



TEST REPORT

No. 2013TAR345

for

TCT Mobile Limited

HSDPA/HSUPA/UMTS dual band / GSM quad bands mobile phone

Model Name: Comet Hybrid(Beetle Lite JB VF)

Marketing Name: Vodafone 875

FCC ID: RAD376

with

Hardware Version: PIO1

Software Version: v1B2

Issued Date: Apr. 25th, 2013

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:

DAkks accreditation (DIN EN ISO/IEC 17025): No. D-PL-12123-01-01

FCC 2.948 Listed: No.733176

IC O.A.T.S listed: No.6629A-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.....	3
1.1. TESTING LOCATION	3
1.2. TESTING ENVIRONMENT	3
1.3. PROJECT DATA.....	3
1.4. SIGNATURE	3
2. CLIENT INFORMATION.....	4
2.1. APPLICANT INFORMATION.....	4
2.2. MANUFACTURER INFORMATION.....	4
3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE)	5
3.1. ABOUT EUT	5
3.2. INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST	5
3.3. INTERNAL IDENTIFICATION OF AE USED DURING THE TEST.....	5
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

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%

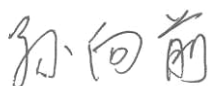
1.3. Project data

Testing Start Date: Apr. 19th, 2013
Testing End Date: Apr. 20nd, 2013

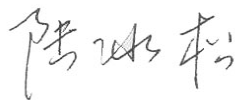
1.4. Signature



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: TCT Mobile Limited
Address /Post: 5F, C 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, C 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	HSDPA/HSUPA/UMTS dual band / GSM quad bands mobile phone
Model Name	Comet Hybrid(Beetle Lite JB VF)
Marketing Name	Vodafone 875
FCC ID	RAD376
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 Telecommunication Metrology Center of MIIT of People's Republic of China. The HSDPA/HSUPA/UMTS triband / GSM quad bands mobile phone One Touch 4010E manufactured by TCT Mobile Limited is a variant model based on One Touch 4010A for conformance test. According to the declaration of changes, No tests need to be performed. All results are coming from the initial model. The initial model report No. is 2013TAR022.

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	355963050101807	PIO1	vIB2

*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	B1112465FFA	/
AE2	Battery	/	/
AE3	Battery	/	/
AE4	Battery	/	/
AE5	Travel charger	/	/
AE6	Travel charger	/	/
AE7	USB cable	/	/
AE8	USB cable	/	/

AE1

Model	CAB31P0000C1
Manufacturer	BYD
Capacitance	1300mAh
Nominal voltage	3.7V

AE2

Model	CAB31P0000C3
Manufacturer	SCUD
Capacitance	1300mAh
Nominal voltage	3.7V

AE3

Model	TLi014A1
Manufacturer	BYD
Capacitance	1400mAh
Nominal voltage	3.7V

AE4

Model	TliB60B
Manufacturer	SCUD
Capacitance	1400mAh
Nominal voltage	3.7V

AE5

Model	CBA3001AG0C2
Manufacturer	Tenpao
Length of cable	5cm

AE6

Model	CBA3001AG0C1
Manufacturer	BYD
Length of cable	5cm

AE7

Model	CDA6050000C1
Manufacturer	Juwei
Length of cable	101cm

AE8

Model	CDA6050000C2
Manufacturer	Shenghua
Length of cable	101cm

*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 + AE7	USB Mode
Set.2	EUT1+ AE1 + AE5+AE7	Charger
Set.3	EUT1+ AE1 + AE6+AE7	Charger

Note: MicroSD card was installed in the device during the testing.

