



# TEST REPORT

## No. I14Z48053-EMC01

for

**TCT Mobile Limited**

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

**band mobile phone**

**Model Name: 5042W**

**FCC ID: RAD539**

with

**Hardware Version: PIO**

**Software Version: 01**

**Issued Date: 2015-01-13**

**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>
I14Z48053-EMC01	Rev.0	1 <sup>st</sup> edition	2015-01-13

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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: 2014-12-15

Testing End Date: 2014-12-18

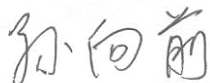
### **1.4. Signature**



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**Zhang Hui**

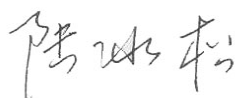
**(Prepared this test report)**



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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.  
City: Shanghai  
Postal Code: 201203  
Country: China  
Contact Person: Gong Zhizhou  
Contact Email: zhizhou.gong@jrdcom.com  
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### **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	HSDPA/HSUPA/HSPA+/UMTS quad band /GSM quad band /LTE 5 band mobile phone
Model Name	5042W
FCC ID	RAD539
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 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
EUT4	014243000001826	PIO	01

\*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	/	14TCT-BA-0507
AE2	Battery	/	14TCT-BA-0297
AE3	Battery	/	14TCT-BA-2106
AE4	Battery	/	14TCT-BA-2107
AE5	USB cable	/	14TCT-DC-0649
AE6	USB cable	/	14TCT-DC-0638
AE7	Travel	/	14TCT-CH-2024
AE8	Travel	/	14TCT-CH-2010
AE9	Travel	/	14TCT-CH-1755
AE10	Travel	/	14TCT-CH-1752

AE1,AE2

Model	CAB2000010C1
Manufacturer	BYD
Capacitance	2000 mAh
Nominal voltage	3.8 V

AE3,AE4

Model	CAB2000013C2
Manufacturer	SCUD
Capacitance	2000 mAh
Nominal voltage	3.8 V

## AE5

Model	CDA3122002C2
Manufacturer	Shenghua
Length of cable	98cm

## AE6

Model	CDA3122002C1
Manufacturer	Juwei
Length of cable	99cm

## AE7,AE8

Model	CBA3000AG0C1
Manufacturer	TEN PAO
Length of cable	/

## AE9,AE10

Model	CBA3000AG0C2
Manufacturer	BYD
Length of cable	/

\*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.1	EUT4+ AE1+ AE5 + AE7	Charger
Set.2	EUT4+ AE1+ AE5 + AE9	Charger
Set.3	EUT4+ 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	10-1-13 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	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	A/B/C/D	The test is performed in test location A, B, C or D which are described in section 1.1 of this report

Items	Test Name	Clause in FCC rules	Clause in IC rules	Section in this report	Verdict	Test Location
1	Radiated Emission	15.109(a)	Section 5	B.1	P	A
2	Conducted Emission	15.107(a)	Section 5	B.2	P	A

## 7. Test Equipments Utilized

NO.	Description	TYPE	SERIES NUMBER	MANUFACTUR E	CAL DUE DATE	CALIBRATI ON INTERVAL
1	Test Receiver	ESCI	100344	R&S	2015-03-03	1 year
2	Test Receiver	ESCI 7	100948	R&S	2015-07-16	1 year
3	Universal Radio Communication Tester	CMU200	109914	R&S	2015-04-13	1 year
4	Test Receiver	FSV	101047	R&S	2015-07-03	1 year
5	LISN	ENV216	101200	R&S	2015-07-07	1 year
6	EMI Antenna	VULB 9163	9163-234	Schwarzbeck	2016-09-15	3 years
7	EMI Antenna	3115	6914	ETS-Lindgren	2016-12-15	3 years
8	PC	OPTIPLEX 380	2X1YV2X	DELL	N/A	N/A
9	Monitor	E178FPc	CN-OWR979-64 180-7AJ-D2MS	DELL	N/A	N/A
10	Printer	P1606dn	VNC3L52122	HP	N/A	N/A
11	Keyboard	L100	CN0RH6596589 07ATOI40	DELL	N/A	N/A
12	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 - 2009, 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 ( $\mu\text{V/m}$ )		
	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.1:****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
17888.438	49.4	-18.5	45.6	22.300	VERTICAL
17881.000	49.4	-18.5	45.6	22.300	HORIZONTAL
17884.188	49.3	-18.5	45.6	22.200	VERTICAL
17893.750	49.3	-18.5	45.6	22.200	HORIZONTAL
17899.063	49.3	-18.5	45.6	22.200	VERTICAL
17874.625	49.2	-18.5	45.6	22.100	VERTICAL

