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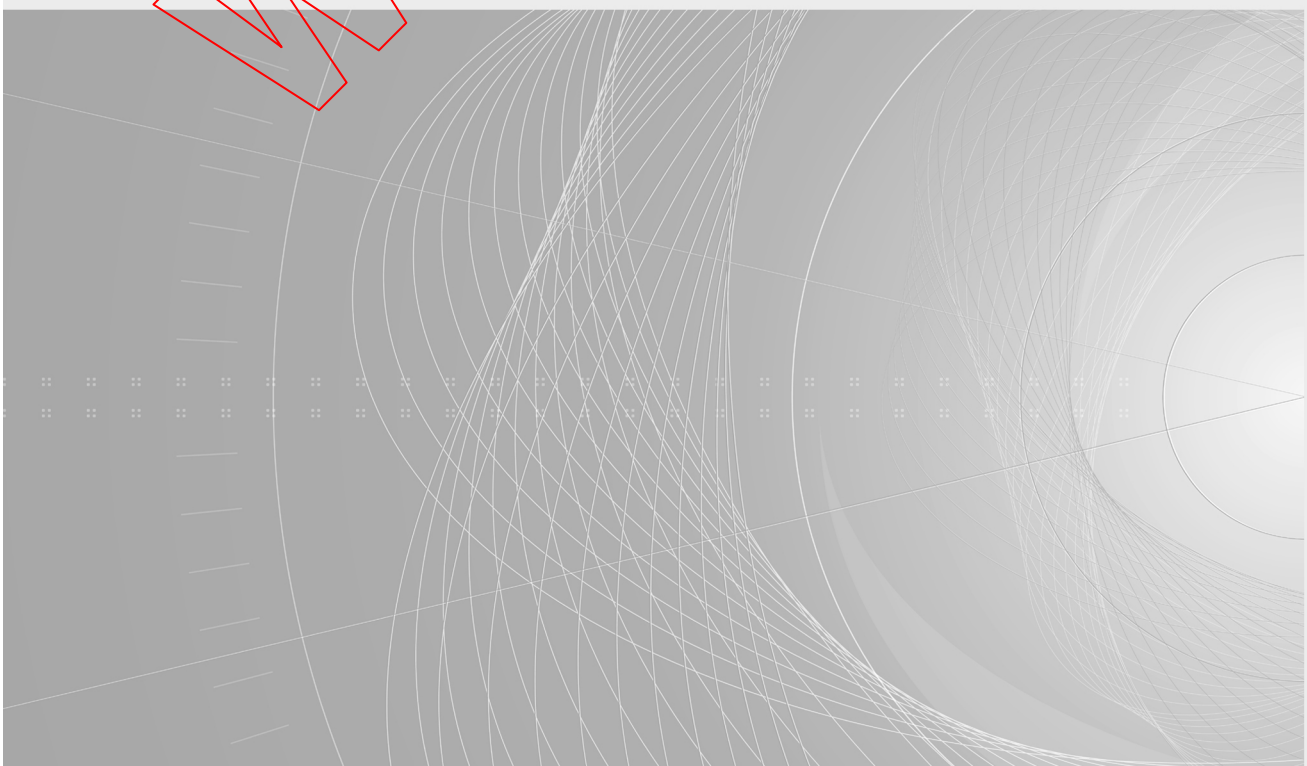
Edition 2.0 2008-10

TECHNICAL SPECIFICATION

Process management for avionics – Preparation of an electronic components management plan



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INTERNATIONAL ELECTROTECHNICAL COMMISSION

PROCESS MANAGEMENT FOR AVIONICS –

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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 62239, 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 2003. This edition constitutes a technical revision.

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

1) 4.2.2 – Derating and stress analysis, addition of JEP149.
2) 4.2.3 – Derating and stress analysis, thermal analysis allowed using provisions of JEP149.
3) 4.3.4.2.1 – Component manufacturing technology qualification data, added JESD47, JESD94, AEC-Q100, AEC-Q101, and AEC-Q200.
4) 4.3.4.2.1.1- Added avionics qualified electronic component program.
5) 4.5 – Component dependability, added integrated circuit wear out criteria from JESD47.
6) 4.8 – Configuration control, added counterfeit parts requirement.

