



TEST REPORT

No. I15Z41694-EMC01

for

TCL Communication Ltd.

GSM Quad Band & UMTS Dual Band Mobile Phone

Model Name: 2036A

FCC ID: 2ACCJB019

with

Hardware Version: PIO

Software Version: V1.1

Issued Date: 2015-07-28

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 CTTL.

Test Laboratory:

FCC 2.948 Listed: No. 525429

CTTL, Telecommunication Technology Labs, Academy of Telecommunication Research, MIIT

No. 52, Huayuan North Road, Haidian District, Beijing, P. R. China 100191.

Tel: +86(0)10-62304633-2512, Fax: +86(0)10-62304633-2504

Email: ctl_terminals@catr.cn, website: www.chinattl.com



REPORT HISTORY

Report Number	Revision	Description	Issue Date
I15Z41694-EMC01	Rev.0	1st edition	2015-7-28



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1. Test Laboratory

1.1. Testing Location

Location 1: CTTL(huayuan North Road)

Address: No. 52, Huayuan North Road, Haidian District, Beijing,
P. R. China 100191

1.2. Testing Environment

Normal Temperature: 15-35°C

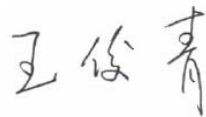
Relative Humidity: 20-75%

1.3. Project data

Testing Start Date: 2015-07-07

Testing End Date: 2015-07-13

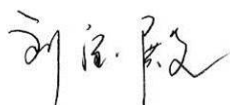
1.4. Signature



Wang Junqing
(Prepared this test report)



Qu Pengfei
(Reviewed this test report)



Liu Baodian
Deputy Director of the laboratory
(Approved this test report)



2. Client Information

2.1. Applicant Information

Company Name: TCL Communication Ltd.
Address /Post: 5F, C-Tower, No. 232, Liang Jing Road, ZhangJiang High-Tech Park,
Pudong Area,Shanghai,201203,P.R.China
City: Shanghai
Postal Code: 201203
Country: China
Contact Person: Tiffany.Tang
Contact Email: xiu.tang@tcl.com
Telephone: 0086- (0)21 51798260
Fax: 0086-(0)21 6146 0600

2.2. Manufacturer Information

Company Name: TCL Communication Ltd.
Address /Post: 5F, C-Tower, No. 232, Liang Jing Road, ZhangJiang High-Tech Park,
Pudong Area,Shanghai,201203,P.R.China
City: Shanghai
Postal Code: 201203
Country: China
Contact Person: Tiffany.Tang
Contact Email: xiu.tang@tcl.com
Telephone: 0086- (0)21 51798260
Fax: 0086-(0)21 6146 0600

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

3.1. About EUT

Description	GSM Quad Band & UMTS Dual Band Mobile Phone
Model Name	2036A
FCC ID	2ACCJB019
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
EUT1	014407000001066	PIO	V1.1

*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	/	1541694BA012
AE3	Travel charger	/	1541694CH004
AE4	USB cable	/	1541694DC005

AE1

Model	CAB22D0000C1
Manufacturer	BYD
Capacitance	650mAh
Nominal voltage	3.7V

AE2

Model	CAB22B0000C1
Manufacturer	BYD
Capacitance	750mAh
Nominal voltage	3.7V



AE3

Model	CBA0053AG0C4
Manufacturer	AOHAI
Length of cable	120cm

AE4

Model	CDA0000030C3
Manufacturer	JIAYIKANG
Length of cable	90cm

*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 +AE2 +AE3	Charger
Set.2	EUT1 +AE2 +AE4	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	10-1-13 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	1/2/3/4	The test is performed in test location 1, 2, 3 or 4 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	1
2	Conducted Emission	15.107(a)	P	1



