



# TEST REPORT

No. 2013TAR054

for

**TCT Mobile Limited**

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

**Model Name: Smart III 4 NFC**

**Marketing Name: Vodafone 975N**

**FCC ID : RAD352**

with

**Hardware Version: PIO**

**Software Version: G5B**

**Issued Date: 2013-03-06**

**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. 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

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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. GENERAL DESCRIPTION .....</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

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°C  
Relative Humidity: 20-75%

### 1.3. Project data

Testing Start Date: Feb. 7<sup>th</sup>, 2013  
Testing End Date: Mar. 2<sup>nd</sup>, 2013

### 1.4. Signature



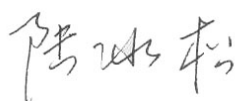
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Qu Pengfei  
(Prepared this test report)



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Sun Xiangqian  
(Reviewed this test report)



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Deputy Director of the laboratory  
(Approved this test report)

## **2. Client Information**

### **2.1. Applicant Information**

Company Name: TCT Mobile Limite  
Address /Post: 5F, C building, No. 232, Liang Jing Road ZhangJiang High-Tech Park,  
Pudong Area Shanghai, P.R. China. 201203  
City: Shanghai  
Postal Code: 201203  
Country: China  
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. 201203  
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	Smart III 4 NFC
FCC ID	RAD352
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**

<b>EUT ID*</b>	<b>SN or IMEI</b>	<b>HW Version</b>	<b>SW Version</b>
EUT3	869535010053556	PIO	G5B

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

#### **3.3. Internal Identification of AE used during the test**

<b>AE ID*</b>	<b>Description</b>	<b>SN</b>
AE1	Battery	/
AE2	Battery	/
AE3	Travel charger	/
AE4	Travel charger	/
AE5	USB cable	/
AE6	USB cable	/

##### AE1

Model	CAB32A0004C1
Manufacturer	BYD
Capacitance	1500mAh
Nominal voltage	3.7V

##### AE2

Model	CAB32A0004C2
Manufacturer	SCUD
Capacitance	1500mAh
Nominal voltage	3.7V

##### AE3

Model	CBA3001AG0C1
Manufacturer	BYD
Length of cable	5cm

##### AE4

Model	CBA3001AG0C2
Manufacturer	TenPao
Length of cable	5cm

AE5

Model	CDA6050000C1
Manufacturer	Juwei
Length of cable	100cm

AE6

Model	CDA6050000C2
Manufacturer	Shenghua
Length of cable	100cm

\*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.4	EUT3+ AE1/AE2 + AE5	USB Mode
Set.5	EUT3+ AE1/AE2 + AE3+AE5	Charger
Set.6	EUT3+ AE1/AE2 + AE4+AE5	Charger

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

**3.4. General Description**

The HSDPA/HSUPA/UMTS dual band / GSM quad bands mobile phone Vodafone 975N manufactured by TCT Mobile Limited is a variant model based on Vodafone 975 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 2013TAE038.

## **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	10-1-11 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

**Conducted chamber/ Control room** 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

**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	> 100 dB
Electrical insulation	> 2 MΩ
Ground system resistance	< 0.5 Ω
Normalised site attenuation (NSA)	< ±3.5 dB, 3 m distance, from 30 to 1000 MHz
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



## 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**

<b>NO.</b>	<b>Description</b>	<b>TYPE</b>	<b>SERIES NUMBER</b>	<b>MANUFACTURE</b>	<b>CAL DUE DATE</b>
1	LISN	ESH2-Z5	829991/012	R&S	2013-04-16
2	Test Receiver	ESCI	100344	R&S	2013-03-28
3	EMI Antenna	VULB 9163	514	Schwarzbeck	2014-11-10
4	Test Receiver	ESU26	100376	R&S	2013-11-07
5	EMI Antenna	3117	00139065	ETS-Lindgren	2014-07-31
6	Universal Radio Communication Tester	CMU200	100680	R&S	2013-09-05
7	Universal Radio Communication Tester	E5515C	MY48361083	Agilent	2013-03-16

## **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.

#### **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
960-4000	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.

