



# TEST REPORT

No. 2012TAR427

for

**TCT Mobile Limited**

**HSUPA/HSDPA/UMTS single band / GSM quad bands mobile phone**

**Model Name: GIN NFC VF**

**Marketing Name: Vodafone Smart 861**

**FCC ID: RAD305**

with

**Hardware Version: PIO**

**Software Version: 01003**

**Issued Date: 2012-08-20**

**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.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

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## 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°C  
Relative Humidity: 20-75%

### 1.3. Project data

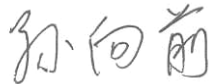
Testing Start Date: Dec. 04<sup>th</sup>, 2011  
Testing End Date: Aug. 17<sup>th</sup>, 2012

### 1.4. Signature



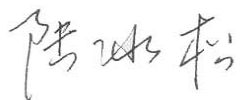
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Qu Pengfei  
(Prepared this test report)



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Sun Xiangqian  
(Reviewed this test report)



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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	HSUPA/HSDPA/UMTS single band / GSM quad bands mobile phone
Model Name	GIN NFC VF
Marketing Name	Vodafone Smart 861
FCC ID	RAD305
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	867757010051362	PIO	01003

\*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	B1192924C4A
AE2	Battery	/
AE3	Travel Adapter	/
AE4	Travel Adapter	/
AE5	USB Cable	/
AE6	USB Cable	/
AE7	USB Cable	/
AE8	USB Cable	/

##### AE1

Model	CAB31P0000C1
Manufacturer	BYD
Capacitance	1300mAh
Nominal Voltage	3.7V

##### AE2

Model	CAB31P0000C2
Manufacturer	BAK
Capacitance	1300mAh
Nominal Voltage	3.7V

##### AE3

Model	CBA6050AA1C2
Manufacturer	BYD
Length of cable	9.5cm

##### AE4

Model	CBA6050AA1C1
Manufacturer	Tenpao
Length of cable	10cm
AE5	
Model	CDA3122005C1
Manufacturer	Juwei
Length of cable	150cm
AE6	
Model	CDA3122005C2
Manufacturer	Shenhua
Length of cable	150cm
AE7	
Model	CDA3122002C1
Manufacturer	Juwei
Length of cable	150cm
AE8	
Model	CDA3122002C2
Manufacturer	Shenhua
Length of cable	150cm

\*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/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

Note: The EUT is a variant model of one touch 918A. Only travel adapter related radiated emission and conducted emission need to be tested according to the change from one touch 918A to Vodafone Smart 861. In this report the test results of test set-up Set.3 are cited from one touch 918A's test report 2011TAR614.

## **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	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-1** (23 meters×17meters×10meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 °C, Max. = 30 °C
Relative humidity	Min. = 30 %, Max. = 60 %
Shielding effectiveness	> 110 dB
Electrical insulation	> 2 MΩ
Ground system resistance	< 0.5 Ω
Normalised site attenuation (NSA)	< ±3.2 dB, 10 m distance, from 30 to 1000 MHz
Uniformity of field strength	Between 0 and 6 dB, from 80 to 2000 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

**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

<b>Abbreviations used in this clause:</b>	
P	Pass
NA	Not applicable
F	Fail

<b>Clause</b>	<b>List</b>	<b>Clause in FCC rules</b>	<b>Verdict</b>
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	ESS	847151/015	R&S	2012-12-28
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	2014-02-10
5	LISN	ESH3-Z5	825562/028	R&S	2013-06-14
6	Universal Radio Communication Tester	CMU200	100680	R&S	2012-09-05
7	Dual-Ridge Waveguide Horn Antenna	3115	6914	EMCO	2012-12-16
8	Test Receiver	ESU26	100376	R&S	2012-11-08
9	EMI Antenna	VULB 9163	9163-514	Schwarzbeck	2014-11-10
10	EMI Antenna	3117	00139065	ETS-Lindgren	2014-07-31
11	LISN	ESH2-Z5	829991/012	R&S	2013-04-16
12	Test Receiver	ESCI	100344	R&S	2013-03-28
13	PC	OPTIPLEX 755	3908243625	DELL	N/A
14	Monitor	E178FPc	CN-OWR979-6 4180-7AJ-D2M S	DELL	N/A
15	Printer	DeskJet D2368	TH72E12G7Q	HP	N/A
16	Keyboard	L100	CN0RH659658 907ATO140	DELL	N/A
17	Mouse	VR-301	692722550019 8	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:

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

Where

$G_A$ : Antenna factor of receive antenna

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

$P_{\text{Mea}}$ : Measurement result on receiver.

