



# TEST REPORT

No. I15Z40876-EMC01

for

**TCT Mobile Limited**

**HSDPA/HSUPA/HSPA+/UMTS quad band / GSM quad band/LTE 5**

**band Mobile phone**

**Model Name: 4045O**

**FCC ID: RAD551**

with

**Hardware Version: PIO**

**Software Version: v5L38**

**Issued Date: 2015-04-28**

**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.

This project is only tested using FCC standards and not an application of FCC, so the project does not have a FCC ID.

**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>
I15Z40876-EMC01	Rev.0	1st edition	2015-04-22
I15Z40876-EMC01	Rev.1	2st edition	2015-04-28



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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°C

Relative Humidity: 20-75%

### 1.3. Project data

Testing Start Date: 2015-04-16

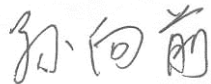
Testing End Date: 2015-04-18

### 1.4. Signature



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Qu Pengfei  
(Prepared this test report)



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Sun Xiangqian  
(Reviewed this test report)



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Lu Bingsong  
Director of the laboratory  
(Approved this test report)



## **2. Client Information**

### **2.1. Applicant 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. 201203  
City: Shanghai  
Postal Code: 201203  
Country: China  
Contact Person: Zhizhou Gong  
Contact Email: /  
Telephone: +86 21 51798260  
Fax: +86 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. 201203  
City: Shanghai  
Postal Code: 201203  
Country: China  
Telephone: +86 21 51798260  
Fax: +86 21 61460602

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

#### **3.1. About EUT**

Description	HSDPA/HSUPA/HSPA+/UMTS quad band / GSM quad band/LTE 5 band Mobile phone
Model Name	4045O
FCC ID	RAD551
Extreme vol. Limits	3.55VDC 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**

<b>EUT ID*</b>	<b>SN or IMEI</b>	<b>HW Version</b>	<b>SW Version</b>
EUT3	865948020100321	PIO	v5L38

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

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

<b>AE ID*</b>	<b>Description</b>	<b>SN</b>	<b>Remarks</b>
AE1	battery	B2000010C1100J9S	14TCT-BA-0070
AE2	battery	B2000013C2Y0S8L1	14TCT-BA-2145
AE3	battery	B2000010C1100MKL	14TCT-BA-0425
AE4	battery	B2000013C2Y0S9VG	14TCT-BA-2150
AE5	Travel Charger	/	14TCT-CH-2129
AE6	Travel Charger	/	14TCT-CH-1517
AE7	Travel Charger	/	14TCT-CH-2430
AE8	Travel Charger	/	14TCT-CH-2422
AE9	USB Cable	/	14TCT-DC-0777
AE10	USB Cable	/	14TCT-DC-0163

AE1, AE3

Commercial name	TLi020F1
Manufacturer	BYD
Capacity	2000mAh
Nominal Voltage	3.8V

AE2, AE4

Commercial name	TLi020F2
Manufacturer	SCUD
Capacity	2000mAh
Nominal Voltage	3.8V



AE5, AE6	Type	CBA3007AG0C1
	Manufacturer	BYD
	Length of cable	100cm (length of USB cable)
AE7, AE8	Type	CBA3007AG0C4
	Manufacturer	Aohai
	Length of cable	100cm (length of USB cable)
AE9	Type	CDA3122005C2
	Manufacturer	Shenghua
	Length of cable	100cm (length of USB cable)
AE10	Type	CDA3122005C1
	Manufacturer	Juwei
	Length of cable	100cm (length of USB cable)
AE11	Type	CDA3122002C2
	Manufacturer	Shenghua
	Length of cable	100cm (length of USB cable)
AE12	Type	CDA3122002C1
	Manufacturer	Juwei
	Length of cable	100cm (length of USB 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.2	EUT3 + AE3 + AE5 + AE9	Charger
Set.3	EUT3 + AE4 + AE7 + AE10	Charger
Set.4	EUT3 + AE9	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	10-1-14 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	2009



