TEST REPORT

No. I14Z45730-EMC01

for

TCT Mobile Limited

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

Model Name: 5138E

FCC ID: RAD490

with

Hardware Version: Proto

Software Version: 6B13

Issued Date: Mar. 06th, 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 D

Company Name:	TMC Beijing, Telecommunication Metrology Center of MIIT
Address:	No.18A, Kangding Street, Beijing Economic-Technological Development Area, Beijing, China
Postal Code:	100176

1.2. Testing Environment

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

1.3. Project data

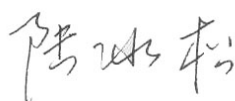|	
Testing Start Date:	Apr. 28th, 2014
Testing End Date:	Mar. 06th, 2014

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	5138E
FCC ID	RAD490
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	864622020000093	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*	描述	序列号	备注
AE4	Battery	/	TCT-B-2189
AE5	Travel charger	/	TCT-CHR-1407
AE6	Travel charger	/	TCT-CHR-1721
AE7	USB cable	/	TCT-DC-0526
AE8	USB cable	/	TCT-DC-0123

AE4
Model	TLi018D2
Manufacturer	SCUD
Capacitance	1800mAh
Nominal voltage	3.8V

AE5
Model	CBA3007AG0C1
Manufacturer	BYD
Length of cable	/

AE6
Model	CBA3007AG0C3
Manufacturer	YINGJU
Length of cable	/

AE7
Model	CDA3122002C2
Manufacturer	Shenhua
Length of cable	98cm

AE8

Model	CDA3122002C1
Manufacturer	Juwei
Length of cable	100cm

*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+ AE4 + AE5 + AE7	Charging mode
Set.2	EUT1+ AE4 + AE6 + AE7	Charger
Set.3	EUT1+ AE4 + AE7	USB mode

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	< 4Ω
Normalised site attenuation (NSA)	**<** ± 4 dB, 3m/10m distance, from 30 to 1000 MHz
Site voltage standing-wave ratio (S_{VSWR})	Between 0 and 6 dB, from 1GHz to 18GHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 3000 MHz

Fully-anechoic chamber FAC-3 (9 meters×6.5 meters×4 meters) 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
Site voltage standing-wave ratio (S_{VSWR})	Between 0 and 6 dB, from 1GHz to 18GHz
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	D
2	Conducted Emission	15.107(a)	P	D

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	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 a distance of 3 meters (above 1GHz) and 10 meters (below 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 meters (above 1GHz) and 10 meters (below 1GHz) 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 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

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 result for Set.1:

Charging Mode/Average detector

Frequency(MHz)	Result(dBµV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBµV)	Polarity
9990.719	34.3	-24.2	38.0	20.500	V
9983.406	34.2	-24.2	38.0	20.400	V
9990.156	34.2	-24.2	38.0	20.400	H
9993.531	34.2	-24.2	38.0	20.400	V
9986.781	34.2	-24.2	38.0	20.400	V
9966.250	34.1	-24.2	38.0	20.300	V

Charging Mode/Peak detector

Frequency(MHz)	Result(dBµV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBµV)	Polarity
9992.969	47.0	-24.2	38.0	33.200	V
8692.188	46.7	-27.0	38.0	35.700	V
8986.656	46.3	-26.7	38.0	35.000	H
9987.344	46.3	-24.2	38.0	32.500	V
9138.813	46.2	-26.1	38.4	33.900	V
8847.438	46.1	-26.6	38.0	34.700	V

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
9982.563	34.2	-24.2	38.0	20.400	H
9963.156	34.0	-24.2	38.0	20.200	V
9994.094	34.0	-24.2	38.0	20.200	V
9983.125	34.0	-24.2	38.0	20.200	V
9976.375	34.0	-24.2	38.0	20.200	H
9982.844	34.0	-24.2	38.0	20.200	V

