



# TEST REPORT

No. I14Z45782-EMC03

for

**TCT Mobile Limited**

**HSUPA/HSDPA/UMTS triband/GSM quadband mobile phone**

**Model Name:4035A**

**FCC ID: RAD453**

with

**Hardware Version: PIO**

**Software Version: v9H26**

**Issued Date: May 21<sup>st</sup>, 2014**

**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 TMC Beijing.

**Test Laboratory:**

***FCC 2.948 Listed: No.733176***

***IC O.A.T.S listed: No.6629A-1***

TMC Beijing, Telecommunication Metrology Center of Ministry of Industry and Information Technology

No. 52, Huayuan Bei Road, Haidian District, Beijing, P. R. China 100191

Tel: +86(0)10-62304633-2561, Fax: +86(0)10-62304633-2504 Email:welcome@emcite.com. www.emcite.com

## **CONTENTS**

<b>1. TEST LABORATORY.....</b>	<b>3</b>
<b>1.1. TESTING LOCATION .....</b>	<b>3</b>
<b>1.2. TESTING ENVIRONMENT .....</b>	<b>3</b>
<b>1.3. PROJECT DATA.....</b>	<b>3</b>
<b>1.4. SIGNATURE .....</b>	<b>3</b>
<b>2. CLIENT INFORMATION.....</b>	<b>4</b>
<b>2.1. APPLICANT INFORMATION.....</b>	<b>4</b>
<b>2.2. MANUFACTURER INFORMATION.....</b>	<b>4</b>
<b>3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE) .....</b>	<b>5</b>
<b>3.1. ABOUT EUT .....</b>	<b>5</b>
<b>3.2. INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST .....</b>	<b>5</b>
<b>3.3. INTERNAL IDENTIFICATION OF AE USED DURING THE TEST.....</b>	<b>5</b>
<b>3.4. EUT SET-UPS .....</b>	<b>6</b>
<b>4. REFERENCE DOCUMENTS .....</b>	<b>7</b>
<b>4.1. REFERENCE DOCUMENTS FOR TESTING .....</b>	<b>7</b>
<b>5. LABORATORY ENVIRONMENT .....</b>	<b>8</b>
<b>6. SUMMARY OF TEST RESULTS.....</b>	<b>9</b>
<b>7. TEST EQUIPMENTS UTILIZED.....</b>	<b>10</b>
<b>ANNEX A: MEASUREMENT RESULTS .....</b>	<b>11</b>

## 1. Test Laboratory

### 1.1. Testing Location

#### Location A

Company Name: TMC Beijing, Telecommunication Metrology Center of MIIT  
Address: No 52, Huayuan Bei Road, Haidian District, Beijing, P.R. China  
Postal Code: 100191

### 1.2. Testing Environment

Normal Temperature: 15-35°C  
Relative Humidity: 20-75%

### 1.3. Project data

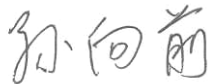
Testing Start Date: May 5<sup>th</sup>, 2014  
Testing End Date: May 6<sup>th</sup>, 2014

### 1.4. Signature



---

Qu Pengfei  
(Prepared this test report)



---

Sun Xiangqian  
(Reviewed this test report)



---

Lu Bingsong  
Deputy 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  
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.**

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

##### **4.1. About EUT**

Description	HSUPA/HSDPA/UMTS triband/GSM quadband mobile phone
Model Name	4035A
Marketing Name	/
FCC ID	RAD453
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.