#### Set.1 Charging Mode

Frequency(MHz)	Result(dBuV/m)	$G_{\text{PL}}$ (dB)	$G_A$ (dB/m)	$P_{\text{Mea}}$ (dBuV)	Polarity
2771.800	39.0	-26.3	33.8	31.484	HORIZONTAL
2769.800	38.8	-26.3	33.8	31.335	VERTICAL
2761.600	38.8	-26.3	33.8	31.328	VERTICAL
2772.000	38.8	-26.3	33.8	31.310	VERTICAL
2770.600	38.8	-26.3	33.8	31.305	HORIZONTAL
2771.400	38.8	-26.3	33.8	31.299	VERTICAL

#### Set.2 Charging Mode

Frequency(MHz)	Result(dBuV/m)	$G_{\text{PL}}$ (dB)	$G_A$ (dB/m)	$P_{\text{Mea}}$ (dBuV)	Polarity
2776.800	38.9	-26.3	33.8	31.471	VERTICAL
2772.000	38.8	-26.3	33.8	31.348	HORIZONTAL
2779.800	38.8	-26.3	33.8	31.323	HORIZONTAL
2769.800	38.7	-26.3	33.8	31.283	VERTICAL
2775.200	38.7	-26.3	33.8	31.278	VERTICAL
2776.000	38.7	-26.3	33.8	31.264	VERTICAL

#### Set.3 USB Mode

Frequency(MHz)	Result(dBuV/m)	$G_{\text{PL}}$ (dB)	$G_A$ (dB/m)	$P_{\text{mea}}$ (dBuV)	Polarity
2995.992	40.01	-19.5	29.2	30.31	VERTICAL
3699.399	39.74	-19.5	33.4	25.84	VERTICAL
3701.403	39.70	-19.4	33.4	25.70	VERTICAL
3703.407	39.65	-19.4	33.4	25.65	VERTICAL
3697.395	39.63	-19.5	33.4	25.73	VERTICAL
3695.391	39.62	-19.5	33.4	25.72	VERTICAL

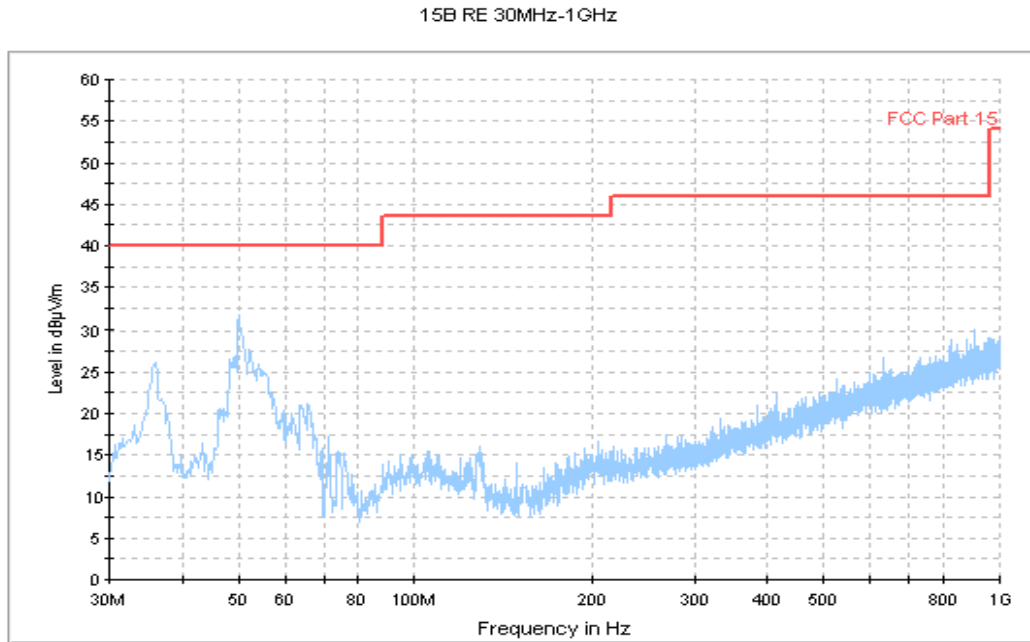


Figure A.1 Radiated Emission from 30MHz to 1GHz (Set.1, charging mode)

