



TEST REPORT

No. 2013TAR648

for

TCT Mobile Limited

HSUPA/HSDPA/UMTS triband/GSM quadband mobile phone

Model Name: Yaris-4.5 US 1SIM DTV

Marketing Name: ONE TOUCH 5037A

FCC ID: RAD413

with

Hardware Version: proto

Software Version: vF06

Issued Date: Sep. 11th, 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:

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

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1. Test Laboratory

1.1. Testing Location

Location D

Company Name: TMC Beijing, Telecommunication Metrology Center of MIIT
Address: No.18A, Kangding Street, Beijing Economic-Technological
Development Area, Beijing, China
Postal Code: 100176

1.2. Testing Environment

Normal Temperature: 15-35°C
Relative Humidity: 20-75%


1.3. Project data

Testing Start Date: Sep. 3rd, 2013
Testing End Date: Sep. 6th, 2013

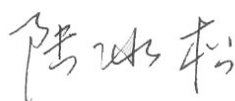
1.4. Signature



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	HSUPA/HSDPA/UMTS triband/GSM quadband mobile phone
Model Name	Yaris-4.5 US 1SIM DTV
Marketing Name	ONE TOUCH 5037A
FCC ID	RAD413
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.

3.2. Internal Identification of EUT used during the test

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	013823000050252	proto	vF06

*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	Note
AE1	Battery	/	TCT-B-1098
AE2	Battery	/	TCT-B-1158
AE3	Travel Adapter	/	TCT-CHR-1392
AE4	Travel Adapter	/	TCT-CHR-1265
AE5	USB cable	/	TCT-DC-0282
AE6	USB cable	/	TCT-DC-0239

AE1

Model	CAB32E0000C1
Manufacturer	BYD
Capacitance	1800mAh
Nominal voltage	3.7V

AE2

Model	CAB32E0000C2
Manufacturer	SCUD
Capacitance	1800mAh
Nominal voltage	3.7V

AE3

Model	CBA3007AG0C1
Manufacturer	BYD
Length of cable	120 cm

AE4

Model	CBA3007AG0C2
Manufacturer	Tenpao
Length of cable	98 cm (length of USB cable)

AE5

Model CDA3122002C1
Manufacturer JUWEI
Length of cable 98 cm (length of USB cable)

AE6

Model CDA3122002C2
Manufacturer Shenghua
Length of cable 98 cm (length of USB 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+AE3	Charging
Set.2	EUT1+ AE1+AE4	Charging
Set.3	EUT1+ AE1+AE5	USB

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	10-1-12 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×6.7 meters×6.15 meters) 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, 3 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

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. = 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
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

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

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

7. Test Equipments Utilized

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURE	CAL. DATE	CAL DUE DATE
1	Test Receiver	ESU26	100376	R&S	2012-11-08	2013-11-07
2	Test Receiver	ESCI	100766	R&S	2013-04-09	2014-04-08
3	EMI Antenna	VULB 9163	9163-514	Schwarzbeck	2011-11-11	2014-11-10
4	EMI Antenna	3117	00139065	ETS-Lindgren	2011-08-01	2014-07-31
5	LISN	ESH3-Z5	825562/028	R&S	2013-06-13	2014-06-12
7	Universal Radio Communication Tester	E5515C	MY48361083	Agilent	2013-3-17	2014-03-16
8	PC	OPTIPLEX 755	3908243625	DELL	N/A	N/A
9	Monitor	E178FPc	CN-OWR979-64 180-7AJ-D2MS	DELL	N/A	N/A
10	Printer	LaserJet 1160	CNM2D33740	HP	N/A	N/A
11	Keyboard	L100	CN0RH6596589 07ATOI40	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 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 range (MHz)	Field strength limit ($\mu\text{V}/\text{m}$)		
	Quasi-peak	Average	Peak
30-88	100		
88-216	150		
216-960	200		
960-1000	500		
>1000		500	5000

