



# EMC TEST REPORT

No. I15Z41258-EMC01

for

**ZTE Corporation**

**WCDMA/LTE Dual -Mode Digital Mobile Phone**

**Model Name: ZTE Blade A460**

**FCC ID: SRQ-BLADEA460S**

with

**Hardware Version: P809A20.H01S**

**Software Version: ETB-CO-P809A20V1.0.0**

**Issued Date:2015-06-02**

**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***

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## **REPORT HISTORY**

<b>Report Number</b>	<b>Revision</b>	<b>Description</b>	<b>Issue Date</b>
I15Z41258-EMC01	Rev.0	1st edition	2015-06-02

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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

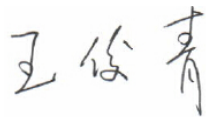
Relative Humidity: 20-75%

### **1.3. Project data**

Testing Start Date: 2015-04-26

Testing End Date: 2015-05-25

### **1.4. Signature**



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**Wang Junqing**

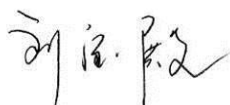
**(Prepared this test report)**



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**Qu Pengfei**

**(Reviewed this test report)**



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**Liu Baodian**

**Deputy Director of the laboratory**

**(Approved this test report)**



## **2. Client Information**

### **2.1. Applicant Information**

Company Name: ZTE Corporation  
Address: ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park,  
Nanshan District, Shenzhen, Guangdong, 518057, P.R.China  
City: Shenzhen  
Postal Code: 518057  
Country: P.R.China  
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### **2.2. Manufacturer Information**

Company Name: ZTE Corporation  
Address: ZTE Plaza, Keji Road South, Hi-Tech, Industrial Park,  
Nanshan District, Shenzhen, Guangdong, 518057, P.R.China  
City: Shenzhen  
Postal Code: 518057  
Country: P.R.China  
Telephone: 86-0755-26773333  
Fax: ----

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

#### 3.1. About EUT

Description	WCDMA/LTE Dual -Mode Digital Mobile Phone
Model Name	ZTE Blade A460
FCC ID	SRQ-BLADEA460S
Extreme vol. Limits	3.5VDC to 4.35VDC (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	/	P809A20.H01S	ETB-CO-P809A20V1.0.0

\*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	/	1540989BA007
AE2	Battery	/	1540989BA004
AE3	Battery	/	1540989BA006
AE4	Battery	/	1540989BA008
AE5	Travel charger	/	1540989CH001
AE6	USB cable	/	1540991DC006

AE1, AE2, AE3, AE4

Model	Li3822T43P3h736044
Manufacturer	ZTE CORPORATION
Capacitance	2200mAh
Nominal voltage	3.8V

AE5

Model	STC-A51-Z
Manufacturer	RUIDE
Length of cable	/

AE6

Model	LQ-04100017
Manufacturer	Xiamen Li Qi Electronics Co., Ltd.
Length of cable	120cm

\*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 + AE5 + AE6	Charger
Set.2	EUT1+ AE1 + AE6	USB

Note: The WCDMA/LTE Dual -Mode Digital Mobile Phone ZTE Blade A460 manufactured by ZTE Corporation is a variant model based on ZTE Blade A460 for conformance test. According to the declaration of changes, no test needs to been performed, all results are cited from the initial model. The report number for initial model is I15Z40989-EMC01.

## **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	2014



## 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	2016-03-03	1 year
2	Test Receiver	ESCI 7	100948	R&S	2015-07-16	1 year
3	Universal Radio Communication Tester	CMU200	109914	R&S	2016-03-26	1 year
4	Test Receiver	FSV	101047	R&S	2015-06-27	1 year
5	LISN	ESH2-Z5	829991/012	R&S	2016-04-12	1 year
6	EMI Antenna	VULB 9163	9163-234	Schwarzbeck	2016-09-16	3 years
7	EMI Antenna	3115	9906-5827	ETS-Lindgren	2016-11-19	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 ( $\mu\text{V/m}$ )		
	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
17988.667	43.7	-17.7	45.6	15.800	V
17990.933	43.7	-17.7	45.6	15.800	V
17981.300	43.7	-17.7	45.6	15.800	V
17996.600	43.7	-17.7	45.6	15.800	H
17984.133	43.7	-17.7	45.6	15.800	V
17975.067	43.6	-17.7	45.6	15.700	H

