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Translated English of Chinese Standard: YD/T2436-2012

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ICS 01.040.33

M 04

**YD**

**INDUSTRY STANDARD**

**OF THE PEOPLE'S REPUBLIC OF CHINA**

YD/T 2436-2012

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**Technical requirements and measurement  
method of the interference of multi mode  
terminal equipment**

**多模移动终端电磁干扰技术要求和测试方法**

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**Issued on: December 28, 2012**

**Implemented on: March 1, 2013**

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**Issued by: Ministry of Industry and Information Technology of  
the People's Republic of China**

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## Foreword

The coordination and unification with the following standards has been considered during the formulation process of this standard.

YD/T 1484 Measurement method for radiated RF (Radio Frequency) power and receiver performance of mobile station

YD/T 1977 2GHz TD-SCDMA Measurement method for radiated RF power and receiver performance of mobile station

YD/T 1978 2GHz WCDMA Measurement method for radiated RF power and receiver performance of mobile station

YD/T2193 Measurement method for radiated RF power and receiver performance of mobile subscriber terminal WLAN devices

This standard was proposed by and shall be under the jurisdiction of China Communications Standards Association.

This standard was drafted by organizations: China Academy of Telecommunication Research of MIT, ZTE Corporation, Hangzhou Motorola Cellular Equipment Co., Ltd, Tianjin Sumsung Telecom Technology Co., Ltd., and Guangdong Telecommunication Terminal Products Quality Supervision and Inspection Center.

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# Technical requirements and measurement method of the interference of multi mode terminal equipment

## 1 Scope

This standard specifies technical requirements and measurement method of the interference of multi mode terminal equipment.

This standard is applicable to all multi mode terminals, including multi mode single-standby terminals and multi mode multi-standby terminals. Such as: GSM/CDMA (cdma2000 1x) dual mode terminal, dual GSM terminal, GSM/WLAN terminal and CDMA (cdma2000 1x)/ WLAN terminal.

## 2 Normative references

The articles contained in the following documents have become part of this standard when they are quoted herein. For the dated documents so quoted, all the modifications (Including all corrections) or revisions made thereafter shall be applicable to this Standard.

GB/T 26256 Interference, coexistence and corresponding measurement methods of  
2.4 GHz wireless telecommunications equipment

YD/T 1484 Measurement Method for Radiated RF Power and Receiver Performance  
of Mobile Stations

YD/T 1977 Measurement method for Radiated RF power and receiver performance of  
2GHz TD-SCDMA mobile stations

YD/T 1978 Measurement method for radiated RF power and receiver performance of  
2GHz WCDMA mobile stations

YD/T 2193 Measurement method for radiated RF power and receiver performance of  
WLAN devices

## 3 Terms, definitions and abbreviations

### 3.1 Terms and definitions

middle and high signal sections, the spatial location of optimum sensitivity point on high, middle and low signal channels and the measuring antenna polarization shall be taken as the reference location and reference polarization respectively. If the difference BETWEEN the sensitivity of high and low signal channels measured which is based on the spatial location of optimum sensitivity point on middle signal channels and test antenna polarization AND the sensitivity on the middle signal channels is less than 3dB, then the spatial location of the optimum sensitivity point and antenna polarization on middle signal channels can be used as the uniform reference location and reference polarization on high, middle and low signal channels.

4) It shall conduct EIS measurements for all signal channels within each section under the corresponding reference location and reference polarization within the above-mentioned sections respectively. And record the measurement results.

5) It shall establish connection on CDMA (cdma2000 1x) 850 frequency band for Module 2 according to the requirements of YD/T 1484, and select the high, middle and low signal channels and launch Module 2 with the maximum power.

6) EUT location and test antenna polarization shall be adjusted according to the reference location and reference polarization determined by step 3.

7) It shall rerun step 4). And record the EIS of each channel.

8) Difference between measurement results of step 7 and step 4 on each signal channels shall not be more than 5dB.

9) It shall establish connection on CDMA (cdma2000 1x) 2GHz frequency band for Module 2. Repeat measurements in step 5) ~step 8). And the difference of measurement results shall not be more than [TBD] dB.

10) It shall establish connection on GSM1800 for Module 1. Repeat measurements in step 1)-step 9). And the requirements of step 8 shall not be more than 5dB and not more than [TBD] dB in step 9.

11) As specified in Section 4.2, if Module 1 supports multiple applications and scenarios, measurement shall be conducted under multiple applications and scenarios according to step 1)- step 10).