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 result 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
2999.800	43.0	-29.0	33.2	38.779	HORIZONTAL
2999.000	42.9	-29.0	33.2	38.679	VERTICAL
2999.400	42.8	-29.0	33.2	38.579	HORIZONTAL
2993.400	42.8	-29.0	33.2	38.579	VERTICAL
2994.800	42.8	-29.0	33.2	38.579	HORIZONTAL
3000.000	42.8	-28.4	32.8	38.372	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
2987.400	54.9	-29.0	33.2	50.679	VERTICAL
2999.600	54.7	-29.0	33.2	50.479	HORIZONTAL
2991.600	54.6	-29.0	33.2	50.379	VERTICAL
2999.000	54.4	-29.0	33.2	50.179	VERTICAL
2933.600	54.4	-28.1	32.5	50.011	HORIZONTAL
2998.600	54.3	-29.0	33.2	50.079	VERTICAL

Measurement result 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
2999.600	42.9	-29.0	33.2	38.679	VERTICAL
2999.800	42.8	-29.0	33.2	38.579	VERTICAL
2995.400	42.8	-29.0	33.2	38.579	VERTICAL
3000.000	42.8	-28.4	32.8	38.372	HORIZONTAL
2994.000	42.8	-29.0	33.2	38.579	HORIZONTAL
2995.200	42.8	-29.0	33.2	38.579	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
2995.600	54.8	-29.0	33.2	50.579	HORIZONTAL
2993.000	54.6	-29.0	33.2	50.379	VERTICAL
2994.800	54.5	-29.0	33.2	50.279	VERTICAL
2973.600	54.5	-28.6	33.1	50.015	HORIZONTAL
2981.200	54.4	-29.0	33.2	50.179	HORIZONTAL
2998.200	54.3	-29.0	33.2	50.079	VERTICAL

Measurement result 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
3000.000	45.5	-28.4	32.8	41.072	HORIZONTAL
2999.800	44.8	-29.0	33.2	40.579	HORIZONTAL
2999.600	44.6	-29.0	33.2	40.379	HORIZONTAL
2999.400	43.9	-29.0	33.2	39.679	HORIZONTAL
2999.200	43.4	-29.0	33.2	39.179	HORIZONTAL
2999.000	43.0	-29.0	33.2	38.779	HORIZONTAL

USB Mode/ Peak detector

Frequency(MHz)	Result(dB μ V/m)	G _{PL} (dB)	G _A (dB/m)	P _{mea} (dB μ V)	Polarity
2997.600	55.6	-29.0	33.2	51.379	VERTICAL
3000.000	55.6	-28.4	32.8	51.172	HORIZONTAL
2942.000	55.3	-28.1	32.5	50.911	HORIZONTAL
2999.400	55.2	-29.0	33.2	50.979	HORIZONTAL
2996.200	55.0	-29.0	33.2	50.779	VERTICAL
2987.800	54.9	-29.0	33.2	50.679	HORIZONTAL

