

Thermistors - Directly heated positive temperature coefficient - Part 1: Generic specification

## EESTI STANDARDI EESSÕNA

## NATIONAL FOREWORD

See Eesti standard EVS-EN IEC 60738-1:2022 sisaldab Euroopa standardi EN IEC 60738-1:2022 ingliskeelset teksti.	This Estonian standard EVS-EN IEC 60738-1:2022 consists of the English text of the European standard EN IEC 60738-1:2022.
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English Version

Thermistors - Directly heated positive temperature coefficient -  
Part 1: Generic specification  
(IEC 60738-1:2022)

Thermistances - Coefficient de température positif à  
chauffage direct - Partie 1: Spécification générique  
(IEC 60738-1:2022)

Direkt geheizte temperaturabhängige Widerstände mit  
positivem Temperaturkoeffizienten - Teil 1:  
Fachgrundspezifikation  
(IEC 60738-1:2022)

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## European foreword

The text of document 40/2969/FDIS, future edition 4 of IEC 60738-1, prepared by IEC/TC 40 "Capacitors and resistors for electronic equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60738-1:2022.

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IEC 60068-2-45:1980      NOTE      Harmonized as EN 60068-2-45:1992 (not modified)

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
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)	EN 60068-2-58	-
IEC 60068-2-78	-	Environmental testing - Part 2-78: Tests - Test Cab: Damp heat, steady state	EN 60068-2-78	-
IEC 60294	-	Measurement of the dimensions of a cylindrical component with axial terminations	EN 60294	-
IEC 60617	-	Standard data element types with associated classification scheme for electric components - Part 4: IEC reference collection of standard data element types and component classes	-	-
IEC 60717	-	Method for the determination of the space required by capacitors and resistors with unidirectional terminations	EN 60717	-
IEC 61193-2	-	Quality assessment systems - Part 2: Selection and use of sampling plans for inspection of electronic components and packages	EN 61193-2	-
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	EN 61249-2-7	-
IEC 61760-1	-	Surface mounting technology - Part 1: Standard method for the specification of surface mounting components (SMDs)	EN IEC 61760-1	-
ISO 80000-1	-	Quantities and units - Part 1: General	EN ISO 80000-1	-

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE



**Thermistors – Directly heated positive temperature coefficient –  
Part 1: Generic specification**

**Thermistances – Coefficient de température positif à chauffage direct –  
Partie 1: Spécification générique**



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# INTERNATIONAL STANDARD

## NORME INTERNATIONALE



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Part 1: Generic specification**

**Thermistances – Coefficient de température positif à chauffage direct –  
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## CONTENTS

FOREWORD.....	7
1 Scope.....	9
2 Normative references .....	9
3 Terms and definitions .....	10
4 General requirements .....	19
4.1 Units and symbols.....	19
4.2 Preferred values .....	20
4.2.1 Climatic categories .....	20
4.2.2 Spacings .....	20
4.3 Marking.....	20
4.3.1 General .....	20
4.3.2 Coding.....	21
5 General provisions for measurements and test method.....	21
5.1 General.....	21
5.2 Standard conditions for testing.....	21
5.2.1 Standard atmospheric conditions for testing .....	21
5.2.2 Error of measurement.....	21
5.3 Drying and recovery.....	21
5.3.1 Drying.....	21
5.3.2 Recovery .....	22
5.3.3 Shock test severities.....	22
5.3.4 Vibration severities .....	22
5.4 Mounting (for surface mount thermistors only) .....	22
5.4.1 General .....	22
5.4.2 Printed wiring board and land pattern .....	23
5.4.3 Wave soldering method .....	23
5.4.4 Reflow soldering method .....	23
6 Electrical tests and measurements .....	24
6.1 Zero-power resistance .....	24
6.1.1 General .....	24
6.1.2 Measurement procedures .....	24
6.1.3 Requirements .....	25
6.2 Temperature coefficient of resistance .....	25
6.2.1 General .....	25
6.2.2 Requirements .....	25
6.3 Insulation resistance (for insulated types only).....	25
6.3.1 General .....	25
6.3.2 Test methods.....	25
6.3.3 Applied voltage.....	26
6.3.4 Requirements .....	26
6.4 Voltage proof (for insulated types only).....	26
6.4.1 General .....	26
6.4.2 Test methods.....	26
6.4.3 Test voltage.....	26
6.4.4 Requirements .....	26
6.5 Resistance/temperature characteristic .....	26

