DOCUMENT CHANGE REQUEST

DCR number 1231	Changes required for: General	Originator: Steve Jeffery
Date: 2020/02/14	Date sent: 2019/01/09	Organisation: ESCC Executive
Status: IMPLEMENTED		

Title:	Generic Specification for Capacitors Fixed Film Dielectric		
Number:	3006	Issue:	2

Other documents affected:

Page:

All.

Paragraph:

Total reformat/re-write of ESCC Generic Specification 3006 issue 2 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 3006 issue 3, see the attached MSWord document
3006 draft 3C for DCR review.docx

Original wording:

See ESCC 3006 Issue 2

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 3006 draft 3C are based on other published, converted ESCC Generic Specifications such as ESCC 5000, 9000, 4001 etc.

The proposed technical content of ESCC 3006 draft 3C is based on the current content of ESCC 3006 issue 2 plus additional changes proposed for the purposes of general improvement.

This DCR summarises all the amendments to ESCC 3006 issue 2, 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2) Chart III (Burn-in and Electrical Measurements) has been replaced by Chart F3, Screening Tests.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 / Electrical 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 9.16, 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 & 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; in-line with Table 7-1 (Quality levels for Class 1 components) of ECSS-Q-ST-60 there is now only a single ESCC testing level which is equivalent to old SCC level C and 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/repeated tests in Chart II are removed (Electrical Measurements, External Visual Inspection & Seal Test). Rapid Change of Temperature is 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 3006 issue 2).

15) Para 9.6.3, Electrical Measurements at High and Low Temperatures (Para 8.4.3 in ESCC 3006 draft 3C): 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, 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 3006:

18) Paras 2.1 & 2.2:
Reference documents that are not actually referenced in 3006 are removed, i.e. ESCC 20900, IEC No. 410, MIL-STD-414, ‘ESA PSS-01-702’.
ESCC 22600, 23100, 25400 are added.

19) Para 7.1.1 (and Para 9.20), Burn-in test requirements are detailed in new Para 8.6 in ESCC 3006 draft 3C.

20) 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.

21) 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.

22) Weight requirements are added to Para 5.2.3 & Chart F2 of ESCC 3006 draft 3C.

23) Para 9.2.2, Fine Leak ‘SI’ unit (kPa) is used for the immersion pressure instead of “bar”.

24) Para 9.3, Rapid Change of Temperature, is modified to take account of the changes from Charts II, IV & V to Charts

F2/F3 and F4.

25) Paras 9.4 and 9.5 are merged into a single Para (External Visual Inspection and Dimension Check).

26) Paras 9.6.1.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, e.g. electrical measurements specific to High Voltage capacitors).
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 (Para 8.4.1.x in ESCC 3006 draft 3C).

27) Para 9.8, Corrosion is deleted as the corrosion test, although relevant to component evaluation, is considered to be unnecessary w.r.t the processing of actual components (controlled by the mfr's PID).

28) Para 9.9 includes clarification that the required Robustness of Terminations test, per IEC Publication No. 60068-2-21, shall be specified in the Detail Specification.

29) Para 9.10, Resistance to Soldering Heat:
Addition of "Unless otherwise specified…"
The requirements for other capacitors and surface mount capacitors are deleted.
Test temperature added.

30) Para 9.11, Solderability: Test temperature and duration are specified for Test Method 1 (solder bath test).

31) Para 9.12.2, Vibration Procedure: Test Method corrected to 'Fc' (was 'Fe'); vibration amplitude is amended; unit of acceleration changed to metres-per-second-squared.

32) Para 9.13 etc:
'Bump' is deleted as test is either Shock OR Bump; typically (in various converted Generics) only Shock is retained.
Typo in IEC Publication No. for Shock is corrected (from "7" to "27").
Unit of acceleration changed to metres-per-second-squared.

33) Para 9.14, Climatic Sequence: various modifications for clarification purposes (e.g. test temperature added to Damp Heat, Accelerated, First Cycle and also Remaining Cycles; the 'SI' Unit (kPa) is used for Low Air Pressure instead of "mbar").

34) Para 9.15, Temperature Coefficient: Para is moved to the "Electrical Measurements" Section of ESCC 3006 draft 3C, and is modified to clarify the test requirements. The Para is also made applicable to Temperature Coefficient measured during Screening Tests (measured on a go-no-go basis) and Qualification and Periodic Testing (where Read & Record measurements are required).

35) Para 9.16, Operating Life:
"In accordance with IEC Publication No. 60384-1 clause 4.23" is added (it is assumed, based on other Generic

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Specifications for capacitors, that this had been omitted in error from ESCC 3006 issue 2. See also the Para for Burn-in). Tolerance on duration is added.

36) Paras 9.18 and 9.19 are deleted.

37) 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 3006 draft 3C 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:

3006_draft_3c_for_dcr_review.docx, escc3006iss3_for_publishing_review.docx, 3006020_draft_4a.docx

Modifications:

The version of the spec to be published includes the following changes to 3006 Draft 3C which were discussed and agreed between CNES/ESA/Exxelia and were also reviewed and accepted during the PSWG review of this DCR

1. Para. 7.1.2 Distribution within the Qualification Test Lot: the wording regarding specific sampling for the Qualification Test Lot has been deleted. The detailed Qualification Test Lot sampling requirements are now defined in Note 1 to Chart F4.

2. Para. 8.9 Climatic Sequence: Dry Heat Test Ba has been withdrawn, it has therefore been replaced by Test Bb; Cold Test Aa has been withdrawn, it has therefore been replaced by Test Ab.

3. Radiographic Inspection, performed in accordance with ESCC Basic Specification No. 20900, has been added. Radiographic Inspection shall be performed on a sample basis during Subgroup 2A of Chart F4 (Qualification, Periodic Testing and Lot Validation Testing).

Approval signature:



Date signed:
2020-02-14