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

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**Thermal runaway test for bypass diode applied in photovoltaic
modules**

光伏组件用旁路二极管热失控测试

(English Translation)

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Foreword

This document is in accordance with the provisions of GB/T 1.1-2020 "Guidelines for standardization work Part 1: Structure and drafting rules for standardization documents" Drafting.

This document is equivalent to IEC 62979:2017 "Photovoltaic module bypass diode thermal runaway test". The following minimal editorial changes were made to this document.

--- To coordinate with the existing standards, the document name is changed to "Thermal runaway test of bypass diodes for photovoltaic modules".

1 Scope

This document describes a test method for thermal runaway of bypass diodes used in photovoltaic modules.

Are bypass diodes in PV modules prone to thermal runaway, or are the junction boxes too hot to handle the heat when switching from forward bias to reverse bias? capacity to prevent the diode from overheating.

This document is applicable to the testing of Schottky diodes, because Schottky diodes have the characteristic that the leakage current increases with the reverse bias voltage at high temperature. This characteristic makes Schottky diodes prone to thermal runaway.

The samples using PN junction diodes as bypass diodes do not need to be subjected to the thermal runaway test method required by this document because the PN junction Diodes have a strong ability to withstand reverse bias.

2 Normative references

The contents of the following documents constitute the essential clauses of this document through normative references in this document.

For referenced documents without a date, only the version corresponding to that date applies to this document; for referenced documents without a date, the latest version (including all amendments) applies to This document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions are applicable.

3.1 Reverse current

A current that flows through a bypass diode in a direction opposite to the diode's polarity.

3.2 Reverse bias voltage

A voltage applied across a bypass diode that is opposite in polarity to that of the diode.

3.3 Tlead

Thermocouples measure the temperature of the bypass diode leads.

4.1 Diode Thermal Runaway

Some bypass diodes in photovoltaic modules have the characteristic that the leakage current increases with the temperature in the reverse bias state.

When the diode is reverse biased, the temperature is already very high, and there may be a large reverse current inside the diode.

The reverse current can cause the diode junction temperature to rise significantly. When the temperature rise exceeds the heat dissipation capacity of the junction box, this temperature rise and reverse current can cause The bypass diode fails. This phenomenon is called "thermal runaway". Therefore, the thermal design of the bypass diode in the PV module junction box should be carried out.