

SLOVENSKI STANDARD SIST EN IEC 63251:2024

01-februar-2024

Metoda preskušanja mehanskih lastnosti toplotno obremenjenih zvijavih optoelektričnih tiskanih vezij

Test Method for Mechanical Property of Flexible Opto-Electric Circuit Boards under Thermal Stress

Prüfverfahren für mechanische Eigenschaften von elektrisch-optischen Leiterplatten unter Wärmebeanspruchung

Méthode d'essai des propriétés mécaniques des circuits opto-électriques souples sous contrainte thermique

Ta slovenski standard je istoveten z: EN IEC 63251:2023

ICS:

31.180 Tiskana vezja (TIV) in tiskane Printed circuits and boards

plošče

SIST EN IEC 63251:2024 en

iTeh Standards (https://standards.iteh.ai) Document Preview

SIST EN IEC 63251:2024

https://standards.iteh.ai/catalog/standards/sist/77110ede-b619-4288-a2df-6ca3a9b9de28/sist-en-jec-63251-2024

EUROPEAN STANDARD NORME EUROPÉENNE FUROPÄISCHE NORM **EN IEC 63251**

December 2023

ICS 31.180

English Version

Test method for mechanical properties of flexible opto-electric circuit boards under thermal stress (IEC 63251:2023)

Méthode d'essai des propriétés mécaniques des circuits optoélectriques souples sous contrainte thermique (IEC 63251:2023)

Prüfverfahren für mechanische Eigenschaften von elektrisch-optischen Leiterplatten unter Wärmebeanspruchung (IEC 63251:2023)

This European Standard was approved by CENELEC on 2023-12-06. 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 CEN-CENELEC Management Centre 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 CEN-CENELEC Management Centre has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

SIST EN IEC 63251:2024

https://standards.iteh.ai/catalog/standards/sist/77110ede-b619-4288-a2df-6ca3a9b9de28/sist-en-iec-63251-202



European Committee for Electrotechnical Standardization Comité Européen de Normalisation Electrotechnique Europäisches Komitee für Elektrotechnische Normung

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

EN IEC 63251:2023 (E)

European foreword

The text of document 91/1898/FDIS, future edition 1 of IEC 63251, prepared by IEC/TC 91 "Electronics assembly technology" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 63251:2023.

The following dates are fixed:

- latest date by which the document has to be implemented at national (dop) 2024-09-06 level by publication of an identical national standard or by endorsement
- latest date by which the national standards conflicting with the (dow) 2026-12-06 document have to be withdrawn

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Any feedback and questions on this document should be directed to the users' national committee. A complete listing of these bodies can be found on the CENELEC website.

Endorsement notice

The text of the International Standard IEC 63251:2023 was approved by CENELEC as a European Standard without any modification.

In the official version, for Bibliography, the following notes have to be added for the standard indicated:

IEC 60793-2 (series) NOTE Approved as EN 60793-2 (series)

IEC 62496-3-1 NOTE Approved as EN 62496-3-1 \$\frac{325}{2024}\$ https://standards.iteh.ai/catalog/standards/sist/77110ede-b619-4288-a2df-6ca3a9b9de28/sist-en-iec-63251-2024

EN IEC 63251:2023 (E)

Annex ZA (normative)

Normative references to international publications with their corresponding European publications

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.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cencenelec.eu.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	EN/HD	<u>Year</u>
IEC 60068-2-2	-	Environmental testing - Part 2-2: Tests Test B: Dry heat	s -EN 60068-2-2	-
IEC 60068-2-14	-	Environmental testing - Part 2-14: Tests Test N: Change of temperature	s -EN IEC 60068-2-1	4 -
IEC 60068-2-78	-	Environmental testing - Part 2-78: Tests Test Cab: Damp heat, steady state	s -EN 60068-2-78	-

(https://standards.iteh.ai)
Document Preview

SIST EN IEC 63251:2024

https://standards.iteh.ai/catalog/standards/sist/77110ede-b619-4288-a2df-6ca3a9b9de28/sist-en-iec-63251-202

iTeh Standards (https://standards.iteh.ai) Document Preview

SIST EN IEC 63251:2024

https://standards.iteh.ai/catalog/standards/sist/77110ede-b619-4288-a2df-6ca3a9b9de28/sist-en-jec-63251-2024



IEC 63251

Edition 1.0 2023-11

INTERNATIONAL STANDARD

NORME INTERNATIONALE



Test method for mechanical properties of flexible opto-electric circuit boards under thermal stress

Méthode d'essai des propriétés mécaniques des circuits optoélectriques souples sous contrainte thermique

https://standards.iteh.ai/catalog/standards/sist/77110ede-b619-4288-a2df-6ca3a9b9de28/sist-en-iec-63251-202

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

ICS 31.180 ISBN 978-2-8322-7750-8

Warning! Make sure that you obtained this publication from an authorized distributor.