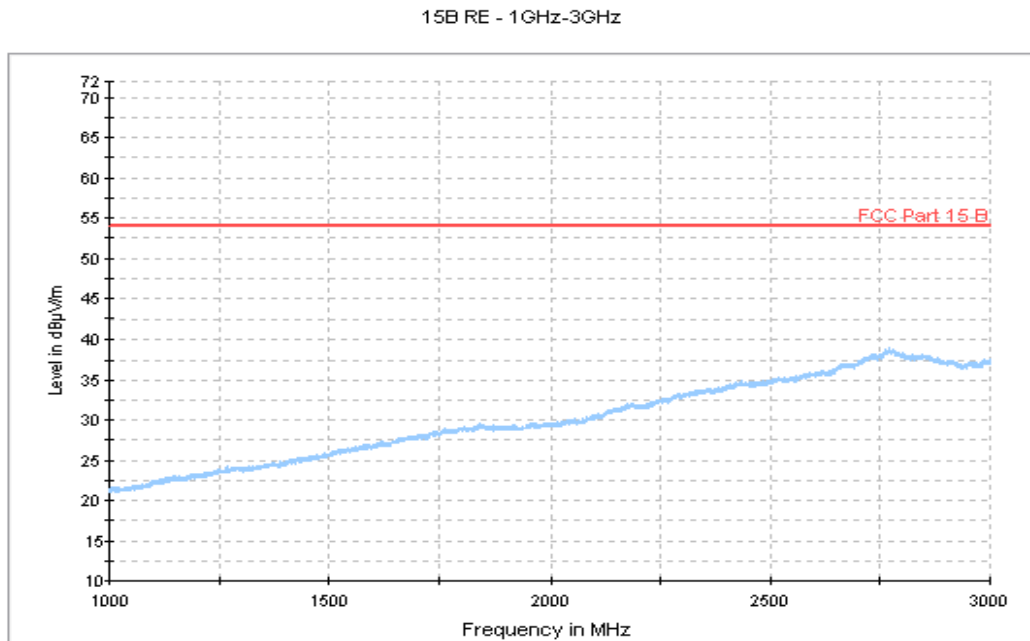
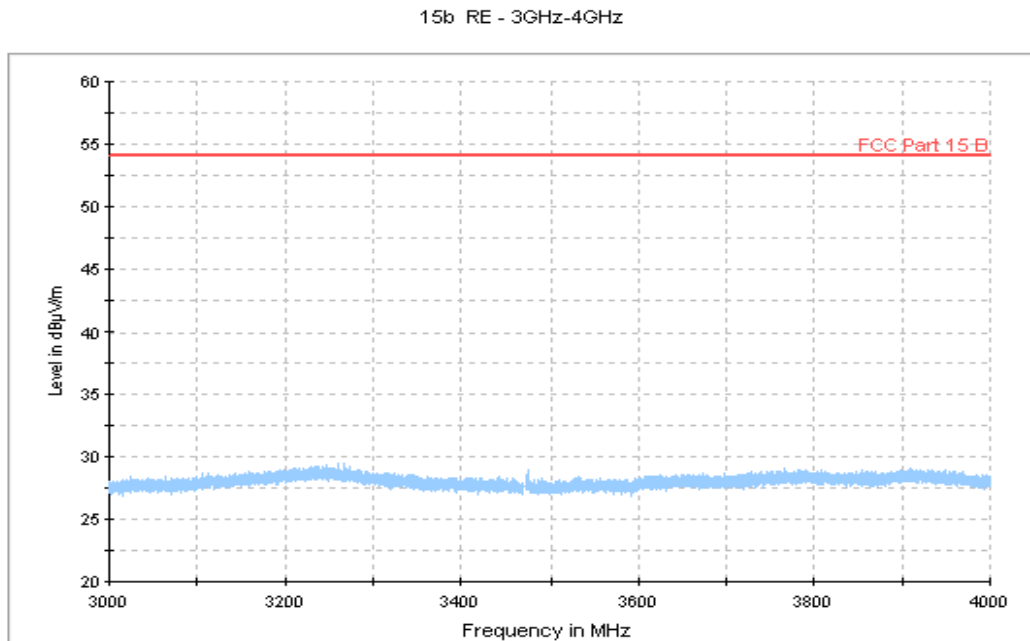
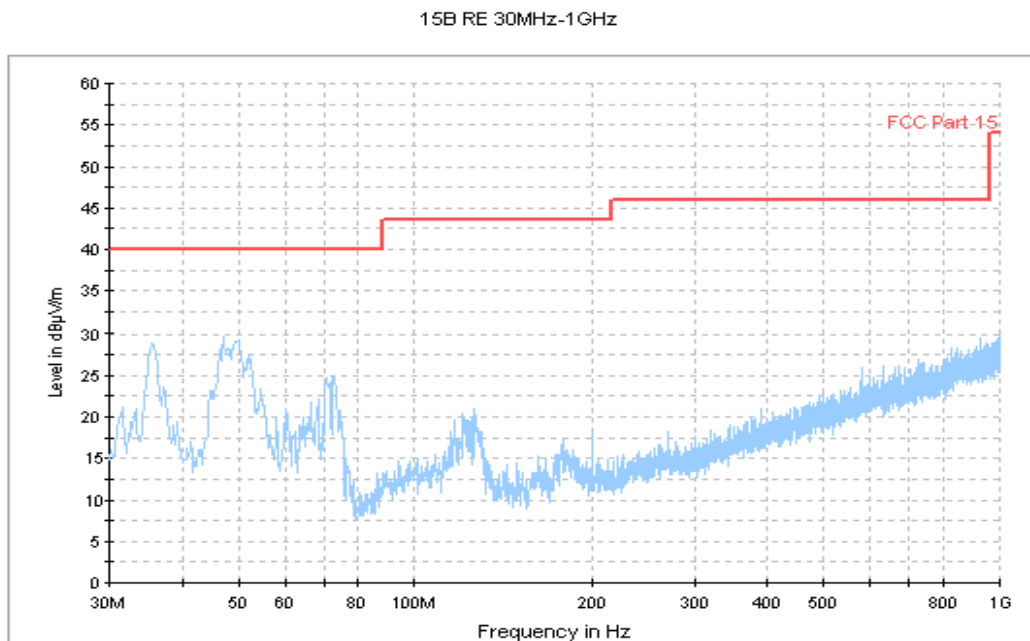