7. Test Equipments Utilized

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURE	CAL DUE DATE	CALIBRATION INTERVAL
1	Test Receiver	ESCI	100344	R&S	2016-03-02	1 year
2	Test Receiver	ESCI 7	100948	R&S	2016-07-07	1 year
3	Universal Radio Communication Tester	CMU200	109914	R&S	2016-03-26	1 year
4	Test Receiver	FSV	101047	R&S	2016-07-02	1 year
5	LISN	ENV216	101200	R&S	2016-07-07	1 year
6	EMI Antenna	VULB 9163	9163-234	Schwarzbeck	2016-09-15	3 years
7	EMI Antenna	3115	6914	ETS-Lindgren	2017-12-15	3 years
8	PC	OPTIPLEX 380	2X1YV2X	DELL	N/A	N/A
9	Monitor	E178FPc	CN-OWR979-64180-7AJ-D2MS	DELL	N/A	N/A
10	Printer	P1606dn	VNC3L52122	HP	N/A	N/A
11	Keyboard	L100	CN0RH659658907 ATOI40	DELL	N/A	N/A
12	Mouse	M-UAE119	LZ935220ZRC	Lenovo	N/A	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_{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
17971.100	43.6	-17.7	45.6	15.700	V
17996.600	43.5	-17.7	45.6	15.600	H
17980.167	43.5	-17.7	45.6	15.600	V
17974.500	43.5	-17.7	45.6	15.600	H
17973.933	43.4	-17.7	45.6	15.500	H
17986.967	43.4	-17.7	45.6	15.500	V

Charging Mode/Peak detector

Frequency(MHz)	Result(dB μ V/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea} (dB μ V)	Polarity
17892.333	54.7	-18.5	45.6	27.600	V
17922.367	53.9	-17.7	45.6	26.000	H
18000.000	53.9	-45.6	44.5	54.966	V
17983.000	53.9	-17.7	45.6	26.000	H
17923.500	53.9	-17.7	45.6	26.000	V
17865.133	53.8	-18.5	45.6	26.700	V

Measurement results 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
17989.800	43.4	-17.7	45.6	15.500	V
17991.500	43.2	-17.7	45.6	15.300	H
17996.600	43.1	-17.7	45.6	15.200	H
17997.733	43.1	-17.7	45.6	15.200	H
17926.333	43.1	-17.7	45.6	15.200	V
17980.733	43.0	-17.7	45.6	15.100	V

USB Mode/Peak detector

Frequency(MHz)	Result(dB μ V/m)	G _{PL} (dB)	G _A (dB/m)	P _{Mea} (dB μ V)	Polarity
17955.233	54.8	-17.7	45.6	26.900	H
17977.333	54.7	-17.7	45.6	26.800	H
17829.433	54.5	-18.5	45.6	27.400	V
17989.800	54.4	-17.7	45.6	26.500	H
17819.233	54.3	-18.5	45.6	27.200	V
17939.933	54.2	-17.7	45.6	26.300	V

