**APPLICATION FOR EXTENSION OF ESCC QUALIFICATION APPROVAL**

Component Title: Switching Diodes based on types 1N5819U and 1N5822U

Executive Member: CNES Date: 29/06/2018



Appl. No. 302D

1 Components (including series and families) submitted for Extension of Qualification Approval:

| ESCC COMPONENT NO. | VARIANTS | RANGE OF COMPONENTS | BASED ON | TEST VEHICLE / S | COMPONENT SIMILAR |
|---|---|---|---|---|---|
| 5106/021 | 02, 03 | LCC2B | 1N5819U | ID33125201XZ | |
| 5106/020 | 01, 02 | LCC2B | 1N5822U | ID33622004ZW | |
| | | | | | |
| | | | | | |

2 Component Manufacturer
STMicroelectronics

3 Location of Manufacturing Plant(s)
3, rue de Suisse BP4199, 35041 Rennes Cedex

4 Date of original qualification approval:
Date: 01/09/2010

Certificate Ref No. 302

5 ESCC Specifications used for Maintenance of qualification testing:
Generic: 5000 Issue: 6

Detail(s): 5106/021 Issue: 3
5106/020 3

6 Deviations to LVT testing and Detail Specification used:
No ☒ Yes ☐ (supply details in Box 15)

Deviation from current Specifications:
No ☒ Yes ☐ (Supply details)

7 Qualification Extension Report reference and date:
ID33622004ZW _1N5822U_ChartF4 - 12/02/2018
ID33125201XZ _1N5919U_ChartF4 - 24/01/2017

8 Summary of procurement or equivalent test results during current validity period in support of this application (those to ESCC listed first)

| Project Name | Testing Level | LAT | Date code | Quantity Delivered |
|---|---|---|---|---|
| See appendix | | | | |
| | | | | |
| | | | | |
| | | | | |

9 **PID** changes since start of qualification
None ☐
Minor* ☒
Major* ☐ *Provide details in box:

10 Current **PID** Verified by: CNES
Name of Excutive Representative
Ref No: 8097046 (generic) Rev18 and 8170379 (specific Diodes switching) rev17
Issue: Date: 15/07/2016
Rev Date:

11 Current Manufacturing facilities surveyed by: CNES on 27/03/2018
(Name of Executive Representative) (Date)

Satisfactory: Yes ☒ No ☐ Explain

Report Reference: CR-ST-27-03-2018

12

Failure Analysis, DPA, NCCS available: Yes ☐ No ☒ (Supply data)

Ref. No's and purposes:

13

The undersigned hereby certifies on behalf of the ESCC Executive - that the above information is correct; - that the appropriate documentation has been evaluated; - that full compliance to all ESCC requirements is evidence (except as stated in box 15;) - that the reports and data are available at the ESCC Executive and therefore applies on behalf of CNES as the responsible Executive Member for ESCC qualification status to be extended to the component(s) listed herein.

Date: 25/07/2018

JP. BUSSENOT

(Signature of the Executive Coordinator)

Continuation of Boxes above:

14

15

Non compliance to ESCC requirements:

| No.: | Specification | Paragraph | Non compliance |
|---|---|---|---|
| | | | |

16

Additional tasks required to achieve full compliance for ESCC qualification or rationale for acceptability of noncompliance:

17

Executive Manager Disposition

Application Approval: Yes ☒ No ☐

Action / Remarks:

Date:

B. Schade, Head of Product Assurance
And Safety Department - ESA Representative

ANNEX 1: LIST OF TESTS DONE TO SUPPORT EXTENSION OF QUALIFICATION



Tests conducted in compliance with:

- ESCC 5000 generic specification; Chart F4 (for ESCC/QPL parts);
- or PID-TFD (for ESCC/QML parts)

Tests vehicle identification/description:

| | |
|---|---|
| 1N5819U01B Lot ID33125201XZ DC1622A | Full Chart F4 |
| 1N5822U01B Lot ID33622004ZW DC1720A | Full Chart F4 |

Detail Specification reference:

