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**HCT**

# TEST REPORT

EMI Test for FCC Certification of LM-F100TM Model

APPLICANT

LG Electronics USA, Inc.

REPORT NO.

HCT-EM-2008-FC002-R1

DATE OF ISSUE

September 07, 2020

Tested by  
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# TEST REPORT

EMI Test for  
FCC Certification

**REPORT NO.**

HCT-EM-2008-FC002-R1

**DATE OF ISSUE**

September 07, 2020

**FCC ID.**

ZNFF100TM

**Applicant**

**LG Electronics USA, Inc.**

111 Sylvan Avenue, North Building , Englewood Cliffs NJ 07632 United States

**Product Name**

Multi-band CDMA/GSM/EDGE/WCDMA/LTE/5G NR Phone with WLAN, BT and RFID

**Model Name**

LM-F100TM

**Series Model Name**

Refer to the clause 1.1 Description of EUT

**Date of Test**

July 22, 2020 to July 31, 2020

**Test Standard Used**

FCC CFR 47 PART 15 Subpart B 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.

This test results were applied only to the test methods required by the standard.

## REVISION HISTORY

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

Revision No.	Date of Issue	Description
0	August 07, 2020	Initial Release
1	September 07, 2020	Revised the frequency band

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

The above Test Report is not related to the accredited test result by (KS Q) ISO/IEC 17025 and KOLAS(Korea Laboratory Accreditation Scheme) / A2LA(American Association for Laboratory Accreditation), which signed the ILAC-MRA.

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## 1. GENERAL INFORMATION

### 1.1 Description of EUT

<b>FCC ID</b>	ZNFF100TM
<b>Model Name</b>	LM-F100TM
<b>Series Model Name</b>	LMF100TM, F100TM
<b>Product Name</b>	Multi-band CDMA/GSM/EDGE/WCDMA/LTE/5G NR Phone with WLAN, BT and RFID
<b>TX Frequency</b>	<p>824.70 MHz to 848.31 MHz (CDMA BC0)</p> <p>1 851.25 MHz to 1 908.75 MHz (CDMA BC1)</p> <p>817.90 MHz to 823.10 MHz (CDMA BC10)</p> <p>824.20 MHz to 848.80 MHz (GSM 850)</p> <p>1 850.20 MHz to 1 909.80 MHz (GSM 1 900)</p> <p>1 852.4 MHz to 1 907.6 MHz (WCDMA B2)</p> <p>1712.4 MHz to 1752.6 MHz (WCDMA B4)</p> <p>826.40 MHz to 846.60 MHz (WCDMA B5)</p> <p>1 850 MHz to 1 910 MHz (LTE B2)</p> <p>1 710 MHz to 1 755 MHz (LTE B4)</p> <p>824 MHz to 849 MHz (LTE B5)</p> <p>699 MHz to 716 MHz (LTE B12)</p> <p>777 MHz to 787 MHz (LTE B13)</p> <p>704 MHz to 716 MHz (LTE B17)</p> <p>1 850 MHz to 1 915 MHz (LTE B25)</p> <p>814 MHz to 849 MHz (LTE B26)</p> <p>2 496 MHz to 2 690 MHz (LTE B41)</p> <p>3 550 MHz to 3 700 MHz (LTE B48)</p> <p>1 710 MHz to 1 780 MHz (LTE B66)</p> <p>663 MHz to 698 MHz (LTE B71)</p> <p>2 402 MHz to 2 480 MHz ( Bluetooth)</p> <p>2 412 MHz to 2 462 MHz ( WiFi 2.4 GHz)</p> <p>5 180 MHz to 5 240 MHz (WiFi 5 GHz_UNII 1)</p> <p>5 260 MHz to 5 320 MHz (WiFi 5 GHz_UNII 2A)</p> <p>5 500 MHz to 5 720 MHz (WiFi 5 GHz_UNII 2C)</p> <p>5 745 MHz to 5 825 MHz (WiFi 5 GHz_UNII 3)</p> <p>13.56 MHz (NFC)</p> <p>1 850 MHz to 1 910 MHz (5G NR n2)</p> <p>824 MHz to 849 MHz (5G NR n5)</p> <p>1 850 MHz to 1 915 MHz (5G NR n25)</p> <p>2 496 MHz to 2 690 MHz (5G NR n41)</p> <p>1 710 MHz to 1 780 MHz (5G NR n66)</p> <p>663 MHz to 698 MHz (5G NR n71)</p>

