



TEST REPORT

No. I14Z49231-EMC01

for

ZTE CORPORATION

WCDMA/LTE Dual-Mode Digital Mobile Phone

Model Name: ZTE Blade A450, Blade A450, BGH Joy Smart A4G

FCC ID: SRQ-BLADEA450

with

Hardware Version: MBV1.0

Software Version: BGH_Joy_Smart_A4G_V1.0.0

Issued Date: 2015-01-19

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.

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REPORT HISTORY

Report Number	Revision	Description	Issue Date
I14Z49231-EMC01	Rev.0	1st edition	2015-01-19

CONTENTS

1. TEST LABORATORY.....	4
1.1. TESTING LOCATION	4
1.2. TESTING ENVIRONMENT	4
1.3. PROJECT DATA.....	4
1.4. SIGNATURE	4
2. CLIENT INFORMATION.....	5
2.1. APPLICANT INFORMATION.....	5
2.2. MANUFACTURER INFORMATION.....	5
3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE)	6
3.1. ABOUT EUT	6
3.2. INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST	6
3.3. INTERNAL IDENTIFICATION OF AE USED DURING THE TEST.....	6
3.4. EUT SET-UPS	6
4. REFERENCE DOCUMENTS	7
4.1. REFERENCE DOCUMENTS FOR TESTING.....	7
5. LABORATORY ENVIRONMENT	8
6. SUMMARY OF TEST RESULTS.....	9
7. TEST EQUIPMENTS UTILIZED.....	10
ANNEX A: MEASUREMENT RESULTS	11

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: 2014-12-31

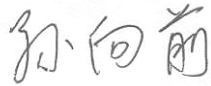
Testing End Date: 2015-01-04

1.4. Signature



Zhang Hui

(Prepared this test report)



Sun Xiangqian

(Reviewed this test report)



Lu Bingsong

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
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City: Shenzhen
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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
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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 A450, Blade A450, BGH Joy Smart A4G
FCC ID	SRQ-BLADEA450
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 CTTL, Telecommunication Technology Labs, Academy of Telecommunication Research, MIIT.

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT4	014243000001826	MBV1.0	BGH_Joy_Smart_A4G_V1.0.0

*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	/	/
AE2	USB cable	/	1449231DC003
AE3	Travel Charger	/	1449231CH006

AE1

Model	Li3834T43P6h726452
Manufacturer	ZTE
Capacitance	/
Nominal voltage	/

AE2

Model	11.5001030046
Manufacturer	/
Length of cable	71cm

AE3

Model	STC-A22O50I1000USBA-C
Manufacturer	ZTE
Length of cable	/

*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+ AE2 + AE3	Charger
Set.2	EUT1+ AE1+ AE2	USB mode

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 (23meters×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

Items	Test Name	Clause in FCC rules	Clause in IC rules	Section in this report	Verdict	Test Location
1	Radiated Emission	15.109(a)	Section 5	B.1	P	A
2	Conducted Emission	15.107(a)	Section 5	B.2	P	A

7. Test Equipments Utilized

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURE	CAL DUE DATE	CALIBRATI ON INTERVAL
1	Test Receiver	ESCI	100344	R&S	2015-03-03	1 year
2	Test Receiver	ESCI 7	100948	R&S	2015-07-16	1 year
3	Universal Radio Communication Tester	CMU200	109914	R&S	2015-04-13	1 year
4	Test Receiver	FSV	101047	R&S	2015-07-03	1 year
5	LISN	ENV216	101200	R&S	2015-07-07	1 year
6	EMI Antenna	VULB 9163	9163-234	Schwarzbeck	2016-09-15	3 years
7	EMI Antenna	3115	6914	ETS-Lindgren	2016-12-15	3 years
8	PC	OPTIPLEX 380	2X1YV2X	DELL	N/A	N/A
9	Monitor	E178FPc	CN-OWR979-6 4180-7AJ-D2M S	DELL	N/A	N/A
10	Printer	P1606dn	VNC3L52122	HP	N/A	N/A
11	Keyboard	L100	CN0RH659658 907ATOI40	DELL	N/A	N/A
12	Mouse	M-UAE119	LZ935220ZRC	Lenovo	N/A	N/A