6.5.1	Test methods.....	26
6.5.2	Requirements .....	27
6.6	Dissipation factor at $U_{\max}$ ( $\delta$ ) .....	27
6.6.1	General .....	27
6.6.2	Preconditioning.....	27
6.6.3	Test circuit.....	27
6.6.4	Test methods.....	27
6.6.5	Requirements .....	28
6.7	Response time by ambient temperature change ( $t_a$ ) .....	28
6.7.1	General .....	28
6.7.2	Preconditioning.....	28
6.7.3	Test procedures.....	28
6.7.4	Measurement procedures .....	29
6.7.5	Requirements .....	29
6.8	Response time by power change ( $t_p$ ) .....	29
6.8.1	Mounting .....	29
6.8.2	Test methods.....	29
6.9	Thermal time constant by ambient temperature change ( $\tau_a$ ).....	30
6.10	Thermal time constant by cooling ( $\tau_c$ ) .....	30
6.10.1	Mounting .....	30
6.10.2	Test methods.....	30
6.10.3	Requirements .....	32
6.11	Tripping current and tripping time.....	32
6.12	Non-tripping current.....	32
6.13	Residual current.....	32
6.14	Surface temperature .....	33
6.15	Inrush current .....	34
6.15.1	Measuring circuit .....	34
6.15.2	Measuring method .....	34
6.16	Energy by discharge .....	35
6.16.1	Measuring circuit .....	35
6.16.2	Measuring method .....	35
7	Mechanical test and measurements.....	36
7.1	Visual examination and check of dimensions .....	36
7.1.1	Visual examination .....	36
7.1.2	Marking .....	36
7.1.3	Dimensions (gauging).....	36
7.1.4	Dimensions (detail).....	36
7.2	Robustness of terminations.....	36
7.2.1	General .....	36
7.2.2	Test $U_{a1}$ – Tensile .....	36
7.2.3	Test $U_b$ – Bending .....	37
7.2.4	Test $U_c$ – Torsion .....	37
7.2.5	Visual examination .....	37
7.2.6	Final measurements and requirements .....	37
7.3	Vibration .....	37
7.4	Shock .....	38
7.5	Shear (adhesion) test.....	38

7.5.1	Test conditions .....	38
7.5.2	Test methods .....	38
7.5.3	Requirements .....	38
7.6	Substrate bending test .....	38
7.6.1	Mounting .....	38
7.6.2	Initial measurements .....	39
7.6.3	Test procedures .....	39
7.6.4	Measurements .....	39
7.6.5	Requirements .....	39
7.6.6	Final inspection and requirements .....	39
8	Environmental and climatic tests .....	39
8.1	Rapid change of temperature .....	39
8.2	Climatic sequence .....	39
8.2.1	General .....	39
8.2.2	Initial measurements .....	39
8.2.3	Dry heat .....	40
8.2.4	Damp heat (cyclic), first cycle .....	40
8.2.5	Cold .....	40
8.2.6	Low air pressure .....	40
8.2.7	Damp heat (cyclic), remaining cycles .....	40
8.2.8	Final measurements .....	40
8.3	Damp heat, steady state .....	41
8.4	Endurance .....	41
8.4.1	Endurance at room temperature (cycling) .....	41
8.4.2	Endurance at upper category temperature .....	42
8.4.3	Endurance at maximum operating temperature and maximum voltage .....	43
8.4.4	Cold environment electrical cycling .....	44
8.4.5	Thermal runaway .....	45
9	Test related to component assembly .....	45
9.1	Solderability .....	45
9.1.1	General .....	45
9.1.2	Thermistors with leads .....	45
9.1.3	Surface mount thermistors .....	46
9.2	Resistance to soldering heat .....	46
9.2.1	General .....	46
9.2.2	Test conditions .....	46
9.2.3	The period of recovery .....	47
9.2.4	Requirements for except surface mount thermistors .....	47
9.2.5	Requirements for surface mount thermistors .....	47
10	Quality assessment procedures .....	47
Annex A (informative)	Mounting for electrical measurements .....	48
A.1	Mounting for thermistors without wire terminations .....	48
A.2	Mounting for thermistors with wire terminations .....	48
A.3	Mounting for surface mount thermistors .....	49
Annex B (informative)	Mounting for temperature measurements .....	51
Annex Q (normative)	Quality assessment procedures .....	52
Q.1	General .....	52
Q.2	Applicability of qualification approval .....	52

Q.3	Primary stage of manufacture .....	52
Q.4	Subcontracting.....	52
Q.5	Structurally similar components .....	52
Q.5.1	General .....	52
Q.5.2	For electrical tests .....	53
Q.5.3	For environmental tests .....	53
Q.5.4	For visual inspection.....	53
Q.5.5	For endurance tests.....	53
Q.6	Qualification approval procedures.....	53
Q.6.1	Eligibility for qualification approval.....	53
Q.6.2	Application for qualification approval .....	53
Q.6.3	Test procedure for qualification approval .....	53
Q.6.4	Qualification approval based on the fixed sample size procedure.....	54
Q.6.5	Granting of qualification approval .....	59
Q.6.6	Maintenance of qualification approval .....	59
Q.6.7	Quality conformance inspection .....	60
Q.7	Rework and repair.....	61
Q.7.1	Rework .....	61
Q.7.2	Repair .....	61
Q.8	Release for delivery .....	61
Q.8.1	General .....	61
Q.8.2	Release for delivery under qualification approval before the completion of group B tests .....	62
Q.9	Certified test records of released lots.....	62
Q.10	Delayed delivery .....	62
Q.11	Alternative test methods .....	62
Q.12	Manufacture outside the geographical limits.....	62
Q.13	Unchecked parameters .....	62
Annex X (informative)	Cross-references to IEC 60738-1:2009.....	63
Bibliography	.....	65
Figure 1	– Typical resistance-temperature characteristic and definitions for PTC thermistors (at zero power) .....	12
Figure 2	– Typical R-TNF characteristic for PTC thermistors in sensor applications .....	13
Figure 3	– Typical current/voltage characteristic for PTC thermistors .....	14
Figure 4	– $I_{in}$ against $t$ at $U_{dc}$ .....	17
Figure 5	– $I_{in}$ against $t$ at $U_{RMS}$ .....	17
Figure 6	– Dissipation factor test circuit .....	28
Figure 7	– Temperature gradient.....	29
Figure 8	– Circuit for measurement of thermal time constant by cooling .....	30
Figure 9	– Circuit for surface temperature measurement.....	33
Figure 10	– Measuring circuit.....	34
Figure 11	– Measuring circuit.....	35
Figure 12	– Circuit for endurance at maximum operating temperature and maximum voltage.....	44
Figure A.1	– Example of a preferred mounting method for thermistors without wire terminations .....	48

