PD ISO/PAS 19451-2:2016

BSI Standards Publication

Application of ISO 26262:2011-2012 to semiconductors

Part 2: Application of hardware qualification

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National foreword

This Published Document is the UK implementation of ISO/PAS 19451-2:2016.

The UK participation in its preparation was entrusted to Technical Committee AUE/32, Electrical and electronic components and general system aspects (Road vehicles).

A list of organizations represented on this committee can be obtained on request to its secretary.

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ISBN 978 0 580 89825 9

ICS 43.040.10

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This Published Document was published under the authority of the Standards Policy and Strategy Committee on 31 July 2016.

Amendments issued since publication

Date	Text affected

PD ISO/PAS 19451-2:2016

PUBLICLY AVAILABLE SPECIFICATION

ISO/PAS 19451-2

First edition
2016-07-15

Application of ISO 26262:2011-2012 to semiconductors —

Part 2: Application of hardware qualification

Application de l'ISO 26262:2011-2012 aux semi-conducteurs —
Partie 2: Application de la qualification du matériel

Reference number
ISO/PAS 19451-2:2016(E)

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

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Foreword

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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

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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 *Road vehicles — 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.

Application of ISO 26262:2011-2012 to semiconductors —

Part 2:
Application of hardware qualification

1 Scope

This document is applicable to developers who are evaluating the use of hardware qualification for semiconductor elements according to ISO 26262-8:2011, Clause 13.

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 16750-1, *Road vehicles — Environmental conditions and testing for electrical and electronic equipment — Part 1: General*

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

ISO 26262-4, *Road vehicles — Functional safety — Part 4: Product development at the system level*

ISO 26262-5:2011, *Road vehicles — Functional safety — Part 5: Product development at the hardware level*

ISO 26262-8:2011, *Road vehicles — Functional safety — Part 8: Supporting processes*

3 Terms and definitions

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

4 Hardware qualification

Hardware qualification is a process in which it is determined if the hardware can fulfil the allocated requirements of a given design. There are multiple ways in which hardware qualification can be defined and applied. Unfortunately ISO 26262-1 does not include a formal definition of hardware qualification. Due to the variety of usages of the phrase “hardware qualification” there can be perceived ambiguity in ISO 26262-8:2011, Clause 13 dependent on the background of the reader.

Throughout the remainder of this document the phrase “hardware qualification” is used to reference “Qualification of Hardware Components” according to ISO 26262-8:2011, Clause 13. Activities used to qualify hardware for compliance to relevant automotive quality standards for safety related or non-safety related hardware components and parts are described as “standard qualification.”

5 How is “standard qualification” differentiated from ISO 26262 hardware qualification?

5.1 Standard qualification

ISO 26262-8:2011, Clause 13 does not specify a particular standard or set of standards which should be applied for standard qualification. Several examples are listed as understood to be relevant to current