



# TEST REPORT

No. I14Z47644-EMC01

for

**TCL Communication Ltd.**

**CDMA 1X/EVDO tri-band mobile phone**

**Model Name: 4037V**

**FCC ID: 2ACCJB001**

with

**Hardware Version: VC**

**Software Version: V5HT3-5**

**Issued Date: Sep. 24<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

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

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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: Sep. 12<sup>th</sup>, 2014  
Testing End Date: Sep. 22<sup>nd</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: TCL Communication Ltd.  
Address /Post: 12F/B, TCL Tower, Gaoxin Nanyi Road, Nanshan District, Shenzhen, Guangdong, P.R. China  
City: Shenzhen  
Postal Code: 518057  
Country: China  
Contact Person: Lv Meixian  
Contact Email: meixian.lv@tcl.com  
Telephone: 0086 755 33956929  
Fax: 0086 755 36645072

### **2.2. Manufacturer Information**

Company Name: TCL Communication Ltd.  
Address /Post: 12F/B, TCL Tower, Gaoxin Nanyi Road, Nanshan District, Shenzhen, Guangdong, P.R. China  
City: Shenzhen  
Postal Code: 518057  
Country: China  
Telephone: 0086 755 33956929  
Fax: 0086 755 36645072

### 3. Equipment Under Test (EUT) and Ancillary Equipment (AE)

#### 3.1. About EUT

Description	CDMA 1X/EVDO tri-band mobile phone
Model Name	4037V
FCC ID	2ACCJB001
Extreme vol. Limits	3.5VDC to 4.2VDC (nominal: 3.7VDC)

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
EUT4	A100003BCFECE9	VC	V5HT3-5

\*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	/	1447644BA013
AE2	Battery	/	1447644BA007
AE3	Battery	/	1447644BA005
AE4	Battery	/	1447644BA002
AE5	Travel charger	/	14TCT-CH-2102
AE6	Travel charger	/	14TCT-CH-2104
AE7	USB	/	14TCT-DC-0659
AE8	USB	/	14TCT-DC-0660

AE1, AE2, AE3, AE4

Model	TLi014A1
Manufacturer	BYD
Capacitance	1400 mAh
Nominal voltage	3.7V

AE5, AE6

Model	CBA3000AG0C2
Manufacturer	BYD
Length of cable	/

AE7, AE8

Model	CDA3122005C2
Manufacturer	shenhua
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.4	EUT4+ AE4 + AE7 + AE5	Charger
Set.5	EUT4+ AE4 + AE7	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.	NAME	TYPE	SERIES NUMBER	PRODUCER	CAL. DUE DATE	CAL. INTERVAL
1.	EMI Antenna	VULB 9163	9163-234	Schwarzbeck	2016-09-15	3 Years
2.	Test Receiver	ESCI 7	100948	R&S	2015-07-18	1 Year
3.	Test Receiver	FSV40	101047	R&S	2015-07-03	1 Year
4.	EMI Antenna	3115	6914	ETS-Lindgren	2014-12-16	3 Years
5.	Test Receiver	ESCI	100344	R&S	2015-03-03	1 Year
6.	LISN	ESH2-Z5	829991/012	R&S	2015-04-14	1 Year
7.	Universal Radio Communication Tester	CMU200	109914	R&S	2015-04-13	1 Year
8.	PC	OPTIPLEX 380	2X1YV2X	DELL	/	/
9.	Monitor	E1709Wc	CN-OJ672H-6 4180-9BF-1CR L	DELL	/	/
10.	Printer	P1606dn	VNC3L52122	HP	/	/
11.	Keyboard	L100	CN-ORH656-6 5890-03S-041 Y	DELL	/	/
12.	Mouse	M-UAR	LZ013HC1YLV	DELL	/	/

## **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

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

$P_{\text{Mea}}$ : Measurement result on receiver.

Measurement uncertainty (worst case):  $U = 4.3 \text{ dB}$ ,  $k=2$ .