**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
17911.813	61.0	-18.5	45.6	33.900	VERTICAL
17904.375	60.9	-18.5	45.6	33.800	VERTICAL
17956.438	60.8	-17.7	45.6	32.900	HORIZONTAL
17888.438	60.7	-18.5	45.6	33.600	VERTICAL
17859.750	60.7	-18.5	45.6	33.600	HORIZONTAL
17906.500	60.7	-18.5	45.6	33.600	VERTICAL

**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
17894.813	49.4	-18.5	45.6	22.300	HORIZONTAL
17882.063	49.3	-18.5	45.6	22.200	VERTICAL
17890.563	49.2	-18.5	45.6	22.100	VERTICAL
17901.188	49.2	-18.5	45.6	22.100	HORIZONTAL
17892.688	49.2	-18.5	45.6	22.100	HORIZONTAL
17878.875	49.2	-18.5	45.6	22.100	VERTICAL

**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
17882.063	61.7	-18.5	45.6	34.600	HORIZONTAL
17887.375	61.4	-18.5	45.6	34.300	VERTICAL
17867.188	61.3	-18.5	45.6	34.200	VERTICAL
17890.563	61.2	-18.5	45.6	34.100	HORIZONTAL
17847.000	61.0	-18.5	45.6	33.900	HORIZONTAL
17998.938	60.7	-17.7	45.6	32.800	VERTICAL

**Measurement result for Set.3:**
**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
17898.000	49.3	-18.5	45.6	22.200	VERTICAL
17906.500	49.2	-18.5	45.6	22.100	VERTICAL
17886.313	49.2	-18.5	45.6	22.100	VERTICAL
17869.313	49.2	-18.5	45.6	22.100	VERTICAL
17878.875	49.2	-18.5	45.6	22.100	VERTICAL
17885.250	49.1	-18.5	45.6	22.000	HORIZONTAL

**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
17972.375	61.2	-17.7	45.6	33.300	VERTICAL
17998.938	61.0	-17.7	45.6	33.100	HORIZONTAL
17910.750	61.0	-18.5	45.6	33.900	VERTICAL
17904.375	60.9	-18.5	45.6	33.800	HORIZONTAL
17884.188	60.8	-18.5	45.6	33.700	VERTICAL
17900.125	60.7	-18.5	45.6	33.600	VERTICAL

Note: The measurement results of Set.1, Set.2, Set.3 showed here are worst cases of the combinations of different batteries and USB cables.

