



TECHNICAL SPECIFICATION

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

INTERNATIONAL
ELECTROTECHNICAL
COMMISSION

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CONTENTS

FOREWORD.....	4
INTRODUCTION.....	7
1 Scope.....	8
2 Normative references	8
3 Terms, definitions and abbreviations	10
3.1 Terms and definitions	10
3.2 Abbreviations	14
4 Technical requirements	14
4.1 General	14
4.2 Component selection	15
4.3 Component application	16
4.3.1 General	16
4.3.2 Electromagnetic compatibility (EMC)	16
4.3.3 Derating and stress analysis	17
4.3.4 Thermal analysis	17
4.3.5 Mechanical analysis	18
4.3.6 Testing, testability, and maintainability	18
4.3.7 Avionics radiation environment	18
4.3.8 Management of lead-free termination finish and soldering	18
4.3.9 Counterfeit, fraudulent and recycled component avoidance	19
4.4 Component qualification	19
4.4.1 General	19
4.4.2 General component qualification requirements	19
4.4.3 Component manufacturer quality management	19
4.4.4 Component manufacturer process management approval	19
4.4.5 Demonstration of component qualification	20
4.4.6 Qualification of components from a supplier that is not qualified	21
4.4.7 Distributor process management approval	21
4.4.8 Subcontractor assembly facility quality and process management approval	22
4.5 Continuous component quality assurance.....	22
4.5.1 General quality assurance requirements	22
4.5.2 On-going component quality assurance	22
4.5.3 Plan owner in-house continuous monitoring	23
4.5.4 Component design and manufacturing process change monitoring	23
4.6 Component availability and associated risk assessment	23
4.6.1 General	23
4.6.2 Component obsolescence.....	24
4.6.3 Pro-active measures.....	24
4.6.4 Component obsolescence awareness	25
4.6.5 Reporting.....	25
4.6.6 Component dependability	25
4.6.7 Semiconductor reliability and wear out.....	25
4.6.8 Reliability assessment	25
4.7 Component compatibility with the equipment manufacturing process	26

4.8	Component data	26
4.9	Configuration control	27
4.9.1	General	27
4.9.2	Alternative sources	27
4.9.3	Equipment change documentation	27
4.9.4	Customer notifications and approvals	28
4.9.5	Focal organisation	28
5	Plan administration requirements	28
5.1	Using components outside the manufacturer's specified temperature range	28
5.2	Plan organization	28
5.3	Plan terms and definitions	29
5.4	Plan focal point	29
5.5	Plan references	29
5.6	Plan applicability	29
5.7	Plan implementation	29
5.8	Plan acceptance	29
5.9	Plan maintenance	29
Annex A (informative) Typical qualification requirements, typical component minimum qualification requirements		30
Annex B (informative) Semiconductor reliability and wear out		34
Annex C (informative) Guidelines for environmental protection techniques, and for comparison of components specifications		35
Bibliography		50
Table A.1 – Typical qualification requirements, typical component minimum qualification requirements		31
Table C.1 – Environmental protection techniques to be considered during the avionics design process		35
Table C.2 – Guidelines for the comparison of internationally available component specifications – Microcircuits		40

INTERNATIONAL ELECTROTECHNICAL COMMISSION

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

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 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*