SLOVENSKI STANDARD

SIST EN 62258-2:2006

februar 2006

Polprevodniški izdelki – 2. del: Izmenjava podatkovnih formatov (IEC 62258-2:2005)

Semiconductor die products – Part 2: Exchange data formats (IEC 62258-2:2005)

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 62258-2:2006
https://standards.iteh.ai/catalog/standards/sist/e2460328-c9b5-480a-baa0-47ac57e2ea2a/sist-en-62258-2-2006

ICS 31.080.99; 31.200

Referenčna številka
SIST EN 62258-2:2006(en)

© Standard je založil in izdal Slovenski inštitut za standardizacijo. Razmnoževanje ali kopiranje celote ali delov tega dokumenta ni dovoljeno

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST EN 62258-2:2006
https://standards.iteh.ai/catalog/standards/sist/e2460328-c9b5-480a-baa0-47ac57e2ea2a/sist-en-62258-2-2006

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 62258-2

June 2005

ICS 31.080.99

Supersedes ES 59008-6-1:1999

English version

Semiconductor die products
Part 2: Exchange data formats
(IEC 62258-2:2005)

Produits de matrice de semi-conducteur
Partie 2: Formats de données d'échange
(CEI 62258-2:2005)

Halbleiter-Chip-Erzeugnisse
Teil 2: Datenaustausch-Formate
(IEC 62258-2:2005)

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST EN 62258-2:2006
https://standards.iteh.ai/catalog/standards/sist/e2460328-c9b5-480a-baa0-47ac57e2ea2a/sist-en-62258-2-2006

This European Standard was approved by CENELEC on 2005-06-01. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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

© 2005 CENELEC - All rights of exploitation in any form and by any means reserved worldwide for CENELEC members.

Ref. No. EN 62258-2:2005 E

Foreword

The text of document 47/1809/FDIS, future edition 1 of IEC 62258-2, prepared by IEC TC 47, Semiconductor devices, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 62258-2 on 2005-06-01.

This Part of EN 62258 should be read in conjunction with EN 62258-1.

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)	2006-03-01
– latest date by which the national standards conflicting with the EN have to be withdrawn	(dow)	2008-06-01

Annex ZA has been added by CENELEC.

Endorsement notice

iTeh STANDARD PREVIEW

The text of the International Standard IEC 62258-2:2005 was approved by CENELEC as a European Standard without any modification.

(standards.iteh.ai)
SIST EN 62258-2:2006
https://standards.iteh.ai/catalog/standards/sist/e2460328-c9b5-480a-baa0-47ac57e2ea2a/sist-en-62258-2-2006

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 Where an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

Publication	Year	Title	EN/HD	Year
IEC 62258-1	- [1]	Semiconductor die products Part 1: Requirements for procurement and use	EN 62258-1	- [1]
IEC 61360-1	2002	Standard data element types with associated classification scheme for electric components Part 1: Definitions - Principles and methods	EN 61360-1	2002
IEC 61360-2	2002	Part 2: EXPRESS dictionary schema	EN 61360-2	2002
IEC 61360-4	1997	Part 4: IEC reference collection of standard data element types, component classes and terms	EN 61360-4	1997
ISO 6093	1985	Information processing - Representation of numerical values in character strings for information interchange	-	-
ISO 8601	2004	Data elements and interchange formats - Information interchange - Representation of dates and times	-	-
ISO 10303-21	2002	Industrial automation systems and integration - Product data representation and exchange Part 21: Implementation methods: Clear text encoding of the exchange structure	-	-

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST EN 62258-2:2006
https://standards.iteh.ai/catalog/standards/sist/e2460328-c9b5-480a-baa0-47ac57e2ea2a/sist-en-62258-2-2006

[1] To be published.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 62258-2:2006
https://standards.iteh.ai/catalog/standards/sist/e2460328-c9b5-480a-baa0-47ac57e2ea2a/sist-en-62258-2-2006

INTERNATIONAL STANDARD

IEC 62258-2

First edition
2005-06

Semiconductor die products –

Part 2: Exchange data formats

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 62258-2:2006
https://standards.iteh.ai/catalog/standards/sist/e2460328-c9b5-480a-baa0-47ac57e2ea2a/sist-en-62258-2-2006

