

# EMI TEST REPORT

## FCC CERTIFICATION

**Applicant:**

LG Electronics MobileComm U.S.A., Inc.  
1000 Sylvan Avenue, Englewood Cliffs NJ 07632  
United States

Date of Receipt: April 09, 2018

Date of Issue: April 20, 2018

Test Report No. HCT-EM-1804-FC023

**FCC ID :****ZNFG710VM**

Rule Part(s) / Standard(s) : FCC CFR 47 PART 15 Subpart B Class B  
FCC Classification : JBP (Part 15 B – Class B Computing Device Peripheral)  
EUT Type : Multi-band CDMA/GSM/EDGE/WCDMA/LTE phone with  
WLAN, Bluetooth and RFID  
Model Name : LM-G710VM  
Additional Model Name : LMG710VM, G710VM, LG-G710PM, LGG710PM, G710PM,  
LM-G710ULM, LMG710ULM, G710ULM, LM-G710VMP,  
LMG710VMP, G710VMP  
Date of Test : April 09, 2018 – April 19, 2018

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**

Wook Yi  
Test Engineer  
EMC Team  
Certification Division

**Reviewed By**

Jin-Pyo Hong  
Technical Manager  
EMC Team  
Certification Division

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 document is shown in table.*

Report No.	Issue Date	Information About Changes
HCT-EM-1804-FC023	April 20, 2018	Initial Release



## TABLE OF CONTENTS

	<b>PAGE</b>
1. GENERAL INFORMATION .....	4
1.1 Description of EUT .....	4
1.2 Related Submittal(s) / Grant(s) .....	5
1.3 Test Facility .....	5
1.4 Calibration of Measuring Instrument .....	5
1.5 Tested System Details .....	6
1.6 Cable Description .....	8
1.7 Noise Suppression Parts on Cable. (I/O Cable) .....	9
2. MEASUREMENT UNCERTAINTY .....	10
3. DESCRIPTION OF TEST .....	11
3.1 Measurement of Conducted Emission.....	11
3.2 Measurement of Radiated Measurements .....	10
4. PRELIMINARY TEST .....	15
4.1 Conducted Emission Test .....	15
4.2 Radiated Emission Test .....	15
5. CONDUCTED AND RADIATED EMISSION TEST SUMMARY .....	16
5.1 Conducted Emission Test .....	16
5.2 Radiated Emission Test .....	30
6. LIST OF TEST EQUIPMENT.....	34
7. CONCLUSION.....	35
8. APPENDIX A_ TEST SETUP PHOTOGRAPHS .....	36



## 1. GENERAL INFORMATION

### 1.1 Description of EUT

Its basic purpose is used for communications.

FCC ID	ZNFG710VM
Model	LM-G710VM
Additional Model	LMG710VM, G710VM, LG-G710PM, LGG710PM, G710PM. LM-G710ULM, LMG710ULM, G710ULM, LM-G710VMP, LMG710VMP, G710VMP
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) 1 850.7 MHz to 1 909.3 MHz (LTE B2) 1 710 MHz to 1 755 MHz (LTE B4) 824 MHz to 849 MHz (LTE B5) 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) 814 MHz to 849 MHz (LTE B26) 2 496 MHz to 2 690 MHz (LTE B41) 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	869.70 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)



RX Frequency	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) 2 496 MHz to 2 690 MHz (LTE B41) 5 150 MHz to 5 925 MHz (LTE B46) 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 Related Submittal(s) / Grant(s)

Original submittal only.

## 1.3 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 1GHz) 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	

## 1.4 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).



## 1.5 Tested System Details

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

### Type: C to USB

Device Type	Model Name	Serial Number	Manufacturer	FCC ID / DoC
EUT	LM-G710VM	-	LG	ZNFG710VM
Data cable	EAD64746103	-	Ningbo Broad	-
Earphone	EAB64168751	-	I-SOUND	-
Earphone	EAB63728244 (4 M)	-	CRESYN	-
Earphone	EAB63728244 <sup>*NOTE</sup>	-	CRESYN	-
Earphone	EAB63728245	-	BUJEON	-
Notebook PC	ProBook6560b	5CB2053MXF	HP	DoC
Notebook PC adaptor	Series PPP009L-E	-	LITE-On Technology	-
RJ45 cable	-	-	-	-
Gateway	TL-WR747N	-	TP-LINK	-
Gateway adaptor	T120150-2H1	-	TP-LINK	-
Serial mouse	Serial 2 button mouse	02031069	Radio shack	FSUGMZE3
Micro SD card	256GB EVO+UHS-I microSDXC U1	-	SAMSUNG	-

**\*NOTE.** The worst-case emissions were reported.

**Type: C to C**

Device Type	Model Name	Serial Number	Manufacturer	FCC ID / DoC
EUT	LM-G710VM	-	LG	ZNFG710VM
Data cable	EAD64506502	-	Luxshare	-
Earphone	EAB63728244 (4 M)	-	CRESYN	-
Earphone	EAB63728244 <i>*NOTE</i>	-	CRESYN	
Earphone	EAB63728245	-	BUJEON	
Notebook PC	C1501W	-	GOOGLE	DoC
Notebook PC adaptor	PA-1600-23	-	LITE-On (Europe)	-
USB mouse	M-U0026	-	Logitech	-
Micro SD card	256 EVO+UHS-I microSDXC U1	-	SAMSUNG	-

*\*NOTE. The worst-case emissions were reported.*



## 1.6 Cable Description

### Type: C to USB

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	Y	(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

### Type: C to C

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	Y	(D)1.2
Notebook PC	USB Type C (Adaptor)	N/A	N	(D)1.8
	USB Type A (Mouse)	N/A	Y	(D)2.0

\* The marked “(D)” means the data cable and “(P)” means the power cable.





