



# TEST REPORT

No. 2013TAR242

for

**ZTE Corporation**

**HSPA+Wireless Router**

**Model Name: MF25A**

**FCC ID: Q78-MF25A**

with

**Hardware Version: PCBMF25AV1.0.0**

**Software Version: CR\_MF25AV1.0.0B04**

**Issued Date: Mar. 20<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:**

***DAkks accreditation (DIN EN ISO/IEC 17025): No. D-PL-12123-01-01***

***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 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

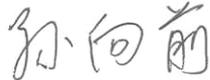
Testing Start Date: Mar. 2<sup>nd</sup>, 2013  
Testing End Date: Mar. 2<sup>nd</sup>, 2013

### 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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Lu Bingsong  
Deputy Director of the laboratory  
(Approved this test report)

## **2. Client Information**

### **2.1. Applicant Information**

Company Name: ZTE Corporation  
Address /Post: #68 Zijin Hua Road, Nanjing, Jiangsu Province, P. R. China  
City: Nan Jing  
Postal Code: 210012  
Country: China  
Telephone: +86-25-52878232  
Fax: +86-25-68897541

### **2.2. Manufacturer Information**

Company Name: ZTE Corporation  
Address /Post: #68 Zijin Hua Road, Nanjing, Jiangsu Province, P. R. China  
City: Nan Jing  
Postal Code: 210012  
Country: China  
Telephone: +86-25-52878232  
Fax: +86-25-68897541

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

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

Description	HSPA+Wireless Router
Model Name	MF25A
FCC ID	Q78-MF25A
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
EUT3	869842010003544	PCBMF25AV1.0.0	CR_MF25AV1.0.0B04

\*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	Travel adapter	/

AE1

Model	STC-A2O12015C55-A
Manufacturer	ZTE
Length of 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.3	EUT3+ AE1	/

## **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

**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	> 110 dB
Electrical insulation	> 2 MΩ
Ground system resistance	< 1Ω
Normalised site attenuation (NSA)	< ±3.5 dB, 3m distance, from 30 to 1000 MHz
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

**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
Site voltage standing-wave ratio ( $S_{VSWR}$ )	Between 0 and 6 dB, from 1GHz to 18GHz

**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	ESU26	100376	R&S	2013-11-07
2	EMI Antenna	VULB 9163	9163-514	Schwarzbeck	2014-11-10
3	EMI Antenna	3117	00139065	ETS-Lindgren	2014-07-31
4	LISN	ESH2-Z5	829991/012	R&S	2013-04-16
5	Test Receiver	ESCI	100344	R&S	2013-03-28
6	Universal Radio Communication Tester	CMU200	102228	R&S	2013-07-07
7	Universal Radio Communication Tester	E5515C	MY48361083	Agilent	2014-03-16
8	Laptop	T400	R8-CMYVG	DELL	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 (connected with and with out laptop) 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:**

During the test the LAN port of EUT is connected to a laptop via a cat-5 UTP cable. A PING program is used to set up a communication link between EUT and laptop. Meanwhile the EUT is under GSM1900MHz idle mode and its WLAN function is switched off

#### **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	120kHz IF Bandwidth	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

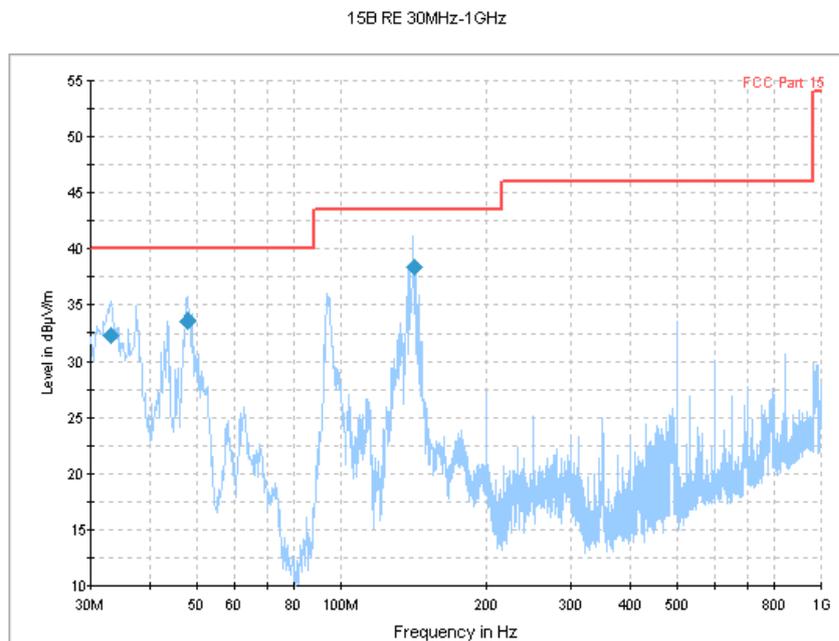
$G_A$ : Antenna factor of receive antenna

