DOCUMENT CHANGE REQUEST

DCR number 715	Changes required for: General	Originator: Steve Thacker
Date: 2013/12/05	Date sent: 2012/02/24	Organisation: ESCC Executive Secretariat
Status: IMPLEMENTED		

Title:	Relays Electromagnetic Non-Latching 1A 28Vdc 2PDT 1/6 Crystal Can		
Number:	3601/012	Issue:	3

Other documents affected:

Page:

Total reformat/re-write of ESCC 3601/012 issue 3 as part of the ongoing conversion to the ESCC format.

The changes incorporated into 3601/012 include the following:
• editorial & technical changes that reflect the content of Generic specification No.3601 issue 3 (per DCR672).
• technical changes per approved DCRs 340, 341.
• technical changes in accordance with the still relevant content of pending DCRs 289, 348, 351, 353, 355, 359, 360 (as applicable).
• additional editorial and technical changes as detailed herein.

Paragraph:

See below

Original wording:

See 3601/012 issue 3

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 the Generic specification No.3601 per DCR672.

Note: The proposed technical content of ESCC3601/012 issue 4 is based on the current content of ESCC3601/012 issue 3 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have already been proposed in other DCRs (those already approved: DCRs 340, 341)(those still open or intended to be withdrawn: DCRs 289, 348, 351, 353, 355, 359, 360).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 3601/012 Issue 4 Draft A which incorporates all amendments proposed per this DCR.

Note: known support for active procurement against this specification includes the following Manufacturer:
Leach/F (is ESCC qualified for all variants).

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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(a) & Figures 2(a) to 2(k): Description/title is amended including:
• Variants 04 to 11, Delete 'shoulder'
• Variants 04 to 06, Change to read 'Raised Horizontal Brackets'

4) Table 1(b) Maximum Ratings.
• In item 2 the Rated Coil Voltage reference is corrected to be '26.5V' (was '28V')
• 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) Figure 2(a) to 2(k), Dimensions E & Dia.F
It has been noted during the spec review that dimensions E & Dia.F for the different variants as currently specified are inconsistent between variants, with other relevant ESCC specs (i.e. 3602/019, 3601/003 & 3602/010), and with the Manufacturers data sheet (Leach E).
Leach (Esterline)/F) are requested to specifically review the limits applicable to these dimensions for all variants and advise corrected values if necessary.

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

7) Para 4.2.2, 4.2.3, 4.2.4 & 4.2.5, All deviations from the generic spec are removed (no longer needed as the detail spec is now compliant with the generic spec).

8) 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 colour reference beads, as specified in Paras 1.6.1 to 1.6.11).
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'.

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

10) 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%)

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

13) Table 3
• For Pick-up Voltage the max limits only apply to the high temperature test. No test is required at low temperature.
• For Drop-out Voltage the min limits only apply to the low temperature test. No test is required at high temperature.

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

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

16) 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.

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

18) 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 Contact Monitoring, fuse continuity, visual examination are removed from the Table).

19) 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)

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.

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

21) Table 6, some Contact Voltage Drop limits are amended.
i.e.
• Overload: 200mV during monitoring (was 1.4V); 10mV during final measurements (was 20mV)
• Intermediate Current: 10mV during monitoring (was 300mV); 10mV during final measurements (was 20mV per DCR157)
• Operating Life Resistive (= Resistive Life): 100mV during monitoring (was 2.8V); 10mV during final measurements (was 20mV)

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22) 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 DCR672)

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 DCR672).

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 10 & 19 above).
Note - This change has not yet been agreed with the ESCC QPL Manufacturer Leach/F.

Attachments:

3601012_draft_4c_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 3601/012 draft 4C 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 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 (or “Flush”) 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”

• “Lead Terminals” changed to “Long Lead Terminals”

Item 5) Figures 2(a) to 2(k)
Delete item and replace with the following:
Dimensions as follows are amended (as requested by Leach) (see attachment for details):
Variant 01: D E
Variant 02: D
Variant 04: D E N O
Variant 05: D N O
Variant 06: D E G N O
Variant 07: D E N
Variant 10: D N O
Variant 11: D E G N O

Item 10) 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 12) 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 13) Deleted

Item 19) 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 21) 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 23) Table 1(a), Figure 2
Variants 03 08 09 are deleted (as requested by Leach).

Add New Item 24) Para 4.3.2
Maximum weight is amended for each variant (was 4g max for all variants) (as requested by Leach).

Add New Item 25) Para 4.4.1
Add the following new 2nd sentence: “Tin-lead alloy plating may be used.” (to be consistent with other ESCC relay Detail specs)

Add New Item 26) Para 4.4.2
Lead material and finish type D4 is added as an equivalent option to current type D3 (as requested by Leach) (see also Item 28 below)

Add New Item 27) Table 2
Pick-up voltage maximum limit for 12V option is amended to be 6.4V (was 6V)
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 28) 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 & 9.0V respectively)
For Drop-out voltage, the maximum limits are amended to be 14V (for UR=26.5V), 6.5V (for UR=12V) & 3.2V (for UR=6V) (was not specified previously)
(as requested by Leach)

Add New Item 29) 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).

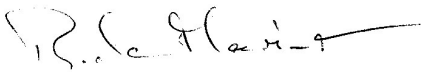
• Deviations to Chart F4: Coil Life subgroup test sequence (under Endurance Subgroup 1): Coil Life and the subsequent tests shall only be performed for Qualification. They are not required for Periodic Testing except in the case of any significant change to the design (as requested by Leach)

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 10 & 19 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