##### 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
17964.867	55.7	-17.7	45.6	27.800	V
17989.233	55.6	-17.7	45.6	27.700	H
17946.733	55.4	-17.7	45.6	27.500	V
17985.833	55.3	-17.7	45.6	27.400	H
17998.300	55.2	-17.7	45.6	27.300	V
17996.600	55.2	-17.7	45.6	27.300	V

**Measurement results for Set.2:****USB Mode/Average detector**

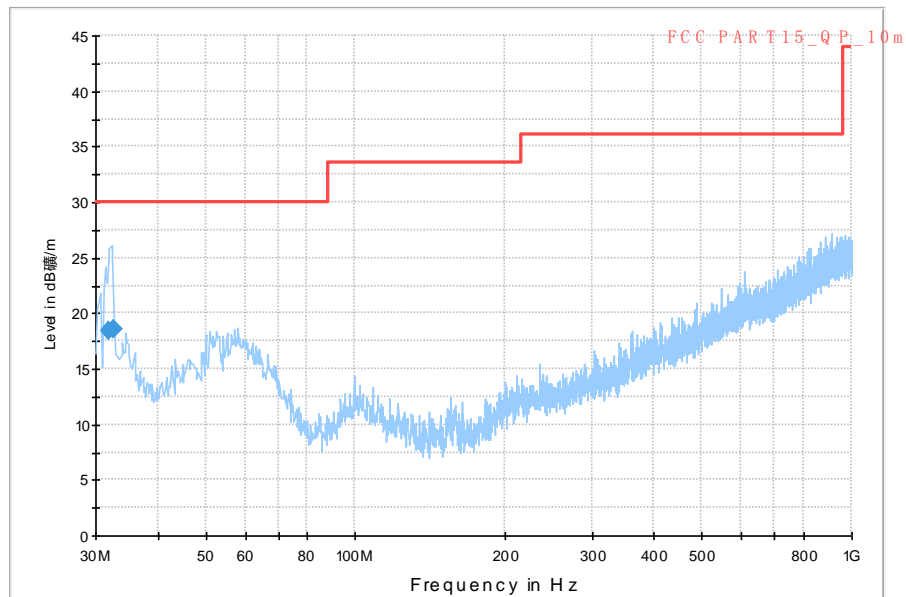
Frequency(MHz)	Result(dB $\mu$ V/m)	G <sub>PL</sub> (dB)	G <sub>A</sub> (dB/m)	P <sub>Mea</sub> (dB $\mu$ V)	Polarity
17986.967	43.9	-17.7	45.6	16.000	V
17990.367	43.7	-17.7	45.6	15.800	H
17987.533	43.7	-17.7	45.6	15.800	V
17983.000	43.6	-17.7	45.6	15.700	H
17997.733	43.6	-17.7	45.6	15.700	V
17997.167	43.6	-17.7	45.6	15.700	V

**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
17882.700	56.5	-18.5	45.6	29.400	H
17999.433	56.4	-17.7	45.6	28.500	H
17998.300	56.0	-17.7	45.6	28.100	V
17989.800	55.6	-17.7	45.6	27.700	H
17993.767	55.6	-17.7	45.6	27.700	H
17981.867	55.4	-17.7	45.6	27.500	V

