



# **FCC TEST REPORT**

**Prepared for :**

**LG Electronics USA, Inc.**

**1000 Sylvan Ave. Englewood Cliffs, New Jersey, United States 07632**

**FCC ID: ZNFX210LMW**

**Product: 4G Mobile phone**

**Trade Name: LG**

**Model Name: LM-X210LMW**

**Date of Test: Jun 25, 2019 ~ July 11, 2019**

**Date of Report: July 11, 2019**

**Report Number: HK1907111626-8E**

**Prepared By :**

**Shenzhen HUAKE Testing Technology Co., Ltd.**

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### TEST REPORT VERIFICATION

Applicant : LG Electronics USA, Inc.  
 Address : 1000 Sylvan Ave. Englewood Cliffs, New Jersey, United States 07632  
 Manufacturer : OPTIEMUS ELECTRONICS LIMITED  
 Address : D-348, Sector 63, Gautam Budh Nagar, Noida, Uttar Pradesh 201307 India  
 EUT Description : 4G Mobile phone  
 (A) Model No. : LM-X210LMW  
 (B) Serial No. : N/A  
 (C) Power Supply : DC3.85V By Battery or DC5V from adapter

**Standards** ..... FCC Part 15 Subpart B  
 ..... ANSI C63.4:2014

This device described above has been tested by HUAKE, and the test results show that the equipment under test (EUT) is in compliance with Part 15 of FCC Rules. And it is applicable only to the tested sample identified in the report.

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**Date of Test**.....

Date (s) of performance of tests..... Jun 25, 2019 ~ July 11, 2019

Date of Issue ..... July 11, 2019

Test Result ..... **Pass**

Testing Engineer : Gary Qian  
 (Gary Qian)

Technical Manager : Eden Hu  
 (Eden Hu)

Authorized Signatory : Jason Zhou  
 (Jason Zhou)



|  |    |
|--|----|
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## 1. TEST SUMMARY

Test procedures according to the technical standards:

| EMC Emission                             |                    |         |          |        |
|--|--------------------|---------|----------|--------|
| Standard                                 | Test Item          | Limit   | Judgment | Remark |
| FCC Part 15 Subpart B<br>ANSI C63.4:2014 | Conducted Emission | Class B | PASS     |        |
|  | Radiated Emission  | Class B | PASS     |        |

**NOTE:**

- (1) 'N/A' denotes test is not applicable in this Test Report
- (2) For client's request and manual description, the test will not be executed.



## 1.1 TEST FACILITY

Test Firm : Shenzhen HUAKE Testing Technology Co., Ltd.

Address : 1F, B2 Building, Junfeng Zhongcheng Zhizao Innovation Park,  
Fuhai Street, Bao'an District, Shenzhen City, China

Designation Number : CN1229

Test Firm Registration Number:616276

IC Registration No.: 21210

The 3m alternate test site of Shenzhen HUAKE Testing Technology Co., Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration No.: 21210 on May 24, 2016.

## 1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $y \pm U$  · where expanded uncertainty  $U$  is based on a standard uncertainty multiplied by a coverage factor of  $k=2$  · providing a level of confidence of approximately **95** %.

### Measurement Uncertainty

|   |   |             |
|---|---|-------------|
| Conducted Emission Expanded Uncertainty               | = | 2.23dB, k=2 |
| Radiated emission expanded uncertainty(9kHz-30MHz)    | = | 3.08dB, k=2 |
| Radiated emission expanded uncertainty(30MHz-1000MHz) | = | 4.42dB, k=2 |
| Radiated emission expanded uncertainty(Above 1GHz)    | = | 4.06dB, k=2 |



## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

|                      |  |                      |     |                      |     |
|----------------------|--|----------------------|-----|----------------------|-----|
| Equipment            | 4G Mobile phone  |                      |     |                      |     |
| Model Name           | LM-X210LMW   |                      |     |                      |     |
| Serial No            | N/A  |                      |     |                      |     |
| Model Difference     | N/A  |                      |     |                      |     |
| Product Description  | <p>The EUT is a 4G Mobile phone</p> <table border="1"><tr><td>Operating frequency:</td><td>N/A</td></tr><tr><td>Connecting I/O port:</td><td>N/A</td></tr></table> <p>Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.</p> | Operating frequency: | N/A | Connecting I/O port: | N/A |
| Operating frequency: | N/A  |                      |     |                      |     |
| Connecting I/O port: | N/A  |                      |     |                      |     |
| Power Source         | AC Voltage   |                      |     |                      |     |
| Power Rating         | DC3.85V By Battery or DC5V from adapter  |                      |     |                      |     |



