APPLICATION FOR EXTENSION OF ESCC QUALIFICATION APPROVAL

Component Title: TRANSISTORS, MICROWAVE, SMALL SIGNAL, SILICON, BIPOLAR, BASED ON TYPES BFY405, BFY420 AND BFY450

Appl. No. 245J

Executive Member: DLR Date: 10/11/2019

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
5611/008	01 to 03		BFY405 BFY420 BFY450	BFY193C(ES)	Y

2 Component Manufacturer

Infineon Technologies AG

3 Location of Manufacturing Plant(s)

Am Campeon 1-12
D- 85579 Neubiberg
Germany

4 Date of original qualification approval:

Date: 01/06/1997

Certificate Ref No. 245

5 ESCC Specifications used for Maintenance of qualification testing:

Generic: 5010 Issue: 03

Detail(s): 5512/020 Issue: 20

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:

1922LR10, Iss. 1, Sep 2019

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 last MoQ

None ☐

Minor* ☒

Major* ☐

*Provide details in box:

Gen. PID: 650V Power MOSFET device is implemented
Det. PID: updated based on the agreement during ESCC Executive Meeting on 10.10.2019

10 Current **PID** Verified by: Burak Gökgöz

Name of Executive Representative

Generic PID: A63500-GEPID-P000, Issue 2d, 25.09.2019
Detail PID: A63500-T503-P000, Issue 4, 16.10.2019

11 Current Manufacturing facilities surveyed by: Thilo Kaupisch on 17-18/10/2018

(Name of Executive Representative) (Date)

Satisfactory: Yes ☒ No ☐ Explain

Report Reference: IFX-AUD-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 DLR as the responsible Executive Member for ESCC qualification status to be extended to the component(s) listed herein.

Date: 10/11/2019

Burak Gökgöz

(Signature of the Executive Coordinator)

Continuation of Boxes above:

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Non compliance to ESCC requirements:

No.:	Specification	Paragraph	Non compliance

16

17

Executive Manager Disposition

Application Approval: Yes ☑ No ☐

Action / Remarks:

Date: 27.01.2020

B. Schade, Head of ESA Product Assurance and Safety Department

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

18

Tests conducted in compliance with:

- ESCC 5010 generic specification; Chart F4 (for ESCC/QPL parts);

Tests vehicle identification/description:

1922LR10	BFY193C(ES)

Detail Specification reference: ESCC 5611/006 Issue 7, Nov. 2016

Chart F4A	Test	Tick when done	Conditions	Date Code Diffusion Lot	Tested Qty	No. of Rejects	Comments if not performed. Comments on Rejection
Environmental/Mechanical Subgroups	Thermal Shock Test	☒	ESCC 5010 Para. 9.5.2	1848A	8	0	
	Shock Test	☐	MIL-STD-750 Test Method 2016				n.a. acc. Detail Spec
	Vibration Test	☐	MIL-STD-750 Test Method 2056				n.a. acc. Detail Spec
	Constant Acceleration	☐	MIL-STD-750 Test Method 2006				n.a. acc. Detail Spec
	Seal Test	☐	MIL-STD-750 Test Method 1071				n.a. acc. Detail Spec
	Moisture Resistance	☒	MIL-STD-750 Test Method 1021	1848A	8	0	
	Seal Test	☒	MIL-STD-750 Test Method 1071	1848A	8	0	
	Electrical Measurements at Room Temp.	☒	Table 2 of the Detail Specification	1848A	8	0	
	External Visual Inspection	☒	ESCC Basic Specification No. 20500	1848A	8	0	
Endurance Subgroup*	Operating Life	☐	MIL-STD-750 Test Method 1026				Former data from Wafer available
	Electrical Measurements during Endur. Test	☐	Table 6 of the Detail Specification				Former data from Wafer available
	External Visual Inspection	☐	ESCC Basic Specification No. 20500				Former data from Wafer available

* LAT2 on actual wafer was performed satisfactorily used in:

Assembly Lot:	Date Code:
1008.02	1016A
0715.02	0716B

Chart F4B	Test	Tick when done	Conditions	Date Code Diffusion Lot	Tested Qty	No. of Rejects	Comments if not performed. Comments on Rejection
Electrical Subgroup – Electrical Measurements	Electrical Measurements at Room Temp.	☐	Table 2 of the Detail Specification				
	Electrical Measurements at High & Low Temp's	☐	Table 3 of the Detail Specification				
	External Visual Inspection	☐	ESCC Basic Specification No. 20500				
	Special Testing	☐	The Detail Specification				n.a. acc. Detail Spec
Electrical Subgroup – Assembly Capability Tests	Solderability Test	☒	MIL-STD-750 Test Method 2026	1848A	4	0	
	Permanence of Marking	☐	ESCC Basic Specification No. 24800				n.a. due to laser marking
	Terminal Strength	☒	MIL-STD-750 Test Method 2036	1848A	4	0	
De-encapsulation Tests	Internal visual inspection	☒	ESCC Basic Specification No. 20400	1848A	6	0	
	Bond Strength	☒	MIL-STD-750 Test Method 2037	1848A	6	0	
	Die Shear	☒	MIL-STD-750 Test Method 2017	1848A	6	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.