TEST REPORT

No. 2012TAR378

for

TCT Mobile Limited

GSM Quad Band and UMTS Dual Band Mobile Phone

Model Name: Blue3G

Marketing Name: Vodafone Chat 655

FCC ID: RAD280

with

Hardware Version: PIO01

Software Version: J30

Issued Date: 2012-08-06

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:

DAR accreditation (DIN EN ISO/IEC 17025): No. DGA-PL-114/01-02

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
Tel:+86(0)10-62304633-2561 , Fax:+86(0)10-62304633-2504 Email:welcome@emcite.com. www.emcite.com

CONTENTS

1. Test Laboratory

1.1. Testing Location

Company Name:	TMC Beijing, Telecommunication Metrology Center of MIIT
Address:	No 52, Huayuan Bei Road, Haidian District, Beijing, P. R. China
Postal Code:	100191
Telephone:	0086-10-62304633-2561
Fax:	0086-10-62304633-2504

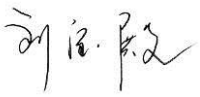
1.2. Testing Environment

Normal Temperature:	15-35℃
Relative Humidity:	20-75%

1.3. Project data

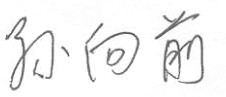
Testing Start Date:	Jul. 27th, 2012
Testing End Date:	Jul. 27th, 2012

1.4. Signature



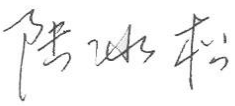
Liu Baodian

(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:	TCT Mobile Limited
Address /Post:	5F, E building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P.R. China.
City:	Shanghai
Postal Code:	201203
Country:	China
Contact Person:	Gong Zhizhou
Contact Email	zhizhou.gong@jrdcom.com
Telephone:	0086-21-61460890
Fax:	0086 21 61460602

2.2. Manufacturer Information

Company Name:	TCT Mobile Limited
Address /Post:	5F, E building, No. 232, Liang Jing Road ZhangJiang High-Tech Park, Pudong Area Shanghai, P.R. China.
City:	Shanghai
Postal Code:	201203
Country:	China
Telephone:	0086-21-61460890
Fax:	0086 21 61460602

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

3.1. About EUT

Description	GSM Quad Band and UMTS Dual Band Mobile Phone
Model Name	Blue3G
Marketing Name	Vodafone Chat 655
FCC ID	RAD280
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
EUT1	865659010150206	PIO01	J30

*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
AE1	Battery	B095241FA1A
AE2	Battery	/
AE3	Travel Adapter	/
AE4	Travel Adapter	/
AE7	USB Cable	/
AE8	USB Cable	/

AE1

Model	CAB31L0000C1
Manufacturer	BYD
Capacitance	1000mAh
Nominal Voltage	3.7V

AE2

Model	CAB31L0000C2
Manufacturer	BAK
Capacitance	1000mAh
Nominal Voltage	3.7V

AE3

Model	CBA6050AA1C1
Manufacturer	Tenpao
Length of cable	10cm

AE4

Model	CBA6050AA1C2
Manufacturer	BYD
Length of cable	9.5cm

AE7

Model	CDA3122005C2
Manufacturer	Shenhua
Length of cable	150cm

AE8

Model	CDA3122005C1
Manufacturer	Juwei
Length of cable	150cm

*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 + AE7/AE8	Charging mode
Set.2	EUT1+ AE1/AE2 + AE4 + AE7/AE8	Charging mode
Set.3	EUT1+ AE1/AE2 + AE7/AE8	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	10-1-10 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	2003

5. LABORATORY ENVIRONMENT

Control room/ conducted chamber did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ˚C, Max. = 35 ˚C
Relative humidity	Min. =20 %, Max. = 80 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 2 MΩ
Ground system resistance	< 0.5 Ω

Fully-anechoic chamber FAC-3 (9 meters×6.5 meters×4 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ˚C**,** Max. = 30 ˚C
Relative humidity	Min. = 35 %**,** Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 2 MΩ
Ground system resistance	< 1 Ω
Site voltage standing-wave ratio (S_{VSWR})	Between 0 and 6 dB, from 1GHz to 18GHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 4000 MHz

Semi-anechoic chamber SAC-2 (10 meters×6.7 meters×6.1 meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ˚C**,** Max. = 30 ˚C
Relative humidity	Min. = 35 %**,** Max. = 60 %
Shielding effectiveness	> 100 dB
Electrical insulation	> 2 MΩ
Ground system resistance	< 0.5 Ω
Normalised site attenuation (NSA)	**<** ±3.5 dB, 3 m distance
Site voltage standing-wave ratio (S_{VSWR})	Between 0 and 6 dB, from 1GHz to 18GHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 3000 MHz

6. SUMMARY OF TEST RESULTS

Abbreviations used in this clause:	
P	Pass
NA	Not applicable
F	Fail

Clause	List	Clause in FCC rules	Verdict
1	Radiated Emission	15.109(a)	P
2	Conducted Emission	15.107(a)	P