## 2.2 DESCRIPTION OF TEST MODES

To investigate the maximum EMI emission characteristics generated from EUT, the test system was pre-scanning tested based on the consideration of following EUT operation mode or test configuration mode which possibly have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

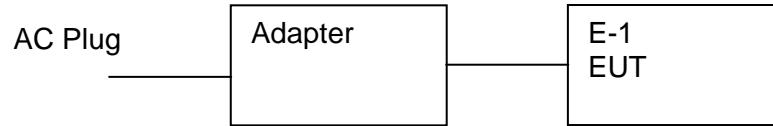
| Pretest Mode | Description |
|--------------|-------------|
| Mode 1       | Running     |

| For Conducted Test |             |
|--------------------|-------------|
| Final Test Mode    | Description |
| Mode 1             | Running     |

| For Radiated Test |             |
|-------------------|-------------|
| Final Test Mode   | Description |
| Mode 1            | Running     |



### 2.3 DESCRIPTION OF TEST SETUP



### 2.4 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

| Item | Equipment       | Mfr/Brand | Model/Type No. | Series No. | Note |
|------|-----------------|-----------|----------------|------------|------|
| E-1  | 4G Mobile phone | LG        | LM-X210LMW     | N/A        | EUT  |
|      |                 |           |                |            |      |
|      |                 |           |                |            |      |
|      |                 |           |                |            |      |





## 2.5 MEASUREMENT INSTRUMENTS LIST

| Item | Equipment                               | Manufacturer    | Model No.           | Serial No. | Last Cal.     | Cal. Interval |
|------|---|-----------------|---------------------|------------|---------------|---------------|
| 1.   | L.I.S.N.<br>Artificial Mains<br>Network | R&S             | ENV216              | HKE-002    | Dec. 27, 2018 | 1 Year        |
| 2.   | Receiver                                | R&S             | ESCI 7              | HKE-010    | Dec. 27, 2018 | 1 Year        |
| 3.   | RF automatic<br>control unit            | Tonscend        | JS0806-2            | HKE-060    | Dec. 27, 2018 | 1 Year        |
| 4.   | Spectrum analyzer                       | R&S             | FSP40               | HKE-025    | Dec. 27, 2018 | 1 Year        |
| 5.   | Spectrum analyzer                       | Agilent         | N9020A              | HKE-048    | Dec. 27, 2018 | 1 Year        |
| 6.   | Preamplifier                            | Schwarzbeck     | BBV 9743            | HKE-006    | Dec. 27, 2018 | 1 Year        |
| 7.   | EMI Test Receiver                       | Rohde & Schwarz | ESCI 7              | HKE-010    | Dec. 27, 2018 | 1 Year        |
| 8.   | Bilog Broadband<br>Antenna              | Schwarzbeck     | VULB9163            | HKE-012    | Dec. 27, 2018 | 1 Year        |
| 9.   | Loop Antenna                            | Schwarzbeck     | FMZB 1519<br>B      | HKE-014    | Dec. 27, 2018 | 1 Year        |
| 10.  | Horn Antenna                            | Schwarzbeck     | 9120D               | HKE-013    | Dec. 27, 2018 | 1 Year        |
| 11.  | Pre-amplifier                           | EMCI            | EMC05184<br>5SE     | HKE-015    | Dec. 27, 2018 | 1 Year        |
| 12.  | Pre-amplifier                           | Agilent         | 83051A              | HKE-016    | Dec. 27, 2018 | 1 Year        |
| 13.  | EMI Test Software<br>EZ-EMC             | Tonscend        | JS1120-B<br>Version | HKE-083    | Dec. 27, 2018 | N/A           |
| 14.  | Power Sensor                            | Agilent         | E9300A              | HKE-086    | Dec. 27, 2018 | 1 Year        |
| 15.  | Spectrum analyzer                       | Agilent         | N9020A              | HKE-048    | Dec. 27, 2018 | 1 Year        |
| 16.  | Signal generator                        | Agilent         | N5182A              | HKE-029    | Dec. 27, 2018 | 1 Year        |
| 17.  | Signal Generator                        | Agilent         | 83630A              | HKE-028    | Dec. 27, 2018 | 1 Year        |
| 18.  | Shielded room                           | Shiel Hong      | 4*3*3               | HKE-039    | Dec. 27, 2018 | 3 Year        |



