



# TEST REPORT

No. I14Z45368-EMC01

for

**TCT Mobile Limited**

**HSDPA/HSUPA/HSPA+/UMTS Bi bands / GSM quad bands/LTE 2**

**bands mobile phone**

**Model Name: A845L**

**Marketing Name: A845L**

**FCC ID: RAD471**

with

**Hardware Version: PIO**

**Software Version: v1H1F**

**Issued Date: May.4<sup>th</sup>, 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°C  
Relative Humidity: 20-75%

### **1.3. Project data**

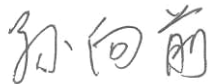
Testing Start Date: Apr. 26<sup>th</sup>, 2014  
Testing End Date: Apr. 26<sup>th</sup>, 2014

### **1.4. Signature**



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**Qu Pengfei**  
**(Prepared this test report)**



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**Sun Xiangqian**  
**(Reviewed this test report)**



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**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 Bi bands / GSM quad bands/LTE 2 bands mobile phone
Model Name	A845L
Marketing Name	A845L
FCC ID	RAD471
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	014036000003077	PIO	v1H1F

\*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	/	1445368BA024
AE2	Battery	/	1445368BA015
AE3	Battery	/	1445368BA020
AE4	Battery	/	1445368BA023
AE5	Battery	/	1445368BA018
AE6	Travel charger	/	1445368CH008
AE7	Travel charger	/	1445368CH003
AE8	USB cable	/	TCT-DC-0493
AE9	USB cable	/	TCT-DC-0331

AE1, AE2, AE3, AE4, AE5

Model	CAC2000003C3
Manufacturer	SCUD
Capacitance	2000 mAh
Nominal voltage	3.8V

AE6, AE7

Model	CBA3000AG0C1
Manufacturer	TEN PAO
Length of cable	/

AE8

Model	CDA3122002C2
Manufacturer	
Length of cable	98cm

AE9

Model CDA3122002C1

Manufacturer

Length of cable 98cm

\*AE ID: is used to identify the test sample in the lab internally.

### 3.4. EUT set-ups

<b>EUT set-up No.</b>	<b>Combination of EUT and AE</b>	<b>Remarks</b>
Set.1	EUT3+ AE1 + AE6 + AE8/AE9	Charger
Set.2	EUT3+ AE1 + AE8/AE9	USB

## **4. Reference Documents**

### **4.1. Reference Documents for testing**

The following documents listed in this section are referred for testing.

<b>Reference</b>	<b>Title</b>	<b>Version</b>
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
1	Test Receiver	ESCI	100344	R&S	2015-03-03
2	Test Receiver	ESCI 7	100948	R&S	2014-07-18
3	Universal Radio Communication Tester	CMU200	109914	R&S	2015-04-13
4	Test Receiver	FSV	101047	R&S	2014-06-30
5	LISN	ESH2-Z5	829991/012	R&S	2015-04-14
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 ( $\mu\text{V}/\text{m}$ )		
	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

$G_{\text{PL}}$ : Path Loss

$P_{\text{Mea}}$ : 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 $\mu$ V/m)	$G_{\text{PL}}$ (dB)	$G_A$ (dB/m)	$P_{\text{Mea}}$ (dB $\mu$ V)	Polarity
5939.688	29.3	-33.5	35.1	27.700	VERTICAL
5534.063	29.3	-34.0	35.1	28.200	VERTICAL
5971.563	29.3	-33.5	35.1	27.700	VERTICAL
5933.750	29.3	-34.1	35.1	28.300	VERTICAL
5699.375	29.2	-34.2	35.1	28.300	VERTICAL
5699.688	29.2	-34.2	35.1	28.300	HORIZONTAL

##### Charging Mode/Peak detector

Frequency(MHz)	Result(dB $\mu$ V/m)	$G_{\text{PL}}$ (dB)	$G_A$ (dB/m)	$P_{\text{Mea}}$ (dB $\mu$ V)	Polarity
5968.125	42.1	-33.5	35.1	40.500	VERTICAL
5830.156	41.9	-33.8	35.1	40.600	VERTICAL
5731.406	41.7	-33.8	35.1	40.400	HORIZONTAL
5955.781	41.6	-33.5	35.1	40.000	VERTICAL
5986.719	41.5	-33.5	35.1	39.900	VERTICAL
5515.313	41.5	-34.0	35.1	40.400	HORIZONTAL