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	10-1-11 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

Semi-anechoic chamber SAC-2 (10 meters×6.7meters×6.1meters) 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	< 1Ω
Normalised site attenuation (NSA)	< ±3.5 dB, 3m distance, from 30 to 1000 MHz
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

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
Uniformity of field strength	Between 0 and 6 dB, from 80 to 4000 MHz
Site voltage standing-wave ratio (S_{VSWR})	Between 0 and 6 dB, from 1GHz to 18GHz

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

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	2013-11-07
2	EMI Antenna	VULB 9163	9163-514	Schwarzbeck	2014-11-10
3	EMI Antenna	3117	00139065	ETS-Lindgren	2014-07-31
4	LISN	ESH3-Z5	825562/028	R&S	2013-06-14
5	Test Receiver	ESCI	100344	R&S	2014-03-28
6	Universal Radio Communication Tester	CMU200	102228	R&S	2013-07-07
7	PC	OPTIPLEX 755	3908243625	DELL	N/A
8	Monitor	E178FPc	CN-OWR979-6 4180-7AJ-D2M S	DELL	N/A
9	Printer	LaserJet 1160	CNM2D33740	HP	N/A
10	Keyboard	L100	CN0RH659658 907ATOI40	DELL	N/A
11	Mouse	M-UAE119	LZ935220ZRC	Lenovo	N/A
12	Universal Radio Communication Tester	E5515C	MY48361083	Agilent	2014-03-16

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	120kHz IF Bandwidth	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:

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

Where

G_A : Antenna factor of receive antenna

G_{PL} : Path Loss

P_{Mea} : Measurement result on receiver.

Set.1 USB mode

Frequency(MHz)	Result(dBuV/m)	G_{PL} (dB)	G_A (dB/m)	P_{mea} (dBuV)	Polarity
3000.000	43.4	-28.4	34.1	37.672	VERTICAL
2999.800	43.3	-29.0	33.8	38.479	VERTICAL
2999.600	43.1	-29.0	33.8	38.279	VERTICAL
2999.200	42.4	-29.0	33.8	37.579	VERTICAL
2999.400	42.4	-29.0	33.8	37.579	VERTICAL
2989.400	42.3	-29.0	33.8	37.479	HORIZONTAL

Set.2 Charging mode

Frequency(MHz)	Result(dBuV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea} (dBuV)	Polarity
2997.600	42.3	-29.0	33.8	37.479	VERTICAL
2997.400	42.3	-29.0	33.8	37.479	HORIZONTAL
2996.400	42.3	-29.0	33.8	37.479	HORIZONTAL
2998.400	42.3	-29.0	33.8	37.479	VERTICAL
2995.200	42.2	-29.0	33.8	37.379	HORIZONTAL
3000.000	42.2	-28.4	34.1	36.472	HORIZONTAL

Set.3 Charging mode

Frequency(MHz)	Result(dBuV/m)	G_{PL} (dB)	G_A (dB/m)	P_{Mea} (dBuV)	Polarity
2996.600	42.3	-29.0	33.8	37.479	VERTICAL
2998.400	42.3	-29.0	33.8	37.479	VERTICAL
2988.200	42.3	-29.0	33.8	37.479	HORIZONTAL
2996.400	42.2	-29.0	33.8	37.379	HORIZONTAL
2999.400	42.2	-29.0	33.8	37.379	HORIZONTAL
2999.600	42.2	-29.0	33.8	37.379	VERTICAL