### 3. EMC EMISSION TEST

#### 3.1 CONDUCTED EMISSION MEASUREMENT

##### 3.1.1 POWER LINE CONDUCTED EMISSION (Frequency Range 150KHz-30MHz)

| FREQUENCY (MHz) | Class A (dBuV) |         | Class B (dBuV) |           |
|-----------------|----------------|---------|----------------|-----------|
|                 | Quasi-peak     | Average | Quasi-peak     | Average   |
| 0.15 -0.5       | 79.00          | 66.00   | 66 - 56 *      | 56 - 46 * |
| 0.50 -5.0       | 73.00          | 60.00   | 56.00          | 46.00     |
| 5.0 -30.0       | 73.00          | 60.00   | 60.00          | 50.00     |

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

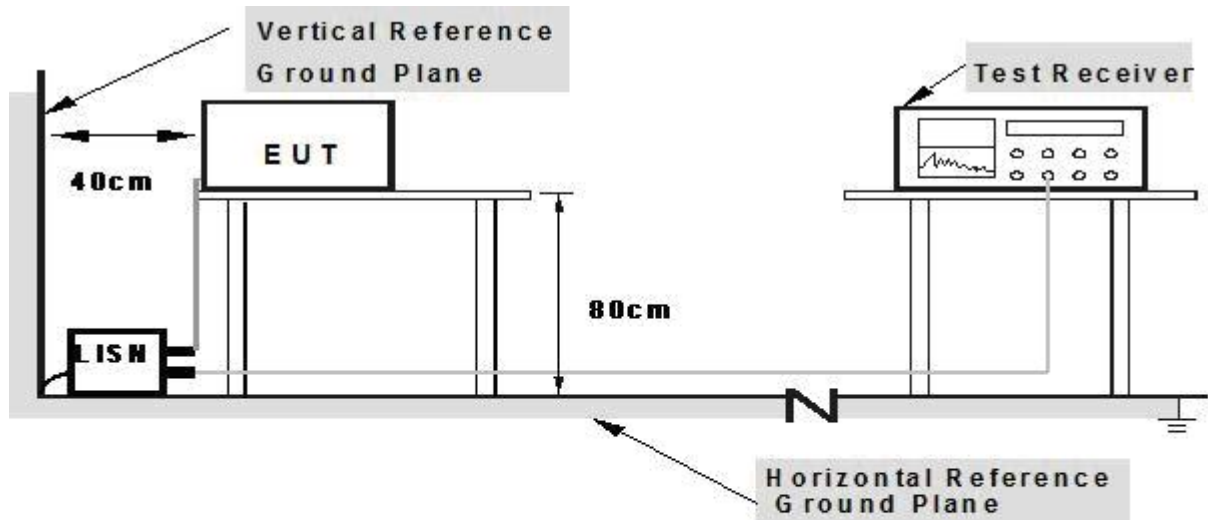
The following table is the setting of the receiver

| Receiver Parameters | Setting  |
|---------------------|----------|
| Attenuation         | 10 dB    |
| Start Frequency     | 0.15 MHz |
| Stop Frequency      | 30 MHz   |
| IF Bandwidth        | 9 kHz    |

### 3.1.2 TEST PROCEDURE

- a. The EUT was placed 0.4 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 3.1.3 TEST SETUP



