SLOVENSKI STANDARD

SIST-TP CLC/TR 62258-3:2008

01-januar-2008

Nadomeģļ a:

SIST-TS ES 59008-4-2:2007

Izdelki s polprevodniģkimi ļ ipi - 3. del: Priporoļ ila za dobro prakso pri ravnanju z njimi, pakiranju in skladiģļ enju (IEC/TR 62258-3:2005)

Semiconductor die products - Part 3: Recommendations for good practice in handling, packing and storage (IEC/TR 62258-3:2005)

Halbleiter-Chip-Erzeugnisse - Teil 3: Empfehlungen für die Praxis bei Handhabung, Verpackung und Lagerung (IEC/TR 62258-3:2005)

Ta slovenski standard je istoveten z: **CLC/TR 62258-3:2007**

ICS:

31.080.99	Drugi polprevodniški elementi	Other semiconductor devices
31.200	Integrirana vezja, mikroelektronika	Integrated circuits. Microelectronics

SIST-TP CLC/TR 62258-3:2008 **en,de**

TECHNICAL REPORT

RAPPORT TECHNIQUE

TECHNISCHER BERICHT

CLC/TR 62258-3

February 2007

ICS 31.080.99

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English version

Semiconductor die products – Part 3: Recommendations for good practice in handling, packing and storage

(IEC/TR 62258-3:2005)

Halbleiter-Chip-Erzeugnisse –
Teil 3: Empfehlungen für die Praxis bei Handhabung, Verpackung und Lagerung
(IEC/TR 62258-3:2005)

This Technical Report was approved by CENELEC on 2006-12-12.

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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. CLC/TR 62258-3:2007 E

Foreword

The text of the Technical Report IEC/TR 62258-3:2005, prepared by IEC TC 47, Semiconductor devices, was submitted to vote and was approved by CENELEC as CLC/TR 62258-3 on 2006-12-12.

This Technical Report supersedes ES 59008-4-2:2000.

Annex ZA has been added by CENELEC.

Endorsement notice

The text of the Technical Report IEC/TR 62258-3:2005 was approved by CENELEC as a Technical Report without any modification.

In the official version, for Bibliography, the following note has to be added for the standard indicated:

IEC 62258-2	NOTE	Harmonized as EN 62258-2:2005 (not modified).

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 60050	Series	International Electrotechnical Vocabulary (IEV)	-	-
IEC 60286-3	- [1)]	Packaging of components for automatic handling - Part 3: Packaging of surface mount components on continuous tapes	EN 60286-3	1998 [2)]
IEC 61340-5-1 + corr. February	1998 1999	Electrostatics – Part 5-1: Protection of electronic devices from electrostatic phenomena - General requirements	EN 61340-5-1 + corr. April	2001 2001
IEC 61340-5-2	1999	Electrostatics – Part 5-2: Protection of electronic devices from electrostatic phenomena - User guide	EN 61340-5-2 + corr. August	2001 2001
IEC 62258-1	- [1)]	Semiconductor die products – Part 1: Requirements for procurement and use	EN 62258-1	2005 [2)]
ISO 14644-1	- [1)]	Cleanrooms and associated controlled environments – Part 1: Classification of air cleanliness	EN ISO 14644-1	1999 [2)]

[1)] Undated reference.

[2)] Valid edition at date of issue.

TECHNICAL REPORT

IEC TR 62258-3

First edition
2005-06

Semiconductor die products –

Part 3:
Recommendations for good practice in handling, packing and storage

International Electrotechnical Commission, 3, rue de Varembé, PO Box 131, CH-1211 Geneva 20, Switzerland
Telephone: +41 22 919 02 11 Telefax: +41 22 919 03 00 E-mail: inmail@iec.ch Web: www.iec.ch

Commission Electrotechnique Internationale
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

SEMICONDUCTOR DIE PRODUCTS –

Part 3: Recommendations for good practice in handling, packing and storage

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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The main task of IEC technical committees is to prepare International Standards. However, a technical committee may propose the publication of a technical report when it has collected data of a different kind from that which is normally published as an International Standard, for example "state of the art".

IEC 62258-3, which is a technical report, has been prepared by IEC technical committee 47: Semiconductor devices.

The text of this technical report is based on the following documents:

Enquiry draft	Report on voting
47/1794/DTR	47/1806/RVC

Full information on the voting for the approval of this technical report 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.

IEC 62258, as currently conceived, consists of the following parts, under the general title *Semiconductor die products* [1]

Part 1: Requirements for procurement and use

Part 2: Exchange data formats

Part 3: Recommendations for good practice in handling, packing and storage

Part 4: Questionnaire for die users and suppliers

Part 5: Requirements for information concerning electrical simulations

Part 6: Requirements for information concerning thermal simulations

Further parts may be added as required.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result 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

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

A bilingual version of this publication may be issued at a later date.

[1] At the time of writing, IEC 62258-3 is the only part in existence. Other parts are under consideration.

INTRODUCTION

Organizations that helped prepare this technical report included the ESPRIT GOOD-DIE project, DPC, and JEITA.

SEMICONDUCTOR DIE PRODUCTS –

Part 3: Recommendations for good practice in handling, packing and storage

1 Scope and object

This technical report has been developed to facilitate the production, supply and use of semiconductor die products, including:

– wafers,
– singulated bare die,
– die and wafers with attached connection structures, and
– minimally or partially encapsulated die and wafers.

This report contains suggested good practice for the handling, packing and storage of die products.