#### Charging Mode Set.5

Frequency(MHz)	Result(dBuV/m)	GPL (dB)	GA (dB/m)	PMea(dBuV)	Polarity
2996.800	42.3	-29.0	33.8	37.479	HORIZONTAL
2996.400	42.3	-29.0	33.8	37.479	HORIZONTAL
2999.600	42.2	-29.0	33.8	37.379	HORIZONTAL
2990.800	42.2	-29.0	33.8	37.379	VERTICAL
2998.000	42.2	-29.0	33.8	37.379	VERTICAL
2995.400	42.2	-29.0	33.8	37.379	VERTICAL

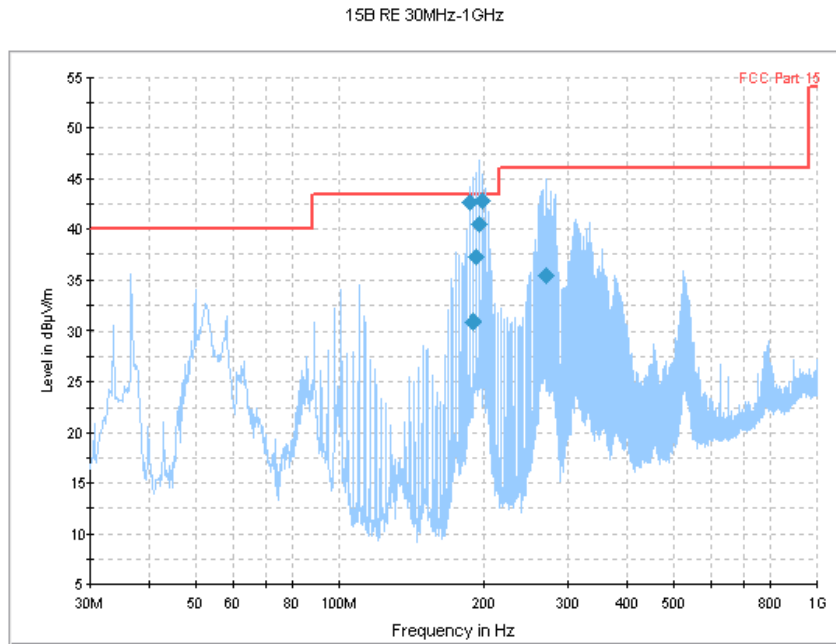
#### Charging Mode Set.6

Frequency(MHz)	Result(dBuV/m)	GPL (dB)	GA (dB/m)	PMea(dBuV)	Polarity
2875.400	45.4	-27.8	33.8	39.403	VERTICAL
2875.200	45.2	-27.8	33.8	39.203	VERTICAL
2875.000	45.0	-27.8	33.8	39.003	VERTICAL
2875.600	44.7	-27.8	33.8	38.703	VERTICAL
2572.600	44.5	-29.6	32.6	41.535	HORIZONTAL
2572.800	44.4	-29.6	32.6	41.435	HORIZONTAL

#### USB Mode Set.4

Frequency(MHz)	Result(dBuV/m)	GPL (dB)	GA (dB/m)	PMea(dBuV)	Polarity
2875.200	45.4	-27.8	33.8	39.403	VERTICAL
2875.400	45.3	-27.8	33.8	39.303	VERTICAL
2875.000	44.9	-27.8	33.8	38.903	VERTICAL
3000.000	44.9	-28.4	34.1	39.172	HORIZONTAL
2875.600	44.9	-27.8	33.8	38.903	VERTICAL
2999.800	44.6	-29.0	33.8	39.779	HORIZONTAL

