BS EN 62137-4:2014

Incorporating corrigendum February 2015

BSI Standards Publication

Electronics assembly technology

Part 4: Endurance test methods for solder joint of area array type package surface mount devices

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The UK participation in its preparation was entrusted to Technical Committee EPL/501, Electronic Assembly Technology.

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Technique d'assemblage des composants électroniques - Partie 4: Méthodes d'essais d'endurance des joints brasés des composants pour montage en surface à boîtiers de type matriciel
(CEI 62137-4:2014)

Montageverfahren für elektronische Baugruppen - Teil 4: Oberflächenmontierbare Bauteilgehäuse mit Flächenmatrix - (Lebens-)Dauerprüfungen für Lötverbindungen
(IEC 62137-4:2014)

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Foreword

The text of document 91/1188/FDIS, future edition 1 of IEC 62137-4, prepared by IEC/TC 91 "Electronics assembly technology" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62137-4:2014.

The following dates are fixed:

• latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement	(dop)	2015-08-13
• latest date by which the national standards conflicting with the document have to be withdrawn	(dow)	2017-11-13

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This document supersedes EN 62137:2004.

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In the official version, for Bibliography, the following notes have to be added for the standards indicated:

IEC 60068-1:1988+A1:1992	NOTE	Harmonized as EN 60068-1:1994 (not modified).
IEC 60068-2-2	NOTE	Harmonized as EN 60068-2-2.
IEC 60068-2-6	NOTE	Harmonized as EN 60068-2-6.
IEC 60068-2-21:2006	NOTE	Harmonized as EN 60068-2-21:2006 (not modified).
IEC 60068-2-27	NOTE	Harmonized as EN 60068-2-27.
IEC 60068-2-44:1995	NOTE	Harmonized as EN 60068-2-44:1995 (not modified).
IEC 60068-2-58:2004	NOTE	Harmonized as EN 60068-2-58:2004 (not modified).
IEC 60068-2-78:2001	NOTE	Harmonized as EN 60068-2-78:2001[1)] (not modified).
IEC 60749-1:2002	NOTE	Harmonized as EN 60749-1:2003 (not modified).
IEC 60749-20:2008	NOTE	Harmonized as EN 60749-20:2009 (not modified).
IEC 60749-20-1:2009	NOTE	Harmonized as EN 60749-20-1:2009 (not modified).
IEC 61188-5-8	NOTE	Harmonized as EN 61188-5-8.
IEC 61189-3:2007	NOTE	Harmonized as EN 61189-3:2008 (not modified).
IEC 61189-5	NOTE	Harmonized as EN 61189-5.
IEC 61190-1-1	NOTE	Harmonized as EN 61190-1-1.
IEC 61190-1-2	NOTE	Harmonized as EN 61190-1-2.
IEC 61760-1:2006	NOTE	Harmonized as EN 61760-1:2006 (not modified).
IEC 62137-1-3	NOTE	Harmonized as EN 62137-1-3.
IEC 62137-1-4:2009	NOTE	Harmonized as EN 62137-1-4:2009 (not modified).

[1)] Superseded by EN 60068-2-78:2013 (IEC 60068-2-78:2012): DOW = 2015-12-03.

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 1 When an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu

Publication	Year	Title	EN/HD	Year
IEC 60068-2-14	-	Environmental testing - Part 2-14: Tests - Test N: Change of temperature	EN 60068-2-14	-
IEC 60191-6-2	-	Mechanical standardization of semiconductor devices - Part 6-2: General rules for the preparation of outline drawings of surface mounted semiconductor device packages - Design guide for 1,50 mm, 1,27 mm and 1,00 mm pitch ball and column terminal packages	EN 60191-6-2	-
IEC 60191-6-5	-	Mechanical standardization of semiconductor devices - Part 6-5: General rules for the preparation of outline drawings of surface mounted semiconductor device packages - Design guide for fine-pitch ball grid array (FBGA)	EN 60191-6-5	-
IEC 60194	-	Printed board design, manufacture and assembly - Terms and definitions	EN 60194	-
IEC 61190-1-3	-	Attachment materials for electronic assembly - Part 1-3: Requirements for electronic grade solder alloys and fluxed and non-fluxed solid solders for electronic soldering applications	EN 61190-1-3	-
IEC 61249-2-7	-	Materials for printed boards and other interconnecting structures - Part 2-7: Reinforced base materials, clad and unclad - Epoxide woven E-glass laminated sheet of defined flammability (vertical burning test), copper-clad	EN 61249-2-7	-
IEC 61249-2-8	-	Materials for printed boards and other interconnecting structures - Part 2-8: Reinforced base materials, clad and unclad - Modified brominated epoxide woven fibreglass reinforced laminated sheets of defined flammability (vertical burning test), copper-clad	EN 61249-2-8	-

Publication	Year	Title	EN/HD	Year
IEC 62137-3	2011	Electronics assembly technology - Part 3: Selection guidance of environmental and endurance test methods for solder joints	EN 62137-3	2012

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ELECTRONICS ASSEMBLY TECHNOLOGY –

Part 4: Endurance test methods for solder joint of area array type package surface mount devices

1 Scope

This part of IEC 62137 specifies the test method for the solder joints of area array type packages mounted on the printed wiring board to evaluate solder joint durability against thermo-mechanical stress.

This part of IEC 62137 applies to the surface mounting semiconductor devices with area array type packages (FBGA, BGA, FLGA and LGA) including peripheral termination type packages (SON and QFN) that are intended to be used in industrial and consumer electrical or electronic equipment.

An acceleration factor for the degradation of the solder joints of the packages by the temperature cycling test due to the thermal stress when mounted, is described Annex A.

Annex H provides some explanations concerning various types of mechanical stress when mounted.

The test method specified in this standard is not intended to evaluate semiconductor devices themselves.

NOTE 1 Mounting conditions, printed wiring boards, soldering materials, and so on, significantly affect the result of the test specified in this standard. Therefore, the test specified in this standard is not regarded as the one to be used to guarantee the mounting reliability of the packages.

NOTE 2 The test method is not necessary, if there is no stress (mechanical or other) to solder joints in field use and handling after mounting.

2 Normative references

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.

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

IEC 60191-6-2, *Mechanical standardization of semiconductor devices – Part 6-2: General rules for the preparation of outline drawings of surface mounted semiconductor device packages – Design guide for 1,50 mm, 1,27 mm and 1,00 mm pitch ball and column terminal packages*

IEC 60191-6-5, *Mechanical standardization of semiconductor devices – Part 6-5: General rules for the preparation of outline drawings of surface mounted semiconductor device packages – Design guide for fine-pitch ball grid array (FBGA)*

IEC 60194, *Printed board design, manufacture and assembly – Terms and definitions*