



# TEST REPORT

No. 2013TAR646

for

**TCT Mobile Limited**

**HSUPA/HSDPA/UMTS triband/GSM quadband mobile phone**

**Model Name: Yaris-4.5 US 2SIM DTV**

**Marketing Name: ONE TOUCH 5037E**

**FCC ID: RAD420**

with

**Hardware Version: proto**

**Software Version: vG06**

**Issued Date: Sep. 11<sup>th</sup>, 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**

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## **CONTENTS**

<b>1. TEST LABORATORY.....</b>	<b>3</b>
<b>1.1. TESTING LOCATION.....</b>	<b>3</b>
<b>1.2. TESTING ENVIRONMENT.....</b>	<b>3</b>
<b>1.3. PROJECT DATA.....</b>	<b>3</b>
<b>1.4. SIGNATURE.....</b>	<b>3</b>
<b>2. CLIENT INFORMATION.....</b>	<b>4</b>
<b>2.1. APPLICANT INFORMATION.....</b>	<b>4</b>
<b>2.2. MANUFACTURER INFORMATION.....</b>	<b>4</b>
<b>3. EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE).....</b>	<b>5</b>
<b>3.1. ABOUT EUT.....</b>	<b>5</b>
<b>3.2. INTERNAL IDENTIFICATION OF EUT USED DURING THE TEST.....</b>	<b>5</b>
<b>3.3. INTERNAL IDENTIFICATION OF AE USED DURING THE TEST.....</b>	<b>5</b>
<b>3.4. EUT SET-UPS.....</b>	<b>6</b>
<b>4. REFERENCE DOCUMENTS.....</b>	<b>7</b>
<b>4.1. REFERENCE DOCUMENTS FOR TESTING.....</b>	<b>7</b>
<b>5. LABORATORY ENVIRONMENT.....</b>	<b>8</b>
<b>6. SUMMARY OF TEST RESULTS.....</b>	<b>9</b>
<b>7. TEST EQUIPMENTS UTILIZED.....</b>	<b>10</b>
<b>ANNEX A: MEASUREMENT RESULTS.....</b>	<b>11</b>

## 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

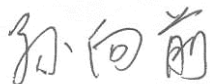
Testing Start Date: Sep. 3<sup>rd</sup>, 2013  
Testing End Date: Sep. 6<sup>th</sup>, 2013

### 1.4. Signature



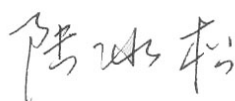
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Qu Pengfei  
(Prepared this test report)



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## **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  
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### **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 2SIM DTV
Marketing Name	ONE TOUCH 5037E
FCC ID	RAD420
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	862804020000032	proto	vG06

\*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*	描述	序列号	备注
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

<b>EUT set-up No.</b>	<b>Combination of EUT and AE</b>	<b>Remarks</b>
Set.1	EUT1+ AE1+AE3	Charging
Set.2	EUT1+ AE1+AE4	Charging
Set.3	EUT1+ AE1+AE5	USB

Note: The HSUPA/HSDPA/UMTS triband/GSM quad-band mobile phone ONE TOUCH 5037E manufactured by TCT Mobile Limited is a variant model based on ONE TOUCH 5037A for conformance test. According to the declaration of changes, no test needs to be performed, all results are cited from the initial model. The report number for initial model is 2013TAR648.

## **4. Reference Documents**

### **4.1. Reference Documents for testing**

The following documents listed in this section are referred for testing.

