



TEST REPORT

No. I15Z40867-EMC01

for

TCL Communication Ltd.

CDMA+LTE mobile phone for Sprint

Model Name: 7046T

FCC ID: 2ACCJN003

with

Hardware Version: HW0001

Software Version: 7046TC01

Issued Date: 2015-05-15

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

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I15Z40867-EMC01	Rev.0	1st edition	2015-05-15

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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℃

Relative Humidity: 20-75%

1.3. Project data

Testing Start Date: 2015-05-09

Testing End Date: 2015-05-14

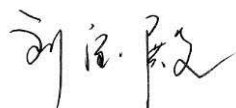
1.4. Signature



Zhang Ying
(Prepared this test report)



Qu Pengfei
(Reviewed this test report)



Liu Baodian
(Approved this test report)



2. Client Information

2.1. Applicant Information

Company Name: TCL Communication Ltd.
Address /Post: 5F, C building, No. 232, Liang Jing Road, ZhangJiang High-Tech
Park, Pudong Area, Shanghai, P.R. China. 201203
City: Shanghai
Postal Code: 201203
Country: China
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2.2. Manufacturer Information

Company Name: TCL Communication Ltd.
Address /Post: 5F, C building, No. 232, Liang Jing Road, ZhangJiang High-Tech
Park, Pudong Area, Shanghai, P.R. China. 201203
City: Shanghai
Postal Code: 201203
Country: China
Telephone: +86 21 51798260
Fax: +86 21 61460602

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

3.1. About EUT

Description	CDMA+LTE mobile phone for Sprint
Model Name	7046T
FCC ID	2ACCJN003
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
EUT5	86708702001564	HW0001	7046TC01

*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	battery	/	/
AE4	Travel Charger	/	/
AE5	Travel Charger	/	/
AE6	Travel Charger	/	/
AE7	USB Cable	/	/
AE8	USB Cable	/	/
AE9	USB Cable	/	/

AE1, AE2, AE3

Model	TLp025A2
Manufacturer	SCUD
Capacitance	2500mAh
Nominal voltage	3.8V

AE4, AE5, AE6

Type	CBA0057AG0C1
Manufacturer	BYD
Length of cable	102 cm (length of USB cable)

AE7, AE8, AE9

Type	CDA3122002C1
Manufacturer	Shenghua
Length of cable	102 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.4	EUT5+ AE2 + AE5 + AE8	Charger
Set.5	EUT5+ AE2 + AE8	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	10-1-14 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.	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	2015-07-16	1 Year
3.	Test Receiver	FSV	101047	R&S	2015-07-03	1 Year
4.	EMI Antenna	3115	9906-5827	ETS-Lindgren	2016-11-19	3 Years
5.	Test Receiver for Conducted Emission	ESU26	100235	R&S	2016-03-02	1 Year
6.	LISN	ENV216	101200	R&S	2015-07-07	1 Year
7.	Universal Radio Communication Tester	CMW500	143008	R&S	2015-12-09	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_{PL} : Path Loss

P_{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 $\mu\text{V}/\text{m}$)	GPL (dB)	GA (dB/m)	PMea(dB μV)	Polarity
17998.867	43.5	-17.7	45.6	15.600	V
17999.433	43.5	-17.7	45.6	15.600	V
17995.467	43.4	-17.7	45.6	15.500	H
17998.300	43.4	-17.7	45.6	15.500	H
18000.000	43.3	-45.6	44.5	44.366	H
17996.033	43.3	-17.7	45.6	15.400	V

Charging Mode/Peak detector

Frequency(MHz)	Result(dB $\mu\text{V}/\text{m}$)	GPL (dB)	GA (dB/m)	PMea(dB μV)	Polarity
17957.500	55.3	-17.7	45.6	27.400	V
17990.367	54.9	-17.7	45.6	27.000	H
17986.967	54.8	-17.7	45.6	26.900	V
17989.800	54.8	-17.7	45.6	26.900	V
17949.000	54.6	-17.7	45.6	26.700	H
17999.433	54.6	-17.7	45.6	26.700	H

