



TEST REPORT

No. 2013TAR820

for

TCT Mobile Limited

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

Model Name: Yaris-3.5

Marketing Name: 4015A,4016A

FCC ID: RAD406

with

Hardware Version: PIO

Software Version: VAA8

Issued Date: Dec. 24th, 2013

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°C
Relative Humidity: 20-75%

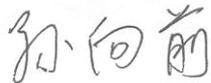
1.3. Project data

Testing Start Date: Dec. 5th, 2013
Testing End Date: Dec. 11th, 2013

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	Yaris-3.5
Marketing Name	4015A,4016A
FCC ID	RAD406
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	013916000000077	PIO	VAA8

*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-1064
AE2	Battery	/	TCT-B-1059
AE3	Battery	/	TCT-B-0520
AE4	Battery	/	TCT-B-0888
AE5	Battery	/	TCT-B-0880
AE6	Travel charger	/	TCT-CHR-1265
AE7	Travel charger	/	TCT-CHR-1399
AE8	Travel charger	/	13169CHR10
AE9	USB cable	/	TCT-DC-0203
AE10	USB cable	/	TCT-DC-0499
AE11	USB cable	/	/
AE12	USB cable	/	/

AE1, AE2

Model	CAB31P0000C1
Manufacturer	BYD
Capacitance	1300 mAh
Nominal voltage	3.7V

AE3

Model	CAB31P0000C2
Manufacturer	BAK
Capacitance	1300 mAh
Nominal voltage	3.7V

AE4, AE5

Model	CAB31P0000C3
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Manufacturer	SCUD
Capacitance	1300 mAh
Nominal voltage	3.7V
AE6	
Model	CBA3007AG0C2
Manufacturer	TENPAO
Length of cable	/
AE7	
Model	CBA3007AG0C3
Manufacturer	YINGJU
Length of cable	/
AE8	
Model	CBA3007AG0C1
Manufacturer	BYD
Length of cable	/
AE9	
Model	CDA3122002C1
Manufacturer	JUWEI
Length of cable	100 cm
AE10	
Model	CDA3122002C2
Manufacturer	Shenghua
Length of cable	100 cm
AE11	
Model	CDA3122005C1
Manufacturer	JUWEI
Length of cable	/
AE12	
Model	CDA3122005C2
Manufacturer	Shenghua
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/AE3/AE4+ AE6 + AE9/AE10/AE11/AE12	Charger
Set.2	EUT1+ AE1/AE3/AE4+ AE9/AE10/AE11/AE12	USB
Set.3	EUT1+ AE1/AE3/AE4+ AE7 + AE9/AE10/AE11/AE12	Charger
Set.4	EUT1+ AE1/AE3/AE4+ AE8 + AE9/AE10/AE11/AE12	Charger

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	10-1-12 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
1	Test Receiver	ESCI	100344	R&S	2014-03-28
2	Test Receiver	ESCI 7	100948	R&S	2014-07-18
3	Universal Radio Communication Tester	CMU200	109914	R&S	2014-04-18
5	LISN	ESH2-Z5	829991/012	R&S	2014-04-14
6	EMI Antenna	VULB 9163	9163-483	Schwarzbeck	2014-02-16
7	EMI Antenna	3115	6914	ETS-Lindgren	2014-12-15
8	PC	OPTIPLEX 380	2X1YV2X	DELL	N/A
9	Monitor	E178FPc	CN-OWR979-6 4180-7AJ-D2M S	DELL	N/A
10	Printer	P1606dn	VNC3L52122	HP	N/A
11	Keyboard	L100	CN0RH659658 907ATOI40	DELL	N/A
12	Mouse	M-UAE119	LZ935220ZRC	Lenovo	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
5935.625	36.6	-34.1	35.1	35.600	HORIZONTAL
5949.375	36.6	-33.5	35.1	35.000	VERTICAL
5945.000	36.5	-33.5	35.1	34.900	VERTICAL
5961.250	36.5	-33.5	35.1	34.900	VERTICAL
5940.625	36.5	-33.5	35.1	34.900	VERTICAL
5951.250	36.4	-33.5	35.1	34.800	HORIZONTAL