## 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	9163-234	Schwarzbeck	2016-09-15	3 Years
2.	Test Receiver	ESCI 7	100948	R&S	2015-07-16	1 Year
3.	Test Receiver	FSV	101047	R&S	2015-07-03	1 Year
4.	EMI Antenna	3115	6914	ETS-Lindgren	2016-12-15	3 Years
5.	Test Receiver	ESU26	100235	R&S	2016-03-02	1 Year
6.	LISN	ENV216	101200	R&S	2015-07-07	1 Year
7.	Universal Radio Communication Tester	CMW500	143008	R&S	2015-12-09	1 Year
8.	Universal Radio Communication Tester	CMU200	116455	R&S	2015-05-13	1 Year
9.	PC	OPTIPLEX 380	2X1YV2X	DELL	/	/
10.	Monitor	E1709Wc	CN-OJ672H-6 4180-9BF-1CR L	DELL	/	/
11.	Printer	P1606dn	VNC3L52122	HP	/	/
12.	Keyboard	L100	CN-ORH656-6 5890-03S-041 Y	DELL	/	/
13.	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. 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 ( $\mu\text{V}/\text{m}$ )		
	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.2:

##### Charging Mode/Average detector

Frequency(MHz)	Result(dB $\mu\text{V}/\text{m}$ )	GPL (dB)	GA (dB/m)	PMea(dB $\mu\text{V}$ )	Polarity
17888.969	46.2	-18.5	45.6	19.100	V
17886.313	46.1	-18.5	45.6	19.000	H
17864.000	46.1	-18.5	45.6	19.000	V
17891.625	46.1	-18.5	45.6	19.000	H
17879.938	46.1	-18.5	45.6	19.000	H
17869.844	46.0	-18.5	45.6	18.900	V

##### Charging Mode/Peak detector

Frequency(MHz)	Result(dB $\mu\text{V}/\text{m}$ )	GPL (dB)	GA (dB/m)	PMea(dB $\mu\text{V}$ )	Polarity
17875.688	57.6	-18.5	45.6	30.500	V
17878.344	57.4	-18.5	45.6	30.300	H
17960.688	57.1	-17.7	45.6	29.200	V
17878.875	57.0	-18.5	45.6	29.900	H
17951.125	57.0	-17.7	45.6	29.100	V
17898.000	56.9	-18.5	45.6	29.800	V

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

**Measurement results for Set.4:**

**USB Mode/Average detector**

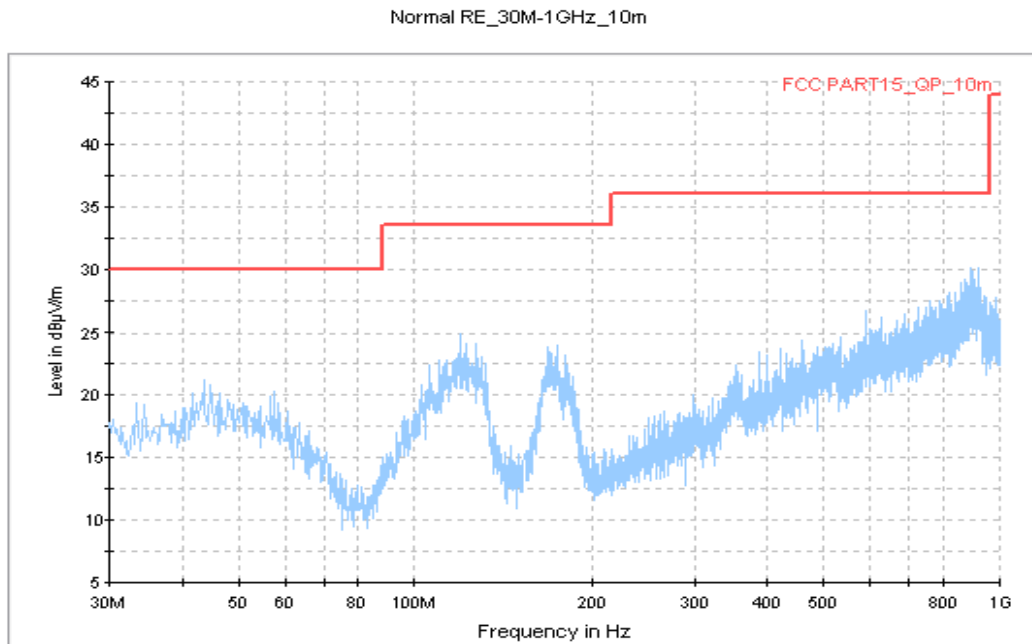
Frequency(MHz)	Result(dB $\mu$ V/m)	G <sub>PL</sub> (dB)	G <sub>A</sub> (dB/m)	P <sub>Mea</sub> (dB $\mu$ V)	Polarity
17908.625	45.8	-18.5	45.6	18.700	V
17861.344	45.8	-18.5	45.6	18.700	H
17903.313	45.8	-18.5	45.6	18.700	H
17899.063	45.8	-18.5	45.6	18.700	H
17894.813	45.8	-18.5	45.6	18.700	V
17883.656	45.8	-18.5	45.6	18.700	V