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

Measurement results for Set.5:
USB Mode/Average detector

Frequency(MHz)	Result(dB μ V/m)	G _{PL} (dB)	G _A (dB/m)	P _{Mea} (dB μ V)	Polarity
16502.867	46.7	-20.5	39.9	27.300	H
16504.000	46.7	-20.5	39.9	27.300	V
16502.300	46.7	-20.5	39.9	27.300	V
16503.433	46.6	-20.5	39.9	27.200	V
16501.733	46.4	-20.5	39.9	27.000	V
16504.567	46.4	-20.5	39.9	27.000	H

USB Mode/Peak detector

Frequency(MHz)	Result(dB μ V/m)	G _{PL} (dB)	G _A (dB/m)	P _{Mea} (dB μ V)	Polarity
16496.633	58.0	-20.5	38.7	39.800	V
16505.700	57.5	-20.5	39.9	38.100	H
16511.367	57.4	-20.5	39.9	38.000	H
16504.000	57.2	-20.5	39.9	37.800	H
16498.333	57.0	-20.5	38.7	38.800	V
16507.400	56.9	-20.5	39.9	37.500	H

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

Charging Mode, Set.4

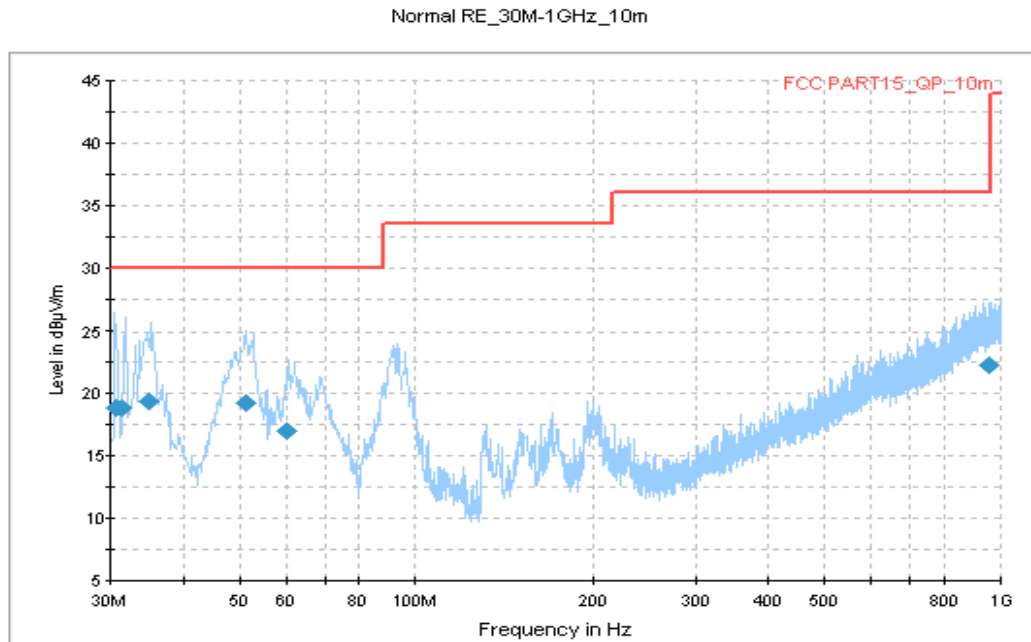


Fig.1 Radiated Emission from 30MHz to 1GHz

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dBμV/m)
30.720000	18.9	175.0	V	96.0	-13.9	11.1	30.0
31.314500	18.8	125.0	V	69.0	-13.7	11.2	30.0
34.915000	19.4	293.0	V	187.0	-13.0	10.6	30.0
51.097500	19.3	100.0	V	-22.0	-11.6	10.7	30.0
60.366000	17.1	325.0	V	150.0	-12.1	12.9	30.0
958.188000	22.3	188.0	V	30.0	3.0	13.7	36.0

