DOCUMENT CHANGE REQUEST

DCR number 1232	Changes required for: General	Originator: Steve Jeffery
Date: 2022/06/13	Date sent: 2019/01/10	Organisation: ESCC Executive
Status: IMPLEMENTED		

Title:	Generic Specification for Capacitors and Capacitor Filters Feedthrough.		
Number:	3008	Issue:	3

Other documents affected:

Page:

All.

Paragraph:

Total reformat/re-write of ESCC Generic Specification 3008 issue 3 in order to implement changes as part of the ongoing conversion of legacy ESA/SCC specifications to the ESCC format.

For details of the proposed contents of ESCC 3008 issue 4, see the attached MSWord document 3008 draft 4C for DCR review.docx

Original wording:

See 3008 Issue 3

Proposed wording:

This Generic Specification is proposed to be extensively amended to incorporate various policy, technical & editorial amendments, and 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 3008 draft 4C are based on other published, converted ESCC Generic Specifications such as ESCC 5000, 9000, 4001 etc.

The proposed technical content of ESCC 3008 draft 4C is based on the current content of ESCC 3008 issue 3 plus additional changes proposed for the purposes of general improvement.

This DCR summarises all the amendments to ESCC 3008 issue 3, plus identifies the additional editorial & technical changes not already generally detailed and justified by previous, approved DCRs related to conversion of ESCC Generic Specifications.

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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):

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

2) Chart III (Burn-in and Electrical Measurements) has been replaced by Chart F3, Screening Tests.

3) Charts IV & V (Qualification and Lot Acceptance Testing) have been incorporated, with some modifications, into a single Chart F4: “Qualification, Periodic Testing and Lot Validation Testing”. Modifications include:
• Periodic testing is mandatory for ESCC qualified components with a defined testing schedule (i.e. 24 months for Endurance and Environmental / Mechanical Subgroups and 12 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 9.19, 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 LAT2).
• No failures are allowed during Chart F4 testing.
• Sampling for the various test subgroups in Chart F4 has been amended.

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) Paras 2.1 and 4.5, Material outgassing reference document is corrected to be ESCC No. 22600 (not ESA PSS-01-702). Material restrictions per ESCC No. 22600 are specified.

9) Paras 4.1, 4.3.1, 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 B, but it is not given a specific designation.

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/repeated tests in Chart II are removed (Electrical Measurements, External Visual Inspection & Seal Test). Serialisation, Rapid Change of Temperature and Vibration 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, mechanical, handling, lost components and visual failures after Burn-in.

15) Para 9.5.3, Electrical Measurements at High and Low Temperatures (Para 8.5.3 in ESCC 3008 draft 4C): 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 per standard ESCC policy (was 5).

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

B) Editorial and/or Technical Changes specific to ESCC 3008:

18) Paras 2.1 and 2.2:
Reference documents that are not actually referenced in 3008 are removed, i.e. IEC No. 410, MIL STD-105, MIL-STD-414, ‘ESA PSS-01-702’.
ESCC 22600, 23100, 25400 are added.

19) Para 4.1.5, Pre-encapsulation Inspection: Paragraph is re-named “Pre-Assembly Customer Source Inspection” and re-worded per new requirements; CSI is a necessary requirement for such components according to ECSS-Q-ST-60.

20) Para 5.2.1, Supplementary Components: The paragraph is moved (see Para 4.6 of ESCC 3008 draft 4C) as it is considered to be a specific Requirement and not a Special In-process Control.

21) Weight requirements are added to Para 5.2.3 & Chart F2 of ESCC 3008 draft 4C.

22) Para 7.1.1 (and Para 9.23), Burn-in test requirements are detailed in new Para 8.6 in ESCC 3008 draft 4C.

23) Paras 7.2.3 & 8.3.3, The “Other Failures” are standardised to the same types of failure in other converted Generic Specs, i.e. Visual, Mechanical and Handling failures and Lost components.

24) Para 8.1.2, Distribution of Qualification Test Lot: The defined minimum sample is replaced by general distribution guidelines for qualification of a single type or a family of types.

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25) Para 9.2, Rapid Change of Temperature, is modified to take account of the changes from Charts II, IV & V to Charts F2/F3 and F4. See also items on Accelerated Damp Heat and Immersion below.