Charging Mode, Set.1

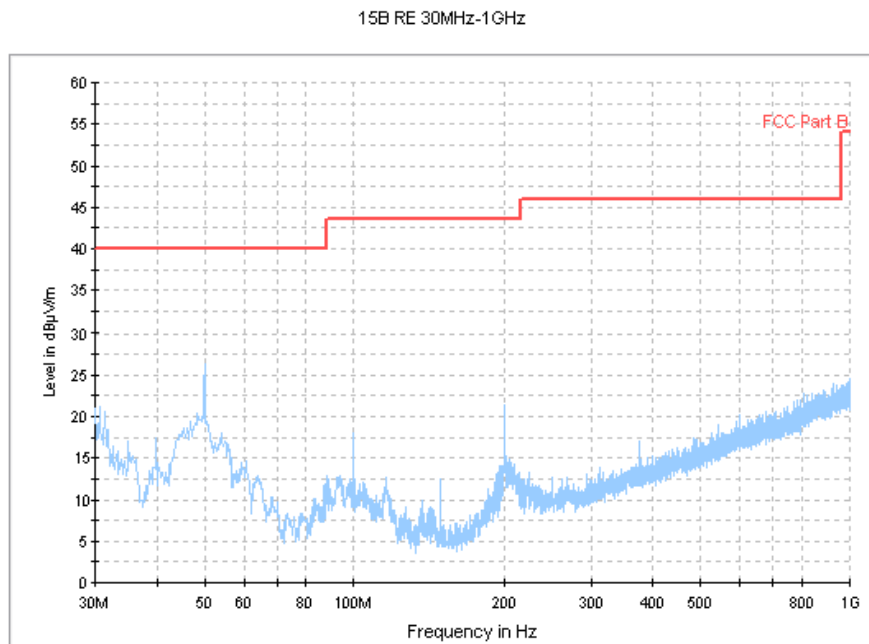


Figure A.1 Radiated Emission from 30MHz to 1GHz

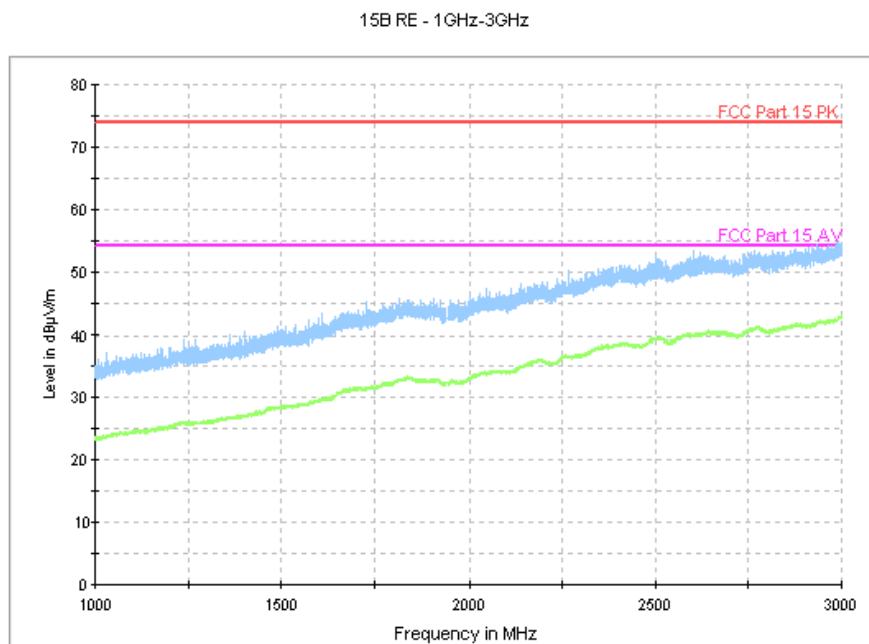


Figure A.2 Radiated Emission from 1GHz to 3GHz

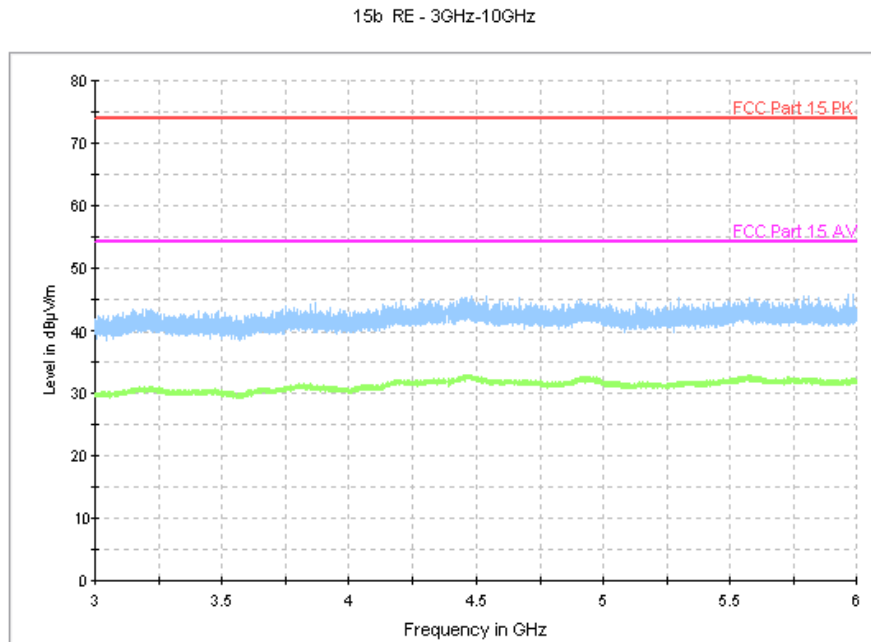