### Measurement results for Set.4:

#### 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
5332.500	30.6	-34.8	34.6	30.800	H
5261.500	30.6	-34.5	34.6	30.500	V
5793.500	30.6	-33.8	35.1	29.300	H
5820.500	30.6	-33.8	35.1	29.300	H
5261.000	30.6	-34.5	34.6	30.500	V
5283.500	30.5	-34.4	34.6	30.300	V

#### 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
5265.500	42.8	-34.5	34.6	42.700	H
5236.500	42.6	-34.5	34.6	42.500	V
5561.500	42.5	-34.2	35.1	41.600	V
4998.500	42.5	-34.6	33.1	44.000	V
5244.000	42.4	-34.5	34.6	42.300	H
5255.500	42.3	-34.5	34.6	42.200	H

**Measurement result for Set.5:**
**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
1255.000	34.0	-41.1	24.1	51.000	V
1499.000	33.9	-40.3	24.1	50.100	H
1254.000	33.8	-41.1	24.1	50.800	V
1252.500	33.7	-41.1	24.1	50.700	H
1498.500	33.7	-40.3	24.1	49.900	H
1246.000	33.6	-41.1	24.1	50.600	H

**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
1059.500	55.5	-41.7	24.1	73.100	V
1059.000	54.0	-41.7	24.1	71.600	H
1060.000	53.7	-41.7	24.1	71.300	V
1066.500	53.7	-41.5	24.1	71.100	H
1063.000	53.6	-41.5	24.1	71.000	H
1067.000	53.1	-41.5	24.1	70.500	V

Note: The measurement results of Set.4 and Set.5 showed here are worst cases of the combinations of different batteries and USB cables.

