TEST REPORT
No. I14Z47257-EMC01

for

TCT Mobile Limited

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

band mobile phone

Model Name: 5042A

FCC ID: RAD516

with

Hardware Version: PIO

Software Version: 01

Issued Date: Aug.13th, 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

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CONTENTS

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℃
Relative Humidity:	20-75%

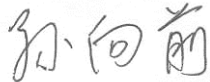### 1.3. Project data

Testing Start Date:	Aug. 5th, 2014
Testing End Date:	Aug. 8th, 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. 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	5042A
FCC ID	RAD516
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
EUT4	01415200010100	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-0429
AE2	Battery	/	14TCT-BA-1338
AE3	Battery	/	14TCT-BA-1348
AE4	Battery	/	1447257BA006
AE5	Battery	/	1447257BA002
AE6	Battery	/	1447257BA005
AE7	Battery	/	14TCT-BA-0248
AE8	USB cable	/	14TCT-DC-0316
AE9	USB cable	/	14TCT-DC-0312
AE10	USB cable	/	14TCT-DC-0453
AE11	USB cable	/	14TCT-DC-0447
AE12	Travel	/	14TCT-CH-0331
AE13	Travel	/	14TCT-CH-0898
AE14	Travel	/	14TCT-CH-0560
AE15	Travel	/	14TCT-CH-0563

AE1,AE2,AE3

Model	CAB2000010C1
Manufacturer	BYD
Capacitance	2000 mAh
Nominal voltage	3.8 V

AE4,AE5,AE6,AE7

Model	CAB2000013C2
Manufacturer	SCUD
Capacitance	2000 mAh
Nominal voltage	3.8 V

AE8,AE9
  Model   CDA3122002C2
  Manufacturer   Shenghua
  Length of cable   98cm

AE10,AE11
  Model   CDA3122002C1
  Manufacturer   Juwei
  Length of cable   99cm

AE12,AE13
  Model   CBA3000AG0C1
  Manufacturer   TEN PAO
  Length of cable   /

AE14,AE15
  Model   CBA3000AG0C2
  Manufacturer   BYD
  Length of cable   /

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

3.4. <u>EUT set-ups</u>

EUT set-up No.	Combination of EUT and AE	Remarks
Set.1	EUT4+ AE1+ AE8 + AE12	Charger
Set.2	EUT4+ AE1+ AE8 + AE14	Charger
Set.3	EUT4+ AE1+ AE8	USB

4. Reference Documents

4.1. Reference Documents for testing

The following documents listed in this section are referred for testing.

Reference	Title	Version
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	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	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	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-OWR979-64180-7AJ-D2MS	DELL	N/A	N/A
10	Printer	P1606dn	VNC3L52122	HP	N/A	N/A
11	Keyboard	L100	CN0RH659658907ATOI40	DELL	N/A	N/A
12	Mouse	M-UAE119	LZ935220ZRC	Lenovo	N/A	N/A

* NOTE: Test equipment not valid for extended during the test.

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 (µV/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:

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

Where

G_A: Antenna factor of receive antenna

G_{PL}: Path Loss

P_{Mea}: Measurement result on receiver.

Measurement uncertainty (worst case): U = 4.3 dB, k=2.

Measurement results for Set.1:

Charging Mode/Average detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBμV)	Polarity
17887.375	49.7	-18.5	45.6	22.600	VERTICAL
17876.750	49.6	-18.5	45.6	22.500	VERTICAL
17885.250	49.6	-18.5	45.6	22.500	VERTICAL
17878.875	49.5	-18.5	45.6	22.400	VERTICAL
17895.875	49.5	-18.5	45.6	22.400	VERTICAL
17881.000	49.5	-18.5	45.6	22.400	VERTICAL

Charging Mode/Peak detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBμV)	Polarity
17906.500	61.3	-18.5	45.6	34.200	VERTICAL
17883.125	61.0	-18.5	45.6	33.900	VERTICAL
17902.250	61.0	-18.5	45.6	33.900	VERTICAL
17836.375	60.9	-18.5	45.6	33.800	VERTICAL
17925.625	60.9	-17.7	45.6	33.000	VERTICAL
17868.250	60.9	-18.5	45.6	33.800	HORIZONTAL

Measurement results for Set.2:

Charging Mode/Average detector

Frequency(MHz)	Result(dBµV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBµV)	Polarity
17889.500	49.7	-18.5	45.6	22.600	VERTICAL
17887.375	49.7	-18.5	45.6	22.600	VERTICAL
17891.625	49.7	-18.5	45.6	22.600	HORIZONTAL
17883.125	49.5	-18.5	45.6	22.400	VERTICAL
17904.375	49.5	-18.5	45.6	22.400	VERTICAL
17908.625	49.5	-18.5	45.6	22.400	VERTICAL

Charging Mode/Peak detector

Frequency(MHz)	Result(dBµV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBµV)	Polarity
17912.875	62.0	-18.5	45.6	34.900	VERTICAL
17889.500	61.2	-18.5	45.6	34.100	HORIZONTAL
17883.125	61.0	-18.5	45.6	33.900	VERTICAL
17902.250	61.0	-18.5	45.6	33.900	VERTICAL
17874.625	61.0	-18.5	45.6	33.900	HORIZONTAL
17917.125	61.0	-17.7	45.6	33.100	VERTICAL

Measurement result for Set.3:

USB Mode/Average detector

Frequency(MHz)	Result(dBµV/m)	G_{PL} (dB)	G_A (dB/m)	P_{mea}(dBµV)	Polarity
17893.750	49.8	-18.5	45.6	22.700	VERTICA
17889.500	49.6	-18.5	45.6	22.500	VERTICAL
17874.625	49.6	-18.5	45.6	22.500	VERTICAL
17885.250	49.6	-18.5	45.6	22.500	VERTICAL
17895.875	49.6	-18.5	45.6	22.500	VERTICAL
17898.000	49.5	-18.5	45.6	22.400	HORIZONTAL

USB Mode/ Peak detector

Frequency(MHz)	Result(dBµV/m)	G_{PL} (dB)	G_A (dB/m)	P_{mea}(dBµV)	Polarity
17859.750	61.5	-18.5	45.6	34.400	HORIZONTAL
17953.250	61.3	-17.7	45.6	33.400	VERTICAL
17861.875	61.2	-18.5	45.6	34.100	VERTICAL
17898.000	61.2	-18.5	45.6	34.100	VERTICAL
17946.875	61.0	-17.7	45.6	33.100	VERTICAL
17883.125	60.9	-18.5	45.6	33.800	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.
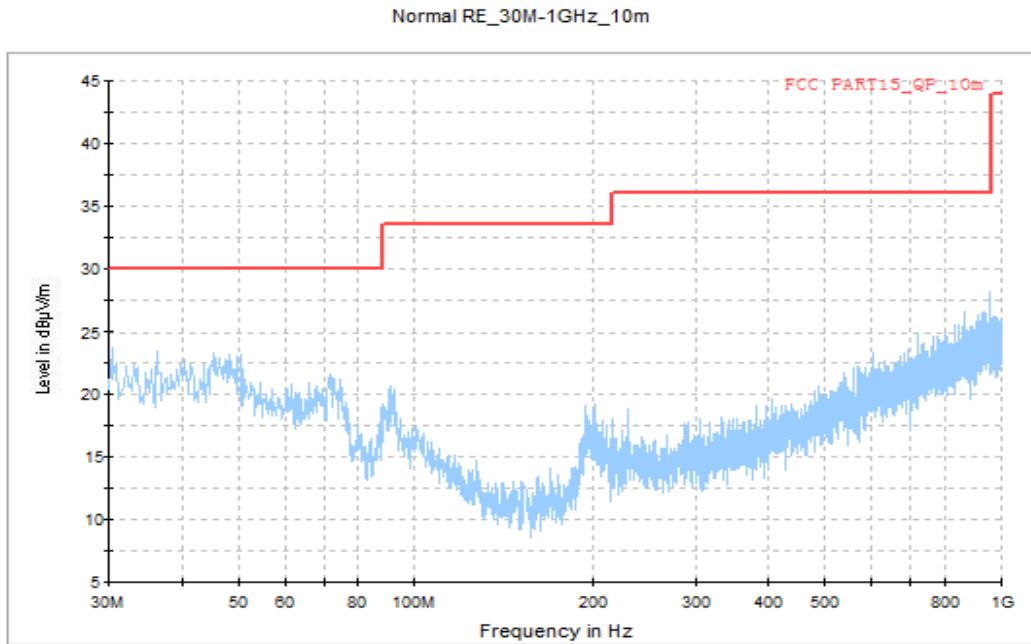
Charging Mode, Set.1

