TEST REPORT

No. I14Z47556-EMC02

for

TCT Mobile Limited

GSM quad band mobile phone

Model Name: 2004C

FCC ID: RAD529

with

Hardware Version: PIO

Software Version: SWC41

Issued Date: Sep.25th, 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

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%

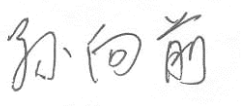
1.3. Project data

Testing Start Date: Sep. 9th, 2014
Testing End Date: Sep. 12th, 2014

1.4. Signature

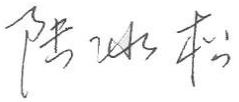
Qu Pengfei

(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@tcl.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	GSM quad band mobile phone
Model Name	2004C
FCC ID	RAD529
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	014253000000173	PIO	SWC41

*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-0128
AE2	Battery	/	14TCT-BA-1095
AE3	USB cable	/	14TCT-DC-0638
AE4	USB cable	/	14TCT-DC-0649
AE5	USB cable	/	/
AE6	USB cable	/	/
AE18	Travel charger	/	14TCT-CH-0237
AE19	Travel charger	/	14TCT-CH-0315
AE20	Charger Cradle	/	/

AE1,AE2

Model	CAB31L0000C1
Manufacturer	BYD
Capacitance	1000mAh
Nominal voltage	3.7V

AE3

Model	CDA3122002C1
Manufacturer	JUWEI
Length of cable	99cm

AE4

Model	CDA3122002C2
Manufacturer	SHENGHUA
Length of cable	97.5cm

AE5

Model	CDA3122005C1
Manufacturer	JUWEI

Length of cable	/
AE6	
Model	CDA3122005C2
Manufacturer	SHENGHUA
Length of cable	/
AE18	
Model	CBA3007AG0C1
Manufacturer	BYD
Length of cable	/
AE19	
Model	CBA3007AG0C3
Manufacturer	YINGJU
Length of cable	/
AE20	
Model	YJC003R-050D
Manufacturer	/
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+ AE4+ AE18	Charger
Set.2	EUT3+ AE1+ AE4+ AE19	Charger
Set.3	EUT3+ AE1+ AE4	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	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	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

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
17984.700	46.3	-17.7	45.6	18.400	HORIZONTAL
17996.600	46.3	-17.7	45.6	18.400	VERTICAL
17989.800	46.2	-17.7	45.6	18.300	VERTICAL
17972.800	46.1	-17.7	45.6	18.200	HORIZONTAL
17983.000	46.1	-17.7	45.6	18.200	HORIZONTAL
17986.400	46.1	-17.7	45.6	18.200	VERTICAL

Charging Mode/Peak detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBμV)	Polarity
17991.500	57.5	-17.7	45.6	29.600	VERTICAL
17881.000	57.5	-18.5	45.6	30.400	VERTICAL
17937.100	57.5	-17.7	45.6	29.600	HORIZONTAL
17969.400	57.2	-17.7	45.6	29.300	HORIZONTAL
17972.800	57.1	-17.7	45.6	29.200	VERTICAL
17947.300	57.1	-17.7	45.6	29.200	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
17994.900	46.5	-17.7	45.6	18.600	HORIZONTAL
17977.900	46.3	-17.7	45.6	18.400	HORIZONTAL
18000.000	46.3	-17.7	44.5	19.500	VERTICAL
17984.700	46.2	-17.7	45.6	18.300	VERTICAL
17991.500	46.2	-17.7	45.6	18.300	HORIZONTAL
17967.700	46.2	-17.7	45.6	18.300	HORIZONTAL

Charging Mode/Peak detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBμV)	Polarity
17991.500	57.9	-17.7	45.6	30.000	VERTICAL
17916.700	57.4	-17.7	45.6	29.500	VERTICAL
17964.300	57.4	-17.7	45.6	29.500	HORIZONTAL
17976.200	57.3	-17.7	45.6	29.400	VERTICAL
17865.700	57.3	-18.5	45.6	30.200	HORIZONTAL
17988.100	57.3	-17.7	45.6	29.400	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
17996.600	46.4	-17.7	45.6	18.500	HORIZONTAL
17989.800	46.3	-17.7	45.6	18.400	VERTICAL
17981.300	46.3	-17.7	45.6	18.400	VERTICAL
17993.200	46.2	-17.7	45.6	18.300	HORIZONTAL
17998.300	46.2	-17.7	45.6	18.300	HORIZONTAL
17984.700	46.2	-17.7	45.6	18.300	VERTICAL