7. Test Equipments Utilized

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURE	CAL DUE DATE
1	Test Receiver	ESU26	100376	R&S	2012-11-08
2	EMI Antenna	VULB 9163	514	Schwarzbeck	2014-11-10
3	EMI Antenna	3117	00139065	ETS-Lindgren	2014-07-31
4	LISN	ESH2-Z5	829991/012	R&S	2013-04-16
5	Test Receiver	ESCI	100344	R&S	2013-03-28
6	Universal Radio Communication Tester	CMU200	100680	R&S	2012-09-05
7	Universal Radio Communication Tester	E5515C	MY48361083	Agilent	2013-03-16
8	PC	OPTIPLEX 755	3908243625	DELL	N/A
9	Monitor	E178FPc	CN-OWR979-64180-7AJ-D2MS	DELL	N/A
10	Printer	DeskJet D2368	TH72E12G7Q	HP	N/A
11	Keyboard	L100	CN0RH659658907ATOI40	DELL	N/A
12	Mouse	VR-301	6927225500198	XINGYU	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 a distance of 3 meters is tested. Tested in accordance with the procedures of ANSI C63.4 - 2003, section 8.3.

The EUT was placed on a non-conductive table. The measurement antenna was placed at a distance of 3 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 755, and the serial number of the PC is 3908243625. 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 of emission (MHz)	Field strength (microvolts/meter)
30-88	100
88-216	150
216-960	200
Above 960	500

A.1.4 Test Condition

Frequency of emission (MHz)	RBW/VBW	Sweep Time(s)
30-1000	100KHz/300KHz	5
1000-4000	1MHz/1MHz	15

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:

Result = $P_{Mea} + A_{Rpl} = P_{Mea} + G_A + G_{PL}$

Where

G_A: Antenna factor of receive antenna

G_{PL}: Path Loss

P_{Mea}: Measurement result on receiver.

Set.1 Charging mode

Frequency(MHz)	Result(dBuV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBuV)	Polarity
2772.800	39.0	-27.1	33.3	32.833	HORIZONTAL
2773.600	39.0	-27.1	33.3	32.757	HORIZONTAL
2778.200	39.0	-26.3	33.3	32.008	HORIZONTAL
2766.800	38.9	-27.1	33.3	32.638	VERTICAL
2772.200	38.8	-27.1	33.3	32.615	HORIZONTAL
2775.400	38.8	-27.1	33.3	32.610	HORIZONTAL

Set.2 Charging mode

Frequency(MHz)	Result(dBuV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea}(dBuV)	Polarity
2777.800	39.0	-26.3	33.3	31.990	VERTICAL
2777.400	38.9	-26.3	33.3	31.972	HORIZONTAL
2766.200	38.9	-27.1	33.3	32.709	HORIZONTAL
2775.800	38.8	-26.3	33.3	31.880	VERTICAL
2774.800	38.8	-27.1	33.3	32.621	VERTICAL
2776.400	38.8	-26.3	33.3	31.834	VERTICAL

Set.3 USB mode

Frequency(MHz)	Result(dBuV/m)	G_{PL} (dB)	G_A (dB/m)	P_{mea}(dBuV)	Polarity
2794.000	39.0	-26.3	33.3	32.047	VERTICAL
2775.400	39.0	-27.1	33.3	32.780	HORIZONTAL
2793.600	38.9	-26.3	33.3	31.972	VERTICAL
2771.400	38.9	-27.1	33.3	32.669	VERTICAL
2777.400	38.9	-26.3	33.3	31.918	HORIZONTAL
2772.200	38.8	-27.1	33.3	32.621	HORIZONTAL

