



TEST REPORT

No. I14Z45042-EMC01

for

TCT Mobile Limited

HSUPA/HSDPA/UMTS triband / GSM quadband mobile phone

Model Name: Alpha

Marketing Name: 6032A

FCC ID: RAD397

with

Hardware Version: PIO

Software Version: vA2A

Issued Date: Feb. 13th, 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

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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℃
Relative Humidity: 20-75%

1.3. Project data

Testing Start Date: Jan. 17th, 2014
Testing End Date: Jan. 28th, 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: 0086-21-51798260
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: 0086-21-51798260
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3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1. About EUT

Description	HSUPA/HSDPA/UMTS triband / GSM quadband mobile phone
Model Name	Alpha
Marketing Name	6032A
FCC ID	RAD397
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	013780000050270	PIO	vA2A

*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-0826
AE4	Travel charger	/	TCT-CHR-0838
AE5	USB cable	/	TCT-DC-0180
AE6	USB cable	/	TCT-DC-0175
AE7	USB cable	/	TCT-DC-0147
AE8	USB cable	/	TCT-DC-0156

AE1

Model	CAC2000005C2
Manufacturer	SCUD
Capacitance	2000 mAh
Nominal voltage	3.8V

AE2

Model	CAC2000009C1
Manufacturer	BYD
Capacitance	2000 mAh
Nominal voltage	3.8V

AE3, AE4

Model	CBA0003AG0C1
Manufacturer	BYD
Length of cable	/

AE5, AE6

Model	CDA0000025C1
Manufacturer	Shenghua
Length of cable	98cm

AE7, AE8

Model	CDA0000025C2
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+ AE1/AE2+ AE3 + AE5/AE7	Charger
Set.2	EUT1+ AE1/AE2+ AE5/AE7	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	9163-483	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 ($\mu\text{V/m}$)		
	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
5613.281	29.4	-34.4	35.1	28.700	HORIZONTAL
5653.906	29.4	-34.2	35.1	28.500	HORIZONTAL
5654.219	29.4	-34.2	35.1	28.500	VERTICAL
5653.750	29.3	-34.2	35.1	28.400	HORIZONTAL
5866.250	29.3	-33.8	35.1	28.000	HORIZONTAL
5608.438	29.3	-34.4	35.1	28.600	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
5776.875	41.5	-33.8	35.1	40.200	HORIZONTAL
5622.500	41.5	-34.4	35.1	40.800	HORIZONTAL
5067.813	41.4	-34.9	34.6	41.700	VERTICAL
5780.313	41.4	-33.8	35.1	40.100	HORIZONTAL
5673.906	41.3	-34.2	35.1	40.400	HORIZONTAL
5374.063	41.2	-34.8	34.6	41.400	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
17890.031	52.2	-18.5	45.6	25.100	HORIZONTAL
17908.094	52.1	-18.5	45.6	25.000	HORIZONTAL
17880.469	52.1	-18.5	45.6	25.000	VERTICAL
17901.188	52.0	-18.5	45.6	24.900	HORIZONTAL
17888.438	52.0	-18.5	45.6	24.900	HORIZONTAL
17893.750	52.0	-18.5	45.6	24.900	HORIZONTAL

USB Mode/ Peak detector

Frequency(MHz)	Result(dB μ V/m)	G _{PL} (dB)	G _A (dB/m)	P _{mea} (dB μ V)	Polarity
17949.000	63.8	-17.7	45.6	35.900	HORIZONTAL
17911.281	63.7	-18.5	45.6	36.600	HORIZONTAL
17891.094	63.6	-18.5	45.6	36.500	VERTICAL
17868.250	63.4	-18.5	45.6	36.300	HORIZONTAL
17875.688	63.2	-18.5	45.6	36.100	HORIZONTAL
17953.781	63.1	-17.7	45.6	35.200	HORIZONTAL