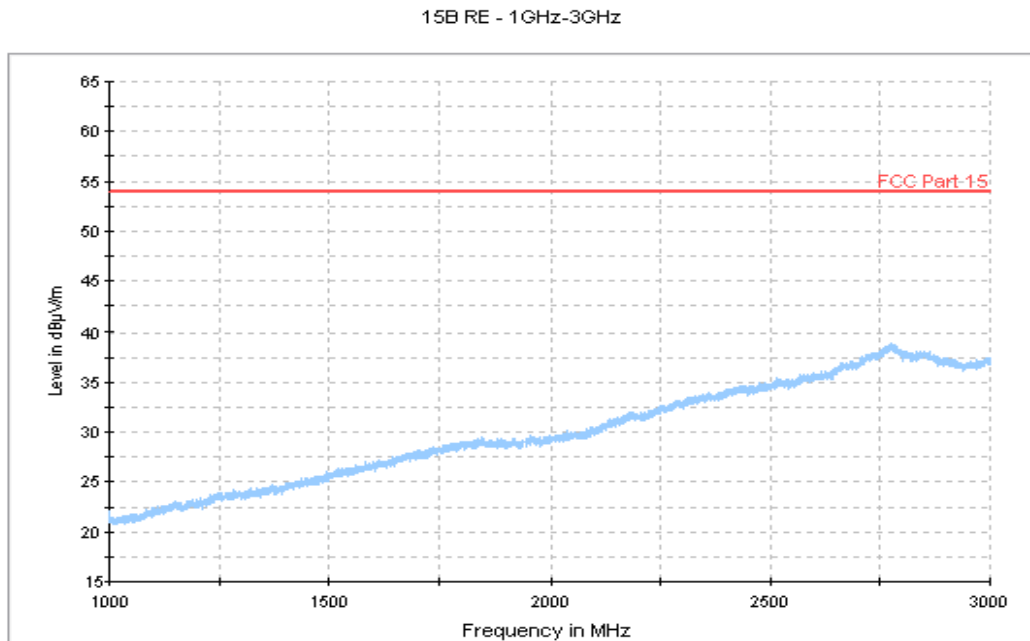
Figure A.2 Radiated Emission from 1GHz to 3GHz (Set.1, charging mode)



