



# TEST REPORT

## No. I16Z41526-EMC01

for

**TCL Communication Ltd.**

**GSM Quad Band Mobile phone**

**Model Name: 2008G**

**FCC ID: 2ACCJB070**

with

**Hardware Version: PIO**

**Software Version: V1.0**

**Issued Date: 2016-07-25**

**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***

CTTL, Telecommunication Technology Labs, Academy of Telecommunication Research, MIIT

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## **REPORT HISTORY**

Report Number	Revision	Description	Issue Date
I16Z41526-EMC01	Rev.0	1 <sup>st</sup> edition	2016-07-25

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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℃

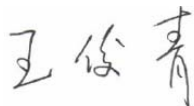
Relative Humidity: 20-75%

### 1.3. Project data

Testing Start Date: 2016-07-11

Testing End Date: 2016-07-25

### 1.4. Signature



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Wang Junqing

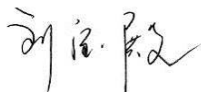
(Prepared this test report)



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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-Tower, No. 232, Liang Jing Road, ZhangJiang High-Tech Park,  
Pudong Area,Shanghai,201203,P.R.China  
City: Shanghai  
Postal Code: 201203  
Country: P. R. China  
Contact Person: Smile. Wu  
Contact Email: xia.wu@tcl.com  
Telephone: 0086-21-51798260  
Fax: 0086-21-61460600

### **2.2. Manufacturer Information**

Company Name: TCL Communication Ltd.  
Address /Post: 5F, C-Tower, No. 232, Liang Jing Road, ZhangJiang High-Tech Park,  
Pudong Area,Shanghai,201203,P.R.China  
City: Shanghai  
Postal Code: 201203  
Country: P. R. China  
Contact Person: Smile. Wu  
Contact Email: xia.wu@tcl.com  
Telephone: 0086-21-51798260  
Fax: 0086-21-61460600

### 3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

#### 3.1. About EUT

Description	GSM Quad Band Mobile phone
Model Name	2008G
Marketing Name	/
FCC ID	2ACCJB070
Extreme vol. Limits	3.35VDC 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	359297070005334	PIO	V1.0

\*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-0918
AE2	Battery	/	16TCT-BA-0913
AE4	Charger	/	16TCT-CH-0748
AE5	Charger	/	16TCT-CH-0753
AE6	Charger	/	/
AE8	USB Cable	/	16TCT-DC-0358
AE9	USB Cable	/	16TCT-DC-0362
AE10	Charger	/	16TCT-CH-0795
AE11	Charger	/	16TCT-CH-0801

AE1, AE2

Model	CAB1400058C1
Manufacturer	BYD
Capacitance	1400 mAh
Nominal voltage	3.7 V

AE4, AE5

Model	CBA3068AGAC1
Manufacturer	BYD
Length of cable	/

**AE6**

Model	CBA3068ABAC1
Manufacturer	BYD
Length of cable	/

**AE10, AE11**

Model	CBA3068AAAC1
Manufacturer	BYD
Length of cable	/

**AE8, AE9**

Model	CDA0000092C3
Manufacturer	JIAYIKANG
Length of cable	97cm

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

Note: The USB cables are shielded.

**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+ AE4+ AE8	Charger
Set.2	EUT1+ AE1+ AE8	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



## 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	2017-03-02	1 year
2	Universal Radio Communication Tester	CMW500	143008	R&S	2016-12-09	1 year
3	LISN	ESH3Z2	357881052	Rohde & Schwarz	2017-10-05	1 year
4	EMI Antenna	VULB 9163	9163-301	Schwarzbeck	2017-12-16	3 years
5	EMI Antenna	3115	6914	ETS-Lindgren	2016-12-15	3 years
6	Test Receiver	ESCI7	100948	R&S	2017-07-05	1 year
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

## **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 (USB mode of MS and charging mode of MS) at distances of 10 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 USB mode and charging mode. During the test MS is connected to a PC via a USB cable in the case of USB mode and is connected to a charger in the case of charging mode. The model of the PC is DELL OPTIPLEX 380, and the serial number of the PC is 2X1YV2X. The software is used to let the PC keep on copying data to MS, reading and erasing the data after copy action was finished.

Note: I/O information: Printer – USB, Mouse – PS/2, Keyboard – USB.