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

Charging Mode, Set.1

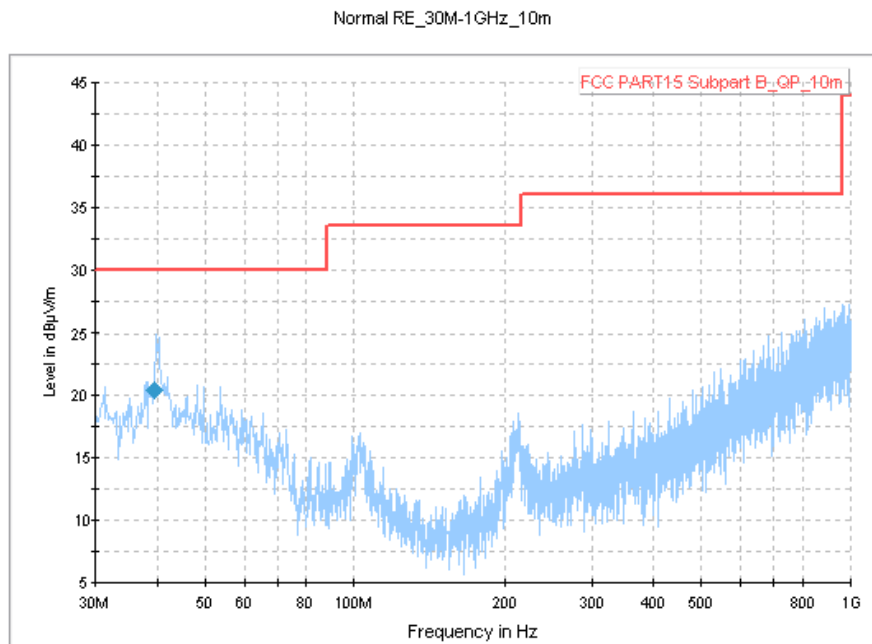


Figure A.1 Radiated Emission from 30MHz to 1GHz

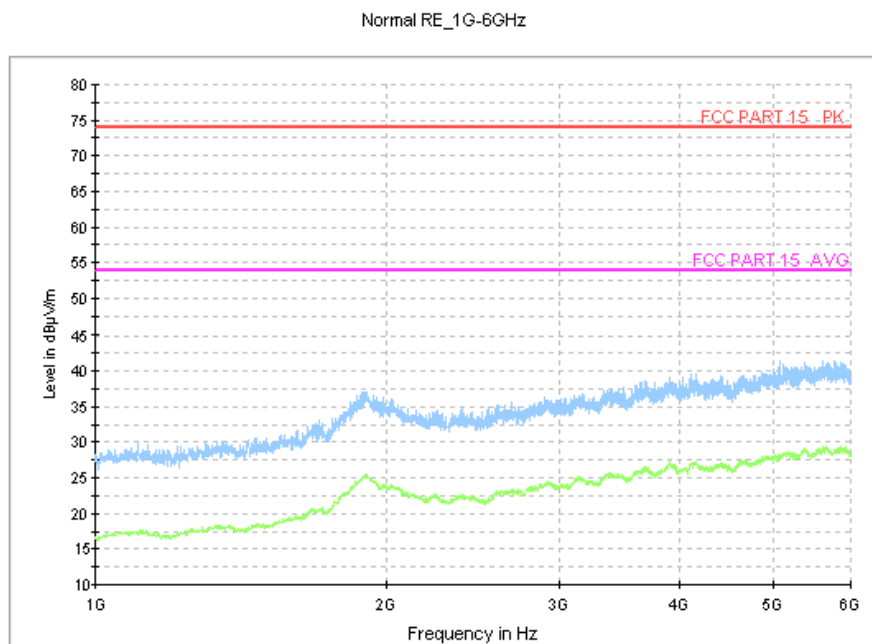


Figure A.2 Radiated Emission from 1GHz to 6GHz

USB Mode, Set.2

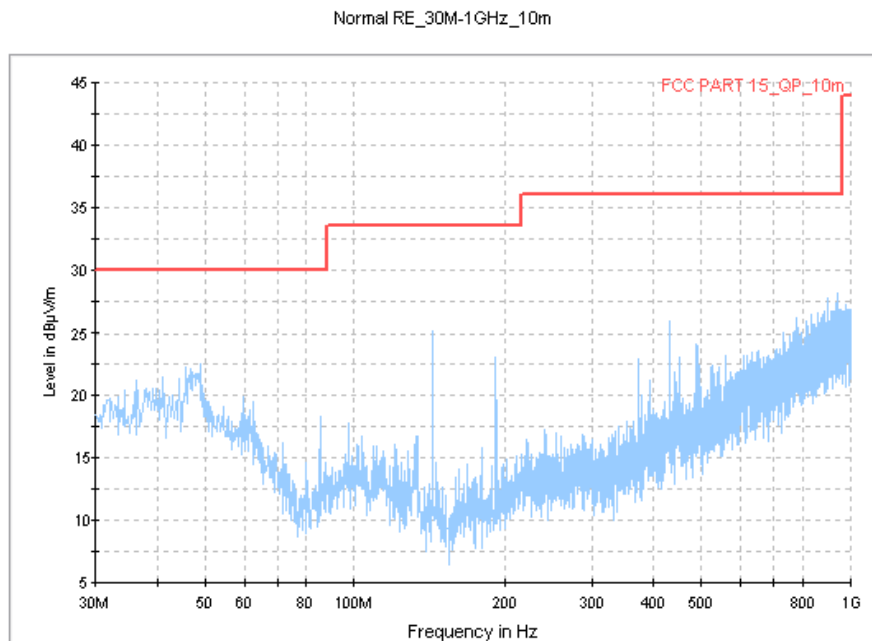


Figure A.3 Radiated Emission from 30MHz to 1GHz

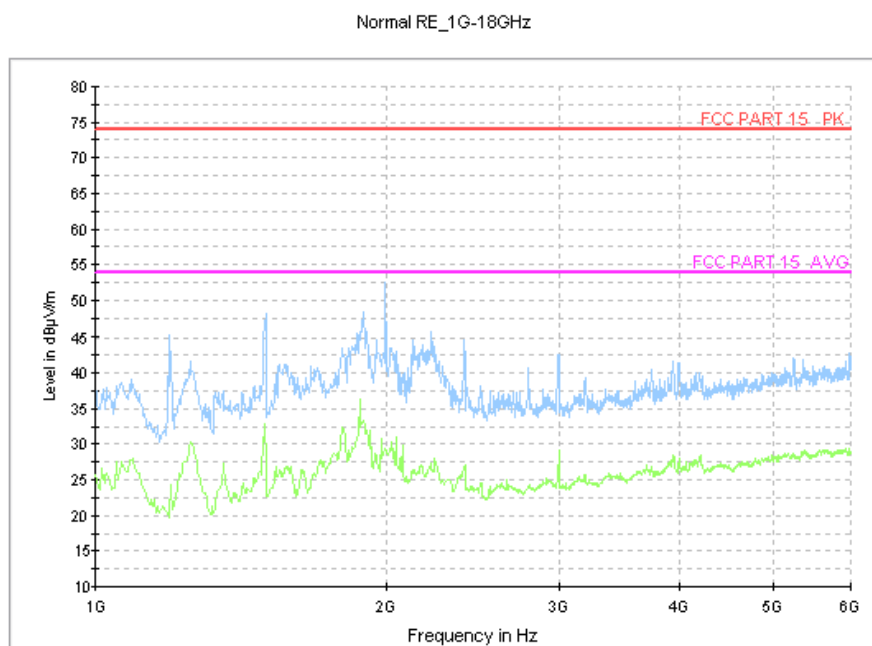


Figure A.4 Radiated Emission from 1GHz to 6GHz

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

Charging Mode, Set.1

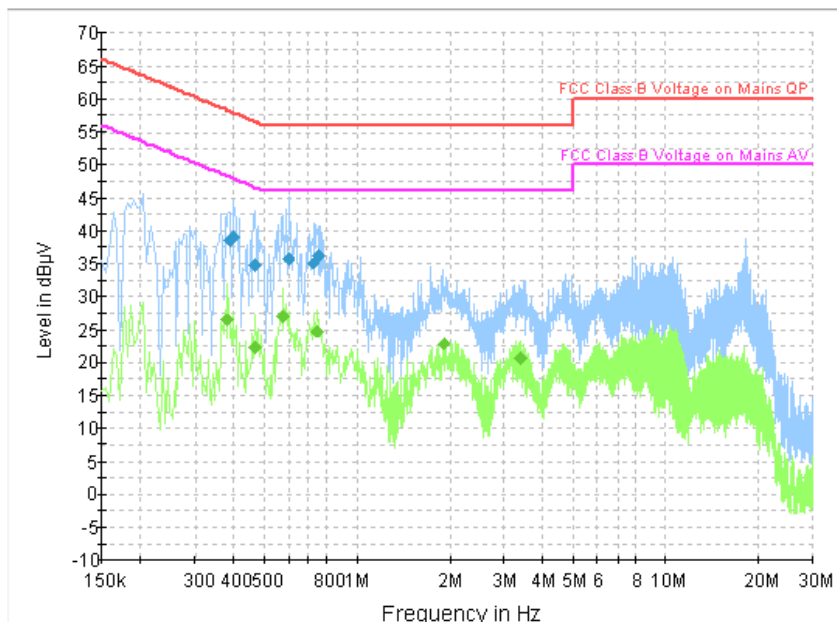