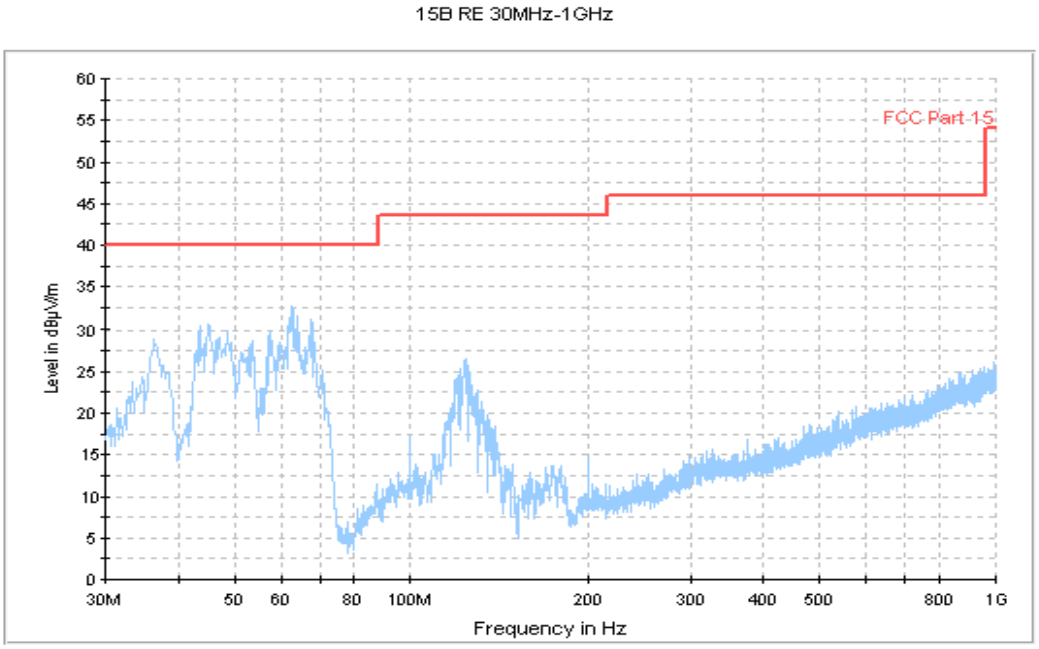


Figure A.1 Radiated Emission from 30MHz to 1GHz (Set.1, Charging mode)

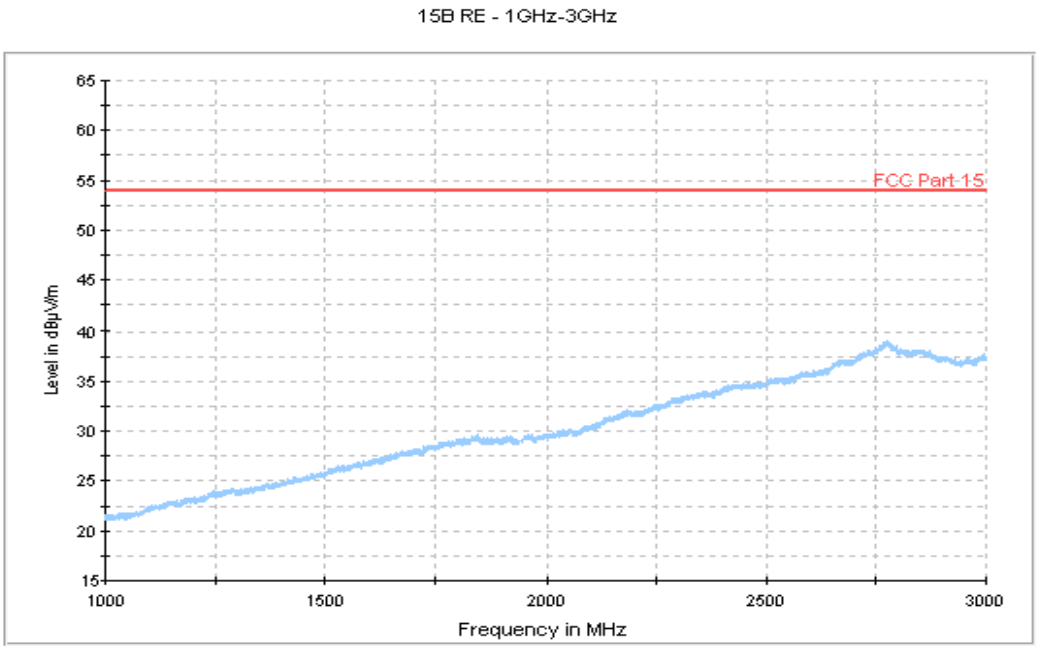


Figure A.2 Radiated Emission from 1GHz to 3GHz (Set.1, Charging mode)

