



TEST REPORT

No. I14Z46098-EMC03

for

TCT Mobile Limited

HSUPA/HSDPA/UMTS triband/GSM quadband mobile phone

Model Name: 4036E/4136E

with

Hardware Version: PIO

Software Version: v9H26

Issued Date: May 21st, 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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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°C
Relative Humidity: 20-75%

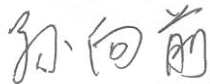
1.3. Project data

Testing Start Date: May 5th, 2014
Testing End Date: May 6th, 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 triband/GSM quadband mobile phone
Model Name	4036E/4136E
FCC ID	RAD455
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	863665020100133	PIO	v9H26

*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	/	TCT-B-1746
AE2	Battery	/	TCT-B-2090
AE3	Travel charger	/	TCT-CHR-0661
AE4	Travel charger	/	S004ACU0500055
AE5	USB cable	/	TCT-DC-0458
AE6	USB cable	/	TCT-DC-0670
AE7	Battery	/	TCT-B-1378
AE8	Battery	/	TCT-B-2255
AE9	Battery	/	TCT-B-1013
AE10	Battery	/	/

AE1、AE2

Model	CAB60B0000C1
Manufacturer	BYD
Capacitance	1400 mAh
Nominal voltage	3.7V

AE3

Model	CBA3007AG0C1
Manufacturer	BYD
Length of cable	/

AE4

Model	CBA3007AG0C2
Manufacturer	TEN PAO
Length of cable	/

AE5	
Model	CDA3122002C1
Manufacturer	Juwei
Length of cable	/
AE6	
Model	CDA3122002C2
Manufacturer	Shenghua
Length of cable	98cm
AE7	
Model	CAB60BA000C1
Manufacturer	SCUD
Capacitance	1400mAh
Nominal voltage	3.7V
AE8	
Model	CAB60B0000CB
Manufacturer	OS
Capacitance	1400mAh
Nominal voltage	3.7V
AE9	
Model	CAB1400002C1
Manufacturer	BYD
Capacitance	1400mAh
Nominal voltage	3.7V
AE10	
Model	CAB31P0000C1
Manufacturer	BYD
Capacitance	1300mAh
Nominal voltage	3.7V

*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/AE7/AE8/AE9+ AE3 + AE5/AE6	Charger
Set.2	EUT3+ AE1/AE2/AE7/AE8/AE9+ AE4 + AE5/AE6	Charger
Set.3	EUT3+ AE1/AE2/AE7/AE8/AE9+ AE5/AE6	USB

Note: The HSUPA/HSDPA/UMTS triband/GSM quadband mobile phone 4036E/4136E manufactured by TCT Mobile Limited is a variant model based on 4035A for conformance test. The results are inherited from the initial model. The report number of initial model is I14Z45782-EMC03.

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	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	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 ($\mu\text{V}/\text{m}$)		
	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:

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

Where

G_A : Antenna factor of receive antenna

G_{PL} : Path Loss

P_{Mea} : Measurement result on receiver.

Measurement uncertainty (worst case): $U = 4.3 \text{ dB}$, $k=2$.

Measurement results for Set.1:

Charging Mode/Average detector

Frequency(MHz)	Result(dB μ V/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea} (dB μ V)	Polarity
9987.625	35.6	-24.2	38.0	21.800	HORIZONTAL
9990.156	35.5	-24.2	38.0	21.700	HORIZONTAL
9998.875	35.4	-24.2	38.0	21.600	VERTICAL
9993.813	35.4	-24.2	38.0	21.600	VERTICAL
9994.375	35.3	-24.2	38.0	21.500	VERTICAL
9996.906	35.3	-24.2	38.0	21.500	VERTICAL

Charging Mode/Peak detector

Frequency(MHz)	Result(dB μ V/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea} (dB μ V)	Polarity
9984.250	47.6	-24.2	38.0	33.800	VERTICAL
9991.000	47.5	-24.2	38.0	33.700	VERTICAL
9122.219	47.2	-26.1	38.4	34.900	HORIZONTAL
9105.063	47.0	-26.7	38.4	35.300	VERTICAL
9998.594	47.0	-24.2	38.0	33.200	VERTICAL
9056.406	46.9	-26.7	38.4	35.200	VERTICAL