26) Paras 9.3 and 9.11, both for Vibration, are re-written and merged into a single paragraph with Subparagraphs for Vibration during Qualification and Periodic Testing and Vibration during Screening. Para 9.11.2, Vibration Procedure: Unit of acceleration changed to metres-per-second-squared.

27) Paras 9.4.1 / 9.4.1.x:
The 'General' para/statement is modified to clarify the flexibility of electrical measurements (i.e. additional electrical measurements may be specified in the Detail Specification).
All electrical test methods are amended, e.g. irrelevant details/information deleted.
Modifications made to take account of the changes from Charts IV and V to Chart F4 (Paras 8.5.1 / 8.5.1.x in ESCC 3008 draft 4C).

28) Paras 9.5 and 9.7 are merged into a single Para (External Visual Inspection and Dimension Check).

29) Para 9.6.2, Fine Leak 'SI' unit (kPa) is used for the immersion pressure instead of "bar".

30) Paras 9.9, 9.12, 9.16 & 9.17: All now include clarification that these tests apply to "Qualification Testing, and to Periodic Testing for renewal of qualification after lapse".

31) Para 9.10, Shock: Unit of acceleration changed to metres-per-second-squared.

32) Para 9.12, Accelerated Damp Heat:
The Rapid Change of Temperature pre-test cycling is now a standalone item per Chart F4 of ESCC 3008 draft 4C (Accelerated Damp Heat is required to be performed "immediately after Rapid Change of Temperature").
"UR" is replaced, for clarity, by "100% of rated voltage".

33) Para 9.13, Low Air Pressure is in 'SI' unit of pressure "kPa" instead of "mbar".

34) Para 9.14 includes clarification that the required Robustness of Terminations test, per IEC Publication No. 60068-2-21, shall be specified in the Detail Specification.

35) Para 9.15, Immersion: The Rapid Change of Temperature pre-test cycling is now a standalone item per Chart F4 of ESCC 3008 draft 4C (Immersion is required to be performed "immediately after Rapid Change of Temperature"). Chart F4 specifies that Immersion is "Applicable to hermetically sealed components".

36) Para 9.17, Resistance to Soldering Heat:
Addition of "Unless otherwise specified…"
Test temperature added.

37) Para 9.18, Solderability: Addition of "Unless otherwise specified…".

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38) Para 9.19, Operating Life:
“In accordance with IEC Publication No. 60384-1 clause 4.23” is added (it is assumed that this had been omitted in error from ESCC 3008 issue 3. See also the Para for Burn-in).
Tolerance on duration is added.
Initial Measurement requirement is added (Capacitance measurement) (based on Operating Life for other component types, e.g. 3001).
Change in Capacitance is added to Intermediate and Final Measurements after recovery (based on Operating Life for other component types, e.g. 3001).
Modifications to cover the changes from Charts IV & V to Chart F4 are included.

39) Para 9.20 Corrosion:
Reference to the test ‘salt mist’ is added for clarification.
The duration is clarified as “minimum”.

40) Para 9.22 is deleted.

41) Annex I 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 3008 draft 4C is written to closely follow the layout, format and content of the latest ESCC 5000. 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.

Attachments:
3008_draft_4c_for_dcr_review.docx, 3008014_draft_4c.docx
Modifications:
The updated Generic Specification 3008 Issue 4 Draft I includes various changes to the initial 3008 Draft 4C. Many of the changes included in Drafts 4D to 4I were minor editorial changes and are therefore not listed here. The additional technical changes included in Drafts 4D to 4I are given below (N.B. These changes have all been discussed and agreed during PSWG reviews and PSWG meetings, notably PSWG#97 & PSWG#98): - Qualification, Periodic Testing and Lot Validation Testing is modified: There are separate Charts F4A for hermetically sealed components and F4B for non-hermetic; The testing sequences have been re-arranged for Subgroups 1A, 1B; Shock test added to Subgroup 1B (required to be performed immediately prior to Vibration); 'Corrosion' test is deleted; Subgroup 1C is only required for Qualification Testing / Periodic Testing for renewal of qual. after lapse.
Approval signature:

Date signed:
2022-06-13