



DOCUMENT CHANGE REQUEST

DCR number 1233 Changes required for: General

Date: 2020/09/10

Date sent: 2019/01/10

Status: IMPLEMENTED

Originator: Steve Thacker

Organisation: ESCC Executive Secretariat

Title: Generic Specification for Capacitors Leadless Surface Mounted Tantalum Solid Electrolyte

Number: 3012

Issue: 3

Other documents affected:

Page:

Total reformat/re-write of ESCC Generic Specification 3012 issue 3 as part of the ongoing conversion of legacy ESA/SCC specifications to the ESCC format.

Paragraph:

All

Original wording:

See 3012 issue 3

Proposed wording:

The Generic Specification is proposed to be extensively amended to incorporate various policy, technical & editorial amendments & corrections in order to bring it in line with other ESCC Generic Specifications that have already been converted to the new ESCC format.

The layout, format and general structure, and editorial content of ESCC 3012 draft 4 are based on other published, converted ESCC Generic Specifications such as ESCC 5000, 9000, 4001, 3001, etc.

The proposed technical content of ESCC 3012 draft 4 is based on the current content of ESCC 3012 issue 3 plus additional changes proposed for the purposes of general improvement.

This DCR summarises all the amendments to ESCC 3012 issue 3, plus identifies the additional technical changes not already generally detailed and justified by previous, approved DCRs related to conversion of other ESCC Generic Specifications.

For full details of the proposed contents of ESCC 3012 issue 4, see the attached draft Generic specification ESCC 3012 Draft 4 that implements all the proposed changes.

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Change Details:

A) Main General Changes (similar to those already incorporated into other converted ESCC generic specifications e.g. ESCC5000, etc, including rewording and restructure of various sections, paragraphs and Charts of the specification, plus other editorial changes based on the layout and editorial content of other Generic Specifications already converted to ESCC

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format):

1) Chart I, The General Flow Chart is replaced by Chart F1; It clarifies the flow of components for Procurement.

2) Charts II & III have been replaced by Chart F2 Production Controls & Chart F3, Screening Tests.

3) Chart IV & V, Qualification and Lot Acceptance Testing charts have been incorporated, with some modifications, into a single Chart F4, Qualification, Periodic Testing and Lot Validation Testing. The tests included in Chart F4 are based on a mix of qualification and LAT level 1 requirements.

Modifications include:

- Periodic testing is mandatory for ESCC qualified components with a defined testing schedule (i.e. 12 months for Endurance Subgroup and 24 months for all other testing).
- Para 8.2 & Chart IV, etc, Lot Acceptance Testing has been deleted but an Orderer option for similar Lot Validation Testing, for procurement, has been added. Lot Validation Testing is not mandatory and will only be done if specifically stipulated by the Orderer in the PO.
- Para 8.2.1, The requirement for LAT level 3 as a minimum for non-qualified component procurement is removed.
- Para 9.17, Operating Life is 2000hours for Qualification Testing and when Periodic Testing is being performed due to lapse of qualification; 1000hours for Periodic Testing performed to achieve extension of qualification (previously was 2000hours for Qual / 1000hours for LAT).
- No failures are allowed during Chart F4 testing.
- Sampling for the Environmental/Mechanical and Assembly Capability subgroups in Chart F4 is based on Chart IV sampling.

4) Para 1.2, etc, Introduction of Technology Flow Qualification per ESCC No. 25400 to the Generic spec.

5) Para 1.2, etc, Introduction of ESCC 23100 (ESCC Recommendations on the use of the ESCC Specification System for the Evaluation and Procurement of Unqualified Components) to the generic spec.

6) Para 1.2, etc, The Generic Specification has been made applicable and fully usable for procurement of unqualified components as well as for ESCC Qualified components.

7) Para 2.1, etc, Clarification that the term PID is specific to ESCC qualified components.

8) Para 2.1 & 5.2, Material outgassing reference document is corrected to be ESCC No. 22600 (not ECSS-Q-ST-70-02). Material restrictions per ESCC No. 22600 are specified.



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9) Para 4.1, 4.3, 4.3.2, Chart I, Chart III, etc, The SCC testing levels B and C have been deleted; there is now only a single ESCC testing level, equivalent to old SCC level C, but it is not given a specific designation. All requirements applicable to ESCC level B are deleted (e.g. Parameter Drift Value measurements, Radiographic Inspection, serialisation during screening, documentation requirements).

10) Para 4.3, When using the ESCC System to procure components from an unqualified source and marking the parts with the ESCC component number, the Manufacturer should possess a manufacturing and quality assurance system that is compatible with space application. As such, the user expectation should be that parts would be compatible with passing the testing requirements of Chart F4. Accordingly the requirement placed on qualified sources to not knowingly supply components that cannot meet the Chart F4 testing is extended to unqualified sources.

