



TEST REPORT

No. 2013TAR913

for

TCT Mobile Limited

HSDPA/HSUPA/HSPA+/UMTS Quad bands / GSM quad bands/LTE 5

bands mobile phone

Model Name: Miata LATAM

Marketing Name: 6036A

FCC ID: RAD449

with

Hardware Version: PIO

Software Version: v4E18

Issued Date: Mar. 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.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

Tel: +86(0)10-62304633-2561, Fax: +86(0)10-62304633-2504 Email:welcome@emcite.com. www.emcite.com

©Copyright. All rights reserved by TMC Beijing.

CONTENTS

1. TEST LABORATORY.....	3
1.1. TESTING LOCATION	3
1.2. TESTING ENVIRONMENT	3
1.3. PROJECT DATA.....	3
1.4. SIGNATURE	3
2. CLIENT INFORMATION.....	4
2.1. APPLICANT INFORMATION.....	4
2.2. MANUFACTURER INFORMATION.....	4
3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE)	5
3.1. ABOUT EUT	5
3.2. INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST	5
3.3. INTERNAL IDENTIFICATION OF AE USED DURING THE TEST.....	5
3.4. EUT SET-UPS	6
4. REFERENCE DOCUMENTS	7
4.1. REFERENCE DOCUMENTS FOR TESTING.....	7
5. LABORATORY ENVIRONMENT	8
6. SUMMARY OF TEST RESULTS.....	9
7. TEST EQUIPMENTS UTILIZED.....	10
ANNEX A: MEASUREMENT RESULTS	11

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%

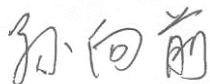
1.3. Project data

Testing Start Date: Feb. 13th, 2013
Testing End Date: Feb. 20th, 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	HSDPA/HSUPA/HSPA+/UMTS Quad bands / GSM quad bands/LTE 5 bands mobile phone
Model Name	Miata LATAM
Marketing Name	6036A
FCC ID	RAD449
Extreme vol. Limits	3.5VDC to 4.2VDC (nominal: 3.9VDC)

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	014010000053234	PIO	V4E18

*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	/	/
AE2	Battery	/	/
AE3	Travel charger	/	TCT-CHR-0136
AE4	Travel charger	/	TCT-CHR-1557
AE5	USB cable	/	TCT-DC-0493
AE6	USB cable	/	TCT-DC-0331

AE1

Model	CAB2000013C2
Manufacturer	BYD
Capacitance	2000 mAh
Nominal voltage	3.8V

AE2

Model	CAB2000010C1
Manufacturer	SCUD
Capacitance	2000 mAh
Nominal voltage	3.8V

AE3

Model	CBA3000AG0C1
Manufacturer	TEN PAO
Length of cable	/

AE4

Model	CBA3000AG0C2
Manufacturer	BYD
Length of cable	/

AE5

Model	CDA3122002C1
Manufacturer	/
Length of cable	98cm

AE6

Model	CDA3122002C2
Manufacturer	/
Length of cable	98cm

*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+ AE3 + AE5/AE6	Charger
Set.2	EUT3+ AE1/AE2+ AE4 + AE5/AE6	Charger
Set.3	EUT3+ AE1/AE2+ AE5/AE6	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	10-1-12 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
4	Test Receiver	FSV	101047	R&S	2014-06-30
5	LISN	ESH2-Z5	829991/012	R&S	2014-04-14
6	EMI Antenna	VULB 9163	9163-234	Schwarzbeck	2016-09-15
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 ($\mu\text{V/m}$)		
	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
9987.000	34.9	-24.2	38.0	21.100	HORIZONTAL
9948.500	34.9	-24.9	38.0	21.800	VERTICAL
9959.000	34.9	-24.9	38.0	21.800	HORIZONTAL
9991.000	34.8	-24.2	38.0	21.000	VERTICAL
9987.500	34.8	-24.2	38.0	21.000	HORIZONTAL
9997.000	34.8	-24.2	38.0	21.000	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
9859.500	47.3	-24.8	38.0	34.100	HORIZONTAL
9366.000	47.2	-26.3	38.4	35.100	VERTICAL
9997.500	46.9	-24.2	38.0	33.100	HORIZONTAL
9626.500	46.9	-25.4	38.0	34.300	VERTICAL
9309.000	46.9	-26.3	38.4	34.800	HORIZONTAL
9661.500	46.8	-25.4	38.0	34.200	HORIZONTAL