**Measurement result for Set.2:**

**USB Mode/Average detector**

Frequency(MHz)	Result(dB $\mu$ V/m)	G <sub>PL</sub> (dB)	G <sub>A</sub> (dB/m)	P <sub>mea</sub> (dB $\mu$ V)	Polarity
1875.000	37.4	-35.6	25.3	47.700	VERTICAL
1875.156	36.5	-35.6	25.3	46.800	VERTICAL
1893.906	33.8	-35.0	25.3	43.500	HORIZONTAL
1875.469	33.6	-35.6	25.3	43.900	VERTICAL
1908.125	33.1	-35.0	25.3	42.800	VERTICAL
1908.281	33.1	-35.0	25.3	42.800	VERTICAL

**USB Mode/ Peak detector**

Frequency(MHz)	Result(dB $\mu$ V/m)	G <sub>PL</sub> (dB)	G <sub>A</sub> (dB/m)	P <sub>mea</sub> (dB $\mu$ V)	Polarity
1996.094	50.7	-35.7	25.3	61.100	VERTICAL
2000.156	49.6	-35.7	27.7	57.600	HORIZONTAL
1990.781	49.6	-35.7	25.3	60.000	VERTICAL
1993.906	49.2	-35.7	25.3	59.600	VERTICAL
1994.688	48.9	-35.7	25.3	59.300	VERTICAL
1893.906	48.1	-35.0	25.3	57.800	VERTICAL

