TEST REPORT

No. 2013TAR828

for

TCT Mobile Limited

HSUPA/HSDPA/UMTS Triband / GSM quadband mobile phone

Model Name: HERO

Marketing Name: ONE TOUCH 8020A

FCC ID: RAD398

with

Hardware Version: PIO

Software Version: vBAM

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.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 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

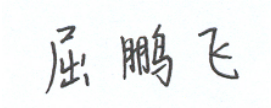
1.2. Testing Environment

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

1.3. Project data

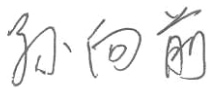
Testing Start Date: Dec. 05th, 2013
Testing End Date: Dec. 23rd, 2013

1.4. Signature



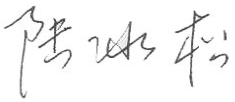
Qu Pengfei

(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 Triband / GSM quadband mobile phone
Model Name	HERO
Marketing Name	ONE TOUCH 8020A
FCC ID	RAD398
Extreme vol. Limits	3.5VDC to 4.35VDC (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	013802001012321	PIO	vBAM

*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	/	Inbuilt
AE2	Travel charger	/	TCT-CHR-1665
AE3	USB cable	/	TCT-DC-0477

AE1

Model	CAC3380001C2
Manufacturer	SCUD
Capacitance	3400 mAh
Nominal voltage	3.8 V

AE2

Model	CBA0015AG1C1
Manufacturer	BYD
Length of cable	78 cm (length of USB cable)

AE3

Model	CDA3122002C1
Manufacturer	Shenghua
Length of cable	78 cm

*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	Charger
Set.2	EUT1 + AE1 + AE3	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.	Spectrum Analyzer	FSU26	200278	R&S	2014-01-30
4.	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	2014-12-16
8.	PC	OPTIPLEX 380	2X1YV2X	DELL	N/A
9.	Monitor	E178FPc	CN-OWR979-64180-7AJ-D2MS	DELL	N/A
10.	Printer	P1606dn	VNC3L52122	HP	N/A
11.	Keyboard	L100	CN0RH659658907ATOI40	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

Limit from CFR Part 15.109(a)

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 results for Set.1:

Charging Mode/Average detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBμV)	Polarity
1947.800	41.2	-35.2	25.3	51.100	H
1947.450	40.2	-35.2	25.3	50.100	V
1948.150	37.6	-35.2	25.3	47.500	H
1947.100	33.0	-35.2	25.3	42.900	H
7738.900	32.5	-28.3	37.5	23.300	H
7651.050	32.5	-28.4	37.5	23.400	V

Charging Mode/Peak detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBμV)	Polarity
7520.850	44.6	-28.9	37.5	36.000	V
7652.450	44.5	-28.4	37.5	35.400	V
1947.800	44.2	-35.2	25.3	54.100	H
7646.150	44.1	-28.4	37.5	35.000	V
1947.450	44.1	-35.2	25.3	54.000	V
7585.950	44.1	-28.5	37.5	35.100	H

Measurement result for Set.2:

USB Mode/Average detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBμV)	Polarity
2999.900	36.3	-38.6	28.9	46.000	H
1925.050	35.0	-34.6	25.3	44.300	V
3000.250	34.7	-38.6	30.9	42.400	V
1924.700	34.4	-34.6	25.3	43.700	H
1948.850	33.9	-35.2	25.3	43.800	H
1498.750	33.6	-40.3	24.1	49.800	H

USB Mode/Peak detector

Frequency(MHz)	Result(dBμV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBμV)	Polarity
1499.450	49.3	-40.3	24.1	65.500	H
1493.150	49.0	-40.3	24.1	65.200	H
1498.400	48.6	-40.3	24.1	64.800	V
1498.750	48.6	-40.3	24.1	64.800	H
1499.100	48.3	-40.3	24.1	64.500	V
1948.500	48.3	-35.2	25.3	58.200	V

