



# TEST REPORT

No. 2010TAR312

for

**ZTE CORPORATION**

**WCDMA/GSM (GPRS) Dual-Mode Digital Mobile Phone**

**Model Name: Vodafone 945**

**FCC ID : Q78-VDF945**

with

**Hardware Version: p3sC**

**Software Version: VF945-MSM7227-V01a-June072010-Vodafone-DE**

**Issued Date: 2010-08-11**

**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***

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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: 00861062304633  
Fax: 00861062304793

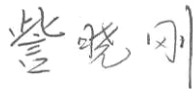
### **1.2. Testing Environment**

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

### **1.3. Project data**

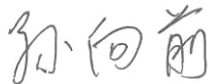
Testing Start Date: July 5,2010  
Testing End Date: July 11,2010

### **1.4. Signature**



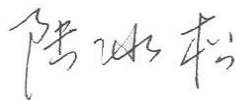
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**Zi Xiaogang**  
**(Prepared this test report)**



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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: ZTE CORPORATION  
Address /Post: ZTE Plaza, Keji Road South, Hi-Tech Industrial Park,Nanshan  
District,Shenzhen, Guangdong, 518057, P.R.China  
City: Shenzhen  
Postal Code: 518057  
Country: China  
Telephone: +86-21-68897541  
Fax: +86-21-50801070

### **2.2. Manufacturer Information**

Company Name: ZTE CORPORATION  
Address /Post: ZTE Plaza, Keji Road South, Hi-Tech Industrial Park,Nanshan  
District,Shenzhen, Guangdong, 518057, P.R.China  
City: Shenzhen  
Postal Code: 518057  
Country: China  
Telephone: +86-21-68897541  
Fax: +86-21-50801070

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

#### **3.1. About EUT**

|                     |                                                 |
|---------------------|-------------------------------------------------|
| Description         | WCDMA/GSM (GPRS) Dual-Mode Digital Mobile Phone |
| Model Name          | Vodafone 945                                    |
| FCC ID              | Q78-VDF945                                      |
| 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.

#### **3.2. Internal Identification of EUT used during the test**

| EUT ID* | SN or IMEI      | HW Version | SW Version                                |
|---------|-----------------|------------|-------------------------------------------|
| N09     | 004401782133934 | p3sC       | VF945-MSM7227-V01a-June072010-Vodafone-DE |

\*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    | Travel Adapter | /  |

##### **AE1**

|                 |                    |
|-----------------|--------------------|
| Model           | Li3715T42P3h654251 |
| Manufacturer    | ZTE                |
| Capacitance     | 1500mAh            |
| Nominal Voltage | 3.7V               |

##### **AE2**

|                   |                    |
|-------------------|--------------------|
| Model             | STC-A220501700M5-C |
| Manufacturer      | RUIDE              |
| Length of DC line | 180cm              |

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

## **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                                                                                                              | July 10, 2008<br>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** (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             | > 10 kΩ                                       |
| 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       |

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

|                          |                            |
|--------------------------|----------------------------|
| Temperature              | Min. = 15 °C, Max. = 35 °C |
| Relative humidity        | Min. =30 %, Max. = 60 %    |
| Shielding effectiveness  | > 110 dB                   |
| Electrical insulation    | > 10 kΩ                    |
| Ground system resistance | < 0.5 Ω                    |

**Conducted chamber** 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    | > 10 kΩ                    |
| Ground system resistance | < 0.5 Ω                    |

**Fully-anechoic chamber** (6.8 meters×3.08 meters×3.53 meters) 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        | > 10 kΩ                                 |
| Ground system resistance     | < 0.5 Ω                                 |
| Uniformity of field strength | Between 0 and 6 dB, from 80 to 2000 MHz |

