

TECHNICAL SPECIFICATION

**Process management for avionics – Management plan –
Part 1: Preparation and maintenance of an electronic components management
plan**



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**Process management for avionics – Management plan –
Part 1: Preparation and maintenance of an electronic components management
plan**

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**PROCESS MANAGEMENT FOR AVIONICS –
MANAGEMENT PLAN –****Part 1: Preparation and maintenance of an
electronic components management plan**

FOREWORD

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The main task of IEC technical committees is to prepare International Standards. In exceptional circumstances, a technical committee may propose the publication of a technical specification when

- 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 62239-1, which is a technical specification, has been prepared by IEC Technical Committee 107: Process management for avionics.

This edition cancels and replaces IEC/TS 62239 published in 2008. This edition constitutes a technical revision.

This edition includes the following significant technical changes with respect to IEC/TS 62239:2008:

- a) Scope – Added DO-254 for clarification
- b) Normative references – Added additional references
- c) Terms, definitions and abbreviations – Clarified some definitions
- d) 4 Technical requirements – Added clarification related to managing ECMP at subcontractor
- e) 4.2 Component selection – Clarified temperature range requirements
- f) 4.3.3 De-rating and stress analysis – Added information relative to part wear out
- g) 4.3.8 Management of lead free termination finish and soldering – Added requirement
- h) 4.3.9 Counterfeit, fraudulent and recycled component avoidance – Added requirement
- i) 4.4.5 Demonstration of component qualification – Clarified documentation required
- j) 4.4.5.3.4 Equipment manufacturer validation – Added additional requirements
- k) 4.4.7 Distributor process management approval – Added additional requirements
- l) 4.5.2. On-going component quality assurance – Changed title to clarify purpose and changed STACK 0001 reference to IEC/PAS 62686-1
- m) 4.6.5 Reporting – Added requirement to periodically report status of obsolescence program to customer
- n) 4.6.7 Semiconductor reliability and wear out – Added requirement to address semiconductor wear out
- o) Annex A: Typical Qualification Requirements – Added requirement for minimum part qualification
- p) Annex B Semiconductor reliability and wear out – Added annex B to provide information about wear out

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

Enquiry draft	Report on voting
107/161/DTS	107/179/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/TS 62239 series under the general title *Process management for avionics – Management plan*, 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 web site 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 Technical Specification provides the structure for aerospace equipment manufacturers, subcontractors, maintenance facilities, and other aerospace component users to develop their own Electronic Component Management Plans (ECMPs), hereinafter also referred to as 'plan'. This Technical Specification states objectives to be accomplished; it does not require specific tasks to be performed, specific data to be collected or reports to be issued. Those who prepare plans in compliance with this Technical Specification will document processes that are the most effective and efficient for them in accomplishing the objectives of this Technical Specification. In order to allow flexibility in implementing and updating the documented processes, plan authors are encouraged to refer to their own internal process documents instead of including detailed process documentation within their plans.

Subcontractors or test houses will be assessed by the plan owner on the relevant parts of 4.1 to 4.9 as agreed with the plan owner

This component management Technical Specification is intended for aerospace users of electronic components. This Technical Specification is not intended for use by the manufacturers of electronic components. Components selected and managed according to the requirements of a plan compliant to this Technical Specification may be approved by the concerned parties for the proposed application, and for other applications with equal or less severe requirements.

Organizations that prepare such plans may prepare a single plan, and use it for all relevant products supplied by the organization, or may prepare a separate plan for each relevant product or customer.

PROCESS MANAGEMENT FOR AVIONICS – MANAGEMENT PLAN –

Part 1: Preparation and maintenance of an electronic components management plan

1 Scope

This part of the IEC/TS 62239 series defines the requirements for developing an Electronic Components Management Plan (ECMP) to assure customers and regulatory agencies that all of the electronic components in the equipment of the plan owner are selected and applied in controlled processes compatible with the end application and that the technical requirements detailed in Clause 4 are accomplished. In general, the owners of a complete electronic components management plan are avionics equipment manufacturers. This part of the IEC/TS 62239 series provides the minimum requirements for system development assurance levels according to levels A, B and C of the DO-254 A, B and C for flight equipment.

Although developed for the avionics industry, this process may be applied by other industrial sectors.

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.

