ECSS-Q-ST-60-13C Rev.2
30 April 2025

Space product assurance

Commercial electrical, electronic and electromechanical (EEE) components

ECSS Secretariat
ESA-ESTEC
Requirements & Standards Section
Noordwijk, The Netherlands

Foreword

ECSS is a cooperative effort of the European Space Agency, national space agencies and European industry associations for the purpose of developing and maintaining common standards. Requirements in this Standard are defined in terms of what shall be accomplished, rather than in terms of how to organize and perform the necessary work. This allows existing organizational structures and methods to be applied where they are effective, and for the structures and methods to evolve as necessary without rewriting the standards.

This Standard has been prepared by the ECSS-Q-ST-60-13C Working Group, under the auspice of the ESCC Space Components Steering Board, reviewed by the ECSS Executive Secretariat and jointly approved by the ESCC SCSB and the ECSS Technical Authority.

Disclaimer

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Change log

ECSS-Q-ST-60-13C 21 October 2013	First issue.
ECSS-Q-ST-60-13C Rev.1 12 May 2022	First issue, Revision 1 The applicability matrix identifies the changes with respect to ECSS-Q-ST-60-13C (21 October 2013).
ECSS-Q-ST-60-13C Rev.2 30 April 2025	First issue, Revision 2 The applicability matrix identifies the changes with respect to ECSS-Q-ST-60-13C Rev.1 (12 May 2022). **Main changes:** • Implementation of Change Requests • Alignment with updated ECSS-Q-ST-60C Rev.4 **Detailed changes:** **Changes to requirements of ECSS-Q-ST-60 that are applicable in ECSS-Q-ST-60-13:** Added requirements of ECSS-Q-ST-60 applicable as is: • 4.3.1i; 4.4e to h; 4.6.7a; 4.6.8b; 5.2.2.3c; 5.3.1i; 5.3.5c; 5.4e to h; 5.5.5b; 5.6.7a; 5.6.8a and b; 6.1.3b to d; 6.2.2.3c; 6.3.1f and g; 6.3.5c; 6.4e to h; 6.6.5b; 6.6.7a; 6.6.8a and b; B.2.1. Added requirements of ECSS-Q-ST-60, modified in ECSS-Q-ST-60-13: • 4.2.4g to j; 5.2.4g to j; 6.2.4g to j. Deleted requirements: • 4.2.2.4c to f; 4.6.4b, g and h; 4.2.2.4c to f; 5.2.2.4c to f; 5.6.4b,g and h; 6.2.2.4c to f; 6.3.3.f; 6.6.4b, g and h. Editorial changes: • Titles of clauses 4.6.4, 5.6.4 and 6.6.4 updated to include “and reprogrammable”. • Clause 5.2.2.5 “Preferred sources” moved as clause 5.2.2.3, causing renumbering of follow-on clauses. • Table H-2 row “Bond shear (for ball bonding)” procedure corrected to read “JESD22”. **Changes to requirements of ECSS-Q-ST-60-13 only:** Modified requirement not included in ECSS-Q-ST-60: • 4.2.2.6b; 5.2.2.6b; 6.2.2.6b.

	Modified requirement number due to changes in ECSS-Q-ST-60: • 4.3.1j; 4.4j; 5.3.1j to l; 5.3.5d; 5.4i; 6.3.1h; 6.3.5d; 6.4i. Deleted requirements not included in ECSS-Q-ST-60: • 4.6.4b. Editorial changes: • 4.3.9e Note; 5.3.9d Note; 6.3.9d Note.

Table of contents

Figures

Tables

Introduction

This standard is based on and complementary to ECSS-Q-ST-60C. It defines the applicability and tailoring of the requirements of ECSS-Q-ST-60C for COTS EEE. This standard can only be used in conjunction with ECSS-Q-ST-60C in its current revision. This standard applies only to commercial components - as defined in its scope - which meet defined technical parameters that are on the system application level demonstrated to be unachievable with existing space components or only achievable with qualitative and quantitative penalties. The standard requires that qualitative and quantitative penalties are specified, as applicable, as a minimum in terms of quantifiable parameters such as: functional capability, parts count, power dissipation, frequency of operation, data/signal processing efficiency, interconnect complexity, mass, volume, …

For traceability to ECSS-Q-ST-60, the modifications or additions are marked in blue. Text in black colour is unmodified text.

For easy tailoring and implementation of the requirements into a Requirement Management Tool, and for direct traceability to ECSS-Q-ST-60, requirements in this standards have been written in the way of a ECSS Applicability Requirement Matrix (EARM), as defined in Annex A of ECSS-S-ST-00 "ECSS system – Description, implementation and general requirements".

In line with ECSS-Q-ST-60, this standard differentiates between three classes of components through three different sets of standardization requirements (clauses) to be met.

The three classes provide for three levels of trade-off between assurance and risk. The highest assurance and lowest risk is provided by class 1 and the lowest assurance and highest risk by class 3. Procurement costs are typically highest for class 1 and lowest for class 3. Mitigation and other engineering measures can decrease the total cost of ownership differences between the three classes. The project objectives, definition and constraints determine which class or classes of components are appropriate to be utilised within the system and subsystems.

a. Class 1 components are described in Clause 4

b. Class 2 components are described in Clause 5

c. Class 3 components are described in Clause 6

The objective of the EEE component selection, control, procurement and use requirements is to ensure that EEE components used in a space project enables the project to meet its mission requirements.

Important elements of EEE component requirements include:

a. component programme management,

b. component selection, evaluation and approval,

c. procurement,

d. handling and storage,

e. component quality assurance,

f. specific components, and

g. documentation.

The main tools which can be used to reach the objective are:

a. concurrent engineering,

b. standardization of component types,

c. characterization of components,

d. assessment of component manufacturers including declared competencies and processes,

e. testing, screening, lot acceptance and periodic testing,

f. procurement specifications,

g. control and inspection,

h. control of nonconforming materials,

i. assessment and use of existing component data,

j. application of specific control to mitigate risk for components with limited data or confidence, and

k. information management.

The basic approach is as follows:

- The customer of a given space project defines the EEE component requirements within the boundaries of this standard. They appear in the appropriate clauses of the project requirements as defined in ECSS-M-ST-10.
- The supplier defines a component control plan to implement those requirements into a system which enables, for instance, to control the selection, approval, procurement, handling in a schedule compatible with his requirements, and in a cost-efficient way.
- The supplier ensures that the applicable parts requirements are passed down to lower level suppliers and ensure that they are compliant to these parts requirements.

1
Scope

This standard defines the requirements for selection, control, procurement and usage of EEE commercial components for space projects.

This standard is applicable to commercial parts from the following families:

- Ceramic capacitors chips
- Solid electrolyte tantalum capacitors chips
- Discrete parts (transistors, diodes, optocouplers)
- Fuses
- Magnetic parts
- Microcircuits
- Resistors chips
- Thermistors

In addition for families of EEE components not addressed by the present ECSS standard, it can be used as guideline on case by case basis.

The requirements of this document are applicable to all parties involved at all levels in the integration of EEE commercial components into space segment hardware and launchers.

This standard may be tailored for the specific characteristics and constrains of a space project in conformance with ECSS-S-ST-00.

2
Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this ECSS standard. For dated references, subsequent amendments to, or revision of any of these publications do not apply. However, parties to agreements based on this ECSS Standard are encouraged to investigate the possibility of applying the more recent editions of the normative documents indicated below. For undated references, the latest edition of the publication referred to applies.

ECSS-S-ST-00-01	ECSS system - Glossary of terms
ECSS-Q-ST-60	Space product assurance - Electrical, electronic and electromechanical (EEE) components
ECSS-Q-ST-60-14	Space product assurance - Relifing procedure - EEE components
ECSS-Q-ST-60-15	Space product assurance – Radiation hardness assurance – EEE components
ESCC 21300	Terms, definitions, abbreviations, symbols and units
ESCC 24900	Minimum requirements for controlling environmental contamination of components
ESCC 25500	Methodology for the detection of pure tin in the external surface finish of case and leads of EEE components
MIL-STD-750	Test methods for semiconductor devices
MIL-STD-883	Test method standard microcircuits
JESD22-A101	Steady state temperature humidity bias life test
JESD22-A110	Highly accelerated temperature and humidity stress test
JESD22-A113	Preconditioning of plastic surface mount devices prior to reliability testing
JESD22-A121	Test Method for Measuring Whisker Growth on Tin and Tin Alloy Surface Finishes
JESD22-B106	Resistance to soldering temperature for through hole mounted devices
JESD-201	Environmental Acceptance Requirements for Tin Whisker Susceptibility of Tin and Tin Alloy Surface Finishes
J-STD-020	Moisture/Reflow sensitivity classification for nonhermetic solid state surface mount devices

J-STD-033	Handling, packing, shipping and use of moisture/ reflow sensitive surface mount devices
GEIA-STD-005-2	Standard for mitigating the effects of tin whiskers in aerospace and high performance electronic systems.
ESCC 21004	Guidelines for incoming inspection of EEE components (ESCC basic specification no. 21004)
ESCC22500	Guidelines for displacement damage irradiation testing
ESCC20600	Preservation packaging and despatch of SCC components
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 abbreviated terms

3.1 Terms from other standards

a. For the purpose of this standard, the terms and definitions from ECSS-S-ST-00-01 apply.

b. For the purpose of this standard, the following terms and definitions from ECSS-Q-ST-60 apply:

1. agent
2. characterization
3. commercial component
4. concurrent engineering
5. franchised distributor
6. parts engineer
7. parts procurer
8. qualified parts
9. screening
10. space qualified parts

3.2 Terms specific to the present standard

3.2.1 traceability information (trace code)

unique identifier used by manufacturers to label and trace a quantity of components with at least a common assembly history

NOTE 1 The notion of “lot of EEE parts” used for lot acceptance tests, except for radiation, is defined by the same trace code.

NOTE 2 The notion of "lot of EEE parts" used for the radiation is defined by the same diffusion lot.

NOTE 3 Several trace codes can be part of a same delivery from the manufacturer or the distributor.

NOTE 4 It is possible to have several diffusion lots and wafer fabs (as per ESCC 21300) in the same trace code.

3.3 Abbreviated terms

For the purpose of this Standard, the abbreviated terms from ECSS-S-ST-00-01 and the following apply:

Abbreviation	Meaning
AOQ	average outgoing quality
ASIC	application specific integrated circuit
BGA	ball grid array
CA	construction analysis
CCD	charge coupled device
CCP	component control plan
CN	change notice
CoC	certificate of conformance
CDR	critical design review
CR	change request
DCL	declared components list
DPA	destructive physical analysis
DRD	document requirement definition
DSM	deep Sub-Micron
Ea	activation energy
ECSS	European Coordination for Space Standardization
EEE	electrical, electronic, electromechanical
EFR	early failure rate
ESCC	European space components coordination
GSE	ground support equipment
HAST	highly accelerated stress test
HTRB	high temperature reverse bias
JD	justification document
LAT	lot acceptance test
LED	light emitting diode
LVT	lot validation testing
MMIC	microwave monolithic integrated circuit
PAD	parts approval document
PCB	parts control board
PCN	process change notice
PDA	percent defective allowable
PED	plastic encapsulated device
PIND	particle impact noise detection
QBSD	full quadrant back scatter electron detector
QCI	quality conformance inspection

Abbreviation	Meaning
RFD	request for deviation
RH	relative humidity
RoHs	restriction of the use of certain hazardous substances
RVT	radiation verification testing
SCSB	Space Components Steering Board
SAM	scanning accoustic microscopy
SEM	scanning electron microscope
SMD	surface mount device
TCI	technology conformance inspection
Tg	Glass Transition Temperature
THB	temperature humidity bias
Tj	junction temperature
T/C	thermal cycling
TM	Test Method

3.4 Conventions

a. The term “EEE component“ is synonymous with the terms "EEE Part", "Component" or just "Part".

b. The term “for approval” means that a decision of the approval authority is necessary for continuing the process.

c. The term “for review” means that raised reviewers comments are considered and dispositioned.

d. The term “for information” means that no comments are expected about the delivered item.

e. For the purpose of clear understanding of this document, hereunder is a listing of component categories which are covered by the term EEE component, encapsulated or non-encapsulated, irrespective of the quality level:

1. Cable assemblies (high date rate & RF & microwave, optical cable)
2. Capacitors
3. Connectors
4. Crystals
5. Discrete semiconductors (including diodes, transistors, microwave)
6. Filters
7. Fuses

8. Magnetic components (e.g. inductors, transformers, including in-house products)
9. Monolithic Microcircuits (including MMICs)
10. Oscillators
11. Hybrid circuits
12. Relays
13. Resistors, heaters
14. Surface acoustic wave devices
15. Switches (including mechanical, thermal)
16. Thermistors
17. Wires and Cables
18. Optoelectronic Devices (including opto-couplers, LED, CCDs, displays, sensors)
19. Passive Microwave Devices (including, for instance, mixers, couplers, isolators and switches)

NOTE Microwave switches consisting of multiple EEE components are considered as equipment. The requirements of this standard are applicable to the EEE parts they incorporate and to microwave switches having a simple design (single EEE part).

3.5 Nomenclature

The following nomenclature applies throughout this document:

a. The word “shall” is used in this Standard to express requirements. All the requirements are expressed with the word “shall”.

b. The word “should” is used in this Standard to express recommendations. All the recommendations are expressed with the word “should”.

NOTE It is expected that, during tailoring, recommendations in this document are either converted into requirements or tailored out.

c. The words “may” and “need not” are used in this Standard to express positive and negative permissions, respectively. All the positive permissions are expressed with the word “may”. All the negative permissions are expressed with the words “need not”.

d. The word “can” is used in this Standard to express capabilities or possibilities, and therefore, if not accompanied by one of the previous words, it implies descriptive text.

NOTE In ECSS “may” and “can” have completely different meanings: “may” is normative (permission), and “can” is descriptive.

e. The present and past tenses are used in this Standard to express statements of fact, and therefore they imply descriptive text.