Charging Mode/Peak detector

Frequency(MHz)	Result(dB μ V/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea} (dB μ V)	Polarity
5906.250	48.7	-34.1	35.1	47.700	HORIZONTAL
5947.500	48.6	-33.5	35.1	47.000	VERTICAL
5713.750	48.2	-33.8	35.1	46.900	HORIZONTAL
5850.000	48.1	-33.8	35.1	46.800	HORIZONTAL
5943.125	48.1	-33.5	35.1	46.500	HORIZONTAL
5533.125	48.0	-34.0	35.1	46.900	HORIZONTAL

Measurement result for Set.3:

Charging Mode/Average detector

Frequency(MHz)	Result(dB μ V/m)	G _{PL} (dB)	G _A (dB/m)	P _{Mea} (dB μ V)	Polarity
5942.000	37.7	-33.5	35.1	36.100	HORIZONTAL
5960.000	37.6	-33.5	35.1	36.000	VERTICAL
5915.500	37.6	-34.1	35.1	36.600	VERTICAL
5779.000	37.6	-33.8	35.1	36.300	HORIZONTAL
5979.000	37.6	-33.5	35.1	36.000	HORIZONTAL
5936.500	37.6	-33.5	35.1	36.000	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
5659.000	50.5	-34.2	35.1	49.600	VERTICAL
5799.500	50.0	-33.8	35.1	48.700	HORIZONTAL
5958.000	49.8	-33.5	35.1	48.200	HORIZONTAL
5980.000	49.7	-33.5	35.1	48.100	VERTICAL
5471.500	49.6	-34.9	34.6	49.900	HORIZONTAL
5918.000	49.6	-34.1	35.1	48.600	VERTICAL

Measurement result for Set.4:

Charging Mode/Average detector

Frequency(MHz)	Result(dB μ V/m)	G _{PL} (dB)	G _A (dB/m)	P _{Mea} (dB μ V)	Polarity
5725.500	37.7	-33.8	35.1	36.400	VERTICAL
5992.000	37.6	-33.5	35.1	36.000	HORIZONTAL
5713.000	37.6	-33.8	35.1	36.300	HORIZONTAL
5973.500	37.6	-33.5	35.1	36.000	VERTICAL
5964.500	37.5	-33.5	35.1	35.900	HORIZONTAL
5823.000	37.5	-33.8	35.1	36.200	HORIZONTAL

Charging Mode/Peak detector

Frequency(MHz)	Result(dB μ V/m)	G _{PL} (dB)	G _A (dB/m)	P _{Mea} (dB μ V)	Polarity
5786.000	50.7	-33.8	35.1	49.400	HORIZONTAL
5944.000	50.0	-33.5	35.1	48.400	HORIZONTAL
5736.000	49.8	-33.8	35.1	48.500	VERTICAL
5723.000	49.5	-33.8	35.1	48.200	HORIZONTAL
5523.500	49.4	-34.0	35.1	48.300	VERTICAL
5896.000	49.4	-34.1	35.1	48.400	HORIZONTAL

Measurement result for Set.2:

USB Mode/Average detector

Frequency(MHz)	Result(dB μ V/m)	G _{PL} (dB)	G _A (dB/m)	P _{mea} (dB μ V)	Polarity
5938.750	36.6	-33.5	35.1	35.000	HORIZONTAL
5965.000	36.5	-33.5	35.1	34.900	HORIZONTAL
5671.250	36.5	-34.2	35.1	35.600	VERTICAL
5956.875	36.5	-33.5	35.1	34.900	HORIZONTAL
5670.000	36.5	-34.2	35.1	35.600	VERTICAL
5919.375	36.5	-34.1	35.1	35.500	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
1498.125	49.1	-40.3	24.1	65.300	VERTICAL
5971.875	48.8	-33.5	35.1	47.200	HORIZONTAL
1499.375	48.8	-40.3	24.1	65.000	VERTICAL
1498.750	48.7	-40.3	24.1	64.900	VERTICAL
1492.500	48.6	-40.3	24.1	64.800	VERTICAL
1497.500	48.5	-40.3	24.1	64.700	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

