

## EMI TEST REPORT FCC CERTIFICATION / ISED

**Applicant:**

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

**Date of Issue:** February 15, 2019

**Test Report No.** HCT-EM-1901-FI004-R1

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

**FCC ID  
IC**

**ZNFG820UM  
2703C-G820UM**

Rule Part(s) / Standard(s) : FCC CFR 47 PART 15 Subpart B Class B  
ICES-003 Issue 6 Class B  
ANSI C63.4-2014

EUT Type : Multi-band CDMA/GSM/EDGE/WCDMA/LTE Phone with  
WLAN, Bluetooth and RFID

Model Name : LM-G820UM

Additional Model Name : LMG820UM, G820UM, LM-G820TM, LMG820TM, G820TM,  
LM-G820QM, LMG820QM, G820QM

Travel Adaptor Information : Model Name: MCS-H06WP / Manufacturer: PNTELECOM

Date of Test : January 02, 2019 to January 18, 2019

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

**Tested By**



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## REVISION HISTORY

*The revision history for this document is shown in table.*

Report No.	Issue Date	Information About Changes
HCT-EM-1901-FI004	January 18, 2019	Initial Release
HCT-EM-1901-FI004-R1	February 15, 2019	Revised FCC ID



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## 1. GENERAL INFORMATION

### 1.1 Description of EUT

Its basic purpose is used for communications.

FCC ID	ZNFG820UM
IC	2703C-G820UM
Model	LM-G820UM
Series Model Name	LMG820UM, G820UM, LM-G820TM, LMG820TM, G820TM, LM-G820QM, LMG820QM, G820QM
EUT Type	Multi-band CDMA/GSM/EDGE/WCDMA/LTE Phone with WLAN, Bluetooth and RFID
TX Frequency	824.70 MHz to 848.31 MHz (CDMA BC0) 1 851.25 MHz to 1 908.75 MHz (CDMA BC1) 817.90 MHz to 823.10 MHz (CDMA BC10) 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) 788 MHz to 798 MHz (LTE B14) 704 MHz to 716 MHz (LTE B17) 1 850 MHz to 1 915 MHz (LTE B25) 814 MHz to 849 MHz (LTE B26) 2 305 MHz to 2 315 MHz (LTE B30) 2 496 MHz to 2 690 MHz (LTE B41) 3550 MHz to 3700 MHz (LTE B48) 1 710 MHz to 1 780 MHz (LTE B66) 663 MHz to 698 MHz (LTE B71) 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 (RFID)



RX Frequency	869.70 MHz to 893.31 MHz (CDMA BC0) 1 931.25 MHz to 1 988.75 MHz (CDMA BC1) 862.00 MHz to 894.00 MHz (CDMA BC10) 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) 758 MHz to 768 MHz (LTE B14) 734 MHz to 746 MHz (LTE B17) 1 925 MHz to 1 990 MHz (LTE B25) 859 MHz to 894 MHz (LTE B26) 717 MHz to 728 MHz (LTE B29) 2 350 MHz to 2 360 MHz (LTE B30) 2 496 MHz to 2 690 MHz (LTE B41) 5 150 MHz to 5 925 MHz (LTE B46) 3550 MHz to 3700 MHz (LTE B48) 2 110 MHz to 2 200 MHz (LTE B66) 617 MHz to 652 MHz (LTE B71) 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 (RFID)
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## 1.2 Tested System Details

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

Device Type	Model Name	Serial Number	Manufacturer	FCC ID / DoC
EUT	LM-G820UM	-	LG	ZNFG820UM
Data Cable	EAD64746102	-	LUXSHARE	-
Earphone	EAB63728251	-	CRESYN	-
TA	MCS-H06WP	-	PNTELECOM	-
Micro SD card	SAMSUNG EVO +microSDXC CLASS10 UHS-1 (256 GB)	-	SAMSUNG	-
Wireless Charger	EP-PN920	-	SAMSUNG	A3LEPPN920
Micro USB Cable	ECB-DU4EWE	-	SAMSUNG	-
LED Monitor	27UD88	-	LG	-
Monitor Adapter	LCAP31	-	Genmao Electronics (Suzhou)	-
DP cable	NEXT-JCA141	-	EZ-NET Ubiquitous	-