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) 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) 859 MHz to 894 MHz (LTE B26) 717 MHz to 728 MHz (LTE B29) 2 496 MHz to 2 690 MHz (LTE B41) 5 150 MHz to 5 925 MHz (LTE B46) 3 550 MHz to 3 700 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 (NFC) 1 930 MHz to 1 990 MHz (5G NR n2) 869 MHz to 894 MHz (5G NR n5) 1 930 MHz to 1 995 MHz (5G NR n25) 2 496 MHz to 2 690 MHz (5G NR n41) 2 110 MHz to 2 200 MHz (5G NR n66) 617 MHz to 652 MHz (5G NR n71)
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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
EUT	LM-F100TM	-	LG
Notebook PC	ProBook650G2	5CG6331M0P	HP
Notebook PC adaptor	Series PPP009L-E	-	LITE-ON TECHNOLOGY (CHANGZHOU)
Gateway	DIR-806M	-	D-Link
Gateway adaptor	AMS1-0501200FK	-	D-Link
Serial mouse	Serial 2 Button mouse	02031069	Radio Shack
RJ45 cable	-	-	-
DATA cable	EAD65830101	-	LUXSHARE
DATA cable	EAD65830102	-	NINGBO
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	Y	(P,D) 1.0
	Earphone	N/A	N	(D) 1.2
Notebook PC	RJ 45	N/A	N	(D) 1.6
	Serial(Mouse)	N/A	Y	(D) 1.8
	DC IN	N	N/A	(P) 1.8
Gateway	DC IN	N	N/A	(P) 1.8

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
Notebook PC	RJ 45	N	N/A	N	N/A
	Serial(Mouse)	N	N/A	Y	Notebook 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)	1.58 dB
Radiated Emissions (30 MHz to 1 GHz)	4.86 dB
Radiated Emissions (1 GHz to 18 GHz)	4.58 dB
Radiated Emissions (18 GHz to 40 GHz)	5.54 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 $\mu$ V)	Average (dB $\mu$ V)	Quasi-Peak (dB $\mu$ V)	Average (dB $\mu$ 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

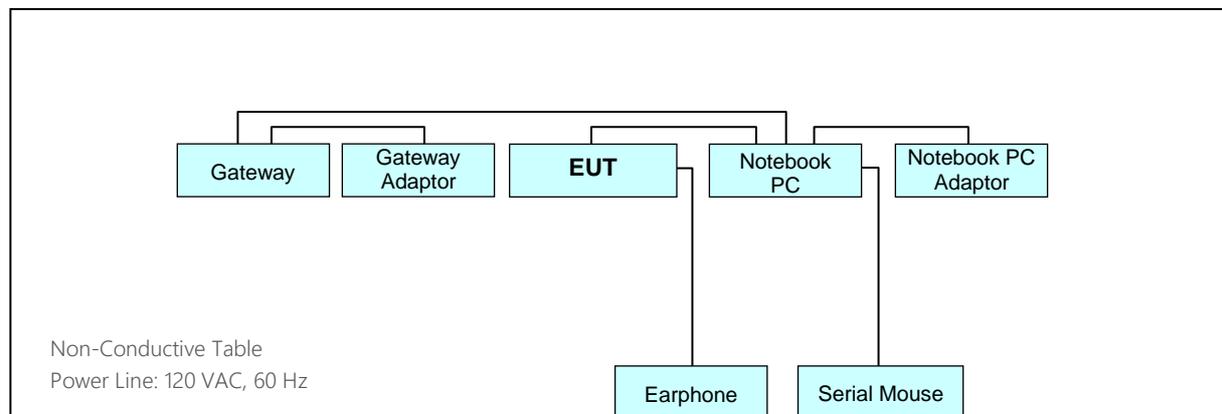
Frequency (MHz)	Class A			Class B		
	Antenna Distance (m)	Field Strength ( $\mu\text{V/m}$ )	Quasi-Peak ( $\text{dB}\mu\text{V/m}$ )	Antenna Distance (m)	Field Strength ( $\mu\text{V/m}$ )	Quasi-Peak ( $\text{dB}\mu\text{V/m}$ )
30 to 88	10	90	39.0	3	100	40.0
88 to 216	10	150	43.5	3	150	43.5
216 to 960	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 ( $\text{dB}\mu\text{V/m}$ )	Average ( $\text{dB}\mu\text{V/m}$ )	Peak ( $\text{dB}\mu\text{V/m}$ )	Average ( $\text{dB}\mu\text{V/m}$ )	
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:** Data Communication mode