Attention! Veuillez vous assurer que vous avez obtenu cette publication via un distributeur agréé.

_

CONTENTS

FOREWORD......4

1 Scor	pe	6
2 Norr	native references	6
3 Tern	ns and definitions	6
4 Test	method	7
4.1	General	7
4.2	Test sample	
4.3	Test process	8
4.3.	General description of the test	8
4.3.2	Preconditioning	9
4.3.3	B Test	9
4.3.4	Recovery	9
4.3.5	Final measurements	10
5 Rep	ort	10
	(informative) Example of optical bending loss test results with general glass	11
	(informative) Example of preparation method of O-E circuit test samples	
(optic fibi	e type)	12
B.1	General	12
B.2	Manufacturing processes of the FOECBs with optic fibres (POF, GOF)	
B.3		
B.4	Characteristics of the optic fibres	
Annex C	(informative) Example of reflow assembly simulation test results	
C.1	General	15
C.2	Results of reflow assembly simulation test for a LED chip mounted FOECB with GOF	15
C.3 /standards	Results of reflow assembly simulation test for a transparent FOECB with GOF for display applications	iec 16 ³ 251-2
C.4	Results of reflow assembly simulation test for a polyimide (PI) based FOECB with GOF	
C.5	Results of reflow assembly simulation test for a polymer-based FOECB	17
Annex D	(informative) Example of thermal shock endurance test results	18
D.1	General	
D.2	Results of thermal shock endurance test for an FOECB with GOF	
	(informative) Example of humidity storage test results	
E.1	General	
E.2	Results of humidity storage test for an FOECB with GOF	
E.3	Results of humidity storage test for an FOECB with POF	
Bibliogra	ohy	21
-	- Schematic diagram of FOECB (top view)	
Figure 2 – Schematic diagrams of the FOECB test samples of fibre type		8
Figure 3	– Schematic diagram of the FOECB test samples of fibre type	8
Figure A.1 – Bending loss test setup		
Figure A.	2 – Optical loss versus bending diameter	11
Figure B.	1 – Arrayed structure of the FOECB test samples formed on one sheet	12

Figure B.2 – Fabrication of the optic circuits with optic fibres	13
Figure B.3 – Fabrication of the optic circuits with optic polymer waveguide via the photo-etching method	13
Figure C.1 – LED chip mounted FOECB	15
Figure C.2 – Appearance of a LED chip mounted FOECB after the reflow assembly simulation test	15
Figure C.3 – Appearance of a transparent FOECB with GOFs after the reflow assembly simulation test	16
Figure C.4 – Appearance of a PI based FOECB with GOF after the reflow assembly simulation test	16
Figure C.5 – Appearance of a polymer-based FOECB after the reflow assembly simulation test	17
Figure D.1 – Appearance of an FOECB with GOF after the thermal shock test	18
Figure E.1 – Appearance of an FOECB with GOF after the humidity storage test	19
Figure E.2 – Appearance of an FOECB with POF after the humidity storage test	20
Table 1 – Thermal endurance test class for FOECB	9

iTeh Standards (https://standards.iteh.ai) Document Preview

SIST EN IEC 63251:2024

https://standards.iteh.ai/catalog/standards/sist/77110ede-b619-4288-a2df-6ca3a9b9de28/sist-en-iec-63251-2024

– 4 –

INTERNATIONAL ELECTROTECHNICAL COMMISSION

TEST METHOD FOR MECHANICAL PROPERTIES OF FLEXIBLE OPTO-ELECTRIC CIRCUIT BOARDS UNDER THERMAL STRESS

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 251-2024 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.

IEC 63251 has been prepared by IEC technical committee 91: Electronics assembly technology. It is an International Standard.

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

Draft	Report on voting
91/1898/FDIS	91/1914/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.