



# TEST REPORT

No. I15Z42161-EMC01

for

**TCT Mobile Limited**

**HSUPA/HSDPA/UMTS quadbands / GSM quadbands/LTE 5 -band  
mobile phone**

**Model Name: 7048A**

**FCC ID: RAD557**

with

**Hardware Version: PIO**

**Software Version: v7F1L\_3**

**Issued Date: 2015-08-28**

**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>
I15Z42161-EMC01	Rev.0	1st edition	2015-08-28

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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: 2015-08-26

Testing End Date: 2015-08-26

### **1.4. Signature**



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**Zhang Ying**

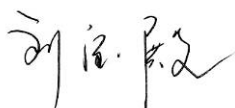
**(Prepared this test report)**



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**Qu Pengfei**

**(Reviewed this test report)**



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**Liu Baodian**

**(Approved this test report)**



## **2. Client Information**

### **2.1. Applicant Information**

Company Name: TCT Mobile Limited  
Address /Post: 5F, E building, No. 232, Liang Jing Road ZhangJiang High-Tech Park,  
Pudong Area Shanghai, P.R. China. 201203  
City: Shanghai  
Postal Code: 201203  
Country: China  
Contact Person: Gong Zhizhou  
Contact Email: zhizhou.gong@tcl.com  
Telephone: 0086-21-61460890  
Fax: 0086-21-61460602

### **2.2. Manufacturer Information**

Company Name: TCT Mobile Limited  
Address /Post: 5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park,  
Pudong Area Shanghai, P.R. China.  
City: Shanghai  
Postal Code: 201203  
Country: China  
Telephone: 0086-21-61460890  
Fax: 0086-21-61460602

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

#### 3.1. About EUT

Description	HSUPA/HSDPA/UMTS quadbands / GSM quadbands/LTE 5 -band mobile phone
Model Name	7048A
FCC ID	RAD557
Extreme vol. Limits	3.5VDC to 4.35VDC (nominal: 3.8VDC)

Note: Components list, please refer to documents of the manufacturer; it is also included in the original test record of Telecommunication Metrology Center of MIIT of People's Republic of China.

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

EUT ID*	SN or IMEI	HW Version	SW Version
EUT5	014506000001073	PIO	v7F1L_3

\*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	/	/
AE2	Travel Charger	5275K00038TP	15TCT-CH-0957
AE3	USB Cable	1243	14TCT-DC-0375
AE4	USB Cable	/	15TCT-DC-0189
AE5	Travel Charger	5275K00505TP	15TCT-CH-0951
AE6	Travel Charger	5275K00484TP	15TCT-CH-0940
AE7	USB Cable	1247	14TCT-DC-0376
AE8	USB Cable	/	15TCT-DC-0190

##### AE1

Model	CAC2500007C1
Manufacturer	BYD
Capacitance	2500mAh
Nominal voltage	3.8V

##### AE2, AE5, AE6

Type	CBA0057AG0C2
Manufacturer	Juwei
Length of cable	/

##### AE3, AE7

Type	CDA3122002C1
Manufacturer	Juwei
Length of cable	100cm



AE4, AE8

Type	CDA3122002C8
Manufacturer	Juwei
Length of cable	98cm

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

### 3.4. EUT set-ups

EUT set-up No.	Combination of EUT and AE	Remarks
Set.4	EUT5 + AE1 + AE2 + AE3	Charger
Set.5	EUT5 + AE1 + AE4	USB

## **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	10-1-13 Edition
ANSI C63.4	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	1/2/3/4	The test is performed in test location 1, 2, 3 or 4 which are described in section 1.1 of this report

Clause	List	Clause in FCC rules	Verdict	Location
1	Radiated Emission	15.109(a)	P	1
2	Conducted Emission	15.107(a)	P	1

