DOCUMENT CHANGE REQUEST

DCR number 713	Changes required for: General	Originator: Steve Jeffery
Date: 2013/12/05	Date sent: 2012/02/23	Organisation: ESCC Executive
Status: IMPLEMENTED		

Title:	Relays Electromagnetic Non-Latching 28Vdc 2A 2PDT 1/2 Crystal Can		
Number:	3601/003	Issue:	4

Other documents affected:

Page:

See below

Paragraph:

See below

Original wording:

See ESCC 3601/003 Issue 4

Proposed wording:

Total reformat of this Detail Specification (from the range of various ESCC Detail Specifications, 3601/XXX, for relays under Generic Specification No. 3601) 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 Generic Specification No. 3601 per DCR 672.

Note: the proposed technical content of ESCC 3601/003 Issue 5 is based on the current content of ESCC 3601/003 Issue 4 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have already been proposed in other DCRs (those already approved: DCRs 340 and 341) (those still open or intended to be withdrawn: DCRs 289, 348, 351, 353, 355, 359 and 360).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.

See also the attached ESCC 3601/003 Issue 5 Draft A which incorporates all proposed amendments per this DCR.

Note - The only manufacturer known to support the Variants listed in ESCC 3601/003 Issue 4 is LEACH/F. LEACH is currently ESCC Qualified for Variants 01 to 08 (Cert. No. 02K). LEACH is hereby requested to advise, as part of their review, whether or not they support (and will continue to support) Variants 09 and 10.

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: Applicable Document MIL-STD-202 is deleted because it is never referenced.

3) Table 1(a) & Figure 2, Variants 02, 03, 04, 06, 07 & 08: Delete shoulder from description/title.

4) Table 1(b) Maximum Ratings
• Rated Coil Voltage and Coil Voltage Range are interrelated and are therefore combined.
• 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).

5) Figures 2(a), 2(i) & 2(j) for Variants 01, 09 & 10: incorporate the 3 figures into a single figure (Para. 1.6.1 of 3601/003 Draft 5A).

6) Figure 2(h), Variant 08: Change symbol G to G1 for clarification purposes (as there is also a dimension ØG).

Note - All dimensions of all 8 package types, including unknown dimensions identified as tbc in ESCC 3601/003 Issue 5 Draft A, should be checked by LEACH as part of this DCR review: All dimensions should be either verified, or corrected values advised, as applicable (DCR 704 also refers).

7) Figure 3: Circuit schematic is redrawn & notes amended to clarify terminals & connections.

8) Paras. 4.2.3, 4.2.4 & 4.2.5: All deviations from the generic spec are removed as all Detail Specifications are now compliant with the latest generic spec.

9) 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.

10) Para. 4.5.1, Marking: Item (a), Terminal Identification, is deleted from the list of mandatory marking items (and Para. 4.5.2 is deleted), as terminal identification is actually specified by use of a colour reference bead (Paras. 1.6.1 to 1.6.8 and 1.7 of ESCC 3601/003 Draft 5A).
Note - The Manufacturer is still permitted to mark a circuit schematic on the body of the relay, if space permits, under the Marking category of Manufacturers Own Marking per ESCC 21700.

11) Para. 4.5.4: The tolerance is added to each coil resistance value (relevant information which forms a link with the Component Type Variants and Range of Components Para. and the Electrical Measurements Paras.).

12) 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 Pick-up Voltage & Drop-out Voltage drift values (+/-15%).

13) Table 2 & Table 6: Voltage Proof Leakage Current test is added whenever Voltage Proof is tested (ref DCR 340; note

that the Voltage Proof test is retained).

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

15) Table 3
• For Pick-up Voltage the limits only apply to the high temperature test and therefore no low temperature testing is required.
• For Drop-out Voltage the limits only apply to the low temperature test and therefore no high temperature testing is required.

16) Table 3, Operating Time: The minimum limit of 1.0ms is in error (correct value is -, i.e. no minimum).

17) Table 3: Contact Voltage Drop test is added (to be consistent with other ESCC relay detail specs).

18) Figures 4, 5(a) & 5(b) are deleted (Not applicable).

19) Table 5(a): The 3 high, low and room temperature conditions for Run-in (= Miss Test) are replaced by a single test temperature of +22 +/-3 deg.C.