Charging Mode, Set.1

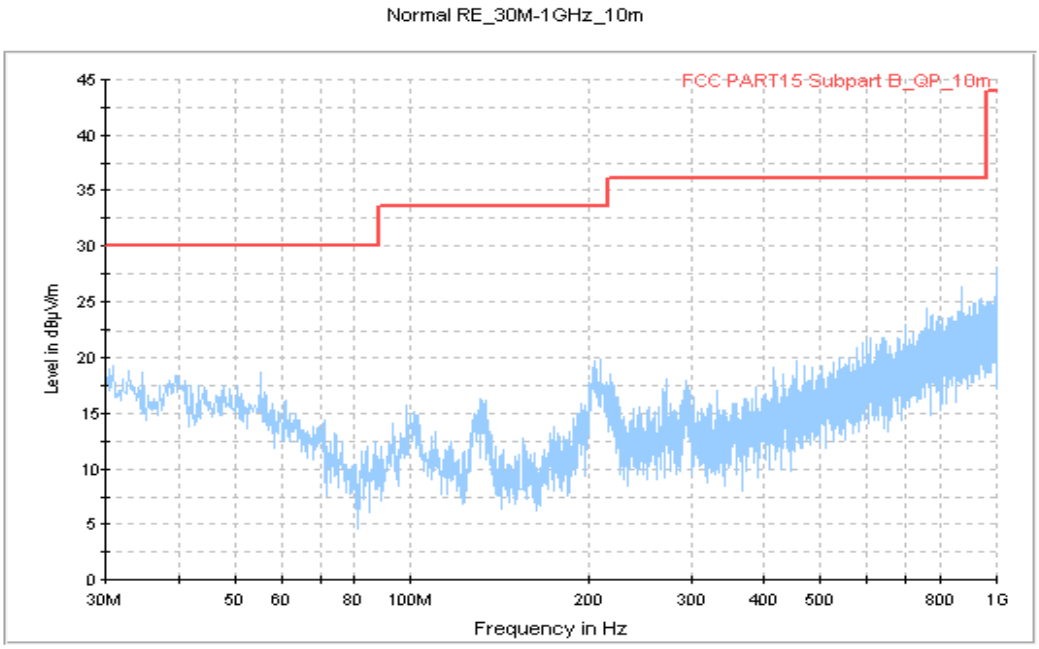


Figure A.1 Radiated Emission from 30MHz to 1GHz

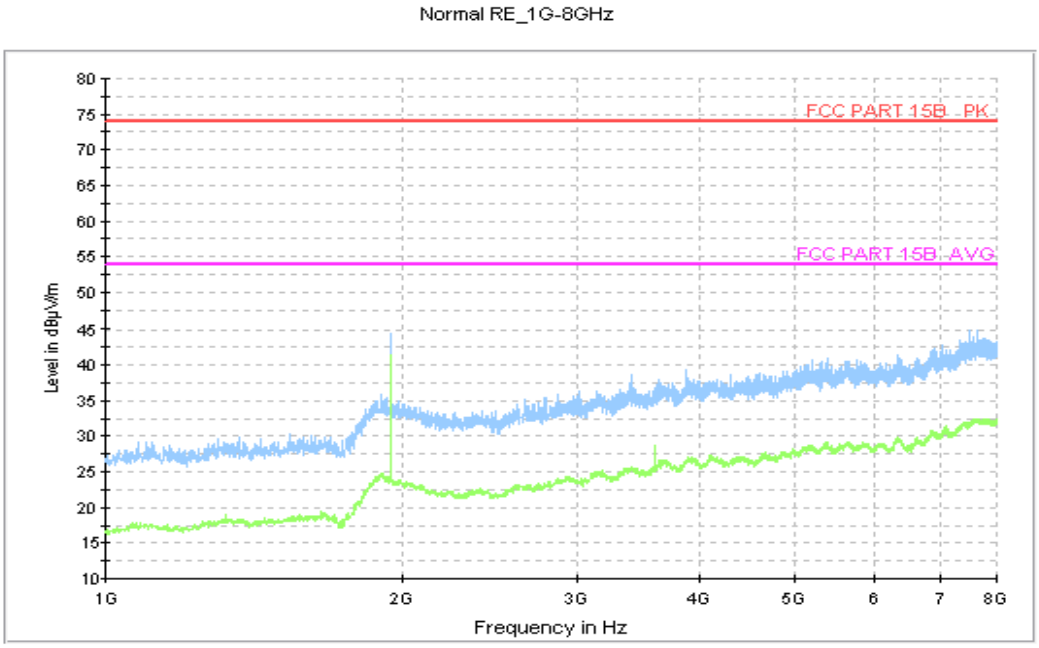


Figure A.2 Radiated Emission from 1GHz to 8GHz

USB Mode, Set.2

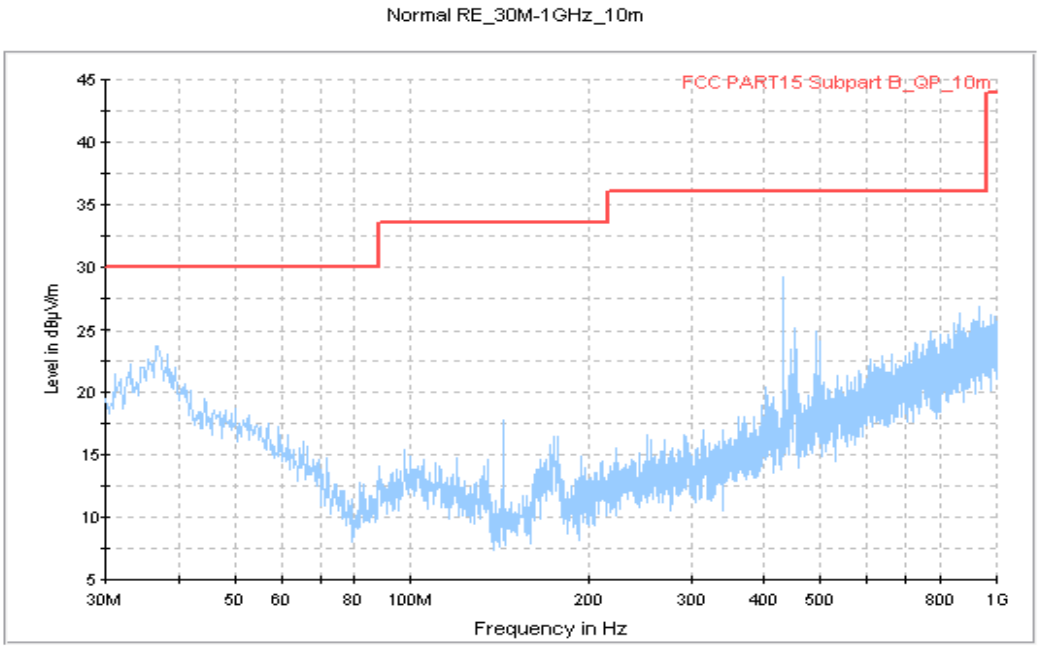