### 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
LED monitor	DC IN	Y	N/A	(P) 1.0
	DP port	N/A	Y	(D) 1.2
Wireless Charger	Micro USB	Y	N/A	(P) 1.5

\* 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
LED monitor	DP port	N	N/A	Y	Both End
Wireless Charger	Micro USB	N	N/A	Y	Both 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	Registration Number
Radiated Field strength measurement facility 3 m Semi Anechoic chamber	90661
Radiated Field strength measurement facility 10 m Semi Anechoic chamber	
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 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).

## 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 (dB)
Conducted Emission (0.15 MHz to 30 MHz)	1.82 dB
Radiated Emissions (30 MHz to 1 GHz)	5.20 dB
Radiated Emissions (1 GHz to 18 GHz)	5.24 dB
Radiated Emissions (18 GHz to 40 GHz)	5.40 dB



## 2. LIST OF TEST EQUIPMENT

<u>Type</u>	<u>Manufacturer</u>	<u>Model Name</u>	<u>Serial Number</u>	<u>Calibration Cycle</u>	<u>CAL Date</u>
<u>Conducted Emission</u>					
<input checked="" type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESCI	100584	1 year	06.25.2018
<input checked="" type="checkbox"/> LISN	Rohde & Schwarz	ENV216	102245	1 year	12.12.2018
<input type="checkbox"/> LISN	Rohde & Schwarz	ENV216	100073	1 year	05.03.2018
<input checked="" type="checkbox"/> Software	Rohde & Schwarz	EMC32 VER8.54.0	-	-	-
<u>Radiated Emission</u>					
-For measurement below 1 GHz					
<input checked="" type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESU40	100524	1 year	07.27.2018
<input checked="" type="checkbox"/> Trilog Antenna	Schwarzbeck	VULB 9168	760	2 year	04.06.2017
<input checked="" type="checkbox"/> Trilog Antenna	Schwarzbeck	VULB 9168	847	2 year	04.13.2018
<input checked="" type="checkbox"/> Antenna master	INNCO Systems	MA4640-XP-ET	-	N/A	-
<input checked="" type="checkbox"/> Antenna master controller	INNCO Systems	CO 3000	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 type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESU26	100241	1 year	08.14.2018
<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"/> Software	Rohde & Schwarz	EMC32 VER8.40.0	-	-	-
-For measurement above 1 GHz					
<input checked="" type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESU40	100524	1 year	07.27.2018
<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"/> Horn Antenna	Schwarzbeck	BBHA 9120D	01836	2 year	05.14.2018
<input checked="" type="checkbox"/> Low Noise Amplifier	TESTEK	TK-PA18H	170034-L	1 year	03.06.2018
<input checked="" type="checkbox"/> Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170#786	2 year	12.05.2017
<input checked="" type="checkbox"/> Power Amplifier	TESTEK	TK-PA1840H	170030-L	1 year	12.17.2018
<input type="checkbox"/> Antenna master controller	HD GmbH	HD 100	100/637	N/A	-
<input type="checkbox"/> Power Amplifier	CERNEX	CBLU1183540	21691	1 year	06.25.2018
<input type="checkbox"/> Antenna master	HD GmbH	MA240	240/520	N/A	-
<input type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESU26	100241	1 year	08.14.2018
<input type="checkbox"/> Turn Table	INNCO Systems	DT3000-3T	DT3000/69	N/A	-
<input checked="" type="checkbox"/> Software	Rohde & Schwarz	EMC32 VER8.40.0	-	-	-



### 3. DESCRIPTION OF TEST

#### 3.1 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)	Quasi-Peak (dB(μV))	Average (dB(μV))
0.15 to 0.5	9	66 to 56*	56 to 46*
0.5 to 5	9	56	46
5 to 30	9	60	50

