TEST REPORT

No. 2012TAR590

for

TCT Mobile Limited

HSUPA/HSDPA/UMTS triband/GSM quadband mobile phone

Model Name: Beetle 2SIM US

Marketing Name: ONE TOUCH 4030E

FCC ID : RAD316

with

Hardware Version: Proto

Software Version: vFA2

Issued Date: 2012-12-21

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. D-PL-12123-01-01

FCC 2.948 Listed: No.733176

IC O.A.T.S listed: No.6629B

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

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

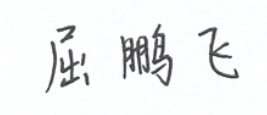
1.2. Testing Environment

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

1.3. Project data

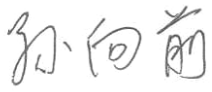
Testing Start Date:	Dec 05, 2012
Testing End Date:	Dec 05, 2012

1.4. Signature



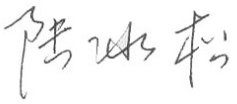
Qu Pengfei

(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
Telephone:	+86-21-61460890
Fax:	+86-21-61460602

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:	+86-21-61460890
Fax:	+86-21-61460602

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

3.1. About EUT

Description	HSUPA/HSDPA/UMTS triband/GSM quadband mobile phone
Model Name	ONE TOUCH 4030E
FCC ID	RAD316
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 MII of People's Republic of China.

The HSUPA/HSDPA/UMTS triband/GSM quadband mobile phone ONE TOUCH 4030E manufactured by TCT Mobile Limited is a variant model based on ONE TOUCH 4030A for conformance test. According to the declaration of changes, No tests have been performed. All results are coming from the initial model. The initial model report No. is 2012TAR589.

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT4	013460000050139	Proto	vFA2

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

AE1

Model	CAB60B0000C2
Manufacturer	BAK
Capacitance	1400mAh
Nominal voltage	3.7V

AE2/AE3

Model	CAB60B0000C1
Manufacturer	BYD
Capacitance	1400mAh
Nominal voltage	3.7V

AE4

Model	CBA3007AG0C1
Manufacturer	BYD
Length of cable	\

AE5

Model	CBA3007AG0C3
Manufacturer	YINGJU
Length of cable	\

AE6

Model	\
Manufacturer	\
Length of cable	

*AE ID: is used to identify the test sample in the lab internally.

EUT set-ups

EUT set-up No.	Combination of EUT and AE	Remarks
Set.1	EUT4+ AE1 + AE6	USB
Set.2	EUT4+ AE1 + AE4+AE6	Charger
Set.3	EUT4+ AE1 + AE5+AE6	Charger

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

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

Temperature	Min. = 15 ℃, Max. = 30 ℃
Relative humidity	Min. = 35 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 2MΩ
Ground system resistance	< 1 Ω
Normalised site attenuation (NSA)	< ±3.5 dB, 3 m 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 ℃, Max. = 30 ℃
Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 2MΩ
Ground system resistance	< 1Ω
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

Conducted chamber did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 30 ℃
Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 2MΩ
Ground system resistance	< 0.5 Ω

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

Temperature	Min. = 15 ℃, Max. = 35 ℃
Relative humidity	Min. =30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 2MΩ
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	ESCI	100344	R&S	2013-03-28
2	Test Receiver	ESCI	100766	R&S	2013-04-09
3	Test Receiver	ESI40	831564/002	R&S	2013-02-12
4	BiLog Antenna	VUL9163	9163-302	Schwarzbeck	2013-02-10
5	Signal Generator	SMB100A	102063	R&S	2013-03-05
6	LISN	ESH2-Z5	829991/012	R&S	2013-04-16
7	Universal Radio Communication Tester	CMU200	102228	R&S	2013-07-07
8	Antenna	3117	00139065	ETS	2014-07-31
9	PC	OPTIPLEX 755	3908243625	DELL	N/A
10	Monitor	E178FPc	CN-OWR979-64 180-7AJ-D2MS	DELL	N/A
11	Printer	DeskJet D2368	TH72E12G7Q	HP	N/A
12	Keyboard	L100	CN0RH6596589 07ATOI40	DELL	N/A
13	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.

A.1.2 EUT Operating Mode:

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.
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”, and including the gain of receive antenna and the path loss.