Measurement results for Set.2:

Charging Mode/Average detector

Frequency(MHz)	Result(dB μ V/m)	G _{PL} (dB)	G _A (dB/m)	P _{Mea} (dB μ V)	Polarity
10000.000	35.3	-24.2	38.5	21.000	HORIZONTAL
9987.625	35.3	-24.2	38.0	21.500	HORIZONTAL
9993.250	35.2	-24.2	38.0	21.400	VERTICAL
9982.563	35.2	-24.2	38.0	21.400	HORIZONTAL
9988.188	35.2	-24.2	38.0	21.400	VERTICAL
9998.313	35.2	-24.2	38.0	21.400	VERTICAL

Charging Mode/Peak detector

Frequency(MHz)	Result(dB μ V/m)	G _{PL} (dB)	G _A (dB/m)	P _{Mea} (dB μ V)	Polarity
9911.969	46.9	-24.9	38.0	33.800	HORIZONTAL
9964.000	46.9	-24.2	38.0	33.100	VERTICAL
9984.531	46.9	-24.2	38.0	33.100	VERTICAL
9949.938	46.8	-24.9	38.0	33.700	VERTICAL
9928.844	46.7	-24.9	38.0	33.600	VERTICAL
9977.781	46.7	-24.2	38.0	32.900	HORIZONTAL

Measurement result for Set.3:

USB Mode/Average detector

Frequency(MHz)	Result(dB μ V/m)	G _{PL} (dB)	G _A (dB/m)	P _{mea} (dB μ V)	Polarity
9987.906	35.4	-24.2	38.0	21.600	HORIZONTAL
9991.000	35.4	-24.2	38.0	21.600	VERTICAL
9983.969	35.4	-24.2	38.0	21.600	HORIZONTAL
9987.625	35.4	-24.2	38.0	21.600	VERTICAL
9998.313	35.4	-24.2	38.0	21.600	VERTICAL
9986.219	35.3	-24.2	38.0	21.500	VERTICAL

USB Mode/ Peak detector

Frequency(MHz)	Result(dB μ V/m)	G _{PL} (dB)	G _A (dB/m)	P _{mea} (dB μ V)	Polarity
1991.688	52.3	-35.7	25.3	62.700	VERTICAL
6747.063	49.1	-31.6	35.3	45.400	HORIZONTAL
6747.906	48.7	-31.6	35.3	45.000	VERTICAL
6747.625	48.3	-31.6	35.3	44.600	HORIZONTAL
6742.000	48.2	-31.6	35.3	44.500	HORIZONTAL
6748.188	48.0	-31.6	35.3	44.300	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

