

ICS 17.220.99, 29.035.01, 29.080.30
CCS K 15



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

GB/T 23642-2026

Replacing GB/T 23642-2017

**Electrical insulating materials and systems - Electrical
measurement of partial discharges (PD) under short rise time
and repetitive voltage impulses**

电气绝缘材料和系统 瞬时上升和重复电压冲击条件下的局部放电(PD)电气测量
(English Translation)

Issued on: July 30, 2026

Implemented on: February 1, 2027

Issued by: State Administration for Market Regulation

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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 replaces GB/T 23642-2017 "Electrical Insulation Materials and Systems - Local Insulation under Instantaneous Rise and Repetitive Voltage Impulses".

The main technical changes in "Electrical Measurement of Discharge (PD)" compared to GB/T 23642-2017, apart from structural adjustments and editorial modifications, are as follows.

---The scope of application for power electronic modules has been expanded (see Chapter 1);

---The definition of the term "partial discharge" has been revised to include the addition that

"this discharge may or may not occur near a conductor." the description of "" (see 3.2, 2017 edition);

---The definition of the term "unipolar impact" has been changed (see 3.7, 2017 edition of 3.7);

---GB/T 7354-2003 has been changed to IEC 60270 (see 4.1, 2017 edition 4.1);

---IEC 60034 (all parts) has been changed to IEC 60034-18-1 (see 4.3.2, 2017 edition of 4.3.2);

---The rise time frequency range has been changed to 0.02 μ s~1 μ s, and the triangular wave is recommended as the preferred waveform (see Table 1, Table 1 in the 2017 version);

--- Charge measurement has been removed (see 5.2.5 in the 2017 version);

---The source control gate technology has been removed (see 5.3 in the 2017 version).

This document is equivalent to IEC TS61934:2024 "Electrical insulation materials and systems under transient rise and repetitive voltage impulse conditions".

"Electrical Measurement of Partial Discharge (PD)". The document type has been changed from an IEC technical specification to a recommended national standard in my country.

The following minimal editorial changes have been made to this document.

---The terminology source has been changed from IEC 60270 to GB/T 7354-2018, and IEC 62068:2013 to GB/T 22566-2017;

---Reference IEC 62068:2013 has been changed to GB/T 22566-2017, and reference GB/T 7354-2018 has been added.

Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents.

This document was proposed by the China Electrical Equipment Industry Association.

This document is under the jurisdiction of the National Technical Committee on Standardization of Electrical Insulation Materials and Insulation Systems (SAC/TC301).

Introduction

The development of power electronics is intertwined with control theory and semiconductor technology. Switching operation is one of the core characteristics of power electronic control.

To achieve higher efficiency and smoother operation, devices such as insulated-gate bipolar transistors (IGBTs) often have switching times shorter than microseconds.

The application of wide-bandgap devices (such as silicon carbide-based devices) can

produce transient processes with rise times on the order of tens of nanoseconds. For example...

This short rise time can trigger transient overvoltage pulses or surges in the system. When these voltage pulses reach the breakdown strength of the air gap, Partial discharge (PD) may occur. Furthermore, these pulses exhibit heavy [symbols] due to power electronic modulation (e.g., pulse width modulation (PWM)).

Reversibility characteristics. Given that partial discharge can cause performance degradation of electrically insulating components in a system, it is a critical parameter that needs to be measured.

one.

Instantaneous rise of electrical insulation materials and systems Local under repetitive voltage impact conditions Discharge (PD) electrical measurement

1 Scope

This document describes the localized impacts that occur when an electrical insulation system (EIS) is subjected to repetitive voltage surges from power electronic equipment.

Offline electrical measurements of partial discharge (PD).

This document applies to EIS (Electronic Information System) powered by power electronic equipment, such as motors, inductive reactors, wind turbines, and power electronic modules.

Note: When using this document for specific products, additional procedures may be required.

This document does not apply to optical or ultrasonic-based PD detection methods or non-repetitive voltage surges (such as lightning strikes or switching equipment interruption surges).

2 Normative references

The contents of the following documents, through normative references within the text, constitute essential provisions of this document. Dated citations are not included.

For references to documents, only the version corresponding to that date applies to this document; for undated references, the latest version (including all amendments) applies.

This document.

Note: GB/T 7354-2018 High Voltage Testing Techniques - Partial Discharge Measurement (IEC 60270:2000, MOD)

3 Terms and Definitions

The following terms and definitions apply to this document.

The URLs for the terminology databases maintained by ISO and IEC for standardization are as follows.

Test voltage surges are used to evaluate power electronic devices with a certain carrier or drive frequency due to switching impulses.

Partial discharge (PD) the insulation between conductors is only partially bridged by electrical discharge, and this discharge may or may not occur near the conductor.

[Source. GB/T 7354-2018, 3.1, with modifications] 3.3 the current pulse measured at the end of the test sample when partial discharge occurs inside the sample.

Note 1: To achieve the testing purpose, the pulse is measured using an appropriate detection circuit connected in the test circuit.

Note 2: According to this document, the current or voltage signal detected at the output terminal is related to the PD pulse at the input terminal.