TEST REPORT

No. I14Z45733-EMC03

for

TCT Mobile Limited

HSUPA/HSDPA/UMTS Tri-band/GSM Quad band mobile phone

Model Name: 5038E

FCC ID: RAD491

with

Hardware Version: Proto

Software Version: 6B13

Issued Date: May 7th, 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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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

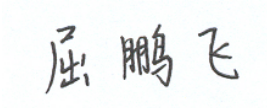
1.2. Testing Environment

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

1.3. Project data

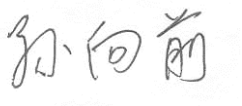
Testing Start Date: Apr. 15th, 2014
Testing End Date: Apr. 16th, 2014

1.4. Signature



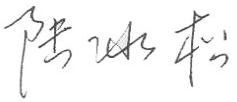
Qu Pengfei

(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 Tri-band/GSM Quad band mobile phone
Model Name	5038E
FCC ID	RAD491
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
EUT1	864658020000253	Proto	6B13
EUT2	864658020000113	Proto	6B13

*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	/	1445729BA003
AE2	Battery	/	/
AE3	Travel charger	/	TCT-CHR-1391
AE4	Travel charger	/	TCT-CHR-1723
AE5	Travel charger	/	13990CHR05
AE6	USB cable	/	TCT-DC-0497
AE7	USB cable	/	TCT-DC-0520
AE8	USB cable	/	TCT-DC-0504
AE9	USB cable	/	/
AE10	USB cable	/	/
AE11	USB cable	/	/
AE12	Battery	/	1445729BA007

AE1, AE12

Model	TLi018D1
Manufacturer	BYD
Capacitance	1800 mAh
Nominal voltage	3.8V

AE2

Model	TLi018D2
Manufacturer	SCUD
Capacitance	1800 mAh
Nominal voltage	3.8V

AE3

Model	CBA3007AG0C1
Manufacturer	BYD
Length of cable	/

AE4

Model	CBA3007AG0C3
Manufacturer	YINGJU
Length of cable	/

AE5

Model	CBA3000AG0C1
Manufacturer	TEN PAO
Length of cable	/

AE6, AE7, AE8

Model	CDA3122002C2
Manufacturer	JUWEI
Length of cable	98cm

AE9

Model	CDA3122002C1
Manufacturer	Shenghua
Length of cable	/

AE10

Model	CDA3122005C1
Manufacturer	JUWEI
Length of cable	/

AE11

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	EUT1+ AE1/AE2+ AE3 + AE6/AE9	Charger
Set.2	EUT1+ AE1/AE2+ AE4 + AE6/AE9	Charger
Set.3	EUT1+ AE1/AE2+ AE5 + AE6/AE9	Charger
Set.4	EUT1+ AE1/AE2+ AE6/AE9	USB模式

Note:

HSUPA/HSDPA/UMTS Tri-band/GSM Quad band mobile phone 5038E manufactured by TCT Mobile Limited is a variant model based on 5038A for conformance test. The results are inherited from the initial model. The report number of initial model is I14Z45729-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	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	ENV216	101200	R&S	2014-07-11	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	CN0RH659658907 ATOI40	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
9993.531	34.1	-24.2	38.0	20.300	VERTICAL
9979.469	33.9	-24.2	38.0	20.100	VERTICAL
9990.719	33.9	-24.2	38.0	20.100	HORIZONTAL
9958.656	33.9	-24.9	38.0	20.800	VERTICAL
9992.969	33.8	-24.2	38.0	20.000	VERTICAL
9101.125	33.8	-26.7	38.4	22.100	VERTICAL

Charging Mode/Peak detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBμV)	Polarity
9993.531	46.9	-24.2	38.0	33.100	VERTICAL
8141.781	46.3	-27.5	37.7	36.100	VERTICAL
8098.469	46.0	-27.5	37.7	35.800	HORIZONTAL
7933.938	45.8	-27.8	37.5	36.100	VERTICAL
8390.688	45.8	-27.1	37.7	35.200	VERTICAL
8114.219	45.7	-27.5	37.7	35.500	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
9993.531	35.5	-24.2	38.0	21.700	VERTICAL
9998.594	35.4	-24.2	38.0	21.600	VERTICAL
9991.281	35.3	-24.2	38.0	21.500	VERTICAL
9987.625	35.3	-24.2	38.0	21.500	VERTICAL
9994.094	35.2	-24.2	38.0	21.400	VERTICAL
9982.563	35.2	-24.2	38.0	21.400	HORIZONTAL