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

Charging Mode, Set.1

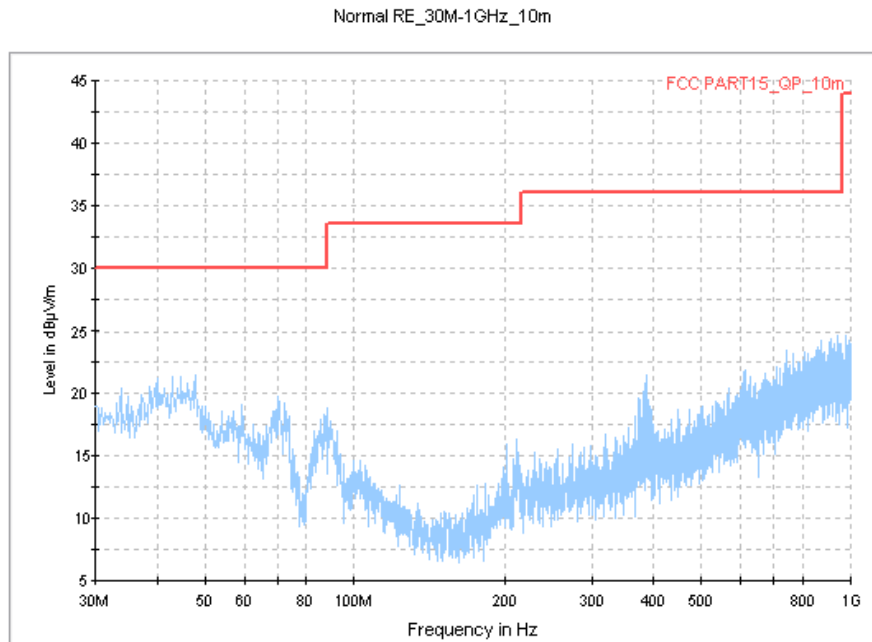


Figure A.1 Radiated Emission from 30MHz to 1GHz

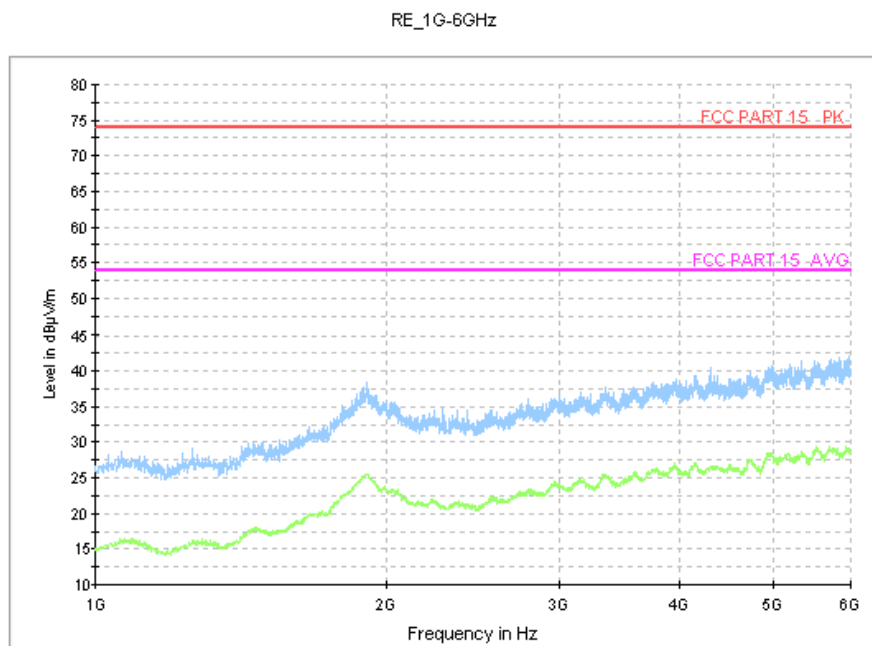


Figure A.2 Radiated Emission from 1GHz to 6GHz

USB Mode, Set.2

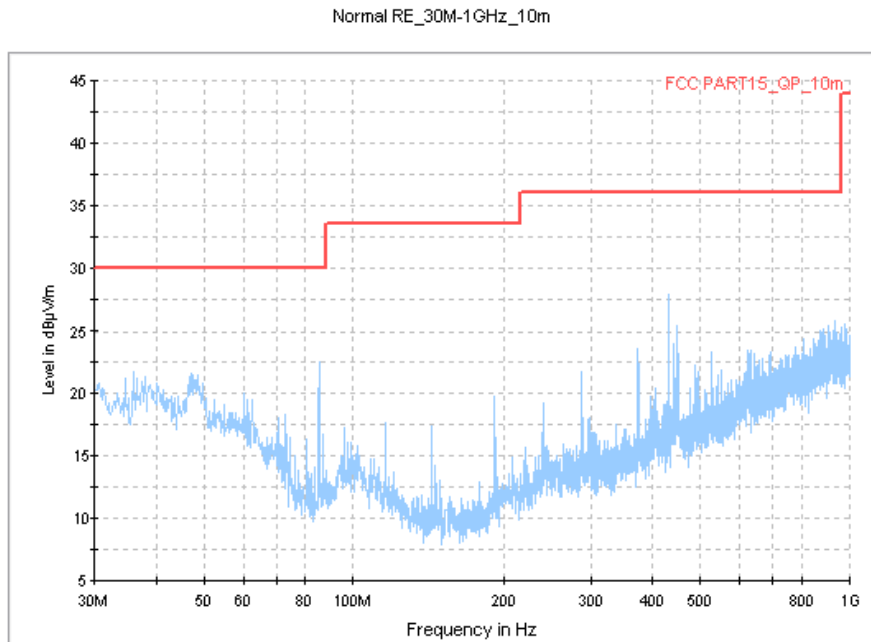


Figure A.3 Radiated Emission from 30MHz to 1GHz

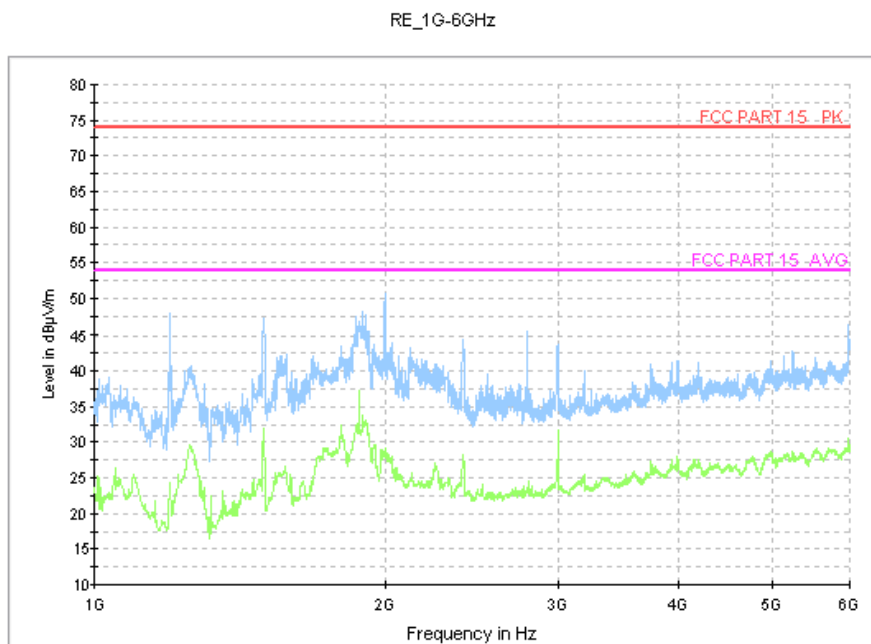


Figure A.4 Radiated Emission from 1GHz to 6GHz

## 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 7.2.

### 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 $\mu$ 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

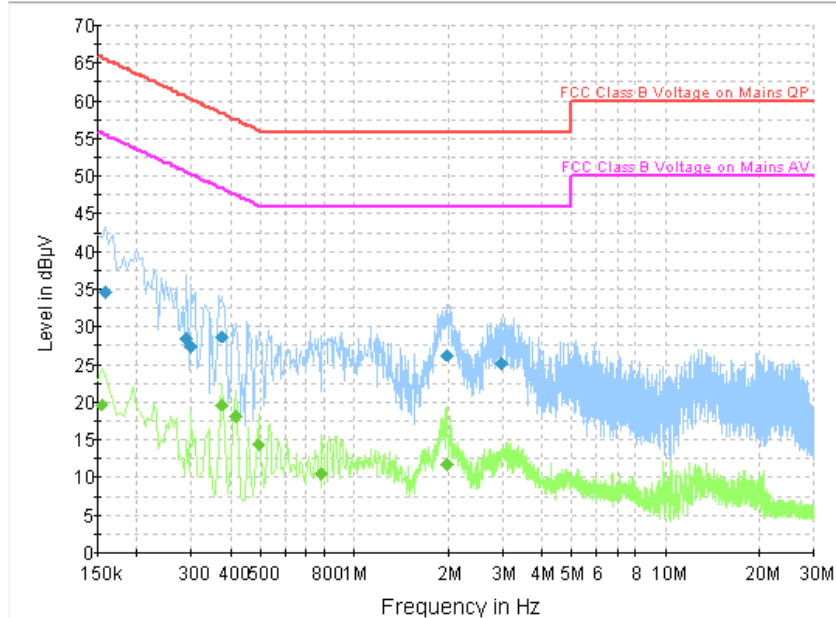


Figure A.5 Conducted Emission

#### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.159000	34.6	GND	L1	10.2	30.9	65.5
0.289500	28.3	GND	L1	10.0	32.2	60.5
0.298500	27.4	GND	L1	10.0	32.9	60.3
0.375000	28.7	GND	L1	10.1	29.7	58.4
1.990500	26.2	GND	L1	9.9	29.8	56.0
2.994000	25.1	GND	N	9.8	30.9	56.0