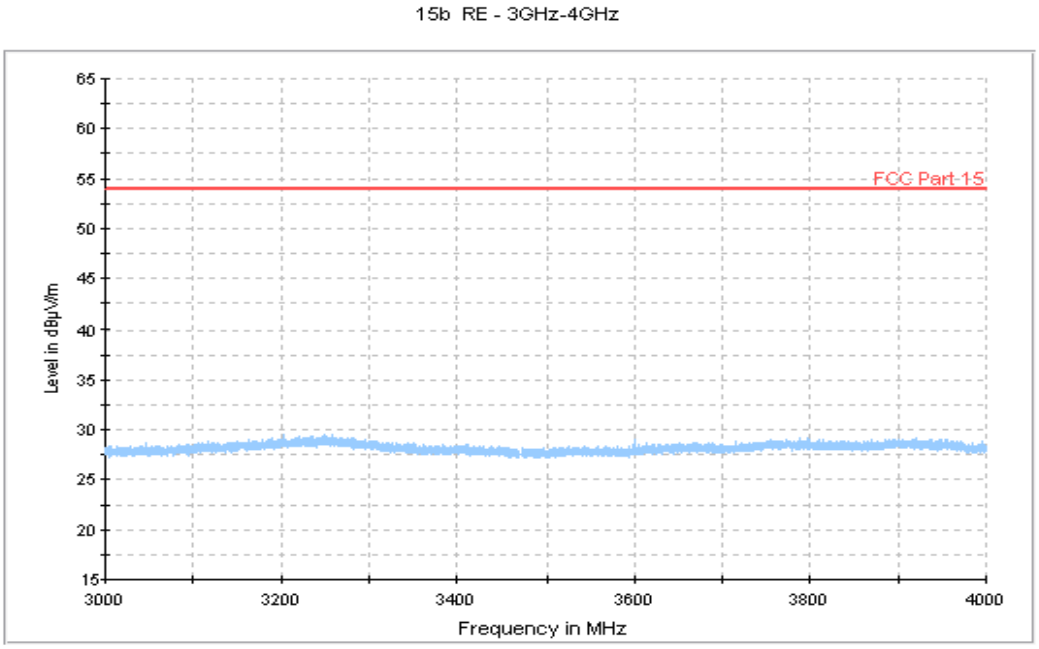


Figure A.3 Radiated Emission from 3GHz to 4GHz (Set.1, Charging mode)

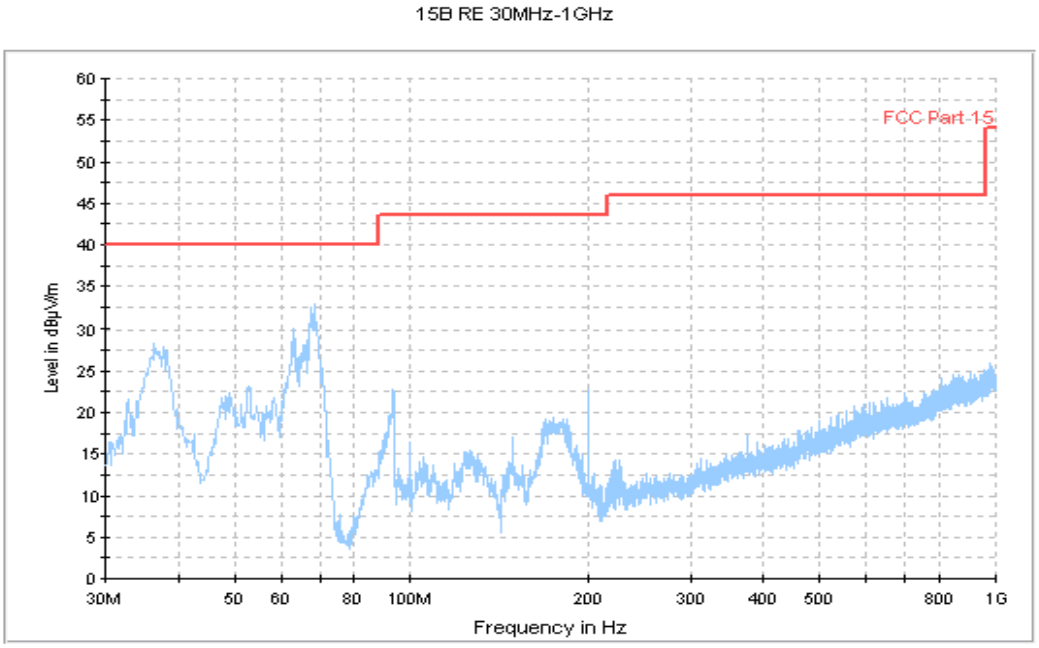


Figure A.4 Radiated Emission from 30MHz to 1GHz (Set.2, Charging mode)

