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

YD 1032-2000

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## Limits and Measurement Methods of Electromagnetic Compatibility for 900/1800MHz Digital Cellular Telecommunications System

### Part 1: Mobile Station and its Ancillary Equipment

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## Preface

With the quick development of communication technology, the digital cellular communication system is widely used in our national mobile communication field, but the EMC problems are sharp increasingly. This Standard is developed for EMC feature for MS and its ancillary equipment in digital cellular communication system according to the actual demands on China communication industry.

This Standard is compiled by referencing ETS 300 342-1 EMC requirements for European Digital Cellular Telecommunication System (GSM 900 MHz and DCS1800MHz) Part 1: MS and its ancillary equipment (1997) and ITU-T K.43 Telecommunication equipment immunity requirements (1998).

This Standard defines EMC test item, emission limits and measurement methods, immunity level, performance criteria and test methods for MS and its ancillary equipment. It is comprised of the scope, quoted standards, definition and acronyms, general test conditions, performance criteria, availability, test methods and limits of spurious emission, test methods and limits of continuous emission, immunity test methods and levels.

This Standard is proposed and managed by China MII Telecommunication Institute.

This Standard is developed by China MII Communication Metering Center

This Standard is drafted mainly by: Wang Hongbo, Xie Yi, Xiao Li, Lu Bingsong, Lu Minniu and Chu Wenhua.

The explanation of this Standard is subject to the department that drafts the standard.

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## Limits and Measurement Methods of Electromagnetic

### Compatibility for 900/1800MHz Digital

### Cellular Telecommunications System

### Part 1: Mobile Station and its Ancillary Equipment

#### 1 Scope

This Standard defines EMC requirements for MS and its ancillary equipment for GSM900MHz and DCS 1800MHz digital cellular mobile telecommunication system Phase 1 and 2 for sending and receiving voice and/or data, including test methods, frequency range, limits and performance criteria.

This specification is applicable not only to portable and vehicle-mount mobile stations, but also to those AC-powered and used at fixed locations.

#### 2 Quoted Standards

The following standards contribute the stipulations of this Standard after quoted. All the mentioned versions are valid at the time when the standard is released. The following standards are subject to modification, and the users shall explore the possibility to use the latest version of the following standards.

GB/T 6113.1-1995	Specifications for Radio Disturbance and Immunity Measuring Device
GB 9254-1998	Information Technology Equipment-Radio Disturbance Characteristics- Limits and Measurement Methods
GB/T 17626.2-1998	EMC -Testing and Measurement Techniques: Electrostatic Discharge Immunity Test
GB/T 17626.3-1998	EMC -Testing and Measurement Techniques: RF Electromagnetic Field Radiation Immunity Test
GB/T 17626.4-1998	EMC -Testing and Measurement Techniques: Electrical Fast Transient Burst Immunity Test
GB/T 17626.5-1998	EMC -Testing and Measurement Techniques: Surge (Shock) Immunity Test
GB/T 17626.6-1998	EMC -Testing and Measurement Techniques: RF Field Induced Conduction Disturbance Immunity Test
GB/T 17626.11-1998	EMC-Testing and Measurement Techniques: Voltage Dips, Short Interruptions and Voltage Variations Immunity Test
ISO 7637-1 (1990)	Road vehicles – Electrical disturbances from conduction and coupling – Part 1: passenger cars and light commercial vehicles with nominal 12 V supply voltage Electrical transient conduction

transmitter does not unintentionally operate.

The maintenance of a communications link shall be assessed by using an indicator, which may be part of the SS or the EUT.

The equipment shall meet the minimum performance criteria specified in the following sections.

MS powered by the vehicle battery shall meet the definition of this Standard for the vehicle MS.

AC-powered MS shall meet the definition of this Standard for the fixed MS. The input/output arrangement and performance criteria for the equipment can not be changed.

### **5.1 Performance Criteria for continuous emission of Transmitters**

A communications link shall be established and maintained during the test.

For the EUT, when the audio BPF test is passed with 1kHz of CF and 200Hz of BW, the uplink and downlink voice output level shall be at least 35dB lower than the recorded reference level.

At the end of the test, the EUT shall operate as intended with no loss of user control functions or stored data, and the communication link shall have been maintained. If the EUT is mobile or portable MS, the test shall be performed in idle mode, and the transmitter shall not unintentionally operate.

If the EUT is only the transmitter, the test shall also be performed in standby mode to ensure the transmitter does not unintentionally operate.

### **5.2 Performance Criteria for transient emission of Transmitters**

A communications link shall be established and maintained during the test.

At the end of the test, the EUT shall operate as intended without user aware of degradation of quality of the communication, with no loss of user control functions or stored data, and the communication link shall have been maintained.

In order to confirming the above performance during the call, the test shall be performed in idle mode, and the transmitter shall not unintentionally operate.

If the EUT is only the transmitter, the test shall also be performed in standby mode to ensure the transmitter does not unintentionally operate.

### **5.3 Performance Criteria for continuous emission of receivers**

## **9 Test Methods and Levels for Immunity Tests**

### **9.1 Static Discharge Immunity Test**

The test item is applied for fixed, vehicle and portable MS and its ancillary.

The test shall be performed in the typical configuration of the MS or the combination of the EUT and its ancillary equipment.

#### **9.1.1 Test Methods and Levels**

The test shall be performed according to GB/T 17626.2 - 1998.

For the transmitter, receiver, transceiver and its ancillary, they shall meet the following requirements:

- a) For contact discharge, the EUT shall be tested at  $\pm 2$  kV and  $\pm 4$  kV.
- b) For air discharge, the EUT shall be tested at  $\pm 2$  kV,  $\pm 4$  kV and  $\pm 8$  kV.

#### **9.1.2 Performance Criteria**

For the transmitter, the performance criteria in section 5.2 are applicable.

For the receiver or receiver as one part of the transceiver, the performance criteria in section 5.4 are applicable.

### **9.2 Radiated emission immunity test**

The test item is applied for fixed, vehicle and portable MS and its ancillary.

The test shall be performed in the typical configuration of the MS or the combination of the EUT and its ancillary equipment.

#### **9.2.1 Test Methods and Levels**

The test shall be performed according to GB/T 17626.3-1998, but shall meet the following requirements:

- a) The test level is 3V/m. The test signals shall perform 80% modulation by 1kHz audio signals;
- b) The frequency scanned step shall be 1% of the transient frequency;
- c) The test shall be performed in the whole range of 80 MHz ~1 GHz, but the exclusion bands of transmitters, receivers or receivers as one part of transceivers are excluded.

The narrowband response on the receiver discrete frequency point that belongs to receiver and transceiver shall be ignored in the test.

Test frequency shall be recorded in the test report.

#### **9.2.2 Performance Criteria**

For the transmitter, the performance criteria in section 5.1 are applicable.

For the receiver or the receiver as one part of the transceiver, the performance criteria in section 5.3 are applicable for Pulse 3a and 3b, but has no audio test (i.e., do not monitor 1kHz of level). The performance criteria in section 5.4 are applicable for Pulse 1, 1a, 1b, 2 and 4. During the test, the communication link is not required to be maintained, but is reestablished after the test.

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