Figure A.3 Radiated Emission from 3GHz to 6GHz

Charging Mode, Set.2

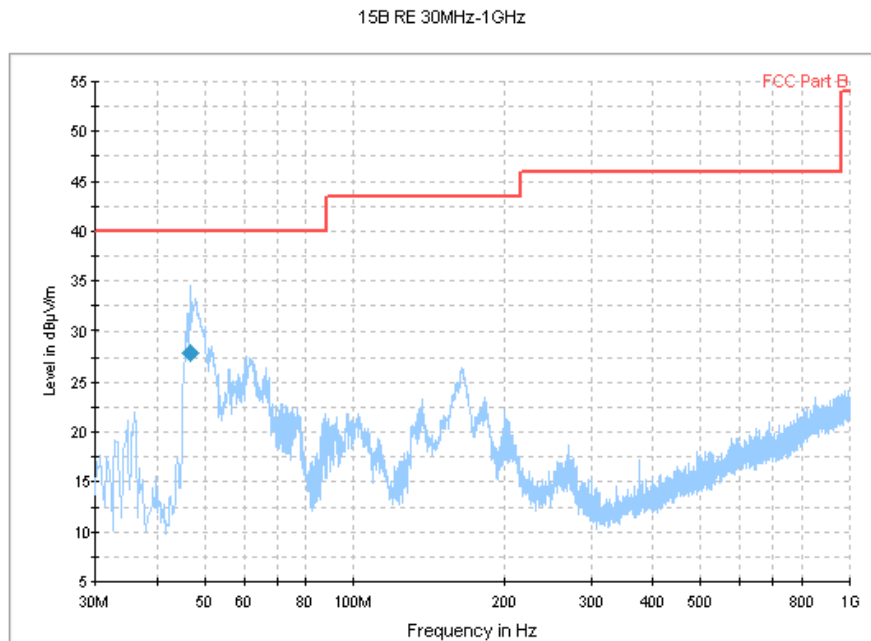


Figure A.4 Radiated Emission from 30MHz to 1GHz

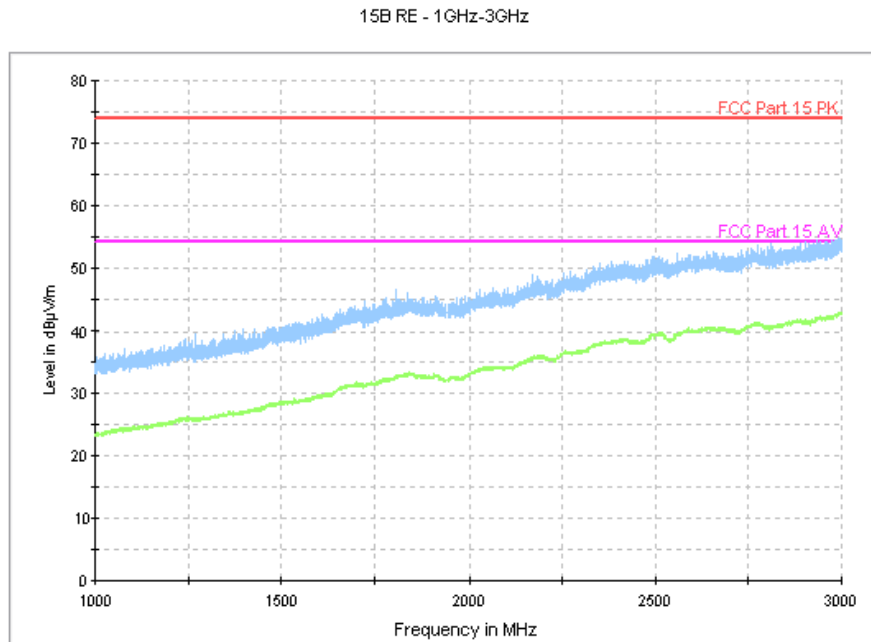


Figure A.5 Radiated Emission from 1GHz to 3GHz

