APPLICATION FOR EXTENSION OF ESCC QUALIFICATION APPROVAL

Page 1

Component Title: TRANSISTORS, POWER, MOSFET, N-CHANNEL, RAD-HARDBASED ON TYPES BUY65CS08J, BUY65CS28A

Appl. No. 360B

Executive Member: German Space Agency at DLR Date: 19/10/2023

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
5205/033	01 02		BUY65CS08J-01 BUY65CS28A-01	BUY65CS08J-02 BUY65CS28A-01	X
				Additional test vehicle for extension MOQ see Annex 1	

2 Component Manufacturer

Infineon Technologies AG

3 Location of Manufacturing Plant(s)

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

4 Date of original qualification approval:

Date: 01/01/2020

Certificate Ref No. 360, initial: May 2020

5 ESCC Specifications used for Maintenance of qualification testing:

Generic: 5000 Issue: 10

Detail(s): 5205/031 Issue: 2

5205/033 2

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:

2236LR30, Iss. 1a, Sept 2023
2236LR20, Iss. 1a, Sept 2023

2117LR10, Iss. 1a, Sept 2023

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
Confidential:				

9 **PID** changes since start of qualification

None ☐

Minor* ☒

Major* ☐ *Provide details in box:

See Annex 2 / Confidential

10 Current **PID** Verified by: Burak Gökgöz, German Space Agency at DLR

Name of Excutive Representative

Generic PID: A63500-GEPID-P000, Issue 2h, 20.09.2023
Detail PID: A63500-L5491-P000, Issue 10, 21.03.2023

11 Current Manufacturing facilities surveyed by: Burak Gökgöz, German Space Agency at DLR on 19-20/09/2023

(Name of Executive Representative) (Date)

Satisfactory: Yes ☒ No ☐ Explain

Report Reference: INFINEON-AUD-DLR-09-2023

Addition new variants

Component Title: TRANSISTORS, POWER, MOSFET, N-CHANNEL, RAD-HARDBASED ON TYPES BUY65CS08J, BUY65CS28A

Executive Member: German Space Agency at DLR Date: 19/10/2023

Appl. No.

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

ESCC COMPONENT. NO.	VARIANTS	RANGE OF COMPONENTS	BASED ON	TEST VEHICLE / S	COMPONENT SIMILAR
5205/033	03 04		BUY65CS08J-02 BUY65CS28A-02	BUY65CS08J-02	X
				Additional test vehicle for new variants SPQ see Annex 1	

2 Component Manufacturer

Infineon Technologies AG

3 Location of Manufacturing Plant

Dresden, for Silicon
Neubiberg, Germany for packing and screening

4 ESCC Specification used for Qualification

Generic: 5000 Issue: 10
Detail/s: 5205/031 Issue: 2
5205/033 2

5 Qualification Report Reference and date:

2236LR20, Iss. 1a, Sept 2023

2117LR10, Iss. 1a, Sept 2023

6 **PID** used for manufacturing Qualification Lot

Generic PID: A63500-GEPID-P000, Issue 2h, 20.09.2023
Detail PID: A63500-L5491-P000, Issue 10, 21.03.2023

7 **PID** changes since start of qualification

None ☐

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

Major* ☐

8 Current **PID** Verified by Burak Gökgöz, German Space Agency at DLR

Name of Executive Representative

Generic PID: A63500-GEPID-P000, Issue 2h, 20.09.2023
Detail PID: A63500-L5491-P000, Issue 10, 21.03.2023

9 Current Manufacturing facilities surveyed by:

	Neubiberg	Dresden
Burak Gökgöz, German Space Agency at DLR	19-20/09/2023	27/06/2023
(Name of Executive Representative)	(Date)	(Date)

INFINEON-AUD-DLR-09-2023

Report Reference

Satisfactory: Yes ☒ No ☐ Explain

10 Quality and Reliability Data

Evaluation testing performed Yes ☐ No ☒

Report Ref. No.: Date:

Equivalent Data: Single Phase Qualification - component evaluation reports reviewed 21.03.2023
Visit Report: MoM Infineon On-Site Datareview.docx
Final Evaluation Report: EHC5CCS_12_RadHard_Evaluation-Test-Report_V1-02-05-2023.pdf

Certification:

Failure analysis, DPA, NCCS available Yes ☐ No ☒

(supply data)

Ref Nos. and purpose:

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:

Date:

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

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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.

