TEST REPORT

No. 2011TAR050

for

ZTE Corporation

DC-HSPA+ USB Modem

Model Name: MF680

with

FCC ID : Q78-MF680

IC ID: 5200A-MF680

Hardware Version: d37A

Software Version: M8220B-SCAQDCZD-2.1.33T

Issued Date: 2011-03-11

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 , Fax:+86(0)10-62304633 Email:welcome@emcite.com. www.emcite.com

CONTENTS

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:	00861062304633

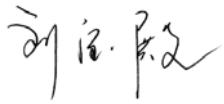
1.2. Testing Environment

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

1.3. Project data

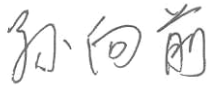
Testing Start Date:	Mar 02, 2011
Testing End Date:	Mar 11, 2011

1.4. Signature



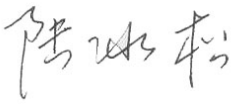
Liu Baodian

(Prepared this test report)



Sun Xiangqian

(Reviewed this test report)



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	DC-HSPA+ USB Modem
Model Name	MF680
FCC ID	Q78-MF680
IC ID	5200A-MF680
Frequency	GSM 850MHz; PCS 1900MHz;WCDMA band Ⅱ/V
Antenna	Internal

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
EUT1	35385304000003	d37A	M8220B-SCAQDCZD-2.1.33T

*EUT 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.

Reference	Title	Version
FCC Part 15, Subpart B	Radio frequency devices	July 10, 2008 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
ICES-003	Spectrum Management and Telecommunications Policy Interference-Causing Equipment Standard Digital Apparatus	Issue 4, Feb. 2004

5. LABORATORY ENVIRONMENT

Semi-anechoic chamber (23 meters×17meters×10meters) did not exceed following limits along the EMC testing:

Temperature	Min. = 15 ℃, Max. = 30 ℃
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 ℃, Max. = 35 ℃
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 ℃, Max. = 30 ℃
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 ℃, Max. = 30 ℃
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	Clause in IC rules	Verdict
1	Radiated Emission	15.109(a)	Section6 Section 7.1	P
2	Conducted Emission	15.107(a)	Section6 Section 7.1	P

7. Test Equipments Utilized

NO.	Description	TYPE	SERIES NUMBER	MANUFACTURE	CAL DUE DATE
1	Test Receiver	ESCI	100344	R&S	2012-03-12
2	Test Receiver	ESCI	100766	R&S	2011-12-06
3	Test Receiver	ESI40	831564/002	R&S	2012-02-12
4	BiLog Antenna	VUL9163	9163-302	Schwarzbeck	2012-02-10
5	Signal Generator	SMB100A	102063	R&S	2012-03-05
6	LISN	ESH2-Z5	829991/012	R&S	2011-04-20
7	Universal Radio Communication Tester	CMU200	100680	R&S	2011-09-05
8	Dual-Ridge Waveguide Horn Antenna	3115	6914	EMCO	2012-01-18
9	Rod Antenna	HFH2-Z6	100043	R&S	2011-09-05
10	Laptop	T400	L3-DCA6X 09/06	Lenovo	N/A

ANNEX A: MEASUREMENT RESULTS

A.1 Radiated Emission (§15.109(a))

Reference

FCC: CFR Part 15.109(a)

IC: ICES-003 Section 5.5.

A.1.1 Method of measurement

The field strength of radiated emissions from the unintentional radiator (USB mode of EUT) 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 EUT is operating in the USB mode. During the test EUT is connected to a USB interface of Laptop . The model of the Laptop is Lenovo T400, and the serial number of the PC is L3-DCA6X 09/06. The software is used to let the Laptop keep on copying data to EUT, 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 and the path loss.

The measurement results are obtained as described below:

Result = P_{Mea} + F_A + G_{PL}

Where

F_A: Receive Antenna Factor

G_{PL}: Cable Loss

P_{Mea}: The measurement result on receiver.

USB Mode

Frequency(MHz)	Result(dBuV/m)	G_{PL} (dB)	F_A (dB)	P_{mea}(dBuV/m)	Polarity
3995.992	51.75	-19.3	33.4	37.65	VERTICAL
3476.954	51.68	-19.7	31.2	40.18	HORIZONTAL
3605.21	51.61	-19.6	33.4	37.81	VERTICAL
3923.848	51.56	-19.8	33.4	37.96	HORIZONTAL
3380.762	51.42	-19.5	31.2	39.72	HORIZONTAL
3857.715	51.41	-19.6	33.4	37.61	VERTICAL