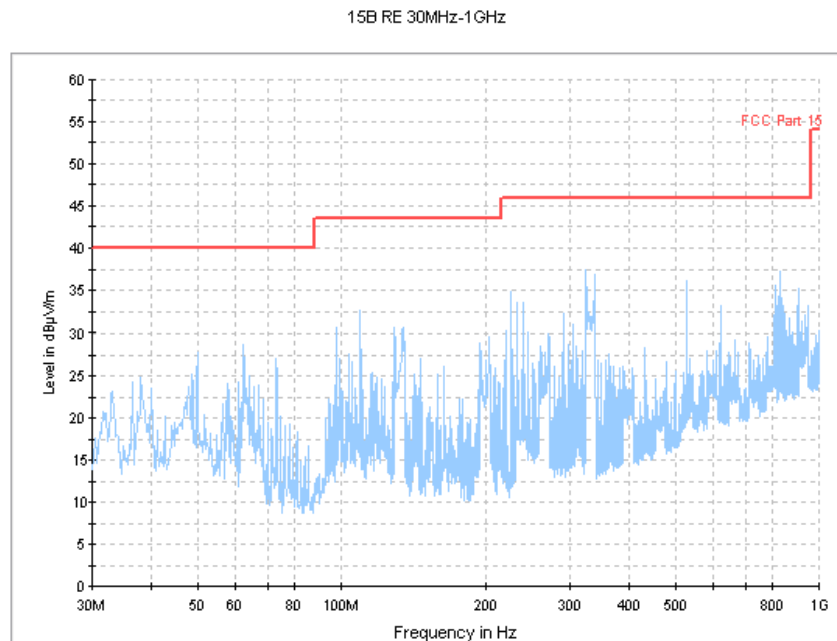


Figure A.1 Radiated Emission from 30MHz to 1GHz (Set.1, USB mode)

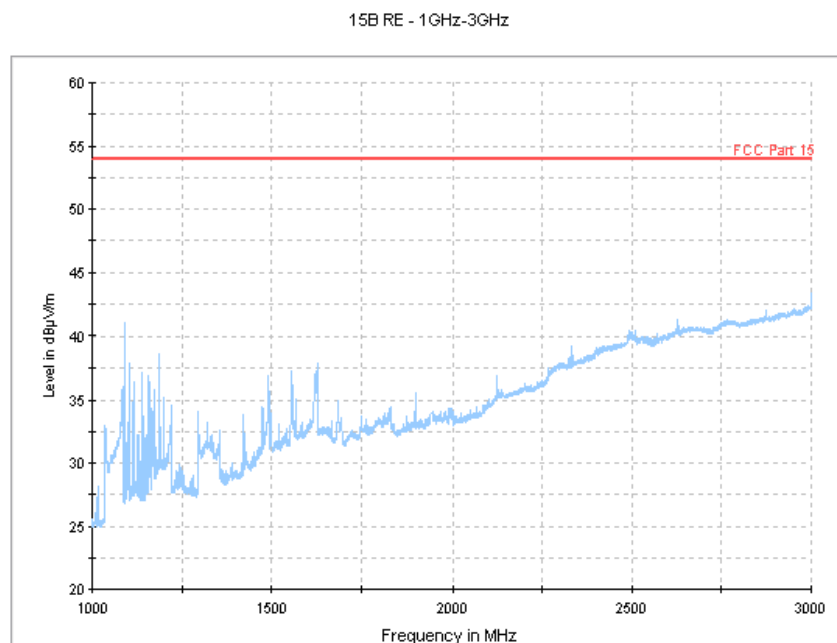


Figure A.2 Radiated Emission from 1GHz to 3GHz (Set.1, USB mode)

