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Semiconductor devices - Part 15: Discrete devices -
Isolated power semiconductor devices

EESTI STANDARDI EESSÕNA

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English Version

**Semiconductor devices - Part 15: Discrete devices - Isolated
power semiconductor devices
(IEC 60747-15:2024)**

Dispositifs à semiconducteurs - Partie 15: Dispositifs
discrets - Dispositifs de puissance à semiconducteurs isolés
(IEC 60747-15:2024)

Halbleiterbauelemente - Einzel-Halbleiterbauelemente - Teil
15: Isolierte Leistungshalbleiter
(IEC 60747-15:2024)

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European foreword

The text of document 47E/832/FDIS, future edition 3 of IEC 60747-15, prepared by SC 47E "Discrete semiconductor devices" of IEC/TC 47 "Semiconductor devices" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN IEC 60747-15:2024.

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IEC 60112:2020 NOTE Approved as EN IEC 60112:2020 (not modified)

IEC 61287-1:2014 NOTE Approved as EN 61287-1:2014 (not modified)

IEC 62368-1:2018 NOTE Approved as EN IEC 62368-1:2020 (not modified) +A11:2020

IEC 62477-1:2022 NOTE Approved as EN IEC 62477-1:2023 (not modified)

INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Semiconductor devices –
Part 15: Discrete devices – Isolated power semiconductor devices**

**Dispositifs à semiconducteurs –
Partie 15: Dispositifs discrets – Dispositifs de puissance à semiconducteurs
isolés**



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INTERNATIONAL STANDARD

NORME INTERNATIONALE

**Semiconductor devices –
Part 15: Discrete devices – Isolated power semiconductor devices**

**Dispositifs à semiconducteurs –
Partie 15: Dispositifs discrets – Dispositifs de puissance à semiconducteurs
isolés**

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ICS 31.080.99

ISBN 978-2-8322-9789-6

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SEMICONDUCTOR DEVICES –

Part 15: Discrete devices – Isolated power semiconductor devices

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IEC 60747-15 has been prepared by subcommittee 47E: Discrete semiconductor devices, of IEC technical committee 47: Semiconductor devices. It is an International Standard.

This third edition cancels and replaces the second edition published in 2010. This edition constitutes a technical revision.

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

- a) The intelligent power semiconductor modules (IPM), which was previously excluded from the first and second edition, is now included in this document (Annex C);
- b) The thermal resistance is described for each switch (6.2.4);
- c) Added isolation test between temperature sensor and terminals, in case there is an agreement with the user (6.1.2).

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

Draft	Report on voting
47E/832/FDIS	47E/844/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.

This International Standard is to be used in conjunction with IEC 60747-1:2006 and Amendment 1: 2010.

A list of all parts in the IEC 60747 series, published under the general title *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 webstore.iec.ch in the data related to the specific document. At this date, the document will be

- reconfirmed,
- withdrawn, or
- revised.

SEMICONDUCTOR DEVICES –

Part 15: Discrete devices – Isolated power semiconductor devices

1 Scope

This part of IEC 60747 gives the requirements for isolated power semiconductor devices. These requirements are additional to those given in other parts of IEC 60747 for the corresponding non-isolated power devices and parts of IEC 60748 for ICs.

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 60068-2-1:2007, *Environmental testing – Part 2-1: Tests – Test A: Cold*

IEC 60270:2015, *High-voltage test techniques – Partial discharge measurements*

IEC 60664-1:2020, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

IEC 60721-3-3:2019, *Classification of environmental conditions – Part 3-3: Classification of groups of environmental parameters and their severities – Stationary use at weather protected locations*

IEC 60747-1:2006, *Semiconductor devices – Part 1: General*
IEC 60747-1:2006/AMD1:2010

IEC 60747-2:2016, *Semiconductor devices – Discrete devices and integrated circuits – Part 2: Rectifier diodes*

IEC 60747-6:2016, *Semiconductor devices – Part 6: Thyristors*

IEC 60747-7:2019, *Semiconductor discrete devices and integrated circuits – Part 7: Bipolar transistors*

IEC 60747-8:2021, *Semiconductor devices – Part 8: Field-effect transistors*

IEC 60747-9:2019, *Semiconductor devices – Discrete devices – Part 9: Insulated-gate bipolar transistors (IGBTs)*

IEC 60748 (all parts), *Semiconductor devices – Integrated circuits*

IEC 60749-5:2017, *Semiconductor devices – Mechanical and climatic test methods – Part 5: Steady-state temperature humidity bias life test*

IEC 60749-6:2017, *Semiconductor devices – Mechanical and climatic test methods – Part 6: Storage at high temperature*

IEC 60749-10:2003, *Semiconductor devices – Mechanical and climatic test methods – Part 10: Mechanical shock*

IEC 60749-12:2017, *Semiconductor devices – Mechanical and climatic test methods – Part 12: Vibration, variable frequency*

IEC 60749-15:2020, *Semiconductor devices – Mechanical and climatic test methods – Part 15: Resistance to soldering temperature for through-hole mounted devices*

IEC 60749-21:2011, *Semiconductor devices – Mechanical and climatic test methods – Part 21: Solderability*

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

IEC 60749-34:2010, *Semiconductor devices – Mechanical and climatic test methods – Part 34: Power cycling*

3 Terms and definitions

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

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

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

3.1

isolated power semiconductor device

semiconductor power device that contains an integral electrical insulator between the cooling surface or base plate and any isolated circuit elements

3.2

constituent parts of the isolated power semiconductor device

3.2.1

switch

any single component that performs a switching function in an electrical circuit, e.g. diode, thyristor, MOSFET, etc.

Note 1 to entry: A switch might be a parallel or series connection of several chips with a single functionality.

3.2.2

base plate

part of the package having a cooling surface that transfers the heat from inside to outside

3.2.3

main terminal

terminal having a high potential of the power circuit and carrying the main current

Note 1 to entry: The main terminal can comprise more than one physical connector.

3.2.4

control terminal

terminal having a low current capability for the purpose of control function, to which the external control signals are applied or from which sensing parameters are taken