# SLOVENSKI STANDARD
# SIST-TS ES 59008-1:2007

**01-januar-2007**

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**Zahtevani podatki za polprevodniška integrirana vezja - 1. del: Splošne zahteve**

Data requirements for semiconductor die -- Part 1: General requirements

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**Ta slovenski standard je istoveten z: ES 59008-1:1999**

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**ICS:**

| | | |
|---|---|---|
| 31.080.01 | Polprevodniški elementi (naprave) na splošno | Semiconductor devices in general |

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2003-01.Slovenski inštitut za standardizacijo. Razmnoževanje celote ali delov tega standarda ni dovoljeno.

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EUROPEAN SPECIFICATION
SPÉCIFICATION EUROPÉENNE
EUROPÄISCHE SPEZIFIKATION

# ES 59008-1

September 1999

English version

## Data requirements for semiconductor die
## Part 1: General requirements

This European Specification was approved by CENELEC on 1999-06-29.

CENELEC members are required to announce the existence of this ES in the same way as for an EN and to make the ES available promptly at national level in an appropriate form. It is permissible to keep conflicting national standards in force.

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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**

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Ref. No. ES 59008-1:1999 E

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## Foreword

This European Specification has been prepared by the CENELEC BTTF 97-1, Known good die.

It was submitted to the vote during the meeting of BTTF 97-1 and approved by CENELEC as ES 59008-1 on 1999-06-29.

The following dates was fixed:

- latest date by which the existence of the ES has to be announced at national level (doa) 1999-11-01

The structure of this European Specification is as follows.

ES 59008 Data requirements for semiconductor die
- Part 1 General requirements
- Part 2 Vocabulary
- Part 3 Mechanical, material and connectivity requirements
- Part 4 Specific requirements and recommendations
  - Part 4-1: Test and quality
  - Part 4-2: Handling and storage
  - Part 4-3: Thermal
  - Part 4-4: Electrical simulation
- Part 5 Particular requirements and recommendations for die types
  - Part 5-1: Bare die
  - Part 5-2: Bare die with added connection structures
  - Part 5-3: Minimally-packaged die
- Part 6 Exchange data formats and data dictionary
  - Part 6-1: Data exchange - DDX file format
  - Part 6-2: Data dictionary

## Introduction

This European Specification has been developed so that the selection of unpackaged and minimally-packaged semiconductor die, with or without connection structures, can be carried out in a constructive way so that the designer and procurer of the components can save both design and procurement time.

It is a data specification which defines the requirements for :

- product identity
- product data
- die mechanical information
- test, quality and reliability information
- handling, storage and mounting information
- thermal data and electrical simulation data.

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This document was prepared by CENELEC Task Force CLC/BTTF 97-1 Known Good Die. Other organisations that helped prepare it were: the ESPRIT GOOD-DIE projects, EECA, Sematech, DPC and EIAJ.

The specification was derived from the work carried out in the ESPRIT 4th Framework project GOOD-DIE. This project was set up to develop a database for the selection of unpackaged and minimally-packaged semiconductor die, with or without connection structures, and for the downloading of information to CAD design stations to facilitate the layout and simulation of MCMs and hybrid circuits. During the early part of the GOOD-DIE project the need was identified for a standard way of presenting information for the selection and procurement of these components.

SIST-TS ES 59008-1:2007



## 1 Scope

This series of European Specifications specifies requirements for the exchange of data pertaining to bare semiconductor die, with or without connection structures, and minimally-packaged semiconductor die.

This Specification also gives recommendations for general industry good practice in the use of bare die, with or without connection structures, and minimally-packaged die.

ES 59008-1 specifies the requirements for the data of a general nature, including

- product identity
- product data
- die mechanical information
- test, quality and reliability information
- handling, storage and mounting information
- thermal data and electrical simulation data

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ES 59008.

ES 59008 *Data requirements for semiconductor die*
Part 1 *General requirements*
Part 2 *Vocabulary*
Part 3 *Mechanical, material and connectivity requirements*
Part 4 *Specific requirements and recommendations*
Part 4-1: *Test and quality*
Part 4-2: *Handling and storage*
Part 4-3: *Thermal*
Part 4-4: *Electrical simulation*
Part 5 *Particular requirements and recommendations for die types*
Part 5-1: *Bare die*
Part 5-2: *Bare die with added connection structures*
Part 5-3: *Minimally-packaged die*
Part 6 *Exchange data formats and data dictionary*
Part 6-1: *Data exchange - DDX*
Part 6-2: *Data dictionary*

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## 3 Definitions

For the purpose of this European Specification, the definitions given in ES 59008-2 apply.

