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

YDC 015-2006 (Replaced by: YD/T 1558-2013)

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### Technical Requirements of Mobile Station (including Non UIM Mobile Station) for 800MHz CDMA 1X Digital Cellular Mobile Telecommunication Network

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## Preface

This Standard is one of the serial standards of 800MHz CDMA 1X Mobile Station. The structure and names of the serial standards are listed as follows:

1. Technical Specification of Mobile Station (MS) for 800MHz CDMA 1X Digital Cellular Mobile Telecommunication Network

2. Test Methods for 800MHz CDMA 1X Digital Cellular Mobile Telecommunication Network Equipment: MS Part 1 Minimum Standard, Function and Performance.

3. Test Methods for 800MHz CDMA 1X Digital Cellular Mobile Telecommunication Network Equipment: MS Part 2 Protocol Conformity Test.

4. The revision of Test Methods for 800MHz CDMA 1X Digital Cellular Mobile Telecommunication Network Equipment: MS Part 3: Network Compatibility Test uses 3GPP2 C.S0011-B Version1.0 Recommended Minimum Performance Standards for CDMA 1X Spread Spectrum Mobile Stations Release B. The RF indicator is basically identical to that in 3GPP2 C.S0011-B Version1.0. Partial contents are modified.

This specification only lists frequency band type 0 of the 12 frequency band types recommended in 3GPP2. MS may choose to use all or part of frequency band type 0 according to the frequency administration regulations. The environmental test method in the original document is not used based on the situation in China.

This Standard replaces YDC 015-2003 *Technical Specification of Mobile Station (MS) for 800MHz CDMA 1X Digital Cellular Mobile Telecommunication Network*.

Main changes of this specification are shown as follows compared YDC 015-2003:

Add MS and UIM integrated contents.

Chapter 4: Add test items for partial basic functions.

Chapter 7: update it according to 3GPP2 C.S0011-B.

Chapter 9: Add the audio performance test.

Chapter 10: delete the original environment adaptability requirements and test methods. Refer to YD/T XXXX Technical requirements and Test Methods for Mobile Handset Reliability.

Chapter 11: Add the test of standby time and talk time.

Chapter 12: Add the card interface test.

Chapter 13: Add the EMC test.

Chapter 14: add Specific Absorption Rate (SAR) test.

This Standard is printed and distributed in response to the deployment and operation demands for 800MHz CDMA 1X commercial trial network, and is used as the reference for scientific research, design, manufacturing, use and management of relevant equipment.

This Standard is proposed and managed by China Communications Standards Association (CCSA).

This Standard is developed by MII Telecommunication Institute and ZTE Inc.

This Standard is drafted by: Ma Xin, Ma Zhiguo, Liu Dongming, Zhang Yufeng, Zhang Xiang and Peng Hongli etc.

It is the first revision of the original standard that was released in May 2003.

# Technical Specification of Mobile Station (MS) for 800MHz CDMA 1X Digital Cellular Mobile Telecommunication Network

## 1 Scope

This Standard defines functions and requirements for the class, frequency band type, functions, performance indicators, audio and environments of MS for 800MHz CDMA 1X Digital Cellular Mobile Telecommunication Network.

This Standard is applied for 800MHz CDMA 1X MS supporting UIM card (MS and UIM separated) and not supporting UIM card (MS and UIM integrated); for 800MHz CDMA 1X MS supporting UIM card, all items in this specification are all applied; for 800MHz CDMA 1X MS not supporting UIM card, the test items for UIM card and UIM card interface involved in this specification are not applied.

## 2 Quoted Standards

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

GB2312	Chinese ideogram coded character set for information exchange (basic set)
GB13000.1	Information technology Universal Multiple-Octet Coded Character Set (UCS) Part 1: Architecture and Basic Multilingual Plane
GB/T18287	General Specification of Li-Ion Battery for Cellular Phone
GB/T18288	General Specification of metal hydride nickel Battery for Cellular Phone
GB/T18289	General Specification of Ni-CD Battery for Cellular Phone
GB 19484.1	EMC Compatibility requirements and measurement method for 800MHz CDMA Digital Cellular Mobile System Part one: Mobile Station and its Auxiliary Equipment
YD1268	Safety Specification and Test Method for Lithium Batteries and Charger for Mobile Phone
YD/T965	Safety Requirement and Test Method of Telecommunication Terminal Equipment
YD/T 1538	Audio Performance Requirement and Test Method of Digital Mobile Device
YD/T 1539	Reliability Requirement and Test Method of Mobile Phone
YDC 023	Test Methods for 800MHz CDMA 1X Digital Cellular Mobile Telecommunication Network Equipment: MS Part 1 Minimum

	Standard, Function and Performance.
YDC 014	Technical Specification of Base Station Subsystem (BSS) for 800MHz CDMA 1X Digital Cellular Mobile Telecommunication Network
YDC 017	Technical Specification of Interface A for 800MHz CDMA 1X Digital Cellular Mobile Telecommunication Network Interface
YDC 018	Technical Specification of Physical Layer over Air Interface for 800MHz CDMA 1X Digital Cellular Mobile Telecommunication Network Interface
YDC 021	Technical Specification of L3 Signaling over Air Interface for 800MHz CDMA 1X Digital Cellular Mobile Telecommunication Network Interface
3GPP2 C.S0011-B	Recommended Minimum Performance Standards for CDMA2000 Spread Spectrum Mobile Stations Release B, Version1.0

### 3 Acronyms

The following acronyms are applicable for this specification.