Measurement result 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
9973.000	34.9	-24.2	38.0	21.100	VERTICAL
9993.500	34.9	-24.2	38.0	21.100	HORIZONTAL
9993.000	34.9	-24.2	38.0	21.100	HORIZONTAL
9952.500	34.9	-24.9	38.0	21.800	HORIZONTAL
9985.500	34.9	-24.2	38.0	21.100	VERTICAL
9949.000	34.9	-24.9	38.0	21.800	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
8472.000	48.3	-27.3	37.7	37.900	HORIZONTAL
9638.000	48.0	-25.4	38.0	35.400	VERTICAL
9979.000	47.5	-24.2	38.0	33.700	HORIZONTAL
9936.000	47.1	-24.9	38.0	34.000	HORIZONTAL
9970.500	47.1	-24.2	38.0	33.300	VERTICAL
9992.000	47.1	-24.2	38.0	33.300	VERTICAL

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
9990.500	35.1	-24.2	38.0	21.300	VERTICAL
9967.000	34.9	-24.2	38.0	21.100	VERTICAL
9987.500	34.9	-24.2	38.0	21.100	HORIZONTAL
9973.500	34.9	-24.2	38.0	21.100	HORIZONTAL
9994.000	34.9	-24.2	38.0	21.100	VERTICAL
9949.000	34.9	-24.9	38.0	21.800	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
1499.500	48.4	-40.3	24.1	64.600	HORIZONTAL
1498.750	48.3	-40.3	24.1	64.500	HORIZONTAL
1569.500	48.1	-40.1	25.3	62.900	VERTICAL
1498.500	48.0	-40.3	24.1	64.200	HORIZONTAL
7998.000	48.0	-27.8	37.5	38.300	VERTICAL
1499.250	48.0	-40.3	24.1	64.200	VERTICAL