ANNEX A: MEASUREMENT RESULTS

A.1 Radiated Emission

Reference

FCC: CFR Part 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.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
17882.063	49.4	-18.5	45.6	22.300	VERTICAL
17895.875	49.4	-18.5	45.6	22.300	VERTICAL
17923.500	49.4	-17.7	45.6	21.500	VERTICAL
17885.250	49.3	-18.5	45.6	22.200	HORIZONTAL
17870.375	49.2	-18.5	45.6	22.100	VERTICAL
17872.500	49.2	-18.5	45.6	22.100	HORIZONTAL

Charging Mode/Peak detector

Frequency(MHz)	Result(dB μ V/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea} (dB μ V)	Polarity
17898.000	61.1	-18.5	45.6	34.000	VERTICAL
17921.375	60.4	-17.7	45.6	32.500	VERTICAL
17937.313	60.4	-17.7	45.6	32.500	VERTICAL
17986.188	60.3	-17.7	45.6	32.400	HORIZONTAL
17958.563	60.2	-17.7	45.6	32.300	VERTICAL
17903.313	60.2	-18.5	45.6	33.100	HORIZONTAL

Measurement result 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
17883.125	49.4	-18.5	45.6	22.300	VERTICAL
17869.313	49.4	-18.5	45.6	22.300	HORIZONTAL
17876.750	49.4	-18.5	45.6	22.300	VERTICAL
17872.500	49.3	-18.5	45.6	22.200	HORIZONTAL
17904.375	49.3	-18.5	45.6	22.200	VERTICAL
17877.813	49.2	-18.5	45.6	22.100	VERTICAL

USB Mode/ Peak detector

Frequency(MHz)	Result(dB μ V/m)	G _{PL} (dB)	G _A (dB/m)	P _{mea} (dB μ V)	Polarity
17934.125	60.4	-17.7	45.6	32.500	VERTICAL
17928.813	60.2	-17.7	45.6	32.300	VERTICAL
17908.625	60.0	-18.5	45.6	32.900	VERTICAL
17904.375	59.9	-18.5	45.6	32.800	HORIZONTAL
17946.875	59.7	-17.7	45.6	31.800	VERTICAL
17874.625	59.7	-18.5	45.6	32.600	VERTICAL