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

Charging Mode, Set.1

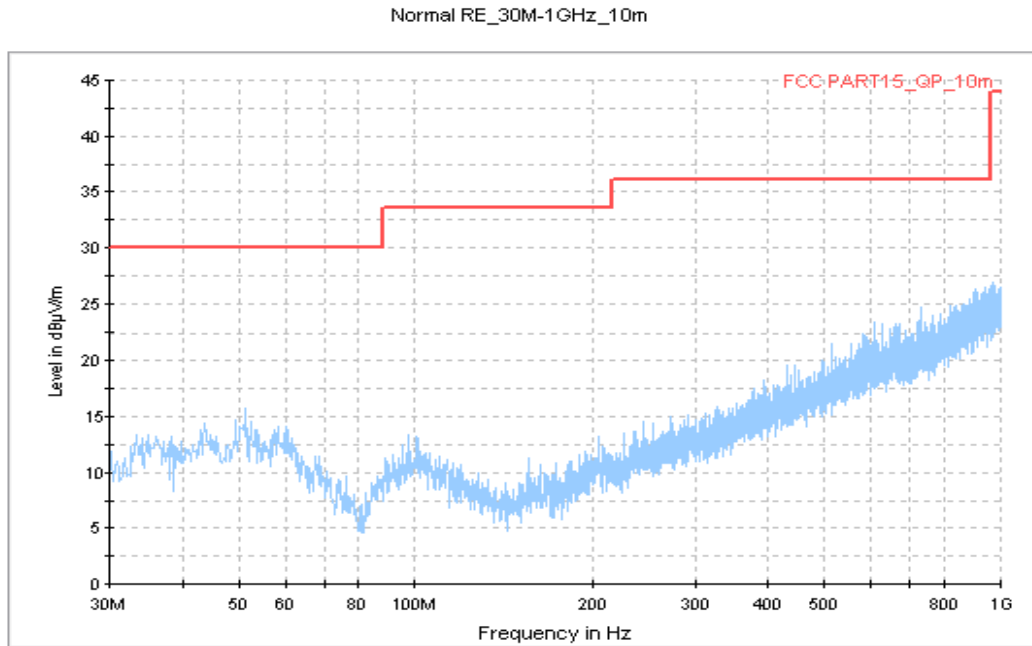


Fig.1 Radiated Emission from 30MHz to 1GHz

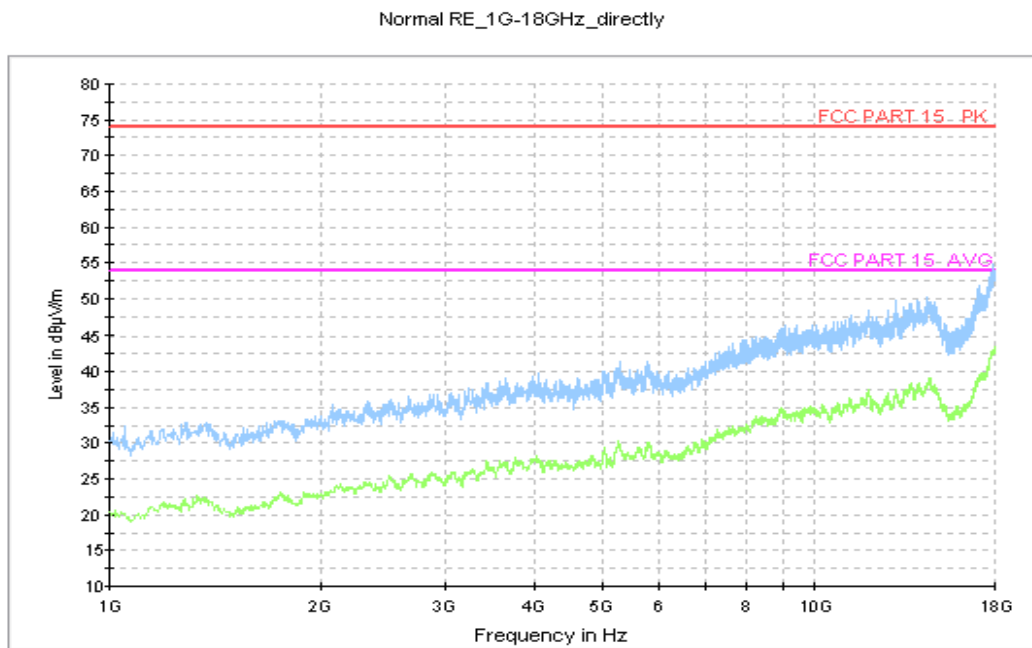


Fig.2 Radiated Emission from 1GHz to 18GHz