#### 3.2 Radiated Emission

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

**Operating Modes:** Data Communication mode

#### 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	06.10.2020
<input checked="" type="checkbox"/>	LISN	Rohde & Schwarz	ENV216	102245	1 year	09.11.2019
<input checked="" type="checkbox"/>	LISN	Rohde & Schwarz	ENV216	100073	1 year	04.27.2020
<input checked="" type="checkbox"/>	Software	Rohde & Schwarz	EMC32	-	-	-

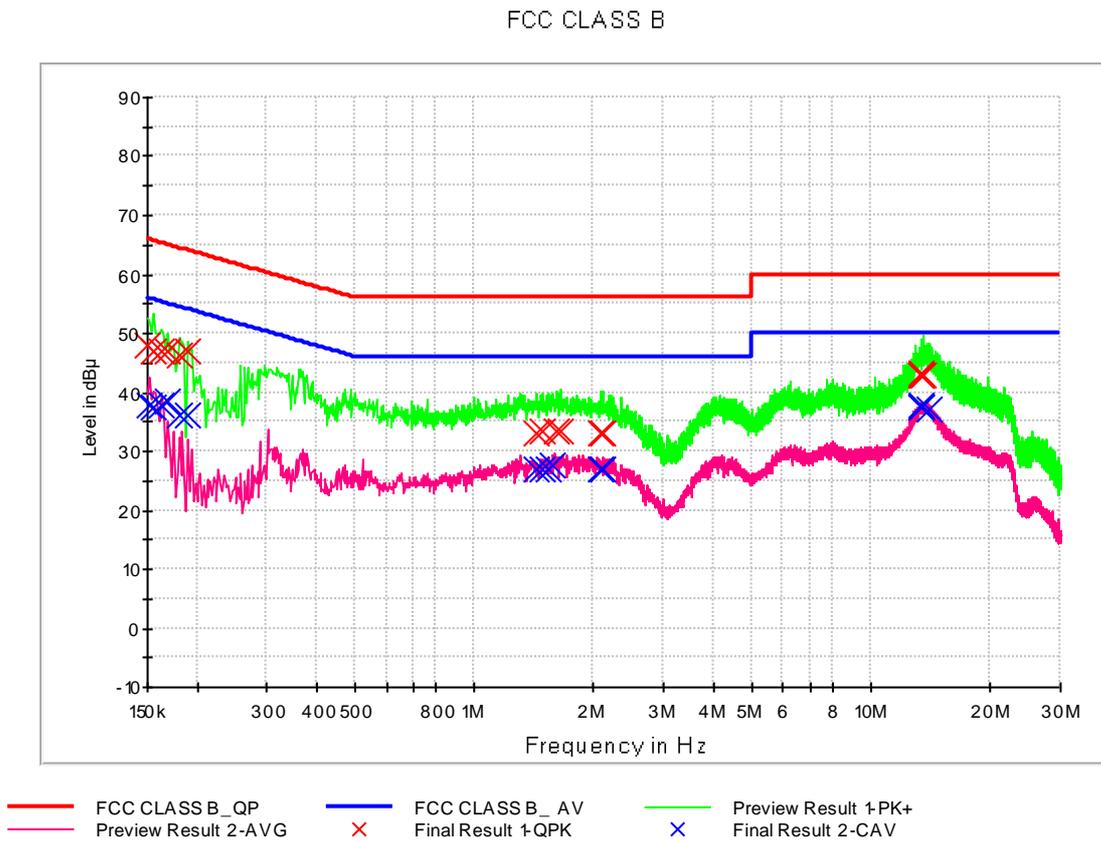
##### 4.1.2 Operating Condition

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 ANSI C63.4-2014
Frequency Range	150 kHz to 30 MHz
Detector	Quasi-Peak, CISPR-Average
Bandwidth	9 kHz (6 dB)
Operating Mode	Data Communication mode
Worst Case of Data Cable	NINGBO (EAD65830102)
Kind of Test Site	EMI Shielded Room
Temperature	23.7 °C
Relative Humidity	47.3 %
Test Date	July 22, 2020