Charging Mode/Peak detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBμV)	Polarity
9971.031	47.0	-24.2	38.0	33.200	VERTICAL
9987.625	46.9	-24.2	38.0	33.100	VERTICAL
8808.344	46.8	-26.8	38.0	35.600	HORIZONTAL
8817.063	46.6	-26.8	38.0	35.400	HORIZONTAL
9991.563	46.5	-24.2	38.0	32.700	VERTICAL
9993.531	46.5	-24.2	38.0	32.700	HORIZONTAL

Measurement result for Set.3:

Charging Mode/Average detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBμV)	Polarity
9990.156	35.1	-24.2	38.0	21.300	VERTICAL
9990.719	35.1	-24.2	38.0	21.300	VERTICAL
9987.063	35.1	-24.2	38.0	21.300	VERTICAL
9987.625	35.1	-24.2	38.0	21.300	VERTICAL
9982.281	35.1	-24.2	38.0	21.300	HORIZONTAL
9991.281	35.0	-24.2	38.0	21.200	VERTICAL

Charging Mode/Peak detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBμV)	Polarity
9985.938	48.2	-24.2	38.0	34.400	VERTICAL
9154.000	47.9	-26.1	38.4	35.600	HORIZONTAL
9101.688	47.0	-26.7	38.4	35.300	VERTICAL
9100.281	46.8	-26.7	38.4	35.100	HORIZONTAL
9152.875	46.7	-26.1	38.4	34.400	VERTICAL
9992.969	46.5	-24.2	38.0	32.700	HORIZONTAL

Measurement result for Set.4:

USB Mode/Average detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{mea}(dBμV)	Polarity
1874.969	38.8	-35.6	25.3	49.100	HORIZONTAL
1874.688	37.6	-35.6	25.3	47.900	VERTICAL
1874.406	34.9	-35.6	25.3	45.200	VERTICAL
9993.250	34.5	-24.2	38.0	20.700	HORIZONTAL
1892.688	34.4	-35.0	25.3	44.100	VERTICAL
7996.375	34.3	-27.8	37.5	24.600	VERTICAL

USB Mode/ Peak detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{mea}(dBμV)	Polarity
1988.875	54.3	-35.7	25.3	64.700	VERTICAL
1992.813	54.1	-35.7	25.3	64.500	HORIZONTAL
7996.938	49.3	-27.8	37.5	39.600	VERTICAL
7996.094	49.3	-27.8	37.5	39.600	HORIZONTAL
1874.969	49.0	-35.6	25.3	59.300	VERTICAL
7995.531	48.7	-27.8	37.5	39.000	VERTICAL

Note: The measurement results of Set.1, Set.2, Set.3 and Set.4 showed here are worst cases of the combinations of different batteries and USB cables.