**USB Mode/Peak detector**

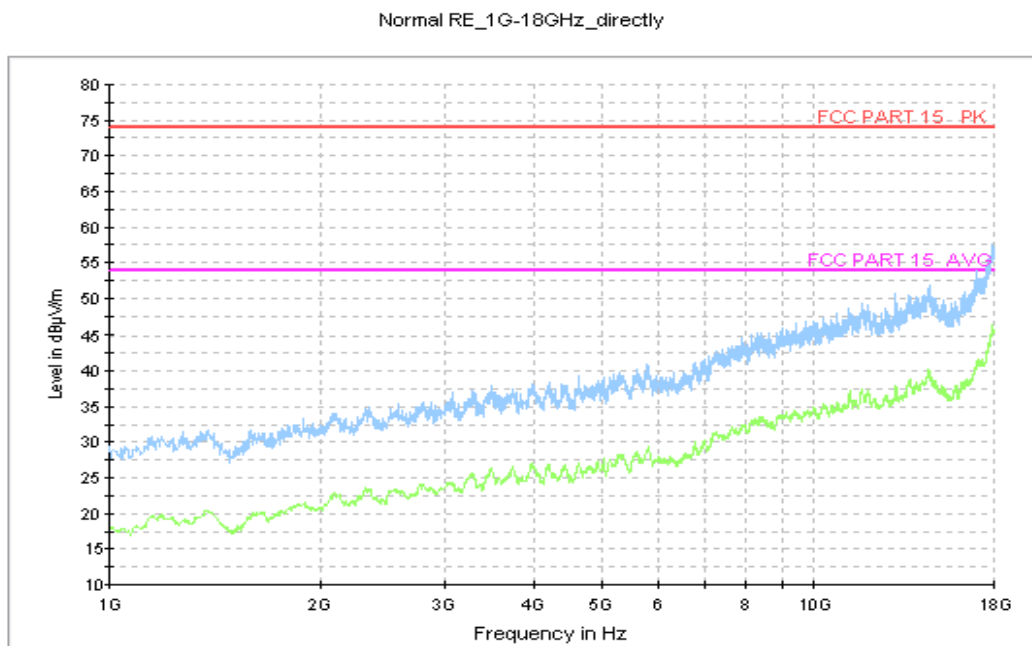
Frequency(MHz)	Result(dB $\mu$ V/m)	G <sub>PL</sub> (dB)	G <sub>A</sub> (dB/m)	P <sub>Mea</sub> (dB $\mu$ V)	Polarity
17899.594	58.0	-18.5	45.6	30.900	H
17966.531	57.8	-17.7	45.6	29.900	H
17877.813	57.4	-18.5	45.6	30.300	V
17867.719	57.3	-18.5	45.6	30.200	H
17874.094	57.3	-18.5	45.6	30.200	V
17994.156	57.2	-17.7	45.6	29.300	V

