IEC 60749-23

Edition 2.0 2025-12

INTERNATIONAL STANDARD

REDLINE VERSION

Semiconductor devices - Mechanical and climatic test methods - Part 23: High temperature operating life

ICS 31.080.01

ISBN 978-2-8327-0941-2

CONTENTS

FOREWORD 2
1 Scope 1
2 Normative references 4
3 Terms and definitions 4
4 Test apparatus 5
4.1 Testing requirements 5
4.2 Circuitry 5
4.3 Device schematic 5
4.4 Power 5
4.5 Device mounting 5
4.6 Power supplies and signal sources 5
4.7 Environmental chamber 5
5 Procedure 5
5.1 Stress requirements 5
5.2 Stress duration 5
5.3 Stress conditions 5
5.3.1 Stress condition application 5
5.3.2 Ambient temperature 6
5.3.3 Operating voltage 6
5.3.4 Biasing configurations 6
6 Cool-down 7
7 Measurements 7
8 Failure criteria 8
9 Life testing reporting 8
10 Summary 9
Bibliography 10

Table 1 – Additional stress requirements for parts not tested within ~~96 h~~ time window 8

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

Semiconductor devices - Mechanical and climatic test methods - Part 23: High temperature operating life

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 itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
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) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at https://patents.iec.ch. IEC shall not be held responsible for identifying any or all such patent rights.

This redline version of the official IEC Standard allows the user to identify the changes made to the previous edition IEC 60749-23:2004+AMD1:2011 CSV. A vertical bar appears in the margin wherever a change has been made. Additions are in green text, deletions are in strikethrough red text.

IEC 60749-23 has been prepared by IEC technical committee 47: Semiconductor devices. It is an International Standard.

This second edition cancels and replaces the first edition published in 2004 and Amendment 1:2011. It is based on JEDEC JESD22-A108G. It is used with permission of the copyright holder, JEDEC Solid State Technology Association. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

a) absolute stress test definitions and resultant test durations have been updated.

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

Draft	Report on voting
47/2962/FDIS	47/2983/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.

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. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 60749 series, published under the general title *Semiconductor devices - Mechanical and climatic test methods*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,
– withdrawn, or
– revised.

1 Scope

This part of IEC 60749 specifies the test used to determine the effects of bias conditions and temperature on solid state devices over time. It simulates the device operating condition in an accelerated way and is primarily for device qualification and reliability monitoring. A form of high temperature bias life using a short duration, popularly known as "burn-in", ~~may~~ can be used to screen for infant-mortality related failures. The detailed use and application of burn-in is outside the scope of this document.

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 60747 (all parts), *Semiconductor devices – Discrete devices and integrated circuits*~~

~~IEC 60749-34: , *Semiconductor devices – Mechanical and climatic test methods – Part 34: Power cycling* [1]~~

There are no normative references in this document.

~~[1] To be published.~~

Bibliography

IEC 60747 (all parts), *Semiconductor devices - Discrete devices and integrated circuits*

IEC 60749-34, *Semiconductor devices - Mechanical and climatic test methods - Part 34: Power cycling*

_____