Charging Mode, Set.1

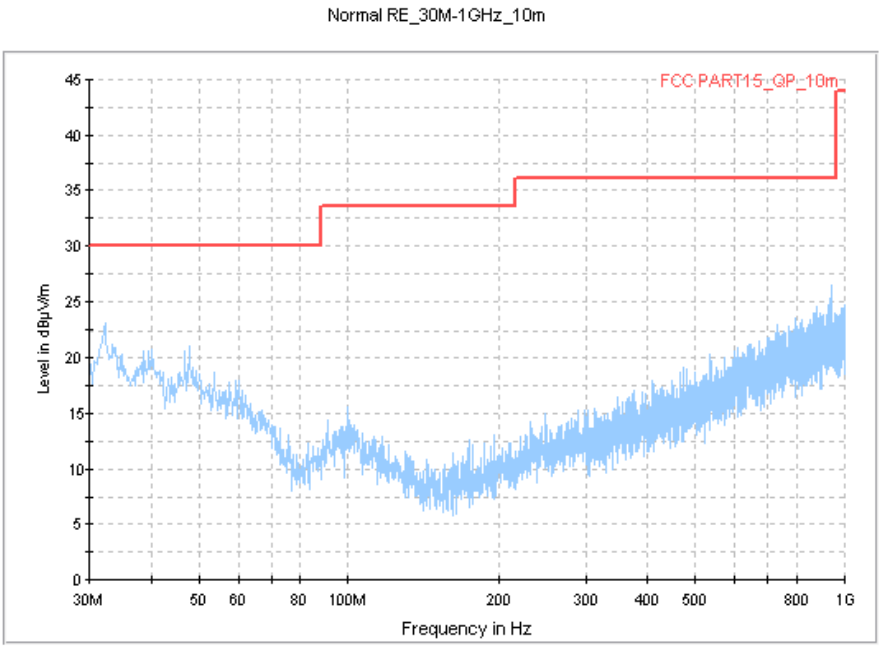


Figure A.1 Radiated Emission from 30MHz to 1GHz

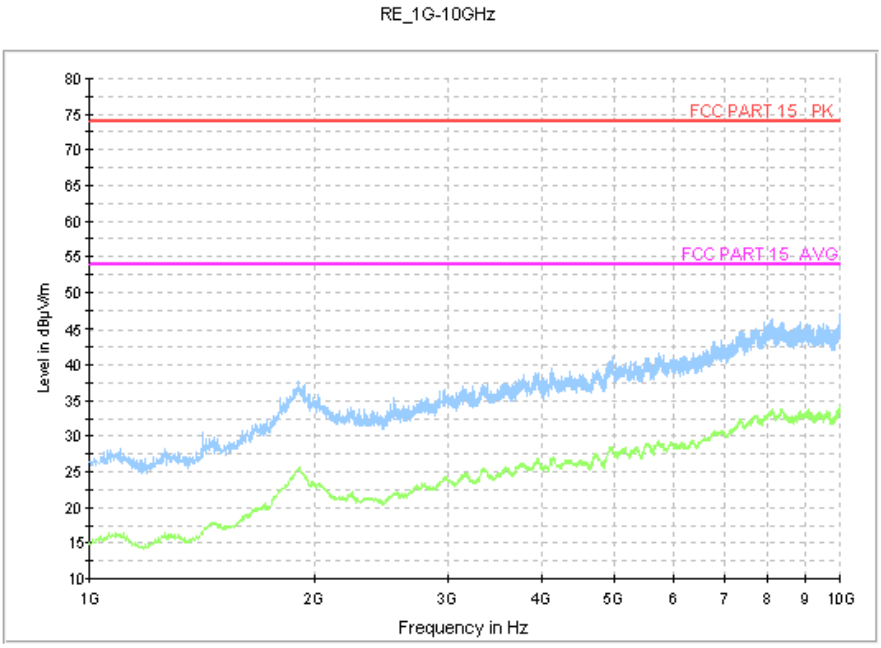


Figure A.2 Radiated Emission from 1GHz to 10GHz

Charging Mode, Set.2

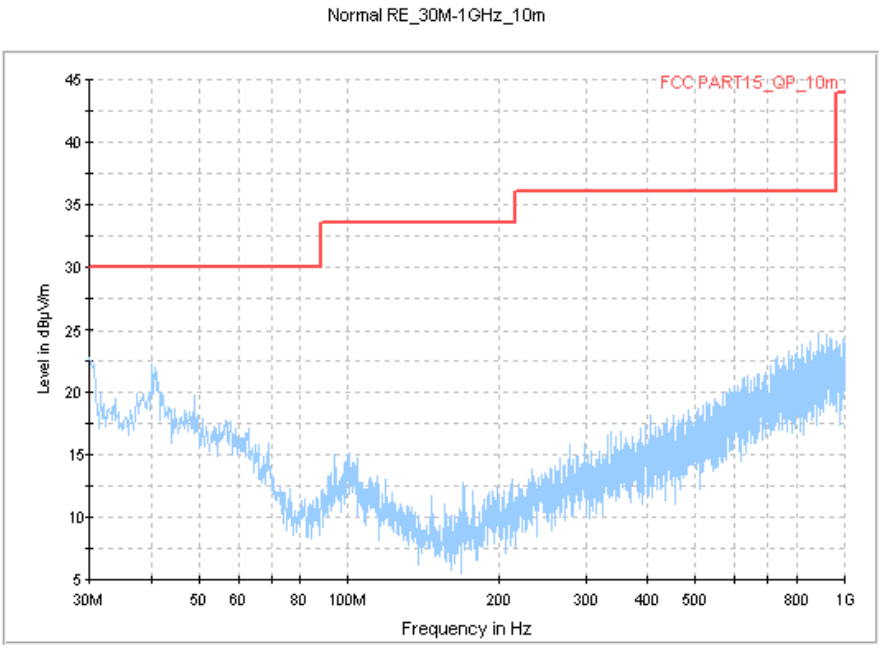


Figure A.3 Radiated Emission from 30MHz to 1GHz

