TEST REPORT

No. I14Z47396-EMC01

for

TCT Mobile Limited

HSUPA/HSDPA/UMTS dual-band/GSM quad-band mobile phone

Model Name: 4018M

FCC ID: RAD515

with

Hardware Version: PIO

Software Version: v8I1F

Issued Date: Aug. 1st, 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.6629B-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

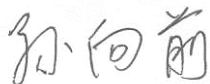|	
Normal Temperature:	15-35℃
Relative Humidity:	20-75%

1.3. Project data

Testing Start Date:	May 26th, 2014
Testing End Date:	May 28th, 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	HSUPA/HSDPA/UMTS dual-band/GSM quad-band mobile phone
Model Name	4018M
FCC ID	RAD515
Extreme vol. Limits	3.5VDC to 4.2VDC (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
EUT3	014141000000212	PIO	v8I1F

*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-0113
AE2	Battery	/	/
AE3	Battery	/	/
AE4	Battery	/	/
AE5	Battery	/	/
AE6	Travel charger	/	14TCT-CH-0307
AE7	Travel charger	/	14TCT-CH-0302
AE8	Travel charger	/	14TCT-CH-0504
AE9	Travel charger	/	14TCT-CH-0511
AE10	USB cable	/	14TCT-DC-0448
AE12	USB cable	/	14TCT-DC-0313
AE14	USB cable	/	/
AE15	USB cable	/	/
AE16	Battery	/	14TCT-BA-0108

AE1, AE16

Model	CAB31P0000C1
Manufacturer	BYD
Capacitance	1300mAh
Nominal voltage	3.7V

AE2

Model	CAB31P0000C3
Manufacturer	SCUD
Capacitance	1300mAh
Nominal voltage	3.7V

AE3
  Model   CAB31P0000CB
  Manufacturer   OCEANSUN
  Capacitance   1300mAh
  Nominal voltage   3.7V

AE4
  Model   CAB1400017C1
  Manufacturer   BYD
  Capacitance   1400mAh
  Nominal voltage   3.7V

AE5
  Model   CAB1400018C2
  Manufacturer   SCUD
  Capacitance   1400mAh
  Nominal voltage   3.7V

AE6, AE7
  Model   CBA3007AG0C1
  Manufacturer   BYD
  Length of cable   /

AE8, AE9
  Model   CBA3007AG0C3
  Manufacturer   YINGJU
  Length of cable   /

AE10
  Model   CDA3122002C1
  Manufacturer   JUWEI
  Length of cable   101cm

AE12
  Model   CDA3122002C2
  Manufacturer   Shenhua
  Length of cable   101cm

AE14
  Model   CDA3122005C1
  Manufacturer   JUWEI
  Length of cable   /

AE15
  Model   CDA3122005C2
  Manufacturer   Shenhua
  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	EUT3+ AE1/AE2/AE3/AE4/AE5+ AE6 + AE10/AE12	Charger
Set.2	EUT3+ AE1/AE2/AE3/AE4/AE5+ AE8 + AE10/AE12	Charger
Set.3	EUT3+ AE1/AE2/AE3/AE4/AE5+ AE10/AE12	USB

Note: The HSUPA/HSDPA/UMTS dual-band/GSM quad-band mobile phone 4018M manufactured by TCT Mobile Limited is a variant model based on 4018A for conformance test. According to the declaration of changes, no test needs to been performed, all results are cited from the initial model. The report number for initial model is I14Z46744-EMC01.

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

Clause	List	Clause in FCC rules	Verdict	Location
1	Radiated Emission	15.109(a)	P	A
2	Conducted Emission	15.107(a)	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	2015-06-27	1 year
5	LISN	ESH2-Z5	829991/012	R&S	2015-04-14	1 year
6	EMI Antenna	VULB 9163	9163-234	Schwarzbeck	2016-09-16	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

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 (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
5813.750	30.6	-33.8	35.1	29.300	VERTICAL
5773.125	30.4	-33.8	35.1	29.100	HORIZONTAL
5808.281	30.4	-33.8	35.1	29.100	VERTICAL
5781.563	30.4	-33.8	35.1	29.100	HORIZONTAL
5779.844	30.4	-33.8	35.1	29.100	VERTICAL
5775.938	30.4	-33.8	35.1	29.100	VERTICAL