Charging Mode/Peak detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBμV)	Polarity
8395.469	46.8	-27.1	37.7	36.200	V
8104.656	46.7	-27.5	37.7	36.500	V
7509.813	46.4	-28.9	37.5	37.800	V
9933.906	46.0	-24.9	38.0	32.900	V
8994.813	46.0	-26.7	38.0	34.700	H
9963.156	45.8	-24.2	38.0	32.000	V

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
9994.656	35.2	-24.2	38.0	21.400	V
9997.750	35.2	-24.2	38.0	21.400	V
9991.000	35.1	-24.2	38.0	21.300	V
9995.781	35.1	-24.2	38.0	21.300	H
9989.875	35.0	-24.2	38.0	21.200	V
9987.063	35.0	-24.2	38.0	21.200	H

USB Mode/ Peak detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{mea}(dBμV)	Polarity
1993.656	48.3	-35.7	25.3	58.700	V
1873.844	46.8	-35.6	25.3	57.100	H
9992.969	46.6	-24.2	38.0	32.800	V
1894.938	46.4	-35.0	25.3	56.100	H
6747.344	46.4	-31.6	35.3	42.700	V
9559.000	46.4	-25.5	38.0	33.900	V

Charging Mode, Set.1

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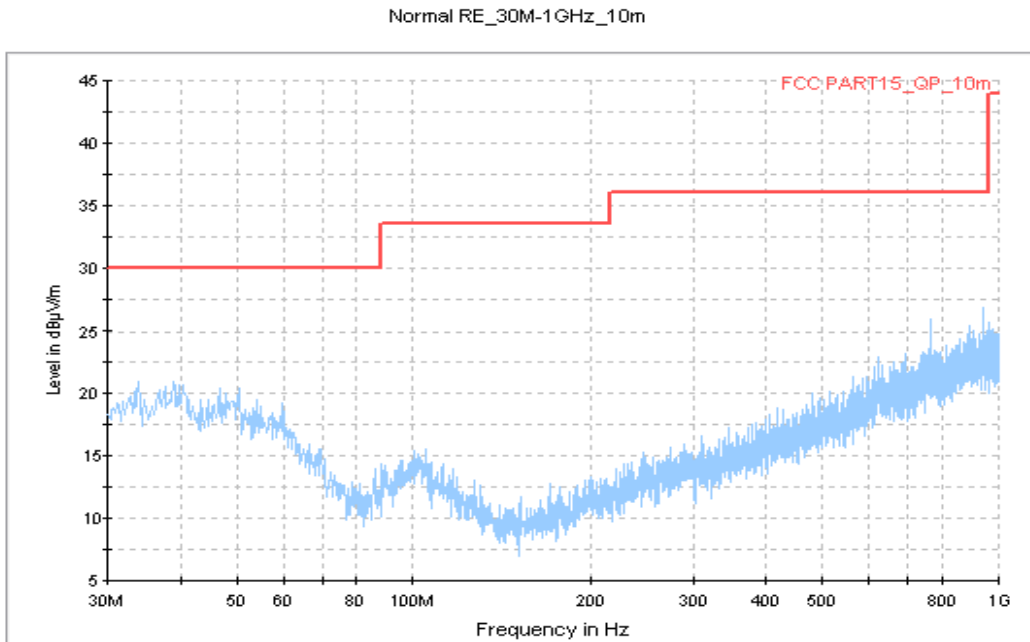
Figure A.1 Radiated Emission from 30MHz to 1GHz

