



TEST REPORT

No. I15Z40869-EMC01

for

TCT Mobile

HSUPA/HSDPA/UMTS triband/GSM quadband mobile phone

Model Name: A463BG

FCC ID: RAD549

with

Hardware Version: PIO

Software Version: v3B15

Issued Date: 2015-05-07

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
I15Z40869-EMC01	Rev.0	1st edition	2015-05-07

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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℃

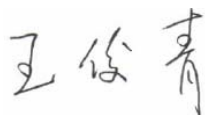
Relative Humidity: 20-75%

1.3. Project data

Testing Start Date: 2015-04-20

Testing End Date: 2015-04-27

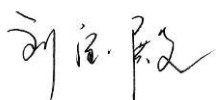
1.4. Signature



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: TCT Mobile Limite
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
Contact Person: Gong Zhizhou
Contact Email: zhizhou.gong@tcl.com
Telephone: 0086-21-51798260
Fax: 0086-21-61460602

2.2. Manufacturer Information

Company Name: TCT Mobile Limite
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: 0086-21-51798260
Fax: 0086-21-61460602

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

3.1. About EUT

Description	WCDMA/GSM(GPRS) Dual-Mode Digital Mobile Phone
Model Name	A463BG
FCC ID	RAD549
Extreme vol. Limits	3.5VDC to 4.2VDC (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
EUT1	014389000000977	PIO	v3B15

*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	/	14TCT-BA-2225
AE2	Battery	/	15TCT-BA-0128
AE3	Battery	/	14TCT-BA-0082
AE4	Travel charger	/	14TCT-CH-1889
AE5	Travel charger	/	14TCT-CH-1457
AE6	USB cable	/	15TCT-DC-0009

AE1

Model	CAB1150000C1
Manufacturer	BYD
Capacitance	1150mAh
Nominal voltage	3.7V

AE2

Model	CAB1400002C1
Manufacturer	BYD
Capacitance	1400mAh
Nominal voltage	3.7V

AE3

Model	CAB1400002C2
Manufacturer	SCUD
Capacitance	1400mAh
Nominal voltage	3.7V



AE4

Model	CBA3002AG0C3
Manufacturer	YINGJU
Length of cable	122cm

AE5

Model	CBA0066AG0C1
Manufacturer	BYD EUP
Length of cable	121cm

AE6

Model	CDA3122002C2
Manufacturer	/
Length of cable	91cm

*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 + AE4	Charger
Set.2	EUT1+ AE1/AE2/AE3 + AE5	Charger
Set.3	EUT1+ 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	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	ESU26	100235	R&S	2016-03-02	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	2015-07-03	1 year
5	LISN	ENV216	101200	R&S	2015-07-07	1 year
6	EMI Antenna	VULB 9163	9163-234	Schwarzbeck	2016-09-16	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-OWR979-64180-7AJ-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_{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
17892.688	46.2	-18.5	45.6	19.100	V
17885.250	45.8	-18.5	45.6	18.700	V
17871.438	45.8	-18.5	45.6	18.700	H
17882.594	45.7	-18.5	45.6	18.600	H
17866.125	45.7	-18.5	45.6	18.600	V
17902.781	45.7	-18.5	45.6	18.600	H

Charging Mode/Peak detector

Frequency(MHz)	Result(dB μ V/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea} (dB μ V)	Polarity
17907.563	57.5	-18.5	45.6	30.400	V
17900.656	57.4	-18.5	45.6	30.300	V
17854.969	57.0	-18.5	45.6	29.900	H
17851.250	56.9	-18.5	45.6	29.800	H
17877.281	56.9	-18.5	45.6	29.800	V
17909.156	56.9	-18.5	45.6	29.800	H

Measurement results for Set.2:
Charging Mode/Average detector

Frequency(MHz)	Result(dB μ V/m)	G _{PL} (dB)	G _A (dB/m)	P _{Mea} (dB μ V)	Polarity
17866.125	45.9	-18.5	45.6	18.800	H
17898.000	45.8	-18.5	45.6	18.700	V
17866.656	45.8	-18.5	45.6	18.700	V
17879.406	45.8	-18.5	45.6	18.700	H
17883.125	45.8	-18.5	45.6	18.700	H
17867.188	45.8	-18.5	45.6	18.700	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
17888.438	58.5	-18.5	45.6	31.400	V
17862.938	57.5	-18.5	45.6	30.400	H
17873.031	57.3	-18.5	45.6	30.200	V
17905.438	57.2	-18.5	45.6	30.100	H
17879.406	57.2	-18.5	45.6	30.100	V
17872.500	57.1	-18.5	45.6	30.000	H