#### **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:

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

Where

$G_A$ : Antenna factor of receive antenna

$G_{PL}$ : Path Loss

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

Measurement uncertainty (worst case):  $U = 4.3 \text{ dB}$ ,  $k=2$ .

### Measurement results for Set.1:

#### Charging Mode/Average detector

Frequency(MHz)	Result(dB $\mu$ V/m)	$G_{PL}$ (dB)	$G_A$ (dB/m)	$P_{\text{Mea}}$ (dB $\mu$ V)	Polarity
17997.450	51.7	-17.7	45.6	23.800	H
17820.650	51.5	-18.5	45.6	24.400	H
17980.450	51.4	-17.7	45.6	23.500	V
17944.750	51.3	-17.7	45.6	23.400	V
17971.100	51.2	-17.7	45.6	23.300	H
17917.550	51.1	-17.7	45.6	23.200	V

#### Charging Mode/Peak detector

Frequency(MHz)	Result(dB $\mu$ V/m)	$G_{PL}$ (dB)	$G_A$ (dB/m)	$P_{\text{Mea}}$ (dB $\mu$ V)	Polarity
17983.850	62.0	-17.7	45.6	34.100	H
17925.200	61.9	-17.7	45.6	34.000	H
17988.100	61.7	-17.7	45.6	33.800	H
17934.550	61.6	-17.7	45.6	33.700	V
17919.250	61.5	-17.7	45.6	33.600	H
17985.550	61.5	-17.7	45.6	33.600	V

**Measurement results for Set.2:****USB 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
17920.950	51.5	-17.7	45.6	23.600	H
17983.850	51.4	-17.7	45.6	23.500	V
17943.050	51.3	-17.7	45.6	23.400	V
17964.300	51.3	-17.7	45.6	23.400	V
17909.050	51.2	-18.5	45.6	24.100	H
17928.600	51.2	-17.7	45.6	23.300	H

**USB 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
17905.650	62.3	-18.5	45.6	35.200	H
17918.400	62.1	-17.7	45.6	34.200	V
17887.800	61.4	-18.5	45.6	34.300	H
17849.550	61.4	-18.5	45.6	34.300	H
17996.600	61.2	-17.7	45.6	33.300	V
17925.200	61.2	-17.7	45.6	33.300	H