##### **4.2. Internal Identification of EUT used during the test**

EUT ID*	SN or IMEI	HW Version	SW Version
EUT3	014013000000189	PIO	v9H26

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

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

AE ID*	Description	SN	Remarks
AE1	Battery	/	TCT-B-1746
AE2	Battery	/	TCT-B-2090
AE3	Travel charger	/	TCT-CHR-0661
AE4	Travel charger	/	S004ACU0500055
AE5	USB cable	/	TCT-DC-0458
AE6	USB cable	/	TCT-DC-0670
AE7	Battery	/	TCT-B-1378
AE8	Battery	/	TCT-B-2255
AE9	Battery	/	TCT-B-1013

##### AE1

Model	CAB60B0000C1
Manufacturer	BYD
Capacitance	1400 mAh
Nominal voltage	3.7V

##### AE2

Model	CAB1400002C1
Manufacturer	BYD
Capacitance	1400 mAh
Nominal voltage	3.7V

##### AE3

Model	CBA3007AG0C1
Manufacturer	BYD
Length of cable	/

AE4

Model CBA3007AG0C2  
 Manufacturer TEN PAO  
 Length of cable /

AE5

Model CBA3122002C2  
 Manufacturer Shenhua  
 Length of cable /

AE6

Model CBA3122002C1  
 Manufacturer JUWEI  
 Length of cable 98cm

AE7

Model CAB60BA000C1  
 Manufacturer SCUD  
 Capacitance 1400mAh  
 Nominal voltage 3.7V

AE8

Model CAB60B0000CB  
 Manufacturer OS  
 Capacitance 1400mAh  
 Nominal voltage 3.7V

AE9

Model CAB31P0000C1  
 Manufacturer BYD  
 Capacitance 1300mAh  
 Nominal voltage 3.7V

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

**4.4. EUT set-ups**

EUT set-up No.	Combination of EUT and AE	Remarks
Set.1	EUT3+ AE1/AE2/AE7/AE8/AE9+ AE3 + AE5/AE6	Charger
Set.2	EUT3+ AE1/AE2/AE7/AE8/AE9+ AE4 + AE5/AE6	Charger
Set.3	EUT3+ AE1/AE2/AE7/AE8/AE9+ AE5/AE6	USB

## **5. Reference Documents**

### **5.1. 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	10-1-12 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

## 6. 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



## 7. 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

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

### 8. Test Equipments Utilized

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURE	CAL DUE DATE	CALIBRATION INTERVAL
1	Test Receiver	ESCI	100344	R&S	2015-03-03	1 year
2	Test Receiver	ESCI 7	100948	R&S	2014-07-18	1 year
3	Universal Radio Communication Tester	CMU200	109914	R&S	2015-04-13	1 year
4	Test Receiver	FSV	101047	R&S	2014-06-30	1 year
5	LISN	ESH2-Z5	829991/012	R&S	2015-04-14	1 year
6	EMI Antenna	VULB 9163	9163-234	Schwarzbeck	2016-09-15	3 years
7	EMI Antenna	3115	6914	ETS-Lindgren	2014-12-15	3 years
8	PC	OPTIPLEX 380	2X1YV2X	DELL	N/A	N/A
9	Monitor	E178FPc	CN-OWR979-6 4180-7AJ-D2M S	DELL	N/A	N/A
10	Printer	P1606dn	VNC3L52122	HP	N/A	N/A
11	Keyboard	L100	CN0RH659658 907ATOI40	DELL	N/A	N/A
12	Mouse	M-UAE119	LZ935220ZRC	Lenovo	N/A	N/A

## **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 - 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 ( $\mu\text{V}/\text{m}$ )		
	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.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
9987.625	35.6	-24.2	38.0	21.800	HORIZONTAL
9990.156	35.5	-24.2	38.0	21.700	HORIZONTAL
9998.875	35.4	-24.2	38.0	21.600	VERTICAL
9993.813	35.4	-24.2	38.0	21.600	VERTICAL
9994.375	35.3	-24.2	38.0	21.500	VERTICAL
9996.906	35.3	-24.2	38.0	21.500	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
9984.250	47.6	-24.2	38.0	33.800	VERTICAL
9991.000	47.5	-24.2	38.0	33.700	VERTICAL
9122.219	47.2	-26.1	38.4	34.900	HORIZONTAL
9105.063	47.0	-26.7	38.4	35.300	VERTICAL
9998.594	47.0	-24.2	38.0	33.200	VERTICAL
9056.406	46.9	-26.7	38.4	35.200	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
10000.000	35.3	-24.2	38.5	21.000	HORIZONTAL
9987.625	35.3	-24.2	38.0	21.500	HORIZONTAL
9993.250	35.2	-24.2	38.0	21.400	VERTICAL
9982.563	35.2	-24.2	38.0	21.400	HORIZONTAL
9988.188	35.2	-24.2	38.0	21.400	VERTICAL
9998.313	35.2	-24.2	38.0	21.400	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
9911.969	46.9	-24.9	38.0	33.800	HORIZONTAL
9964.000	46.9	-24.2	38.0	33.100	VERTICAL
9984.531	46.9	-24.2	38.0	33.100	VERTICAL
9949.938	46.8	-24.9	38.0	33.700	VERTICAL
9928.844	46.7	-24.9	38.0	33.600	VERTICAL
9977.781	46.7	-24.2	38.0	32.900	HORIZONTAL