Normal RE_30M-1GHz_10m

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

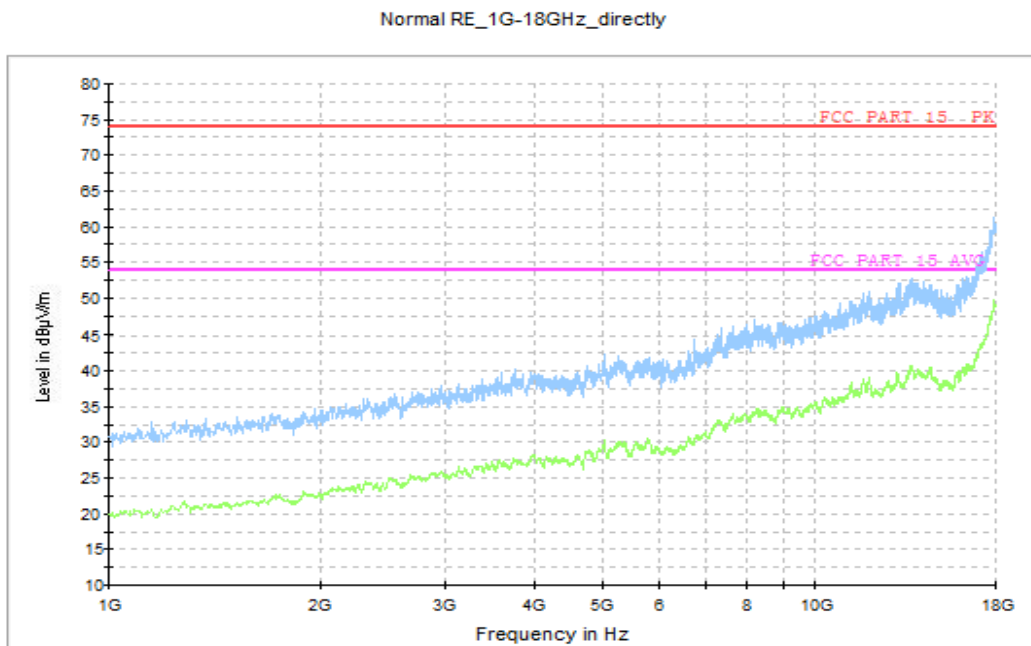Normal RE_1G-18GHz_directly

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

Charging Mode, Set.2