### Charging Mode, Set.1

Normal RE\_30M-1GHz\_10m

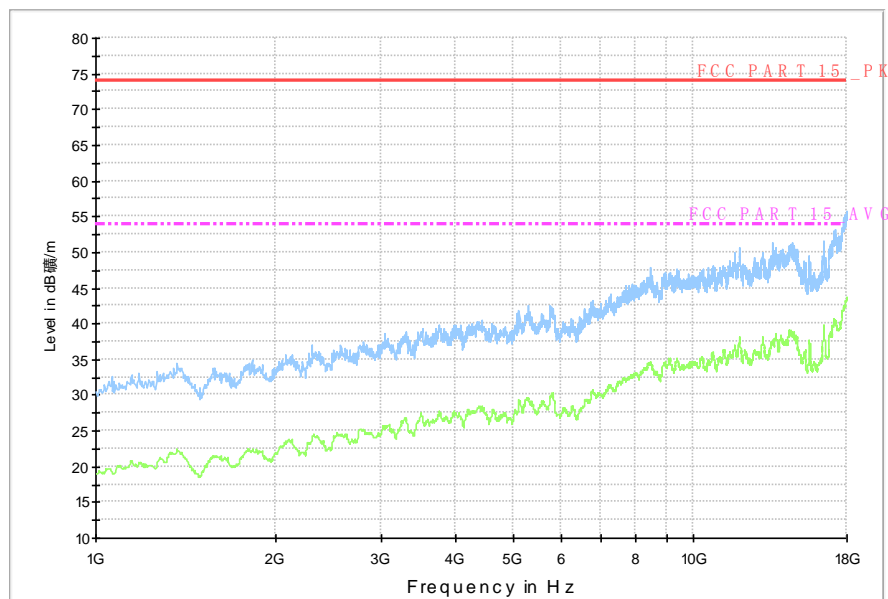


**Fig.1 Radiated Emission from 30MHz to 1GHz**

#### Final Result

Frequency MHz	QuasiPeak dB μV/m	Limit dB μV/m	Margin dB	Azimuth Deg	Polarization H/V
31.848000	18.4	30.0	11.6	-7.0	V
32.588500	18.6	30.0	11.4	187.0	V