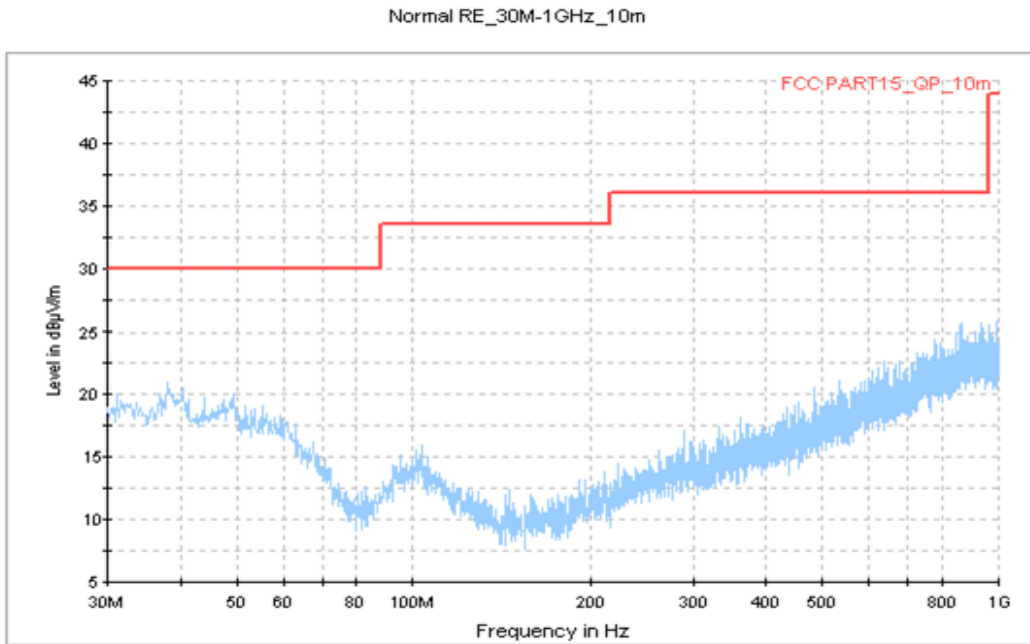


Figure A.1 Radiated Emission from 30MHz to 1GHz

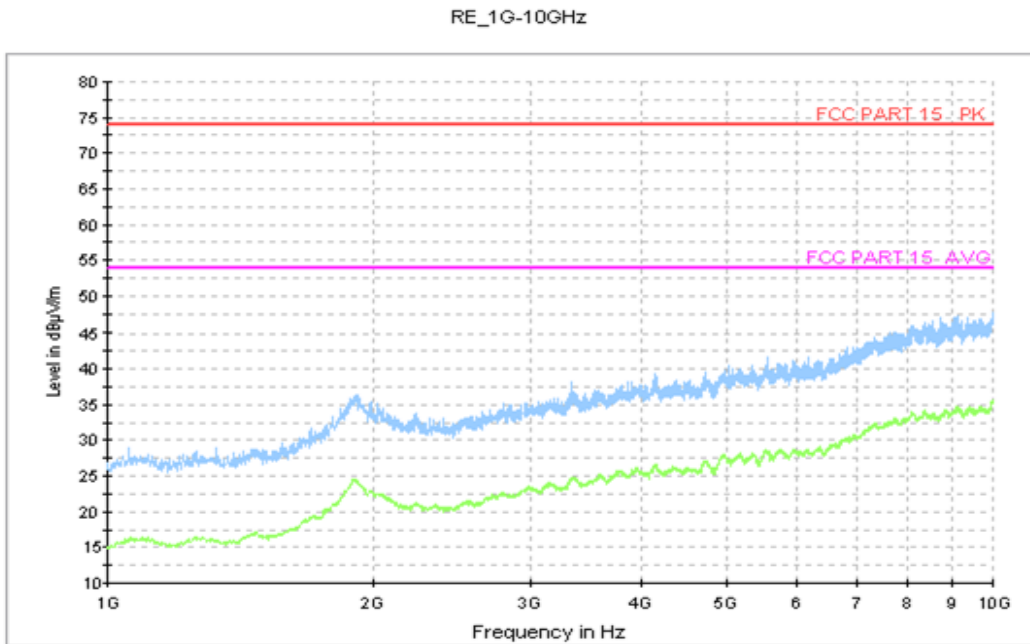


Figure A.2 Radiated Emission from 1GHz to 10GHz

Charging Mode, Set.2

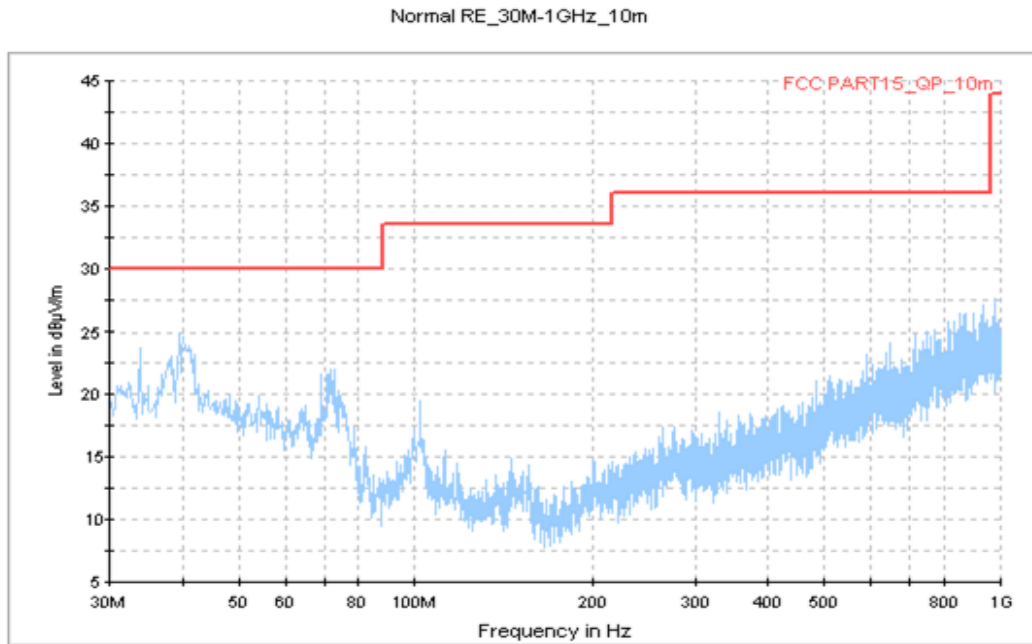