The measurement results are obtained as described below:

Result = P_{Mea} + F_A + G_{PL}

Where

F_A: Receive Antenna Factor

G_{PL}: Cable Loss

P_{Mea}: The measurement result on receiver.

Charging Mode Set.2

Frequency(MHz)	Result(dBuV/m)	G_{PL} (dB)	F_A (dB/m)	P_{Mea}(dBuV)	Polarity
2784.600	44.5	-26.3	33.3	37.538	VERTICAL
2761.400	44.4	-27.1	33.3	38.185	VERTICAL
2770.800	44.3	-27.1	33.3	38.085	HORIZONTAL
2780.400	44.3	-26.3	33.3	37.338	HORIZONTAL
2760.000	44.3	-27.1	33.3	38.085	HORIZONTAL
2791.000	44.3	-26.3	33.3	37.338	VERTICAL

Charging Mode Set.3

Frequency(MHz)	Result(dBuV/m)	G_{PL} (dB)	F_A (dB/m)	P_{mea}(dBuV)	Polarity
2767.600	44.4	-27.1	33.3	38.185	VERTICAL
2760.600	44.4	-27.1	33.3	38.185	VERTICAL
2772.600	44.4	-27.1	33.3	38.185	VERTICAL
2782.600	44.3	-26.3	33.3	37.338	HORIZONTAL
2782.200	44.3	-26.3	33.3	37.338	VERTICAL
2803.800	44.3	-27.6	33.8	38.141	VERTICAL

USB Mode Set.1

Frequency(MHz)	Result(dBuV/m)	G_{PL} (dB)	F_A (dB/m)	P_{mea}(dBuV)	Polarity
2776.200	44.3	-26.3	33.3	37.338	HORIZONTAL
2793.000	44.3	-26.3	33.3	37.338	VERTICAL
2786.600	44.3	-26.3	33.3	37.338	HORIZONTAL
2782.600	44.3	-26.3	33.3	37.338	HORIZONTAL
2771.000	44.3	-27.1	33.3	38.085	HORIZONTAL
2770.800	44.3	-27.1	33.3	38.085	VERTICAL