Figure A.3 Radiated Emission from 30MHz to 1GHz

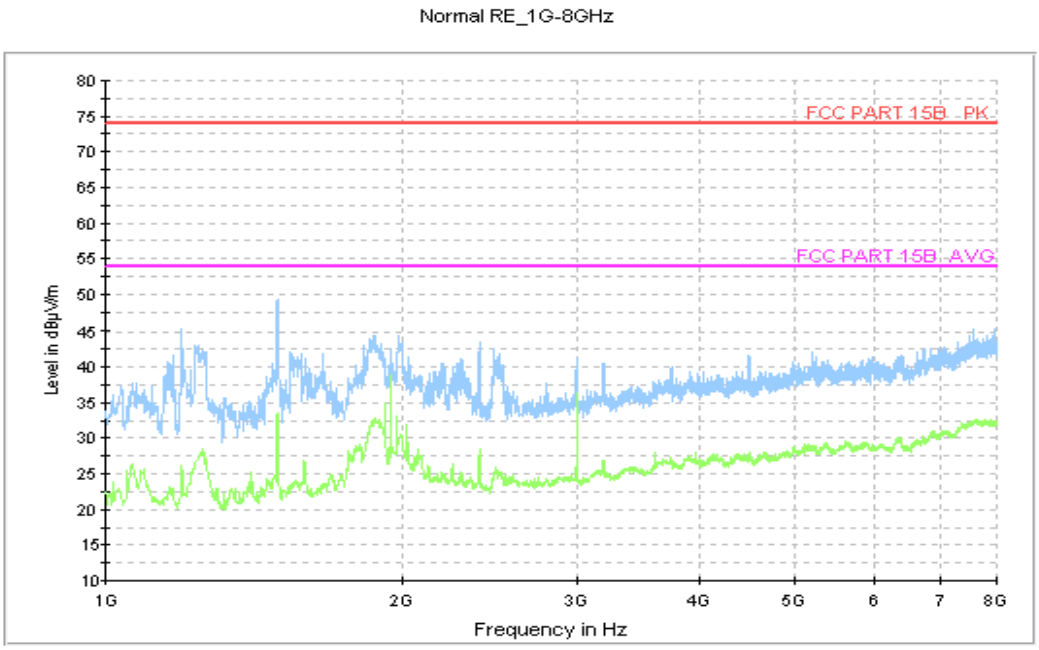


Figure A.4 Radiated Emission from 1GHz to 8GHz

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 (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