Charging Mode/Peak detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBμV)	Polarity
5761.875	42.8	-33.8	35.1	41.500	VERTICAL
5797.813	42.7	-33.8	35.1	41.400	VERTICAL
5772.344	42.6	-33.8	35.1	41.300	VERTICAL
5774.219	42.5	-33.8	35.1	41.200	VERTICAL
5268.594	42.5	-34.4	34.6	42.300	VERTICAL
5285.313	42.4	-34.4	34.6	42.200	VERTICAL

Measurement result for Set.2:

Charging Mode/Average detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBμV)	Polarity
5773.125	30.5	-33.8	35.1	29.200	HORIZONTAL
5772.344	30.5	-33.8	35.1	29.200	VERTICAL
5780.469	30.4	-33.8	35.1	29.100	VERTICAL
5770.313	30.4	-33.8	35.1	29.100	HORIZONTAL
5819.531	30.4	-33.8	35.1	29.100	HORIZONTAL
5809.844	30.4	-33.8	35.1	29.100	VERTICAL

Charging Mode/Peak detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBμV)	Polarity
5272.188	43.1	-34.4	34.6	42.900	HORIZONTAL
5577.344	42.8	-34.2	35.1	41.900	VERTICAL
5981.406	42.8	-33.5	35.1	41.200	VERTICAL
5784.844	42.6	-33.8	35.1	41.300	VERTICAL
5578.281	42.4	-34.2	35.1	41.500	VERTICAL
5738.906	42.4	-33.8	35.1	41.100	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
1254.844	34.7	-41.1	24.1	51.700	HORIZONTAL
1264.219	34.7	-40.8	24.1	51.400	VERTICAL
1254.531	34.5	-41.1	24.1	51.500	VERTICAL
1254.688	34.5	-41.1	24.1	51.500	VERTICAL
1255.000	34.5	-41.1	24.1	51.500	VERTICAL
1260.156	34.4	-40.8	24.1	51.100	HORIZONTAL

USB Mode/ Peak detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{mea}(dBμV)	Polarity
1575.000	50.9	-40.1	25.3	65.700	VERTICAL
1990.938	50.6	-35.7	25.3	61.000	HORIZONTAL
1575.469	50.3	-40.1	25.3	65.100	VERTICAL
1576.563	50.2	-40.1	25.3	65.000	HORIZONTAL
1587.344	50.1	-39.9	25.3	64.700	VERTICAL
1578.906	50.1	-40.1	25.3	64.900	VERTICAL

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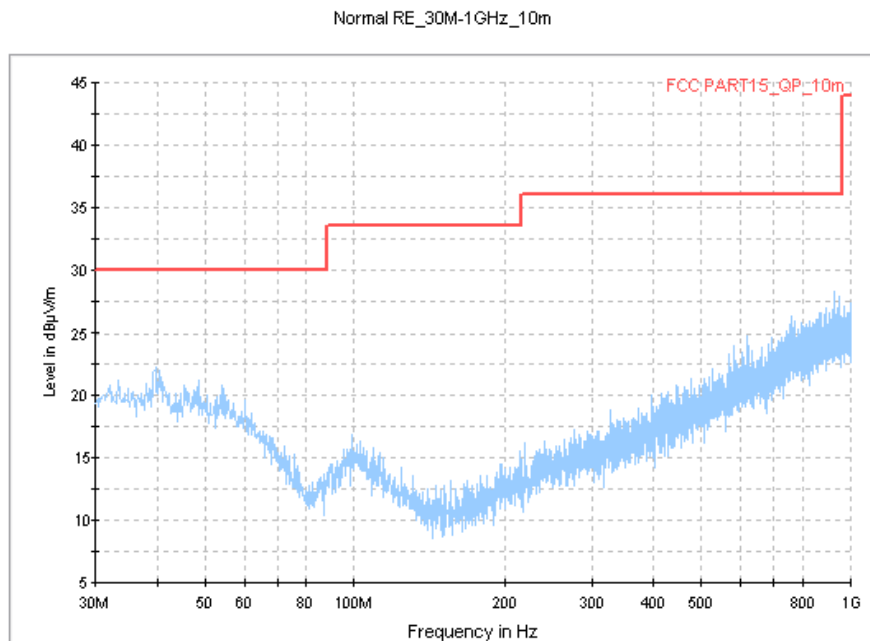
Charging Mode, Set.1