USB Mode/ Peak detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{mea}(dBμV)	Polarity
17989.800	58.6	-17.7	45.6	30.700	VERTICAL
17986.400	57.7	-17.7	45.6	29.800	HORIZONTAL
17979.600	57.5	-17.7	45.6	29.600	VERTICAL
17998.300	57.5	-17.7	45.6	29.600	HORIZONTAL
17996.600	57.3	-17.7	45.6	29.400	VERTICAL
17845.300	57.2	-18.5	45.6	30.100	HORIZONTAL

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

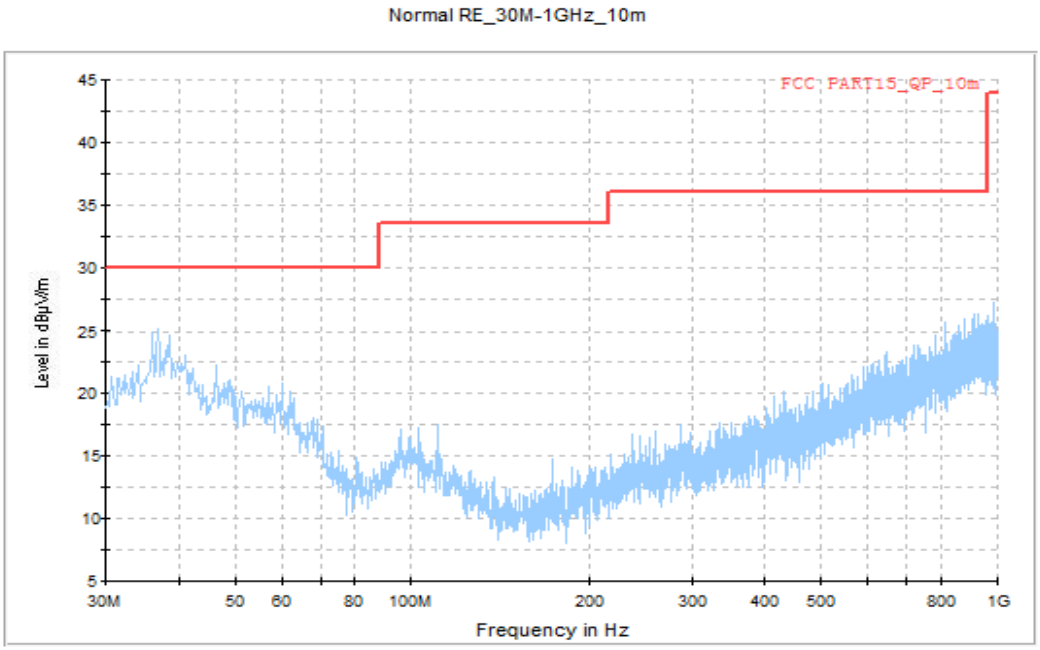


Figure A.1 Radiated Emission from 30MHz to 1GHz

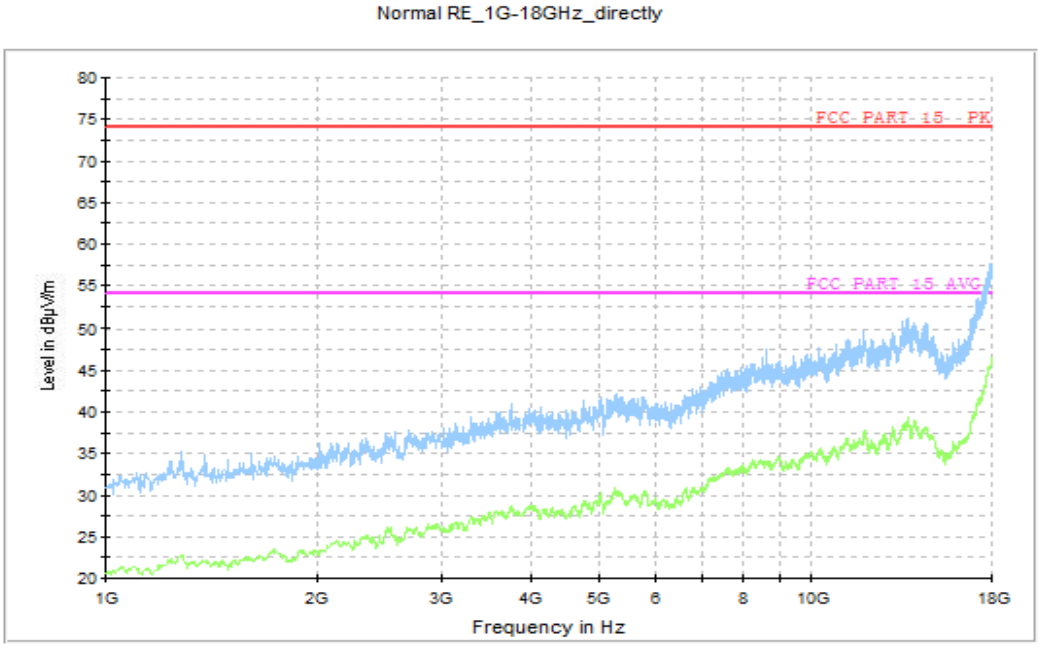