RE_1G-10GHz
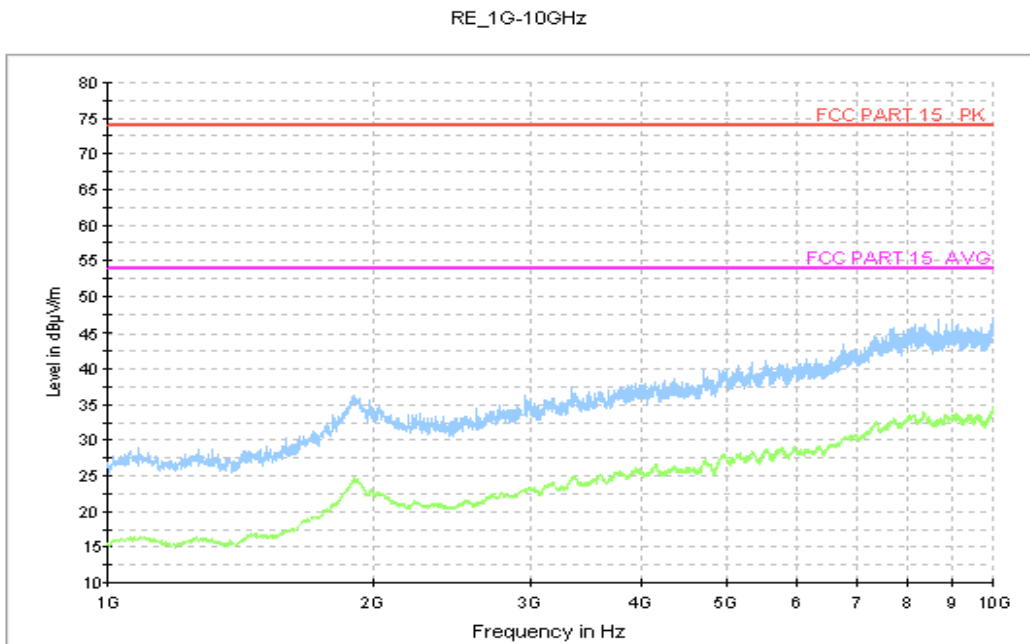
Figure A.2 Radiated Emission from 1GHz to 10GHz

Charging Mode, Set.2

Normal RE_30M-1GHz_10m
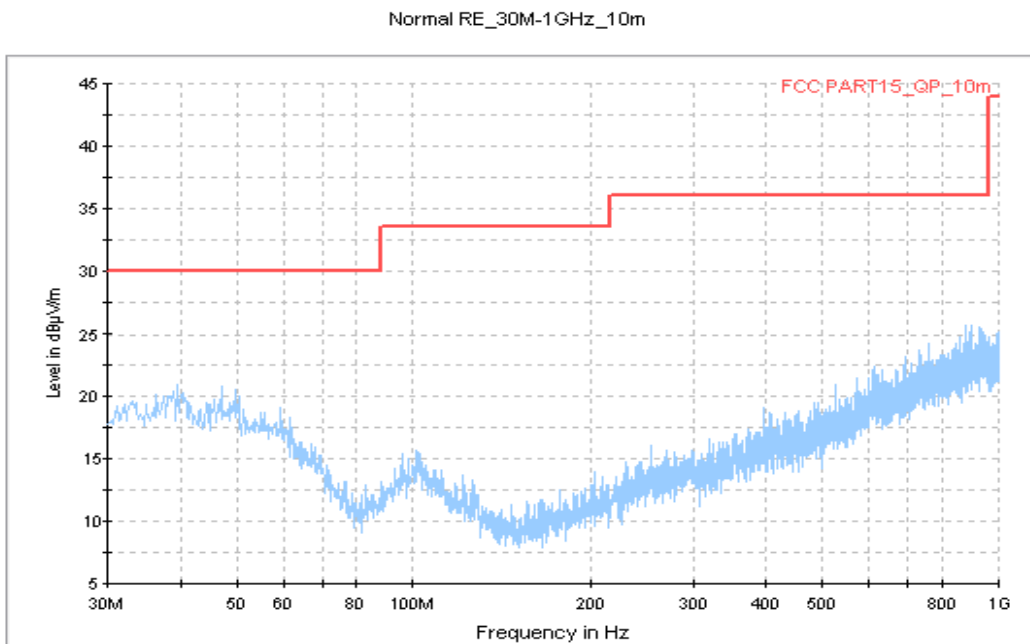
Figure A.3 Radiated Emission from 30MHz to 1GHz