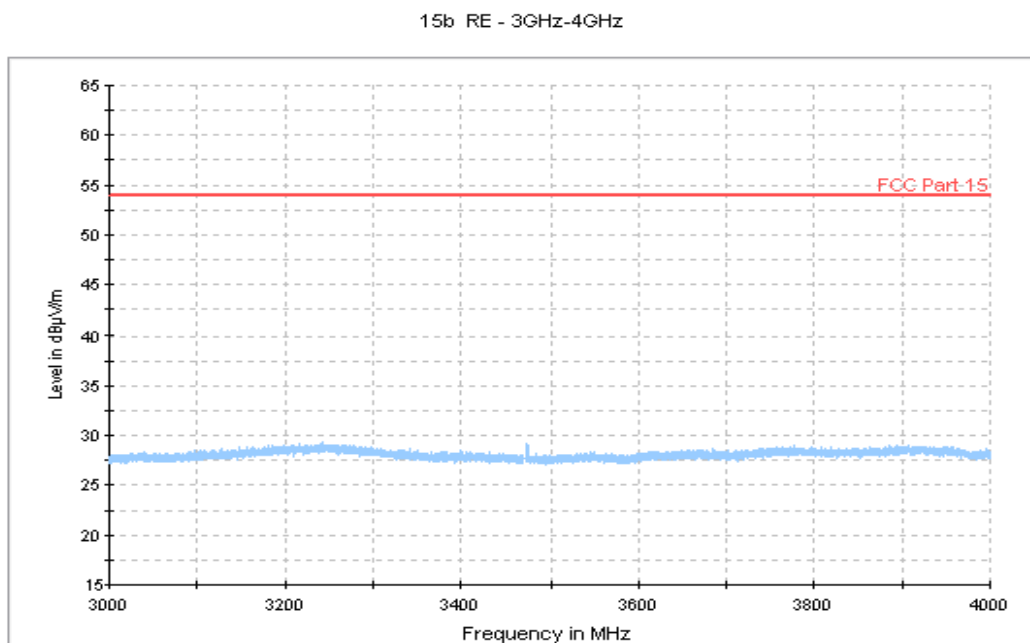
**Figure A.3 Radiated Emission from 3GHz to 4GHz (Set.1, charging mode)**



**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)**

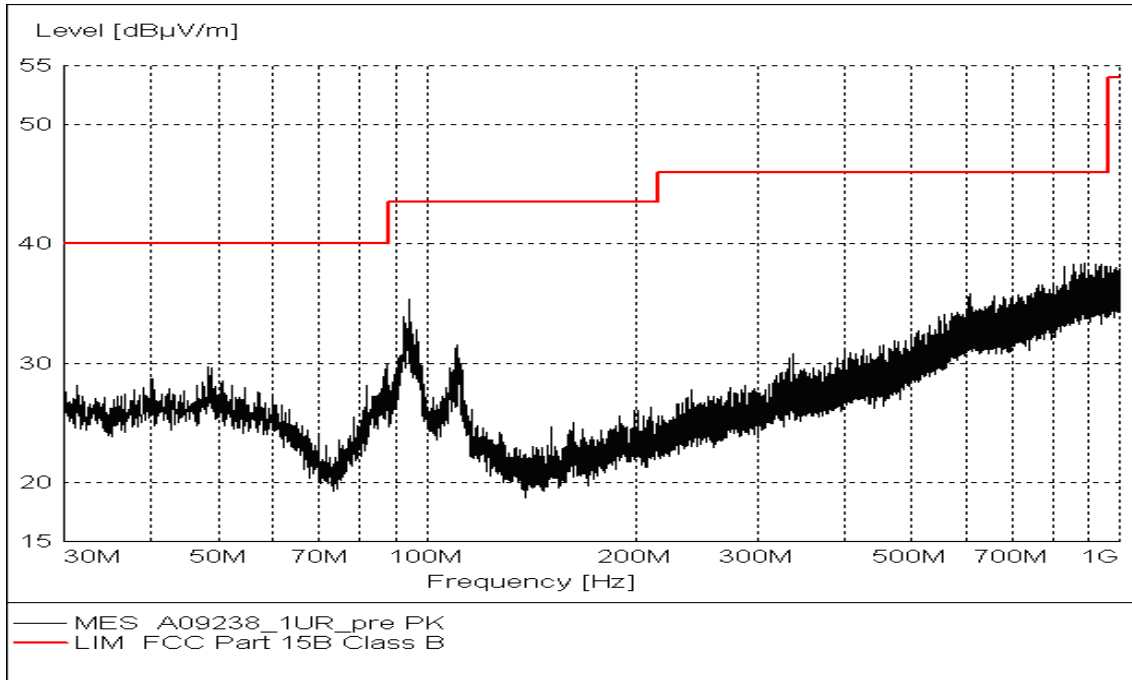


Figure A.7 Radiated Emission from 30MHz to 1GHz (Set.3, USB mode)