### Charging Mode, Set.1

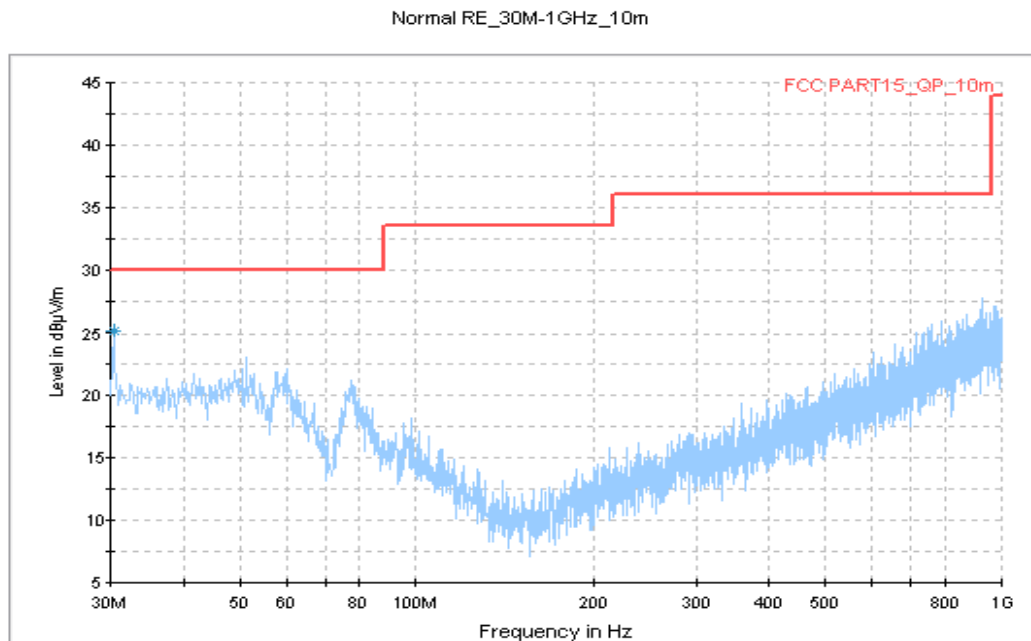


Figure A.1 Radiated Emission from 30MHz to 1GHz

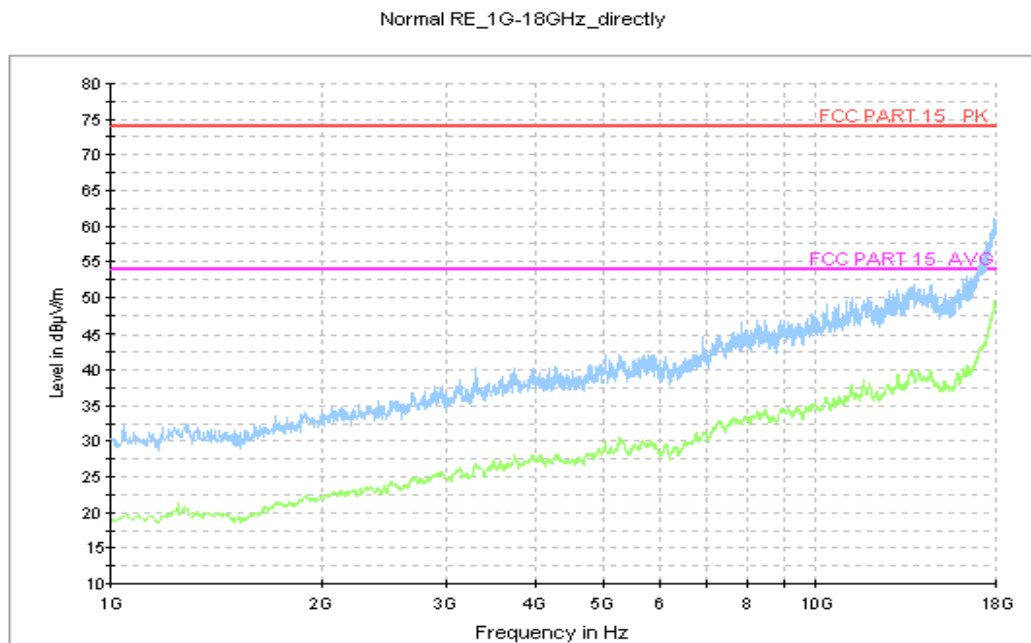


Figure A.2 Radiated Emission from 1GHz to 18GHz

### Charging Mode, Set.2

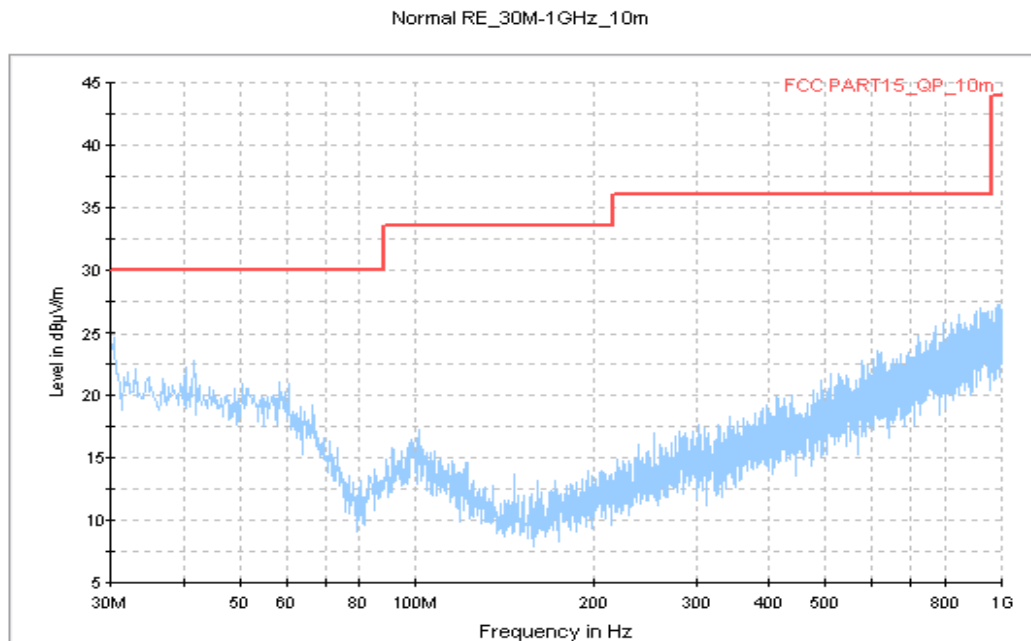


Figure A.3 Radiated Emission from 30MHz to 1GHz

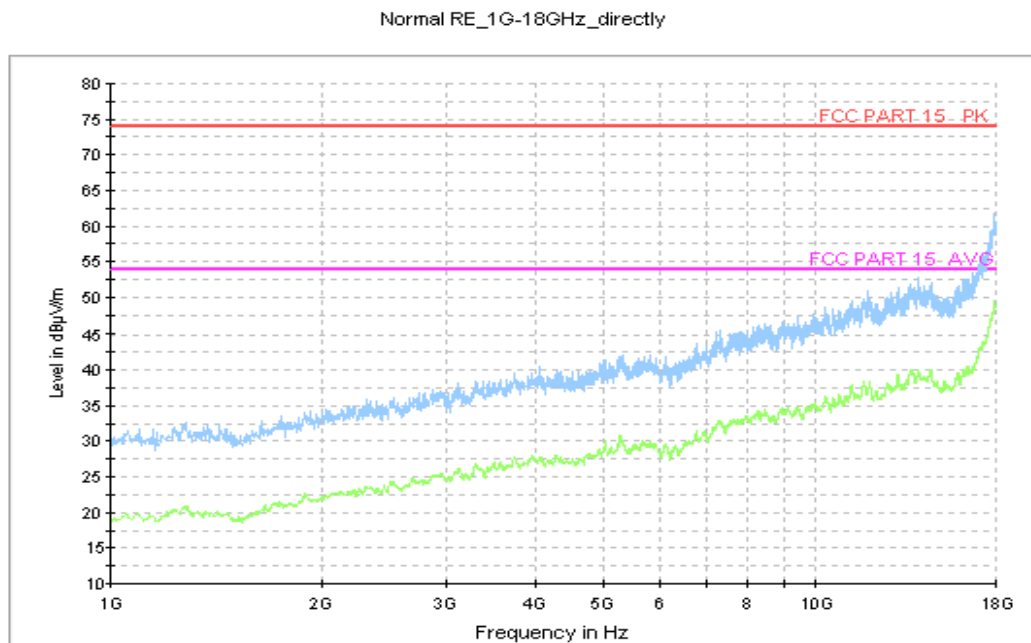


Figure A.4 Radiated Emission from 1GHz to 18GHz