3.6 Convention for the Applicability Matrix

The following terminology applies for the column "Applicability" of the applicability matrix:

Applicability	**Explanation**
Applicable	Requirement of ECSS-Q-ST-60 applies
Not applicable	Requirement from ECSS-Q-ST-60 does not apply
Modified	Requirement of ECSS-Q-ST-60 applies with modified text
New	Requirement added in ECSS-Q-ST-60-13 and not present in ECSS-Q-ST-60
Deleted	Requirement is deleted in the applicable version of ECSS-Q-ST-60 or ECSS-Q-ST-60-13 NOTE: In case of the deletion of a requirement that existed only in ECSS-Q-ST-60-13 the former text is replaced by the word <<deleted>>

4 Requirements for class 1 components

Identifier	Requirement	Applicability
4.1 Component programme management		
	4.1.1 General	
4.1.1a		Deleted
	4.1.2 Components control programme	
	4.1.2.1 Organization	
4.1.2.1a		Applicable
4.1.2.1b		Deleted
	4.1.2.2 Component control plan	
4.1.2.2a		Applicable
4.1.2.2b		Applicable
4.1.2.2c		Applicable
	4.1.3 Parts control board	
4.1.3a		Applicable
4.1.3b		Applicable
4.1.3c		Applicable
4.1.3d		Applicable
	4.1.4 Declared component list	
4.1.4a		Applicable
4.1.4b		Applicable
4.1.4c		Applicable
4.1.4d		Applicable
4.1.4e		Applicable
4.1.4f		Applicable
4.1.4g		Applicable
4.1.4h		Applicable
4.1.4i		Applicable
	4.1.5 Electrical and mechanical GSE	
4.1.5a		Applicable
4.1.5b		Applicable

	4.1.6 EQM components	
4.1.6a		Applicable
4.1.6b		Applicable
4.2 Component selection, evaluation and approval		
	4.2.1 General	
4.2.1a		Applicable
4.2.1b		Applicable
	4.2.2 Manufacturer and component selection	
	4.2.2.1 General rules	
4.2.2.1a		Applicable
4.2.2.1b		Applicable
4.2.2.1c	<<deleted and moved to 4.2.2.3d>>	Deleted
4.2.2.1d	<<deleted, modified and moved to 4.2.2.3e>>	Deleted
4.2.2.1e	<<deleted and moved to 4.2.2.3f>>	Deleted
4.2.2.1f	<<deleted and moved to 4.2.2.3g>>	Deleted
4.2.2.1g	For the assessment of commercial components, the supplier shall collect the available data on the manufacturer and the component in the JD specified in the requirement 4.2.4d. NOTE It is important to check the exhaustiveness of the manufacturer documentation & data sheet with respect to e.g. the following items: • component marking, • mechanical description, • electrical and thermal description.	New
4.2.2.1h	<<deleted>>	Deleted
	4.2.2.2 Parts and material restriction	
4.2.2.2a		Applicable
4.2.2.2b		Applicable
4.2.2.2c		Applicable
4.2.2.2d		Applicable
4.2.2.2e		Applicable
4.2.2.2f		Applicable
4.2.2.2g		Applicable
4.2.2.2h		Applicable
4.2.2.2i		Applicable

4.2.2.2.j		Applicable
4.2.2.2k		Applicable
4.2.2.2l		Applicable
	4.2.2.3 Preferred sources	
4.2.2.3a		Not applicable
4.2.2.3b		Not applicable
4.2.2.3c		Applicable
4.2.2.3d		Not applicable
4.2.2.3e		Applicable
4.2.2.3f		Applicable
4.2.2.3g		Applicable
	4.2.2.4 Radiation hardness	
4.2.2.4a		Applicable
4.2.2.4b		Applicable
4.2.2.4c		Deleted
4.2.2.4d		Deleted
4.2.2.4e		Deleted
4.2.2.4f		Deleted
4.2.2.4g		Applicable
4.2.2.4h		Applicable
4.2.2.4i		Applicable
	4.2.2.5 Derating	
4.2.2.5a		Applicable
4.2.2.5b		Deleted
	4.2.2.6 Temperature range	
4.2.2.6a	Commercial parts shall be selected in the highest available temperature range.	New
4.2.2.6b	A minimum 10 °C margin shall be used between the maximum manufacturer temperature range and the application temperature range (including worst cases) unless there are additional data or evidence available to limit or extend this margin without exceeding the maximum rating.	New
4.2.2.6c	<<deleted>>	Deleted
4.2.2.6d	Operating temperature range of all commercial parts shall be greater or equal to (-40 / 85) °C.	New
4.2.2.6e	Temperature range of commercial ceramic capacitors shall be greater or equal to (-40 / 125) °C	New

4.2.3 Component evaluation		
4.2.3.1 General		
4.2.3.1a		Applicable
4.2.3.1b		Deleted
4.2.3.1c		Applicable
4.2.3.1d		Applicable
4.2.3.1e		Applicable
4.2.3.1f		Applicable
4.2.3.1g		Applicable
4.2.3.1h		Applicable
4.2.3.1i	The supplier shall review the evaluation results to determine their impact on the content of the screening and lot acceptance tests.	Modified
4.2.3.1j		Applicable
4.2.3.1k	The supplier shall prepare a preliminary internal supplier's specification for electrical testing during evaluation tests. NOTE This specification can be part of the Justification document.	New
4.2.3.1l	The supplier specification specified in 4.2.3.1k shall as minimum include tested parameters, test conditions, acceptance criteria, drift limits.	New
4.2.3.1m	The supplier shall update the internal supplier's specification used for screening and lot acceptance in accordance with the results of evaluation testing.	New
4.2.3.1n	The preliminary and the final internal supplier's specification as specified in Annex C shall be submitted to the customer for approval.	New
4.2.3.2 Component manufacturer assessment		
4.2.3.2.1		Not applicable See 4.2.2.1.g
4.2.3.2.2a		Not applicable See 4.2.2.1.g
4.2.3.2.2b		Not applicable See 4.2.2.1.g

4.2.3.3. Construction analysis		
4.2.3.3a		Applicable
4.2.3.3b	The Construction analysis shall be documented by a procedure to be submitted on request to the customer for information. NOTE Annex H provides guidelines for microcircuits, diodes, transistors and optocouplers.	Modified
4.2.3.3c		Applicable
4.2.3.4 Evaluation testing		
4.2.3.4a		Applicable
4.2.3.4b		Applicable
4.2.3.4c	Evaluation tests shall be performed as specified in: 1. Table 8–1 for ceramic capacitors chips 2. Table 8–2 for solid electrolyte tantalum capacitors chips 3. Table 8–3 for discrete parts (diodes, transistors, optocouplers) 4 Table 8–4 for fuses 5. Table 8–5 for magnetic parts 6. Table 8–6 for microcircuits 7. Table 8–7 for resistors 8. Table 8–8 for thermistors	New
4.2.3.4d	Omission of any of the elements of tests specified in Table 8–1, Table 8–2, Table 8–3, Table 8–4, Table 8–5, Table 8–6, Table 8–7 and Table 8–8, or the introduction of alternative activities, shall be justified in the JD.	New
4.2.3.4e	<<deleted>>	Deleted

Figure 4-1: <<deleted>>

Table 4–1: <<deleted and moved as legacy test files as Table 8–9>>

4.2.4 Parts approval		
4.2.4a		Applicable
4.2.4b		Deleted
4.2.4c		Applicable
4.2.4d	The approval process by the customer depends on the part qualification status and shall be organized as follows:	Modified
	1.	Not applicable
	2.	Not applicable
	3.	Applicable
	4. <<deleted>>	Deleted
4.2.4e	In case the evaluation results are changing the testing conditions documented in the JD, a new revision of JD shall be submitted to the customer for approval.	Modified
4.2.4f		Applicable
4.2.4g	The previous use or approval of a part via JD in any other project shall not be considered as an automatic approval for the present program.	Modified
4.2.4h	All programmable devices shall be subject to JD approval. NOTE Programmable devices are considered non-standard parts.	Modified
4.2.4i	Hybrids, ASICs and MMICs shall be covered by JD even if included in Capability Approval List, QML, QPL.	Modified
4.2.4j	For ASICs built on space qualified technologies, the JD may be replaced, if agreed with the customer, by information embedded in the DCL.	Modified
4.3 Component procurement		
4.3.1 General		
4.3.1a		Applicable
4.3.1b		Not applicable
4.3.1c		Not applicable
4.3.1d		Applicable
4.3.1e		Applicable
4.3.1f		Applicable
4.3.1g		Applicable
4.3.1h		Applicable
4.3.1i		Applicable
4.3.1j	Each procured EEE part shall be traceable to a manufacturer assigned trace code.	New

	NOTE 1 The procurement of a single trace code per delivery lot should be preferred and encouraged. NOTE 2 Some passive components can be traceable with datecode only.	
4.3.1k	Each trace code shall be maintained as is through the entire supply chain including distributor. NOTE As far as possible, commercial parts should be ordered in the manufacturer's standard packing quantities or multiples thereof to avoid distributor re-packing and handling and to preserve the traceability information usually included on the original manufacturer packaging.	New
4.3.1l	The supplier shall ensure that the elements of the JD in accordance with Annex F, including any action plan, are applicable to flight parts.	New
4.3.2 Procurement specification		
4.3.2a	The supplier shall procure EEE components according to controlled specifications. NOTE It can be procurer's in-house specification, a manufacturer's drawing or a datasheet as a minimum.	Modified
4.3.2b		Not applicable
4.3.2c		Not applicable
4.3.2d		Not applicable
4.3.2e		Applicable
4.3.2f		Applicable
4.3.2g		Applicable
4.3.2h	If additional requirements to the manufacturer are identified by the supplier, they shall be specified in the procurement specification, in conformance with DRD from Annex C.	New
4.3.3. Screening requirements		
4.3.3a		Applicable
4.3.3b		Applicable
4.3.3c		Applicable
4.3.3d	For commercial parts, screening tests shall be performed in accordance with: 1. Table 8–1 for ceramic capacitors chips, 2. Table 8–2 for solid electrolyte tantalum capacitors chips 3. Table 8–3 for discrete parts (diodes, transistors, optocouplers) 4. Table 8–4 for fuses	Modified

	5. Table 8–5 for magnetic parts 6. Table 8–6 for microcircuits 7. Table 8–7 for resistors 8. Table 8–8 for thermistors	
4.3.3e		Deleted
4.3.3f		Applicable
4.3.3g		Deleted
4.3.3h		Applicable

Table 4–2: <<deleted and moved as legacy test files as Table 8–10>>

4.3.4 Initial customer source inspection (precap)		
4.3.4a		Not applicable
4.3.4b		Not applicable
4.3.4c		Not applicable
4.3.5 Lot acceptance		
4.3.5a	The supplier shall ensure that any lot/date code of EEE parts is submitted to a lot acceptance procedure, in line with applied normative systems, according to the following rules:	Modified
	1.	Not applicable
	2.	Not applicable
	3.	Applicable
4.3.5b		Not applicable
4.3.5c		Applicable
4.3.5d	Lot acceptance tests shall be performed as specified in: 1. Table 8–1 for ceramic capacitors chips 2. Table 8–2 for solid electrolyte tantalum capacitors chips 3. Table 8–3 for discrete parts (diodes, transistors, optocouplers) 4. Table 8–4 for fuses 5. Table 8–5 for magnetic parts 6. Table 8–6 for microcircuits 7. Table 8–7 for resistors 8. Table 8–8 for thermistors	New

Figure 4-2: <<deleted>>

Table 4–3: <<deleted and moved as legacy test files as Table 8–11>>

4.3.6 Final customer source inspection (buy-off)		
4.3.6a		Not applicable
4.3.6b		Not applicable
4.3.6c	For commercial parts, the buy off shall be replaced by an incoming inspection at the procurement entity's facility reported in the JD in accordance with clause 4.3.7.	Modified
4.3.6d		Not applicable
4.3.7 Incoming inspection		
4.3.7a		Applicable
4.3.7b		Applicable
4.3.7c		Applicable
4.3.7d		Not applicable
4.3.7e		Applicable
4.3.8 Radiation verification testing		
4.3.8a		Applicable
4.3.8b		Applicable
4.3.8c		Not applicable
4.3.8d		Applicable
4.3.8e		Applicable
4.3.8f	Parts submitted to total dose test shall be first screened as specified in the clause 4.3.3 to be fully representative of flight parts.	New
4.3.9 Destructive physical analysis		
4.3.9a	The DPA shall be performed according to the procurement Tables Table 8–1, Table 8–2, Table 8–3, Table 8–4, Table 8–5, Table 8–6, Table 8–7, Table 8–8 of Clause 8.	Modified
4.3.9b		Not applicable
4.3.9c		Not applicable
4.3.9d		Not applicable
4.3.9e	The DPA process shall be documented by a procedure to be submitted, on request, to the customer for information. NOTE For guidance refer to the basic specification ESCC 20600 and for active parts ECSS-Q-ST-60-13 Annex H.	Modified

4.3.9f		Applicable
4.3.9g		Deleted
4.3.9h		Not applicable
4.3.9i		Applicable
4.3.9j		Applicable
4.3.9k	<<deleted>>	Deleted
4.3.10 Relifing		
4.3.10a		Applicable
4.3.10b		Applicable
4.3.10c	<<deleted>>	Deleted
4.3.10d	<<deleted>>	Deleted
4.3.11 Manufacturer's data documentation deliveries		
4.3.11a	The manufacturer's or the franchised distributor's CoC shall be delivered to the parts procurer.	Modified
4.3.11b	Any other data, defined in the procurement documents, shall be delivered to the parts' procurer in line with the purchase order.	Modified
4.3.11c		Applicable
4.4 Handling and storage		
4.4a	The supplier shall establish and implement procedures for handling and storage of components in order to prevent possible degradation. NOTE For guidance, refer to the basic specification ESCC 20600.	Applicable
4.4b		Applicable
4.4c		Applicable
4.4d		Applicable
4.4e		Applicable
4.4f		Applicable
4.4g		Applicable
4.4h		Applicable
4.4i	Plastic encapsulated devices shall be stored in one of the following conditions: 1. Dry Nitrogen 2. Dry and ionised air, with RH in a range of 15% to 20% 3. Dry packs as specified in J-STD-033 for dry pack inspection and control	New

4.5 Components quality assurance		
4.5.1 General		
4.5.1a		Applicable
4.5.2 Nonconformances or failures		
4.5.2a		Applicable
4.5.2b		Applicable
4.5.2c		Applicable
4.5.2d		Applicable
4.5.3 Alerts		
4.5.3a		Applicable
4.5.3b		Applicable
4.5.3c		Applicable
4.5.4 Traceability		
4.5.4a		Deleted
4.5.4b		Applicable
4.5.4c		Applicable
4.5.4d	The traceability of EEE parts during installation in equipment, shall be ensured by the supplier through maintaining the traceability to the manufacturer's trace code number of the EEE parts actually mounted.	Modified
4.5.4e	If the as built DCL has not yet been delivered, the supplier shall be able to provide this information (part type actually installed with its relevant trace code number) within one week.	Modified
4.5.5 Lot homogeneity for sampling test		
4.5.5a	If tests are performed by sampling, the sampled parts shall be selected so that they are representative of the trace code distribution.	Modified
4.5.5b		Applicable
4.6 Specific components		
4.6.1 General		
4.6.1a	<<deleted>>	Deleted
4.6.2 ASICs		
4.6.2a		Applicable
4.6.3 Hybrids		
4.6.3a		Not applicable
4.6.3b		Not applicable
4.6.3c		Not applicable

4.6.4 One time programmable and reprogrammable devices		
4.6.4a		Applicable
4.6.4b	The JD shall allow traceability to the information related to the procurement of blank parts, the programming process and the acceptance of the programmed parts. NOTE The programming process and the acceptance of the programmed parts may be part of PCB, for customer approval, if not indicated in the JD.	Modified
4.6.4c	<<deleted>>	Deleted
4.6.4d		Applicable
4.6.4e		Applicable
4.6.4f		Applicable
4.6.4g	<<deleted>>	Deleted
4.6.4h	<<deleted>>	Deleted
4.6.5 Microwave monolithic integrated circuits		
4.6.5a		Not applicable
4.6.6 Connectors		
4.6.6a		Not applicable
4.6.7 High Voltage Application		
4.6.7a		Applicable
4.6.8 Self Made Magnetics		
4.6.8a		Applicable
4.6.8b		Applicable
4.7 Documentation		
4.7a	Any result from inspection or control shall be documented (including lot acceptance, incoming, relifing and complementary tests).	Modified

Table 4-4: Documentation for Class 1 components

Document	Clause	Customer	Comments
New **:** Procedure for hot solder dip process	4.2.2.2j.	Approval	For retinning operation
New **:** Internal supplier's specification	4.2.3.1k.	Approval	Applicable to the preliminary and final internal supplier's specification
PAD : not applicable	4.2.4	-	-
New **:** Justification Document	4.2.4	Approval	-
Procedure for customer precap : not applicable	4.3.4	-	-
New **:** Procedure for construction analysis	4.2.3.3	Information (on request)	-
New **:**-Evaluation and LAT report	4.2.4d.	Information (on request)	-

5
Requirements for class 2 components

5.1 Components programme management		
	5.1.1. General	
5.1.1a		Deleted
	5.1.2 Components control programme	
	5.1.2.1 Organization	
5.1.2.1a		Applicable
	5.1.2.2 Component control plan	
5.1.2.2a		Applicable
5.1.2.2b		Applicable
	5.1.3 Parts control board	
5.1.3a		Applicable
5.1.3b		Applicable
5.1.3c		Applicable
5.1.3d		Applicable
	5.1.4. Declared component list	
5.1.4a		Applicable
5.1.4b		Applicable
5.1.4c		Applicable
5.1.4d		Applicable
5.1.4e		Applicable
5.1.4f		Applicable
5.1.4g		Applicable
5.1.4h		Applicable
5.1.4i		Applicable
	5.1.5. Electrical and mechanical GSE	
5.1.5a		Applicable
5.1.5b		Applicable
	5.1.6 EQM components	
5.1.6a		Applicable
5.1.6b		Applicable

