



APPLICATION FOR EXTENSION OF ESCC QUALIFICATION APPROVAL

Component Title: TRANSISTORS, POWER, MOSFET, N-CHANNEL, RAD-HARDBASED ON TYPES BUY15CS23J, BUY15CS23K, BUY15CS45B, BUY15CS57A
Executive Member: German Space Agency at DLR Date: 19/10/2023

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Appl. No. 339D

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

Table with 6 columns: ESCC COMPONENT NO., VARIANTS, RANGE OF COMPONENTS, BASED ON, TEST VEHICLE / S, COMPONENT SIMILAR. Row 1: 5205/031, 01-04, BUY15CS23J-01 to BUY15CS45B-01, BUY15CS57A-01, X.

Component Manufacturer: Infineon Technologies AG (2). Location of Manufacturing Plant(s): Villach, Austria for Silicon; Neubiberg, Germany for packing and screening (3). Date of original qualification approval: 01/01/2016 (4). Certificate Ref No. 339, initial: May 2016.


ESCC Specifications used for Maintenance of qualification testing (5). Deviations to LVT testing and Detail Specification used (6). Qualification Extension Report reference and date: 2236LR20, 2236LR30, 2117LR10, 2117LR13, 2117LR14 (7).

Summary of procurement or equivalent test results during current validity period in support of this application (those to ESCC listed first)

Table with 5 columns: Project Name, Testing Level, LAT, Date code, Quantity Delivered. All cells are empty.

PID changes since start of qualification (9). Current PID Verified by: Burak Gökgöz, German Space Agency at DLR (10). Name of Executive Representative: Burak Gökgöz. Generic PID: A63500-GEPID-P000, Issue 2h, 20.09.2023. Detail PID: A63500-L5491-P000, Issue 10, 21.03.2023.

Current Manufacturing facilities surveyed by: Burak Gökgöz, German Space Agency at DLR on 19-20/09/2023 (11). Satisfactory: Yes (checked), No, Explain. Report Reference: INFINEON-AUD-DLR-09-2023.

		<b>Addition new variants</b> Component Title: TRANSISTORS, POWER, MOSFET, N-CHANNEL, RAD-HARDBASED ON TYPES BUY15CS23J, BUY15CS23K, BUY15CS45B, BUY15CS57A Executive Member: German Space Agency at DLR Date: 19/10/2023				Page 1 Appl. No.	
		Components (including series and families) submitted for Qualification Approval <span style="float: right;">1</span>					
ESCC COMPONENT. NO.	VARIANTS	RANGE OF COMPONENTS	BASED ON	TEST VEHICLE / S	COMPONENT SIMILAR		
5205/031	05 06 07 08		BUY15CS23J-02 BUY15CS57A-02 BUY15CS23K-02 BUY15CS45B-02	BUY15CS57A-01 BUY15CS57A-02	X		
				Additional test vehicle for new variants SPQ see Annex 1			
Component Manufacturer Infineon Technologies AG <span style="float: right;">2</span>		Location of Manufacturing Plant Dresden, for Silicon Neubiberg, Germany for packing and screening <span style="float: right;">3</span>		ESCC Specification used for Qualification <span style="float: right;">4</span>			
				Generic: 5000 Issue: 10 Detail/s: 5205/030 Issue: 3 5205/031           2 5205/032           3 5205/033           2			
Qualification Report Reference and date: 2236LR20, Iss. 1a, Sept 2023  2117LR10, Iss. 1a, Sept 2023 2117LR12, Iss. 1a, Sept 2023 2117LR13, Iss. 1b, Sept 2023 2117LR14, Iss. 1a, Sept 2023 <span style="float: right;">5</span>			PID used for manufacturing Qualification Lot <span style="float: right;">6</span>				
PID changes since start of qualification <span style="float: right;">7</span>  None <input type="checkbox"/>  Minor* <input checked="" type="checkbox"/> (* Details not published, provided in confidential annex 2.)  Major* <input type="checkbox"/>			Current PID Verified by <u>Burak Gökgöz, German Space Agency at DLR</u> <span style="float: right;">8</span>  Name of Executive Representative Generic PID: A63500-GEPID-P000, Issue 2h, 20.09.2023 Detail PID: A63500-L5491-P000, Issue 10, 21.03.2023				
Current Manufacturing facilities surveyed by:  Burak Gökgöz, German Space Agency at DLR		Neubiberg  <u>19-20/09/2023</u>		Dresden  <u>27/06/2023</u>		9	
(Name of Executive Representative)  INFINEON-AUD-DLR-09-2023		(Date)		(Date)			
Report Reference							
Satisfactory: Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Explain							
Quality and Reliability Data			10				
Evaluation testing performed Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>			Failure analysis, DPA, NCCS available Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				
Report Ref. No.: _____ Date: _____			(supply data)				
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:			Ref Nos. and purpose:				