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

Charging Mode, Set.1

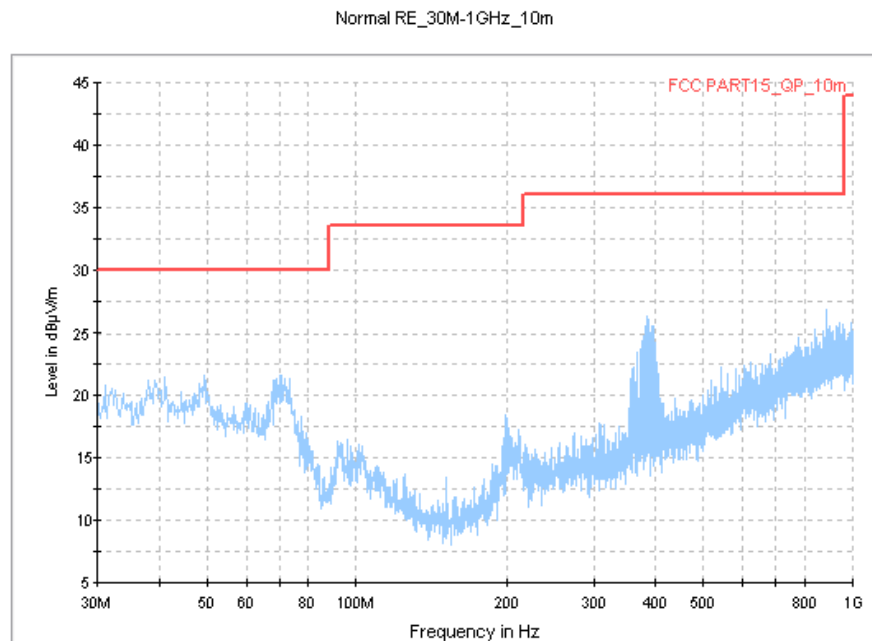


Figure A.1 Radiated Emission from 30MHz to 1GHz

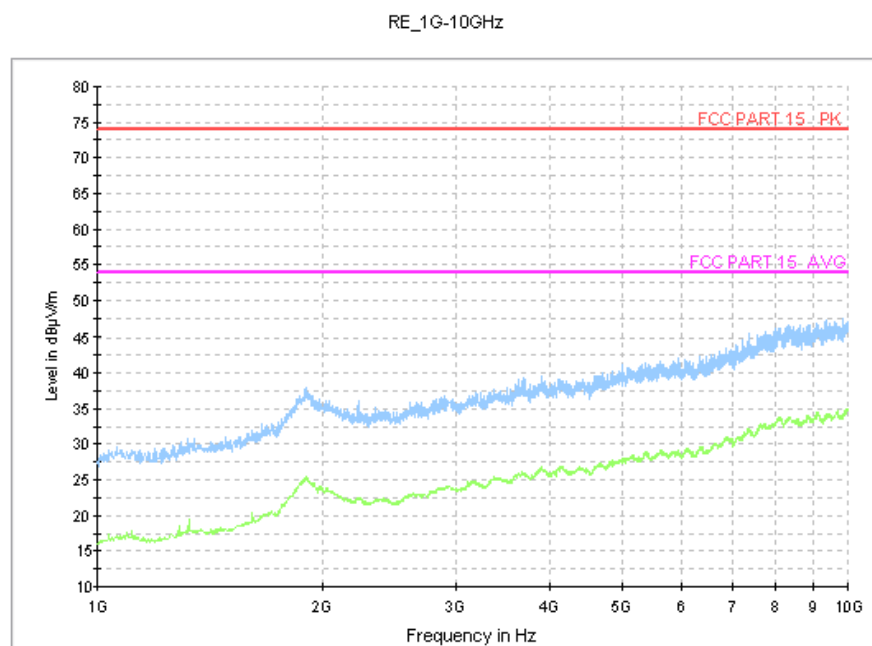


Figure A.2 Radiated Emission from 1GHz to 10GHz

Charging Mode, Set.2

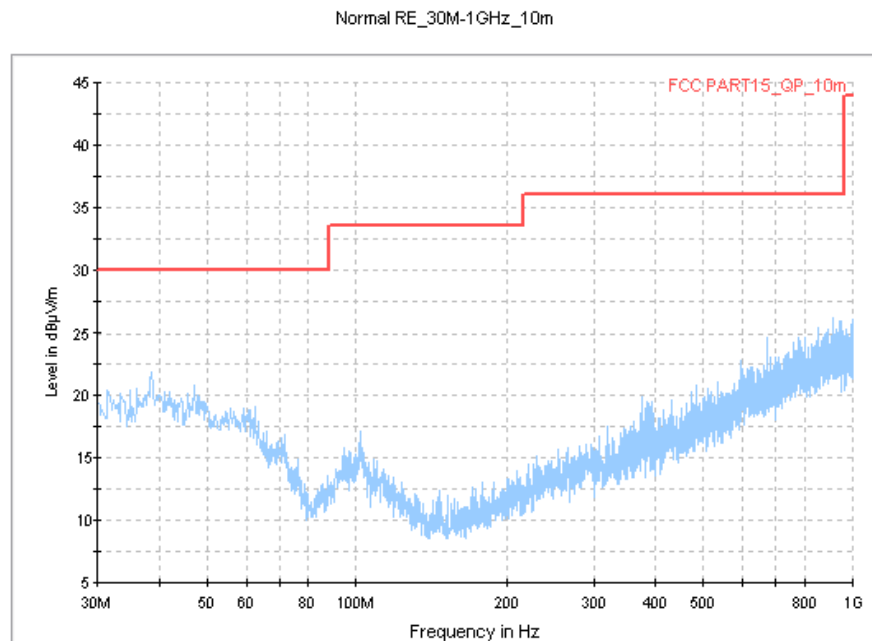


Figure A.3 Radiated Emission from 30MHz to 1GHz

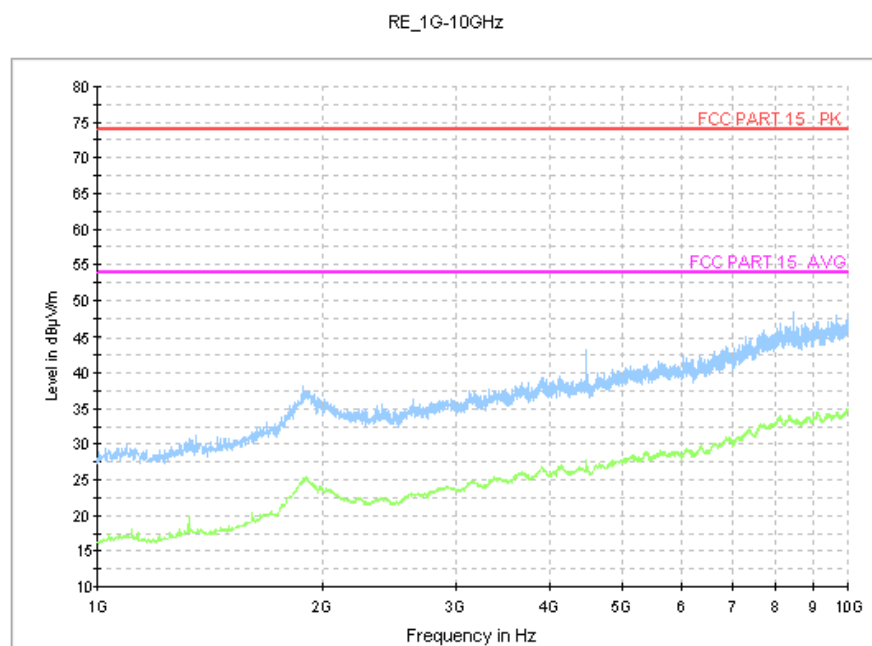


Figure A.4 Radiated Emission from 1GHz to 10GHz

USB Mode, Set.3

