SLOVENSKI STANDARD

SIST-TS ES 59008-6-2:2007

01-januar-2007

Zahtevani podatki za polprevodniška integrirana vezja - 6-2. del: Podatkovni slovar

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

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Ta slovenski standard je istoveten z: ES 59008-6-2:2001

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EUROPEAN SPECIFICATION

SPÉCIFICATION EUROPÉENNE

EUROPÄISCHE SPEZIFIKATION

ES 59008-6-2

March 2001

English version

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

This European Specification was approved by CENELEC on 2000-11-06.

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 59008-6-2:2001 E

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 59008-6-2 on 2000-11-06.

The following date was fixed:

- latest date by which the existence of the ES has to be announced at national level (doa) 2001-05-01

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
  - Part 6-2 Data dictionary

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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.

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 project, 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 this project the need became apparent for standard ways of presenting information for the selection and procurement of these components.

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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.

Part 6-2 of ES 59008 specifies the dictionary for die data including definitions of all necessary die properties according to the requirements of IEC 61360.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this European Specification. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this European Specification are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below.

ES 59008-1		*Data requirements for semiconductor die -- Part 1: General requirements*
ES 59008-2		*Part 2: Vocabulary*
ES 59008-3		*Part 3: Mechanical, material and connectivity requirements*
ES 59008-4-X		*Part 4-X: Specific requirements and recommendations*
ES 59008-5-X		*Part 5-X:* Particular requirements and recommendations for die types
ES 59008-6-1		*Part 6-1: Exchange data format and data dictionary - Data exchange - DDX file format*
EN 60191-4	1999	*Mechanical standardization of semiconductor devices - Part 4: Coding system and classification into forms of package outlines for semiconductor devices* (IEC 60191-4:1999)
EN 61360-1	1995	*Standard data element types with associated classification scheme for electric components -- Part 1: Definitions - Principles and methods* (IEC 61360-1:1995)
EN 61360-4	1995	*Part 4: IEC reference collection of standard data element types, component classes and terms* (IEC 61360-4:1994)
ISO 13584-24 (DIS)		*Industrial automation systems and integration - Parts library - Part 24: Logical resource: Logical model of supplier library*

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3 Definitions

For the purposes of this European Specification, the definitions as given in ES 59008-2: Vocabulary shall apply.

4 Requirements

This Part of the specification should be read in conjunction with ES 59008-1: General Requirements, ES 59008-3: Mechanical, material and connectivity requirements, ES 59008-4: Specific requirements and recommendations, ES 59008-5: Particular requirements and recommendations for die types and ES 59008-6-1: Data exchange - DDX.

4.1 Formats for data element type definitions

This document presents definitions for properties of die as described in other parts of this standard in a computer-sensible form in accordance with the requirements of EN 61360-1. The definitions given in clause 5 are presented in a format which is consistent with the format of the dictionary in annex A of EN 61360-4.

To assist in the understanding of the die property definitions given in clause 5, the Figures 1, 2 and 3 below indicate the various attributes that appear there whilst Table 1 that follows acts as a key to the figures. For a detailed description of the various attributes of the data element type definitions, see EN 61360-1.