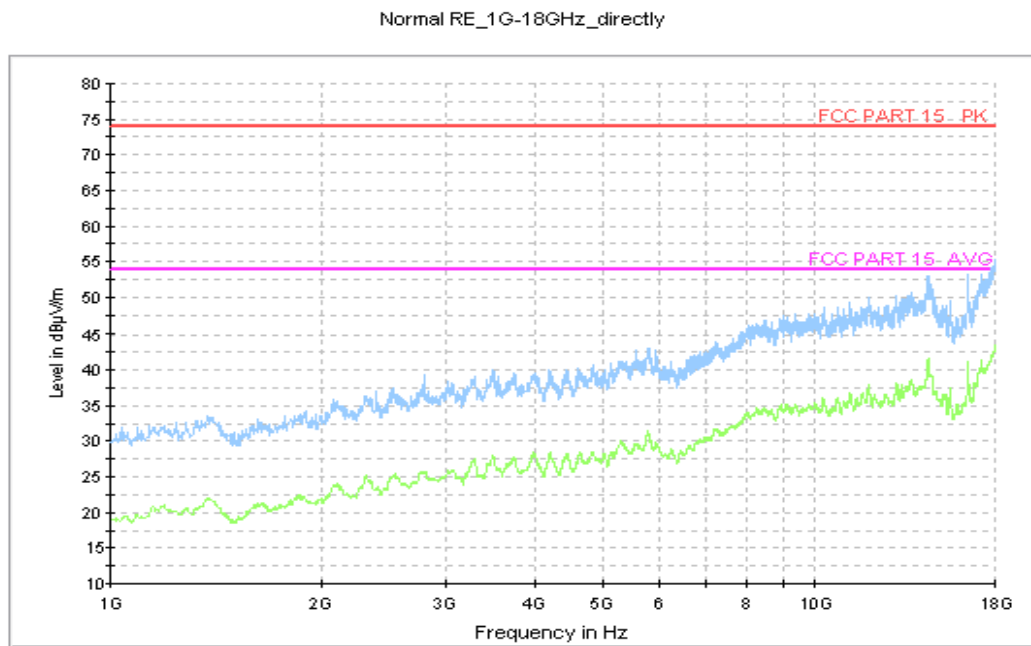


Fig.2 Radiated Emission from 1GHz to 18GHz

USB Mode, Set.5

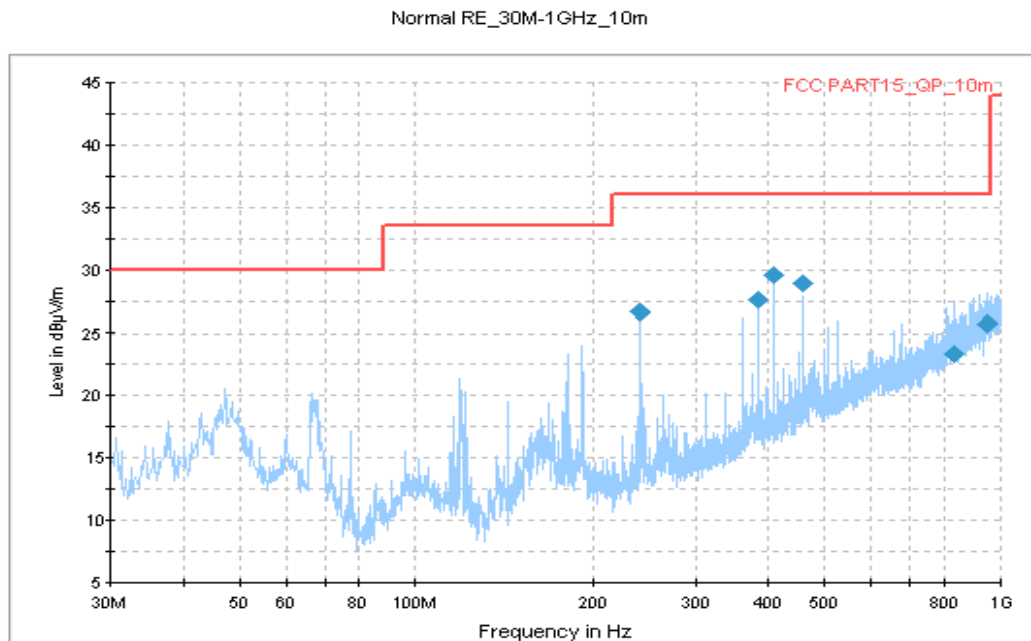


Fig.3 Radiated Emission from 30MHz to 1GHz

Final Result

Frequency (MHz)	QuasiPeak (dB μV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)	Limit (dB μV/m)
240.296000	26.6	389.0	H	272.0	-11.6	9.4	36.0
384.486500	27.5	175.0	H	182.0	-7.6	8.5	36.0
408.554000	29.6	220.0	H	182.0	-7.0	6.4	36.0
456.606000	28.9	288.0	V	278.0	-6.0	7.1	36.0
829.580000	23.4	175.0	V	30.0	0.5	12.6	36.0
949.668500	25.7	300.0	V	163.0	2.8	10.3	36.0