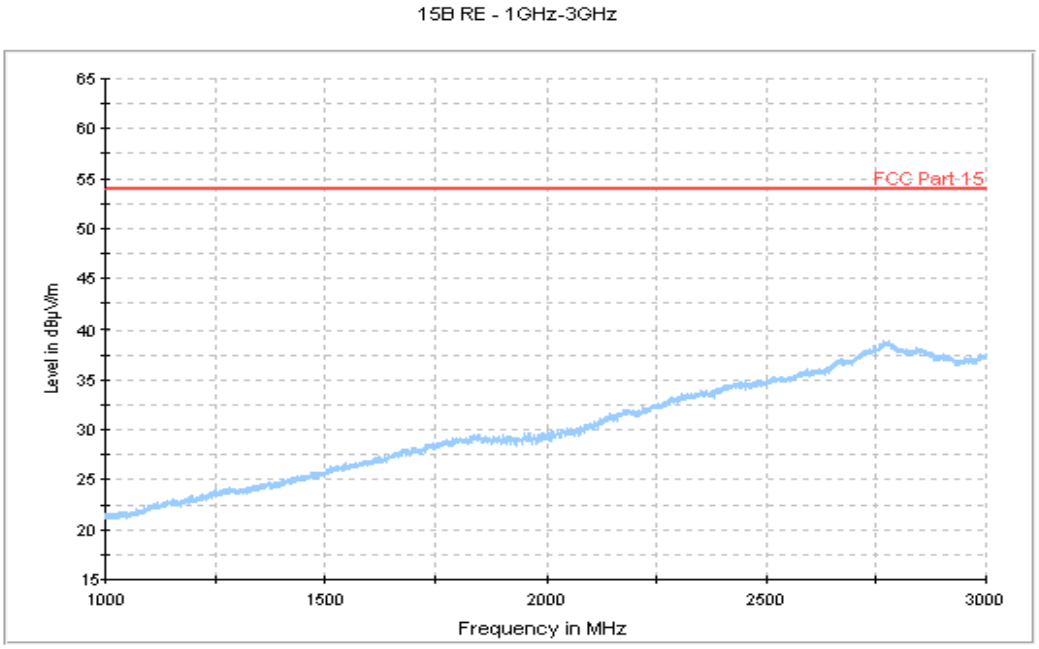


Figure A.5 Radiated Emission from 1GHz to 3GHz (Set.2, Charging mode)

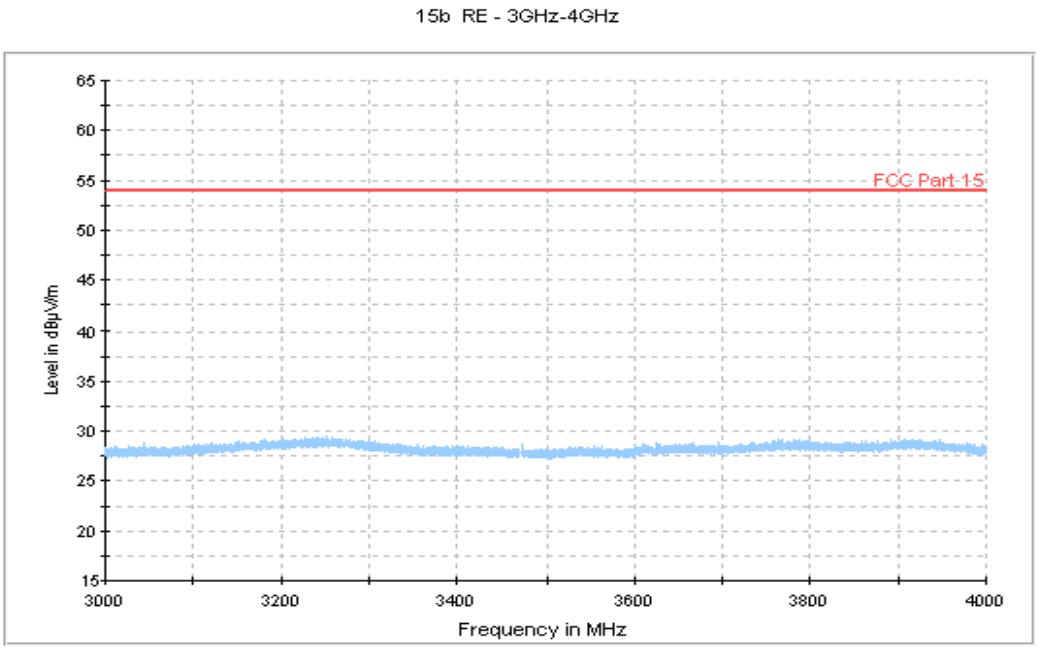


Figure A.6 Radiated Emission from 3GHz to 4GHz (Set.2, Charging mode)

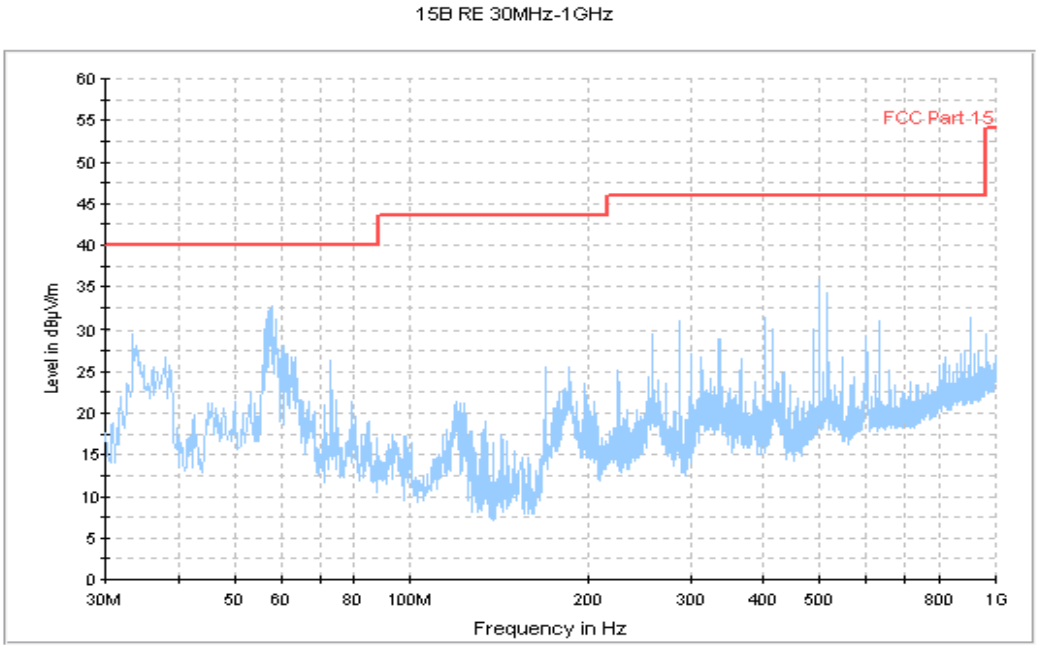


Figure A.7 Radiated Emission from 30MHz to 1GHz (Set.3, USB mode)

