Discrete semiconductor devices - Part 15: Isolated power semiconductor devices

EESTI STANDARDIKESKUS
ESTONIAN CENTRE FOR STANDARDISATION

EESTI STANDARDI EESSÕNA

NATIONAL FOREWORD

Käesolev Eesti standard EVS-EN 60747-15:2004 sisaldab Euroopa standardi EN 60747-15:2004 ingliskeelset teksti.	This Estonian standard EVS-EN 60747-15:2004 consists of the English text of the European standard EN 60747-15:2004.
Standard on kinnitatud Eesti Standardikeskuse 22.06.2004 käskkirjaga ja jõustub sellekohase teate avaldamisel EVS Teatajas.	This standard is ratified with the order of Estonian Centre for Standardisation dated 22.06.2004 and is endorsed with the notification published in the official bulletin of the Estonian national standardisation organisation.
Euroopa standardimisorganisatsioonide poolt rahvuslikele liikmetele Euroopa standardi teksti kättesaadavaks tegemise kuupäev on 07.01.2004.	Date of Availability of the European standard text 07.01.2004.
Standard on kättesaadav Eesti standardiorganisatsioonist.	The standard is available from Estonian standardisation organisation.

ICS 31.080.99

Võtmesõnad:

EUROPEAN STANDARD **EN 60747-15**

NORME EUROPÉENNE

EUROPÄISCHE NORM January 2004

ICS 31.080.99

English version

Discrete semiconductor devices
Part 15: Isolated power semiconductor devices
(IEC 60747-15:2003)

Dispositifs à semiconducteurs
Partie 15: Dispositifs à semiconducteurs de puissance isolés
(CEI 60747-15:2003)

Einzel-Halbleiterbauelemente
Teil 15: Isolierte Leistungshalbleiter
(IEC 60747-15:2003)

This European Standard was approved by CENELEC on 2003-11-01. 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.

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

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Ref. No. EN 60747-15:2004 E

Foreword

The text of the International Standard CEI 60747-15:2003, prepared by SC 47E, Discrete semiconductor devices, of CEI TC 47, Semiconductor devices, was submitted to the Unique Acceptance Procedure and was approved by CENELEC as EN 60747-15 on 2003-11-01 without any modification.

The following dates were 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) 2004-11-01

– latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 2006-11-01

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Endorsement notice

The text of the International Standard CEI 60747-15:2003 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 60068-1	NOTE	Harmonized as EN 60068-1:1994 (not modified).
IEC 60068-2-1	NOTE	Harmonized as EN 60068-2-1:1993 (not modified).
IEC 60068-2-2	NOTE	Harmonized as EN 60068-2-2:1993 (not modified).
IEC 60068-2-58	NOTE	Harmonized as EN 60068-2-58:1999 (not modified).
IEC 60068-2-78	NOTE	Harmonized as EN 60068-2-78:2001 (not modified).
IEC 60112	NOTE	Harmonized as EN 60112:2003 (not modified).
IEC 60146-1-1	NOTE	Harmonized as EN 60146-1-1:1993 (not modified).
IEC 60146-2	NOTE	Harmonized as EN 60146-2:2000 (not modified).
IEC 60664-3	NOTE	Harmonized as HD 625.3 S1:1997 (not modified).
IEC 60747-5-1	NOTE	Harmonized as EN 60747-5-1:2001 (not modified).
IEC 60747-5-2	NOTE	Harmonized as EN 60747-5-2:2001 (not modified).
IEC 60747-5-3	NOTE	Harmonized as EN 60747-5-3:2001 (not modified).
IEC 60749-1	NOTE	Harmonized as EN 60749-1:2003 (not modified).
IEC 60749-2	NOTE	Harmonized as EN 60749-2:2002 (not modified).
IEC 60749-3	NOTE	Harmonized as EN 60749-3:2002 (not modified).
IEC 60749-4	NOTE	Harmonized as EN 60749-4:2002 (not modified).
IEC 60749-7	NOTE	Harmonized as EN 60749-7:2002 (not modified).
IEC 60749-9	NOTE	Harmonized as EN 60749-9:2002 (not modified).
IEC 60749-11	NOTE	Harmonized as EN 60749-11:2002 (not modified).