**Note: 1.Support units were connected to second LISN.**

**2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes**

### 3.1.4 EUT OPERATING CONDITIONS

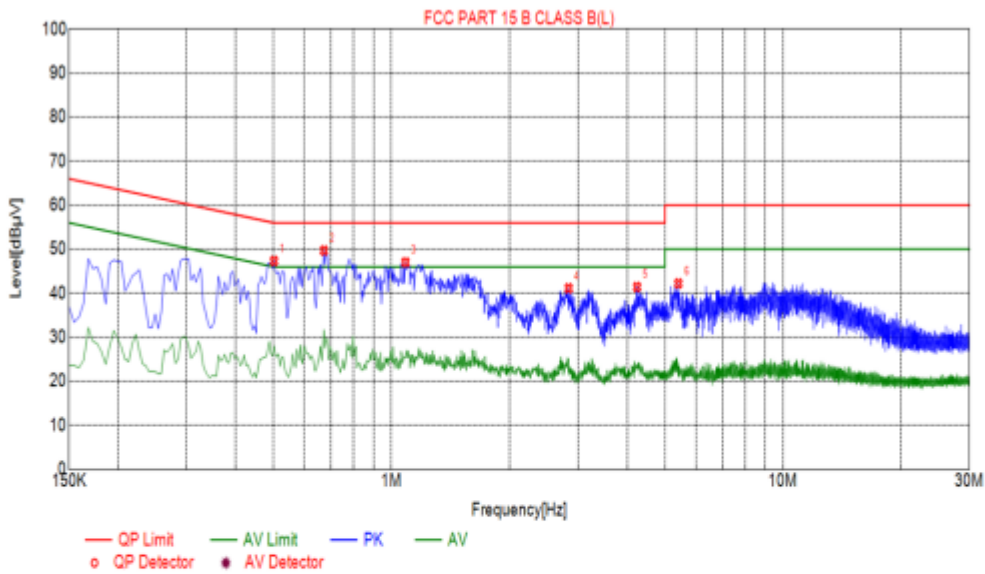
The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

Remark: We tested AC 120V/60Hz and AC 240V/60Hz, the worst case was recorded.



3.1.5 TEST RESULTS

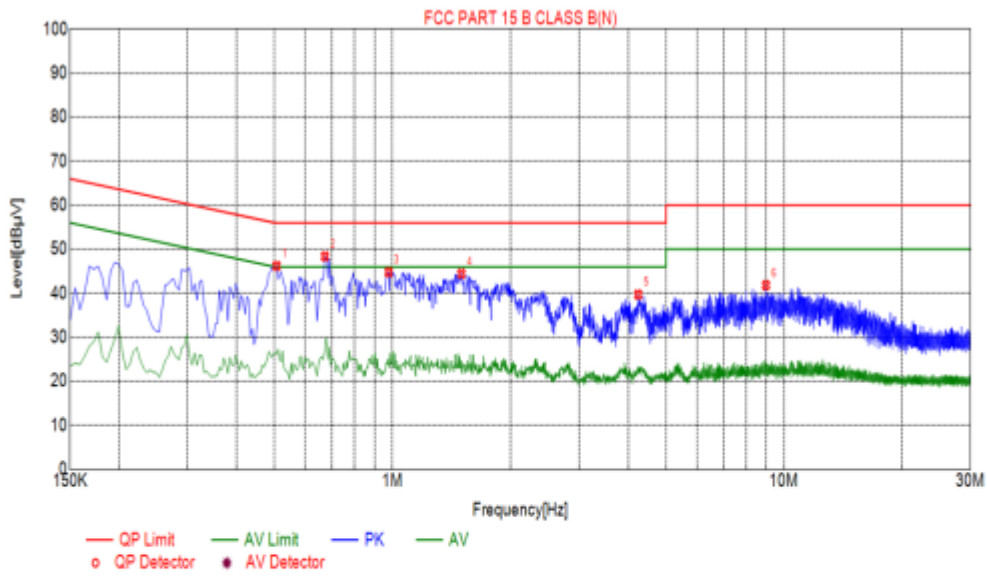
|                |                 |                     |            |
|----------------|-----------------|---------------------|------------|
| EUT :          | 4G Mobile phone | Model Name. :       | LM-X210LMW |
| Temperature :  | 26 °C           | Relative Humidity : | 54%        |
| Pressure :     | 1010hPa         | Test Date :         | 2019-07-11 |
| Test Mode :    | Running         | Phase :             | L          |
| Test Voltage : | AC120V/60Hz     |                     |            |