## 1.7 Noise Suppression Parts on Cable. (I/O Cable)

### Type: C to USB

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 PC End

### Type: C to C

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	USB Type C (Adaptor)	N	N/A	N	Notebook PC End
	USB Type A (Mouse)	N	N/A	Y	Notebook PC End



## 2. 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  $U_{\text{CISPR}}$  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 ( $k = 2$ )
Radiated Emissions (30 MHz to 1 GHz)	5.20 dB ( $k = 2$ )
Radiated Emissions (1 GHz to 18 GHz)	5.24 dB ( $k = 2$ )
Radiated Emissions (18 GHz to 40 GHz)	5.40 dB ( $k = 2$ )



### 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

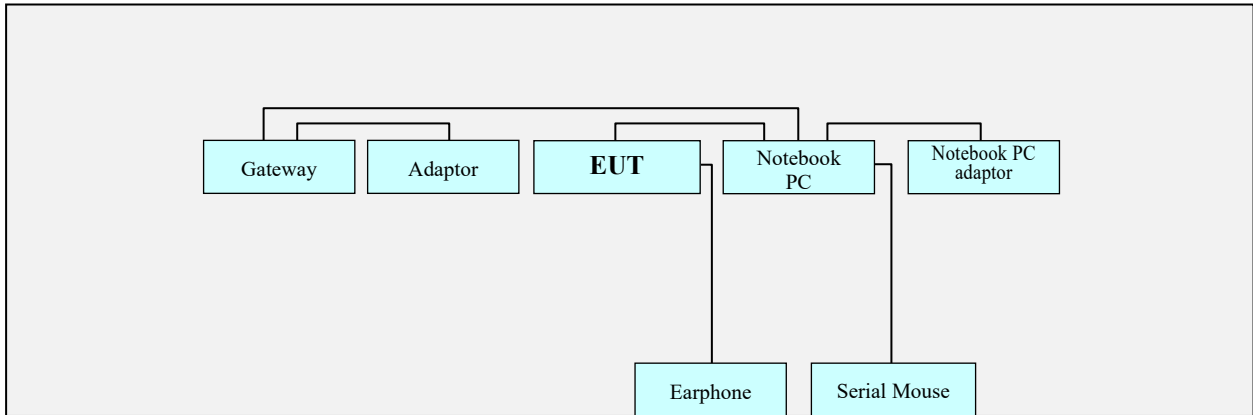
An unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a Radiated Emission limit is specified, up to the frequency shown in the following table

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

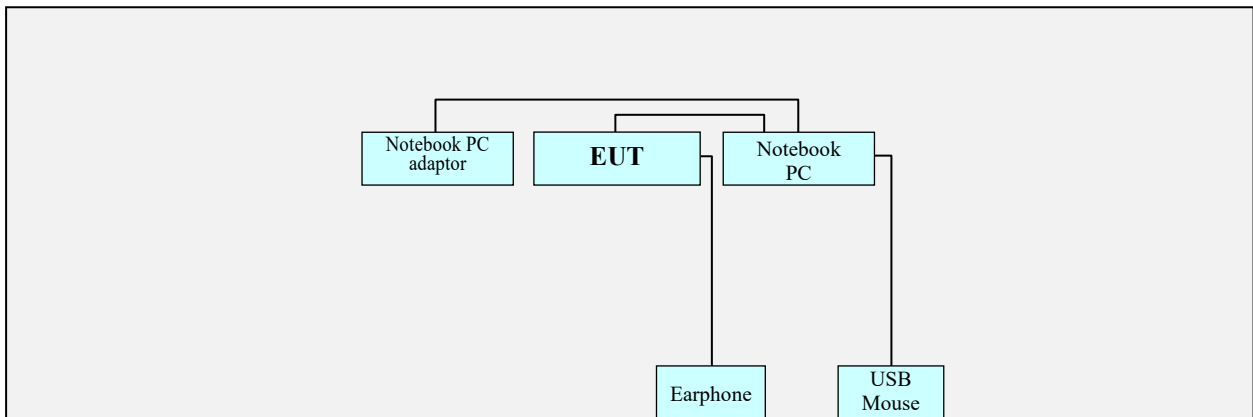


### 3.3 Configuration of Tested System

Type: C to USB



Type: C to C



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



## 4. PRELIMINARY TEST

### 4.1 Conducted Emission Test

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

**Operation Mode:**  Data Communication mode  
Type: C to USB  
Type: C to C

### 4. 2 Radiated Emission Test

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

**Operation Mode:**  Data Communication mode  
Type: C to USB  
Type: C to C



## 5. CONDUCTED AND RADIATED EMISSION TEST SUMMARY

### 5.1 Conducted Emission Test

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

#### Type: C to USB

Rule Part / Standard	FCC PART 15 Subpart B Class B
Detector	Quasi-Peak, CISPR-Average
Bandwidth	9 kHz (6 dB)
Operation Mode	Data Communication mode
Worst Earphone	EAB63728244 (CRESYN)
Kind of Test Site	Shielded Room
Temperature	23.2 / 24.2 °C
Relative Humidity	40.4 / 37.1 %
Test Date	April 10 / April 19, 2018