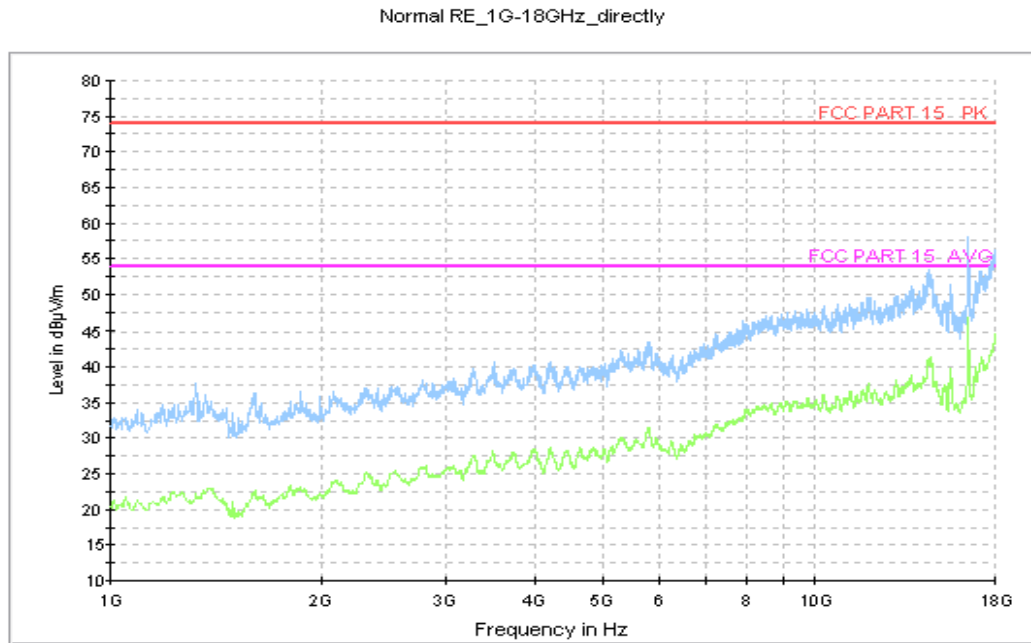


Fig.4 Radiated Emission from 1GHz to 18GHz

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.4

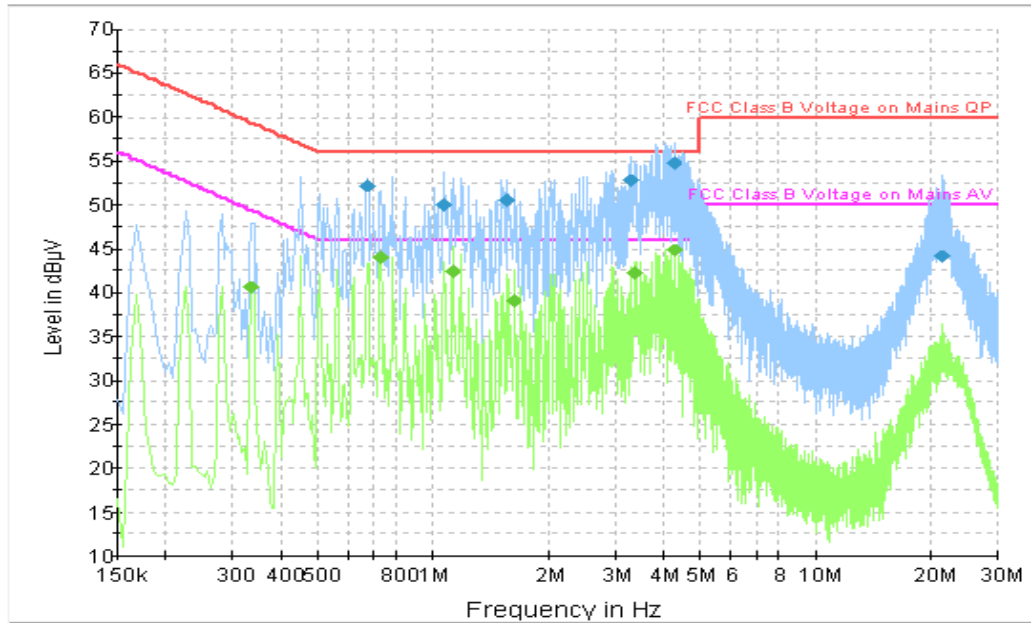


Fig.5 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dB μV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB μV)
0.672000	52.2	GND	L1	19.8	3.8	56.0
1.068000	50.1	GND	L1	19.7	5.9	56.0
1.572000	50.4	GND	L1	19.7	5.6	56.0
3.309000	52.7	GND	L1	19.6	3.3	56.0
4.263000	54.8	GND	L1	19.6	1.2	56.0
21.273000	44.1	GND	N	20.1	15.9	60.0

Final Result 2

Frequency (MHz)	CAverage (dB μV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB μV)
0.334500	40.6	GND	N	19.8	8.8	49.3
0.730500	44.0	GND	L1	19.8	2.0	46.0
1.122000	42.4	GND	L1	19.7	3.6	46.0
1.626000	39.1	GND	N	19.7	6.9	46.0
3.363000	42.2	GND	N	19.7	3.8	46.0
4.317000	44.8	GND	L1	19.7	1.2	46.0