**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
9987.906	35.4	-24.2	38.0	21.600	HORIZONTAL
9991.000	35.4	-24.2	38.0	21.600	VERTICAL
9983.969	35.4	-24.2	38.0	21.600	HORIZONTAL
9987.625	35.4	-24.2	38.0	21.600	VERTICAL
9998.313	35.4	-24.2	38.0	21.600	VERTICAL
9986.219	35.3	-24.2	38.0	21.500	VERTICAL

**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
1991.688	52.3	-35.7	25.3	62.700	VERTICAL
6747.063	49.1	-31.6	35.3	45.400	HORIZONTAL
6747.906	48.7	-31.6	35.3	45.000	VERTICAL
6747.625	48.3	-31.6	35.3	44.600	HORIZONTAL
6742.000	48.2	-31.6	35.3	44.500	HORIZONTAL
6748.188	48.0	-31.6	35.3	44.300	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

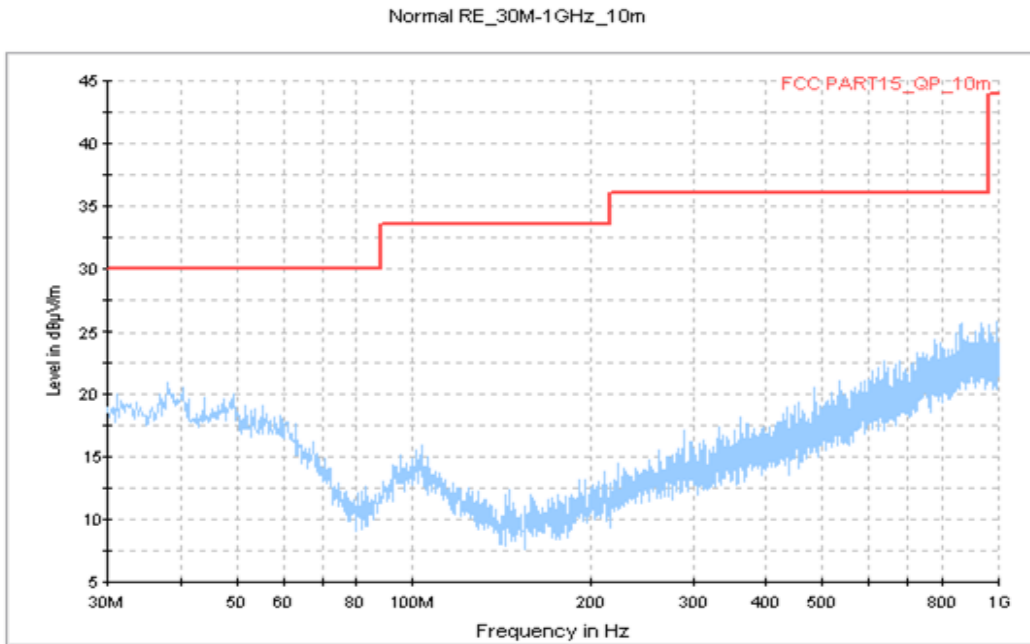