*\*Decreases with the logarithm of the frequency.*



### 3.2 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)	Antenna Distance (m)	Field Strength ( $\mu\text{V}/\text{m}$ )	Quasi-Peak ( $\text{dB}(\mu\text{V}/\text{m})$ )
30 to 88	3	100	40.0
88 to 216	3	150	43.5
216 to 960	3	200	46.0
Above 960	3	500	54.0
Frequency (MHz)	Antenna Distance (m)	Peak ( $\text{dB}(\mu\text{V}/\text{m})$ )	Average ( $\text{dB}(\mu\text{V}/\text{m})$ )
Above 1 000	3	74	54

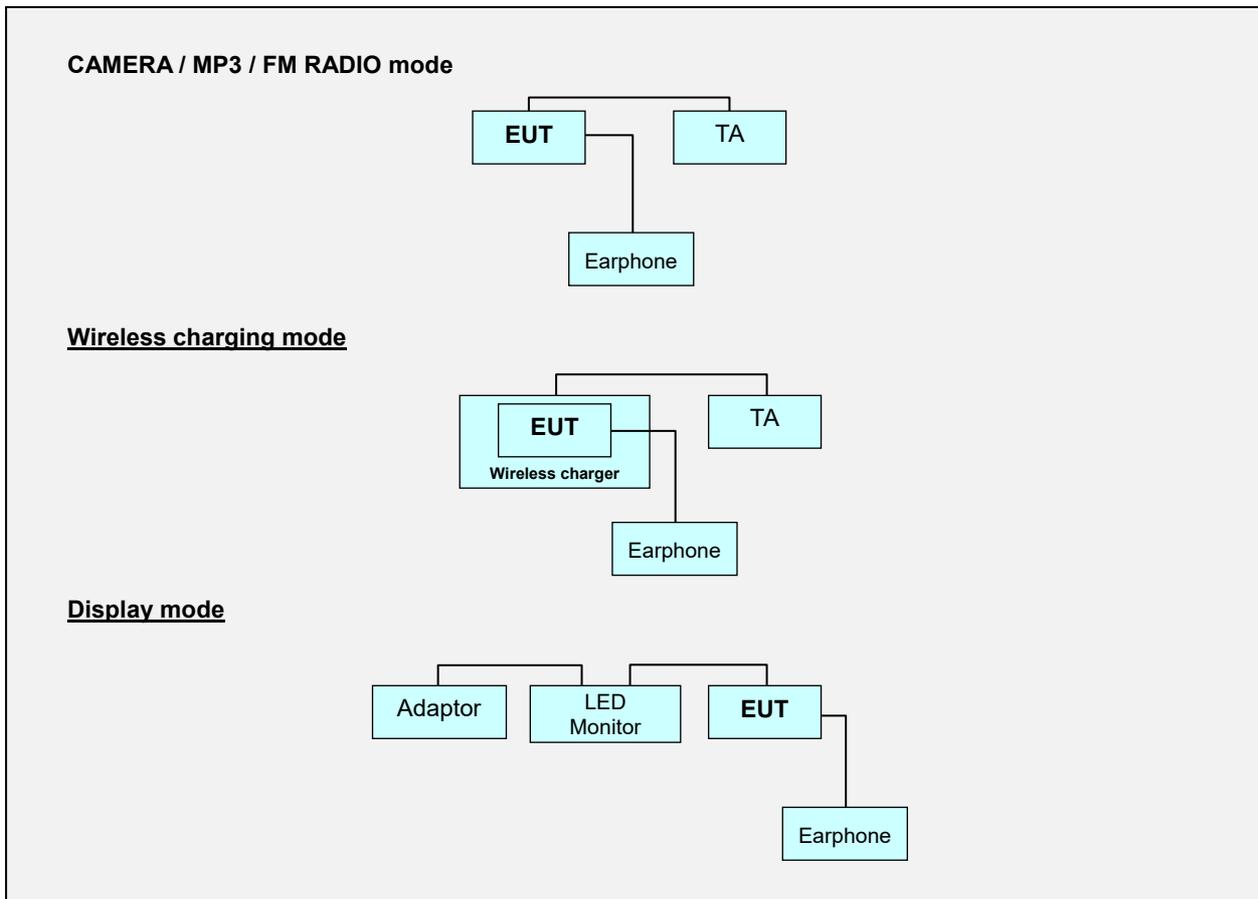


### 3.2.1 Frequency Range of Radiated Measurements

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	5 <sup>th</sup> harmonic of the highest frequency or 40 GHz, whichever is lower

### 3.3 Configuration of Tested System



Non-Conductive Table  
 Power Line: 120 VAC, 60 Hz



