



SLOVENSKI STANDARD

SIST EN 60539-1:2008

01-julij-2008

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SIST EN 60539-1:2003

Neposredno ogrevani termistorji z negativnim koeficientom - 1. del: Rodovna specifikacija (IEC 60539-1:2008)

Directly heated negative temperature coefficient thermistors - Part 1: Generic specification (IEC 60539-1:2008)

Direkt geheizte temperaturabhängige Widerstände mit negativem Temperaturkoeffizienten - Teil 1: Fachgrundspezifikation (IEC 60539-1:2008)

Thermistors à coefficient de température négatif à chauffage direct - Partie 1: Spécification générique (IEC 60539-1:2008)

Ta slovenski standard je istoveten z: EN 60539-1:2008

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31.040.30 Termistorji Thermistors

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English version

**Directly heated negative temperature coefficient thermistors -
Part 1: Generic specification
(IEC 60539-1:2008)**

Thermistors à coefficient de température
négatif à chauffage direct -
Partie 1: Spécification générique
(CEI 60539-1:2008)

Direkt geheizte temperaturabhängige
Widerstände mit negativem
Temperaturkoeffizienten -
Teil 1: Fachgrundspezifikation
(IEC 60539-1:2008)

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This European Standard was approved by CENELEC on 2008-03-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

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CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 40/1878A/FDIS, future edition 2 of IEC 60539-1, prepared by IEC TC 40, Capacitors and resistors for electronic equipment, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60539-1 on 2008-03-01.

This European Standard supersedes EN 60539-1:2002. It constitutes a minor revision related to tables, figures and references.

The following dates were fixed:

- latest date by which the EN has to be implemented
at national level by publication of an identical
national standard or by endorsement (dop) 2008-12-01
- latest date by which the national standards conflicting
with the EN have to be withdrawn (dow) 2011-03-01

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60539-1:2008 was approved by CENELEC as a European Standard without any modification.

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Annex ZA (normative)

Normative references to international publications with their corresponding European publications

The following referenced documents are indispensable for the application 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.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60027-1	- ¹⁾	Letter symbols to be used in electrical technology - Part 1: General	EN 60027-1	2006 ²⁾
IEC 60050	Series	International Electrotechnical Vocabulary (IEV)	-	-
IEC 60062	- ¹⁾	Marking codes for resistors and capacitors	EN 60062 + corr. January	2005 ²⁾ 2007
IEC 60068-1 + A1	1988 1992	Environmental testing - Part 1: General and guidance	EN 60068-1	1994
IEC 60068-2-1	2007	Environmental testing - Part 2-1: Tests - Test A: Cold	EN 60068-2-1	2007
IEC 60068-2-2	2007	Environmental testing - Part 2-2: Tests - Test B: Dry heat	EN 60068-2-2	2007
IEC 60068-2-6	1995	Environmental testing - Part 2-6: Tests - Test Fc: Vibration (sinusoidal)	EN 60068-2-6 ³⁾	1995
IEC 60068-2-11	1981	Environmental testing - Part 2-11: Tests - Test Ka: Salt mist	EN 60068-2-11	1999
IEC 60068-2-14 + A1	1984 1986	Environmental testing - Part 2-14: Tests - Test N: Change of temperature	EN 60068-2-14	1999
IEC 60068-2-17	1994	Environmental testing - Part 2-17: Tests - Test Q: Sealing	EN 60068-2-17	1994
IEC 60068-2-20 + A2	1979 1987	Environmental testing - Part 2-20: Tests - Test T: Soldering	HD 323.2.20 S3	1988
IEC 60068-2-21	2006	Environmental testing - Part 2-21: Tests - Test U: Robustness of terminations and integral mounting devices	EN 60068-2-21	2006
IEC 60068-2-27	1987	Basic environmental testing procedures - Part 2-27: Tests - Test Ea and guidance: Shock	EN 60068-2-27	1993
IEC 60068-2-29	1987	Environmental testing - Part 2-29: Tests - Test Eb and guidance: Bump	EN 60068-2-29	1993
IEC 60068-2-32 + A2	1975 1990	Environmental testing - Part 2-32: Tests - Test Ed: Free fall	EN 60068-2-32	1993

¹⁾ Undated reference.

²⁾ Valid edition at date of issue.

