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

GB/T 28869.3-2023

Replacing GB/T 9632.1-2002

**Cores made of soft magnetic materials - Measuring methods -
Part 3: Magnetic properties at high excitation level
(English Translation)**

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents" Drafting:

This document is Part 3 of GB/T 28869 "Measurement Methods for Magnetic Cores Made of Soft Magnetic Materials": GB/T 28869 has been released the following parts:

---Part 1: General specifications;

---Part 2: Magnetic properties at low excitation levels;

---Part 3: Magnetic properties at high excitation levels:

This document partially replaces GB/T 9632.1-2002 "Measurement Method for Magnetic Cores of Inductors and Transformers for Communications": With GB/T 9632.1-Compared with:2002, in addition to structural adjustments and editorial changes, the main technical changes are as follows:

---Changed the scope of the file (see Chapter 1, Chapter 1 of the:2002 edition);

---Added terms, definitions and symbols (see Chapter 3);

---Added information statement (see Chapter 7);

---Added test report (see Chapter 8):

This document is modified to adopt IEC 62044-3:2000 "Measurement methods for magnetic cores made of soft magnetic materials - Part 3: High excitation levels" Magnetic Properties":

Compared with IEC 62044-3:2000, this document has made the following structural adjustments:

---4:4:1 corresponds to the suspended section in 4:4 of IEC 62044-3:2000, 6:3:2:1 corresponds to 6:3:2 of IEC 62044-3:2000 Suspended section, 6:3:2:3:1 corresponds to the suspended section in 6:3:2:2 of IEC 62044-3:2000, E:4:1 corresponds to IEC 62044-3:

The suspension section in E:4 of:2000 has been adjusted in sequence;

---Appendix F corresponds to the content in IEC 60367-1:1982 cited in 4:4 of IEC 62044-3:2000, and the "technical the content of "Words" has been adjusted to Chapter 3 (see 3.1:10~3:1:18), and the appendix content mentioned therein has been adjusted to Appendix G: Related figures Numbers and formula numbers have been adjusted in sequence:

The technical differences between this document and IEC 62044-3:2000 and their reasons are as follows:

---Replaced IEC 60050(221):1990 (see 3.1) with the normatively quoted GB/T 9637 to adapt to my country's technical conditions parts to increase operability;

---Replace IEC 60367-1:1982 (see 6.1) with the normatively quoted GB/T 28869.1-2012 to adapt to my country's technical conditions parts to increase operability:

The following editorial changes have been made to this document:

---Incorporated the errata content of IEC 62044-3:2000/COR1.2021, the outer margins of the clauses involved are marked with vertical Straight double lines (||) are marked;

- Added a note (see Note 3, 3:13, 3:14 of 3:1:12);
 - The ordering of symbols in Chapter 3 has been adjusted;
 - Deleted Note 4 of 3:2 in IEC 62044-3:2000;
 - Processed suspension sections 4:4:1, 6:3:2:1, 6:3:2:3:1, and E:4:1 in IEC 62044-3:2000;
 - Replace Note 4:2:1, Note 3 of 6:1:3, Note 6:1:5, and 6:2:3 of the recommended clauses containing requirement-type clauses in IEC 62044-3:2000:
- Note, Note 1 of Chapter 7, Note 2 of Figure C:1, Note 1 to Note 4 of Figure E:1 are changed to paragraphs;
- Changed the item numbers in Chapter 7;
 - The numbering of figures and formulas has been adjusted;
 - Added references:

Please note that some content in this document may be subject to patents: The publisher of this document assumes no responsibility for identifying patents:

Introduction

GB/T 9632.1-2002 "Measurement Method for Magnetic Cores of Inductors and Transformers for Communications", as the basic standard of the soft magnetic industry, is widely used by enterprises:

Widely adopted: GB/T 9632.1-2002 is equivalent to IEC 60367-1:1982, which has been replaced by IEC 62044 series standard, so it is revised according to the structural relationship of the new IEC standard: IEC 62044-1:2002 has been converted into GB/T 28869.1-2012: GB/T 28869 "Measurement Method for Magnetic Cores Made of Soft Magnetic Materials" consists of three parts:

---Part 1: General specifications: The purpose is to establish a general standard to be followed for all possible measurement methods of magnetic cores made of soft magnetic materials:

in principle:

---Part 2: Magnetic properties at low excitation levels: The purpose is to establish the magnetic and electrical properties of cores operating at low excitation levels Normative guidelines for energy measurement methods:

---Part 3: Magnetic properties at high excitation levels: The purpose is to specify the power dissipation and amplitude magnetism of closed-circuit cores at high excitation levels:

conductivity measurement method:

The revision of GB/T 28869 is conducive to the test methods of magnetic cores made of soft magnetic materials being in line with international standards, and the test results are internationally recognized:

And expand export trade of related products:

Measurement method for magnetic cores made of soft magnetic materials Part 3: Magnetic properties at high excitation levels

1 Scope

This document specifies closures for inductors, chokes, transformers and other electronic devices with power requirements operating at high excitation levels:

Measurement method of power consumption and amplitude permeability of magnetic core:

The measurement methods given in this document, such as calorimetry and reflection methods, enable the measurement of magnetic properties in the frequency range from direct current (dc) to 10MHz, or even higher: For measuring magnetic properties in a given frequency range, which measurement method is chosen depends on the accuracy required:

The measurement methods in this document are based on usual sinusoidal excitation conditions and are also applicable to other periodic waveforms: However, only if the corresponding the measurement circuits and instruments used can control the magnetic flux density and magnetic field strength waveform accuracy within the spectrum range with only a slight reduction amplitude and phase to obtain sufficient accuracy:

Note: For some soft magnetic alloy materials, it is necessary to follow general principles and material practices related to sample preparation and calculation regulations: These principles are found in IEC 60404-8-6:

2 Normative reference documents

The contents of the following documents constitute essential provisions of this document through normative references in the text: Among them, the dated quotations for undated referenced documents, only the version corresponding to that date applies to this document; for undated referenced documents, the latest version (including all amendments) applies to this document:

GB/T 9637 Electrical terminology Magnetic materials and components [GB/T 9637-2001, eqvIEC 60050(221):1990] GB/T 28869.1-2012 Measurement methods for magnetic cores made of soft magnetic materials Part 1: General specifications (IEC 62044-1:

2002,IDT)