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

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

### Set.3

Frequency(MHz)	Result(dBuV/m)	$G_{\text{PL}}$ (dB)	$G_A$ (dB/m)	$P_{\text{Mea}}$ (dBuV)	Polarity
3000.000	42.3	-28.4	34.1	36.572	VERTICAL
2999.000	42.3	-29.0	33.8	37.479	HORIZONTAL
2998.200	42.3	-29.0	33.8	37.479	HORIZONTAL
2995.200	42.3	-29.0	33.8	37.479	VERTICAL
2993.000	42.2	-29.0	33.8	37.379	VERTICAL
2996.800	42.2	-29.0	33.8	37.379	VERTICAL

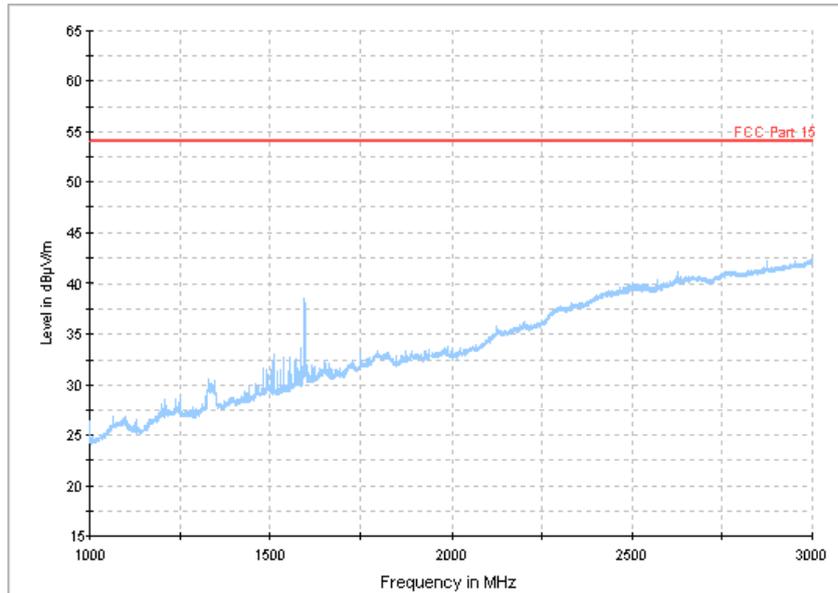


**Figure A.1 Radiated Emission from 30MHz to 1GHz (Set.3)**

**Final Result 1**

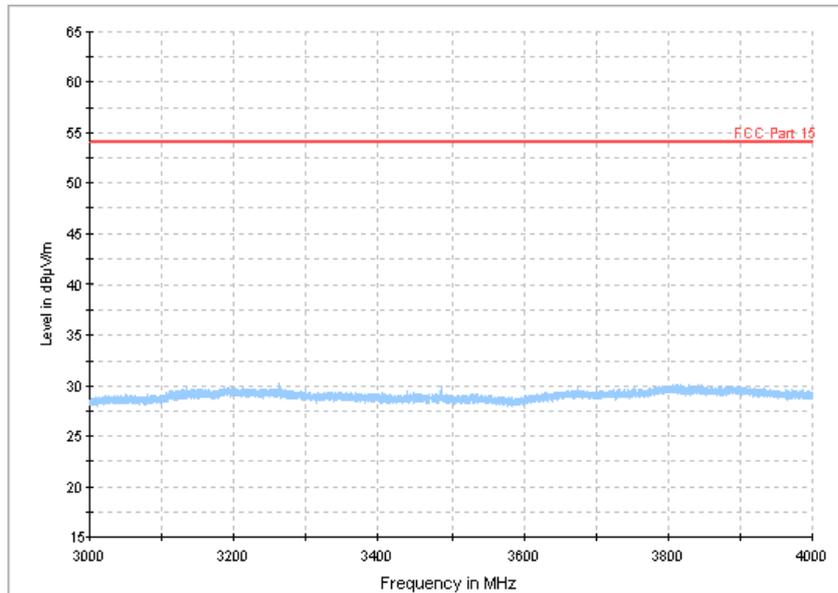
Frequency (MHz)	QuasiPeak (dBμV/m)	Height (cm)	Polarization	Azimuth (deg)	Corr. (dB)	Margin (dB)
33.104000	32.4	100.0	V	41.0	-23.9	7.6
47.848000	33.6	107.0	V	7.0	-23.7	6.4
141.162000	38.3	100.0	V	-32.0	-30.5	5.2