³⁾ EN 60068-2-6 is superseded by EN 60068-2-6:2008, which is based on IEC 60068-2-6:2007.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60068-2-38	1974	Environmental testing - Part 2-38: Tests - Test Z/AD: Composite temperature/humidity cyclic test	EN 60068-2-38	1999
IEC 60068-2-45 A1	1980 1993	Environmental testing - Part 2-45: Tests - Test XA and guidance: Immersion in cleaning solvents	EN 60068-2-45 A1	1992 1993
IEC 60068-2-52	1996	Environmental testing - Part 2-52: Tests - Test Kb: Salt mist, cyclic (sodium chloride solution)	EN 60068-2-52	1996
IEC 60068-2-54	2006	Environmental testing - Part 2-54: Tests - Test Ta: Solderability testing of electronic components by the wetting balance method	EN 60068-2-54	2006
IEC 60068-2-58	2004	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)	EN 60068-2-58 + corr. December	2004 2004
IEC 60068-2-69	2007	Environmental testing - Part 2-69: Tests - Test Te: Solderability testing of electronic components for surface mounting devices (SMD) by the wetting balance method	EN 60068-2-69	2007
IEC 60068-2-78	2001	Environmental testing - Part 2-78: Tests - Test Ca: Damp heat, steady state	EN 60068-2-78	2001
IEC 60294	- ¹⁾	Measurement of the dimensions of a cylindrical component having two axial terminations	-	-
IEC 60410	- ¹⁾	Sampling plans and procedures for inspection - by attributes	-	-
IEC 60617	Data- base	Graphical symbols for diagrams	-	-
IEC 60717	- ¹⁾	Method for the determination of the space required by capacitors and resistors with unidirectional terminations	-	-
IEC 61249-2-7	- ¹⁾	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	EN 61249-2-7 + corr. September	2002 ²⁾ 2005
IEC QC 001002-3	- ¹⁾	IEC Quality Assessment System for Electronic Components (IECQ) - Rules of Procedure - Part 3: Approval procedures	-	-
ISO 1000	- ¹⁾	SI units and recommendations for the use of their multiples and of certain other units	-	-



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

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**DIRECTLY HEATED NEGATIVE TEMPERATURE COEFFICIENT
THERMISTORS –**

Part 1: Generic specification

FOREWORD

- 1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

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

This second edition cancels and replaces the first edition published in 2002 and constitutes a minor revision related to tables, figures and references.

The text of this standard is based on the following documents:

FDIS	Report on voting
40/1878A/FDIS	40/1895/RVD

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

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The QC number that appears on the front cover of the publication is the specification number in the IEC Quality Assessment System for Electronic Components (IECQ).

IEC 60539 consists of the following parts, under the general title *Directly heated negative temperature coefficient thermistors*:

Part 1: Generic specification

Part 2: Sectional specification: Surface mount negative temperature coefficient thermistors

The committee has decided that the contents of this publication will remain unchanged until the maintenance result date indicated on the IEC web site under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

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DIRECTLY HEATED NEGATIVE TEMPERATURE COEFFICIENT THERMISTORS –

Part 1: Generic specification

1 General

1.1 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.

1.2 Normative references

The following referenced documents are indispensable for the application 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 60027-1, *Letter symbols to be used in electrical technology – Part 1: General*

IEC 60050, *International Electrotechnical Vocabulary (IEV)*
SIST EN 60539-1:2008
bf2346-49dd-a948-b55a3f1d9a4e/sist-en-60539-1-2008

IEC 60062, *Marking codes for resistors and capacitors*

IEC 60068-1:1988, *Environmental testing – Part 1: General and guidance*
Amendment 1 (1992)

IEC 60068-2-1:2007, *Environmental testing – Part 2-1: Tests – Tests A: Cold*

IEC 60068-2-2:2007, *Environmental testing – Part 2-2: Tests – Tests B: Dry heat*

IEC 60068-2-6:1995, *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-11:1981, *Environmental testing – Part 2-11: Tests – Test Ka: Salt mist*

IEC 60068-2-14:1984, *Environmental testing – Part 2-14: Tests – Test N: Change of temperature*
Amendment 1 (1986)

IEC 60068-2-17:1994, *Environmental testing – Part 2-17: Tests – Test Q: Sealing*

IEC 60068-2-20:1979, *Environmental testing – Part 2-20: Tests – Test T: Soldering*
Amendment 2 (1987)

IEC 60068-2-21:2006, *Environmental testing – Part 2-21: Tests – Test U: Robustness of terminations and integral mounting devices*

IEC 60068-2-27:1987, *Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock*

IEC 60068-2-29:1987, *Environmental testing – Part 2-29: Tests – Test Eb and guidance: Bump*

IEC 60068-2-32:1975, *Environmental testing – Part 2-32: Tests – Test Ed: Free fall*
Amendment 2 (1990)