IEC 60749-13	NOTE	Harmonized as EN 60749-13:2002 (not modified).
IEC 60749-16	NOTE	Harmonized as EN 60749-16:2003 (not modified).
IEC 60749-17	NOTE	Harmonized as EN 60749-17:2003 (not modified).
IEC 60749-18	NOTE	Harmonized as EN 60749-18:2003 (not modified).
IEC 60749-19	NOTE	Harmonized as EN 60749-19:2003 (not modified).
IEC 60749-29	NOTE	Harmonized as EN 60749-29:2003 (not modified).
IEC 60947-4-2	NOTE	Harmonized as EN 60947-4-2:2000 (not modified).
IEC 60947-4-3	NOTE	Harmonized as EN 60947-4-3:2000 (not modified).
IEC 60950-1	NOTE	Harmonized as EN 60950-1:2001 (modified).
IEC 61000	NOTE	Harmonized in EN 61000 series (not modified).
IEC 61340-5-1	NOTE	Harmonized as EN 61340-5-1:2001 (not modified).
IEC 61800-1	NOTE	Harmonized as EN 61800-1:1998 (not modified).
IEC 61800-2	NOTE	Harmonized as EN 61800-2:1998 (not modified).

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Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

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 60068-2-6	- [1)]	Environmental testing Part 2-6: Tests - Test Fc: Vibration (sinusoidal)	EN 60068-2-6	1995 [2)]
IEC 60068-2-7	- [1)]	Part 2-7: Tests - Test Ga and guidance: Acceleration, steady state	EN 60068-2-7	1993 [2)]
IEC 60068-2-14	- [1)]	Part 2-14: Tests - Test N: Change of temperature	EN 60068-2-14	1999 [2)]
IEC 60068-2-20	- [1)]	Part 2-20: Tests - Test T: Soldering	HD 323.2.20 S3	1988 [2)]
IEC 60068-2-27	- [1)]	Part 2-27: Tests - Test Ea and guidance: Shock	EN 60068-2-27	1993 [2)]
IEC 60068-2-47	- [1)]	Part 2-47: Test methods - Mounting of components, equipment and other articles for vibration, impact and similar dynamic tests	EN 60068-2-47	1999 [2)]
IEC 60068-2-48	- [1)]	Part 2-48: Tests - Guidance on the application of the tests of IEC 60068 to simulate the effects of storage	EN 60068-2-48	1999 [2)]
IEC 60068-3-4	- [1)]	Part 3-4: Supporting documentation and guidance - Damp heat tests	EN 60068-3-4	2002 [2)]
IEC 60191-4	1999	Mechanical standardization of semiconductor devices Part 4: Coding system and classification into forms of package outlines for semiconductor device packages	EN 60191-4	1999
IEC 60270	2000	High-voltage test techniques - Partial discharge measurements	EN 60270	2001

1) Undated reference.

2) Valid edition at date of issue.