<b>Reference</b>	<b>Title</b>	<b>Version</b>
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 DUE DATE
1	Test Receiver	ESU26	100376	R&S	2013-11-07
2	Test Receiver	ESCI	100766	R&S	2014-04-08
3	EMI Antenna	VULB 9163	9163-514	Schwarzbeck	2014-11-10
4	EMI Antenna	3117	00139065	ETS-Lindgren	2014-07-31
5	LISN	ESH3-Z5	825562/028	R&S	2014-06-12
7	Universal Radio Communication Tester	E5515C	MY48361083	Agilent	2014-03-16
8	PC	OPTIPLEX 755	3908243625	DELL	N/A
9	Monitor	E178FPc	CN-OWR979-6 4180-7AJ-D2M S	DELL	N/A
10	Printer	LaserJet 1160	CNM2D33740	HP	N/A
11	Keyboard	L100	CN0RH659658 907ATOI40	DELL	N/A
12	Mouse	M-UAE119	LZ935220ZRC	Lenovo	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

$G_{\text{PL}}$ : Path Loss

$P_{\text{Mea}}$ : 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 $\mu$ V/m)	$G_{\text{PL}}$ (dB)	$G_A$ (dB/m)	$P_{\text{Mea}}$ (dB $\mu$ 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 $\mu$ V/m)	$G_{\text{PL}}$ (dB)	$G_A$ (dB/m)	$P_{\text{Mea}}$ (dB $\mu$ 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 $\mu$ V/m)	G <sub>PL</sub> (dB)	G <sub>A</sub> (dB/m)	P <sub>Mea</sub> (dB $\mu$ 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 $\mu$ V/m)	G <sub>PL</sub> (dB)	G <sub>A</sub> (dB/m)	P <sub>Mea</sub> (dB $\mu$ 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 $\mu$ V/m)	G <sub>PL</sub> (dB)	G <sub>A</sub> (dB/m)	P <sub>mea</sub> (dB $\mu$ 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 $\mu$ V/m)	G <sub>PL</sub> (dB)	G <sub>A</sub> (dB/m)	P <sub>mea</sub> (dB $\mu$ 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