## 7. Test Equipments Utilized

NO.	NAME	TYPE	SERIES NUMBER	PRODUCER	CAL. DUE DATE	CAL. INTERVAL
1.	EMI Antenna	VULB 9163	9163-301	Schwarzbeck	2017-12-09	3 Years
2.	Test Receiver	ESCI 7	100948	R&S	2016-07-07	1 Year
3.	EMI Antenna	3115	6914	ETS-Lindgren	2016-12-15	3 Years
4.	Test Receiver for Conducted Emission	ESU26	100235	R&S	2016-03-02	1 Year
5.	LISN	ENV216	101200	R&S	2016-07-07	1 Year
6.	Universal Radio Communication Tester	CMU500	143008	R&S	2015-12-09	1 Year
7.	PC	OPTIPLEX 380	2X1YV2X	DELL	/	/
8.	Monitor	E1709Wc	CN-OJ672H-6 4180-9BF-1CR L	DELL	/	/
9.	Printer	P1606dn	VNC3L52122	HP	/	/
10.	Keyboard	L100	CN-ORH656-6 5890-03S-041 Y	DELL	/	/
11.	Mouse	M-UAR	LZ013HC1YLV	DELL	/	/

## **ANNEX A: MEASUREMENT RESULTS**

### **A.1 Radiated Emission (§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.

For the charging mode, the EUT is keeping on playing MP3 file.

For the USB 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.

#### **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):  $U = 4.3 \text{ dB}$ ,  $k=2$ .

### Measurement results for Set.4:

#### Charging Mode/Average detector

Frequency(MHz)	Result(dB $\mu$ V/m)	$G_{\text{PL}}$ (dB)	$G_A$ (dB/m)	$P_{\text{Mea}}$ (dB $\mu$ V)	Polarity
17981.300	43.9	-17.7	45.6	16.000	H
17996.033	43.6	-17.7	45.6	15.700	V
17989.233	43.4	-17.7	45.6	15.500	H
17986.967	43.4	-17.7	45.6	15.500	H
17972.233	43.4	-17.7	45.6	15.500	V
17988.667	43.4	-17.7	45.6	15.500	H

#### Charging Mode/Peak detector

Frequency(MHz)	Result(dB $\mu$ V/m)	$G_{\text{PL}}$ (dB)	$G_A$ (dB/m)	$P_{\text{Mea}}$ (dB $\mu$ V)	Polarity
17951.267	54.7	-17.7	45.6	26.800	H
17956.933	54.2	-17.7	45.6	26.300	V
17895.167	54.2	-18.5	45.6	27.100	V
17961.467	54.2	-17.7	45.6	26.300	H
17740.467	54.2	-18.5	45.6	27.100	V
17946.167	54.1	-17.7	45.6	26.200	V

**Measurement results for Set.5:****USB Mode/Average detector**

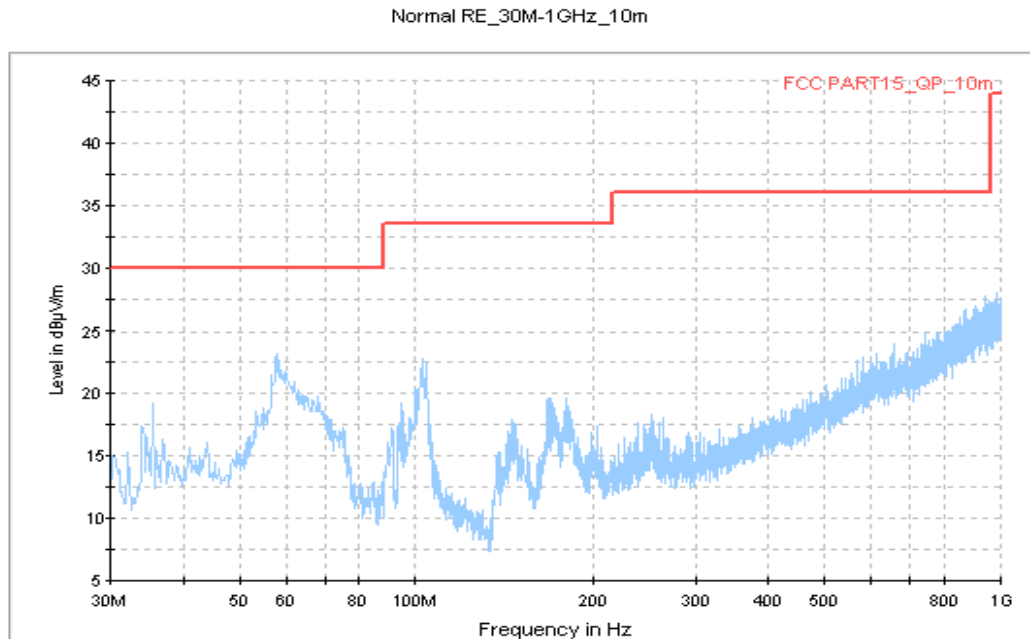
Frequency(MHz)	Result(dB $\mu$ V/m)	G <sub>PL</sub> (dB)	G <sub>A</sub> (dB/m)	P <sub>Mea</sub> (dB $\mu$ V)	Polarity
17983.567	43.4	-17.7	45.6	15.500	V
17979.600	43.4	-17.7	45.6	15.500	H
17966.567	43.3	-17.7	45.6	15.400	V
17994.900	43.3	-17.7	45.6	15.400	V
17992.067	43.3	-17.7	45.6	15.400	H
17989.233	43.3	-17.7	45.6	15.400	H

