Edition 4.0 2026-06

TECHNICAL SPECIFICATION

Process management for avionics - Aerospace qualified electronic components (AQEC) -
Part 1: Integrated circuits and discrete semiconductors

ICS 03.100.50; 31.020; 49.060

ISBN 978-2-8327-1272-6

IEC TS 62564-1:2026-06(en)

Process management for avionics - Aerospace qualified electronic components (AQEC) - Part 1: Integrated circuits and discrete semiconductors

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 itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
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) IEC draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). IEC takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, IEC had not received notice of (a) patent(s), which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at https://patents.iec.ch. IEC shall not be held responsible for identifying any or all such patent rights.

IEC TS 62564-1, which is a technical specification, has been prepared by IEC technical committee 107: Process management for avionics. It is a Technical Specification.

This fourth edition cancels and replaces the third edition published in 2016. This edition constitutes a technical revision.

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

a) addition of optional ADHP PPAP;
b) revision to Annex B; addition of Annex C and Annex D;
c) removal of STACK;
d) general update to referenced standards throughout.

Requirements, Volume 1 - Integrated Circuits and Semiconductors, has served as a basis for the elaboration of the first edition (2009) of this technical specification.

The text of this Technical Specification is based on the following documents:

Draft	Report on voting
107/442/DTS	107/443/RVDTS

Full information on the voting for its approval can be found in the report on voting indicated in the above table.

The language used for the development of this Technical Specification is English.

This document was drafted in accordance with ISO/IEC Directives, Part 2, and developed in accordance with ISO/IEC Directives, Part 1 and ISO/IEC Directives, IEC Supplement, available at www.iec.ch/members_experts/refdocs. The main document types developed by IEC are described in greater detail at www.iec.ch/publications.

A list of all parts in the IEC 62564 series, under the general title *Process management for avionics - Aerospace qualified electronic components (AQEC)*, can be found on the IEC website.

The committee has decided that the contents of this document will remain unchanged until the stability date indicated on the IEC website under webstore.iec.ch in the data related to the specific document. At this date, the document will be

– reconfirmed,
– withdrawn, or
– revised.

Aerospace qualified electronic components (AQEC) plans are developed by manufacturers in order to document compliance with AQEC requirements for aerospace, defence and high performance (ADHP) users. For AQEC designated components, the intention is to

a) provide AQEC users access to information and data from the AQEC manufacturers that is necessary for using commercial-off-the-shelf (COTS) products, particularly in the context of aerospace certification process where complex electronic components are involved;

b) better enable AQEC users to assess whether these parts are capable of operating reliably in their applications;

c) minimize deviations from the AQEC manufacturers' COTS electronic components;

d) have minimal impact on the AQEC manufacturers' standard operating or business procedures;

e) promote communication between the AQEC manufacturers and users.

This document only addresses integrated circuits and discrete semiconductors manufactured using silicon based technology and excludes silicon carbide and gallium nitride technologies.

This part of IEC 62564, which is a Technical Specification, defines the minimum requirements for integrated circuits and semiconductors which are designated as an "aerospace qualified electronic component (AQEC)". It applies to integrated circuits and semiconductors exhibiting the following attributes:

a) a minimum set of responses to requirements, information and data including physical hardware data, provided by the part manufacturer, which will allow a standard COTS electronic component to be designated AQEC by the manufacturer;

b) as a minimum, each COTS electronic component (designated AQEC) will have been designed, fabricated, assembled, and tested in accordance with the component manufacturer's requirements for standard data book components with additional enhancements as considered appropriate;

c) qualification of, and quality systems for, the COTS electronic components to be designated as AQEC will include the manufacturer's standards, operating procedures, and technical specifications. This information will be available when requested;

d) electronic components manufactured before the manufacturer has addressed AQEC requirements, but utilizing the same processes, are also considered AQEC compliant, providing sufficient data is made available;

e) additional desired attributes of a device designated AQEC (that will support AQEC users) are found in Annex B of this document.

This document contributes by the above attributes to the aerospace certification process which include particularly complex COTS electronic components.