## 4. PRELIMINARY TEST

### 4.1 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
- ToF CAMERA mode
- IDLE mode

*NOTE. The worst-case emissions are reported.*

### 4.2 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
- ToF CAMERA mode
- IDLE mode
- Wireless charging mode
- Display mode

*NOTE. The worst-case emissions are reported.*



## 5. CONDUCTED AND RADIATED EMISSION TEST SUMMARY

### 5.1 Conducted Emission

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

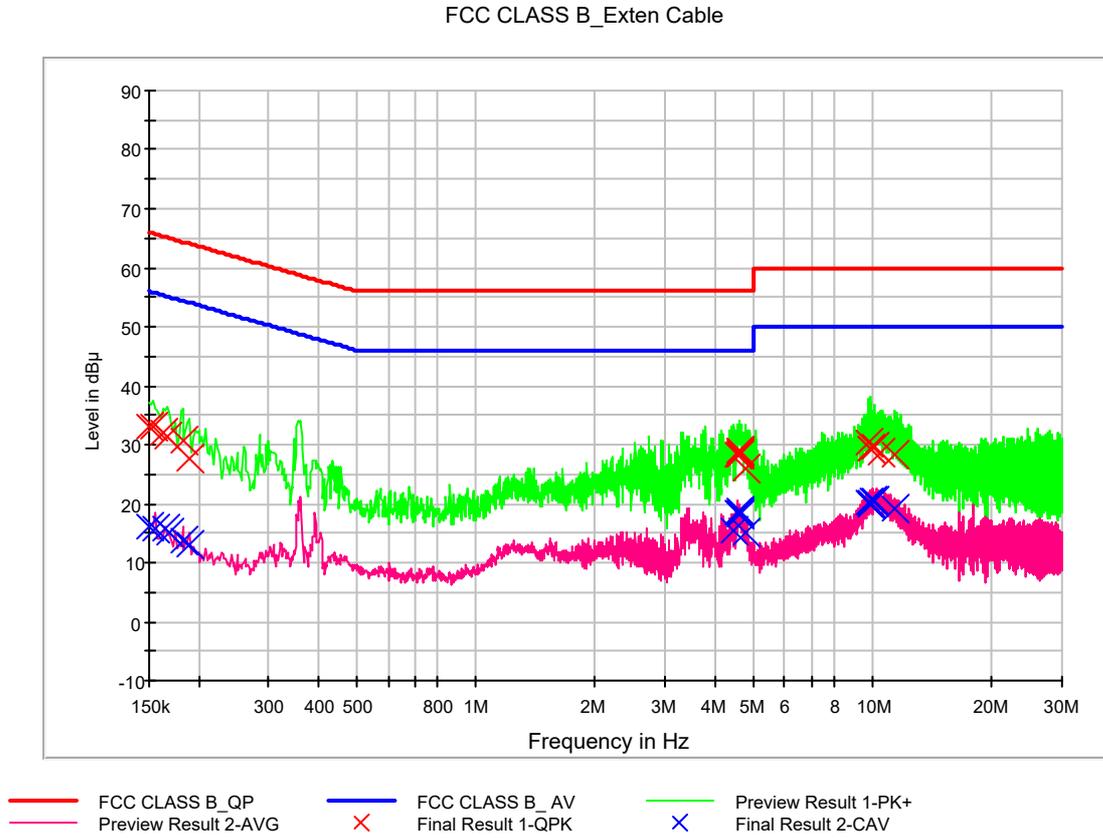
Rule Part / Standard	FCC PART 15 Subpart B Class B ICES-003 Issue 6 Class B ANSI C63.4-2014
Detector	Quasi-Peak, CISPR-Average
Bandwidth	9 kHz (6 dB)
Operating Mode	FRONT CAMERA & MP3 mode
Kind of Test Site	Shielded Room
Temperature	20.1 °C
Relative Humidity	41.5 %
Test Date	January 04, 2019

