TESTING
CNAS L4963

SAR TEST REPORT

Report No. 2012SAR009

FCC ID:	Q78-ZTEMF29A
Applicant:	ZTE Corporation
Product:	HSPA+ Wireless Router Product
Model:	MF29A
HW Version:	PCBMF29AV1.0.0
SW Version:	EN_ZTE_MF29AV1.0.0B05

Prepared by:	Yin Xiaoming	**Date:**	2012.5.15
Reviewed by:	Xue Jianguo	**Date:**	2012.5.15
Approved by:	Wang Jianrong	**Date:**	2012.5.15

Note:

The following test results relate only to the devices specified in this report. This report shall not be reproduced except in full without the written approval of the test laboratory.

General Information

Product Name	HSPA+ Wireless Router Product	Model Name	MF29A
Applicant	ZTE CORPORATION		
Manufacturer	ZTE CORPORATION		
Applicable Standard	**FCC RULES 47 CFR2.1091:** Radiofrequency radiation exposure evaluation: mobile device		
	OET65C-97-01: Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields		
Test Results	Pass		

Change History

Version	Change Contents	Author	Date
V1.0	First edition	Yin xiaoming	2012-01-29
V2.0	Page 11-12: Add evaluating follow KDB 447498 section 8 requirements	Yin xiaoming	2012-03-02
V3.0	Add evaluating for external antenna	Yin xiaoming	2012-05-03
V4.0	Page 11-12，Add evaluating follow KDB 447498 section 8 requirements for external antenna	Yin xiaoming	2012-05-14
V5.0	Page 11-12 ， Update evaluating follow KDB 447498 section 8 requirements for external antenna	Yin xiaoming	2012-05-15

CONTENTS:

1. Test Laboratory

1.1 Testing Location:

Company: Shanghai Tejet Communications Technology Co., Ltd Testing Center.
Address: Room 6205-6208, Building 6, No.399 Cailun Rd. Zhangjiang Hi-Tech Park, Shanghai, China
Post Code : 210203
Tel: +86-21-61650880
Fax: +86-21-61650881
Website: www.tejet.cn

1.2 Laboratory Environment

Temperature	20° C～ 25 ° C
Relative humidity	20%～70%

1.3 Testing date

Test Date: 2012-01-29

2. Client Information

2.1 Applicant information

Company Name:	ZTE Corporation
Address:	ZTE Plaza ,Keji Road South ,Hi-Tech Industrial Park ,Nanshan District, Shenzhen, Guangdong,518057,P.R.China
Post Code :	518057
Country:	China
Tel:	021-68897541
Fax:	021-50801070

2.2 Manufacturer Information

Company Name:	ZTE Corporation
Address:	ZTE Plaza ,Keji Road South ,Hi-Tech Industrial Park ,Nanshan District, Shenzhen, Guangdong,518057,P.R.China
Post Code :	518057
Country:	China
Tel:	021-68897541
Fax:	021-50801070

3.Equipment Under Test (EUT) and Accessory Equipment (AE)

3.1 Information of EUT

Device type	Portable device	
Product name	HSPA+ Wireless Router Product	
Device operation configuration:		
IMEI	3520370312422296	
S/N	T005GR212QB7000087	
Operating mode(s):	GSM850	
	GSM1900	
	WCDMA BAND II	
	WCDMA BAND V	
Test modulation	(GSM)GMSK	
Rated output power	GSM 850:33dBm	
	GSM1900: 30dBm	
	WCDMA Band II：24dBm	
	WCDMA Band V：24dBm	
Operating frequency range(s):	Band	Tx(MHz)
	GSM850	869.2～893.8
	GSM1900	1930.2～1989.8
	WCDMA Band II	1852.4～1907.6
	WCDMA Band V	826.4～846.6
Power class	GSM850: 4,test with power level 5	
	GSM1900: 1,test with power level 0	
	WCDMA Band II：3，test with maximum output power	
	WCDMA Band V：3，test with maximum output power	

3.2 Information Of AE

AE ID*	Description
AE1	Power supply

AE1

Model	STC-A2O120150C55-C
Manufacture	ZTE CORPORATION

*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.

