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

GB/T 29306.1-2012

**Recommended methods for the determination of the dielectric
properties of insulating materials at frequencies above 300 MHz
-- Part 1: General**

绝缘材料在300 MHz以上频率下介电性能测定方法 第1部分：总则

(English Translation)

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Foreword

GB/T 29306 "insulating material frequency dielectric properties determination in the 300MHz or more" is divided into the following sections.

--- Part 1. General;

--- Part 2. Resonance.

This section GB/T Part of 129,306.

This section drafted in accordance with GB/T 1.1-2009 given rules.

This section uses redrafted law revision using IEC 60377-1. 1973 dielectric properties measured "insulating materials at frequencies above 300MHz under Setting Method - Part 1. General. " Technical differences exist compared to 1973, the terms of these differences has been involved through its outer margins. This portion of the IEC 60377-1 A single vertical line (-) positions were marked.

The main technical changes are as follows.

--- Increased in Chapter 2 of normative references, and IEC 60250. 1969 replace GB/T 1409-2006;

--- Adds the second chapter, reg numbers have been modified accordingly;

--- Remove the IEC 60377-1. 1973 and IEC 60377-3 involved in IEC 60377-4 (IEC no original).

This part is proposed by the China Electrical Equipment Industrial Association.

This part of the National Electrical insulation materials and insulation systems assessment Standardization Technical Committee (SAC/TC301) centralized.

This section is drafted. Guilin Electrical Apparatus Research Institute, Xi'an Jiaotong University, Beijing Electrical Machinery Industry Technical and Economic Research Institute.

1 Scope

This section GB/T 29306 specifies the test methods for insulating materials dielectric properties.

This section applies to the determination of the microwave frequency range (from about 300MHz up to optical frequencies) relative permittivity of the dielectric material, the dielectric loss Factor and the amount of consumption related to this, such as loss exponent.

2 Normative references

The following documents for the application of this document is essential. For dated references, only the dated version suitable for use herein Member. For undated references, the latest edition (including any amendments) applies to this document.

GB/T 1409-2006 Measurement of electrical insulating materials at power, audio, high-frequency (including meter wavelengths included) of the permittivity and dielectric loss Consumption factor recommended method (IEC 60250. 1969, MOD) GB/T 29306.2-2012 insulating materials at frequencies above 300MHz dielectric properties measurement method - Part 2. Resonance method (IEC 60377-2. 1977, MOD) Objective 3 Determination of dielectric properties of insulating materials can be broadly divided into two categories.

1) When the applied electromagnetic field is larger than the wavelength of the sample size, you can use lumped parameter method. These relatively simple methods GB/T 1409-2006 already provides a frequency range of frequency to 300MHz.

2) When the electromagnetic field around the sample space changes can not be ignored when using the distributed parameter method. A frequency range of 300MHz to Optical frequency.

300MHz in this "critical" frequency in the vicinity of a narrow frequency range can be used exactly which group of parties (hatched area shown in Figure 1) France, which is mainly determined according to the size and the permittivity of the sample.

Test methods used in different test method specified in this part of the lower frequencies (see GB/T 1409-2006) under this part Sample and test device size is greater than or equivalent test frequency electromagnetic wavelengths.

In theory, this section applies only to material having an absolute permeability of vacuum, for diamagnetic and paramagnetic materials (so-called non-magnetic material), through Often you can get a good approximation, and for iron and ferromagnetic materials, we must use some special method of dielectric and magnetic properties separately. but it is that

these methods are beyond the scope of this section.

Note: The magnetic permeability --- if there is a sufficient magnetic field strength of DC magnetic bias places saturated, rendering the sample magnetic energy may be in accordance with this section test.

Take special measures, using suitable design of the measuring cell, by the method specified in this section can be carried out with the molten liquid and solid materials, like Measuring the material.

Measurement depends on a number of physical conditions such as frequency, temperature, humidity, and in exceptional cases also decided to field strength.

All measurements and calculations in this section are based on the angular frequency $\omega = 2\pi f$ sine wave.