20) Table 5(b) is deleted (Generic Spec No. 3601 default test conditions apply).

21) 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).

22) Table 6: Addition of drift values (for Pick-up Voltage & Drop-out 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)

23) Table 6: 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.

24) Table 6: Salt Spray test is deleted (ref. DCR 341; Note that Solderability and Permanence of Marking are not added to this table).

25) Table 6: The following Contact Voltage Drop limits are amended
• Overload: 400mV (was 1.4V) maximum during monitoring; 10mV (was 20mV) maximum during final measurements.

DCR number 713	Changes required for: General	Originator: Steve Jeffery
Date: 2013/12/05	Date sent: 2012/02/23	Organisation: ESCC Executive
Status: IMPLEMENTED		

• Intermediate Current: 10mV (was 300mV) maximum during monitoring; 10mV (was 20mV per DCR 157) maximum during final measurements.
• Operating Life Resistive (= Resistive Life): 200mV (was 2.8V) maximum during monitoring; 10mV (was 20mV) maximum during final measurements.
• Operating Life Low Level Load and Mechanical Shock (= Low Level Life): 5mV (was 10mV) maximum during final measurements.

26) Table 6: Random Vibration, High Level Sine Vibration, High Level Mechanical Shock and Coil Life electrical measurement requirements are added (to be consistent with the Generic Specification per DCR 672).

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 3601 Issue 3 (per DCR 672).

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 Pick-up Voltage & Drop-out Voltage during Screening (over Run-in) and during Qualification and Periodic Testing on specific tests (see items 12 & 22 above).
Note - This change has not yet been agreed with the ESCC QPL Manufacturer LEACH/F.

Attachments:

3601003_draft_5c_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 3601/003 draft 5C 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).

Amend note on Manufacturer support to read as follows:
Note: known support for active procurement against this specification includes the following Manufacturer:
- Leach International Europe/F (is willing to support procurement of all variants and is ESCC qualified for variants 01 to 08).

Item 3) Table 1(a), Figure 2
Delete item and replace with the following:

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”

Item 5) Deleted

Item 6) Deleted

Item 9) 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) Deleted

Item 12) 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 Pick-up Voltage & Drop-out 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 14) 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 22) 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 25) 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).

Add New Item 27) Table 1(a), Figures 2(g), 2(h), 2(j)
Variants 07, 08, 10 are deleted (as requested by Leach)

Add New Item 28) Table 1(b), Table 2, Table 3, Para 4.5.4
Delete the 6V option for coil voltage (as requested by Leach; see also DCR424).

Add New Item 29) Figure 2
Dimensions as follows are amended (as requested by Leach) (see attachment for details):
Variant 01: D E
Variant 02: D E H K
Variant 03: D M
Variant 04: D E
Variant 05: D
Variant 06: D H K
Variant 09: D

Dia.G clarified to be the inner diameter in Figures 2c, 2e, 2f.
C is a new dimension in figures 2b, 2f

Add New Item 30) Para 4.4.2
Lead material and finish types F4 and D3, D4 are added as equivalent options to current type F3 (as requested by Leach) (as requested by Leach) (see also Item 33 below)

Add New Item 31) Table 2
For Pick-up voltage, only the maximum limits apply (minimum limits are deleted)(as requested by Leach; to be consistent with other similar ESCC specs).

Add New Item 32) Table 3
For Pick-up voltage, the maximum limits are amended to be 19.8V (for UR=26.5V) & 9.9V (for UR=12V)(was 18V & 8.4V respectively)
For Drop-out voltage, the maximum limits are amended to be 14V (for UR=26.5V) & 6.5V (for UR=12V)(was not specified previously)
(as requested by Leach)

Add New Item 33) 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).

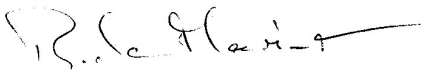
• Deviations to Chart F4 High Level Sine Vibration & High Level Mechanical Shock tests which shall be not applicable for Leach (as requested by Leach due to the increased level in the Generic spec not yet having been assessed).

• 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 Pick-up Voltage & Drop-out Voltage during Screening (over Run-in) and during Qualification and Periodic Testing on specific tests (see items 12 & 22 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