RE_1G-10GHz
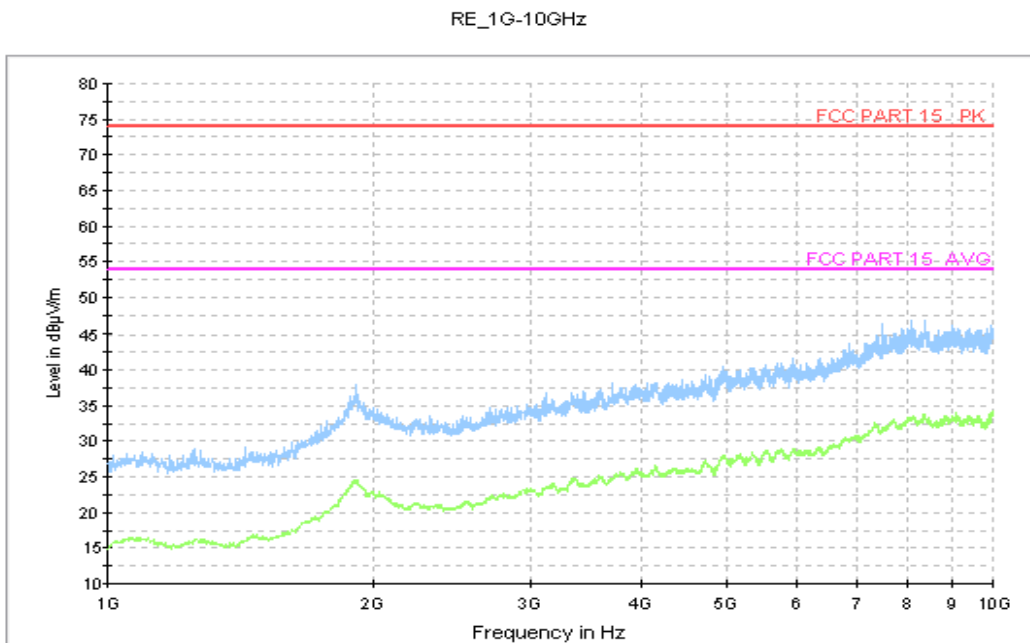
Figure A.4 Radiated Emission from 1GHz to 10GHz