| Suspected List |             |              |             |              |             |          |
|----------------|-------------|--------------|-------------|--------------|-------------|----------|
| NO.            | Freq. [MHz] | Level [dBµV] | Factor [dB] | Limit [dBµV] | Margin [dB] | Detector |
| 1              | 0.5010      | 47.33        | 10.04       | 56.00        | 8.67        | PK       |
| 2              | 0.6720      | 49.70        | 10.05       | 56.00        | 6.30        | PK       |
| 3              | 1.0860      | 47.02        | 10.07       | 56.00        | 8.98        | PK       |
| 4              | 2.8365      | 41.13        | 10.21       | 56.00        | 14.87       | PK       |
| 5              | 4.2405      | 41.42        | 10.25       | 56.00        | 14.58       | PK       |
| 6              | 5.4105      | 42.22        | 10.26       | 60.00        | 17.78       | PK       |



|                |                 |                     |            |
|----------------|-----------------|---------------------|------------|
| EUT :          | 4G Mobile phone | Model Name. :       | LM-X210LMW |
| Temperature :  | 26 °C           | Relative Humidity : | 54%        |
| Pressure :     | 1010hPa         | Test Date :         | 2019-07-11 |
| Test Mode :    | Running         | Phase :             | N          |
| Test Voltage : | AC120V/60Hz     |                     |            |



| Suspected List |             |              |             |              |             |          |
|----------------|-------------|--------------|-------------|--------------|-------------|----------|
| NO.            | Freq. [MHz] | Level [dBµV] | Factor [dB] | Limit [dBµV] | Margin [dB] | Detector |
| 1              | 0.5055      | 46.21        | 10.04       | 56.00        | 9.79        | PK       |
| 2              | 0.6720      | 48.37        | 10.05       | 56.00        | 7.63        | PK       |
| 3              | 0.9780      | 44.78        | 10.06       | 56.00        | 11.22       | PK       |
| 4              | 1.5000      | 44.44        | 10.10       | 56.00        | 11.56       | PK       |
| 5              | 4.2450      | 39.70        | 10.25       | 56.00        | 16.30       | PK       |
| 6              | 9.0015      | 41.82        | 10.11       | 60.00        | 18.18       | PK       |



## 3.2 RADIATED EMISSION MEASUREMENT

### 3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

| FREQUENCY (MHz) | Class A (at 10m) | Class B (at 3m) |
|-----------------|------------------|-----------------|
|                 | dBuV/m           | dBuV/m          |
| 30 ~ 88         | 39.0             | 40.0            |
| 88 ~ 216        | 43.5             | 43.5            |
| 216 ~ 960       | 46.5             | 46.0            |
| Above 960       | 49.5             | 54.0            |

Notes:

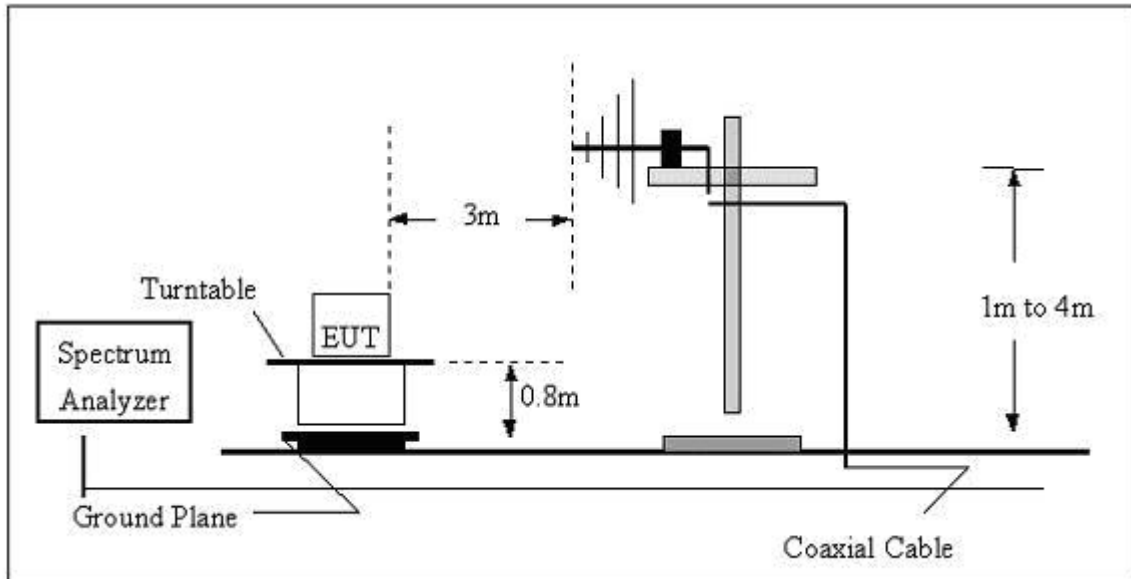
- (1) The limit for radiated test was performed according to as following:  
FCC PART 15B /ICES-003.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