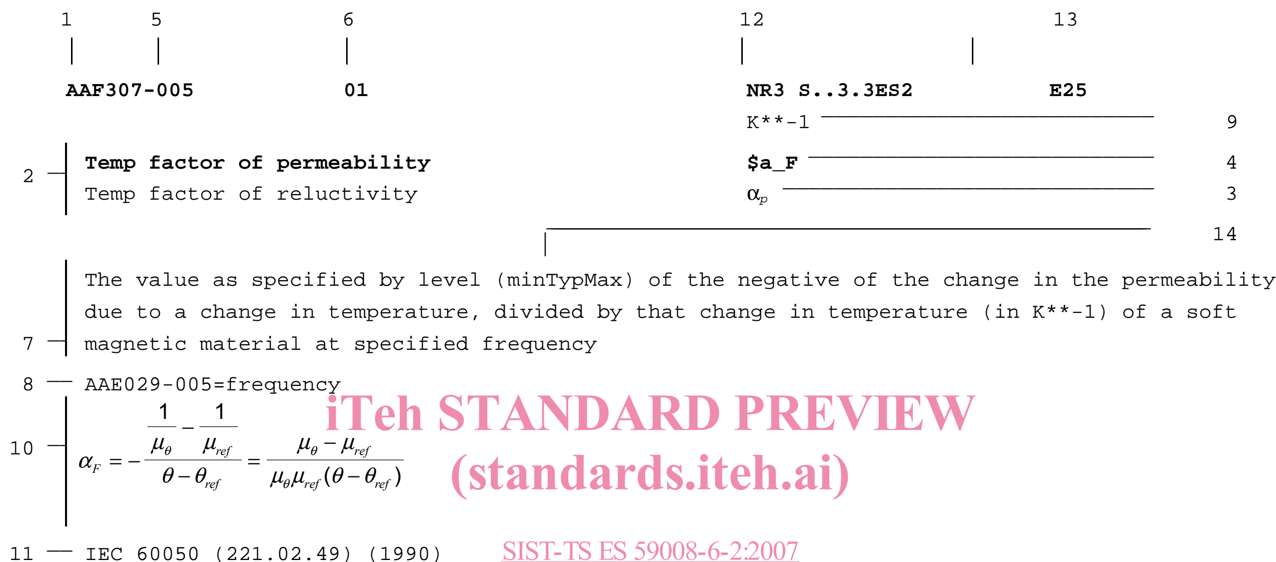

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Figure 1 - Quantitative data element type specification attributes

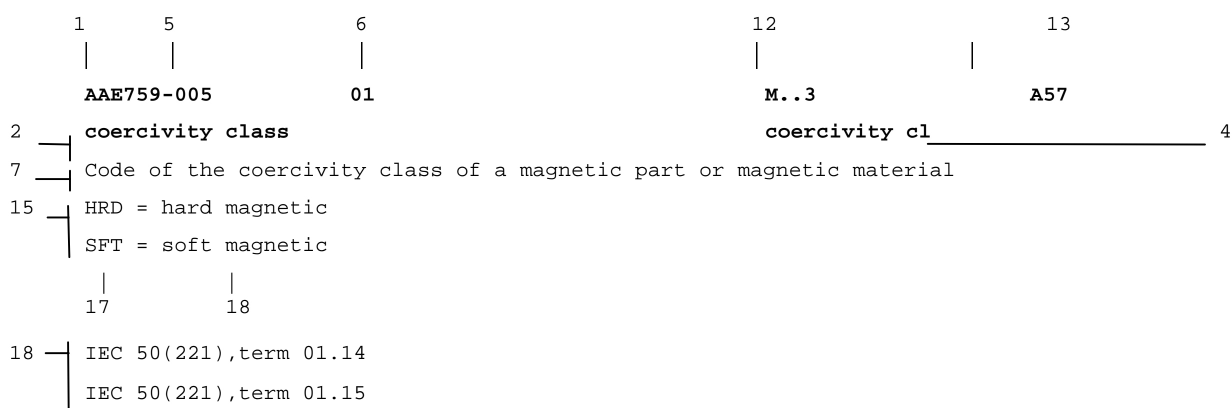

Figure 2 - Non-quantitative data element type specification attributes

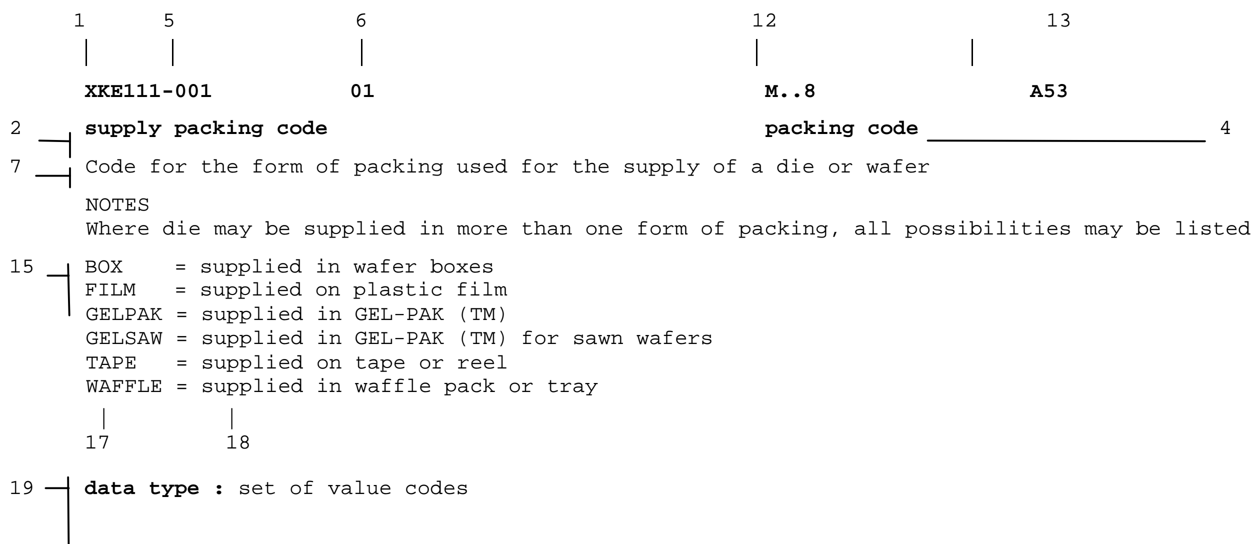

Figure 3 - Data element type specification attributes for complex data types

NOTE Where a data type is a simple type or a level type and the data type can be inferred from other attributes, an explicit data type may not be shown.