Normal RE_30M-1GHz_10m

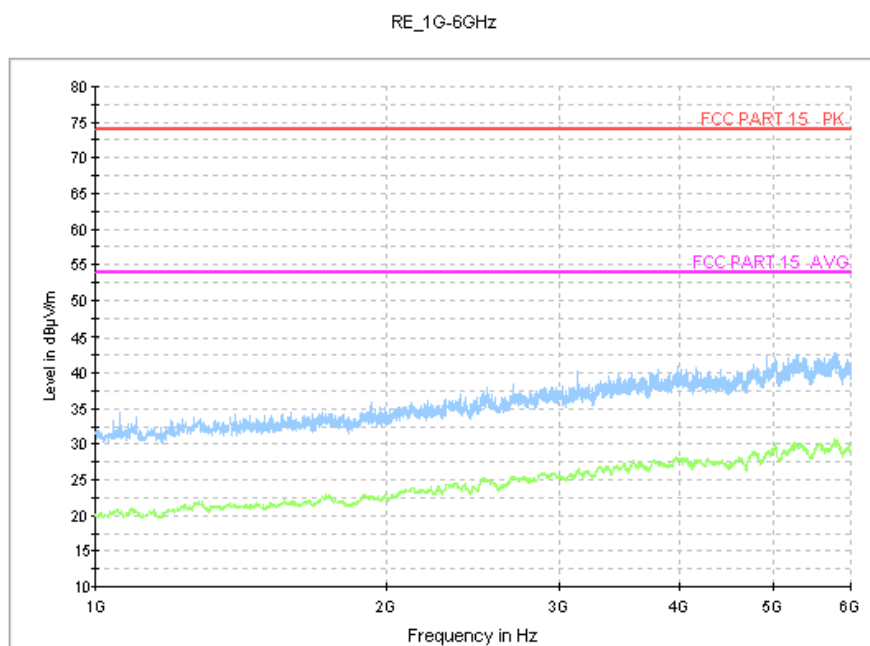**Figure A.1 Radiated Emission from 30MHz to 1GHz**

RE_1G-6GHz

Figure A.2 Radiated Emission from 1GHz to 6GHz

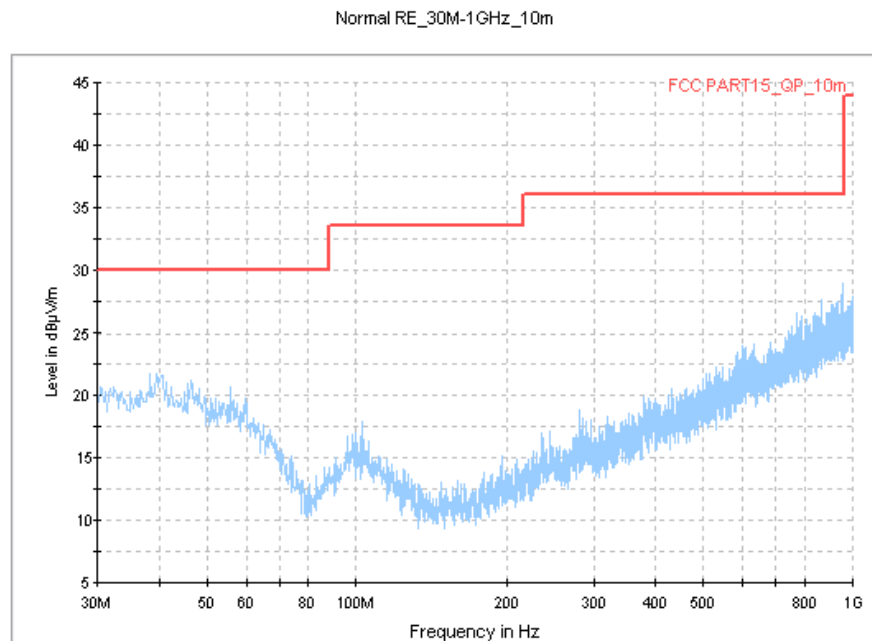**Charging Mode, Set.2**
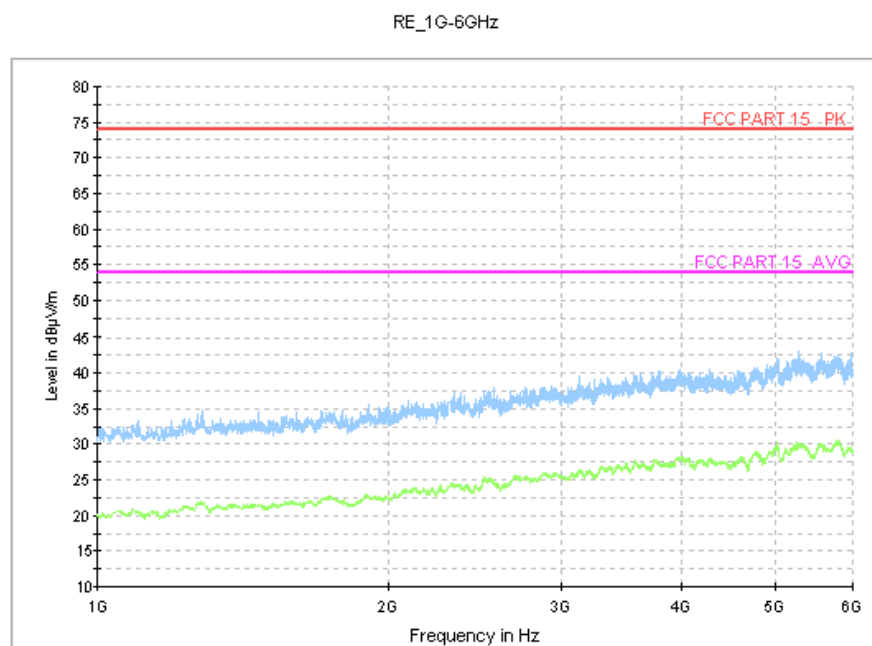