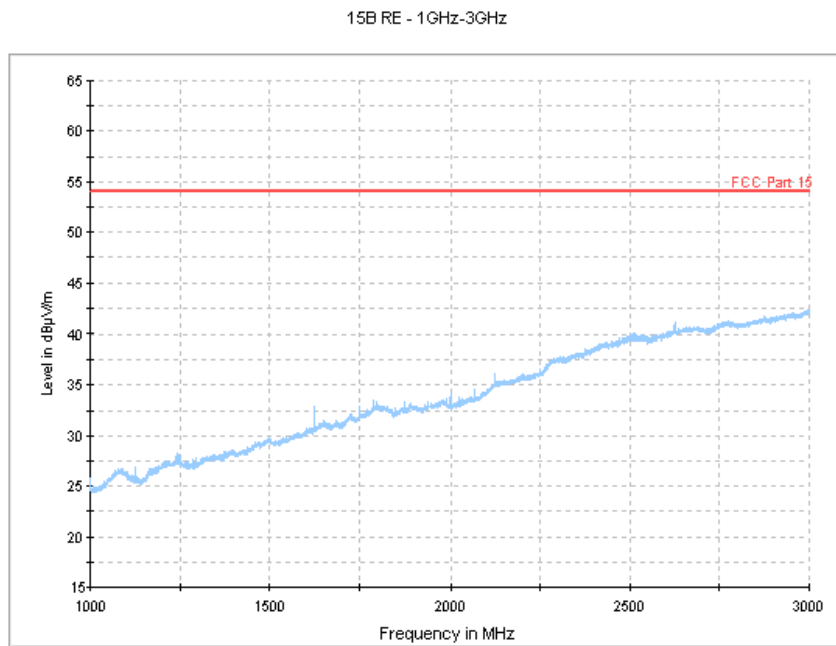
**Charging Mode Set.5**



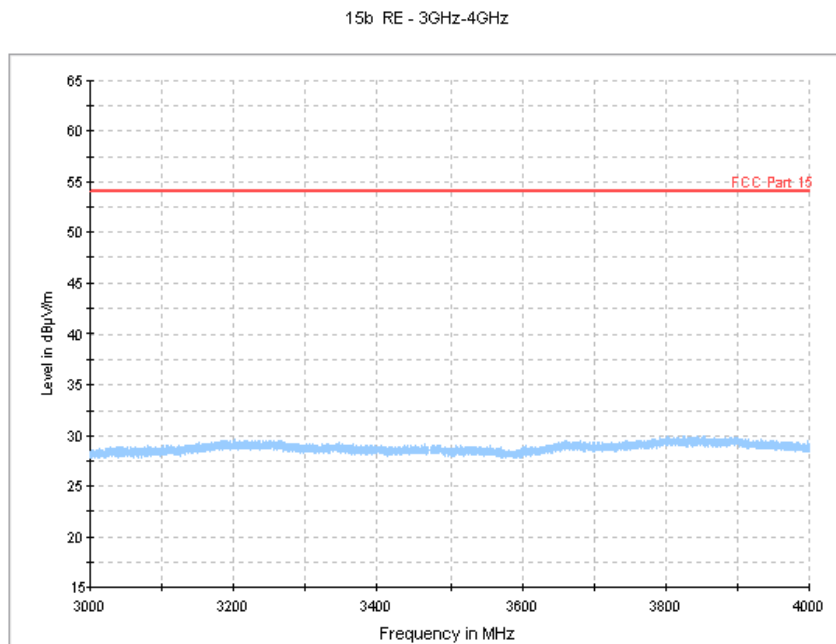
**Figure A.1 Radiated Emission from 30MHz to 1GHz**

**Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)
186.558000	42.6	100.0	V	17.0	-28.8	0.9
189.468000	30.9	110.0	V	77.0	-28.9	12.6
192.572000	37.2	100.0	V	31.0	-28.8	6.3
195.676000	40.6	100.0	V	188.0	-28.6	2.9
198.780000	42.8	100.0	V	200.0	-28.5	0.7
269.008000	35.5	100.0	H	195.0	-26.7	10.5