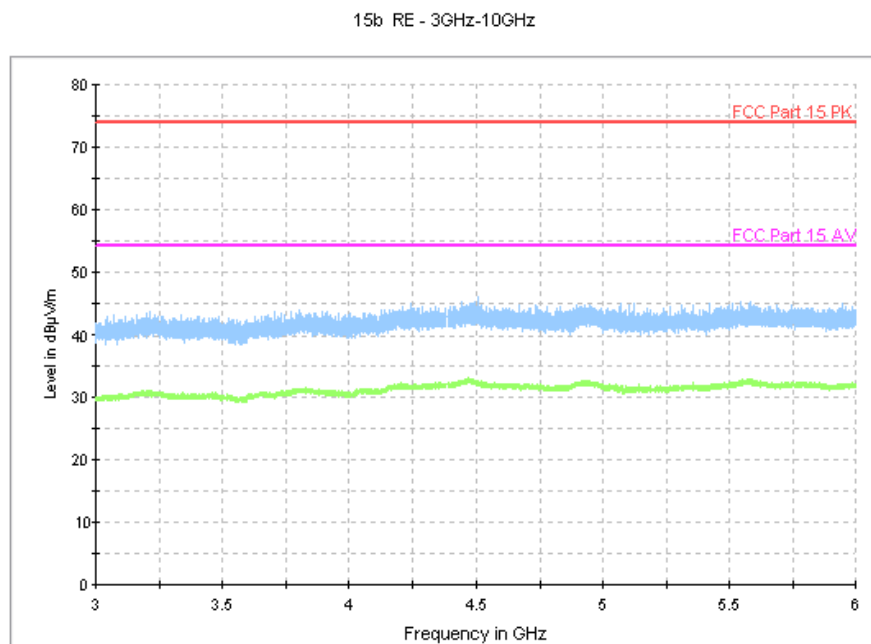


Figure A.6 Radiated Emission from 3GHz to 6GHz

USB Mode, Set.3

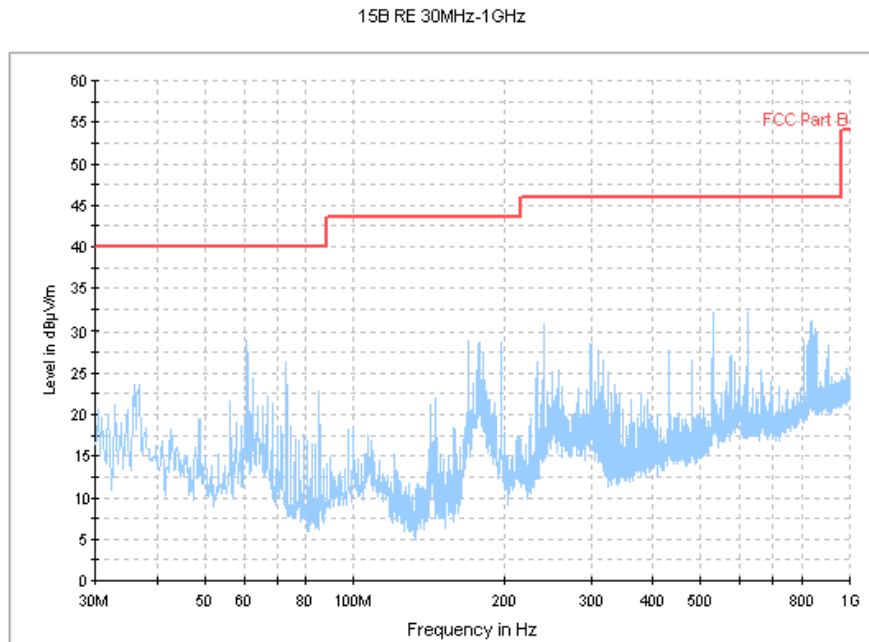


Figure A.7 Radiated Emission from 30MHz to 1GHz

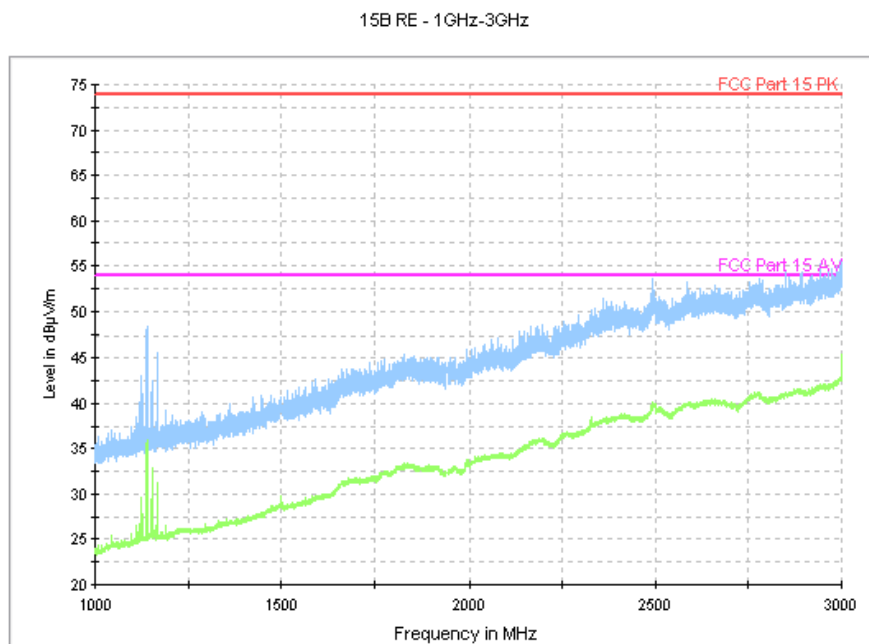


Figure A.8 Radiated Emission from 1GHz to 3GHz