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

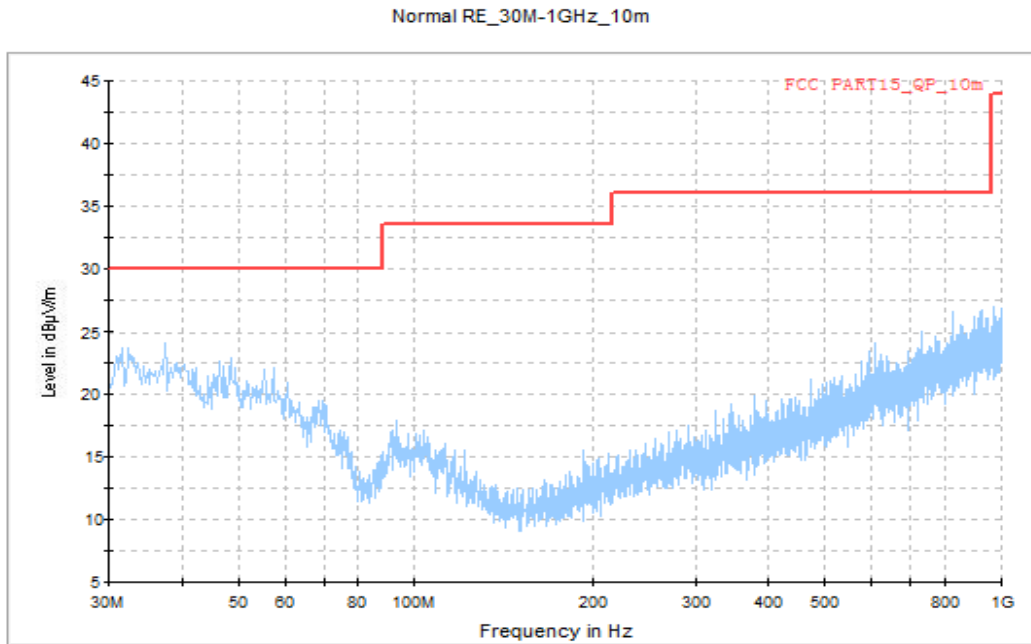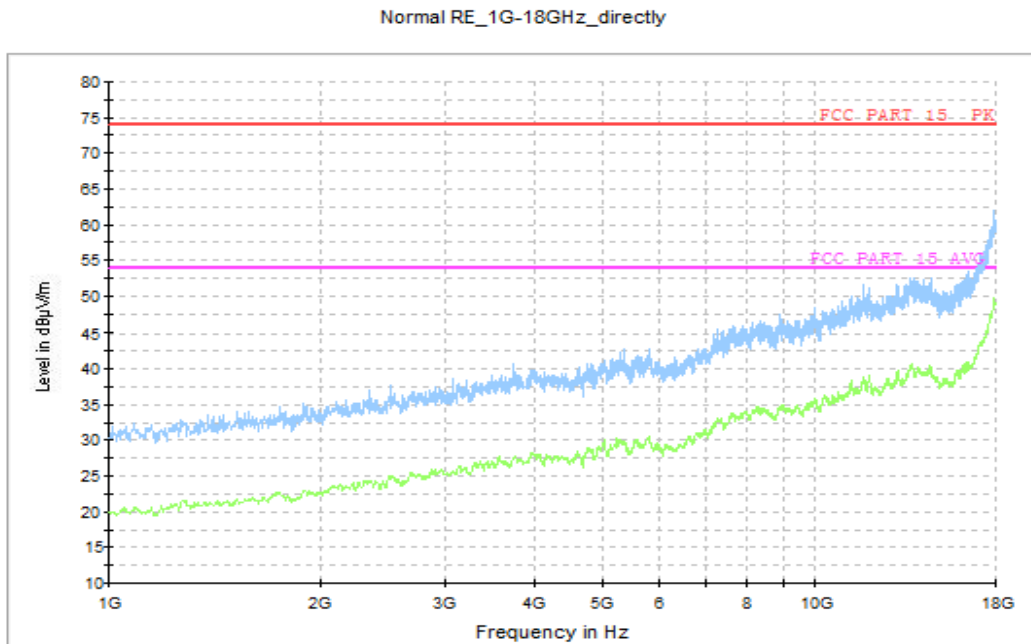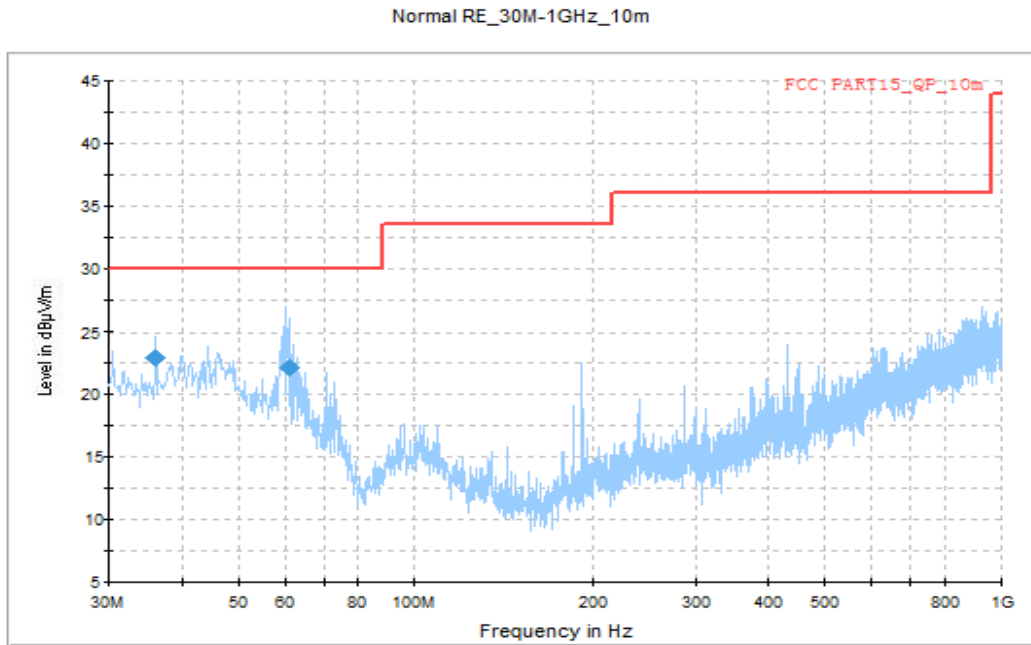**Figure A.4 Radiated Emission from 1GHz to 18GHz**