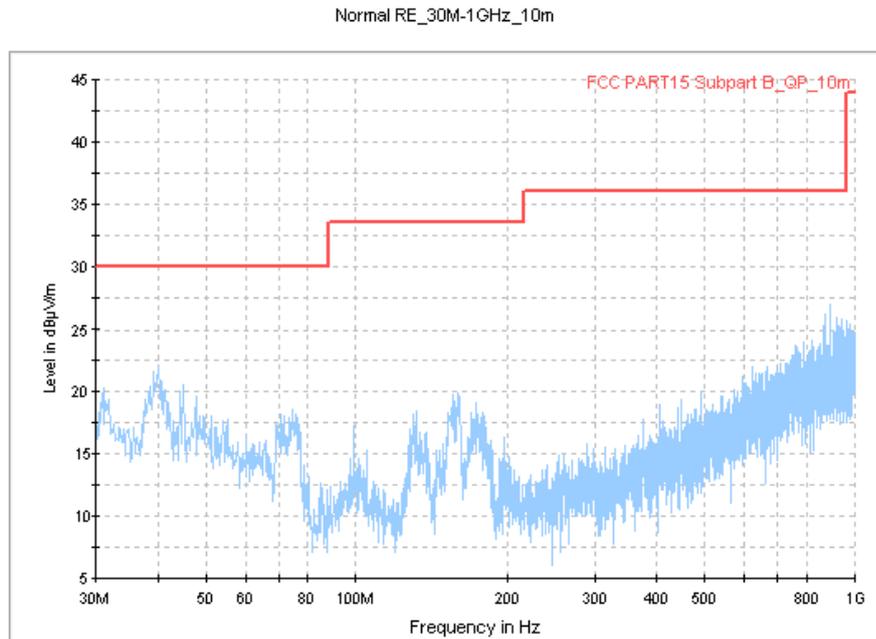


Figure A.1 Radiated Emission from 30MHz to 1GHz

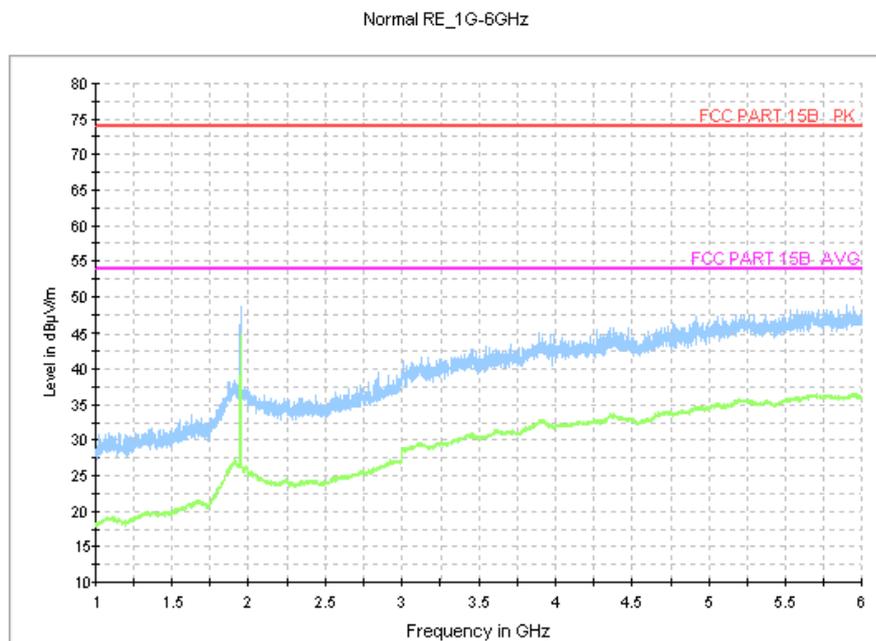


Figure A.2 Radiated Emission from 1GHz to 6GHz

Charging Mode, Set.3