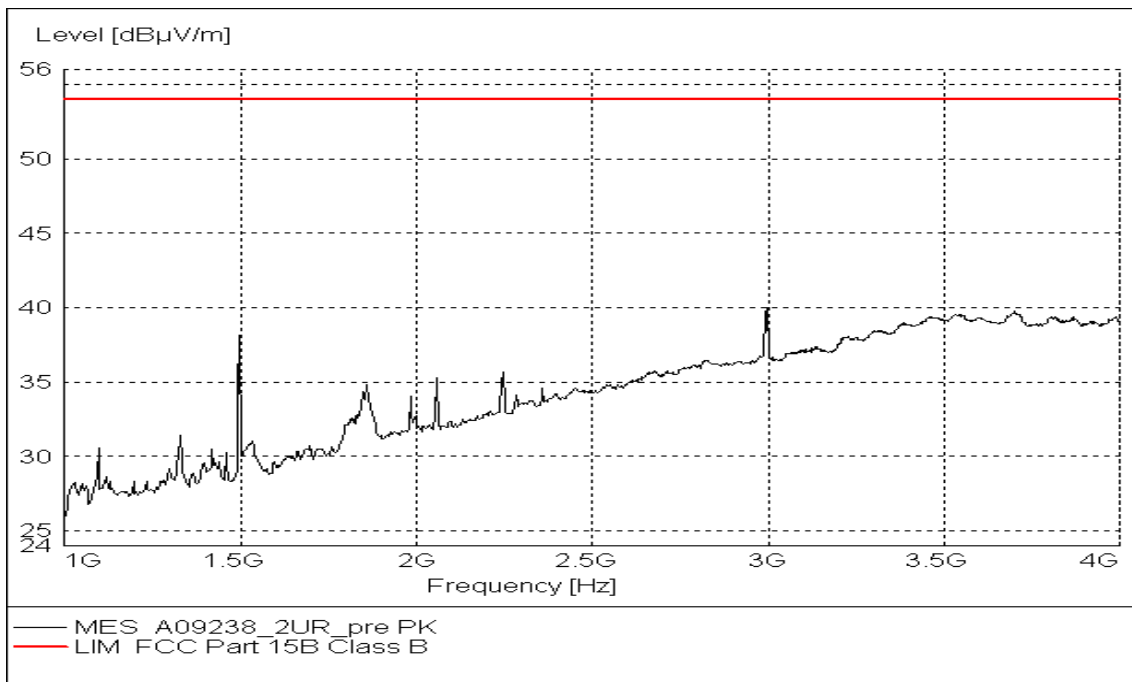


Figure A.8 Radiated Emission from 1GHz to 4GHz (Set.3, USB mode)



## 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 (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	Sweep Time(s)
9kHz	1