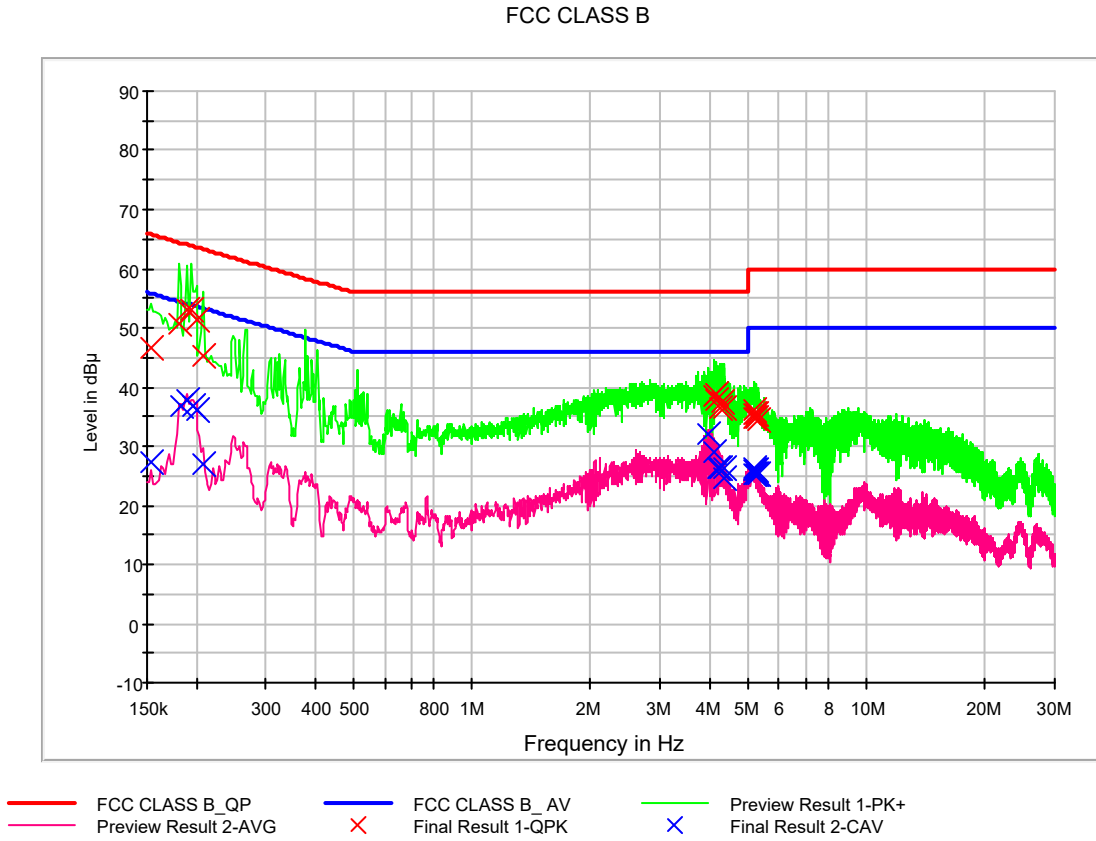
#### - Calculation Formula:

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)
0.154000	46.5	9.000	L1	9.6	19.2	65.8
0.180000	50.8	9.000	L1	9.6	13.7	64.5
0.190000	53.2	9.000	L1	9.6	10.8	64.0
0.194000	53.0	9.000	L1	9.6	10.9	63.9
0.200000	51.4	9.000	L1	9.6	12.2	63.6
0.208000	45.2	9.000	L1	9.6	18.1	63.3
4.092000	38.4	9.000	L1	9.8	17.6	56.0
4.156000	37.7	9.000	L1	9.8	18.3	56.0
4.164000	38.9	9.000	L1	9.8	17.1	56.0
4.276000	36.3	9.000	L1	9.8	19.7	56.0
4.288000	37.3	9.000	L1	9.8	18.7	56.0
4.368000	36.3	9.000	L1	9.8	19.7	56.0
5.186000	36.2	9.000	L1	9.8	23.8	60.0
5.190000	35.4	9.000	L1	9.8	24.6	60.0
5.198000	34.7	9.000	L1	9.8	25.3	60.0
5.240000	34.9	9.000	L1	9.8	25.1	60.0
5.248000	35.4	9.000	L1	9.8	24.6	60.0
5.298000	34.3	9.000	L1	9.8	25.7	60.0