### 3.2.2 TEST PROCEDURE

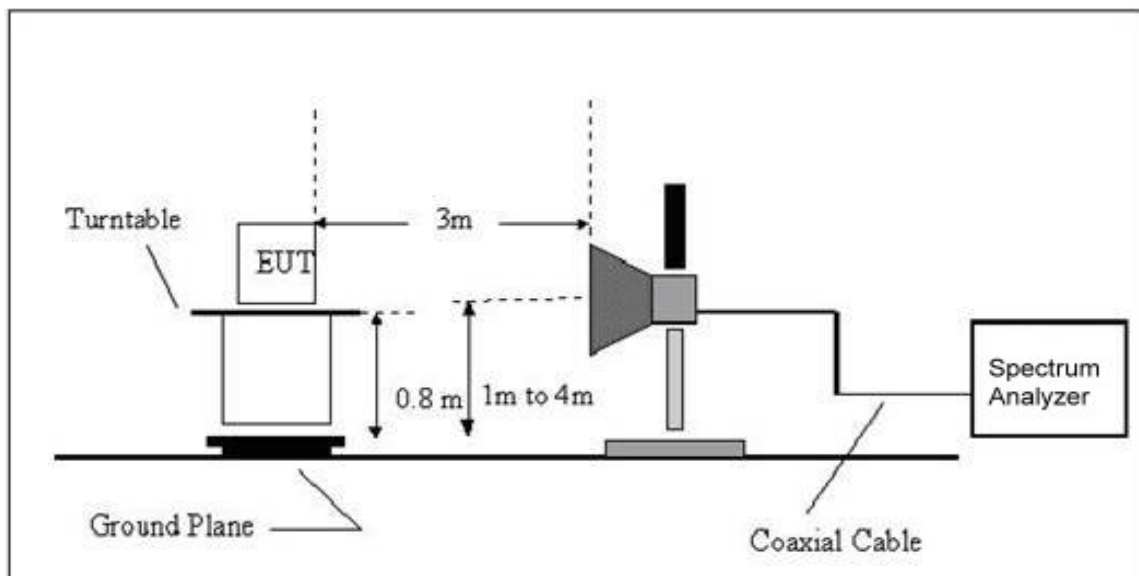
- a. The measuring distance of at 10 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured, above 1G Average detector mode will be instead.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP(AV) Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 3.2.3 TEST SETUP

#### (A) Radiated Emission Test Set-Up Frequency Below 1 GHz



#### (B) Radiated Emission Test Set-Up Frequency Above 1GHz



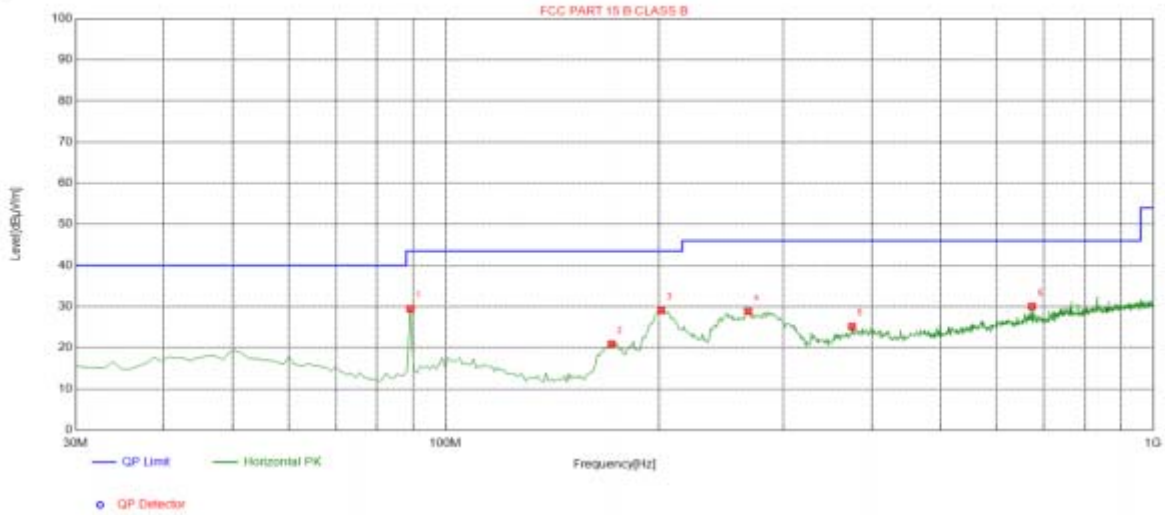
### 3.2.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.



