DOCUMENT CHANGE REQUEST

DCR number 1456	Changes required for: General	Originator: Steve Thacker	
Date: 2023/02/10	Date sent: 2021/09/03	Organisation: ESCC Executive Secretariat	
Status: IMPLEMENTED			

Title:	Generic Specification for Relays Electromagnetic RF Coaxial Switch Latching		
Number:	3603	Issue:	1
Other documents affected:			
Page:			
-			
Paragraph:			
-			
Original wording:			
-			
Proposed wording:			
-			
Justification:			
-			

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Number:	3603	Issue:	1

Other documents affected:

Page:

Various

Paragraph:

Total reformat/re-write of ESCC Generic Specification 3603 issue 1 as part of the ongoing conversion of legacy ESA/SCC specifications to the ESCC format.

Note: This generic spec had been retired in 2013 by DCR761 due to no current Manufacturer support. The spec was republished in 2021 by DCR1415 in order that this conversion DCR could be raised (i.e., so that ESCC 3603 can be used with new ESCC Detail Specification No. 323 (3603/007) for Manufacturer Radiall/F).

Original wording:

As per ESCC 3603 issue 1

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 3603 draft 2 are based on other published, converted ESCC Generic Specifications such as ESCC 5000, 9000, 4001, 3001, etc.

The proposed technical content of ESCC 3603 draft 2 is based on the current content of ESCC 3603 issue 1 plus additional changes proposed for the purposes of general improvement.
This DCR summarises all the amendments to ESCC 3603 issue 1, plus identifies the additional technical changes not already generally detailed and justified by previous, approved DCRs related to conversion of other ESCC Generic Specifications.

The majority of these additional changes were instigated by the CTB RF Working Group together with supporting Manufacturer: Radiall/F, for the purposes of improvement, for the addition of surface mount technology components to the scope of this Generic spec, and for alignment with other ESCC Generic specifications (where possible).

For full details of the proposed contents of ESCC 3603 issue 2, see the attached draft Generic specification ESCC 3603 Draft 2 that implements all the proposed changes.

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Change Details:

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A) Main General Changes (similar to those already incorporated into other converted ESCC generic specifications e.g. ESCC 5000, 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 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 Control & Chart F3, Screening Tests.

3) Para. 8 and Charts 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 existing qualification and LAT level 1 requirements (plus specific additions to cover SMT components; see B) below for details).

Modifications include:
• Periodic testing is mandatory for ESCC qualified components with a defined testing schedule (i.e. 24 months for all testing).
• Para 8.2 & Chart V, 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. 8.1.2 & Chart F4, Sampling in Chart F4 is marginally reduced. The selection of samples will be specified by or agreed with, the ESCC Executive.
• Para 8.2.1, The requirement for LAT level 2 as a minimum for non-qualified component procurement is removed.

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 & 4.5, Material outgassing reference document is corrected to be ESCC No. 22600 (not ESA PSS). Material restrictions per ESCC No. 22600 are specified.

9) Para 4.1, 4.3.2, Chart I, etc, The SCC testing level B has been deleted; the single ESCC testing level, equivalent to old SCC level B, is not given a specific designation.

10) Para 4.1.5, The option for a Final Customer Source Inspection is added. The required notice for both Pre-Cap & FCSI is as will be agreed between Customer & Manufacturer (stipulated in the customer's PO).

11) 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.

12) Para 4.3.1, The maximum allowed delay for Lot failure notification (provided by the Manufacturer) is now 5 working

days (was 2).

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

14) Para 5 & Chart F2, Production Control/Special In-Process Controls, replaces Paras 5 & 6 and Chart II. Some tests are moved to new Chart F3.

15) Para 10.1.2, 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 3603):

16) Requirements necessary to cover components with either coaxial connectors (integral or non-integral) or SMT terminations are added throughout i.e. in Charts F2, F3 & F4 (as applicable), and new Para. 8 (see also attached for details).
i.e.
Contact Engagement (and Separation) Forces; Coupling Proof Torque; Mating and Unmating Forces; Connector Interface Dimensions Check; Run-in; Vibration Scan; Connector Endurance; Power Handling; Multipaction; DPA

17) Para 2.1 & 2.2:
Reference documents that are not actually referenced in 3603 or are obsolete are removed, i.e. ESCC 3401, 3402, MIL-STD-1344, IEC No. 255-5, 410 & 68, PSS-01-702, PSS-01-736.
ESCC 21001, 22600, 23100, 25400, REP005, REP006, ECSS-Q-ST-70-37, ECSS-E-20-01, MIL-STD-461, MIL-STD-883 are added.

18) Para 3 , used definitions are added.

19) Para 4.1.6, Add-on Components: Only coaxial connectors are defined as add-on components (see new Para. 4.6) (use of any other components internally within the components will be covered by the Manufacturers PID)

20) Para 4.5: ECSS-Q-ST-70-37 stress-corrosion resistance requirements added.

21) Para 5.2.1, The in-process Low Level Test (Miss Test) is deleted (and effectively replaced by Run-in in new Chart F2).

22) Para 6.1, Rework options are deleted.

23) Charts II & III:
Tests and the test sequence are amended as detailed in the attached spec mark-up (in new Charts F2 & F3)
Various test requirements have been amended and added (see attached for details):
• Amended: Dimension Check & Weight; Random Vibration; Seal; Thermal Cycling; Contact Engagement (and Separation) Forces
• Added: Coupling Proof Torque; Mating and Unmating Forces; Connector Interface Dimensions Check; Run-in

24) Charts IV & V (and Para. 8):
The test sampling for qualification is changed to be on 3 samples (or 1 for some specific tests).
Tests and the test sequence are amended as detailed in the attached spec mark-up (in new Chart F4).
Various test requirements have been deleted, amended and added (see attached for details):
• Deleted: Coupling Proof Torque; Damp Heat Steady State;

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• Amended: Vibration; Rapid Change of Temperature; RF Leakage; Mechanical Shock; Solderability; Resistance to Soldering Heat; Robustness of Terminations; Seal; Life/Mechanical Life; Thermal Vacuum
• Added: Vibration Scan; Connector Endurance; Power Handling; Multipaction; DPA.

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 3603 draft 2 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.

In addition, changes/additions are made in order to include components with surface mount technology terminations within the scope of this Generic spec.

Attachments:

escc_no._323_draft_1l_(3603007_radial_rf_switch)_to_assist_pswg_review_of_3603.docx, escc3603_draft_2g_to_assist_pswg_review_of_dcr1456.docx, escc3603_draft_2h_implementing_pswg#100_review.docx

Modifications:

DCR1456 Modifications

The following additional changes are included in this DCR (as detailed in the new final spec mark-up 3603 Draft 2H, that implement all DCR1456 changes as well as the additional specific changes required by PSWG#100):

DCR Item 23) ‘Multipaction’ test is also added to new Chart F3 (ref. Chart III)

DCR Item 24) ‘Electrical Measurements at High and Low Temperatures’ are also added to new Chart F4 (ref. Charts IV & V)

Add new DCR item:
25) ref. Para. 9.4 (new Para. 8.4), Electrical Measurements (and in ref. Charts II, II, IV, V).
Various changes and additions are made; see attached spec mark-up for details.

Approval signature:

Date signed:

2023-02-10