#### **- 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



Figure 1: Conducted Emission, AC Main Port, Line (L1)





**QuasiPeak Final Result, Line (L1)**

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	32.9	9.000	L1	9.7	33.1	66.0
0.154000	33.0	9.000	L1	9.7	32.8	65.8
0.162000	32.2	9.000	L1	9.7	33.2	65.4
0.166000	31.4	9.000	L1	9.7	33.8	65.2
0.182000	30.7	9.000	L1	9.7	33.7	64.4
0.190000	27.8	9.000	L1	9.7	36.3	64.0
4.578000	28.4	9.000	L1	10.0	27.6	56.0
4.600000	28.8	9.000	L1	10.0	27.2	56.0
4.612000	28.3	9.000	L1	10.0	27.7	56.0
4.626000	29.1	9.000	L1	10.0	26.9	56.0
4.636000	29.1	9.000	L1	10.0	26.9	56.0
4.774000	25.9	9.000	L1	10.0	30.1	56.0
9.772000	30.2	9.000	L1	10.2	29.8	60.0
9.840000	29.5	9.000	L1	10.2	30.5	60.0
9.876000	29.3	9.000	L1	10.2	30.7	60.0
10.106000	29.7	9.000	L1	10.2	30.3	60.0
10.466000	28.8	9.000	L1	10.2	31.2	60.0
11.378000	28.4	9.000	L1	10.3	31.6	60.0

