DOCUMENT CHANGE REQUEST

DCR number 704	Changes required for: General	Originator: Steve Thacker
Date: 2013/12/05	Date sent: 2012/01/30	Organisation: ESCC Executive Secretariat
Status: IMPLEMENTED		

Title:	Relays Electromagnetic Latching 28Vdc 2A 2PDT 1/2 Crystal Can		
Number:	3602/003	Issue:	5

Other documents affected:

Page:

Total reformat/re-write of ESCC 3602/003 issue 5 as part of the ongoing conversion to the ESCC format.

The changes incorporated into 3602/003 include the following:
• editorial & technical changes that reflect the content of Generic specification No.3602 issue 3 (per DCR673).
• technical changes per approved DCRs 340, 341.
• technical changes in accordance with the still relevant content of pending DCRs 289, 343, 348, 351, 353, 355, 359, 360 (as applicable).
• additional editorial and technical changes as detailed herein.

Paragraph:

See below

Original wording:

See 3602/003 issue 5

Proposed wording:

Total reformat of this Detail Specification (from the range of various ESCC Detail Specifications, 3602/xxx, for resistors under Generic Specification No. 3602) as part of the ongoing conversion of ESA/SCC legacy Detail specifications to the ESCC format, as well as amendments resulting from the changes to the Generic specification No.3602 per DCR673.

Note: The proposed technical content of ESCC3602/003 issue 6 is based on the current content of ESCC3602/003 issue 5 plus amendments discussed and agreed by ESA and CNES since 2006. Many of the amendments have already been proposed in other DCRs (those already approved: DCRs 340, 341)(those still open or intended to be withdrawn: DCRs 289, 343, 348, 351, 353, 355, 359, 360). This DCR details all changes including the applicable changes from all these other DCRs.

See below for summary of changes proposed by this DCR.

Also see the attached proposed 3602/003 Issue 6 Draft B which incorporates all amendments proposed per this DCR.

Note: known support for active procurement against this specification includes the following Manufacturer:
Leach/F (is willing to support procurement of all variants and is ESCC qualified for Variants 01 to 08).

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Summary of changes to the current format, layout and content is as follows

1) General
Rewording and restructure of various sections and paragraphs of the specification, plus other editorial changes based on the layout and editorial content of other Detail Specifications already converted to ESCC format.

2) Para 2, Reference to MIL-STD-202 is deleted (as it is not actually referenced)

3) Table 1(b) Maximum Ratings.
• Contact Resistance is deleted (as Contact Resistance is not a rating; Contact Voltage Drop is specified in Room Temperature Electrical Measurements)
• Storage Temperature ratings are added (these standard ESCC ratings were missing).
• Note 3 on Coil voltage rise time and required applied duration is moved to be a note to Table 2 (Para 2.4.1 in 3602/003 draft 6B)

4) Figures 2(a), 2(i) 2(j) for Variants 01, 09, 10: incorporate the 3 figures into a single figure (Para 1.6.1 in 3602/003 draft 6B).

5) Figure 2(h) Variant 08: Change symbol ‘G’ to be ‘G2’ (for clarification purposes as there is already a dimension ‘ØG’)

6) Figure 3, Circuit schematic is redrawn & notes amended to clarify terminals & connections.

7) Para 4.2.4 & 4.2.5, Deviations from the generic spec (Mechanical Shock) are removed (to be compliant with the generic spec; Condition C: 100g/6ms is specified as a standard test condition for all relays (was condition A: 50g /11ms)

8) Para 4.4.1, Case description is amended (to be consistent with other ESCC relay Detail specs). Reference to “EP 90/10 SnPb alloy” is deleted.

9) Para 4.5.1, Marking, item (a) & Para 4.5.2, Terminal Identification is deleted from the list of mandatory marking items (Terminal identification is actually specified by use of a colour reference bead, as specified in Paras 1.6.1 to 1.6.8).
Note - The Manufacture is still permitted to mark a circuit schematic on the body of the relay, if space permits, under the Marking category of ‘Manufacturer’s Own Marking’.

