



BSI Standards Publication

# Process management for avionics — Electronic components for aerospace, defence and high performance (ADHP) applications

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Part 1: General requirements for high reliability integrated circuits and discrete semiconductors

## National foreword

This Published Document is the UK implementation of IEC TS 62686-1:2020. It supersedes PD IEC/TS 62686-1:2015, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee GEL/107, Process management for avionics.

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

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Published by BSI Standards Limited 2020

ISBN 978 0 539 03739 5

ICS 03.100.50; 31.020; 49.060

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This Published Document was published under the authority of the Standards Policy and Strategy Committee on 30 April 2020.

### Amendments/corrigenda issued since publication

Date	Text affected
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# TECHNICAL SPECIFICATION

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**Process management for avionics – Electronic components for aerospace,  
defence and high performance (ADHP) applications –  
Part 1: General requirements for high reliability integrated circuits and discrete  
semiconductors**

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

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ICS 03.100.50; 31.020; 49.060

ISBN 978-2-8322-8011-9

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## INTERNATIONAL ELECTROTECHNICAL COMMISSION

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**PROCESS MANAGEMENT FOR AVIONICS –  
ELECTRONIC COMPONENTS FOR AEROSPACE, DEFENCE  
AND HIGH PERFORMANCE (ADHP) APPLICATIONS –****Part 1: General requirements for high reliability  
integrated circuits and discrete semiconductors**

## 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.
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- the required support cannot be obtained for the publication of an International Standard, despite repeated efforts, or
- the subject is still under technical development or where, for any other reason, there is the future but no immediate possibility of an agreement on an International Standard.

Technical Specifications are subject to review within three years of publication to decide whether they can be transformed into International Standards.

IEC TS 62686-1, which is a Technical Specification, has been prepared by IEC technical committee 107: Process management for avionics.

This third edition cancels and replaces the second edition, published in 2015. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to the previous edition:

- a) update related to obsolescence of STACK Specification S/0001 revision 14 notice 3;
- b) addition of alternative automotive methods of compliance and revision of Annex B initially related to cross-reference to STACK Specification S/0001;
- c) addition of an Annex C to include a requirement matrix for IEC TS 62686-1 verification.

The text of this Technical Specification is based on the following documents:

Draft TS	Report on voting
107/349/DTS	107/361A/RVDTS 107/361/RVDTS

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

This document has been drafted in accordance with the ISO/IEC Directives, Part 2.

A list of all parts in the IEC 62686 series, published under the general title *Process management for avionics – Electronic components for aerospace, defence and high performance (ADHP) applications*, can be found on the IEC website.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "<http://webstore.iec.ch>" in the data related to the specific publication. At this date, the publication will be

- transformed into an International standard,
- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

## INTRODUCTION

This part of IEC 62686 includes all the requirements of the now obsolete STACK Specification S/0001 revision 14 notice 3 and also contains revisions for alternative strategies using for example automotive standards together with the option of using various qualification test methods and additional test information.

This document complements IEC TS 62564-1 which is used for ADHP applications when additional manufacturers' data is required beyond the publicly available original component manufacturers' published data sheets (for example when additional thermal performance data is required for thermally challenging applications or when additional verification data is needed, for example to comply with the requirements of RTCA DO-254/EUROCAE ED-80 for complex components for flight critical applications, etc.).

This document can also be used to comply with the typical qualification requirements of IEC TS 62564-1. Further guidance is given in IEC 62239-1.

NOTE Existing STACK certified manufacturers can be audited by IECQ under the new STACK-IECQ joint venture or alternatively to the new IECQ automotive scheme.

# PROCESS MANAGEMENT FOR AVIONICS – ELECTRONIC COMPONENTS FOR AEROSPACE, DEFENCE AND HIGH PERFORMANCE (ADHP) APPLICATIONS –

## Part 1: General requirements for high reliability integrated circuits and discrete semiconductors

### 1 Scope

This part of IEC 62686, which is a Technical Specification, defines the minimum requirements for general purpose "off the shelf" COTS (commercial off-the-shelf) integrated circuits and discrete semiconductors for ADHP (aerospace, defence and high performance) applications.

This document applies to all components that can be operated in ADHP applications within the manufacturers' publicly available data sheet limits in conjunction with IEC 62239-1. It can be used by other high performance and high reliability industries, at their discretion.

ADHP application requirements are not necessarily fulfilled by this document alone. ADHP OEMs (original equipment manufacturers) might need to consider redesigning their products or conducting further testing to verify suitability in ADHP applications using their IEC 62239-1 ECMP procedures. Alternatively, a component in accordance with IEC TS 62564-1 can be more suitable.

NOTE Component qualification and outgoing quality discussed herein do not address component atmospheric radations SEE effects per IEC 62396-1.

### 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

*ANSI/EIA-556, Outer Shipping Container Bar Code Label Standard*

*ANSI/ESD S541, Packaging Materials Standards for ESD Sensitive Items*

*IPC/JEDEC J-STD-609, Marking and Labeling of Components, PCBs and PCBAs to Identify Lead (Pb), Lead-Free (Pb-Free) and Other Attributes*

*JEDEC/IPC/ECIA J-STD-048, Notification Standard for Product Discontinuance*

*JEP130, Guidelines for Packing and Labeling of Integrated Circuits in Unit Container Packing*

*JESD471, Symbol and Label for Electrostatic Sensitive Devices*

*J-STD-046, Customer Notification of Product/Process Changes by Solid-State Suppliers*