Charging Mode Set.2

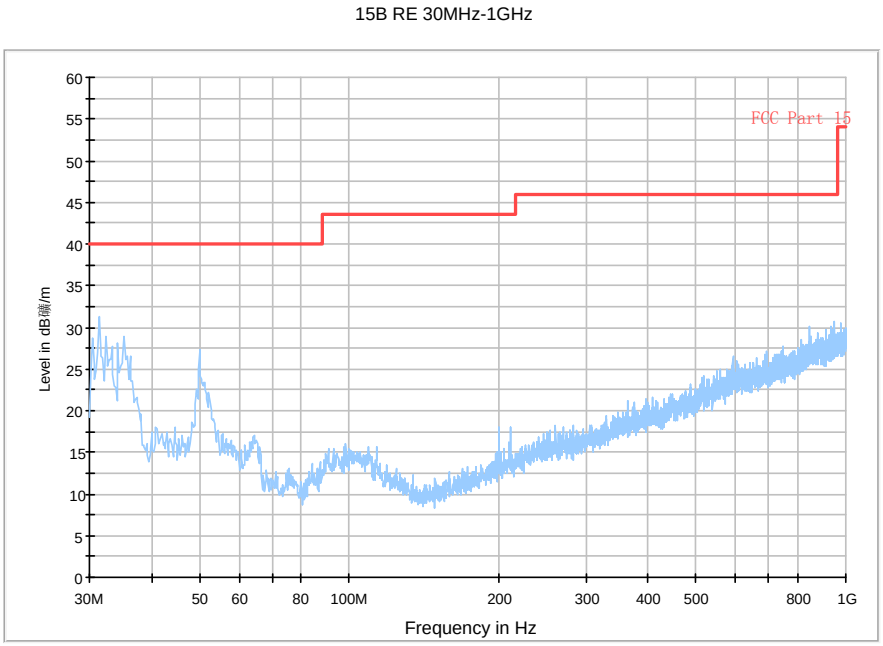


Figure A.1 Radiated Emission from 30MHz to 1GHz

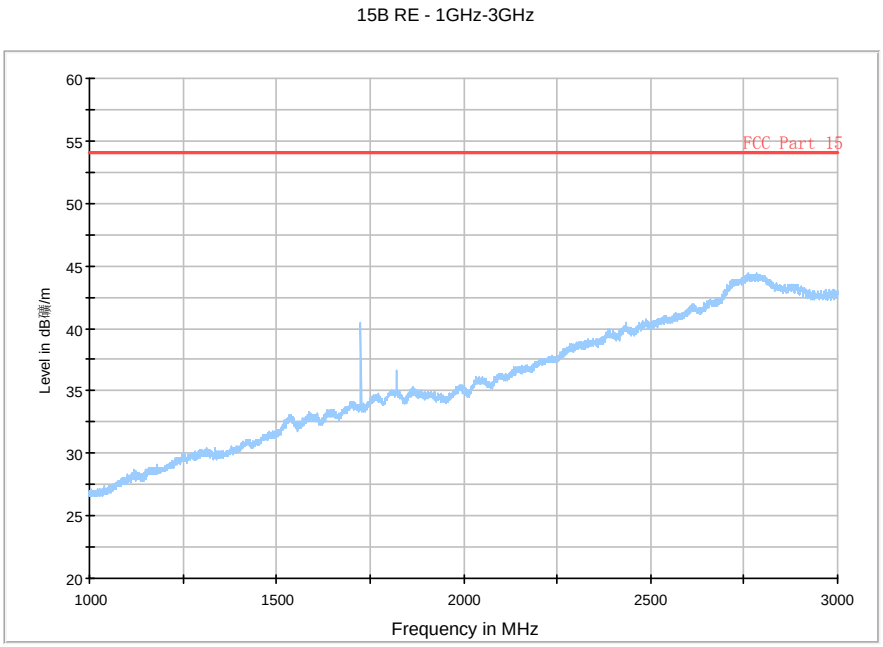


Figure A.2 Radiated Emission from 1GHz to 3GHz

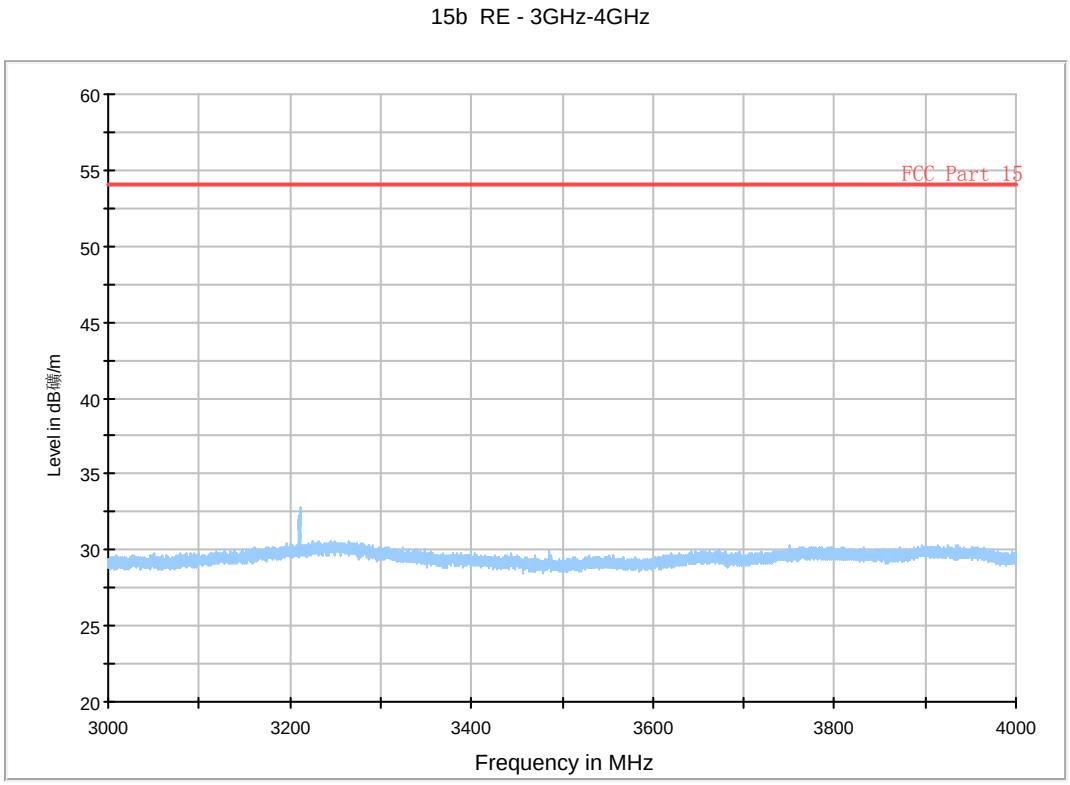


Figure A.3 Radiated Emission from 3GHz to 4GHz

Charging Mode Set.3