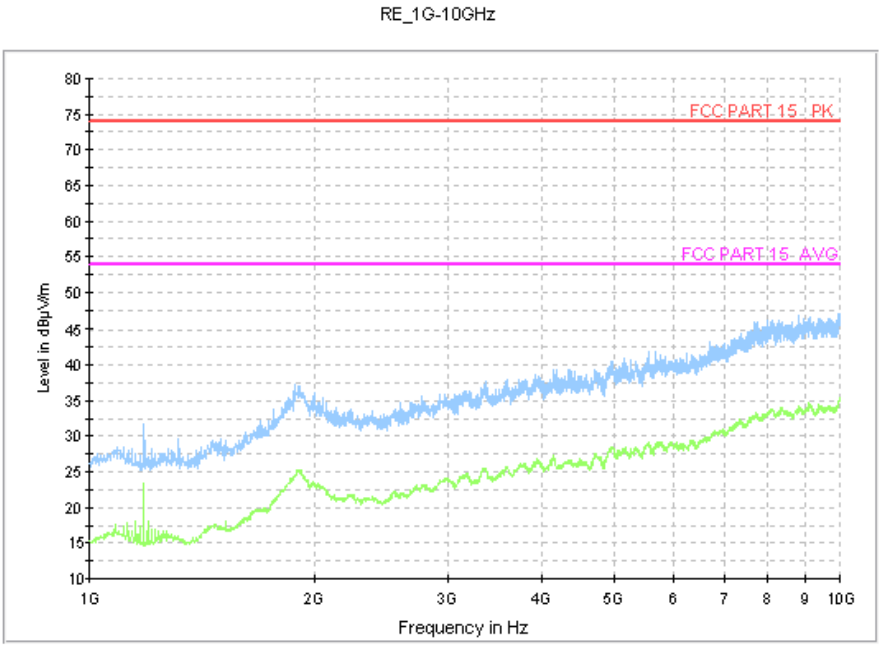


Figure A.4 Radiated Emission from 1GHz to 10GHz

Charging Mode, Set.3

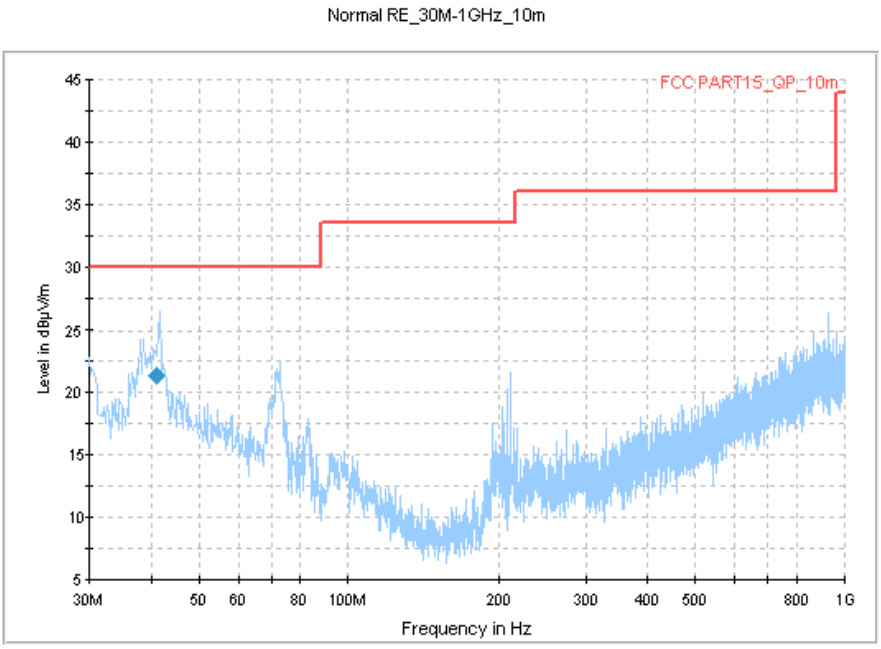


Figure A.5 Radiated Emission from 30MHz to 1GHz

Final Result

Frequency MHz	Level dBµV/m	Limit dBµV/m	Margin dB	Azimuth Deg	Polarisation H/V
41.100000	21.4	30.0	8.6	210.0	V