### A.2.5 Measurement Results

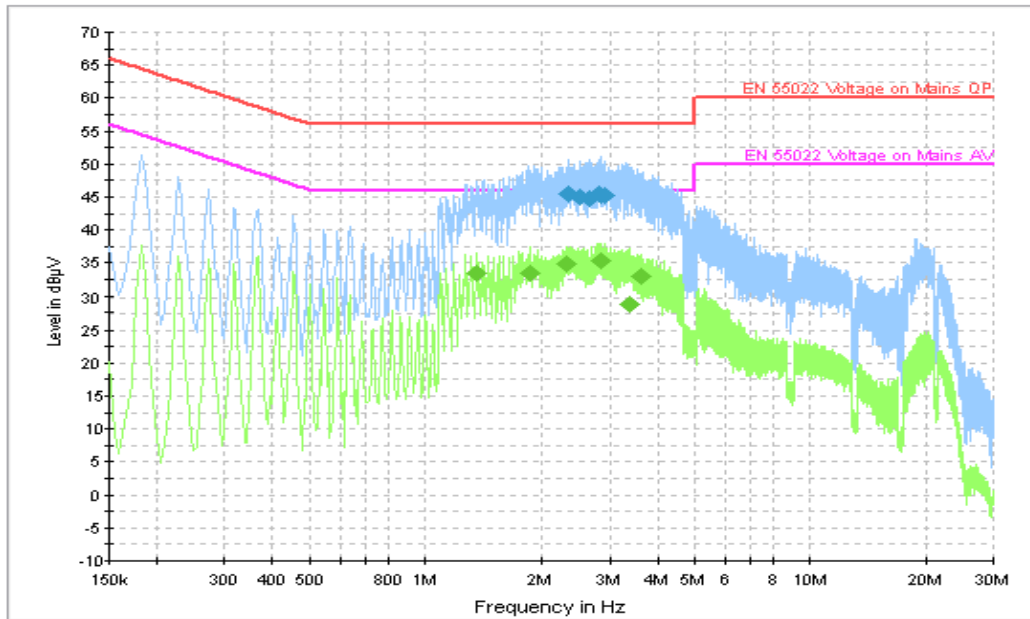


Figure A.9 Conducted Emission (Set.1, charging mode)

#### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
2.346000	45.4	GND	L1	10.0	10.6	56.0
2.508000	45.0	GND	L1	10.0	11.0	56.0
2.652000	44.9	GND	L1	10.0	11.1	56.0
2.823000	45.4	GND	L1	10.0	10.6	56.0
2.854500	45.2	GND	L1	10.0	10.8	56.0
2.895000	45.1	GND	L1	10.0	10.9	56.0

#### Final Result 2

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
1.369500	33.4	GND	L1	10.0	12.6	46.0
1.855500	33.4	GND	L1	10.0	12.6	46.0
2.301000	34.9	GND	L1	10.0	11.1	46.0
2.854500	35.3	GND	L1	10.0	10.7	46.0
3.363000	29.0	GND	L1	10.0	17.0	46.0
3.601500	32.9	GND	L1	10.0	13.1	46.0

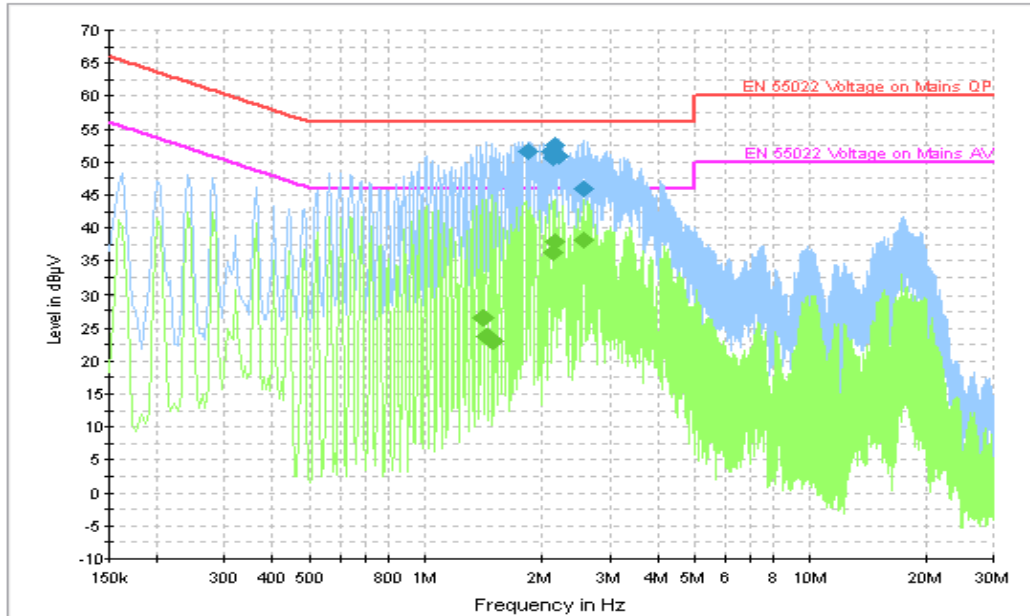


Figure A.10 Conducted Emission (Set.2, charging mode)

**Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
1.833000	51.6	GND	L1	10.0	4.4	56.0
2.112000	51.7	GND	L1	10.0	4.3	56.0
2.130000	50.6	GND	L1	10.0	5.4	56.0
2.152500	52.5	GND	L1	10.0	3.5	56.0
2.211000	51.0	GND	L1	10.0	5.0	56.0
2.571000	45.9	GND	L1	10.0	10.1	56.0

**Final Result 2**

Frequency (MHz)	CAverage (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
1.405500	26.6	GND	L1	10.0	19.4	46.0
1.446000	23.7	GND	L1	10.0	22.3	46.0
1.486500	22.9	GND	L1	10.0	23.1	46.0
2.130000	36.2	GND	L1	10.0	9.8	46.0
2.170500	37.8	GND	L1	10.0	8.2	46.0
2.571000	38.1	GND	L1	10.0	7.9	46.0

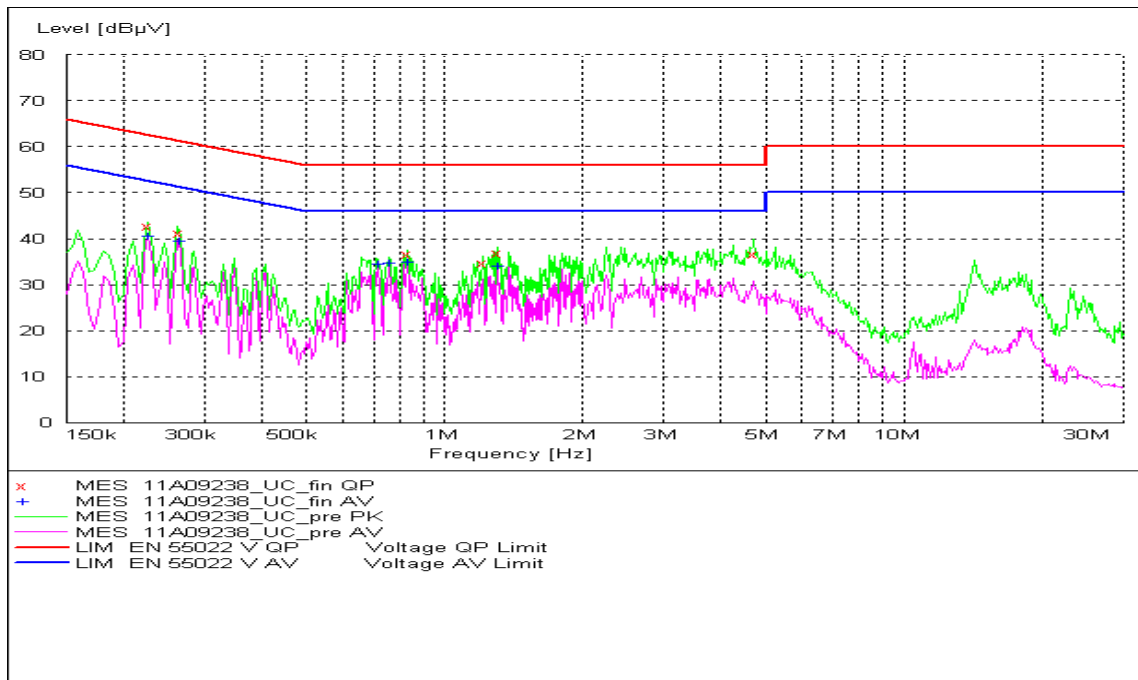


Figure A.11 Conducted Emission (Set.3, USB mode)

**MEASUREMENT RESULT: "11A09238\_UC\_fin QP"**

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.226500	42.70	10.2	63	19.9	N	GND
0.262500	41.40	10.2	61	19.9	N	GND
0.829500	36.70	10.2	56	19.3	N	GND
1.216500	34.80	10.2	56	21.2	N	GND
1.302000	37.00	10.2	56	19.0	N	GND
4.728980	36.70	10.3	56	19.3	L1	GND

**MEASUREMENT RESULT: "11A09238\_UC\_fin AV"**

Frequency MHz	Level dBµV	Transd dB	Limit dBµV	Margin dB	Line	PE
0.226500	40.70	10.2	53	11.8	N	GND
0.262500	39.50	10.2	51	11.9	N	GND
0.717000	34.60	10.2	46	11.4	N	GND
0.753000	34.80	10.2	46	11.2	N	GND
0.829500	35.10	10.2	46	10.9	N	GND
1.302000	34.20	10.2	46	11.8	N	GND

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