NOTE 1 Parts qualified to military specifications such as JAN, JANTX, JANTXV transistors and diodes, MIL-PRF-38535 or MIL-PRF-5962-XX microcircuits, CECC (CENELEC Electronics Component Committee) specified components, etc. (except those identified as being for "logistic support" purposes only) are considered AQEC; the remainder of this document only addresses non-military specification parts.

NOTE 2 Adding a TX to JAN prefix means that the part was not only made to MIL-PRF-19500 but it was also tested to Mil spec. Adding a V to the TX means that the part was verified during testing before the package was completed.

NOTE 3 Electronic components classified by original component manufacturers (OCMs) as being 'enhanced' components only become AQEC components when they meet the requirements of this document.

Parts qualified to AEC-Q100, grade 0, AEC-Q100 grade 1, and AEC-Q100 grade 2 according to the standard qualification test plan according to Table 2 of AEC-Q100:2023 are considered candidates for AQEC providing they meet the requirements of this document. Parts qualified to AEC-Q100 for a specific mission profile require analysis to determine suitability for AQEC selection. The users should document that the grade category used is compatible with the application in accordance with their IEC 62239-1 electronic components management plan (ECMP).

Although developed for the avionics industry, this document can be applied by other industrial sectors at their discretion.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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 62239-1, *Process management for avionics - Management plan - Part 1: Preparation and maintenance of an electronic components management plan*

J-STD-048, *Notification Standard for Product Discontinuance*

IEC 60812, *Failure modes and effects analysis (FMEA and FMECA)*

IEC 61508-1, *Functional safety of electrical/electronic/programmable electronic safety-related systems - Part 1: General requirements (see Functional Safety and IEC 61508)*

IEC TR 62240-2, *Process Management For Avionics - Electronic Components Capability In Operation - Part 2: Semiconductor Microcircuit Lifetime*

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 62686-1, *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*

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

IEC 63287-1, *Semiconductor devices - Generic semiconductor qualification guidelines - Part 1: Guidelines for IC reliability qualification*

IEC 63287-2, *Semiconductor devices - Guidelines for reliability qualification plans - Part 2: Concept of mission profile*

ISO 9001, *Quality management systems - Requirements*

ISO 26262, *Road vehicles - Functional safety*

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

AEC-Q100:2023, *Failure Mechanisms Based Stress Qualification For Integrated Circuits*

AEC-Q101, *Failure Mechanism Based Stress Test Qualification For Discrete Semiconductors*

AS/EN/JISQ 9100, *Quality management systems - Requirements for Aviation, Space and Defense Organizations*

DSIAC (formerly RIAC), *Physics of Failure Based Handbook of Microelectronics Systems (webpage:* Physics of Failure Based Handbook of Microelectronic Systems | Request PDF*)*

IPC-1066, *Marking, Symbols and Labels for Identification of Lead-Free and Other Reportable Materials in Lead-Free Assemblies, Components and Devices*

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

JEDEC JIG101, *Material composition declaration for electronic products.*

JEITA ETR-7021, *Guidance for the Lead-Free Marking of Materials, Components and Mounted Boards used in Electronic and Electric Equipment*

JESD47, *Stress-test-driven qualification of integrated circuits*

JESD91, *Method for developing acceleration models for electronic component failure mechanisms*

JESD94, *Application specific qualification using knowledge based test methodology*

JESD97, *Marking, symbols, and labels for identification of lead (Pb) free assemblies, components, and devices*

JEP122, *Failure mechanisms and models for semiconductor devices*

JEP149, *Application thermal derating methodologies*

JP001, *Foundry process Qualification Guidelines (Wafer Fabrication Manufacturing Sites)*

MIL-PRF-19500, *Semiconductor Devices, General Specification for*

MIL-PRF 38535, *Integrated Circuits (Microcircuits) Manufacturing, General Specification for*

SAE ARP5890, *Guidelines for Preparing Reliability Assessment Plans for Electronic Engine Controls*

SAE ARP 6379, *Processes for Application Specific Qualification of electrical, Electronic and Electromechanical Parts and Sub-Assemblies for Use in Aerospace, Defense and High Performance Systems*

SAE ARP 6338, *Process for assessment and mitigation of early wearout of life limited microcircuits*

SAE J1879, *Handbook for robustness Validation of semiconductor devices in automotive applications*

_____