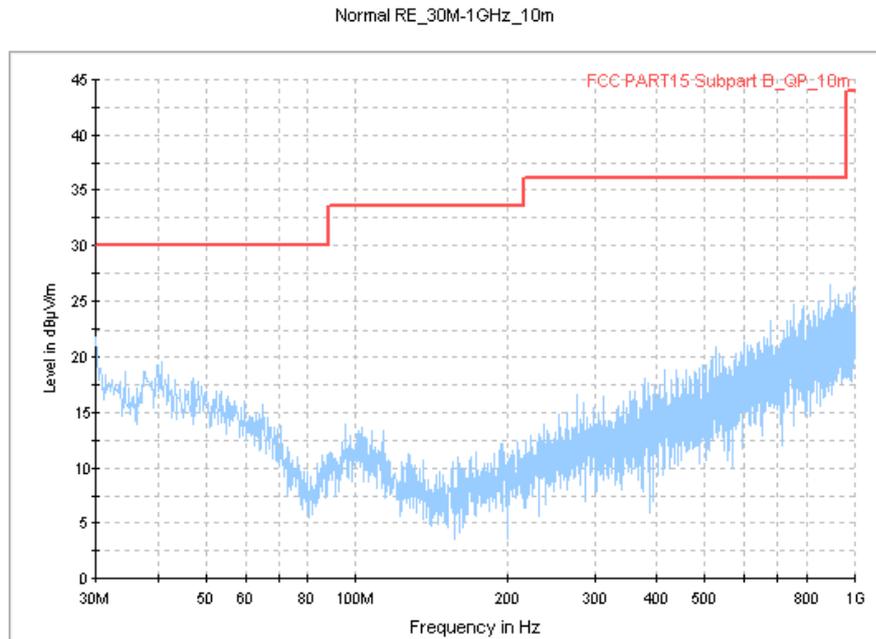


Figure A.3 Radiated Emission from 30MHz to 1GHz

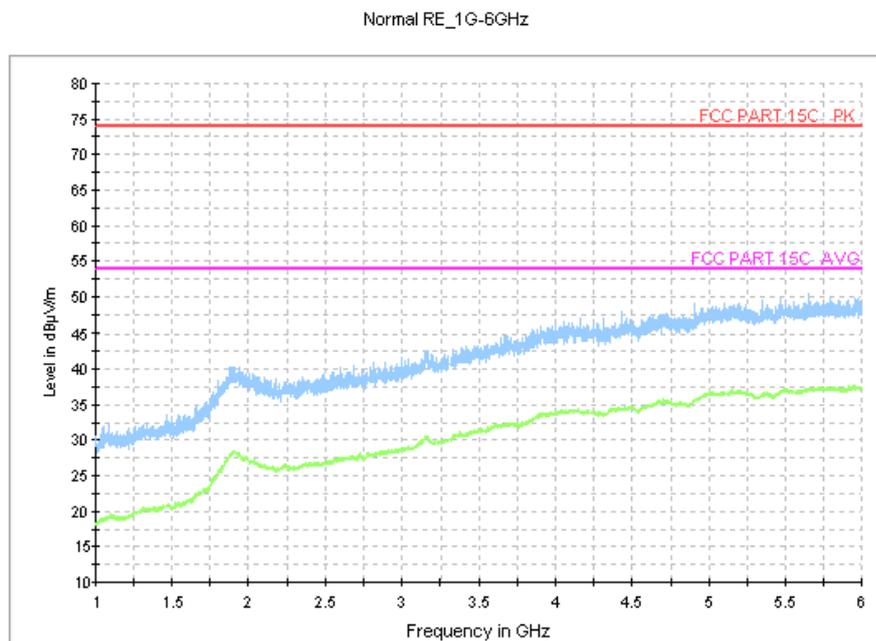


Figure A.4 Radiated Emission from 1GHz to 6GHz

Charging Mode, Set.4