Measurement results for Set.3:
USB Mode/Average detector

Frequency(MHz)	Result(dB μ V/m)	G _{PL} (dB)	G _A (dB/m)	P _{Mea} (dB μ V)	Polarity
17886.313	46.0	-18.5	45.6	18.900	H
17878.344	46.0	-18.5	45.6	18.900	V
17894.281	46.0	-18.5	45.6	18.900	H
17881.000	45.9	-18.5	45.6	18.800	H
17891.625	45.9	-18.5	45.6	18.800	V
17875.688	45.9	-18.5	45.6	18.800	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
17931.469	58.0	-17.7	45.6	30.100	H
17832.656	57.7	-18.5	45.6	30.600	V
17900.656	57.6	-18.5	45.6	30.500	H
17894.813	57.3	-18.5	45.6	30.200	V
17895.344	57.3	-18.5	45.6	30.200	V
17902.781	57.2	-18.5	45.6	30.100	H

Charging Mode, Set.1

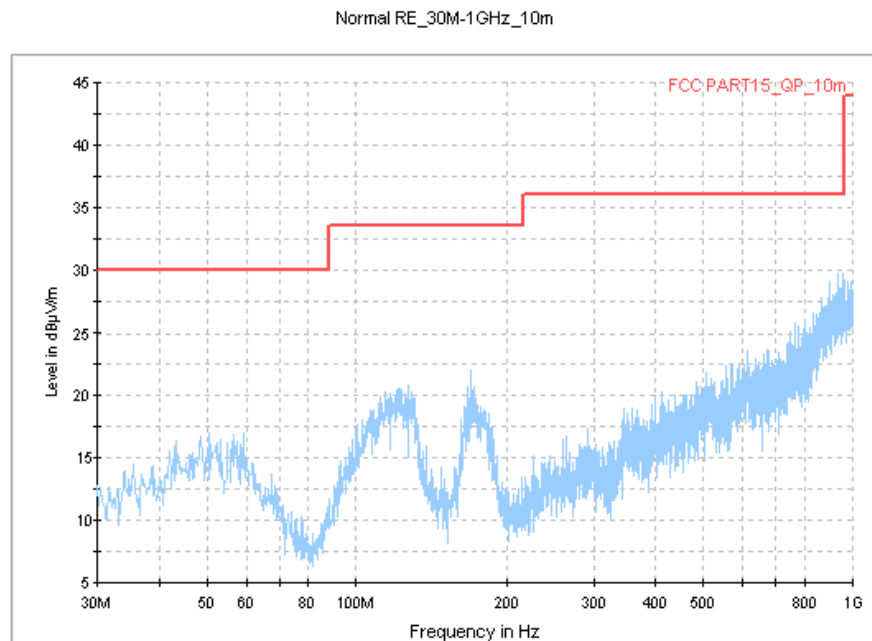


Fig.1 Radiated Emission from 30MHz to 1GHz

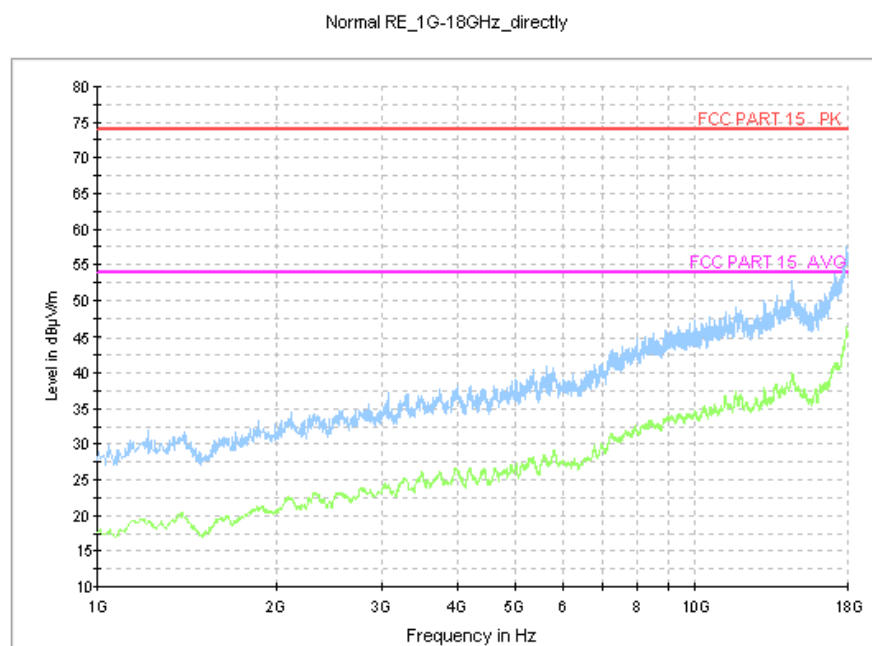


Fig.2 Radiated Emission from 1GHz to 18GHz

Charging Mode, Set.2

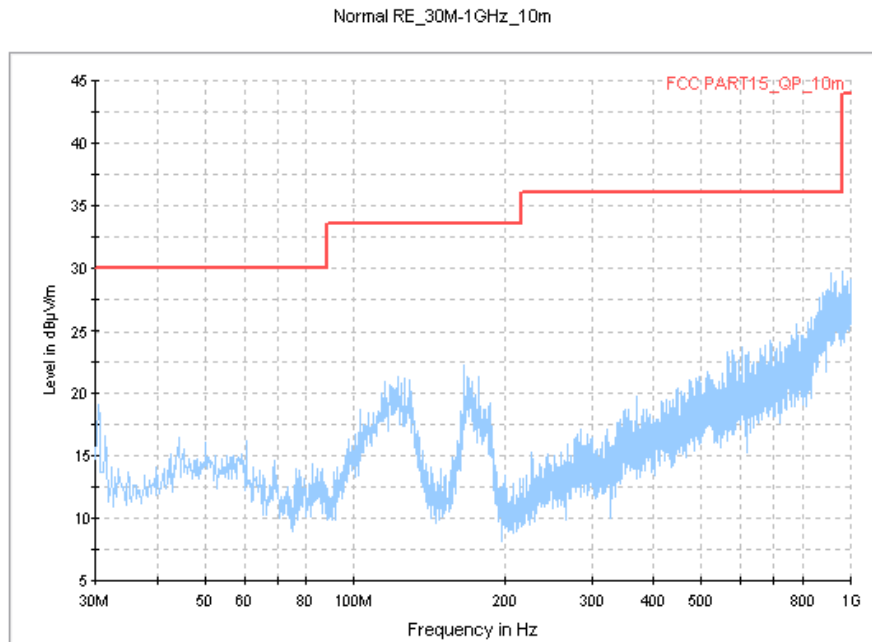


Fig.3 Radiated Emission from 30MHz to 1GHz

