

This is a preview - click here to buy the full publication



IEC/TS 62239

Edition 2.0 2008-10

# TECHNICAL SPECIFICATION

---

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

INTERNATIONAL  
ELECTROTECHNICAL  
COMMISSION

PRICE CODE

T

---

ICS 03.100.50; 31.020; 49.060

ISBN 978-2-88910-651-6

## CONTENTS

FOREWORD.....	4
INTRODUCTION.....	6
1 Scope.....	7
2 Normative references.....	7
3 Terms, definitions and abbreviations.....	8
3.1 Terms and definitions.....	8
3.2 Abbreviations.....	11
4 Technical requirements.....	11
4.1 Component selection.....	12
4.2 Component application.....	12
4.2.1 Electromagnetic compatibility (EMC).....	13
4.2.2 De-rating and stress analysis.....	13
4.2.3 Thermal analysis.....	13
4.2.4 Mechanical analysis.....	13
4.2.5 Testing, testability, and maintainability.....	14
4.2.6 Avionics radiation environment.....	14
4.3 Component qualification.....	14
4.3.1 General component qualification requirements.....	14
4.3.2 Component manufacturer quality management.....	14
4.3.3 Component manufacturer process management approval.....	14
4.3.4 Demonstration of component qualification.....	15
4.3.5 Qualification of components from a supplier that is not qualified.....	16
4.3.6 Distributor quality and process management approval.....	16
4.4 Continuous component quality assurance.....	16
4.4.1 General quality assurance requirements.....	16
4.4.2 On-going component quality assurance.....	17
4.4.3 Plan owner in-house continuous monitoring.....	17
4.4.4 Component design and manufacturing process change monitoring.....	17
4.5 Component dependability.....	18
4.5.1 Reliability assessment.....	18
4.5.2 Component availability and associated risk assessment.....	18
4.5.3 Component obsolescence.....	19
4.6 Component compatibility with the equipment manufacturing process.....	20
4.7 Component data.....	20
4.8 Configuration control.....	21
4.8.1 Alternative sources.....	21
4.8.2 Equipment change documentation.....	21
4.8.3 Customer notifications and approvals.....	22
4.8.4 Focal organisation.....	22
5 Plan administration requirements.....	22
5.1 Using components outside the manufacturer's specified temperature range.....	22
5.2 Plan organization.....	22
5.3 Plan terms and definitions.....	23
5.4 Plan focal point.....	23
5.5 Plan references.....	23
5.6 Plan applicability.....	23

5.7 Plan implementation.....	23
5.8 Plan acceptance.....	23
Bibliography.....	24

## INTERNATIONAL ELECTROTECHNICAL COMMISSION

---

### PROCESS MANAGEMENT FOR AVIONICS –

#### Preparation 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.
- 2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
- 3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
- 4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
- 5) IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with an IEC Publication.
- 6) All users should ensure that they have the latest edition of this publication.
- 7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
- 8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
- 9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

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, 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*