

INTERNATIONAL STANDARD

IEC 62319-1

First edition
2005-02

Polymeric thermistors – Directly heated positive step function temperature coefficient –

Part 1: Generic specification

© IEC 2005 — Copyright - all rights reserved

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

International Electrotechnical Commission, 3, rue de Varembé, PO Box 131, CH-1211 Geneva 20, Switzerland
Telephone: +41 22 919 02 11 Telefax: +41 22 919 03 00 E-mail: inmail@iec.ch Web: www.iec.ch



Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

PRICE CODE

V

For price, see current catalogue

CONTENTS

FOREWORD.....	4
1 General.....	6
1.1 Scope.....	6
1.2 Normative references	6
2 Technical data.....	7
2.1 Units and symbols	7
2.2 Terms and definitions.....	7
2.3 Preferred values	10
2.4 Marking.....	11
3 Quality assessment procedures	11
3.1 General.....	11
3.2 Primary stage of manufacture	11
3.3 Subcontracting	12
3.4 Structurally similar components	12
3.5 Qualification approval procedures	12
3.6 Rework and repair	18
3.7 Release for delivery.....	18
3.8 Certified test records of released lots.....	19
3.9 Delayed delivery.....	19
3.10 Alternative test methods	19
3.11 Manufacture outside the geographical limits of IECQ NSIs.....	19
3.12 Unchecked parameters	19
4 Test and measurement procedures	19
4.1 Standard conditions for testing.....	19
4.2 Drying and recovery.....	20
4.3 Visual inspection and check of dimensions.....	20
4.4 Zero power resistance	21
4.5 Insulation resistance (for insulated types only)	21
4.6 Voltage proof (for insulated types only)	22
4.7 Robustness of terminations (for leaded types only).....	22
4.8 Soldering.....	23
4.9 Mounting	23
4.10 Rapid change of temperature	24
4.11 Climatic sequence	24
4.12 Cycle life testing.....	25
4.13 Trip endurance	27
4.14 Trip current	28
4.15 Hold current	28
4.16 Residual current and power dissipation	29
4.17 Time-to-trip	29
4.18 Cold environmental electrical cycling.....	30
4.19 Thermal runaway.....	30

Annex A (normative) Fixed sample size test schedules for qualification approval.....	31
Annex B (normative) Vibration-, bump-, shock-, shear-, substrate bending test.....	32
B.1 Vibration	32
B.2 Bump	32
B.3 Shock.....	33
B.4 Shear (adhesion) test	33
B.5 Substrate bending test.....	33
Figure 1 – Test schedule flow chart.....	15
Figure 2 – Circuit for Trip endurance	28
Table 1 – Fixed sample size test schedule for qualification approval of Polymeric PTC thermistors for current limitation, assessment level EZ.....	16
Table 2 – Quality conformance inspection for lot-by-lot inspection.....	17
Table 3 – Quality conformance inspection for periodic testing	18
Table 4 – Loading weight for wire terminations	22
Table 5 – Number of cycles.....	25

INTERNATIONAL ELECTROTECHNICAL COMMISSION

POLYMERIC THERMISTORS – DIRECTLY HEATED POSITIVE STEP FUNCTION TEMPERATURE COEFFICIENT – 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.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 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 62319-1 has been prepared by IEC technical committee 40: Capacitors and resistors for electronic equipment.

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

FDIS	Report on voting
40/1505/FDIS	40/1534/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 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.

The contents of the corrigendum of March 2009 have been included in this copy.

POLYMERIC THERMISTORS – DIRECTLY HEATED POSITIVE STEP FUNCTION TEMPERATURE COEFFICIENT –

Part 1: Generic specification

1 General

1.1 Scope

This part of IEC 62319 prescribes terms and methods of test for polymeric positive temperature coefficient thermistors, insulated and non-insulated types, typically intended for use in current limiting and overcurrent protection applications.

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.

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*

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

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

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

IEC 60068-2-20: *Environmental testing – Part 2: Tests – Test T: Soldering*

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: Tests – Test Ea and guidance: Shock*

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

IEC 60068-2-45: *Environmental testing – Part 2: Tests – Test XA and guidance: Immersion in cleaning solvents*

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-DB: 2001¹ *Graphical symbols for diagrams*

IECQ 001003: *IEC Quality Assessment System for Electronic Components – Guidance documents*

IECQ 001002-3: *IEC Quality Assessment System for Electronic Components – Rules of Procedure – Part 3: Approval procedures*

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

¹ “DB” refers to the IEC on-line database.