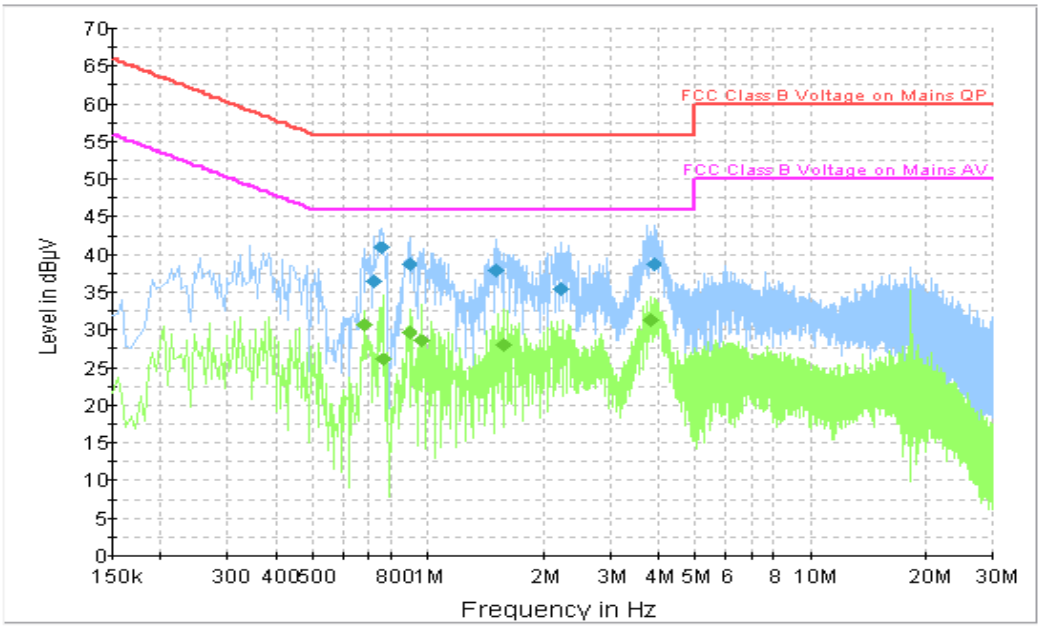


Figure A.5 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.721500	36.5	GND	L1	9.8	19.5	56.0
0.757500	41.0	GND	L1	9.8	15.0	56.0
0.897000	38.8	GND	L1	9.7	17.2	56.0
1.513500	37.9	GND	L1	9.7	18.1	56.0
2.211000	35.6	GND	L1	9.7	20.4	56.0
3.876000	38.7	GND	L1	9.7	17.3	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.685500	30.7	GND	L1	9.8	15.3	46.0
0.766500	26.1	GND	L1	9.8	19.9	46.0
0.897000	29.7	GND	L1	9.7	16.3	46.0
0.960000	28.5	GND	L1	9.7	17.5	46.0
1.581000	28.1	GND	L1	9.7	17.9	46.0
3.817500	31.4	GND	L1	9.7	14.6	46.0

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

