APPLICATION FOR EXTENSION OF ESCC QUALIFICATION APPROVAL

Component Title: Power Schottky Barrier Diodes based on types 1N5819U, 1N5822U and STPS

Executive Member: CNES Date: 18/01/2023

Appl. No. 368A-rev1

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	510602102	
5106/020	01, 02	LCC2B	1N5822U	510602001	
5106/016	05, 06, 07, 11	TO-254, SMD0.5, SMD1	STPS20100		
5106/017	01, 02	SMD0.5	STPS1045		
5106/018 5106/019	02 03, 05	SMD1 TO254, SMD1	STPS6045 STPS40100		
5106/023	01, 02, **05, 06**	SMD.5, TO-254AA	STPS60A150 STPS80A150	510602301 510602303 **510602306**	
5106/024	01, 02, 03	SMD.5, TO-254AA	STPS40A45		

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: 01/09/2020

Certificate Ref No. 368

5 ESCC Specifications used for Maintenance of qualification testing:

Generic: 5000 Issue: 10

Detail(s):		Issue:
	5106/016	10
	5106/017	7
	5106/018	8
	5106/019	9
	5106/020	5
	5106/021	5
	5106/023	6
	5106/024	4

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:

ID 33712001YX Sg2 DC 2006A
ID 33652005ZT Sg2 DC 2017A
ID 33848001YW Sg2 DC 2113A
ID 33945004ZP Sg2 DC 2113A

ID 33712001YX Sg1&3 DC2006A
ID 33652005ZT Sg1&3 DC2017A
ID 33018003ZZ Sg1&3 DC2027A
ID 33848001YW Sg1&3 DC2113A
ID 33945004ZP Sg1&3 DC2113A
ID 33042002ZT Sg1&3 DC2114A

ID 33945004ZD Sg1 DC 2121A

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

9 **PID** changes since start of qualification

None ☒
Minor* ☐
Major* ☐ *Provide details in box:

10 Current **PID** Verified by: F. Vacher, CNES

Name of Excutive Representative

Ref No: Generic: 8097046 (generic) Rev 36 and Diodes: 8122351 rev 18

Issue: Date:

Rev Date: 02/11/2021

11 Current Manufacturing facilities surveyed by: JP Sauveplane, CNES on 08/10/2021

(Name of Executive Representative) (Date)

Satisfactory: Yes ☒ No ☐ Explain

Report Reference: CR-Visite Octobre 2021

Component title: Power Schottky Barrier Diodes based on types 1N5819U, 1N5822U and STPS

Executive Member: CNES Date: 18/01/2023

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

Ref. No's and purposes:

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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: 20/01/2023

G. QUADRI

(Signature of the Executive Coordinator)

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Continuation of Boxes above:

Extension of qualified range to SMD.5 with Sn/PB finish variants based on Chart F4 sg1 tests done on **510602306 (SMD.5 device with tin lead finish)**

Non compliance to ESCC requirements: 15

No.:	Specification	Paragraph	Non compliance

Additional tasks required to achieve full compliance for ESCC qualification or rationale for acceptability of noncompliance: 16

Executive Manager Disposition 17

Application Approval: Yes ☒ No ☐

Action / Remarks:

Date:

B. Schade: Head of the Product Assurance and Safety Department

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 [redacted] (for ESCC/QML parts)

Tests vehicle identification/description:

ID 33712001YX Sg2 DC 2006A ID 33652005ZT Sg2 DC 2017A ID 33945004ZD Sg1 DC 2121A (SMD.5)	ID 33848001YW Sg2 DC 2113A ID 33945004ZP Sg2 DC 2113A
ID 33712001YX Sg1&3 DC2006A (LCC2B) ID 33652005ZT Sg1&3 DC2017A (SMD.5) ID 33018003ZZ Sg1&3 DC2027A (TO254AA)	ID 33848001YW Sg1&3 DC2113A (LCC2B) ID 33945004ZP Sg1&3 DC2113A (TO254AA) ID 33042002ZT Sg1&3 DC2114A (SMD1)

Detail Specification reference: See box 5

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	2006 2114 2121	90 +15	0	
	Vibration	☒	MIL-STD-750 TM2056	2006 2114	90 +15	0	
	Constant acceleration	☒	MIL-STD-750 TM2006	2006 2114	90 +15	0	
	Seal Fine leak Gross leak	☒	MIL-STD-750 TM1071	2006 2114	90 +15	0	
	Electrical Measurement	☒	Intermediate and End-Point Electrical Measurements	2006 2114	90 +15	0	
	External Visual	☒	ESCC Basic Spec 20500	2006 2114	90 +15	0	
	Thermal shock	☐	MIL-STD-750 TM1056				Only applicable to axial lead glass diodes
	Temperature Cycling	☒	MIL-STD-750 TM1051	2006 2114	90 +15	0	
	Moisture Resistance	☒	MIL-STD-750 TM1021	2006 2114	90 +15	0	
	Seal Fine leak Gross leak	☒	MIL-STD-750 TM1071	2006 2114	90 +15	0	
	Electrical Measurement	☒	Intermediate and End-Point Electrical Measurements	2006 2114	90 +15	0	
	External Visual	☒	ESCC Basic Spec 20500	2006 2114	90 +15	0	
Endurance Subgroup	Operating Life	☒	ESCC 5000 Para. 8.19	2006 2113	90	0	
	Electrical Measurement	☒	Intermediate and End-Point Electrical Measurements	2006 2113	90	0	
	Seal Fine leak Gross leak	☒	MIL-STD-750 TM1071	2006 2113	90	0	
	External Visual Inspection	☒	ESCC Basic Spec 20500	2006 2113	90	0	
Assembly Capability Subgroup	Permanence of Marking	☐	ESCC Basic Spec 24800				Not applicable for laser marking
	Terminal Strength	☒	ESCC 5000 Para. 8.18	2006 2114	30	0	
	Internal Visual	☒	ESCC Basic Spec 20400	2006 2114	30	0	
	Bond Strength	☒	MIL-STD-750 TM 2037	2006 2114	12	0	
	Die Shear	☒	MIL-STD-750 TM 2017	2006 2114	12	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		☐					
		☐					
		☐					

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.