Figure A.3 Radiated Emission from 30MHz to 1GHz

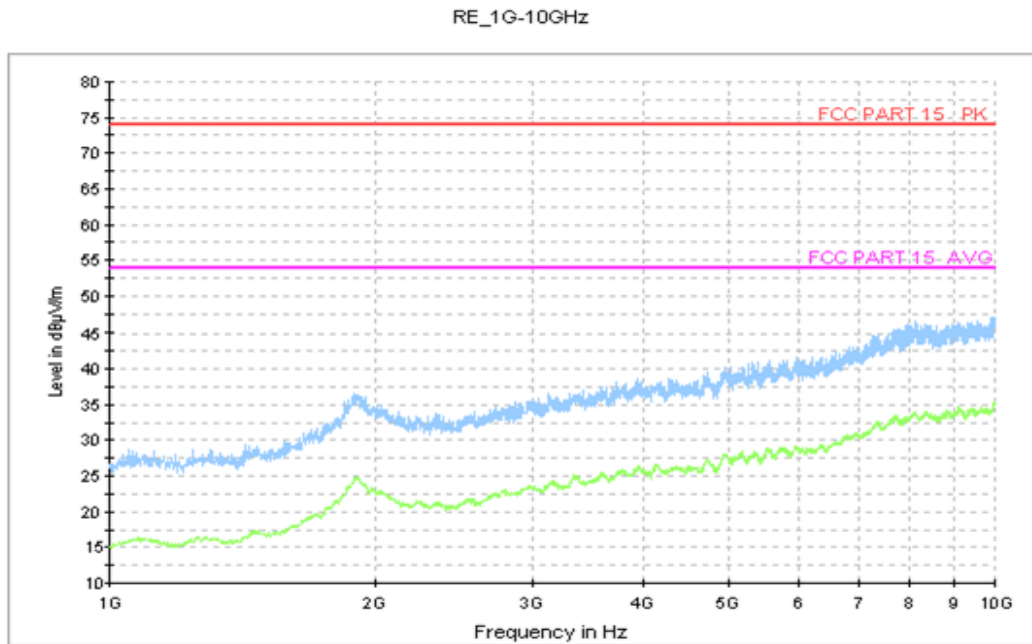


Figure A.4 Radiated Emission from 1GHz to 10GHz

USB Mode, Set.3

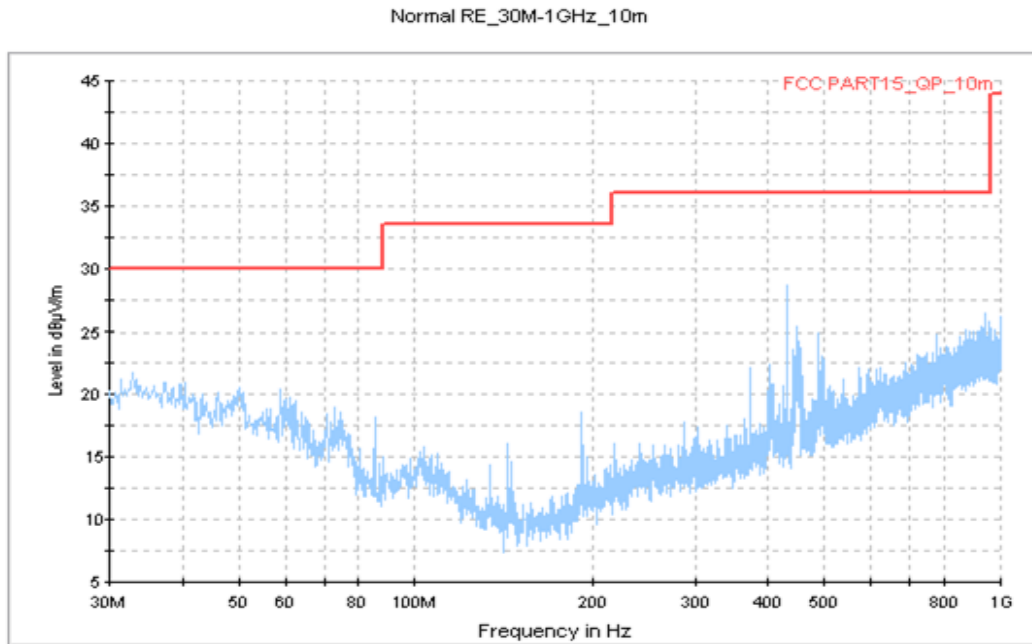


Figure A.5 Radiated Emission from 30MHz to 1GHz