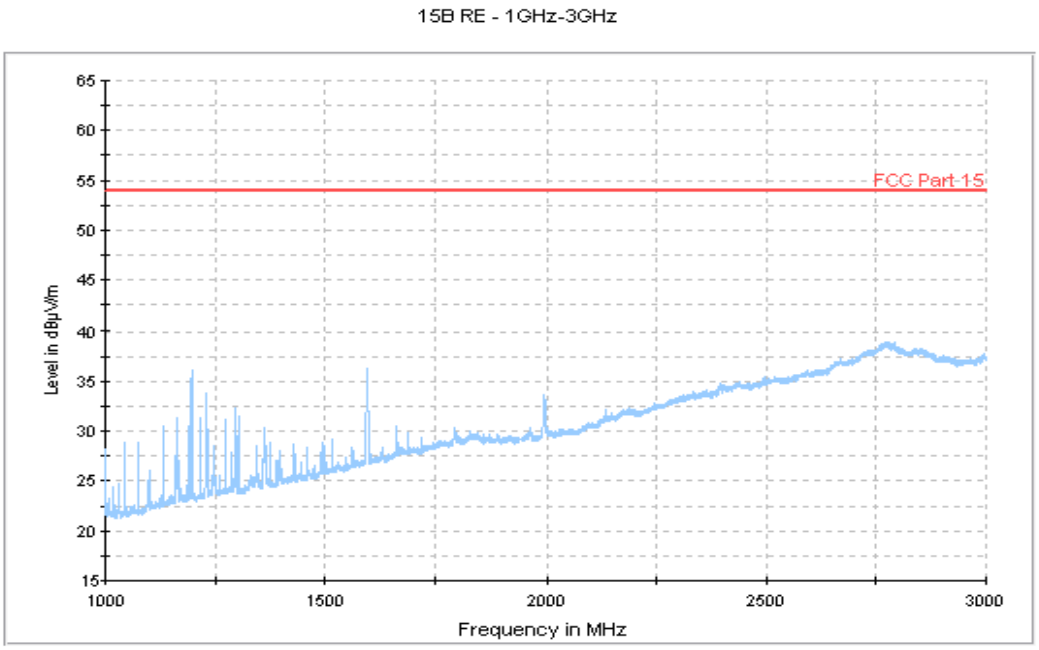


Figure A.8 Radiated Emission from 1GHz to 3GHz (Set.3, USB mode)

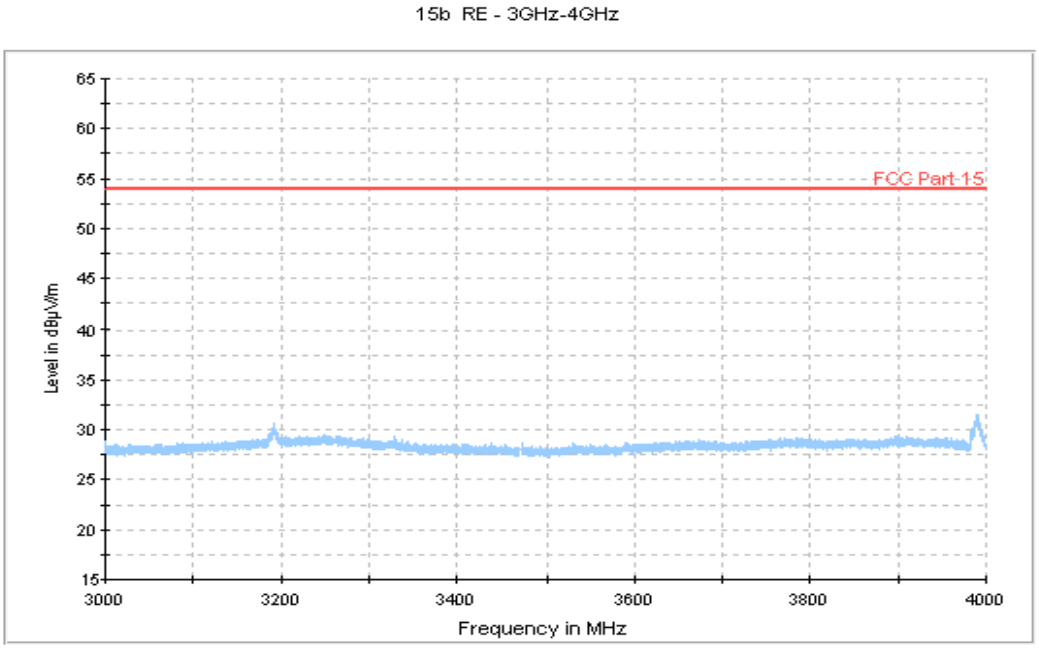


Figure A.9 Radiated Emission from 3GHz to 4GHz (Set.3, USB mode)