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

Charging Mode, Set.1

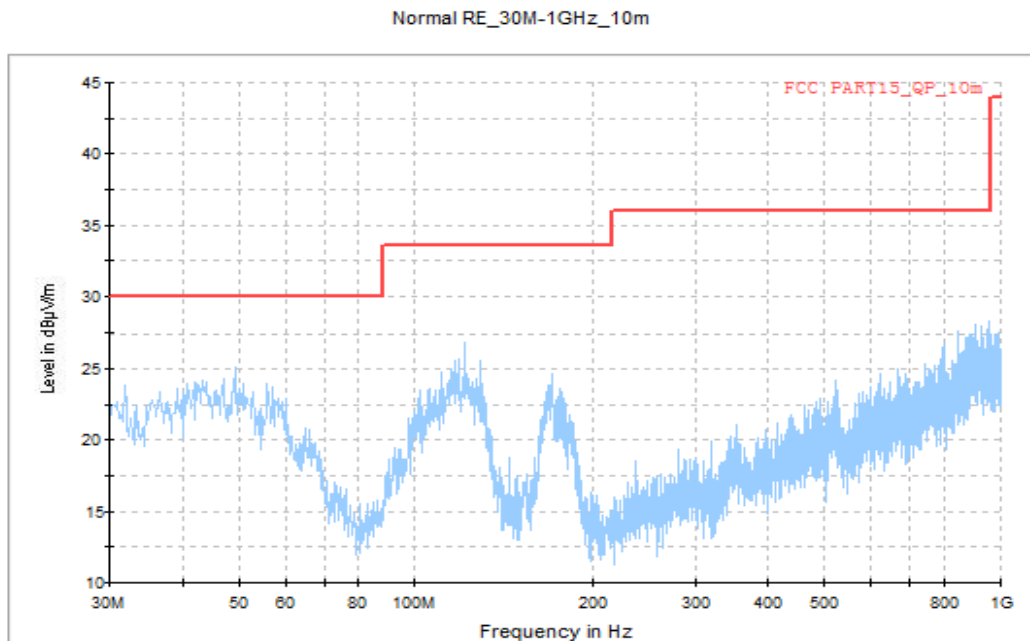


Figure A.1 Radiated Emission from 30MHz to 1GHz

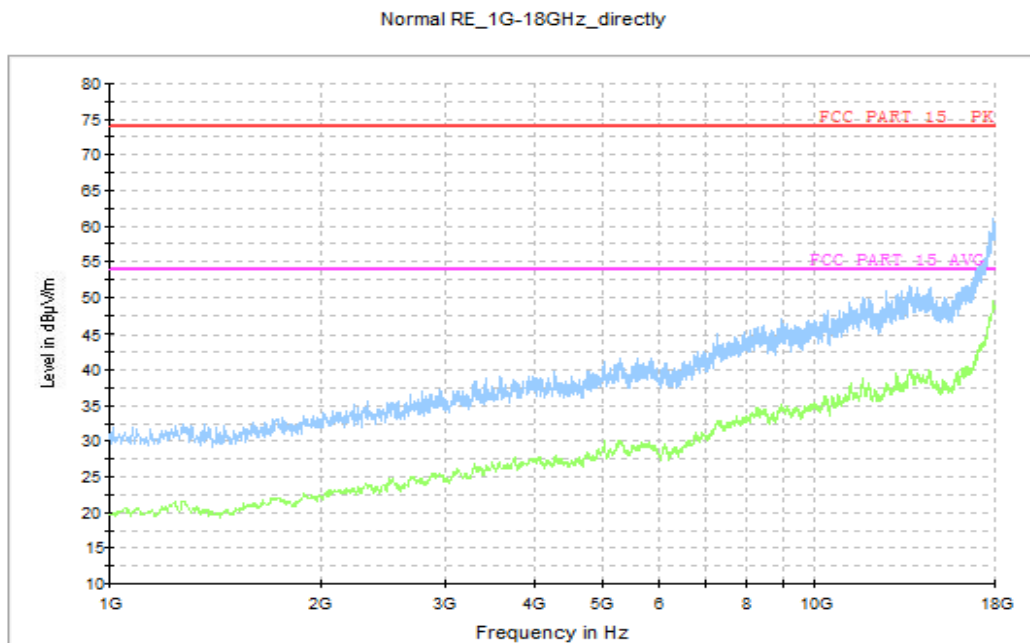


Figure A.2 Radiated Emission from 1GHz to 18GHz

USB Mode, Set.2

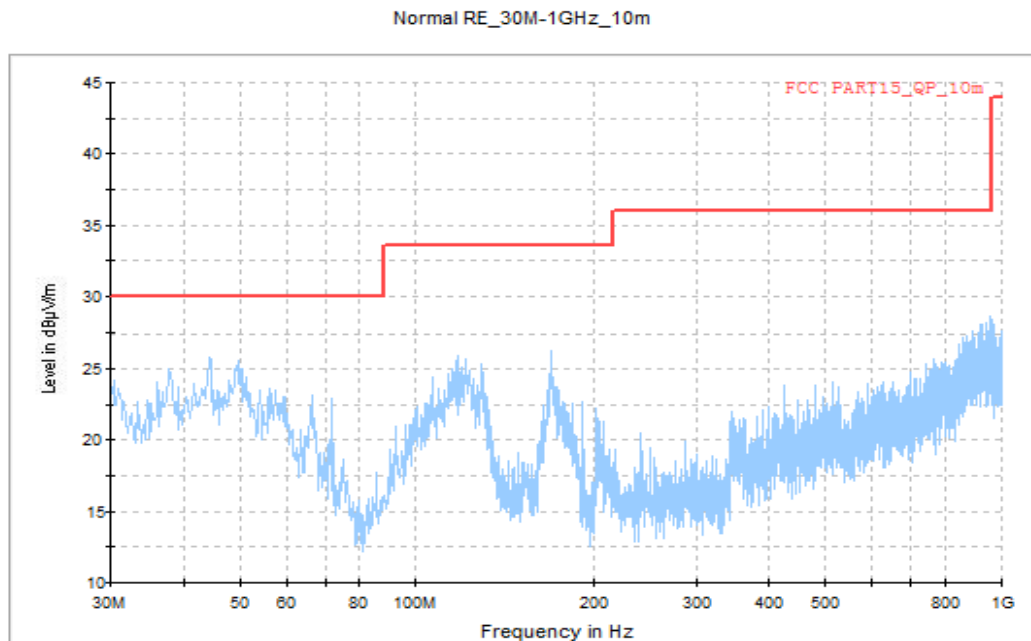