5.2 Component selection, evaluation and approval		
5.2.1 General		
5.2.1a		Applicable
5.2.1b		Applicable
5.2.2. Manufacturer and component selection		
5.2.2.1 General rules		
5.2.2.1a		Applicable
5.2.2.1b		Applicable
5.2.2.1c	<<deleted and moved to 5.2.2.5a>>	Deleted
5.2.2.1d	<<deleted and moved to 5.2.2.5b>>	Deleted
5.2.2.1e	For the assessment of commercial components, the supplier shall collect the available data on the manufacturer and the component in the JD. Specified in the requirement 5.2.4.d. NOTE It is important to check the exhaustiveness of the manufacturer documentation & data sheet with respect to the following items: • component marking, • mechanical description, • electrical and thermal description	New
5.2.2.1f	<<deleted>>	Deleted
5.2.2.2. Parts and material restriction		
5.2.2.2a		Applicable
5.2.2.2b		Applicable
5.2.2.2c		Applicable
5.2.2.2d		Applicable
5.2.2.2e		Applicable
5.2.2.2f		Applicable
5.2.2.2g		Applicable
5.2.2.2h		Applicable
5.2.2.2i		Applicable
5.2.2.2.j		Applicable
5.2.2.2k		Applicable
5.2.2.2l		Applicable
5.2.2.3 Preferred sources		
5.2.2.3a		Not applicable
5.2.2.3b		Applicable

5.2.2.3c		Applicable
	5.2.2.4 Radiation hardness	
5.2.2.4a		Applicable
5.2.2.4b		Applicable
5.2.2.4c	<<deleted>>	Deleted
5.2.2.4d	<<deleted>>	Deleted
5.2.2.4e	<<deleted>>	Deleted
5.2.2.4f	<<deleted>>	Deleted
5.2.2.4g		Applicable
5.2.2.4h		Applicable
5.2.2.4i		Applicable
	5.2.2.5 Derating	
5.2.2.5a		Applicable
5.2.2.5b		Deleted
	5.2.2.6 Temperature range	
5.2.2.6a	Commercial parts shall be selected in the highest available temperature range.	New
5.2.2.6b	A minimum 10°C margin shall be used between the maximum manufacturer temperature range and the application temperature range (including worst cases) unless there are additional data or evidence available to limit or extend this margin without exceeding the maximum rating.	New
5.2.2.6c	<<deleted>>	Deleted
5.2.2.6d	Operating temperature range of all commercial parts shall be greater or equal to (-40 / 85) °C.	New
5.2.2.6e	Temperature range of commercial ceramic capacitors shall be greater or equal to (-40 / 125) °C.	New
	5.2.3 Component evaluation	
	5.2.3.1 General	
5.2.3.1a		Applicable
5.2.3.1b		Deleted
5.2.3.1c		Applicable
5.2.3.1d		Applicable
5.2.3.1e		Applicable
5.2.3.1f		Applicable
5.2.3.1g		Applicable
5.2.3.1h		Applicable

5.2.3.1i	The supplier shall review the evaluation results to determine their impact on the content of the screening and lot acceptance tests.	Modified
5.2.3.1j		Applicable
5.2.3.1k	The supplier shall prepare a preliminary internal supplier's specification for electrical testing during evaluation tests. NOTE This specification can be part of the Justification document.	New
5.2.3.1l	The supplier specification specified in 5.2.3.1k shall as minimum include test parameters, test conditions, acceptance criteria, drift limits.	New
5.2.3.1m	The supplier shall update the internal supplier's specification used for screening and lot acceptance in accordance with the results of evaluation testing.	New
5.2.3.1n	The preliminary and the final internal supplier's specification as specified in Annex C shall be submitted to the customer for approval.	New
5.2.3.2 Component manufacturer assessment		
5.2.3.2a	<<deleted>>	Deleted See 5.2.2.1.e.
5.2.3.3 Construction analysis		
5.2.3.3a		Applicable
5.2.3.3b	The Construction analysis shall be documented by a procedure to be submitted on request to the customer for information. NOTE Annex H provides guidelines for microcircuits, diodes, transistors and optocouplers.	Modified
5.2.3.3c		Applicable
5.2.3.4. Evaluation testing		
5.2.3.4a		Applicable
5.2.3.4b		Applicable
5.2.3.4c	Evaluation tests shall be performed as specified in: 1. Table 8–1 for ceramic capacitors chips 2. Table 8–2 for solid electrolyte tantalum capacitors chips 3. Table 8–3 for discrete parts (diodes, transistors, optocouplers) 4 Table 8–4 for fuses 5. Table 8–5 for magnetic parts 6. Table 8–6 for microcircuits 7. Table 8–7 for resistors 8. Table 8–8 for thermistors	New

5.2.3.4d	Omission of any of the elements of tests specified in Table 8–1, Table 8–2, Table 8–3, Table 8–4, Table 8–5, Table 8–6, Table 8–7 and Table 8–8, or the introduction of alternative activities, shall be justified in the JD.	New
5.2.3.4e	<<deleted>>	Deleted

Figure 5-1: <<deleted>>

Table 5–1: <<deleted and moved as Legacy test files as Table 8–12>>

5.2.4 Parts approval		
5.2.4a		Applicable
5.2.4b		Deleted
5.2.4c		Applicable
5.2.4d	The approval process by the customer depends on the part qualification status and shall be organized as follows:	Modified
	1.	Not applicable
	2.	Not applicable
	3.	Applicable
	4. <<deleted>>	Deleted
5.2.4e	In case the evaluation results are changing the testing conditions documented in the JD, a new revision of JD shall be submitted to the customer for approval.	Modified
5.2.4f		Applicable
5.2.4g	The previous use or approval of a part, via JD, in any other project shall not be considered as an automatic approval for the present program. NOTE The pertinence of the heritage in terms of mission profile and requirements can be assessed as well as all the deviations (e.g. RFDs, RFWs, special dispositions for a specific space program) previously accepted.	Modified
5.2.4h	All programmable devices shall be subject to JD approval. NOTE Programmable devices are considered non-standard parts.	Modified
5.2.4i	Hybrids, ASICs and MMICs shall be covered by JD even if included in Capability Approval List, QML, QPL.	Modified
5.2.4j	For ASICs built on space qualified technologies, the JD may be replaced, if agreed with the customer, by information embedded in the DCL.	Modified

5.3 Component procurement

5.3.1 General

5.3.1a		Applicable
5.3.1b		Not applicable
5.3.1c		Not applicable
5.3.1d		Applicable
5.3.1e		Applicable
5.3.1f		Applicable
5.3.1g		Applicable
5.3.1h		Applicable
5.3.1i		Applicable
5.3.1j	Each procured EEE part shall be traceable to a manufacturer assigned trace code. NOTE 1 The procurement of a single trace code per delivery lot should be preferred and encouraged. NOTE 2 Some passive components can be traceable with datecode only.	New
5.3.1k	Each trace code shall be maintained as is through the entire supply chain including distributor. NOTE As far as possible, commercial parts should be ordered in the manufacturer's standard packing quantities or multiples thereof to avoid distributor re-packing and handling and to preserve the traceability information usually included on the original manufacturer packaging.	New
5.3.1l	The supplier shall ensure that the elements of the JD in accordance with Annex F, including any action plan, are applicable to flight parts.	New

5.3.2 Procurement specification

5.3.2a	The supplier shall procure EEE components according to controlled specifications. NOTE It can be procurer's in-house specification, a manufacturer's drawing or a datasheet as a minimum.	Modified
5.3.2b		Not applicable
5.3.2c		Not applicable
5.3.2d		Not applicable
5.3.2e		Applicable

5.3.2f		Applicable
5.3.2g		Applicable
5.3.2h	If additional requirements to the manufacturer are identified, they shall be specified in the procurement specification.	New
5.3.3 Screening requirements		
5.3.3a		Applicable
5.3.3b		Applicable
5.3.3c		Applicable
5.3.3d	For commercial parts, screening tests shall be performed in accordance with: 1. Table 8–1 for ceramic capacitors chips 2. Table 8–2 for solid electrolyte tantalum capacitors chips 3. Table 8–3 for discrete parts (diodes, transistors, optocouplers) 4. Table 8–4 for fuses 5. Table 8–5 for magnetic parts 6. Table 8–6 for microcircuits 7. Table 8–7 for resistors 8. Table 8–8 for thermistors	Modified
5.3.3e		Deleted
5.3.3f		Applicable
5.3.3g		Not applicable
5.3.3h	In case of X-rays or CT scan inspection, the total dose deposited and exposure time shall not deteriorate part performance or reliability.	Applicable
5.3.3.i	<<deleted>>	Deleted
5.3.3.j	<<deleted>>	Deleted
5.3.3.k	<<deleted>>	Deleted
5.3.3.l	<<deleted>>	Deleted

Table 5–2: <<deleted and moved as Legacy test files as Table 8–13>>

5.3.4 Initial customer source inspection (precap)		
5.3.4a		Not applicable
5.3.4b		Not applicable

5.3.5 Lot acceptance		
5.3.5a	The supplier shall ensure that any lot/date code of EEE parts is submitted to a lot acceptance procedure, in line with applied normative system, according to the following rules:	Modified
	1.	Not applicable
	2.	Not applicable
	3.	Applicable
5.3.5b		Not applicable
5.3.5c		Applicable
5.3.5d	Lot acceptance tests shall be performed in accordance with: 1. Table 8–1 for ceramic capacitors chips, 2. Table 8–2 for solid electrolyte tantalum capacitors chips 3. Table 8–3 for discrete parts (diodes, transistors, optocouplers) 4. Table 8–4 for fuses 5. Table 8–5 for magnetic parts 6. Table 8–6 for microcircuits 7. Table 8–7 for resistors 8. Table 8–8 for thermistors	New

Figure 5-2: <<deleted>>

Table 5–3: <<deleted and moved to Legacy test files as Table 8–14>>

5.3.6 Final customer source inspection (buy-off)		
5.3.6a		Not applicable
5.3.6b		Not applicable
5.3.6c	For commercial parts, the buy off shall be replaced by an incoming inspection at the procurement entity's facility reported in the JD in accordance with clause 5.3.7.	Modified
5.3.6d		Not applicable
5.3.7 Incoming inspection		
5.3.7a		Applicable
5.3.7b		Applicable
5.3.7c		Applicable
5.3.7d		Not Applicable
5.3.7e		Applicable

5.3.8 Radiation verification testing		
5.3.8a		Applicable
5.3.8b		Applicable
5.3.8c		Not applicable
5.3.8d		Applicable
5.3.8e		Applicable
5.3.8f	Parts submitted to total dose test shall be screened as specified in clause 5.3.3 to be fully representative of flight parts.	New
5.3.9 Destructive physical analysis		
5.3.9a	The DPA shall be performed according to the procurement Tables Table 8–1, Table 8–2, Table 8–3, Table 8–4, Table 8–5, Table 8–6, Table 8–7, Table 8–8 of Clause 8.	Modified
5.3.9b		Not applicable
5.3.9c		Not applicable
5.3.9d	The DPA process shall be documented by a procedure to be submitted, on request, to the customer for information. NOTE For guidance refer to the basic specificaton ESCC 20600 and for active parts ECSS-Q-ST-60-13 Annex H.	Modified
5.3.9e		Applicable
5.3.9f		Deleted
5.3.9g		Not applicable
5.3.9h		Applicable
5.3.9i		Applicable
5.3.9j	<<deleted>>	Deleted
5.3.10 Relifing		
5.3.10a		Applicable
5.3.10b		Applicable
5.3.10c	<<deleted>>	Deleted
5.3.10d	<<deleted>>	Deleted
5.3.11 Manufacturer's data documentation deliveries		
5.3.11a	The manufacturer's or the franchised distributor's CoC shall be delivered to the parts procurer.	Modified
5.3.11b	Any other data, defined in the procurement documents, shall be delivered to the parts' procurer in line with the purchase order.	Modified
5.3.11c		Applicable

5.4 Handling and storage		
5.4a		Applicable
5.4b		Applicable
5.4c		Applicable
5.4d		Applicable
5.4e		Applicable
5.4f		Applicable
5.5g		Applicable
5.4h		Applicable
5.4i	Plastic encapsulated devices shall be stored in one of the following conditions: 1. Dry Nitrogen 2. Dry and ionised air with RH in a range of 15% to 20% 3. Dry packs as specified in J-STD-033 for dry pack inspection and control	New
5.5 Components quality assurance		
5.5.1 General		
5.5.1a		Applicable
5.5.2 Nonconformances or failures		
5.5.2a		Applicable
5.5.2b		Applicable
5.5.2c		Applicable
5.5.2d		Applicable
5.5.3 Alerts		
5.5.3a		Applicable
5.5.3b		Applicable
5.5.4 Traceability		
5.5.4a		Deleted
5.5.4b		Applicable
5.5.4c		Applicable
5.5.4d	The traceability of EEE parts during installation in equipment, shall be ensured by the supplier through maintaining the traceability to the manufacturer's trace code number of the EEE parts actually mounted.	Modified
5.5.4e	If the as built DCL has not yet been delivered, the supplier shall be able to provide this information (part type actually installed with its relevant trace code number) within one week.	Modified

5.5.5 Lot homogeneity for sampling test		
5.5.5a		Applicable
5.5.5b		Applicable
5.6 Specific components		
5.6.1 General		
5.6.1a	<<deleted>>	Deleted
5.6.2 ASICs		
5.6.2a		Applicable
5.6.3 Hybrids		
5.6.3a		Not applicable
5.6.3b		Not applicable
5.6.3c		Not applicable
5.6.4 One time programmable and reprogrammable devices		
5.6.4a		Applicable
5.6.4b	The JD shall allow traceability to the information related to the procurement of blank parts, the programming process and the acceptance of the programmed parts. NOTE The programming process and the acceptance of the programmed parts may be part of PCB, for customer approval, if not indicated in the JD.	Modified
5.6.4c	<<deleted>>	Deleted
5.6.4d		Applicable
5.6.4e		Applicable
5.6.4f		Applicable
5.6.4g	<<deleted>>	Deleted
5.6.4h	<<deleted>>	Deleted
5.6.5 Microwave monolithic integrated circuits		
5.6.5a		Not applicable
5.6.6 Connectors		
5.6.6a		Not applicable
5.6.7 High Voltage Application		
5.6.7a		Applicable
5.6.8 Self Made Magnetics		

5.6.8a		Applicable
5.6.8b		Applicable
5.7 Documentation		
5.7a	Any result from inspection or control shall be documented (including lot acceptance, incoming, relifing and complementary tests).	Modified

Table 5–4: Documentation for Class 2 components

Document	Clause	Customer	Comments
New *:* Procedure for hot solder dip process	5.2.2.2j	Approval	For retinning operation
New *:* Internal supplier's specification	5.2.3.1k	Approval	Applicable to the preliminary and final internal supplier's specification
PAD : not applicable	4.2.4	-	-
New *:* Justification Document	5.2.4d	Approval	-
Procedure for customer precap : not applicable	4.3.4	-	-
New *:* Procedure for construction analysis	5.2.3.3	Information (on request)	-
New *:* Evaluation, screening and LAT report	5.2.4d	Information (on request)	-

6
Requirements for class 3 components

6.1 Component programme management		
	6.1.1. General	
6.1.1a		Deleted
	6.1.2 Components control programme	
	6.1.2.1 Organization	
6.1.2.1a		Applicable
	6.1.2.2 Component control plan	
6.1.2.2a		Applicable
6.1.2.2b		Applicable
	6.1.3 Parts control board	
6.1.3a		Applicable
6.1.3b		Applicable
6.1.3c		Applicable
6.1.3d		Applicable
	6.1.4 Declared component list	
6.1.4a		Applicable
6.1.4b		Applicable
6.1.4c		Applicable
6.1.4d		Applicable
6.1.4e		Applicable
6.1.4f		Applicable
6.1.4g		Applicable
6.1.4h		Applicable
	6.1.5 Electrical and mechanical GSE	
6.1.5a		Applicable
6.1.5b		Applicable
	6.1.6 EQM components	
6.1.6a		Applicable
6.1.6b		Applicable