# Charging Mode, Set.1

Normal RE\_30M-1GHz\_10m

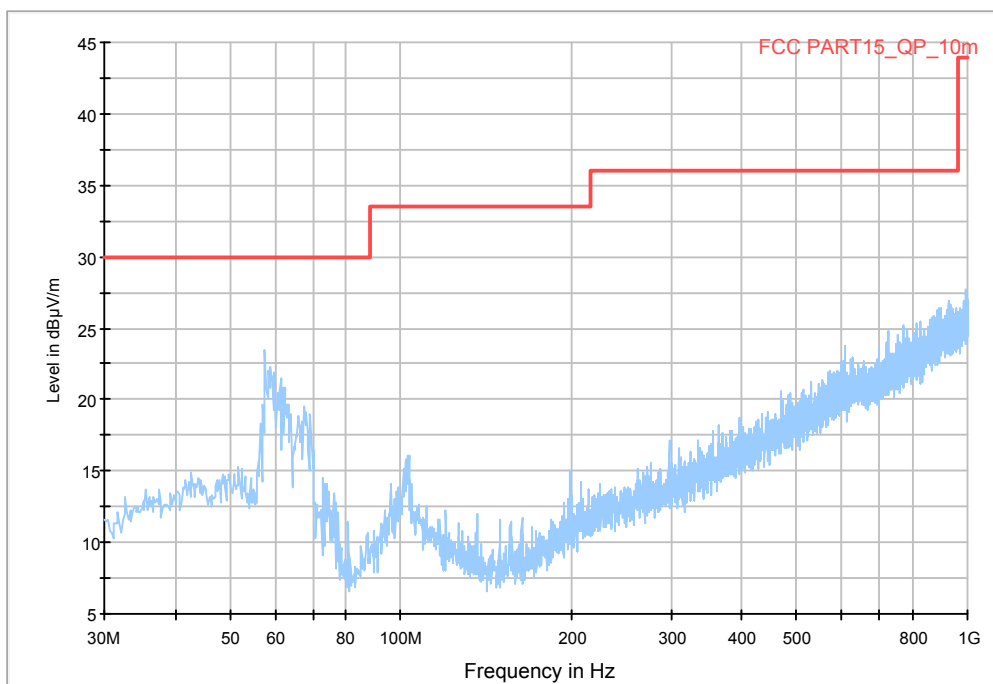


Figure A.1 Radiated Emission from 30MHz to 1GHz

Normal RE\_1G-18GHz

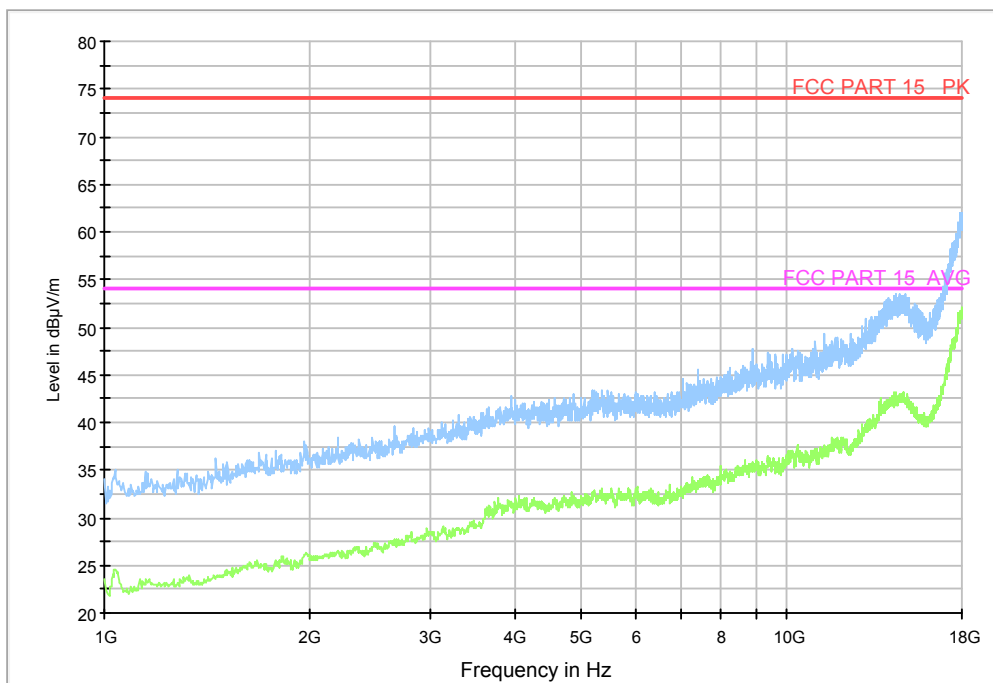
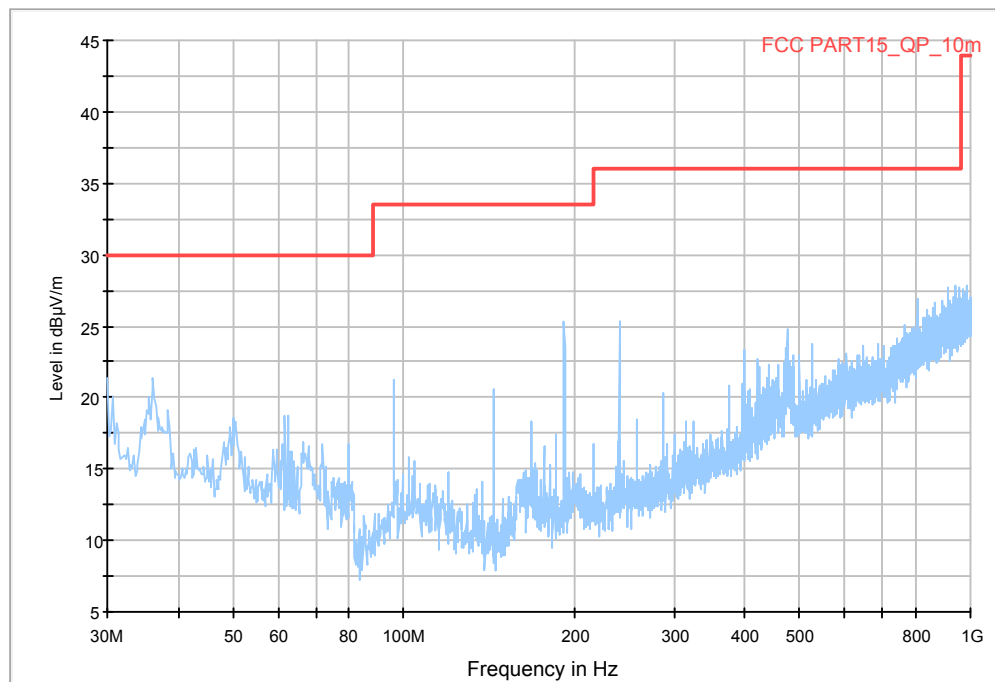