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

Charging Mode, Set.2

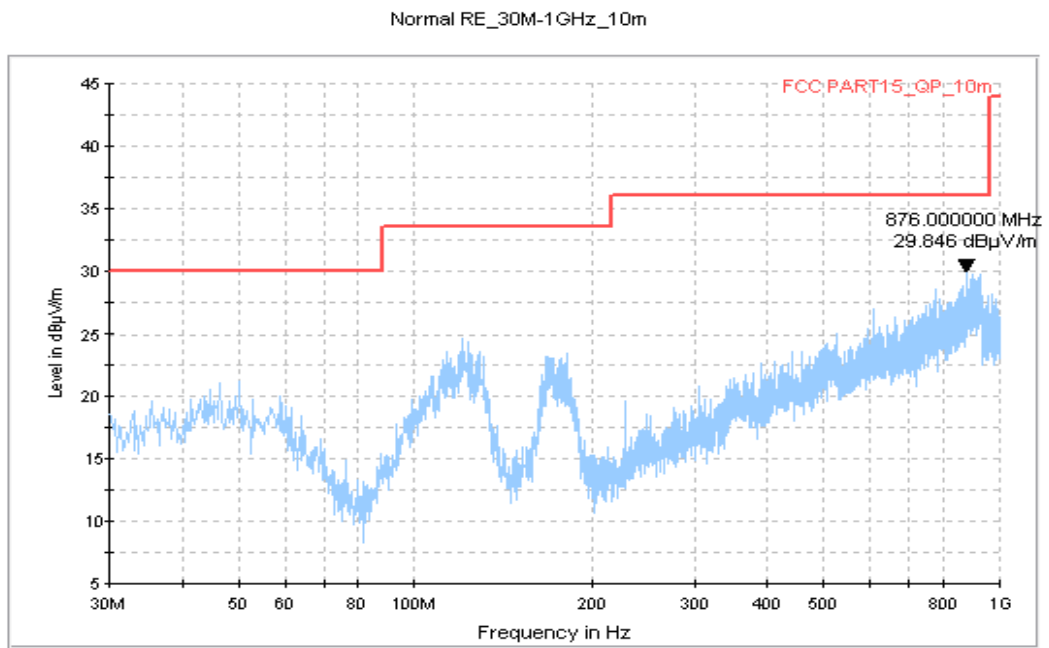


**Fig.1 Radiated Emission from 30MHz to 1GHz**



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

**Charging Mode, Set.3**



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



USB Mode, Set.4