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 - 2003, 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 755, and the serial number of the PC is 3908243625. 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	Sweep Time(s)
9kHz	1

A.2.5 Measurement Results

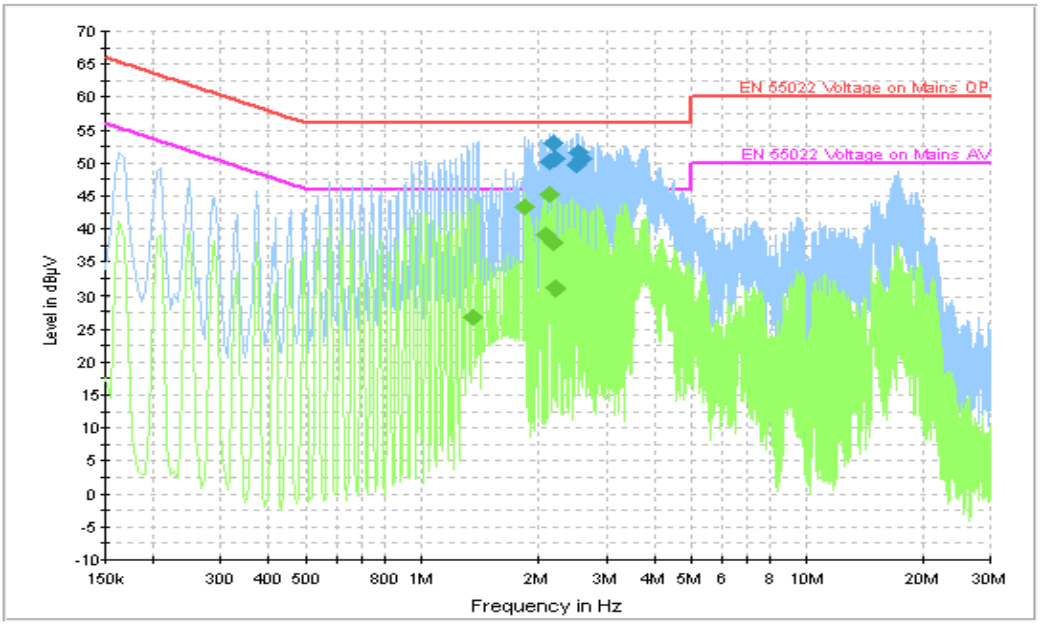


Figure A.10 Conducted Emission (Set.1, Charging mode)

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.134500	50.1	GND	L1	10.0	5.9	56.0
2.175000	53.0	GND	L1	10.0	3.0	56.0
2.215500	50.5	GND	L1	10.0	5.5	56.0
2.503500	49.7	GND	L1	10.0	6.3	56.0
2.544000	51.6	GND	L1	10.0	4.4	56.0
2.584500	50.5	GND	L1	10.0	5.5	56.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
1.360500	26.9	GND	L1	10.0	19.1	46.0
1.846500	43.4	GND	L1	10.0	2.6	46.0
2.094000	39.0	GND	L1	10.0	7.0	46.0
2.134500	45.2	GND	L1	10.0	0.8	46.0
2.175000	37.9	GND	L1	10.0	8.1	46.0
2.215500	31.1	GND	L1	10.0	14.9	46.0

