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INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Semiconductor devices – Semiconductor devices for energy harvesting and generation – Part 1: Vibration based piezoelectric energy harvesting

Dispositifs à semiconducteurs – Dispositifs à semiconducteurs pour récupération et production d'énergie – Partie 1: Récupération d'énergie piézoélectrique basée sur des vibrations

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SEMICONDUCTOR DEVICES – SEMICONDUCTOR DEVICES FOR ENERGY HARVESTING AND GENERATION –

Part 1: Vibration based piezoelectric energy harvesting

FOREWORD

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International Standard IEC 62830-1 has been prepared by IEC technical committee 47: Semiconductor devices.

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

FDIS	Report on voting
47/2341/FDIS	47/2366/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 62830 series, published under the general title *Semiconductor devices – Semiconductor devices for energy harvesting and generation*, 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- withdrawn,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 – SEMICONDUCTOR DEVICES FOR ENERGY HARVESTING AND GENERATION –

Part 1: Vibration based piezoelectric energy harvesting

1 Scope

This part of IEC 62830 defines terms, definitions, symbols, configurations, and test methods that can be used to evaluate and determine the performance characteristics of vibration based piezoelectric energy harvesting devices for practical use. This document is applicable to energy harvesting devices for consumer, general industries, military and aerospace applications without any limitations on device technology and size.

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 60749-5:2003, *Semiconductor devices – Mechanical and climatic test methods – Part 5: Steady-state temperature humidity bias life test*

IEC 60749-12:2002, *Semiconductor devices – Mechanical and climatic test methods – Part 12: Vibration, variable frequency*

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 General terms

3.1.1
vibration
mechanical oscillation

3.1.2
vibration based energy harvester
energy transducer that transforms vibration energy into electric energy

Note 1 to entry: A vibration based energy harvester to convert vibration to electricity by using piezoelectric transducers comprises an inertial mass, spring, and piezoelectric transducer as shown in Figure 1. The piezoelectric transducer contains the two electrodes and a piezoelectric film. The induced vibration introduces the reciprocating motion to the mass. The spring which suspends the mass bends and the bending of the spring introduces tensile and compression of the piezoelectric film. The top and bottom electrodes of the piezoelectric film harvest charges generated from the piezoelectric effect.