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Table 1 - Key to data element type attributes

1 Code
2 Preferred name / synonymous name
3 Preferred symbol / synonymous symbol
4 Short name
5 Version number
6 Revision number
7 Definition
8 Condition(s)
9 Unit of measure
10 Formula
11 Source document of data element type definition
12 Value format for numeric or string data types or class identifier for class instance type
13 Data element type class
14 Level
15 Value list
16 Value codes
17 Value meanings
18 Source document(s) of value(s)
19 Data type

5 Data element type definitions

5.1 List of DET definitions

DET identifier	Name	Short name	Units	Format
XKE001-001	die identifier	die ID		M..17
XKE002-001	die name	die name		M..17
XKE003-001	die version	die version		M..17
XKE004-001	die type code	die code		M..4
XKE085-001	die type	die type		M..35
XKE086-001	die type description	die desc		M..175
XKE140-001	die manufacturer	manufacturer		M..35
XKE141-001	die supplier	supplier		M..35
XKE142-001	die data source	data source		M..35
XKE143-001	packaged part name	packaged part		M..35
XKE010-001	die description	die desc		M..70
XKE127-001	die picture	die picture		M..35
XKE115-001	geometric units	geometric units		M..8
XKE144-001	geometric view	geometric view		M..8
XKE070-001	die step dimension x	D	m	NR2..3.3
XKE071-001	die step dimension y	E	m	NR2..3.3
XKE072-001	die thickness	A	m	NR2..3.3
XKE129-001	die centre x-position	X_0	m	NR2..3.3
XKE130-001	die centre y-position	Y_0	m	NR2..3.3
XKE018-001	number of bond sites	n_bond	1	NR1..2
XKE145-001	terminal count	n_term	1	NR1..4
XKE116-001	pad geometry count	n_g	1	NR1..4
XKE117-001	die size tolerance	S_tol	m	NR3..3.3ES2
XKE118-001	die thickness tolerance	T_tol	m	NR3..3.3ES2
XKE122-001	bump size	bump size		M..70
XKE146-001	bump height	h_b	m	NR3..3.3ES2
XKE147-001	bump height tolerance	h_b_tol	m	NR3..3.3ES2
XKE123-001	bumped height	A_1	m	NR2..3.3
XKE011-001	wafer size	wafer size	m	NR1..3
XKE005-001	substrate material	substrate		M..17
XKE148-001	bulk material	bulk material		M..17
XKE119-001	backside finish	backside finish		M..35
XKE149-001	maximum assembly temperature	assembly temp	Cel	NR2 S..3.3
XKE006-001	connection requirement code	conn req code		M..4
XKE091-001	connection requirement	conn req		M..35
XKE093-001	substrate connection desc	subst conn desc		M..175
XKE007-001	substrate connection	substr conn		M..17
XKE078-001	passivation material	passivation		M..35
XKE120-001	pad metallisation	pad metallisation		M..35
XKE124-001	bump material	bump material		M..35
XKE125-001	lead-frame material	lead material		M..35
XKE126-001	Underfill	underfill		M..70
XKE150-001	encapsulation material	encapsulation		M..70
XKE151-001	power limit	P_lim	W	NR3 S..3.3ES2
XKE012-001	termination number	terminal ID	1	NR1..4
XKE013-001	manufacturer pad identifier	manuf pad ID		M..17
XKE018-001	number of bond sites	bond sites	1	NR1..2
XKE014-001	pad geometry name	pad geom name		M..17
XKE015-001	pad x position	pad x	m	NR2 S..3.3