Success in manufacture of electronic assemblies containing die products is enhanced by attention to handling, storage and environmental conditions. This report provides guidelines taken from industry experience and is especially useful to those integrating die products into assemblies for the first time. It is also intended as an aid to setting up and auditing facilities that handle or use bare die products, from wafer fabrication to final assembly.

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 lasted edition of the referenced document (including any amendments) applies.

IEC 60050 (all parts), *International Electrotechnical Vocabulary*

IEC 60286-3, *Packaging of components for automatic handling – Part 3: Packaging of surface mount components on continuous tapes*

IEC 61340-5-1:1998, *Electrostatics – Part 5-1: Protection of electronic devices from electrostatic phenomena – General requirements*

IEC 61340-5-2:1999, *Electrostatics – Part 5-2: Protection of electronic devices from electrostatic phenomena – User guide*

IEC 62258-1, *Semiconductor die products – Part 1: Requirements for procurement and use* [2]

ISO 14644-1, *Cleanrooms and associated controlled environments – Part 1: Classification of air cleanliness*

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2 Under consideration.

3 Terms and definitions

For the purposes of this document, relevant terms which are defined in IEC 60050, together with additional terms and acronyms as given is IEC 62258-1, shall apply.

4 Handling – Good practice

4.1 General

Contact with the exposed active surface of die products should be avoided. When contact is absolutely necessary, only properly designed tools and materials should be used.

The working environment, including tools, materials and containers for handling and transport of die products should provide for ESD protection (refer to IEC 61340-5-1 and IEC 61340-5-2).

It should also be realised that die products are sensitive to certain chemicals.

4.2 Working environmental controls

The following are the typical recommended working environmental conditions for most semiconductor technologies. Characterisation of the particular technology used should be conducted to determine any specific environmental needs. This working environment should not be used for storage of semiconductor die.

a) Temperature: 17 °C – 28 °C

b) Humidity 40 % nominal $^{+20}_{-10}$ %

c) Particle count: ISO 14644-1, Class 8 or better

4.3 General handling precautions

The selection of appropriate tools is critical to successful handling of bare die and wafers. There is a range of specialized tools available for correct handling of die and wafers. If any tooling or equipment is found to damage die products, its use should be suspended immediately.

Die products should never be allowed to come into contact with each other, or to be stacked on top of each other without the use of suitable separators.

Die products should never be placed with the active side touching a hard surface. The die surface may also be damaged if it touches a soft surface that has embedded hard particles, such as silicon debris.

When handling wafers it is recommended that physical contact should be made only with the outer periphery and/or the back side of the wafer.

4.4 Cleanroom good practice

Containers of bare die or wafers should only be opened in a work area with a controlled environment, known as a cleanroom. This applies to any process that exposes the die or wafer surface to the environment, for example quality checks, die sorting or assembly of products containing bare die.

Personnel working in these areas need to be adequately trained to ensure that die products are not physically damaged nor contaminated when handled in the cleanroom.

4.4.1 General

ESD damage may be reduced through the use of grounded workstations, conductive wrist straps and/or shoe straps, conductive material totes, staticide chemicals, conductive floor waxes, tiles, mats, ionizers, conductive packing foams, and shielded bags. These items can also improve the efficiency of the environmental controls employed.

Bare die or wafers in process should remain in a clean environment at all times. If wafers are to be transported between cleanrooms, a suitable wafer carrier should be used and the container should remain closed during transportation. The container should be externally cleaned on re-entering the cleanroom.

It is recommended that die or wafers should not be handled manually. Handling die or wafers with bare hands should be avoided since this will cause contamination from skin oil, skin flakes, and a variety of other contaminants from human and other sources. Even when using gloves, handling may cause contamination by transfer of plasticizer from the glove. However, it is acceptable to handle wafers with a gloved hand as long as the wafer is held on the edge and the active surface is not touched at all.

All surfaces coming in contact with die products throughout the process should be clean and, when practicable, non-metallic. Any hard material in contact with the die products may cause scratches or chipping. These principles should be observed at all times, since if one die or wafer becomes contaminated, the contaminants may be transferred to other surfaces, process equipment and wafers.

Care should be taken to avoid contaminating surfaces used for product handling. Working surfaces should not be used to hold non-clean items, such as equipment covers, internal parts or personal belongings. Wiping a surface clean may not adequately remove oils and residues.

4.4.2 Attire

4.4.2.1 Hats, hoods, nets, masks and shoes

Head and facial hair should be completely enclosed at all times using appropriate hoods or nets to avoid contamination from skin particles or hair.

It is recommended that masks are worn at all times while in the production area with exposed wafers or die to prevent contamination by spittle. Masks should cover the mouth, and ideally, the nose and should be replaced daily or more often if they become contaminated.

Special ESD-safe cleanroom shoes should be worn within the cleanroom. These shoes should be kept inside the cleanroom or changing area and only be taken outside the area for cleaning or repair. Alternatively, overshoes may be used which should be discarded immediately after use in suitable waste containers. Some overshoes are suitable for re-use after washing, however, they are not intended to be re-used without being cleaned.

4.4.2.2 Smocks and gowns

Special smocks and gowns should be worn within the cleanroom, to cover normal clothing. They should be selected according to the cleanroom classification and should be made of material that is both anti-static and lint-free.

4.4.2.3 Gloves

Gloves serve as the final barrier in preventing release of skin flakes, skin oils, and other hand-carried contaminants. Disposable vinyl gloves that are approved for cleanrooms are appropriate for general use.