SLOVENSKI STANDARD
SIST EN 60738-1-3:2002

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Thermistors - Directly heated positive step-function temperature coefficient - Part 1-3: Blank detail specification - Inrish current application - Assessment level EZ (IEC 60738-1-3:1998)

Thermistors - Directly heated positive step-function temperature coefficient -- Part 1-3: Blank detail specification - Inrush current application - Assessment level EZ

Direkt geheizte temperaturabhängige Widerstände mit positivem Temperaturkoeffizienten -- Teil 1-3: Vordruck für Bauartspezifikation: Anwendung als Schaltelement - Qualitätsbewertungsstufe EZ

Thermistances à basculement à coefficient de température positif à chauffage direct -- Partie 1-3: Spécification particulière cadre - Application pour courant d'appel - Niveau d'assurance EZ

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English version

Thermistors - Directly heated positive step-function temperature coefficient
Part 1-3: Blank detail specification - Inrush current application
Assessment level EZ
(IEC 60738-1-3:1998)

Thermistances à basculement à coefficient de température positif à chauffage direct
Partie 1-3: Spécification particulière cadre - Application pour courant d'appel
Niveau d'assurance EZ
(CEI 60738-1-3:1998)

Direkt geheizte temperaturabhängige Widerstände mit positivem Temperaturkoeffizienten
Teil 1-3: Vordruck für Bauartspezifikation: Anwendung als Schaltelement
Qualitätsbewertungsstufe EZ
(IEC 60738-1-3:1998)

This European Standard was approved by CENELEC on 1999-01-01. 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.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

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

Ref. No. EN 60738-1-3:1999 E

Foreword

The text of document 40/1083/FDIS, future edition 1 of IEC 60738-1-3, 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 60738-1-3 on 1999-01-01.

This European Standard supersedes EN 144003:1994.

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) 1999-10-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2001-10-01

This EN 60738-1-3 is to be used in conjunction with EN 60738-1:1999.

Endorsement notice

The text of the International Standard IEC 60738-1-3:1998 was approved by CENELEC as a European Standard without any modification.

THERMISTORS –

DIRECTLY HEATED POSITIVE STEP-FUNCTION TEMPERATURE COEFFICIENT –

Part 1-3: Blank detail specification –

Inrush current application – Assessment level EZ

INTRODUCTION

Blank detail specification

A blank detail specification is a supplementary document to the generic specification and contains requirements for style and layout and minimum content of detail specifications. Detail specifications not complying with these requirements shall not be considered as being in accordance with IEC specifications nor shall they so be described.

In the preparation of detail specifications the content of 1.4 of the generic specification shall be taken into account.

The numbers between brackets on the first page correspond to the following information which shall be inserted in the position indicated.

Identification of the detail specification

[1] The "International Electrotechnical Commission" or the National Standards Organization under whose authority the detail specification is drafted.

[2] The IEC or National Standards number of the detail specification, date of issue and any further information required by the national system.

[3] The number and issue number of the IEC or national generic specification.

[4] The IEC number of the blank detail specification.

Identification of the thermistor

[5] A short description of the type of thermistor.

[6] Information on typical construction (if applicable).

NOTE – When the thermistor is not designed for use on printed boards, this should clearly be stated in the detail specification in this position.

[7] Outline drawing with main dimensions which are of importance for interchangeability and/or reference to the national or international documents for outlines. Alternatively, this drawing may be given in an annex to the detail specification.

[8] Application or group of applications covered and/or assessment level.

[9] Reference data on the most important properties, to allow comparison between the various thermistor types.

[1]	IEC 60738-1-3-XXX [2] QC 440003
ELECTRONIC COMPONENTS OF ASSESSED QUALITY IN ACCORDANCE WITH: [3]	IEC 60738-1-3 [4] QC 440003
Outline drawing: [see 1.2] [... angle projection] [7] [Other shapes are permitted within the dimensions given]	DIRECTLY HEATED POSITIVE STEP-FUNCTION TEMPERATURE COEFFICIENT THERMISTORS FOR INRUSH CURRENT APPLICATION [5] MODIFIED FERRO-ELECTRIC CERAMIC MATERIAL [6] Assessment level: EZ [8]

Information on the availability of components qualified to this detail specification is given in the Register of Approvals. [9]

1 General data

1.1 Method(s) of mounting (to be inserted)

(See 4.12.1 of IEC 60738-1.)

1.2 Dimensions

(All dimensions are in millimetres or inches and millimetres; it shall be stated which dimensions are suitable for gauging.)

Dimensioned drawing(s) shall be given in the detail specification. If necessary, the dimensions may be listed in tabular form with reference to styles or codes.

1.3 Coating

The detail specification shall state:

a) whether the coating is insulating or non-insulating;

b) the material;

c) the colour, if applicable.

1.4 Terminations

The detail specification shall state whether the terminations are suitable for soldering. If they are not, suitable methods of connection shall be stated for example: welding, clamping or crimping.

1.5 Flammability

The detail specification shall state whether the thermistor is actively or passively flammable if applicable. The test method shall be given in the test schedule.

1.6 Resistance to solvents

The detail specification shall state whether the coating and the marking of the thermistor are solvent resistant if applicable. The test methods shall be given in the test schedule.