## 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<br>NUMBER             | MANUFACTUR<br>E | CAL DUE<br>DATE |
|-----|--------------------------------------------|---------------|------------------------------|-----------------|-----------------|
| 1   | Test Receiver                              | ESS           | 847151/015                   | R&S             | 2010-10-30      |
| 2   | Test Receiver                              | ESI40         | 831564/002                   | R&S             | 2011-2-10       |
| 3   | BiLog Antenna                              | 3142B         | 9908-1403                    | EMCO            | 2011-1-15       |
| 4   | BiLog Antenna                              | VUL9163       | 9163 175                     | Schwarzbeck     | 2010-9-19       |
| 5   | Signal Generator                           | SMT06         | 831285/005                   | R&S             | 2010-12-26      |
| 6   | Signal Generator                           | SMP04         | 100070                       | R&S             | 2011-4-19       |
| 7   | LISN                                       | ESH2-Z5       | 829991/012                   | R&S             | 2010-9-13       |
| 8   | Spectrum Analyzer                          | FSU26         | 200030                       | R&S             | 2011-6-16       |
| 9   | Universal Radio<br>Communication<br>Tester | CMU200        | 100680                       | R&S             | 2010-8-22       |
| 10  | Dual-Ridge<br>Waveguide Horn<br>Antenna    | 3115          | 9906-5827                    | EMCO            | 2011-3          |
| 11  | Dual-Ridge<br>Waveguide Horn<br>Antenna    | 3116          | 2663                         | EMCO            | 2011-3          |
| 12  | Dual-Ridge<br>Waveguide Horn<br>Antenna    | 3116          | 2661                         | EMCO            | 2011-3          |
| 13  | Climatic chamber                           | SH-241        | 92003546                     | ESPEC           | 2011-5-14       |
| 14  | PC                                         | OPTIPLEX 755  | 3908243625                   | DELL            | N/A             |
| 15  | Monitor                                    | E178FPc       | CN-OWR979-641<br>80-7AJ-D2MS | DELL            | N/A             |
| 16  | Printer                                    | DeskJet D2368 | TH72E12G7Q                   | HP              | N/A             |
| 17  | Keyboard                                   | L100          | CN0RH65965890<br>7ATOI40     | DELL            | N/A             |
| 18  | 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, the gain of the preamplifier, the cable los.

The measurement results are obtained as described below:

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

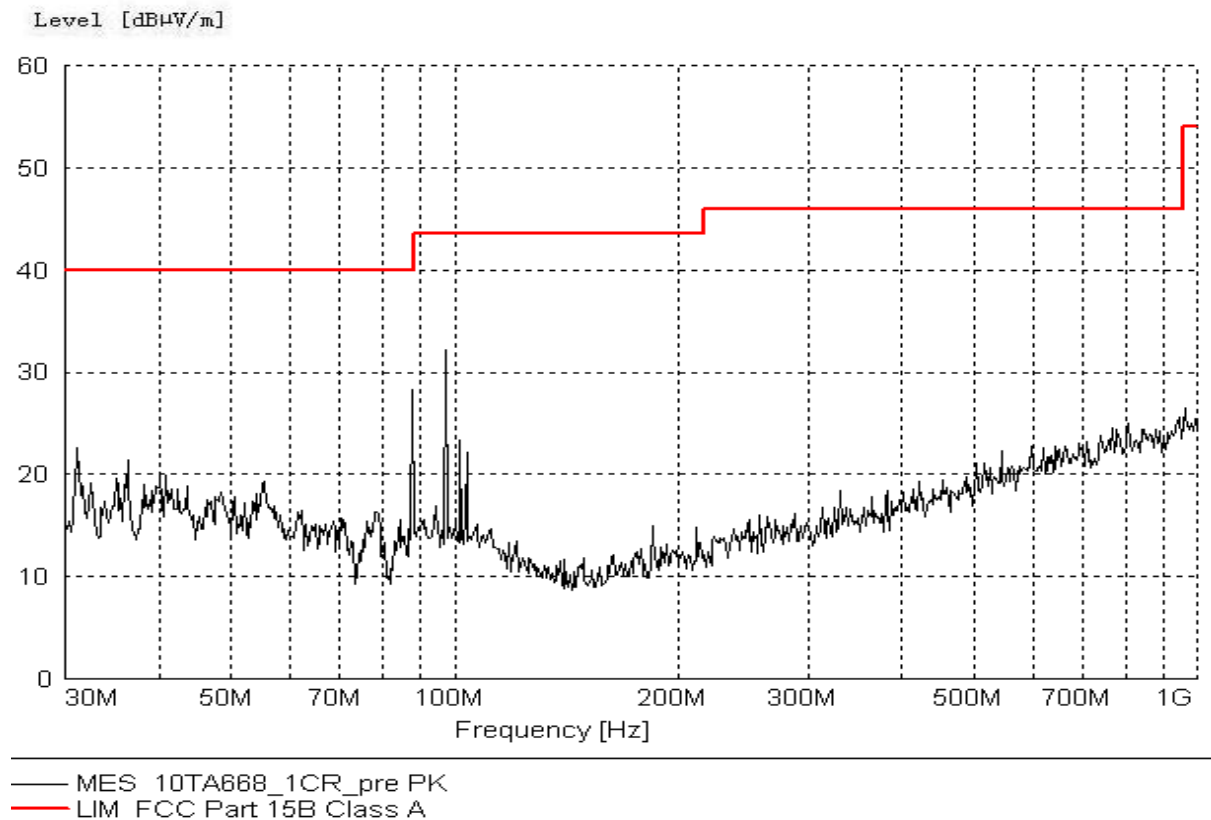
#### Charging Mode

| Frequency(MHz) | Result(dBuV/m) | ARpl (dB) | PMea(dBuV/m) | Polarity   |
|----------------|----------------|-----------|--------------|------------|
| 3703.407       | 50.37          | 14        | 36.37        | VERTICAL   |
| 3673.347       | 50.25          | 13.8      | 36.45        | HORIZONTAL |
| 3579.158       | 50.13          | 13.8      | 36.33        | VERTICAL   |
| 3513.026       | 50.12          | 13.8      | 36.32        | VERTICAL   |
| 3945.892       | 49.94          | 13.6      | 36.34        | VERTICAL   |
| 3695.391       | 49.93          | 13.9      | 36.03        | HORIZONTAL |