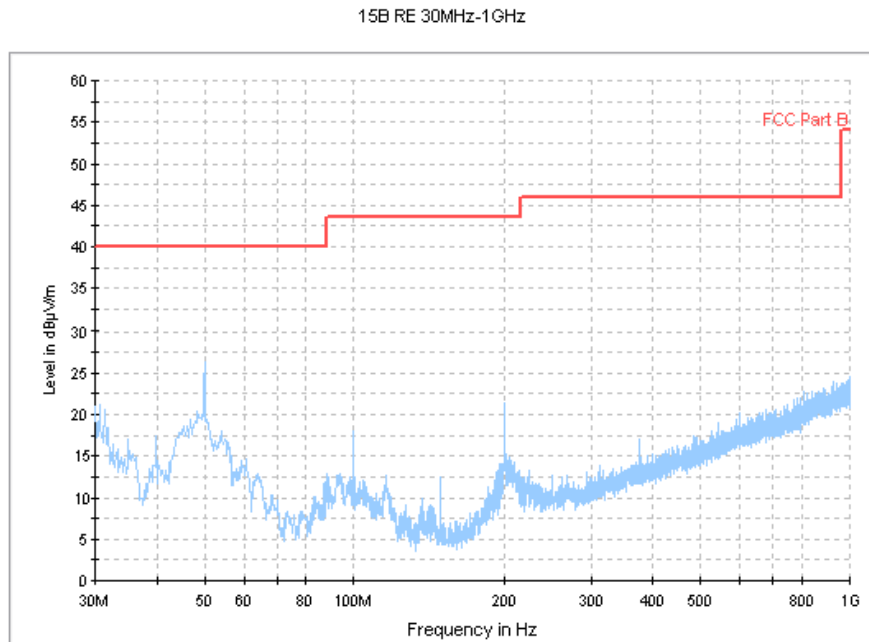


Figure A.1 Radiated Emission from 30MHz to 1GHz

