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Irish Standard
I.S. EN 60749-27:2006

Semiconductor devices - Mechanical and climatic test methods -- Part 27: Electrostatic discharge (ESD) sensitivity testing - Machine model (MM) (IEC 60749-27:2006 (EQV))

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60749-27/A1

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English version

Semiconductor devices - Mechanical and climatic test methods - Part 27: Electrostatic discharge (ESD) sensitivity testing - Machine model (MM)

(IEC 60749-27:2006/A1:2012)

Dispositifs à semiconducteurs - Méthodes d'essais mécaniques et climatiques - Partie 27: Essai de sensibilité aux décharges électrostatiques (DES) - Modèle de machine (MM) (CEI 60749-27:2006/A1:2012)

Halbleiterbauelemente - Mechanische und klimatische Prüfverfahren - Teil 27: Prüfung der Empfindlichkeit gegen elektrostatische Entladungen (ESD) - Machine Model (MM) (IEC 60749-27:2006/A1:2012)

This amendment A1 modifies the European Standard EN 60749-27:2006; it was approved by CENELEC on 2012-10-30. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

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

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Foreword

The text of document 47/2135/FDIS, future amendment 1 to edition 2 of IEC 60749-27, prepared by IEC/TC 47 "Semiconductor devices" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 60749-27:2006/A1:2012.

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• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2013-07-30
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I.S. EN 60749-27:2006

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 60749-27

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English version

Semiconductor devices - Mechanical and climatic test methods Part 27: Electrostatic discharge (ESD) sensitivity testing - Machine model (MM)

(IEC 60749-27:2006)

Dispositifs à semiconducteurs - Méthodes d'essais mécaniques et climatiques
Partie 27: Essai de sensibilité aux décharges électrostatiques (DES) - Modèle de machine (MM)
(CEI 60749-27:2006)

Halbleiterbauelemente - Mechanische und klimatische Prüfverfahren
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European Committee for Electrotechnical Standardization
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Foreword

The text of document 47/1861/FDIS, future edition 2 of IEC 60749-27, prepared by IEC TC 47, Semiconductor devices, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 60749-27 on 2006-08-01.

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)	2007-05-01
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Annex ZA has been added by CENELEC.

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The text of the International Standard IEC 60749-27:2006 was approved by CENELEC as a European Standard without any modification.

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Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

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.

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 61340-3-2	-[1)]	Electrostatics Part 3-2: Methods for simulation of electrostatic effects - Machine model (MM) - Component testing	EN 61340-3-2	2002[2)]
IEC 60749-26	-[1)]	Semiconductor devices - Mechanical and climatic test methods Part 26: Electrostatic discharge (ESD) sensitivity testing - Human body model (HBM)	EN 60749-26	2006[2)]

[1)] Undated reference.

[2)] Valid edition at date of issue.

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SEMICONDUCTOR DEVICES – MECHANICAL AND CLIMATIC TEST METHODS –

Part 27: Electrostatic discharge (ESD) sensitivity testing – Machine model (MM)

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of 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, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). 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. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
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This consolidated version of IEC 60749-27 consists of the second edition (2006) [documents 47/1861/FDIS and 47/1873/RVD] and its amendment 1 (2012) [documents 47/2135/FDIS and 47/2144/RVD]. It bears the edition number 2.1.

The technical content is therefore identical to the base edition and its amendment and has been prepared for user convenience. A vertical line in the margin shows where the base publication has been modified by amendment 1. Additions and deletions are displayed in red, with deletions being struck through.

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International Standard IEC 60749-27 has been prepared by IEC technical committee 47: Semiconductor devices.

This second edition cancels and replaces the first edition, published in 2003, and has been revised in collaboration with technical committee 101. Whilst it does not contain any major technical changes, reference is now made, where necessary, to IEC 61340-3-2.

A list of all parts of IEC 60749 series, under the general title *Semiconductor devices – Mechanical and climatic test methods* can be found on the IEC website.

The committee has decided that the contents of the base publication and its amendments will remain unchanged until the stability date indicated on the IEC web site under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

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- replaced by a revised edition, or
- amended.

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SEMICONDUCTOR DEVICES – MECHANICAL AND CLIMATIC TEST METHODS –

Part 27: Electrostatic discharge (ESD) sensitivity testing – Machine model (MM)

1 Scope

This part of IEC 60749 establishes a standard procedure for testing and classifying semiconductor devices according to their susceptibility to damage or degradation by exposure to a defined machine model (MM) electrostatic discharge (ESD). It may be used as an alternative test method to the human body model ESD test method. The objective is to provide reliable, repeatable ESD test results so that accurate classifications can be performed.

This test method is applicable to all semiconductor devices and is classified as destructive.

ESD testing of semiconductor devices is selected from this test method, the human body model (HBM – see IEC 60749-26) or other test methods in the IEC 60749 series. The MM and HBM test methods produce similar but not identical results. Unless otherwise specified, the HBM test method is the one selected.

NOTE 1 This test method does not truly simulate discharge from real machines or metallic tools because the test method uses high parasitic inductance of the test circuit, whereas real machines and metallic tools, whose discharge rise time is approximately 100 ps, have no inductance.

NOTE 2 Certain clauses in this test method are in accordance with IEC 61340-3-2.

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 61340-3-2, *Electrostatics – Part 3-2: Methods for simulation of electrostatic effects – Machine model (MM – Component testing) electrostatic discharge test waveforms*

IEC 60749-26: *Semiconductor devices – Mechanical and climatic test methods – Part 26: Electrostatic discharge (ESD) sensitivity testing – Human body model (HBM)*

3 Terms and definitions

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

3.1
device under test
DUT
semiconductor product subjected to MM ESD test

3.2
DUT failure
condition in which a DUT does not meet one or more specified parameters as a result of ESD test

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