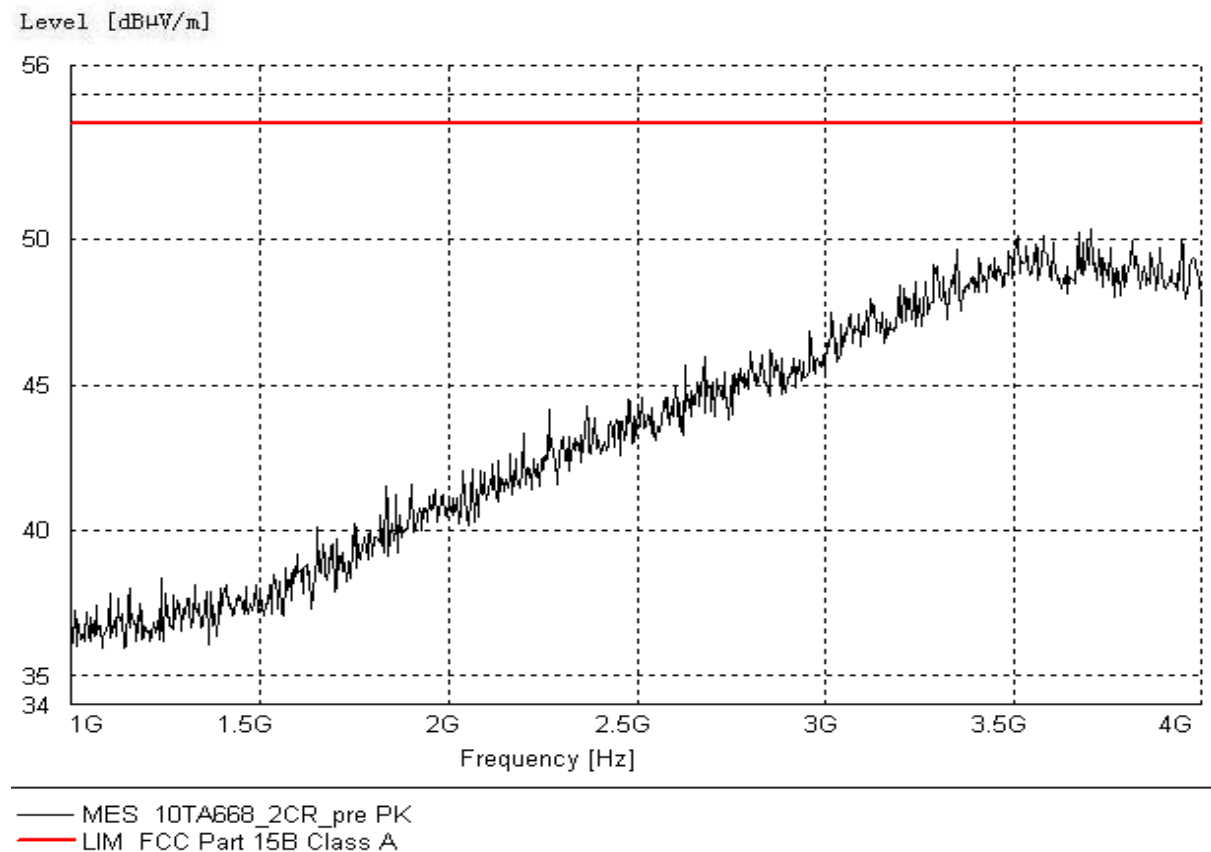
#### USB Mode

| Frequency(MHz) | Result(dBuV/m) | ARpl (Db) | Pmea(dBuV/m) | Polarity   |
|----------------|----------------|-----------|--------------|------------|
| 2058.116       | 51.71          | 7.3       | 44.41        | VERTICAL   |
| 2062.124       | 51.6           | 7.3       | 44.3         | VERTICAL   |
| 2054.108       | 51.19          | 7.3       | 43.89        | HORIZONTAL |
| 3699.399       | 50.38          | 13.9      | 36.48        | VERTICAL   |
| 3595.19        | 50.27          | 13.8      | 36.47        | VERTICAL   |
| 3641.283       | 50.07          | 13.7      | 36.37        | VERTICAL   |