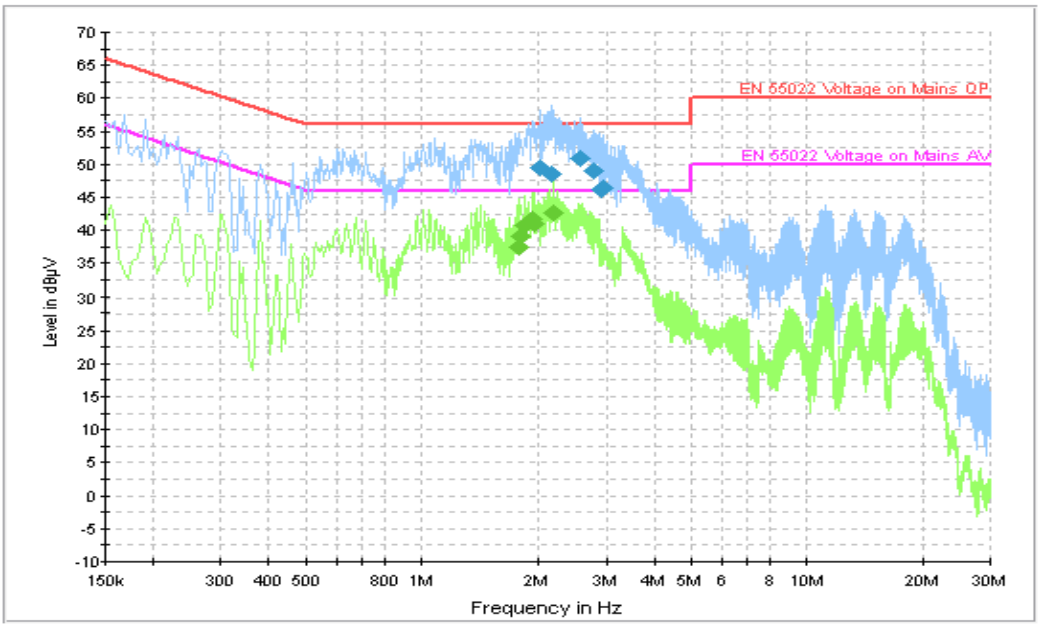


Figure A.11 Conducted Emission (Set.2, Charging mode)

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.013000	49.5	GND	N	10.0	6.5	56.0
2.148000	48.5	GND	N	10.0	7.5	56.0
2.562000	50.8	GND	L1	10.0	5.2	56.0
2.787000	49.1	GND	L1	10.0	6.9	56.0
2.922000	46.1	GND	N	10.0	9.9	56.0
2.940000	46.5	GND	N	10.0	9.5	56.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
1.765500	37.5	GND	L1	10.0	8.5	46.0
1.806000	39.1	GND	L1	10.0	6.9	46.0
1.846500	40.7	GND	L1	10.0	5.3	46.0
1.923000	41.8	GND	L1	10.0	4.2	46.0
1.954500	41.1	GND	L1	10.0	4.9	46.0
2.184000	42.7	GND	L1	10.0	3.3	46.0

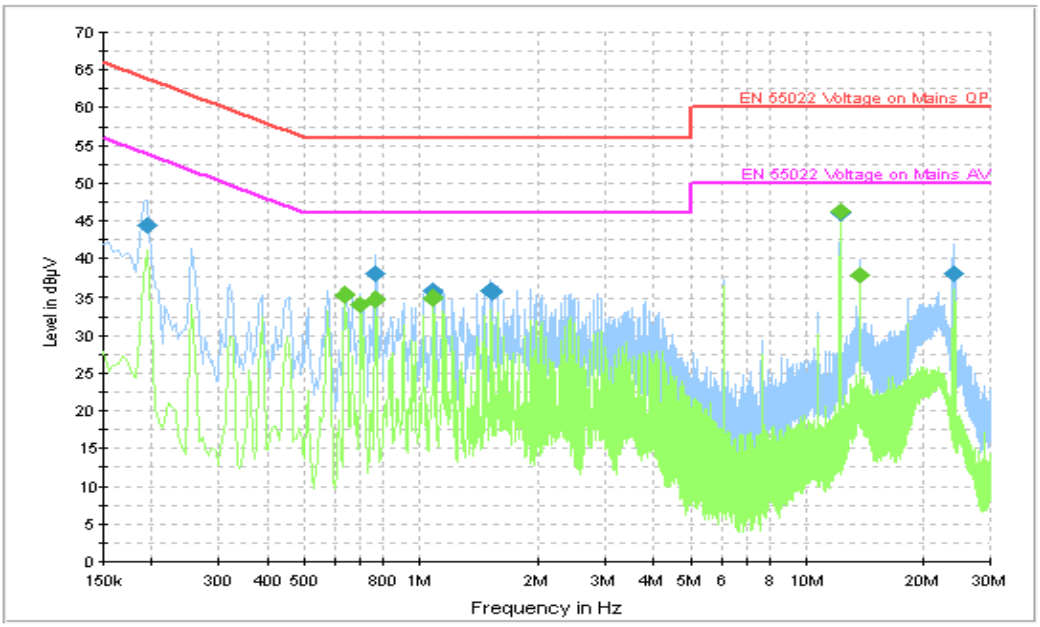


Figure A.12 Conducted Emission (Set.3, USB mode)

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.195000	44.4	GND	L1	10.0	19.4	63.8
0.766500	37.9	GND	N	10.0	18.1	56.0
1.081500	35.7	GND	N	10.0	20.3	56.0
1.527000	35.7	GND	N	10.0	20.3	56.0
12.196500	46.1	GND	N	9.9	13.9	60.0
24.000000	38.1	GND	N	9.6	21.9	60.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.636000	35.4	GND	N	10.0	10.6	46.0
0.699000	34.2	GND	N	10.0	11.8	46.0
0.766500	34.8	GND	N	10.0	11.2	46.0
1.081500	34.8	GND	N	10.0	11.2	46.0
12.196500	46.3	GND	N	9.9	3.7	50.0
13.722000	37.8	GND	N	9.7	12.2	50.0

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