IEC 61340-5-1, *Electrostatics – Part 5-1: Protection of electronic devices from electrostatic phenomena – General requirements*

IEC/TR 61340-5-2, *Electrostatics – Part 5-2: Protection of electronic devices from electrostatic phenomena – User guide*

IEC/TR 62240, *Process management for avionics – Use of semiconductor devices outside manufacturers' specified temperature range*

IEC 62396-1, *Process management for avionics – Atmospheric radiation effects – Part 1: Accommodation of atmospheric radiation effects via single event effects within avionics electronic equipment*

IEC/TS 62396-2, *Process management for avionics – Atmospheric radiation effects – Part 2: Guidelines for single event effects testing for avionics systems*

IEC/TS 62396-3, *Process management for avionics – Atmospheric radiation effects – Part 3: Optimising system design to accommodate the single event effects (SEE) of atmospheric radiation*

IEC/TS 62396-4, *Process management for avionics – Atmospheric radiation effects – Part 4: Guidelines for designing with high voltage aircraft electronics and potential single event effects*

IEC/TS 62396-5, *Process management for avionics – Atmospheric radiation effects – Part 5: Guidelines for assessing thermal neutron fluxes and effects in avionics systems*

IEC 62402, *Obsolescence management – Application guide*

IEC/TS 62564-1, *Process management for avionics Aerospace qualified electronic components (AQEC) – Part 1: Integrated circuits and discrete semiconductors*

IEC/PAS 62647-1, *Process management for avionics – Aerospace and defence electronic systems containing lead-free solder – Part 1: Lead-free management*

IEC/TS 62647-11, *Process management for avionics – Aerospace and defence electronic systems containing lead-free solder – Part 1: Preparation for a lead-free control plan*

IEC/PAS 62647-2, *Process management for avionics – Aerospace and defence electronic systems containing lead-free solder – Part 2: Mitigation of the deleterious effects of tin*

IEC/TS 62647-22, *Process management for avionics – Aerospace and defence electronic systems containing lead-free solder – Part 2: Mitigation of the deleterious effects of tin*

IEC/TS 62668-1, *Process management for avionics – Counterfeit prevention – Part 1: Avoiding the use of counterfeit, fraudulent and recycled electronic components*

IEC/PAS 62686-1, *Process management for avionics – Aerospace qualified electronic components (AQEC) – Part 1: General requirements for high reliability integrated circuits and discrete semiconductors*

IEC/TS 62686-13, *Process management for avionics – Aerospace qualified electronic components (AQEC) – Part 1: General requirements for high reliability integrated circuits and discrete semiconductors*

ISO 9000:2005, *Quality management systems – Fundamentals and vocabulary*

JEP 149:2004, JEDEC Standard, *Application Thermal Derating Methodologies*

JESD 47, JEDEC Standard, *Stress – Test-driven qualification of integrated circuits*

JESD 94.01, JEDEC Standard, *Application Specific Qualification Using Knowledge Based Test Methodology*

MIL-HDBK-263, Revision B, *Electrostatic Discharge Control Handbook*

AEC-Q100, *Failure Mechanism based Stress Test Qualification for Integrated Circuits*

AEC-Q101, *Stress Test Qualification for Automotive Grade Discrete Semiconductors*

AEC-Q200, *Stress Test Qualification for Passive components*

SAE AS5553, *Counterfeit Electronic Parts, Avoidance, Detection, Mitigation, and Disposition*

ANSI/GEIA-STD-0002-1, *Aerospace Qualified Electronic Component (AQEC) Volume 1 – Integrated Circuits and Semiconductors*

¹ To be published. This will supersede the PAS document.

² To be published. This will supersede the PAS document.

³ To be published. This will supersede the PAS document.

ANSI/GEIA-STD-0005-1, *Performance Standard for Aerospace and Military Electronic Systems Containing Lead-Free Solder*

ANSI/GEIA-STD-0005-2, *Standard for Mitigating the Effects of Tin Whiskers in Aerospace and High Performance Electronic Systems*

GIFAS/5052/2008, *Guide for managing electronic component sourcing through non franchised distributors. Preventing fraud and counterfeiting*

AS/EN/JISQ 9100 *Quality Management Systems-Requirements for Aviation Space and Defense Organizations*

IPC/JEDEC J-STD-20, *Moisture/Reflow Sensitivity Classifications*

3 Terms, definitions and abbreviations

For the purposes of this document, the following terms, definitions and abbreviations apply.

In their plan, plan owners may use alternative definitions consistent with convention in their company.

3.1 Terms and definitions

3.1.1

environment

applicable environmental conditions (as described per the equipment specification) that the equipment is able to withstand without loss or degradation in equipment performance throughout its manufacturing cycle and maintenance life (the length of which is defined by the equipment manufacturer in conjunction with customers)

3.1.2

purchased

bought outside the plan owner organization, from an independent supplier

Note 1 to entry: This indicates that the plan owner does not manufacture this in-house

3.1.3

capable

capacity of a component to be used successfully in the intended application

3.1.4

certified

assessed and compliant to an applicable 3rd party

3.1.5

characterization

process of testing a sample of components to determine the key electrical parameter values that can be expected of all produced components of the type tested

3.1.6

component application

domain of use where the component meets the design requirements

3.1.7

component manufacturer

organization responsible for the component specification and its production