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



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

Charging Mode Set.6

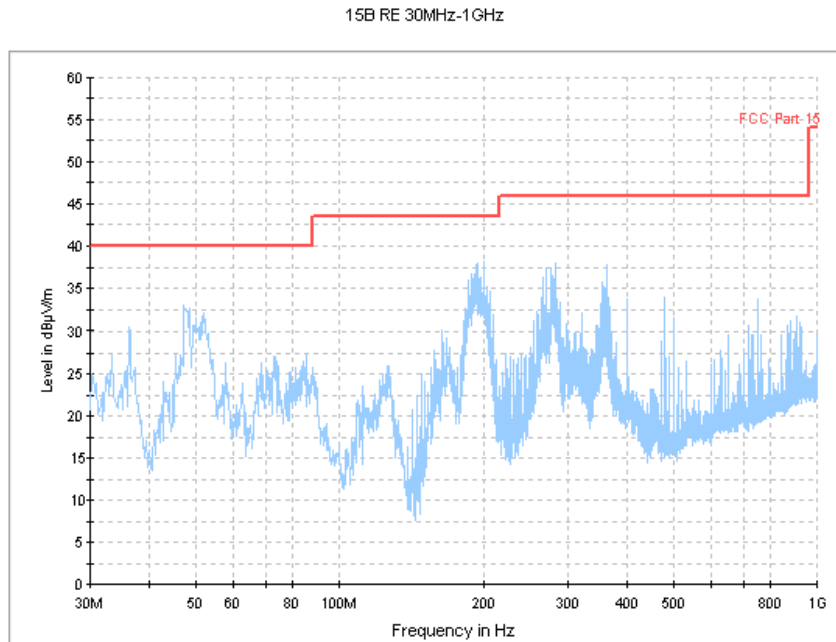


Figure A.4 Radiated Emission from 30MHz to 1GHz

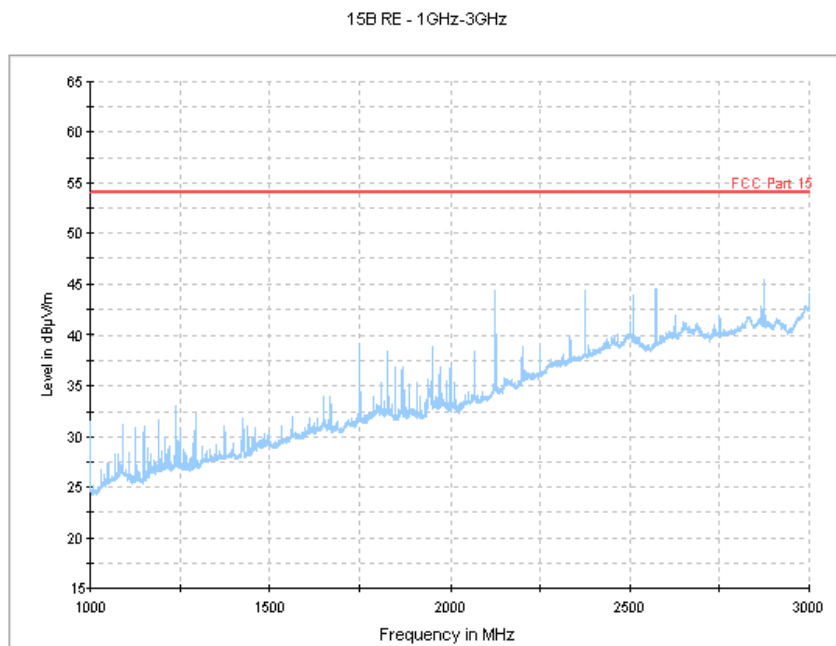
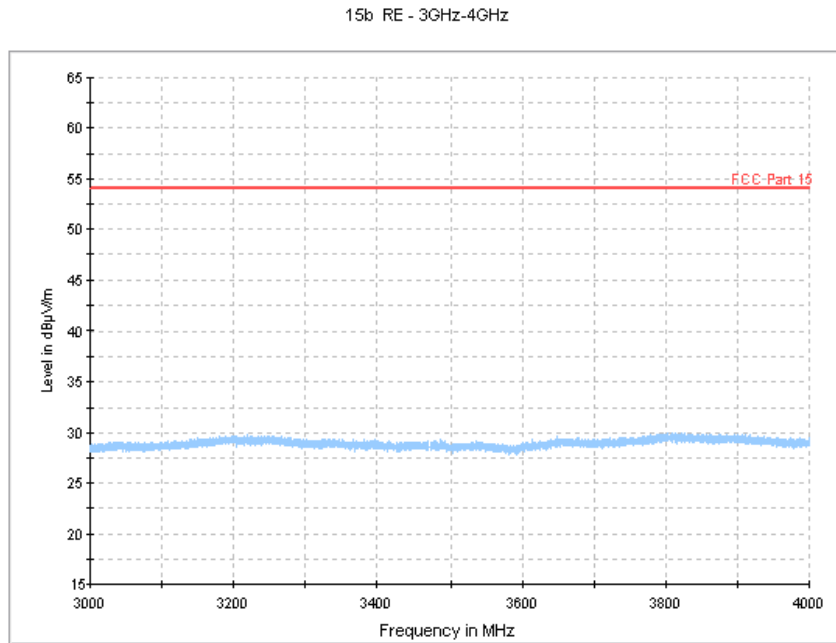
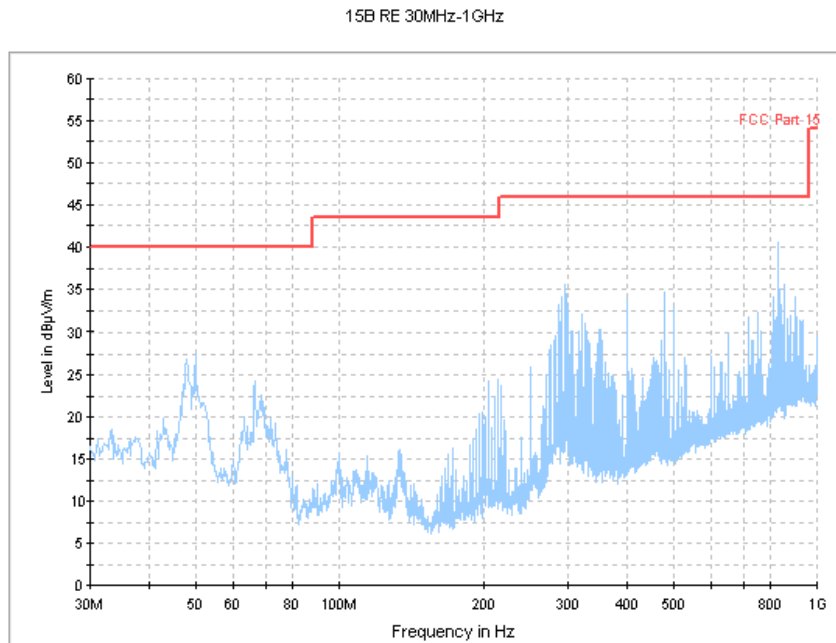