11) Para 4.3.1, The maximum allowed delay for Lot failure notification (provided by the Manufacturer) is now 5 working days (was 2).

12) Para 4.4, Marking requirements per ESCC No. 21700 shall apply.

13) Para 5 & Chart F2, Production Control/Special In-Process Controls, replaces Paras 5 & 6 and Chart II. Redundant tests in Chart II are removed (i.e. optional initial Electrical Measurements at High and Low Temperatures & initial sample External Visual Inspection). Some tests are moved to new Chart F3.

14) Para 7.4.1, etc, Check for lot failure during Screening (PDA), only includes Electrical Parameter limit failures (excluding the mechanical, handling, lost and visual failures counting towards PDA in ESCC 3012 issue 3).

15) Para 9.4.3, Electrical Measurements at High and Low Temperatures: A default sample of 5 components with 0 failures (otherwise 100%) is fixed for this test.

16) Para 9.5 & Chart II, Dimension Check is performed on 3 samples instead of 5.

17) Para 10.1.2, 10.1.3, The minimum required delivered documentation to the customer for procurement is a Certificate of Conformity & a Cover sheet.

B) Other Technical Changes (specific to ESCC 3012):

18) Para 2.1 & 2.2:

Reference documents that are not actually referenced in 3012 are removed, i.e. ESCC 20900, ECSS Q-ST-70-02, IEC No. 410.

ESCC 22600, 23100, 25400 are added.

19) Para 4.1.5 Pre-encapsulation Inspection: requirement for the Orderer to be notified in order to be able to witness the pre-encapsulation Inspection is deleted (precap is not required under ECSS-Q-ST-60).

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20) Weight requirements are added (to Para 5.2.3 & Chart F2).

21) Para 9.4.1.1, test voltage for measuring Capacitance amended to be 2.2V max (was maximum 2.1 to 2.5V) (same as is specified for ESR)

New Para. 8.4.1.5 Temperature Characteristic is added to enable & clarify how the TC is measured (as read & record measurements from Table 2 no longer apply)

22) Para 9.4.1.3, delete reference to "reading accuracy of 0.1%" for measurement of Dissipation Factor.

23) Seal testing option for hermetic components is added (in Para 8.6, Charts F3 & F4)

24) Para 9.9, initial capacitance measurement option is added to Mounting.

25) Para 9.13, Various recovery periods are added to the various test steps

26) Para 9.13.5, pressure converted to SI unit (8.5kPa instead of 85mbar)

27) Para 9.12.2, optional Bump test is deleted (effectively replaced by Mechanical Shock)

28) Para 9.15, Temperature tolerance is added.

29) Para 9.16, obsolete IEC test method Ca replaced by equivalent test Cab per IEC Publication No. 60068-2-78.

30) Para 9.17, Generic IEC test method is added plus tolerances for test duration, and test temperatures and Recovery period after test are added.

31) Chart F4, etc, The Chart title is amended in line with general DCR1027.

32) Appendix A is deleted.

Justification:

All changes have been defined and included to serve the purposes of technical improvement, clarification, accuracy, completeness, simplification, harmonisation and consistency. The aim is to simplify and improve the content and interpretation of the specification and its requirements whilst maintaining an efficient and acceptable technical baseline.

ESCC 3012 draft 4 is written to closely follow the layout, format and content of the latest converted ESCC Generic specifications such as ESCC 5000, 9000, 4001, 3001, etc. The justifications for the related policy and editorial changes given in all other previous DCRs related to the conversion of ESCC Generic Specifications also apply to this DCR.

Note: For information purposes, and to hopefully aid the review process, an MSWord document of an associated Detail Specification in the "converted" format is attached to this DCR.



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Attachments:

esc3012_draft_4b_(converted___for_dcr_review).docx,
3012005_draft_2b_draft_4b_for_information_during_review_of_generic_spec_conversion_dcr.docx

Modifications:

DCR item A3) The sampling for Chart F4 is based on original Chart IV sampling & also Chart V sampling (as requested by Exxelia to reduce sampling for Periodic testing (=LAT)).

* DCR item B22) Para. 9.4.1.3, Dissipation Factor: The measurement accuracy is simplified to be +/-2% (as requested by Exxelia).

* DCR item B26) Para. 9.13.5, Low Air Pressure: this test is deleted as it is not relevant to solid tantalum components (as requested by Kemet).

* New DCR item B33) Para. 9.4.1.4 Equivalent Series Resistance: add 500kHz as an alternative test frequency (as requested by Exxelia).

Approval signature:

Date signed:

2020-09-10