15b RE - 3GHz-10GHz

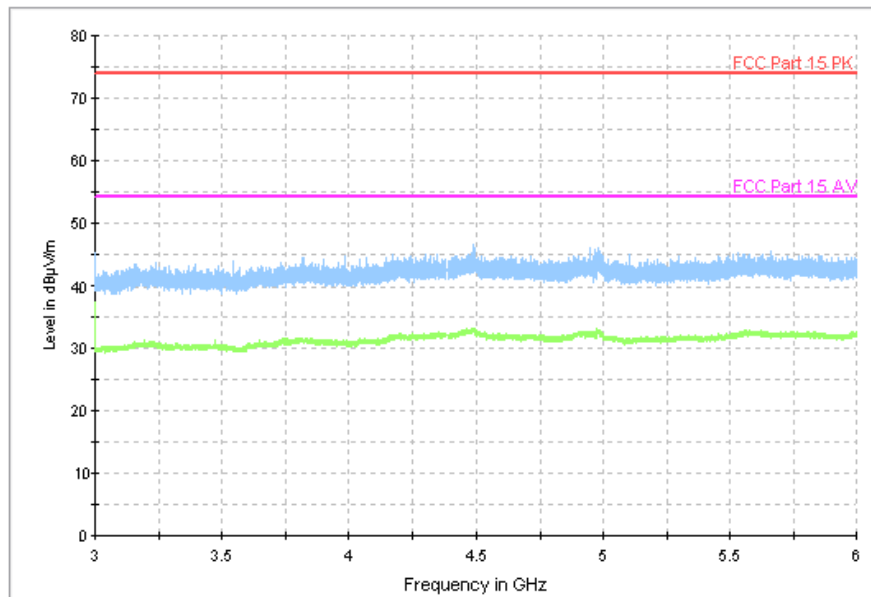


Figure A.9 Radiated Emission from 3GHz to 6GHz

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 (dB μ V)	
	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: $U= 2.9$ dB, $k=2$.