#### Final Result 2

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.154500	19.7	GND	L1	10.1	36.1	55.8
0.375000	19.6	GND	L1	10.1	28.7	48.4
0.415500	18.2	GND	L1	10.1	29.3	47.5
0.492000	14.3	GND	L1	10.1	31.8	46.1
0.789000	10.6	GND	L1	10.0	35.4	46.0
1.990500	11.7	GND	L1	9.9	34.3	46.0

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

USB Mode, Set.2

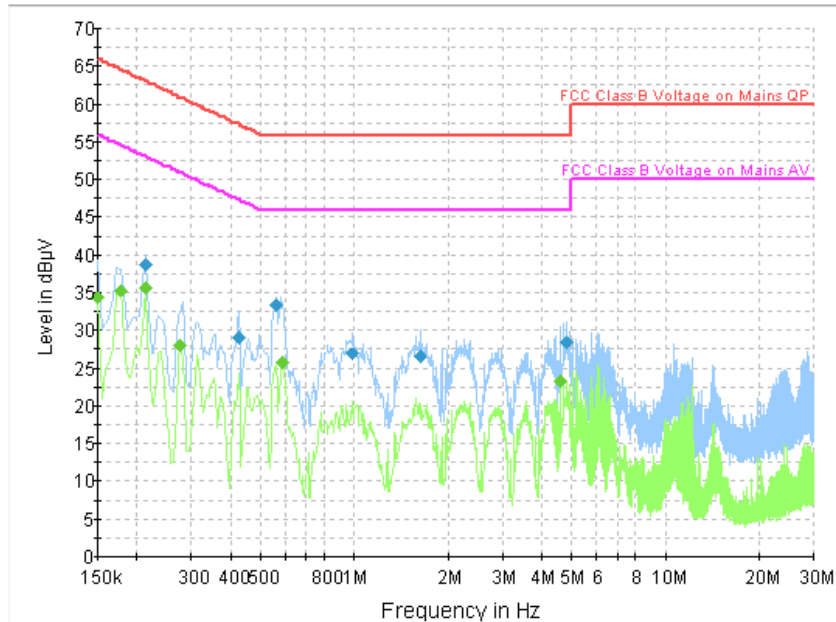


Figure A.6 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.213000	38.8	GND	L1	10.0	24.3	63.1
0.424500	29.0	GND	L1	10.1	28.4	57.4
0.559500	33.4	GND	N	10.1	22.6	56.0
0.991500	26.9	GND	L1	9.9	29.1	56.0
1.630500	26.6	GND	N	9.8	29.4	56.0
4.816500	28.3	GND	L1	9.7	27.7	56.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.150000	34.3	GND	N	9.9	21.7	56.0
0.177000	35.4	GND	N	10.2	19.3	54.6
0.213000	35.7	GND	N	9.9	17.4	53.1
0.276000	28.0	GND	L1	10.0	22.9	50.9
0.586500	25.8	GND	N	10.1	20.2	46.0
4.609500	23.3	GND	L1	9.7	22.7	46.0

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

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