10.0	22.4	46.0
3.886000	23.9	9.000	L1	10.0	22.1	46.0
3.890000	23.8	9.000	L1	10.0	22.2	46.0
3.964000	23.7	9.000	L1	10.0	22.3	46.0
15.418000	16.5	9.000	L1	10.4	33.5	50.0
15.558000	17.0	9.000	L1	10.4	33.0	50.0
16.632000	18.3	9.000	L1	10.4	31.7	50.0
16.682000	18.3	9.000	L1	10.4	31.7	50.0
16.686000	18.4	9.000	L1	10.4	31.6	50.0
16.694000	18.3	9.000	L1	10.4	31.7	50.0

Figure 2: Conducted Emission (150 kHz to 30 MHz), Line (N)



QuasiPeak Final Result, Line (N)

Frequency (MHz)	QuasiPeak (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.150000	41.1	9.000	N	9.8	25.0	66.0
0.154000	39.8	9.000	N	9.8	26.0	65.8
0.162000	39.4	9.000	N	9.8	26.0	65.4
0.168000	37.7	9.000	N	9.8	27.4	65.1
0.176000	36.5	9.000	N	9.8	28.2	64.7
0.184000	36.4	9.000	N	9.8	27.9	64.3
3.986000	30.6	9.000	N	10.0	25.4	56.0
3.996000	30.3	9.000	N	10.0	25.7	56.0
4.022000	29.4	9.000	N	10.0	26.6	56.0
4.072000	29.5	9.000	N	10.0	26.5	56.0
4.082000	28.7	9.000	N	10.0	27.3	56.0
4.154000	27.9	9.000	N	10.0	28.1	56.0
18.276000	30.6	9.000	N	10.6	29.4	60.0
19.254000	30.4	9.000	N	10.6	29.6	60.0
19.458000	29.8	9.000	N	10.6	30.2	60.0
19.528000	29.4	9.000	N	10.6	30.6	60.0
19.642000	28.6	9.000	N	10.6	31.4	60.0
19.896000	27.2	9.000	N	10.6	32.8	60.0

CAverage Final Result, Line (N)

Frequency (MHz)	CAverage (dB μ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB μ V)
0.152000	24.6	9.000	N	9.8	31.3	55.9
0.156000	24.0	9.000	N	9.8	31.7	55.7
0.160000	23.6	9.000	N	9.8	31.9	55.5
0.166000	23.8	9.000	N	9.8	31.4	55.2
0.170000	22.5	9.000	N	9.8	32.5	55.0
0.184000	21.3	9.000	N	9.8	33.0	54.3
3.826000	21.5	9.000	N	10.0	24.5	46.0
3.996000	21.2	9.000	N	10.0	24.8	46.0
4.116000	20.1	9.000	N	10.0	25.9	46.0
4.122000	20.4	9.000	N	10.0	25.6	46.0
4.136000	18.2	9.000	N	10.0	27.8	46.0
4.154000	17.8	9.000	N	10.0	28.2	46.0
19.252000	16.1	9.000	N	10.6	33.9	50.0
19.458000	15.5	9.000	N	10.6	34.5	50.0
19.528000	15.1	9.000	N	10.6	34.9	50.0
19.546000	14.8	9.000	N	10.6	35.2	50.0
19.642000	14.4	9.000	N	10.6	35.6	50.0
19.896000	12.4	9.000	N	10.6	37.6	50.0

4.2 Radiated Emission Below 1 GHz

4.2.1 Measuring instruments

	Type	Manufacturer	Model Name	Serial Number	Calibration Cycle	Calibration Date
<input checked="" type="checkbox"/>	EMI test receiver	Rohde & Schwarz	ESU40	100524	1 year	05.17.2019
<input checked="" type="checkbox"/>	Bi-Log antenna	Schwarzbeck	VULB 9168	255	2 year	03.26.2019
<input checked="" type="checkbox"/>	Antenna master	INNCO Systems	MA4640-XP-ET	-	N/A	-
<input checked="" type="checkbox"/>	Antenna master controller	INNCO Systems	CO3000	CO3000/870/ 35990515/L	N/A	-
<input checked="" type="checkbox"/>	Turn Table	INNCO Systems	1060	-	N/A	-
<input checked="" type="checkbox"/>	Turn table controller	INNCO Systems	CO2000	CO2000/095/ 7590304/L	N/A	-
<input checked="" type="checkbox"/>	Radio communication analyzer	ANRITSU	MT8820C	6201138643	1 year	08.20.2019
<input checked="" type="checkbox"/>	Antenna (for Communication)	Schwarzbeck	USLP9142	VSLP 9142-200	-	-
<input checked="" type="checkbox"/>	Software	Rohde & Schwarz	EMC32	-	-	-

4.2.2 Operating Condition

The test results of radiated emission provide the following information:

Used Test Standard	FCC CFR 47 PART 15 Subpart B Class B ICES-003 Issue 6 Class B ANSI C63.4-2014
Frequency Range	30 MHz to 1 000 MHz
Detector	Quasi-Peak
Bandwidth	120 kHz (6 dB)
Worst Case of Operating Mode	FRONT CAMERA & MP3 mode
Kind of Test Site	3 m semi anechoic chamber
Temperature	23.1 °C
Relative Humidity	42.9 %
Test Date	February 28, 2020