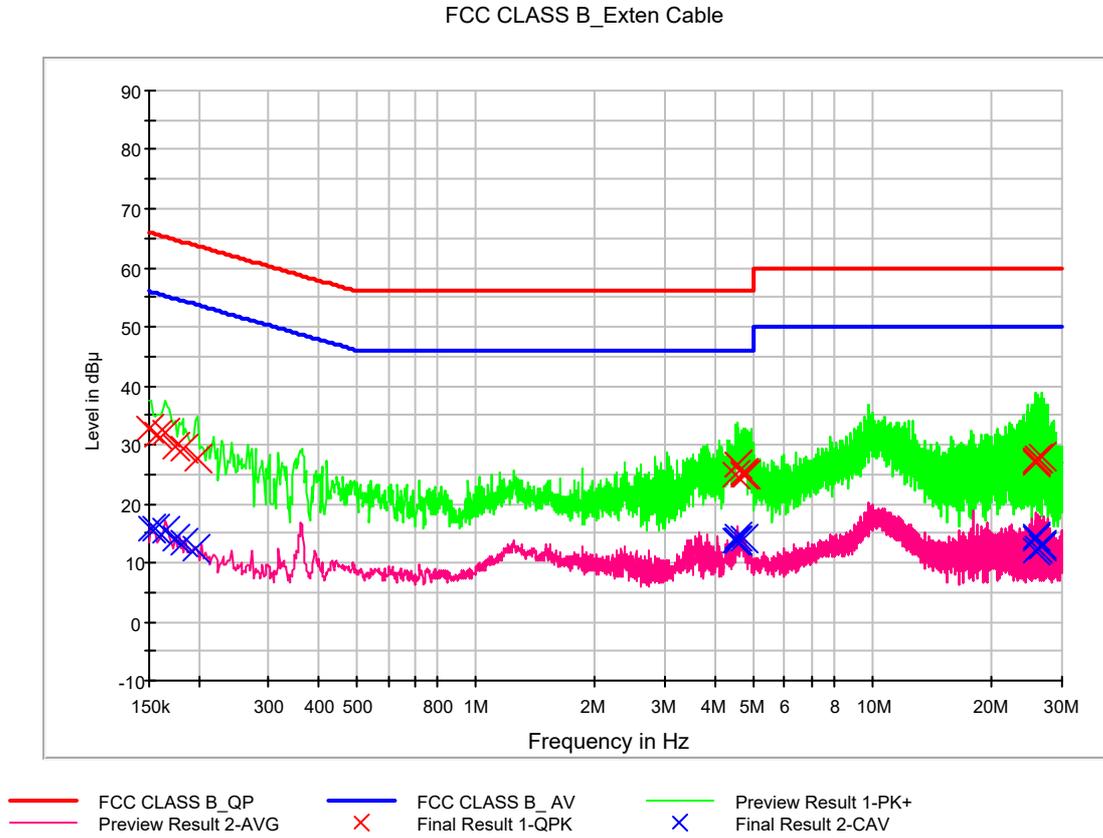


**CAverage Final Result, Line (L1)**

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	16.3	9.000	L1	9.7	39.7	56.0
0.156000	15.9	9.000	L1	9.7	39.8	55.7
0.164000	15.9	9.000	L1	9.7	39.3	55.3
0.168000	15.0	9.000	L1	9.7	40.1	55.1
0.182000	13.6	9.000	L1	9.7	40.8	54.4
0.190000	13.1	9.000	L1	9.7	40.9	54.0
4.446000	15.3	9.000	L1	10.0	30.7	46.0
4.578000	18.4	9.000	L1	10.0	27.6	46.0
4.598000	19.0	9.000	L1	10.0	27.0	46.0
4.612000	18.2	9.000	L1	10.0	27.8	46.0
4.636000	18.5	9.000	L1	10.0	27.5	46.0
4.774000	15.2	9.000	L1	10.0	30.8	46.0
9.772000	20.2	9.000	L1	10.2	29.8	50.0
9.840000	20.3	9.000	L1	10.2	29.7	50.0
9.876000	19.9	9.000	L1	10.2	30.1	50.0
9.984000	20.6	9.000	L1	10.2	29.4	50.0
10.106000	20.5	9.000	L1	10.2	29.5	50.0
11.378000	19.2	9.000	L1	10.3	30.8	50.0



Figure 2: Conducted Emission, AC Main Port, Line (N)





**QuasiPeak Final Result, Line (N)**

Frequency (MHz)	QuasiPeak (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	32.7	9.000	N	9.8	33.3	66.0
0.158000	31.7	9.000	N	9.8	33.9	65.6
0.164000	32.1	9.000	N	9.8	33.2	65.3
0.174000	29.7	9.000	N	9.8	35.0	64.8
0.182000	29.2	9.000	N	9.8	35.1	64.4
0.198000	27.8	9.000	N	9.8	35.9	63.7
4.526000	24.7	9.000	N	10.2	31.3	56.0
4.542000	26.7	9.000	N	10.2	29.3	56.0
4.556000	26.5	9.000	N	10.2	29.5	56.0
4.704000	25.0	9.000	N	10.2	31.0	56.0
4.748000	25.2	9.000	N	10.2	30.8	56.0
4.766000	24.8	9.000	N	10.2	31.2	56.0
25.784000	26.8	9.000	N	11.0	33.2	60.0
25.842000	27.3	9.000	N	11.0	32.7	60.0
25.882000	27.2	9.000	N	11.0	32.8	60.0
25.934000	27.6	9.000	N	11.0	32.4	60.0
26.078000	27.8	9.000	N	11.1	32.2	60.0
26.738000	28.1	9.000	N	11.1	31.9	60.0