6) BER on all adjacent signal channels closest to the signal channels (as shown in Figure 1) for Module 1 shall be measured under the forward power determined by step 5). Measurement result of BER shall not exceed 1.2%.

7) The BER measurement results in all the channels of Module 1 shall be recorded.

8) As specified in Section 4.2, if Module 1 supports multi-band frequency, multiple applications and scenarios, measurement shall be conducted under multi-band frequency, multiple applications and scenarios according to step 1)~step 7).

### **6.6.3 Test methods of the interference of WCDMA module to WLAN module**

1) The total isotropic sensitivity on the high, middle and low signal channels for Module 2 shall be measured according to the requirements of YD/T 2193, while Module 1 is under the idle mode.

2) The location and polarization of the optimum sensitivity point on high, middle and low signal channels of Module 2 of EUT as well as the measurement results of optimum sensitivity on that point shall be recorded.

3) The connection between Module 1 and base station simulator (connection by selection of high, middle and low signal channels on different frequency bands respectively) shall be established according to the requirements of YD/T 1978 and Module 1 is launched with the maximum power.

4) The position and polarization of EUT shall be adjusted to make it the same with the recording results of step 2).

5) The output power (i.e. forward power) of base station simulator of Module 2 shall be adjusted to the optimum sensitivity +5dB recorded in step 2) (As shown in Figure 1

6) The packet error rate on all adjacent signal channels closest to the signal channels (as shown in Figure 1) for Module 1 shall be measured under the forward power determined by step 5). Measurement result of packet error rate shall not exceed 10%.

7) The measurement results of packet error rate in all the channels of Module 2 shall be recorded.

8) If Module 2 supports 5GHz frequency band, corresponding measurement shall be conducted for 5GHz frequency band according to the methods mentioned above with the

module as Module 2.

### **6.9.2 Test methods of the interference of WCDMA module to GSM module**

- 1) The connection between Module 1 and corresponding base station simulator according to the requirements of YD/T 1484 shall be established (if EUT Module 1 only supports data service. Measurement shall be conducted under the data connection status. At this time, Module 1 is required to work under the maximum downstream time slot which it can support), and launched with the maximum power, while Module 2 is under the idle mode. The total isotropic radiated sensitivity of Module 1 on high, middle and low signal channels on GSM900 frequency band shall be measured.
- 2) After the measurement, it shall record the spatial location of optimum sensitivity point of Module 1 on high, middle and low signal channels and test antenna polarization.
- 3) As shown in Table 1, the signal channels section of Module 1 shall be divided into three sections – low, middle and high signal sections, the spatial location of optimum sensitivity point on high, middle and low signal channels and test antenna polarization shall be taken as the reference location and reference polarization respectively. If the difference BETWEEN the sensitivity of high and low signal channels measured which based on the spatial location of optimum sensitivity point on middle signal channels and test antenna polarization AND the sensitivity on the middle signal channels is less than 3dB, then the spatial location of the optimum sensitivity point and antenna polarization on middle signal channels can be taken as the uniform reference location and reference polarization on high, middle and low signal channels.
- 4) It shall conduct EIS measurement for all signal channels within each section under the corresponding reference location and reference polarization within the above-mentioned sections respectively. And record the measurement results.
- 5) The connection for Module 2 shall be established (connection by selection of high, middle and low signal channels on different frequency bands) according to the requirements of YD/T 1978 and Module 2 is launched with the maximum power.
- 6) EUT location and test antenna polarization shall be adjusted according to the reference location and reference polarization determined by step 3).

1 according to the requirements of YD/T 1484 (connection by selecting the high, middle and low signal channels on GSM900 and GSM1800 respectively). If EUT Module 1 only supports the data service, degree of interference of Module 1 on Module 2 is only measured in the data connection status. At this time, Module 1 is required to work under the condition of the maximum upstream time slot which it can support and be launched with the maximum power.

6) EUT location and test antenna polarization shall be adjusted according to the reference location and reference polarization determined by step 3).

7) It shall rerun the tests of step 4). And record the EIS of each signal channels.

8) Difference between measurement results of step 7) and step 4) on each signal channels shall not be more than [TBD] dB.

9) As specified in Section 4.2, if Module 2 supports multi-band frequency, multiple applications and scenarios, measurement shall be conducted under multi-band frequency, multiple applications and scenarios according to step 1)~step 7).

#### **6.10 Technology requirements and test methods for electromagnetic interference of 2.4GHz wireless telecommunication equipment**

It can see GB/T 26256 for technical requirements and measurement methods of electromagnetic interference of 2.4GHz wireless telecommunication equipment.

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