10) Para 4.5.4, nominal coil resistance values are deleted (as redundant information)

11) Para 4.7.1 & Table 4, Miss Test is renamed ‘Run-in’ and Table 4 is used to specify Parameter Drift Values.
Miss Test Contact Resistance limit is deleted from Table 4 and replaced by Latch Voltage & Reset Voltage drift values (+/-15%)

12) Table 2 & Table 6, Voltage Proof Leakage Current test is added whenever Voltage Proof is tested (ref DCR340; note that the Voltage Proof test is retained)

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13) Table 2 & Table 3, Contact Voltage Drop test current is specified (=100mA to be consistent with the generic spec)

14) Table 2, Coil Resistance; Reference to 'Latch', RBL & 'Reset', RBR are deleted. Reference to "Both coils" is added to the test condition (Only a single limit for RB for each coil is specified; the 2 coils are not actually differentiated as 'Latch' & 'Reset').

15) Table 3
• For Latch Voltage the max limits only apply to the high temperature test. No test is required at low temperature.
• For Reset Voltage the max limits only apply to the high temperature test. No test is required at low temperature.

16) Table 3, Contact Voltage Drop test is added (to be consistent with other ESCC relay details specs).

17) Figure 4, Figure 5(a), Figure 5(b) are deleted (Not applicable)

18) Table 5(a), the 3 high, low and room temperature conditions for Run-in (= "Miss Test") are replaced by a single test temperature of 22C.

19) Table 5(b) is deleted (Generic Spec No.3602 default test conditions apply).

20) Table 6, tests that do not include electrical measurements are removed from the table (i.e. Terminal Strength). Only relevant electrical tests per the applicable test in the Generic specification are included in the Table (e.g. references to fuse continuity, visual examination are removed from the Table).

21) Table 6, Addition of drift values (for Latch Voltage & Reset Voltage, +/-15%) during the following tests:
• Vibration (= Low Level Sine Vibration)
• Mechanical Shock (= Low Level Mechanical Shock)
• Overload
• Intermediate Current
• Operating Life Resistive (= Resistive Life)
• Operating Life Low Level Load and Mechanical Shock (= Low Level Life)
• Random Vibration (new test)
• High Level Sine Vibration (new test)
• High Level Mechanical Shock (new test)

Note 1 is added to permit an additional measurement (of drift parameters) prior to the test in question in order to facilitate the drift calculation.

22) Table 6, Salt Spray test is deleted (ref. DCR341; Note that Solderability is not added to this table)

23) Table 6, some Contact Voltage Drop limits are amended.
i.e.
• Overload: 400mV during monitoring (was 1.4V); 10mV during final measurements (was 20mV)

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• Intermediate Current: 10mV during monitoring; 10mV during final measurements (was 300mV for both)
• Operating Life Resistive (= Resistive Life): 200mV during monitoring (was 2.8V); 10mV during final measurements (was 20mV)

24) Table 6, Random Vibration, High Level Sine Vibration & High Level Mechanical Shock electrical measurement requirements are added (to be consistent with the Generic Specification per DCR673)

25) Table 6, Note 2 is deleted (already covered by generic spec)

Justification:

a) Part of the ongoing activity of conversion of legacy ESA/SCC specifications to the ESCC format. Amendments are made to the format and editorial content in order to be consistent with various other ESCC Detail Specifications.

b) To make the detail spec fully consistent with the requirements and content of the ESCC Generic spec 3602 issue 3 (per DCR673).

c) To incorporate specific technical changes as detailed in the relevant change item above. All changes are for the purposes of technical improvement and have been previously discussed with CNES/ESA.

d) Implement drift measurement limits for Latch Voltage & Reset Voltage during Screening (over Run-in) and during Qualification and Periodic Testing on specific tests (see item 21 above).
Note - This change has not yet been agreed with the ESCC QPL Manufacturer Leach/F.

Attachments:

3602003_draft_6e_in_review.pdf, null

Modifications:

DCR contents are modified as follows in order to incorporate the latest comments and agreements made by the Manufacturer (LEACH) and CNES.

The DCR attachment is changed to be 3602/003 draft 6E which includes all the changes in the final version of this DCR.

Note: This DCR now also implements the use of alternate publishing software for this specification (was: GlobalView; is now: WORD2010).

Item 4) Deleted

Item 5) Deleted

Item 8) Para 4.4.1
Delete item and replace with the following:
Case details are amended (to be consistent with other ESCC Relay Detail Specs); 2nd sentence, “electro-deposited tin shall not be used”, is deleted (as it is considered redundant). 3rd sentence is amended to read “Tin lead alloy plating may be used”.

Item 11) Para 4.7.1 & Table 4
Delete item and replace with the following:
Miss Test is renamed ‘Run-in’ and Table 4 is used to specify Parameter Drift Values.
Miss Test Contact Resistance limit is deleted from Table 4 and replaced by Latch Voltage & Reset Voltage drift values. Drift value limits are not specified at this time. Drift values are to be recorded for information purposes only in order to amass data so that suitable drift value limits can be specified at a later date (in a later revision).