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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

	<p style="text-align: center;"><b>APPLICATION FOR EXTENSION OF ESCC QUALIFICATION APPROVAL</b></p> <p>Component title: TRANSISTORS, POWER, MOSFET, N-CHANNEL, RAD-HARDBASED ON TYPES BUY15CS23J, BUY15CS23K, BUY15CS45B, BUY15CS57A</p> <p>Executive Member: German Space Agency at DLR      Date: 19/10/2023</p>	<p>Page 2</p> <p>Appl. No. 339D</p>
<p>Failure Analysis, DPA, NCCS available:    Yes    <input type="checkbox"/>    No    <input checked="" type="checkbox"/>    (Supply data) <span style="float: right;">12</span></p> <p>Ref. No's and purposes:</p>		
<p>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. <span style="float: right;">13</span></p> <div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="text-align: center;"> <p><b>Burak Goekgoez</b></p> <p>ez P</p> </div> <div style="font-size: small;"> <p>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 13:38:54 +01'00'</p> </div> <div style="text-align: right;"> <p><u>Burak Gökgöz, German Space Agency at DLR</u> (Signature of the Executive Coordinator)</p> </div> </div> <p>Date: 06/11/2023 <span style="float: right;">Foxit PDF Editor Version: 13.0.0</span></p>		
<p>Continuation of Boxes above: <span style="float: right;">14</span></p>		





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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 F4A (for ESCC/QPL parts);
- or PID-TFD (for ESCC/QML parts)

Tests vehicle identification/description:

MoQ lot 1	2236LR30_I1a, 2312A	BUY65CS28A-01, EndSG
MoQ lot 2	2236LR20_I1a, 2248G	BUY15CS57A-01, EnvMechSG
SPQ 1st qual lot	2117LR10_I1a, 2311A	BUY65CS08J-02, AssCapSG
SPQ 4th qual lot	2117LR13_I1b, 2234A	BUY06CS45B-02, AssCapSG
SPQ 5th qual lot	2117LR14_I1a, 2243F	BUY25CS12K-02, EnvMechSG