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

Enquiry draft	Report on voting
107/60/DTS	107/78A/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.

The committee has decided that the contents of this publication will remain unchanged until the maintenance result 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 technical specification may be issued at a later date.

INTRODUCTION

This Technical Specification is intended to help aerospace equipment manufacturers, subcontractors, maintenance facilities, and other aerospace component users 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 are encouraged to 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.

This component management Technical Specification is intended for aerospace users of electronic components. This standard 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.

NOTE Verification of compliance with IEC/TS 62239 will be done in accordance with IECQ documentation listed in the bibliography.

PROCESS MANAGEMENT FOR AVIONICS –

Preparation of an electronic components management plan

1 Scope

This Technical Specification 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.

2 Normative references

The following referenced documents are indispensable for the application 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.

IEC 61340-5-1:2007, *Electrostatics – Part 5-1: Protection of electronic devices from electrostatic phenomena – General requirements*

IEC/TR 61340-5-2:2007, *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/TS 62396 (all parts), *Process management for avionics – Atmospheric radiation effects*

IEC 62402:2007, *Obsolescence management – Application guide*

JEP149 (Nov 2004), *JEDEC Publication, JEDEC Standard Application Thermal Derating Methodologies*

JESD47, *JEDEC Standard, Stress – Test-Driven Qualification of integrated circuits*

JESD94.01, *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*

3 Terms, definitions and abbreviations

3.1 Terms and definitions

For the purposes of this document, the following definitions apply.

NOTE Plan owners may use alternative definitions consistent with convention within their company in their plan.

3.1.1
avionics equipment environment
applicable environmental conditions (as described per the equipment specification) that the equipment shall be 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
capable
term used to indicate that a component can be used successfully in the intended application

3.1.3
certified
indicates assessment and compliance to an applicable third party standard and maintenance of a certificate and registration (i.e. JAN, IECQ)

3.1.4
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

3.1.5
component application
process that assures that the component meets the design requirements of the equipment in which it is used

3.1.6
component manufacturer
organization responsible for the component specification and its production

3.1.7
component obsolescence management
range of management actions taken to avoid or resolve the effects of components not being procurable due to the manufacturer(s) ceasing production. Component obsolescence management should be considered an element of component dependability

3.1.8
component qualification
process used to demonstrate that the component is capable of meeting its specification for all the required conditions and environments

3.1.9
component quality assurance
all activities and processes to provide adequate confidence that each individual component meets the performance and environmental requirements

3.1.10
component selection
process of choosing a specific component for a specific application

3.1.11
component standardization
process of developing and agreeing on (by consensus of decision) uniform engineering criteria for products and methods for achieving compatibility, interoperability, interchangeability, or commonality of material

NOTE Standardization is used to reduce proliferation of parts into inventory.

3.1.12
dependability
capability of a product enabling it to achieve the specified functional performance at the appropriate time and for the planned duration, without damage to itself or its environment

NOTE Dependability is generally characterised by the following four parameters: reliability, maintainability, availability, safety.

3.1.13
distributor
organization contractually authorized by a manufacturer to store, split, repack and distribute completely finished components which have been declared by the manufacturer as conforming to their specifications. The distributor is responsible for providing any technical information and traceability information supplied by the component manufacturer

3.1.14
Electronic Components Management Plan
ECMP
equipment manufacturer's document that defines the processes and practices for applying components to an equipment or range of equipment. Generally, it addresses all relevant aspects of controlling components during system design, development, production, and post-production support

3.1.15
electronic components
electrical or electronic devices that are not subject to disassembly without destruction or impairment of design use. They are sometimes called electronic parts, or piece parts

EXAMPLES Resistors, capacitors, diodes, integrated circuits, hybrids, application specific integrated circuits, wound components and relays.

3.1.16
component source facility
this is a subcontractor to an OEM that procures and supplies the components in accordance with the requirements of IEC/TS 62239

3.1.17
electronic equipment
item produced by the plan owner, which incorporates electronic components

EXAMPLES End items, sub-assemblies, line-replaceable units and shop-replaceable units.

3.1.18
may
Indicates a course of action which is permissible within the limits of this Technical Specification

3.1.19
obsolete component
component which is no longer manufactured, and may or may not still be available