Figure A.5 Radiated Emission from 1GHz to 3GHz



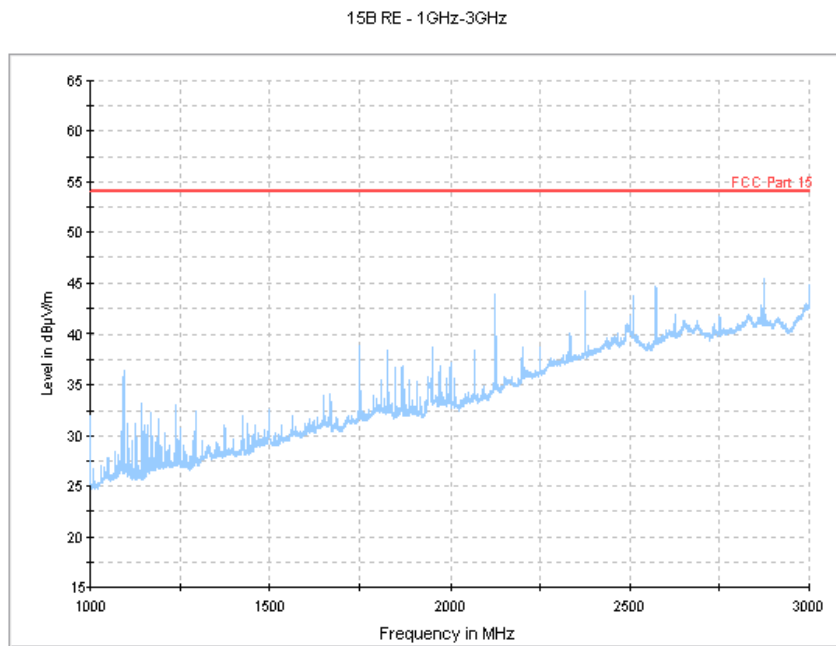
**Figure A.6 Radiated Emission from 3GHz to 4GHz**