USB Mode, Set.3

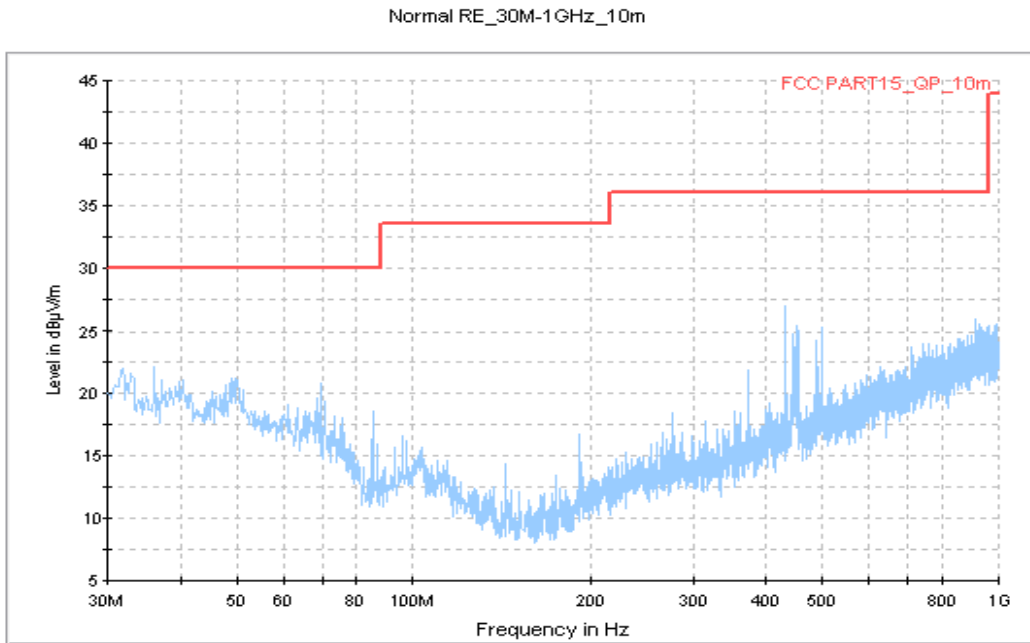Normal RE_30M-1GHz_10m

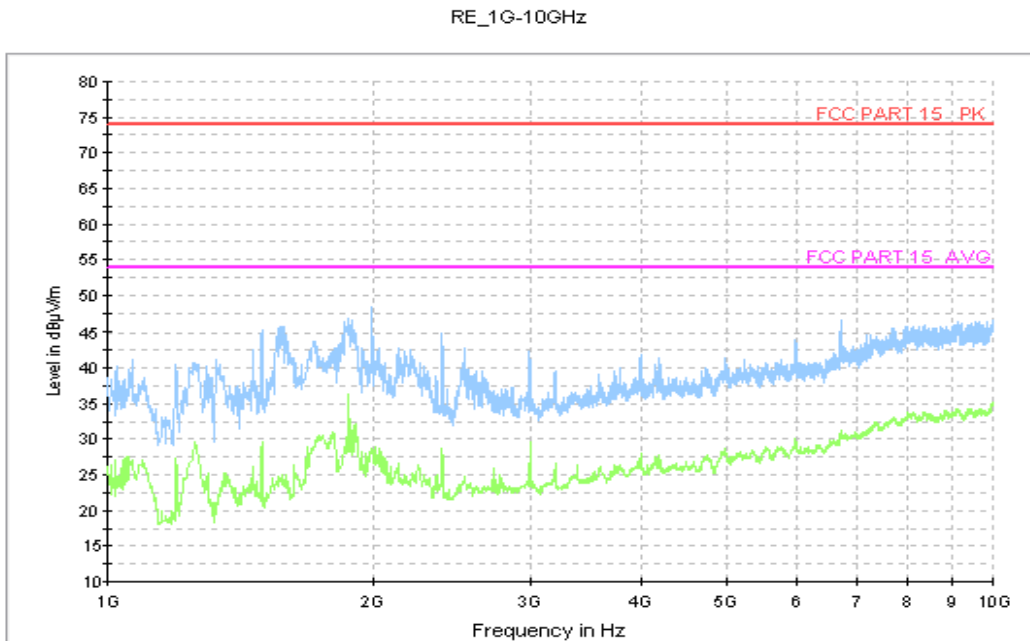**Figure A.5 Radiated Emission from 30MHz to 1GHz**

