



TEST REPORT

No. I14Z45278-EMC01

for

ZTE CORPORATION

GSM/DC HSPA+ uFi

Model Name: R209-Z

FCC ID: SRQR209-Z

with

Hardware Version: ddxB

Software Version: BD R209V0.1

Issued Date: Apr. 4th, 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℃
Relative Humidity: 20-75%

1.3. Project data

Testing Start Date: Mar. 6th, 2014
Testing End Date: Mar. 18th, 2014

1.4. Signature



Qu Pengfei
(Prepared this test report)



Sun Xiangqian
(Reviewed this test report)



Lu Bingsong
Deputy Director of the laboratory
(Approved this test report)

2. Client Information

2.1. Applicant Information

Company Name: ZTE CORPORATION
Address /Post: ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan
District, Shenzhen, Guangdong, 518057, P.R. China
City: Shenzhen
Postal Code: 518057
Country: China
Telephone: +86-21-68897541
Fax: +86-21-50801070

2.2. Manufacturer Information

Company Name: ZTE CORPORATION
Address /Post: ZTE Plaza, Keji Road South, Hi-Tech Industrial Park, Nanshan
District, Shenzhen, Guangdong, 518057, P.R. China
City: Shenzhen
Postal Code: 518057
Country: China
Telephone: +86-21-68897541
Fax: +86-21-50801070

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

3.1. About EUT

Description	GSM/DC HSPA+ uFi
Model Name	R209-Z
FCC ID	SRQR209-Z
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
EUT3	862891010004314	ddxB	BD R209V0.1

*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	/	1445278BA004
AE2	Battery	/	1445278BA008
AE3	Travel charger	/	TCT-CHR-0080
AE4	Travel charger	/	TCT-CHR-0089
AE5	USB cable	/	1445278DC003
AE6	USB cable	/	1445278DC007

AE1, AE2

Model	Li3715T42P3h654251
Manufacturer	ZTE
Capacitance	1500 mAh
Nominal voltage	3.7V

AE3, AE4

Model	STC-A220501700USBA-Z
Manufacturer	RUIDE
Length of cable	/

AE5, AE6

Model	Micro USB dat-A
Manufacturer	/
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.4	EUT3+ AE1 + AE4 + AE6	Charger
Set.5	EUT3+ AE1 + AE6	USB模式

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	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 7	100948	R&S	2014-07-18
2.	Test Receiver	ESCI 7	101047	R&S	2014-06-30
3.	Universal Radio Communication Tester	CMU200	109914	R&S	2014-04-18
4.	LISN	ESH2-Z5	829991/012	R&S	2014-04-14
5.	EMI Antenna	VULB 9163	9163-234	Schwarzbeck	2016-09-15
6.	EMI Antenna	3115	6914	ETS-Lindgren	2014-12-15
7.	PC	OPTIPLEX 380	2X1YV2X	DELL	N/A
8.	Monitor	E178FPc	CN-OWR979-6 4180-7AJ-D2M S	DELL	N/A
9.	Printer	P1606dn	VNC3L52122	HP	N/A
10.	Keyboard	L100	CN0RH659658 907ATOI40	DELL	N/A
11.	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 ($\mu\text{V/m}$)		
	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 μ V/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea} (dB μ V)	Polarity
9948.250	34.6	-24.9	38.0	21.500	VERTICAL
9938.406	34.5	-24.9	38.0	21.400	VERTICAL
9928.844	34.5	-24.9	38.0	21.400	HORIZONTAL
9903.813	34.5	-24.9	38.0	21.400	HORIZONTAL
9952.469	34.5	-24.9	38.0	21.400	HORIZONTAL
8061.906	34.5	-27.9	37.7	24.700	VERTICAL

Charging Mode/Peak detector

Frequency(MHz)	Result(dB μ V/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea} (dB μ V)	Polarity
8119.281	47.2	-27.5	37.7	37.000	VERTICAL
8102.125	47.2	-27.5	37.7	37.000	HORIZONTAL
9935.594	46.8	-24.9	38.0	33.700	VERTICAL
9100.281	46.6	-26.7	38.4	34.900	VERTICAL
9029.406	46.5	-26.7	38.4	34.800	HORIZONTAL
8031.250	46.3	-27.9	37.7	36.500	HORIZONTAL

Measurement result for Set.5:

USB Mode/Average detector

Frequency(MHz)	Result(dBμV/m)	G _{PL} (dB)	G _A (dB/m)	P _{mea} (dBμV)	Polarity
9920.969	35.4	-40.3	24.1	46.300	HORIZONTAL
9898.750	35.4	-40.3	24.1	45.800	VERTICAL
9919.000	35.3	-34.1	35.1	28.400	HORIZONTAL
9921.250	35.3	-34.1	35.1	28.400	VERTICAL
9955.563	35.3	-40.3	24.1	45.600	VERTICAL
9923.781	35.2	-34.1	35.1	28.300	HORIZONTAL