Publication	Year	Title	EN/HD	Year
IEC 60319	- [1)]	Presentation and specification of reliability data for electronic components	-	-
IEC 60664-1	1992	Insulation coordination for equipment within low-voltage systems Part 1: Principles, requirements and tests	EN 60664-1 [3)]	2003
IEC 60721-3-3	1994	Classification of environmental conditions Part 3-3: Classification of groups of environmental parameters and their severities - Stationary use at weatherprotected locations	EN 60721-3-3	1995
IEC 60747-1	1983	Semiconductor devices - Discrete devices and integrated circuits – Part 1: General	-	-
A1	1991		-	-
A3	1996		-	-
IEC 60747-2	2000	Part 2: Rectifier diodes	-	-
IEC 60747-6	2000	Part 6: Thyristors	-	-
IEC 60747-7	2000	Part 7: Bipolar transistors	-	-
IEC 60747-8	2000	Part 8: Field-effect transistors	-	-
IEC 60747-9	1998	Part 9: Insulated-gate bipolar transistors (IGBTs)	-	-
IEC 60749-5	- [1)]	Semiconductor devices - Mechanical and climatic test methods Part 5: Steady-state temperature humidity bias life test	EN 60749-5	2003 [2)]
IEC 60749-6	- [1)]	Part 6: Storage at high temperature	EN 60749-6	2002 [2)]
IEC 60749-10	- [1)]	Part 10: Mechanical shock	EN 60749-10	2002 [2)]
IEC 60749-12	- [1)]	Part 12: Vibration, variable frequency	EN 60749-12	2002 [2)]
IEC 60749-14	- [1)]	Part 14: Robustness of terminations (lead integrity)	EN 60749-14	2003 [2)]
IEC 60749-15	- [1)]	Part 15: Resistance to soldering temperature for through-hole mounted devices	EN 60749-15	2003 [2)]
IEC 60749-21	- [4)]	Part 21: Solderability	-	-
IEC 60749-25	- [1)]	Part 25: Temperature cycling	EN 60749-25	2003 [2)]

[3)] EN 60664-1 includes A1:2000 + A2:2002 to IEC 60664-1.

[4)] At draft stage.

Publication	Year	Title	EN/HD	Year
IEC 60749-26	- [1)]	Part 26: Electrostatic discharge (ESD) sensitivity testing - Human body model (HBM)	-	-
IEC 60749-36	- [1)]	Part 36: Acceleration, steady state	EN 60749-36	2003 [2)]
IEC 61287-1	1995	Power convertors installed on board rolling stock Part 1: Characteristics and test methods	-	-
ISO 1302	2002	Geometrical Product Specifications (GPS) - Indication of surface texture in technical product documentation	EN ISO 1302	2002
ISO 2768-2	1989	General tolerances Part 2: Geometrical tolerances for features without individual tolerance indications	EN 22768-2	1993

INTERNATIONAL STANDARD

IEC 60747-15

First edition
2003-06

Discrete semiconductor devices –

Part 15: Isolated power semiconductor devices

Dispositifs à semiconducteurs –

Partie 15:
Dispositifs à semiconducteurs de puissance isolés

Reference number
IEC 60747-15:2003(E)

Publication numbering

As from 1 January 1997 all IEC publications are issued with a designation in the 60000 series. For example, IEC 34-1 is now referred to as IEC 60034-1.

Consolidated editions

The IEC is now publishing consolidated versions of its publications. For example, edition numbers 1.0, 1.1 and 1.2 refer, respectively, to the base publication, the base publication incorporating amendment 1 and the base publication incorporating amendments 1 and 2.

Further information on IEC publications

The technical content of IEC publications is kept under constant review by the IEC, thus ensuring that the content reflects current technology. Information relating to this publication, including its validity, is available in the IEC Catalogue of publications (see below) in addition to new editions, amendments and corrigenda. Information on the subjects under consideration and work in progress undertaken by the technical committee which has prepared this publication, as well as the list of publications issued, is also available from the following:

- **IEC Web Site (www.iec.ch)**

- **Catalogue of IEC publications**

  The on-line catalogue on the IEC web site (http://www.iec.ch/searchpub/cur_fut.htm) enables you to search by a variety of criteria including text searches, technical committees and date of publication. On-line information is also available on recently issued publications, withdrawn and replaced publications, as well as corrigenda.

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INTERNATIONAL STANDARD

IEC 60747-15

First edition
2003-06

Discrete semiconductor devices –

Part 15: Isolated power semiconductor devices

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Partie 15: Dispositifs à semiconducteurs de puissance isolés

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Commission Electrotechnique Internationale
International Electrotechnical Commission
Международная Электротехническая Комиссия

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

DISCRETE SEMICONDUCTOR DEVICES –

Part 15: Isolated power semiconductor devices

FOREWORD

1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the 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, the IEC publishes International Standards. 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. The 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 the 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 National Committees.
3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical specifications, technical reports or guides and they are accepted by the National Committees in that sense.
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6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. The IEC shall not be held responsible for identifying any or all such patent rights.