#### Charging Mode, Set.4

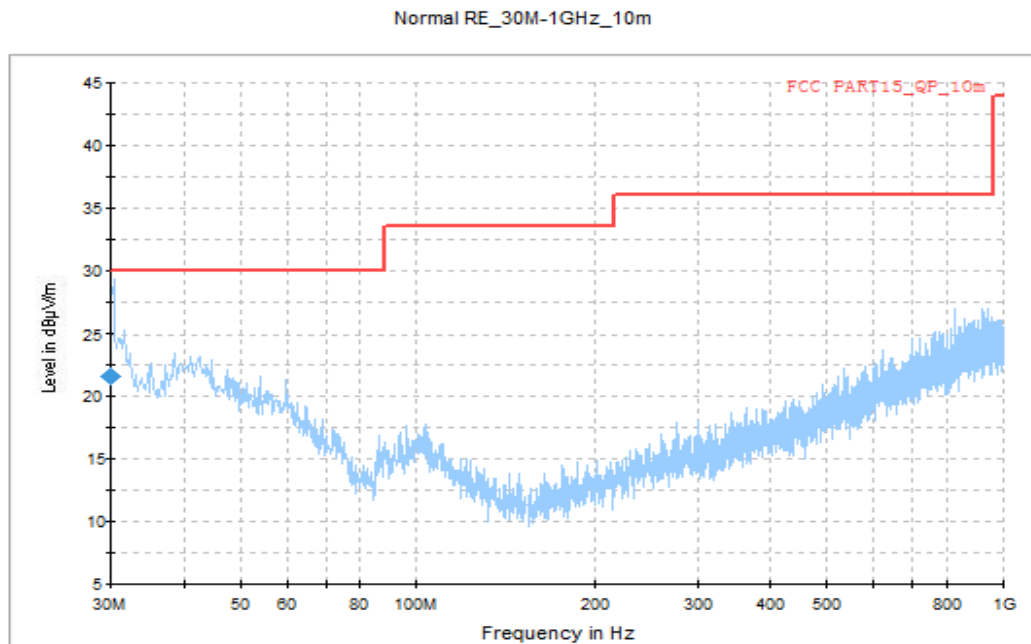


Figure A.1 Radiated Emission from 30MHz to 1GHz

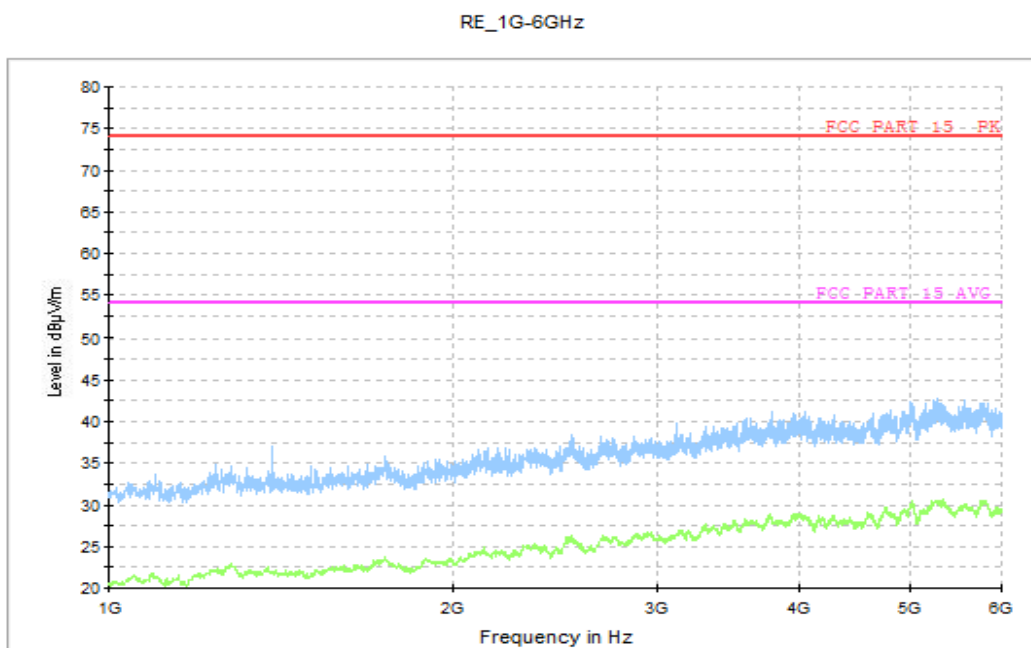


Figure A.2 Radiated Emission from 1GHz to 6GHz

# USB Mode, Set.5

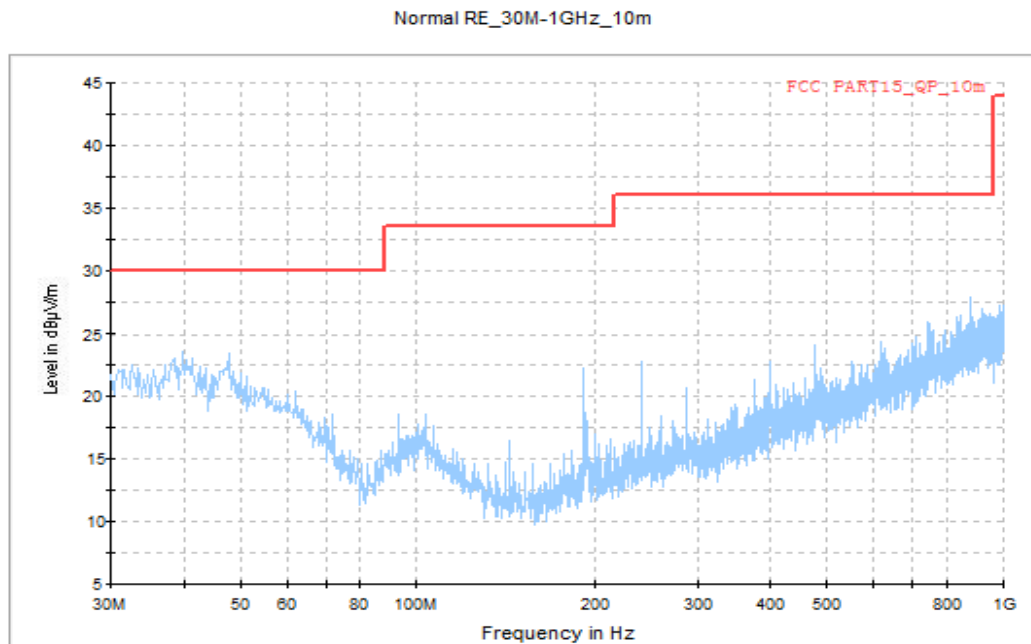


Figure A.3 Radiated Emission from 30MHz to 1GHz

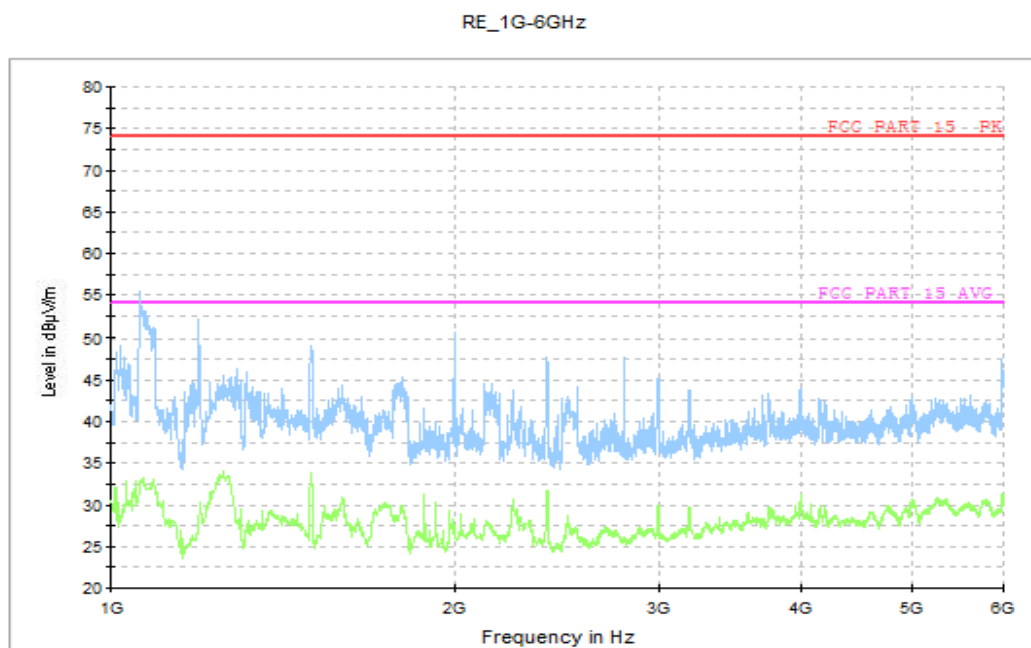


Figure A.4 Radiated Emission from 1GHz to 6GHz

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

#### Charging Mode, Set.4

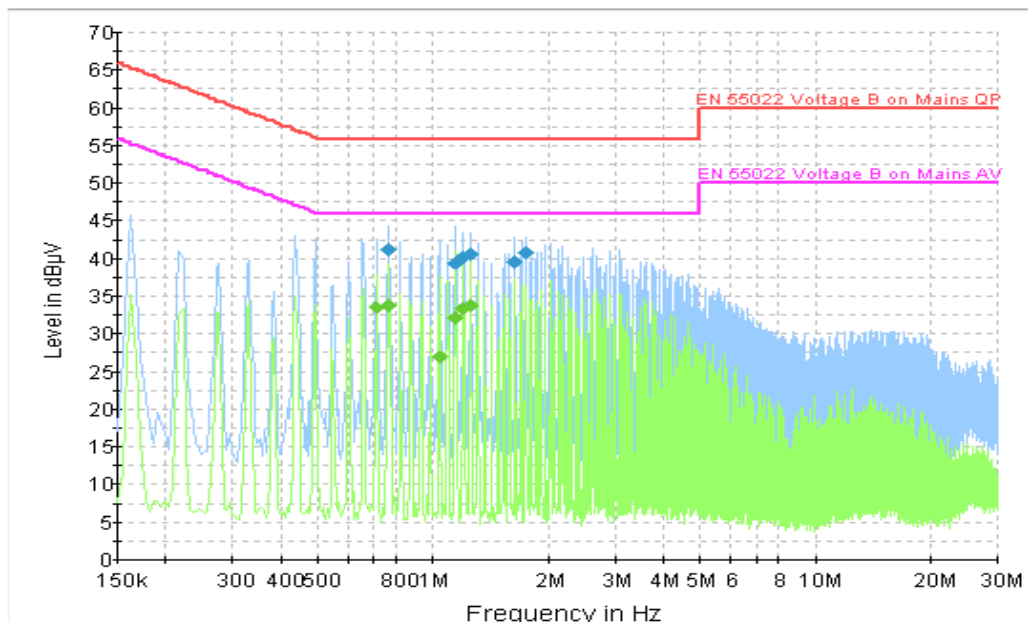


Figure A.5 Conducted Emission

#### Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
1.149000	39.5	GND	N	10.0	14.6	56.0