Figure A.2 Radiated Emission from 1GHz to 18GHz

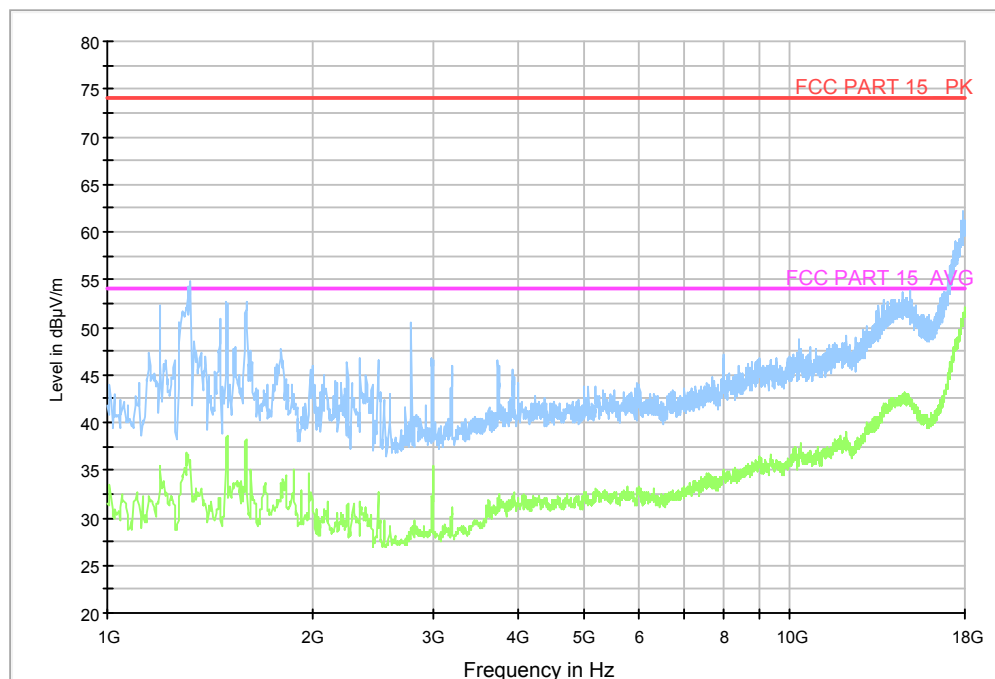
# USB Mode, Set.2

Normal RE\_30M-1GHz\_10m



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

Normal RE\_1G-18GHz



**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 USB mode and charging mode. During the test MS is connected to a PC via a USB cable in the case of USB mode and is connected to a charger in the case of charging mode. The model of the PC is DELL OPTIPLEX 380, and the serial number of the PC is 2X1YV2X. The software is used to let the PC keep on copying data to MS, reading and erasing the data after copy action was finished.

Note: I/O information: Printer – USB, Mouse – PS/2, Keyboard – USB.

### A.2.3 Measurement Limit

Frequency of emission (MHz)	Conducted limit (dBμV)	
	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:  $U = 2.9 \text{ dB}$ ,  $k=2$ .