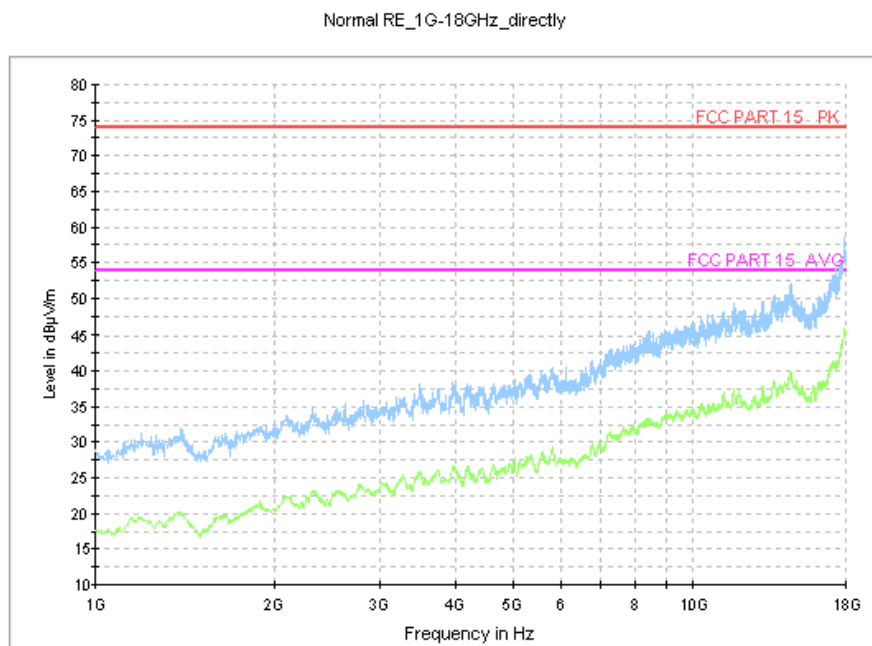


Fig.4 Radiated Emission from 1GHz to 18GHz

USB Mode, Set.3

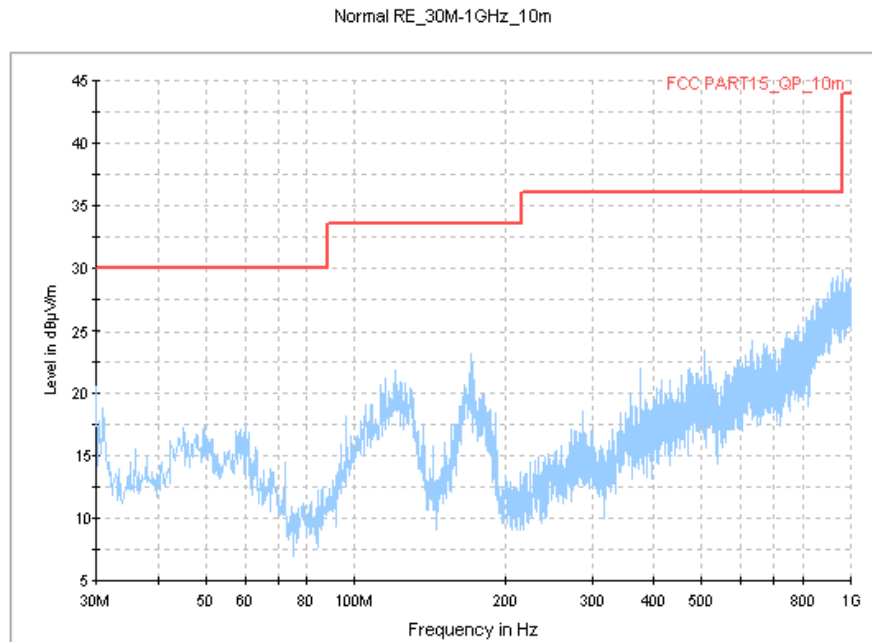


Fig.5 Radiated Emission from 30MHz to 1GHz

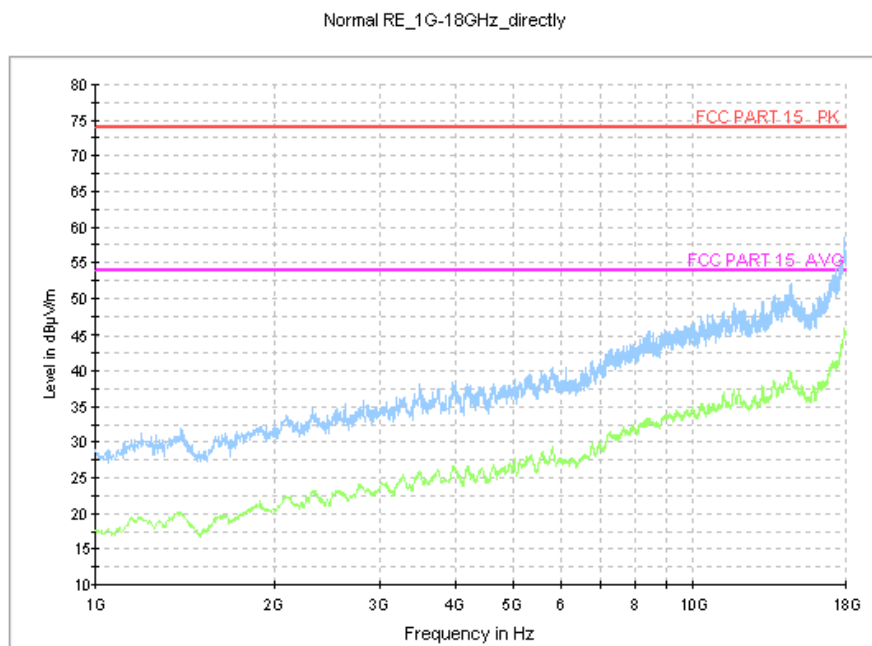


Fig.6 Radiated Emission from 1GHz to 18GHz

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 (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

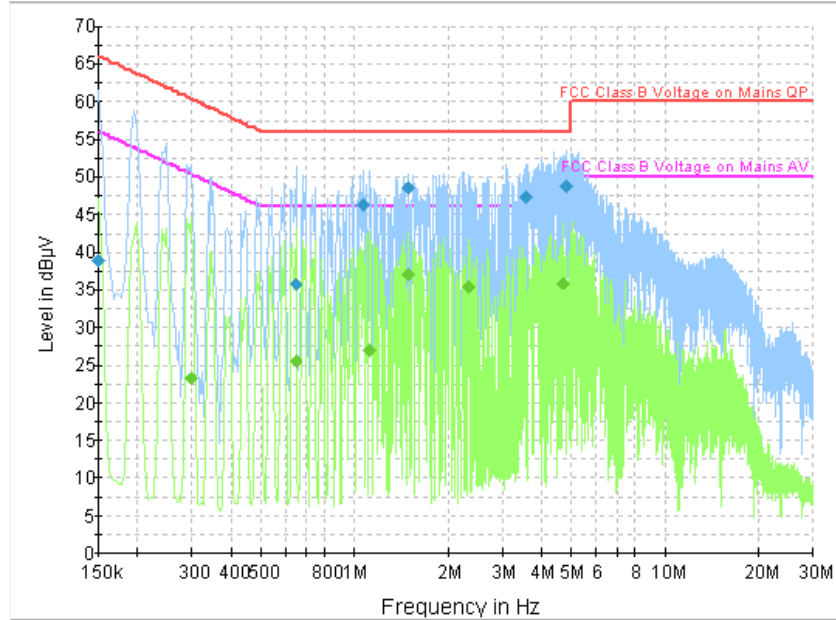


Fig.7 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150000	38.8	GND	L1	20.1	27.2	66.0
0.645000	35.6	GND	L1	19.8	20.4	56.0
1.068000	46.3	GND	N	19.7	9.7	56.0
1.495500	48.5	GND	N	19.6	7.5	56.0
3.579000	47.2	GND	N	19.7	8.8	56.0
4.798500	48.7	GND	N	19.7	7.3	56.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.298500	23.1	GND	L1	19.8	27.2	50.3
0.645000	25.5	GND	L1	19.8	20.5	46.0
1.117500	27.0	GND	N	19.7	19.0	46.0
1.495500	37.1	GND	N	19.6	8.9	46.0
2.323500	35.4	GND	L1	19.7	10.6	46.0
4.740000	35.9	GND	N	19.7	10.1	46.0