6.2 Component selection, evaluation and approval		
6.2.1 General		
6.2.1a		Applicable
6.2.1b		Applicable
6.2.2 Manufacturer and component selection		
6.2.2.1 General rules		
6.2.2.1a		Applicable
6.2.2.1b		Applicable
6.2.2.1c	<<deleted and moved to 6.2.2.3a>>	Deleted
6.2.2.1d	<<deleted and moved to 6.2.2.3b>>	Deleted
6.2.2.1e	For the assessment of commercial components, the supplier shall collect the available data on the manufacturer and the component in the JD specified in the requirement 6.2.4.d. NOTE It is important to check the exhaustiveness of the manufacturer documentation & data sheet with respect to the following items: • component marking, • mechanical description, • electrical and thermal description	New
6.2.2.1f	<<deleted>>	Deleted
6.2.2.2 Parts and material restriction		
6.2.2.2a		Applicable
6.2.2.2b		Applicable
6.2.2.2c		Applicable
6.2.2.2d		Applicable
6.2.2.2e		Applicable
6.2.2.2f		Applicable
6.2.2.2g		Applicable
6.2.2.2h		Applicable
6.2.2.2i		Applicable
6.2.2.2.j		Applicable
6.2.2.2k		Applicable
6.2.2.2l		Applicable

	6.2.2.3 Preferred sources	
6.2.2.3a		Not applicable
6.2.2.3b		Applicable
6.2.2.3c		Applicable
	6.2.2.4 Radiation hardness	
6.2.2.4a		Applicable
6.2.2.4b		Applicable
6.2.2.4c	<<deleted>>	Deleted
6.2.2.4d	<<deleted>>	Deleted
6.2.2.4e	<<deleted>>	Deleted
6.2.2.4f	<<deleted>>	Deleted
6.2.2.4g		Applicable
6.2.2.4h		Applicable
6.2.2.4i		Applicable
	6.2.2.5 Derating	
6.2.2.5a		Applicable
6.2.2.5b		Deleted
	6.2.2.6 Temperature range	
6.2.2.6a	Commercial parts shall be selected in the highest available temperature range.	New
6.2.2.6b	A minimum 10°C margin shall be used between the maximum manufacturer temperature range and the application temperature range (including worst cases) unless there are additional data or evidence available to limit or extend this margin without exceeding the maximum rating.	New
6.2.2.6c	<<deleted>>	Deleted
6.2.2.6d	Operating temperature range of all commercial parts shall be greater or equal to (-40 / 85) °C.	New
6.2.2.6e	Temperature range of commercial ceramic capacitors shall be greater or equal to (-40 / 125) °C	New
	6.2.3 Component evaluation	
	6.2.3.1 General	
6.2.3.1a		Not applicable
6.2.3.1b		Deleted
6.2.3.1c		Not applicable
6.2.3.1d	An evaluation plan shall be sent to the customer for approval, and include the following elements:	Modified

	1. Construction Analysis	Applicable
	2. Evaluation testing	Not applicable
	3. Radiation Hardness	Applicable
6.2.3.1e		Applicable
6.2.3.1f		Applicable
6.2.3.1g		Applicable
6.2.3.1h		Applicable
6.2.3.1i	The supplier shall review the evaluation results to determine their impact on the content of the lot acceptance tests.	Modified
6.2.3.1j		Applicable
6.2.3.1k		Deleted
6.2.3.2 Component manufacturer assessment		
6.2.3.2a	<<deleted>>	Deleted See 6.2.2.1e
6.2.3.3. Construction analysis		
6.2.3.3a		Applicable
6.2.3.3b	The Construction analysis shall be documented by a procedure to be submitted on request to the customer for information. NOTE Annex H provides guidelines for microcircuits, diodes, transistors and optocouplers.	Modified
6.2.3.3c		Applicable
6.2.3.4 Evaluation testing		
6.2.3.4a		Not applicable
6.2.3.4b		Not applicable
6.2.3.4c	Evaluation tests shall be performed as specified in: 1. Table 8–1 for ceramic capacitors chips, 2. Table 8–2 for solid electrolyte tantalum capacitors chips 3. Table 8–3 for discrete parts (diodes, transistors, optocouplers) 4 Table 8–4 for fuses 5. Table 8–5 for magnetic parts 6. Table 8–6 for microcircuits 7. Table 8–7 for resistors 8. Table 8–8 for thermistors	New

6.2.3.4d	Omission of any of the elements of tests specified in Table 8–1, Table 8–2, Table 8–3, Table 8–4, Table 8–5, Table 8–6, Table 8–7 and Table 8–8, or the introduction of alternative activities, shall be justified in the JD.	New
6.2.3.4.e	<<deleted>>	Deleted

Table 6–1: <<deleted>>

6.2.4 Parts approval		
6.2.4a		Applicable
6.2.4b		Deleted
6.2.4c		Applicable
6.2.4d	The approval process by the customer depends on the part qualification status and shall be organized as follows:	Modified
	1.	Not applicable
	2.	Not applicable
	3.	Applicable
6.2.4e	In case the evaluation results are changing the testing conditions documented in the JD, a new revision of JD shall be submitted to the customer for approval.	Modified
6.2.4f		Applicable
6.2.4g	The previous use or approval of a part, via JD, in any other project shall not be considered as an automatic approval for the present program. NOTE The pertinence of the heritage in terms of mission profile and requirements can be assessed as well as all the deviations (e.g. RFDs, RFWs, special dispositions for a specific space program) previously accepted.	Modified
6.2.4h	Hybrids, ASICs and MMICs shall be covered by JD.	Modified
6.2.4i	For ASICs built on space qualified technologies, the JD may be replaced, if agreed with the customer, by information embedded in the DCL.	Modified
6.3 Component procurement		
6.3.1 General		
6.3.1a		Applicable
6.3.1b		Not applicable
6.3.1c		Not applicable

6.3.1d		Applicable
6.3.1e		Applicable
6.3.1f		Applicable
6.3.1g		Applicable
6.3.1h	Each procured EEE part shall be traceable to a manufacturer assigned trace code. NOTE 1 The procurement of a single trace code per delivery lot should be preferred and encouraged. NOTE 2 Some passive components can be traceable with datecode only.	New
6.3.1i	Each trace code shall be maintained as is through the entire supply chain including distributor. NOTE As far as possible, commercial parts should be ordered in the manufacturer's standard packing quantities or multiples thereof to avoid distributor re-packing and handling and to preserve the traceability information usually included on the original manufacturer packaging.	New
6.3.1j	The supplier shall ensure that the elements of the JD in accordance with Annex F, including any action plan, are applicable to flight parts.	New
6.3.2 Procurement specification		
6.3.2a	The supplier shall procure EEE components according to controlled specifications. NOTE It can be procurer's in-house specification, a manufacturer's drawing or a datasheet as a minimum.	Modified
6.3.2b		Not applicable
6.3.2c		Not applicable
6.3.2d		Not applicable
6.3.2e		Applicable
6.3.2f		Applicable
6.3.2g		Applicable
6.3.2h	If additional requirements are specified to the manufacturer, they shall be identified in a procurement specification.	New

6.3.3 Screening requirements		
6.3.3a		Applicable
6.3.3b		Applicable
6.3.3c		Applicable
6.3.3d	For commercial parts, screening tests shall be performed in accordance with: 1. Table 8–1 for ceramic capacitors chips 2. Table 8–2 for solid electrolyte tantalum capacitors chips 3. Table 8–3 for discrete parts (diodes, transistors, optocouplers) 4. Table 8–4 for fuses 5. Table 8–5 for magnetic parts 6. Table 8–6 for microcircuits 7. Table 8–7 for resistors 8. Table 8–8 for thermistors	Modified
6.3.3e		Deleted
6.3.3f	<<deleted>>	Deleted
6.3.3g		Not applicable
6.3.3h		Applicable

Table 6–2: <<deleted>>

6.3.4 Initial customer source inspection (precap)		
6.3.4a		Applicable
6.3.5 Lot acceptance		
6.3.5a	The supplier shall ensure that any lot/date code of EEE parts is submitted to a lot acceptance procedure, in line with applied normative system, according to the following rules:	Modified
	1.	Not applicable
	2.	Not applicable
	3.	Applicable
6.3.5b		Not applicable
6.3.5c		Applicable
6.3.5d	Lot acceptance tests shall be performed in accordance with: 1. Table 8–1 for ceramic capacitors chips	New

	2. Table 8–2 for solid electrolyte tantalum capacitors chips 3. Table 8–3 for discrete parts (diodes, transistors, optocouplers) 4. Table 8–4 for fuses 5. Table 8–5 for magnetic parts 6. Table 8–6 for microcircuits 7. Table 8–7 for resistors 8. Table 8–8 for thermistors	

Figure 6-1: <<deleted>>

Table 6–3: <<deleted and moved as Legacy test files Table 8–15>>

6.3.6 Final customer inspection (buy-off)		
6.3.6a		Applicable
6.3.7 Incoming inspection		
6.3.7a		Applicable
6.3.7b		Applicable
6.3.7c		Applicable
6.3.7d		Not applicable
6.3.7e		Applicable
6.3.8 Radiation verification testing		
6.3.8a		Applicable
6.3.8b		Applicable
6.3.8c		Not applicable
6.3.8d		Applicable
6.3.8e		Applicable
6.3.8f	Parts submitted to total dose test shall be screened as specified in clause 5.3.3 to be fully representative of flight parts.	New
6.3.9 Destructive physical analysis		
6.3.9a	The DPA shall be performed according to the procurement Tables Table 8–1, Table 8–2, Table 8–3, Table 8–4, Table 8–5, Table 8–6, Table 8–7, Table 8–8 of Clause 8.	Modified
6.3.9b		Not applicable
6.3.9c		Not applicable

6.3.9d	The DPA process shall be documented by a procedure to be submitted, on request, to the customer for information. NOTE For guidance refer to the basic specificaton ESCC 20600 and for active parts ECSS-Q-ST-60-13 Annex H.	Modified
6.3.9e		Applicable
6.3.9f		Deleted
6.3.9g		Not applicable
6.3.9h		Applicable
6.3.9i		Applicable
6.3.9j	<<deleted>>	Deleted
	6.3.10 Relifing	
6.3.10a		Applicable
6.3.10b		Applicable
6.3.10c	<<deleted>>	Deleted
6.3.10d	<<deleted>>	Deleted
	6.3.11 Manufacturer's data documentation deliveries	
6.3.11a	The manufacturer's or the franchised distributor's CoC shall be delivered to the parts procurer.	Modified
6.3.11b	Any other data, defined in the applicable procurement documents, shall be delivered to the parts' procurer in line with the purchase order.	Modified
6.3.11c		Applicable
6.4 Handling and storage		
6.4a		Applicable
6.4b		Applicable
6.4c		Applicable
6.4d		Applicable
6.4e		Applicable
6.4.f		Applicable
6.4.g		Applicable
6.4.h		Applicable
6.4i	Plastic encapsulated devices shall be stored in one of the following conditions: 1. Dry Nitrogen 2. Dry and ionised air with RH in a range of 15% to 20% 3. Dry packs as specified in J-STD-033 for dry pack inspection and control	New

6.5 Components quality assurance		
	6.5.1. General	
6.5.1a		Applicable
	6.5.2 Nonconformances or failures	
6.5.2a		Applicable
6.5.2b		Applicable
6.5.2c		Applicable
6.5.2d		Applicable
	6.5.3 Alerts	
6.5.3a		Applicable
6.5.3b		Applicable
	6.5.4 Traceability	
6.5.4a		Deleted
6.5.4b		Applicable
6.5.4c		Applicable
6.5.4d	The traceability of EEE parts during installation in equipment, shall be ensured by the supplier through maintaining the traceability to the manufacturer's trace code number of the EEE parts actually mounted.	Modified
6.5.4e	The supplier shall be able to provide these information (part type actually installed with its relevant trace code number) within one working day (when the flight system is on launch pad) or within one week (in the other cases).	Modified
	6.5.5 Lot homogeneity for sampling test	
6.5.5a		Applicable
6.5.5b		Applicable
6.6 Specific components		
	6.6.1 General	
6.6.1a	<<deleted>>	Deleted
	6.6.2 ASICs	
6.6.2a		Applicable
	6.6.3 Hybrids	
6.6.3a		Not applicable
6.6.3b		Not applicable
6.6.3c		Not applicable

	6.6.4 One time programmable and reprogrammable devices	
6.6.4a		Applicable
6.6.4b	The JD shall allow traceability to the information related to the procurement of blank parts, the programming process and the acceptance of the programmed parts. NOTE The programming process and the acceptance of the programmed parts may be part of PCB (if it is required), for customer approval, if not indicated in the JD.	Modified
6.6.4c	<<deleted>>	Deleted
6.6.4d		Applicable
6.6.4e		Applicable
6.6.4f		Applicable
6.6.4g	<<deleted>>	Deleted
6.6.4h	<<deleted>>	Deleted
	6.6.5 Microwave monolithic integrated circuits	
6.6.5a		Not Applicable
	6.6.6 Connectors	
6.6.6a		Not applicable
	6.6.7 High Voltage Application	
6.6.7a		Applicable
	6.6.8 Self Made Magnetics	
6.6.8a		Applicable
6.6.8b		Applicable
6.7 Documentation		
6.7a	Any result from inspection or control shall be documented (including lot acceptance, incoming, relifing and complementary tests).	Modified

Table 6–4: Documentation for Class 3 components

Document	Clause	Customer	Comments
New *:* Procedure for hot solder dip process	6.2.2.2j	Approval	For retinning operation
PAD : not applicable	4.2.4	-	-
New *:* Justification Document	6.2.4	Approval	-
Procedure for customer precap : not applicable	4.3.4	-	-
New *:* Procedure for construction analysis	6.2.3.3	Information (on request)	-
New *:* Evaluation, screening and LAT report	6.2.4	Information (on request)	-

7
Quality levels

Not applicable

8
Evaluation, screening and LAT tests

8.1 General

	Clause 8.2 defines the evaluation, screening and lot acceptance tests applicable to several commercial parts families. These tests are requested in the previous requirements clause 4 to clause 6. Clause 8.3 defines legacy test files which are called in Clause 8.2, for active parts. It ensures the consistency between the various issues of the ECSS-Q-ST-60-13.	New
8.1a	<<deleted>>	Deleted

Figure 8-1: <<deleted>>

Figure 8-2: <<deleted>>

Figure 8-3: <<deleted>>

Figure 8-4: <<deleted>>

Figure 8-5: <<deleted>>

Figure 8-6: <<deleted>>

8.2 Applicable Procurement test tables

8.2a	The Test Tables Table 8–1, Table 8–2, Table 8–3, Table 8–4, Table 8–5, Table 8–6, Table 8–7, Table 8–8 shall be used for evaluation, screening and LAT of commercial parts.	New
8.2b	Based on the review of representative data, as per 8.2f, the supplier may propose an adaptation and a minimization of these evaluation tests, to be submitted to customer for approval through the JD's approval process. NOTE This permission is referenced in the Procurement Test Tables as "Note (a)".	New
8.2c	Based on representative data, as per 8.2f, collected in evaluation tests and in the JD, the supplier may propose an adaptation and a minimization of these screening tests to be submitted to customer for approval through the JD's approval process. NOTE This permission is referenced in the Procurement Test Tables as "Note (b)".	New
8.2d	The supplier may propose an adaptation and a minimization of these LAT tests, to be submitted to customer for approval through the JD's approval process, based on representative data, as per 8.2f, on parts not older than 2 years. NOTE This permission is referenced in the Procurement Test Tables as "Note (c)".	New
8.2e	Outgassing test shall only be applied if all the three following conditions are met: 1. part package is based on organic material, AND 2. weight of one part > 100mg, AND 3. test required by the user program or critical applications. NOTE This permission is referenced in the Procurement Test Tables as "Note (d)".	New
8.2f	Representativity data in requirement 8.2b, 8.2c and 8.2d shall comply with the following criteria: 1. Ceramic capacitors chip : same serie; same ceramic type; same range of voltage, capacitance and packages; same manufacturing plant. 2. Solid electrolyte Tantalum capacitor chips: same serie; same electrolyte; same range of voltage, capacitance and package range; same manufacturing plant. 3. Resistor chips: same serie; same range of voltage, resistance and packages; same manufacturing plant. 4. Magnetics : same serie; same rating and package range, same manufacturing plant. 5. Thermistor: same serie; same rating and package range, same manufacturing plant.	New

