APPLICATION FOR EXTENSION OF ESCC QUALIFICATION APPROVAL

Page 1

Component Title: TRANSISTORS, MICROWAVE, SMALL SIGNAL, BIPOLAR, BASED ON TYPES BFY640, BFY640B, BFY450B AND 740B

Appl. No. 322E

Executive Member: DLR Date: 22/10/2021

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
5611/009 5611/010 - 5611/011	01, 02, 03 01, 02, 03, 04 - 01, 02		BFY640 BFY640B BFY650B BFY740B	BFY193C(ES)	Y

2 Component Manufacturer

Infineon Technologies AG

3 Location of Manufacturing Plant(s)

Villach, Austria and Regensburg, Germany for Silicon
Neubiberg, Germany for packing and screening

4

Date of original qualification approval:
Date: 01/01/2012

Certificate Ref No. 322, initial: Sep. 2012

5

ESCC Specifications used for Maintenance of qualification testing:

Generic: 5010 Issue: 3

Detail(s): 5611/006 Issue: 8

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:

2013LR80, Iss. 1, Aug. 2021

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:

See Annex 2

10

Current **PID** Verified by: B. Gökgöz, DLR

Name of Excutive Representative

Generic PID: A63500-GEPID-P000, Issue 2f, 13.10.2021
Detail PID, BFY640: A63500-T580-P000, Issue 4, 16.10.2019
, Rest: A36500-T1580B-P000, Issue 5, 13.10.2021

11

Current Manufacturing facilities surveyed by: DLR (B. Gökgöz, T. Kaupisch) on 13/10/2021

(Name of Executive Representative) (Date)

Satisfactory: Yes ☒ No ☐ Explain

Report Reference: Infineon_MoQ_2021_MoM_Rev_1.5

Addition new variants

Component Title: TRANSISTORS, MICROWAVE, SMALL SIGNAL, BIPOLAR, BASED ON TYPES BFY650-12

Executive Member: DLR Date: 12/10/2021

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

ESCC COMPONENT. NO.	VARIANTS	RANGE OF COMPONENTS	BASED ON	TEST VEHICLE / S	COMPONENT SIMILAR
5611/010	05		BFY650B-12	1943B 1943C	O

2 Component Manufacturer

Infineon Technologies AG

3 Location of Manufacturing Plant

Villach, Austria and Regensburg, Germany for Silicon
Neubiberg, Germany for packing and screening

4 ESCC Specification used for Qualification

Generic: 5010 Issue: 3
Detail/s: 5611/010 Issue: 4

5 Qualification Report Reference and date:

ESA1649LR10 Iss. 1, Aug 2021
ESA1649LR11 Iss. 1, Aug 2021

Date: 18/08/2021

6 **PID** used for manufacturing Qualification Lot

Ref No: A63500-T1580B-P000_Detail_PID_BFY640Bff_I5_signed
Issue: 4
Date: 16/10/2019

7 **PID** changes since start of qualification

None ☐
Minor* ☒
Major* ☐

(* Details not published, provided in confidential annex 2.)

8 Current **PID** Verified by B. Gökgöz, DLR

Name of Executive Representative

Ref No: A63500-T1580B-P000_Detail_PID_BFY640Bff_I6_signed
Issue 5
Date 13/10/2021

9 Current Manufacturing facilities surveyed by:

DLR (B. Gökgöz, T. Kaupisch) 13/10/2021

(Name of Executive Responsible) (Date)

Infineon_MoQ_2021_MoM_Rev_1.5

Report Reference

Satisfactory: Yes ☒ No ☐ Explain

10 Quality and Reliability Data

Evaluation testing performed Yes ☐ No ☒

Report Ref. No.: Date:

Equivalent Data:

Certification:

Failure analysis, DPA, NCCS available Yes ☐ No ☒

(supply data)

Ref Nos. and purpose:

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: 17/11/2021

B. Gökgöz

(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:

Britta Schade

Digitally signed by Britta Schade
Date: 2021.12.20 14:02:12 +01'00'

Date:

B. Schade: Head of the 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 V (for ESCC/QPL parts)

Tests vehicle identification/description:

2013LR80, 2010A	BFY193C(ES), EnvMechSG, EndSG, AssCapSG, DecapSG

Detail Specification reference: 5611/006

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	2010A	11	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	2010A	11	0	
	Seal Test	☒	MIL-STD-750 Test Method 1071	2010A	11	0	
	Electrical Measurements at Room Temp.	☒	Table 2 of the Detail Specification	2010A	11	0	
	External Visual Inspection	☒	ESCC Basic Specification No. 20500	2010A	11	0	
Endurance Subgroup	Operating Life	☒	MIL-STD-750 Test Method 1026	2010A	16	0	
	Electrical Measurements during Endur. Test	☒	Table 6 of the Detail Specification	2010A	16	0	
	External Visual Inspection	☒	ESCC Basic Specification No. 20500	2010A	16	0	
Electrical Subgroup – Assembly Capability Tests	Solderability Test	☒	MIL-STD-750 Test Method 2026	2010A	5	0	
	Permanence of Marking	☐	ESCC Basic Specification No. 24800				n.a. due to laser marking
	Terminal Strength	☒	MIL-STD-750 Test Method 2036	2010A	5	0	
De-encapsulation Tests	Internal visual inspection	☒	ESCC Basic Specification No. 20400	2010A	6	0	
	Bond Strength	☒	MIL-STD-750 Test Method 2037	2010A	6	0	
	Die Shear	☒	MIL-STD-750 Test Method 2017	2010A	6	0	

ANNEX 1: LIST OF TESTS DONE TO SUPPORT QUALIFICATION 16

Tests conducted in compliance with:

– ESCC 5010 generic specification; Chart IV (for ESCC/QPL parts)

Tests vehicle identification/description:

ESA1649LR10; 1943B ESA1649LR11; 1943C	BFY650B-12(ES) EnvMechSG, EndSG BFY650B-12(ES) EnvMechSG, EndSG

Detail Specification reference: 5611/010

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	1943B 1943C	12 12	0 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	1943B 1943C	12 12	0 0 0 0	
	Seal Test	☒	MIL-STD-750 Test Method 1071	1943B 1943C	12 12	0 0	
	Electrical Measurements at Room Temp.	☒	Table 2 of the Detail Specification	1943B 1943C	12 12	0 0	
	External Visual Inspection	☒	ESCC Basic Specification No. 20500	1943B 1943C	12 12	0 0	
Endurance Subgroup	Operating Life	☒	MIL-STD-750 Test Method 1026	1943B 1943C	17 21	0 0	
	Electrical Measurements during Endur. Test	☒	Table 6 of the Detail Specification	1943B 1943C	17 21	0 0	
	Seal Test	☐	MIL-STD-750 Test Method 1071				n.a. no package change
	External Visual Inspection	☒	ESCC Basic Specification No. 20500	1943B 1943C	17 21	0 0	
Assembly Capability Subgroup	Solderability Test	☐	MIL-STD-750 Test Method 2026				Reference to MOQ 2021 Report: 2013LR80
	Permanence of Marking	☐	ESCC Basic Specification No. 24800				n.a. laser marking
	Terminal Strength	☐	MIL-STD-750 Test Method 2036				Reference to MOQ 2021 Report: 2013LR80

De-encapsulation Tests	Internal visual inspection	☐	ESCC Basic Specification No. 20400				Reference to MOQ 2021 Report 2013LR80
	Bond Strength	☐	MIL-STD-750 Test Method 2037				Reference to MOQ 2021 Report 2013LR80
	Die Shear	☐	MIL-STD-750 Test Method 2017				Reference to MOQ 2021 Report 2013LR80
Special Test Subgroup	Special Testing	☐	The Detail Specification				n.a. acc. Detail Spec.
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.