4.1.3 Measuring Data

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



## QuasiPeak Final Result, Line (L1)

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.150000	48.0	9.000	L1	9.7	18.0	66.0
0.156000	46.9	9.000	L1	9.7	18.7	65.7
0.162000	46.9	9.000	L1	9.7	18.5	65.4
0.168000	46.9	9.000	L1	9.7	18.1	65.1
0.180000	46.2	9.000	L1	9.7	18.3	64.5
0.190000	46.9	9.000	L1	9.7	17.1	64.0
1.430000	33.1	9.000	L1	9.8	22.9	56.0
1.482000	33.3	9.000	L1	9.8	22.7	56.0
1.608000	33.5	9.000	L1	9.8	22.5	56.0
1.644000	33.4	9.000	L1	9.8	22.6	56.0
2.086000	33.0	9.000	L1	9.8	23.0	56.0
2.106000	33.0	9.000	L1	9.8	23.0	56.0
13.324000	42.8	9.000	L1	10.0	17.2	60.0
13.350000	42.9	9.000	L1	10.0	17.1	60.0
13.358000	42.7	9.000	L1	10.0	17.3	60.0
13.380000	42.9	9.000	L1	10.0	17.1	60.0
13.462000	43.2	9.000	L1	10.0	16.8	60.0
13.502000	43.0	9.000	L1	10.0	17.0	60.0

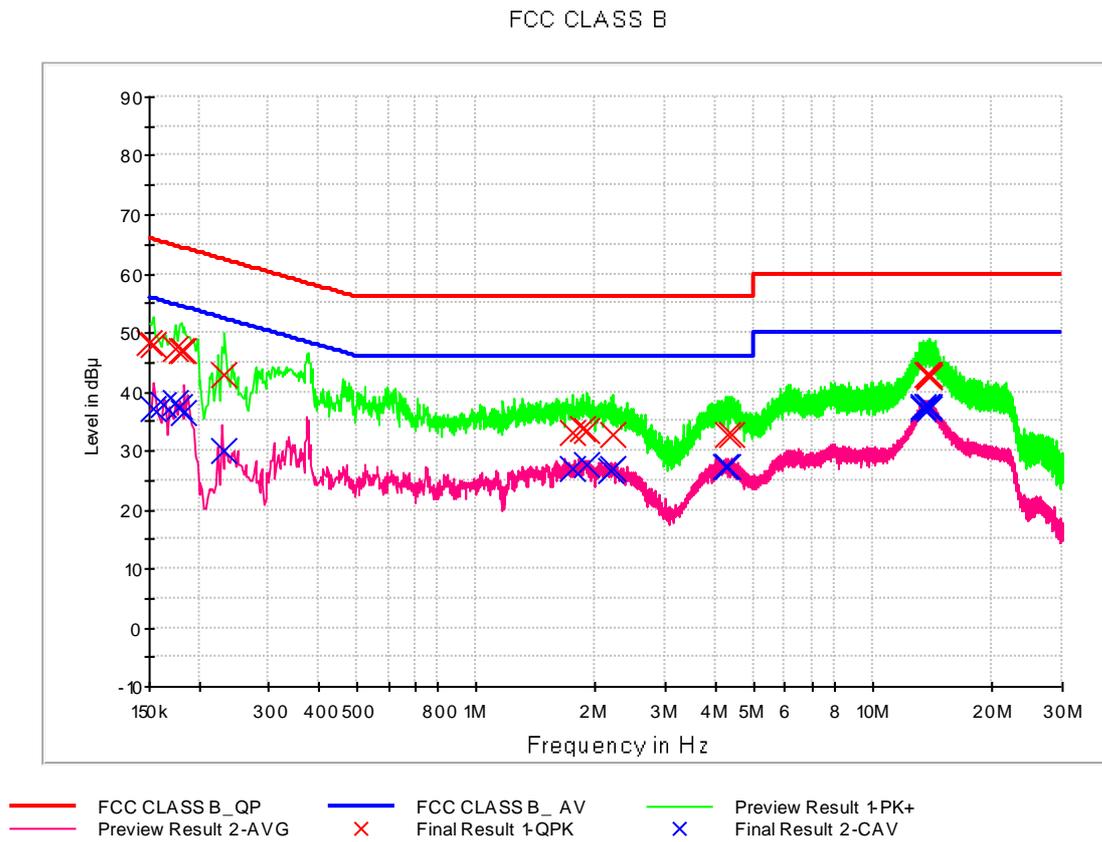
## Calculation Formula:

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 $\mu$ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.152000	37.7	9.000	L1	9.7	18.2	55.9
0.156000	37.5	9.000	L1	9.7	18.2	55.7
0.162000	37.9	9.000	L1	9.7	17.5	55.4
0.168000	38.6	9.000	L1	9.7	16.4	55.1
0.180000	36.3	9.000	L1	9.7	18.2	54.5
0.190000	36.2	9.000	L1	9.7	17.8	54.0
1.430000	26.8	9.000	L1	9.8	19.2	46.0
1.482000	27.1	9.000	L1	9.8	18.9	46.0
1.538000	26.8	9.000	L1	9.8	19.2	46.0
1.570000	27.5	9.000	L1	9.8	18.5	46.0
2.086000	26.8	9.000	L1	9.8	19.2	46.0
2.106000	27.0	9.000	L1	9.8	19.0	46.0
13.350000	37.4	9.000	L1	10.0	12.6	50.0
13.380000	37.5	9.000	L1	10.0	12.5	50.0
13.412000	37.6	9.000	L1	10.0	12.4	50.0
13.420000	37.6	9.000	L1	10.0	12.4	50.0
13.462000	37.6	9.000	L1	10.0	12.4	50.0
14.020000	37.3	9.000	L1	10.0	12.7	50.0

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



## QuasiPeak Final Result, Line (N)

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.150000	48.3	9.000	N	9.7	17.8	66.0
0.154000	47.8	9.000	N	9.7	18.0	65.8
0.174000	47.4	9.000	N	9.7	17.4	64.8
0.180000	47.1	9.000	N	9.7	17.4	64.5
0.184000	47.1	9.000	N	9.7	17.2	64.3
0.232000	42.8	9.000	N	9.7	19.6	62.4
1.754000	33.1	9.000	N	9.8	22.9	56.0
1.860000	33.6	9.000	N	9.8	22.4	56.0
1.894000	33.3	9.000	N	9.8	22.7	56.0
2.210000	32.9	9.000	N	9.8	23.1	56.0
4.286000	32.7	9.000	N	9.8	23.3	56.0
4.400000	32.9	9.000	N	9.8	23.1	56.0
13.772000	42.8	9.000	N	10.0	17.2	60.0
13.818000	42.6	9.000	N	10.0	17.4	60.0
13.872000	42.6	9.000	N	10.0	17.4	60.0
13.884000	42.8	9.000	N	10.0	17.2	60.0
13.900000	42.7	9.000	N	10.0	17.3	60.0
13.904000	42.6	9.000	N	10.0	17.4	60.0

## CAverage Final Result, Line (N)

Frequency (MHz)	CAverage (dB $\mu$ V)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.154000	37.1	9.000	N	9.7	18.7	55.8
0.162000	37.7	9.000	N	9.7	17.6	55.4
0.174000	38.2	9.000	N	9.7	16.6	54.8
0.178000	37.3	9.000	N	9.7	17.3	54.6
0.184000	36.5	9.000	N	9.7	17.8	54.3
0.232000	30.0	9.000	N	9.7	22.4	52.4
1.754000	27.0	9.000	N	9.8	19.0	46.0
1.894000	27.5	9.000	N	9.8	18.5	46.0
2.196000	26.6	9.000	N	9.8	19.4	46.0
2.210000	26.8	9.000	N	9.8	19.2	46.0
4.268000	27.2	9.000	N	9.8	18.8	46.0
4.286000	27.2	9.000	N	9.8	18.8	46.0
13.318000	37.2	9.000	N	10.0	12.8	50.0
13.448000	37.5	9.000	N	10.0	12.5	50.0
13.750000	37.4	9.000	N	10.0	12.6	50.0
13.772000	37.3	9.000	N	10.0	12.7	50.0
13.844000	37.3	9.000	N	10.0	12.7	50.0
13.900000	37.2	9.000	N	10.0	12.8	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	05.12.2020
<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"/> Software	Rohde & Schwarz	EMC32	-	-	-