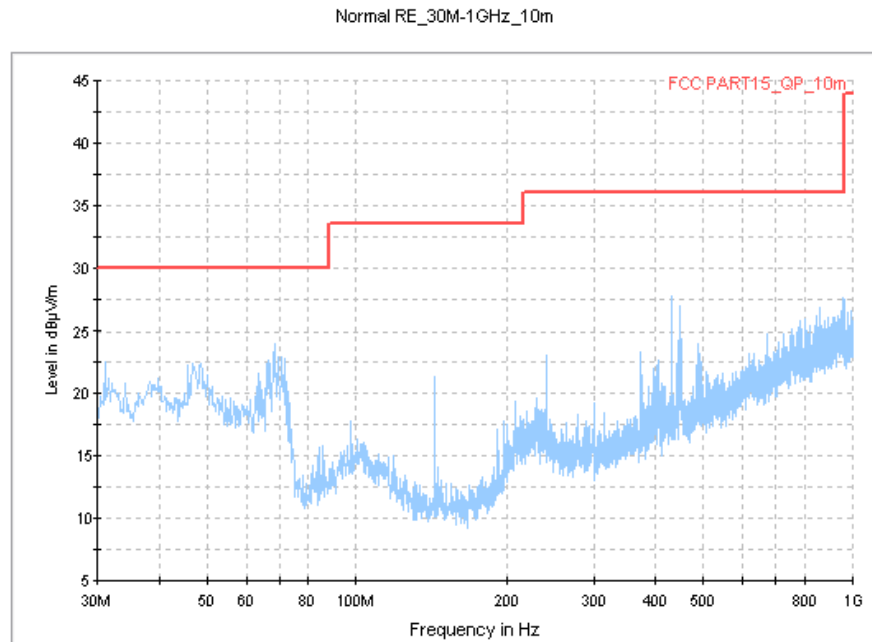


Figure A.5 Radiated Emission from 30MHz to 1GHz

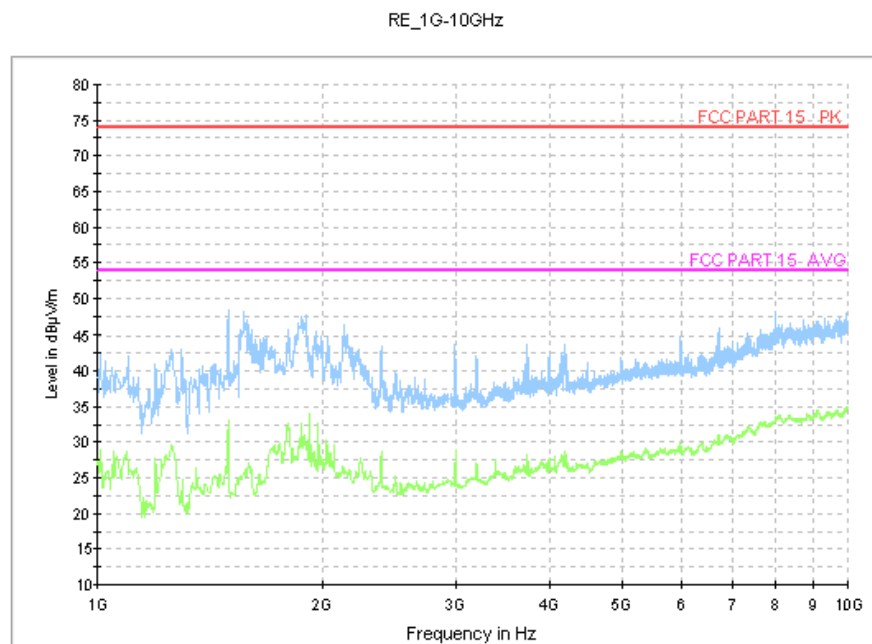


Figure A.6 Radiated Emission from 1GHz to 10GHz

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 7.2.

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 (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: $U= 2.9 \text{ dB}$, $k=2$.

Charging Mode, Set.1

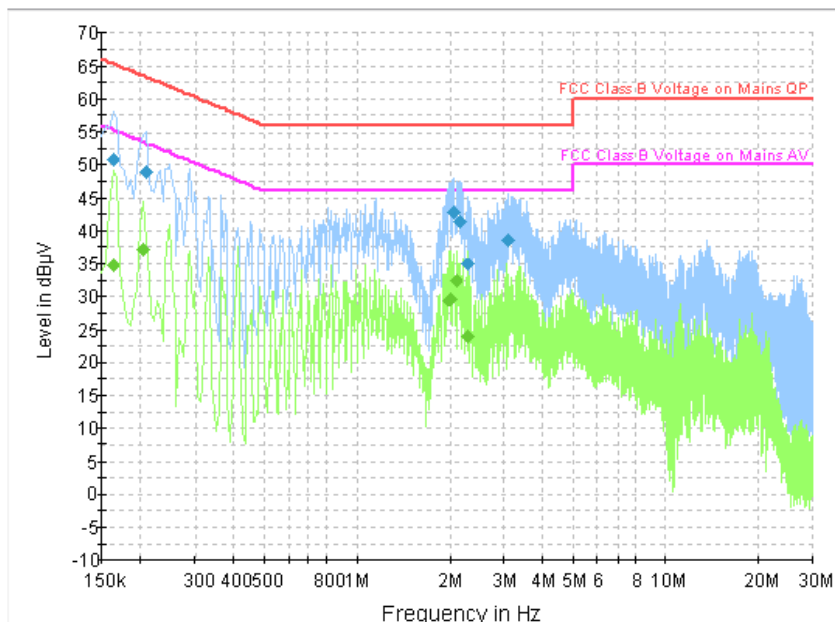


Figure A.7 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.163500	50.7	GND	N	9.8	14.6	65.3
0.208500	48.9	GND	L1	9.8	14.4	63.3
2.067000	42.8	GND	L1	9.7	13.2	56.0
2.157000	41.3	GND	L1	9.7	14.7	56.0
2.274000	34.9	GND	L1	9.7	21.1	56.0
3.102000	38.4	GND	L1	9.7	17.6	56.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.163500	34.8	GND	N	9.8	20.5	55.3
0.204000	37.2	GND	L1	9.8	16.3	53.4
1.986000	29.5	GND	L1	9.7	16.5	46.0
2.026500	29.6	GND	L1	9.7	16.4	46.0
2.098500	32.5	GND	L1	9.7	13.5	46.0
2.274000	24.0	GND	L1	9.7	22.0	46.0