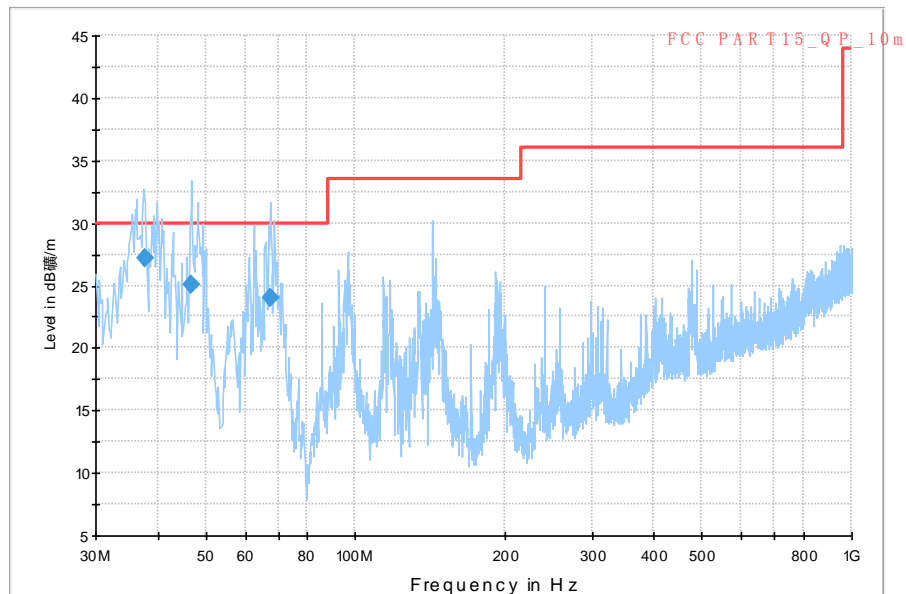
Normal RE\_1G-18GHz\_directly



**Fig.2 Radiated Emission from 1GHz to 18GHz**

## USB Mode, Set.2

Normal RE\_30M-1GHz\_10m

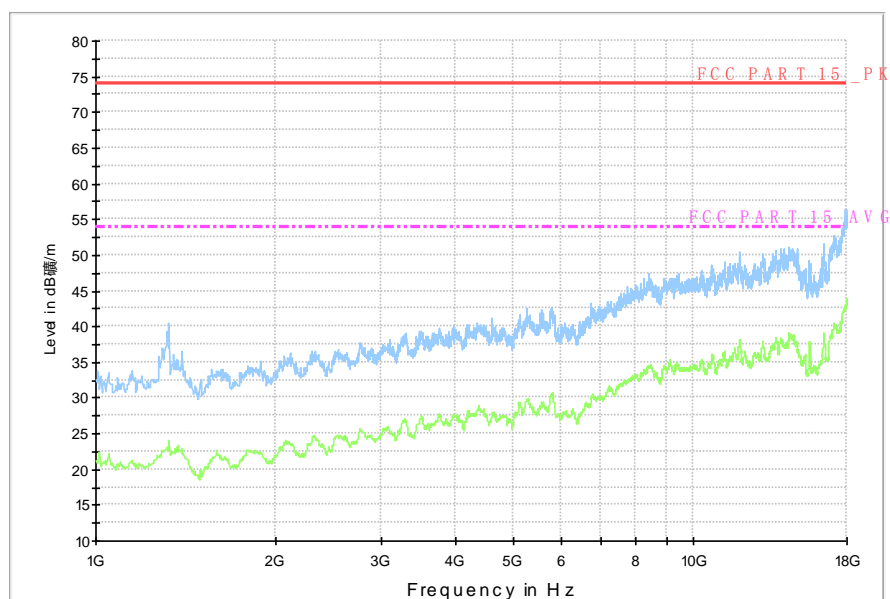


**Fig.3 Radiated Emission from 30MHz to 1GHz**

### Final Result

Frequency MHz	QuasiPeak dB μV/m	Limit dB μV/m	Margin dB	Azimuth Deg	Polarization H/V
37.626000	27.2	30.0	2.8	151.0	V
46.912500	25.0	30.0	5.0	151.0	V
67.442000	24.0	30.0	6.0	274.0	V