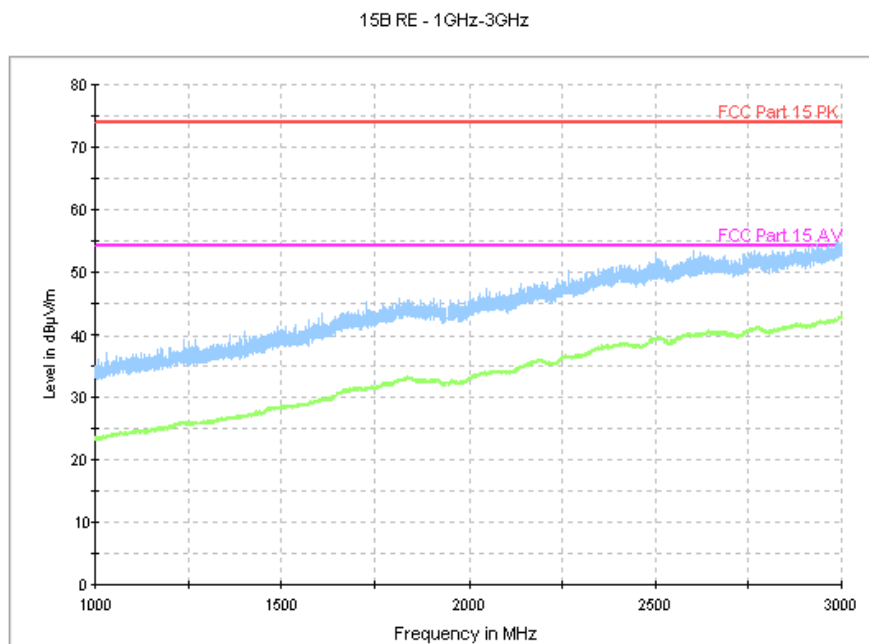
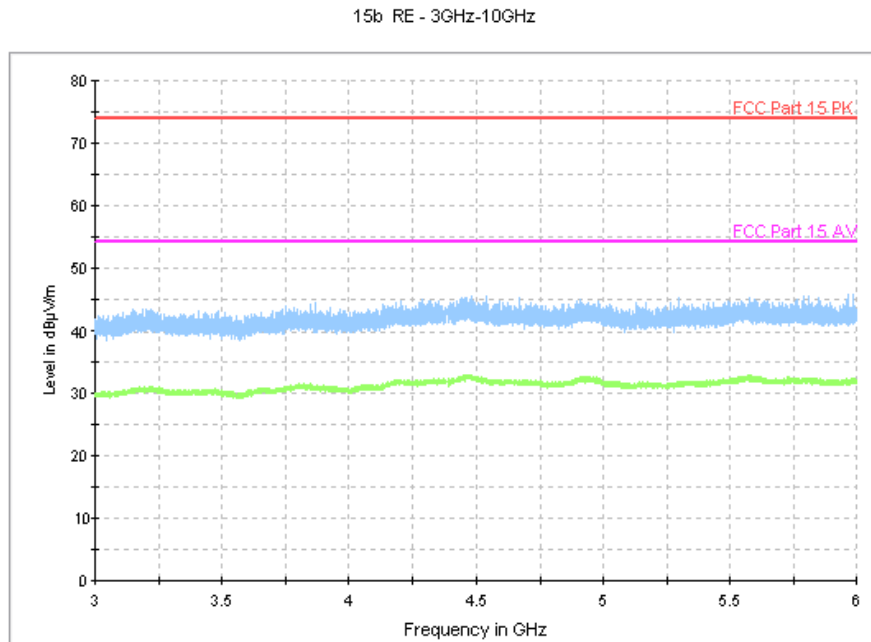
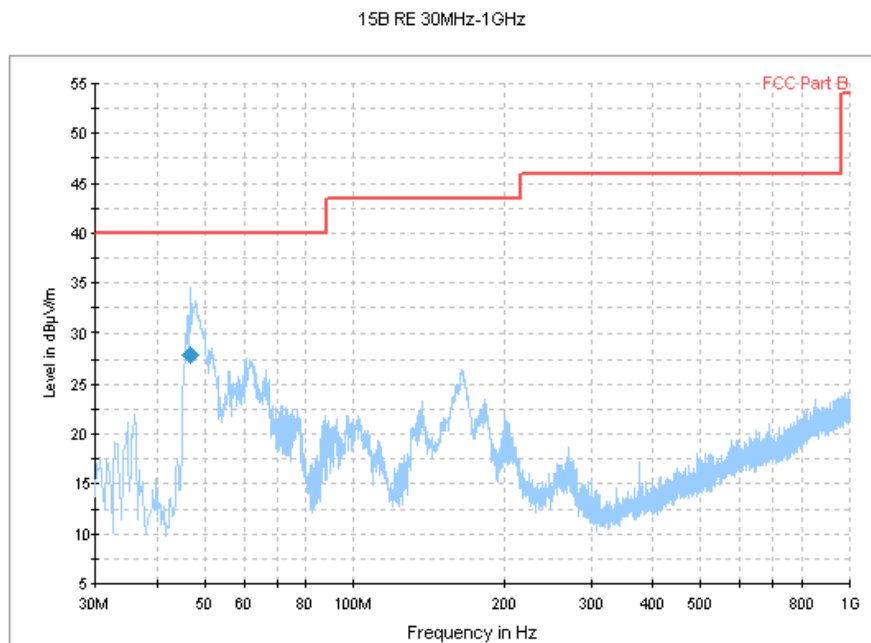