Reference	Title	Version
OET65C	Evaluating Compliance with FCC Guidelines for Human Exposure to Radiofrequency Electromagnetic Fields	1997-01

KDB 447498 D01： Mobile and Portable Device RF Exposure Procedures and Equipment Authorization Polices

4.2 RF Exposure Limit

According to OET65C: The criteria listed in the following table shall be used to evaluate the environmental impact of human exposure to radio-frequency (RF) radiation 。

Table 1. ***FCC Limits for Maximum Permissible Exposure (MPE)***

(B) Limits for General Population/Uncontrolled Exposure

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	--	--	f/1500	30
1500-100,000	--	--	1.0	30

f = frequency in MHz *Plane-wave equivalent power density

5. Friis Formula

Friis transmission formula : Pd = (Pout*G) *DutyFactor / (4*Pi*r^2)
where
Pd = power density in **mW/cm^2**
Pout = output power to antenna in m**W**
G = gain of antenna in linear scale
Pi = **3.1416**
R = distance between observation point and center of the radiator in **cm**
Pd is the limit of MPE. If we know the maximum Gain of the antenna and the total power input to the antenna, through the calculation, we will know the MPE value at distance 20cm.
Of GSM Duty Factor=1：8.3.
Of WCDMA Duty Factor=1：1
Of WIFI 802.11b/g/n Duty Factor=1：1：

6. Classification

The antennas of this product, under normal use condition, is at least 20cm away from the body of the user.

So, this device is classified as Mobile Device.

7. Test Results

7.1 The maximum antenna gain

The maximum antenna gain for internal antenna is

GSM 850: 2.13dBi

GSM1900: 2.31dBi

WCDMA BAND II: 2.78dBi

WCDMA BAND V: 2.28dB

WIFI 802.11b/g/n： 3.3 dBi

The maximum antenna gain for external antenna is

GSM 850: 0.95dBi

GSM1900: -4.56dBi

WCDMA BAND II: -4.31dBi

WCDMA BAND V: 0.85dB

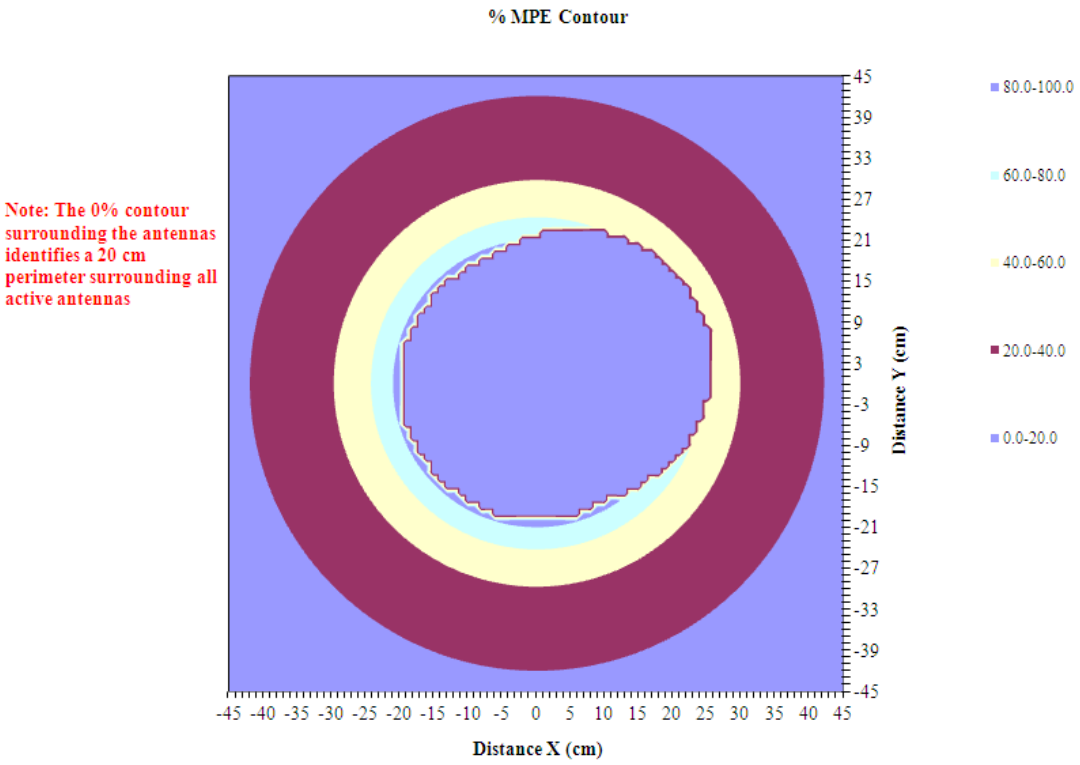
7.2 Output Power Into Antenna & RF Exposure value at distance 20cm

Frequency band	Output power（dBm）	Power density（mW/ cm^2）	Limit of Power density（mW/ cm^2）
GSM850 (internal)	31.5	0.055	**0.55**
GSM1900 (internal)	29.5	0.036	**1**
WCDMA BAND II (internal)	22.5	0.067	**0.55**
WCDMA BAND V (internal)	22.6	0.061	**1**
WIFI	16.9	0.021	**1**
GSM850 (external)	25.64	0.011	**0.55**
GSM1900 (external)	27.50	0.005	**1**
WCDMA BAND II (external)	19.01	0.006	**0.55**
WCDMA BAND V (external)	23.44	0.053	**1**