4.2.3 Measuring Data

Frequency (MHz)	Quasi Peak (dB μ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
32.042600	18.8	100.0	V	25.0	18.5	21.2	40.0
46.383800	18.3	100.0	V	244.0	19.5	21.7	40.0
68.424000	21.7	100.0	V	328.0	18.3	18.3	40.0
80.581000	16.4	299.9	H	336.0	15.7	23.6	40.0
114.585400	20.3	174.8	V	45.0	16.8	23.2	43.5
143.666200	25.1	100.0	V	195.0	19.2	18.4	43.5

- Calculation Formula:

1. POL. H = Horizontal, POL. V = Vertical
2. QuasiPeak = Reading (Receiver Reading) + Corr.
3. Corr. (Correction Factor) = Antenna Factor + Cable Loss
4. Margin = Limit - QuasiPeak

4.3 Radiated Emission Above 1 GHz

4.3.1 Measuring instruments

	Type	Manufacturer	Model Name	Serial Number	Calibration Cycle	Calibration Date
<input checked="" type="checkbox"/>	EMI test receiver	Rohde & Schwarz	ESU40	100524	1 year	05.17.2019
<input checked="" type="checkbox"/>	Antenna master	INNCO Systems	MA4640-XP-ET	-	N/A	-
<input checked="" type="checkbox"/>	Antenna master controller	INNCO Systems	CO3000	CO3000/870/ 35990515/L	N/A	-
<input checked="" type="checkbox"/>	Turn table	INNCO Systems	1060	-	N/A	-
<input checked="" type="checkbox"/>	Turn table controller	INNCO Systems	CO2000	CO2000/095/ 7590304/L	N/A	-
<input checked="" type="checkbox"/>	Low Noise amplifier	TESTEK	TK-PA18H	170034-L	1 year	03.04.2019
<input checked="" type="checkbox"/>	Low Noise amplifier	TESTEK	TK-PA1840H	170030-L	1 year	02.13.2020
<input checked="" type="checkbox"/>	Horn antenna	Schwarzbeck	BBHA 9120D	01836	1 year	07.19.2019
<input checked="" type="checkbox"/>	Horn antenna	Schwarzbeck	BBHA 9170	BBHA9170786	1 year	12.03.2019
<input checked="" type="checkbox"/>	Radio communication analyzer	ANRITSU	MT8820C	6201138643	1 year	08.20.2019
<input checked="" type="checkbox"/>	Antenna (for Communication)	Schwarzbeck	USLP9142	VSLP 9142-200	-	-
<input checked="" type="checkbox"/>	Software	Rohde & Schwarz	EMC32	-	-	-

4.3.2 Operating Condition

The test results of radiated emission provide the following information:

Used Test Standard	FCC CFR 47 PART 15 Subpart B Class B ICES-003 Issue 6 Class B ANSI C63.4-2014
Detector	Peak mode: Peak (RBW: 1 MHz, VBW: 3 MHz) CISPR-Average mode: Peak (RBW: 1 MHz, VBW: 10 Hz)
Highest Frequency	5 825 MHz
Tested Frequency Range	1 GHz to 30 GHz
Worst Case of Operating Mode	FRONT CAMERA & MP3 mode
Kind of Test Site	3 m semi anechoic chamber
Temperature	22.9 / 23.1 °C
Relative Humidity	43.5 / 43.7 %
Test Date	February 25 / February 26, 2020

4.3.3 Measuring Data

Frequency (MHz)	Peak (dB μ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
1416.150000	36.7	216.4	H	193.0	-26.0	37.3	74.0
4926.510000	39.1	249.9	H	205.0	-16.0	34.9	74.0
7336.060000	44.2	150.0	V	115.0	-9.7	29.8	74.0
9241.920000	48.0	139.6	V	124.0	-5.8	26.0	74.0
11261.880000	48.3	160.5	V	214.0	-2.4	25.7	74.0
12286.075000	45.7	150.0	V	24.0	-3.3	28.3	74.0

Frequency (MHz)	CAverage (dB μ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μ V/m)
1416.150000	28.9	216.4	H	193.0	-26.0	25.1	54.0
4926.510000	26.5	249.9	H	205.0	-16.0	27.5	54.0
7336.060000	31.6	150.0	V	115.0	-9.7	22.4	54.0
9241.920000	35.2	139.6	V	124.0	-5.8	18.8	54.0
11261.880000	35.4	160.5	V	214.0	-2.4	18.6	54.0
12286.075000	33.0	150.0	V	24.0	-3.3	21.0	54.0

- Calculation Formula:

1. POL. H = Horizontal, POL. V = Vertical
2. Peak or CAverage = Reading (Receiver Reading) + Corr.
3. Corr. (Correction Factor) = Antenna Factor+ Cable Loss –Amplifier Gain
4. Margin = Limit - Peak or CAverage

5. CONCLUSION

The data collected shows that the **Product Name: Multi-band GSM/WCDMA/LTE phone with Bluetooth, WLAN, NFC and Model: LM-Q630UM** complies with §15.107 and §15.109 of the FCC rules and ICES-003 Issue 6 of the IC rules.

6. APPENDIX A. TEST SETUP PHOTO

Please refer to Appendix. A and test setup photo file no. as follows;

File No.	Date of Issue	Description
HCT-EM-2003-FI002-P	March 03, 2020	Initial Release

End of report