IEC 62951-4

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INTERNATIONAL STANDARD

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Semiconductor devices – Flexible and stretchable semiconductor devices – Part 4: Fatigue evaluation for flexible conductive thin film on the substrate for flexible semiconductor devices

Dispositifs à semiconducteurs – Dispositifs à semiconducteurs souples et extensibles – Partie 4: Evaluation de la fatigue pour les couches minces conductrices souples sur les substrats pour dispositifs à semiconducteurs souples

IEC 62951-4:2019-02(en-fr)

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SEMICONDUCTOR DEVICES – FLEXIBLE AND STRETCHABLE SEMICONDUCTOR DEVICES –

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

FDIS	Report on voting
47/2531/FDIS	47/2549/RVD

Full information on the voting for the approval of this International Standard can be found in the report on voting indicated in the above table.

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 62951 series, published under the general title *Semiconductor devices – Flexible and stretchable semiconductor devices*, 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 "http://webstore.iec.ch" in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

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SEMICONDUCTOR DEVICES – FLEXIBLE AND STRETCHABLE SEMICONDUCTOR DEVICES –

Part 4: Fatigue evaluation for flexible conductive thin film on the substrate for flexible semiconductor devices

1 Scope

This part of IEC 62951 specifies an evaluation method of the bending fatigue properties of conductive thin film and flexible substrate for the application at flexible semiconductor devices. The films include any films deposited or bonded onto a non-conductive flexible substrate such as thin metal film, transparent conducting electrode, and thin silicon film used for flexible semiconductor devices. The electrical and mechanical behaviours of films on the substrate are evaluated. The fatigue test methods include dynamic bending fatigue test and static bending fatigue test.

2 Normative references

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.

IEC 62047-2:2006, *Semiconductor devices – Micro-electromechanical devices – Part 2: Tensile testing method of thin film materials*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at http://www.electropedia.org/
- ISO Online browsing platform: available at http://www.iso.org/obp

3.1
bending radius
radius of arc corresponding to the curvature of the central line between innermost and outermost surfaces of flexible electronic devices during a bending test

[SOURCE: IEC 62715-1-1:2013, 2.5.1, modified – The words "a flexible display device" have been replaced by "flexible electronic devices".]

3.2
critical bending radius
bending radius at which the failure of the flexible semiconductor devices occurs

Note 1 to entry: For the conductive films, the electrical resistance starts to exceed a predefined limit, and/or fracture of the film or caused by delamination or initiation of the cracks occurs, or by damage of the substrate.