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

USB Mode, Set.5

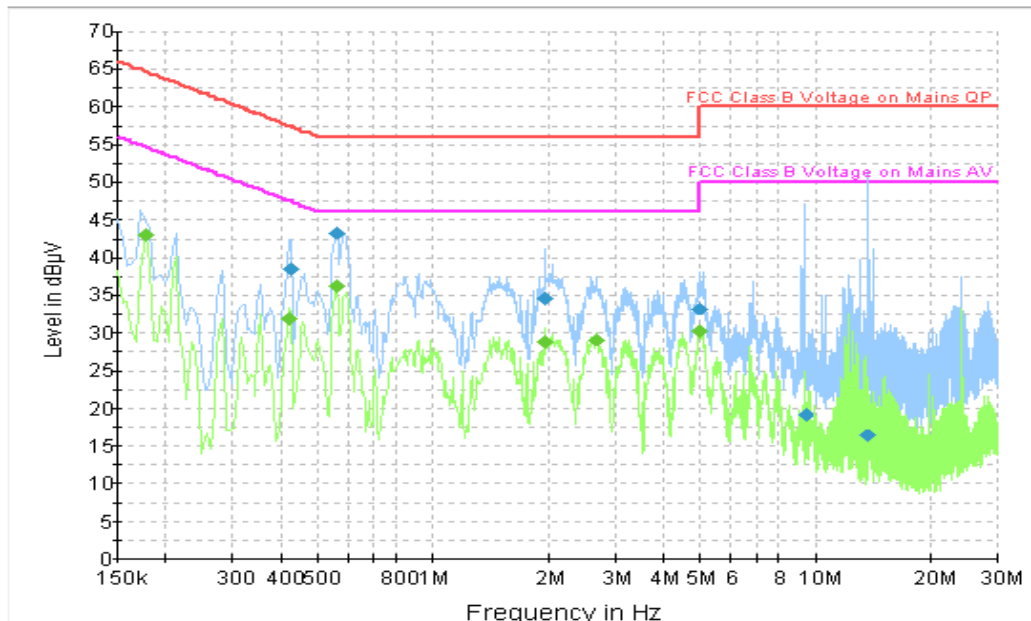


Fig.6 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.424500	38.5	GND	L1	19.8	18.9	57.4
0.559500	43.2	GND	N	19.8	12.8	56.0
1.968000	34.4	GND	L1	19.6	21.6	56.0
4.996500	33.1	GND	N	19.6	22.9	56.0
9.406500	19.2	GND	L1	19.8	40.8	60.0
13.717500	16.4	GND	L1	20.1	43.6	60.0

Final Result 2

Frequency (MHz)	CAverage (dB µV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB µV)
0.177000	42.9	GND	N	19.7	11.8	54.6
0.420000	31.8	GND	N	19.8	15.6	47.4
0.559500	36.2	GND	N	19.8	9.8	46.0
1.968000	28.7	GND	L1	19.6	17.3	46.0
2.674500	29.1	GND	N	19.7	16.9	46.0
4.996500	30.2	GND	N	19.6	15.8	46.0

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

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