**USB Mode/Peak detector**

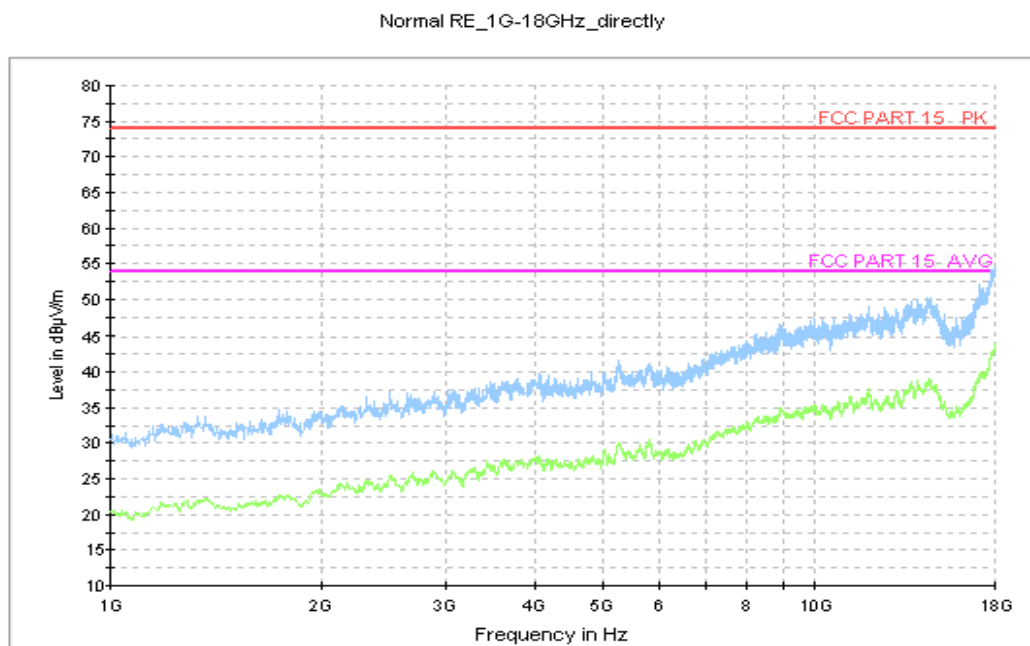
Frequency(MHz)	Result(dB $\mu$ V/m)	G <sub>PL</sub> (dB)	G <sub>A</sub> (dB/m)	P <sub>Mea</sub> (dB $\mu$ V)	Polarity
17961.467	55.6	-17.7	45.6	27.700	V
17995.467	54.9	-17.7	45.6	27.000	H
17986.400	54.7	-17.7	45.6	26.800	H
17939.367	54.6	-17.7	45.6	26.700	V
17977.333	54.5	-17.7	45.6	26.600	V
17955.800	54.5	-17.7	45.6	26.600	H

Note: The measurement results of Set.4 and Set.5 showed here are worst cases of the combinations of different batteries and USB cables.