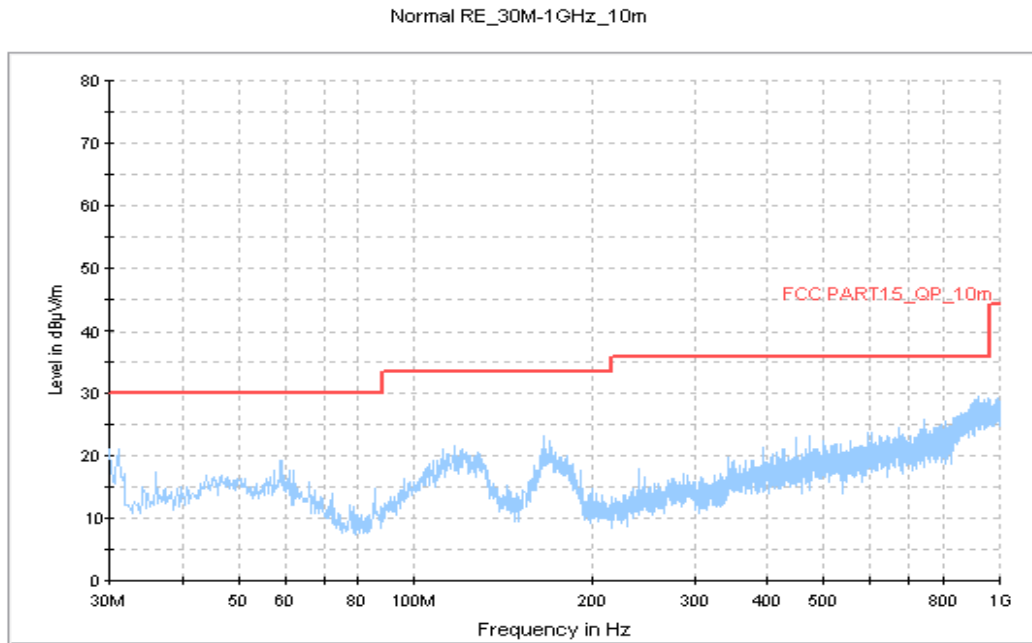


Fig.4 Radiated Emission from 30MHz to 1GHz

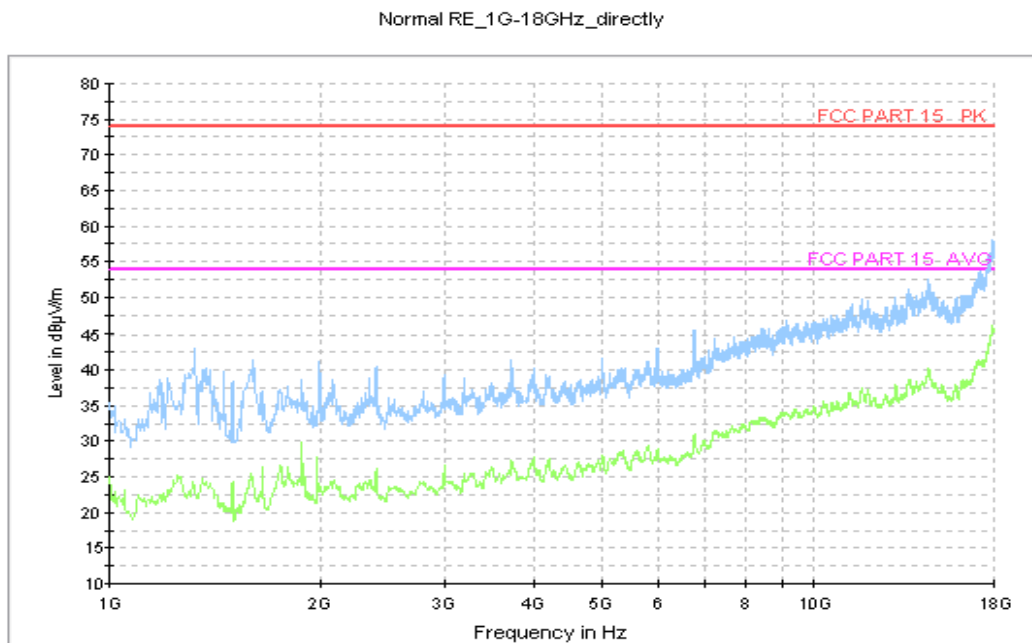


Fig.5 Radiated Emission from 1GHz to 18GHz

## 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. 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 (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