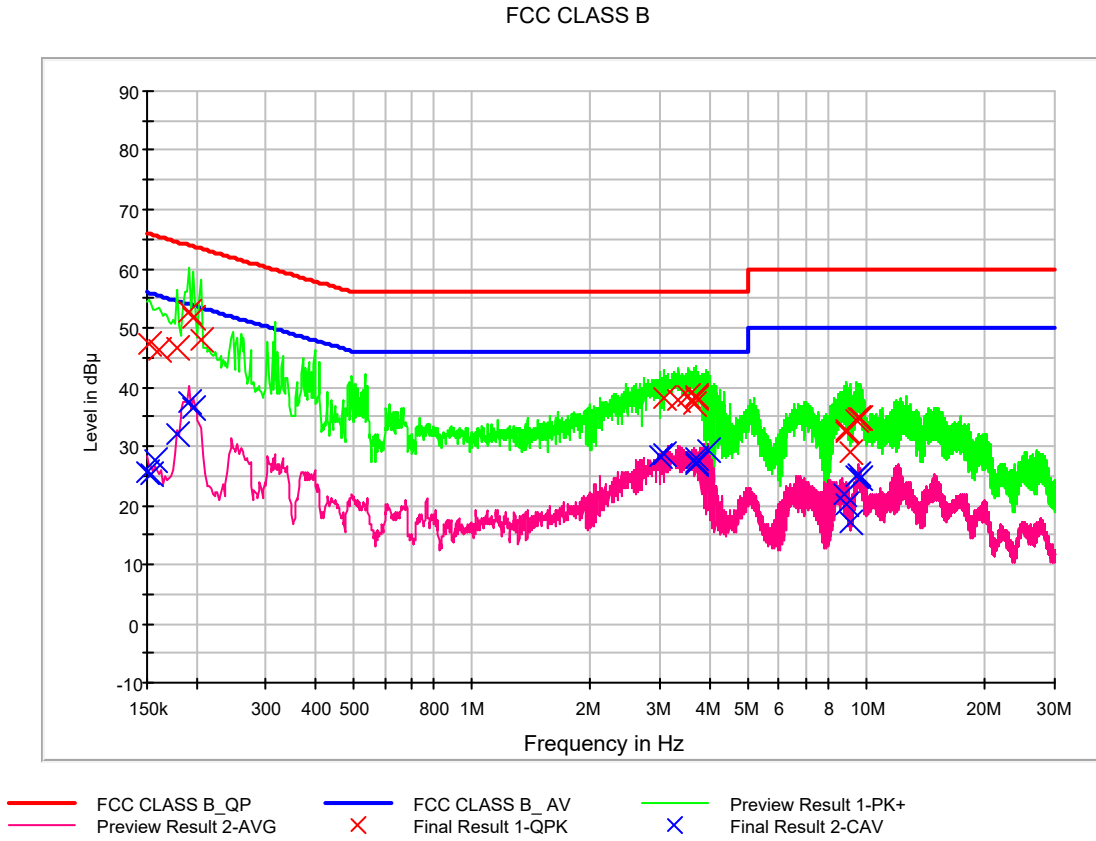


### CAverage Final Result, Line (L1)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.154000	27.4	9.000	L1	9.6	28.3	55.8
0.182000	36.7	9.000	L1	9.6	17.7	54.4
0.190000	37.8	9.000	L1	9.6	16.3	54.0
0.196000	36.7	9.000	L1	9.6	17.1	53.8
0.200000	36.0	9.000	L1	9.6	17.6	53.6
0.208000	26.9	9.000	L1	9.6	26.4	53.3
3.980000	32.0	9.000	L1	9.8	14.0	46.0
4.092000	28.9	9.000	L1	9.8	17.1	46.0
4.182000	26.4	9.000	L1	9.8	19.6	46.0
4.276000	26.1	9.000	L1	9.8	19.9	46.0
4.356000	26.1	9.000	L1	9.8	19.9	46.0
4.368000	24.5	9.000	L1	9.8	21.5	46.0
5.186000	26.3	9.000	L1	9.8	23.7	50.0
5.190000	25.9	9.000	L1	9.8	24.1	50.0
5.198000	25.1	9.000	L1	9.8	24.9	50.0
5.230000	25.8	9.000	L1	9.8	24.2	50.0
5.240000	25.1	9.000	L1	9.8	24.9	50.0
5.298000	25.2	9.000	L1	9.8	24.8	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)
0.152000	47.3	9.000	N	9.6	18.5	65.9
0.160000	46.2	9.000	N	9.6	19.3	65.5
0.178000	46.5	9.000	N	9.6	18.0	64.6
0.192000	52.6	9.000	N	9.6	11.4	63.9
0.196000	51.7	9.000	N	9.6	12.1	63.8
0.206000	48.1	9.000	N	9.6	15.3	63.4
3.070000	38.1	9.000	N	9.8	17.9	56.0
3.346000	37.8	9.000	N	9.8	18.2	56.0
3.548000	38.5	9.000	N	9.8	17.5	56.0
3.644000	37.0	9.000	N	9.8	19.0	56.0
3.680000	38.6	9.000	N	9.8	17.4	56.0
3.686000	38.1	9.000	N	9.8	17.9	56.0
8.890000	32.6	9.000	N	10.0	27.4	60.0
8.914000	32.3	9.000	N	10.0	27.7	60.0
9.058000	28.8	9.000	N	10.0	31.2	60.0
9.374000	34.3	9.000	N	10.0	25.7	60.0
9.536000	34.9	9.000	N	10.0	25.1	60.0
9.600000	34.6	9.000	N	10.0	25.4	60.0