### USB Mode, Set.3

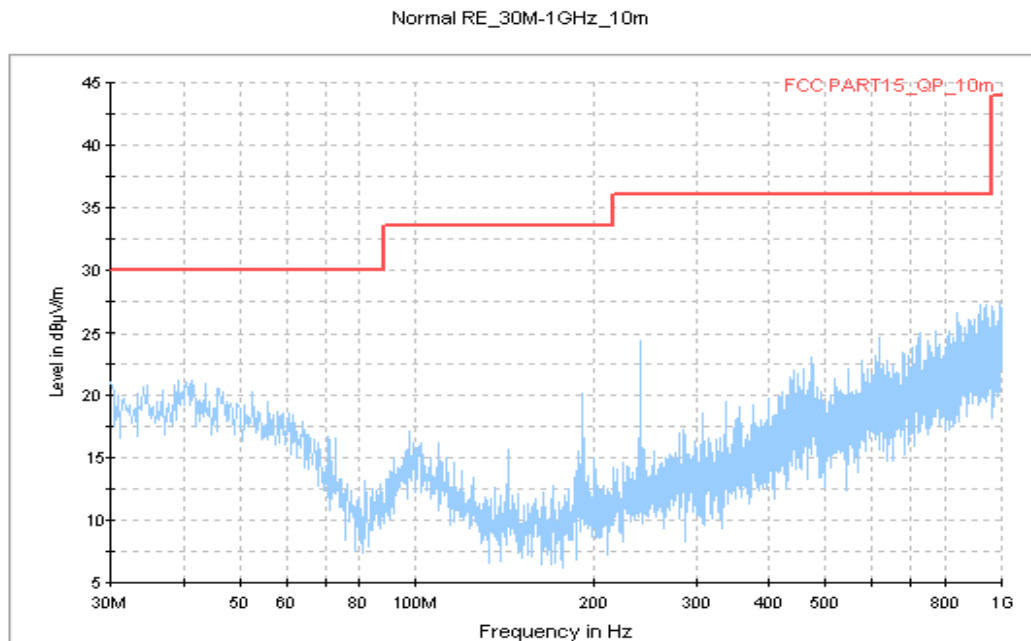


Figure A.5 Radiated Emission from 30MHz to 1GHz

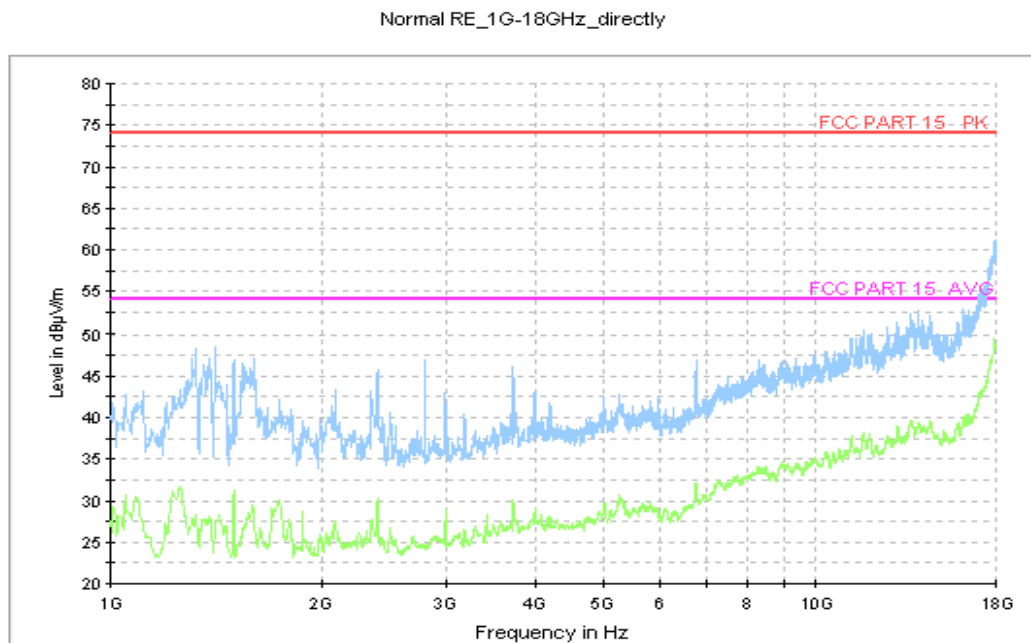


Figure A.6 Radiated Emission from 1GHz to18GHz

## 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 - 2009, 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.

### 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:  $U= 2.9 \text{ dB}$ ,  $k=2$ .

#### Charging Mode, Set.1

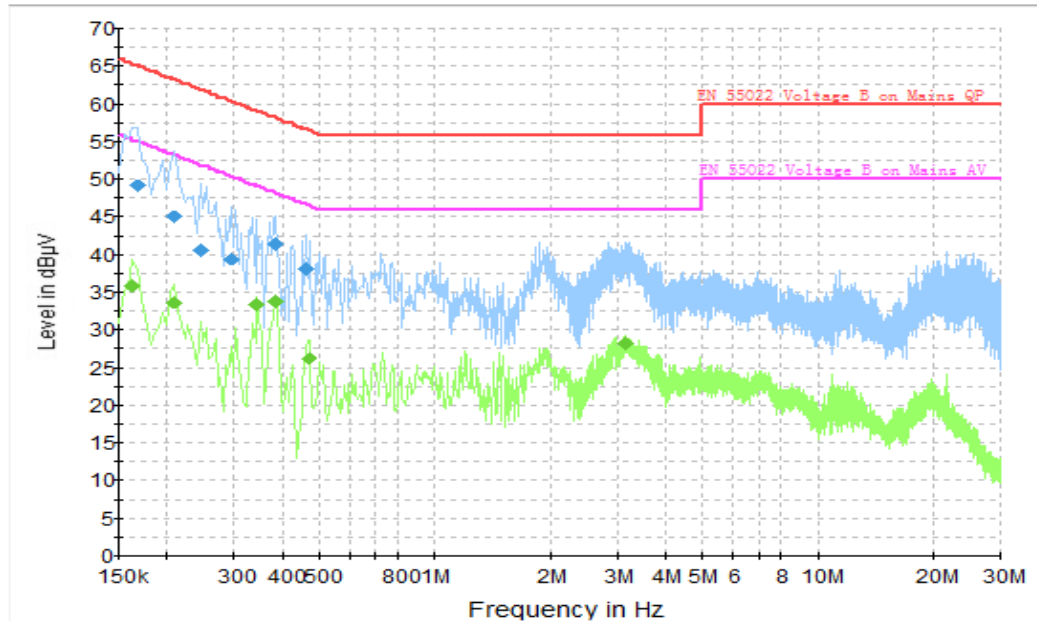