Figure A.2 Radiated Emission from 1GHz to 3GHz

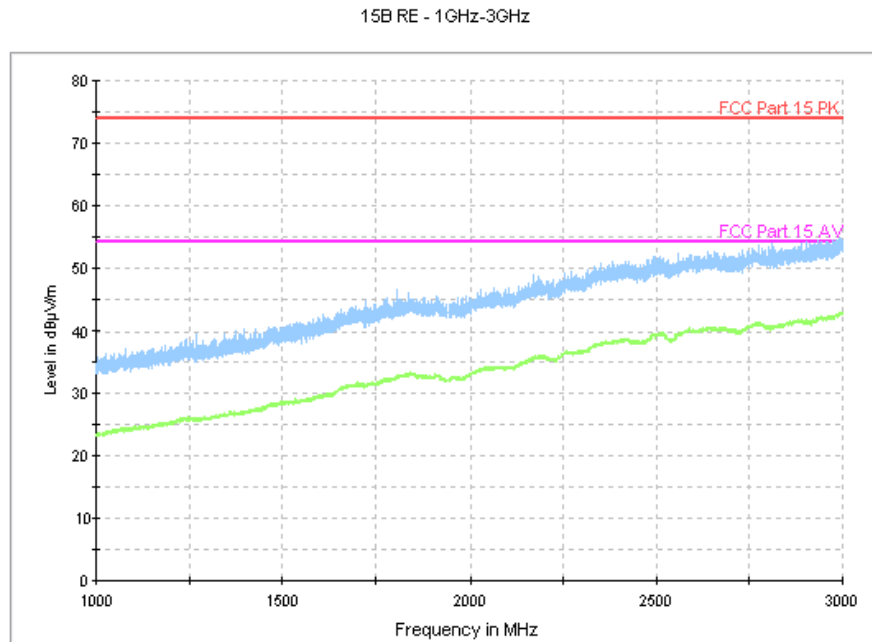


**Figure A.3 Radiated Emission from 3GHz to 6GHz**

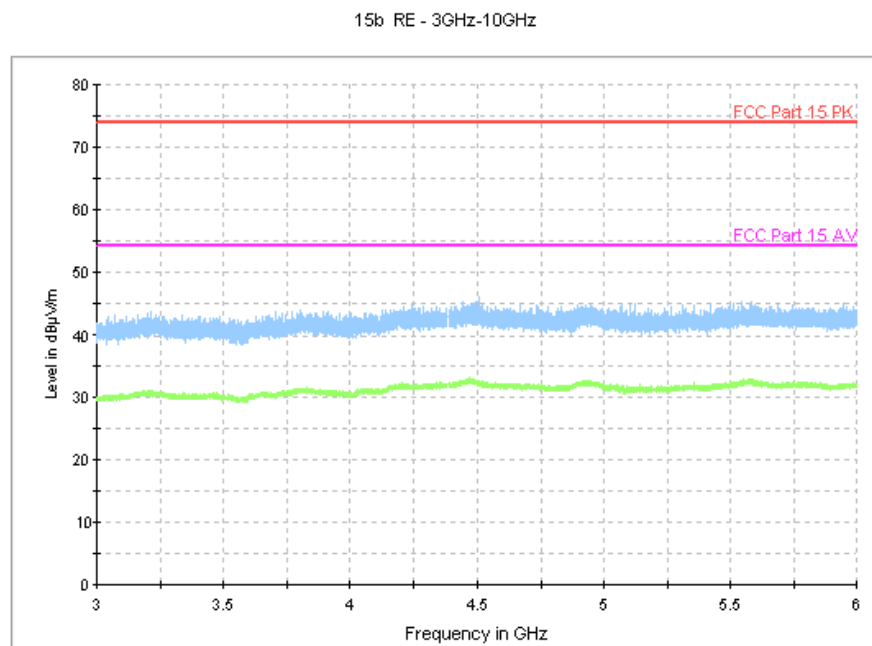
**Charging Mode, Set.2**



**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

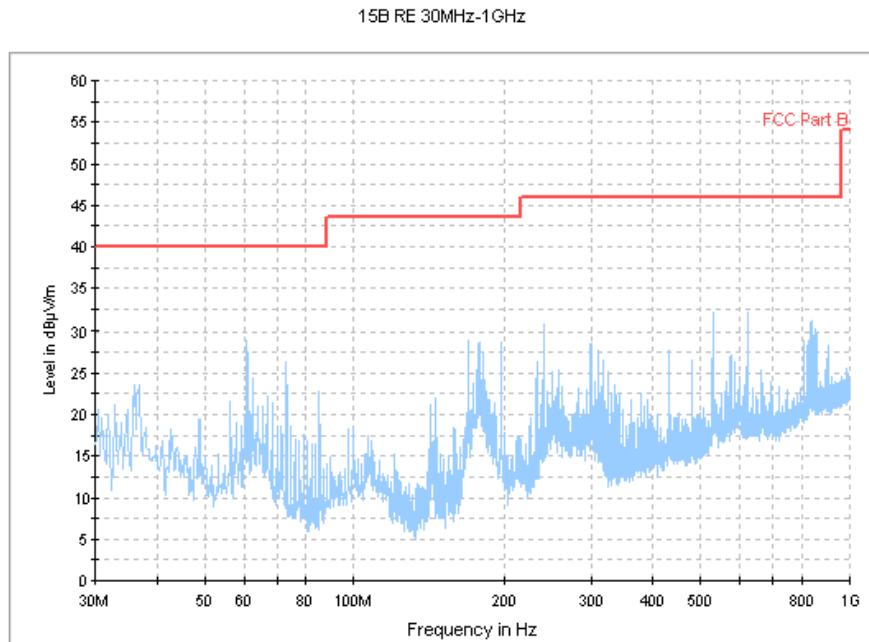


Figure A.7 Radiated Emission from 30MHz to 1GHz