Normal RE\_1G-18GHz\_directly



**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 $\mu$ 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

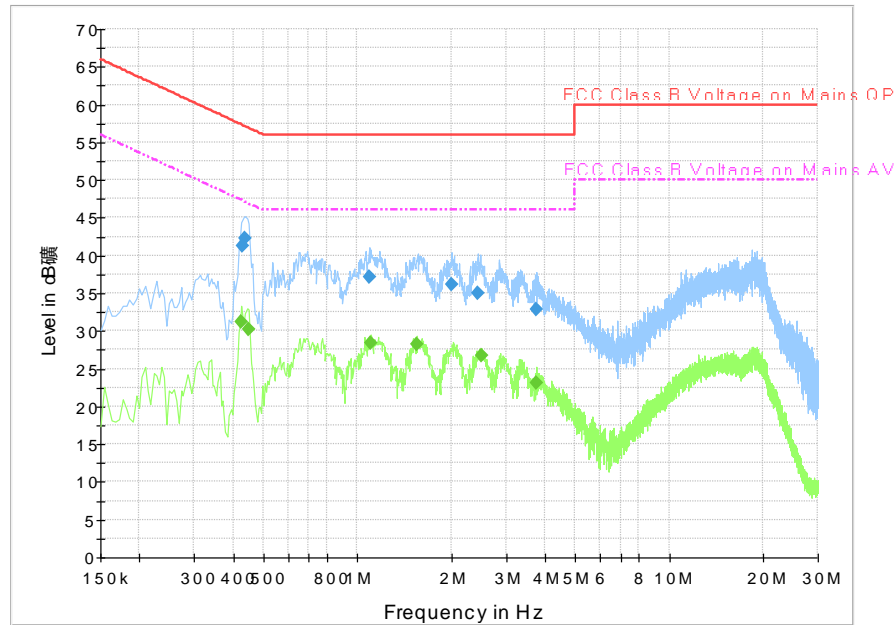
Voltage (V)	Frequency (Hz)
120	60

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



**Fig.5 Conducted Emission**

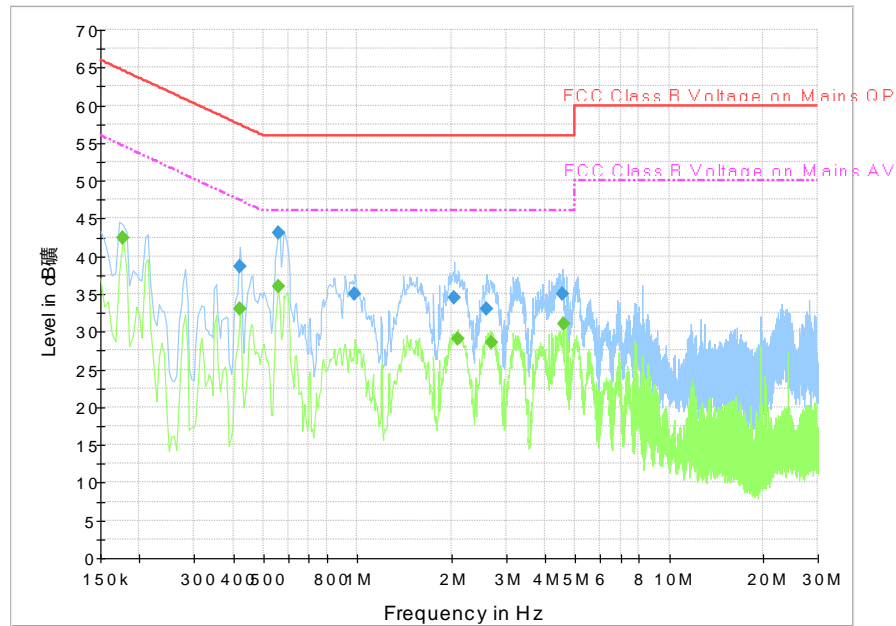
#### Final Result 1

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.429000	41.2	GND	L1	19.8	16.1	57.3
0.438000	42.3	GND	N	19.8	14.8	57.1
1.090500	37.1	GND	L1	19.7	18.9	56.0
1.999500	36.2	GND	L1	19.6	19.8	56.0
2.445000	35.0	GND	L1	19.6	21.0	56.0
3.745500	32.9	GND	N	19.7	23.1	56.0

#### Final Result 2

Frequency (MHz)	CAverage (dB $\mu$ V)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.424500	31.2	GND	N	19.8	16.2	47.4
0.447000	30.2	GND	N	19.8	16.8	46.9
1.108500	28.4	GND	L1	19.7	17.6	46.0
1.558500	28.1	GND	N	19.7	17.9	46.0
2.494500	26.7	GND	L1	19.6	19.3	46.0
3.745500	23.2	GND	N	19.7	22.8	46.0

## USB Mode, Set.2



**Fig.6 Conducted Emission**

### Final Result 1

Frequency (MHz)	QuasiPeak (dB $\mu$ V)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.420000	38.7	GND	N	19.8	18.7	57.4
0.559500	43.0	GND	N	19.8	13.0	56.0
0.982500	35.0	GND	L1	19.7	21.0	56.0
2.040000	34.5	GND	N	19.6	21.5	56.0
2.598000	33.0	GND	N	19.6	23.0	56.0
4.542000	35.0	GND	L1	19.6	21.0	56.0

### Final Result 2

Frequency (MHz)	CAverage (dB $\mu$ V)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dB $\mu$ V)
0.177000	42.4	GND	N	19.7	12.2	54.6
0.420000	33.0	GND	N	19.8	14.4	47.4
0.559500	36.0	GND	N	19.8	10.0	46.0
2.103000	29.1	GND	L1	19.6	16.9	46.0
2.706000	28.5	GND	L1	19.6	17.5	46.0
4.605000	31.0	GND	L1	19.6	15.0	46.0

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