RE_1G-10GHz

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 OPTIPLEX 380, and the serial number of the PC is2X1YV2X. 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
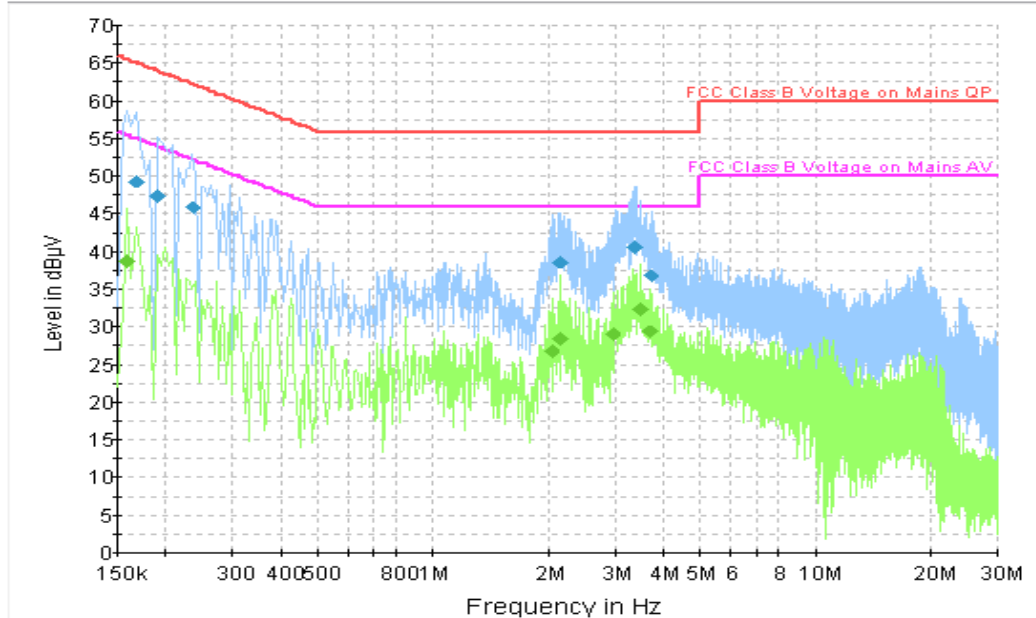
Figure A.7 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.168000	49.4	GND	N	9.8	15.7	65.1
0.190500	47.4	GND	L1	9.8	16.6	64.0
0.235500	45.9	GND	L1	9.8	16.4	62.3
2.161500	38.6	GND	L1	9.7	17.4	56.0
3.354000	40.6	GND	L1	9.7	15.4	56.0
3.732000	36.8	GND	L1	9.7	19.2	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.159000	38.7	GND	L1	9.8	16.8	55.5
2.044500	26.7	GND	L1	9.7	19.3	46.0
2.161500	28.4	GND	L1	9.7	17.6	46.0
2.962500	29.0	GND	L1	9.7	17.0	46.0
3.471000	32.4	GND	L1	9.7	13.6	46.0
3.687000	29.4	GND	L1	9.7	16.6	46.0

Charging Mode, Set.2
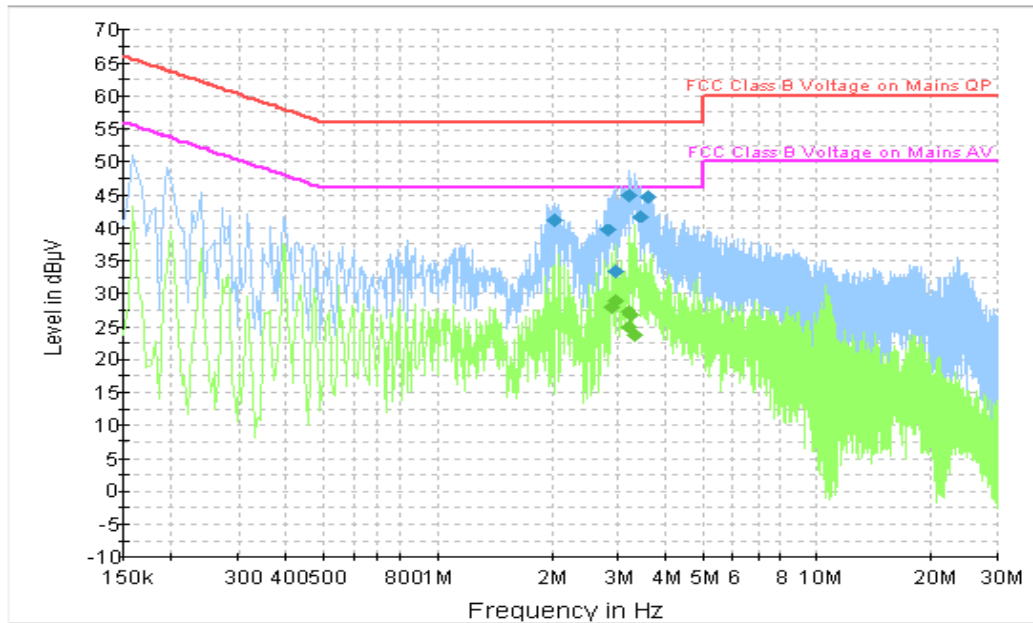
Figure A.8 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.035500	41.1	GND	L1	9.7	14.9	56.0
2.823000	39.7	GND	L1	9.7	16.3	56.0
2.962500	33.4	GND	N	9.7	22.6	56.0
3.214500	45.0	GND	L1	9.7	11.0	56.0
3.448500	41.6	GND	L1	9.7	14.4	56.0
3.606000	44.8	GND	L1	9.7	11.2	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.868000	27.9	GND	L1	9.7	18.1	46.0
2.953500	29.0	GND	L1	9.7	17.0	46.0
3.187500	27.1	GND	L1	9.7	18.9	46.0
3.223500	24.9	GND	L1	9.7	21.1	46.0
3.259500	26.7	GND	L1	9.7	19.3	46.0
3.304500	23.6	GND	L1	9.7	22.4	46.0

