



# TEST REPORT

## No. I17Z60774-EMC01

for

**TCL Communication Ltd.**

**HSUPA/HSDPA/UMTS Tri Band/GSM Quad Band/LTE 5 Band mobile  
phone**

**Model Name: 4044L**

**FCC ID: 2ACCJN012**

with

**Hardware Version: 03**

**Software Version: B4LUAL0**

**Issued Date: 2017-06-15**

**Note:**

The test results in this test report relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of CTTL.

**Test Laboratory:**

**FCC 2.948 Listed: No.525429**

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## **REPORT HISTORY**

<b>Report Number</b>	<b>Revision</b>	<b>Description</b>	<b>Issue Date</b>
I17Z60774-EMC01	Rev.0	1 <sup>st</sup> edition	2017-06-15

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## **1. Test Laboratory**

### **1.1. Testing Location**

**Location 1: CTTL(huayuan North Road)**

Address: No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China  
100191

### **1.2. Testing Environment**

Normal Temperature: 15-35℃

Relative Humidity: 20-75%

### **1.3. Project data**

Testing Start Date: 2017-06-10

Testing End Date: 2017-06-15

### **1.4. Signature**



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**Zhang Hui**  
**(Prepared this test report)**



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**Qu Pengfei**  
**(Reviewed this test report)**



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**Liu Baodian**  
**Deputy Director of the laboratory**  
**(Approved this test report)**

## **2. Client Information**

### **2.1. Applicant Information**

Company Name: TCL Communication Ltd.  
Address /Post: 5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park,  
Pudong Area Shanghai, P.R. China. 201203  
City: Shanghai  
Postal Code: 201203  
Country: P. R. China  
Contact Person: Gong Zhizhou  
Contact Email: zhizhou.gong@tcl.com  
Telephone: 0086-21-31363544  
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### **2.2. Manufacturer Information**

Company Name: TCL Communication Ltd.  
Address /Post: 5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park,  
Pudong Area Shanghai, P.R. China. 201203  
City: Shanghai  
Postal Code: 201203  
Country: P. R. China  
Contact Person: Gong Zhizhou  
Contact Email: zhizhou.gong@tcl.com  
Telephone: 0086-21-31363544  
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### 3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

#### 3.1. About EUT

Description	HSUPA/HSDPA/UMTS Tri Band/GSM Quad Band/LTE 5 Band mobile phone
Model Name	4044L
FCC ID	2ACCJN012
Extreme vol. Limits	3.5VDC to 4.2VDC (nominal: 3.7VDC)

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of CTTL, Telecommunication Technology Labs, Academy of Telecommunication Research, MIIT.

#### 3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	014960000100098	03	B4LUAL0

\*EUT ID: is used to identify the test sample in the lab internally.

#### 3.3. Internal Identification of AE used during the test

AE ID*	Description	SN	Remarks
AE1	Battery	/	16TCT-BA-1140
AE2	Battery	/	1760774BA004
AE3	Battery	/	16TCT-BA-1083
AE4	Battery	/	17TCT-BA-0031
AE5	USB Cable	/	16TCT-DC-0051
AE6	USB Cable	/	16TCT-DC-0366
AE8	Charger	/	1760774CH005
AE9	Charger	/	1760774CH003
AE10	Charger	/	1760774CH001

AE1,AE2,AE3,AE4

Model	TLi013C1
Manufacturer	BYD
Capacitance	1350 mAh
Nominal voltage	3.7 V

AE5,AE6

Model	CDA3122002C1
Manufacturer	/
Length of cable	/

AE8,AE9,AE10

Model	CBA0058AGAC4
Manufacturer	Aohai
Length of cable	/

\*AE ID: is used to identify the test sample in the lab internally.



### 3.4. EUT set-ups

<b>EUT set-up No.</b>	<b>Combination of EUT and AE</b>	<b>Remarks</b>
Set.1	EUT1+ AE1+ AE5+ AE8	Charging mode
Set.2	EUT1+ AE1+ AE5	USB mode

## **4. Reference Documents**

### **4.1. Reference Documents for testing**

The following documents listed in this section are referred for testing.