### CAverage Final Result, Line (N)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	25.7	9.000	N	9.6	30.3	56.0
0.154000	25.4	9.000	N	9.6	30.4	55.8
0.158000	27.5	9.000	N	9.6	28.1	55.6
0.178000	31.9	9.000	N	9.6	22.7	54.6
0.192000	37.5	9.000	N	9.6	16.4	53.9
0.196000	36.5	9.000	N	9.6	17.3	53.8
3.002000	28.2	9.000	N	9.8	17.8	46.0
3.070000	28.6	9.000	N	9.8	17.4	46.0
3.680000	27.9	9.000	N	9.8	18.1	46.0
3.686000	27.4	9.000	N	9.8	18.6	46.0
3.694000	26.9	9.000	N	9.8	19.1	46.0
3.958000	29.3	9.000	N	9.8	16.7	46.0
8.760000	21.9	9.000	N	10.0	28.1	50.0
8.914000	20.1	9.000	N	10.0	29.9	50.0
9.058000	17.2	9.000	N	10.0	32.8	50.0
9.374000	24.8	9.000	N	10.0	25.2	50.0
9.564000	25.4	9.000	N	10.0	24.6	50.0
9.620000	24.6	9.000	N	10.0	25.4	50.0



### Type: C to C

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

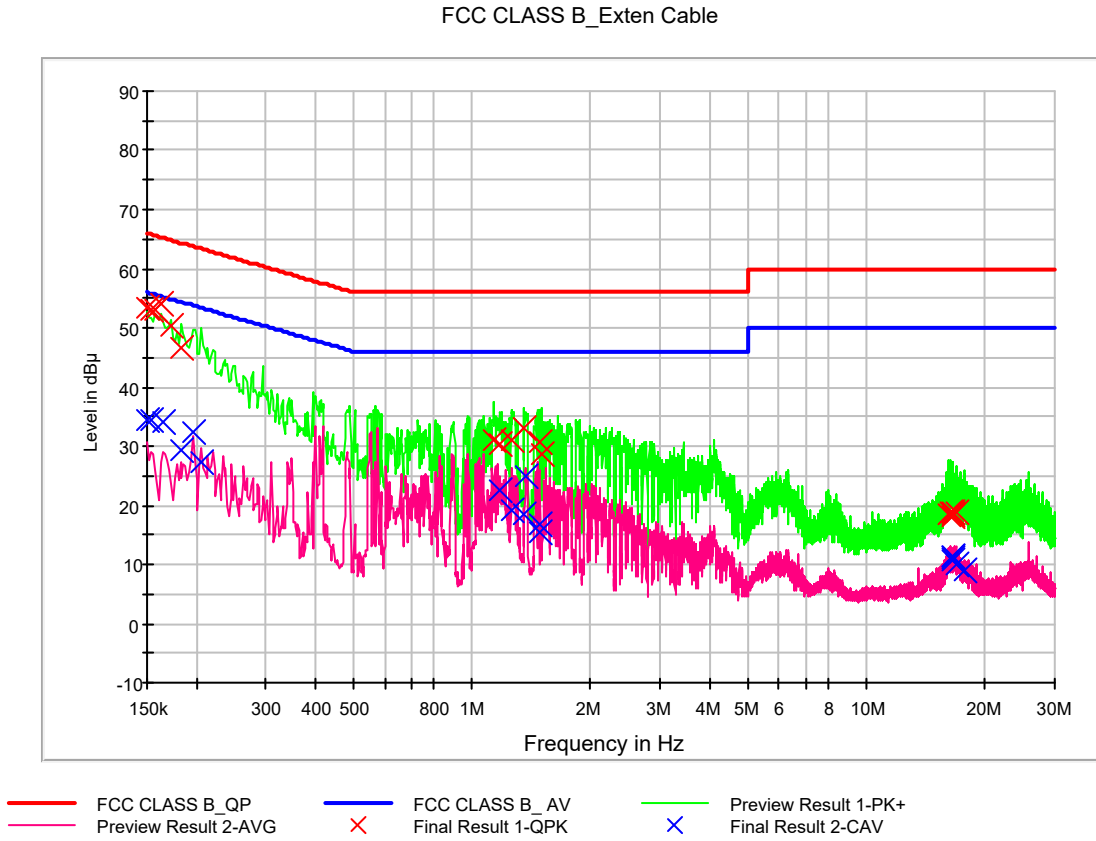
Rule Part / Standard	FCC PART 15 Subpart B Class B
Detector	Quasi-Peak, CISPR-Average
Bandwidth	9 kHz (6 dB)
Operation Mode	Data Communication mode
Worst Earphone	EAB63728244 (CRESYN)
Kind of Test Site	Shielded Room
Temperature	24.2 °C
Relative Humidity	37.1 %
Test Date	April 19, 2018

#### - 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 3: 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	53.3	9.000	L1	9.7	12.7	66.0
0.154000	53.2	9.000	L1	9.7	12.6	65.8
0.158000	53.1	9.000	L1	9.7	12.4	65.6
0.162000	54.0	9.000	L1	9.7	11.3	65.4
0.172000	50.3	9.000	L1	9.7	14.6	64.9
0.184000	46.5	9.000	L1	9.7	17.8	64.3
1.132000	31.0	9.000	L1	9.8	25.0	56.0
1.182000	30.3	9.000	L1	9.8	25.7	56.0
1.256000	31.1	9.000	L1	9.8	24.9	56.0
1.356000	33.0	9.000	L1	9.8	23.0	56.0
1.478000	30.5	9.000	L1	9.8	25.5	56.0
1.498000	28.5	9.000	L1	9.8	27.5	56.0
16.232000	18.6	9.000	L1	10.3	41.4	60.0
16.412000	18.7	9.000	L1	10.3	41.3	60.0
16.518000	18.8	9.000	L1	10.3	41.2	60.0
16.528000	18.0	9.000	L1	10.3	42.0	60.0
16.540000	18.3	9.000	L1	10.3	41.7	60.0
16.832000	18.7	9.000	L1	10.3	41.3	60.0