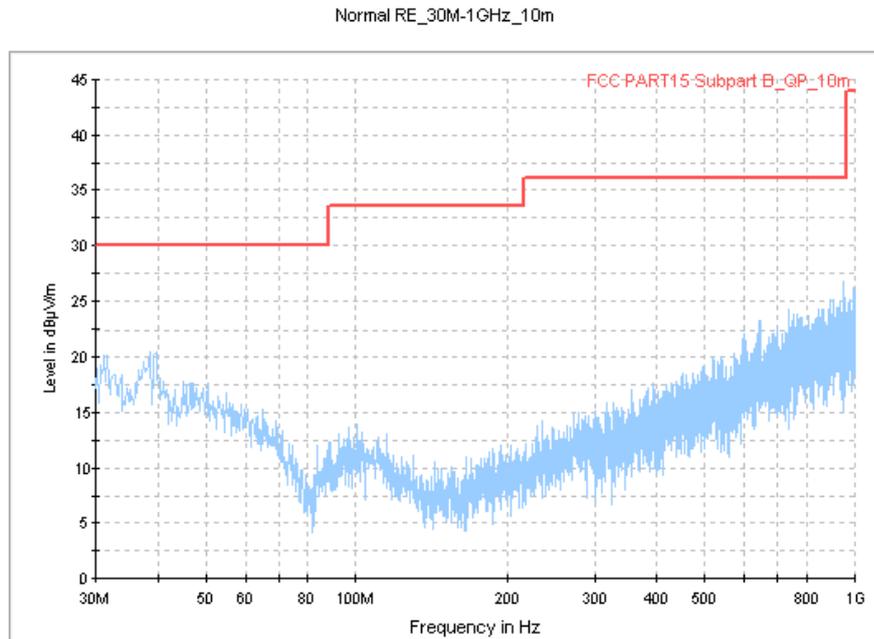


Figure A.5 Radiated Emission from 30MHz to 1GHz

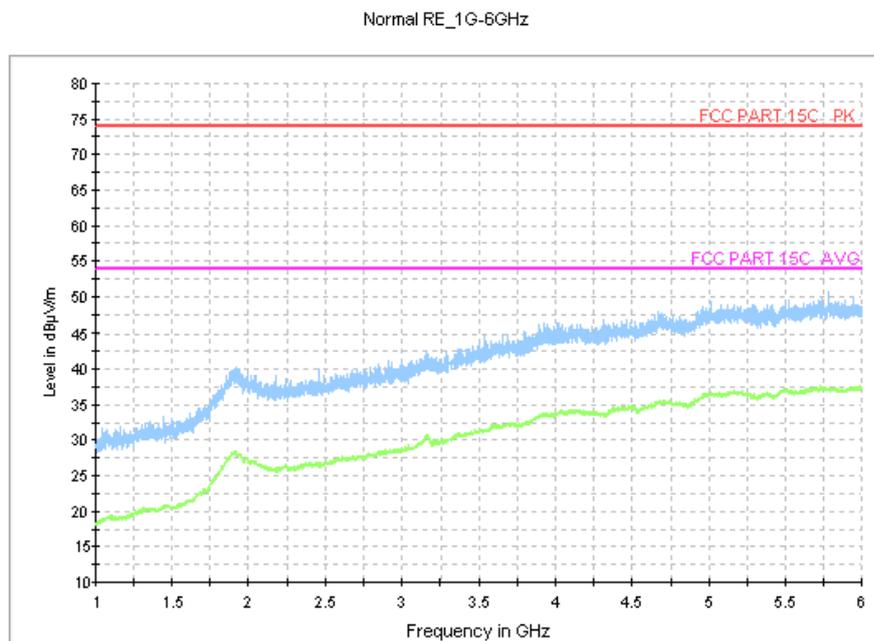


Figure A.6 Radiated Emission from 1GHz to 6GHz

USB Mode, Set.2

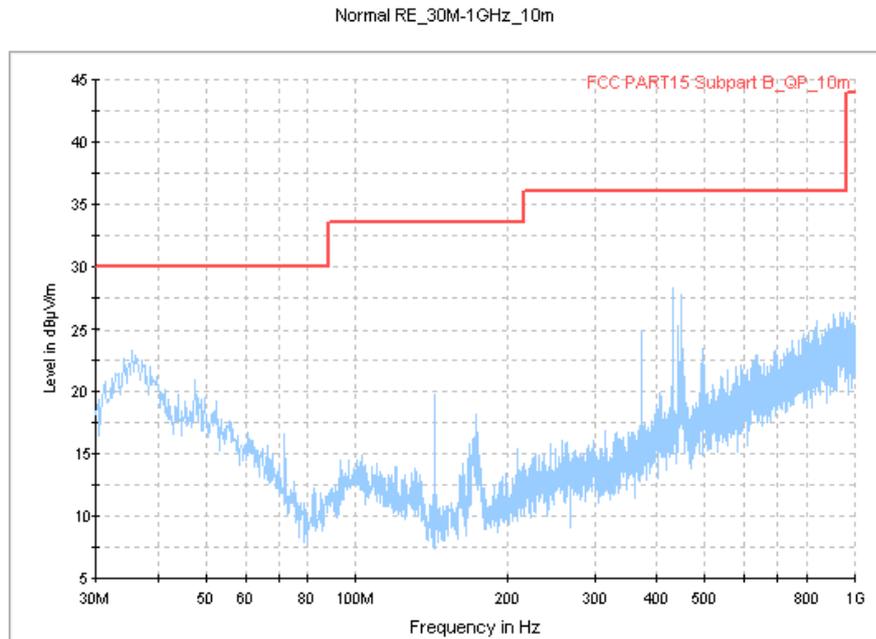