Figure A.2 Radiated Emission from 1GHz to 18GHz

Charging Mode, Set.2

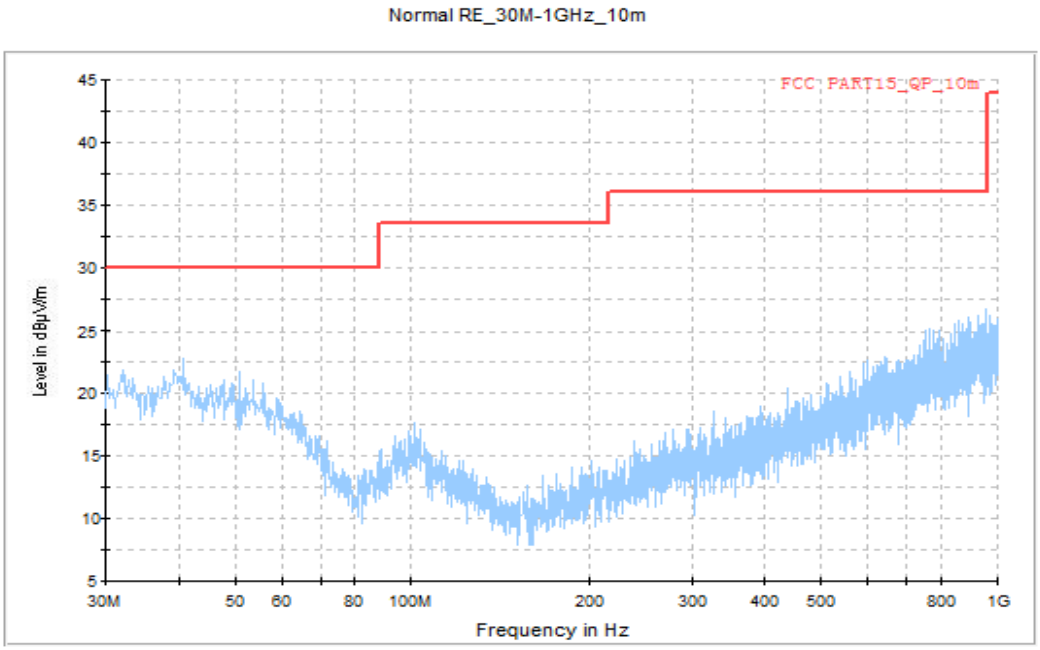


Figure A.3 Radiated Emission from 30MHz to 1GHz

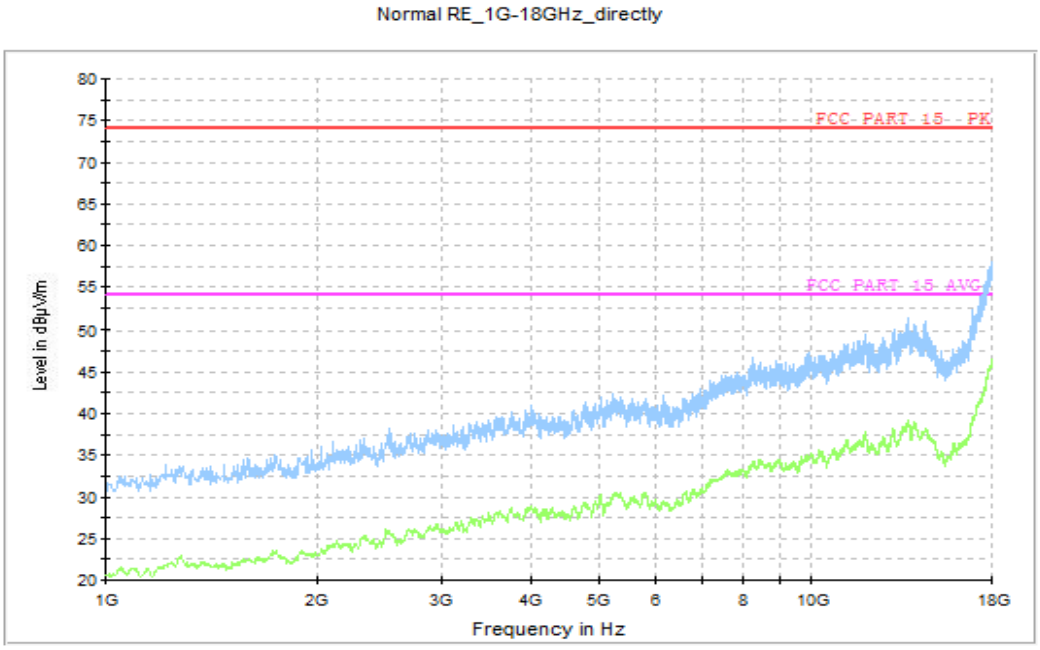


Figure A.4 Radiated Emission from 1GHz to 18GHz

USB Mode, Set.3