**USB Mode Set.4**

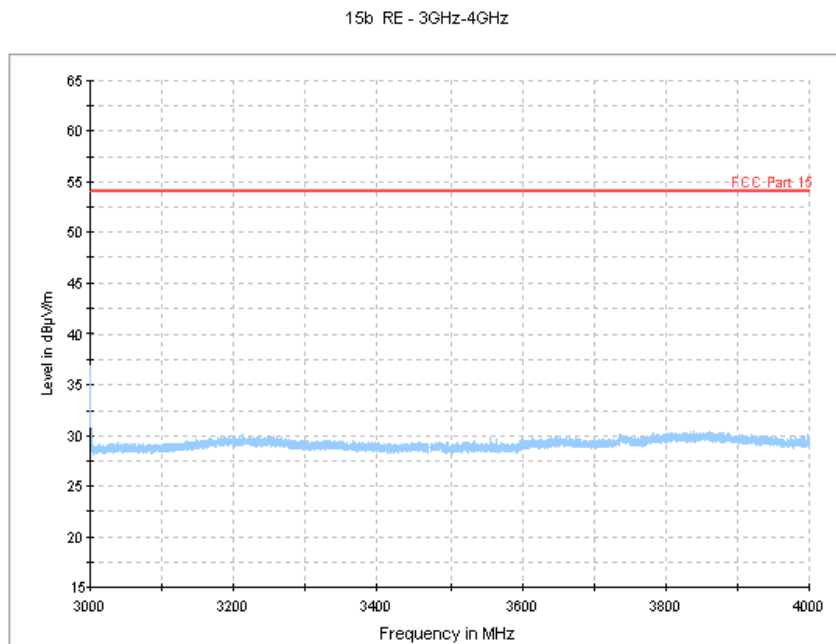


**Figure A.7 Radiated Emission from 30MHz to 1GHz**





**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 (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		

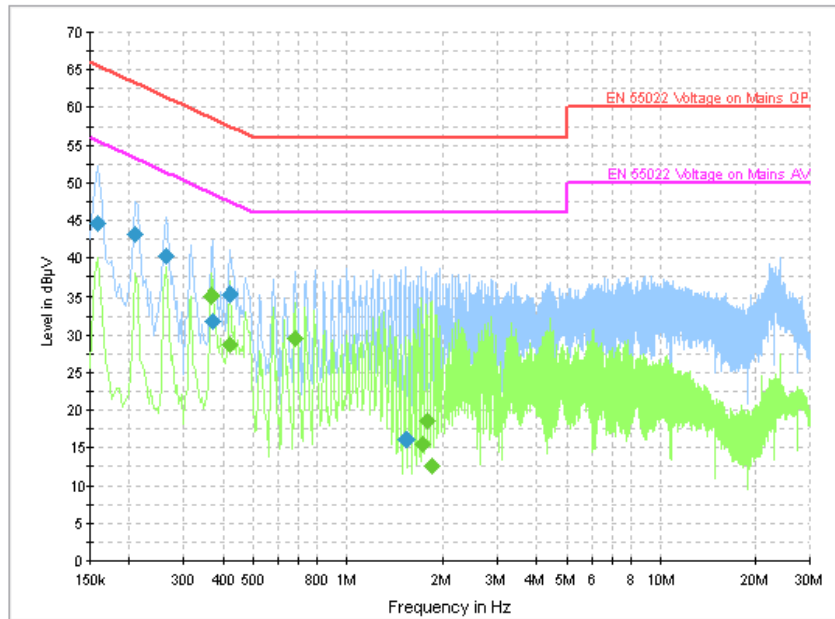
### A.2.4 Test Condition in charging mode

Voltage (V)	Frequency (Hz)
120	60

RBW	Sweep Time(s)
9kHz	1

**A.2.5 Measurement Results**  
**Charging Mode Set.5**



**Figure A.10 Conducted Emission**

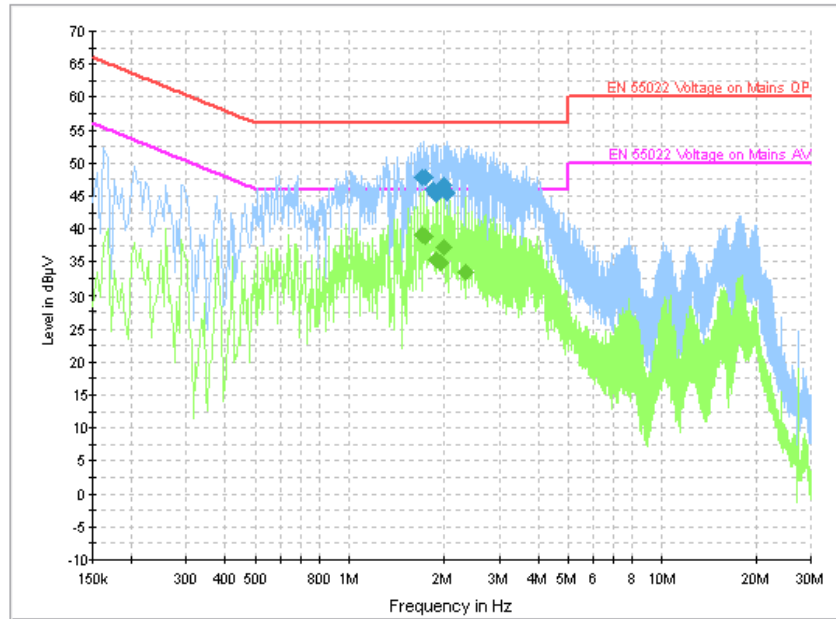
**Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.159000	44.7	GND	L1	10.0	20.9	65.5
0.208500	43.2	GND	N	10.0	20.1	63.3
0.262500	40.2	GND	L1	10.0	21.1	61.4
0.370500	31.7	GND	L1	10.0	26.8	58.5
0.420000	35.4	GND	L1	10.0	22.1	57.4
1.536000	16.1	GND	L1	10.0	39.9	56.0