Figure A.3 Radiated Emission from 30MHz to 1GHz

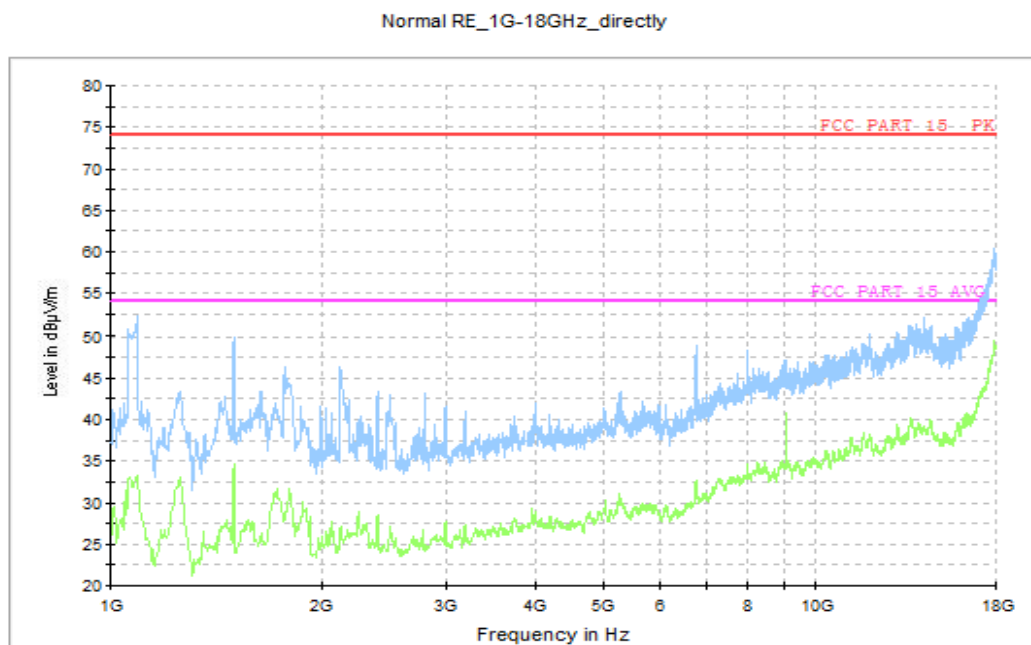


Figure A.4 Radiated Emission from 1GHz to18GHz

A.2 Conducted Emission

Reference

FCC: CFR Part 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 (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.1