Figure A.7 Conducted Emission

#### Final Result 1

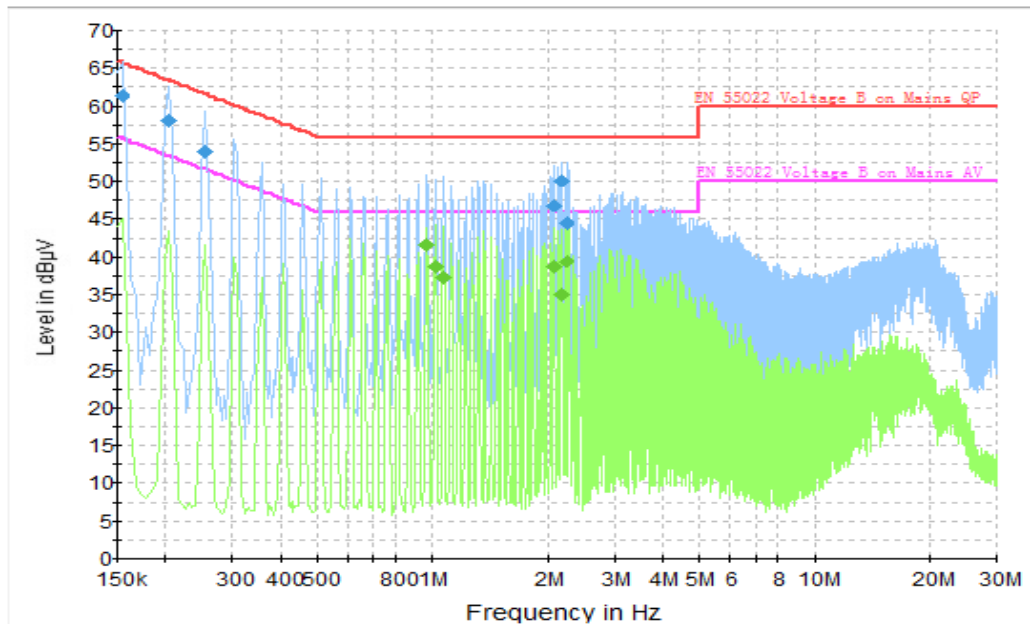
Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time(ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.168000	49.3	2000.0	9.000	On	L1	19.9	15.8	65.1
0.208500	45.0	2000.0	9.000	On	L1	19.8	18.2	63.3
0.244500	40.7	2000.0	9.000	On	L1	19.8	21.3	61.9
0.294000	39.4	2000.0	9.000	On	L1	19.8	21.0	60.4
0.384000	41.5	2000.0	9.000	On	N	20.0	16.7	58.2
0.460500	38.2	2000.0	9.000	On	N	20.0	18.5	56.7

#### Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time(ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.163500	35.9	2000.0	9.000	On	L1	19.9	19.4	55.3
0.208500	33.7	2000.0	9.000	On	L1	19.8	19.6	53.3
0.343500	33.4	2000.0	9.000	On	L1	19.9	15.7	49.1
0.384000	33.9	2000.0	9.000	On	L1	19.9	14.3	48.2
0.469500	26.3	2000.0	9.000	On	L1	20.0	20.2	46.5
3.142500	28.2	2000.0	9.000	On	L1	19.7	17.8	46.0