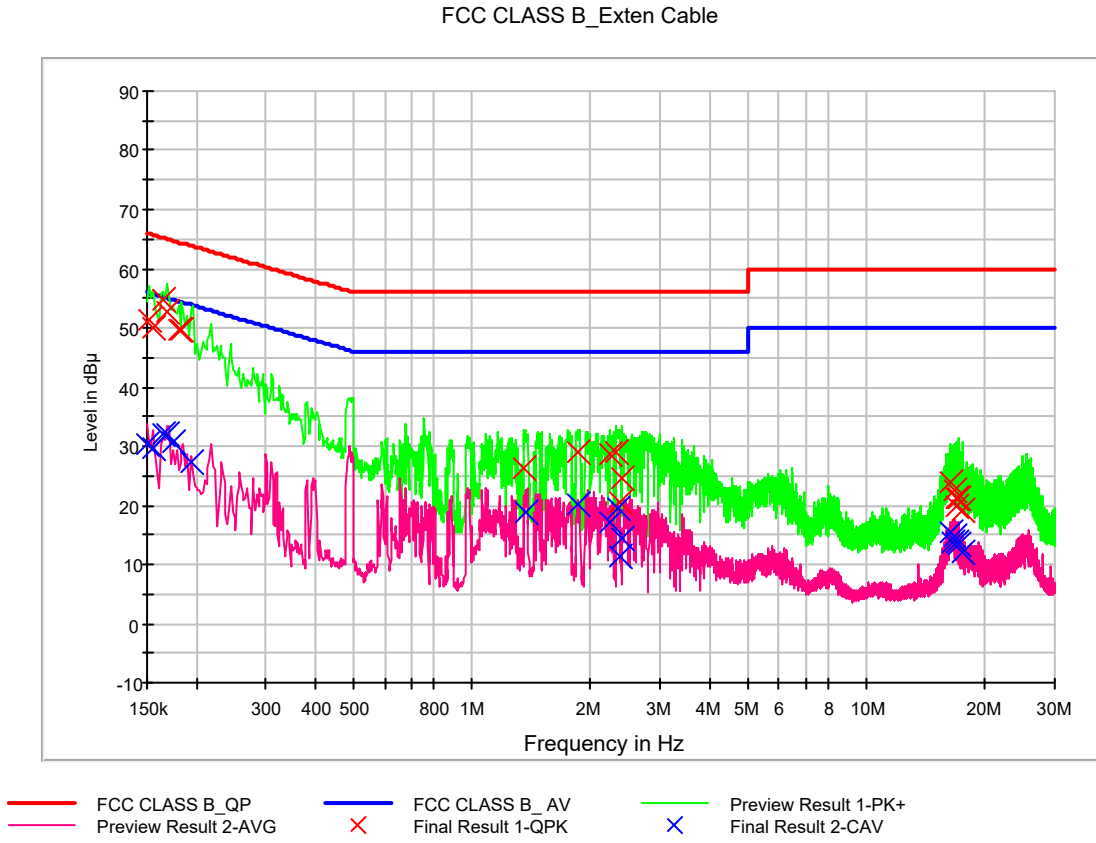


### CAverage Final Result, Line (L1)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	34.5	9.000	L1	9.7	21.5	56.0
0.154000	34.3	9.000	L1	9.7	21.5	55.8
0.164000	34.1	9.000	L1	9.7	21.1	55.3
0.182000	29.2	9.000	L1	9.7	25.2	54.4
0.196000	32.5	9.000	L1	9.7	21.3	53.8
0.206000	27.1	9.000	L1	9.7	26.2	53.4
1.182000	22.7	9.000	L1	9.8	23.3	46.0
1.256000	19.0	9.000	L1	9.8	27.0	46.0
1.356000	18.3	9.000	L1	9.8	27.7	46.0
1.368000	25.1	9.000	L1	9.8	20.9	46.0
1.478000	15.6	9.000	L1	9.8	30.4	46.0
1.492000	16.8	9.000	L1	9.8	29.2	46.0
16.518000	11.2	9.000	L1	10.3	38.8	50.0
16.528000	11.2	9.000	L1	10.3	38.8	50.0
16.538000	10.9	9.000	L1	10.3	39.1	50.0
16.552000	10.7	9.000	L1	10.3	39.3	50.0
16.832000	10.1	9.000	L1	10.3	39.9	50.0
17.620000	9.1	9.000	L1	10.3	40.9	50.0