Figure A.1 Radiated Emission from 30MHz to 1GHz

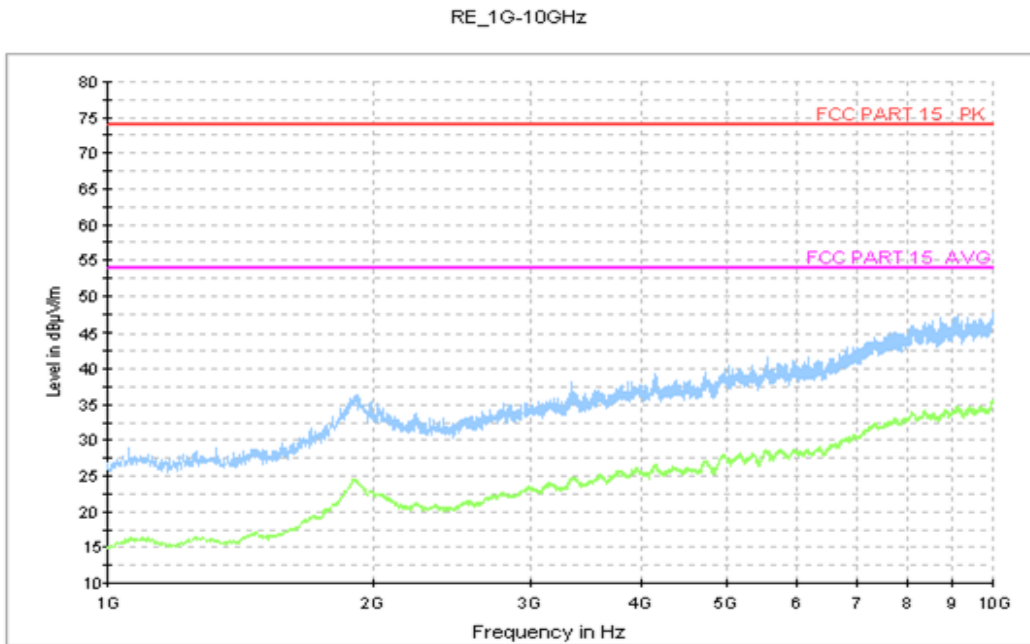


Figure A.2 Radiated Emission from 1GHz to 10GHz

Charging Mode, Set.2

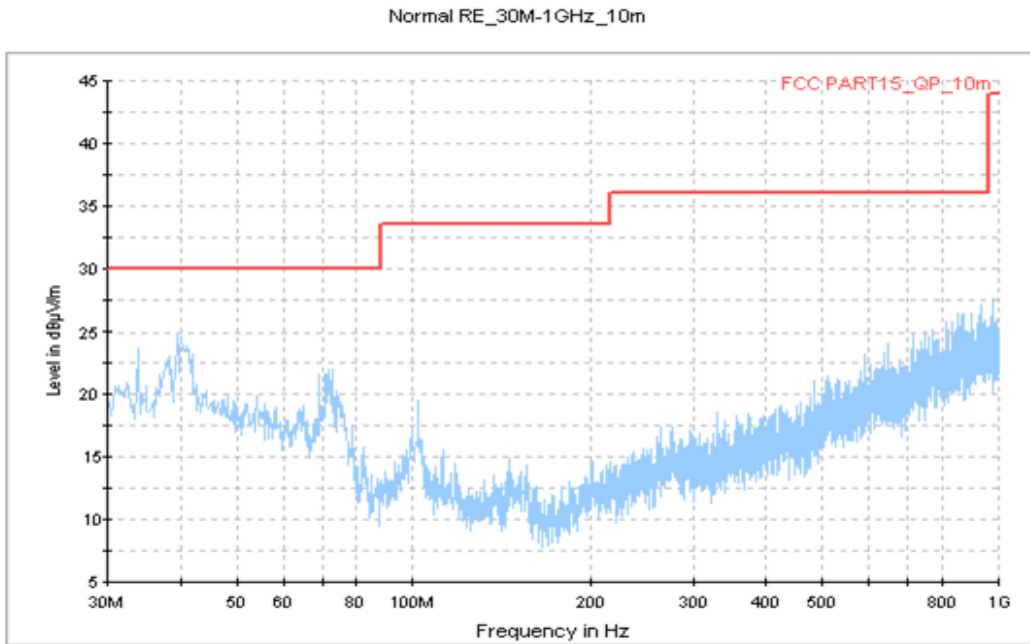


Figure A.3 Radiated Emission from 30MHz to 1GHz

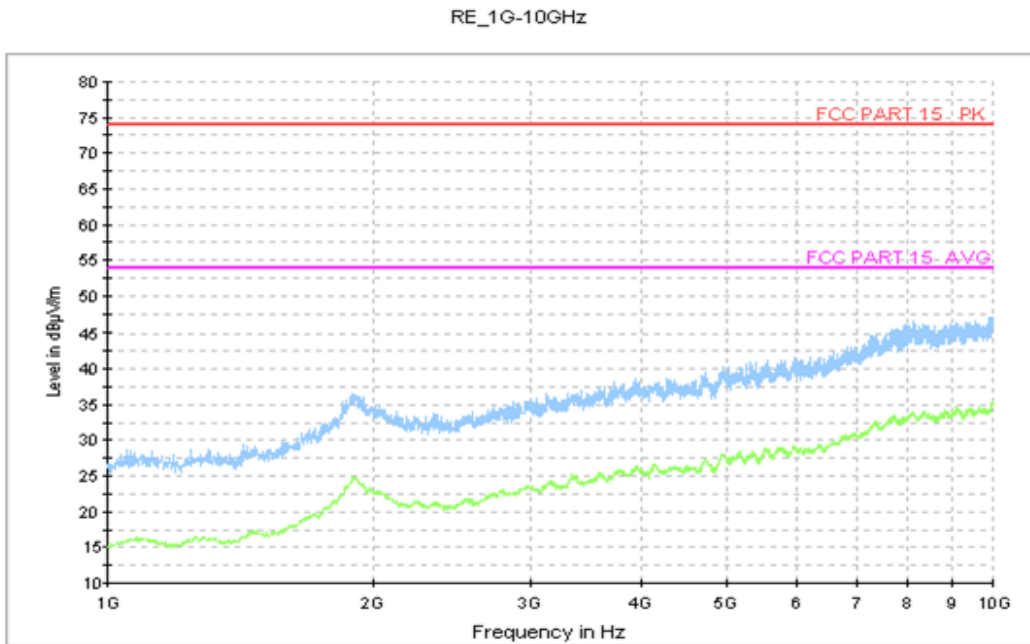


Figure A.4 Radiated Emission from 1GHz to 10GHz