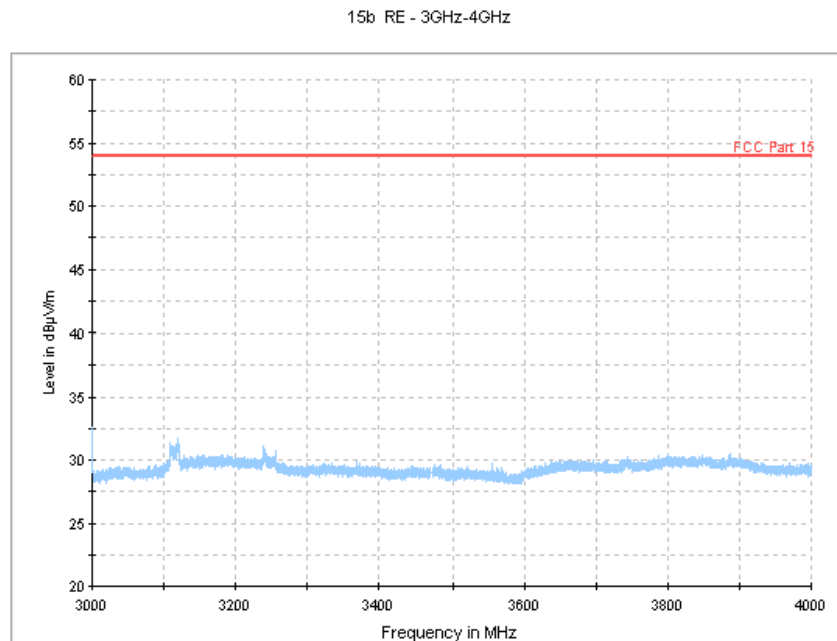


Figure A.3 Radiated Emission from 3GHz to 4GHz (Set.1, USB mode)

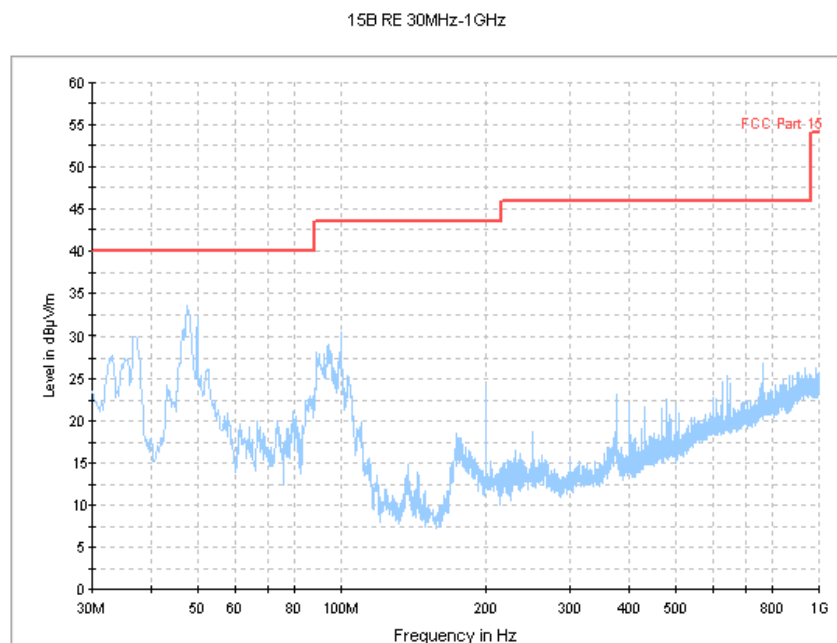


Figure A.4 Radiated Emission from 30MHz to 1GHz (Set.2, Charging mode)

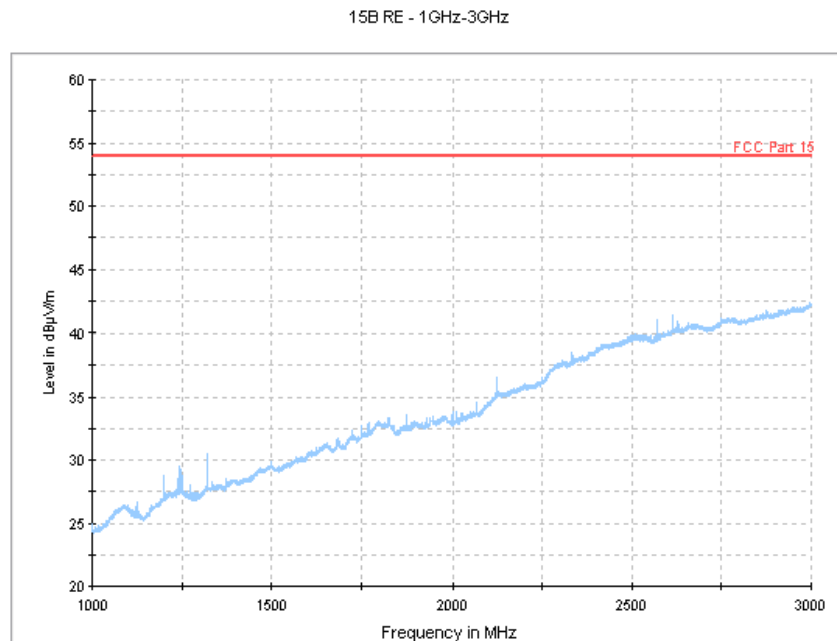


Figure A.5 Radiated Emission from 1GHz to 3GHz (Set.2, Charging mode)