USB Mode, Set.3
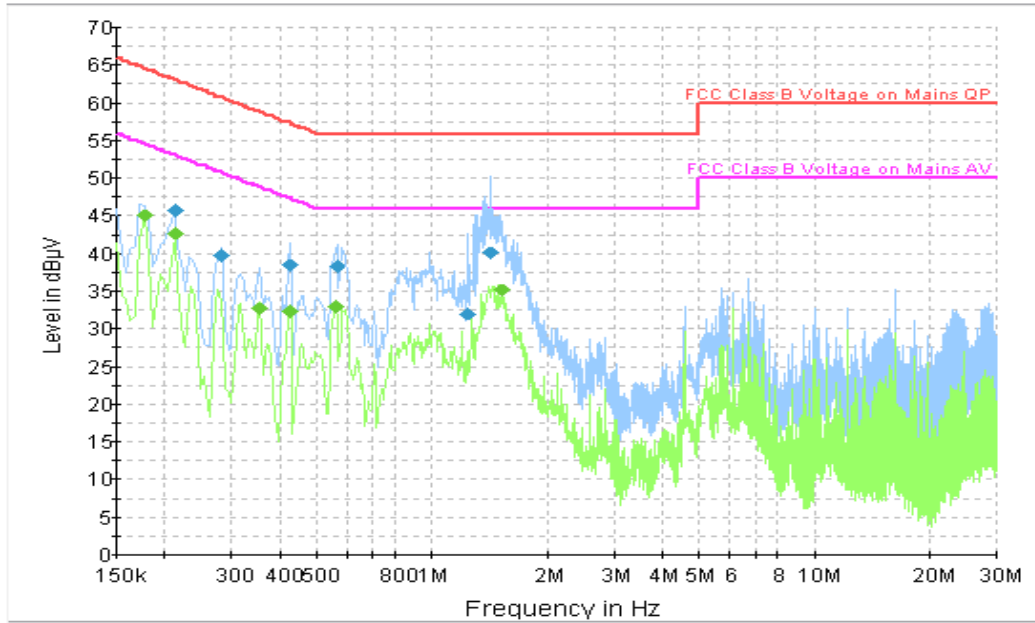
Figure A.9 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.213000	45.8	GND	L1	9.8	17.3	63.1
0.280500	39.7	GND	L1	9.8	21.1	60.8
0.424500	38.5	GND	N	9.8	18.8	57.4
0.564000	38.3	GND	N	9.8	17.7	56.0
1.243500	32.0	GND	N	9.7	24.0	56.0
1.423500	40.1	GND	N	9.7	15.9	56.0

Final Result 2

Frequency (MHz)	Average (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.177000	45.0	GND	L1	9.8	9.6	54.6
0.213000	42.7	GND	L1	9.8	10.4	53.1
0.352500	32.7	GND	L1	9.8	16.2	48.9
0.424500	32.4	GND	L1	9.8	15.0	47.4
0.559500	33.0	GND	N	9.8	13.0	46.0
1.527000	35.1	GND	N	9.7	10.9	46.0

END OF REPORT