#### Charging Mode, Set.4

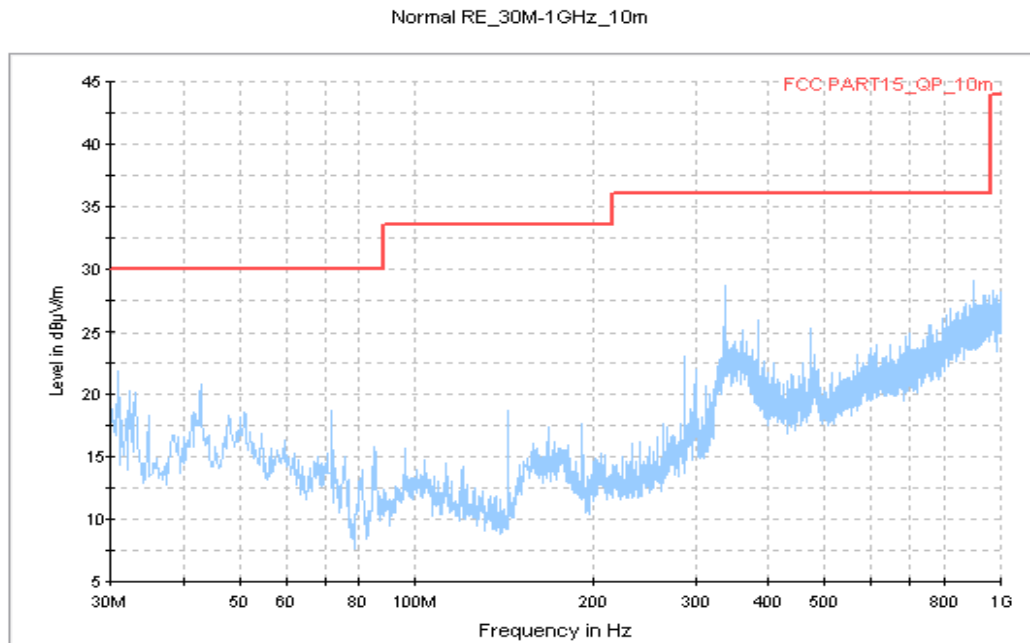


**Fig.1 Radiated Emission from 30MHz to 1GHz**



**Fig.2 Radiated Emission from 1GHz to 18GHz**

## USB Mode, Set.5

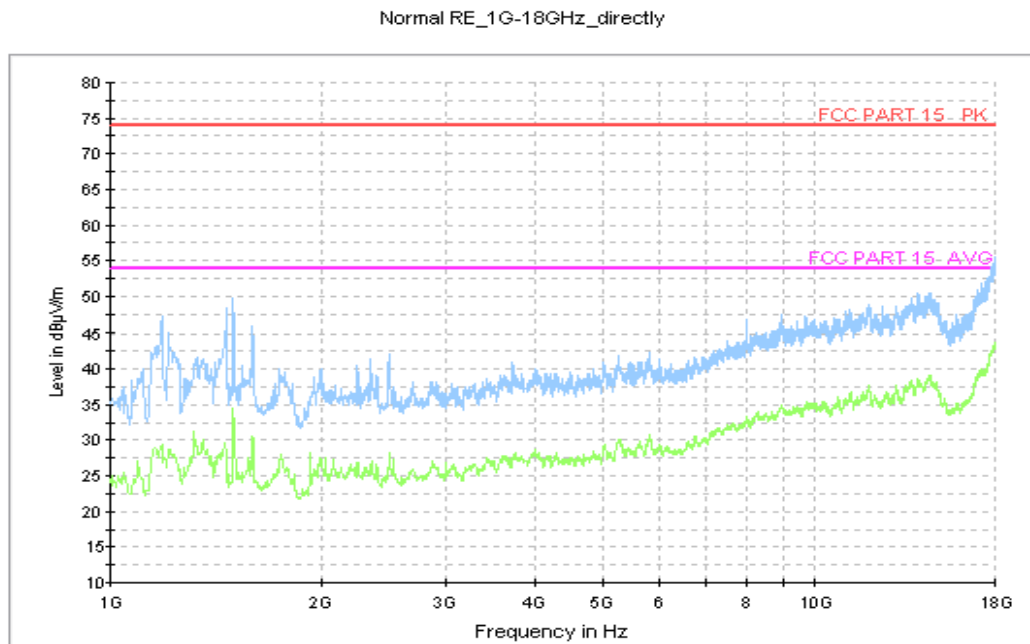


**Fig.3 Radiated Emission from 30MHz to 1GHz**

### Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
191.992500	25.5	395.0	H	182.0	-13.6	8.0	33.5
408.542500	28.9	200.0	H	194.0	-7.0	7.1	36.0
456.606000	30.8	175.0	H	201.0	-6.0	5.2	36.0
524.979500	24.8	275.0	V	78.0	-4.6	11.2	36.0