Figure A.3 Radiated Emission from 30MHz to 1GHz

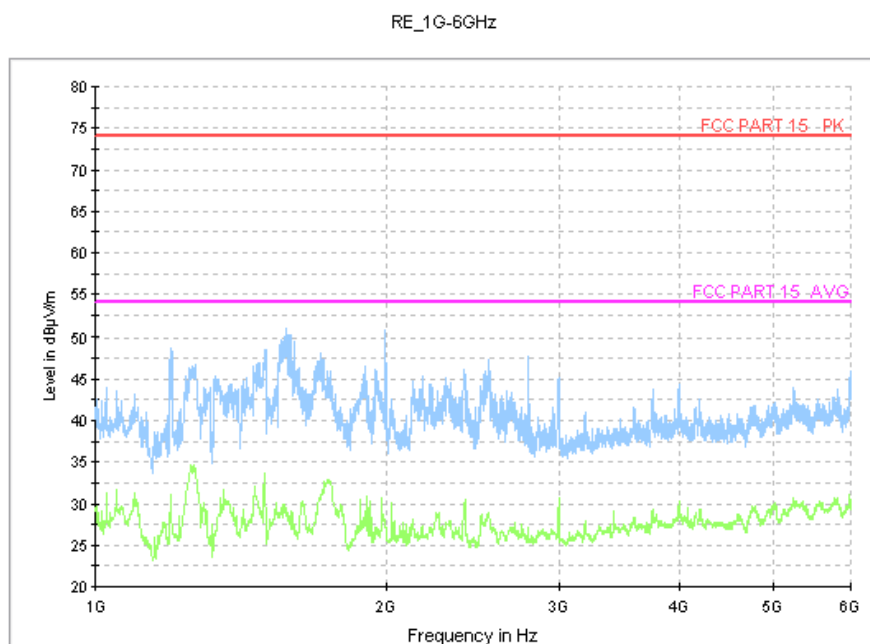**Figure A.4 Radiated Emission from 1GHz to 6GHz**