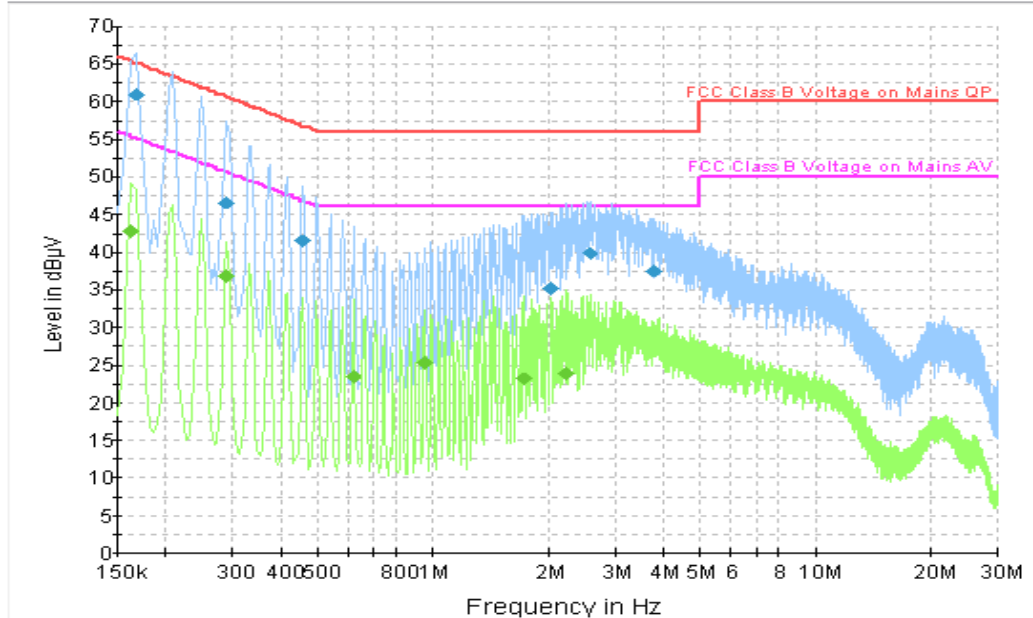
Voltage (V)	Frequency (Hz)
120	60

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

### A.2.5 Measurement Results

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

#### Charging Mode, Set.2



**Fig.6 Conducted Emission**

#### Final Result 1

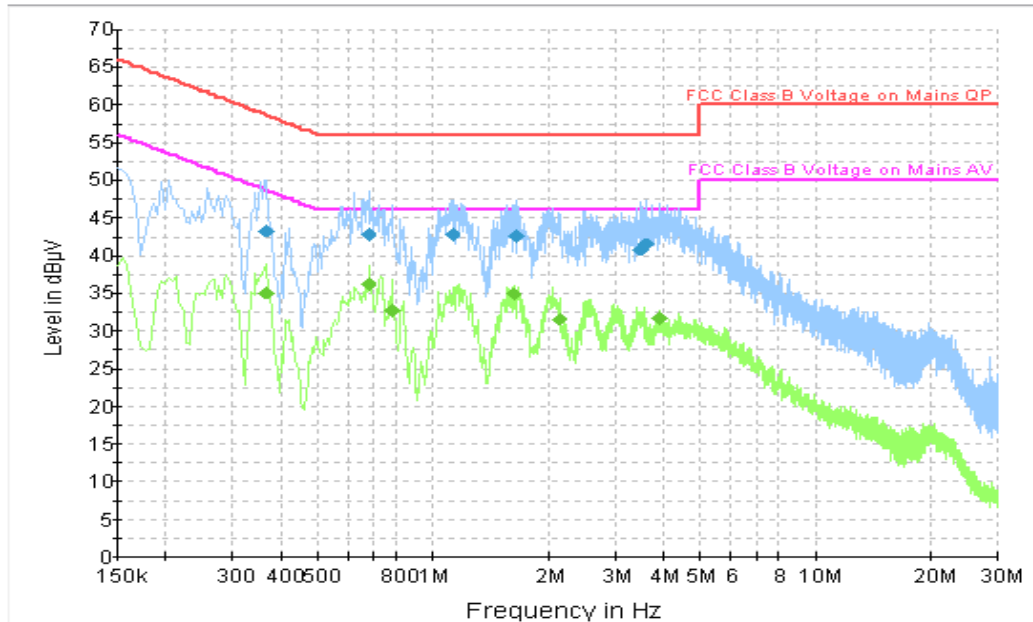
Frequency (MHz)	QuasiPeak (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.168000	60.9	GND	N	19.7	4.2	65.1
0.289500	46.5	GND	N	19.8	14.0	60.5
0.456000	41.5	GND	L1	19.8	15.3	56.8
2.022000	35.2	GND	L1	19.6	20.8	56.0
2.566500	39.8	GND	L1	19.6	16.2	56.0
3.804000	37.4	GND	L1	19.7	18.6	56.0

#### Final Result 2

Frequency (MHz)	CAverage (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.163500	42.8	GND	L1	19.7	12.5	55.3
0.289500	36.9	GND	L1	19.8	13.6	50.5
0.618000	23.4	GND	L1	19.8	22.6	46.0
0.951000	25.2	GND	L1	19.7	20.8	46.0
1.734000	23.1	GND	L1	19.7	22.9	46.0
2.229000	23.8	GND	L1	19.6	22.2	46.0