USB Mode, Set.2

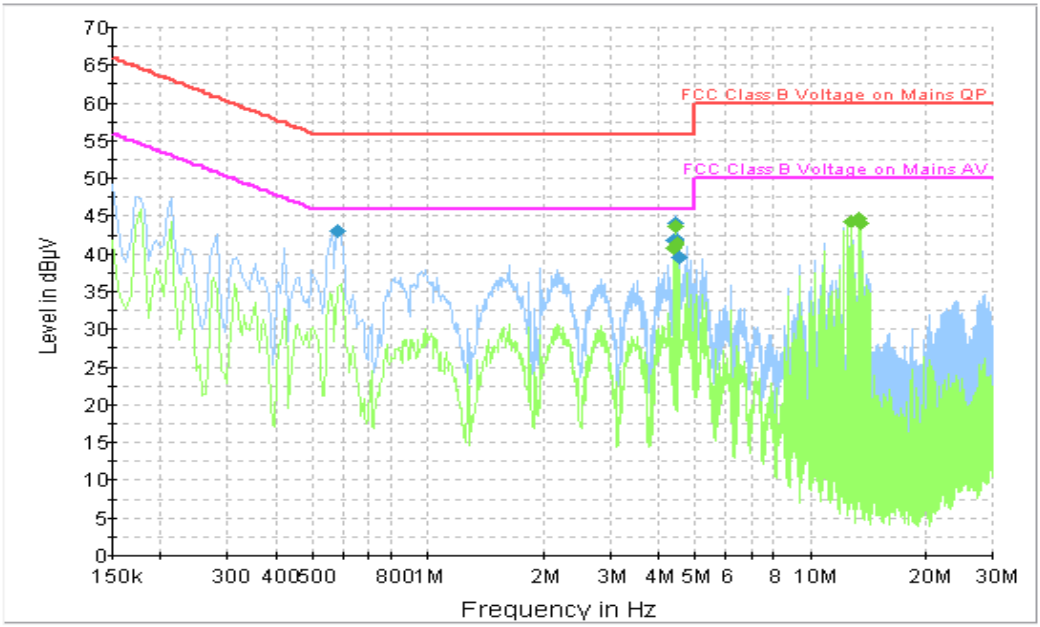


Figure A.6 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.582000	43.0	GND	L1	9.8	13.0	56.0
4.380000	41.9	GND	N	9.7	14.1	56.0
4.411500	44.1	GND	N	9.7	11.9	56.0
4.474500	41.9	GND	N	9.7	14.1	56.0
4.533000	39.6	GND	N	9.7	16.4	56.0
13.357500	44.8	GND	N	9.5	15.2	60.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
4.380000	40.8	GND	N	9.7	5.2	46.0
4.411500	43.8	GND	N	9.7	2.2	46.0
4.474500	41.4	GND	N	9.7	4.6	46.0
12.808500	44.4	GND	N	9.5	5.6	50.0
13.357500	44.8	GND	N	9.5	5.2	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*****