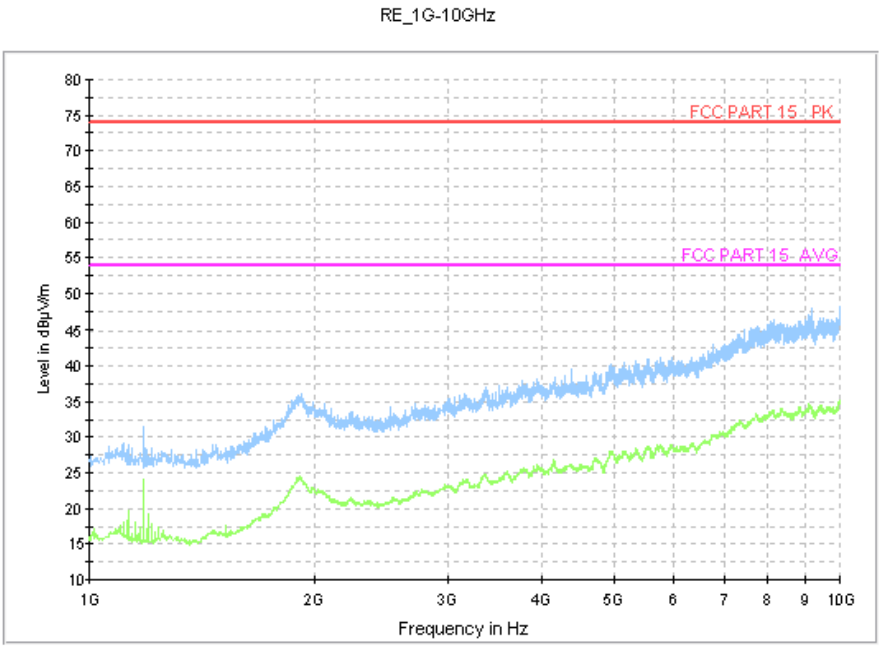


Figure A.6 Radiated Emission from 1GHz to 10GHz

USB Mode, Set.4

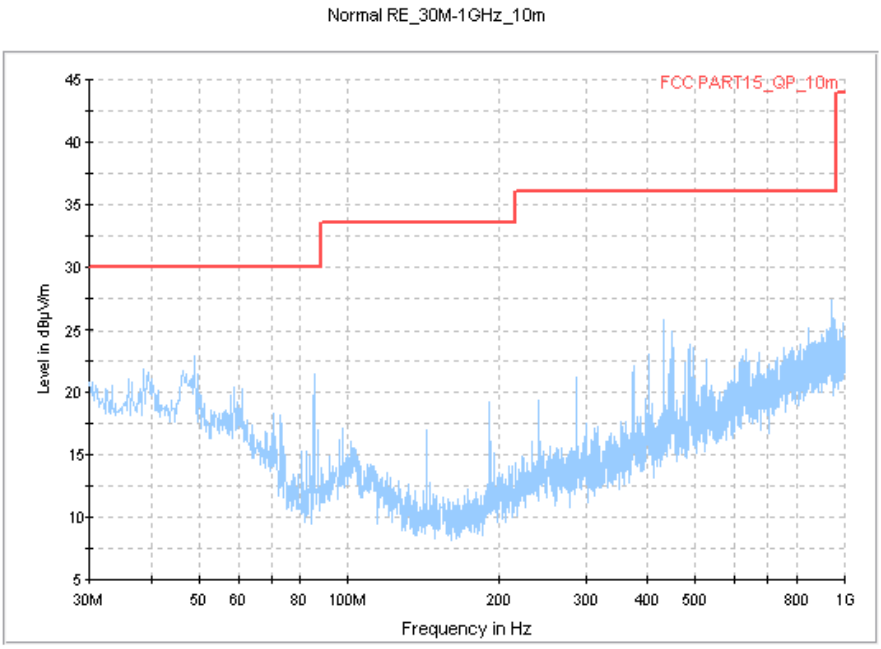


Figure A.7 Radiated Emission from 30MHz to 1GHz

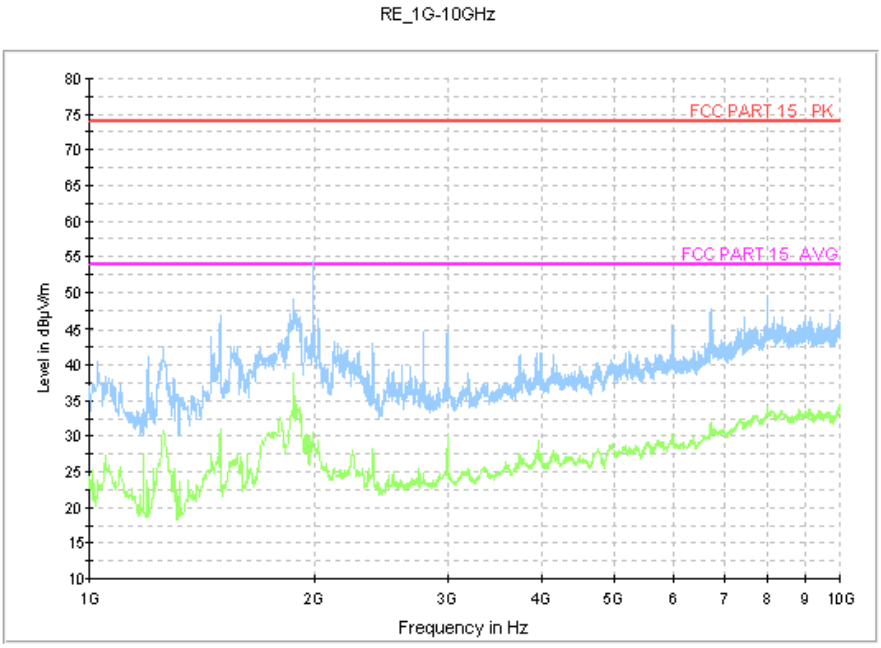


Figure A.8 Radiated Emission from 1GHz to 10GHz

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 7.2.

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

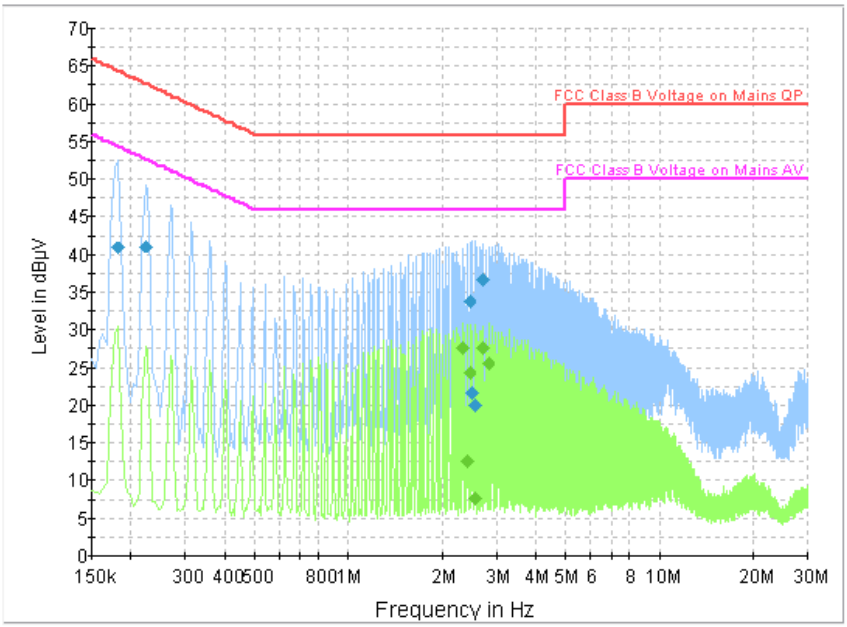


Figure A.9 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.181500	41.0	GND	L1	10.2	23.4	64.4
0.222000	41.1	GND	L1	10.0	21.6	62.7
2.454000	33.8	GND	N	9.8	22.2	56.0
2.503500	21.7	GND	L1	9.8	34.3	56.0
2.548500	19.9	GND	L1	9.8	36.1	56.0
2.719500	36.7	GND	N	9.8	19.3	56.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.319000	27.6	GND	N	9.8	18.4	46.0
2.413500	12.6	GND	L1	9.8	33.4	46.0
2.454000	24.3	GND	N	9.8	21.7	46.0
2.548500	7.6	GND	L1	9.8	38.4	46.0
2.719500	27.6	GND	N	9.8	18.4	46.0
2.809500	25.6	GND	N	9.8	20.4	46.0