1.7 Packaging

The detail specification shall give the following information (if required):

a) whether bulk packed or taped and if taped, drawing or references;

b) the dimensions of the immediate packaging and the number of thermistors packed;

c) the dimensions of the outer package and the number of immediate packages;

d) methods of disposal of the packaging material.

1.8 Electrical data/Ratings and characteristics

The detail specification shall give units and tolerances or limiting values for the following parameters. If necessary, electrical data may be listed in tabular form, with reference to styles and codes.

Upper/Lower category temperatures (UCT/LCT);

Operating temperature range at maximum voltage;

Maximum voltage ($U_{max.}$);

Zero-power resistance (R_T) of series PTC;

Zero-power resistance (R_T) of parallel PTC;

Isolation voltage (insulated thermistors only);

Insulation resistance (insulated thermistors only);

Minimum series impedance (coil);

Minimum peak-to-peak inrush current ($I_{in\ pp\ max.}$);

Maximum peak-to-peak inrush current ($I_{in\ pp\ min.}$);

Residual current at $U_{max.}$ (I_{res}).

1.9 Related documents

Generic specification:

IEC 60738-1:1998, *Thermistors – Directly heated positive step-function temperature coefficient thermistors – Part 1: Generic specification*

1.10 Marking

The marking of the thermistors and package containing the thermistors shall be in accordance with the requirements of 2.4 of IEC 60738-1.

The details of the marking of the thermistors and package containing the thermistor shall be given in full in the detail specification.

1.11 Ordering information

Orders for thermistors covered by this specification shall contain, in clear or in coded form, the following minimum information:

a) style reference;

b) maximum continuous a.c. voltage;

c) number and issue reference of the detail specification.

1.12 Additional information (not for inspection purposes)

1.13 Additional or increased severities or requirements to those specified in the generic sectional specification

NOTE – Additions or increased requirements should be specified only when essential.

2 Inspection requirements

2.1 Procedures

2.1.1 For qualification approval, the procedures shall be in accordance with the generic specification IEC 60738-1, 3.5.

2.1.2 For quality conformance inspection, the test schedules (tables 1 and 2) include sampling, periodicity, severities and requirements. The formation of inspection lots is covered by 3.12 of the generic specification.

The following list applies to the test schedules developed in tables 1 and 2:

1) Subclause numbers of tests and performance requirements refer to the generic specification, IEC 60738-1, and clause 1 of this specification.

2) Number to be tested: sample size as directly allotted to the code letter for IL in table IIA of IEC 60410 (Single sampling plan for normal inspection).

3) In these tables:
   - p is the periodicity (in months)
   - n is the sample size
   - c is the acceptance criterion (permitted number of non-conforming items)
   - D indicates a destructive test
   - ND indicates a non-destructive test
   - IL is the inspection level

4) The temperature at which the zero-power resistance shall be measured is the temperature specified in the detail specification. This temperature shall be stated, where required, in the test schedule.

5) The specimens used for this group may, at the discretion of the manufacturer, be used for any subsequent group which is identified as being "destructive".

6) The soldering – solderability and soldering – resistance to heat tests shall only be applied where the thermistor has terminations which are appropriate for soldering.

7) Where the terminations are stated to be suitable for printed wiring applications, the appropriate test conditions in IEC 60068 shall apply.

8) The thermistors shall be mounted by their normal means.

9) The bump test and the shock test are alternatives. The test selected in the detail specification shall be used.

10) The detail specification shall specify which of the endurance tests in groups C4, C5 and D1 respectively are appropriate to the construction and application of the thermistor.

11) Any deviation from annex B of the generic specification shall be given in the detail specification.

12) 100 % testing shall be followed by re-inspection by sampling in order to monitor outgoing quality level by non-conforming items per million ($\times 10^{-6}$). The sampling level shall be established by the manufacturer. For the calculation of $\times 10^{-6}$ values any parametric failure shall be counted as a non-conforming item. In case one or more non-conforming items occur in a sample, this lot shall be rejected.

Table 1 – Test schedule for quality conformance inspection: lot-by-lot

Subclause number and test (see list item 1)	D or ND	Conditions of test (see list item 1)	IL (see list item 3)	n (see list item 3)	c (see list item 3)	Performance requirements (see list item 1)
GROUP A INSPECTION (lot-by-lot)						
Subgroup A0	ND		100 % (see list item 12)			
4.5 Zero-power resistance R_T		Temperature: ... °C Voltage: ... V Frequency: ... Hz (if applicable)				As in 4.5.3
Subgroup A1	ND		S-4	2)	0	
4.4.1 Visual examination						As in 4.4.1
Subgroup A2	ND		S-3	2)	0	
4.4.2 Marking						As in 4.4.2
4.4.3 Dimensions (gauging)						As specified in the detail specification
GROUP B INSPECTION (lot-by-lot)						
Subgroup B1	ND		S-2	2)	0	
4.28 Inrush current		Series resistance: ... Ω Voltage: ... V Temperature: ... °C				$I_{in\ pp\ min.} \geq$ ... A_{pp} $I_{in\ pp\ max.} \leq$ ... A_{pp}
4.26 Residual current		After ... s				$I_{res} \leq$ ... mA
Subgroup B2	ND		S-2	2)	0	
4.8 Voltage proof		(Insulated thermistors only) Method: ... Applied voltage: ... V a.c.				As in 4.8.4
4.16.1 Soldering - Solderabilty		(see list item 6 and 7) Solder bath method				The terminations shall be uniformly tinned