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**Telecommunication Industry Standard
Of the People's Republic of China**

YD/T 1548.1-2007

**Testing Method for 2GHz WCDMA Digital Cellular
Mobile Communication Network User Equipment
(Phase II)**

**Part I: Basic Function, Service and Performance
Test**

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Preface

“Testing Method for 2GHz WCDMA Digital Cellular Mobile Communication Network User Equipment (Phase II) Part I: Basic Function, Service and Performance Test” is one of the serial standards of “Testing Method for 2GHz WCDMA Digital Cellular Mobile Communication Network User Equipment (Phase II) Part I: Basic Function, Service and Performance Test”. The names and structure of the series of standards are shown as follows:

- (1) Test Method for 2GHz WCDMA Digital Cellular Mobile Telecommunication Network User Equipment Part I: Basic Function, Services and Performance Test;
- (2) Test Method for 2GHz WCDMA Digital Cellular Mobile Communication Network User Equipment Part II: Network Compatibility Test;

This Standard is one of the serial standards of 2GHz WCDMA Digital Cellular Mobile Communication Network. The structure and names of the serial standards are listed as follows:

- (1) Technical Requirement for 2GHz WCDMA Digital Cellular Mobile Communication Network Radio Access Equipment;
- (2) Test Method for 2GHz WCDMA Digital Cellular Mobile Communication Network Radio Access Equipment;
- (3) Technical Requirement for 2GHz WCDMA Digital Cellular Mobile Telecommunication Network User Equipment;
- (4) Test Method for 2GHz WCDMA Digital Cellular Mobile Telecommunication Network User Equipment;
- (5) Test method for 2GHz WCDMA/TD-SCDMA Digital Cellular Mobile Communication Network Iu Interface;
- (6) Test method for 2GHz WCDMA Digital Cellular Mobile Communication Network Iur Interface;
- (7) Test method for 2GHz WCDMA Digital Cellular Mobile Communication Network Iub Interface;

(8) Technical Requirement for 2GHz WCDMA Digital Cellular Mobile Telecommunication Network Uu Interface Physical Layer;

(9) Technical Requirement for 2GHz WCDMA Digital Cellular Mobile Telecommunication Network Uu Interface Layer 2;

(10) Technical Requirement for 2GHz WCDMA Digital Cellular Mobile Telecommunication Network Uu Interface RRC Layer;

(11) Technical Requirement for 2GHz WCDMA Digital Cellular Mobile Communication Network Iu Interface;

(12) Technical Requirement for 2GHz WCDMA Digital Cellular Mobile Communication Network Iub Interface;

Subsequent standards shall be made with the development of technology.

This Standard is based on the version of 3GPP R99 released on Dec., 2002.

This Standard is proposed and managed by China Telecommunication Standardization Association.

This Standard is developed by: MIIT Telecommunication Institute, and ZTE.

This Standard is written by: Li Xin, Chen Yongxin, Yang Hongmei, Guo Gan, Li Bo, Peng Hongli, and Chen Jianjiang.

Test Method for 2GHz WCDMA Digital Cellular Mobile

Communication Network User Equipment (Phase II)

Part I: Basic Function, Service and Performance Test

1 Scope

This specification defines the test method of basic function, service, RF, audio, environment, reliability, lifecycle and others for user equipment of 2GHz WCDMA digital cellular mobile communication network.

This Standard is applicable to user equipment of 2GHz WCDMA digital cellular mobile telecommunication.

2. Quoted Standards

The following standards contribute to the stipulation of this specification after being quoted. All the revision versions (excluding correction version) of the quoted standards specified with date are not applicable for the document. Constituents are encouraged to use the latest version of the documents. The latest versions of the quoted documents without date specified are applicable to this Standard.

3GPP TS 34.124	Electromagnetic compatibility (EMC) requirements for Mobile terminals and ancillary equipment
ITU-T P.57 (2002)	Artificial ears
ITU-T P.581 (2000)	Use of head and torso simulator (HATS) for Hand-free terminal testing
ITU-T P.64 (1999)	Determination of sensitivity/frequency characteristics of local telephone systems
ITU-T P.79 (1999)	Calculation of loudness ratings for telephone sets
ITU-T P.340	Transmission characteristics of Hand-free telephones
ITU-T P.501	Test signals for use in telephony
GB/T 18287-2000	General Specification of Li-Ion Battery for Cellular Phone
GB/T 18288-2000	General Specification of Metal Hydride Nickel Battery for Cellular Phone
GB/T 18289-2000	General Specification of Ni-CD Battery for Cellular Phone
GB/T 4943-2001	Security of IT Equipment (including electric equipment)

3 Acronyms

The following acronyms are applied in this part:

ACLR	Adjacent Channel Leakage power Ratio	邻道泄漏功率比
ACS	Adjacent Channel Selectivity	邻道选择性
AFC	Automatic Frequency Control	自动频率控制
AGC	Automatic Gain Control	自动增益控制

6.7 Short Message Indication and Acknowledgement

6.7.1 Test Purpose

To test that UE can provide corresponding indication after sending and receiving short message.

6.7.2 Test Method

- (1) Insert USIM into UE and power it on;
- (2) Other mobile user sends SMS to the UE under test. Observe the performance of UE when receiving the SMS;
- (3) UE sends SMS to other mobile user. Observe the performance of UE after sending the SMS;

6.7.3 Expected Test Result

When there is incoming SMS, UE shall display on its human-machine interface indication information for SMS arrival, or send out prompt tones to report the reception; if the SMS has not been read by the user, it shall be tagged with “Unread”.

After UE sends SMS, there shall be corresponding indication of success or failure on the human-machine interface. If the receiving state is activated, then according to the information returned by the network, there shall be acknowledgement on the man-machine interface when the message is received by the recipient.