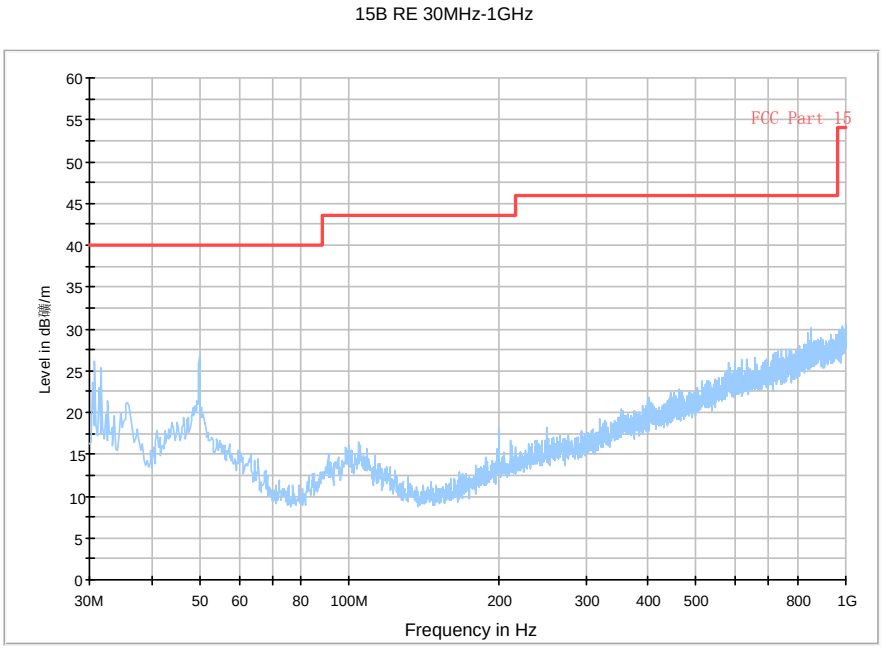


Figure A.4 Radiated Emission from 30MHz to 1GHz

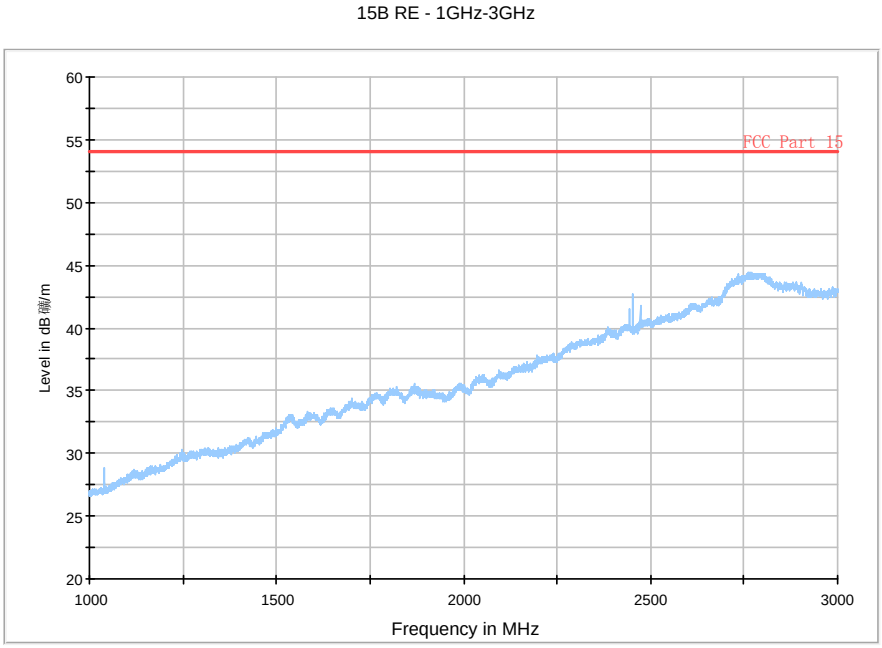


Figure A.5 Radiated Emission from 1GHz to 3GHz

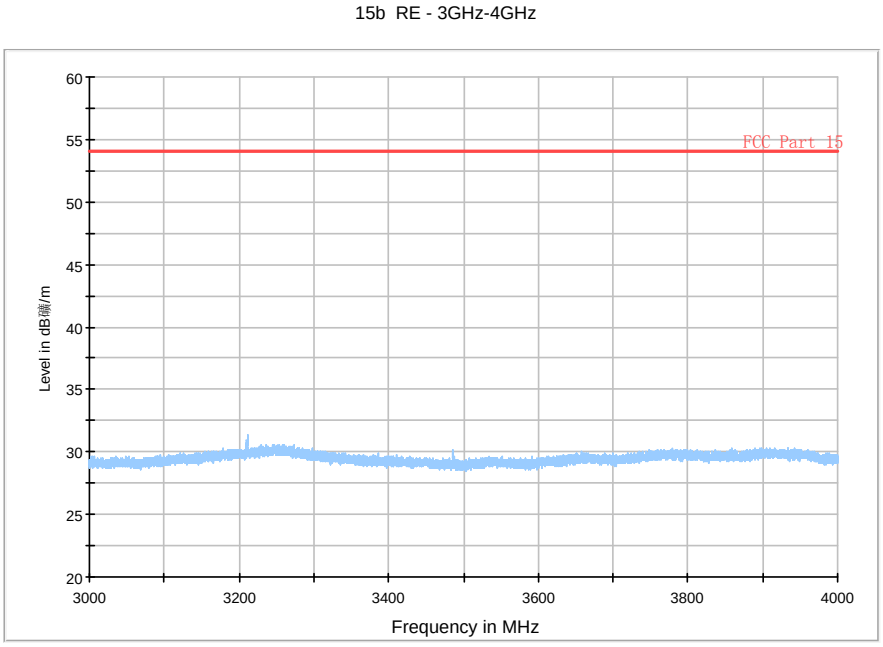


Figure A.6 Radiated Emission from 3GHz to 4GHz

USB Mode Set.1