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XKE016-001	pad y position	pad y	m	NR2 S..3.3
XKE017-001	pad orientation	pad orientation		M..4
XKE081-001	die surface	die surface		A1
XKE024-001	pad shape	pad shape		A4
XKE025-001	pad length	b	m	NR2..3.3
XKE026-001	pad width	c	m	NR2..3.3
XKE121-001	pad diameter	$fb	m	NR2..3.3
XKE027-001	number of polygon vertices	n_v	1	NR1..2
XKE028-001	vertex number	v_p	1	NR1..2
XKE029-001	vertex x coordinate	x_v	m	NR2 S..3.3
XKE030-001	vertex y coordinate	y_v	m	NR2 S..3.3
XKE019-001	signal name	signal name		M..35
XKE020-001	signal type	signal type		M..8
XKE021-001	electrical reference	elect ref		M..17
XKE022-001	signal direction	I/O direction		A2
XKE023-001	swap codes	swap codes		M..17
XKE049-001	supply name	supply name		M..17
XKE032-001	supply voltage	V_sup	V	NR2 S..3.3
XKE054-001	supply current	I_sup	A	NR3 S..3.3ES2
XKE031-001	supply variability	variability		A3
XKE033-001	pad supply current	I_pad	A	NR3..3.3ES2
XKE082-001	test name	test name		M..35
XKE008-001	die test level code	test level		M..17
XKE060-001	test procedure description	test procedure		M..2000
XKE009-001	die yield	die yield	%	NR2..2.2
XKE131-001	defect rate	DPM	ppm	NR2..2.2
XKE095-001	die yield code	yield code		M1
XKE132-001	test flow code	test flow		X1
XKE133-001	temperature specification code	test temp		X1
XKE134-001	test screening code	screening		X1
XKE153-001	test reliability code	reliability		X1
XKE154-001	test maturity code	maturity		X1
XKE137-001	conformity level code	conformity		X1
XKE056-001	delivery form code	supply code		M..8
XKE055-001	delivery packing code	packing code		M..8
XKE087-001	delivery form	supply form		M..35
XKE088-001	delivery form description	supply form desc		M..175
XKE089-001	delivery packing	packing		M..35
XKE090-001	delivery packing description	packing desc		M..175
XKE155-001	MPD delivery form	MPD delivery		M..35
XKE156-001	fiducial name	fiducial name		M..17
XKE157-001	fiducial file name	fiducial file		M..35
XKE158-001	fiducial width	x_f		NR2 S..3.3
XKE159-001	fiducial height	y_f		NR2 S..3.3
XKE160-001	fiducial x position	fid x		NR2 S..3.3
XKE161-001	fiducial y position	fid y		NR2 S..3.3
XKE162-001	fiducial orientation	fid orient		M..4

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5.2 Die identification and source

XKE001-001 01 M..17 A52

die identifier die ID

A code based on the code as defined in EN 60191-4 to identify the die

NOTES
The code has the form A-XBCC-Dnn/mmm, where
A is a shape class code
X is a code for the encapsulation material
B is a terminal position code
CC is the body style code
D is the terminal shape code
nn is the number of terminations
mmm is a sequence number

IEC 60191-4 : 1999

XKE002-001 01 M..17 A52

die name die name

The name or identifier given to the die by the manufacturer

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XKE003-001 01 M..17 A52

die version die version

The code given by the manufacturer to identify the version of the die

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XKE004-001 01 M..4 A52

die type die type

Code of a geometry class containing geometric properties of die devices

BARE = bare die with pads on one side and without connection structure
BUMP = bare die with bumped pads
MPD = minimally packaged die device
DUAL = bare die with pads on both surfaces
LEAD = bare die with attached lead frame

REMARKS
The code relates to the physical form in which the die or wafer is supplied
If the die or wafer is in its original form, then the code is BARE or DUAL. Die with codes BUMP or LEAD have been post-processed to add the solder bumps or metal lead frame respectively.

XKE085-001 01 M..35 A52

die type die type

A short title for the physical form of a die or wafer

NOTES
This is a short title for the form described more fully in XKE086-001. The value list consists of the value meanings from XKE004-001.

XKE086-001 01 M..175 A52

die type description die desc

The description of the physical form of a die or wafer

XKE140-001 01 M..35 A21

die manufacturer manufacturer

The original manufacturer of the die device

XKE141-001 01 M..35 A21

die supplier supplier

The organisation that supplied the die device, where different from the original manufacturer

XKE142-001 01 M..35 A21

die data source data source

The organisation that supplied the data on the die device, where different from the original manufacturer

XKE143-001 01 M..35 A51

packaged part name packaged part

The manufacturer’s type number or part name for an packaged part equivalent to the die device

XKE010-001 01 M..70 A58

die description die desc

A description of the physical form of the die including information on interconnection structures and packaging where applicable

XKE127-001 01 M..35 A58

die picture die picture

Reference to a file or document containing a picture of the die which shows the positions of all pads