IEC 60068-2-38:1974, *Environmental testing – Part 2-38: Tests – Test Z/AD: Composite temperature/humidity cyclic test*

IEC 60068-2-45:1980, *Environmental testing – Part 2-45: Tests – Test XA and guidance: Immersion in cleaning solvents*
Amendment 1 (1993)

IEC 60068-2-52:1996, *Environmental testing – Part 2-52: Tests – Test Kb: Salt mist, cyclic (sodium chloride solution)*

IEC 60068-2-54:2006, *Environmental testing – Part 2-54: Tests – Test Ta: Solderability testing of electronic components by the wetting balance method*

IEC 60068-2-58:2004, *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 60068-2-69:2007, *Environmental testing – Part 2-69: Tests – Test Te: Solderability testing of electronic components for surface mounting devices (SMD) by the wetting balance method*

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IEC 60068-2-78:2001, *Environmental testing – Part 2-78: Tests – Test Cab: Damp heat, steady state*

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

IEC 60410, *Sampling plans and procedures for inspection by attributes*

IEC 60617, *Graphical symbols for diagrams*

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*

IECQ 001002-3, *IEC Quality Assessment System for Electronic Components (IECQ) – Rules of procedure – Part 3: Approval procedures*

ISO 1000, *SI units and recommendations for the use of their multiples and of certain other units*

2 Technical data

2.1 Units, symbols and terminology

Units, graphical symbols, letter symbols and terminology should, whenever possible, be taken from the following publications:

- IEC 60027-1
- IEC 60050
- IEC 60617
- ISO 1000

When further items are required, they should be derived in accordance with the principles of the publications listed above.

2.2 Terms and definitions

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

2.2.1

type

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 Mounting accessories are ignored, provided they have no significant effect on the test results.

NOTE 2 Ratings cover the combination of

- electrical ratings;
- sizes;
- climatic category.

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NOTE 3 The limits of the range of ratings should be given in the detail specification.

2.2.2

style

variation within a type having specific nominal dimensions and characteristics

2.2.3

thermistor

thermally sensitive semiconducting resistor whose primary function is to exhibit an important change in electrical resistance with a change in body temperature

2.2.4

negative temperature coefficient thermistor (NTC)

thermistor in which the resistance decreases with increasing temperature

2.2.5

directly heated negative temperature coefficient thermistor

thermistor which obtains its resistance variation by the changes of physical conditions such as current through it, ambient temperature, humidity, wind velocity, gas, etc.

2.2.6

indirectly heated negative temperature coefficient thermistor

thermistor which obtains its resistance variation primarily by the change of temperature of the thermistor, due to the change of a current through a separate heater which is in close contact with, but electrically insulated from, the thermistor element

NOTE The temperature of the thermistor can also be changed by the changes of physical conditions such as current through the thermistor element itself, ambient temperature, humidity, wind velocity, gas, etc.

2.2.7

positive temperature coefficient (PTC) thermistor (for information only)
thermistor in which the resistance increases with increasing temperature

2.2.8

thermistor with wire terminations
thermistor provided with wire terminations

2.2.9

thermistor without wire terminations
thermistor provided only with two metallized faces, to be used as electrical contacts

2.2.10

insulated thermistor
thermistor coated with materials such as resin, glass or ceramic, capable of meeting the requirements of the insulation resistance and voltage proof tests when specified in the test schedule

2.2.11

non-insulated thermistor
thermistor with or without coating materials for surfacing of elements but not intended to meet the requirements of the insulation resistance and voltage proof tests when specified in the test schedule

2.2.12

surface mount thermistor
thermistor whose small dimensions and nature or shape of terminations make them suitable for use in hybrid circuits and on printed board

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2.2.13

assembled thermistor (probe)
thermistor encapsulated in different materials such as tubes, plastic and metal housing and/or assembled with cables and/or connectors

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2.2.14

thermistor for sensing
thermistor which responds to temperature changes and therefore is used for temperature sensing and control

2.2.15

inrush current limiting thermistor
thermistor which limits the inrush current just after switching on the power

2.2.16

residual resistance (only for inrush current-limiting thermistors)
value of the d.c. resistance of a thermistor when its thermal stability is reached with the maximum current passing

2.2.17

maximum permissible capacitance (only for inrush current-limiting thermistors)
maximum permissible capacitance value of a capacitor which can be connected to a thermistor under loading

2.2.18

zero-power resistance, R_T
value of the d.c. resistance of a thermistor, when measured at a specified temperature, under such conditions that the change in resistance due to the internal generation of heat is negligible with respect to the total error of measurement