

Directly heated negative temperature coefficient
thermistors - Part 1: Generic specification

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

See Eesti standard EVS-EN IEC 60539-1:2023 sisaldab Euroopa standardi EN IEC 60539-1:2023 ingliskeelset teksti.	This Estonian standard EVS-EN IEC 60539-1:2023 consists of the English text of the European standard EN IEC 60539-1:2023.
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English Version

Directly heated negative temperature coefficient thermistors -
Part 1: Generic specification
(IEC 60539-1:2022)

Thermistances à coefficient de température négatif à
chauffage direct - Partie 1: Spécification générique
(IEC 60539-1:2022)

Direkt geheizte temperaturabhängige Widerstände mit
negativem Temperaturkoeffizienten - Teil 1:
Fachgrundspezifikation
(IEC 60539-1:2022)

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European foreword

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IEC 60027-1 NOTE Approved as EN 60027-1

ISO 80000-1 NOTE Approved as EN ISO 80000-1

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Directly heated negative temperature coefficient thermistors –
Part 1: Generic specification**

**Thermistances à coefficient de température négatif à chauffage direct –
Partie 1: Spécification générique**



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INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Directly heated negative temperature coefficient thermistors –
Part 1: Generic specification**

**Thermistances à coefficient de température négatif à chauffage direct –
Partie 1: Spécification générique**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

DIRECTLY HEATED NEGATIVE TEMPERATURE COEFFICIENT THERMISTORS –

Part 1: Generic specification

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IEC 60539-1 has been prepared by IEC technical committee 40: Capacitors and resistors for electronic equipment. It is an International Standard.

This fourth edition cancels and replaces the third edition published in 2016. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) Restructured completely to comply to ISO/IEC directives; categorization and reorganization of test methods into these categories;
- b) Annex X added for comparison to the previous edition;
- c) Some wordings, figures and references have been revised.

The text of this International Standard is based on the following documents:

Draft	Report on voting
40/2975/FDIS	40/3016/RVD

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this International Standard is English.

A list of all parts in the IEC 60539-1 series, published under the general title *Directly heated negative temperature coefficient thermistors*, can be found on the IEC website.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

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DIRECTLY HEATED NEGATIVE TEMPERATURE COEFFICIENT THERMISTORS –

Part 1: Generic specification

1 Scope

This part of IEC 60539 is applicable to directly heated negative temperature coefficient thermistors, typically made from transition metal oxide materials with semiconducting properties.

It establishes standard terms, inspection procedures and methods of test for use in sectional and detail specifications of electronic components for quality assessment or any other purpose.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 60062, *Marking codes for resistors and capacitors*

IEC 60068-1:2013, *Environmental testing – Part 1: General and guidance*

IEC 60068-2-1, *Environmental testing – Part 2-1: Tests – Tests A: Cold*

IEC 60068-2-2, *Environmental testing – Part 2-2: Tests – Tests B: Dry heat*

IEC 60068-2-6, *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-11, *Environmental testing – Part 2-11: Tests – Test Ka: Salt mist*

IEC 60068-2-14, *Environmental testing – Part 2-14: Tests – Test N: Change of temperature*

IEC 60068-2-17, *Basic environmental testing procedures – Part 2-17: Tests – Test Q: Sealing*

IEC 60068-2-20, *Environmental testing – Part 2-20: Tests – Test Ta and Tb: Test methods for solderability and resistance to soldering heat of devices with leads*

IEC 60068-2-21:2021, *Environmental testing – Part 2-21: Tests – Test U: Robustness of terminations and integral mounting devices*

IEC 60068-2-27:2008, *Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock*

IEC 60068-2-31, *Environmental testing – Part 2-31: Tests – Test Ec: Rough handling shocks, primarily for equipment-type specimens*

IEC 60068-2-38, *Environmental testing – Part 2-38: Tests – Test Z/AD: Composite temperature/humidity cyclic test*

IEC 60068-2-45:1980, *Basis Environmental testing procedures – Part 2-45: Tests – Test XA and guidance: Immersion in cleaning solvents*
IEC 60068-2-45:1980/AMD1:1993

IEC 60068-2-52, *Environmental testing – Part 2-52: Tests – Test Kb: Salt mist, cyclic (sodium chloride solution)*

IEC 60068-2-58, *Environmental testing – Part 2-58: Tests – Test Td: Test methods for solderability, resistance to dissolution of metallization and to soldering heat of surface mounting devices (SMD)*

IEC 60068-2-69, *Environmental testing – Part 2-69: Tests – Test Te/Tc: Solderability testing of electronic components and printed boards by the wetting balance (force measurement) method*

IEC 60068-2-78, *Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state*

IEC 60294, *Measurement of the dimensions of a cylindrical component with axial terminations*

IEC 61193-2, *Quality assessment systems – Part 2: Selection and use of sampling plans for inspection of electronic components and packages*

IEC 60717, *Method for the determination of the space required by capacitors and resistors with unidirectional terminations*

IEC 61249-2-7, *Materials for printed boards and other interconnecting structures – Part 2-7: Reinforced base materials clad and unclad – Epoxide woven E-glass laminated sheet of defined flammability (vertical burning test), copper-clad*

3 Terms and definitions

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

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

3.1

type

group of products having similar design features manufactured by the same techniques and falling within the manufacturer's usual range of ratings for these products

Note 1 to entry: Mounting accessories are ignored, provided they have no significant effect on the test results.

Note 2 to entry: Ratings cover the combination of

- electrical ratings,
- sizes, and
- climatic category.

Note 3 to entry: The limits of the range of ratings should be given in the detail specification.

3.2

style

variation within a type having specific nominal dimensions and characteristics