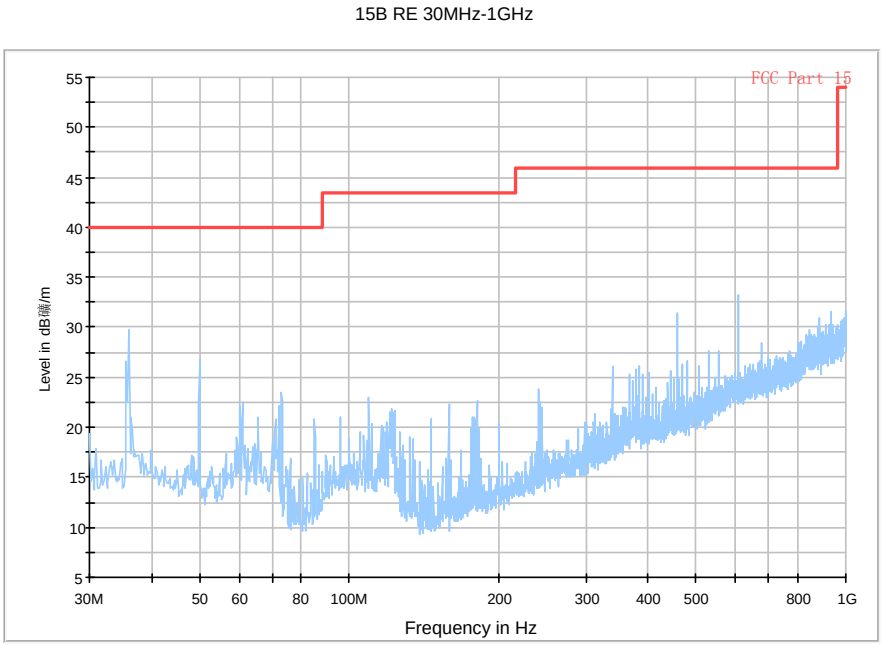


Figure A.7 Radiated Emission from 30MHz to 1GHz

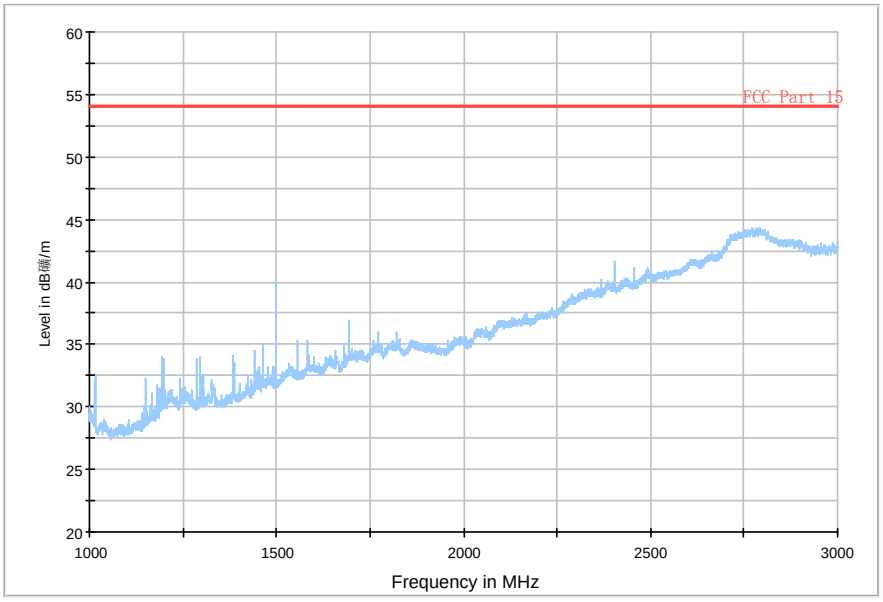


Figure A.8 Radiated Emission from 1GHz to 3GHz

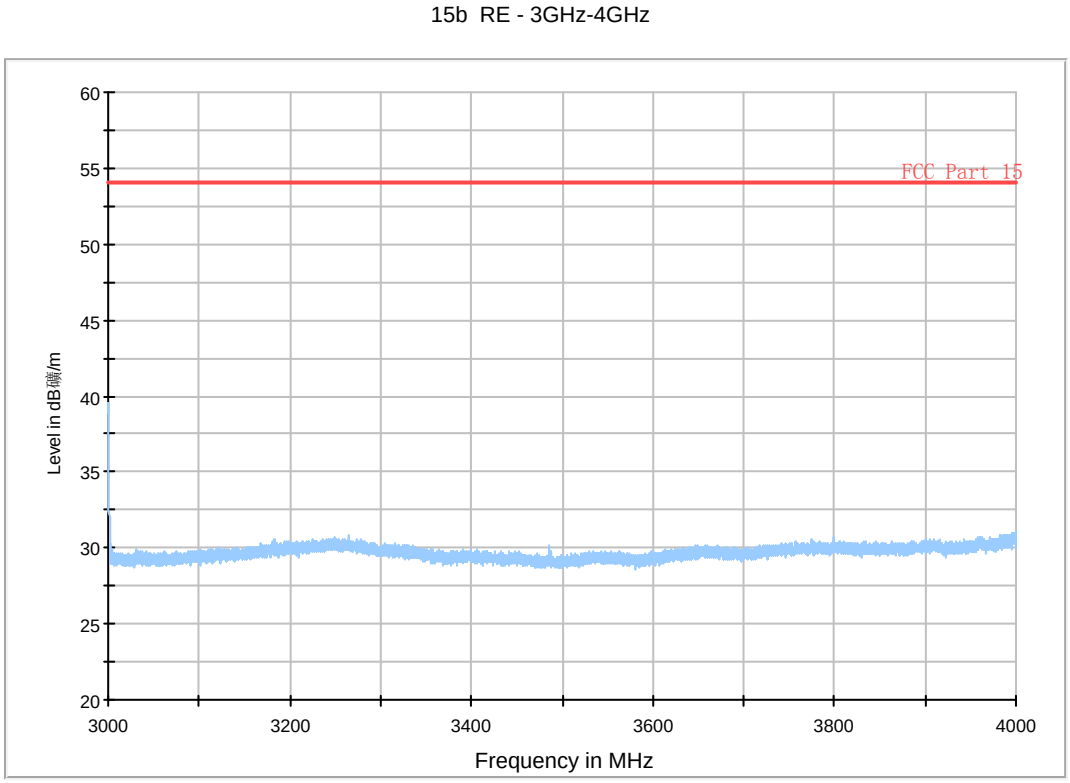


Figure A.9 Radiated Emission from 3GHz to 4GHz

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.2.4 Measurement Results