Charging Mode, Set.1

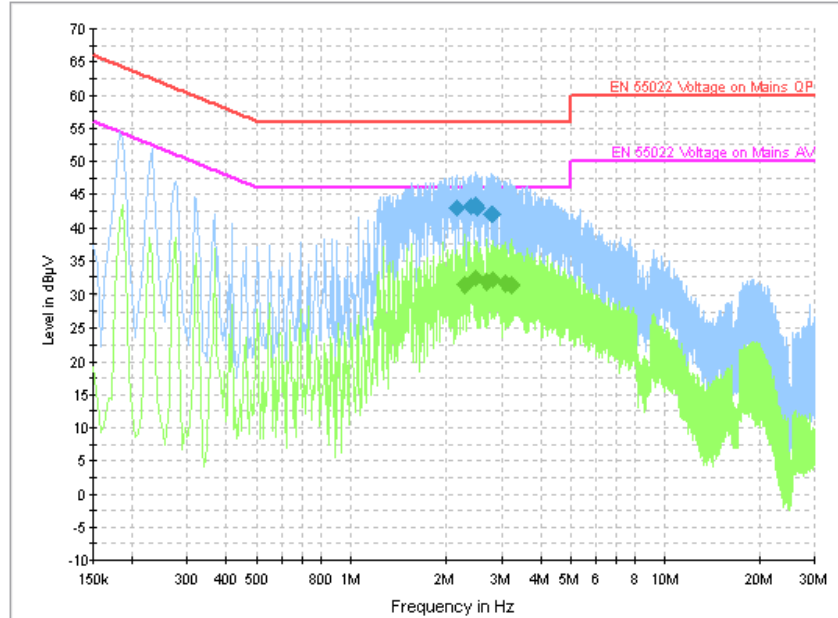


Figure A.10 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.157001	42.8	GND	N	9.9	13.2	56.0
2.404501	43.1	GND	N	9.9	12.9	56.0
2.467501	43.5	GND	N	9.9	12.5	56.0
2.512501	42.9	GND	N	9.9	13.1	56.0
2.791501	42.1	GND	N	9.9	13.9	56.0
2.823001	42.1	GND	N	9.9	13.9	56.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.296501	31.4	GND	N	9.9	14.6	46.0
2.467501	32.3	GND	N	9.9	13.7	46.0
2.670001	32.0	GND	N	9.9	14.0	46.0
2.809501	32.1	GND	N	9.9	13.9	46.0
3.075001	31.7	GND	N	9.9	14.3	46.0
3.214501	31.3	GND	N	9.9	14.7	46.0