USB Mode, Set.3

Normal RE_30M-1GHz_10m

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

Final Result 1

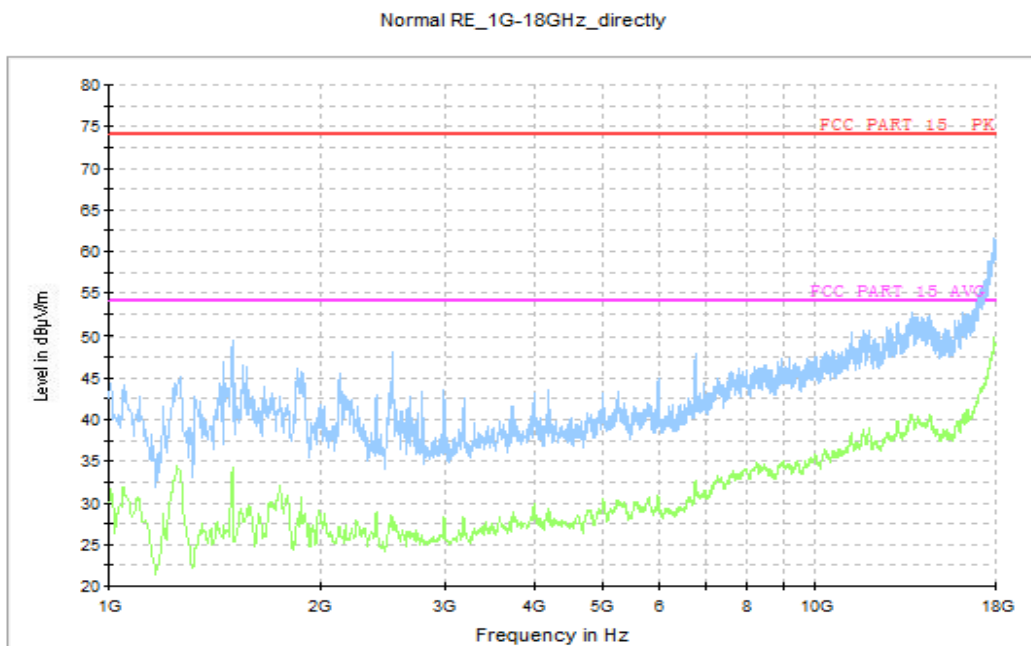| Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
36.062500	22.9	201.0	V	157.0	-18.4	7.1	30.0
60.973750	22.2	100.0	V	181.0	-17.9	7.8	30.0

Normal RE_1G-18GHz_directly

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 (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