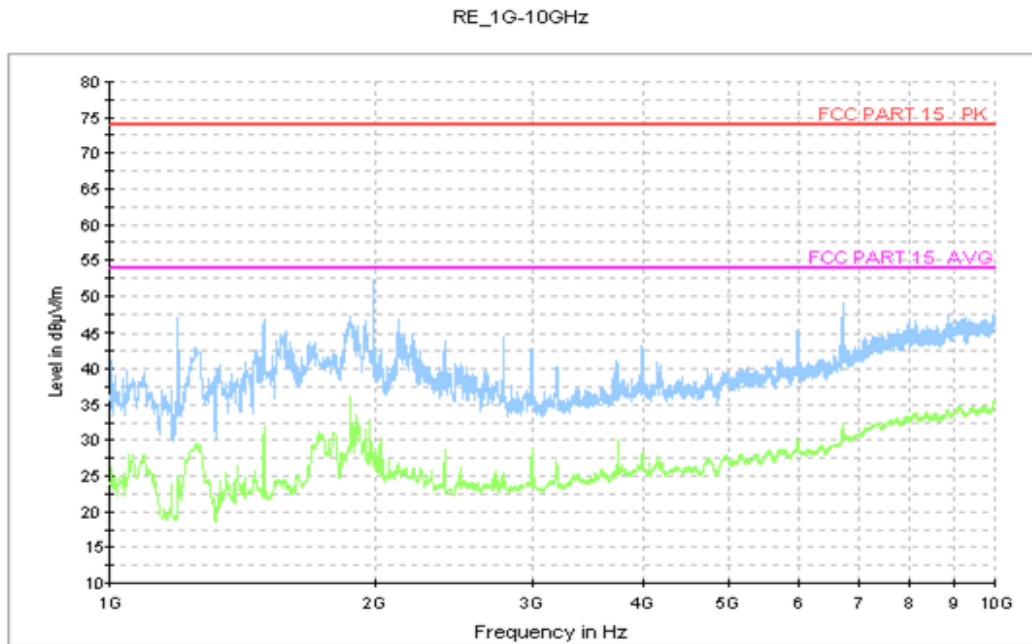


Figure A.6 Radiated Emission from 1GHz to 10GHz

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 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 (dB μ V)	
	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