USB Mode/ Peak detector

Frequency(MHz)	Result(dBμV/m)	G _{PL} (dB)	G _A (dB/m)	P _{mea} (dBμV)	Polarity
9105.063	47.7	-40.3	24.1	62.700	VERTICAL
8088.906	47.6	-38.8	27.7	57.300	HORIZONTAL
9952.469	47.6	-40.3	24.1	62.000	HORIZONTAL
7955.031	47.1	-38.8	27.7	56.300	VERTICAL
9969.344	47.1	-38.8	27.7	56.200	VERTICAL
9056.688	47.0	-40.3	24.1	61.300	HORIZONTAL

Charging Mode, Set.4

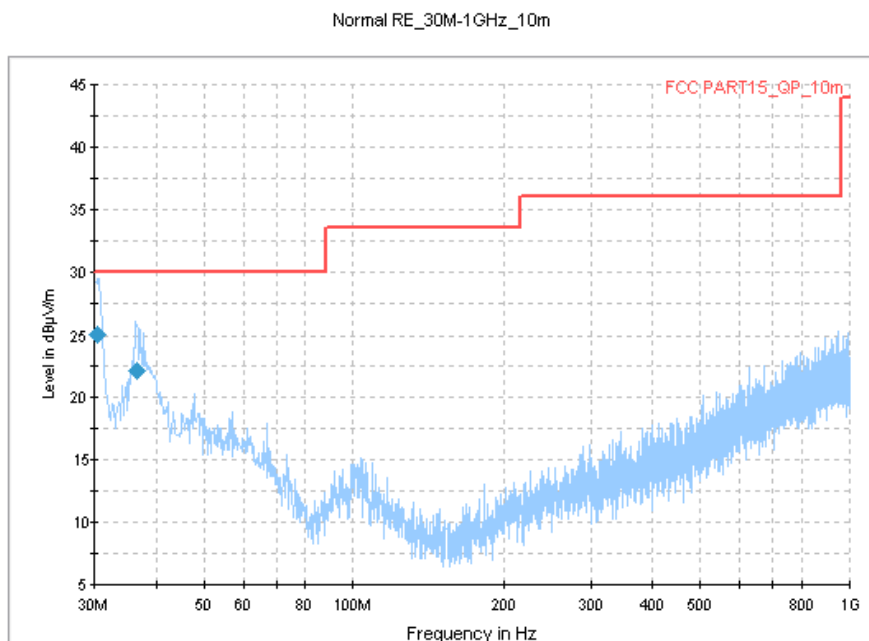


Figure A.1 Radiated Emission from 30MHz to 1GHz

Final Average

Frequency Hz	Level dBμV/m	Limit dBμV/m	Margin dB	Azimuth Deg	Polarisation H/V
30.420000	25.1	30.0	4.9	210.0	V
36.546250	22.1	30.0	7.9	210.0	V