| Chart F4 | Test | Tick when done | Conditions | Date Code Diffusion Lot | Tested Qty | N° of Rejects | Comments if not performed. Comments on Rejection |
|---|---|---|---|---|---|---|---|
| Environmental/Mechanical Subgroup | Mechanical shock | ☒ | MIL-STD-750 TM2016 | 1622A 1720A | 15 + 15 | 0 | |
| | Vibration | ☒ | MIL-STD-750 TM2056 | 1622A 1720A | 15 + 15 | 0 | |
| | Constant acceleration | ☒ | MIL-STD-750 TM2006 | 1622A 1720A | 15 + 15 | 0 | |
| | Seal Fine leak Gross leak | ☒ | MIL-STD-750 TM1071 | 1622A 1720A | 15 + 15 | 0 | |
| | Electrical Measurement | ☒ | Intermediate and End-Point Electrical Measurements | 1622A 1720A | 15 + 15 | 0 | |
| | External Visual | ☒ | ESCC Basic Spec 20500 | 1622A 1720A | 15 + 15 | 0 | |
| | Thermal shock | ☐ | MIL-STD-750 TM1056 | Click here to enter text. | | | Only applicable to axial lead glass diodes |
| | Temperature Cycling | ☒ | MIL-STD-750 TM1051 | 1622A 1720A | 15 + 15 | 0 | |
| | Moisture Resistance | ☒ | MIL-STD-750 TM1021 | 1622A 1720A | 15 + 15 | 0 | |
| | Seal Fine leak Gross leak | ☒ | MIL-STD-750 TM1071 | 1622A 1720A | 15 + 15 | 0 | |
| | Electrical Measurement | ☒ | Intermediate and End-Point Electrical Measurements | 1622A 1720A | 15 + 15 | 0 | |
| | External Visual | ☒ | ESCC Basic Spec 20500 | 1622A 1720A | 15 + 15 | 0 | |
| Endurance Subgroup | Operating Life | ☒ | ESCC 5000 Para. 8.19 | 1622A 1720A | 15 + 15 | 0 | |
| | Electrical Measurement | ☒ | Intermediate and End-Point Electrical Measurements | 1622A 1720A | 15 + 15 | 0 | |
| | Seal Fine leak Gross leak | ☒ | MIL-STD-750 TM1071 | 1622A 1720A | 15 + 15 | 0 | |
| | External Visual Inspection | ☒ | ESCC Basic Spec 20500 | 1622A 1720A | 15 + 15 | 0 | |
| Assembly Capability Subgroup | Permanence of Marking | ☐ | ESCC Basic Spec 24800 | | | | Not applicable on Laser marking |
| | Terminal Strength | ☒ | ESCC 5000 Para. 8.18 | 1622A 1720A | 5 + 5 | 0 | |
| | Internal Visual | ☒ | ESCC Basic Spec 20400 | 1622A 1720A | 5 + 5 | 0 | |
| | Bond Strength | ☒ | MIL-STD-750 TM 2037 | 1622A 1720A | 3 + 3 | 0 | |
| | Die Shear | ☒ | MIL-STD-750 TM 2017 | 1622A 1720A | 3 + 3 | 0 | |

ANNEX 1: LIST OF TESTS DONE TO SUPPORT EXTENSION OF QUALIFICATION

18

Tests conducted in compliance with:

- ESCC 5000 generic specification; Chart F4 (for ESCC/QPL parts);
- or PID-TFD (for ESCC/QML parts)

Tests vehicle identification/description:

| | |
|---|---|
| 1N5819U01B Lot ID33125201XZ DC1622A | Full Chart F4 |
| 1N5822U01B Lot ID33622004ZW DC1720A | Full Chart F4 |

Detail Specification reference:

| Chart F4 | Test | Tick when done | Conditions | Date Code Diffusion Lot | Tested Qty | N° of Rejects | Comments if not performed. Comments on Rejection |
|---|---|---|---|---|---|---|---|
| Environmental/Mechanical Subgroup | Mechanical shock | ☒ | MIL-STD-750 TM2016 | 1622A 1720A | 15 + 15 | 0 | |
| | Vibration | ☒ | MIL-STD-750 TM2056 | 1622A 1720A | 15 + 15 | 0 | |
| | Constant acceleration | ☒ | MIL-STD-750 TM2006 | 1622A 1720A | 15 + 15 | 0 | |
| | Seal Fine leak Gross leak | ☒ | MIL-STD-750 TM1071 | 1622A 1720A | 15 + 15 | 0 | |
| | Electrical Measurement | ☒ | Intermediate and End-Point Electrical Measurements | 1622A 1720A | 15 + 15 | 0 | |
| | External Visual | ☒ | ESCC Basic Spec 20500 | 1622A 1720A | 15 + 15 | 0 | |
| | Thermal shock | ☐ | MIL-STD-750 TM1056 | Click here to enter text. | | | Only applicable to axial lead glass diodes |
| | Temperature Cycling | ☒ | MIL-STD-750 TM1051 | 1622A 1720A | 15 + 15 | 0 | |
| | Moisture Resistance | ☒ | MIL-STD-750 TM1021 | 1622A 1720A | 15 + 15 | 0 | |
| | Seal Fine leak Gross leak | ☒ | MIL-STD-750 TM1071 | 1622A 1720A | 15 + 15 | 0 | |
| | Electrical Measurement | ☒ | Intermediate and End-Point Electrical Measurements | 1622A 1720A | 15 + 15 | 0 | |
| | External Visual | ☒ | ESCC Basic Spec 20500 | 1622A 1720A | 15 + 15 | 0 | |
| Endurance Subgroup | Operating Life | ☒ | ESCC 5000 Para. 8.19 | 1622A 1720A | 15 + 15 | 0 | |
| | Electrical Measurement | ☒ | Intermediate and End-Point Electrical Measurements | 1622A 1720A | 15 + 15 | 0 | |
| | Seal Fine leak Gross leak | ☒ | MIL-STD-750 TM1071 | 1622A 1720A | 15 + 15 | 0 | |
| | External Visual Inspection | ☒ | ESCC Basic Spec 20500 | 1622A 1720A | 15 + 15 | 0 | |
| Assembly Capability Subgroup | Permanence of Marking | ☐ | ESCC Basic Spec 24800 | | | | Not applicable on Laser marking |
| | Terminal Strength | ☒ | ESCC 5000 Para. 8.18 | 1622A 1720A | 5 + 5 | 0 | |
| | Internal Visual | ☒ | ESCC Basic Spec 20400 | 1622A 1720A | 5 + 5 | 0 | |
| | Bond Strength | ☒ | MIL-STD-750 TM 2037 | 1622A 1720A | 3 + 3 | 0 | |
| | Die Shear | ☒ | MIL-STD-750 TM 2017 | 1622A 1720A | 3 + 3 | 0 | |

