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

EESTI STANDARDIKESKUS
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NATIONAL FOREWORD

See Eesti standard EVS-EN 60747-15:2012 sisaldab Euroopa standardi EN 60747-15:2012 ingliskeelset teksti.	This Estonian standard EVS-EN 60747-15:2012 consists of the English text of the European standard EN 60747-15:2012.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 16.03.2012.	Date of Availability of the European standard is 16.03.2012.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

ICS 31.080.99

EUROPEAN STANDARD

NORME EUROPÉENNE

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EN 60747-15

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English version

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

(IEC 60747-15:2010)

Dispositifs à semi-conducteurs - Dispositifs discrets - Partie 15: Dispositifs de puissance à semiconducteurs isolés (CEI 60747-15:2010)

Halbleiterbauelemente - Einzel-Halbleiterbauelemente - Teil 15: Isolierte Leistungshalbleiter (IEC 60747-15:2010)

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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.

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CENELEC

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

Management Centre: Avenue Marnix 17, B - 1000 Brussels

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Foreword

The text of document 47E/403/FDIS, future edition 2 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 60747-15:2012.

The following dates are fixed:

– latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2012-09-16
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2014-01-20

This European Standard supersedes EN 60747-15:2004.

The main changes with respect to EN 60747-15:2004 are listed below.

a) Clause 3, 4 and 5 were re-edited and some of them were combined to other sub clauses.

b) Clause 6, 7 were re-edited as a part of “Measuring methods” with amendment of suitable addition and deletion.

c) Clause 8 was amended by suitable addition and deletion.

d) Annex C, D and Bibliography were deleted.

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

Endorsement notice

The text of the International Standard IEC 60747-15:2010 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 standards indicated:

IEC 60112	NOTE	Harmonized as EN 60112.
IEC 61287-1:2005	NOTE	Harmonized as EN 61287-1:2006 (not modified).

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 60270	-	High-voltage test techniques - Partial discharge measurements	EN 60270	-
IEC 60664-1	2007	Insulation coordination for equipment within low-voltage systems - Part 1: Principles, requirements and tests	EN 60664-1	2007
IEC 60721-3-3	1994	Classification of environmental conditions - Part 3: Classification of groups of environmental parameters and their severities - Section 3: Stationary use at weatherprotected locations	EN 60721-3-3	1995
IEC 60747-1	2006	Semiconductor devices - Part 1: General	-	-
IEC 60747-2	-	Semiconductor devices - Discrete devices and integrated circuits - Part 2: Rectifier diodes	-	-
IEC 60747-6	-	Semi conductor devices - Part 6: Thyristors	-	-
IEC 60747-7	-	Semiconductor devices - Part 7: Bipolar transistors	-	-
IEC 60747-8	-	Semiconductor devices - Part 8: Field-effect transistors	-	-
IEC 60747-9	-	Surface mounting technology - Discrete devices - Part 9: Insulated-gate bipolar transistors (IGBTs)	-	-
IEC 60749-5	-	Semiconductor devices - Mechanical and climatic test methods - Part 5: Steady-state temperature humidity bias life test	EN 60749-5	-
IEC 60749-6	-	Semiconductor devices - Mechanical and climatic test methods - Part 6: Storage at high temperature	EN 60749-6	-
IEC 60749-10	-	Semiconductor devices - Mechanical and climatic test methods - Part 10: Mechanical shock	EN 60749-10	-
IEC 60749-12	-	Semiconductor devices - Mechanical and climatic test methods - Part 12: Vibration, variable frequency	EN 60749-12	-

Publication	Year	Title	EN/HD	Year
IEC 60749-15	-	Semiconductor devices - Mechanical and climatic test methods - Part 15: Resistance to soldering temperature for through-hole mounted devices	EN 60749-15	-
IEC 60749-21	-	Semiconductor devices - Mechanical and climatic test methods - Part 21: Solderability	EN 60749-21	-
IEC 60749-25	-	Semiconductor devices - Mechanical and climatic test methods - Part 25: Temperature cycling	EN 60749-25	-
IEC 60749-34	-	Semiconductor devices - Mechanical and climatic test methods - Part 34: Power cycling	EN 60749-34	-

CONTENTS

SEMICONDUCTOR DEVICES – DISCRETE DEVICES –

Part 15: Isolated power semiconductor devices

1 Scope

This part of IEC 60747 gives the requirements for isolated power semiconductor devices excluding devices with incorporated control circuits. These requirements are additional to those given in other parts of IEC 60747 for the corresponding non-isolated power devices.

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

IEC 60664-1:2007, *Insulation coordination for equipment within low-voltage systems – Part 1: Principles, requirements and tests*

IEC 60721-3-3:1994, *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 60747-2, *Semiconductor devices – Discrete devices and integrated circuits – Part 2: Rectifier diodes*

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

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

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

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

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

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

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

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

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

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

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

IEC 60749-34, *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.

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 a electrical circuit, e.g. diode, thyristor, MOSFET, etc.

NOTE 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. 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

3.2.4.1
high voltage control terminal
terminal electrically connected to an isolated circuit element, but carrying only low current for control function

NOTE Examples include current shunts and collector sense terminals having the high potential of the main terminals.

3.2.4.2
low voltage control terminal
terminal having a control function and isolated from the high voltage control terminals

NOTE Examples include the terminals of isolated temperature sensors and isolated gate driver inputs etc.