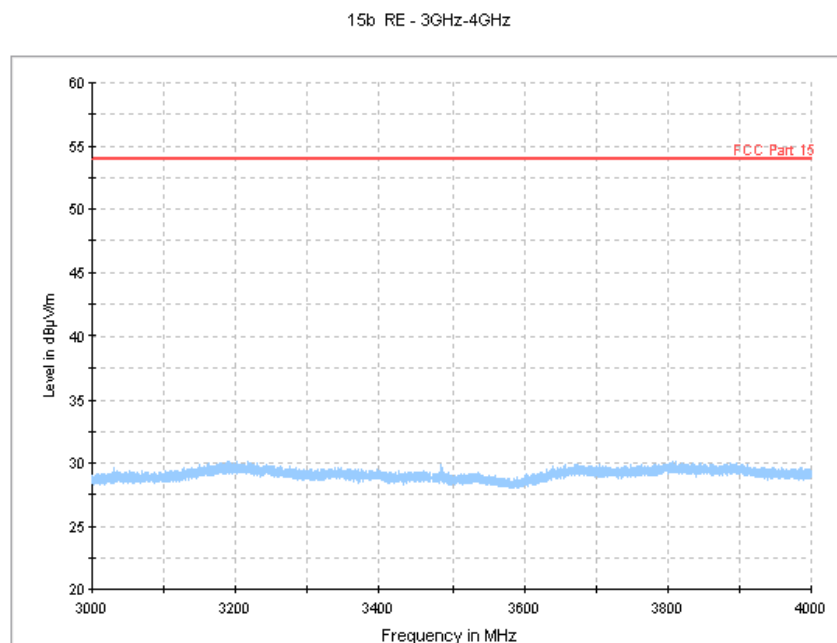


Figure A.6 Radiated Emission from 3GHz to 4GHz (Set.2, Charging mode)

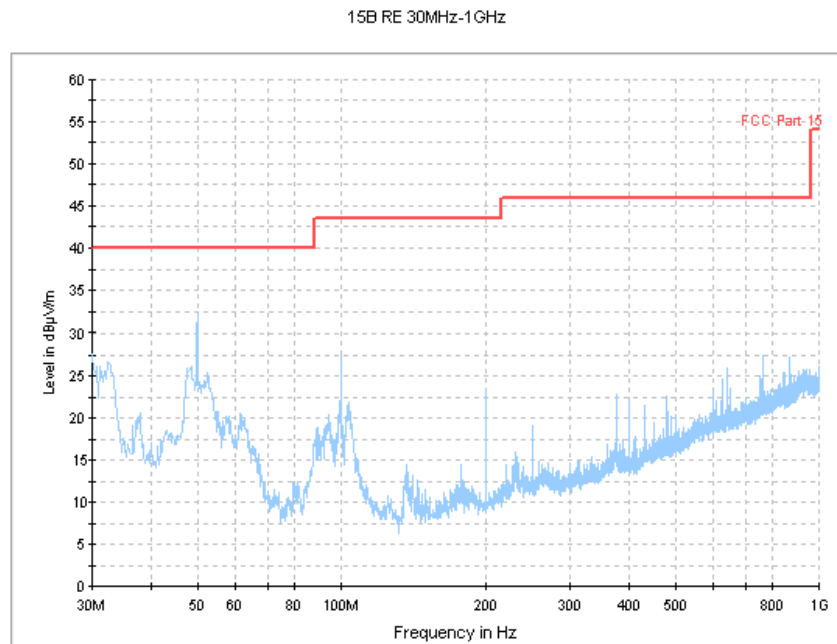


Figure A.7 Radiated Emission from 30MHz to 1GHz (Set.3, Charging mode)