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

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

FDIS	Report on voting
47E/236/FDIS	47E/238/RVD

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

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

The committee has decided that the contents of this publication will remain unchanged until 2006. At this date, the publication will be

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

DISCRETE SEMICONDUCTOR DEVICES –

Part 15: Isolated power semiconductor devices

1 Scope

This part of IEC 60747 gives the product specific standards, requirements and test methods for isolated power semiconductor devices. These requirements are added to those given in other parts of IEC 60747, IEC 60748 and IEC 60749 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 60068-2-6, *Environmental testing – Part 2-6: Tests – Test Fc: Vibration (sinusoidal)*

IEC 60068-2-7, *Environmental testing – Part 2-7: Tests – Test Ga and guidance: Acceleration, steady state*

IEC 60068-2-14, *Environmental testing – Part 2-14: Tests – Test N: Change of temperature*

IEC 60068-2-20, *Environmental testing – Part 2-20: Tests – Test T: Soldering*

IEC 60068-2-27, *Environmental testing – Part 2-27: Tests – Test Ea and guidance: Shock*

IEC 60068-2-47, *Environmental testing – Part 2-47: Test methods – Mounting of components, equipment and other articles for vibration, impact and other similar dynamic tests*

IEC 60068-2-48, *Environmental testing – Part 2-48: Test methods – Guidance on the application of the tests of IEC 60068 to simulate the effects of storage*

IEC 60068-3-4: *Environmental testing – Part 3-4: Supporting documentation and guidance – Damp heat tests*

IEC 60191-4:1999, *Mechanical standardization of semiconductor devices – Part 4: Coding system and classification into forms of package outlines for semiconductor device packages*

IEC 60270:2000, *High voltage test techniques – Partial discharge measurements*

IEC 60319, *Presentation and specification of reliability data for electronic components*

IEC 60664-1:1992, *Insulation coordination for equipment within low-voltage systems – 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 60747-1:1983, *Semiconductor devices – Discrete devices and integrated circuits – Part 1: General*
Amendment 1 (1991)
Amendment 3 (1996)

IEC 60747-2:2000, *Semiconductor devices – Discrete devices and integrated circuits – Part 2: Rectifier diodes*

IEC 60747-6:2000, *Semiconductor devices – Part 6: Thyristors*

IEC 60747-7:2000, *Semiconductor devices – Part 7: Bipolar transistors*

IEC 60747-8:2000, *Semiconductor devices – Part 8: Field effect transistors*

IEC 60747-9:1998, *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 60749-14: *Semiconductor devices – Mechanical and climatic test methods – Part 14: Robustness of terminations (lead integrity)*[1]

IEC 60749-15: *Semiconductor devices – Mechanical and climatic test methods – Part 15: Resistance to soldering temperature for through-hole mounted devices*[1]

IEC 60749-21: *Semiconductor devices – Mechanical and climatic test methods – Part 21: Solderability*[1]

IEC 60749-25: *Semiconductor devices – Mechanical and climatic test methods – Part 25: Rapid change of temperature (air, air)*[1]

IEC 60749-26: *Semiconductor devices – Mechanical and climatic test methods – Part 26: Rapid change of temperature (air, air)*[1]

IEC 60749-36: *Semiconductor devices – Mechanical and climatic test methods – Part 36: Acceleration, steady-state*

IEC 61287-1:1995, *Power convertors installed on board rolling stock – Part 1: Characteristics and test methods*[2]

ISO 1302:2002, *Geometrical Product Specifications (GPS) – Indication of surface texture in technical product documentation*

ISO 2768-2:1989, *General tolerances – Part 2: Geometrical tolerances for features without individual tolerance indications*

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1 In preparation.

2 A new edition is being prepared.