© IEC 2005 — Copyright - all rights reserved

No part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

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
International Electrotechnical Commission
Международная Электротехническая Комиссия

PRICE CODE XB

For price, see current catalogue

CONTENTS

FOREWORD 5

INTRODUCTION 7
1 Scope 8
2 Normative references 8
3 Terms and definitions 9
4 Requirements 9
5 Device Data eXchange format (DDX) file goals and usage 9
6 DDX file format and file format rules 10
7 DDX file content 10
7.1 DDX file content rules 10
7.2 DDX DEVICE block syntax 12
7.3 DDX data syntax 13
8 Definitions of DEVICE block parameters 14
8.1 BLOCK_CREATION_DATE Parameter 15
8.2 BLOCK_VERSION Parameter 15
8.3 VERSION Parameter 15
8.4 DEVICE_FORM Parameter 15
8.5 DEVICE_NAME Parameter 15
8.6 DIE_MASK_REVISION Parameter 16
8.7 MANUFACTURER Parameter 16
8.8 DIE_NAME Parameter 16
8.9 DIE_PACKAGED_PART_NAME Parameter 16
8.10 FUNCTION Parameter 16
8.11 DATA_SOURCE Parameter 17
8.12 DATA_VERSION Parameter 17
8.13 GEOMETRIC_UNITS Parameter 17
8.14 GEOMETRIC_VIEW Parameter 17
8.15 SIZE Parameter 18
8.16 THICKNESS Parameter 18
8.17 GEOMETRIC_ORIGIN Parameter 18
8.18 SIZE_TOLERANCE Parameter 20
8.19 THICKNESS_TOLERANCE Parameter 20
8.20 TERMINAL_COUNT Parameter 20
8.21 TERMINAL_TYPE_COUNT Parameter 21
8.22 CONNECTION_COUNT Parameter 21
8.23 TERMINAL_TYPE Parameter 21
8.24 TERMINAL Parameter 23
8.25 IC_TECHNOLOGY Parameter 26
8.26 DIE_SEMICONDUCTOR_MATERIAL Parameter 26
8.27 DIE_SUBSTRATE_MATERIAL Parameter 26
8.28 DIE_SUBSTRATE_CONNECTION Parameter 26
8.29 DIE_PASSIVATION_MATERIAL Parameter 27
8.30 DIE_TERMINAL_MATERIAL Parameter 27
8.31 DIE_BACK_DETAIL Parameter 28

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST EN 62258-2:2006
https://standards.iteh.ai/catalog/standards/sist/e2460328-c9b5-480a-baa0-47ac57e2ea2a/sist-en-62258-2-2006

8.32 WAFER_SIZE Parameter 28
8.33 MAX_TEMP Parameter 28
8.34 POWER_RANGE Parameter 28
8.35 TEMPERATURE_RANGE Parameter 28
8.36 Simulator MODEL FILE Parameter 29
8.37 Simulator MODEL FILE DATE Parameter 29
8.38 Simulator NAME Parameter 29
8.39 Simulator VERSION Parameter 29
8.40 Simulator COMPLIANCE Parameter 30
8.41 DIE_DELIVERY_FORM Parameter 30
8.42 PACKING_CODE Parameter 30
8.43 BUMP_MATERIAL Parameter 30
8.44 BUMP_HEIGHT Parameter 30
8.45 BUMP_HEIGHT_TOLERANCE Parameter 31
8.46 MPD_PACKAGE_MATERIAL Parameter 31
8.47 MPD_PACKAGE_STYLE Parameter 31
8.48 MPD_DELIVERY_FORM Parameter 31
8.49 MPD_CONNECTION_TYPE Parameter 32
8.50 MPD_CONNECTION_MATERIAL Parameter 32
8.51 FIDUCIAL_TYPE Parameter 32
8.52 FIDUCIAL Parameter 33
8.53 WAFER_DIE_STEP_SIZE Parameter 35
8.54 WAFER_GROSS_DIE_COUNT Parameter 35
8.55 WAFER_INDEX Parameter 35
8.56 WAFER_RETICULE_STEP_SIZE Parameter 35
8.57 WAFER_RETICULE_GROSS_DIE_COUNT Parameter 36
9 DDX EXPRESS model schema 36
9.1 Type definitions 36
9.2 File structure 40
9.3 Device names 40
9.4 Device block 40
9.5 Die size 41
9.6 Bare or bumped die type 42
9.7 Bare die type 42
9.8 Bumped bare die type 42
9.9 Lead-frame die type 43
9.10 Minimally packaged device 43
9.11 Die delivery forms 43
9.12 Terminal types 44
9.13 Rectangular terminal 44
9.14 Circular terminal 44
9.15 Elliptic terminal 44
9.16 Polygonal terminal 45
9.17 Terminals 45
9.18 Simulation data 46
9.19 Fiducial type 46
9.20 Fiducial 46
9.21 Die and feature size 47
9.22 Position 47