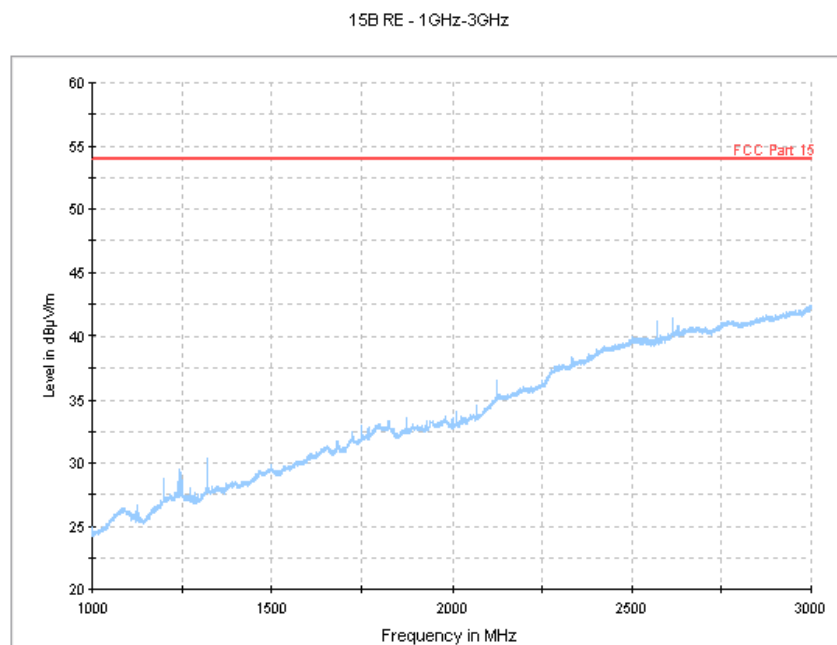


Figure A.8 Radiated Emission from 1GHz to 3GHz (Set.3, Charging mode)

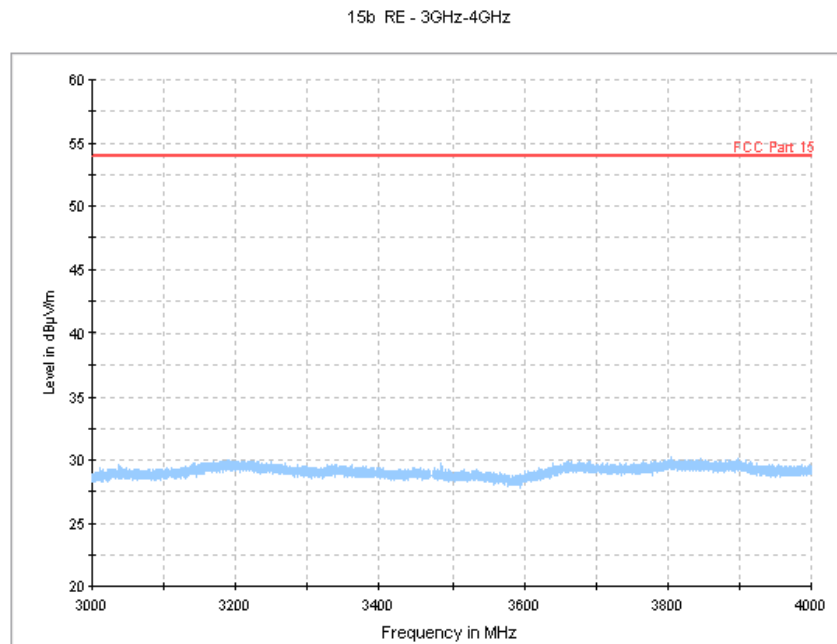


Figure A.9 Radiated Emission from 3GHz to 4GHz (Set.3, Charging mode)