Burak Goekgoez

Digital signiert von Burak Goekgoez
DN: C=DE, S=Nordrhein-Westfalen, L=Koeln, O=Deutsches Zentrum fuer Luft- und Raumfahrt e.V. (DLR), SN=Goekgoez, G=Burak, CN=Burak Goekgoez
Grund: Ich bin der Verfasser dieses Dokuments
Ort: Bonn
Datum: 2023.11.06 13:42:02+01'00'
Foxit PDF Editor Version: 13.0.0

Date: 06/11/2023

Burak Gökgöz, German Space Agency at DLR

(Signature of the Executive Coordinator)

Continuation of Boxes above:

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

18

Tests conducted in compliance with:

- ESCC 5000 generic specification; Chart F4A (for ESCC/QPL parts);
- or PID-TFD (for ESCC/QML parts)

Tests vehicle identification/description:

MoQ lot 1 MoQ lot 2	2236LR30_I1a, 2312A 2236LR20_I1a, 2248G	BUY65CS28A-01, EndSG BUY15CS57A-01, EnvMechSG
SPQ 1st qual lot	2117LR10_I1a, 2311A	BUY65CS08J-02, AssCapSG

Detail Specification reference: 5205/031; 5205/033

Chart F4A	Test	Tick when done	Conditions	Date Code	Tested Qty	N° of Rejects	Comments if not performed. Comments on Rejection
Environmental/Mechanical Subgroup	Mechanical shock	☒	MIL-STD-750 TM2016	2248G	17	0	
	Vibration	☒	MIL-STD-750 TM2056	2248G	17	0	
	Constant acceleration	☒	MIL-STD-750 TM2006	2248G	17	0	
	Seal Fine leak Gross leak	☒	MIL-STD-883 TM1014	2248G	17	0	See Appendix 'A' in ESCC Detail Specifications – Deviations from Chart F4A
	Electrical Measurement	☒	Intermediate and End-Point Electrical Measurements	2248G	17	0	
	External Visual	☒	ESCC Basic spec 20500	2248G	17	0	
	Thermal shock	☐	MIL-STD-750 TM1056				Temperature Cycling performed
	Temperature Cycling	☒	MIL-STD-883 TM1010	2248G	17	0	See Appendix 'A' in ESCC Detail Specifications – Deviations from Chart F4A
	Moisture Resistance	☒	MIL-STD-750 TM1021	2248G	17	0	
	Seal Fine leak Gross leak	☒	MIL-STD-883 TM1014	2248G	17	0	See Appendix 'A' in ESCC Detail Specifications – Deviations from Chart F4A
	Electrical Measurement	☒	Intermediate and End-Point Electrical Measurements	2248G	17	0	
	External Visual	☒	ESCC Basic spec 20500	2248G	17	0	
Endurance Subgroup	Operating Life	☒	ESCC 5000 Para. 8.19	2312A	16	0	
	Electrical Measurement	☒	Intermediate and End-Point Electrical Measurements	2312A	16	0	
	Seal Fine leak Gross leak	☒	MIL-STD-883 TM1014	2312A	16	0	See Appendix 'A' in ESCC Detail Specifications – Deviations from Chart F4A
	External Visual Inspection	☒	ESCC Basic spec 20500	2312A	16	0	
Assembly Capability Subgroup	Permanence of Marking	☐	ESCC Basic Spec 24800				n.a. due to laser marking
	Terminal Strength	☐	ESCC 5000 Para. 8.18				N/A acc. ESCC Det. Spec 5205/033 §§ 2.1.1.2
	Internal Visual	☒	ESCC Basic Spec 20400	2311A	7	0	
	Bond Strength	☒	MIL-STD-750 TM 2037	2311A	7	0	
	Die Shear	☒	MIL-STD-750 TM 2017	2311A	7	0	
Additional Tests	Internal Gas Analyse	☒	MIL-STD-883 TM 2036	2311A	6	0	On BUY65CS08J-02 Report: 2117LR10:I1a