1.203000	40.3	GND	L1	9.9	16.5	56.0
1.257000	40.7	GND	N	9.9	15.7	56.0
1.639500	39.7	GND	L1	9.9	15.3	56.0
1.747500	40.8	GND	L1	9.9	16.3	56.0
1.149000	39.5	GND	L1	9.9	15.2	56.0

#### Final Result 2

Frequency (MHz)	CAverage (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.708000	33.4	GND	L1	10.0	12.6	46.0
0.762000	33.9	GND	L1	10.0	12.1	46.0
1.041000	26.9	GND	L1	9.9	19.1	46.0
1.149000	32.2	GND	L1	9.9	13.8	46.0
1.203000	33.3	GND	L1	9.9	12.7	46.0
1.257000	33.8	GND	L1	9.9	12.2	46.0

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

## USB Mode, Set.5

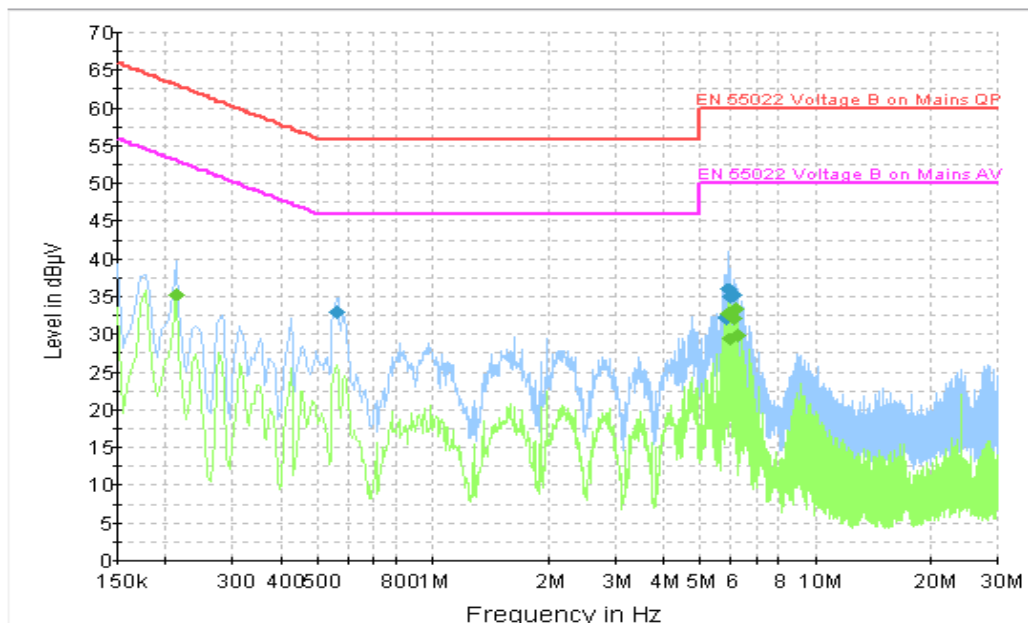


Figure A.6 Conducted Emission

### Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.559500	33.0	GND	L1	10.1	23.0	56.0
5.815500	32.2	GND	N	9.7	27.8	60.0
5.860500	32.3	GND	N	9.7	27.7	60.0
5.905500	35.9	GND	N	9.7	24.1	60.0
6.004500	35.0	GND	L1	9.7	25.0	60.0
6.099000	35.2	GND	L1	9.7	24.8	60.0

### Final Result 2

Frequency (MHz)	CAverage (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.213000	35.3	GND	N	9.9	17.8	53.1
5.905500	32.8	GND	N	9.7	17.2	50.0
6.004500	29.4	GND	L1	9.7	20.6	50.0
6.099000	32.1	GND	L1	9.7	17.9	50.0
6.193500	33.4	GND	L1	9.7	16.6	50.0
6.292500	29.9	GND	N	9.7	20.1	50.0

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

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