USB Mode, Set.3

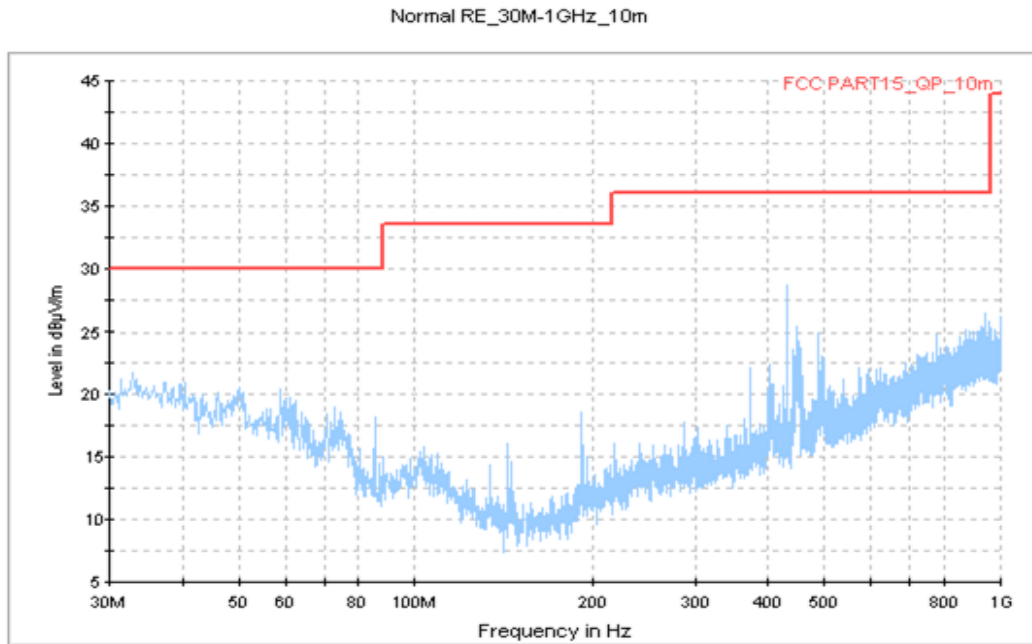


Figure A.5 Radiated Emission from 30MHz to 1GHz

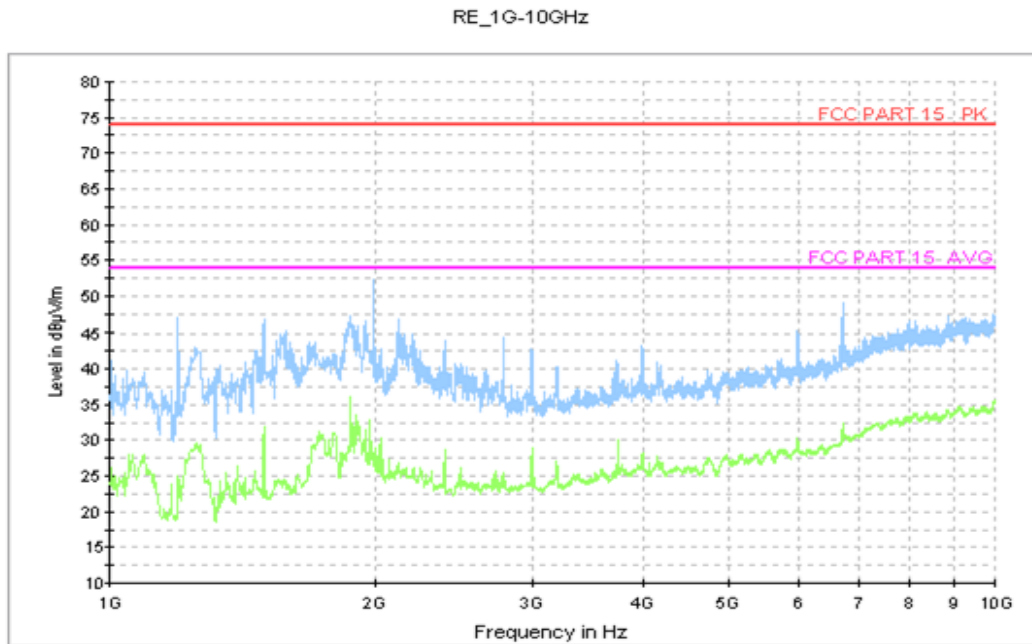


Figure A.6 Radiated Emission from 1GHz to 10GHz



## 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 - 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:  $U= 2.9$  dB,  $k=2$ .

