

Semiconductor devices - Mechanical and climatic test methods - Part 25:
Temperature cycling (IEC 60749-25:2003)

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN 60749-25:2004](https://standards.iteh.ai/catalog/standards/sist/71bcd7e9-b8b2-4164-ae82-02d287629745/sist-en-60749-25-2004)
<https://standards.iteh.ai/catalog/standards/sist/71bcd7e9-b8b2-4164-ae82-02d287629745/sist-en-60749-25-2004>

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 60749-25:2004](#)

<https://standards.iteh.ai/catalog/standards/sist/71bcd7e9-b8b2-4164-ae82-02d287629745/sist-en-60749-25-2004>

**Semiconductor devices -
Mechanical and climatic test methods
Part 25: Temperature cycling
(IEC 60749-25:2003)**

Dispositifs à semiconducteurs -
Méthodes d'essais mécaniques
et climatiques
Partie 25: Cycles de température
(CEI 60749-25:2003)

Halbleiterbauelemente -
Mechanische und klimatische
Prüfverfahren
Teil 25: Zyklische Temperaturwechsel
(IEC 60749-25:2003)

**iTeh STANDARD PREVIEW
(standards.iteh.ai)**

SIST EN 60749-25:2004

<https://standards.iteh.ai/catalog/standards/sist/71bcd7e9-b8b2-4164-ae82-0209762945/sist-en-60749-25-004>
This European Standard was approved by CENELEC on 2003-09-01. 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, Hungary, Iceland, Ireland, Italy, Lithuania, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, 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

Foreword

The text of document 47/1696/FDIS, future edition 1 of IEC 60749-25, prepared by IEC TC 47, Semiconductor devices, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60749-25 on 2003-09-01.

This mechanical and climatic test method, as it relates to change of temperature, is a complete rewrite of the test contained in Subclause 1.1 of Chapter 3 of EN 60749:1999.

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) 2004-06-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2006-09-01

Annexes designated "normative" are part of the body of the standard.

In this standard, annex ZA is normative.

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 60749-25:2003 was approved by CENELEC as a European Standard without any modification.

iTeh STANDARD REVIEW

(standards.iteh.ai)

SIST EN 60749-25:2004

<https://standards.iteh.ai/catalog/standards/sist/71bcd7e9-b8b2-4164-ae82-02d287629745/sist-en-60749-25-2004>

Annex ZA
(normative)

**Normative references to international publications
with their corresponding European publications**

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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 60068-2-14	1984	Environmental testing Part 2: Tests - Test N: Change of temperature	EN 60068-2-14 ¹⁾	1999

**iTeh STANDARD PREVIEW
(standards.iteh.ai)**

SIST EN 60749-25:2004
<https://standards.iteh.ai/catalog/standards/sist/71bcd7e9-b8b2-4164-ae82-02d287629745/sist-en-60749-25-2004>

¹⁾ EN 60068-2-14 includes A1:1986 to IEC 60068-2-14.

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN 60749-25:2004](#)

<https://standards.iteh.ai/catalog/standards/sist/71bcd7e9-b8b2-4164-ae82-02d287629745/sist-en-60749-25-2004>

NORME INTERNATIONALE INTERNATIONAL STANDARD

CEI
IEC
60749-25

Première édition
First edition
2003-07

Dispositifs à semiconducteurs – Méthodes d'essais mécaniques et climatiques –

Partie 25: Cycles de température

iTeh STANDARD PREVIEW Semiconductor devices – Mechanical and climatic test methods – SIST EN 60749-25:2004

<https://standards.iteh.ai/catalog/standards/sist/71bcd7e9-b8b2-4164-ae82-02d287629745/sist-en-60749-25-2004>
Part 25:
Temperature cycling

© IEC 2003 Droits de reproduction réservés — Copyright - all rights reserved

Aucune partie de cette publication ne peut être reproduite ni utilisée sous quelque forme que ce soit et par aucun procédé, électronique ou mécanique, y compris la photocopie et les microfilms, sans l'accord écrit de l'éditeur.

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

CODE PRIX
PRICE CODE

M

Pour prix, voir catalogue en vigueur
For price, see current catalogue

CONTENTS

FOREWORD	5
1 Scope	9
2 Normative references	9
3 Terms and definitions	9
4 Test apparatus	13
5 Procedure	13
5.1 Initial measurements	13
5.2 Conditioning	13
5.3 Cycle rates	15
5.4 Upper and lower soak times	19
5.5 Upper and lower soak temperatures	19
5.6 Soak modes	19
5.7 Cycle time	19
5.8 Ramp rate	21
5.9 Load transfer time	21
5.10 Recovery	21
5.11 Final measurements	21
5.12 Failure criteria	23
6 Summary	23
Figure 1 – Representative temperature profile for thermal cycle test conditions	25
https://standards.iteh.ai/catalog/standards/sist/71bcd7e9-b8b2-4164-ae82-02d287629745/sist-en-60749-25-2004	
Table 1 – Temperature cycling test conditions	17
Table 2 – Soak mode conditions	17
Table 3 – Typical frequency and soak mode for test conditions	19
Table 4 – Recommended test conditions for solder interconnection temperature cycling	21

INTERNATIONAL ELECTROTECHNICAL COMMISSION

SEMICONDUCTOR DEVICES –
MECHANICAL AND CLIMATIC TEST METHODS –

Part 25: Temperature cycling

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, 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.
<https://standards.iec.ch/catalog/standards/SIS/1bcd7e9-b8b2-4164-ac02-02d287629745/sist-en-60749-25-2004>
- 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 60749-25 has been prepared by IEC technical committee 47: Semiconductor devices.

This standard cancels and replaces IEC/PAS 62178 published in 2000. This first edition constitutes a technical revision.

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

FDIS	Report on voting
47/1696/FDIS	47/1706/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.