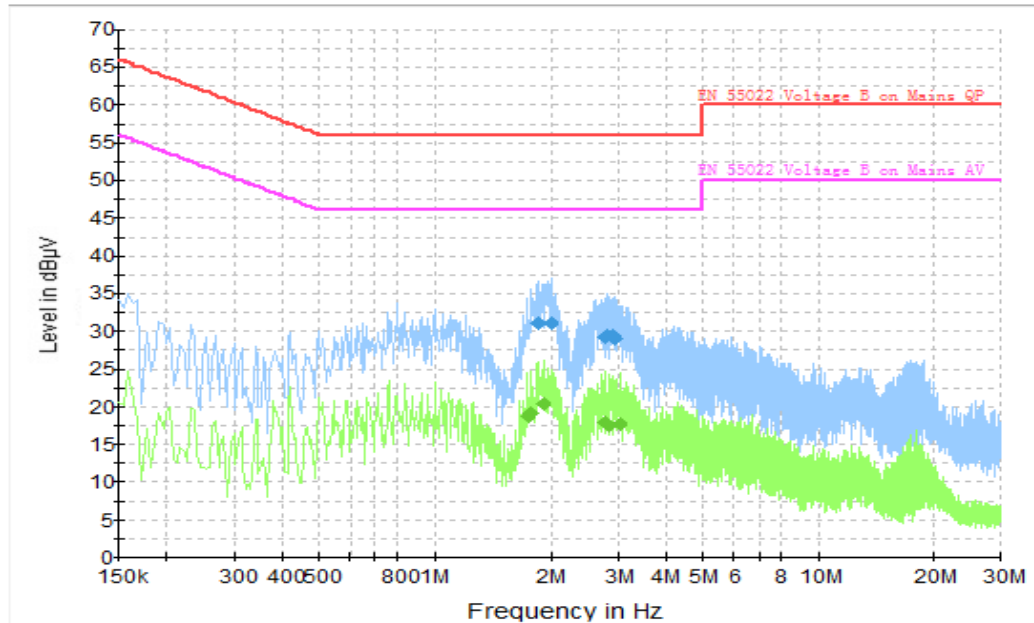Measurement uncertainty: *U*= 2.9 dB, *k*=2.