Charging Mode, Set.2

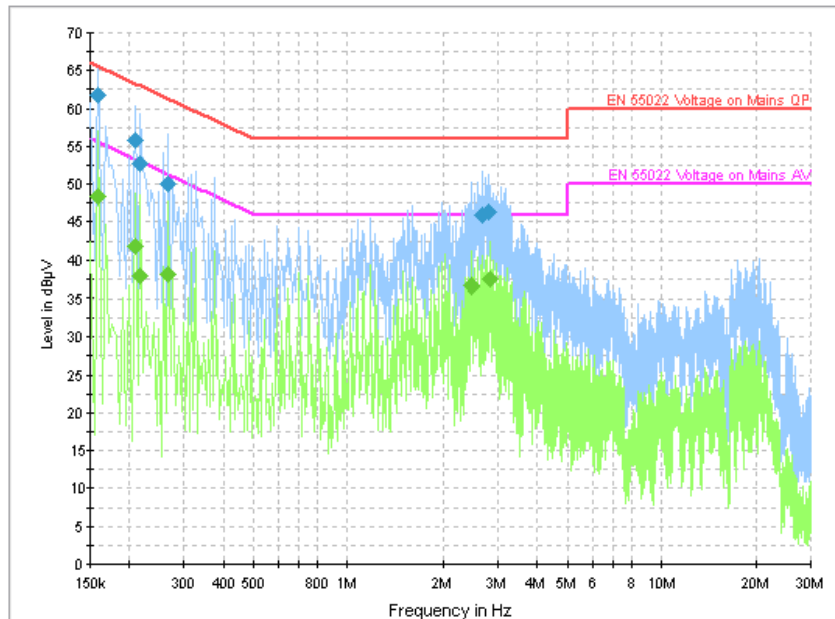


Figure A.11 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.159001	61.8	GND	L1	9.9	3.7	65.5
0.208501	55.7	GND	L1	9.9	7.6	63.3
0.217501	52.7	GND	L1	9.9	10.2	62.9
0.267001	50.0	GND	L1	9.9	11.2	61.2
2.679001	45.8	GND	N	9.9	10.2	56.0
2.787001	46.4	GND	N	9.9	9.6	56.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.159001	48.4	GND	L1	9.9	7.1	55.5
0.208501	41.9	GND	L1	9.9	11.4	53.3
0.217501	37.9	GND	L1	9.9	15.0	52.9
0.267001	38.1	GND	L1	9.9	13.1	51.2
2.463001	36.6	GND	N	9.9	9.4	46.0
2.836501	37.5	GND	N	9.9	8.5	46.0

USB Mode, Set.3

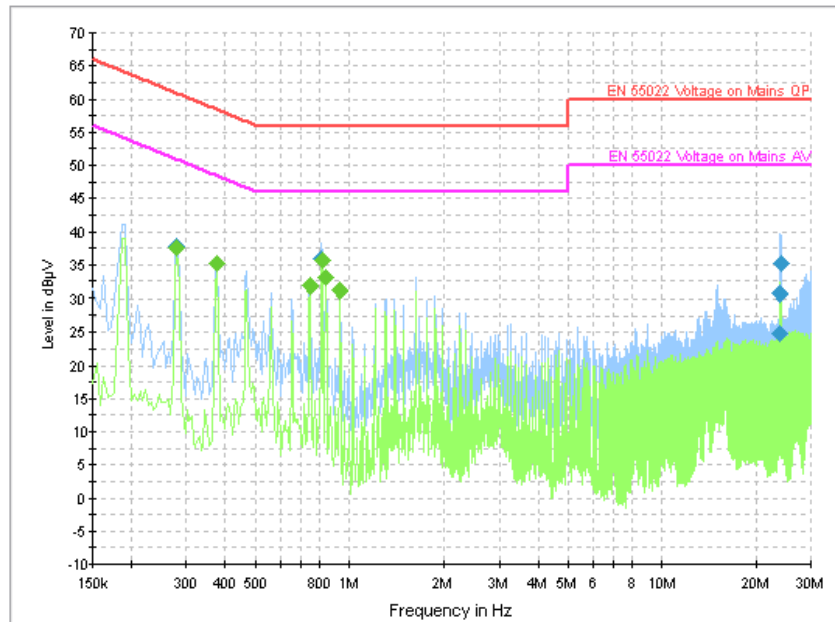


Figure A.12 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.280501	37.7	GND	L1	9.9	23.1	60.8
0.816001	36.0	GND	N	9.9	20.0	56.0
0.843001	33.1	GND	L1	9.9	22.9	56.0
23.910001	24.8	GND	N	9.5	35.2	60.0
23.968501	30.8	GND	L1	9.5	29.2	60.0
24.049501	35.2	GND	L1	9.5	24.8	60.0

Final Result 2

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.280501	37.5	GND	L1	9.9	13.3	50.8
0.375001	35.1	GND	L1	9.9	13.3	48.4
0.748501	31.8	GND	L1	9.9	14.2	46.0
0.820501	35.6	GND	N	9.9	10.4	46.0
0.843001	33.1	GND	L1	9.9	12.9	46.0
0.933001	31.1	GND	L1	9.9	14.9	46.0

END OF REPORT