Charging Mode Set.2

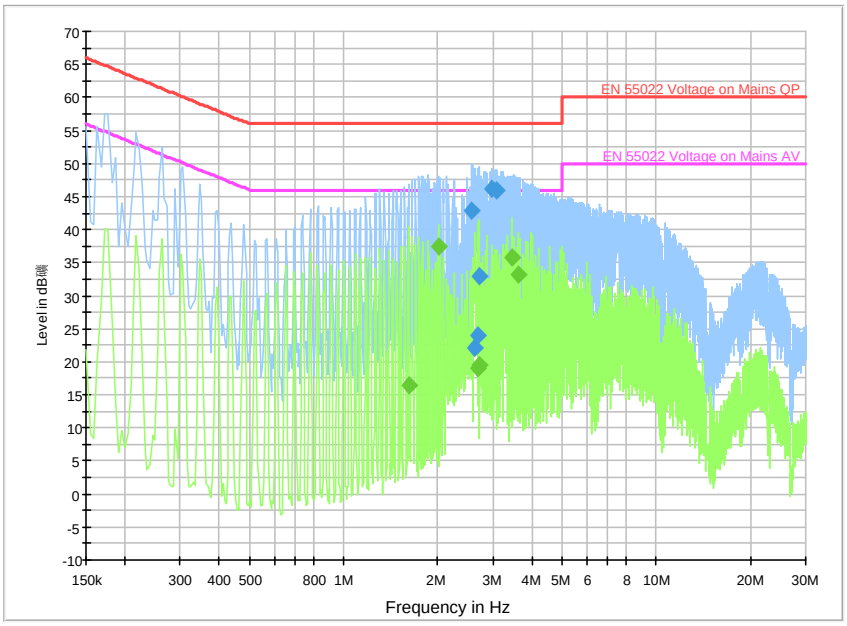


Figure A.10 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.575500	42.8	GND	L1	10.0	13.2	56.0
2.629500	22.1	GND	L1	10.0	33.9	56.0
2.670000	23.9	GND	L1	10.0	32.1	56.0
2.710500	33.1	GND	L1	10.0	22.9	56.0
2.994000	46.1	GND	L1	10.0	9.9	56.0
3.088500	45.9	GND	L1	10.0	10.1	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
1.612500	16.5	GND	L1	10.0	29.5	46.0
2.004000	37.4	GND	L1	10.0	8.6	46.0
2.670000	19.0	GND	L1	10.0	27.0	46.0
2.710500	19.6	GND	L1	10.0	26.4	46.0
3.444000	35.8	GND	L1	10.0	10.2	46.0
3.619500	33.3	GND	L1	10.0	12.8	46.0