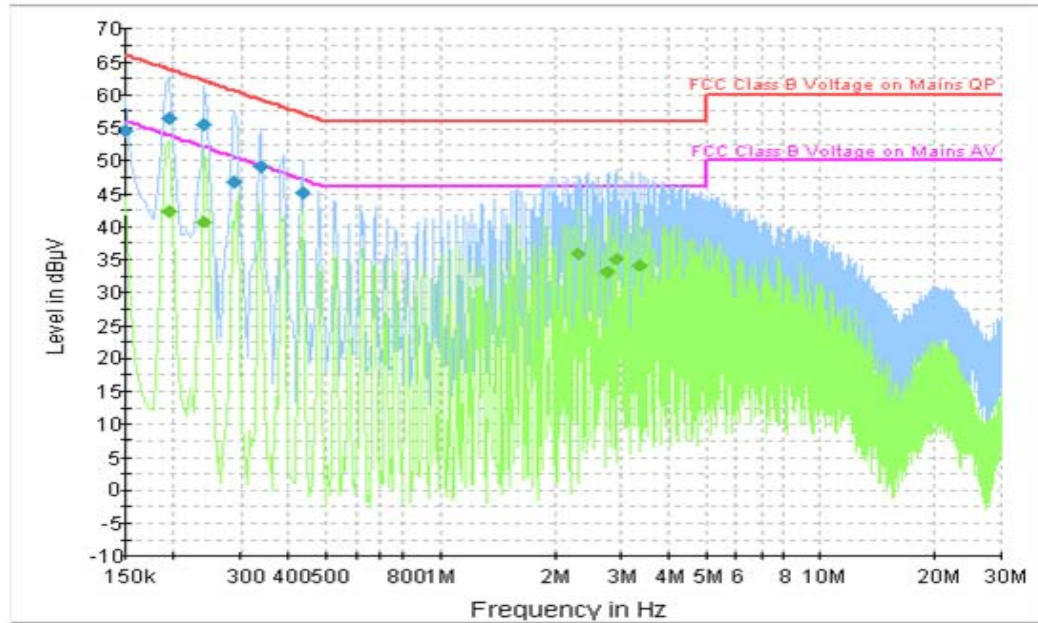


Figure A.7 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	54.6	GND	L1	9.8	11.4	66.0
0.195000	56.3	GND	N	9.8	7.5	63.8
0.240000	55.4	GND	L1	9.8	6.7	62.1
0.289500	46.8	GND	N	9.8	13.7	60.5
0.339000	49.0	GND	L1	9.8	10.2	59.2
0.433500	45.0	GND	L1	9.8	12.2	57.2

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.195000	42.2	GND	N	9.8	11.6	53.8
0.240000	40.8	GND	L1	9.8	11.3	52.1
2.314500	35.8	GND	L1	9.7	10.2	46.0
2.751000	33.0	GND	L1	9.7	13.0	46.0
2.895000	35.1	GND	L1	9.7	10.9	46.0
3.376500	34.2	GND	L1	9.7	11.8	46.0