Figure A.2 – Example of a preferred mounting method for thermistors with wire terminations .....	49
Figure A.3 – Example of a preferred mounting method for surface mount thermistors .....	50
Figure B.1 – Example of a preferred mounting method for temperature measurement on cylindrical heating elements .....	51
Table 1 – Creepage distances and clearances .....	20
Table 2 – Test severities of vibration .....	22
Table 3 – Tensile force .....	37
Table 4 – Number of cycles per climatic category .....	40
Table A.1 – Recommended land dimensions.....	50
Table Q.1 – Fixed sample size test schedule for qualification approval of thermistors for current limitation – Assessment level EZ.....	56
Table Q.2 – Fixed sample size test schedule for qualification approval of thermistors for use as heating elements – Assessment level EZ.....	57
Table Q.3 – Fixed sample size test schedule for qualification approval of thermistors for inrush current application – Assessment level EZ .....	58
Table Q.4 – Fixed sample size test schedule for qualification approval of thermistors for use as temperature sensing elements – Assessment level EZ .....	59
Table Q.5 – Quality conformance inspection for lot-by-lot inspection.....	60
Table Q.6 – Quality conformance inspection for periodic testing .....	61
Table X.1 – Cross-references to the previous edition .....	63

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

**THERMISTORS – DIRECTLY HEATED POSITIVE  
TEMPERATURE COEFFICIENT –****Part 1: Generic specification****FOREWORD**

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IEC 60738-1 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 2006 and Amendment 1:2009. 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 with ISO/IEC Directives; categorization and reorganization of test methods into these categories;
- b) Some wordings, figures and references have been revised.

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

Draft	Report on voting
40/2969/FDIS	40/2977/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 60738 series, published under the general title *Thermistors – Directly heated positive temperature coefficient*, 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](http://www.iec.ch/members_experts/refdocs). The main document types developed by IEC are described in greater detail at [www.iec.ch/publications](http://www.iec.ch/publications).

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# THERMISTORS – DIRECTLY HEATED POSITIVE TEMPERATURE COEFFICIENT –

## Part 1: Generic specification

### 1 Scope

This part of IEC 60738 describes terms and methods of test for positive step-function temperature coefficient thermistors, insulated and non-insulated types, typically made from ferro-electric semi-conductor materials.

It establishes standard terms, inspection procedures and methods of test for use in detail specifications for qualification approval and for quality assessment systems for electronic components.

### 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 60027 (all parts), *Letter symbols to be used in electrical technology*

IEC 60050 (all parts), *International Electrotechnical Vocabulary (IEV)* (available at [www.electropedia.org](http://www.electropedia.org))

IEC 60062, *Marking codes for resistors and capacitors*

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

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

IEC 60068-2-2:2007, *Environmental testing – Part 2-2: Tests – Test 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 60068-2-13, *Environmental testing – Part 2-13: Tests – Test M: Low air pressure*

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

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

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



IEC 60068-2-30, *Environmental testing – Part 2-30: Tests – Test Db: Damp heat, cyclic (12 h + 12-hour cycle)*

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 60068-2-78, *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 60617, *Graphical symbols for diagrams* (available at <http://std.iec.ch/iec60617>)

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

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

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*

IEC 61760-1, *Surface mounting technology – Part 1: Standard method for the specification of surface mounting components (SMDs)*

ISO 80000-1, *Quantities and units – Part 1: General*

### 3 Terms and definitions

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

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

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

#### 3.1

##### type

group of components having similar design features and whose similar manufacturing techniques enable them to be grouped together either for qualification approval or for quality conformance inspection

Note 1 to entry: A type is generally covered by a single detail specification.

Note 2 to entry: Components described in several detail specifications can, in some cases, be considered as belonging to the same type, but they are generally covered by a single detail specification.

#### 3.2

##### style

variation within a type having specific nominal dimensions and characteristics