<b>Reference</b>	<b>Title</b>	<b>Version</b>
FCC Part 15, Subpart B	Radio frequency devices - Unintentional Radiators	10-1-15 Edition
ANSI C63.4	American National Standard for Methods of Measurement of Radio- Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz	2014

Note: The test methods have no deviation with standards.



## 5. LABORATORY ENVIRONMENT

**Semi-anechoic chamber SAC-1** (23 meters×17meters×10meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 15 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz, >60dB; 1MHz - 1000MHz, >90dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4 Ω
Normalised site attenuation (NSA)	< ±4 dB, 10 m distance
Site voltage standing-wave ratio ( $S_{VSWR}$ )	Between 0 and 6 dB, from 1GHz to 6GHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 3000 MHz

**Shielded room** did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 35 °C
Relative humidity	Min. = 20 %, Max. = 75 %
Shielding effectiveness	0.014MHz-1MHz, >60dB; 1MHz—1000MHz, >90dB.
Electrical insulation	> 2 MΩ
Ground system resistance	< 4 Ω

## 6. SUMMARY OF TEST RESULTS

Abbreviations used in this clause:		
Verdict Column	P	Pass
	NA	Not applicable
	F	Fail
Location Column	1	The test is performed in test location 1 which is described in section 1.1 of this report

Items	Test Name	Clause in FCC rules	Section in this report	Verdict	Test Location
1	Radiated Emission	15.109(a)	B.1	P	1
2	Conducted Emission	15.107(a)	B.2	P	1

## 7. Test Equipments Utilized

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURE	CAL DUE DATE	CALIBRATI ON INTERVAL
1	Test Receiver	ESU26	100235	R&S	2018-03-01	1 year
2	Test Receiver	ESCI 7	100344	R&S	2017-07-05	1 year
3	Universal Radio Communication Tester	CMW500	143008	R&S	2017-12-01	1 year
4	LISN	ENV216	101200	R&S	2017-07-10	1 year
5	EMI Antenna	VULB 9163	9163-301	Schwarzbeck	2017-12-16	3 years
6	EMI Antenna	3115	6914	ETS-Lindgren	2017-12-15	3 years
7	PC	OPTIPLEX 380	2X1YV2X	DELL	N/A	N/A
8	Printer	P1606dn	VNC3L52122	HP	N/A	N/A
9	Keyboard	L100	CN0RH6596589 07ATOI40	DELL	N/A	N/A
10	Mouse	M-UAE119	LZ935220ZRC	Lenovo	N/A	N/A

Test Item	Test Software and Version	Software Vendor
Radiated Continuous Emission	EMC32 V9.01	R&S
Conducted Emission	EMC32 V8.52.0	R&S

## **ANNEX A: MEASUREMENT RESULTS**

### **A.1 Radiated Emission**

#### **Reference**

FCC: CFR Part 15.109(a).

#### **A.1.1 Method of measurement**

The field strength of radiated emissions from the unintentional radiator (charging mode of MS) at distances of 3 meters (for 30MHz-1GHz) and 3 meters (for above 1GHz) is tested. Tested in accordance with the procedures of ANSI C63.4 – 2014, section 8.3.

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3/10 meters from the EUT. During the tests, the antenna height and the EUT azimuth were varied in order to identify the maximum level of emissions from the EUT. This maximization process was repeated with the EUT positioned in each of its three orthogonal orientations.

#### **A.1.2 EUT Operating Mode:**

The MS is operating in the charging mode. During the test MS is connected to a charger in the case of charging mode.

#### **A.1.3 Measurement Limit**

Frequency range (MHz)	Field strength limit ( $\mu\text{V/m}$ )		
	Quasi-peak	Average	Peak
30-88	100		
88-216	150		
216-960	200		
960-1000	500		
>1000		500	5000

Note: the above limit is for 3 meters test distance. 10 meters' limit is got by converting.