**CAverage Final Result, Line (N)**

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.152000	15.8	9.000	N	9.8	40.1	55.9
0.156000	15.9	9.000	N	9.8	39.8	55.7
0.164000	15.4	9.000	N	9.8	39.9	55.3
0.174000	14.2	9.000	N	9.8	40.6	54.8
0.182000	13.5	9.000	N	9.8	40.9	54.4
0.196000	12.3	9.000	N	9.8	41.5	53.8
4.526000	13.6	9.000	N	10.2	32.4	46.0
4.542000	14.5	9.000	N	10.2	31.5	46.0
4.550000	13.6	9.000	N	10.2	32.4	46.0
4.556000	13.9	9.000	N	10.2	32.1	46.0
4.580000	13.7	9.000	N	10.2	32.3	46.0
4.704000	14.1	9.000	N	10.2	31.9	46.0
25.784000	12.1	9.000	N	11.0	37.9	50.0
25.842000	14.1	9.000	N	11.0	35.9	50.0
25.882000	14.4	9.000	N	11.0	35.6	50.0
25.934000	12.2	9.000	N	11.0	37.8	50.0
26.726000	12.8	9.000	N	11.1	37.2	50.0
26.738000	13.1	9.000	N	11.1	36.9	50.0



## 5.2 Radiated Emission

The test results of radiated emission provide the following information:

### For Measurement Below 1 GHz

Rule Part / Standard	FCC PART 15 Subpart B Class B ICES-003 Issue 6 Class B ANSI C63.4-2014
Detector	Quasi-Peak
Bandwidth	120 kHz (6 dB)
Operating Mode	FRONT CAMERA & MP3 mode Wireless charging mode Display mode
Kind of Test Site	3 m semi anechoic chamber
Temperature	22.7 / 23.3 / 21.1 °C
Relative Humidity	41.6 / 44.2 / 43.0 %
Test Date	January 07 / January 15 / January 17, 2019

### - 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



**FRONT CAMERA & MP3 Mode**

Frequency (MHz)	Quasi Peak (dBµV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
31.492000	27.6	100.0	V	345.0	18.8	12.4	40.0
82.284000	20.0	174.9	V	174.0	15.3	20.0	40.0
86.999200	28.6	206.9	H	107.0	14.8	11.4	40.0
130.031200	22.3	100.0	V	259.0	18.7	21.2	43.5
151.858400	28.7	207.9	H	313.0	20.0	14.8	43.5
695.406400	28.4	191.9	V	228.0	28.6	17.6	46.0

**Wireless Charging Mode**

Frequency (MHz)	Quasi Peak (dBµV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
30.585736	20.0	174.9	V	4.0	18.7	20.0	40.0
54.821600	27.0	100.0	V	0.0	20.0	13.0	40.0
84.822400	22.6	400.0	H	287.0	15.0	17.4	40.0
143.980000	22.2	100.0	V	298.0	19.8	21.3	43.5
161.527200	19.3	125.1	V	16.0	20.1	24.2	43.5
696.693600	28.6	325.1	H	0.0	28.7	17.4	46.0

**Display Mode**

Frequency (MHz)	Quasi Peak (dBµV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
37.264800	23.7	100.0	V	1.0	19.3	16.3	40.0
90.008000	30.9	225.1	H	304.0	14.4	12.6	43.5
150.000000	30.4	191.9	H	90.0	20.0	13.1	43.5
399.563200	36.9	100.0	H	120.0	23.0	9.1	46.0
506.152000	32.9	100.0	V	222.0	25.3	13.1	46.0
874.832000	33.1	100.0	H	265.0	30.9	12.9	46.0



**For Measurement Above 1 GHz**

Rule Part / Standard	FCC 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	5 925 MHz
Tested Frequency Range	1 GHz to 30 GHz
Operating Mode	FRONT CAMERA & MP3 mode Wireless charging mode Display mode
Kind of Test Site	3 m semi anechoic chamber
Temperature	20.7 / 20.4 / 23.3 / 21.3 °C
Relative Humidity	40.2 / 39.7 / 44.2 / 41.9 %
Test Date	January 02 / January 03 / January 15 / January 18, 2019