Figure 4: 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)
0.152000	51.4	9.000	N	9.7	14.5	65.9
0.156000	49.9	9.000	N	9.7	15.8	65.7
0.164000	54.7	9.000	N	9.7	10.6	65.3
0.168000	52.8	9.000	N	9.7	12.3	65.1
0.180000	49.5	9.000	N	9.7	15.0	64.5
0.184000	49.5	9.000	N	9.7	14.8	64.3
1.352000	26.3	9.000	N	9.8	29.7	56.0
1.852000	29.1	9.000	N	9.8	26.9	56.0
2.240000	28.5	9.000	N	9.8	27.5	56.0
2.324000	29.1	9.000	N	9.8	26.9	56.0
2.380000	20.7	9.000	N	9.8	35.3	56.0
2.396000	24.7	9.000	N	9.8	31.3	56.0
16.284000	23.9	9.000	N	10.5	36.1	60.0
16.712000	22.7	9.000	N	10.5	37.3	60.0
16.842000	20.0	9.000	N	10.5	40.0	60.0
16.962000	21.2	9.000	N	10.5	38.8	60.0
17.056000	21.2	9.000	N	10.5	38.8	60.0
17.468000	19.3	9.000	N	10.6	40.7	60.0



### CAverage Final Result, Line (N)

Frequency (MHz)	CAverage (dBuV)	Bandwidth (kHz)	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	30.3	9.000	N	9.7	25.7	56.0
0.156000	29.6	9.000	N	9.7	26.1	55.7
0.164000	31.9	9.000	N	9.7	23.3	55.3
0.168000	32.0	9.000	N	9.7	23.0	55.1
0.174000	30.8	9.000	N	9.7	24.0	54.8
0.194000	27.4	9.000	N	9.7	26.5	53.9
1.362000	18.9	9.000	N	9.8	27.1	46.0
1.852000	20.1	9.000	N	9.8	25.9	46.0
2.240000	17.1	9.000	N	9.8	28.9	46.0
2.346000	19.4	9.000	N	9.8	26.6	46.0
2.380000	11.4	9.000	N	9.8	34.6	46.0
2.396000	14.6	9.000	N	9.8	31.4	46.0
16.284000	15.6	9.000	N	10.5	34.4	50.0
16.538000	13.7	9.000	N	10.5	36.3	50.0
16.726000	14.8	9.000	N	10.5	35.2	50.0
16.978000	13.9	9.000	N	10.5	36.1	50.0
17.056000	13.5	9.000	N	10.5	36.5	50.0
17.468000	12.0	9.000	N	10.6	38.0	50.0



## 5.2 Radiated Emission Test

The test results of radiated emission provide the following information:

### -For Measurement Below 1 GHz

**Type: C to USB**

Rule Part / Standard	FCC PART 15 Subpart B Class B
Detector	Quasi-Peak
Bandwidth	120 kHz (6 dB)
Operation Mode	Data Communication mode
Worst Earphone	EAB63728244 (CRESYN)
Kind of Test Site	3 m semi anechoic chamber
Temperature	22.9 / 24.1 °C
Relative Humidity	42.1 / 38.6 %
Test Date	April 09 / April 16, 2018

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)
65.658400	25.9	99.8	V	0.0	18.8	14.1	40.0
82.590400	28.9	400.0	H	279.0	15.3	11.1	40.0
159.032000	28.8	174.7	H	0.0	20.2	14.7	43.5
178.172000	34.4	174.7	H	340.0	18.9	9.1	43.5
276.980000	32.7	99.8	H	297.0	19.8	13.3	46.0
800.037600	36.0	99.8	H	35.0	30.2	10.0	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

**Type: C to C**

Rule Part / Standard	FCC PART 15 Subpart B Class B
Detector	Quasi-Peak
Bandwidth	120 kHz (6 dB)
Operation Mode	Data Communication mode
Worst Earphone	EAB63728244 (CRESYN)
Kind of Test Site	3 m semi anechoic chamber
Temperature	24.1 °C
Relative Humidity	38.6 %
Test Date	April 16, 2018

Frequency (MHz)	Quasi Peak (dBμV/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
35.491200	24.4	99.9	V	8.0	19.2	15.6	40.0
55.619200	21.5	99.7	V	168.0	20.0	18.5	40.0
97.033600	17.2	392.9	V	318.0	15.2	26.3	43.5
233.670400	34.8	99.9	V	180.0	18.2	11.2	46.0
316.752800	25.5	115.7	H	51.0	21.0	20.5	46.0
555.923200	26.3	99.8	V	184.0	26.5	19.7	46.0



## -For Measurement Above 1 GHz

Type: C to USB

Rule Part / Standard	FCC PART 15 Subpart B Class B
Detector	Peak mode: Peak (RBW: 1 MHz, VBW: 3 MHz) CISPR-Average mode: Peak (RBW: 1 MHz, VBW: 10 Hz)
Highest Operating Frequency	5 925 MHz
Tested Frequency Range	1 GHz to 30 GHz
Operation Mode	Data Communication mode
Worst Earphone	EAB63728244 (CRESYN)
Kind of Test Site	3 m semi anechoic chamber
Temperature	23.7 / 24.1 / 24.3 °C
Relative Humidity	39.5 / 38.6 / 38.1 %
Test Date	April 12 / April 16 / April 17, 2018

Frequency (MHz)	Peak (dB $\mu$ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V/m)
1400.020000	46.7	299.5	H	328.0	-28.5	27.3	74.0
1997.225000	51.9	99.8	V	50.0	-27.0	22.1	74.0
2588.585000	54.8	290.4	V	54.0	-24.1	19.2	74.0
2666.260000	46.9	198.4	V	36.0	-23.9	27.1	74.0
4498.105000	40.7	244.5	V	20.0	-19.7	33.3	74.0
5990.360000	44.7	99.8	V	331.0	-16.6	29.3	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)
1400.020000	40.1	299.5	H	328.0	-28.5	13.9	54.0
1997.225000	35.3	99.8	V	50.0	-27.0	18.7	54.0
2588.585000	32.9	290.4	V	54.0	-24.1	21.1	54.0
2666.260000	27.2	198.4	V	36.0	-23.9	26.8	54.0
4498.105000	25.1	244.5	V	20.0	-19.7	28.9	54.0
5990.360000	28.1	99.8	V	331.0	-16.6	25.9	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





