



EMF TEST REPORT

No. I14N01244-EMF

For

ZTE CORPORATION

GSM Wireless Phone

Model Name: ZTE WP659+

Marketing Name: ZTE

FCC ID: SRQ-ZTEWP659

With

Hardware Version: WP659+ REV: V/1

Software Version: QX_XX_WP659+X.X.XBXX

Issued Date: November 14th, 2014

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:

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Revision Version

Report Number	Revision	Date	Memo
I14Z01244-SAR	00	2014-11-14	Initial creation of test report

TABLE OF CONTENT

1. TEST LABORATORY	4
1.1 TESTING LOCATION	4
1.2 TESTING ENVIRONMENT.....	4
1.3 PROJECT DATA	4
1.4 SIGNATURE.....	4
2 CLIENT INFORMATION	5
2.1 APPLICANT INFORMATION	5
2.2 MANUFACTURER INFORMATION	5
3 EQUIPMENT UNDER TEST (EUT) AND ANCILLARY EQUIPMENT (AE)	6
3.1 ABOUT EUT	6
3.2 INTERNAL IDENTIFICATION OF EUT	6
3.3 INTERNAL IDENTIFICATION OF AE	6
4 REFERENCE DOCUMENTS.....	7
5 RF EXPOSURE LIMIT	7
6 FRIIS FORMULA	7
7 CLASSIFICATION.....	7
8 TEST RESULTS.....	8

1. Test Laboratory

1.1 Testing Location

Company Name: TMC Shenzhen, Telecommunication Metrology Center of MIIT
Address: No. 12building, Shangsha Innovation and Technology Park, Futian District, Shenzhen, P. R. China
Postal Code: 518048
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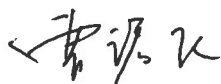
1.2 Testing Environment

Temperature: 18°C~25 °C,
Relative humidity: 30%~ 70%
Ground system resistance: < 0.5 Ω
Ambient noise & Reflection: < 0.012 W/kg

1.3 Project Data

Project Leader: Zhang Bojun
Test Engineer: Cao Junfei
Testing Start Date: Nov 10th, 2014
Testing End Date: Nov 10th, 2014

1.4 Signature



Cao Junfei

(Prepared this test report)



Zhang Bojun

(Reviewed this test report)



Lu Minniu

Director of the laboratory
(Approved this test report)

2 Client Information

2.1 Applicant Information

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2.2 Manufacturer Information

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3 Equipment Under Test (EUT) and Ancillary Equipment (AE)

3.1 About EUT

Description:	GSM Wireless Phone
Model name:	ZTE WP659+
Marketing name:	ZTE
Operating mode(s):	GSM850/GSM1900
GPRS Multislot Class:	/
Device type:	Mobile device
Accessories/Body-worn configurations:	/
Tested Tx Frequency:	824.2 – 848.8 MHz (GSM 850) 1850.2 – 1909.8 MHz (GSM 1900)

3.2 Internal Identification of EUT

EUT ID*	SN or IMEI	HW Version	SW Version
EUT1	/	WP659+ REV: V/1	QX_XX_WP659+X.X.XBXX

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

3.3 Internal Identification of AE

AE ID*	Description	Model	SN	Manufacturer
AE1	Battery	L1423450AR+	A0171409060001098	/

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

4 Reference Documents

ANSI C95.1–1999: IEEE Standard for Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz.

FCC KDB publication 447498 D01 General 1 RF Exposure Guidance v05r02: Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies.

FCC CFR 47 part1 1.1310: Radiofrequency radiation exposure limits.

FCC CFR 47 part2 2.1091: Radiofrequency radiation exposure evaluation: mobile devices.

5 RF Exposure Limit

Limits for General Population/Uncontrolled Exposure in §1.1310

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/f²)*	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

6 Friis Formula

Friis transmission formula : $P_d = (P_{out} \cdot G) / (4 \cdot \pi \cdot r^2)$

where

P_d = power density in **W/m²**

P_{out} = output power to antenna in **W**

G = gain of antenna in linear scale

π = **3.1416**

R = distance between observation point and center of the radiator in **m**

P_d 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.

7 Classification

The antenna 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.

8 Test Results

8.1 The maximum antenna gain

The maximum antenna gain for external antenna is

GSM 850: 0.79dBi

GSM1900: 1.83dBi

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

Conducted Output power calculation:

mode	timeslot	Duty cycle	Peak Output Power (dBm)	Average Output Power(dBm)
GSM 850	1 slot	12.5%	33.04	24.01
GSM 1900	1 slot	12.5%	31.17	22.14

To average the power, the division factor is as follows:

1TX-slot = 1 transmit time slot out of 8 time slots=> conducted power divided by (8/1) => -9.03dB

2TX-slots = 2 transmit time slots out of 8 time slots=> conducted power divided by (8/2) => -6.02dB

3TX-slots = 3 transmit time slots out of 8 time slots=> conducted power divided by (8/3) => -4.26dB

4TX-slots = 4 transmit time slots out of 8 time slots=> conducted power divided by (8/4) => -3.01dB

8.3 Tune Up Procedure

Measurement Procedure for GSM:

1. Connect EUT with CMU200 (E5515C) and FSU26 through RF cable. Make a call from CMU200
2. After setup a call, Set Power Level to 5 for GSM850 and 0 for PCS1900
3. Measure the Output Power Peak value

Remarks: All Output Power are tested in Peak Value specification.

GSM Speech (Target Value is Peak Output Power Value)

GSM 850			
Channel	Channel 975	Channel 124	Channel 30
Target (dBm)	32.5	32.5	32.5
Tolerance $\pm$ (dB)	1	1	1
GSM 1900			
Channel	Channel 884	Channel 699	Channel 513
Target (dBm)	30.5	30.5	30.5
Tolerance $\pm$ (dB)	1	1	1

So the worst cases for each frequency band are:

Frequency band	Average Output Power(dBm)	Average Output Power(mW)	Antenna gain(dBi)	Antenna gain(numeric)	Power Density (mW/cm ²)	Limit of Power Density (mW/cm ²)	PASS /FAIL
GSM 850	24.47	279.90	0.79	1.20	0.067	0.57	PASS
GSM 1900	22.47	176.60	1.83	1.52	0.054	1	PASS

END OF REPORT