**Fig.4 Radiated Emission from 1GHz to 18GHz**

## A.2 Conducted Emission (§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 7.2.

### A.2.2 EUT Operating Mode

The MS is operating in the USB mode and charging mode.

For the charging mode, the EUT is keeping on playing MP3 file.

For the USB 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.

### 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

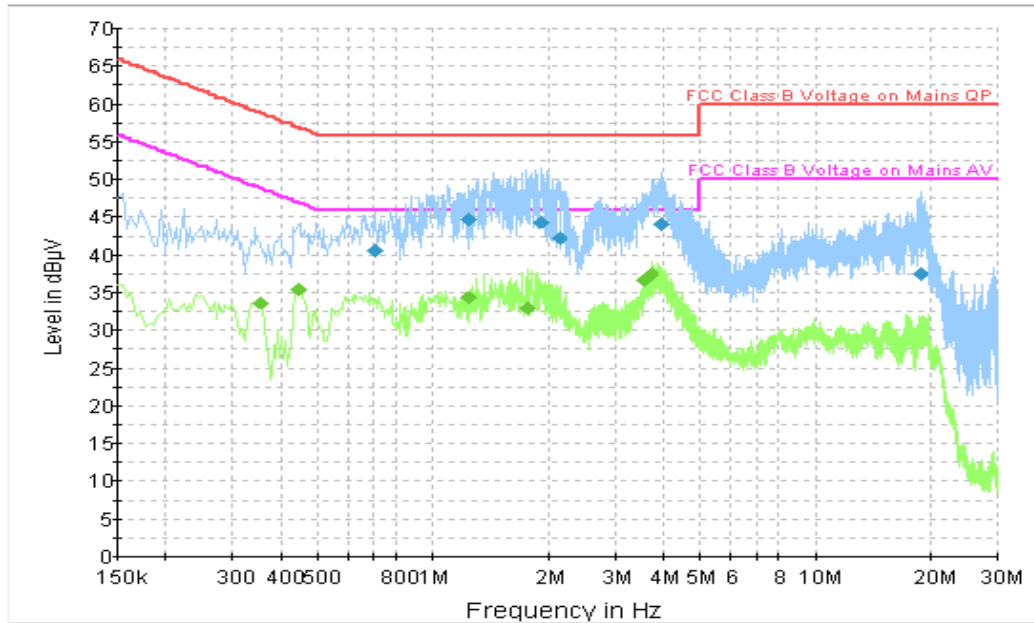
Voltage (V)	Frequency (Hz)
120	60

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

### A.2.5 Measurement Results

Measurement uncertainty:  $U= 2.9$  dB,  $k=2$ .