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

IF Bandwidth	Sweep Time(s)
9kHz	1

A.2.5 Measurement Results

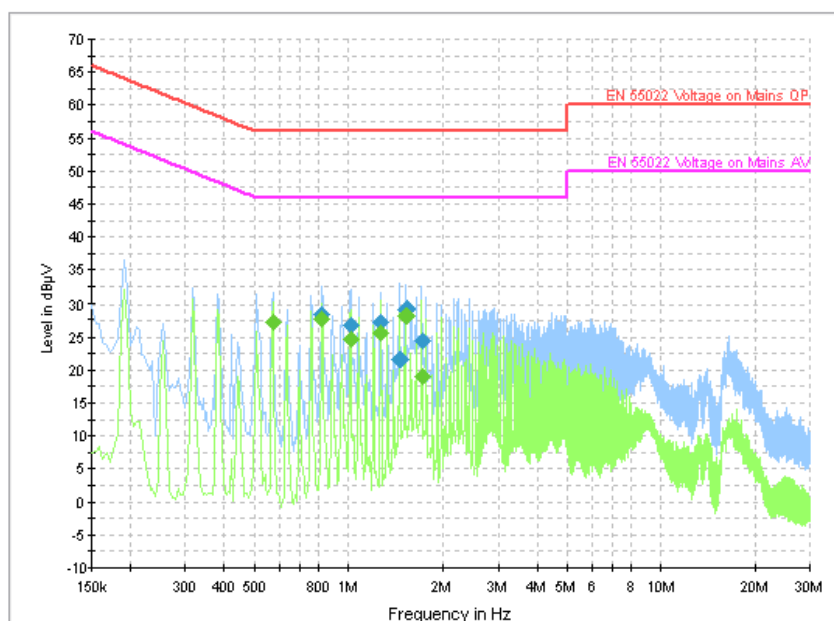


Figure A.10 Conducted Emission (Set.1, USB mode)

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.825001	28.6	GND	N	9.9	27.4	56.0
1.018501	26.8	GND	N	9.9	29.2	56.0
1.270501	27.3	GND	N	9.9	28.7	56.0
1.459501	21.7	GND	N	9.9	34.3	56.0
1.527001	29.3	GND	N	9.9	26.7	56.0
1.716001	24.4	GND	N	9.9	31.6	56.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.573001	27.4	GND	N	9.9	18.6	46.0
0.825001	27.7	GND	N	9.9	18.4	46.0
1.018501	24.8	GND	N	9.9	21.2	46.0
1.270501	25.7	GND	N	9.9	20.3	46.0
1.527001	28.2	GND	N	9.9	17.8	46.0
1.716001	19.0	GND	N	9.9	27.0	46.0

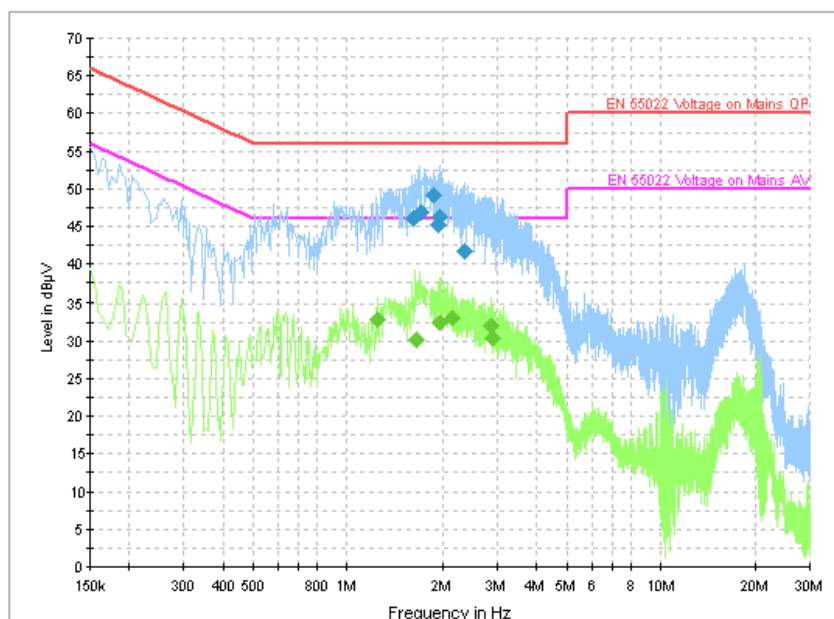


Figure A.11 Conducted Emission (Set.2, Charging mode)