**Final Result 2**

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.366000	35.1	GND	N	10.0	13.5	48.6
0.420000	28.6	GND	L1	10.0	18.8	47.4
0.681000	29.6	GND	N	10.0	16.4	46.0
1.734000	15.5	GND	N	10.0	30.5	46.0
1.783500	18.6	GND	N	10.0	27.4	46.0
1.851000	12.6	GND	L1	10.0	33.4	46.0

**Charging Mode Set.6**



**Figure A.11 Conducted Emission**

**Final Result 1**

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
1.693500	47.8	GND	L1	10.0	8.2	56.0
1.738500	47.8	GND	L1	10.0	8.2	56.0
1.833000	46.0	GND	L1	10.0	10.0	56.0
1.878000	45.1	GND	L1	10.0	10.9	56.0
1.986000	46.5	GND	L1	10.0	9.5	56.0
2.035500	45.5	GND	L1	10.0	10.5	56.0

**Final Result 2**

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
1.693500	39.2	GND	L1	10.0	6.8	46.0
1.738500	38.9	GND	L1	10.0	7.1	46.0
1.878000	35.3	GND	L1	10.0	10.7	46.0
1.954500	34.8	GND	L1	10.0	11.2	46.0
1.986000	37.1	GND	L1	10.0	8.9	46.0
2.328000	33.3	GND	L1	10.0	12.7	46.0

USB mode Set.4

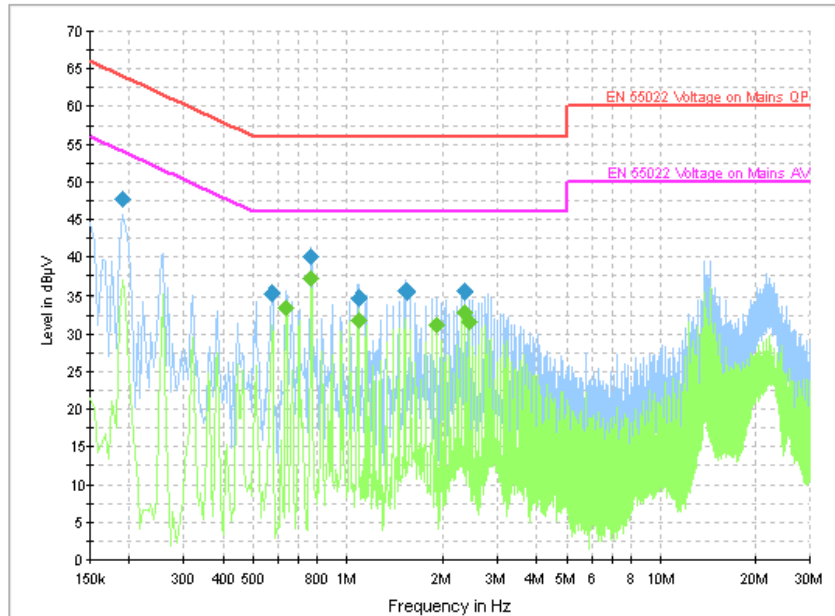


Figure A.12 Conducted Emission

Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190500	47.7	GND	N	10.0	16.3	64.0
0.573000	35.3	GND	L1	10.0	20.7	56.0
0.766500	40.0	GND	L1	10.0	16.0	56.0
1.086000	34.6	GND	N	10.0	21.4	56.0
1.531500	35.6	GND	L1	10.0	20.4	56.0
2.359500	35.5	GND	L1	10.0	20.5	56.0

Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.636000	33.5	GND	N	10.0	12.5	46.0
0.766500	37.2	GND	N	10.0	8.8	46.0
1.086000	31.7	GND	N	10.0	14.3	46.0
1.914000	31.2	GND	N	10.0	14.8	46.0
2.359500	32.8	GND	L1	10.0	13.2	46.0
2.422500	31.6	GND	L1	10.0	14.4	46.0

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