Item 13) Table 2 & Table 3
Delete item and replace with the following:
Contact Voltage Drop test current is specified (=100mA maximum to be consistent with the generic spec).

The VD max limit is specified as 0.05 x ITEST (based on 50mOhm value from Table 1(b) for contact resistance and the test current of 100mA maximum).

Item 15) Deleted.

Item 21) Table 6
Add the following note to this item and delete reference to +/-15%:
Note - Drift value limits are not specified in the table at this time. Drift values are to be recorded for information purposes only in order to amass data so that suitable drift value limits can be specified at a later date (in a later revision). Note 1 is added to clarify this position.

Item 23) Table 6
Delete item and replace with the following:
The following Contact Voltage Drop limits are amended:
• Overload: 1.4V maximum during monitoring (clarification only; no actual change); 0.1 x ITEST (= 10mV) (was 20mV) maximum during final measurements.

• Intermediate Current: 300mV maximum during monitoring (clarification only; no actual change); 0.1 x ITEST (= 10mV) (was 20mV per DCR 157) maximum during final measurements.

• Operating Life Resistive (= Resistive Life): 2.8V maximum during monitoring (clarification only; no actual change); 0.1 x ITEST (= 10mV) (was 20mV) maximum during final measurements.

• Operating Life Low Level Load and Mechanical Life (= Low Level Life): 0.1 x ITEST (= 10mV) maximum during final measurements (clarification only; no actual change).

Item 24) Table 6
Coil Life is added to the list of tests added to the Table.

Add New Item 26) Table 1(a), Figure 2

Variants 07, 08 are deleted (as requested by Leach)

Add New Item 27) Table 1(a), Figure 2
The description of package & terminals for all Variants is amended as follows (to be consistent with MIL terminology):
• “Plain Case” changed to “Plain Case (No Mount)”
• “Horizontal Shoulder Brackets” changed to “Raised Vertical Flange Mount”
• “Vertical Shoulder Brackets” changed to “Horizontal Flange Mount”
• “Plug-in Terminals” changed to “Solder Pin Terminals”
• “Hook-end Terminals” changed to “Solder Hook Terminals”

Add New Item 28) Figure 2
Dimensions as follows are amended (as requested by Leach) (see attachment for details):
Variant 01: D
Variant 02: D H K
Variant 03: C D
Variant 04: D
Variant 05: D
Variant 06: D G H K
Variant 09: D
Variant 10: D

C is new for figure 2b

Add New Item 29) Para 4.4.2
Lead material is amended to be type F or D (was H). Finish type 4 is added as an equivalent option to current type 3 (i.e. D3, D4, F3 or F4) (as requested by Leach) (see also Item 31 below)

Add New Item 30) Table 3
For Latch & Reset voltage, the maximum limits are amended to be 9V (for UR=12V) & 4.5V (for UR=6V)(was 9.8V & 4.6V respectively) (as requested by Leach)

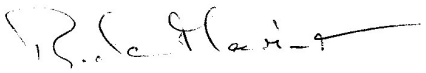
Add New Item 31) Appendix A for Leach International Europe
Add Appendix to detail the following deviations:
• Deviation to Materials & Finishes – Terminals: to allow a modification to finish type 3 such that: tin-lead plating shall have a composition of 85 to 95% tin (remainder lead) (was 30 to 70% tin (remainder lead)) (as requested by Leach).

• Deviations to Chart F4 High Level Sine Vibration & High Level Mechanical Shock tests which shall be not applicable for Leach (as requested by Leach due to the increased level in the Generic spec not yet having been assessed).

• Deviations to Chart F4: Coil Life subgroup test sequence (under Endurance Subgroup 1): Coil Life and the subsequent tests shall only be performed for Qualification. They are not required for Periodic Testing except in the case of any significant change to the design (as requested by Leach)

In the Justification section:

Item d) Delete item and replace with the following:
d) Implement drift measurement for Latch Voltage & Reset Voltage during Screening (over Run-in) and during Qualification and Periodic Testing on specific tests (see items 11 & 21 above). Limits have not been specified at this time due to lack of applicable performance data. Measurements will now be recorded for information purposes so that suitable drift value limits

can be specified at a later date in a further revision of this specification.
Approval signature:

Date signed:
2013-12-05