| Chart F4 | Test | Tick when done | Conditions | Date Code Diffusion Lot | Tested Qty | N° of Rejects | Comments if not performed. Comments on Rejection |
|---|---|---|---|---|---|---|---|
| Additional Tests | IVC testing | ☒ | MIL-STD-750 TM1018 | 1622A 1720A | 3+3 | 0 | |
| | | ☐ | | | | | |
| | | ☐ | | | | | |

***NOTES ON THE COMPLETION OF THE APPLICATION FORM FOR ESCC QUALIFICATION EXTENSION APPROVAL***

**ENTRIES**

| | |
|---|---|
| Form heading | shall indicate: - the title of the component as given in its detail specification or the name of the series, family; - the Executive Member; - the entering date; - the certificate number and its sequential suffix. |
| **Box 1** | shall provide details given in the table; in particular there shall be listed: - the variants or range of variants; - the range of components (the ESCC code is recommended to indicate the values or values range, the tolerance, the voltage, etc); the designation given in the detail specification as 'base on'; - under Test Vehicle enter either an ESCC code or the specific characteristic capable of identifying the component tested (e.g., voltage of coil for a relay); - under component similar enter a cross if relevant. |
| **Box 2; 3 and 4** | As per QPL entry; otherwise, an explanation of the changes must be supplied. |
| **Box 5** | Will show the ESCC Generic and Detail specifications, including issue number and revision letter, current at the time the tests reported were performed. If the specifications are different from those current on the date of the application, see Box 6. |
| **Box 6** | Will show the deviations from the Generic and Detail Specifications listed in Box 5, in particular deviations from testing. In case of deviations this must be listed in Box 15. In case the referenced specification in Box 5 have currently a different issue and/or revision indicate also whether the test data deviates or not from such current documents. |
| **Box 7** | Must reference the report(s) supplied in support of the application. |
| **Box 8** | Should provide the details of procurement to the full ESCC System, documentation of all of which should already have been delivered to the ESCC Executive under the terms of the relevant Generic Specification. An appropriate table has been drawn in this box. |
| **Box 9** | If the PID evolved after the Original Qualification or after the last Extension of Qualification, adequate details of such evolution shall be provided together with the reasons for the changes. Major changes shall be clearly marked. |
| **Box 10** | Identify the current PID issue status, date and actual date of verification. The date of verification of the current PID should be arranged as close as possible to the required date of extension. |
| **Box 11** | This box can be completed only after a physical visit to the plant to confirm that no unexplained changes occurred and that the practices, procedures, material, etc. used in manufacturing the components are as described in the PID. This survey shall be carried out in accordance with the requirements of ESCC Basic Specification No. 20200 and its findings shall be recorded. |
| **Box 12** | Provide details of, or reference to, any Destructive Physical Analysis (DPA) and Failure Analysis reports as well as any Nonconformance(s) (NCCS) occurred during the qualification validity period, stating if established corrective action have produced satisfactory results. |
| **Box 13** | Enter only the name of the Executive Member (i.e., CNES, DLR, ESTEC, etc.) and the signature of the responsible Executive Coordinator. |
| **Box 14** | To be used when there is a need to expand any of the boxes from 1 through 12. Identify box affected and reference the Box 14 in the relevant Box. Box 14 can be broken into 14a, 14b, etc. if several boxes have to be expanded. |
| **Box 15** | Fill in Table as requested. |
| **Box 16** | Any additional action deemed necessary by the Executive Member to bring the submitted data to a standard likely to be accepted by the ESCC Executive should be listed herein or the reason(s) to accept the noncompliance. |
| **Box 17** | All Executive Manager recommendations on the application itself, special conditions or restrictions, modifications of the QPL or QML entry, letters to the manufacturer, etc. shall be entered clearly in Box 19, signed by the representative for ESA, and dated. |
| **Box 18** | Fill in Table as requested. |
| **Box 19** | Confidential Details of PID changes including those of a confidential nature, shall be provided. |
| **Box 20** | State noncompliance with reference to specification(s) and paragraph(s). To simplify reference in Box 16 each nonconformance shall be sequentially numbered. If relevant state 'None'. |
| **Box 21** | Any additional action deemed necessary by the Executive Member to bring the submitted data to a standard likely to be accepted by the ESCC Executive should be listed herein or the reason(s) to accept the noncompliance. |
| **Box 22** | Additional Comments. |