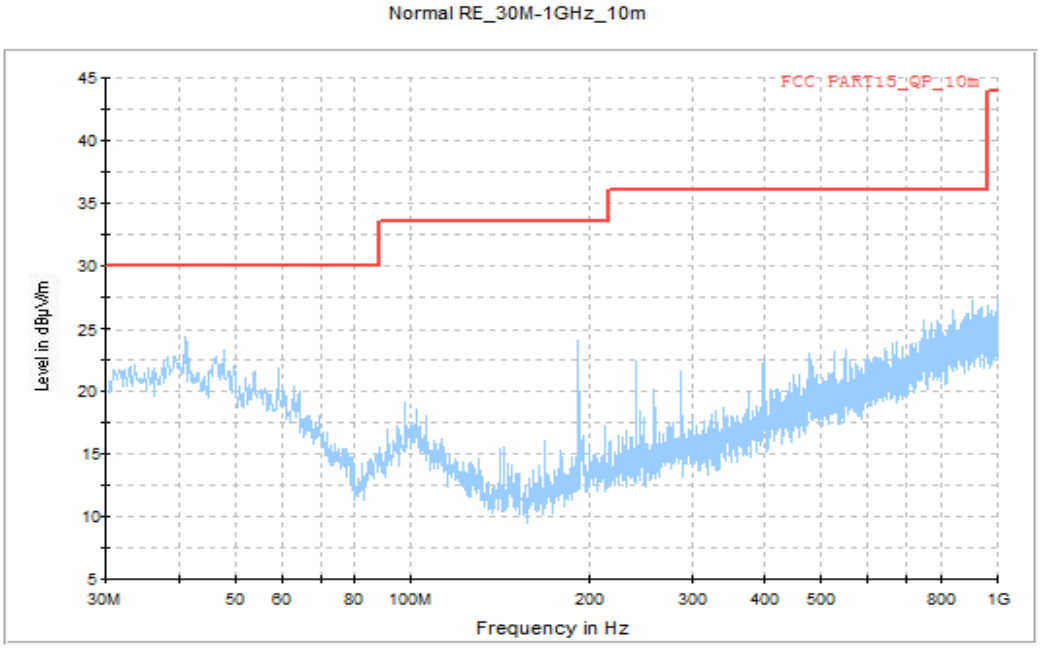


Figure A.5 Radiated Emission from 30MHz to 1GHz

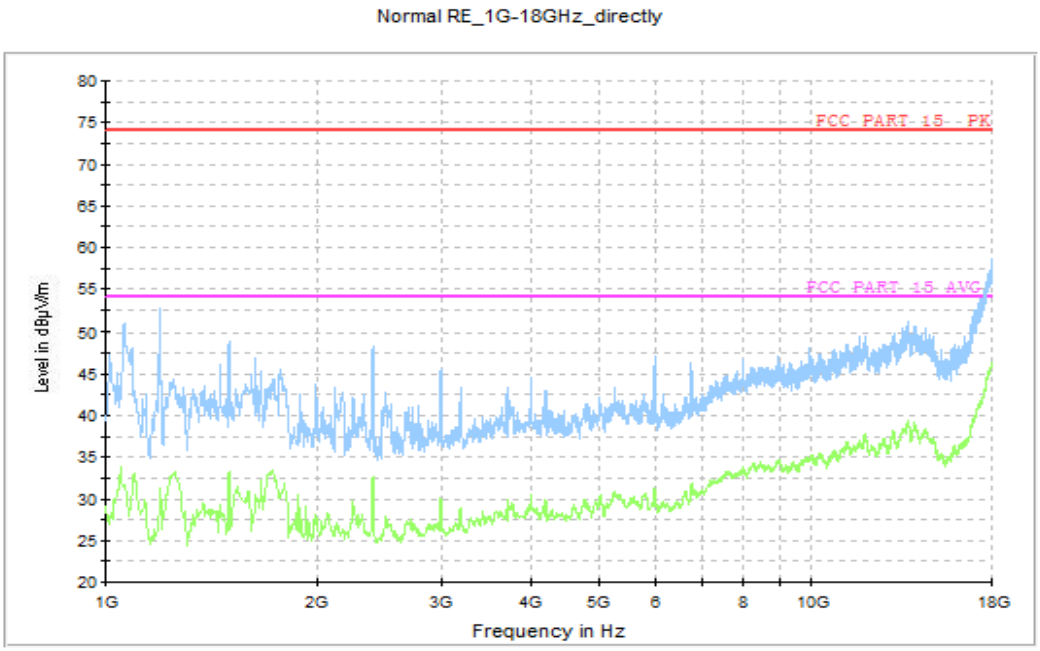


Figure A.6 Radiated Emission from 1GHz to18GHz

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 (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