#### **A.1.4 Test Condition**

Frequency range (MHz)	RBW/VBW	Sweep Time (s)	Detector
30-1000	120kHz (IF Bandwidth)	5	Peak/Quasi-peak
Above 1000	1MHz/1MHz	15	Peak, Average

### A.1.5 Measurement Results

A "reference path loss" is established and the  $A_{Rpl}$  is the attenuation of "reference path loss". It includes the antenna factor of receive antenna and the path loss.

The measurement results are obtained as described below:

$$\text{Result} = P_{\text{Mea}} + A_{\text{Rpl}} = P_{\text{Mea}} + G_A + G_{\text{PL}}$$

Where

$G_A$ : Antenna factor of receive antenna

$G_{\text{PL}}$ : Path Loss

$P_{\text{Mea}}$ : Measurement result on receiver.

Measurement uncertainty (worst case): 30MHz-1GHz: 4.86dB, 1GHz-18GHz: 5.26dB,  $k=2$ .

#### Measurement results for Set.1:

##### Charging Mode/Average detector

Frequency(MHz)	Result(dB $\mu\text{V}/\text{m}$ )	$G_{\text{PL}}$ (dB)	$G_A$ (dB/m)	$P_{\text{Mea}}$ (dB $\mu\text{V}$ )	Polarity
17962.033	44.2	-17.7	45.6	16.300	V
17971.667	44.1	-17.7	45.6	16.200	H
17952.967	44.0	-17.7	45.6	16.100	H
17945.033	44.0	-17.7	45.6	16.100	H
17930.867	44.0	-17.7	45.6	16.100	H
17951.267	44.0	-17.7	45.6	16.100	V

##### Charging Mode/Peak detector

Frequency(MHz)	Result(dB $\mu\text{V}/\text{m}$ )	$G_{\text{PL}}$ (dB)	$G_A$ (dB/m)	$P_{\text{Mea}}$ (dB $\mu\text{V}$ )	Polarity
17878.733	55.3	-18.5	45.6	28.200	H
17965.433	55.2	-17.7	45.6	27.300	V
17957.500	55.0	-17.7	45.6	27.100	H
17979.033	54.9	-17.7	45.6	27.000	V
17836.233	54.6	-18.5	45.6	27.500	H
17951.833	54.6	-17.7	45.6	26.700	V

**Measurement results for Set.2:**
**Charging Mode/Average detector**

Frequency(MHz)	Result(dB $\mu$ V/m)	G <sub>PL</sub> (dB)	G <sub>A</sub> (dB/m)	P <sub>Mea</sub> (dB $\mu$ V)	Polarity
17952.967	44.1	-17.7	45.6	16.200	V
17954.667	44.0	-17.7	45.6	16.100	H
17951.833	43.8	-17.7	45.6	15.900	V
17943.333	43.8	-17.7	45.6	15.900	V
17932.000	43.8	-17.7	45.6	15.900	V
17929.733	43.8	-17.7	45.6	15.900	V

**Charging Mode/Peak detector**

Frequency(MHz)	Result(dB $\mu$ V/m)	G <sub>PL</sub> (dB)	G <sub>A</sub> (dB/m)	P <sub>Mea</sub> (dB $\mu$ V)	Polarity
17990.933	54.9	-17.7	45.6	27.000	V
17953.533	54.8	-17.7	45.6	26.900	H
17825.467	54.6	-18.5	45.6	27.500	V
17955.233	54.4	-17.7	45.6	26.500	V
17919.533	54.4	-17.7	45.6	26.500	H
17874.200	54.4	-18.5	45.6	27.300	H

Sample calculation: Peak detector, 17990.933MHz

Result =P<sub>Mea</sub> (27 dB $\mu$ V)+ G<sub>A</sub> (45.6dB/m)+ G<sub>PL</sub>(-17.7dB) =54.9 B $\mu$ V/m