Detail Specification reference: 5205/030; 5205/031; 5205/32; 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	<input checked="" type="checkbox"/>	MIL-STD-750 TM2016	2248G 2243F	17 17	0 0	
	Vibration	<input checked="" type="checkbox"/>	MIL-STD-750 TM2056	2248G 2243F	17 17	0 0	
	Constant acceleration	<input checked="" type="checkbox"/>	MIL-STD-750 TM2006	2248G 2243F	17 17	0 0	
	Seal Fine leak Gross leak	<input checked="" type="checkbox"/>	MIL-STD-883 TM1014	2248G 2243F	17 17	0 0	See Appendix 'A' in ESCC Detail Specifications – Deviations from Chart F4A
	Electrical Measurement	<input checked="" type="checkbox"/>	Intermediate and End-Point Electrical Measurements	2248G 2243F	17 17	0 0	
	External Visual	<input checked="" type="checkbox"/>	ESCC Basic spec 20500	2248G 2243F	17 17	0 0	
	Thermal shock	<input type="checkbox"/>	MIL-STD-750 TM1056				Temperature Cycling performed
	Temperature Cycling	<input checked="" type="checkbox"/>	MIL-STD-883 TM1010	2248G 2243F	17 17	0 0	See Appendix 'A' in ESCC Detail Specifications – Deviations from Chart F4A
	Moisture Resistance	<input checked="" type="checkbox"/>	MIL-STD-750 TM1021	2248G 2243F	17 17	0 0	
	Seal Fine leak Gross leak	<input checked="" type="checkbox"/>	MIL-STD-883 TM1014	2248G 2243F	17 17	0 0	See Appendix 'A' in ESCC Detail Specifications – Deviations from Chart F4A
	Electrical Measurement	<input checked="" type="checkbox"/>	Intermediate and End-Point Electrical Measurements	2248G 2243F	17 17	0 0	
	External Visual	<input checked="" type="checkbox"/>	ESCC Basic spec 20500	2248G 2243F	17 17	0 0	
Endurance Subgroup	Operating Life	<input checked="" type="checkbox"/>	ESCC 5000 Para. 8.19	2312A	16	0	
	Electrical Measurement	<input checked="" type="checkbox"/>	Intermediate and End-Point Electrical Measurements	2312A	16	0	
	Seal Fine leak Gross leak	<input checked="" type="checkbox"/>	MIL-STD-883 TM1014	2312A	16	0	See Appendix 'A' in ESCC Detail Specifications – Deviations from Chart F4A
	External Visual Inspection	<input checked="" type="checkbox"/>	ESCC Basic spec 20500	2312A	16	0	
Assembly Capability Subgroup	Permanence of Marking	<input type="checkbox"/>	ESCC Basic Spec 24800				n.a. due to laser marking
	Terminal Strength	<input type="checkbox"/>	ESCC 5000 Para. 8.18	2311A			N/A acc. ESCC Det. Spec 5205/033 §§ 2.1.1.2
	Terminal Strength	<input checked="" type="checkbox"/>	ESCC 5000 Para. 8.18	2234A	6	0	
	Internal Visual	<input checked="" type="checkbox"/>	ESCC Basic Spec 20400	2311A 2234A	7 6	0 0	
	Bond Strength	<input checked="" type="checkbox"/>	MIL-STD-750 TM 2037	2311A 2234A	7 6	0 0	
	Die Shear	<input checked="" type="checkbox"/>	MIL-STD-750 TM 2017	2311A 2234A	7 6	0 0	
Additional Tests	Internal Gas Analyse	<input checked="" type="checkbox"/>	MIL-STD-883 TM 2036	2311A	6	0	On BUY65CS08J-02 Report: 2117LR10:11a



**Addition new variants**

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SPQ 3rd qual lot	2117LR12_11a, 2234B	BUY15CS57A-02, EndSG
SPQ 4th qual lot	2117LR13_11b, 2234A	BUY06CS45B-02, AssCapSG
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	Thermal shock	<input type="checkbox"/>	MIL-STD-750 TM1056				Temperature Cycling performed
	Temperature Cycling	<input checked="" type="checkbox"/>	MIL-STD-883 TM1010	2248G 2243F	17 17	0 0	See Appendix 'A' in ESCC Detail Specifications – Deviations from Chart F4A
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Endurance Subgroup	Operating Life	<input checked="" type="checkbox"/>	ESCC 5000 Para. 8.19	2234B	17	0	
	Electrical Measurement	<input checked="" type="checkbox"/>	Intermediate and End-Point Electrical Measurements	2234B	17	0	
	Seal Fine leak Gross leak	<input checked="" type="checkbox"/>	MIL-STD-883 TM1014	2234B	17	0	See Appendix 'A' in ESCC Detail Specifications – Deviations from Chart F4A
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Assembly Capability Subgroup	Permanence of Marking	<input type="checkbox"/>	ESCC Basic Spec 24800				n.a. due to laser marking
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	Terminal Strength	<input checked="" type="checkbox"/>	ESCC 5000 Para. 8.18	2234A	6	0	
	Internal Visual	<input checked="" type="checkbox"/>	ESCC Basic Spec 20400	2311A 2234A	7 6	0 0	
	Bond Strength	<input checked="" type="checkbox"/>	MIL-STD-750 TM 2037	2311A 2234A	7 6	0 0	
	Die Shear	<input checked="" type="checkbox"/>	MIL-STD-750 TM 2017	2311A 2234A	7 6	0 0	
Additional Tests	Internal Gas Analyse	<input checked="" type="checkbox"/>	MIL-STD-883 TM 2036	2311A	6	0	On BUY65CS08J-02 Report: 2117LR10:11a





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Component title: TRANSISTORS, POWER, MOSFET, N-CHANNEL,  
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Appl. No.

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

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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.