USB Mode, Set.2

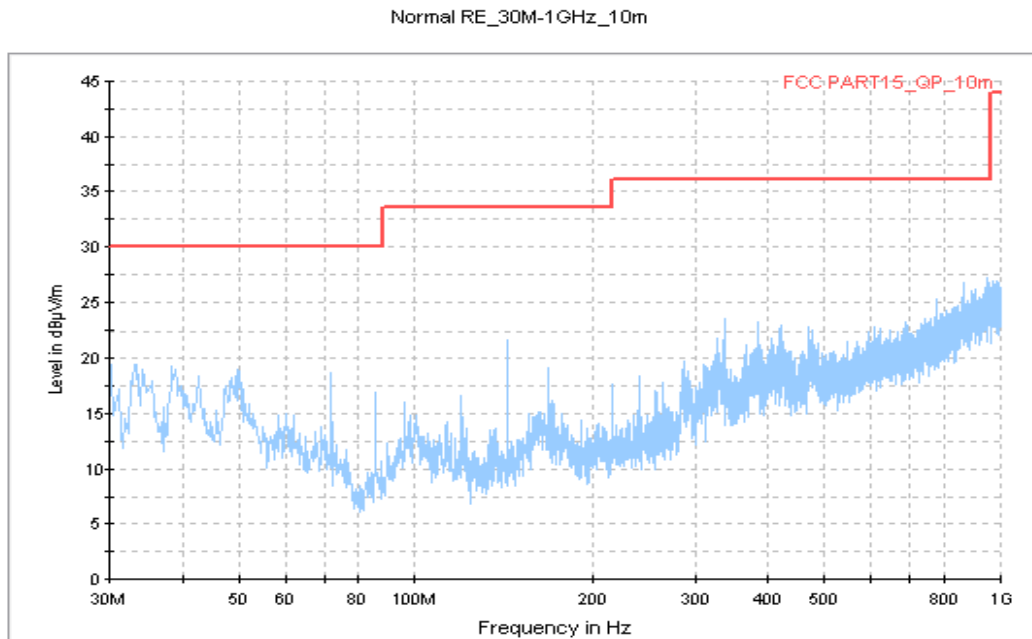


Fig.3 Radiated Emission from 30MHz to 1GHz

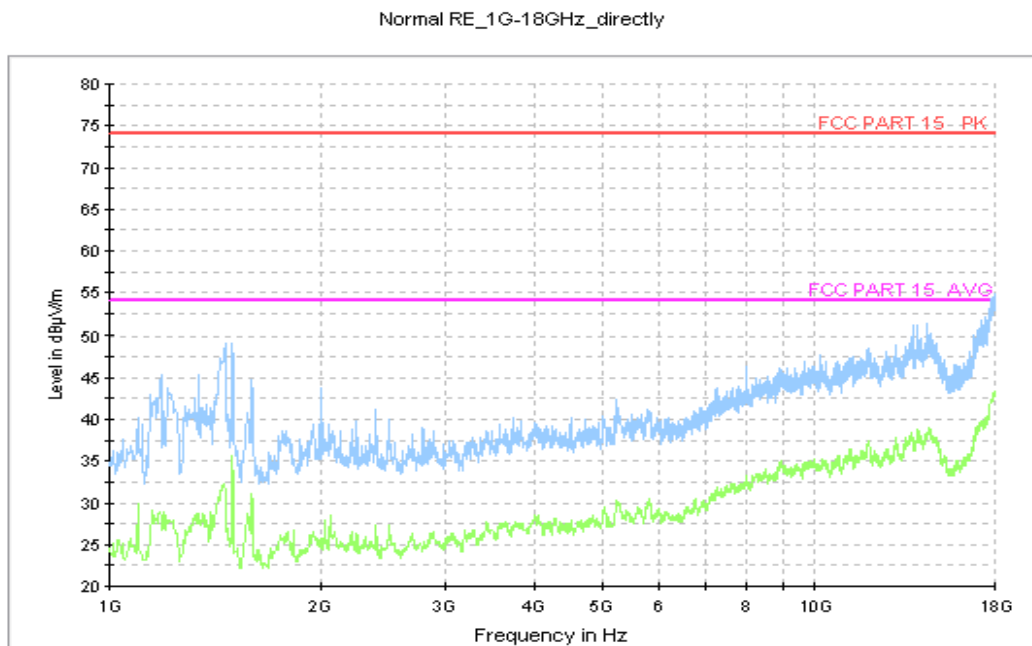


Fig.4 Radiated Emission from 1GHz to 18GHz

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: $U= 2.9$ dB, $k=2$.