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
1.612501	46.0	GND	L1	9.9	10.0	56.0
1.707001	47.0	GND	L1	9.9	9.0	56.0
1.878001	49.1	GND	L1	9.9	6.9	56.0
1.945501	45.3	GND	L1	9.9	10.7	56.0
1.968001	46.2	GND	L1	9.9	9.8	56.0
2.364001	41.8	GND	L1	9.9	14.2	56.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
1.248001	32.8	GND	L1	9.8	13.2	46.0
1.657501	30.1	GND	L1	9.9	15.9	46.0
1.968001	32.4	GND	L1	9.9	13.6	46.0
2.152501	33.0	GND	L1	9.9	13.0	46.0
2.859001	32.0	GND	L1	9.8	14.0	46.0
2.899501	30.3	GND	L1	9.8	15.7	46.0

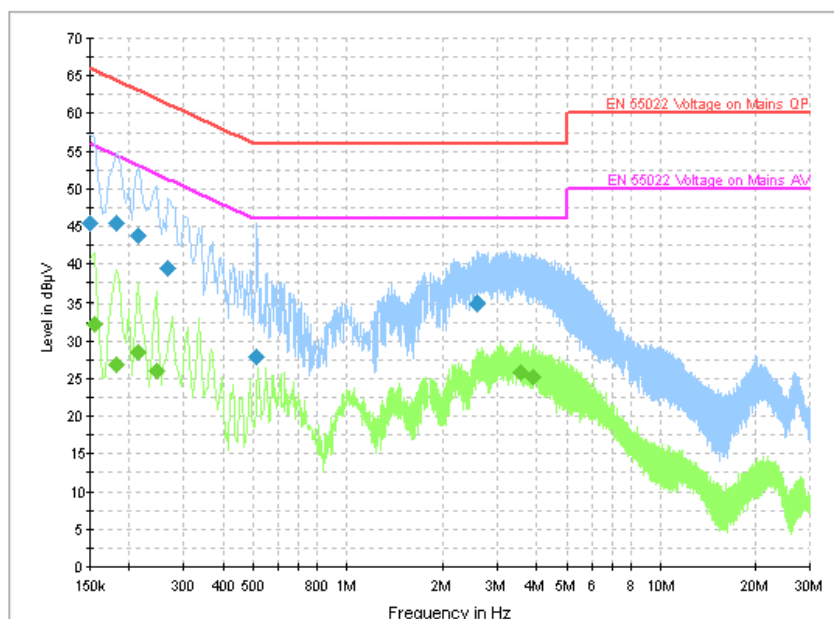


Figure A.12 Conducted Emission (Set.3, Charging mode)

Final Result 1

Frequency (MHz)	QuasiPeak (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.150001	45.5	GND	L1	8.6	20.5	66.0
0.181501	45.4	GND	L1	8.7	19.1	64.4
0.213001	43.7	GND	L1	8.8	19.3	63.1
0.267001	39.4	GND	L1	9.0	21.9	61.2
0.514501	27.8	GND	N	9.8	28.2	56.0
2.580001	34.9	GND	L1	9.8	21.1	56.0

Final Result 2

Frequency (MHz)	CAverage (dBμV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBμV)
0.154501	32.2	GND	L1	8.6	23.6	55.8
0.181501	26.9	GND	L1	8.7	27.6	54.4
0.213001	28.4	GND	L1	8.8	24.7	53.1
0.244501	26.0	GND	L1	8.9	25.9	51.9
3.561001	25.8	GND	L1	9.8	20.2	46.0
3.907501	25.2	GND	L1	9.8	20.8	46.0

END OF REPORT