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

Charging Mode, Set.2

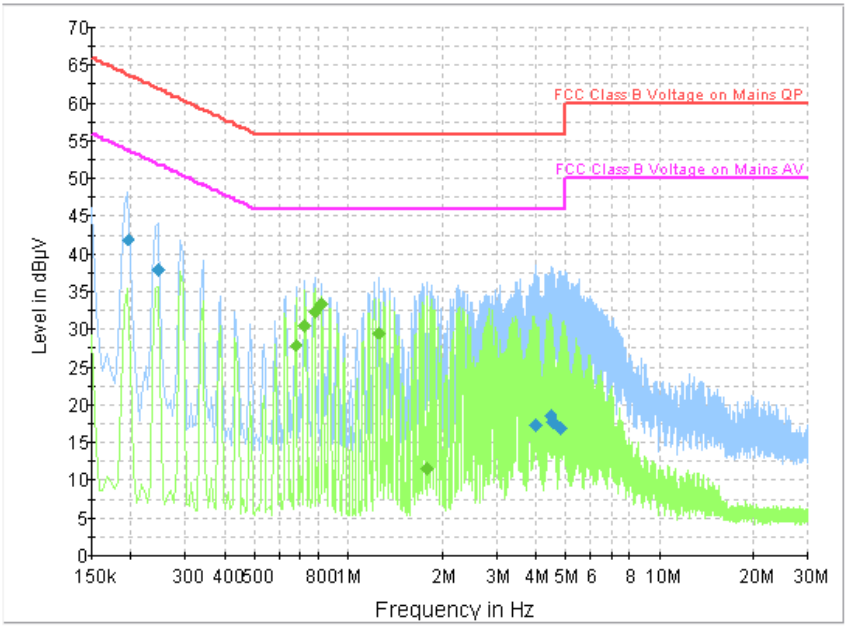


Figure A.10 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.195000	42.0	GND	L1	10.0	21.8	63.8
0.244500	38.0	GND	L1	10.0	24.0	61.9
4.020000	17.3	GND	N	9.7	38.7	56.0
4.488000	18.5	GND	L1	9.8	37.5	56.0
4.560000	17.6	GND	L1	9.7	38.4	56.0
4.803000	16.8	GND	N	9.7	39.2	56.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.676500	27.9	GND	L1	10.1	18.1	46.0
0.726000	30.5	GND	N	10.0	15.5	46.0
0.775500	32.3	GND	N	10.0	13.7	46.0
0.825000	33.3	GND	N	10.0	12.7	46.0
1.261500	29.6	GND	N	9.9	16.4	46.0
1.792500	11.5	GND	N	9.8	34.5	46.0