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST EN 62258-2:2006
https://standards.iteh.ai/catalog/standards/sist/e2460328-c9b5-480a-baa0-47ac57c2ca2a/sist-en-62258-2-2006

9.23 Orientation 47
9.24 Date 48
9.25 Substrate connection 48
9.26 Wafer index 48

Annex A (informative) Example of a DDX DEVICE block 49
Annex B (informative) Example of DDX data in STEP Physical FILE (SPF) format.................51
Annex C (informative) Typical CAD view from the DDX file block example given in Annex A 53
Annex D (informative) Properties for simulation 54
Annex E (informative) TERMINAL and TERMINAL_TYPE graphical usage for CAD/CAM systems 55
Annex F (informative) Cross-reference with IEC 61360-4 58
Annex G (informative) Notes on VERSION and NAME parameters.......................................60
Annex H (informative) Notes on WAFER parameters 61
Annex I (informative) additional notes 63
Annex J (informative) DDX version history...64

Bibliography 66

iTeh STANDARD PREVIEW
(standards.iteh.ai)

Figure 1 – Relationship between geometric centre and geometric origin...............................19
Figure C.1 – CAD representation of DDX example from Annex A 53
Figure E.1 – Highlighting the MX and MY orientation properties 56
Figure E.2 – Highlighting the angular rotational orientation properties 57
Figure H.1 – Illustrating the WAFER parameters..62

SIST EN 62258-2:2006
https://standards.iteh.ai/catalog/standards/sist/e2460328-c9b5-480a-baa0-47ac57e2ea2a/sist-en-62258-2-2006

Table 1 – Terminal shape types...22
Table 2 – Terminal shape coordinates 22
Table 3 – Terminal IO types 24
Table 4 – Substrate connection parameters...27
Table F.1 – Parameter list 58
Table J.1 – Parameter change history list 64

INTERNATIONAL ELECTROTECHNICAL COMMISSION

____

SEMICONDUCTOR DIE PRODUCTS –

Part 2: Exchange data formats

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.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST EN 62258-2:2006
https://standards.iteh.ai/catalog/standards/sist/e2460328-c9b5-480a-baa0-47ac57e2ea2a/sist-en-62258-2-2006

International Standard IEC 62258-2 has been prepared by IEC technical committee 47: Semiconductor devices.

The text of this standard is based on the following documents:

FDIS	Report on voting
47/1809/FDIS	47/1822/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This Part of IEC 62258 should be read in conjunction with IEC 62258-1.

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*

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 simulation

Part 6: Requirements for information concerning thermal simulation

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.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

SIST EN 62258-2:2006
https://standards.iteh.ai/catalog/standards/sist/e2460328-c9b5-480a-baa0-47ac57e2ea2a/sist-en-62258-2-2006

INTRODUCTION

This International Standard is based on the work carried out in the ESPRIT 4th Framework project GOOD-DIE which resulted in the publication of the ES 59008 series of European specifications. Organisations that helped prepare this standard included the ESPRIT GOOD-DIE and ENCAST projects, the Die Products Consortium, and JEITA.

iTeh STANDARD PREVIEW
(standards.iteh.ai)
SIST EN 62258-2:2006
https://standards.iteh.ai/catalog/standards/sist/e2460328-c9b5-480a-baa0-47ac57e2ea2a/sist-en-62258-2-2006