## 4 Requirements

Suppliers of die devices shall furnish information which is necessary and sufficient for users of the devices at all stages of design, procurement, manufacture and test of products containing them. Details of the requirements and the forms in which the information should be given are covered in other parts of this specification.

SIST-TS ES 59008-1:2007



### 4.1 Identity

All die devices shall have an identifier, consisting of one or more type designators, which shall distinguish each die device from all other die devices and from equivalent packaged parts. Such identifiers shall ensure the ability to distinguish among different versions of die which are intended to perform the same or different functions.

### 4.2 Source

The source of supply for die devices shall be given with sufficient information to communicate adequately with the supplier. If the die manufacturer is different from the supplier, the identity of the manufacturer should also be given.

### 4.3 Function

A description of the electrical function and performance variants of all die devices shall be given.

### 4.4 Electrical and physical characteristics

Electrical characteristics covering limiting conditions of use and normal operating conditions shall be given for all die devices. Technology of manufacture, including the materials used, shall be given where necessary.

### 4.5 Geometry

All physical dimensions needed for layout and assembly of a product containing die devices shall be given. These shall include dimensions of the die and the size, shape and position of all terminals.

### 4.6 Connectivity

The electrical function of all terminals shall be given in such a way that the relationships between electrical function and geometric position of the terminals are fully defined. Any requirement for connection to the die substrate shall also be given.

### 4.7 Documentation

Data sheets containing all the information prescribed herein shall be provided. These should contain or be supplemented by pictures of the die, application notes and recommendations on handling and assembly.

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### 4.8 Test and quality

A description of the test processes used to verify the functionality and performance of the die device shall be given, together with an indication of the expected quality level. Information on device reliability should also be given.

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### 4.9 Handling

Information necessary for handling and assembly of the die should be provided, including recommendations for mounting, ESD protection, form of supply and form of packing for shipment.

SIST-TS ES 59008-1:2007



### 4.10 Thermal data

Thermal properties needed for thermal modelling of the die device and the system in which it is installed should be given which include limits to the junction temperature of the die and the power dissipation under typical operating conditions. Where relevant, other thermal properties should be also be given such as thermal conductivity and variation of power dissipation.

### 4.11 Models

The availability of any models for simulation or test of the die device should be stated.

## 5 Conformity

### 5.1 Conformity levels

This specification defines three conformity levels for supply of information on bare or minimally-packaged semiconductor die as follows:

Level 1. Essential information for the procurement and use of die devices which shall be supplied in all cases. Such information includes die identification, die form, die manufacturer, die size, terminal positions and terminal identification.

Level 2. Desirable information for procurement and use of die devices which should be provided if at all possible. Such information includes die technology, power dissipation, die picture, wafer map and form of supply.

Level 3. Optional information for procurement and use of die devices which should be provided where available and applicable. Such information includes dimensional tolerances, pad metallisation, passivation material, bump material, thermal data, bonding requirements and underfill.

### 5.2 Claiming conformity

For any part of this specification, a supplier shall only claim conformity to any level if he supplies all the information required for that level and for all levels below it. Thus, conformity at level 2 may only be claimed if all the information required at levels 1 and 2 is supplied and conformity at level 3 may only be claimed if all the information required at levels 1, 2 and 3 is supplied.

Detailed requirements on conformity levels for any specific item of information are given in Parts 3, 4 and 5 of this specification.

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To claim conformity to this specification, the claim shall, as a minimum, contain a claim to the appropriate level of Part 3. Additional conformity claims may also be made to the appropriate levels in Parts 4 and/or 5.

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Example of a conformity claim :

The information given conforms to the requirements of ES 59008 Part 3 at level 2 plus Part 4-1 at level 3 and Part 4-2 at level 1.

SIST-TS ES 59008-1:2007



## Annex A
(informative)

## Bibliography

The following publications are associated specifications and additional information.

1. ES 59008-6-1 Data requirements for semiconductor die - Part 6-1: Exchange data formats and data dictionary - Data exchange - DDX

   ES 59008-6-2 Data requirements for semiconductor die - Part 6-2: Data dictionary

2. ISO 9000 Series Quality Management Standard

3. EIA/JESD49 Procurement Standard for Known Good Die (KGD) February 1996

4. EN 100015-1 Basic Specification on the Protection of Electrostatic Sensitive Devices

5. Die Information Exchange (DIE) Format Version 1.0.3 : November 1994

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