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BSI Standards Publication

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

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This Published Document is the UK implementation of IEC/TS 62686-1:2015.
It supersedes PD IEC/TS 62686-1:2012 which is now withdrawn.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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Part 1: General requirements for high reliability integrated circuits and discrete semiconductors

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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 second edition cancels and replaces the first edition, published in 2012. This edition constitutes a technical revision.

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

a) adoption and modification of STACK Specification S/0001 revision 14 notice 3, *General requirements for integrated circuits and discrete semiconductors*;

b) update of IEC semiconductor test methods;

c) update of JEDEC semiconductor test methods; including addition of JEP148A, based on the Physics of Failure Risk and Opportunity assessment;

d) update of Annex A with additional JEDEC and IEC test information;

e) revision of lead-free termination finish requirements.

The text of this technical specification is based on the following documents:

Enquiry draft	Report on voting
107/248/DTS	107/259/RVC

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

A list of all the 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.

A bilingual version of this publication may be issued at a later date.

INTRODUCTION

This part of IEC 62686 includes all the requirements of STACK Specification S/0001 revision 14 notice 3 and contains revisions for alternative IEC qualification test methods and additional test information.

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

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

NOTE With the adoption of the STACK Specification S/0001 revision 14 notice 3 it will be possible for all existing STACK certified manufacturers to be audited by IECQ under the new STACK-IECQ joint venture.

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

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

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 9001, *Quality management systems – Requirements*

ISO TS 16949, *Quality management systems – Particular requirements for the application of ISO 9001:2008 for automotive production and relevant service part organizations*

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

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

AS/EN/JISQ 9100, *Aerospace series – Quality management systems – Requirements for aviation, space and defense organisations*

IPC/JEDEC J-STD-020, *Moisture/Reflow Sensitivity Classification for Nonhermetic Solid State Surface Mount Devices*

IPC/JEDEC J-STD-033, *Handling, Packing, Shipping and Use of Moisture/Reflow Sensitive Surface Mount Devices*

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