Figure A.5 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.388500	38.5	GND	N	9.8	19.6	58.1
0.402000	39.1	GND	N	9.8	18.7	57.8
0.469500	34.7	GND	L1	9.8	21.8	56.5
0.600000	35.7	GND	L1	9.8	20.3	56.0
0.726000	35.1	GND	N	9.8	20.9	56.0
0.748500	36.2	GND	N	9.8	19.8	56.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.384000	26.4	GND	L1	9.8	21.7	48.2
0.469500	22.3	GND	L1	9.8	24.2	46.5
0.577500	27.0	GND	L1	9.8	19.0	46.0
0.744000	24.8	GND	L1	9.8	21.2	46.0
1.914000	22.8	GND	L1	9.7	23.2	46.0
3.408000	20.7	GND	L1	9.7	25.3	46.0

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

USB Mode, Set.2

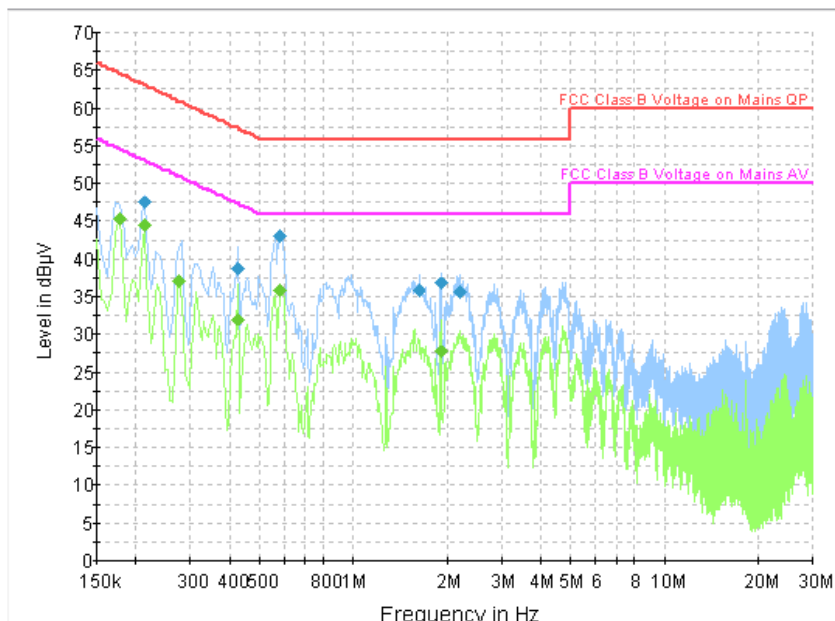


Figure A.6 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.213000	47.6	GND	N	9.8	15.5	63.1
0.424500	38.8	GND	L1	9.8	18.5	57.4
0.582000	43.1	GND	L1	9.8	12.9	56.0
1.626000	35.9	GND	L1	9.7	20.1	56.0
1.909500	36.8	GND	N	9.7	19.2	56.0
2.193000	35.7	GND	N	9.7	20.3	56.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.177000	45.4	GND	N	9.8	9.3	54.6
0.213000	44.6	GND	N	9.8	8.5	53.1
0.276000	37.2	GND	N	9.8	13.8	50.9
0.424500	32.1	GND	L1	9.8	15.3	47.4
0.582000	35.9	GND	L1	9.8	10.1	46.0
1.909500	27.7	GND	N	9.7	18.3	46.0

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

END OF REPORT