Figure A.7 Radiated Emission from 30MHz to 1GHz

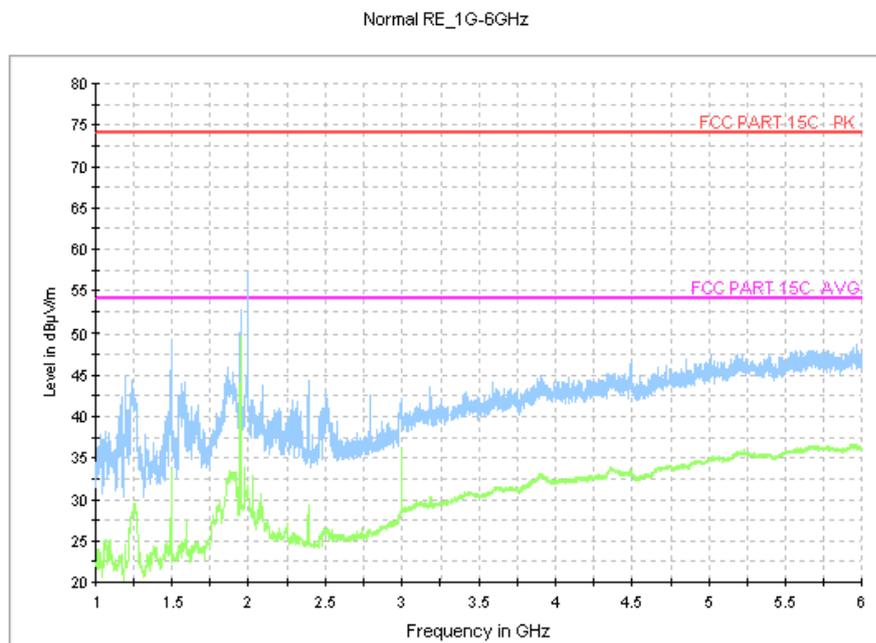


Figure A.8 Radiated Emission from 1GHz to 6GHz

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 7.3.