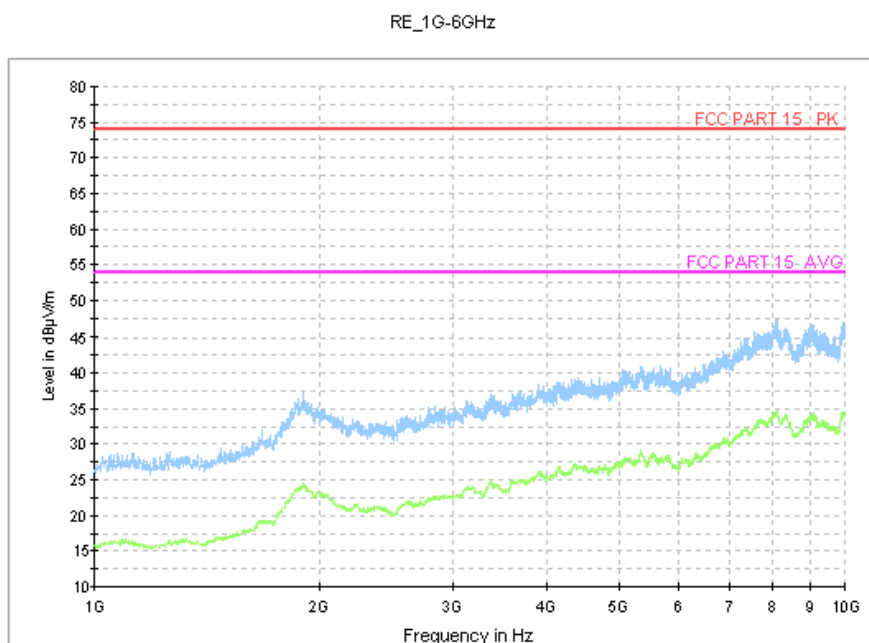


Figure A.2 Radiated Emission from 1GHz to 6GHz

USB Mode, Set.5

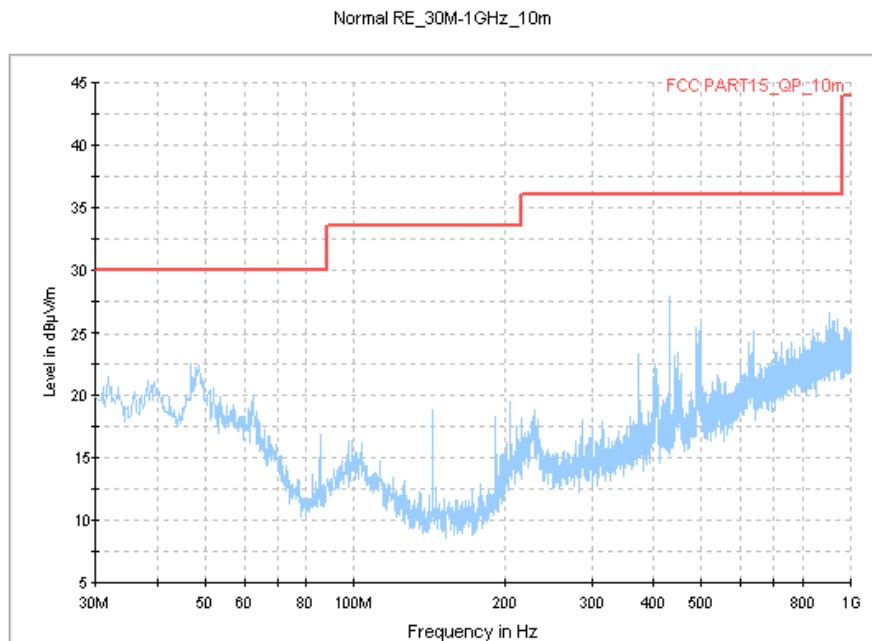


Figure A.3 Radiated Emission from 30MHz to 1GHz

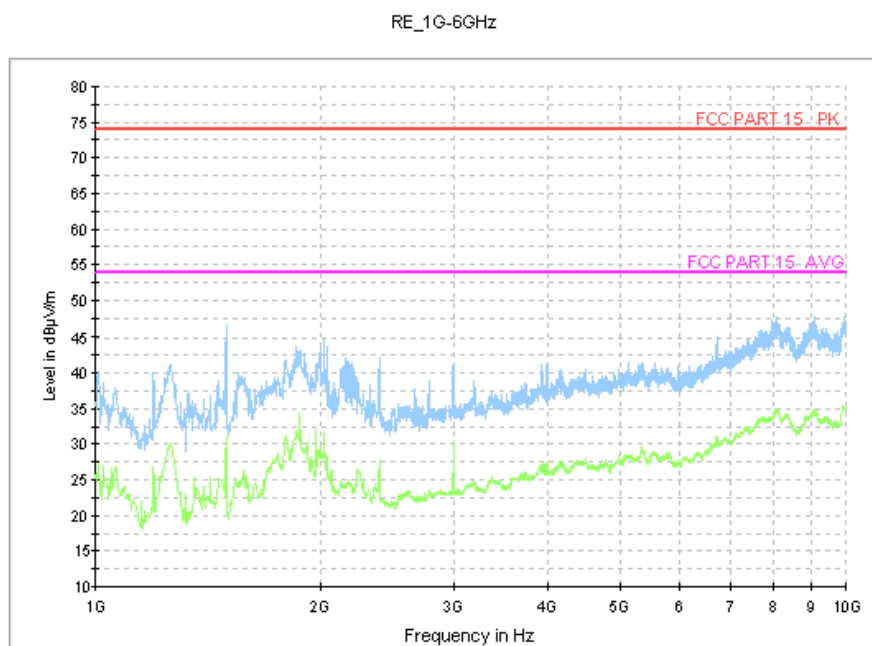


Figure A.4 Radiated Emission from 1GHz to 6GHz

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 7.2.