### Charging Mode

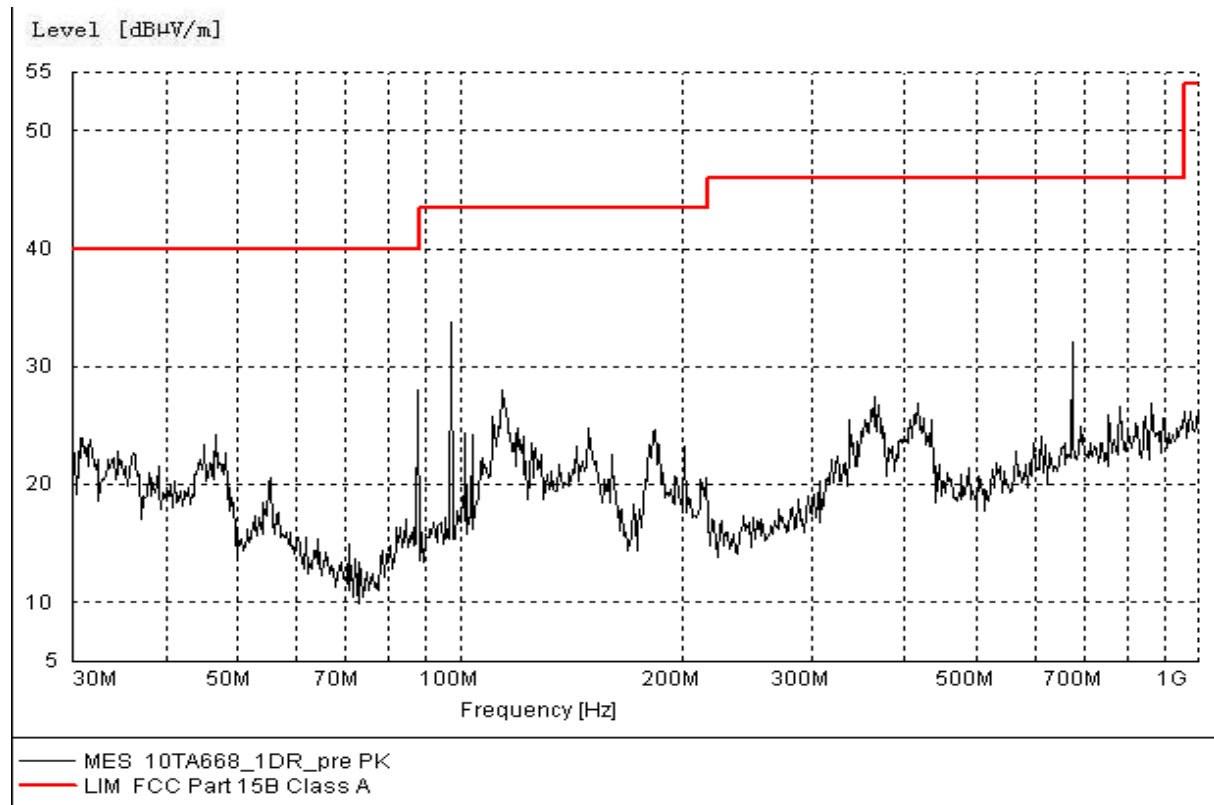


**Figure A.1 Radiated Emission from 30MHz to 1GHz**

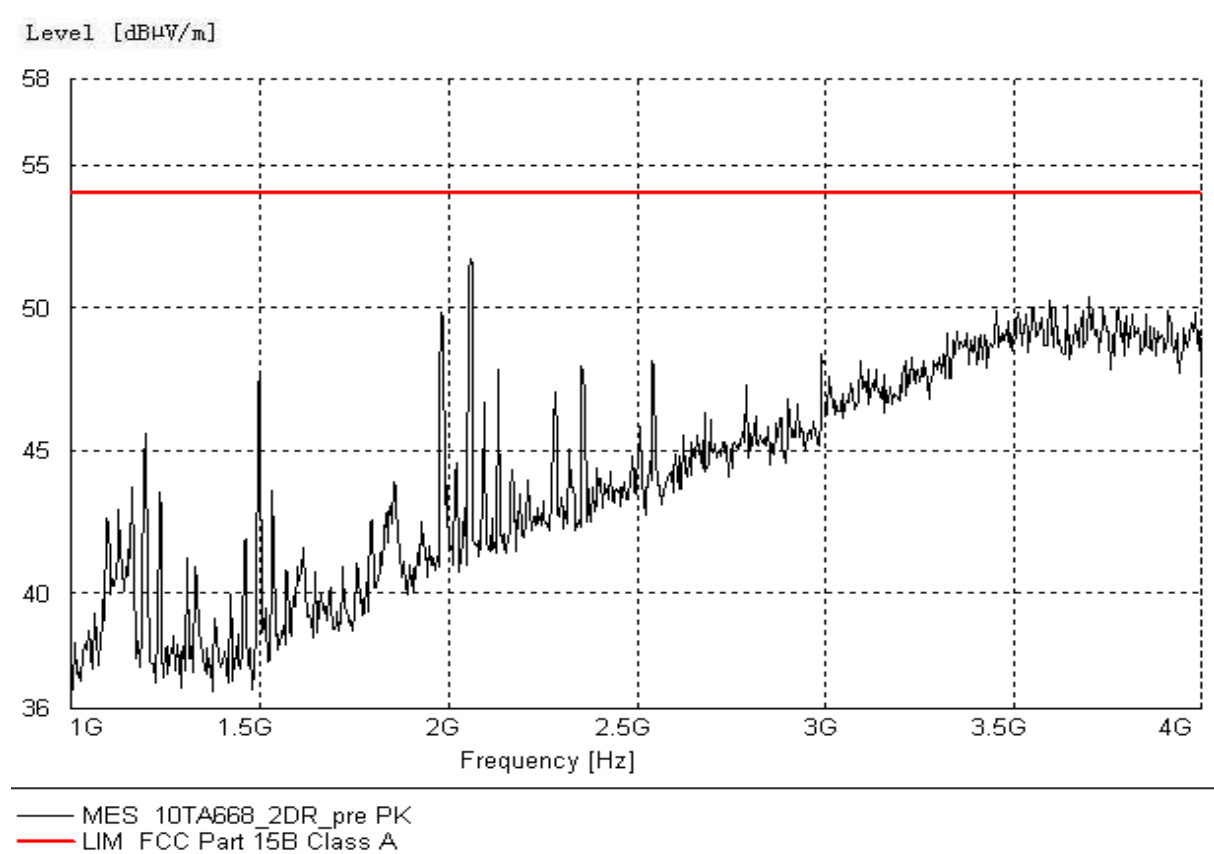


**Figure A.2 Radiated Emission from 1GHz to 4GHz**

### USB Mode



**Figure A.3 Radiated Emission from 30MHz to 1GHz**



**Figure A.4 Radiated Emission from 1GHz 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 150kHz to 30MHz 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