6.8 Short Message Overflow Indication

6.8.1 Test Purpose

To test when UE can not continue receiving short messages due to the insufficient memory of the USIM card or of its SMS memory, whether there is short message overflow indication on its human-machine interface or whether UE gives SMS overflow prompt tone.

6.8.2 Test Method

- (1) Insert the USIM card with full SMS memory into UE, or send a number of short messages that exceeds the number that UE SMS memory can store.
- (2) Resend a short message to UE and test whether there is indication message on the UE;
- (3) Delete several short messages on UE' USIM card or its SMS memory, and check whether the short messages that are rejected due to full SMS memory now can be correctly received or not;

6.8.3 Expected Test Result

When UE can not continue receiving short messages due to the insufficient memory of the USIM card or of its SMS memory, there shall be short message overflow indication on its human-machine interface or UE gives SMS overflow prompt tone. After one or more short messages are deleted at the location where the SMS is stored (USIM card or SMS memory), the indication shall disappear.

(10) Test the average output power per time slot in Step (2)~(9).

7.2.5.4 Expected Test Result

(1) In Step (1), the difference of average output power of adjacent slots complies with TPC_cmd=0 in Table 11.

(2) In Step (2), the average output power change of successive 10 time slots complies with TPC_cmd=0 in Table 12.

(3) In Step (3), the average output power difference of adjacent slots complies with the requirements in Table 11: the value of every fifth TPC command = +1, step = 1dB, other TPC commands = 0;

(4) In Step (3), the average output power of successive 50 time slots complies with {0, 0, 0, 0, +1} TPC commands in Table 12.

(5) In Step (4), the average output power difference of adjacent slots complies with the requirements in Table 11: the value of every fifth TPC command = -1, step = 1dB, other TPC commands = 0;

(6) In Step (4), the average output power of successive 50 time slots complies with {0, 0, 0, 0, -1} TPC commands in Table 12.

(7) In Step (5), the average output power difference of adjacent time slots complies with the requirements in Table 11: the value of TPC commands = -1, step = 1dB; The criteria is applied to the initial time slot and the termination time slot that are set between the Min power threshold and the Max power threshold. The reduced step requirement is not applicable in the case that the power step is close to the Min. or Max. power threshold.

(8) In Step (5), the average output power change of 10 successive time slots complies with the TPC command value = -1, step = 1dB defined in Table 12. The criteria is applied to the initial time slot and the termination time slot that are set between the Min power threshold and the Max power threshold. When the power step is close to the Min. or Max. power threshold, it is not included in the 10 successive time slots.

(9) In Step (6), the average output power difference of adjacent time slots complies with the requirements in Table 11: the value of TPC commands = +1, step = 1dB; The criteria is applied to the initial time slot and the termination time slot that are set between the Min power threshold and the Max power threshold. The reduced step requirement is not applicable in the case that the power step is close to the Min. or Max. power threshold.

(10) In Step (6), the average output power change of 10 successive time slots complies with the TPC command value = +1, step = 1dB defined in Table 12. The criteria is applied to the initial time slot and the termination time slot that are set between the Min power threshold and the Max power threshold. When the power step is close to the Min. or Max. power threshold, it is not included in the 10 successive time slots.

(11) In Step (7), the average output power difference of adjacent time slots complies with the requirements in Table 11: the value of TPC commands = -1, step = 2dB; The criteria is applied to the initial time slot and the termination time slot that are set between the Min power threshold and the Max power threshold. The reduced step requirement is not applicable in the case that the power step is close to the Min. or Max. power threshold.

(12) In Step (7), the average output power change of 10 successive time slots complies with

and heat chamber and maintain it for 22 hours, the storage temperature is $(40\pm 2)^{\circ}\text{C}$, and the relative humidity is 90%~95%.

Spray the frog and place it according the above specification, which constitutes a cycle. Perform the test for 3 cycles according to the severity requirements.

For the test method of UE and the salt spray sedimentation rate, see the requirements of GB2423.18 and GB2424.10.

9.9 Shock

Handheld UE shall be installed directly or installed with the fixture on the shocking table, and the UE shall be equipped with the battery together.

Apply 3 continuous peak accelerations of 300m/s^2 on each direction of 3 mutually vertical axes according to the severity level. Apply the shock for 18 times in total with pulse duration of 18ms. Then check the exterior and the voice communication, there shall be no mechanical damage and loose structure on the exterior, and the voice communication shall be carried out properly.

9.10 Collision

Handheld UE shall be installed directly or installed with the fixture on the shocking table, and the UE shall be equipped with the battery together.

Apply 1000 peak accelerations of 250m/s^2 on each direction of 3 mutually vertical axes according to the severity level. Apply the collision for 3000 times in total with pulse duration of 6ms. Then check the exterior and the voice communication, there shall be no mechanical damage and loose structure on the exterior, and the voice communication shall be carried out properly.

9.11 Knock

Equip handheld UE with the battery together, and place it on the hard supporting surface with power off. Knock the sample for 5 times at knock energy of 0.2J with the spring hammer. The knock shall be applied on the position that is most prone to be damaged. Then check the exterior and the voice communication, the UE exterior shall not be damaged and the voice communication shall be carried out properly.

9.12 Extrusion

Following the structure shown in Figure 28, place the handheld UE face up, the body and the fixed bracket are axially and vertically placed on the canvas. Fasten the sample with the cloth belt, and the sample is in power on status with the keyboard locked. Extrude the head elastically with a force of 400 N for 3000 times with a frequency of 10~30 times/min. Then check the exterior and the voice communication, the exterior shall not be damaged and the voice communication shall be carried out properly.

Main References

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