Charging Mode Set.3

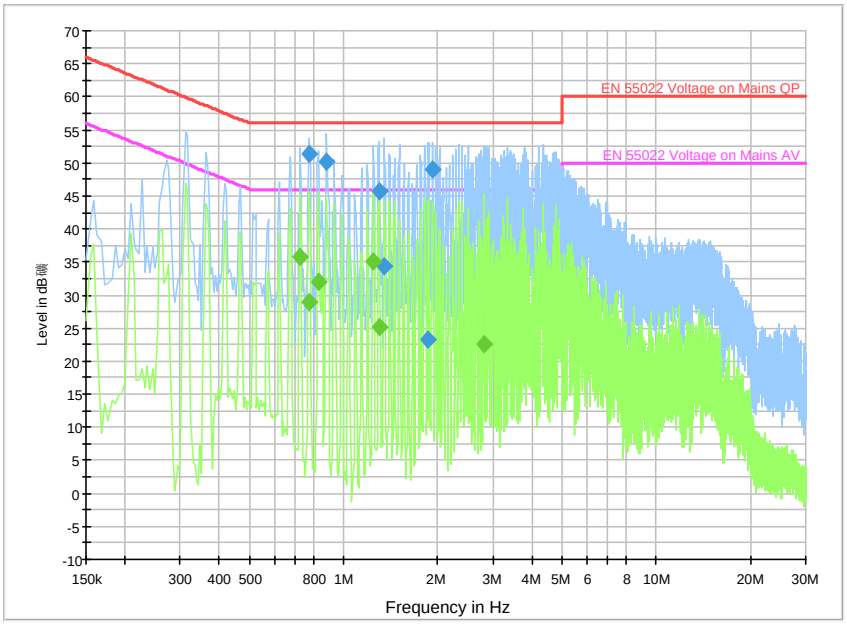


Figure A.11 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.780000	51.4	GND	L1	10.0	4.6	56.0
0.883500	50.3	GND	L1	10.0	5.7	56.0
1.297500	45.7	GND	L1	10.0	10.3	56.0
1.347000	34.3	GND	L1	10.0	21.7	56.0
1.864500	23.2	GND	L1	10.0	32.8	56.0
1.923000	48.9	GND	L1	10.0	7.1	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.726000	35.8	GND	L1	10.0	10.2	46.0
0.775500	28.9	GND	L1	10.0	17.1	46.0
0.829500	32.0	GND	L1	10.0	14.0	46.0
1.248000	35.0	GND	L1	10.0	11.0	46.0
1.297500	25.0	GND	L1	10.0	21.0	46.0
2.809500	22.5	GND	L1	10.0	23.5	46.0

USB Mode

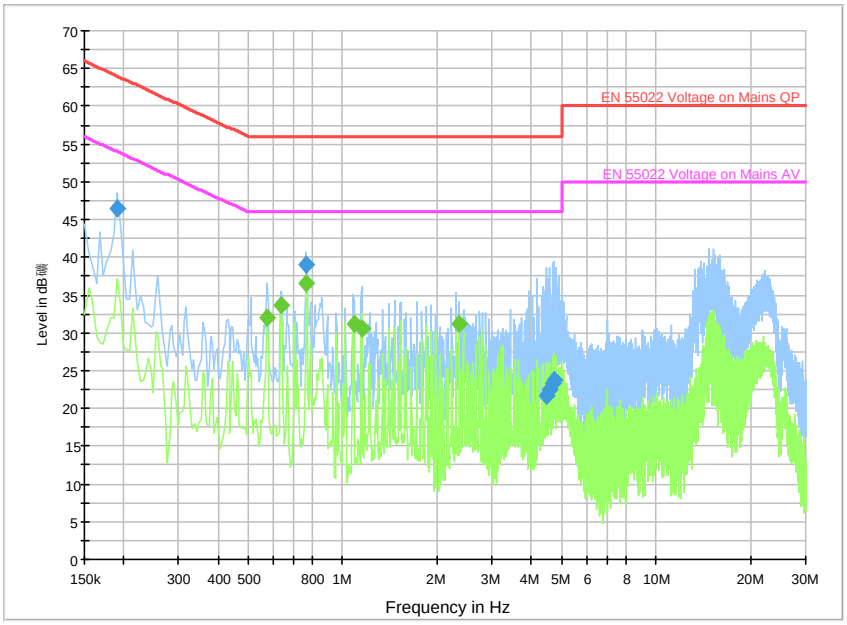


Figure A.12 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190500	46.4	GND	N	10.0	17.7	64.0
0.766500	39.1	GND	L1	10.0	16.9	56.0
4.447500	21.7	GND	N	10.0	34.3	56.0
4.591500	22.5	GND	N	10.0	33.5	56.0
4.663500	23.4	GND	N	10.0	32.6	56.0
4.731000	23.7	GND	N	10.0	32.3	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.573000	32.0	GND	N	10.0	14.0	46.0
0.636000	33.6	GND	N	10.0	12.4	46.0
0.766500	36.5	GND	L1	10.0	9.5	46.0
1.086000	31.1	GND	N	10.0	14.9	46.0
1.149000	30.5	GND	N	10.0	15.5	46.0
2.359500	31.3	GND	L1	10.0	14.7	46.0

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