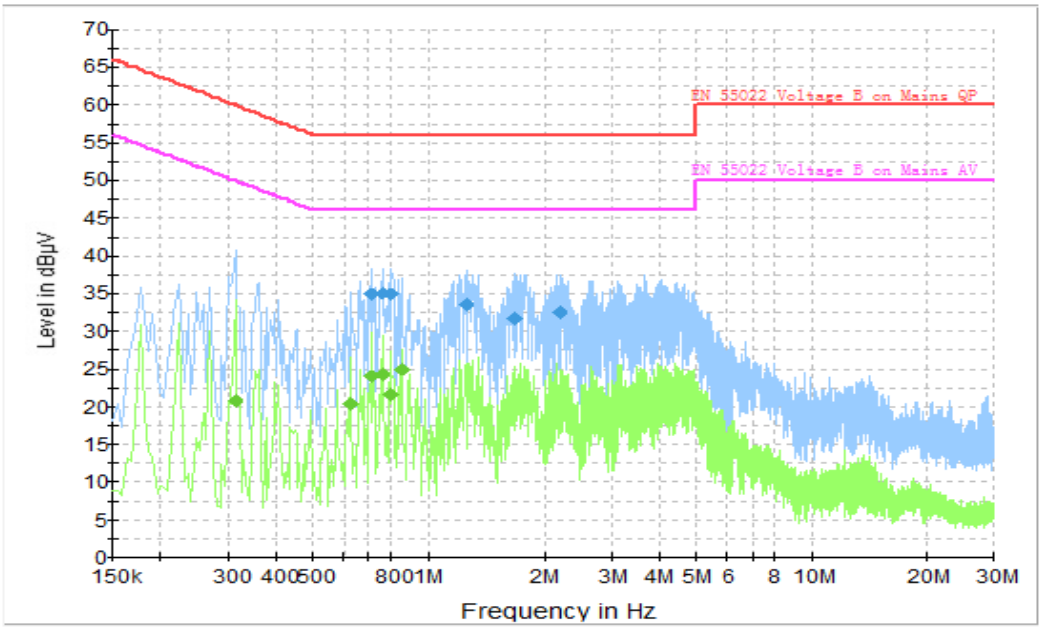


Figure A.7 Conducted Emission

Final Result 1

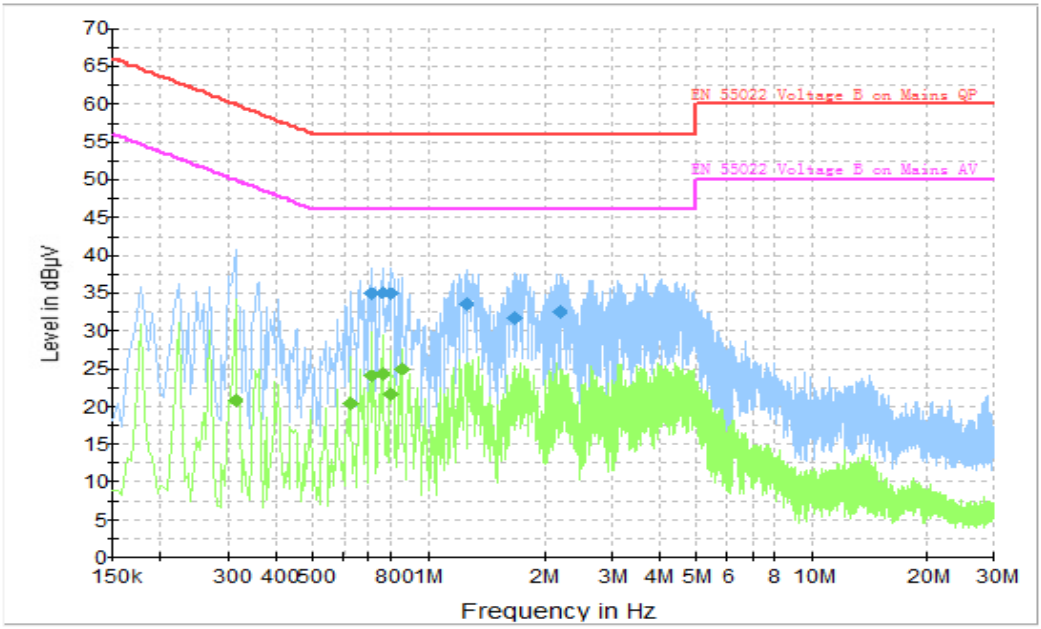
Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.712500	34.8	2000.0	9.000	On	N	10.0	21.2	56.0
0.757500	35.0	2000.0	9.000	On	N	10.0	21.0	56.0
0.802500	34.8	2000.0	9.000	On	L1	10.0	21.2	56.0
1.252500	33.5	2000.0	9.000	On	L1	9.9	22.5	56.0
1.689000	31.7	2000.0	9.000	On	L1	9.9	24.3	56.0
2.202000	32.5	2000.0	9.000	On	N	9.8	23.5	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.312000	20.8	2000.0	9.000	On	L1	10.0	29.1	49.9
0.622500	20.2	2000.0	9.000	On	N	10.1	25.8	46.0
0.712500	24.0	2000.0	9.000	On	N	10.0	22.0	46.0
0.757500	24.3	2000.0	9.000	On	N	10.0	21.7	46.0
0.798000	21.6	2000.0	9.000	On	N	10.0	24.4	46.0
0.852000	24.9	2000.0	9.000	On	N	10.0	21.1	46.0