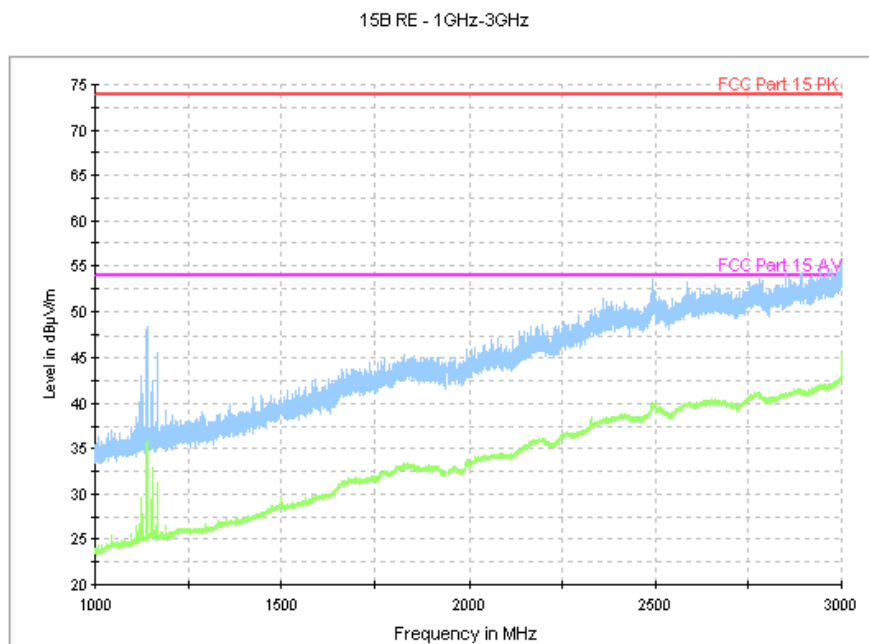


Figure A.8 Radiated Emission from 1GHz to 3GHz

15b RE - 3GHz-10GHz

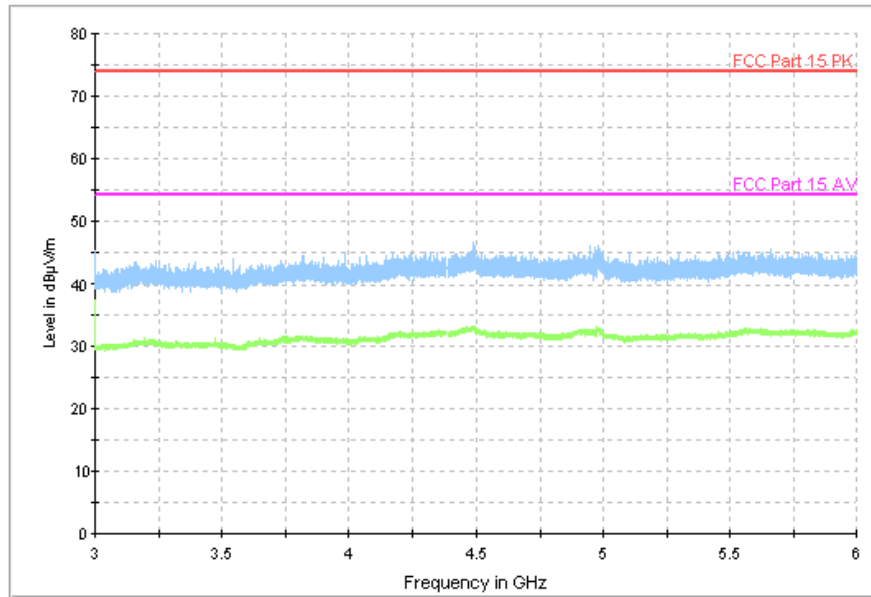


Figure A.9 Radiated Emission from 3GHz to 6GHz

## 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 $\mu$ 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

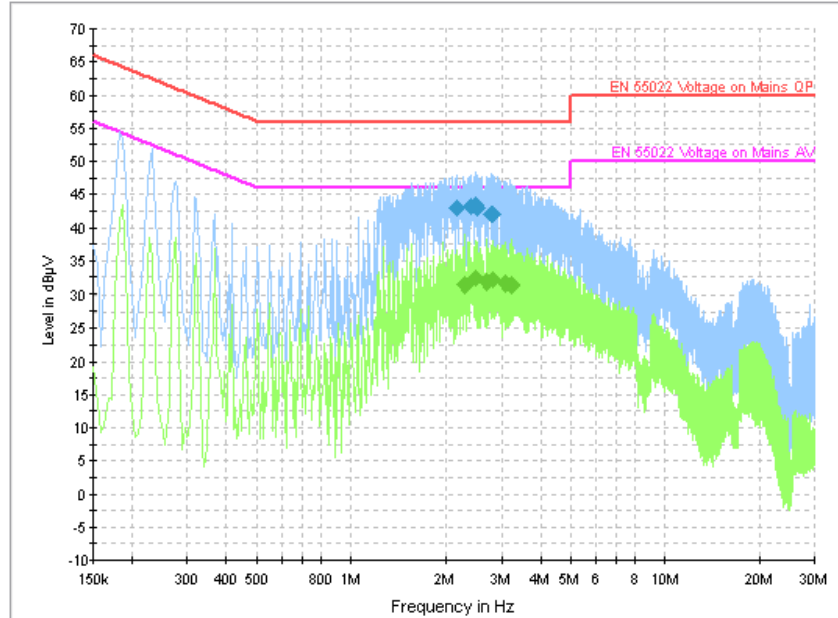