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

## Charging Mode, Set.2



**Figure A.8 Conducted Emission**

### Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time(ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.154500	61.4	2000.0	9.000	On	L1	19.7	4.3	65.8
0.204000	58.1	2000.0	9.000	On	L1	19.8	5.4	63.4
0.253500	54.0	2000.0	9.000	On	L1	19.8	7.6	61.6
2.085000	46.9	2000.0	9.000	On	N	19.7	9.1	56.0
2.184000	50.2	2000.0	9.000	On	L1	19.7	5.8	56.0
2.233500	44.6	2000.0	9.000	On	L1	19.7	11.4	56.0

### Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time(ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.964500	41.7	2000.0	9.000	On	L1	19.8	4.3	46.0
1.014000	38.8	2000.0	9.000	On	L1	19.7	7.2	46.0
1.063500	37.3	2000.0	9.000	On	L1	19.8	8.7	46.0
2.080500	38.8	2000.0	9.000	On	L1	19.7	7.2	46.0
2.179500	35.1	2000.0	9.000	On	L1	19.7	10.9	46.0
2.233500	39.5	2000.0	9.000	On	L1	19.7	6.5	46.0

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

### USB Mode, Set.3

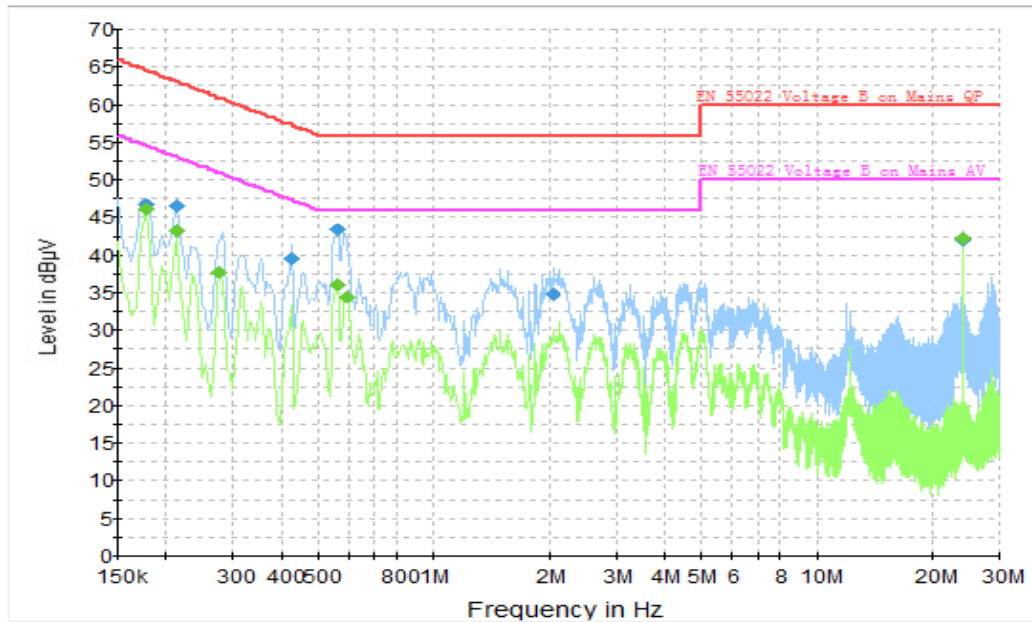


Figure A.9 Conducted Emission

### Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time(ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.177000	46.8	2000.0	9.000	On	N	19.9	17.9	64.6
0.213000	46.6	2000.0	9.000	On	N	19.9	16.5	63.1
0.424500	39.6	2000.0	9.000	On	N	20.0	17.7	57.4
0.559500	43.4	2000.0	9.000	On	L1	20.0	12.6	56.0
2.049000	34.9	2000.0	9.000	On	L1	19.7	21.1	56.0
23.986500	42.1	2000.0	9.000	On	L1	19.8	17.9	60.0

### Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time(ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.177000	46.2	2000.0	9.000	On	N	19.9	8.4	54.6
0.213000	43.2	2000.0	9.000	On	N	19.9	9.9	53.1
0.276000	37.8	2000.0	9.000	On	N	19.9	13.1	50.9
0.559500	36.1	2000.0	9.000	On	L1	20.0	9.9	46.0
0.595500	34.5	2000.0	9.000	On	N	20.0	11.5	46.0
23.986500	42.3	2000.0	9.000	On	N	19.9	7.7	50.0

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

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