SEMICONDUCTOR DIE PRODUCTS –

Part 2: Exchange data formats

1 Scope

This part of IEC 62258 has been developed to facilitate the production, supply and use of semiconductor die products, including but not limited to

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

This standard specifies the data formats that may be used for the exchange of data covered by other parts in the IEC 62258 series as well as definitions of all parameters used according to the principles and methods of IEC 61360-1, IEC 61360-2 and IEC 61360-4. It introduces a Device Data Exchange (DDX) format, with the prime goal of facilitating the transfer of adequate geometric data between the die manufacturer and the CAD/CAE user and formal information models that allow data exchange in other formats such as STEP physical file format, fin accordance with ISO 10303-21 and XML. The data format has been kept intentionally flexible to permit usage beyond this initial scope.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

This standard reflects the DDX data format: version 1.2.1.

SIST EN 62258-2:2006
https://standards.iteh.ai/catalog/standards/sist/e2460328-c9b5-480a-baa0-47ac57e2ea2a/sist-en-62258-2-2006

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

IEC 61360-1:2002, *Standard data element types with associated classification scheme for electric components – Part 1: Definitions – Principles and methods*

IEC 61360-2:2002, *Standard data element types with associated classification scheme for electric components – Part 2: EXPRESS dictionary schema*

IEC 61360-4:1997, *Standard data element types with associated classification scheme for electric components – Part 4: IEC reference collection of standard data element types, component classes and terms*

ISO 6093:1985, *Information processing – Representation of numerical values in character strings for information interchange*

ISO 8601:2004, *Data elements and interchange formats – Information interchange – Representation of dates and times*

ISO 10303-21:2002, *Industrial automation systems and integration – Product data representation and exchange – Part 21: Implementation methods: Clear text encoding of the exchange structure*

---

[1] To be published.

3 Terms and definitions

For the purposes of this document, the definitions as given in IEC 62258-1 shall apply.

4 Requirements

Specific reference for Parameter Variables is made to the IEC 61360 Data Element Type (DET) codes, which are defined in Part 4 of IEC 61360-4.

5 Device Data eXchange format (DDX) file goals and usage

To facilitate the transferral of data by electronic media from the device vendor to the end-user for use within a CAD or CAE system, a data file format, **D**evice **D**ata e**X**change, (**DDX**), shall be used. This data file format has been deliberately kept flexible, to permit further enhancements and additions for future use.

It is strongly recommended that **D**evice **D**ata e**X**change files have the three letter **DDX** file extension, and a **D**evice **D**ata e**X**change file shall hereon be referred to as a **DDX** file.

5.1 Data that are to be transferred from a device vendor to a user shall be contained in a single computer-readable DDX file, and the minimum contents of this file shall suffice a geometric CAD/CAE software design system. The file shall be textually readable, to permit simple manual verification.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

5.2 The DDX file and its data contents shall be independent of both computer machine and operating system.

SIST EN 62258-2:2006
https://standards.iteh.ai/catalog/standards/sist/e2460328-c9b5-480a-baa0-47ac57e2ea2a/sist-en-62258-2-2006

5.3 The DDX file contents shall include mechanical and interconnectivity information, but may additionally include electrical and functional data.

5.4 The DDX file may contain data for one or more devices and shall be capable of being used as a library file by a CAD/CAE software design system. The file may contain one or more sets of data for the same device type, each having different delivery forms, such as bumped die, bare die, and Chip-Scale packaging.

5.5 The DDX file shall be capable of being simply or automatically generated, such as by an ASCII text editor or a spreadsheet.

5.6 The DDX file shall be capable of referencing additional external files, such as simulation and thermal model files.

5.7 All data shall be defined in such a way that conversion to or from other exchange formats is possible, such as GDSII and CIF for geometric data of die. As close a compatibility to the existing DIE (Die Information Exchange) data as possible is desired, to facilitate simple translation of partial DIE data files.

5.8 Definitions of parameters shall be in conformity with IEC 61360-1 (refer to Clause 5 of IEC 62258-1).