USB Mode

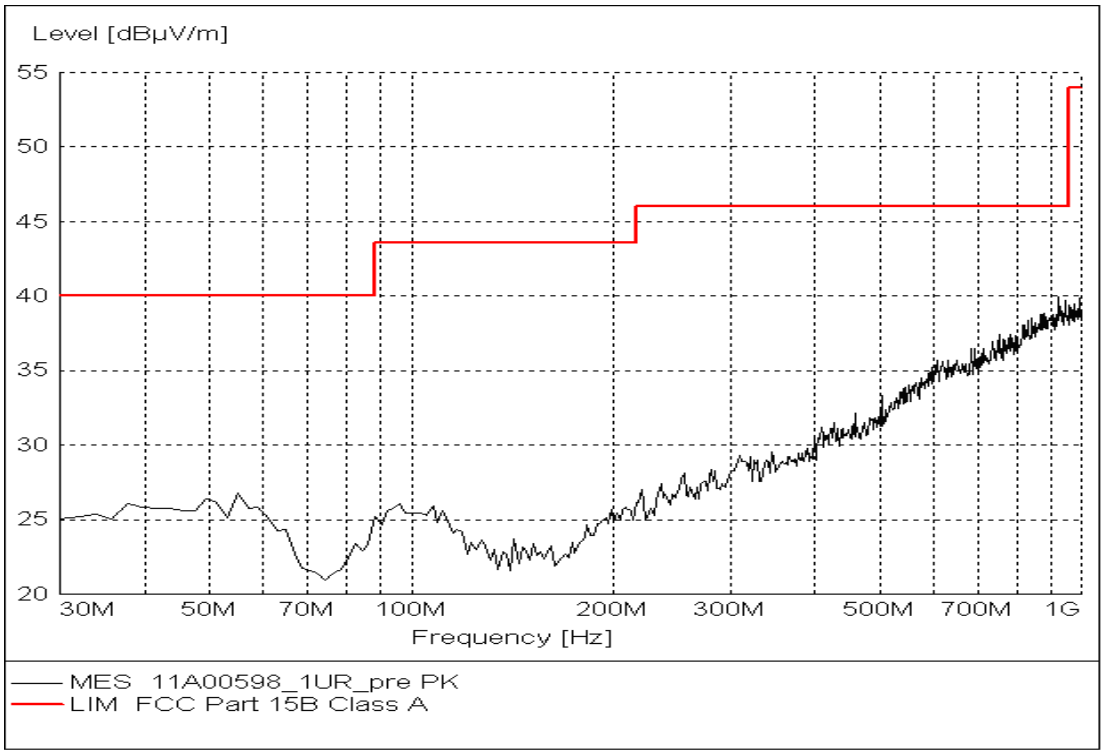


Figure A.1 Radiated Emission from 30MHz to 1GHz

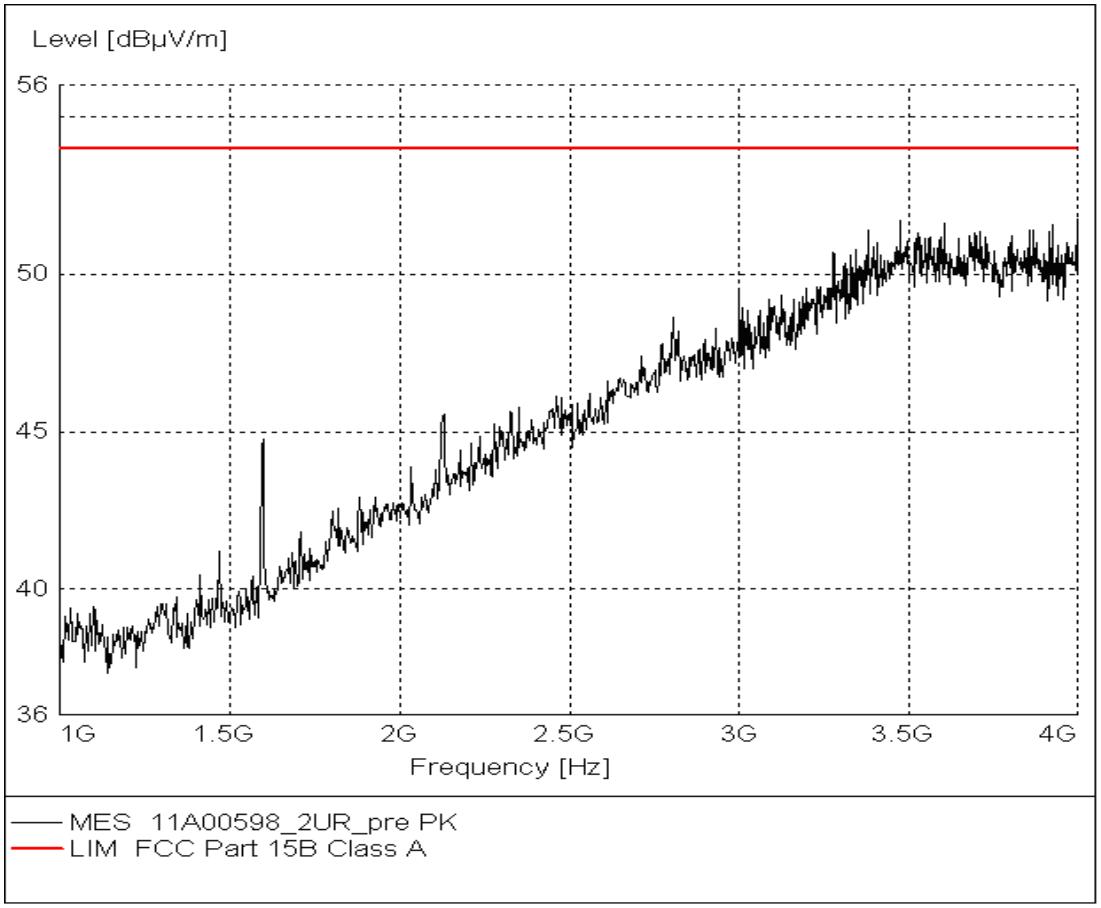


Figure A.2 Radiated Emission from 1GHz to 4GHz

A.2 Conducted Emission (§15.107(a))

Reference

FCC: CFR Part 15.107(a)

IC: ICES-003 Section 5.3.

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 EUT is operating in the USB mode. During the test EUT is connected to a USB interface of Laptop . The model of the Laptop is Lenovo T400, and the serial number of the PC is L3-DCA6X 09/06. The software is used to let the PC keep on copying data toEUT, 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

USB Mode

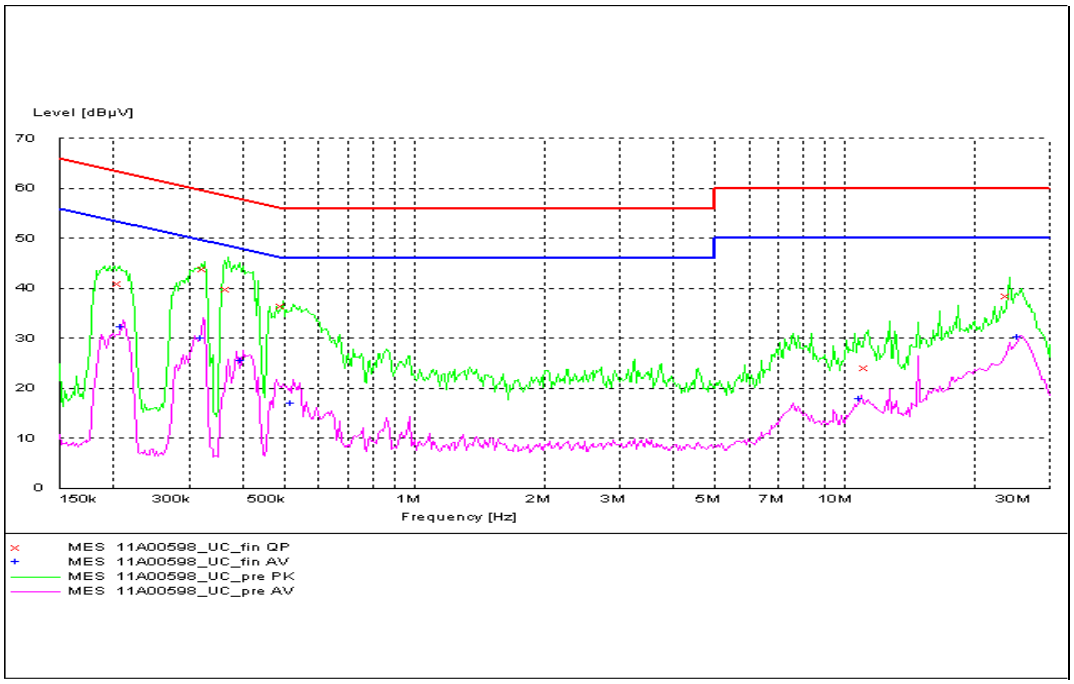


Figure A.3 Conducted Emission

MEASUREMENT RESULT: "11A00598_UC_fin QP"

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBµV	dB	dBµV	dB		
0.206241	41.00	10.1	63	22.4	L1	GND
0.325956	43.80	10.1	60	15.7	L1	GND
0.370968	39.90	10.1	59	18.5	N	GND
0.495058	36.40	10.1	56	19.7	N	GND
11.296633	24.10	10.2	60	35.9	N	GND
24.064312	38.40	10.3	60	21.6	L1	GND

MEASUREMENT RESULT: "11A00598_UC_fin AV"

Frequency	Level	Transd	Limit	Margin	Line	PE
MHz	dBµV	dB	dBµV	dB		
0.210387	32.10	10.1	53	21.1	N	GND
0.322728	30.00	10.1	50	19.6	N	GND
0.401705	25.50	10.1	48	22.3	N	GND
0.525514	16.90	10.1	46	29.1	N	GND
10.964401	17.80	10.2	50	32.2	N	GND
25.544752	30.20	10.3	50	19.8	L1	GND

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