	6. Discrete parts: Same manufacturing plant, same die mask for life test, same package for environmental and mechanical tests. 7. Microcircuits: Same manufacturing plant, same die mask for life test, same package for environmental and mechanical tests. 8. Fuses: same serie; same range of voltage and packages; same manufacturing plant.	
8.2g	DPA shall only be done on representative samples from each procurement batch in class 2 and class 3. NOTE 1 Representative samples are for example the highest and lowest values or the biggest package). NOTE 2 This permission is referenced in the Procurement Test Tables as "Note (e)".	New

Table 8–1: Procurement test table for ceramic capacitors chips

Ceramic capacitors chips									
Automotive grade	**Class 1**	**Class 2**	**Class 3**	**Category**	**Test type**	**Sample size**	**Test Procedure**	**Specific Test condition**	**Note**
AEC-Q grd 0/1	X	X	X	Evaluation	Construction Analysis	5	ESCC21001		
AEC-Q grd 0/1	X	X	X	Evaluation	Temperature characterization	5	ESCC3009 8.10		Note (a)
AEC-Q grd 0/1	X			Evaluation	Life Test 2000h	40	ESCC3009 8.6 + 8.9	2000 hours	Note (a)
AEC-Q grd 0/1	X			Screening	Complete screening	100%	ESCC3009 chart F3		Note (b)
AEC-Q grd 0/1	X	X	X	LAT	DPA	3	ESCC21001		Note (e)
AEC-Q grd 0/1	X	X		LAT	Life Test 1000h	20	ESCC3009 8.6 + 8.9	1000 hours	Note (c)
No	X	X	X	Evaluation	Construction Analysis	5	ESCC21001		
No	X	X	X	Evaluation	Temperature characterization	5	ESCC 3009 8.10		Note (a)
No	X	X		Evaluation	Complete evaluation	72	ESCC 3009 chart F4	Life Test : 2000h - 40 parts	Note (a)
No			X	Evaluation	Life Test 1000h	40	ESCC3009 8.6 + 8.9	1000 hours	Note (a)
No	X	X	X	Screening	Complete screening	100%	ESCC3009 chart F3		The sample size for the test electrical test @ hot/cold temperature (ESCC3009- 8.3.3) shall be 20 parts Note (b) for class 2 and 3
No	X	X	X	LAT	DPA	3	ESCC21001		

Ceramic capacitors chips									
Automotive grade	**Class 1**	**Class 2**	**Class 3**	**Category**	**Test type**	**Sample size**	**Test Procedure**	**Specific Test condition**	**Note**
No	X			LAT	Complete LAT	52	ESCC 3009 chart F4	Life Test : 1000h – 20 parts	
No		X	X	LAT	Life Test 1000h	20	ESCC3009 8.6 + 8.9	1000 hours	Note (c) for class 3

Note (a): see 8.2b: *Based on the review of representative data, as per 8.2f, the supplier may propose an adaptation and a minimization of these evaluation tests, to be submitted to customer for approval through the JD's approval process.*

Note (b): see 8.2c: *Based on representative data, as per 8.2f, collected in evaluation tests and in the JD, the supplier may propose an adaptation and a minimization of these screening tests to be submitted to customer for approval through the JD's approval process.*

Note (c): see 8.2d: *The supplier may propose an adaptation and a minimization of these LAT tests, to be submitted to customer for approval through the JD's approval process, based on representative data, as per 8.2f, on parts not older than 2 years.*

Note (d): see 8.2e: *Outgassing test shall only be applied if all the three following conditions are met:*
1.part package is based on organic material, AND
2.weight of one part > 100 mg, AND
3.test required by the user program or critical applications.

Note (e): see 8.2g: *DPA shall only be done on representative samples from each procurement batch in class 2 and class 3.*

Table 8–2: Procurement test table for solid electrolyte tantalum capacitors chips

Solid electrolyte tantalum capacitors chips									
Automotive grade	**Class 1**	**Class 2**	**Class 3**	**Category**	**Test type**	**Sample size**	**Test Procedure**	**Specific Test condition**	**Note**
AEC-Q grd 0/1	X	X	X	Evaluation	Construction Analysis	5	ESCC21001		
AEC-Q grd 0/1	X			Evaluation	Life Test 2000h	60	ESCC 3012 chart IV endurance subgroup	36 parts, 85°C @Ur, 2000h 24 parts, 125°C @Uc , 2000h	Note (a)
AEC-Q grd 0/1	x	X	X	Screening	Surge current	100%	Surge current test	MIL-PRF-55365 cond. B or ESCC 3012 ie 9.3.1 + 9.20	
AEC-Q grd 0/1	X			Screening	Complete screening	100%	ESCC 3012 chart III		Note (b)
AEC-Q grd 0/1	X	X	X	LAT	DPA	3	ESCC21001		Note (e)
AEC-Q grd 0/1	X	X		LAT	Life Test 1000h	16	ESCC 3012 chart V - Endurance subgroup	16 parts, 85°C @Ur, 1000h	Note (c)
No	X	X	X	Evaluation	Construction Analysis	5	ESCC21001		
No	X	X		Evaluation	Complete evaluation	108	ESCC 3012 chart IV		Note (a)
No			X	Evaluation	Life Test 1000h	16	ESCC 3012 chart V - Endurance subgroup	16 parts, 85°C @Ur	Note (a)
No	X	X	X	Screening	Surge current	100%	Surge current test	MIL-PRF-55365 cond. B or ESCC 3012 ie 9.3.1 + 9.20	
No	X			Screening	Complete screening	100%	ESCC 3012 chart III		

Solid electrolyte tantalum capacitors chips									
Automotive grade	**Class 1**	**Class 2**	**Class 3**	**Category**	**Test type**	**Sample size**	**Test Procedure**	**Specific Test condition**	**Note**
No		X	X	Screening	burn-in	100%	MIL-PRF-55365 4.7.5	40h; Vrated, 85°C	Note (b)
No	X	X	X	LAT	DPA	3	ESCC21001		
No	X			LAT	Complete LAT	34	ESCC 3012 chart V LAT level 1		
No		X	X	LAT	LAT	16	ESCC 3012 chart V - Endurance subgroup	16 parts, 85°C @Ur	Note (c) in class 3

Note (a): see 8.2b: *Based on the review of representative data, as per 8.2f, the supplier may propose an adaptation and a minimization of these evaluation tests, to be submitted to customer for approval through the JD's approval process.*

Note (b): see 8.2c: *Based on representative data, as per 8.2f, collected in evaluation tests and in the JD, the supplier may propose an adaptation and a minimization of these screening tests to be submitted to customer for approval through the JD's approval process.*

Note (c): see 8.2d: *The supplier may propose an adaptation and a minimization of these LAT tests, to be submitted to customer for approval through the JD's approval process, based on representative data, as per 8.2f, on parts not older than 2 years.*

Note (d): see 8.2e: *Outgassing test shall only be applied if all the three following conditions are met:*
1.part package is based on organic material, AND
2.weight of one part > 100 mg, AND
3.test required by the user program or critical applications.

Note (e): see 8.2g: *DPA shall only be done on representative samples from each procurement batch in class 2 and class 3.*

Table 8–3: Procurement test table for discrete parts (diodes, transistors, optocouplers)

Discrete parts (diodes, transistors, optocouplers)									
Automotive grade	**Class 1**	**Class 2**	**Class 3**	**Category**	**Test type**	**Sample size**	**Test Procedure**	**Specific Test condition**	**Note**
AEC-Q	X	X	X	Evaluation	Radiation evaluation		i.a.w. ECSS-Q-ST-60-15		
AEC-Q	X	X	X	Evaluation	Construction Analysis	5	i.a.w. Annex H + outgassing		Note (d)
AEC-Q	X			Evaluation	Life Test 2000h	15	TM from table 8-9	Life test duration 2000h	Note (a)
AEC-Q	X	X	X	Screening	Hermeticity	all	TM from table 8-10 and 8-13		for hermetic parts
AEC-Q	X	X	X	Screening	PIND test	all	TM from table 8-10 and 8-13		for parts with cavity
AEC-Q	X			Screening	Complete screening	all	TM from table 8-10	burn-in duration 240h	Note (b)
AEC-Q	X	X	X	LAT	RVT		i.a.w. ECSS-Q-ST-60-15		
AEC-Q	X	X	X	LAT	Construction Analysis	5	i.a.w. Annex H		
AEC-Q	X	X		LAT	Life test	15	TM from table 8-11 and 8-14	Life test duration 1000h	Note (c)
No	X	X	X	Evaluation	Radiation evaluation		i.a.w. ECSS-Q-ST-60-15		
No	X	X	X	Evaluation	Construction Analysis	5	i.a.w. Annex H + outgassing		Note (d)
No	X	X		Evaluation	Complete Evaluation	see tables	TM from table 8-9 and 8-12		Note (a)
No	X	X	X	Screening	Hermeticity	all	TM from table 8-10 and 8-13		for hermetic parts

Discrete parts (diodes, transistors, optocouplers)									
Automotive grade	**Class 1**	**Class 2**	**Class 3**	**Category**	**Test type**	**Sample size**	**Test Procedure**	**Specific Test condition**	**Note**
No	X	X	X	Screening	PIND test	all	TM from table 8-10 and 8-13		for parts with cavity
No	X	X		Screening	Complete screening	all	TM from table 8-10 and 8-13	240/168h duration in class 1/2	Note (b) in class 2
No	X	X	X	LAT	RVT		i.a.w. ECSS-Q-ST-60-15		
No	X	X	X	LAT	Construction Analysis	5	i.a.w. Annex H		
No	X	X	X	LAT	Complete LAT	see tables	TM from table 8-11, 8-14, 8-15	Life test duration 1000h	Note (c) in class3

Note (a): see 8.2b: *Based on the review of representative data, as per 8.2f, the supplier may propose an adaptation and a minimization of these evaluation tests, to be submitted to customer for approval through the JD's approval process.*

Note (b): see 8.2c: *Based on representative data, as per 8.2f, collected in evaluation tests and in the JD, the supplier may propose an adaptation and a minimization of these screening tests to be submitted to customer for approval through the JD's approval process.*

Note (c): see 8.2d: *The supplier may propose an adaptation and a minimization of these LAT tests, to be submitted to customer for approval through the JD's approval process, based on representative data, as per 8.2f, on parts not older than 2 years.*

Note (d): see 8.2e: *Outgassing test shall only be applied if all the three following conditions are met:*
1.part package is based on organic material, AND
2.weight of one part > 100 mg, AND
3.test required by the user program or critical applications.

Note (e): see 8.2g: *DPA shall only be done on representative samples from each procurement batch in class 2 and class 3.*

Table 8–4: Procurement test table for fuses

Fuses									
Automotive grade	**Class 1**	**Class 2**	**Class 3**	**Category**	**Test type**	**Sample size**	**Test Procedure**	**Specific Test condition**	**Note**
AEC-Q grd 0/1	X	X	X	Evaluation	Construction Analysis	5	ESCC 21001		
AEC-Q grd 0/1	X	X	X	Evaluation	Fusion characterization	20	ESCC 4008 test 8.5		
AEC-Q grd 0/1	X			Evaluation	Life Test 2000h	20	ESCC 4008 chart F4 endurance subgroup	2000h at 125°C and rated current specified at 125°C	Note (a)
AEC-Q grd 0/1	X			Screening	Complete screening	all	ESCC 4008 chart F3	168h burn-in at 85°C and rated current specified at 85°C	Note (b)
AEC-Q grd 0/1	X	X	X	LAT	DPA	3	ESCC 21001		Note (e)
AEC-Q grd 0/1	X	X		LAT	Life test 1000h	20	ESCC 4008 chart F4 endurance subgroup	1000h at 125°C and rated current specified at 125°C	Note (c)
No	X	X	X	Evaluation	Construction Analysis	5	ESCC 21001		
No	X	X	X	Evaluation	Fusion characterization	20	ESCC 4008 test 8.5		
No	X	X		Evaluation	Complete Evaluation	66	ESCC 4008 chart F4	Life test 2000h at 125°C and rated current specified at 125°C	Note (a) If max rating temperature is less than 125°C then the life test shall be extended to cover an equivalent life time

Fuses									
Automotive grade	**Class 1**	**Class 2**	**Class 3**	**Category**	**Test type**	**Sample size**	**Test Procedure**	**Specific Test condition**	**Note**
No			X	Evaluation	Life test 1000h	20	ESCC 4008 chart F4 endurance subgroup	1000h at 125°C and rated current specified at 125°C	Note (a) If max rating temperature is less than 125°C then the life test shall be extended to cover an equivalent life time.
No	X	X	X	Screening	Complete screening	all	ESCC 4008 chart F3	168h burn-in class 1 96h burn-in class 2&3 at 85°C and rated current specified at 85°C	Note (b) in class 2 & 3
No	X	X	X	LAT	DPA	3	ESCC 21001		
No	X			LAT	Complete LAT	66	ESCC 4008 chart F4		
No		X	X	LAT	Life Test 1000h	20	ESCC 4008 chart F4 endurance subgroup	1000h at 125°C and rated current specified at 125°C	Note (c) in class 3 If max rating temperature is less than 125°C then the life test shall be extended to cover an equivalent life time

Note (a): see 8.2b: *Based on the review of representative data, as per 8.2f, the supplier may propose an adaptation and a minimization of these evaluation tests, to be submitted to customer for approval through the JD's approval process.*

Note (b): see 8.2c: *Based on representative data, as per 8.2f, collected in evaluation tests and in the JD, the supplier may propose an adaptation and a minimization of these screening tests to be submitted to customer for approval through the JD's approval process.*

Fuses									
Automotive grade	**Class 1**	**Class 2**	**Class 3**	**Category**	**Test type**	**Sample size**	**Test Procedure**	**Specific Test condition**	**Note**
Note (c): see 8.2d: *The supplier may propose an adaptation and a minimization of these LAT tests, to be submitted to customer for approval through the JD's approval process, based on representative data, as per 8.2f, on parts not older than 2 years.* Note (d): see 8.2e: *Outgassing test shall only be applied if all the three following conditions are met:* *1.part package is based on organic material, AND* *2.weight of one part > 100 mg, AND* *3.test required by the user program or critical applications.* Note (e): see 8.2g: *DPA shall only be done on representative samples from each procurement batch in class 2 and class 3.*									

Table 8–5: Procurement test table for magnetics

Magnetic parts									
Automotive grade	**Class 1**	**Class 2**	**Class 3**	**Category**	**Test type**	**Sample size**	**Test Procedure**	**Specific Test condition**	**Note**
AEC-Q grd 0/1	X	X	X	Evaluation	Construction Analysis	5	ESCC 21001 + outgassing test		Note (d)
AEC-Q grd 0/1	X			Evaluation	Life Test 2000h	20	ESCC 3201 chart F4 endurance subgroup	2000h at max rated temperature and current/power	Note (a) and Shock and vibration level tolerance shall be compared to the application constraint to adapt the evaluation tests
AEC-Q grd 0/1	X	X	X	Evaluation	Temperature Rise test		ESCC 3201 Para 8.7		Note (a)
AEC-Q grd 0/1	X			Screening	Complete screening	all	ESCC 3201 chart F3	168h burn-in current on for high power component Current off for low power component	Note (b) Part is considered high power if max rated power is above 0,8W
AEC-Q grd 0/1	X	X	X	LAT	DPA	3	ESCC 21001		Note (e)
AEC-Q grd 0/1	X	X		LAT	Life test 1000h	20	ESCC 3201 chart F4 endurance subgroup	1000h at max rated temperature and current/power	Note (c)

Magnetic parts									
Automotive grade	**Class 1**	**Class 2**	**Class 3**	**Category**	**Test type**	**Sample size**	**Test Procedure**	**Specific Test condition**	**Note**
No	X	X	X	Evaluation	Construction Analysis	5	ESCC 21001 + outgassing test		Note (d)
No	X	X		Evaluation	Complete Evaluation	43	ESCC 3201 chart F4	2000h at max rated temperature and current/power	Note (a)
No			X	Evaluation	Life test 1000h	20	ESCC 3201 chart F4 endurance subgroup	1000h at max rated temperature and current/power	Note (a)
No			X	Evaluation	Temperature Rise test + thermal shocks	10	ESCC 3201 Para 8.7 + 8,2	100 cycles	Note (a)
No	X	X			Complete screening	all	ESCC 3201 chart F3	168/96h burn-in class ½ current on for high power component Current off for low power component 25 cycles thermal cycles	Note (b) in class 2 Part is considered high power if max rated power is above 0,8W
No			X	Screening	Thermal Shocks	all	ESCC 3201 para 8,2	25 cycles	Note (b)
No	X	X	X	LAT	DPA	3	ESCC 21001		
No	X			LAT	Complete LAT	43	ESCC 3201 chart F4	1000h at max rated temperature and current/power	Note (c)

Magnetic parts									
Automotive grade	**Class 1**	**Class 2**	**Class 3**	**Category**	**Test type**	**Sample size**	**Test Procedure**	**Specific Test condition**	**Note**
No		X	X	LAT	Life Test 1000h	20	ESCC 3201 chart F4 endurance subgroup	1000h at max rated temperature and current/power	Note (c) in class 3

Note (a): see 8.2b: *Based on the review of representative data, as per 8.2f, the supplier may propose an adaptation and a minimization of these evaluation tests, to be submitted to customer for approval through the JD's approval process.*

Note (b): see 8.2c: *Based on representative data, as per 8.2f, collected in evaluation tests and in the JD, the supplier may propose an adaptation and a minimization of these screening tests to be submitted to customer for approval through the JD's approval process.*

Note (c): see 8.2d: *The supplier may propose an adaptation and a minimization of these LAT tests, to be submitted to customer for approval through the JD's approval process, based on representative data, as per 8.2f, on parts not older than 2 years.*

Note (d): see 8.2e: *Outgassing test shall only be applied if all the three following conditions are met:*
1.part package is based on organic material, AND
2.weight of one part > 100 mg, AND
3.test required by the user program or critical applications.