3.2.5 TEST RESULTS

|               |                 |                     |            |
|---------------|-----------------|---------------------|------------|
| EUT :         | 4G Mobile phone | Model Name :        | LM-X210LMW |
| Temperature : | 24 °C           | Relative Humidity : | 54%        |
| Pressure :    | 1010 hPa        | Test Date :         | 2019-07-11 |
| Test Mode :   | Running         | Polarization :      | Horizontal |
| Test Power :  | AC120V/60Hz     |                     |            |

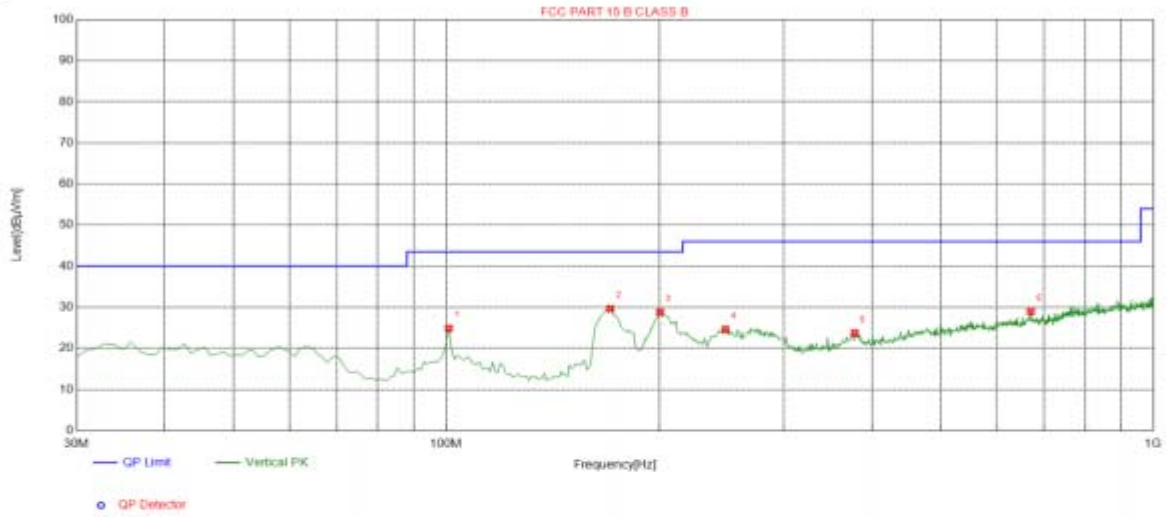


| Suspected List |             |                |             |                |             |             |           |            |
|----------------|-------------|----------------|-------------|----------------|-------------|-------------|-----------|------------|
| NO.            | Freq. [MHz] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity   |
| 1              | 89.1700     | 29.46          | -17.27      | 43.50          | 14.04       | 100         | 277       | Horizontal |
| 2              | 171.620     | 20.92          | -17.23      | 43.50          | 22.58       | 100         | 98        | Horizontal |
| 3              | 201.690     | 29.07          | -15.02      | 43.50          | 14.43       | 100         | 82        | Horizontal |
| 4              | 267.650     | 28.86          | -13.63      | 46.00          | 17.14       | 100         | 271       | Horizontal |
| 5              | 375.320     | 25.16          | -10.91      | 46.00          | 20.84       | 100         | 69        | Horizontal |
| 6              | 674.080     | 30.05          | -4.69       | 46.00          | 15.95       | 100         | 296       | Horizontal |