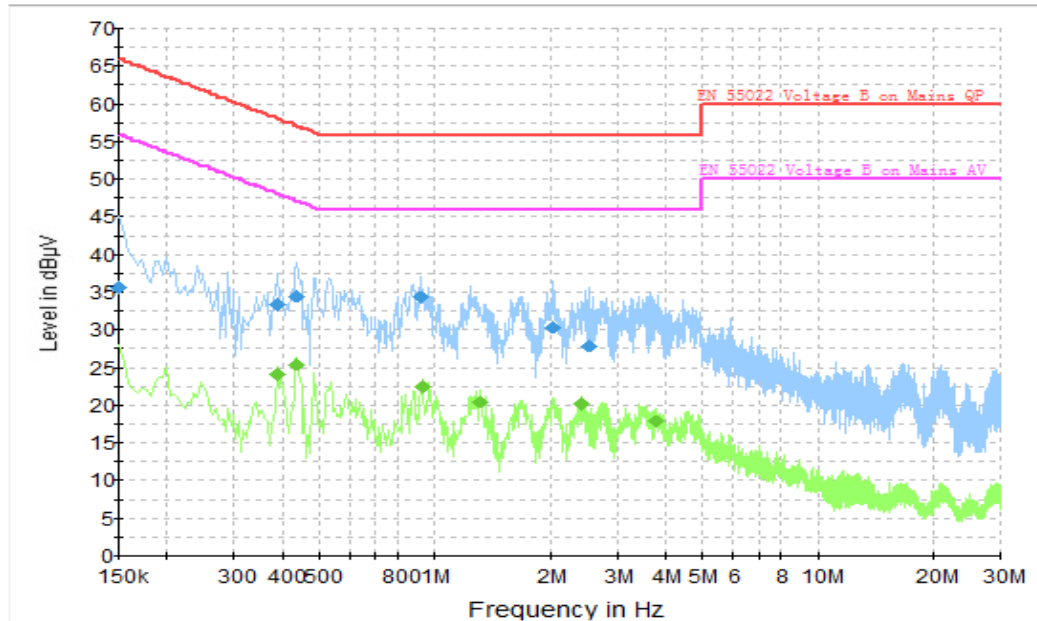


Figure A.5 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time(ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	35.6	2000.0	9.000	On	L1	19.7	30.4	66.0
0.388500	33.4	2000.0	9.000	On	L1	19.9	24.7	58.1
0.438000	34.4	2000.0	9.000	On	N	20.0	22.7	57.1
0.915000	34.3	2000.0	9.000	On	L1	19.8	21.7	56.0
2.026500	30.3	2000.0	9.000	On	L1	19.7	25.7	56.0
2.530500	27.9	2000.0	9.000	On	N	19.7	28.1	56.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time(ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.388500	24.2	2000.0	9.000	On	L1	19.9	23.9	48.1
0.438000	25.4	2000.0	9.000	On	L1	20.0	21.7	47.1
0.924000	22.5	2000.0	9.000	On	L1	19.8	23.5	46.0
1.320000	20.4	2000.0	9.000	On	L1	19.7	25.6	46.0
2.418000	20.1	2000.0	9.000	On	L1	19.7	25.9	46.0
3.777000	17.9	2000.0	9.000	On	L1	19.7	28.1	46.0

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

USB Mode, Set.2

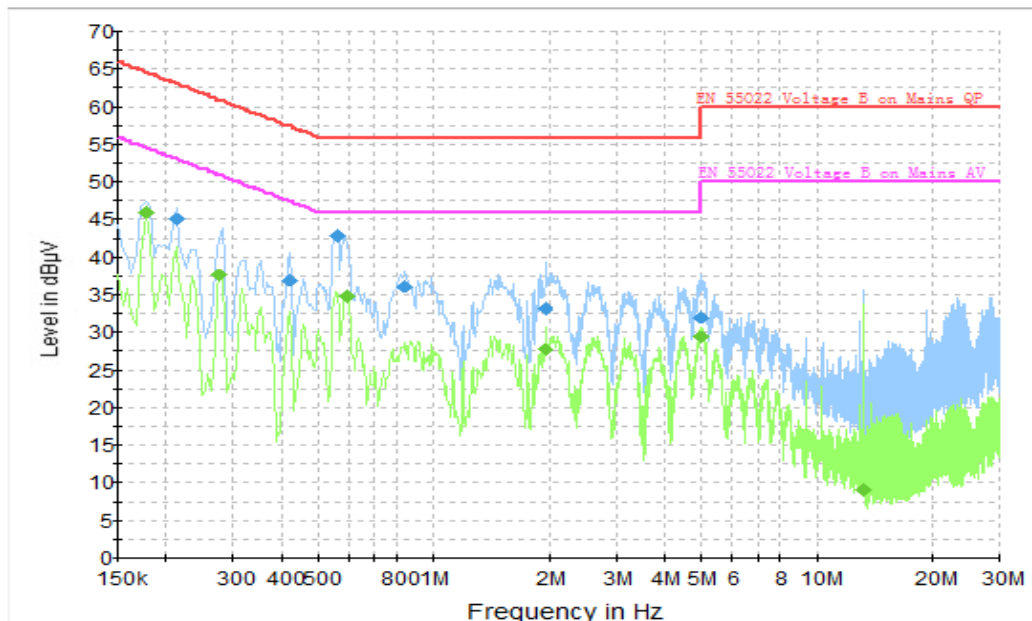


Figure A.6 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	Meas. Time(ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.213000	45.0	2000.0	9.000	On	N	19.9	18.1	63.1
0.420000	36.9	2000.0	9.000	On	N	20.0	20.5	57.4
0.559500	43.0	2000.0	9.000	On	L1	20.0	13.0	56.0
0.838500	36.2	2000.0	9.000	On	N	19.9	19.8	56.0
1.959000	33.2	2000.0	9.000	On	L1	19.7	22.8	56.0
4.987500	32.1	2000.0	9.000	On	N	19.6	23.9	56.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	Meas. Time(ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.177000	46.0	2000.0	9.000	On	N	19.9	8.6	54.6
0.276000	37.7	2000.0	9.000	On	N	19.9	13.3	50.9
0.595500	34.8	2000.0	9.000	On	N	20.0	11.2	46.0
1.959000	27.8	2000.0	9.000	On	L1	19.7	18.2	46.0
4.987500	29.4	2000.0	9.000	On	N	19.6	16.6	46.0
13.218000	9.0	2000.0	9.000	On	L1	19.8	41.0	50.0

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

END OF REPORT