Note (e): see 8.2g: *DPA shall only be done on representative samples from each procurement batch in class 2 and class 3.*

Table 8–6: Procurement test table for microcircuits

Microcircuits									
Automotive grade	**Class 1**	**Class 2**	**Class 3**	**Category**	**Test type**	**Sample size**	**Test Procedure**	**Specific Test condition**	**Note**
AEC-Q grd 0/1	X	X	X	Evaluation	Radiation evaluation		i.a.w. ECSS-Q-ST-60-15		
AEC-Q grd 0/1	X	X	X	Evaluation	Construction Analysis	5	i.a.w. Annex H + outgassing		Note (d)
AEC-Q grd 0/1	X			Evaluation	Life Test 2000h	15	TM from Table 8-9	2000h LT	Note (a)
AEC-Q grd 0/1	X	X	X	Screening	Hermeticity	all	TM from Table 8-10 and 8-13		for hermetic parts
AEC-Q grd 0/1	X	X	X	Screening	PIND test	all	TM from Table 8-10 and 8-13		for parts with cavity
AEC-Q grd 0/1	X			Screening	Complete screening	all	TM from Table 8-10	240h burn-in	Note (b)
AEC-Q grd 0/1	X	X	X	LAT	RVT		i.a.w. ECSS-Q-ST-60-15		
AEC-Q grd 0/1	X	X	X	LAT	Construction Analysis	5	i.a.w. Annex H		
AEC-Q grd 0/1	X	X		LAT	Life test 1000h	15	TM from Table 8-11 and 8-14	1000h LT	Note (c)
No	X	X	X	Evaluation	Radiation evaluation		i.a.w. ECSS-Q-ST-60-15		
No	X	X	X	Evaluation	Construction Analysis	5	i.a.w. Annex H + outgassing		Note (d)
No	X	X		Evaluation	Complete Evaluation	see tables	TM from Table 8-9 and 8-12		Note (a)
No	X	X	X	Screening	Hermeticity	all	TM from Table 8-10 and 8-13		for hermetic parts
No	X	X	X	Screening	PIND test	all	TM from Table 8-10 and 8-13		for parts with cavity
No	X	X		Screening	Complete screening	all	TM from Table 8-10 and 8-13	240/168h duration in class 1/2	Note (b) in class 2
No	X	X	X	LAT	RVT		i.a.w. ECSS-Q-ST-60-15		
No	X	X	X	LAT	Construction Analysis	5	i.a.w. Annex H		

Microcircuits									
Automotive grade	**Class 1**	**Class 2**	**Class 3**	**Category**	**Test type**	**Sample size**	**Test Procedure**	**Specific Test condition**	**Note**
No	X	X	X	LAT	Complete LAT	see tables	TM from Table 8-11, 8-14 and 8-15	Life test duration 1000h	Note (c) in class 3

Note (a): see 8.2b: *Based on the review of representative data, as per 8.2f, the supplier may propose an adaptation and a minimization of these evaluation tests, to be submitted to customer for approval through the JD's approval process.*

Note (b): see 8.2c: *Based on representative data, as per 8.2f, collected in evaluation tests and in the JD, the supplier may propose an adaptation and a minimization of these screening tests to be submitted to customer for approval through the JD's approval process.*

Note (c): see 8.2d: *The supplier may propose an adaptation and a minimization of these LAT tests, to be submitted to customer for approval through the JD's approval process, based on representative data, as per 8.2f, on parts not older than 2 years.*

Note (d): see 8.2e: *Outgassing test shall only be applied if all the three following conditions are met:*
1.part package is based on organic material, AND
2.weight of one part > 100 mg, AND
3.test required by the user program or critical applications.

Note (e): see 8.2g: *DPA shall only be done on representative samples from each procurement batch in class 2 and class 3.*

Table 8–7: Procurement test table for resistor chips

Resistor chips									
Automotive grade	**Class 1**	**Class 2**	**Class 3**	**Category**	**Test type**	**Sample size**	**Test Procedure**	**Specific Test condition**	**Note**
AEC-Q grd 0/1	X	X	X	Evaluation	Construction Analysis	5	ESCC 21001		
AEC-Q grd 0/1	X			Evaluation	Life Test 2000h	54	ESCC 4001 - Chart F4 Endurance subgroup	Life Test 2000h at 70C at voltage √(Pn x Rn) where Pn rated dissipation and Rn rated resistance or limiting element voltage whichever is less	Note (a)
AEC-Q grd 0/1	X			Screening	Complete screening	all	ESCC 4001 - chart F3	Burn-in for 168h at 70C at voltage √(Pn x Rn) where Pn rated dissipation and Rn rated resistance or limiting element voltage whichever is less	Note (b)
AEC-Q grd 0/1	X	X	X	LAT	DPA	3	ESCC 21001		Note (e)
AEC-Q grd 0/1	X	X		LAT	Life test 1000h	15	ESCC 4001 - Chart F4 Endurance subgroup	Life test 1000H at 70C at voltage √(Pn x Rn) where Pn rated dissipation and Rn rated resistance or limiting element voltage whichever is less	Note (c)
No	X	X	X	Evaluation	Construction Analysis	5	ESCC 21001		
No	X	X	X	Evaluation	Humidity test	15	IEC Publication No. 60068-2	40°C/95%, 100V or Vmax	Note (a) and

Resistor chips									
Automotive grade	**Class 1**	**Class 2**	**Class 3**	**Category**	**Test type**	**Sample size**	**Test Procedure**	**Specific Test condition**	**Note**
									For NiCr resistors only
No	X	X		Evaluation	Complete Evaluation	96	ESCC 4001 - chart F4 "Environmental + endurance"	Life test 2000H at 70°C at voltage √(Pn x Rn) where Pn rated dissipation and Rn rated resistance or limiting element voltage whichever is less	Note (a)
No			X	Evaluation	Life test 1000h	54	ESCC 4001 - Chart F4 Endurance subgroup	Life Test 1000h at 70°C at voltage √(Pn x Rn) where Pn rated dissipation and Rn rated resistance or limiting element voltage whichever is less	Note (a)
No	X			Screening	Complete screening	all	ESCC 4001 - chart F3	Burn-in for 168h at 70°C at voltage √(Pn x Rn) where Pn rated dissipation and Rn rated resistance or limiting element voltage whichever is less	
No		X	X	Screening	Burn-in	all	ESCC 4001 8.4+ 8.3.2 + 8.3.4	96h at 70°C at voltage √(Pn x Rn) where Pn rated dissipation and Rn rated resistance or limiting	Note (b)

Resistor chips									
Automotive grade	**Class 1**	**Class 2**	**Class 3**	**Category**	**Test type**	**Sample size**	**Test Procedure**	**Specific Test condition**	**Note**
								element voltage whichever is less	
No	X	X	X	LAT	DPA	3	ESCC 21001		
No	X			LAT	Complete LAT	57	ESCC 4001 - chart F4 Environmental + endurance	Life test 2000H at 70°C at voltage √(Pn x Rn) where Pn rated dissipation and Rn rated resistance or limiting element voltage whichever is less	
No		X	X	LAT	Life Test 1000h	15	ESCC 4001 - Chart F4 Endurance subgroup	Life test 1000H at 70°C at voltage √(Pn x Rn) where Pn rated dissipation and Rn rated resistance or limiting element voltage whichever is less	Note (c) in class 3

Note (a): see 8.2b: *Based on the review of representative data, as per 8.2f, the supplier may propose an adaptation and a minimization of these evaluation tests, to be submitted to customer for approval through the JD's approval process.*

Note (b): see 8.2c: *Based on representative data, as per 8.2f, collected in evaluation tests and in the JD, the supplier may propose an adaptation and a minimization of these screening tests to be submitted to customer for approval through the JD's approval process.*

Note (c): see 8.2d: *The supplier may propose an adaptation and a minimization of these LAT tests, to be submitted to customer for approval through the JD's approval process, based on representative data, as per 8.2f, on parts not older than 2 years.*

Note (d): see 8.2e: *Outgassing test shall only be applied if all the three following conditions are met:*
1.part package is based on organic material, AND
2.weight of one part > 100 mg, AND
3.test required by the user program or critical applications.

Note (e): see 8.2g: *DPA shall only be done on representative samples from each procurement batch in class 2 and class 3.*

Table 8–8: Procurement test table for Thermistors

Thermistors									
Automotive grade	**Class 1**	**Class 2**	**Class 3**	**Category**	**Test type**	**Sample size**	**Test Procedure**	**Specific Test condition**	**Note**
AEC-Q grd 0/1	X	X	X	Evaluation	Construction Analysis	5	ESCC 21001		
AEC-Q grd 0/1	X			Evaluation	Endurance 2000h	40	ESCC 4006 - Chart F4 - Endurance subgroup	Life test 2000h at maximum rated power and temperature	Note (a)
AEC-Q grd 0/1	X	X	X	Evaluation	Resistance versus Temperature	10	ESCC 4006 Para 8.3.3 and 8.3.4		Note (a)
AEC-Q grd 0/1	X			Screening	Complete screening	all	ESCC 4006 - Chart F3	Burn-in 168h at maximum rated power and temperature	Note (b)
AEC-Q grd 0/1	X	X	X	LAT	Construction Analysis	3	ESCC 21001		Note (e)
AEC-Q grd 0/1	X	X		LAT	Endurance 1000h	40	ESCC 4006 - Chart F4 - Endurance subgroup	Life test 1000h at maximum rated power and temperature	Note (c)
No	X	X	X	Evaluation	Construction Analysis	5	ESCC 21001		
No	X	X		Evaluation	Complete Evaluation	76	ESCC4006 - chart F4	Thermal shock 100 cycles Condition C with an exposure time of 10 minutes at each rated temperature extreme. Life test 2000h at maximum rated power and temperature	Note (a)

Thermistors									
Automotive grade	**Class 1**	**Class 2**	**Class 3**	**Category**	**Test type**	**Sample size**	**Test Procedure**	**Specific Test condition**	**Note**
No			X	Evaluation	Endurance 1000h	40	ESCC 4006 - Chart F4 - Endurance subgroup	Life test 1000h at maximum rated power and temperature	Note (a)
No			X	Evaluation	Resistance versus Temperature	10	ESCC 4006 Para 8.3.3 and 8.3.4		Note (a)
No	X			Screening	Complete screening	all	ESCC 4006 - Chart F3	Burn-in 168h at maximum rated power and temperature	
No		X	X	Screening	Burn-in	all	ESCC 4006 - 8.4 + 8.3.3 + 8.3.4	96h at maximum rated power and temperature	Note (b)
No	X	X	X	LAT	DPA	3	ESCC 21001		
No	X			LAT	Complete LAT	76	ESCC4006 - chart F4	Thermal shock 100 cycles Condition C with an exposure time of 10 minutes at each rated temperature extreme. Life test 2000h at maximum rated power and temperature	
No		X		LAT	Endurance 1000h	40	ESCC 4006 - Chart F4 - Endurance subgroup	Life test 1000h at maximum rated power and temperature	

Thermistors									
Automotive grade	**Class 1**	**Class 2**	**Class 3**	**Category**	**Test type**	**Sample size**	**Test Procedure**	**Specific Test condition**	**Note**
No			X	LAT	Life Test 1000h	20	ESCC 4006 - Chart F4 - Life test file from Endurance subgroup	1000h at maximum rated power and temperature	Note (c)

Note (a): see 8.2b: *Based on the review of representative data, as per 8.2f, the supplier may propose an adaptation and a minimization of these evaluation tests, to be submitted to customer for approval through the JD's approval process.*

Note (b): see 8.2c: *Based on representative data, as per 8.2f, collected in evaluation tests and in the JD, the supplier may propose an adaptation and a minimization of these screening tests to be submitted to customer for approval through the JD's approval process.*

Note (c): see 8.2d: *The supplier may propose an adaptation and a minimization of these LAT tests, to be submitted to customer for approval through the JD's approval process, based on representative data, as per 8.2f, on parts not older than 2 years.*

Note (d): see 8.2e: *Outgassing test shall only be applied if all the three following conditions are met:*
1.part package is based on organic material, AND
2.weight of one part > 100 mg, AND
3.test required by the user program or critical applications.

Note (e): see 8.2g: *DPA shall only be done on representative samples from each procurement batch in class 2 and class 3.*

8.3 Legacy test files

8.3.a	The test methods and test files in Table 8–9, Table 8–10, Table 8–11, Table 8–12, Table 8–13. Table 8–14, Table 8–15 shall be used for the procurement of discrete and microcircuits, when they are requested in Table 8–3 and Table 8–6. NOTE These test tables are inherited from the ECSS-Q-ST-60-13C with small corrections. They are used to ensure consistency between the various ECSS-Q-ST-60-13 issues.	New

Table 8–9: Legacy test files - Evaluation tests for Class 1 components - Active parts

	TEST	SAMPLING	METHOD / CRITERIA	COMMENTS
1	Construction analysis	5 parts	As per clause 4.2.3.3 See Annex H	-
2	Electrical characterization	10 parts min 0 defect accepted	Electrical test under 3 T° (min, typ, max) or at using range +10 °C (whichever is higher as per 4.2.2.6).	Read & record for electrical test as per the preliminary issue of the internal supplier's specification (see 4.2.3.1.k).
3	External visual inspection	10 parts min	ESCC 2055000 ESCC 2059000	
4	Mechanical shocks	10 parts min	MIL STD 883 TM 2002 condition B - 50 pulses (per orientation) instead of 5 pulses (per orientation). MIL-STD-750 TM 2016, 1500g, 0,5ms duration - 50 shocks instead of 5 shocks, planes X1, Y1 and Z1.	Applicable to cavity package. Read & record for electrical test as per the preliminary issue of the internal supplier's specification (see 4.2.3.1.k).
	Vibrations		MIL-STD-883, TM 2007 condition A - 120 times (total) instead of 12 times (total) MIL-STD-750, TM 2056, 20g, 10-2000Hz, cross over at 50Hz - 120 times (total) instead of 12 times (total).	
	Constant acceleration		MIL-STD-883, TM 2001 condition E (resultant centrifugal acceleration to be in the Y1 axis only).	