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

Charging Mode, Set.2



Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.712500	34.8	2000.0	9.000	On	N	10.0	21.2	56.0
0.757500	35.0	2000.0	9.000	On	N	10.0	21.0	56.0
0.802500	34.8	2000.0	9.000	On	L1	10.0	21.2	56.0
1.252500	33.5	2000.0	9.000	On	L1	9.9	22.5	56.0
1.689000	31.7	2000.0	9.000	On	L1	9.9	24.3	56.0
2.202000	32.5	2000.0	9.000	On	N	9.8	23.5	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.312000	20.8	2000.0	9.000	On	L1	10.0	29.1	49.9
0.622500	20.2	2000.0	9.000	On	N	10.1	25.8	46.0
0.712500	24.0	2000.0	9.000	On	N	10.0	22.0	46.0
0.757500	24.3	2000.0	9.000	On	N	10.0	21.7	46.0
0.798000	21.6	2000.0	9.000	On	N	10.0	24.4	46.0
0.852000	24.9	2000.0	9.000	On	N	10.0	21.1	46.0

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

USB Mode, Set.3

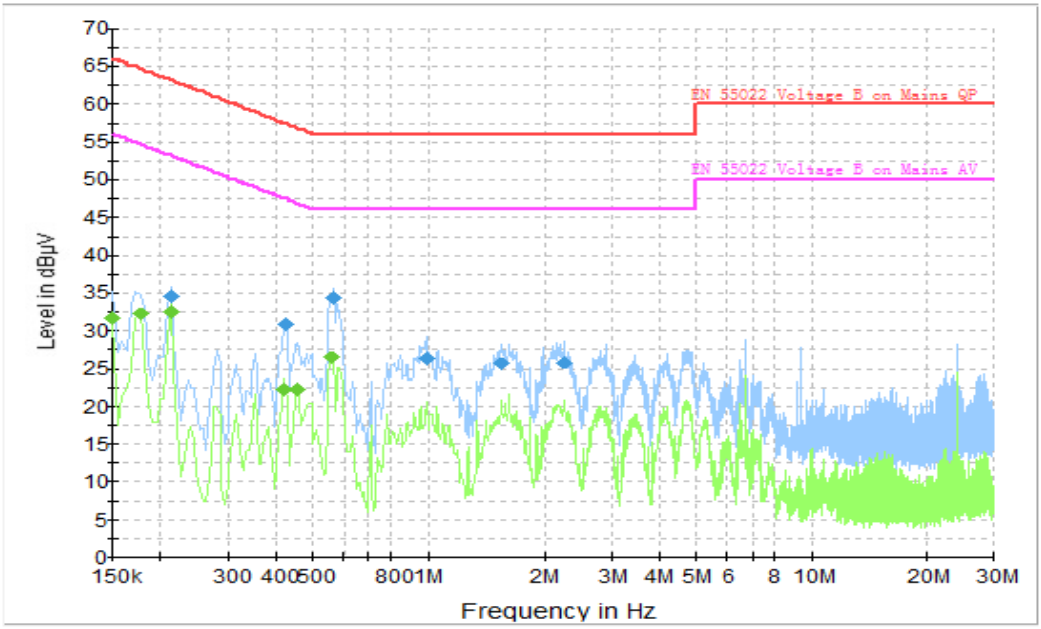


Figure A.9 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.213000	34.6	2000.0	9.000	On	L1	10.0	28.5	63.1
0.424500	30.9	2000.0	9.000	On	L1	10.1	26.5	57.4
0.564000	34.3	2000.0	9.000	On	N	10.1	21.7	56.0
0.987000	26.3	2000.0	9.000	On	N	9.9	29.7	56.0
1.554000	25.6	2000.0	9.000	On	L1	9.9	30.4	56.0
2.265000	25.7	2000.0	9.000	On	N	9.8	30.3	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	31.6	2000.0	9.000	On	N	9.9	24.4	56.0
0.177000	32.1	2000.0	9.000	On	N	10.2	22.5	54.6
0.213000	32.5	2000.0	9.000	On	L1	10.0	20.6	53.1
0.420000	22.1	2000.0	9.000	On	N	10.1	25.4	47.4
0.456000	22.1	2000.0	9.000	On	L1	10.1	24.7	46.8
0.559500	26.4	2000.0	9.000	On	N	10.1	19.6	46.0

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

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