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# Application of ISO 26262:2011-2012 to semiconductors

Part 1: Application of concepts

**bsi.**

**National foreword**

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to semiconductors —**

**Part 1:  
Application of concepts**

*Application de l'ISO 26262:2011-2012 aux semi-conducteurs —  
Partie 1: Application des concepts*



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# Contents

Page

<b>Foreword</b> .....	<b>vi</b>
<b>Introduction</b> .....	<b>vii</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms and definitions</b> .....	<b>1</b>
<b>4 Symbols and abbreviated terms</b> .....	<b>2</b>
<b>5 Analogue/mixed signal components and ISO 26262</b> .....	<b>4</b>
5.1 About analogue and mixed signal components.....	4
5.2 Analogue and mixed signal components and failure modes.....	5
5.2.1 About failure modes.....	5
5.2.2 About safe faults.....	13
5.2.3 About transient faults.....	14
5.3 Notes about safety analysis.....	14
5.3.1 General.....	14
5.3.2 Level of granularity of analysis.....	14
5.3.3 Examples of usage of failure mode distribution.....	15
5.3.4 Example of failure rates estimation for an analogue part.....	16
5.3.5 Example of safety metrics computation.....	17
5.3.6 Dependent failures analysis.....	31
5.3.7 Verification of architectural metrics computation.....	31
5.4 Examples of safety mechanisms.....	32
5.4.1 Resistive pull up/down.....	33
5.4.2 Over and under voltage monitoring.....	33
5.4.3 Voltage clamp (limiter).....	34
5.4.4 Over-current monitoring.....	34
5.4.5 Current limiter.....	34
5.4.6 Power on reset.....	34
5.4.7 Analogue watchdog.....	34
5.4.8 Filter.....	35
5.4.9 Thermal monitor.....	35
5.4.10 Analogue Built-in Self-Test (Analogue BIST).....	35
5.4.11 ADC monitoring.....	35
5.4.12 AFE state transition detection.....	35
5.4.13 Stack on ADC channel detection.....	35
5.5 About avoidance of systematic faults during the development phase.....	36
5.6 About safety documentation.....	39
<b>6 Intellectual property and ISO 26262</b> .....	<b>39</b>
6.1 About intellectual property.....	39
6.1.1 Understanding intellectual property.....	39
6.1.2 Types of intellectual property.....	40
6.2 Safety requirements for intellectual property.....	41
6.3 Intellectual property lifecycle.....	43
6.3.1 ISO 26262 and the intellectual property lifecycle.....	43
6.3.2 Intellectual property as safety element out of context (SEooC).....	44
6.3.3 Intellectual property designed in context.....	45
6.3.4 Intellectual property use through hardware component qualification.....	45
6.3.5 Intellectual property use through proven in use argument.....	45
6.4 Work products for intellectual property.....	45
6.4.1 ISO 26262 and work products for intellectual property.....	45
6.4.2 Safety plan.....	45
6.4.3 Safety requirements and verification review of the IP design.....	46
6.4.4 Safety analysis report.....	46

6.4.5	Analysis of dependent failures.....	46
6.4.6	Confirmation measure reports.....	46
6.4.7	Development interface agreement.....	47
6.4.8	Integration documentation set.....	47
6.5	Integration of black-box intellectual property.....	48
<b>7</b>	<b>Multi-core components and ISO 26262.....</b>	<b>49</b>
7.1	Types of MC components.....	49
7.2	Implications of ISO 26262 on MC components.....	49
7.2.1	Introduction.....	49
7.2.2	ASIL decomposition in MC components.....	50
7.2.3	Coexistence of elements with different ASILs in MC components.....	52
7.2.4	Freedom from interference (FFI) in MC components.....	53
7.2.5	Software partitioning in MC components.....	54
7.2.6	Dependent failures in MC component.....	54
7.2.7	Timing requirements in MC component.....	54
<b>8</b>	<b>Programmable logic devices and ISO 26262.....</b>	<b>55</b>
8.1	About programmable logic devices.....	55
8.1.1	General.....	55
8.1.2	About PLD types.....	56
8.1.3	ISO 26262 Lifecycle mapping to PLD.....	56
8.2	Fault models and failure modes of PLD.....	59
8.3	Notes about safety analyses for PLDs.....	61
8.3.1	Quantitative analysis for a PLD.....	61
8.3.2	Dependent failure analysis for a PLD.....	65
8.4	Examples of safety mechanisms for PLD.....	67
8.5	Avoidance of systematic faults for PLD.....	68
8.5.1	Avoiding systematic faults in the implementation of PLD.....	68
8.5.2	About PLD supporting tools.....	68
8.5.3	Avoiding systematic faults for PLD users.....	68
8.6	Safety documentation for a PLD.....	70
8.7	Example of safety analysis for PLD.....	71
8.7.1	Architecture of the example.....	71
8.7.2	PLD external measures.....	72
8.7.3	PLD internal measures.....	73
<b>9</b>	<b>Base failure rate estimation and ISO 26262 (all parts).....</b>	<b>76</b>
9.1	About base failure rate estimation.....	76
9.1.1	Impact of failure mechanisms on base failure rate estimation.....	76
9.1.2	Considerations in base failure rate estimation for functional safety.....	77
9.1.3	Techniques for base failure rate estimation.....	78
9.1.4	Documentation on the assumptions for base failure rate calculation.....	78
9.2	(General) Clarifications on terms.....	78
9.2.1	Clarification of transient fault quantification.....	78
9.2.2	Clarification on component package failure rate.....	79
9.2.3	Clarification on power-up and power-down times.....	80
9.3	Permanent base failure rate calculation methods.....	80
9.3.1	Permanent base failure rate calculation using industry sources.....	80
9.3.2	Permanent base failure rate calculation using field data statistics.....	87
9.3.3	Calculation example of hardware component failure rate.....	89
9.3.4	Base failure rate calculation using accelerated life tests.....	92
9.3.5	Failure rate distribution methods.....	93
<b>10</b>	<b>Semiconductor dependent failure analysis and ISO 26262.....</b>	<b>94</b>
10.1	Introduction to DFA for semiconductors.....	94
10.2	Relationship between DFA and safety analysis.....	95
10.3	Dependent failure scenarios.....	95
10.4	Distinction between cascading failures and common cause failures.....	98
10.5	Dependent failure initiators.....	98