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 (dBμV)	
	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

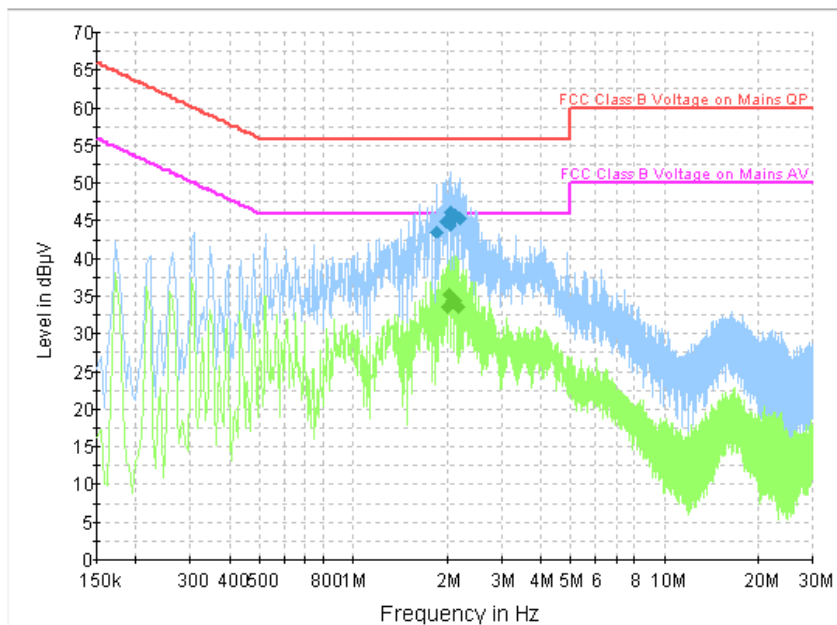


Figure A.5 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
1.851000	43.6	GND	L1	9.7	12.4	56.0
1.981500	44.8	GND	L1	9.7	11.2	56.0
2.035500	44.6	GND	N	9.7	11.4	56.0
2.062500	46.2	GND	L1	9.7	9.8	56.0
2.125500	45.7	GND	L1	9.7	10.3	56.0
2.193000	45.4	GND	L1	9.7	10.6	56.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
2.004000	33.6	GND	L1	9.7	12.4	46.0
2.017500	35.3	GND	L1	9.7	10.7	46.0
2.080500	34.4	GND	L1	9.7	11.6	46.0
2.112000	34.4	GND	L1	9.7	11.6	46.0
2.143500	33.8	GND	L1	9.7	12.2	46.0
2.175000	33.4	GND	L1	9.7	12.6	46.0

USB Mode, Set.5

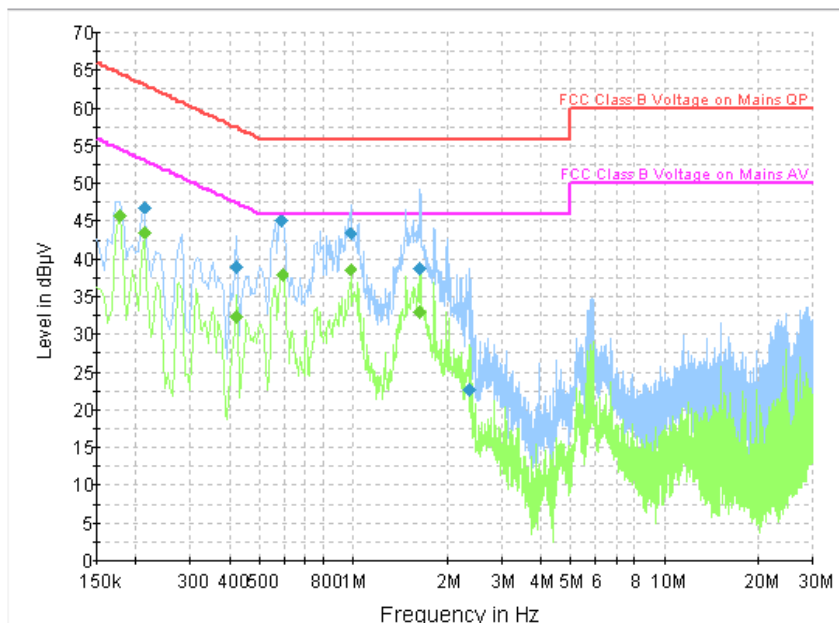


Figure A.6 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.213000	46.8	GND	N	9.8	16.2	63.1
0.420000	38.9	GND	L1	9.8	18.5	57.4
0.586500	45.1	GND	L1	9.8	10.9	56.0
0.978000	43.5	GND	L1	9.7	12.5	56.0
1.644000	38.8	GND	L1	9.7	17.2	56.0
2.377500	22.6	GND	L1	9.7	33.4	56.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.177000	45.8	GND	N	9.8	8.9	54.6
0.213000	43.6	GND	N	9.8	9.5	53.1
0.420000	32.3	GND	L1	9.8	15.2	47.4
0.591000	37.9	GND	N	9.8	8.1	46.0
0.982500	38.7	GND	N	9.7	7.3	46.0
1.644000	33.0	GND	L1	9.7	13.0	46.0

END OF REPORT