15B RE - 1GHz-3GHz



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

15b RE - 3GHz-4GHz



**Figure A.3 Radiated Emission from 3GHz to 4GHz (Set.3)**

## 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:

During the test the LAN port of EUT is connected to a laptop via a cat-5 UTP cable. A PING program is used to set up a communication link between EUT and laptop. Meanwhile the EUT is under GSM1900MHz idle mode and its WLAN function is switched off

### 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

IF Bandwidth	Sweep Time(s)
9kHz	1

### A.2.5 Measurement Results

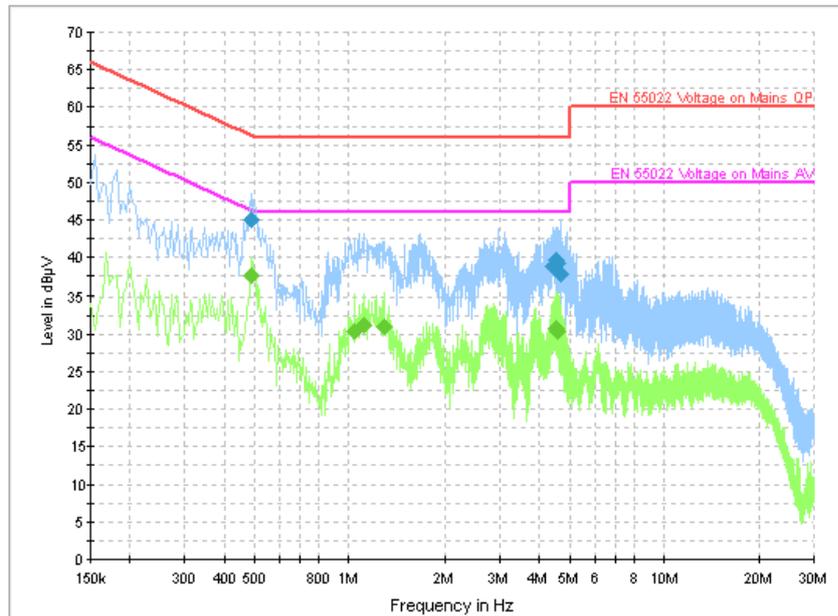


Figure A.4 Conducted Emission (Set.3)

#### Final Result 1

Frequency (MHz)	QuasiPeak (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.487500	44.9	GND	N	10.0	11.3	56.2
4.407000	38.9	GND	N	10.0	17.1	56.0
4.510500	39.6	GND	N	10.0	16.4	56.0
4.537500	39.7	GND	N	10.0	16.3	56.0
4.596000	39.2	GND	N	10.0	16.8	56.0
4.654500	37.7	GND	L1	10.0	18.3	56.0

#### Final Result 2

Frequency (MHz)	Average (dBµV)	PE	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.487500	37.7	GND	N	10.0	8.5	46.2
1.041000	30.4	GND	N	10.0	15.6	46.0
1.113000	31.1	GND	L1	10.0	14.9	46.0
1.288500	31.1	GND	N	10.0	14.9	46.0
4.510500	30.8	GND	N	10.0	15.2	46.0
4.569000	30.3	GND	N	10.0	15.7	46.0

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