USB Mode, Set.3

Normal RE_30M-1GHz_10m
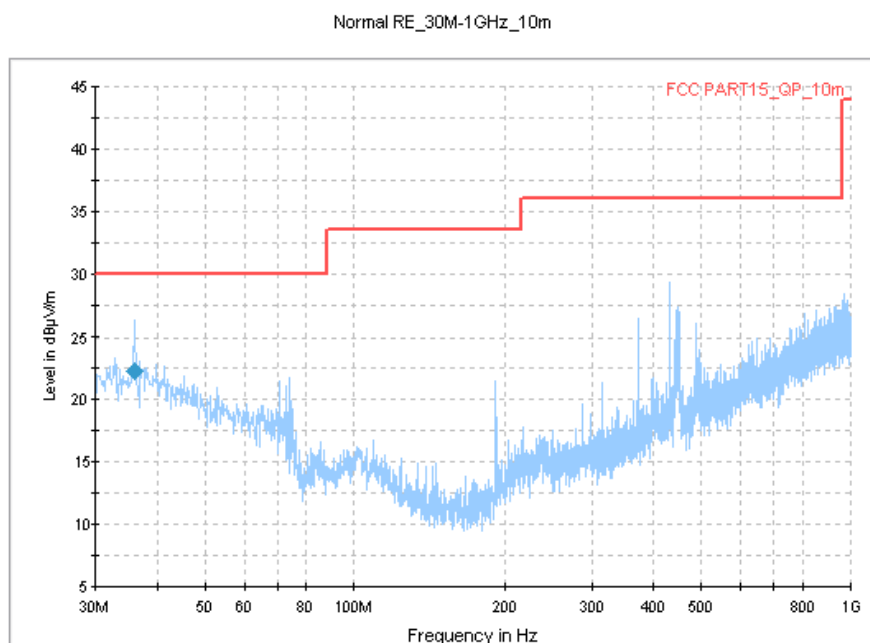
Figure A.5 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency MHz	QuasiPeak dBμV/m	Limit dBμV/m	Margin dB	Azimuth Deg	Polarization H/V
36.062500	22.3	30.0	7.7	150.0	V

RE_1G-6GHz

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

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 7.2.

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 (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
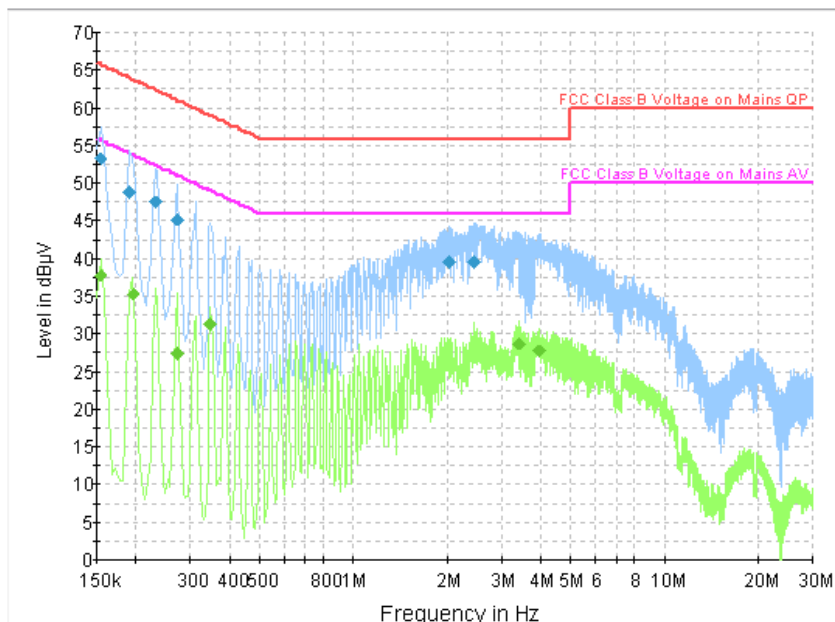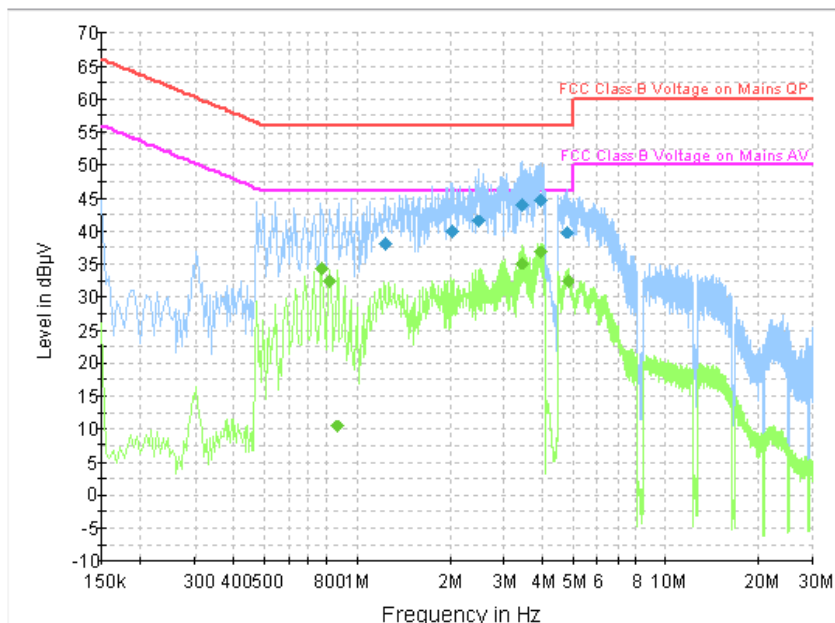