Charging Mode, Set.2

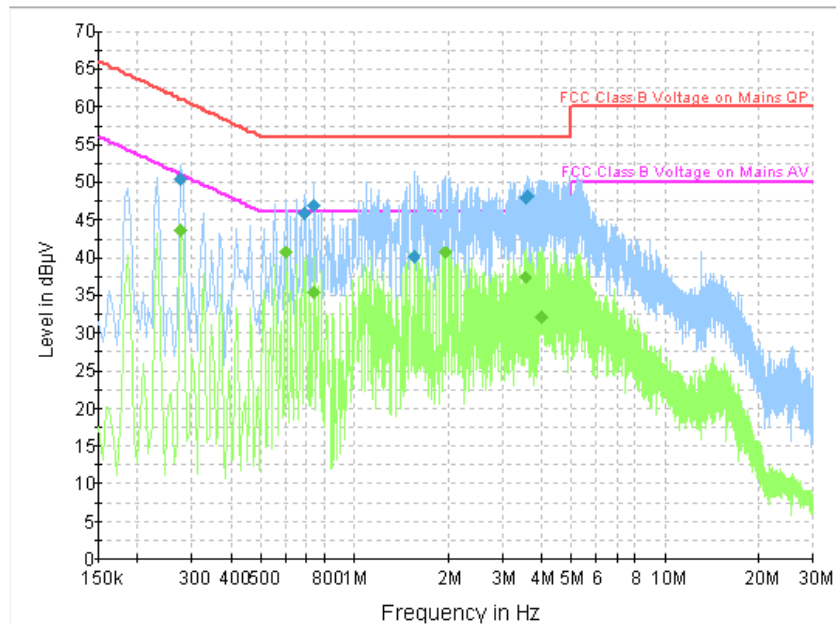


Fig.8 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.276000	50.3	GND	L1	19.8	10.6	60.9
0.690000	45.9	GND	N	19.8	10.1	56.0
0.739500	46.9	GND	N	19.8	9.1	56.0
1.554000	40.1	GND	N	19.7	15.9	56.0
3.561000	47.8	GND	N	19.7	8.2	56.0
3.615000	48.1	GND	L1	19.7	7.9	56.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.276000	43.7	GND	N	19.8	7.3	50.9
0.600000	40.6	GND	N	19.8	5.4	46.0
0.739500	35.4	GND	N	19.8	10.6	46.0
1.968000	40.5	GND	N	19.6	5.5	46.0
3.561000	37.4	GND	N	19.7	8.6	46.0
4.020000	32.0	GND	N	19.6	14.0	46.0

USB Mode, Set.3

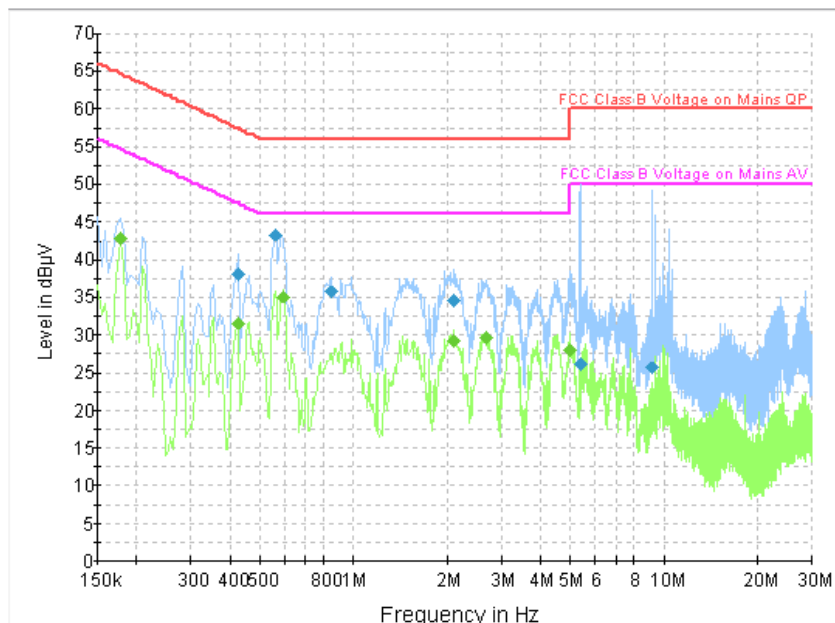


Fig.9 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.424500	38.0	GND	N	19.8	19.4	57.4
0.559500	43.2	GND	N	19.8	12.8	56.0
0.843000	35.7	GND	L1	19.8	20.3	56.0
2.107500	34.5	GND	N	19.6	21.5	56.0
5.365500	26.2	GND	L1	19.6	33.8	60.0
9.141000	25.5	GND	L1	19.8	34.5	60.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.177000	42.8	GND	L1	19.7	11.9	54.6
0.424500	31.5	GND	N	19.8	15.9	47.4
0.595500	35.1	GND	L1	19.8	10.9	46.0
2.103000	29.2	GND	L1	19.6	16.8	46.0
2.674500	29.6	GND	N	19.7	16.4	46.0
4.983000	28.0	GND	L1	19.6	18.0	46.0

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