#### Charging Mode, Set.4



**Fig.5 Conducted Emission**

#### Final Result 1

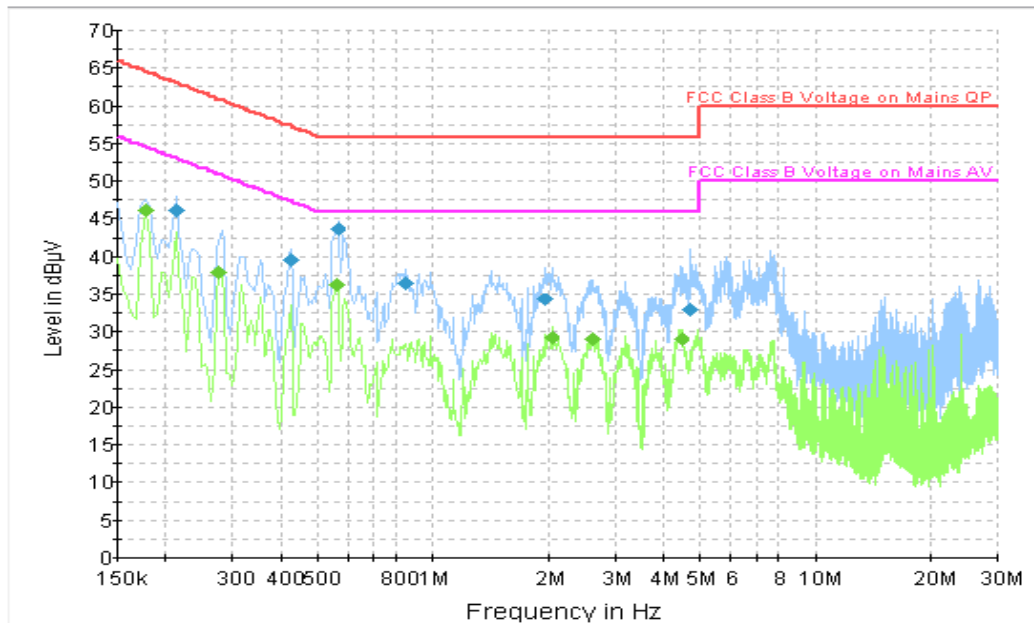
Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.703500	40.7	GND	L1	19.8	15.3	56.0
1.239000	44.8	GND	L1	19.7	11.2	56.0
1.923000	44.4	GND	L1	19.6	11.6	56.0
2.148000	42.2	GND	L1	19.6	13.8	56.0
3.957000	44.1	GND	L1	19.7	11.9	56.0
18.852000	37.4	GND	L1	20.0	22.6	60.0

#### Final Result 2

Frequency (MHz)	CAverage (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.352500	33.7	GND	N	19.8	15.2	48.9
0.442500	35.5	GND	N	19.8	11.5	47.0
1.239000	34.4	GND	L1	19.7	11.6	46.0
1.761000	33.0	GND	L1	19.7	13.0	46.0
3.592500	36.6	GND	L1	19.7	9.4	46.0
3.732000	37.4	GND	L1	19.7	8.6	46.0

Note: The measurement results showed here are worst cases of the combinations of different batteries.

## USB Mode, Set.5



**Fig.6 Conducted Emission**

### Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.213000	46.3	GND	N	19.8	16.8	63.1
0.424500	39.7	GND	L1	19.8	17.7	57.4
0.564000	43.7	GND	L1	19.8	12.3	56.0
0.847500	36.4	GND	N	19.8	19.6	56.0
1.977000	34.3	GND	N	19.6	21.7	56.0
4.740000	33.0	GND	N	19.7	23.0	56.0

### Final Result 2

Frequency (MHz)	CAverage (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.177000	46.2	GND	N	19.7	8.4	54.6
0.276000	38.0	GND	N	19.8	12.9	50.9
0.559500	36.3	GND	L1	19.8	9.7	46.0
2.049000	29.3	GND	N	19.6	16.7	46.0
2.611500	29.1	GND	L1	19.7	16.9	46.0
4.452000	29.0	GND	N	19.7	17.0	46.0

Note: The measurement results showed here are worst cases of the combinations of different batteries and USB cables.

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