## Type: C to C

Rule Part / Standard	FCC PART 15 Subpart B Class B
Detector	Peak mode: Peak (RBW: 1 MHz, VBW: 3 MHz) CISPR-Average mode: Peak (RBW: 1 MHz, VBW: 10 Hz)
Highest Operating Frequency	5 925 MHz
Tested Frequency Range	1 GHz to 30 GHz
Operation Mode	Data Communication mode
Worst Earphone	EAB63728244 (CRESYN)
Kind of Test Site	3 m semi anechoic chamber
Temperature	24.1 / 24.3 °C
Relative Humidity	38.6 / 38.1 %
Test Date	April 16 / April 17, 2018

Frequency (MHz)	Peak (dB $\mu$ V/m)	Antenna Height (cm)	POL. (H/V)	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V/m)
1118.435000	32.5	176.4	V	36.0	-29.2	41.5	74.0
1759.210000	39.5	149.5	V	327.0	-27.6	34.5	74.0
3364.320000	33.9	249.9	V	299.0	-22.4	40.1	74.0
4960.520000	36.8	149.9	H	72.0	-18.4	37.2	74.0
7681.035000	42.2	249.9	V	59.0	-12.1	31.8	74.0
9535.655000	43.8	99.7	V	109.0	-10.8	30.2	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)
1118.435000	18.6	176.4	V	36.0	-29.2	35.4	54.0
1759.210000	18.0	149.5	V	327.0	-27.6	36.0	54.0
3364.320000	21.2	249.9	V	299.0	-22.4	32.8	54.0
4960.520000	24.4	149.9	H	72.0	-18.4	29.6	54.0
7681.035000	29.5	249.9	V	59.0	-12.1	24.5	54.0
9535.655000	30.8	99.7	V	109.0	-10.8	23.2	54.0



## 6. 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 type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESCI	100584	1 year	06.20.2017
<input checked="" type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESCI	100033	1 year	06.27.2017
<input checked="" type="checkbox"/> LISN	Rohde & Schwarz	ENV216	102245	1 year	12.20.2017
<input checked="" type="checkbox"/> LISN	Rohde & Schwarz	ESH3-Z5	100282	1 year	05.22.2017
<input type="checkbox"/> LISN	Rohde & Schwarz	ENV216	100073	1 year	07.18.2017
<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	08.16.2017
<input checked="" type="checkbox"/> Trilog Antenna	Schwarzbeck	VULB 9168	760	2 year	04.06.2017
<input checked="" type="checkbox"/> Antenna master	INNCO Systems	MA4000-XP-ET	-	N/A	-
<input checked="" type="checkbox"/> Antenna master controller	INNCO Systems	CO 3000	CO 3000/870/ 35990515/L	N/A	-
<input checked="" type="checkbox"/> Turn Table	INNCO Systems	-	-	N/A	-
<input checked="" type="checkbox"/> Turn Table controller	INNCO Systems	CO2000	-	N/A	-
<input type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESU26	100241	1 year	08.16.2017
<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	08.16.2017
<input checked="" type="checkbox"/> Antenna master	INNCO Systems	MA4000-XP-ET	-	N/A	-
<input checked="" type="checkbox"/> Antenna master controller	INNCO Systems	CO 3000	CO 3000/870/ 35990515/L	N/A	-
<input checked="" type="checkbox"/> Turn Table	INNCO Systems	-	-	N/A	-
<input checked="" type="checkbox"/> Turn Table controller	INNCO Systems	CO2000	-	N/A	-
<input checked="" type="checkbox"/> Horn Antenna	Schwarzbeck	BBHA 9120D	296	2 year	10.12.2016
<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	12.20.2017
<input type="checkbox"/> Antenna master controller	HD GmbH	HD 100	100/637	N/A	-
<input type="checkbox"/> Power Amplifier	CERNEX	CBLU1183540	21691	1 year	06.28.2017
<input type="checkbox"/> Antenna master	HD GmbH	MA240	240/520	N/A	-
<input type="checkbox"/> Horn Antenna	Schwarzbeck	BBHA 9120D	1300	2 year	06.30.2017
<input type="checkbox"/> EMI Test Receiver	Rohde & Schwarz	ESU26	100241	1 year	08.16.2017
<input type="checkbox"/> Turn Table	INNCO Systems	DT3000-3T	DT3000/69	N/A	-
<input checked="" type="checkbox"/> Software	Rohde & Schwarz	EMC32 VER8.40.0	-	-	-



## 7. CONCLUSION

The data collected shows that the **EUT Type: Multi-band CDMA/GSM/EDGE/WCDMA/LTE phone with WLAN, Bluetooth and RFID, Model: LM-G710VM, FCC ID: ZNFG710VM** complies with §15.107 and §15.109 of the FCC rules.



## 8. APPENDIX A. TEST SETUP PHOTOGRAPHS

Please refer to Appendix A