Charging Mode, Set.1

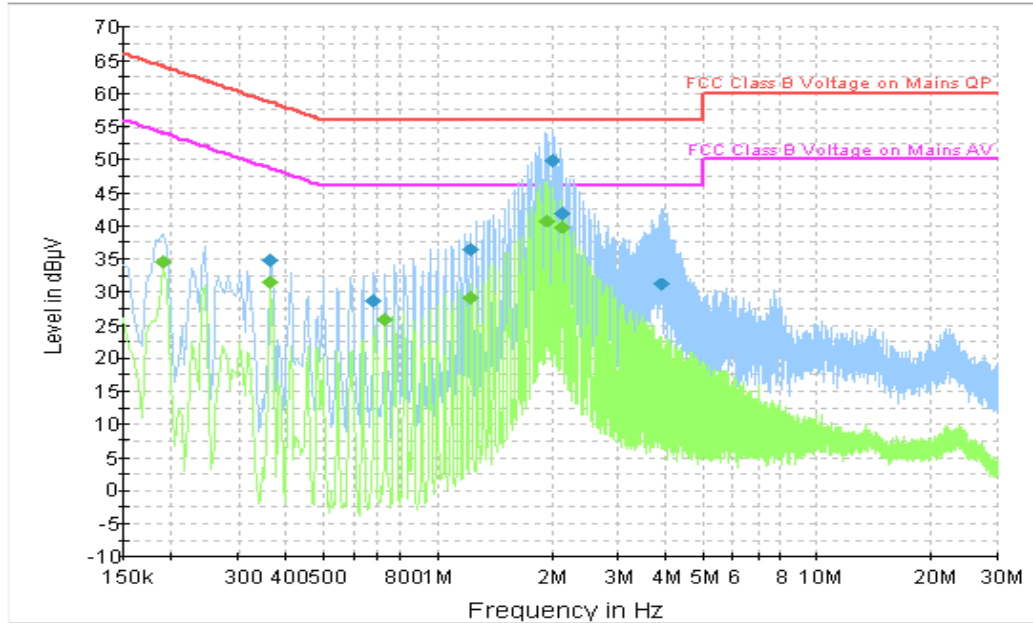


Fig.5 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.366000	34.8	GND	N	10.0	23.8	58.6
0.681000	28.6	GND	N	10.1	27.4	56.0
1.230000	36.4	GND	N	10.1	19.6	56.0
2.004000	49.8	GND	N	10.2	6.2	56.0
2.139000	41.9	GND	N	10.2	14.1	56.0
3.916500	31.0	GND	N	10.2	25.0	56.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190500	34.6	GND	N	10.0	19.4	54.0
0.366000	31.4	GND	N	10.0	17.1	48.6
0.730500	25.9	GND	N	10.1	20.1	46.0
1.230000	29.0	GND	N	10.1	17.0	46.0
1.959000	40.7	GND	N	10.2	5.3	46.0
2.143500	39.9	GND	N	10.2	6.1	46.0

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

USB Mode, Set.2

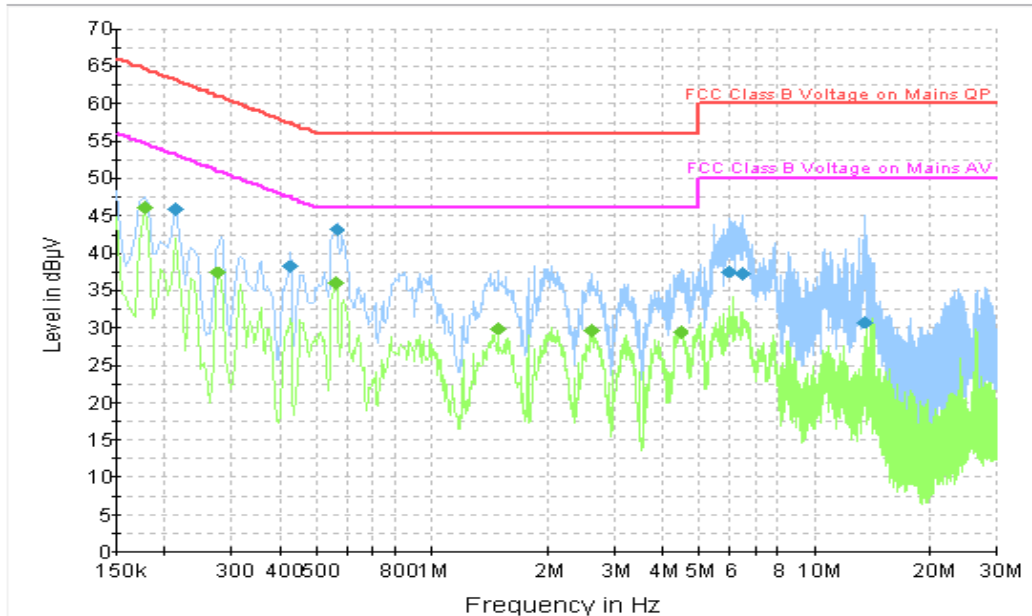


Fig.6 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.213000	46.0	GND	N	10.1	17.1	63.1
0.424500	38.2	GND	N	10.1	19.2	57.4
0.564000	43.2	GND	L1	10.2	12.8	56.0
5.986500	37.5	GND	L1	10.5	22.5	60.0
6.463500	37.1	GND	N	10.4	22.9	60.0
13.479000	30.6	GND	L1	11.0	29.4	60.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.177000	46.1	GND	N	10.0	8.5	54.6
0.276000	37.3	GND	N	10.1	13.7	50.9
0.559500	36.0	GND	L1	10.2	10.0	46.0
1.491000	29.8	GND	L1	10.2	16.2	46.0
2.629500	29.5	GND	N	10.2	16.5	46.0
4.465500	29.4	GND	N	10.3	16.6	46.0

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

END OF REPORT