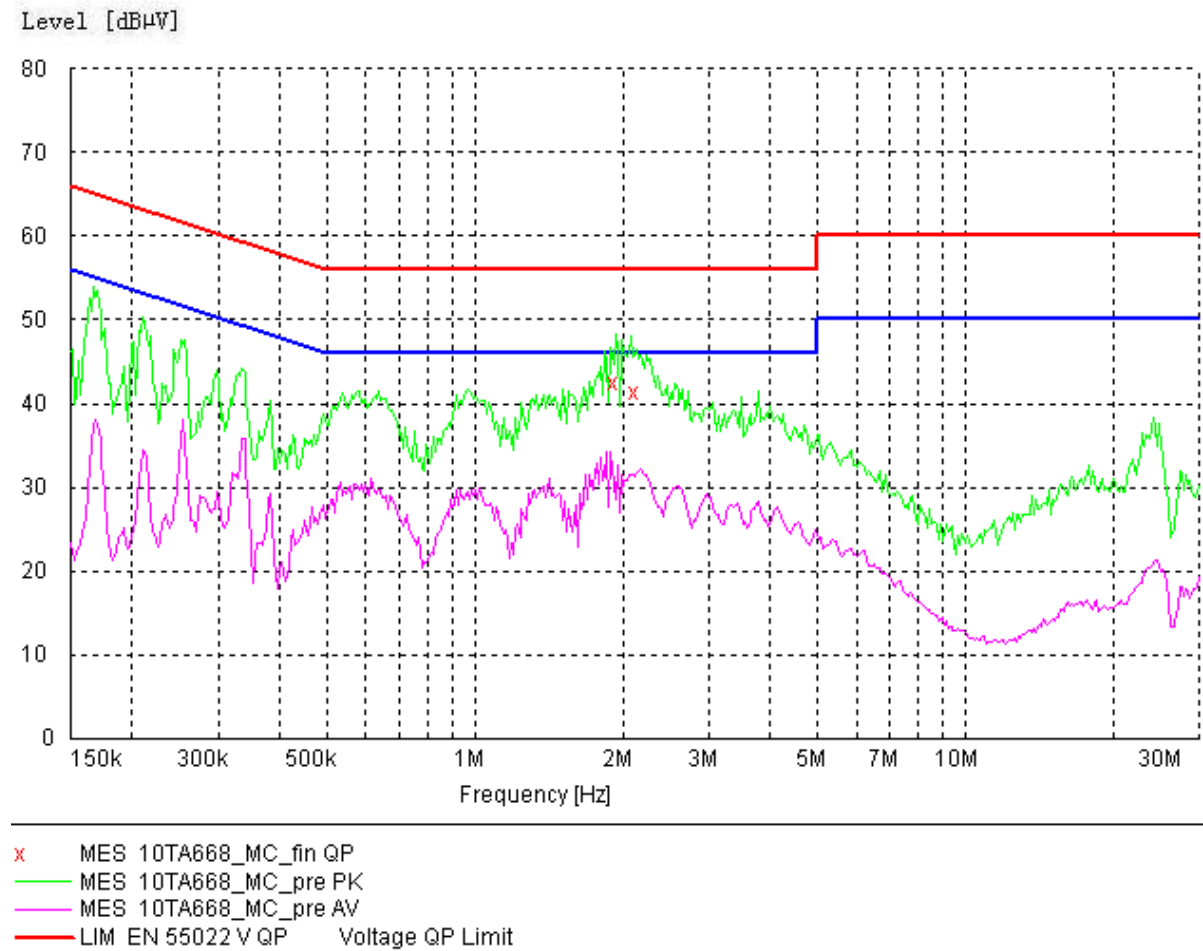
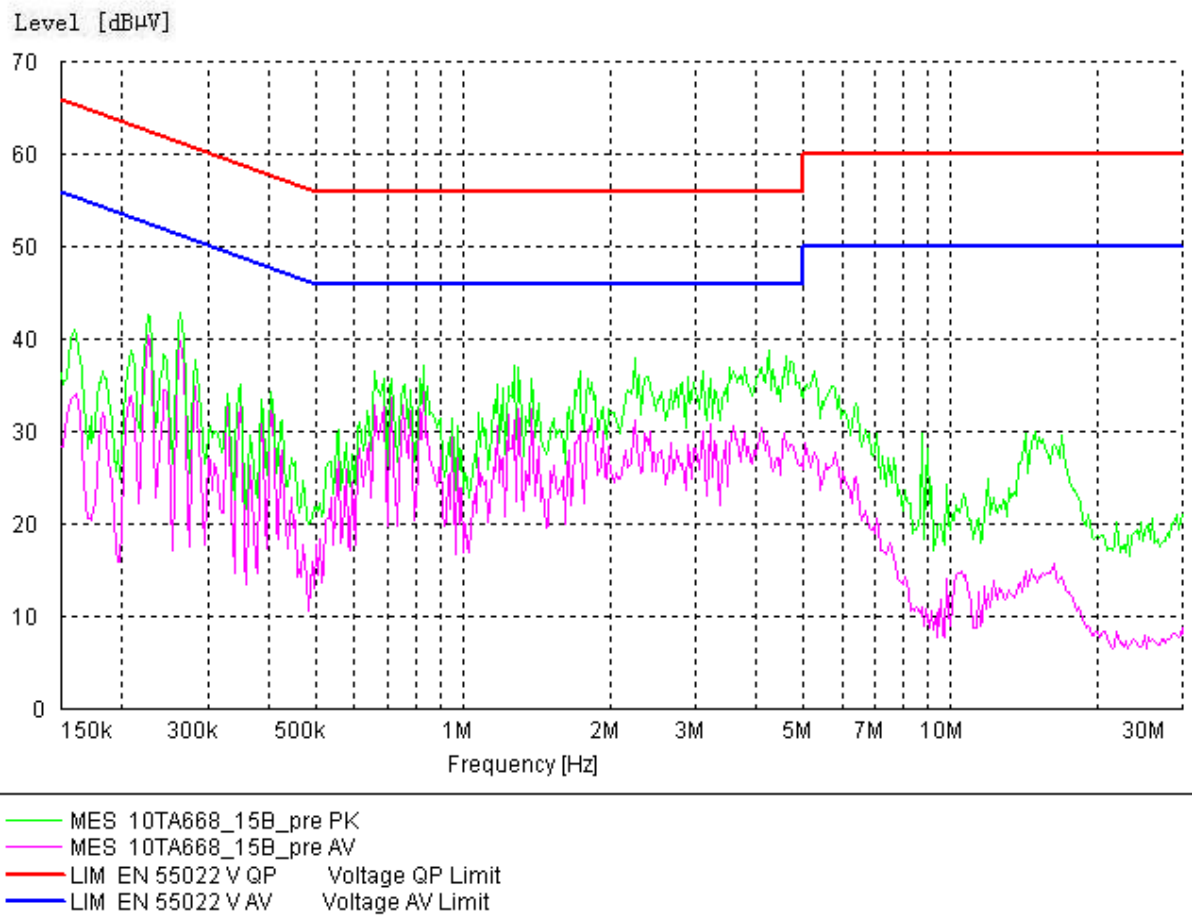


Figure A.5 Conducted Emission

##### MEASUREMENT RESULT: "10TA668\_MC\_fin QP"

| Frequency | Level | Transd | Limit | Margin | Line | PE  |
|-----------|-------|--------|-------|--------|------|-----|
| MHz       | dBμV  | dB     | dBμV  | dB     |      |     |
| 1.935015  | 42.50 | 10.1   | 56    | 13.5   | L1   | GND |
| 2.144271  | 41.30 | 10.1   | 56    | 14.7   | L1   | GND |

# USB Mode



**Figure A.6 Conducted Emission**

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