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

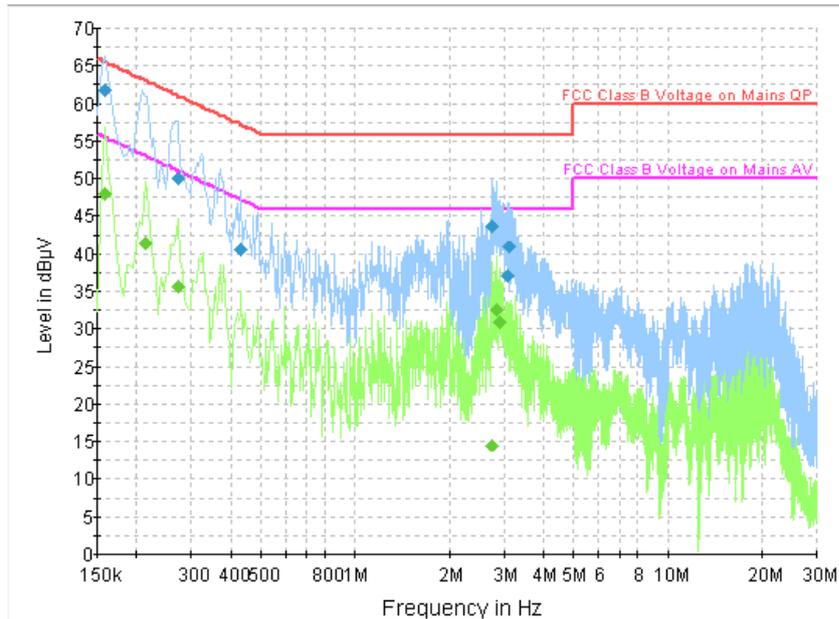


Figure A.9 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.159000	61.9	GND	L1	9.8	3.6	65.5
0.271500	50.1	GND	L1	9.8	11.0	61.1
0.433500	40.6	GND	L1	9.8	16.6	57.2
2.751000	43.8	GND	L1	9.7	12.2	56.0
3.070500	37.2	GND	N	9.7	18.8	56.0
3.115500	41.0	GND	L1	9.7	15.0	56.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.159000	48.0	GND	L1	9.8	7.5	55.5
0.213000	41.5	GND	N	9.8	11.6	53.1
0.271500	35.7	GND	L1	9.8	15.4	51.1
2.751000	14.6	GND	L1	9.7	31.4	46.0
2.854500	32.5	GND	L1	9.7	13.5	46.0
2.913000	30.9	GND	L1	9.7	15.1	46.0

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

Charging Mode, Set.3

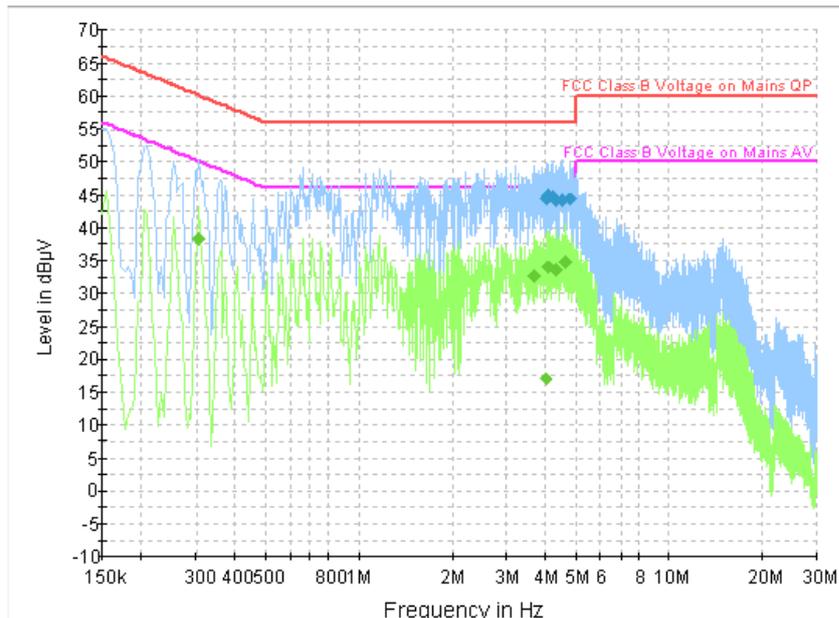


Figure A.10 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
4.029000	44.4	GND	L1	9.7	11.6	56.0
4.087500	44.9	GND	L1	9.7	11.1	56.0
4.218000	44.8	GND	L1	9.7	11.2	56.0
4.348500	44.2	GND	L1	9.7	11.8	56.0
4.524000	44.2	GND	L1	9.7	11.8	56.0
4.785000	44.3	GND	L1	9.8	11.7	56.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.307500	38.4	GND	L1	9.8	11.7	50.0
3.709500	32.6	GND	L1	9.7	13.4	46.0
4.029000	17.1	GND	L1	9.7	28.9	46.0
4.087500	34.0	GND	L1	9.7	12.0	46.0
4.321500	33.5	GND	L1	9.7	12.5	46.0
4.641000	34.8	GND	L1	9.8	11.2	46.0