**- 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



**FRONT CAMERA & MP3 Mode**

Frequency (MHz)	Peak (dBµV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2126.675000	31.2	100.0	V	228.0	-26.3	42.8	74.0
4058.290000	35.2	245.4	V	302.0	-20.8	38.8	74.0
5390.595000	36.7	218.4	V	245.0	-18.0	37.3	74.0
7430.160000	41.9	175.5	H	128.0	-12.9	32.1	74.0
8857.740000	42.1	138.8	H	311.0	-11.7	31.9	74.0
9844.660000	43.5	100.0	H	283.0	-9.6	30.5	74.0

Frequency (MHz)	CAverage (dBµV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
2126.675000	18.6	100.0	V	228.0	-26.3	35.4	54.0
4058.290000	22.9	245.4	V	302.0	-20.8	31.1	54.0
5390.595000	24.0	218.4	V	245.0	-18.0	30.0	54.0
7430.160000	28.7	175.5	H	128.0	-12.9	25.3	54.0
8857.740000	29.6	138.8	H	311.0	-11.7	24.4	54.0
9844.660000	31.1	100.0	H	283.0	-9.6	22.9	54.0

**Wireless Charging Mode**

Frequency (MHz)	Peak (dBµV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
3035.800000	33.5	124.6	H	132.0	-22.8	40.5	74.0
5305.445000	36.5	198.5	V	161.0	-18.1	37.5	74.0
7463.670000	41.1	126.7	V	276.0	-12.8	32.9	74.0
9671.690000	43.5	139.6	V	219.0	-9.8	30.5	74.0
10997.250000	45.6	100.0	V	276.0	-5.6	28.4	74.0
14772.420000	46.3	233.6	V	4.0	-1.4	27.7	74.0

Frequency (MHz)	CAverage (dBµV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
3035.800000	21.1	124.6	H	132.0	-22.8	32.9	54.0
5305.445000	23.7	198.5	V	161.0	-18.1	30.3	54.0
7463.670000	28.4	126.7	V	276.0	-12.8	25.6	54.0
9671.690000	30.9	139.6	V	219.0	-9.8	23.1	54.0
10997.250000	32.9	100.0	V	276.0	-5.6	21.1	54.0
14772.420000	34.0	233.6	V	4.0	-1.4	20.0	54.0



**Display Mode**

Frequency (MHz)	Peak (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1094.995000	47.7	149.6	H	284.0	-29.5	26.3	74.0
2404.040000	41.3	113.6	H	160.0	-25.3	32.7	74.0
2981.125000	42.0	150.0	H	273.0	-22.9	32.0	74.0
5400.020000	46.3	176.5	H	184.0	-18.0	27.7	74.0
14733.390000	46.9	350.0	V	328.0	-1.4	27.1	74.0
17915.120000	53.2	299.4	V	50.0	6.8	20.8	74.0

Frequency (MHz)	CAverage (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
1094.995000	34.6	149.6	H	284.0	-29.5	19.4	54.0
2404.040000	28.7	113.6	H	160.0	-25.3	25.3	54.0
2981.125000	28.2	150.0	H	273.0	-22.9	25.8	54.0
5400.020000	42.8	176.5	H	184.0	-18.0	11.2	54.0
14733.390000	33.9	350.0	V	328.0	-1.4	20.1	54.0
17915.120000	40.2	299.4	V	50.0	6.8	13.8	54.0



## 6. CONCLUSION

The data collected shows that the **EUT Type: Multi-band CDMA/GSM/EDGE/WCDMA/LTE Phone with WLAN, Bluetooth and RFID, Model: LM-G820UM** complies with §15.107 and §15.109 of the FCC rules and ICES-003 Issue 6 of the IC rules.



## 7. APPENDIX A. TEST SETUP PHOTOGRAPHS

Please refer to Appendix A