Charging Mode, Set.1

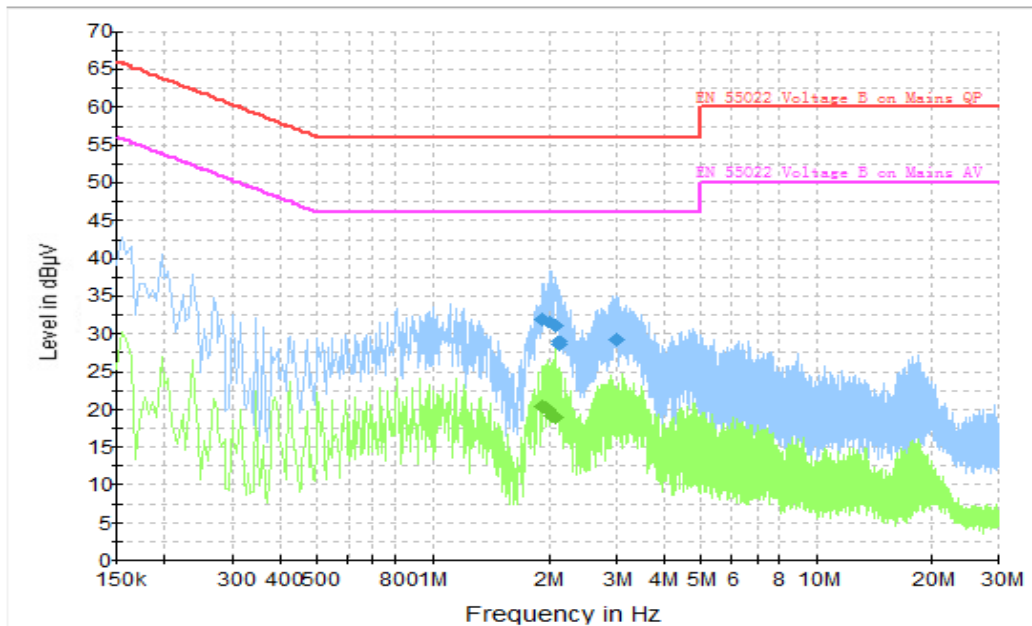**Figure A.7 Conducted Emission**

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
1.873500	31.0	2000.0	9.000	On	N	9.8	25.0	56.0
2.004000	31.1	2000.0	9.000	On	L1	9.9	24.9	56.0
2.773500	29.2	2000.0	9.000	On	N	9.8	26.8	56.0
2.818500	29.3	2000.0	9.000	On	L1	9.8	26.7	56.0
2.935500	29.4	2000.0	9.000	On	L1	9.8	26.6	56.0
2.967000	29.0	2000.0	9.000	On	L1	9.8	27.0	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
1.752000	18.7	2000.0	9.000	On	N	9.8	27.3	46.0
1.783500	19.2	2000.0	9.000	On	N	9.8	26.8	46.0
1.909500	20.2	2000.0	9.000	On	L1	9.9	25.8	46.0
2.791500	17.8	2000.0	9.000	On	L1	9.8	28.2	46.0
2.850000	17.6	2000.0	9.000	On	L1	9.8	28.4	46.0
3.039000	17.7	2000.0	9.000	On	L1	9.8	28.3	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)
1.914000	31.9	2000.0	9.000	On	N	9.8	24.1	56.0
2.004000	31.6	2000.0	9.000	On	N	9.8	24.4	56.0
2.076000	31.0	2000.0	9.000	On	L1	9.9	25.0	56.0
2.134500	28.9	2000.0	9.000	On	L1	9.9	27.1	56.0
2.148000	28.5	2000.0	9.000	On	L1	9.9	27.5	56.0
3.007500	29.3	2000.0	9.000	On	N	9.8	26.7	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
1.914000	20.2	2000.0	9.000	On	N	9.8	25.8	46.0
1.972500	20.1	2000.0	9.000	On	L1	9.9	25.9	46.0
1.990500	20.0	2000.0	9.000	On	N	9.8	26.0	46.0
2.004000	19.6	2000.0	9.000	On	L1	9.9	26.4	46.0
2.035500	19.2	2000.0	9.000	On	N	9.8	26.8	46.0
2.076000	18.9	2000.0	9.000	On	L1	9.9	27.1	46.0

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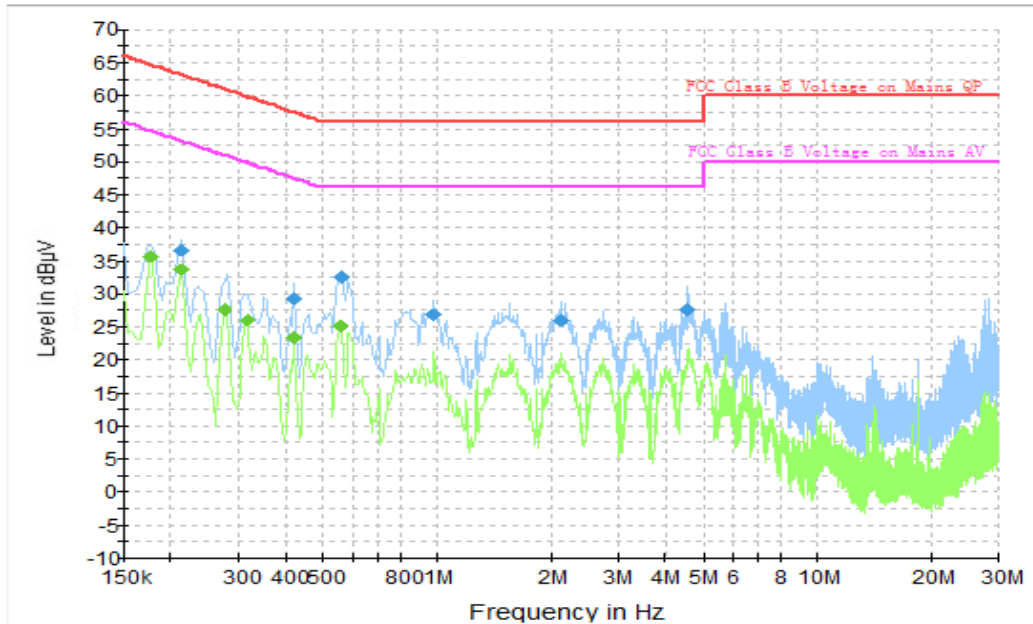
USB Mode, Set.3

Figure A.9 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.213000	36.7	GND	L1	9.8	26.4	63.1
0.424500	29.2	GND	N	9.8	28.2	57.4
0.564000	32.5	GND	L1	9.8	23.5	56.0
0.987000	26.8	GND	N	9.7	29.2	56.0
2.116500	25.9	GND	N	9.7	30.1	56.0
4.524000	27.6	GND	N	9.7	28.4	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.177000	35.7	GND	L1	9.8	18.9	54.6
0.213000	33.5	GND	L1	9.8	19.6	53.1
0.276000	27.6	GND	N	9.8	23.3	50.9
0.316500	26.1	GND	L1	9.8	23.7	49.8
0.424500	23.3	GND	N	9.8	24.0	47.4
0.559500	25.1	GND	N	9.8	20.9	46.0

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

END OF REPORT