10.5.1	Dependent failure initiator list.....	98
10.5.2	Verification of mitigation measures.....	103
10.6	DFA workflow.....	104
10.6.1	DFA decision and identification of HW and SW elements (B1).....	104
10.6.2	Identification of DFI (B2).....	105
10.6.3	Sufficiency of insight provided by the available information on the effect of identified DFI (B3 and B4).....	105
10.6.4	Consolidation of list of relevant DFI (B5).....	105
10.6.5	Identification of necessary safety measures to control or mitigate DFI (B6).....	106
10.6.6	Sufficiency of insight provided by the available information on the defined mitigation measures (B7 and B8).....	106
10.6.7	Consolidate list of safety measures (B9).....	106
10.6.8	Evaluation of the effectiveness to control or to avoid the dependent failure (B10).....	106
10.6.9	Assessment of risk reduction sufficiency and if required improved defined measures (B11 and B12).....	107
10.7	Examples of dependent failure analysis.....	107
10.7.1	Microcontroller example.....	107
10.7.2	Analog example.....	113
<b>Bibliography</b> .....		<b>122</b>

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. [www.iso.org/directives](http://www.iso.org/directives)

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received. [www.iso.org/patents](http://www.iso.org/patents)

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT), see the following URL: [Foreword - Supplementary information](#)

The committee responsible for this document is ISO/TC 22, *Road vehicles*, Subcommittee SC 32, *Electrical and electronic components and general system aspects*.

ISO/PAS 19451 consists of the following parts, under the general title *Application of ISO 26262:2011-2012 to semiconductors*:

- *Part 1: Application of concepts*
- *Part 2: Application of hardware qualification*

## Introduction

This document is an informative guideline which provides users of the ISO 26262 series of standards recommendations and best practices which can be utilized when applying ISO 26262 to semiconductor components and parts. This document was created by a group of industry experts including semiconductor developers, system developers, and vehicle manufacturers in order to clarify concerns seen after the initial release of the ISO 26262 series of standards and when possible to align on common interpretations of the standard.

This document serves to augment the existing normative and informative guidance in the ISO 26262 series of standards. The approach is similar to that taken in writing ISO 26262-10:2012, Annex A, "ISO 26262 and microcontrollers," with extension to additional types of semiconductor technologies and relevant topics.

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# Application of ISO 26262:2011-2012 to semiconductors —

## Part 1: Application of concepts

### 1 Scope

This document is applicable to developers who are evaluating the use of semiconductor components or parts in hardware components, systems, or items developed according to ISO 26262.

### 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.

ISO 26262-1, *Road vehicles — Functional safety — Part 1: Vocabulary*

ISO 26262-2:2011, *Road vehicles — Functional safety — Part 2: Management of functional safety*

ISO 26262-9:2011, *Road vehicles — Functional safety — Part 9: Automotive Safety Integrity Level (ASIL)-oriented and safety-oriented analyses*

### 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 26262-1 and the following apply.

#### 3.1

##### **base failure rate**

##### **BFR**

failure rate of a hardware element in a given application use case used as an input to functional safety analysis according to ISO 26262-5:2011, 8.4.3

#### 3.2

##### **guest machine**

virtual instance of a *processing element* (3.7)

#### 3.3

##### **host machine**

*processing element* (3.7) which implements a *hypervisor* (3.4) and one or more *guest machines* (3.2)

#### 3.4

##### **hypervisor**

software or hardware that instantiates and manages one or more virtual design elements

Note 1 to entry: A hypervisor is sometimes referred to as a virtual machine monitor.

#### 3.5

##### **microkernel**

$\mu$ -kernel

software which provides the minimal mechanisms needed to implement an operating system