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

Charging Mode, Set.3

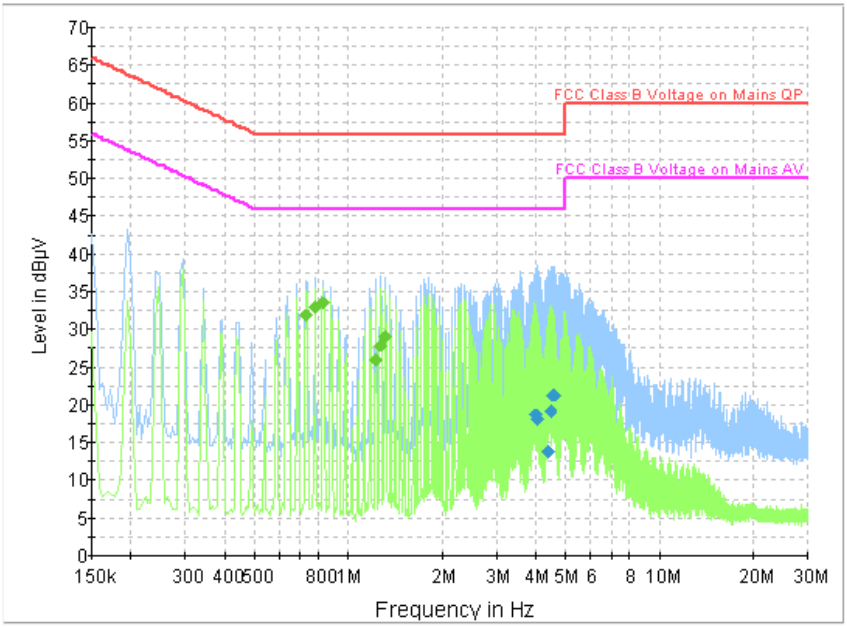


Figure A.11 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
3.997500	18.6	GND	L1	9.8	37.4	56.0
4.047000	18.2	GND	L1	9.8	37.8	56.0
4.398000	13.9	GND	N	9.7	42.1	56.0
4.488000	19.1	GND	L1	9.8	36.9	56.0
4.542000	21.4	GND	N	9.7	34.6	56.0
4.591500	21.2	GND	N	9.7	34.8	56.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.730500	31.9	GND	L1	10.0	14.1	46.0
0.780000	33.0	GND	L1	10.0	13.0	46.0
0.829500	33.5	GND	L1	10.0	12.5	46.0
1.221000	25.9	GND	N	9.9	20.1	46.0
1.270500	28.0	GND	N	9.9	18.0	46.0
1.320000	29.1	GND	N	9.9	16.9	46.0

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

USB Mode, Set.4

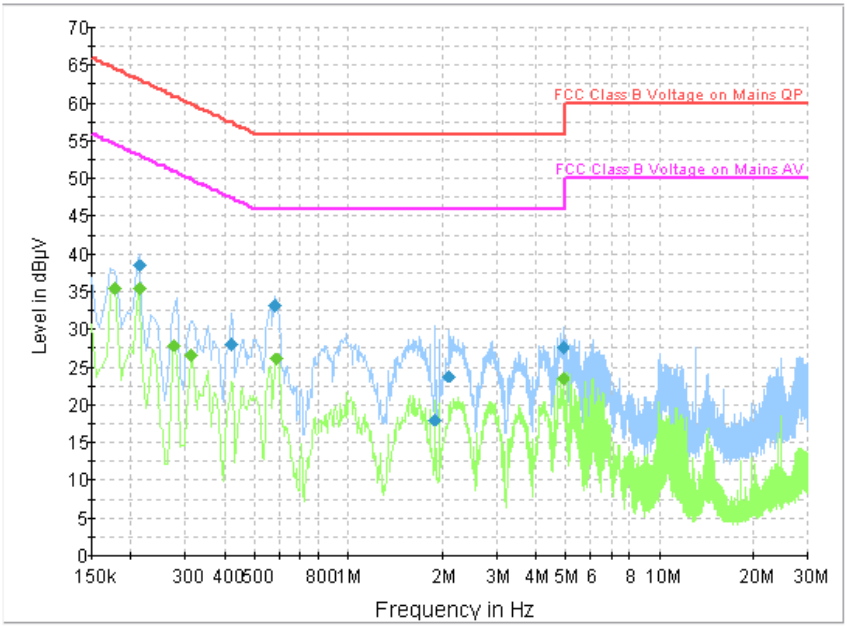


Figure A.12 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.213000	38.4	GND	N	9.9	24.6	63.1
0.420000	28.1	GND	N	10.1	29.3	57.4
0.582000	33.2	GND	N	10.1	22.8	56.0
1.900500	18.1	GND	L1	9.9	37.9	56.0
2.107500	23.8	GND	L1	9.9	32.2	56.0
4.915500	27.5	GND	N	9.7	28.5	56.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.177000	35.5	GND	N	10.2	19.1	54.6
0.213000	35.4	GND	N	9.9	17.6	53.1
0.276000	27.9	GND	L1	10.0	23.0	50.9
0.312000	26.6	GND	N	10.0	23.3	49.9
0.586500	26.2	GND	N	10.1	19.8	46.0
4.915500	23.4	GND	N	9.7	22.6	46.0

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

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