BER	Bit Error Rate
CDMA	Code Division Multi Access
ERP	Effective Radiated Power
FER	Frame Error Rate
UIM	User Identity Module

### 4 MS Functions

#### 4.1 Overview

MS can be divided into the required function and optional function based on the function. The functions shall meet the appropriate international standards, industry standards or corporate standards.

The required function is that MS must provide to complete the basic operation.

The vendor decides whether to support the optional function based on the market conditions. Not all optional functions are described in This Standard. If the optional function is supported, it must ensure not impacting the proper operation of the network and other MS's.

#### 4.2 Mandatory Functions

##### 4.2.1 Display functions

- UIM card prompt (only applicable for the MS supporting UIM card)
- Country/Operator indication
- Connected Line Presentation
- Automatic roaming indication
- SMS Indication and Verification
- SMS Overflow Indication

It shall complete various handover operations.

### **7.3.3 Modulation Requirements**

800MHz CDMA 1X MS receiver shall correctly demodulate the reverse traffic channel and reverse control channel defined in YDC 018 (see YDC 014 for the channel types).

#### **7.3.3.1 Reference time**

In the steady-state condition, the MS time reference shall be measured at the MS antenna connector; which is within  $\pm 1\mu\text{s}$  of the time when the demodulated earliest arriving multipath component appears.

If radio configuration 1 or 2 requires calibrating the time reference of MS, it shall be calibrated to a level no faster than 203ns and no slower than 305ns per second within any 200ms period.

If radio configuration 3 or 5 requires calibrating the time reference of MS, it shall be calibrated to a level no faster than 203ns and no slower than 460ns per second within any 200ms period.

#### **7.3.3.2 Time tolerance of reverse pilot channel for code division channel**

When it operates in RC3 or RC4, the time tolerance of reverse pilot channel and other channels in the same reverse channel shall be less than  $\pm 10\text{ns}$ .

#### **7.3.3.3 Phase tolerance of reverse pilot channel for code division channel**

The time tolerance of reverse pilot channel and other channels in the same reverse channel shall be less than 0.15 radian.

#### **7.3.3.4 Waveform Quality and Frequency Accuracy**

Waveform quality factor  $\rho$  shall be more than 0.944. The carrier frequency error  $\Delta f$  shall be in  $\pm 300\text{Hz}$  range; Tx time error  $\tau$  shall be in  $\pm 1\mu\text{s}$  range.

#### **7.3.3.5 Code domain power**

The code domain power of each inactivated channel shall be 23dB lower than the total output power measured at I and Q channels.

### **7.3.4 RF Output Power Requirements**

#### **7.3.4.1 Range of Open Loop Output Power**

The mean open loop output power of MS is estimated based on its mean input power. For transmission on the access channel, the estimation is defined as follows:

Mean output power (dBm) = mean input power (dBm) + offset power + interference correction + NOM\_PWR (dB) -  $16 \times \text{NOM\_PWR\_EXT} + \text{INIT\_PWR}$  (dB).

For band type 0, the offset power is -73.

For transmission on the enhanced access channel, the estimation is defined as follows:

Note: All FPs in the measurement bands shall meet the restricted requirements of  $|\Delta f|$ , where  $|f|$  = central frequency—the closer edge frequency measured ( $f$ ).

## 8 Service Requirements

### 8.1 Overview

800MHz CDMA 1X MS shall at least support one of mandatory services in Section 8.1, and support the optional services in section 8.2 as operator required.

### 8.2 Mandatory Service

#### 8.2.1 Telecom Service

800MHz CDMA 1X MS shall support voice services (use 8k EVRC voice encoder; radio configuration can use RC3 or RC1/RC2 and support RC4 optionally based on the negotiation of protocol version).

#### 8.2.2 Packet switched bearer service

800MHz CDMA 1X MS shall support the packet data services. Minimum requirements shall support the data service in 153.6 kb/s of forward peak rate and in 76.8kbps of reverse peak rate.

#### 8.2.3 Supplementary Service

800MHz CDMA 1X MS shall support the operation of the following supplementary services:

- Calling number identification presentation (CNIP)
- Calling number identification restriction (CNIR)
- Call forward busy (CFB)
- Call forward Default (CFD)
- Call forward no answer (CFNA)
- Call forward unconditional (CFU)
- Call wait (CW)
- 3-party call (3WC).

### 8.3 Optional Services

#### 8.3.1 Overview

800MHz CDMA 1X MS shall implement the following optional services as operator required. The following is not all optional services, which are supported optionally according to the operator requirements or market demands.

#### 8.3.2 Circuit switched bearer service

- 14.4 kb/s asynchronous data and fax service
- SMS

SMS includes:

- MS-originated (MO) SMS
- MS-terminated (MT) point-to-point SMS
- MS-terminated (MT) broadcast SMS



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	The display shows in whole, the brightness and color are even
	There is no obvious rusting on metal surface
Identity	The identities on product or its package shall include product quality inspection certificate, name of product, manufacturer or company name, factory address or company address

## **18 Technical Documents and After-sale Service**

### **18.1 Technical Documents**

The factory shall provide the random materials for use and maintenance when the equipment is shipped. Chinese technical documents provided by the factory shall include user manual and O&M instruction, including the following contents:

- 1) Unit structure, main functions and its operations
- 2) Unit KPI
- 3) Power kinds, power consumption
- 4) Environmental conditions
- 5) Human-machine command and fault report manual
- 6) Various guides displayed by MS
- 7) 3 guarantees certificate

### **18.2 After-sale Service**

To ensure the long-term reliable usage of the equipment in the market, the vendor shall strengthen the after-sale service after the equipment is sold. The method and primary contents of after-sale service shall be performed based on the relevant national documents and standards.

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