### Charging Mode, Set.1

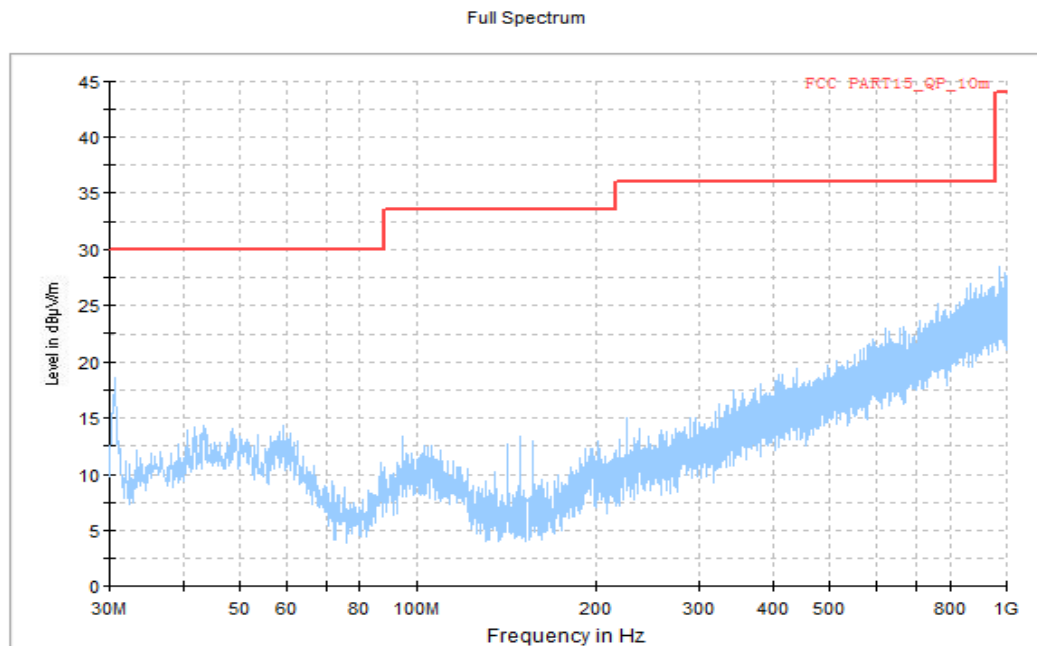


Figure A.1 Radiated Emission from 30MHz to 1GHz

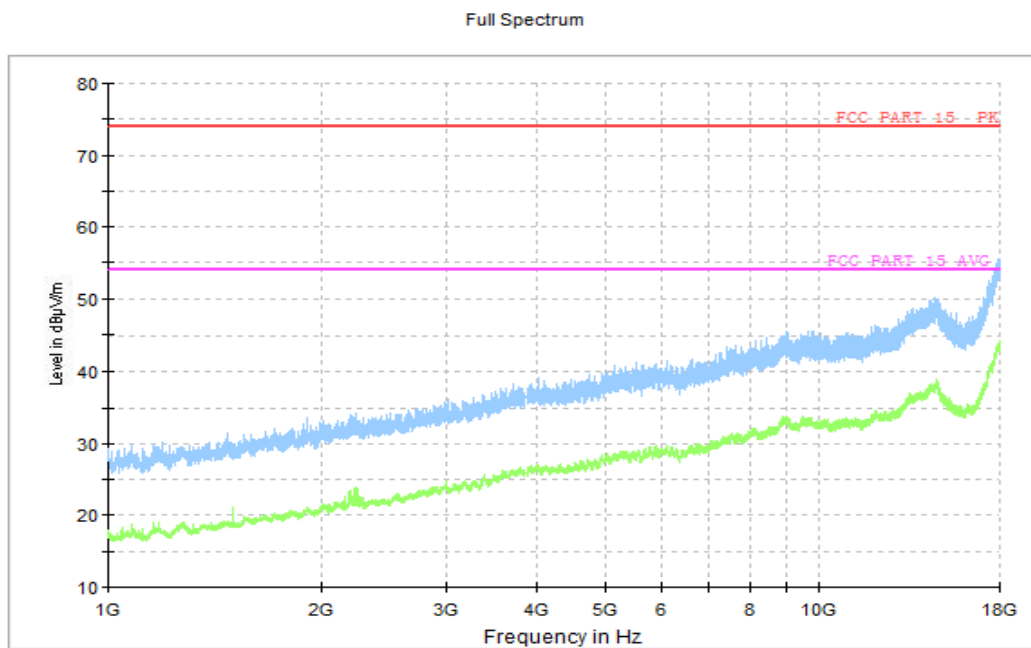


Figure A.2 Radiated Emission from 1GHz to 18GHz

USB Mode, Set.2

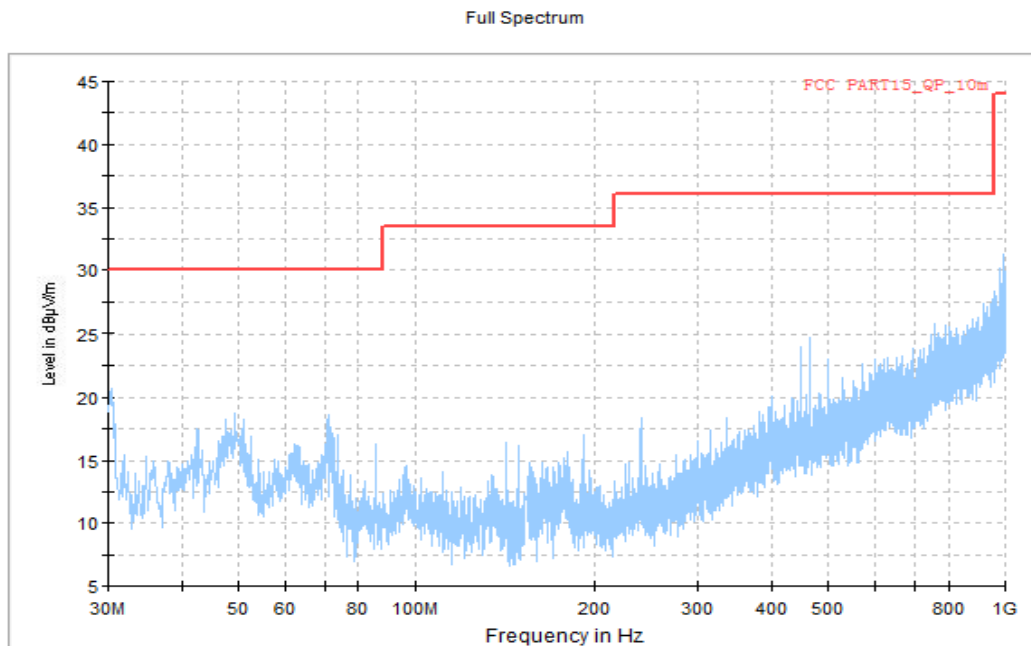


Figure A.3 Radiated Emission from 30MHz to 1GHz

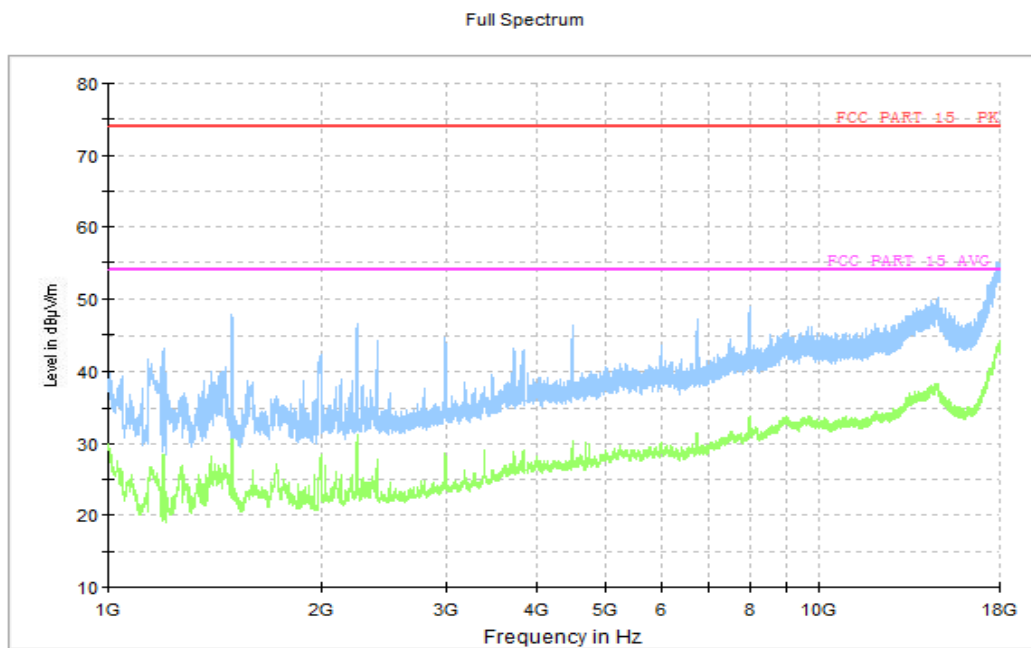


Figure A.4 Radiated Emission from 1GHz to 18GHz



## A.2 Conducted Emission

### Reference

FCC: CFR Part 15.107(a).