#### Charging Mode, Set.1

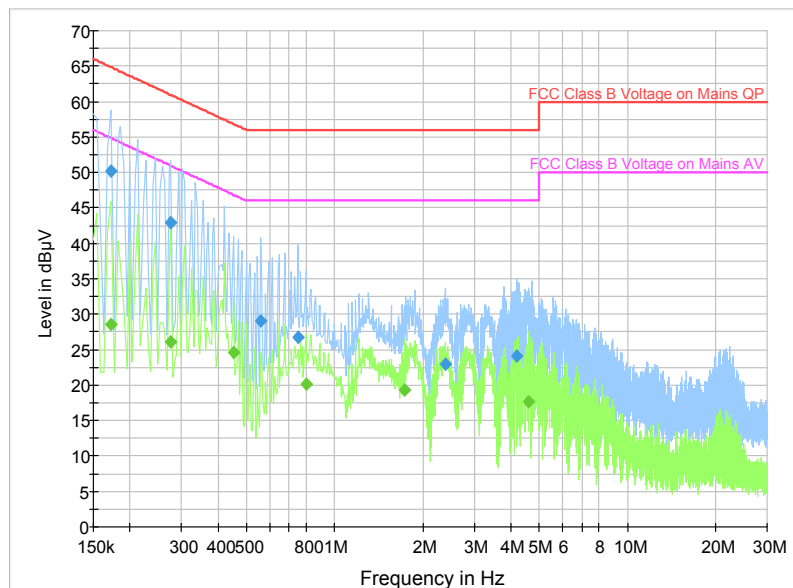


Figure A.7 Conducted Emission

#### Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time(ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.172500	50.1	2000.0	9.000	On	N	10.5	14.7	64.8
0.276000	42.9	2000.0	9.000	On	N	10.6	18.0	60.9
0.559500	29.0	2000.0	9.000	On	L1	10.6	27.0	56.0
0.748500	26.7	2000.0	9.000	On	N	10.6	29.3	56.0
2.382000	23.0	2000.0	9.000	On	N	10.1	33.0	56.0
4.200000	24.1	2000.0	9.000	On	N	10.5	31.9	56.0

#### Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time(ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.172500	28.6	2000.0	9.000	On	N	10.5	26.3	54.8
0.276000	26.1	2000.0	9.000	On	N	10.6	24.8	50.9
0.451500	24.6	2000.0	9.000	On	N	10.6	22.2	46.8
0.798000	20.1	2000.0	9.000	On	N	10.6	25.9	46.0
1.738500	19.3	2000.0	9.000	On	N	10.6	26.7	46.0
4.447500	27.3	2000.0	9.000	On	N	19.6	18.7	46.0

## USB Mode, Set.2

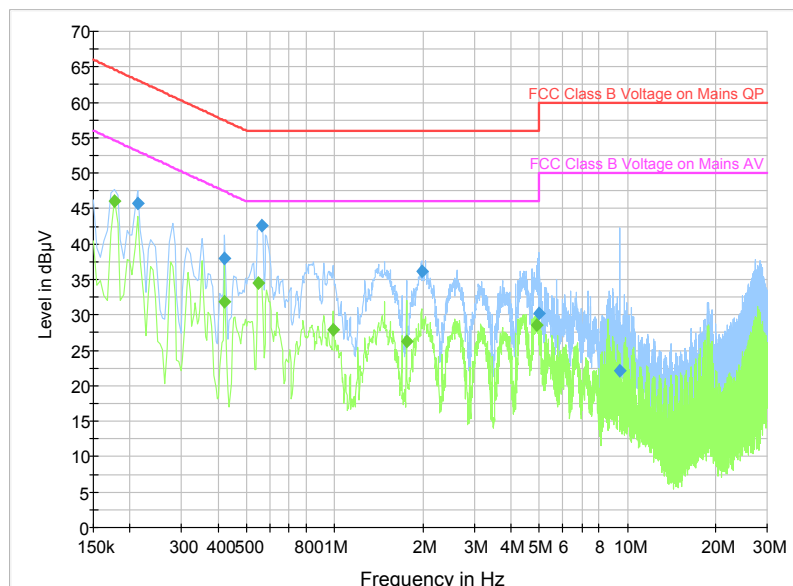


Figure A.9 Conducted Emission

### Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time(ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.213000	45.7	2000.0	9.000	On	N	10.6	17.4	63.1
0.420000	37.9	2000.0	9.000	On	L1	10.6	19.6	57.4
0.564000	42.6	2000.0	9.000	On	N	10.6	13.4	56.0
1.981500	36.1	2000.0	9.000	On	N	10.6	19.9	56.0
4.992000	30.2	2000.0	9.000	On	L1	10.6	25.8	56.0
9.438000	22.2	2000.0	9.000	On	N	10.6	37.8	60.0

### Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time(ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.177000	46.1	2000.0	9.000	On	L1	10.5	8.5	54.6
0.420000	31.9	2000.0	9.000	On	L1	10.6	15.5	47.4
0.550500	34.4	2000.0	9.000	On	N	10.6	11.6	46.0
0.987000	27.9	2000.0	9.000	On	L1	10.6	18.1	46.0
1.765500	26.3	2000.0	9.000	On	L1	10.6	19.7	46.0
4.920000	28.6	2000.0	9.000	On	L1	10.6	17.4	46.0

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