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

Charging Mode, Set.4

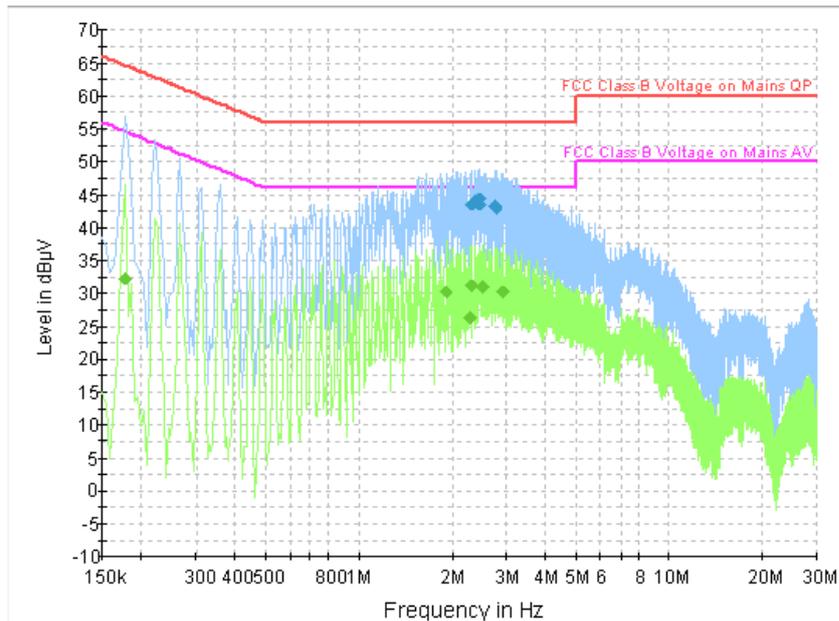


Figure A.11 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
2.332500	43.6	GND	L1	9.7	12.4	56.0
2.364000	43.9	GND	L1	9.7	12.1	56.0
2.449500	44.4	GND	L1	9.7	11.6	56.0
2.463000	43.7	GND	L1	9.7	12.3	56.0
2.742000	43.1	GND	L1	9.7	12.9	56.0
2.769000	43.0	GND	L1	9.7	13.0	56.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.177000	32.3	GND	L1	9.8	22.3	54.6
1.918500	30.3	GND	L1	9.7	15.7	46.0
2.274000	26.3	GND	L1	9.7	19.7	46.0
2.319000	31.0	GND	L1	9.7	15.0	46.0
2.508000	31.0	GND	L1	9.7	15.0	46.0
2.931000	30.2	GND	L1	9.7	15.8	46.0

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

USB Mode, Set.2

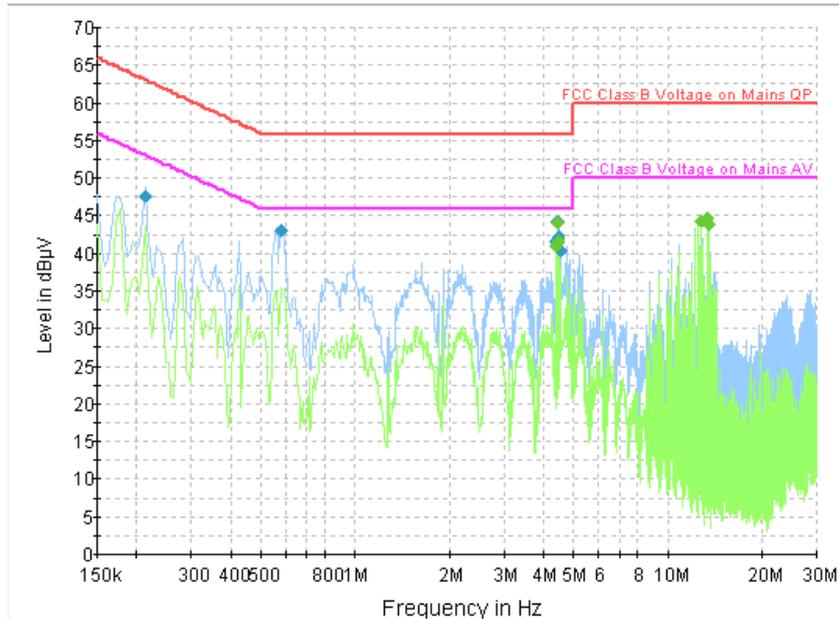


Figure A.12 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.213000	47.8	GND	N	9.8	15.3	63.1
0.577500	43.1	GND	L1	9.8	12.9	56.0
4.380000	41.6	GND	L1	9.7	14.4	56.0
4.411500	44.2	GND	N	9.7	11.8	56.0
4.474500	42.3	GND	N	9.7	13.7	56.0
4.533000	40.5	GND	N	9.7	15.5	56.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
4.380000	40.9	GND	L1	9.7	5.1	46.0
4.411500	44.0	GND	L1	9.7	2.0	46.0
4.474500	41.6	GND	L1	9.7	4.4	46.0
12.808500	44.5	GND	N	9.5	5.5	50.0
13.357500	44.7	GND	N	9.5	5.3	50.0
13.420500	44.0	GND	N	9.5	6.0	50.0

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

END OF REPORT