### A.2.1 Method of measurement

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits. Tested in accordance with the procedures of ANSI C63.4 – 2014, section 7.3.

### A.2.2 EUT Operating Mode

The MS is operating in the charging mode. During the test MS is connected to a charger in the case of charging mode.

### A.2.3 Measurement Limit

Frequency of emission (MHz)	Conducted limit (dB $\mu$ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50
*Decreases with the logarithm of the frequency		

### A.2.4 Test Condition in charging mode

Voltage (V)	Frequency (Hz)
120	60

RBW/IF bandwidth	Sweep Time(s)
9kHz	1

### A.2.5 Measurement Results

Measurement uncertainty:  $U= 3.38\text{dB}$ ,  $k=2$ .

#### Charging Mode, Set.1

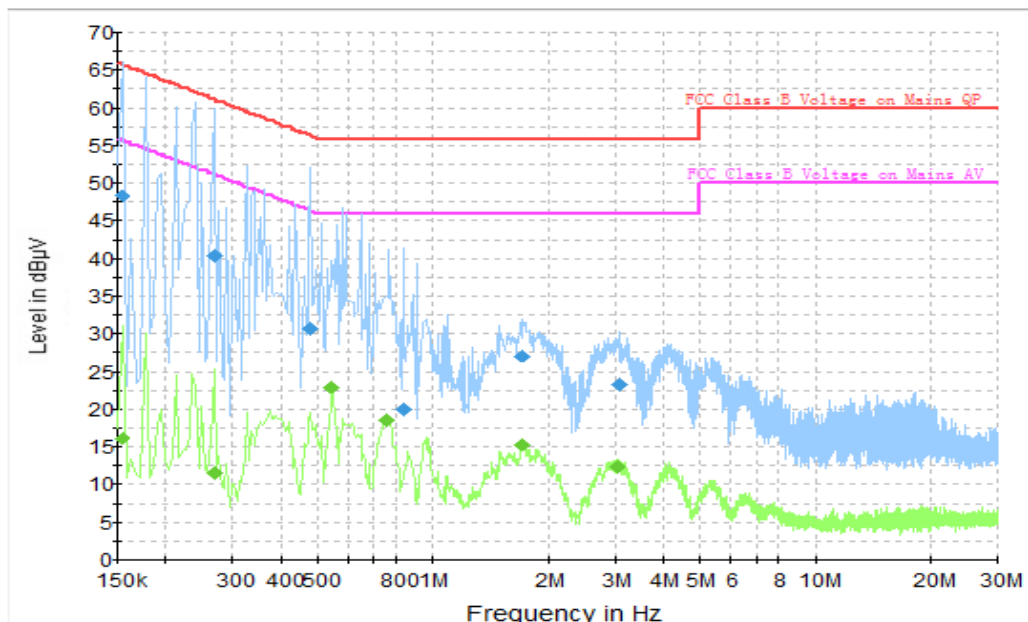


Figure A.5 Conducted Emission

#### Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.154500	48.4	2000.0	9.000	On	L1	20.1	17.3	65.8
0.267000	40.4	2000.0	9.000	On	L1	19.8	20.8	61.2
0.478500	30.8	2000.0	9.000	On	L1	19.9	25.6	56.4
0.834000	19.9	2000.0	9.000	On	L1	19.8	36.1	56.0
1.720500	27.1	2000.0	9.000	On	N	19.7	28.9	56.0
3.057000	23.3	2000.0	9.000	On	L1	19.2	32.7	56.0

#### Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.154500	16.2	2000.0	9.000	On	L1	20.1	39.6	55.8
0.267000	11.5	2000.0	9.000	On	L1	19.8	39.7	51.2
0.546000	23.0	2000.0	9.000	On	N	19.9	23.0	46.0
0.757500	18.5	2000.0	9.000	On	N	19.8	27.5	46.0
1.716000	15.3	2000.0	9.000	On	N	19.7	30.7	46.0
3.043500	12.4	2000.0	9.000	On	N	19.2	33.6	46.0

## Charging Mode, Set.2

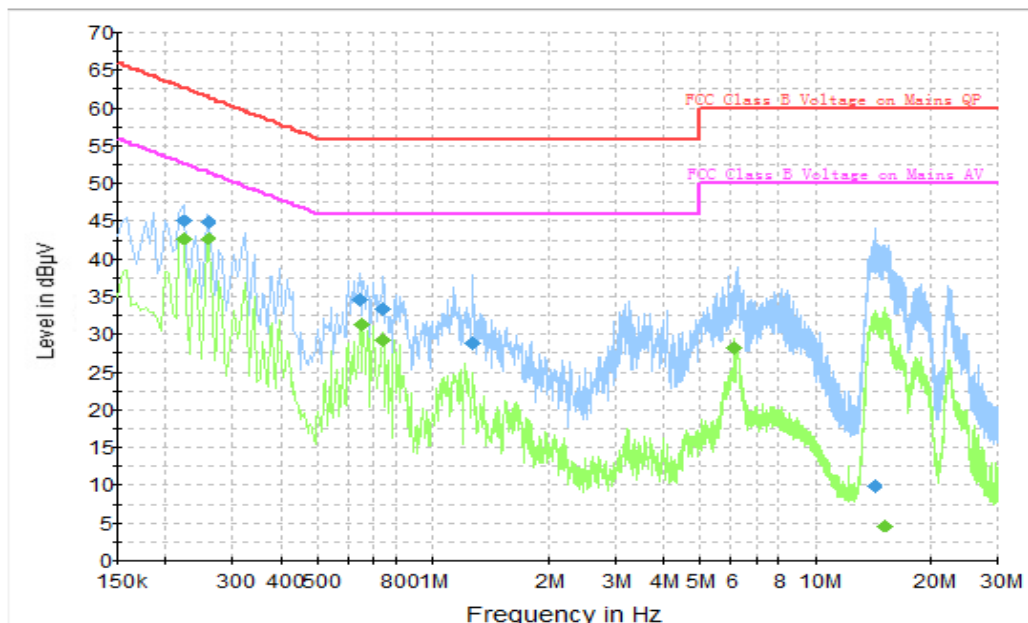


Figure A.6 Conducted Emission

### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.222000	45.1	2000.0	9.000	On	L1	19.8	17.7	62.7
0.258000	44.9	2000.0	9.000	On	L1	19.8	16.6	61.5
0.640500	34.7	2000.0	9.000	On	L1	19.8	21.3	56.0
0.739500	33.3	2000.0	9.000	On	L1	19.8	22.7	56.0
1.270500	28.8	2000.0	9.000	On	L1	19.7	27.2	56.0
14.176500	9.8	2000.0	9.000	On	L1	19.8	50.2	60.0

### Final Result 2

Frequency (MHz)	CAverage (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.222000	42.8	2000.0	9.000	On	L1	19.8	10.0	52.7
0.258000	42.8	2000.0	9.000	On	L1	19.8	8.7	51.5
0.654000	31.4	2000.0	9.000	On	L1	19.8	14.6	46.0
0.739500	29.2	2000.0	9.000	On	L1	19.8	16.8	46.0
6.090000	28.2	2000.0	9.000	On	L1	19.6	21.8	50.0
15.180000	4.7	2000.0	9.000	On	L1	19.8	45.3	50.0

\*\*\*END OF REPORT\*\*\*