



APPLICATION FOR EXTENSION OF ESCC QUALIFICATION APPROVAL

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

Executive Member: CNES Date: 14/11/2022

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

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	2N5551HRGE 2N5551RUBT 2N2222AHRG	
5203/010 5203/016 5207/002 5201/020	04, 05, 06, 07 06, 07, 12, 15, 16, 17 01	TO-257, SMD.5 TO-257 LCC6, FP8 SMD.5	2N 5154 BUX77ESY 2N 2920A 2ST15300		
5202/001 5202/014 5204/002 5204/006 5207/005	04, 05, 06, 07 04, 05, 06, 07 04, 05, 06, 07 06, 07 07, 09 10, 11	LCC3, LCC3+1 LCC3, LCC3+1 TO-257, SMD.5 TO-257 LCC6, FP8	2N 2907A 2N 5401 2N 5153 BUX78ESY 2N 3810	2N3810KT 2N3810RHRG 2N5153RESYHRG 2N5153SHRG	
5207/009	01,02	FP8	2ST 3360		

Component Manufacturer STMicroelectronics	2	Location of Manufacturing Plant(s) 3, rue de Suisse BP4199, 35041 Rennes Cedex	3	Date of original qualification approval: Date: 15/07/2019 Certificate Ref No. 361	4
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ESCC Specifications used for Maintenance of qualification testing: Generic: 5000 Issue: 10 Detail(s): 5201/001 Issue: 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	5	Deviations to LVT testing and Detail Specification used: No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> (supply details in Box 15) Deviation from current Specifications: No <input checked="" type="checkbox"/> Yes <input type="checkbox"/> (Supply details)	6	Qualification Extension Report reference and date: 2N3810RKT ID33620003X8 DC2034A 2N5153SRHRG ID33838005YL DC2040A 2N5551RUBT ID33621001Z0 DC2012A SOC3810RHRG ID33103004ZX DC2105B 2N5153RESYHRG ID33838006ZP DC2044A SOC2222AHRG ID33920008YL DC2209B SOC5551HRGE ID33926008Z5 DC2138A	7
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Summary of procurement or equivalent test results during current validity period in support of this application (those to ESCC listed first) 8

Project Name	Testing Level	LAT	Date code	Quantity Delivered

PID changes since start of qualification None <input type="checkbox"/> Minor* <input checked="" type="checkbox"/> Major* <input type="checkbox"/> *Provide details in box:	9	Current PID Verified by: G. Quadri, CNES Name of Executive Representative Ref No: 8097046 (generic) rev 36 & 8124528 (specific Bipolar) rev 25 Issue: Rev 36 & 25 Date: 08/11/2022 Rev Date: 19/08/2022	10
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Current Manufacturing facilities surveyed by: JP Sauveplane, CNES on 08/10/2021 (Name of Executive Representative) (Date)	11
Satisfactory: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Explain	
Report Reference: CR-Visite Octobre 2021	



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

Ref. No's and purposes: NCCS2CSTM203: Arcing during initial electrical measurement.

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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.

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Gianandrea Quadri
(Signature of the Executive Coordinator)

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Continuation of Boxes above:



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Non compliance to ESCC requirements:

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No.:	Specification	Paragraph	Non compliance

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

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Executive Manager Disposition

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Application Approval: Yes No

Action / Remarks:

Date:

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



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

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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:

Full F4: 2N2222AHRG (LCC3 DC2209)	F4 Sg1 & 3: 2N3810RKT (FP8 DC2034) 2N5153RESYHRG (TO257 DC2044) 2N5153SRHRG (SMD.5 DC2040)
Full F4: 2N5551HRGE (LCC3 2138)	F4 Sg2: 2N5551 (LCC3+1 DC2012) 2N3810RHRG (SMD.5 DC2105)

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	<input checked="" type="checkbox"/>	MIL-STD-750 TM2016	2034-2209	75	0	
	Vibration	<input checked="" type="checkbox"/>	MIL-STD-750 TM2056	2034-2209	75	0	
	Constant acceleration	<input checked="" type="checkbox"/>	MIL-STD-750 TM2006	2034-2209	75	0	
	Seal Fine leak Gross leak	<input checked="" type="checkbox"/>	MIL-STD-750 TM1071	2034-2209	75	0	
	Electrical Measurement	<input checked="" type="checkbox"/>	Intermediate and End-Point Electrical Measurements	2034-2209	75	0	
	External Visual	<input checked="" type="checkbox"/>	ESCC Basic Spec 20500	2034-2209	75	0	
	Thermal shock	<input type="checkbox"/>	MIL-STD-750 TM1056	Click here to enter text.			Only applicable to axial lead glass diodes
	Temperature Cycling	<input checked="" type="checkbox"/>	MIL-STD-750 TM1051	2034-2209	75	0	
	Moisture Resistance	<input checked="" type="checkbox"/>	MIL-STD-750 TM1021	2034-2209	75	0	
	Seal Fine leak Gross leak	<input checked="" type="checkbox"/>	MIL-STD-750 TM1071	2034-2209	75	0	
	Electrical Measurement	<input checked="" type="checkbox"/>	Intermediate and End-Point Electrical Measurements	2034-2209	75	0	
External Visual	<input checked="" type="checkbox"/>	ESCC Basic Spec 20500	2034-2209	75	0		
Endurance Subgroup	Operating Life	<input checked="" type="checkbox"/>	ESCC 5000 Para. 8.19	2012-2209	60	0	
	Electrical Measurement	<input checked="" type="checkbox"/>	Intermediate and End-Point Electrical Measurements	2012-2209	60	0	
	Seal Fine leak Gross leak	<input checked="" type="checkbox"/>	MIL-STD-750 TM1071	2012-2209	60	0	
	External Visual Inspection	<input checked="" type="checkbox"/>	ESCC Basic Spec 20500	2012-2209	60	0	
Assembly Capability Subgroup	Permanence of Marking	<input type="checkbox"/>	ESCC Basic Spec 24800				Not applicable on Laser marking
	Terminal Strength	<input checked="" type="checkbox"/>	ESCC 5000 Para. 8.18	2034-2209	25	0	
	Internal Visual	<input checked="" type="checkbox"/>	ESCC Basic Spec 20400	2034-2209	25	0	
	Bond Strength	<input checked="" type="checkbox"/>	MIL-STD-750 TM 2037	2034-2209	25	0	
	Die Shear	<input checked="" type="checkbox"/>	MIL-STD-750 TM 2017	2034-2209	15	0	



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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		<input type="checkbox"/>					
		<input type="checkbox"/>					
		<input type="checkbox"/>					



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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.