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

Charging Mode, Set.2

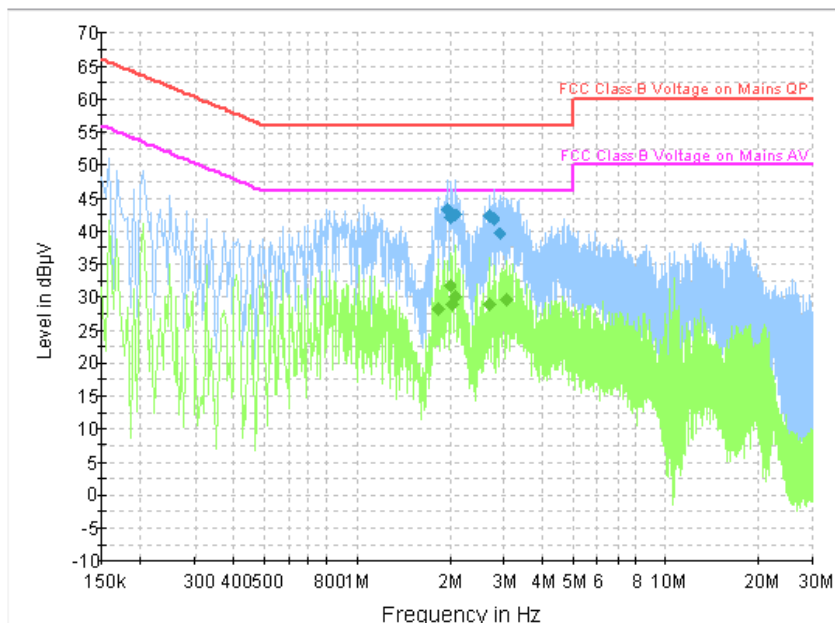


Figure A.8 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
1.968000	43.2	GND	L1	9.7	12.8	56.0
2.017500	42.1	GND	L1	9.7	13.9	56.0
2.089500	42.4	GND	L1	9.7	13.6	56.0
2.701500	42.3	GND	L1	9.7	13.7	56.0
2.773500	41.8	GND	L1	9.7	14.2	56.0
2.908500	39.6	GND	L1	9.7	16.4	56.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
1.846500	28.1	GND	L1	9.7	17.9	46.0
1.999500	31.8	GND	L1	9.7	14.2	46.0
2.053500	28.9	GND	L1	9.7	17.1	46.0
2.089500	30.0	GND	L1	9.7	16.0	46.0
2.701500	28.9	GND	L1	9.7	17.1	46.0
3.066000	29.6	GND	L1	9.7	16.4	46.0

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

USB Mode, Set.3

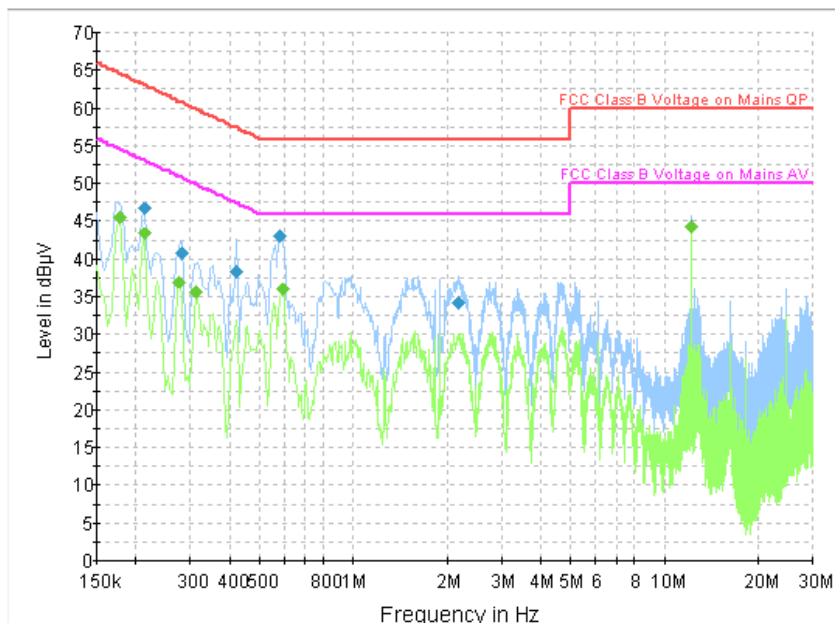


Figure A.9 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.213000	46.6	GND	N	9.8	16.4	63.1
0.280500	40.9	GND	N	9.8	19.9	60.8
0.420000	38.3	GND	L1	9.8	19.2	57.4
0.582000	43.0	GND	L1	9.8	13.0	56.0
2.179500	34.1	GND	N	9.7	21.9	56.0
12.205500	44.5	GND	N	9.6	15.5	60.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.177000	45.6	GND	N	9.8	9.0	54.6
0.213000	43.4	GND	N	9.8	9.7	53.1
0.276000	36.9	GND	N	9.8	14.0	50.9
0.312000	35.7	GND	N	9.8	14.2	49.9
0.595500	36.0	GND	N	9.8	10.0	46.0
12.205500	44.2	GND	N	9.6	5.8	50.0

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

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