|               |                 |                     |            |
|---------------|-----------------|---------------------|------------|
| EUT :         | 4G Mobile phone | Model Name :        | LM-X210LMW |
| Temperature : | 24 °C           | Relative Humidity : | 54%        |
| Pressure :    | 1010 hPa        | Test Date :         | 2019-07-11 |
| Test Mode :   | Running         | Polarization :      | Vertical   |
| Test Power :  | AC120V/60Hz     |                     |            |



| Suspected List |             |                |             |                |             |             |           |          |
|----------------|-------------|----------------|-------------|----------------|-------------|-------------|-----------|----------|
| NO.            | Freq. [MHz] | Level [dBµV/m] | Factor [dB] | Limit [dBµV/m] | Margin [dB] | Height [cm] | Angle [°] | Polarity |
| 1              | 100.810     | 24.85          | -15.40      | 43.50          | 18.65       | 100         | 281       | Vertical |
| 2              | 170.650     | 29.62          | -17.27      | 43.50          | 13.88       | 100         | 240       | Vertical |
| 3              | 200.720     | 28.77          | -15.04      | 43.50          | 14.73       | 100         | 34        | Vertical |
| 4              | 248.250     | 24.62          | -13.47      | 46.00          | 21.38       | 100         | 213       | Vertical |
| 5              | 378.230     | 23.74          | -10.86      | 46.00          | 22.26       | 100         | 138       | Vertical |
| 6              | 671.170     | 28.93          | -4.60       | 46.00          | 17.07       | 100         | 143       | Vertical |



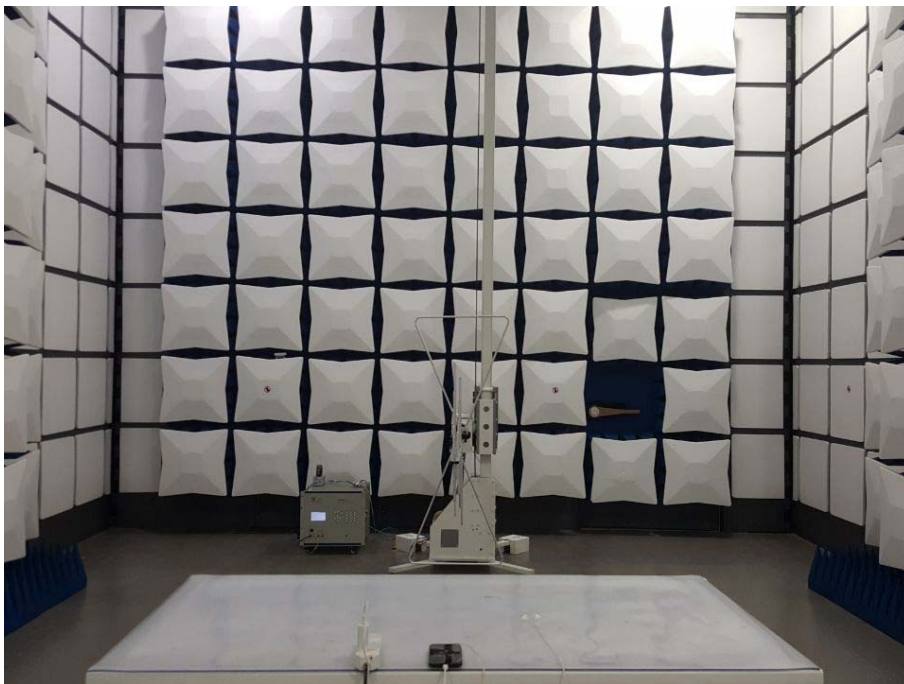
## 3.2.6 TEST RESULTS(Above 1GHz)

|               |                 |                     |            |
|---------------|-----------------|---------------------|------------|
| EUT :         | 4G Mobile phone | Model Name :        | LM-X210LMW |
| Temperature : | 24 °C           | Relative Humidity : | 54%        |
| Pressure :    | 1010 hPa        | Test Date :         | N/A        |
| Test Mode :   | N/A             |                     |            |
| Test Power :  | N/A             |                     |            |

## Note:

- 1) N/A - denotes test is not applicable in this test report
- 2) There was not any unintentional transmission in standby mode

#### 4. EUT TEST PHOTO





## 5. PHOTOS OF THE EUT

Reference to the reporter : ANNEX A of external photos and ANNEX B of internal photos

-----End of report-----