ANNEX 1: LIST OF TESTS DONE TO SUPPORT **NEW** OF QUALIFICATION

18

Tests conducted in compliance with:

- ESCC 5000 generic specification; Chart F4A (for ESCC/QPL parts);
- or PID-TFD (for ESCC/QML parts)

Tests vehicle identification/description:

MoQ lot 2	2236LR20_l1a, 2248G	BUY15CS57A-01, EnvMechSG
SPQ 1st qual lot	2117LR10_l1a, 2311A	BUY65CS08J-02, EndSG, AssCapSG

Detail Specification reference: 5205/031; 5205/033

Chart F4A	Test	Tick when done	Conditions	Date Code	Tested Qty	N° of Rejects	Comments if not performed. Comments on Rejection
Environmental/Mechanical Subgroup	Mechanical shock	☒	MIL-STD-750 TM2016	2248G	17	0	
	Vibration	☒	MIL-STD-750 TM2056	2248G	17	0	
	Constant acceleration	☒	MIL-STD-750 TM2006	2248G	17	0	
	Seal Fine leak Gross leak	☒	MIL-STD-883 TM1014	2248G	17	0	See Appendix 'A' in ESCC Detail Specifications – Deviations from Chart F4A
	Electrical Measurement	☒	Intermediate and End-Point Electrical Measurements	2248G	17	0	
	External Visual	☒	ESCC Basic spec 20500	2248G	17	0	
	Thermal shock	☐	MIL-STD-750 TM1056				Temperature Cycling performed
	Temperature Cycling	☒	MIL-STD-883 TM1010	2248G	17	0	See Appendix 'A' in ESCC Detail Specifications – Deviations from Chart F4A
	Moisture Resistance	☒	MIL-STD-750 TM1021	2248G	17	0	
	Seal Fine leak Gross leak	☒	MIL-STD-883 TM1014	2248G	17	0	See Appendix 'A' in ESCC Detail Specifications – Deviations from Chart F4A
	Electrical Measurement	☒	Intermediate and End-Point Electrical Measurements	2248G	17	0	
	External Visual	☒	ESCC Basic spec 20500	2248G	17	0	
Endurance Subgroup	Operating Life	☒	ESCC 5000 Para. 8.19	2311A	17	0	
	Electrical Measurement	☒	Intermediate and End-Point Electrical Measurements	2311A	17	0	
	Seal Fine leak Gross leak	☒	MIL-STD-883 TM1014	2311A	17	0	See Appendix 'A' in ESCC Detail Specifications – Deviations from Chart F4A
	External Visual Inspection	☒	ESCC Basic spec 20500	2311A	17	0	
Assembly Capability Subgroup	Internal Gas Analysis	☒	MIL-STD-883 TM1018	2311A	6	0	IVA® Test Report 027213 Date: 09/05/2023
	Permanence of Marking	☐	ESCC Basic Spec 24800				n.a. due to laser marking
	Terminal Strength	☐	ESCC 5000 Para. 8.18				N/A acc. ESCC Det. Spec 5205/033 §§ 2.1.1.2
	Internal Visual	☒	ESCC Basic Spec 20400	2311A	7	0	
	Bond Strength	☒	MIL-STD-750 TM 2037	2311A	7	0	
	Die Shear	☒	MIL-STD-750 TM 2017	2311A	7	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.