Figure A.10 Conducted Emission

#### 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

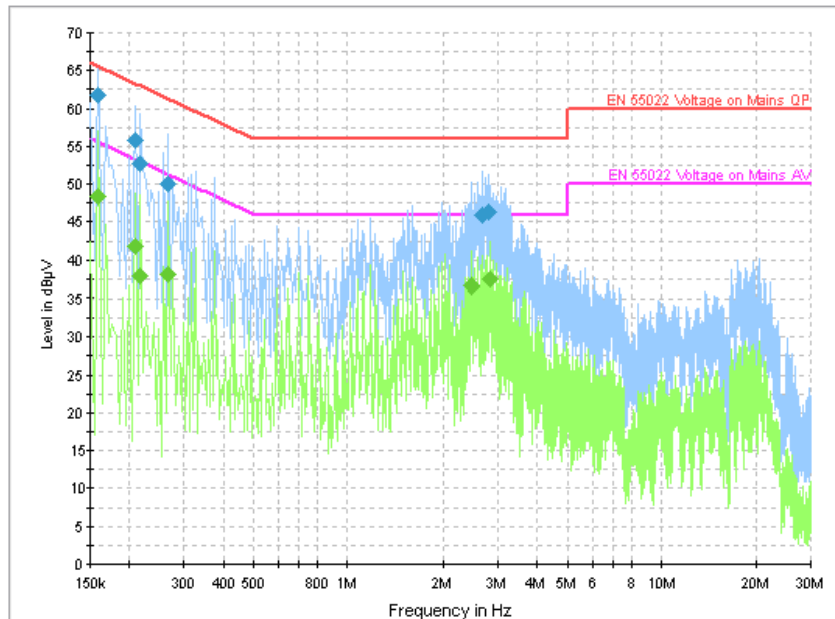


Figure A.11 Conducted Emission

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

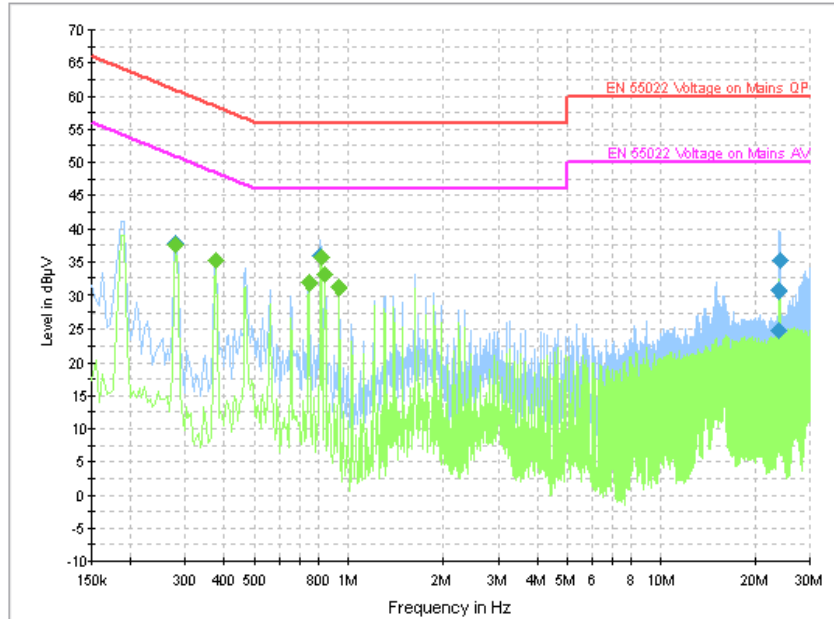


Figure A.12 Conducted Emission

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\*\*\*