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

Charging Mode, Set.2

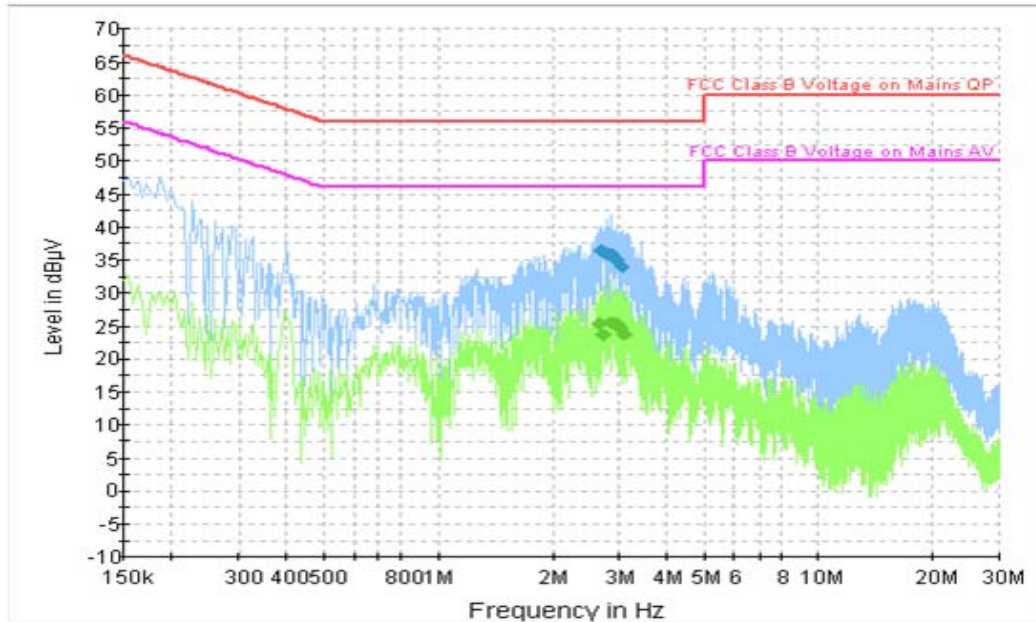


Figure A.8 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.688000	36.5	GND	L1	9.7	19.5	56.0
2.782500	35.9	GND	L1	9.7	20.1	56.0
2.809500	36.0	GND	L1	9.7	20.0	56.0
2.841000	35.9	GND	L1	9.7	20.1	56.0
2.971500	35.1	GND	L1	9.7	20.9	56.0
3.057000	33.9	GND	L1	9.7	22.1	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.665500	25.2	GND	L1	9.7	20.8	46.0
2.724000	23.5	GND	L1	9.7	22.5	46.0
2.841000	25.5	GND	L1	9.7	20.5	46.0
2.971500	25.2	GND	L1	9.7	20.8	46.0
3.030000	24.5	GND	L1	9.7	21.5	46.0
3.102000	23.7	GND	L1	9.7	22.3	46.0

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

USB Mode, Set.3

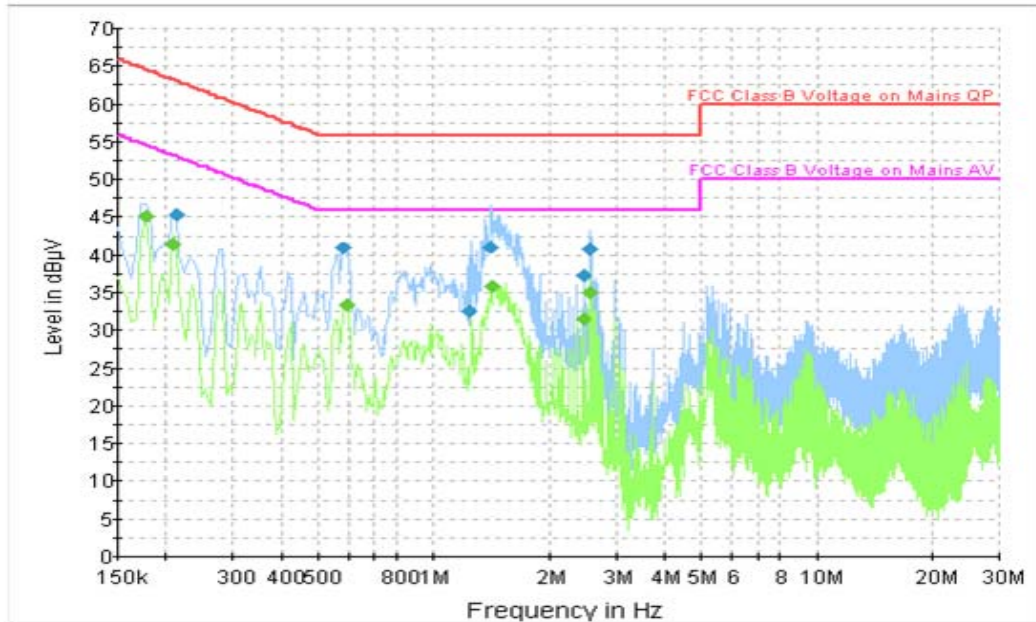


Figure A.9 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.213000	45.3	GND	N	9.8	17.8	63.1
0.582000	40.9	GND	L1	9.8	15.1	56.0
1.230000	32.6	GND	L1	9.7	23.4	56.0
1.405500	41.2	GND	N	9.7	14.8	56.0
2.458500	37.2	GND	N	9.7	18.8	56.0
2.557500	40.7	GND	L1	9.7	15.3	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.177000	45.2	GND	N	9.8	9.4	54.6
0.208500	41.4	GND	N	9.8	11.9	53.3
0.595500	33.4	GND	L1	9.8	12.6	46.0
1.432500	35.9	GND	N	9.7	10.1	46.0
2.458500	31.5	GND	N	9.7	14.5	46.0
2.557500	35.0	GND	L1	9.7	11.0	46.0

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

END OF REPORT