	TEST	SAMPLING	METHOD / CRITERIA	COMMENTS
			For components which have a package weight of 5 grammes or more, or whose inner seal or cavity perimeter is more than 5 cm, Condition D shall be used MIL-STD-750, TM 2006, 20000g, planes X1, Y1 and Y2.	
5	Preconditioning + 96h HAST (or 1000h THB 85/85)	10 parts min	HAST 96h-130°C-85% RH (JESD22-A110 with continuous bias) or THB (JESD22-A101) Initial and final electrical test at 25°C (parameter & functional) Preconditioning: i.a.w. JESD-22-A113 for SMD JESD-22-B106 for through hole.	Applicable to plastic package. Read & record for electrical test as per the preliminary issue of the internal supplier's specification (see 4.2.3.1.k).
6	C-SAM	10 parts min	JEDEC J-STD-020	To be done on the 10 parts of step 7 after the electrical test at 25°C and before preconditioning. C-SAM test only applicable to plastic package.
7	Preconditioning + Thermal Cycling	10 parts min	500 T/C -55°/+125°C (or to the manufacturer storage temp., whichever is less) MIL-STD-750. method 1051 cond.B MIL-STD-883 method 1010 cond.B Initial, intermediate (100 T/C) and final electrical tests at 25°C (parameter & functional). Preconditioning: i.a.w. JESD-22-A113 for SMD JESD-22-B106 for through hole.	Preconditioning applicable to plastic package only. Read & record for electrical tests as per the preliminary issue of the internal supplier's specification (see 4.2.3.1.k).
8	Seal test	10 parts min	MIL-STD-883 TM 1014 condition A or B (fine leak) and condition C (gross leak). MIL-STD-750 TM 1071 condition H1 or H2 (fine leak) and condition C or K (gross leak with cavity) or condition E (gross leak without cavity).	Applicable to hermetic & cavity package.
9	Lifetest 2000h-125°C minimum	10 parts min	MIL-STD-750 method 1026 & 1042 MIL-STD-883 method 1005 cond.D	The lifetest duration shall be 2000h at minimum 125°C.

	TEST	SAMPLING	METHOD / CRITERIA	COMMENTS
			Initial, intermediate (1000h) and final electrical tests at 3 T° (min, typ, max) (parameter & functional).	In case of a temperature lower than 125°C, the lifetest duration is extended i.a.w. MIL-STD-883 method 1005. Read & record for electrical tests. as per the preliminary issue of the internal supplier's specification (see 4.2.3.1.k).
10	DPA	3 parts	As per clause 4.3.9	To be done on 3 parts after lifetest (as per above step 4).
11	Radiation evaluation	i.a.w. ECSS-Q-ST-60-15	See ECSS-Q-ST-60-15	-

Table 8–10: Legacy test files - Screening tests for Class 1 components - Active parts

	TEST	SAMPLING	METHOD	COMMENTS
1	X-rays	100%	MIL-STD-750 method 2076 MIL-STD-883 method 2012.	The total dose deposited and exposure time shall not deteriorate part performance or reliability.
2	Serialization	100%	Defined by the supplier.	-
3	Temperature cycling	100%	10 T/C -55°/+125°C (or to the manufacturer storage temp., whichever is less). MIL-STD-750 method 1051 MIL-STD-883 method 1010	-
4	PIND test	100%	MIL-STD-750 method 2052 cond.A MIL-STD-883 method 2020 cond.A	Applicable to cavity package only.
5	Initial electrical test	100%	Electrical test (para-metrical and functional) at 25°C as per the internal supplier's specification.	Read & record on selected parameters as per the internal supplier's specification (see 4.2.3.1.k).
6	Burn-in	100%	MIL-STD-750 method 1038 & 1039 MIL-STd-883 method 1015 cond.B 240h – 125°C or 445h – 105°C or 885h – 85°C	Temperature shall be < Tjmax-10°C and Tg-10°C whichever is lower. In absence of Tj or Tg knowledge, 105°C max is required. Ea = 0,4eV for equivalence calculation unless a different value has been demonstrated for the product. Termination oxidation risk shall be controlled after burn-in. For discrete, HTRB and power burn-in depend on product family.
7	Final electrical test	100%	Electrical test (para-metrical and functional) at 3 temp. as per the internal supplier's specification.	Read & record on selected parameters as per the internal supplier's specification (see 4.2.3.1k).

	TEST	SAMPLING	METHOD	COMMENTS
8	PDA	-	On steps 5 and 7. Max acceptable PDA: 5%	PDA calculation applies to room temperature measurement only.
9	Seal test	100%	MIL-STD-750 method 1071 cond H1 or H2 and C or K. MIL-STD-883 method 1014 cond A or B and C.	Applicable to hermetic & cavity package only.
10	External visual inspection	100%	MIL-STD-750 method 2071 MIL-STD-883 method 2009	The MIL specs are not adapted to visual inspection of plastic encapsulated components, but can be used as reference (mainly for connection corrosion and marking acceptance). In addition, for plastic packages, inspect for the following defects: Package deformation/ Foreign inclusions in the package, voids and cracks in the plastic/ deformed leads.

Table 8–11: Legacy test files - Lot acceptance tests for Class 1 components - Active parts

	TEST	SAMPLING / CRITERIA	METHOD	COMMENTS
1	Construction analysis	5 parts	As per clause 4.2.3.3 see Annex H.	-
2	Mechanical shocks	10 parts min (0 defect accepted)	MIL STD 883 TM 2002 condition B - 5 pulses (per orientation) MIL-STD-750 TM 2016, 1500g, 0,5ms duration - 5 shocks, planes X1, Y1 and Z1.	Applicable to cavity package. Read & record for electrical test as per the preliminary issue of the internal supplier's specification (see 4.2.3.1.k).
	Vibrations		MIL-STD-883, TM 2007 condition A - 12 times (total). MIL-STD-750, TM 2056, 20g, 10-2000Hz, cross over at 50Hz - 12 times (total).	
	Constant acceleration		MIL-STD-883, TM 2001 condition E (resultant centrifugal acceleration to be in the Y1 axis only). For components which have a package weight of 5 grammes or more, or whose inner seal or cavity perimeter is more than 5 cm, Condition D shall be used. MIL-STD-750, TM 2006, 20000g, planes X1, Y1 and Y2.	
3	Preconditioning + 96h HAST (or 1000h THB 85/85)	10 parts 0 defect accepted	HAST 96h-130°C-85%RH (JESD22-A110 with continuous bias) or THB (JESD22-A101). Electrical test (para-metrical and functional) at 25°C as per the internal supplier's specification. Preconditioning: i.a.w. JESD-22-A113 for SMD JESD-22-B106 for through hole.	Applicable to plastic package. Internal supplier's specification (see 4.2.3.1k)
4	C-SAM	10 parts	JEDEC J-STD-020	To be done on the 10 parts of step 5 after the electrical test at 25°C and before preconditioning.

	TEST	SAMPLING / CRITERIA	METHOD	COMMENTS
				C-SAM test only applicable to plastic package.
5	Preconditioning + Thermal Cycling [1]	10 parts 0 defect accepted	100 T/C -55°/+125°C (or to the manufacturer storage temp., whichever is less) MIL-STD-750 method 1051 cond.B MIL-STD-883 method 1010 cond.B Electrical test (para-metrical and functional) at 25°C as per the internal supplier's specification. Preconditioning: i.a.w. JESD-22-A113 for SMD JESD-22-B106 for through hole.	Preconditioning applicable to plastic package only. Internal supplier's specification (see 4.2.3.1k)
6	Seal test	10 parts min (0 defect accepted)	MIL-STD-883 TM 1014 condition A or B (fine leak) and condition C (gross leak). MIL-STD-750 TM 1071 condition H1 or H2 (fine leak) and condition C or K (gross leak with cavity) or condition E (gross leak without cavity).	Applicable to hermetic & cavity package.
7	C-SAM	10 parts	JEDEC J-STD-020	To be done on the 10 parts of step 5 after thermal cycling and the electrical test at 25°C. C-SAM test only applicable to plastic package.
8	Lifetest [1]	15 parts 0 defect accepted	1000h – 125°C minimum MIL-STD-750 method 1026 or 1042 MIL-STD-883 method 1005 cond.D Initial, intermediate (1000h) and final electrical test (para-metrical and functional) at 25°C	The lifetest duration shall be 1000h at minimum 125°C. In case of a temperature lower than 125°C, the lifetest duration is extended i.a.w. MIL-STD-883 method 1005. Can be reduced to 1000h if data 2000h are available (DC less than 2 years) and no technology change occurred.

	TEST	SAMPLING / CRITERIA	METHOD	COMMENTS
				Read & record and drift calculation on selected parameters as per the internal supplier's specification (see 4.2.3.1k).
9	External visual inspection	10 parts min	ESCC 2055000 ESCC 2059000	
10	Radiation Verification Test [1]	i.a.w. ECSS-Q-ST-60-15	See ECSS-Q-ST-60-15	-
[1] : Lifetest, thermal cycling and radiation verification test are performed on screened parts (see 4.3.3).				

Table 8–12: Legacy test files - Evaluation tests - Class 2 components - Active parts

	TEST	SAMPLING	METHOD / CRITERIA	COMMENTS
1	Construction analysis	5 parts	As per clause 5.2.2.3 See Annex H	-
2	Electrical characterization	10 parts min 0 defect accepted	Electrical test under 3 T° (min, typ, max) or at using range +10 °C (whichever is higher as per 4.2.2.6).	Read & record for electrical test as per the preliminary issue of the internal supplier's specification (see 4.2.3.1.k).
3	External visual inspection	10 parts min	ESCC 2055000 ESCC 2059000	
4	Mechanical shocks	10 parts min 0 defect accepted	MIL STD 883 TM 2002 condition B - 50 pulses (per orientation) instead of 5 pulses (per orientation). MIL-STD-750 TM 2016, 1500g, 0,5ms duration - 50 shocks instead of 5 shocks, planes X1, Y1 and Z1.	Applicable to cavity package. Read & record for electrical test as per the preliminary issue of the internal supplier's specification (see 4.2.3.1.k).
	Vibrations		MIL-STD-883, TM 2007 condition A - 120 times (total) instead of 12 times (total). MIL-STD-750, TM 2056, 20g, 10-2000Hz, cross over at 50Hz - 120 times (total) instead of 12 times (total).	
	Constant acceleration		MIL-STD-883, TM 2001 condition E (resultant centrifugal acceleration to be in the Y1 axis only). For components which have a package weight of 5 grammes or more, or whose inner seal or cavity perimeter is more than 5 cm, Condition D shall be used. MIL-STD-750, TM 2006, 20000g, planes X1, Y1 and Y2.	

	TEST	SAMPLING	METHOD / CRITERIA	COMMENTS
5	Preconditioning + 96h HAST (or 1000h THB 85/85)	10 parts min	HAST 96h-130°C-85%RH (JESD22-A110 with continuous bias) or THB (JESD22-A101) Initial and final electrical test at 25°C (parameter & functional) Preconditioning: i.a.w. JESD-22-A113 for SMD JESD-22-B106 for through hole.	Applicable to plastic package. Read & record for electrical test as per the preliminary issue of the internal supplier's specification (see 4.2.3.1.k).
6	C-SAM	10 parts min	JEDEC J-STD-020	To be done on the 10 parts of step 7 after the electrical test at 25°C and before preconditioning. C-SAM test only applicable to plastic package.
7	Preconditioning + Thermal Cycling	10 parts min 0 defect accepted	500 T/C -55°/+125°C (or to the manufacturer storage temp., whichever is less) MIL-STD-750. method 1051 cond.B MIL-STD-883 method 1010 cond.B Initial, intermediate (100 T/C) and final electrical tests at 25°C (parameter & functional). Preconditioning: i.a.w. JESD-22-A113 for SMD JESD-22-B106 for through hole.	Preconditioning applicable to plastic package only. Read & record for electrical tests as per the preliminary issue of the internal supplier's specification (see 4.2.3.1.k).
8	Seal test	10 parts min 0 defect accepted	MIL-STD-883 TM 1014 condition A or B (fine leak) and condition C (gross leak). MIL-STD-750 TM 1071 condition H1 or H2 (fine leak) and condition C or K (gross leak with cavity) or condition E (gross leak without cavity).	Applicable to hermetic & cavity package.
9	Lifetest 2000h-125°C minimum	10 parts min 0 defect accepted	MIL-STD-750 method 1026 & 1042. MIL-STD-883 method 1005 cond.D Initial, intermediate (1000h) and final electrical tests at 3 T° (min, typ, max) (parameter & functional).	The lifetest duration shall be 2000h at minimum 125°C. In case of a temperature lower than 125°C, the lifetest duration is extended i.a.w. MIL-STD-883 method 1005.

	TEST	SAMPLING	METHOD / CRITERIA	COMMENTS
				Read & record for electrical tests. as per the preliminary issue of the internal supplier's specification (see 4.2.3.1.k).
10	DPA	3 parts	As per clause 4.3.9 see Annex H.	To be done on 3 parts after lifetest (as per above step 4).
11	Radiation evaluation	i.a.w. ECSS-Q-ST-60-15	See ECSS-Q-ST-60-15	-

Table 8–13: Legacy test files - Screening tests - Class 2 components - Active parts

	TEST	SAMPLING	METHOD	COMMENTS
1	Serialization	100%	Defined by the supplier.	-
2	Temperature cycling	100%	10 T/C -55°/+125°C (or to the manufacturer storage temp., whichever is less). MIL-STD-750 method 1051 MIL-STD-883 method 1010	-
3	PIND test	100%	MIL-STD-750 method 2052 cond.A MIL-STD-883 method 2020 cond.A	Applicable to cavity package only.
4	Initial electrical test	100%	Electrical test (parametrical and functional) at 25°C as per the internal supplier's specification.	Read & record on selected parameters as per the internal supplier's specification (see 5.2.3.1k).
5	Burn-in	100%	MIL-STD-750 method 1038 & 1039 MIL-STD-883 method 1015 cond.B 160h – 125°C or 300h – 105°C or 590h – 85°C	Temperature shall be < Tjmax-10°C and Tg-10°C whichever is lower. In absence of Tj or Tg knowledge, 105°C max is required. Ea = 0,4eV for equivalence calculation unless a different value has been demonstrated for the product. Termination oxidation risk shall be controlled after burn-in. For discrete, HTRB and power burn-in depend on product family.
6	Final electrical test	100%	Electrical test (para-metrical and functional) at 3 temp.as per the internal supplier's specification.	Read & record on selected parameters as per the internal supplier's specification (see 5.2.3.1k).

	TEST	SAMPLING	METHOD	COMMENTS
7	PDA	-	On steps 4 and 6. Max acceptable PDA: 5%	PDA calculation applies to room temperature measurement only.
8	Seal test	100%	MIL-STD-750 method 1071 cond H1 or H2 and C or K. MIL-STD-883 method 1014 cond A or B and C.	Applicable to hermetic & cavity package only.
9	External visual inspection	100%	MIL-STD-750 method 2071 MIL-STD-883 method 2009	The MIL specs are not adapted to visual inspection of plastic encapsulated components, but can be used as reference (mainly for connection corrosion and marking acceptance). In addition, for plastic packages, inspect for the following defects: Package deformation/ Foreign inclusions in the package, voids and cracks in the plastic/ deformed leads.

Table 8–14: Legacy test files - Lot acceptance tests - Class 2 components – Active parts

	TEST	SAMPLING / CRITERIA	METHOD	COMMENTS
1	Construction analysis	5 parts	As per clause 5.2.3.3 see Annex H.	
2	Mechanical shocks	10 parts min 0 defect accepted	MIL STD 883 TM 2002 condition B - 5 pulses (per orientation). MIL-STD-750 TM 2016, 1500g, 0,5ms duration - 5 shocks, planes X1, Y1 and Z1.	Applicable to cavity package. Read & record for electrical test as per the preliminary issue of the internal supplier's specification (see 5.2.3.1.k).
	Vibrations		MIL-STD-883, TM 2007 condition A - 12 times (total). MIL-STD-750, TM 2056, 20g, 10-2000Hz, cross over at 50Hz - 12 times (total).	
	Constant acceleration		MIL-STD-883, TM 2001 condition E (resultant centrifugal acceleration to be in the Y1 axis only). For components which have a package weight of 5 grammes or more, or whose inner seal or cavity perimeter is more than 5 cm, Condition D shall be used MIL-STD-750, TM 2006, 20000g, planes X1, Y1 and Y2.	
3	Preconditioning + 96h HAST (or 1000h THB 85/85)	10 parts 0 defect accepted	HAST 96h-130°C-85%RH (JESD22-A110 with continuous bias) or THB (JESD22-A101). Electrical test (para-metrical and functional) at 25°C as per the internal supplier's specification Preconditioning: i.a.w. JESD-22-A113 for SMD JESD-22-B106 for through hole.	Only for plastic package. Internal supplier's specification (see 5.2.3.1k).
4	C-SAM	10 parts	JEDEC J-STD-020	To be done on the 10 parts of step 5 after the electrical test at 25°C and before preconditioning.