#### Charging Mode, Set.1

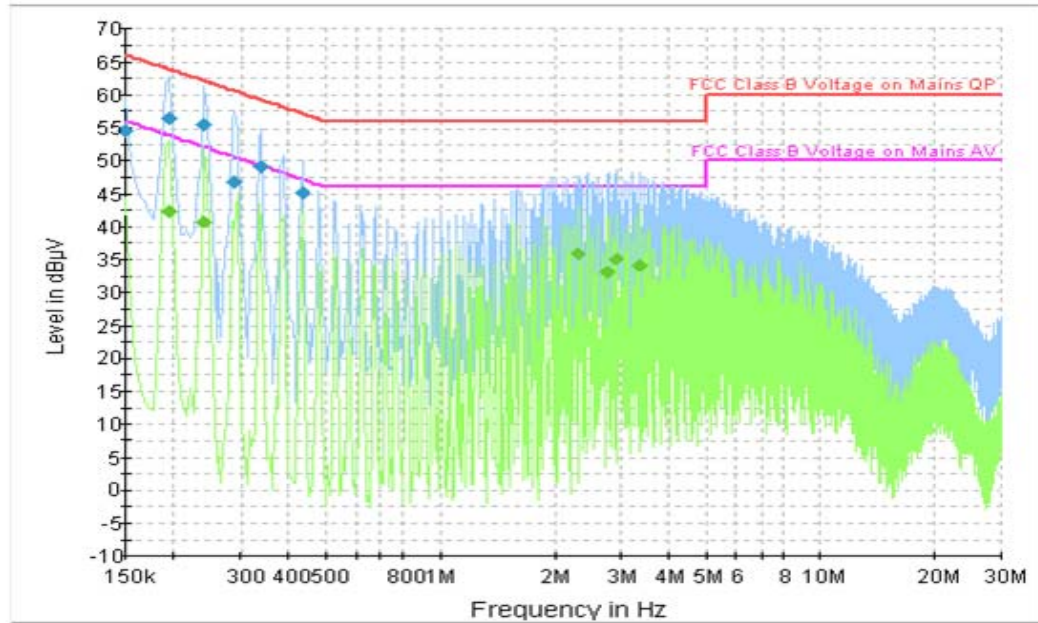


Figure A.7 Conducted Emission

#### Final Result 1

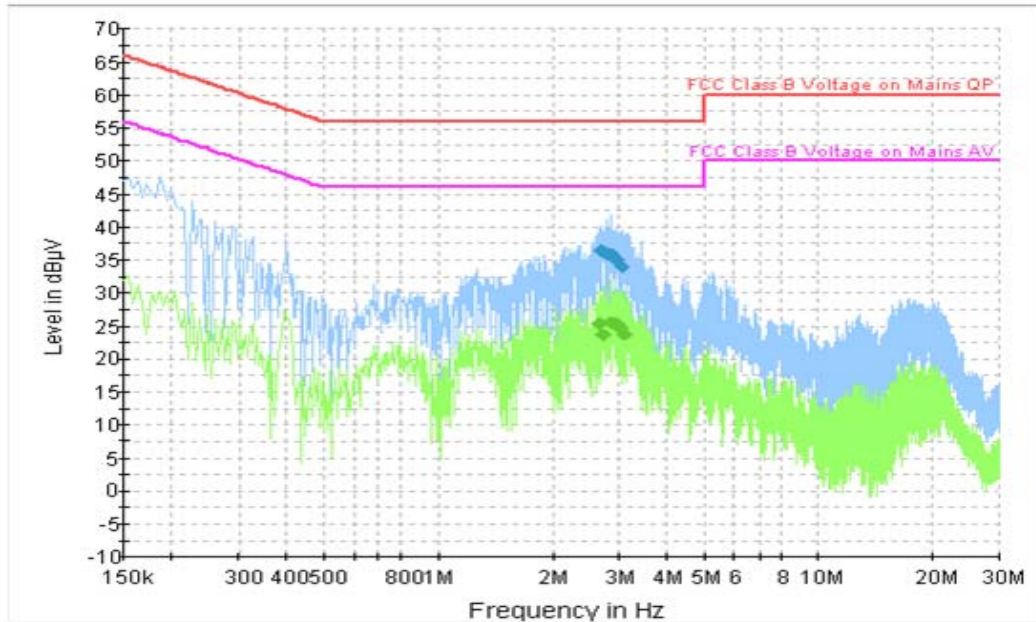
Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	54.6	GND	L1	9.8	11.4	66.0
0.195000	56.3	GND	N	9.8	7.5	63.8
0.240000	55.4	GND	L1	9.8	6.7	62.1
0.289500	46.8	GND	N	9.8	13.7	60.5
0.339000	49.0	GND	L1	9.8	10.2	59.2
0.433500	45.0	GND	L1	9.8	12.2	57.2

#### Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.195000	42.2	GND	N	9.8	11.6	53.8
0.240000	40.8	GND	L1	9.8	11.3	52.1
2.314500	35.8	GND	L1	9.7	10.2	46.0
2.751000	33.0	GND	L1	9.7	13.0	46.0
2.895000	35.1	GND	L1	9.7	10.9	46.0
3.376500	34.2	GND	L1	9.7	11.8	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)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.688000	36.5	GND	L1	9.7	19.5	56.0
2.782500	35.9	GND	L1	9.7	20.1	56.0
2.809500	36.0	GND	L1	9.7	20.0	56.0
2.841000	35.9	GND	L1	9.7	20.1	56.0
2.971500	35.1	GND	L1	9.7	20.9	56.0
3.057000	33.9	GND	L1	9.7	22.1	56.0

**Final Result 2**

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.665500	25.2	GND	L1	9.7	20.8	46.0
2.724000	23.5	GND	L1	9.7	22.5	46.0
2.841000	25.5	GND	L1	9.7	20.5	46.0
2.971500	25.2	GND	L1	9.7	20.8	46.0
3.030000	24.5	GND	L1	9.7	21.5	46.0
3.102000	23.7	GND	L1	9.7	22.3	46.0

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

USB Mode, Set.3

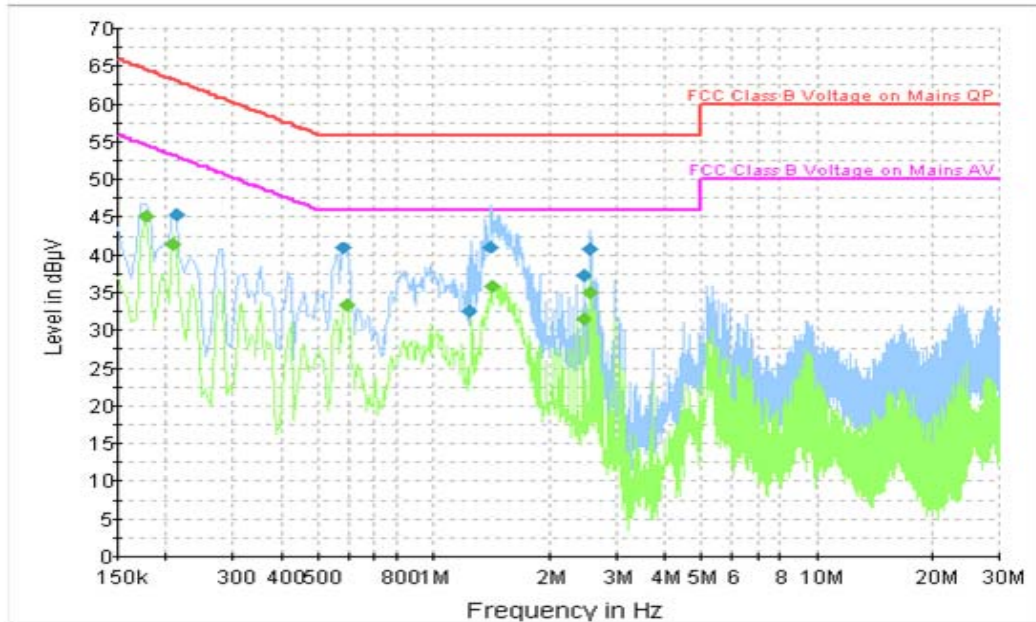


Figure A.9 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.213000	45.3	GND	N	9.8	17.8	63.1
0.582000	40.9	GND	L1	9.8	15.1	56.0
1.230000	32.6	GND	L1	9.7	23.4	56.0
1.405500	41.2	GND	N	9.7	14.8	56.0
2.458500	37.2	GND	N	9.7	18.8	56.0
2.557500	40.7	GND	L1	9.7	15.3	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.177000	45.2	GND	N	9.8	9.4	54.6
0.208500	41.4	GND	N	9.8	11.9	53.3
0.595500	33.4	GND	L1	9.8	12.6	46.0
1.432500	35.9	GND	N	9.7	10.1	46.0
2.458500	31.5	GND	N	9.7	14.5	46.0
2.557500	35.0	GND	L1	9.7	11.0	46.0

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

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