Figure A.7 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.154500	53.3	GND	L1	9.8	12.4	65.8
0.190500	48.8	GND	L1	9.8	15.2	64.0
0.231000	47.6	GND	L1	9.8	14.8	62.4
0.271500	45.2	GND	L1	9.8	15.9	61.1
2.017500	39.6	GND	L1	9.7	16.4	56.0
2.427000	39.7	GND	L1	9.7	16.3	56.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.154500	37.9	GND	L1	9.8	17.9	55.8
0.195000	35.3	GND	L1	9.8	18.6	53.8
0.271500	27.5	GND	L1	9.8	23.6	51.1
0.348000	31.3	GND	N	9.8	17.7	49.0
3.408000	28.6	GND	L1	9.7	17.4	46.0
3.979500	27.7	GND	L1	9.7	18.3	46.0

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

Charging Mode, Set.2
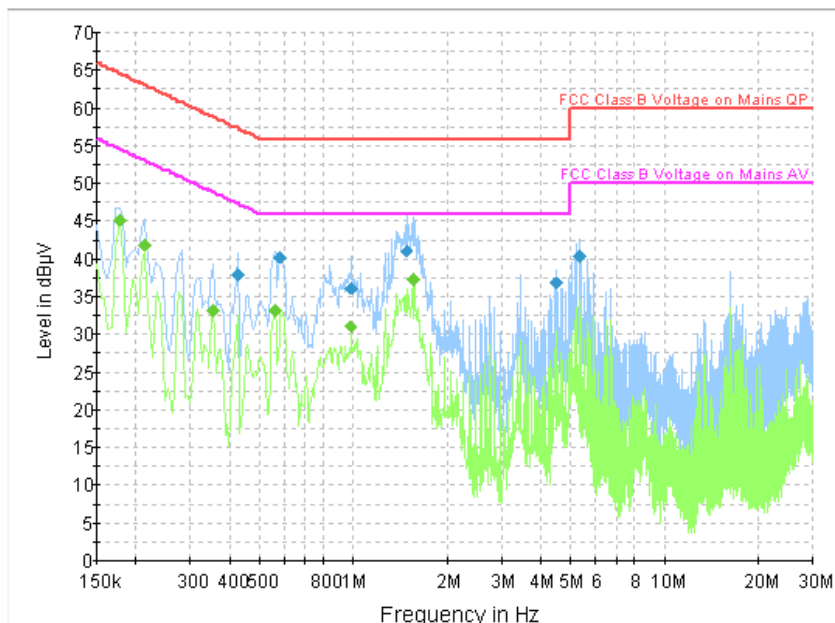

Figure A.8 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
1.234500	38.1	GND	N	9.7	17.9	56.0
2.053500	40.0	GND	L1	9.7	16.0	56.0
2.472000	41.6	GND	L1	9.7	14.4	56.0
3.439500	43.9	GND	L1	9.7	12.1	56.0
3.952500	44.8	GND	L1	9.7	11.2	56.0
4.807500	39.8	GND	L1	9.8	16.2	56.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.771000	34.4	GND	L1	9.8	11.6	46.0
0.816000	32.5	GND	L1	9.8	13.5	46.0
0.865500	10.4	GND	N	9.7	35.6	46.0
3.439500	35.0	GND	L1	9.7	11.0	46.0
3.952500	36.8	GND	L1	9.7	9.2	46.0
4.821000	32.4	GND	L1	9.8	13.6	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)
0.424500	37.9	GND	N	9.8	19.4	57.4
0.582000	40.2	GND	N	9.8	15.8	56.0
0.987000	36.2	GND	N	9.7	19.8	56.0
1.477500	41.0	GND	L1	9.7	15.0	56.0
4.524000	36.8	GND	L1	9.7	19.2	56.0
5.311500	40.5	GND	N	9.7	19.5	60.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.177000	45.3	GND	L1	9.8	9.4	54.6
0.213000	41.9	GND	L1	9.8	11.2	53.1
0.352500	33.2	GND	L1	9.8	15.7	48.9
0.559500	33.2	GND	N	9.8	12.8	46.0
0.982500	31.1	GND	L1	9.7	14.9	46.0
1.572000	37.4	GND	L1	9.7	8.6	46.0

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

END OF REPORT