	TEST	SAMPLING / CRITERIA	METHOD	COMMENTS
				C-SAM test only applicable to plastic package.
5	Preconditioning + Thermal Cycling [1]	10 parts 0 defect accepted	100 T/C -55°/+125°C (or to the manufacturer storage temp., whichever is less) MIL-STD-750 method 1051 cond.B MIL-STD-883 method 1010 cond.B. Electrical test (para-metrical and functional) at 25°C as per the internal supplier's specification. Preconditioning: i.a.w. JESD-22-A113 for SMD JESD-22-B106 for through hole.	Preconditioning applicable to plastic package only. The necessity to perform this step will depend on the application. Internal supplier's specification (see 5.2.3.1k).
6	Seal test	10 parts min 0 defect accepted	MIL-STD-883 TM 1014 condition A or B (fine leak) and condition C (gross leak). MIL-STD-750 TM 1071 condition H1 or H2 (fine leak) and condition C or K (gross leak with cavity) or condition E (gross leak without cavity).	Applicable to hermetic & cavity package.
7	C-SAM	10 parts	JEDEC J-STD-020	To be done on the 10 parts of step 5 after thermal cycling and the electrical test at 25°C. C-SAM test only applicable to plastic package.

	TEST	SAMPLING / CRITERIA	METHOD	COMMENTS
8	Lifetest [1]	15 parts 0 defect accepted	1000h – 125°C minimum MIL-STD-750 method 1026 or 1042 MIL-STD-883 method 1005 cond.D Initial, intermediate and final electrical test (para-metrical and functional) at 25°C.	The lifetest duration shall be 1000h at minimum 125°C. In case a temperature lower than 125°C, the lifetest duration is extended i.a.w. MIL-STD-883 method 1005. Read & record and drift calculation on selected parameters as per the internal supplier's specification (see 5.2.3.1k)
9	External visual inspection	10 parts min	ESCC 2055000 ESCC 2059000	
10	Radiation Verification Test [1]	i.a.w. ECSS-Q-ST-60-15	See ECSS-Q-ST-60-15	-
[1] : Lifetest, thermal cycling and radiation verification test are performed on screened parts (see 5.3.3).				

Table 8–15: Legacy test files - LAT tests - Class 3 components - Active parts

	TEST	SAMPLING / CRITERIA	METHOD	COMMENTS
1	Construction analysis	5 parts	As per clause 6.2.3.3 see Annex H	In case of retinning, step 1 shall include the SEM "QBSD" mode to check the 100% coverage of SnPb.
2	Mechanical shocks	10 parts min 0 defect accepted	MIL STD 883 TM 2002 condition B - 5 pulses (per orientation). MIL-STD-750 TM 2016, 1500g, 0,5ms duration - 5 shocks, planes X1, Y1 and Z1.	Applicable to cavity package. Read & record for electrical test as per the preliminary issue of the internal supplier's specification (see 5.2.3.1.k).
	Vibrations		MIL-STD-883, TM 2007 condition A - 12 times (total). MIL-STD-750, TM 2056, 20g, 10-2000Hz, cross over at 50Hz - 12 times (total).	
	Constant acceleration		MIL-STD-883, TM 2001 condition E (resultant centrifugal acceleration to be in the Y1 axis only). For components which have a package weight of 5g or more, or whose inner seal or cavity perimeter is more than 5 cm, Condition D shall be used MIL-STD-750, TM 2006, 20000g, planes X1, Y1 and Y2.	
3	Preconditioning + 96h HAST (or 1000h THB 85/85)	10 parts 0 defect accepted	HAST 96h-130°C-85%RH (JESD22-A110 with continuous bias) or THB (JESD22-A101). Electrical test (para-metrical and functional) at 25°C as per the datasheet (selected functional tests and parameters) Preconditioning: i.a.w. JESD-22-A113 for SMD JESD-22-B106 for through hole.	Only for plastic package. To be done, except if representative data collected in the JD are available. In case of retinning, step 2 is mandatory.
4	Lifetest [1]	15 parts 0 defect accepted	1000h – 125°C minimum. MIL-STD-750 method 1026 or 1042 MIL-STD-883 method 1005 cond.D.	The lifetest duration shall be 1000h at minimum 125°C.

	TEST	SAMPLING / CRITERIA	METHOD	COMMENTS
			Initial and final electrical test (parametrical and functional) at 25°C as per the datasheet (selected functional tests and parameters).	In case of a temperature lower than 125°C, the lifetest duration is extended i.a.w. MIL-STD-883 method 1005. Electrical test on selected parameters. To be done, except if representative data collected in the JD are available. In case of retinning, step 3 is mandatory.
5	C-SAM	10 parts	JEDEC J-STD-020	To be done on the 10 parts of step 5 after the electrical test at 25°C and before preconditioning. C-SAM test only applicable to plastic package. To be done, except if representative data collected in the JD are available.
6	Preconditioning + Thermal Cycling [1]	10 parts 0 defect accepted	100 T/C -55°/+125°C (or to the manufacturer storage temp., whichever is less) MIL-STD-750 method 1051 cond.B. MIL-STD-883 method 1010 cond.B. Electrical test (para-metrical and functional) at 25°C as per the datasheet (selected functional tests and parameters). Preconditioning: i.a.w. JESD-22-A113 for SMD JESD-22-B106 for through hole.	Preconditioning applicable to plastic package only. To be done, except if representative data collected in the JD are available. In case of retinning, step 5 is mandatory.
7	Seal test	10 parts min 0 defect accepted	MIL-STD-883 TM 1014 condition A or B (fine leak) and condition C (gross leak).	Applicable to hermetic & cavity package. To be done, except if representative data collected in the JD are available. In case of retinning, step 6 is mandatory.

	TEST	SAMPLING / CRITERIA	METHOD	COMMENTS
			MIL-STD-750 TM 1071 condition H1 or H2 (fine leak) and condition C or K (gross leak with cavity) or condition E (gross leak without cavity).	
8	C-SAM	10 parts	JEDEC J-STD-020	To be done on the 10 parts of step 5 after thermal cycling and the electrical test at 25°C. C-SAM test only applicable to plastic package. To be done, except if representative data collected in the JD are available.
9	Radiation Verification Test [1]	i.a.w. ECSS-Q-ST-60-15	See ECSS-Q-ST-60-15	-
[1] : Lifetest, thermal cycling and radiation verification test areare performed on screened parts (see 6.3.3).				

9
Pure tin lead finish – risk analysis

9.1 Overview		
9.1		Applicable
9.2 Requirements		
9.2a		Applicable

Annex A (normative)
Component control plan (CCP) - DRD

Annex A.1 DRD Identification		
A.1.1 Requirement identification and source document		
A.1.1		Applicable
A.1.2 Purpose and objective		
A.1.2		Applicable
A.2 Expected response		
A.2.1 Scope and content		
A.2.1a		Applicable
A.2.2 Special remarks		
A.2.2a		Applicable

Annex B (normative)
Declared components list (DCL) - DRD

Annex B.1 DRD Identification		
B.1.1 Requirement identification and source document		
B.1.1		Applicable
B.1.2 Purpose and objective		
B.1.2		Applicable
B.2 Expected response		
B.2.1 Scope and content		
B.2.1a		Applicable
B.2.1b		Applicable
B.2.2 Special remarks		
B.2.2		Applicable

Annex C (normative)
Internal Supplier's specification - DRD

Annex C.1 DRD Identification		
C.1.1 Requirement identification and source document		
C.1.1	This DRD is called up from ECSS-Q-ST-60-13 requirements 4.2.3.1.l and 5.2.3.1.l.	Modified
C.1.2 Purpose and objective		
C.1.2	The purpose of the Internal Supplier's Specification is to establish the tested parameters, test conditions, acceptance criteria, drift limits for the electrical testing during evaluation, screening and lot acceptance.	Modified
C.2 Expected response		
C.2.1 Scope and content		
C.2.1a	The internal supplier's specification shall include or refer to the following information:	Modified
	1.	Applicable
	2.	Applicable
	3.	Applicable
	4.	Not applicable
	5.	Applicable
	6.	Applicable
	7.	Not applicable
	8.	Not applicable
	9.	Applicable
	10.	Not applicable
	11.	Not applicable
	12.	Not applicable
	13.	Not applicable
	14.	Not applicable
	15.	Not applicable
	16.	Not applicable
	17.	Not applicable
C.2.2 Special remarks		
C.2.2		Applicable

Annex D (normative)
Parts approval document - DRD

Annex D.1 DRD Identification		
D.1.1 Requirement identification and source document		
D.1.1		Not applicable
D.1.2 Purpose and objective		
D.1.2		Not applicable
D.2 Expected response		
D.2.a		Not applicable

Annex E (informative)
EEE documents delivery per review

Annex E (informative)		
Annex E		Not applicable

Annex F (normative)
Justification document - DRD

Annex F.1 DRD Identification		
F.1.1 Requirement identification and source document		
F.1.1	This DRD is called up from requirements 4.2.4.d, 5.2.4.d and 6.2.4.d.	New
F.1.2 Purpose and objective		
F.1.2	The JD is a control document the objective of which is to identify the component and to provide information about it , its evaluation and its acceptability w.r.t.: • component/ manufacturer data • approval status • evaluation tests • procurement inspections and tests • lot acceptance or lot verification tests • radiation hardness data and RVT	New
F.2 Expected response		
F.2.1 Scope and content		
F.2.1.1 General information		
F.2.1.1a	The JD shall include:	New
	1. Family/ sub-family	
	2. Part number (commercial designation)	
	3. Ordering information (part number description)	
	4. Functional description	
	5. Technology (CMOS, bipolar, etc…)	
	6. Package	
	7. Manufacturer	
	8. Temperature range or AECQ grade	
	9. AEC-Q	
	10 Other qualification	
	11. Datasheets/Procurement specification (revision, date, …)	
	12. Application notes	
	13. errata sheet	

	14. Manufacturer screening & other manufacturer test on procured lot	
	15. Manufacturer parts traceability (trace-code, date-code, assembly plant, wafer fab, diffusion lot, die revision and mask set, process name)	
	16. PCN (Service & for selected parts)	
	17. Obsolescence management (Yes/No)	
	18. Moulding characteristics (Tg)	
	19. Moisture sensitivity level	
	20. ESD level	
	21. Lead finish	
	22. In case of pure tin finish, JESD-201 Class 2 qualified (Yes/No)	
	23. Justification of the need in class 1.	
	F.2.1.2 Supporting data	
F.2.1.2a	The JD shall include:	New
	1. Traceability information (e.g. assembly plant, wafer fab, die revision) for the data given below.	
	2. Construction analysis report	
	3. Mechanical shocks results (in case of sensitive parts)	
	4. Vibration results (in case of sensitive parts)	
	5. Constant acceleration results (in case of sensitive parts)	
	6. Seal tests results (in case of hermetic & cavity package)	
	7. Humidity test results such as HAST (96h – 130°C – 85% RH) or THB (1000h – 85°C – 85% RH)	
	8. Thermal cycling test results (up to 500 cycles, -55°C /+125°C)	
	9. Lifetest / HTOL results (up to 2000h - 125°C)	
	10. Other test results (if any)	
	11. Infant mortality data (EFR computation) – recommended	
F.2.1.2b	When applicable the JD shall contain the following supporting radiation data: 1. TID (Total Ionizing Dose) data 2. DD (Displacement Damage) data 3. SEE (Single Event Effect) data	New
	F.2.1.3 Evaluation plan	
F.2.1.3a	The JD shall include:	New

	1. Evaluation plan with flow diagram 2. Preliminary and final internal supplier's specification	
	F.2.1.4 Additional test on flight lot	
F.2.1.4a	The JD shall include LAT /screening and RVT plan with flow diagram and test conditions and acceptance criteria (including drift calculation).	New
	F.2.1.5 Procurement data	
F.2.1.5a	The JD shall include traceability information (trace-code, date-code, assembly plant, wafer fab, diffusion lot and die revision).	New
	F.2.1.6 Approval status	
F.2.1.6a	The JD shall include the approval status.	New
	F.2.1.7 Appendix	
F.2.1.7a	The JD shall include: 1. A copy of the procurement specification / data sheet 2. Traceability information (CoC, PCN)	New
	F.2.2 Special remarks	
F.2.2	None	New

Annex G <<deleted>>

Annex H (informative)
Flow chart for construction analysis

H.1 Overview

This annex is a guideline for Construction Analysis (CA) and Destructive Physical Analysis (DPA) sequences to be adapted on a case by case basis for specific products/ technologies as DSM, BGA packages. Construction analysis goals are specifically oriented: quality/ reliability aspects, detection of counterfeit parts, identification of lead finish (RoHs).

Destructive Physical Analysis allow evaluating impact of life test or long duration storage on the parts.

H.2 <<deleted>>

Table H-1: <<deleted>>

H.3 Construction analysis sequence

Table H-2: Construction analysis sequence

TEST	SN1	SN2	SN3	SN4	SN5	PROCEDURE	COMMENTS
External visual inspection	X	X	X	X	X	MIL-STD-750 method 2071 MIL-STD-883 method 2009	MIL specifications are not fitted to visual inspection of PED but can be used as reference (Note 1)
X-ray inspection	X	X	X	X	X	MIL-STD-750 method 2076 MIL-STD-883 method 2012	-
C-SAM test	X	X	X	X	X	JEDEC J-STD-020	Only applicable to plastic package
Permanence of marking	X	X	X	X	X	ESCC 24800	-
PIND test (cavity package)	X	X	X	X	X	MIL-STD-750 method 2052 MIL-STD-883 method 2020	-
Hermeticity (cavity package)			X	X	X	MIL-STD-750 method 1071 MIL-STD-883 method 1014	-
Residual gas analysis (cavity package)			X	X	X	MIL-STD-750 Method 1018 MIL-STD-883 Method 1018	5000 ppm H_2O max at 100°C
Lead finish analysis and pure tin identification	X	X				Energy Dispersive X-ray analysis (EDX), X-ray fluorescence, Microfluorescence, Differential Scanning Calorimeter (DSC)	Analysis to identify lead finish w.r.t. RoHs problematic
Solderability	X	X				MIL-STD-750 method 2026 MIL-STD-883 method 2003	-
Terminal strength	X	X				MIL-STD-750 Method 2036 MIL-STD-883 Method 2004	-
Delidding	X	X	X	X		-	-
Internal visual inspection	X	X	X	X		ESCC 2045000 ESCC 2045010 ESCC 2059000	The die revision shall be identified and recorded

TEST	SN1	SN2	SN3	SN4	SN5	PROCEDURE	COMMENTS
SEM inspection	X	X				MIL-STD-750 method 2077 MIL-STD-883 method 2018	To verify the quality of wire bonding, glassivation integrity, die interconnect metallization
Bond strength (for wedged bonding)	X	X	X			MIL-STD-750 method 2037 MIL-STD-883 method 2011	-
Bond shear (for ball bonding)	X	X	X			JEDEC JESD22-B116	-
Glassivation integrity		X	X	X		MIL-STD-883 method 2021	Make sure that the chemical etchant is suitable for the metallization
Die shear test (cavity package)	X	X	X			MIL-STD-750 method 2017 MIL-STD-883 method 2019	-
Package level cross-sectioning					X	Micro-sectioning of leads shall be performed to assess presence and characteristics of the under-layer	Including die micro-sectioning
Visual, SEM and material analysis					X	-	-
Note 1: In addition to MIL specification criteria, inspect for any evidence of: - Package deformation - Foreign inclusions in the package, voids and cracks in the plastic encapsulant - Deformed leads, peeling, blistering or corrosion of finishing - Legibility and correctness of marking - Homogeneity of the lot (package level)							

H.4 <<deleted>>

Bibliography

ECSS-S-ST-00 ECSS system - Description, implementation and general requirements