According KDB 447498:

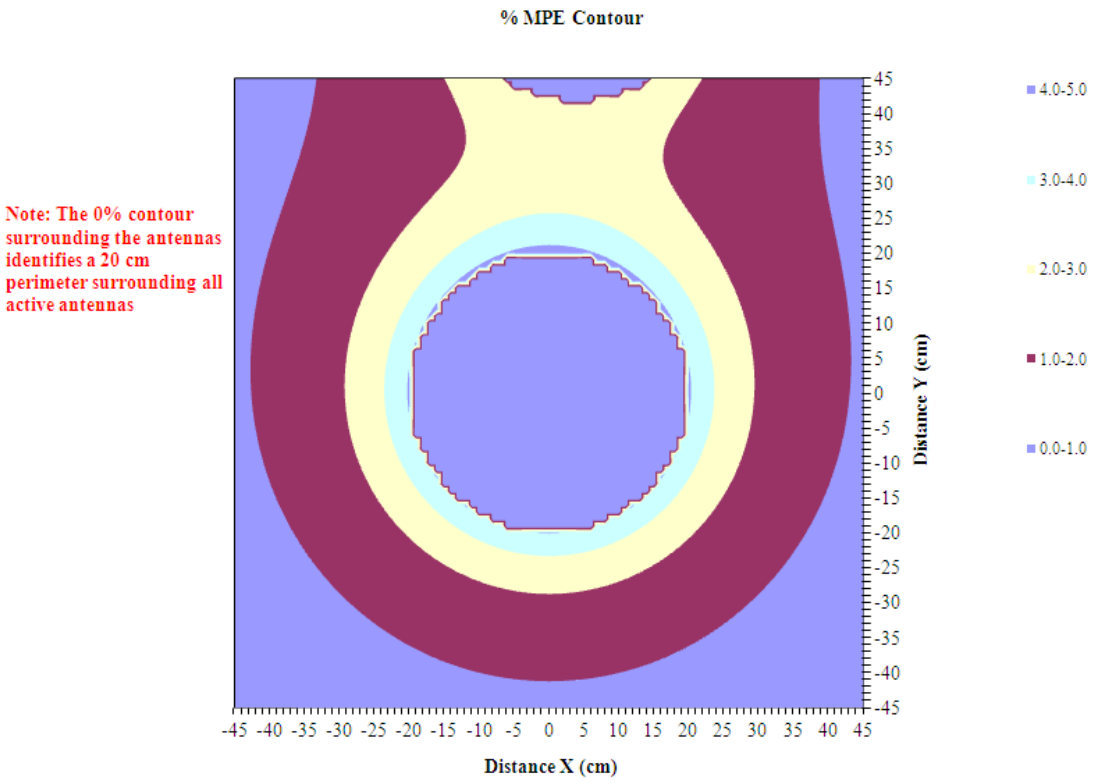
Internal antenna GSM850 and Wi-Fi:

Antenna No.		Total	1	2
Tx Status			On	On
Frequency	MHz		824	2450
MPE Limit	mW/cm^2		0.55	1.00
Max % MPE	%	88.0	86.3	2.1
Power	(W)	1.459	1.410	0.049
Antenna Gain	dBi		2.28	3.30
EIRP	(W)	2.49	2.384	0.105
X	(cm)		0.0	5.8
Y	(cm)		0.0	2.6
Sector			FALSE	FALSE
Arc			FALSE	FALSE
θ_1	degs	input	-120	-120
θ_2			60	60
θ_1		actual	-120	-120
θ_2			60	60



External antenna GSM1900 and Wi-Fi:

Antenna No.		Total	1	2
Tx Status			On	On
Frequency	MHz		1850	2450
MPE Limit	mW/cm^2		1.00	1.00
Max % MPE	%	4.4	3.9	2.1
Power	(W)	0.611	0.562	0.049
Antenna Gain	dBi		4.56	3.30
EIRP	(W)	0.30	0.197	0.105
X	(cm)		0.0	3.9
Y	(cm)		0.0	61.8
Sector			FALSE	FALSE
Arc			FALSE	FALSE
θ_1	degs	input	-120	-120
θ_2			60	60
θ_1		actual	-120	-120
θ_2			60	60



ANNEX A: EUT Photograph

EUT

POWER SUPPLY

ANNEX B: Test Instruments

No.	Name	Type	S/N	Calibration Date	Valid Period
01	BTS	CMU200	121464	Oct 14st，2011	One year

ANNEX C: Measurement Uncertainty

Expanded uncertainty (confidence interval of 95 %)（k=2）	0.4 dB

----------END OF REPORT----------