APPLICATION FOR EXTENSION OF ESCC QUALIFICATION APPROVAL

Page 1

Component Title: DIODES, MICROWAVE, SILICON,SCHOTTKY, GENERAL PURPOSE, BASED ON TYPES BAS40, BAS70, BXY42, BXY43, BXY44

Appl. No. 227J

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
5512/020 5513/017 5513/030	01, 03 01, 02 01, 02, 05, 06		BAS70, BAS40; BXY42; BXY43, BXY44	BXY43-T1(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: 1996

Certificate Ref No. 227, initial: Sept. 1996

5

ESCC Specifications used for Maintenance of qualification testing:

Generic: 5010 Issue: 3

Detail(s): 5513/030 Issue: 7

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:

2013LR70, 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
BXY42 - 44 Detail PID: A63500-D336-P000, Issue 4, 13.10.2021
BAS40 & 70 Detail PID: A63500-D329-P000, Issue 4, 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 of new variants

Page 1 bis

Component Title: DIODES, MICROWAVE, SILICON,SCHOTTKY, GENERAL PURPOSE, BASED ON TYPES BAS40-05, BAS70-04, BXY42-03, BXY43-09, BXY44-10

Appl. No. 227J

Executive Member: DLR Date: 22/10/2021

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

ESCC COMPONENT. NO.	VARIANTS	RANGE OF COMPONENTS	BASED ON	TEST VEHICLE / S	COMPONENT SIMILAR
5512/020	04 05		BAS70-04 BAS40-05	1735B 1735C	X
5513/017	03		BXY42-03	1732B	X
5513/030	09 10		BXY43-09 BXY44-10	1735D 1735A	X

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: Issue:

5512/020 6
5513/017 7
5513/030 7

5 Qualification Report Reference and date:

ESA1636LR10 Iss. 1a, Oct 2021
ESA1636LR11 Iss. 1a, Oct 2021
ESA1636LR12 Iss. 1, Aug 2021
ESA1636LR13 Iss. 1, Aug 2021
ESA1636LR14 Iss. 1a, Oct 2021

6 **PID** used for manufacturing Qualification Lot

Ref No: A63500-D336-P000_Detail_PID_BAS70_I3_signed
A63500-D329-P000_Detail_PID_BXY_I3_signed

Issue: 3, 3

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

Name of Executive Representative

Ref No: A63500-D336-P000_Detail_PID_BAS70_I4_signed
A63500-D329-P000_Detail_PID_BXY_I4_signed

Issue 4, 4

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: 10/11/2021

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 13:56:27 +01'00'

Date:

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

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

Tests conducted in compliance with:

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

Tests vehicle identification/description:

2013LR70, 2050B	BXY43-T1(ES), EnvMechSG, AssCapSG, DecapSG

Detail Specification reference: 5513/030

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	2050B	7	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	2050B	7	0	
	Seal Test	☒	MIL-STD-750 Test Method 1071	2050B	7	0	
	Electrical Measurements at Room Temp.	☒	Table 2 of the Detail Specification	2050B	7	0	
	External Visual Inspection	☒	ESCC Basic Specification No. 20500	2050B	7	0	
Endurance Subgroup	Operating Life	☐	MIL-STD-750 Test Method 1026				* 2050B: Former data from Wafer available
	Electrical Measurements during Endur. Test	☐	Table 6 of the Detail Specification				* 2050B: Former data from Wafer available
	External Visual Inspection	☐	ESCC Basic Specification No. 20500				* 2050B: Former data from Wafer available
Electrical Subgroup – Assembly Capability Tests	Solderability Test	☒	MIL-STD-750 Test Method 2026	2050B	3	0	
	Permanence of Marking	☐	ESCC Basic Specification No. 24800				n.a. due to laser marking
	Terminal Strength	☒	MIL-STD-750 Test Method 2036	2050B	3	0	
De-encapsulation Tests	Internal visual inspection	☒	ESCC Basic Specification No. 20400	2050B	6	0	
	Bond Strength	☒	MIL-STD-750 Test Method 2037	2050B	6	0	
	Die Shear	☒	MIL-STD-750 Test Method 2017	2050B	6	0	

* LAT2 on former assembly lots: on 7 different assembly lots of T1 package (with additional leads), the first Date Code 9124A, the last 0137A, all successfully passed.

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:

ESA1636LR10; 1735C ESA1636LR11; 1735B ESA1636LR12; 1732B ESA1636LR13; 1735D ESA1636LR14; 1735A	BAS40-05(ES), EnvMechSG, EndSG, DecapSG BAS70-04(ES), EnvMechSG, EndSG, DecapSG BXY42-03(ES), EnvMechSG, EndSG, DecapSG BXY43-09(ES), EnvMechSG, EndSG, DecapSG BXY44-10(ES), EnvMechSG, EndSG, DecapSG

Detail Specification reference: 5512/020; 5513/017; 5513/030

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	1735C 1735B 1732B 1735D 1735A	14 11 10 22 21	0 0 0 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	1735C 1735B 1732B 1735D 1735A	14 11 10 22 21	0 0 0 0 0	
	Seal Test	☒	MIL-STD-750 Test Method 1071	1735C 1735B 1732B 1735D 1735A	14 11 10 22 21	0 0 0 0 0	
	Electrical Measurements at Room Temp.	☒	Table 2 of the Detail Specification	1735C 1735B 1732B 1735D 1735A	14 11 10 22 21	0 0 0 0 0	
	External Visual Inspection	☒	ESCC Basic Specification No. 20500	1735C 1735B 1732B 1735D 1735A	14 11 10 22 21	0 0 0 0 0	
Endurance Subgroup	Operating Life	☒	MIL-STD-750 Test Method 1026	1735C 1735B 1732B 1735D 1735A	31 17 15 34 33	0 0 0 0 0	

	Electrical Measurements during Endur. Test	☒	Table 6 of the Detail Specification	1735C 1735B 1732B 1735D 1735A	31 17 15 34 33	0 0 0 0 0	
	Seal Test	☐	MIL-STD-750 Test Method 1071				n.a. no package change
	External Visual Inspection	☒	ESCC Basic Specification No. 20500	1735C 1735B 1732B 1735D 1735A	31 17 15 34 33	0 0 0 0 0	
Assembly Capability Subgroup	Solderability Test	☐	MIL-STD-750 Test Method 2026				Reference to MOQ 2021 Report: 2013LR70
	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: 2013LR70
De-encapsulation Tests	Internal visual inspection	☒	ESCC Basic Specification No. 20400	1735C 1735B 1732B 1735D 1735A	12 6 6 12 12	0 0 0 0 0	
	Bond Strength	☒	MIL-STD-750 Test Method 2037	1735C 1735B 1732B 1735D 1735A	12 6 6 12 12	0 0 0 0 0	
	Die Shear	☒	MIL-STD-750 Test Method 2017	1735C 1735B 1732B 1735D 1735A	12 6 6 12 12	0 0 0 0 0	
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.