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

**Charging Mode, Set.3**



**Fig.7 Conducted Emission**

**Final Result 1**

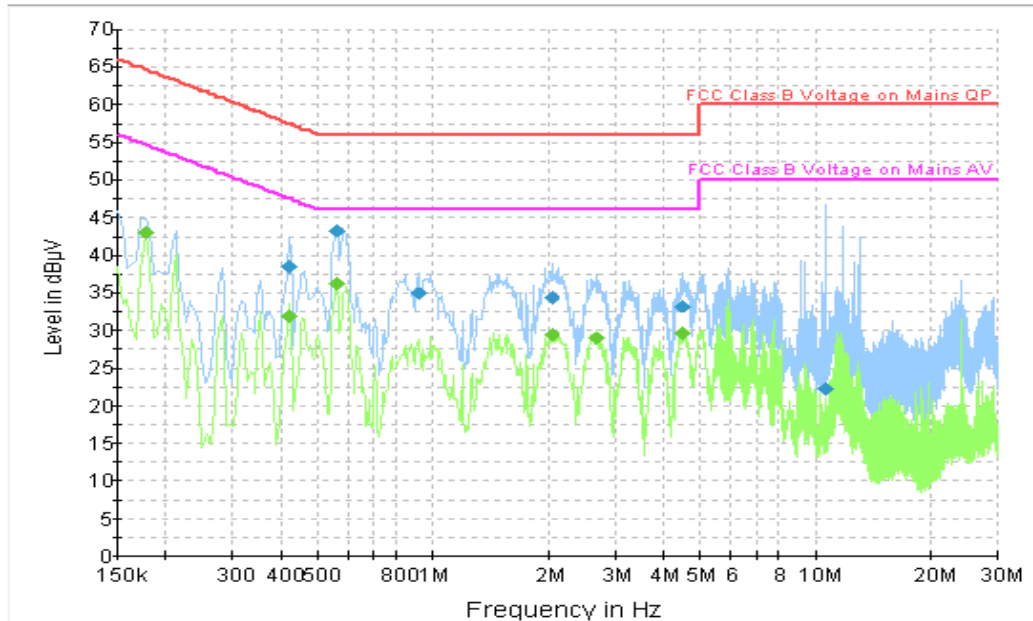
Frequency (MHz)	QuasiPeak (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.366000	43.2	GND	L1	19.8	15.4	58.6
0.681000	42.8	GND	L1	19.8	13.2	56.0
1.126500	42.7	GND	L1	19.6	13.3	56.0
1.653000	42.6	GND	L1	19.6	13.4	56.0
3.498000	40.7	GND	N	19.6	15.3	56.0
3.606000	41.5	GND	N	19.7	14.5	56.0

**Final Result 2**

Frequency (MHz)	CAverage (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.366000	35.1	GND	L1	19.8	13.5	48.6
0.681000	36.1	GND	L1	19.8	9.9	46.0
0.784500	32.7	GND	L1	19.8	13.3	46.0
1.626000	34.8	GND	L1	19.7	11.2	46.0
2.148000	31.5	GND	L1	19.6	14.5	46.0
3.934500	31.6	GND	L1	19.7	14.4	46.0

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

**USB Mode, Set.4**



**Fig.8 Conducted Emission**

**Final Result 1**

Frequency (MHz)	QuasiPeak (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.420000	38.5	GND	N	19.8	19.0	57.4
0.559500	43.2	GND	N	19.8	12.8	56.0
0.915000	34.9	GND	N	19.7	21.1	56.0
2.040000	34.4	GND	N	19.6	21.6	56.0
4.506000	33.3	GND	N	19.6	22.7	56.0
10.590000	22.0	GND	L1	19.8	38.0	60.0

**Final Result 2**

Frequency (MHz)	CAverage (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.177000	42.9	GND	N	19.7	11.8	54.6
0.420000	31.9	GND	N	19.8	15.6	47.4
0.559500	36.1	GND	N	19.8	9.9	46.0
2.040000	29.4	GND	L1	19.6	16.6	46.0
2.670000	28.9	GND	L1	19.7	17.1	46.0
4.506000	29.6	GND	N	19.6	16.4	46.0

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

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