### 4.2.2 Operating Condition

The test results of radiated emission provide the following information:

<b>Used Test Standard</b>	FCC CFR 47 PART 15 Subpart B Class B ANSI C63.4-2014
<b>Frequency Range</b>	30 MHz to 1 000 MHz
<b>Detector</b>	Quasi-Peak
<b>Bandwidth</b>	120 kHz (6 dB)
<b>Operating Mode</b>	Data Communication mode
<b>Worst Case of Data Cable</b>	NINGBO (EAD65830102)
<b>Kind of Test Site</b>	3 m semi anechoic chamber
<b>Temperature</b>	22.9 °C
<b>Relative Humidity</b>	47.6 %
<b>Test Date</b>	July 22, 2020

## 4.2.3 Measuring Data

Frequency (MHz)	Quasi Peak (dB $\mu$ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V/m)
57.963160	28.4	100.0	V	272.0	19.5	11.6	40.0
67.028680	32.2	100.0	V	297.0	18.4	7.8	40.0
100.967880	29.7	208.8	H	304.0	15.3	13.8	43.5
110.057480	30.4	274.9	H	306.0	16.3	13.1	43.5
140.575120	33.2	174.8	H	322.0	19.0	10.3	43.5
216.698080	33.7	125.3	H	322.0	17.3	12.3	46.0

## - 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	05.12.2020
<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	03.03.2020
<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	1641	1 year	06.24.2020
<input type="checkbox"/>	Horn antenna	Schwarzbeck	BBHA 9120D	01836	1 year	07.23.2020
<input checked="" type="checkbox"/>	Horn antenna	Schwarzbeck	BBHA 9170	BBHA9170#786	1 year	12.03.2019
<input checked="" type="checkbox"/>	Software	Rohde & Schwarz	EMC32	-	-	-

#### 4.3.2 Operating Condition

The test results of radiated emission provide the following information:

<b>Used Test Standard</b>	FCC CFR 47 PART 15 Subpart B Class B ANSI C63.4-2014
<b>Detector</b>	Peak mode: Peak (RBW: 1 MHz, VBW: 3 MHz) CISPR-Average mode: Peak (RBW: 1 MHz, VBW: 10 Hz)
<b>Highest Frequency</b>	5 925 MHz
<b>Tested Frequency Range</b>	1 GHz to 30 GHz
<b>Operating Mode</b>	Data Communication mode
<b>Worst Case of Data Cable</b>	NINGBO (EAD65830102)
<b>Kind of Test Site</b>	3 m semi anechoic chamber
<b>Temperature</b>	23.5 / 22.6 °C
<b>Relative Humidity</b>	48.1 / 46.1 %
<b>Test Date</b>	July 23 / July 31, 2020

## 4.3.3 Measuring Data

Frequency (MHz)	Peak (dB $\mu$ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V/m)
1593.830000	48.5	125.7	V	220.0	-27.1	25.5	74.0
2132.045000	39.6	201.6	V	188.0	-25.6	34.4	74.0
2658.655000	41.4	249.9	V	309.0	-23.5	32.6	74.0
3993.130000	43.5	199.5	V	0.0	-20.2	30.5	74.0
11360.775000	45.5	149.7	V	13.0	-4.3	28.5	74.0
17975.402280	56.2	139.6	V	82.0	9.7	17.8	74.0

Frequency (MHz)	CAverage (dB $\mu$ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V/m)
1593.830000	29.7	125.7	V	220.0	-27.1	24.3	54.0
2132.045000	22.2	201.6	V	188.0	-25.6	31.8	54.0
2658.655000	23.6	249.9	V	309.0	-23.5	30.4	54.0
3993.130000	25.6	199.5	V	0.0	-20.2	28.4	54.0
11360.775000	32.8	149.7	V	13.0	-4.3	21.2	54.0
17975.402280	43.1	139.6	V	82.0	9.7	10.9	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 CDMA/GSM/EDGE/WCDMA/LTE/5G NR Phone with WLAN, BT and RFID / Model Name: LM-F100TM** complies with §15.107 and §15.109 of the FCC 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-2008-FC002-P	August 07, 2020	Initial Release

End of report