APPLICATION FOR EXTENSION OF ESCC QUALIFICATION APPROVAL

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Component Title: TRANSISTOR BIPOLAR LOW AND HIGH POWER SINGLE DUAL MATCH AND COMPLEMENTARY NPN/PNP

Appl. No. 361C

Executive Member: CNES Date: 25/11/2024

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
5201/001 5201/002 5201/019 5201/004	04, 05, 06, 07 04, 05, 11, 12 04, 05, 08, 09 04, 05, 06, 07	LCC3, LCC3+1 LCC3, LCC3+1 LCC3, LCC3+1 LCC3, LCC3+1	2N 2484 2N 222AA 2N 5551 2N 3700	SOC2222AHRG	
5203/010 5207/002 5201/020	04 to 07, 09, 10 12, 15, 16, 17 01, 02	TO-257, SMD.5 LCC6, FP8 SMD.5	2N 5154 2N 2920A 2ST15300	2N2920AKT	
5202/001 5202/014 5204/002 5207/005	04, 05, 06, 07 04, 05, 06, 07 04, to 07, 09, 10 07,09 10, 11	LCC3, LCC3+1 LCC3, LCC3+1 TO-257, SMD.5 LCC6, FP8	2N 2907A 2N 5401 2N 5153 2N 3810	SOC2907ARHRTW SOC2907AHRT 2N5153ESYHRG 2N5153RSRHRT	
5207/009	01,02	FP8	2ST 3360		

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: 15/07/2019

Certificate Ref No. 361

5

ESCC Specifications used for Maintenance of qualification testing:

Generic: 5000 Issue: 10

Detail(s):		Issue:
	5201/001	8
	5201/002	10
	5201/019	10
	5201/004	8
	5203/010	10
	5203/016	6
	5207/002	10
	5201/020	3
	5202/001	10
	5202/014	9
	5202/002	5
	5204/006	6
	5207/005	8
	5207/009	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:

2N2920AKT FP8 NPN 3381700301 Full F4
SOC2907ARHRTW LCC3 PNP 33834003XA F4 SG2
SOC2907AHRT LCC3 PNP 33821002WW F4 SG2
SOC2222AHRG LCC3 NPN 33920008YL F4 Sg1&3
2N5153ESYHRG TO257 PNP 33316F7B01 F4 Sg1&3
2N5153RSRHRT SMD.5 PNP 33124007ZP F4 Sg1&3

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: CNES

Name of Excutive Representative

Ref No: 8097046 (generic) rev 39 & 8124528 (specific Bipolar) rev 25

Issue: Rev 39 & 25 Date: 08/10/2024

Rev Date: 13/05/2024

11

Current Manufacturing facilities surveyed by: CNES on 12/07/2023

(Name of Executive Representative) (Date)

Satisfactory: Yes ☒ No ☐ Explain

Report Reference: CR-Activités ST Juillet 2023

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: 26/11/2024

Lya FONTAINE

(Signature of the Executive Coordinator)

14

Continuation of Boxes above:

Signature numérique de Fontaine Lya-Cnes
Date : 2024.11.26 11:07:18 +01'00'

Component title: TRANSISTOR BIPOLAR LOW AND HIGH POWER SINGLE DUAL MATCH AND COMPLEMENTARY NPN/PNP

Appl. No. 361C

Executive Member: CNES Date: 25/11/2024

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 X No ☐

Action / Remarks:

Date: 30/11/2024

B. Schade: Head of the Quality Department

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:

2N2920AKT FP8 NPN 3381700301 Full F4 (DC2310)	SOC2222AHRG LCC3 NPN 33920008YL F4 Sg1&3 (DC2234)
SOC2907ARHRTW LCC3 PNP 33834003XA F4 SG2 (DC2308) ; SOC2907AHRT LCC3 PNP 33821002WW F4 SG2 (2404)	2N5153ESYHRG TO257 PNP 33316F7B01 F4 Sg1&3 (DC2320); 2N5153RSRHRT SMD.5 PNP 33124007ZP F4 Sg1&3 (2229)

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	2229-2320	60	0	
	Vibration	☒	MIL-STD-750 TM2056	2229-2320	60	0	
	Constant acceleration	☒	MIL-STD-750 TM2006	2229-2320	60	0	
	Seal Fine leak Gross leak	☒	MIL-STD-750 TM1071	2229-2320	60	0	
	Electrical Measurement	☒	Intermediate and End-Point Electrical Measurements	2229-2320	60	0	
	External Visual	☒	ESCC Basic Spec 20500	2229-2320	60	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	2229-2320	60	0	
	Moisture Resistance	☒	MIL-STD-750 TM1021	2229-2320	60	0	
	Seal Fine leak Gross leak	☒	MIL-STD-750 TM1071	2229-2320	60	0	
	Electrical Measurement	☒	Intermediate and End-Point Electrical Measurements	2229-2320	60	0	
	External Visual	☒	ESCC Basic Spec 20500	2229-2320	60	0	
Endurance Subgroup	Operating Life	☒	ESCC 5000 Para. 8.19	2234-2404	45	0	
	Electrical Measurement	☒	Intermediate and End-Point Electrical Measurements	2234-2404	45	0	
	Seal Fine leak Gross leak	☒	MIL-STD-750 TM1071	2234-2404	45	0	
	External Visual Inspection	☒	ESCC Basic Spec 20500	2234-2404	45	0	
Assembly Capability Subgroup	Permanence of Marking	☐	ESCC Basic Spec 24800				Not applicable on Laser marking
	Terminal Strength	☒	ESCC 5000 Para. 8.18	2229-2320	20	0	
	Internal Visual	☒	ESCC Basic Spec 20400	2229-2320	20	0	
	Bond Strength	☒	MIL-STD-750 TM 2037	2229-2320	20	0	
	Die Shear	☒	MIL-STD-750 TM 2017	2229-2320	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.